INDUSTRIAL AND COMMERCIAL IOT DEVICES AND PLATFORM

FIOT

Wi-Fi and GSM IoT controllers and sensors for load control, cold chain, water quality, asset tracking and personal safety, an industrial edge gateway, AI condition monitoring and the FIoT platform.

Complete | v1.0 | cutoff 2026-09-15 | Session 6 · FIOT | India · Saudi Arabia · GCC · Europe

Pilot first

Confidence medium

57/100

Grow FIoT as a component business: sell controller design to OEMs and a bank-site kit through existing e-surveillance integrators now, validate one calibrated 4G cold-chain module, and bundle or retire the rest of the catalogue.

8 units
FIoT-branded units sold in two years (vs 1,000+ OEM cards)
Rax-supplied | S2

228 ₹ Cr
Serviceable market 2026, of a ₹926 Cr total
Estimated | S2 | S78 | S253 | S132

134.7 million
M2M cellular connections, India, June 2026
Verified | S31 | S29

AT A GLANCE

1. FIoT sells today only as components: 1,000+ controller cards to water-treatment OEMs and 100 Energy Gateways to an integrator, against eight branded sensors in two years. Rax-supplied | S2
2. Bank e-surveillance RFPs already price AC control and power sensing as line items, so Rax's integrator accounts are a real but narrow cross-sell route on a shrinking ATM base. Verified | S249 | S253
3. No FIoT model has a certificate, a tolerance-level specification or a public reference, and two datasheets claim CE certification that is not held. Rax-supplied | S3 | S5
4. Buyers complain about devices that go silent and data trapped in vendor portals; 4G, uptime reporting and open data export matter more than features. Verified | S216 Publicly observed | S106 | S96
5. Serviceable demand is about ₹228 Cr in 2026; growth is limited by Rax's engineering and sales capacity, reaching about ₹8 Cr by 2031 in the base case. Estimated | S2 | S3

00 Verdict

KEY TAKEAWAYS

- Decision: grow FIoT as a component business now (OEM controller design and a bank-site kit through existing e-surveillance integrators), validate one calibrated 4G cold-chain module before selling it, and bundle or retire the rest of the catalogue. Recommendation
- Classification Pilot first, score 57 of 100, confidence medium: demand and fit are real, readiness is weak (5 of 15) because no model has a certificate, a tolerance-level specification or a public reference. Estimated S2 S3 S4
- Every FIoT rupee in the order book came through an OEM or an integrator that already bought from Rax; eight branded sensors were sold in two years against more than 1,000 controller cards. Rax-supplied S2
- Serviceable demand is about ₹228 Cr in 2026 of a ₹926 Cr total; the constraint is Rax's capacity, not the market. Estimated S2 S78 S253

The decision

Rax has made FIoT a strategic priority. Rax-supplied S3 The evidence supports growing it, but not as a thirteen-model catalogue sold to end users. Grow it as engineering sold inside other companies' products and contracts: connected controller cards and design fees for Indian equipment OEMs, and an AC, power and temperature kit that Rax's e-surveillance integrators bid to banks as a rental. In parallel, validate one calibrated 4G cold-chain module with a refrigeration OEM and a 20-unit Chennai pilot. Retire or fold the rest. The classification is Pilot first at 57 of 100 with medium confidence; three facts drove it: the OEM card business already repeats, bank RFPs already contain the kit's line items, and no FIoT model is ready for a regulated end user. Rax-supplied S2 Verified S249 S42 Recommendation

Five findings that matter

First, FIoT only sells as a component. The order book shows 500 softener cards each to Ion Exchange and Nuetech at ₹4,600, vending cards to SSP at ₹5,940, robot cards to Inforob and 100 Energy Gateway units to ANG, against four THAPS and four THOPS sensors to APAR at ₹6,000. No catalogue model other than THAPS and THOPS has an invoice, a tender award or a public deployment. Rax-supplied S2 Unknown

Second, the e-surveillance cross-sell is real but narrow. Central Bank of India's RFP for 3,000 ATM sites listed thermal sensing, mains and UPS sensing and optional remote AC control priced as a monthly rental, and RBI's July 2026 directions require banks to monitor environmental breaches at data-centre and DR sites. But the ATM estate fell to 2,51,057 in March 2025, specialist ATM site-monitoring vendors already exist, and the integrator decides whether to bid the line. Verified S249 S255 Publicly observed S253 S251

Third, readiness is the gap, and part of it is self-inflicted. No FIoT model holds WPC ETA, MTCTE or CE; two datasheets nevertheless print a CE claim, and they claim no field calibration is ever needed, which conflicts with CDSCO's expectation of calibrated cold-chain monitors. Fixing the claims costs nothing; an ETA self-declaration costs ₹10,000 a model. Rax-supplied S3 S5 S6 Verified S42 S169

Fourth, buyers want uptime and open data, not features. The signals are about devices that go offline daily on Wi-Fi, solar pump monitors of which only 446 of 1,306 still transmitted, and data trapped in controller makers' portals. Nine of thirteen FIoT models are Wi-Fi only, and the platform layer is priced at $149 a month for 100 devices on ThingsBoard, so RT-SW-FIOT should be a free white-label layer with open export, not a product. Publicly observed S106 Verified S216 S108 Rax-supplied S4

Fifth, the market is bigger than Rax can serve. The four addressable families total about ₹926 Cr a year in 2026 and Rax can serve about ₹228 Cr, but with two salespeople and a booked hardware team it can obtain about ₹0.8 Cr in 2026 and about ₹8 Cr by 2031 if it wins one OEM design-in a quarter. Estimated S2 S3

Three numbers to remember

NUMBER	WHAT IT IS	WHY IT CHANGES THE DECISION
8 units	FIoT-branded units invoiced in FY2024-25 and FY2025-26	The catalogue has not been validated by the market; the component business has Rax-supplied S2
₹228 Cr	Serviceable market in 2026, of a ₹926 Cr total	Demand is not the constraint; engineering and sales capacity are Estimated S2 S78 S253
134.7 million	M2M cellular connections in India in June 2026, from 52.3 million in May 2024	Connected devices have standardised on cellular; Wi-Fi-only designs belong inside OEM products, not on bank or pharmacy sites Verified S31 S29

Model dispositions

Invest: RT-DFI-G (4G cold-chain module), RT-IEI-E-G0 (as the kit and OEM reference board), RT-RMC-GX (per the rack-monitoring report). Bundle: RT-DFI-W, RT-RC03-W, RT-LS08-W, RT-Z01-W, RT-Z03-W and the RT-SW-FIOT platform. Retire as catalogue SKUs: RT-RC01-W, RT-WQF-W, RT-ATU-W, RT-SOS-G. Unknown and frozen: RT-ICM, to be retired by March 2027 unless a datasheet and a field trial exist. Recommendation

SO WHAT FOR RAX

Put FIoT's engineering time where purchase orders already arrive, fix the datasheet claims this month, and let OEMs and integrators carry the brand until Rax has a reliability record it can publish. Recommendation

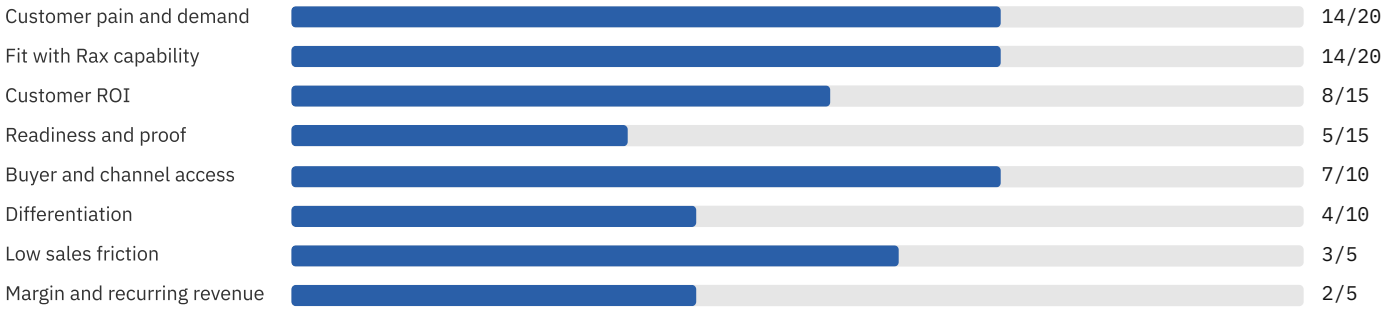
What would change the verdict

Up to Sell now: two new OEM design agreements and an integrator rate card signed by mid-2027, with 97% data availability on installed units and a costed hardware margin of 45% or more. Down to Validate before selling: the reliability audit of ANG and APAR units shows chronic failures, or Ion Exchange and Nuetech stop reordering. Down to Bundle: no integrator will bid the kit and the cold-chain pilot yields no paying reference, leaving FIoT as engineering inside ZenCampus, rack monitoring and OEM work only. Recommendation

The first ninety days

ACTION	OWNER	MEASURABLE RESULT
Withdraw CE and no-calibration claims; publish corrected datasheets	Quality head	Revised datasheets live
Volume and design-agreement reviews with Ion Exchange, Nuetech, SSP, Inforob	Sales (OEM)	Two forecasts, one signed design agreement
Reliability audit of installed ANG and APAR units	Service lead	Report shared with both integrators
Build and price the bank-site kit	Engineering and software	LOI for a 20-site paid pilot
Calibrated 4G DFI-G, ETA filing, OEM sample	Engineering and Quality	ETA acknowledgement; OEM trial accepted
Costed BOM for five products	Finance	Margin table

Sources: section 12 plan. Recommendation



Scorecard, 57 of 100

DIMENSION	SCORE	RATIONALE
Customer pain and demand	14/20	Documented, budgeted needs exist in every recommended family: OEMs are paying for connected controller cards, bank e-surveillance RFPs price AC control and power sensing, PM-KUSUM mandates remote monitoring and CDSCO asks for calibrated cold-chain monitors. Demand is for outcomes and components, not for a branded catalogue, which caps the score. Verified S2 S249 S213 S42 S31
Fit with Rax capability	14/20	Rax designs and manufactures in Chennai with an ISO 9001 scope that names IoT products and custom design, runs a proven OEM card business and has free software bandwidth; hardware and firmware engineering is booked and no radio, telecom or CE certificate is held. Rax-supplied S3 S2
Customer ROI	8/15	OEM buyers see the ROI inside their own product and reorder; end-user ROI is unquantified because no FIoT deployment has a measured outcome, and buyer evidence warns that pilots often prove nothing. Estimated S2 S163
Readiness and proof	5/15	OEM cards ship in hundreds and eight FIoT-branded units were invoiced; eleven of thirteen models have no specification with tolerances, none has a certificate or public reference, RT-ICM has no datasheet and the platform is undocumented. Rax-supplied S2 S4 S5 S14
Buyer and channel access	7/10	Existing OEM and e-surveillance integrator accounts give direct access to the two top segments without new prospecting; two salespeople and failed channel and digital marketing efforts limit anything beyond them. Rax-supplied S3 S2
Differentiation	4/10	Local design, firmware changes and a price inside the ₹3,450 to ₹5,940 band differentiate the OEM offer; branded devices sit between the Shenzhen floor and certified Indian and imported systems with no defensible difference. Publicly observed S2 S102 S82 S233

DIMENSION	SCORE	RATIONALE
Low sales friction	3/5	OEM and integrator sales ride existing purchase relationships and take three to six months; cold-chain and scheme routes add calibration, validation and tender steps. Inferred
Margin and recurring revenue	2/5	COGS is unknown for every model and recurring revenue is limited to possible rentals and app fees; OEM boards are one-off hardware sales. Unknown

01 Product truth

KEY TAKEAWAYS

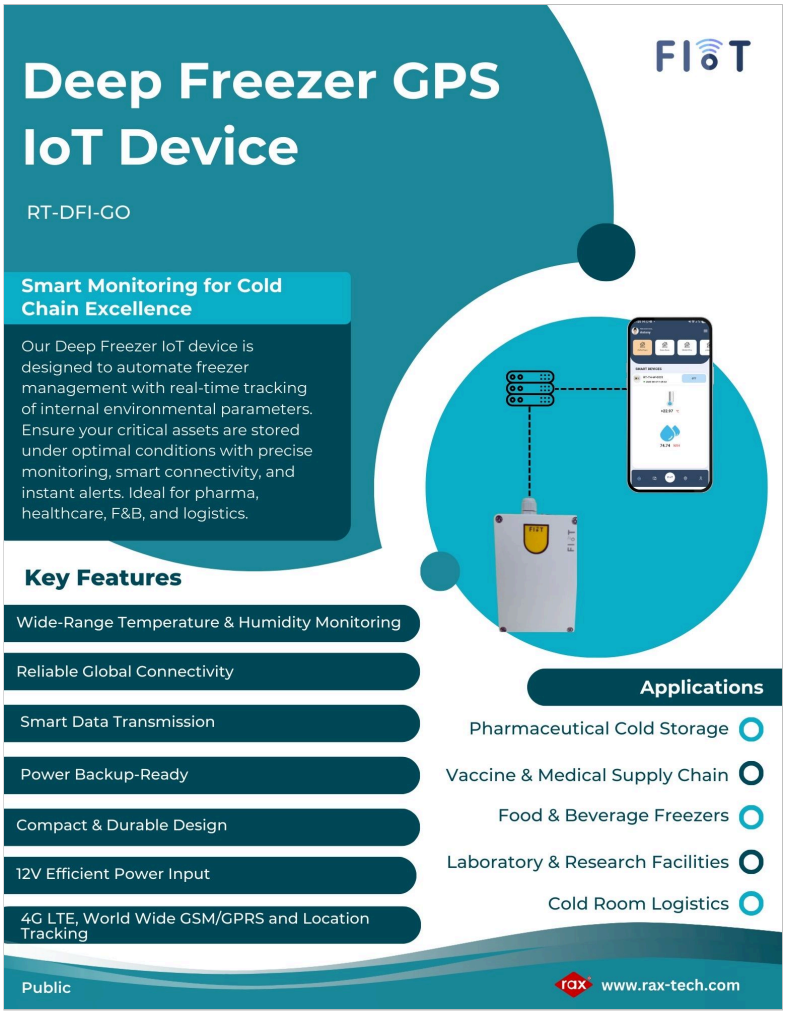
- Thirteen catalogue models exist, but the order book shows only eight FIoT-branded units ever invoiced (THAPS and THOPS to APAR Innosys at ₹6,000 each, November 2025); every other model is catalogue-only as far as the record shows. Rax-supplied | S1 | S2
- The one IoT hardware Rax actually ships in volume is unbranded OEM boards: 1,000 water-softener controller cards for Ion Exchange and Nuetech at ₹4,600, 100 Energy Gateway units for ANG at ₹3,450 to ₹3,900, vending and solar-robot cards. Rax-supplied | S2
- Only two of the thirteen models have a technical datasheet (edge gateway, SOS device); the rest have one-page flyers with features but no accuracy, range, ingress or safety figures. Rax-supplied | S4 | S5 | S6
- Datasheets print "CE certified, RoHS compliant" while the verified internal record says CE is not held; no BIS CRS, WPC ETA or MTCTE certificate exists for any FIoT model. Rax-supplied | S3 | S5 | S6
- The July 2026 Saudi dossiers reached the same conclusion for every model: no independently verified performance, conformity, cybersecurity or reference evidence; the India view inherits every one of those gaps. Rax-supplied | S13

What the catalogue says ships

The product master lists thirteen FIOT models and one platform. Grouped by the buyer they would serve, they fall into seven families, and the grouping matters more than the model numbers because each family has a different regulator, competitor set and price band.
Rax-supplied | S1 Inferred

FAMILY	MODELS	WHAT THE FLYER OR DATASHEET CLAIMS	EVIDENCE OF SHIPMENT
Energy and load control	RT-RC01-W (1 channel, 20 A on the site, 40 A on the flyer), RT-RC03-W (3 channel, 5 A), RT-LS08-W (8 CT channels)	App control of lights, fans and ACs; load monitoring per channel	None invoiced under these codes; "Energy Gateway" boards sold to ANG Rax-supplied | S2 | S4 | S8
Cold chain	RT-DFI-W (Wi-Fi), RT-DFI-G (4G GSM with GPS)	Temperature and humidity, instant alerts, 5 V or 12 V input, power-backup-ready	None Rax-supplied | S2 | S4
Water and utilities	RT-WQF-W (pH, ORP, pulse flow)	OLED, onboard calibration, cloud and app	None as a catalogue unit; 1,000 custom softener cards shipped Rax-supplied | S2 | S4 | S12
Machine and asset monitoring	RT-ATU-W (5 A plug-through CT), RT-ICM (AI motor and pump monitoring)	Running-status and utilisation; MCSA-style diagnostics	None; RT-ICM has no datasheet at all Rax-supplied | S1 | S4 | S17
Digital input and alerting	RT-Z01-W (1 input), RT-Z03-W (3 inputs with feedback)	MQTT, API output, panic and QC use	None Rax-supplied | S4
Personal safety	RT-SOS-G (GPRS SOS with SMS, voice call, GPS)	3-press SOS, two contacts, 15-day standby, OTA	None Rax-supplied | S2 | S6
Industrial data acquisition	RT-IEI-E-G0 (Ethernet, Wi-Fi, LoRa or 4G variants)	4 DI, 2 relay DO, 2 AI, 1 AO, RS-485, MQTT	None Rax-supplied | S2 | S5
Platform	RT-SW-FIOT platform and FIOT app, shared with HSE THAPS, THOPS, SOS and Wi-Fi clock	Cloud server, mobile app, device list, alerts	App screenshots on every flyer; 8 THAPS and THOPS units invoiced Rax-supplied | S2 | S4 | S9 | S10

The rack monitoring controller RT-RMC-GX sits in the same catalogue but is a different business: it is the largest account of FY2025-26 (FUJI, ₹1.75 Cr) and has its own report in this programme; this report cross-references it only where it shares the platform or the buyer.
Rax-supplied | S3 Recommendation



The RT-DFI-G flyer, January 2026: the product claim is temperature and humidity monitoring with 4G and location tracking, but the flyer carries no accuracy, range, logging interval or battery figure, and it labels the Wi-Fi and GSM variants with the same code. Source S4 S15

What is verified versus claimed

Nothing about any FIoT model is independently verified. The internal record is unambiguous on the certification position: ISO 9001:2015 from Bureau Veritas is held since 22 September 2025 with a scope that names IoT products and customised hardware and software design; ZED Silver is held; BIS CRS is applied for and in process; RoHS is claimed; TEC MTCTE, CE, UL and SABER are not held. Rax-supplied S3 The two technical datasheets nevertheless print "CE certified, RoHS compliant, ISO 9001:2015" on their certification line, which a European or GCC buyer would read as a declaration of conformity and could later test. Rax-supplied S5 S6 The Saudi research recorded the same discrepancy for the rack controller and asked for the underlying certificates; none were supplied. Rax-supplied S19

The edge gateway datasheet is the most complete document in the line and is still short of what an industrial buyer asks for: it gives I/O counts, protocols and a 9 to 36 V DC supply, but no CPU, memory, tag limits, Modbus register capacity, operating temperature, EMC standard, surge rating, TLS or certificate handling, offline buffer size or secure-boot statement. Rax-supplied S5 The Saudi dossier listed those same unknowns as the reason the gateway cannot be sold as a generic gateway until a hardware matrix is published. Rax-supplied S16

Technical Data Sheet

Industrial Edge IOT Gateway

Product Specification

Digital Input	4 Zones
Digital Output	2 no's of potential Relay output 230VAC, 3A
Analog Input	2 no's of 4 - 20 mA
Analog Output	1 no's of 4 - 20 mA
PWM Output	1 Channel
Communication	Rs 485
Communication Protocol Supported	MQTT or TCP or HTTP
LORA	Class A,B, and C of LORA WAN 1.0.3 Specification
Ethernet	RJ 45 10/100 Mbs
WiFi	IEEE 802.11 b/g/n, 1x1, 20MHZ Channel, Bandwidth 2.4 GHZ
GPRS	4G
Bluetooth	BLE 4.0
Operating Voltage	9-36VDC
Enclosure	Compact ABS Enclosure, IP65

Product Selection

Type	Description
RT-IEI-ET-GO	Industrial Edge IOT device - Ethernet
RT-IEI-W-GO	Industrial Edge IOT device - WiFi
RT-IEI-LO-GO	Industrial Edge IOT Device - LORA
RT-IEI-GS-G0	Industrial Edge IOT Device - GPRS

RTS-IEI-XX-G0-R02 www.rax-tech.com 2

Confidential

Specification table of the RT-IEI-XX-G0 datasheet, revision 02 of 14 July 2025: four digital inputs, two relay outputs, two 4-20 mA inputs, RS-485, LoRaWAN 1.0.3, Wi-Fi 2.4 GHz, 4G, BLE 4.0 and an IP65 ABS enclosure; no processor, memory, temperature range or security parameters. Source S5

The cold-chain flyers are the weakest relative to their regulated market. Both freezer variants are labelled RT-DFI-GO on the flyer while the site calls them RT-DFI-W and RT-DFI-G; the Wi-Fi flyer also claims worldwide GSM and location tracking. No accuracy, probe type, calibration traceability, logging interval, memory, alarm delay or battery backup is stated. Rax-supplied S4 S8 Rax-supplied S15 A pharmacy, blood bank or vaccine store buying under CDSCO Good Distribution Practice needs calibrated equipment checked at defined intervals with records kept for shelf life plus one year; the flyer cannot be used to answer any of those questions. Verified S42

The SOS device datasheet is specific on the user-facing behaviour (three presses, two contacts, SMS plus voice call with a recorded message, 15-day standby, 45-minute charge, GPS position in the alert, OTA update) but silent on the things a safety programme buyer checks: the cellular module and its certification, the fall-back when GPRS is unavailable, tamper and low-battery reporting, and where the tracking software stores location data. Rax-supplied S6 Location and emergency-contact data of women, children and elders is personal data under the Digital Personal Data Protection Act, whose Rules were notified on 14 November 2025 with penalties up to ₹250 Cr for failing reasonable security safeguards; the datasheet does not mention the Act. Verified S67

The AI condition-monitoring model RT-ICM has no datasheet, flyer or price. The Saudi dossier could verify only that the product identity exists in the catalogue and placed it against Samotics, Artesis, ABB and SKF, all of which publish measurement principles and case studies. Rax-supplied S17 Until Rax publishes what the device measures (current signature at the MCC or vibration at the asset), what faults it claims to detect and on what evidence, RT-ICM should be treated as a concept, not a product. Inferred

Installed base and references

The order book for FY2024-25 and FY2025-26 contains no line for RC01, RC03, LS08, DFI, WQF, ATU, Z01, Z03, SOS or IEI. The only FIoT-branded lines are four THAPS and four THOPS environment sensors sold to APAR Innosys at ₹6,000 each in November 2025, and one "EML IOT UNIT" at ₹5,000 to MRS, which belongs to the X-Lite emergency-light line. Rax-supplied S2 APAR Innosys is a top-six e-surveillance account, so even that sale is an existing-account add-on rather than an IoT market win. Rax-supplied S3

By contrast, the unbranded contract-design work that uses the same engineering is real and repeating: 500 water-softener cards to Ion Exchange (LOI/013/25-26, September 2025) and 500 to Nuetech (April 2026) at ₹4,600 each, solar-panel-cleaner cards to Inforob at ₹5,450 to ₹8,500 (over 170 units across two years), PSIP vending V5 cards to SSP Beverage at ₹5,940 (100 units), Energy Gateway units with TLS

sensors to ANG (100 units), and level-sensor and IR-sensor cards to Pradeep Kitchen in hundreds. Rax-supplied S2 Rax's own site shows the Ion Exchange softener controller as a "custom solution, courtesy Ion Exchange", which is the only public IoT reference the company has. Publicly observed S12

No public deployment, case study, tender award or marketplace listing for any FIoT model was found in this research (searches: "Rax Tech IoT", "FIoT app", model numbers, IndiaMART and GeM catalogue searches). Unknown The site's aggregate claims of 2M+ units sold and 1,200+ customers are unaudited marketing figures that mostly reflect the e-surveillance line and X-Lite. Publicly observed S11 Inferred

Service model

Both technical datasheets state a one-year warranty and factory calibration with "no field calibration necessary for the life of this product". Rax-supplied S5 S6 The second statement is a problem for the cold-chain and water families, where the buyer's regulator expects periodic calibration of the monitoring equipment; a pH or ORP probe in particular drifts and needs buffer calibration. Verified S42 Inferred There is no AMC, spares or remote-support offer on record, and the e-surveillance installed base is served without AMC. Rax-supplied S3 The internal record also carries the constraint that shapes everything in this report: frequent support calls including at installation, sample-based QC on large orders, missed urgent deliveries from component dependency, and a market reputation the sales lead describes as bad. Rax-supplied S3

Readiness gaps ranked by commercial impact

1. No certificates. BIS CRS is only relevant if a model falls under a notified category; WPC ETA is what every 2.4 GHz and 865 to 867 MHz product needs to be sold legally, and it is available by self-declaration with an ISO 17025 RF test report; MTCTE applies to the cellular and gateway models. None is held. Verified S3 S62 S63 S65 Inferred
2. No published specifications with tolerances. Accuracy, range, ingress, operating temperature and EMC are absent on eleven of thirteen models. Rax-supplied S4
3. No platform description. RT-SW-FIOT has no protocol list, tenancy model, API, data-retention statement or hosting location; the Saudi verdict was "insufficient". Rax-supplied S14
4. No reference customer for any model. Rax-supplied S2
5. Wi-Fi-only connectivity on nine models, which fails in the plant and cold-room settings the flyers target; the Saudi dossiers and forum evidence both point at 2.4 GHz reliability. Rax-supplied S4 Publicly observed S106 S107
6. Datasheet claims (CE, no field calibration) that a buyer could use against Rax. Rax-supplied S5 S6 Rax-supplied S3

Adjacent Rax products that bundle naturally

The FIOT app is already the common platform for THAPS, THOPS, SOS and the Wi-Fi clock, so any HSE sale drags the platform along. Publicly observed S9 The rack controller shares the same environmental sensors and the same central-software pattern and is the only Rax IoT-adjacent product with a paying reference. Rax-supplied S3 The alarm panels and EVA edge boxes sold to SIS, Securens and APAR are installed at bank and ATM sites that also need temperature and power monitoring, which is exactly what the Energy Gateway to ANG appears to be. Rax-supplied S2 Inferred ZenCampus lists environment, energy and water monitoring modules that would be delivered with these same devices. Rax-supplied S3

> SO WHAT FOR RAX
>
> The honest product truth is that Rax has a working device-and-app stack and a contract-design business that sells IoT boards in thousands, but no FIoT catalogue model with a specification, a certificate or a customer. Every later section should be read as "what would this family need to become a product", not "how do we sell this product". Recommendation

The FIoT stack as documented, and what a buyer will ask for beyond it

FIELD DEVICES

- RC01, RC03 load controllers
- LS08 eight-channel load sensing
- DFI-W and DFI-G freezer monitors
- WQF pH, ORP and flow
- ATU run status; Z01, Z03 inputs
- SOS-G personal safety
- THAPS, THOPS environment (HSE)

CONNECTIVITY AND EDGE

- 2.4 GHz Wi-Fi on nine models
- GSM or 4G on DFI-G and SOS-G
- RT-IEI-E-G0 gateway: RS-485, 4 DI, 2 DO, 2 AI, LoRaWAN, 4G

PLATFORM

- RT-SW-FIOT cloud and FIoT app
- MQTT and API claimed on Z01, Z03, IEI
- Hosting, tenancy, retention: not documented

WHAT BUYERS EXPECT

- Calibration certificate and accuracy figures
- 4G or LoRa fallback and offline buffering
- Open MQTT, Modbus or REST into their own platform
- WPC ETA, MTCTE, CE evidence; DPDP notice for personal data

Thirteen devices report over Wi-Fi, GSM, Ethernet or LoRa to one Rax cloud and app; the platform has no published protocol list, API, hosting region or data-retention statement. Rax-supplied | S1 | S4 | S5 | S6 | S14

02 Market definition

KEY TAKEAWAYS

- FIOT is not one market. Its seven families sit in five different Indian categories, each with its own regulator, buyer and price band: compliance monitoring (cold chain, effluent), energy and load monitoring, machine condition monitoring, personal safety devices, and industrial data acquisition. Inferred
- The category Rax can actually be checked against is "connected devices sold in India": USD 2.9 billion of device revenue in 2024 per the only country-level estimate, growing 23% a year, and 134.7 million M2M SIMs in June 2026 versus 52.3 million two years earlier. Estimated S33 Verified S29 S31
- Value sits at the platform and service layers, not the device: an unbranded controller card earns Rax ₹4,600, while a managed water-accounting service is quoted at ₹18 to 30 lakh per plant per year. Rax-supplied S2 Publicly observed S118
- Supply is fragmented and import-heavy at the module level; Chinese white-label devices set the floor price for every Wi-Fi family, and Indian startups compete on service, compliance and sector templates. Publicly observed S102 S105 Inferred
- The inflection points in India were regulatory, not technological: OCEMS directions in 2014, Schedule M in 2023, DPDP Rules in 2025 and the carbon market in 2026 each created a monitoring obligation that a device must serve. Verified S22 S43 S67 S55

The category and its boundaries

The thirteen models are marketed under one brand, so the temptation is to size "IoT in India" and take a share. That is the wrong denominator. A cold-chain quality manager, a plant utilities head and a state women's-safety programme do not compete for the same budget, do not read the same tender and are not regulated by the same body. For this report the market is defined as five categories, with the FIOT family that serves each. Inferred

CATEGORY	WHAT IS IN	WHAT IS OUT	FIOT FAMILY
Compliance monitoring of temperature, humidity and water parameters	Loggers, wireless sensors, gateways and dashboards bought to satisfy CDSCO, FSSAI, WHO GDP, CPCB or a customer audit	Refrigeration equipment itself; laboratory instruments	Cold chain (DFI-W, DFI-G), water (WQF-W), environment (THAPS, THOPS)
Energy and load monitoring and control	Sub-metering, CT-based load sensing, remote switching of loads across sites	Utility revenue meters and smart-meter roll-outs, which are regulated and tendered separately	Energy (RC01, RC03, LS08, the ANG Energy Gateway)
Machine condition and utilisation monitoring	Vibration, current-signature and run-status sensors with analytics for rotating equipment	PLC and SCADA control systems	Machine (ATU-W, ICM)
Personal safety devices	Wearable or pocket SOS devices with cellular alerting and tracking software	Smartphone apps such as 112 India; vehicle location trackers under AIS 140	Safety (SOS-G), alerting inputs (Z01, Z03)
Industrial data acquisition and edge connectivity	Gateways and remote I/O that bring RS-485, digital and analogue signals to a cloud or SCADA	Full automation panels, DCS	Gateway (IEI-E-G0), platform (RT-SW-FIOT)

Adjacent categories a buyer may substitute are worth naming because they cap the price. A pharmacist can meet a "temperature record" requirement with a ₹6,500 GSM logger and a paper file; a factory can meet a load-monitoring need with a ₹3,649 Sonoff switch and a spreadsheet; a school can meet a panic-button need with a ₹100 wired button and a hooter. Publicly observed S85 S102 Inferred

The value chain

The CPCB OCEMS documentation page: the 2014 effluent guidelines, the 2017 data policy, the May 2018 tampering caution notice and the 2018 revised CEMS guidelines are the documents that created and then policed the online-monitoring market. Source S23

From component to end user the chain has seven stages and the margin sits at the two ends that Rax does not occupy today. Chipsets, cellular and Wi-Fi modules, probes and CTs are imported or bought from Indian distributors; a WPC ETA-holding module lets an Indian assembler skip a separate radio approval, which is why most Indian devices are built on approved modules. Publicly observed S63 Design and board manufacture is where Rax sits, at a price the order book puts between ₹420 for a level-sensor card and ₹8,500 for a solar-robot card. Rax-supplied S2 Above that sit the platform and application layer, where a global cloud charges cents per device per year but an Indian vertical platform charges thousands of rupees per site per month, and the integration and service layer, where a Chennai integrator quotes ₹50,000 to ₹2 lakh to instrument one to three machines and ₹8 to 15 lakh for a factory. Publicly observed S110 S187 At the top sits the compliance or outcome service: Kritsnam's managed water accounting at ₹18 to 30 lakh per plant per year, Smart Joules' efficiency-as-a-service with no upfront capital, Infinite Uptime's per-plant reliability contracts. Publicly observed S118 S58 Publicly observed S89

Telecom operators sit across the chain as both suppliers and competitors: Airtel had more than 48 million IoT devices on its network in 2025 and sells a connectivity-management platform to 11,000 customers, and Tata Communications sells LoRaWAN and managed connectivity. Publicly observed S37 S38 S39 Rax's position is that of a board maker with a private app; every stage above the board is occupied by somebody with more references. Inferred

How buyers describe and search for the category

Buyer language differs by family and the tender headings follow it. Pharma and food buyers search for "temperature data logger", "cold room monitoring", "21 CFR Part 11", "GDP compliant" and "calibration certificate", and the marketplace listings that rank for those terms are sold with a traceable calibration certificate as a headline feature. Publicly observed S82 S190 Environmental buyers use the CPCB's own vocabulary: "OCEMS", "CEMS", "data acquisition system", "RTDMS connectivity", "85% data availability". Verified S22 Plant buyers search "IoT gateway", "Modbus to MQTT", "energy monitoring system", "OEE", "predictive maintenance". Publicly observed S93 S137 S162 Safety buyers use "panic button", "SOS device", "Safe City" and "ERSS 112". Verified S69 S145

Tender aggregators listed 1,365 tenders described as IoT-based in 2025 and 75 live smart-water-meter tenders in July 2026, most under ₹10 lakh, which is a useful indicator of how fragmented and small public demand is at the device level. Publicly observed S27 S148 Customs headings buyers and importers use are 8517 for communication apparatus (gateways, cellular devices), 9025 for thermometers and hygrometers, 9026 for flow meters, 9032 for automatic regulating instruments and 8537 for control panels. Inferred

Market structure

The supply side is fragmented at every layer. On IndiaMART alone, GSM temperature loggers are offered by sellers in Chennai, Mumbai, Delhi, Indore and Hyderabad at ₹6,000 to ₹20,000, and industrial gateways from Teltonika, Advantech, Milesight and Moxa are resold by small distributors at ₹11,000 to ₹68,000. (Publicly observed | S83 | S84 | S85 | S86 | S87 | S93 | S97 | S98 | S159) The device floor is set by Shenzhen: a Tuya Wi-Fi switch module at ₹950, a Sonoff 20 A metering switch at ₹3,649, an Amazon's Choice Wi-Fi temperature-humidity sensor at ₹2,489 with 1,900 ratings. (Publicly observed | S102 | S103 | S180) Indian startups do not compete on that floor; they package devices into sector outcomes and sell subscriptions, which is how a Belgaum hardware startup ends up with ₹1.7 Cr of revenue while a Pune analytics company raises $35M. (Publicly observed | S116) (Publicly observed | S89)

Price tiers therefore run in three bands: commodity devices at ₹500 to ₹4,000, Indian industrial devices and loggers at ₹6,000 to ₹25,000, and imported industrial gateways and instruments at ₹11,000 to ₹70,000, with subscriptions layered on top at ₹200 to ₹800 per device per month for connectivity and dashboards and lakhs per site per year for managed compliance. (Publicly observed | S82 | S168 | S187 | S118) (Estimated | S105)

Import dependence is structural. Modules, sensors and gateways are largely imported; Indian EMS revenue was about USD 40 to 45 billion in FY25 but PCBA-only work earns 2 to 4% EBITDA with no IP, which is the trap a board maker falls into unless it owns design. (Estimated | S125) Domestic manufacturing incentives (ECMS ₹40,000 Cr, the design-linked incentive, Tamil Nadu's electronics policy) favour firms that design in India, which Rax does. (Verified | S124 | S141)

History and inflection points

The Indian connected-device market has moved in regulatory steps rather than technology waves. The 2014 CPCB direction created the first compulsory industrial monitoring market and by April 2022 3,535 of 4,247 targeted units had connected. (Verified | S21 | S22) The 2015 Smart Cities Mission put an integrated command centre in 100 cities by 2023, each buying sensors through system integrators. (Verified | S152) eVIN put nearly 25,000 temperature loggers into the public vaccine cold chain, the largest single deployment of the cold-chain family in the country. (Verified | S41) COVID-19 vaccination in 2021 made cold-chain monitoring a household concern, and the 2021 Jal Jeevan Mission pilots made sensor-based water monitoring a state tender item. (Verified | S25) The 2022 Energy Conservation amendment and the 2025 to 2026 carbon-market notifications turned energy data from a saving into a compliance obligation for about 490 entities. (Publicly observed | S53 | S55) Revised Schedule M in December 2023 and its MSME deadline of 31 December 2025 did the same for pharmaceutical environmental records. (Publicly observed | S43 | S44) The DPDP Rules of November 2025 attached penalties of up to ₹250 Cr to careless handling of the personal data that safety devices generate. (Verified | S67)

On the technology side the shift that matters most for Rax is connectivity: M2M cellular SIMs went from about 34 million in early 2024 to 134.73 million in June 2026, an Airtel IoT SIM costs ₹450 to ₹699 a year on the open market, and every serious industrial product now ships with 4G or LoRaWAN rather than 2.4 GHz Wi-Fi alone. (Verified | S31 | S32) (Publicly observed | S168) Nine of Rax's thirteen models are Wi-Fi only. (Rax-supplied | S4)

> SO WHAT FOR RAX
>
> Define the market family by family, price the device against the Shenzhen floor and the value against the Indian service ceiling, and treat regulation as the demand engine. On that definition Rax is a low-cost board maker entering markets that buy compliance outcomes. (Recommendation)

Value chain for connected monitoring devices in India

1 **Chips, radio modules, probes**
Espressif, Quectel and SIMCom modules via Indian distributors; Honeywell and Sensirion sensors
Import-dependent; ETA-approved modules avoid separate radio approval

2 **Design and board manufacture**
Rax, Kaynes, Syrma SGS, Elecbits, Chennai design houses
₹420 to ₹8,500 a board in Rax's order book

3 **Equipment OEM or device brand**
Ion Exchange, Nuetech, SSP, Inforob, Blue Star, Elanpro, Shakti, Hygroman
Owns the customer and the brand

4 **Platform and connectivity**
Airtel IoT, DATOMS, ThingsBoard, AWS, Tuya, TagBox
Cents per device on global clouds; ₹150 to ₹800 a month on vertical platforms

5 **Integration and installation**
Tech4LYF, BMS integrators, e-surveillance integrators (SIS, Securens, APAR)
₹50,000 to ₹15 lakh a project

6 **Managed compliance or outcome**
Kritsnam, Infinite Uptime, Smart Joules, Zenatix
₹18 to 30 lakh a plant a year at the top

Margin sits in platforms, integration and managed compliance; Rax sits at design and board manufacture and has earned money only when an OEM carries the product to the end user. Inferred | S2 | S63 | S118 | S187 | S158 | S37

03 Market growth, demand drivers and regulation

KEY TAKEAWAYS

- Connected devices in India are growing faster than any other indicator in this report: M2M SIMs rose from 52.3 million in May 2024 to 134.7 million in June 2026, and device revenue is estimated to grow 23% a year to 2030. Verified S29 S31 Estimated S33
- The demand that pays is compliance-driven: 4,433 industries under OCEMS directions, about 10,500 pharma units under revised Schedule M, roughly 490 entities under carbon-market targets, 12.4 lakh chemists holding refrigerated stock. Verified S21 S44 S55 S132
- Scheme money exists but buys outcomes, not devices: ADEETIE's ₹1,000 Cr subsidises loans for energy-efficient technology, Safe City's ₹2,919.55 Cr bought city surveillance, PMKSY grants of ₹2,095.73 Cr built cold stores; none has a line item for a Wi-Fi sensor. Verified S151 S145 S48
- The single biggest counter-driver is credibility: CPCB had to issue a tampering caution in 2018, most factories are stuck in pilot purgatory, and forum evidence shows Wi-Fi devices dropping offline daily. Verified S23 Publicly observed S106 S131
- Timing favours 2026 to 2028: Schedule M inspections have begun, carbon-market compliance dates fall each July, ADEETIE runs to March 2028, and the OSH Code's state rules are being notified. Verified S45 S55 S151 S74

Market growth

The cleanest primary series is the regulator's count of cellular machine connections, which is a lower bound on devices because it excludes Wi-Fi and LoRa. TRAI reported 52.30 million M2M cellular connections at end May 2024, 73.91 million at end May 2025, 103.48 million at end November 2025, 123.88 million at end March 2026 and 134.73 million at end June 2026. Verified S28 S29 S30 S31 S154 Airtel alone carried 76.99 million in March 2026, a 62% share, and had reported more than 48 million connected devices in May 2025. Verified S30 Publicly observed S37 Two years of 60% annual growth is the fact behind every analyst number in this section; it also tells Rax that the market has standardised on cellular for anything that leaves a building. Inferred

134.73 million

M2M cellular connections in India at end June 2026, up from 52.30 million in May 2024: the connected-device base more than doubled in two years. Verified S29 S31

Analyst estimates of value vary with definition. Grand View puts Indian IoT device revenue at USD 2,885.5 million in 2024 growing at 23.2% to USD 10,276.8 million by 2030, with sensors 41% of the total. Estimated S33 Industrial IoT estimates range from USD 10.1 billion in 2025 (P&S, 12.1% CAGR) to USD 14.1 billion in 2024 (MarketsandMarkets, 10.5%), both including services and platforms; predictive maintenance is put at about 30% of industrial applications and Maharashtra at about 40% of the state mix. Estimated S35 S36 India's predictive-maintenance market specifically is estimated at USD 674 million in 2025 growing above 30% a year. Estimated S128 S129 These figures are used in this report only to triangulate the bottom-up sizing in section 04.

Regulation and mandates by family

FAMILY	RULE	ISSUING BODY AND DATE	WHAT IT REQUIRES	ENFORCEMENT REALITY
Cold chain (pharma)	Revised Schedule M, G.S.R. 922(E)	MoHFW and CDSCO, 28 Dec 2023; MSMEs by 31 Dec 2025	Monitored and recorded temperature, humidity and pressure; computerised system validation; data integrity	Inspections with licence suspension; monthly state reports ordered November 2025 Publicly observed S43 S44 S45
Cold chain (distribution)	Good Distribution Practices guideline, clause 10	CDSCO draft, 25 Sep 2018	Temperature mapping, defined checking intervals, calibrated monitors, records for shelf life plus one year	Draft guideline; applied through state drug inspectors and customer audits Verified S42
Cold chain (food)	FSS Regulations 2011; FSSAI direction of 28 Nov 2022	FSSAI	0 to 4 C chilled, -18 C frozen at receipt and storage; HACCP records	Licence condition; QSR chains cite once-a-day logging duty Verified S153 Publicly observed S51
Water and effluent	OCEMS direction of 5 Feb 2014; revised guidelines 2018	CPCB and SPCBs	Online analysers with data to CPCB and SPCB servers, 85% data availability, tamper-proofing, third-party audit	3,535 of 4,247 units connected by 2022; closure directions for 712 Verified S21 S22

FAMILY	RULE	ISSUING BODY AND DATE	WHAT IT REQUIRES	ENFORCEMENT REALITY
Energy	Energy Conservation (Amendment) Act 2022; CCTS 2023	Ministry of Power and BEE	Designated consumers, GHG intensity targets, annual verified reporting; ECSBC for 100 kW buildings	Targets in force for about 490 entities from FY2025-26 Publicly observed S53 S55
Machine and plant safety	Factories Act s.41B; OSH Code 2020	State factory inspectorates	On-site emergency plans for hazardous processes; safety standards under the Code	Code in force 21 Nov 2025, central rules May 2026, state rules pending Verified S74 S75
Personal safety	DPDP Act 2023 and Rules 2025; AIS 140	MeitY; MoRTH	Reasonable security safeguards and breach notice for personal data; vehicle panic buttons	Rules phased over 18 months; Tamil Nadu refused registration of new public vehicles without GPS and panic button from April 2018 Verified S67 S147
Radio and telecom	WPC ETA; MTCTE	DoT (WPC and TEC)	ETA for 2.4 GHz and 865 to 867 MHz devices, self-declared with an RF report; MTCTE for gateways and cellular devices	ETA fee ₹10,000 per model; MTCTE 6 to 8 weeks, Phase VI mandatory from Aug 2025 Publicly observed S62 S169 S171

The pattern is that every family except energy control now has a written monitoring obligation with a named inspector, and the obligations tightened between 2023 and 2026. Inferred

Schemes and budgets

Scheme money is real but sits one step away from a device purchase. ADEETIE, launched 15 July 2025 with ₹1,000 Cr, pays 5% interest subvention for micro and small enterprises and 3% for medium ones on loans for energy-efficient technology across 14 sectors and 60 clusters in phase one; it funds investment-grade audits and post-implementation monitoring and verification, which is where metering enters the bill of materials. Verified S151 RAMP carries ₹6,062.45 Cr of World Bank-backed MSME support. Verified S157 SAMARTH Udyog funds Industry 4.0 demonstration centres but gives no financial assistance to an MSME adopting the technology. Verified S76 S77 The cold-chain scheme under PMKSY has released ₹2,095.73 Cr to 286 projects, creating 474 cold storages and 1,477 reefer vehicles, and NCCD's 2024 engineering guidelines recommend centralised IoT dashboards for new projects. Verified S48 Estimated S49 Safe City projects for eight cities were appraised at ₹2,919.55 Cr and ₹440.3 Cr has been released for women's safety in public transport, including vehicle tracking with SOS buttons for Telangana buses. Verified S69 S70 S145 Jal Jeevan Mission's IoT pilots targeted sensor cost below 10 to 15% of scheme capex and triggered state tenders from 500 villages to whole districts. Verified S25

Incidents and audits that drive procurement

The CPCB's May 2018 caution notice on OCEMS tampering, its data policy and the requirement for third-party performance audits show a regulator that no longer trusts self-reported data, which raises the specification for any device sold into effluent monitoring. Verified S23 S22 CDSCO's inspection drive after the Schedule M deadline, with over 800 units inspected before the extension and monthly state reports ordered in November 2025, is the pharma equivalent. Publicly observed S44 S45 The Nirbhaya case produced the Safe City programme and the AIS 140 mandate; Tamil Nadu launched AI-enabled panic buttons in 500 Chennai buses in May 2022 under that programme. Verified S145 S146

Technology shifts

Four shifts change what a buyer expects. Cellular M2M has become cheap enough that an Airtel IoT SIM sells at ₹450 to ₹699 a year on IndiaMART, which removes the case for Wi-Fi-only devices in commercial settings. Publicly observed S168 LoRaWAN gateways are available in India at ₹45,000 and sensors at ₹6,245, so long-range battery sensors are a commodity. Publicly observed S97 S100 Cloud platforms price by device: ThingsBoard at $149 a month for 100 devices, AWS IoT Core at about $0.042 per device per year for connectivity plus $1 per million messages, Blynk from $29 a month. Publicly observed S108 S110 S166 And buyers increasingly ask for MQTT, Modbus and API output as a condition, which is why every gateway competitor lists them on page one. Publicly observed S99 Inferred

Macro and sector indicators

INDICATOR	VALUE	YEAR	SOURCE
Registered factories	2,53,334; Tamil Nadu 15.66%	2022-23	Verified S78
Cold storages	8,815 with 402.18 lakh MT	June 2025	Verified S135
Pharmaceutical units	about 10,500, 8,500 MSME	2025	Publicly observed S44
Chemists and distributors	12.4 lakh	2026	Verified S132
17-category polluting industries	4,433	2022	Verified S21

INDICATOR	VALUE	YEAR	SOURCE
Persons aged 60 and over	149 million; 347 million by 2050	2022	Verified S156
Udyam-registered MSMEs in Tamil Nadu	41.6 lakh	June 2026	Publicly observed S139
M2M cellular connections	134.73 million	June 2026	Verified S31

Timing windows

Pharma MSMEs are being inspected against revised Schedule M from January 2026; carbon-market entities must report by 31 July each year; ADEETIE disburses until March 2028; OSH state rules are being notified through 2026; DPDP obligations phase in to May 2027. Verified S45 S55 S151 S74 S67 Public procurement follows the April to March budget year with tender activity concentrated before March. Inferred These windows favour a 2026 to 2028 push in cold chain and energy, and a slower path in safety where the buyer is a state programme. Recommendation

Counter-drivers

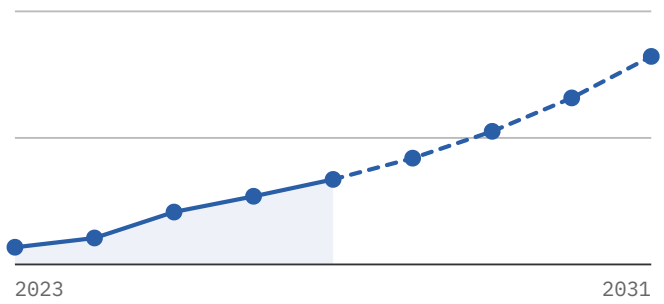
Demand is suppressed by four things. Money: the MSME pharma associations asked for the Schedule M extension because of "the need to arrange finances", and ADEETIE subsidises interest rather than equipment. Verified S44 S151 Credibility: OCEMS tampering, McKinsey's finding that fewer than a third of manufacturers moved a critical use case to scale, and a Chennai practitioner calling predictive maintenance "the most oversold phrase in industrial IoT". Verified S23 Publicly observed S131 S163 Substitutes: a ₹6,500 GSM logger or a ₹2,489 Wi-Fi sensor satisfies the letter of most record-keeping rules. Publicly observed S85 S180 And connectivity: the flyers' Wi-Fi-only designs meet exactly the failure mode users describe on Sonoff and Tuya forums, daily drop-outs on 2.4 GHz networks. Publicly observed S106 S107 S182 Rax-supplied S4

SO WHAT FOR RAX

Demand is real, growing and regulated, but it is demand for a compliant record with an inspector's name on it, not for a device. Rax's families map to that demand only where the device is calibrated, cellular and part of a documented service; today none is. Recommendation

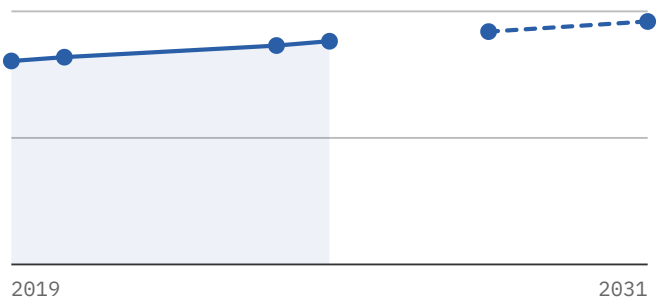
M2M cellular connections (million, TRAI) 411 in 2031

34 in 2023 · +36.6% a year



Cold storages in India (thousand) 9.6 in 2031

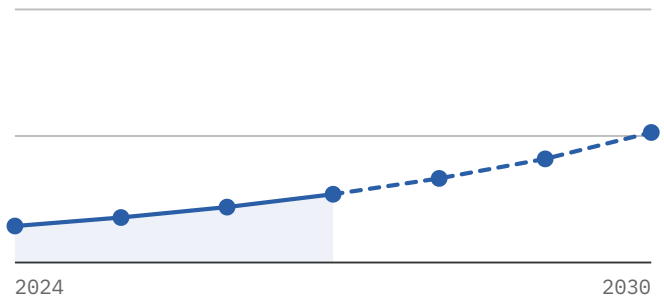
8 in 2019 · +1.5% a year



India IoT devices revenue (USD million, Grand View)

10,277 in 2030

2,886 in 2024 · +23.6% a year



India M2M cellular connections and cold storages, actual to 2026 with outlook, million M2M SIMs; thousand cold storages; USD million IoT device revenue. Each panel has its own scale. Dashed from 2027 is outlook. Series 1: TRAI monthly telecom subscription press releases (May 2024, May 2025, November 2025, March and June 2026) plus the March 2024 recommendation citing 34 million; outlook 2027 to 2031 is an estimate extrapolating 25% a year, half the 2024 to 2026 pace. Series 2: cold storages in thousands from Rajya Sabha replies and PIB; 2031 point is NCCD's 440 lakh MT capacity projection converted at the 2025 tonnes-per-store ratio. Series 3: Grand View Research India IoT devices revenue, USD million, 2024 actual and 2030 forecast with intermediate years interpolated at the published 23.2% CAGR.

2014-02-05 REGULATION
CPCB directs online continuous emission and effluent monitoring in 17 industry categories
Direction B-29016/04/06PCI-1/5401 under the Water and Air Acts; creates the OCEMS market for analysers, gateways and data acquisition

2015-06-25 SCHEME
Smart Cities Mission launched; 100 cities selected by 2018
ICCCs operational in all 100 cities by 2023, each buying sensors and gateways through integrators

2017-09-05 REGULATION
MTCTE notified under the Indian Telegraph (Amendment) Rules
G.S.R. 1131(E); telecom-connected devices including IoT gateways brought under mandatory testing in phases

2018-05-08 INCIDENT
CPCB caution notice to industries on OCEMS data tampering
Signals the credibility problem with online monitoring and the demand for tamper-proof devices and third-party audit

2018-05-30 MARKET
Hero Electronix acquires Zenatix
First exit in Indian energy IoT; Zenatix now trades as Zenatix by Schneider Electric

2019 SCHEME
Safe City projects approved for eight cities at ₹2,919.55 Cr
Nirbhaya Fund money for CCTV, panic buttons and command centres in Chennai, Delhi, Mumbai, Kolkata, Bengaluru, Hyderabad, Ahmedabad and Lucknow

2021-03-31 SCHEME
Jal Jeevan Mission announces sensor-based IoT monitoring for rural water supply
Tata Trusts pilots in five states; state tenders from 500 villages to districts follow

2022-12-12 REGULATION
Energy Conservation (Amendment) Act passed by Parliament
Carbon credit trading scheme, non-fossil obligations and a building code for 100 kW loads; basis of the Indian carbon market

2023-12-28 REGULATION
Revised Schedule M notified (G.S.R. 922(E))
Environmental monitoring and computerised-system requirements for all pharma manufacturers; large units from July 2024, MSMEs by 31 December 2025

2024-01 SCHEME
PM-KUSUM guidelines make vendor-supplied remote monitoring mandatory on every sanctioned solar pump
RMS may include smart meters, IoT devices, software and apps; data to MNRE; indigenous controllers

2024-03-21 REGULATION
TRAI recommendations on embedded SIM for M2M
Cites more than 34 million M2M connections and TEC security-by-design; opens eSIM for devices

2025-03-10 MARKET
Infinite Uptime raises $35M Series C
Pune condition-monitoring company at 800 plants; the benchmark RT-ICM would face

2025-03-31 MARKET
ATM count falls to 2,51,057 as bank branches grow to 1.64 lakh
RBI Trend and Progress 2024-25; shrinking ATM estate, growing branch base for the e-surveillance cross-sell route

2025-07-15 SCHEME
ADEETIE scheme launched with ₹1,000 Cr for MSME energy efficiency
Interest subvention and audits in 14 sectors and 60 clusters; monitoring and verification is a paid step

2025-08-01 REGULATION
EU RED cybersecurity requirements become mandatory for wireless devices
EN 18031 compliance needed for CE marking; gates any RaxTech Europe sale

2025-09-22 RAX
Rax Tech ISO 9001:2015 certificate issued by Bureau Veritas
Scope includes IoT products and customised hardware and software design

2025-11-14 REGULATION
DPDP Rules 2025 notified
18-month phased compliance; penalties up to ₹250 Cr; applies to SOS and tracking data

2025-11-18 RAX
First FIoT-branded invoice: four THAPS and four THOPS to APAR Innosys at ₹6,000
Only catalogue IoT sale in two years of order book

2025-11-21 REGULATION
OSH Code 2020 comes into force; central rules 8 May 2026
Consolidates the Factories Act; state rules still pending in most states

2025-12-31 REGULATION
Revised Schedule M deadline for pharma MSMEs expires; inspections begin
Roughly 8,500 MSME units; only a minority applied for extension; licence suspension on failed inspection

2025-12-31 SCHEME
PM-KUSUM installations reach 9.75 lakh standalone and 12.02 lakh solarised pumps
Every sanctioned pump must carry vendor-supplied remote monitoring; 21.77 lakh farmers benefited

2026-03-21 SCHEME
Indian Carbon Market portal launched; CCTS targets in force for about 490 entities
First compliance date 31 July 2026; creates demand for metered energy data

2026-06 MARKET
M2M cellular connections reach 134.73 million
Up from 52.30 million in May 2024; Airtel holds about 60%

2026-07-19 RAX
IIBDAEI Saudi dossiers: 0 of 13 IoT products get a full verdict
Six conditional, four bundle-only, three insufficient

2026-07-31 REGULATION
RBI technology risk directions require banks to monitor environmental control breaches
Para 61: temperature, water, smoke, access alarms, power and telecom availability at DC and DR sites; supports bank-site and server-room monitoring through integrators

Regulation, schemes, incidents and market events that shape demand, in date order.

04 Market sizing

KEY TAKEAWAYS

- The four FIoT families Rax can serve add up to about ₹926 Cr of annual Indian spend in 2026 on devices, controllers and monitoring service, about 2.5% of India's estimated IoT device revenue. Estimated | S33 | S2 | S132 | S78 | S253
- Rax can serve about ₹228 Cr of it today: OEM controller demand nationally, bank-site kits through its own integrators, and cold-chain and factory monitoring within southern service reach. Estimated | S2 | S3 | S78
- What Rax can obtain is capacity-bound, not market-bound: about ₹0.8 Cr in 2026 rising to about ₹8 Cr by 2031 if it wins one new OEM design-in a quarter. Estimated | S2 | S3
- The OEM controller family is the smallest of the four addressable pools (₹160 Cr) but the only one where Rax already sells; cold chain is the largest (₹384 Cr) but needs certification before Rax can take any of it. Estimated | S2 | S132 | S42
- Government-influenced demand is about a quarter of the total, concentrated in PM-KUSUM remote monitoring and public-sector bank sites; export is excluded from the numbers. Estimated | S213 | S249

What is being sized

The market is sized family by family as annual spend in 2026: the value of devices bought that year (or, for monitored points, the device cost spread over a five-year life) plus the monitoring service attached to them. The four families are those Rax can plausibly serve with a product inside 36 months: connected controllers for equipment OEMs, cold-chain and environment monitoring, energy and site monitoring, and gateways. Heavy-industry condition monitoring, OCEMS effluent analysers and personal safety devices are excluded because RT-ICM, RT-WQF-W and RT-SOS-G are not recommended for investment; they are named at the end of this section. Estimated | S129 | S21 | S198 Recommendation

Bottom-up TAM by family

FAMILY	UNITS	PRICE OR VALUE A YEAR	2026 VALUE
Vending controllers	51,600 new machines a year x 50% connected	₹5,940 a card (Rax price)	₹15 Cr
PM-KUSUM remote monitoring	7 lakh pumps (FY25) x 50% outside in-house OEMs, halved for 2026	₹4,000 of RMS hardware	₹70 Cr
Non-scheme smart pumps	52,500 (0.5% of Coimbatore's 10.5 million)	₹3,000 a controller	₹16 Cr
Refrigeration modules	45,000 (5% connected across three makers of Blue Star's scale)	₹3,500	₹16 Cr
Water-treatment controllers	50,000 (low confidence)	₹4,600 (Rax price)	₹23 Cr
OEM design fees	200 projects	₹10 lakh	₹20 Cr
OEM controllers subtotal			**₹160 Cr**
Chemists	12.4 lakh x 25% needing a monitored refrigerator	₹4,400 a point a year	₹136 Cr
Hospitals	70,000 x 3 points	₹4,400	₹92 Cr
Blood banks	4,000 x 4 points	₹4,400	₹7 Cr
Cold storages	8,815 x 6 points	₹4,400	₹23 Cr
Pharma manufacturers	10,500 x 15 points	₹8,000 (validated)	₹126 Cr
Cold chain subtotal			**₹384 Cr**
Factories	2,53,334 x one multi-channel monitor	₹6,700 a year	₹170 Cr
Bank sites	2,51,057 ATMs plus 1.64 lakh branches	₹4,200 a year (kit plus rental)	₹174 Cr
Energy and site subtotal			**₹344 Cr**
Gateways	25,000 a year	₹15,000	₹38 Cr
TAM			**₹926 Cr**

Sources for units and prices, in row order: vending market report and Rax order book; PM-KUSUM guidelines, progress (9,75,227 standalone and 12,01,552 solarised pumps installed by 31 December 2025) and Shakti's in-house RMS; Coimbatore cluster profile; Blue Star; order book; Chennai integrator cost bands; AIOCD; hospital count; blood-bank count; PIB cold storages; Schedule M unit count; ASI and an IndiaMART

energy monitor; RBI ATM and branch data with the bank RFP rental line; Teltonika and Advantech listings.
Estimated | S126 | S2 | S213 | S215 | S256 | S257 | S217 | S173 | S194 | S236 | S132 | S192 | S133 | S135 | S44 | S78 | S137 | S253 | S249 | S93 | S98

The ₹4,400 a monitored point assumes a ₹10,000 calibrated 4G logger, inside the ₹6,000 to ₹22,000 observed band, depreciated over five years, plus ₹200 a month for SIM, cloud and alerting; an Airtel IoT SIM costs about ₹550 a year on the open market. Estimated | S82 | S85 | S168

₹926 Cr

Annual Indian spend in 2026 on the four FIoT families Rax can serve, of which cold chain is ₹384 Cr and OEM controllers ₹160 Cr.
Estimated | S2 | S132 | S78 | S253

Top-down triangulation

Grand View Research estimates Indian IoT device revenue at USD 2,885.5 million in 2024 growing 23.2% a year to USD 10,276.8 million by 2030; the interpolated 2026 value is about USD 4,380 million, or roughly ₹37,700 Cr at an assumed ₹86 to the dollar. The ₹926 Cr bottom-up TAM is 2.5% of that. Estimated | S33 Given that the bottom-up figure includes service and excludes consumer, automotive, metering, healthcare wearables and smart-city categories, a low single-digit share is plausible. Inferred

Broader estimates confirm the direction but not the level: MarketsandMarkets puts the whole Indian IoT market at USD 50.1 billion in 2025 and P&S puts industrial IoT at USD 10.1 billion in 2025, both including platforms and services. Estimated | S34 | S35 The gap between methods is explained by definition: analyst figures size everything connected, while the bottom-up sizes only the buyer jobs Rax's families can do.
Inferred

For the OEM route, a second cross-check is the design-services market. Indian EMS was about USD 40 to 45 billion in FY25, design and engineering is the fastest-growing EMS service, and Syrma SGS alone expects ₹1,100 to 1,200 Cr of ODM revenue in FY27; the ₹160 Cr OEM controller pool is a small, specific slice of that design-led demand. Estimated | S125 | S235 Publicly observed | S233

SAM and SOM

SAM of ₹228 Cr takes the whole OEM controller pool except most PM-KUSUM volume (₹108 Cr), bank-site kits for the fifth of sites assumed to be served by Rax's integrator accounts (₹35 Cr), 20% of the non-manufacturing cold-chain pool for the four southern states (₹52 Cr), Tamil Nadu's 15.66% of factory energy monitoring (₹27 Cr) and of gateways (₹6 Cr). Pharma manufacturers are excluded until a validated system exists. Estimated | S2 | S3 | S253 | S132 | S78

SOM is set by capacity. In 2026 it is about ₹0.8 Cr: repeat card orders from Ion Exchange and Nuetech worth about ₹46 lakh, other OEM cards about ₹20 lakh, one design fee and small integrator add-ons. By 2031 the base case reaches about ₹8 Cr from twelve OEM accounts at ₹40 lakh a year, integrator rentals on about 7,000 bank sites, cold-chain modules through two refrigeration OEMs and design fees. That is one new OEM design-in a quarter, the most two salespeople and a booked hardware team can deliver without hiring. Estimated | S2 | S3 | S249 | S194

SO WHAT FOR RAX

The market is large enough that Rax's growth is limited by engineering and sales capacity, not by demand. At ₹8 Cr in 2031 FIoT would be roughly the size of Rax's entire FY2025-26 turnover, which is the scale at which the plan in section 12 must be judged. Estimated | S3
Recommendation

Five-year series

YEAR	TAM (₹ CR)	SAM (₹ CR)	SOM (₹ CR)
2026	926	228	0.8
2027	1,037	260	1.8
2028	1,162	296	3.0
2029	1,301	338	4.6
2030	1,457	385	6.2
2031	1,632	439	8.0

TAM is grown at 12% a year, about half the analyst device CAGR, because cold storages grow at about 2% a year and the PM-KUSUM volume may fall after the current extension; SAM grows at 14% as penetration rises in the southern states. M2M cellular connections, which grew from 52.3 million in May 2024 to 134.7 million in June 2026, support the device side of the growth assumption. Estimated | S33 | S47 | S219

Verified | S29 | S31

Sensitivity

DRIVER	LOW (SOM 2031, ₹ CR)	BASE	HIGH	WHAT MOVES IT
New OEM design-ins by 2031	4.8	8.0	11.2	4, 12 or 20 accounts at ₹40 lakh a year
Integrator bank-site kit attach	6.5	8.0	9.2	None; 7,000 sites; 12,450 sites (3%)
Cold-chain module certified and designed in	6.8	8.0	9.2	Never; two OEMs from 2028; four from 2027
PM-KUSUM successor with an RMS mandate	8.0	8.0	9.5	No successor; renewed scheme

Sources: sizing assumptions above. Estimated | S2 | S249 | S194 | S213

Government versus private, India versus export

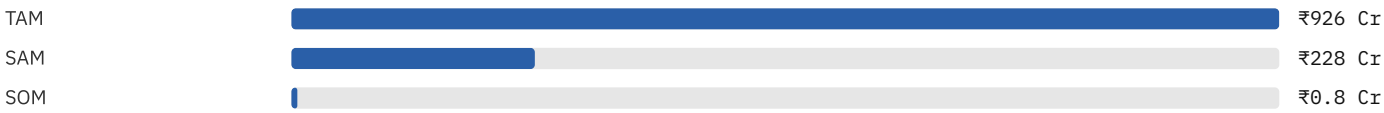
About a quarter of TAM is government-influenced: the ₹70 Cr of PM-KUSUM remote monitoring is paid through a subsidised scheme, and public-sector banks own a large share of the ₹174 Cr bank-site pool, though both are bought through private vendors and integrators. Cold chain, OEM controllers and factory monitoring are private demand. Estimated | S213 | S253 Inferred

Export is excluded from every figure. The Saudi dossiers' own scenarios were small (SAR 3.0 million SAM for refrigerated vehicles, SAR 21.0 million for brownfield factory gateways) and conditional on certification that does not exist. Estimated | S15 | S16

What the sizing does not capture

The vending line is the weakest input: the market report gives 289,000 units for 2024 but is internally inconsistent about later volumes, and if that figure is annual sales rather than a base the vending controller pool would be nearer ₹115 Cr than ₹15 Cr. Estimated | S126

It excludes condition monitoring (India's predictive-maintenance market was estimated at USD 674 million in 2025), OCEMS analysers for 4,433 industries, personal safety devices and QSR and retail chains whose outlet counts are not public. The water-treatment controller volume and the bank-site share served by Rax's integrators are assumptions without a primary source. Read every figure as a range of plus or minus 40%. Estimated | S129 | S21 Unknown



Addressable, serviceable and obtainable market, 2026. Bars share one scale.

	VALUE	DEFINITION	ASSUMPTIONS
TAM	₹926 Cr	Annual Indian spend on connected controllers, monitoring devices and monitoring service in the four FIOT families Rax can serve (OEM controllers, cold chain and environment, energy and site monitoring, gateways), 2026 triangulated	• OEM controllers and design fees ₹160 Cr: vending 52,000 new machines a year (289,000 installed in 2024 growing 15.5%) x 50% connected x ₹5,940 = ₹15 Cr; the source is internally inconsistent on volume, and reading 289,000 as annual sales would raise this to about ₹115 Cr [S126, S2]; PM-KUSUM RMS 7 lakh pumps in FY25 (Component B installations rose from 2.95 lakh in Jan 2024 to 9.75 lakh by Dec 2025, with 12.02 lakh Component C pumps) x ₹4,000 x 50% outside in-house OEMs, halved for 2026 = ₹70 Cr [S215, S256, S257, S213, S217]; non-scheme smart pumps 52,500 x ₹3,000 = ₹16 Cr [S173, S183]; refrigeration 45,000 modules x ₹3,500 = ₹16 Cr [S194]; water-treatment controllers 50,000 x ₹4,600 = ₹23 Cr (low confidence) [S2]; design fees 200 projects x ₹10 lakh = ₹20 Cr [S236] • Cold chain and environment ₹384 Cr at ₹4,400 a monitored point a year (₹10,000 device over five years plus ₹200 a month service): chemists 12.4 lakh x 25% = ₹136 Cr [S132]; hospitals 70,000 x 3 points = ₹92 Cr [S192]; blood banks 4,000 x 4 = ₹7 Cr [S133]; cold storages 8,815 x 6 = ₹23 Cr [S135]; pharma manufacturers 10,500 x 15 points x ₹8,000 = ₹126 Cr [S44] • Energy and site monitoring ₹344 Cr: factories 2,53,334 x ₹6,700 a year (₹18,500 monitor over five years plus ₹3,000 service) = ₹170 Cr [S78, S137]; bank sites 2,51,057 ATMs plus 1.64 lakh branches x ₹4,200 a year (₹12,000 kit over five years plus ₹150 a month rental) = ₹174 Cr [S253, S249] • Gateways and data acquisition ₹38 Cr: 25,000 gateways a year x ₹15,000 [S93, S98] • Top-down cross-check: India IoT device revenue USD 4,380 million in 2026 (Grand View interpolation) at an assumed ₹86 per USD is about ₹37,700 Cr; the ₹926 Cr bottom-up total is 2.5% of it, plausible for four narrow commercial families that include service [S33] • Excluded: heavy-industry condition monitoring (USD 674 million in 2025), OCEMS analysers, personal safety devices, consumer smart home [S129, S21, S198] Estimated | S126 | S2 | S215 | S213 | S217 | S173 | S194 | S236 | S132 | S192 | S133 | S135 | S44 | S78 | S137 | S253 | S249 | S93 | S33 | S256 | S257
SAM	₹228 Cr	Serviceable by Rax in 2026: OEM controller demand it can design for nationally, bank-site kits through its existing integrators, and cold-chain and factory monitoring within southern service reach bottom-up	• OEM controllers ₹108 Cr: all vending, water-treatment, refrigeration, non-scheme pump and design-fee demand (₹90 Cr) plus 25% of PM-KUSUM RMS for southern states (₹18 Cr) [S126, S2, S194, S173, S236, S215] • Bank-site kits ₹35 Cr: Rax's integrator accounts assumed to serve 20% of 4.15 lakh ATM and branch sites x ₹4,200 [S3, S253] • Cold chain ₹52 Cr: 20% of the chemist, hospital, blood-bank and cold-storage pool for Tamil Nadu, Karnataka, Kerala and Puducherry; pharma manufacturers excluded until validation exists [S132, S192, S243] • Factory energy monitoring ₹27 Cr: Tamil Nadu's 15.66% of the factory pool [S78] • Gateways ₹6 Cr: Tamil Nadu share of gateway demand [S78] Estimated | S126 | S2 | S194 | S173 | S236 | S215 | S3 | S253 | S132 | S192 | S243 | S78
SOM	₹0.8 Cr	Obtainable by Rax in 2026 with two salespeople: repeat OEM card orders, one or two new design fees and integrator add-ons, rising to about ₹8 Cr by 2031 in the base case bottom-up	• 2026: Ion Exchange and Nuetech repeat orders of about 1,000 cards at ₹4,600 (₹46 lakh), other OEM cards (₹20 lakh), one design fee (₹10 lakh), integrator add-ons (₹5 lakh) [S2] • Base case 2031: 12 OEM accounts at ₹40 lakh a year (₹4.8 Cr), integrator bank-site rentals on 7,000 sites (₹1.5 Cr), cold-chain modules through two refrigeration OEMs (₹1.2 Cr), design fees (₹0.5 Cr) [S2, S249, S194] • Capacity constraint: one new OEM design-in a quarter is the most two salespeople and a booked hardware team can deliver without new hires [S3] Estimated | S2 | S249 | S194 | S3

Sensitivity

DRIVER	LOW	BASE	HIGH	NOTE
New OEM design-ins won by 2031	4.8	8	11.2	4, 12 or 20 OEM accounts at ₹40 lakh a year; the single largest driver
Integrator bank-site kit attach	6.5	8	9.2	No integrator adopts; 7,000 sites; or 3% of the 4.15 lakh ATM and branch sites (12,450)
Cold-chain module certified and designed in by a refrigeration OEM	6.8	8	9.2	Never certified; two OEMs from 2028; four OEMs from 2027
PM-KUSUM successor scheme with RMS mandate	8	8	9.5	No successor adds nothing to base; a renewed scheme adds southern RMS board volume

05 Segments and ideal customer

KEY TAKEAWAYS

- Thirteen segments were scored; only the top two clear 60, and both are routes through organisations Rax already invoices: equipment OEMs that buy connected controller cards (76) and e-surveillance integrators that add site sensors (65). Estimated | S2 | S3
- The best new segment is commercial refrigeration OEMs embedding a monitoring module (60), because Elanpro and Coca-Cola have shown that brands want freezers and coolers they can see, and the OEM carries the certificate and service burden. Publicly observed | S220 | S221
- Regulated end users (pharmacies, blood banks, Schedule M plants, OCEMS industries) have the strongest pain but the lowest readiness scores, because each needs calibration, validation or type approval that no FIoT model has. Verified | S42 | S43 | S22 Rax-supplied | S3
- Personal safety, heavy-industry condition monitoring and effluent monitoring score below 40 and should not receive sales time. Estimated | S198 | S89 | S21
- The ideal first customer is an Indian OEM with 500 to 5,000 units a year, no in-house electronics team and a customer who has started asking for an app. Inferred

How the segments were built and scored

Segments were defined by who pays and why, not by which Rax model fits. Each was scored on the eight-dimension model in the charter, using the demand, competitor and price evidence in sections 03, 06 and 07 and the internal constraints in the context file: two salespeople, a quality reputation problem, no radio or telecom certificates and free software bandwidth. The data file holds the full scores; the table condenses them. Estimated | S3 | S2 Inferred

RANK	SEGMENT	TOTAL	SIZE SIGNAL	BUDGET SOURCE	PAIN
1	Mid-size equipment OEMs needing a connected controller card	76	About ₹160 Cr a year of controller boards and design fees (2026, estimated)	Product BOM and NRE	Customers ask for an app; no electronics team
2	E-surveillance integrators adding site environment and energy sensors	65	38 existing accounts; ANG took 100 gateways	Bank site AMC and project budgets	Site power and temperature complaints
3	Refrigeration and cold-room OEMs embedding monitoring	60	About ₹16 Cr a year of modules (estimated)	OEM BOM; brand trade-asset budgets	Placed freezers cannot be seen
4	Pharmacy chains, hospital pharmacies, blood banks in Tamil Nadu	57	12.4 lakh chemists; 304 TN blood banks (2015)	Store opex; hospital pharmacy budget	Inspector asks for temperature records
5	PM-KUSUM pump vendors without in-house RMS	57	7 lakh pumps in FY25	Scheme capex (60% subsidy in TN)	RMS clause in every contract
6	Ice-cream, dairy and beverage brands with placed assets	54	Per-brand counts Unknown	Trade marketing	Lost and warm freezers
7	Campuses through ZenCampus	49	300 legacy active users	School IT and facilities	Energy and water bills
8	QSR and food retail under FSSAI	47	Chain counts Unknown	Food safety opex	Daily log duty
9	MSME plants in Tamil Nadu clusters	47	2.53 lakh factories; TN 15.66%	Energy audit, ADEETIE loans	Energy cost, customer ESG asks
10	Pharma manufacturers under revised Schedule M	45	10,500 units	Compliance capex	Licence at risk
11	OCEMS industries needing water-quality monitoring	36	4,433 units	Environmental compliance	Closure directions
12	Heavy-industry condition monitoring	34	USD 674 million market (2025)	Reliability budget	Unplanned downtime
13	Personal safety programmes and elder care	29	149 million people aged 60+	State schemes; families	Unanswered alarms

Sources for the size column, in row order: order book and vending, RMS and EMS sources; context file; Blue Star; chemist, blood-bank and pharmacy counts; PM-KUSUM guidelines and progress; Coca-Cola and Elanpro; deck audit; Rebel Foods; ASI; Schedule M; OCEMS; predictive-maintenance estimate; ageing report. Estimated | S2 | S126 | S213 | S194 | S132 | S243 | S215 | S221 | S51 | S78 | S44 | S21 | S129 | S156 Rax-supplied | S3

Why the top three rank where they do

The OEM controller segment wins on fit and readiness because it is the only place Rax has repeat purchase orders. Ion Exchange and Nuetech each ordered 500 softener controller cards at ₹4,600, SSP Beverage bought vending cards at ₹5,940 and Inforob took more than 170 robot cards; no certificate was a gate because the OEM's finished product carries the compliance, and no reference was needed because the OEM tested the card itself. (Rax-supplied | S2) Differentiation scores only 7 because Kaynes, Syrma SGS, Elecbits and Chennai design houses sell the same service; Syrma's ODM revenue alone reached ₹269 Cr in one quarter. (Publicly observed | S233 | S234 | S205)

The integrator segment ranks second on access, not on demand. SIS, Securens, APAR and ANG already hold purchase relationships with Rax, and two of them bought FIoT hardware without any marketing. The score is capped by the fact that ANG was also the largest account lost to quality and service failures in FY2025-26, so an IoT add-on inherits exactly the reputation that caused the churn. (Rax-supplied | S2 | S3)

The refrigeration OEM segment ranks third because the pain is public and the buyer is an engineering organisation that can specify a module. Elanpro told trade press that brands give refrigerators free to retailers with no system to track them, and Blue Star has capacity for three lakh freezers a year and now sells IoT-enabled cold rooms. A Rax module sold under the OEM's brand avoids the end-customer credibility test that Rax fails today. (Publicly observed | S220 | S194) (Inferred)

> SO WHAT FOR RAX
>
> Every segment that scores above 60 is reached through another company's product and brand. The research does not support a direct end-user sales motion for any FIoT family in the next twelve months. (Recommendation)

Why the regulated end users rank lower than their pain

Pharmacies, blood banks and pharma plants have the clearest written obligation in this report: CDSCO's distribution guideline asks for calibrated monitors and records kept for shelf life plus one year, and revised Schedule M asks for monitored conditions with validated computer systems. (Verified | S42 | S43) They score low on readiness and differentiation because the buyer's first question is for a calibration certificate and an audit trail, and Hygroman, Instrukart-class sellers and GND Solutions already answer it. (Publicly observed | S82 | S190 | S88) The Tamil Nadu pharmacy and blood-bank segment keeps a rank of four because it is close to Chennai service capacity and cheap to pilot, not because Rax is ready. (Inferred)

PM-KUSUM ties at 57. The rule is real and unusually specific: every pump sanctioned must carry a remote monitoring system supplied by the vendor, and controllers must be made in India. (Verified | S213) But the large pump makers build their own RMS dongles and portals, CEEW found that vendors let RMS lapse once paid, and the scheme's period is being extended rather than renewed, so a two-year design-in could land on a shrinking programme. (Publicly observed | S217 | S218) (Verified | S216 | S214)

Ideal customer profile

ATTRIBUTE	OEM CONTROLLER BUYER	REFRIGERATION OEM BUYER	COLD-CHAIN END USER (PILOT ONLY)
Firmographics	Indian equipment maker, ₹25 to 500 Cr revenue, 500 to 5,000 units a year, no electronics design team	Freezer, visi-cooler or cold-room maker selling to brands and chains	Chennai pharmacy chain, hospital pharmacy or licensed blood bank with 10 or more refrigerators
Trigger events	A customer or distributor asks for remote monitoring; a component obsolescence forces a board redesign; a scheme clause (RMS)	A brand tender asks for connected assets; a competitor launches a connected range	Inspection finding; a spoilt vaccine or blood batch; a new store rollout
Current alternative	Imported board from a trader; in-house ESP32 build; no connectivity	Buy a logger kit from a platform vendor such as DATOMS	Paper log, digital thermometer, GSM logger from IndiaMART
Budget holder	Purchase head within the BOM	Product head within the BOM; brand's trade-asset budget	Operations head, from store opex
Decision timeline	3 to 6 months from prototype to first purchase order	6 to 12 months including field trial	1 to 3 months for a pilot of 10 to 20 units

Sources: Rax order book for the OEM buying pattern; Elanpro and DATOMS for refrigeration; CDSCO, Samyak and IndiaMART sellers for cold chain. (Rax-supplied | S2) (Publicly observed | S220 | S210 | S150 | S86) (Inferred)

Buying committee

The committee diagram below lists six roles for the OEM and cold-chain segments. In the OEM segment the R&D or product head is the champion and the purchase head the economic buyer; the deal dies on unit price or a missed delivery, which the context file records as a Rax weakness from component dependency. In the cold-chain segment the QA manager who "reviews temperature data of data loggers" is the champion, and the deal dies on a missing calibration certificate. (Rax-supplied | S3) (Publicly observed | S206) (Inferred)

> *Reviewing and approving temperature excursions of products observed during storage & distribution of temperature sensitive products*
>
> Job description, Manager Quality Assurance, Abbott India Publicly observed S206

End users decide whether the system survives past the pilot. The Delhi audit that found "no control room is being operated to monitor the panic button alarms" and the CEEW finding that most pump RMS units stopped transmitting show the same failure: nobody owns the alert. A Rax offer must name the person who receives each alarm. Publicly observed S223 Verified S216

Jobs to be done and willingness to pay

SEGMENT	JOB	WILLINGNESS TO PAY (EVIDENCE)
OEM controllers	"Make my product connected without hiring an electronics team"	₹3,450 to ₹5,940 a card, paid repeatedly (Rax order book); ₹5 to 15 lakh for a prototype (Chennai integrator band)
Integrator add-ons	"Close the site complaint without a second vendor on site"	₹3,450 to ₹6,000 a unit (ANG, APAR orders)
Refrigeration OEMs	"Sell a connected freezer that a brand will specify"	Module cost must stay a small share of a ₹16,000 to ₹34,000 freezer
Pharmacies and blood banks	"Show the inspector a complete record and get woken when the fridge fails"	₹6,000 to ₹22,000 a logger on the open market; monthly fee Unknown
PM-KUSUM vendors	"Pass commissioning and CFA release"	RMS hardware inside a subsidised pump price; scheme IoT cost ceiling of 10 to 15% of capex in JJM pilots
QSR chains	"Stop manual daily logs"	Subscription quoted by TagBox and Zenatix; list prices not public

Sources: order book; Tech4LYF; Blue Star; IndiaMART and Hygroman listings; PM-KUSUM and Jal Jeevan Mission; Rebel Foods.
Rax-supplied S2 Publicly observed S236 S194 S86 S82 S26 S51

Case study one: the Ion Exchange and Nuetech softener controller (segment 1)

Rax designed a connected controller for water softeners and supplies it unbranded. Ion Exchange placed a letter of intent in September 2025 for 500 cards and Nuetech ordered 500 in April 2026, both at ₹4,600 a card, and Rax's own website shows the controller as a custom solution "courtesy Ion Exchange". Rax-supplied S2 Publicly observed S12 Ion Exchange's consumer products revenue grew 33% in Q1 FY27, which is the growth the card rides on. Publicly observed S127

What made it work: the OEM specified the job, tested the card inside its own product and took the end-customer relationship; Rax needed no certificate beyond what the finished softener carries and no brand credibility with homeowners. What it does not prove: field failure rates, margin and whether Rax owns the firmware IP are all Unknown in the record. The lesson for the portfolio is that the FIoT app and Wi-Fi stack earn money as components inside an OEM's product. Unknown Inferred

Case study two: the ANG Energy Gateway and APAR THAPS add-ons (segment 2)

ANG bought about 100 Energy Gateway units with TLS sensors at ₹3,450 to ₹3,900, and APAR Innosys bought four THAPS and four THOPS environment sensors at ₹6,000 each in November 2025; both are e-surveillance integrators that install Rax panels at bank sites. Rax-supplied S2 These are the only FIoT-branded or FIoT-derived sales in two years that reached an end site, and they arrived with no marketing because the integrator already had a Rax purchase relationship. Rax-supplied S2 S3

The warning in the same record: ANG's revenue to Rax fell by ₹2.02 Cr in FY2025-26, attributed to quality and service failures. A monitoring add-on generates alarms that the bank sees, so a device that drops offline damages the integrator's standing faster than an alarm panel that sits quietly. Any expansion here must start with a reliability fix, not a price list. Rax-supplied S3 Recommendation

Case study three: connected coolers and refrigerators (segment 3)

Coca-Cola India piloted connected coolers with Vodafone Idea Business Services and eBest IoT in 2018, with a sensor for temperature, humidity and door opening and location tracking so that partners could manage inventory and track where coolers were. Publicly observed S221 Elanpro launched IoT-enabled connected refrigerators in 2020 with a Smart Hub that monitors 20 units in a store, explicitly because brands that give refrigerators free to retailers could not track them, and built the vending side with Vendekin, whose own cloud tracks temperature and machine health. Publicly observed S220 S222

The pattern is that the brand defines the requirement, a telecom operator or platform provides connectivity, and the refrigeration OEM integrates a module. Rax can supply the module and white-label app to a second-tier OEM that lacks Elanpro's alliance, but only with a 4G variant: a cooler at a kirana store will not have Wi-Fi. Inferred Rax-supplied S4

Named target organisations

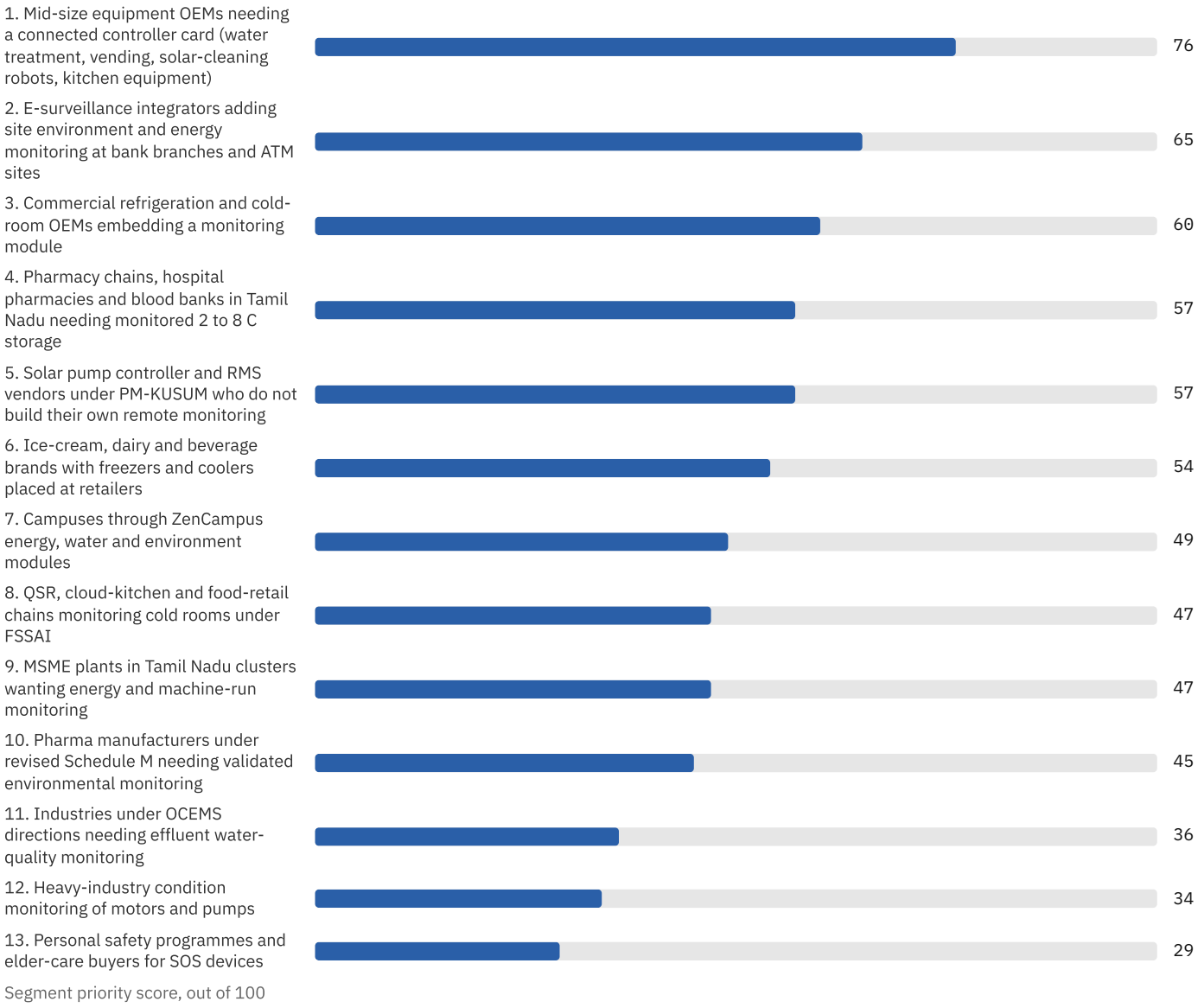
Inclusion below is a research target based on public evidence, not an existing relationship unless the order book shows one.

#	ORGANISATION	SEGMENT	PUBLIC EVIDENCE OF FIT
1	Ion Exchange (India)	1	Existing buyer of 500 softener cards; consumer products up 33% in Q1 FY27 Rax-supplied S2 Publicly observed S127
2	Nuetech Solar Systems, Bengaluru	1	Existing buyer of 500 cards; manual and automatic softener range Rax-supplied S2 Publicly observed S202
3	SSP Beverage	1	Existing buyer of vending V5 cards Rax-supplied S2
4	Inforob	1	Existing buyer of solar robot cards Rax-supplied S2 Publicly observed S201
5	Pradeep Kitchen	1	Existing buyer of level and IR sensor cards Rax-supplied S2
6	Vendekin Technologies	1, 3	Vending OEM with IoT cloud for temperature and machine health Publicly observed S222
7	Elanpro	3	Connected refrigerators with Smart Hub Publicly observed S220
8	Blue Star	3	3 lakh freezer capacity; IoT-enabled cold rooms and pharmacy refrigerators Publicly observed S194
9	Coca-Cola India bottling partners	6	Connected cooler programme since 2018 Publicly observed S221
10	SIS (SIS Alarm Monitoring and Response)	2	Largest e-surveillance account; bank sites Rax-supplied S3
11	Securens	2	Existing e-surveillance account Rax-supplied S3
12	APAR Innosys	2	Bought THAPS and THOPS in November 2025 Rax-supplied S2
13	ANG India	2	Bought 100 Energy Gateway units; churn risk Rax-supplied S2 S3
14	Cattleya Technosys, Bengaluru	2	Existing account that sells central monitoring and asset control Publicly observed S200
15	Apollo Pharmacy, Chennai	4	7,000 stores, cold-chain handling described publicly Publicly observed S195 S230
16	MedPlus	4	5,500+ pharmacies including Tamil Nadu Publicly observed S196
17	Indian Red Cross Society, Tamil Nadu Branch blood bank	4	On the state list of licensed private blood banks Verified S248
18	TEDA-empanelled PM-KUSUM pump vendors (account type)	5	Vendor commissions every pump with RMS Publicly observed S219 Verified S213
19	Coimbatore pump MSMEs through CODISSIA (account type)	5, 9	7,000+ members; about 40% of India's pump sets Publicly observed S244 Verified S173
20	Rebel Foods	8	FSSAI-driven cold-room monitoring (TagBox incumbent) Publicly observed S51
21	Fuji Electric India	cross-reference	Rack monitoring controller buyer; see the rack-monitoring report Rax-supplied S3
22	Multiplex and retail chains of the Zenatix type (account type)	8	Multi-site energy and asset visibility need Publicly observed S231

76 of 100

Score of the OEM connected-controller segment, eleven points above any other: the only FIoT segment with repeat purchase orders today.

Estimated S2



#	SEGMENT	BUYER	SIZE	SCORE	EVIDENCE
1	**Mid-size equipment OEMs needing a connected controller card (water treatment, vending, solar-cleaning robots, kitchen equipment)** Indian OEMs below the scale at which Shakti or Kirloskar build electronics in-house, who want a custom controller with Wi-Fi or 4G, an app and firmware Rax maintains. This is the business Rax already runs: Ion Exchange and Nuetech softener cards, SSP vending cards, Inforob robot cards.	OEM product or R&D head (champion); purchase head (economic buyer)	About ₹160 Cr a year of connected-controller boards and design fees across vending, pump RMS, water treatment, refrigeration and pumps in 2026 (estimated); Rax shipped more than 1,000 softener cards and 270 other cards in two years	76	Estimated | S2 | S126 | S202 | S201 | S127 | S236 | S233
2	**E-surveillance integrators adding site environment and energy monitoring at bank branches and ATM sites** SIS, Securens, APAR Innosys, ANG and the other 38 existing accounts already install Rax panels at bank sites and have bought THAPS sensors and Energy Gateway units as add-ons; the product rides an existing purchase order and service visit.	Integrator product manager and bank premises or facilities head	38 existing integrator accounts; ANG took 100 Energy Gateway units and APAR 8 THAPS units; bank-site counts per integrator Unknown	65	Rax-supplied | S2 | S3

#	SEGMENT	BUYER	SIZE	SCORE	EVIDENCE
3	**Commercial refrigeration and cold-room OEMs embedding a monitoring module** Freezer, visi-cooler and cold-room makers who want to ship a connected unit with temperature, door and location data under their own brand, as Elanpro and Blue Star have started to; Rax would supply an RT-DFI-derived module and white-label app.	OEM product head; key-account head for beverage and ice-cream brand customers	Blue Star alone has capacity for 3 lakh freezers a year; a 5% connected share across three such makers is about 45,000 modules, roughly ₹16 Cr a year (estimated)	60	Estimated S194 S220 S210 S221
4	**Pharmacy chains, hospital pharmacies and blood banks in Tamil Nadu needing monitored 2 to 8 C storage** Compliance owners who must keep temperature records under the Drugs and Cosmetics Rules and CDSCO GDP; the offer is a 4G RT-DFI unit with a calibration certificate and a small monthly alerting fee.	Pharmacy operations or QA head; blood bank medical officer; hospital pharmacy in-charge	12.4 lakh chemists nationally, 7,000 Apollo and 5,500 MedPlus stores, 304 licensed blood banks in Tamil Nadu (2015); at 25% of chemists needing one point the national pool is about ₹136 Cr a year (estimated)	57	Estimated S132 S195 S196 S243 S42 S133
5	**Solar pump controller and RMS vendors under PM-KUSUM who do not build their own remote monitoring** Every pump sanctioned under PM-KUSUM must carry a remote monitoring system; the large OEMs build their own dongles, but mid-tier empanelled vendors buy RMS hardware and portals from third parties. The rules demand indigenous controllers, which favours an Indian design house.	Vendor's technical head and state nodal agency engineer (TEDA in Tamil Nadu)	7 lakh pumps installed or solarised in FY25; at ₹4,000 of RMS hardware per pump and half the market outside in-house OEMs, about ₹140 Cr in a full year, halved for 2026 because the scheme period is being extended rather than renewed (estimated)	57	Estimated S213 S214 S215 S216 S217 S218 S219
6	**Ice-cream, dairy and beverage brands with freezers and coolers placed at retailers** Brands that give freezers to retailers free and cannot see where they are or whether they are cold; asset tracking plus temperature over 4G is the job. Coca-Cola India piloted connected coolers with Vodafone Idea and eBest in 2018.	Head of trade assets or sales operations; CIO	Placed-asset counts per brand Unknown; one national beverage programme can run to tens of thousands of coolers (inferred)	54	Publicly observed S221 S220
7	**Campuses through ZenCampus energy, water and environment modules** Schools and colleges buying ZenCampus get classroom energy control, water and environment monitoring delivered on RC03, LS08 and THAPS hardware; the IoT line earns revenue only inside the platform sale.	School or trust administrator; campus facilities head	300 active legacy Smart School users; AI product has zero users (deck audit)	49	Rax-supplied S3
8	**QSR, cloud-kitchen and food-retail chains monitoring cold rooms under FSSAI** Chains that must log cold storage temperature daily and want automated alerts to kitchen and maintenance staff; TagBox, Zenatix and DATOMS already sell here.	Head of engineering or food safety	Outlet counts per chain vary; Rebel Foods is one reference deployment; national count Unknown	47	Publicly observed S51 S153 S231

#	SEGMENT	BUYER	SIZE	SCORE	EVIDENCE
9	**MSME plants in Tamil Nadu clusters wanting energy and machine-run monitoring** Coimbatore, Chennai and Hosur engineering and pump MSMEs whose energy audits under ADEETIE or customer ESG requests create a metering line item; RT-LS08, RT-ATU and the edge gateway would serve it through an integrator.	Owner-managing director; plant or utilities head	2,53,334 registered factories with Tamil Nadu holding 15.66%; CODISSIA has 7,000+ members; at one multi-channel monitor per factory the national pool is about ₹170 Cr a year (estimated)	47	Estimated S78 S244 S151 S187
10	**Pharma manufacturers under revised Schedule M needing validated environmental monitoring** About 8,500 MSME units that must show monitored and recorded conditions with computerised system validation; the demand is urgent but the buyer needs 21 CFR Part 11-style audit trails and validation packs that Rax does not have.	QA head; plant head; validation consultant	10,500 units including 8,500 MSMEs; at 15 points and ₹8,000 a point a year, about ₹126 Cr a year (estimated)	45	Estimated S43 S44 S45 S88 S150
11	**Industries under OCEMS directions needing effluent water-quality monitoring** Grossly polluting industries must send pH, flow and other parameters to CPCB and SPCB servers; buyers need type-approved analysers, 85% data availability and third-party audit, which a Wi-Fi pH and ORP flyer cannot meet.	Environment, health and safety manager	4,433 industries in 17 categories; about 1,700 alleged still without OCEMS in four northern states (2025)	36	Verified S21 S22 S227 S164
12	**Heavy-industry condition monitoring of motors and pumps** Steel, cement, paper and chemical plants buying vibration or current-signature monitoring with a reliability service; Infinite Uptime and Nanoprecise own this space and RT-ICM has no datasheet.	Reliability or maintenance head	Predictive maintenance in India estimated at USD 674 million in 2025; mostly services to large plants	34	Estimated S128 S129 S89 S232
13	**Personal safety programmes and elder-care buyers for SOS devices** State women's safety schemes, transport departments and families buying SOS trackers; the free 112 India app, unmaintained panic-button estates and DPDP obligations make a standalone device hard to sell.	State transport or women and child department; family buyer	149 million people aged 60 and over (2022); 40,000 inoperative vehicle panic buttons in Maharashtra alone (2025)	29	Publicly observed S156 S198 S224 S67

Buying committee for a connected controller or monitoring module (OEM and cold-chain segments)

Economic buyer
OEM purchase head; pharmacy or hospital operations head
NEEDS Unit price inside the equipment BOM or a monthly fee under the cost of one spoilt batch
KILLS THE DEAL A price above the Shenzhen floor with no written saving

Champion
OEM R&D or product head; QA manager who reviews logger data
NEEDS A working prototype in weeks, firmware changes on request, an audit-ready report
KILLS THE DEAL A vendor who cannot change firmware or supply records an inspector accepts

Technical evaluator
Electronics engineer at the OEM; hospital biomedical engineer
NEEDS Datasheet with tolerances, EMC and surge behaviour, 4G fallback, open protocol
KILLS THE DEAL Wi-Fi-only design, missing accuracy figures, closed cloud

Risk and compliance
OEM quality head; drug-licence holder; DPO where personal data is involved
NEEDS WPC ETA or MTCTE evidence, calibration traceability, data-handling terms
KILLS THE DEAL Datasheet claiming CE that is not held

Procurement
Purchase or central procurement team; GeM buyer for public sites
NEEDS Vendor registration, MSME and GST documents, delivery commitment, warranty terms
KILLS THE DEAL Missed delivery dates and single-source component risk

End user
Service technician, kitchen or store staff, pharmacist on night shift
NEEDS Alerts that reach a named person and stop when acknowledged
KILLS THE DEAL Daily offline events and false alarms that teach staff to ignore the app

In the OEM segment the R&D head champions and purchase decides on unit price; in cold chain the QA or compliance owner champions and the finance or operations head decides on the monthly fee. Inferred | S2 | S206 | S51 | S216 | S44

06 Competitive landscape

KEY TAKEAWAYS

- Fifty-four competitors are profiled, thirty of them direct; the field splits into five buyer-defined arenas (cold chain, energy, machine health, gateways and water, safety) and Rax has no arena in which it is the reference brand. Verified | S51 | S89 | S93 | S118 | S198
- The price floor is set by Shenzhen white-label devices at ₹950 to ₹3,649 and by in-house ESP32 builds; the price ceiling is set by GxP systems from ELPRO, Testo and Vaisala at ₹69,500 a logger and up; Rax's ₹3,450 to ₹6,000 boards sit just above the floor with none of the ceiling's certificates. Publicly observed | S102 | S103 | S203 Rax-supplied | S2
- The funded Indian players (Infinite Uptime $35M, FluxGen ₹28 Cr, Smart Joules $10M, Kritsnam, TagBox) all sell an outcome with a service contract, not a device; the device-only Indian companies (SenseGiz at ₹1.7 Cr revenue) show what a device-only strategy earns. Publicly observed | S89 | S120 | S57 | S116
- The most dangerous competitors for Rax are partner-competitors: DATOMS sells a white-label platform to the same OEMs Rax supplies boards to, Airtel owns the SIM, and Tech4LYF-type Chennai integrators build on the same ESP32 modules at published project prices. Publicly observed | S158 | S37 | S187
- Buyers complain about the incumbents in predictable ways: Sonoff and Tuya devices drop offline, Teltonika software is buggy and thinly documented, imported loggers are expensive to calibrate; each complaint is a wedge Rax could use if it had the certificates and service to back it. Publicly observed | S106 | S181 | S96

Landscape overview

The competitor set was built by starting from the buyer, not from the catalogue. For each Rax family the question was who a Tiruppur dyeing unit, a Chennai pharmacy chain, a Coimbatore pump OEM or a Hyderabad hospital would actually call today, and the answers landed in five arenas. Inferred

ARENA	RAX MODELS EXPOSED	DIRECT COMPETITORS	SUBSTITUTES	PARTNER-COMPETITORS
Cold chain and environment monitoring	RT-DFI-W, RT-DFI-G, THAPS, THOPS	TagBox, ELPRO, Testo, Vaisala, Hygroman, GND, Adaptek and the Amazon and IndiaMART GSM logger sellers	Paper logs, WhatsApp photos, a data logger with no connectivity	Blue Star and other refrigeration OEMs, DATOMS
Energy, load and remote control	RT-RC01-W, RT-RC03-W, RT-LS08-W, RT-ATU-W	Zenatix, Ecolibrium, LoudCell, Sonoff, Tuya, Shelly; at ATM sites Maximus Infoware and Sixth Energy	PLC and BMS panels, Smart Joules service model, manual switching	Schneider EcoXpert partners, Airtel
Machine health	RT-ICM, RT-Z01-W, RT-Z03-W	Infinite Uptime, Nanoprecise, Petasense, Augury, SenseGiz	In-house condition-monitoring staff, ifm and Yokogawa sensors, breakdown maintenance	Tech4LYF and other integrators
Gateways, I/O and water	RT-IEI-E-G0, RT-WQF-W, RT-SW-FIOT	Teltonika, Advantech, Moxa, Milesight, RAK and Dragino, Kritsnam, FluxGen, LogicLadder	ThingsBoard, AWS, Azure, Tuya, Blynk, Bytebeam, ESP32 builds	DATOMS, Siemens, Bosch, CRI Pumps
Personal safety	RT-SOS-G	Leaf Wearables, marketplace GPS SOS trackers	112 India app, the phone itself	Telematics OEMs under AIS 140

Two structural facts hold across every arena. First, imports set both ends of the price range: Shenzhen white-label boards at the bottom, European and American validated systems at the top, with Indian companies occupying the middle by adding service. Second, no Indian device-only company in this set has reached meaningful revenue; the ones that raised capital sell subscriptions and outcomes.
Publicly observed | S102 | S203 | S116 | S89 Inferred

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Iot Data Logger

12,500.00 - 22,000.00 / nos (+ 18% GST applicable)

Quantity | Piece | Edit | Get Best Price

Business Type	Manufacturer, Exporter, Supplier, Distributor
Brand Name	HYGROMAN
Size	Small
Material	Plastic, Stainless Steel,Plastic and Stainless Steel

Click to view more

Request to Call | Send Enquiry

Product Details

Application	Realtime Temperature and Humidity Monitoring IOT Cloud Based Software and APP	Power Source	Electric
Country of Origin	India	Display	1.3" 128X64 OLED monochrome Graphical Display
Automation Grade	Automatic	Total Carbohydrate	1 year against any manufacturing defects
Number Of Flower	Cloud Based IOT Datalogger	Port	Mumbai
Payment Terms	T/T	Delivery Time	3 to 4 days
Packaging Details	Data Logger, Sensor, Wire, Hooter		

Realtime Temperature And Humidity Data Logger (WIFI) or (SIM)

Temperature Range	-40°C to +120°C
Humidity Range	0% RH to 100% RH
Sensor Type	Temp+RH Sensor
Temperature Accuracy	± 0.5°C
Accuracy	±3% RH
Resolution	0.1°C 0.1% RH
Cloud Storage	3 Month
Internal Data Storage	150 Days (15 min Interval
Display Type	Digital LED Display

FEATURES

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The Indian mid-tier: a Mumbai logger with published accuracy, dual connectivity and a published price, which is the minimum an RT-DFI listing would need to match. Source S82

Arena one: cold chain and environment monitoring

This is the arena where Rax has shipped anything at all (eight THAPS and THOPS units) and where regulation is tightening fastest through revised Schedule M, CDSCO's draft Good Distribution Practices and FSSAI's fish-storage direction. Rax-supplied S2 | Verified S43 S42 S153

The Indian mid-tier is represented by Hygroman, whose Wi-Fi or SIM logger lists at ₹12,500 to ₹22,000 with ±0.5 C accuracy, a hooter, an OLED display, 150 days of local memory and IP64 ingress. That is the minimum specification a pharmacy or hospital buyer now sees as normal, and RT-DFI's flyer states none of those figures. Publicly observed S82 | Rax-supplied S4

Below Hygroman sit the GSM alarm loggers on IndiaMART and Amazon: Adaptek of Chennai at ₹6,000, VEGA's GSM-20E at ₹6,500, Pyrotronics at ₹19,000, Innovator Automation at ₹18,500 with a server, Ace Instruments at ₹20,000, and Instrukart-class units that bundle a twelve-month calibration certificate as the selling point. Publicly observed S86 S85 S83 S84 S87 S190

Above the mid-tier sit the GxP systems. Testo's Saveris 2-H1 is listed at ₹69,500 by a Mumbai dealer; ELPRO sells LIBERO cellular loggers with validation packs and pay-per-sensor cloud; Vaisala claims 3,200 life-science customers and 1,400 installed viewLinc systems. These are what a top-50 pharma QA manager who "reviews temperature data of data loggers" and approves excursions is used to. Publicly observed S203 S81 S204 S206

TagBox is the Indian company that has bridged device and service. Its Rebel Foods deployment monitors kitchens and cold rooms in real time with FSSAI compliance framing, and it packages its own Tag360 sensors, TagHub gateways and AssetLens dashboards. GND Solutions markets the same bundle with revised Schedule M and ALCOA+ language. Publicly observed S51 S88

> SO WHAT FOR RAX
>
> RT-DFI could compete only in the ₹6,000 to ₹20,000 band, and only if it published accuracy, ingress and battery figures, shipped a calibration certificate, and offered a SIM variant for sites without reliable Wi-Fi. Without those three things it is a Sonoff-class sensor with a Rax label. Recommendation

Arena two: energy, load and remote control

Zenatix is the reference brand. Acquired by Hero Electronix in 2018 and now sold as Zenatix by Schneider Electric, it monitors energy, temperature and assets across retail chains, QSRs and bank branches with wireless mesh sensors and claims 50,000 connected assets and a twelve to fourteen month payback. Publicly observed | S176 | S60 | S59

Ecolibrium's SmartSense and Smart Joules' DeJoule occupy the enterprise decarbonisation end. Smart Joules raised $10 million in December 2025 and sells cooling and efficiency as a service with no upfront capital, which removes the very budget line Rax's RC and LS devices would have to win. Publicly observed | S61 | S57 | S58

At the bottom of the arena sit the Wi-Fi relays and metering switches that RT-RC01, RT-RC03 and RT-LS08 most resemble. Sonoff's POWR320D 20 A metering switch is ₹3,649 on Amazon.in, Tuya modules are ₹950 on IndiaMART, and Shelly's Plus 1PM with local MQTT is ₹2,200. Buyer forums complain that Sonoff and Tuya devices "keep going offline" on 2.4 GHz networks. Publicly observed | S102 | S103 | S104 | S106 | S181

LoudCell, a Gurugram company monitoring diesel generator fuel and energy since 2013 with Bharti as a logo customer, shows the narrow-niche route: one asset class, one buyer type (retail and bank branches), a decade of references. Publicly observed | S165

Arena three: machine health

Infinite Uptime is the Indian success story, with 800 plants in about thirty countries, a $35 million Series C in March 2025 and a cash-flow-positive business selling edge vibration sensors plus a reliability service to steel, cement, chemical and paper plants. RT-ICM, which has no datasheet, would be compared with this. Publicly observed | S89 Rax-supplied | S1

Nanoprecise, Petasense and Augury complete the imported and venture-funded tier. Third-party estimates put Nanoprecise at $40 to $120 per asset per month plus $300 to $1,200 per sensor. Yokogawa's Sushi Sensor and ifm's moneo sell into large process plants through their own sales forces. Estimated | S90 Publicly observed | S91 | S92 | S161 | S112

SenseGiz of Belgaum is the cautionary case: a decade-old Indian BLE-mesh device company with awards and a broad use-case list that reported ₹1.7 Cr of revenue in FY2025. A device catalogue without a service model does not compound in India. Publicly observed | S116 Inferred

The substitute here is people. Indeed lists roughly a hundred vibration-monitoring vacancies in India including Condition Monitoring Engineer roles in Chennai; a plant that hires one engineer with a handheld analyser has solved the problem RT-Z01 and RT-Z03 address, for ₹4 to 8 lakh a year. Publicly observed | S207 Estimated | S207

Arena four: gateways, I/O, platforms and water

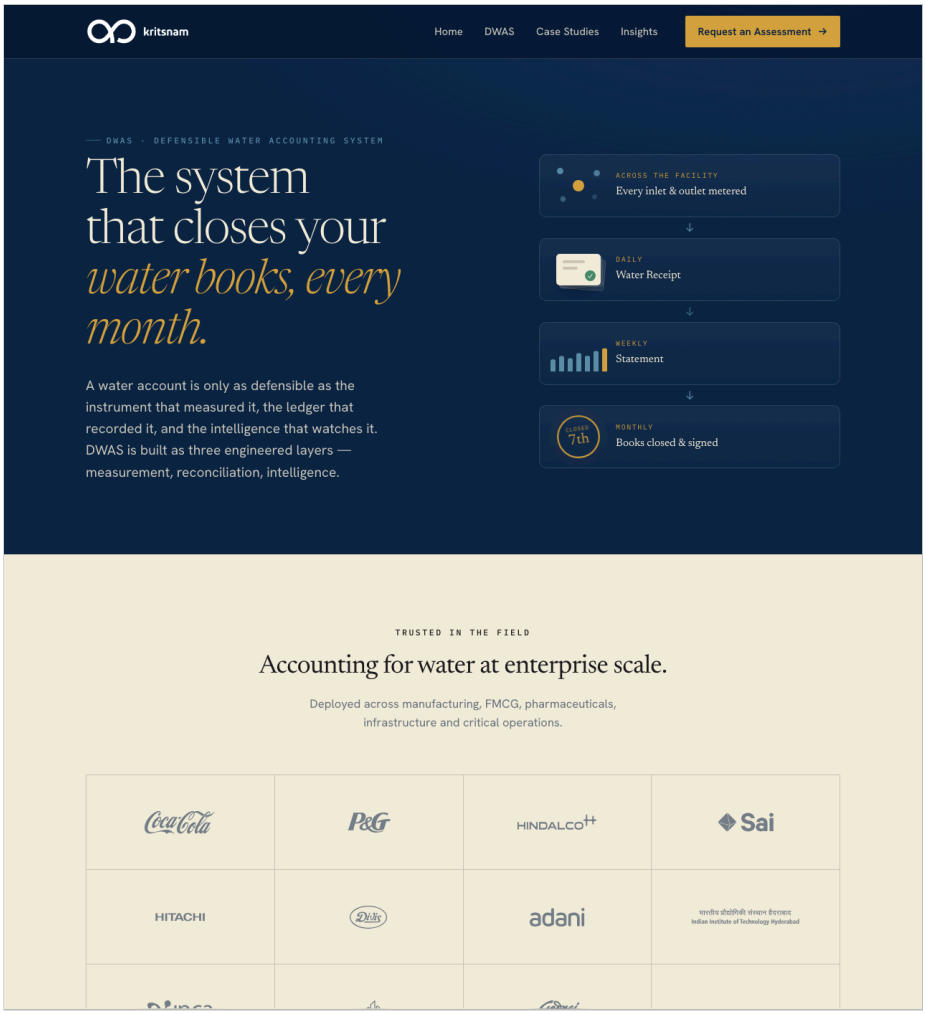
RT-IEI-E-G0 is the only Rax model with a full datasheet, and it lands in the most crowded arena. Teltonika's TRB140 sells at ₹11,000 on IndiaMART and ₹17,999 on Flipkart; Advantech's WISE-4050 Wi-Fi I/O module at ₹14,533; Milesight's UG65 LoRaWAN gateway at ₹45,068; Moxa's UC-8100 at ₹68,000 with UL and IEC ratings and a five-year warranty. Publicly observed | S93 | S95 | S98 | S97 | S159

Every one of those gateways carries CE, FCC or UL marks and a distributor network; Rax's datasheet claims CE that the internal record says is not held. Buyer reviews of Teltonika complain about buggy software and thin documentation, which is the one soft spot a well-supported Indian gateway could exploit. Publicly observed | S99 | S96 Rax-supplied | S3 | S5

The LoRaWAN developer tier is cheaper still: RAKwireless's IN865 RAK7268 gateway from USD 154 and Dragino's LSN50 sensor node at ₹6,245 from a Bengaluru seller. A pilot that once needed Rax's board can now be assembled from these parts by any integrator. Publicly observed | S101 | S100

Platforms are substitutes for RT-SW-FIOT rather than competitors to it. ThingsBoard Community Edition is free, its Cloud tier is $149 a month for 100 devices, AWS IoT Core connectivity costs about $0.042 per device per year, Blynk starts at $29 a month and Tuya's IoT Core charges $3.15 per million API calls. Nobody pays for a small vendor's platform when these exist. Publicly observed | S108 | S110 | S166 | S167 Inferred

Water is its own sub-arena. Kritsnam's Dhaara ultrasonic meters carry OIML R49 type approval and NABL calibration, and the company sells a managed water-accounting service at ₹18 to 30 lakh per plant per year to 2,000 facilities; FluxGen raised ₹28 Cr in 2025 with Tata Steel as a reference; LogicLadder pushes analyser data to CPCB and SPCB servers. RT-WQF-W, a Wi-Fi pH and ORP flyer, is not in this conversation. Publicly observed | S118 | S119 | S120 | S164 Rax-supplied | S4



What winning in industrial water looks like: a Legal Metrology licence, OIML type approval and a signed monthly statement, not a Wi-Fi sensor.
Source S118

Arena five: personal safety

RT-SOS-G competes with a free government service. The 112 India app has 50 lakh+ downloads, raises an SOS when the power button is pressed three times, and the Emergency Response Support System explicitly accepts IoT-based signals as one of its ten channels. Leaf Wearables' SAFER pendant, once priced around ₹2,402, and the ₹2,000 to ₹15,000 GPS SOS trackers on Amazon.in fill the paid niche for elderly and lone workers. Verified S198 S199 S121 S122

Feature and price comparison against Rax

The matrix uses the criteria that appeared in buyer sources: price, connectivity beyond Wi-Fi, published accuracy or ratings, certificates, calibration, service contract, and Indian support. Inferred

CRITERION	RAX FIOT	SONOFF AND TUYA	HYGROMAN	TELTONIKA AND ADVANTECH	TAGBOX AND ZENATIX	ELPRO, TESTO, VAISALA	KRITSNAM
Device price	₹3,450 to ₹6,000	₹950 to ₹3,649	₹12,500 to ₹22,000	₹11,000 to ₹18,000	Bundled in subscription	₹69,500 and up	₹25,000 to ₹75,000
Connectivity	Wi-Fi on 9 of 13; 4G, LoRaWAN, BLE on IEI	Wi-Fi 2.4 GHz	Wi-Fi or SIM	4G, Ethernet, Wi-Fi	Mesh, cellular gateways	Cellular, LoRa, Wi-Fi	Dual-SIM 4G
Published accuracy or ratings	None except IEI I/O	Basic	±0.5 C, IP64	Full datasheets, MTBF	Per-sensor specs	Full, DIN EN 12830	OIML R49
Certificates held	None verified; CE printed but not held	CE and FCC on most	Not stated	CE, FCC, RoHS; UL on Moxa	Not stated	CE, GxP validation	Legal Metrology, NABL
Calibration	None offered	None	Not stated	Not applicable	Offered	Offered, traceable	Offered, NABL
Service contract	None	None	None	RMS subscription	Core of offer	Core of offer	Core of offer

CRITERION	RAX FIOT	SONOFF AND TUYA	HYGROMAN	TELTONIKA AND ADVANTECH	TAGBOX AND ZENATIX	ELPRO, TESTO, VAISALA	KRITSNAM
Indian support	Chennai team	None	Mumbai	Distributor	Direct	Subsidiary or distributor	Direct
Reference customers	APAR Innosys (8 units)	Consumer reviews	Not stated	Global	Rebel Foods; retail chains	Top pharma	2,000 facilities, Nalco class

Sources for the matrix rows: Rax order book and datasheets; Sonoff and Tuya listings; Hygroman; Teltonika, Advantech and Moxa listings; TagBox and Zenatix; Testo and Vaisala; Kritsnam. Rax-supplied | S2 | S3 | S4 | S5
Publicly observed | S102 | S103 | S82 | S93 | S98 | S159 | S51 | S60 | S203 | S204 | S118

Positioning map narrative

The map in the data plots price per monitored point against compliance and service depth. The crowded corner is bottom-left: Sonoff, Tuya, ESP32 builds, and Rax, all selling a cheap sensing point with no certificate or service. The crowded top-right is the validated systems and managed services: ELPRO, Vaisala, Kritsnam, Infinite Uptime. Estimated | S2 | S102 | S203 | S118

The empty space is the lower-middle: a ₹6,000 to ₹15,000 Indian device with a published specification, a calibration certificate, a SIM option and a small monthly service fee, sold through pharma distributors and refrigeration OEMs. Hygroman and the Instrukart-class listings edge toward it on device terms, TagBox and GND approach it from the service side, and nobody owns it in Tamil Nadu.
Publicly observed | S82 | S190 | S51 | S88 Inferred

Five competitor deep-dives

TagBox Solutions

TagBox is a Bengaluru company whose AssetLens platform combines its own Tag360 sensors, TagHub gateways and cloud analytics. Its Rebel Foods contract put real-time temperature, door and energy monitoring across cloud kitchens with an FSSAI compliance narrative, and it lists 50+ organisations across India and APAC. It is angel and IAN funded and won a National Startup Award in 2021. Publicly observed | S51

Strengths: it sells to a compliance owner, not to a plant electrician; it controls hardware and software; it has a named reference in the exact QSR segment where Rax's THAPS sensors could sit. Weaknesses: pricing is quote-only and the company is small enough that a single large account dominates. Expected response to Rax: none, unless Rax lands a QSR chain, in which case TagBox would undercut on the software layer.
Publicly observed | S51 Inferred

Zenatix by Schneider Electric

Zenatix started as an IIT-Delhi energy analytics company, was acquired by Hero Electronix in 2018, and now operates under the Schneider brand with WattMan and ZenConnect wireless mesh monitoring for multi-site retail, QSR and banking. It claims over 50,000 connected assets and a twelve to fourteen month return. Publicly observed | S176 | S60 | S59

Strengths: an enterprise sales motion, the Schneider channel with 4,000+ EcoXpert partners, and a payback claim that finance directors accept. Weaknesses: it does not chase single plants or MSMEs, which leaves the segment Rax could reach. Expected response: Schneider partners would be told to position EcoStruxure Machine Advisor and Zenatix against any Rax pilot that reaches a multi-site chain.
Publicly observed | S209 | S113 Inferred

Infinite Uptime

Infinite Uptime, founded in Pune, sells edge vibration and process sensors with AI diagnostics and a reliability service; it reports 800 plants in about thirty countries, cash-flow positivity and a $35 million Series C in March 2025 led by Avataar Ventures with Tiger Global participating.
Publicly observed | S89

Strengths: a decade of plant references, proprietary sensors rated for hot and dusty environments, and a service model that ties revenue to uptime. Weaknesses: heavy-industry focus and per-plant pricing that MSMEs cannot absorb. Expected response: it would ignore an RT-ICM launch unless Rax reached a steel or cement account, which nothing in the order book suggests. Publicly observed | S89 Inferred

Kritsnam Technologies

Kritsnam, out of IIT Kanpur and based in Hyderabad, makes the Dhaara ultrasonic water meter with dual-SIM 4G telemetry, holds OIML R49 type approval, NABL calibration and a Legal Metrology licence, and reports 2,000+ facilities. It sells a managed water-accounting service at ₹18 to 30 lakh per plant per year on top of meters priced from ₹25,000. Publicly observed | S118 | S119

Strengths: it sells an audited outcome that satisfies CGWA and state boards, and the certificates are the moat. Weaknesses: flow only, no water quality. Expected response: if Rax attempted to sell RT-WQF-W into effluent plants, Kritsnam and LogicLadder would point buyers to the absence of type approval and CPCB data-push integration. Publicly observed | S118 | S164 Inferred

Teltonika Networks

Teltonika, from Vilnius, sells the TRB140 LTE gateway and RUT routers through multiple Indian distributors at ₹11,000 to ₹18,000 with MQTT, SNMP, VPN and its RMS remote management service. Reviews praise reliability and price but complain about buggy firmware, thin documentation and support. Publicly observed | S93 | S94 | S95 | S96

Strengths: certification, five-year design life, a mature remote management platform and stock availability in India. Weaknesses: software quality complaints and no local engineering. Expected response: distributors would match any Rax RT-IEI price with a TRB140 plus RMS bundle, because their margin is in the subscription. Publicly observed | S96 Inferred

Where Rax wins and loses

Rax wins where it has already won: an OEM that needs a controller card with connectivity at ₹3,450 to ₹5,940, designed and supplied from Chennai with tooling and firmware Rax owns. Ion Exchange, Nuetech, ANG, SSP Beverage and Inforob bought exactly that. No competitor in this set sells that combination at that price with local engineering. Rax-supplied | S2 Inferred

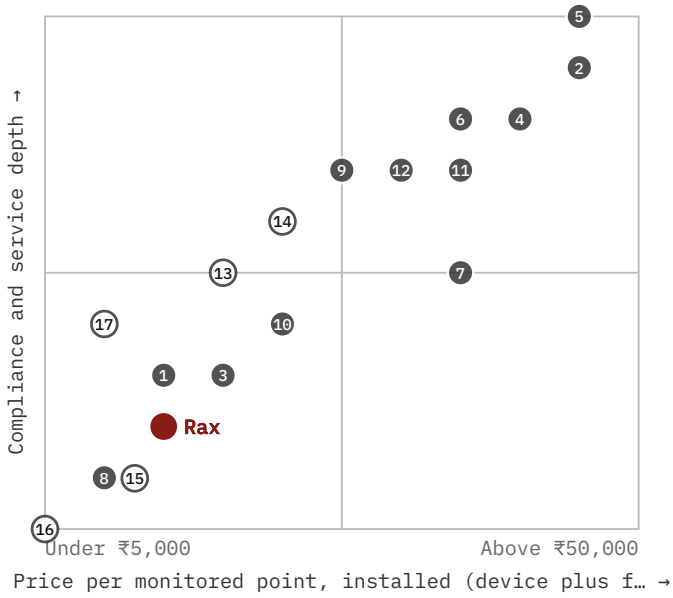
Rax loses wherever the buyer asks for a certificate, an accuracy figure, a SIM option, a calibration report or a service contract, which is every regulated buyer in arenas one, three and four. It also loses on the platform, where ThingsBoard, AWS and Tuya make RT-SW-FIOT unsaleable as a product. Publicly observed | S82 | S203 | S118 | S108 Rax-supplied | S3 | S4

> *"Devices keep going offline." A Sonoff user on Reddit, summarising the most common complaint about the Wi-Fi relay class that RT-RC01 and RT-LS08 belong to.* Publicly observed | S106

Buyers' complaints about incumbents are a map of the wedges: Wi-Fi drop-outs (Sonoff, Tuya), buggy software (Teltonika), price and calibration cost (Testo, Vaisala), enterprise-only pricing (Zenatix, Infinite Uptime). A Rax offer that fixed the first two by shipping a 4G or LoRa option with a Chennai support line, and the third by bundling calibration, would have a story. Publicly observed | S106 | S181 | S96 | S203 Recommendation

Competitor responses to expect

If Rax gains share as an OEM board supplier, the response comes from DATOMS and the Chennai integrators, who would offer the OEM a platform plus a commodity board. If Rax gains share in cold-chain devices, TagBox and Hygroman would compete on service and specification, and the marketplace sellers would compete on price. If Rax gains share in gateways, Teltonika's distributors would bundle RMS. In every case the response arrives within a quarter and costs the competitor nothing structural. Publicly observed | S158 | S187 | S51 | S82 | S96 Inferred



1. Amazon GSM monitors (Instrukart class) — Direct
2. ELPRO, Vaisala — Direct
3. Hygroman — Direct
4. Infinite Uptime, Nanoprecise — Direct
5. Kritsnam — Direct
6. LogicLadder — Direct
7. Moxa — Direct
8. Sonoff, Tuya white-label — Direct
9. TagBox — Direct
10. Teltonika, Advantech gateways — Direct
11. Testo Saveris 2 — Direct
12. Zenatix by Schneider — Direct
13. Airtel IoT — Partner-competitor
14. DATOMS — Partner-competitor
15. In-house ESP32 builds — Substitute
16. Manual logs and WhatsApp — Substitute
17. ThingsBoard, AWS IoT — Substitute

Rax ● Direct ○ Indirect, substitute or partner

Price per monitored point, installed (device plus first-year service) across, Compliance and service depth up. Positions are judgements on a 0 to 10 scale; see the competitor profiles for the evidence.

COMPETITOR	TYPE	PRODUCTS IN INDIA	PRICE BAND	INDIA PRESENCE	THREAT
Adaptek Automation Technology Chennai	direct	S130 GSM data logger for analogue and digital temperature	₹6,000 per unit	Chennai IndiaMART seller	medium

COMPETITOR	TYPE	PRODUCTS IN INDIA	PRICE BAND	INDIA PRESENCE	THREAT
Advantech (WISE and ADAM) Taipei; Advantech India, Bengaluru	direct	WISE-4050 Wi-Fi I/O, ADAM-6700 edge gateways with Node-RED, ECU gateways	₹14,500 to ₹1 lakh	Indian office and resellers; WISE-4050 at ₹14,533	high
Augury New York	direct	Machine Health vibration and magnetic sensors with AI diagnostics; 99.9% accuracy claim	Quote-based enterprise subscription	Global vendor selling to multinational plants in India	low
Ecolibrium (SmartSense) Ahmedabad and London	direct	SmartSense asset and energy analytics platform with sensors and gateways	Quote-based subscription	Indian-founded; 80+ clients and 500+ sites claimed; ISO 27001	medium
ELPRO-BUCHS AG Buchs, Switzerland	direct	LIBERO cellular real-time loggers, ECOLOG-PRO freezer loggers, elproMONITOR cloud with pay-per-sensor pricing	Premium; pay-per-sensor cloud	Global GxP monitoring vendor selling to Indian pharma through distributors	medium
FluxGen Sustainable Technologies Bengaluru	direct	AquaGen water IoT platform with flow, level and quality sensors	Quote-based subscription	Indian; ₹28 Cr Series A 2025; Tata Steel and Microsoft named	medium
GND Solutions India	direct	BLE and LoRaWAN temperature loggers, reefer monitoring, Modbus integration, audit reports	Quote-based	Indian cold-chain IoT vendor exhibiting at AICCS 2026	medium
Hygroman India Mumbai	direct	Wi-Fi or SIM IoT temperature-humidity data logger with hooter, OLED, 150-day memory, IP64, ±0.5 C	₹12,500 to ₹22,000 plus GST per logger	Indian manufacturer; sells direct and online	high
Infinite Uptime Pune and Alpharetta	direct	Edge vibration and process sensors with AI diagnostics and reliability service for steel, cement, chemicals, paper	Per-plant subscription; quote-based	Indian-founded; 800 plants in about 30 countries; $35M Series C March 2025	high
Instrukart TAM1-IoT and other GSM temperature monitors on Amazon.in India and China (various)	direct	Server-room and cold-room GSM temperature monitors with SMS alerts, some with a 12-month calibration certificate	₹6,500 to ₹20,000	Sold on Amazon.in and IndiaMART with Indian sellers	high
ITEAD (SONOFF) and Tuya white-label devices Shenzhen	direct	POWR320D 20 A Wi-Fi metering switch, Basic and Mini relays, Tuya switch modules and temperature-humidity sensors	₹500 to ₹3,649 per device	Sold on Amazon.in, Flipkart, IndiaMART and ITEAD's India B2B store	high
Kritsnam Technologies Hyderabad	direct	Dhaara ultrasonic smart water meters with dual-SIM 4G and a managed water-accounting service	Meters ₹25,000 to ₹75,000; service ₹18 to 30 lakh per plant per year	Indian; 2,000+ facilities claimed; TDB funded; Legal Metrology licence	medium
Leaf Wearables (SAFER) New Delhi	direct	SAFER pendant and SAFER PRO chip with app alerting	About ₹2,402 planned for SAFER PRO	Indian; won $1M Women's Safety XPrize; sold on Amazon and Flipkart	low
LogicLadder (The Sustainability Cloud) Gurugram	direct	IoT gateway pushing analyser data to CPCB and SPCB; effluent, emission, water, energy and carbon modules	Product pricing pages; quote-based	Indian; OCEMS, CGWA, energy and CCTS compliance software; CPCB data push	high
LoudCell Gurugram and Santa Clara	direct	iFMS diesel generator fuel and energy monitoring across retail, banks, data centres, hospitals	Quote-based	Indian DG fuel and energy monitoring since 2013; Bharti as logo customer	low
Marketplace GPS SOS trackers (DrRing, AUSHA GF-07 and others) Shenzhen and Indian brands	direct	GPS trackers and SOS pendants with WhatsApp alerts and subscriptions	₹2,000 to ₹15,000	Amazon.in	medium

COMPETITOR	TYPE	PRODUCTS IN INDIA	PRICE BAND	INDIA PRESENCE	THREAT
Maximus Infoware (OverSite) India	direct	OverSite ATM site monitoring of UPS, batteries, power, AC and temperature with vibration tracking	Quote-based	Indian ATM site monitoring software and hardware vendor	medium
Milesight Xiamen	direct	LoRaWAN gateways UG56 and UG65, EM300 sensors, UC300 controllers, 4G routers	Gateway ₹25,000 to ₹45,000; sensors USD 65 to 105	Indian resellers; UG65 at ₹45,068	medium
Moxa Taipei	direct	UC-8100 Arm gateways with Debian, RS-485, cellular, 5-year warranty, UL and IEC 61000 ratings	₹68,000 per gateway	Indian distributors; UC-8100 at ₹68,000	medium
Nanoprecise Sci Corp Edmonton; India operations	direct	MachineDoctor wireless vibration, acoustic and temperature sensor with AI predictive maintenance	Estimated $40 to $120 per asset per month plus $300 to $1,200 per sensor	Sells in India across metals, cement, chemicals, pharma	medium
Petasense Bengaluru and California	direct	Wireless vibration sensors and ARO analytics	Annual licence per asset	Indian R&D base; annual licence plus maintenance model	low
RAKwireless and Dragino Shenzhen	direct	WisGate RAK7268 gateways (IN865 from USD 154), Dragino LoRa sensor nodes	₹6,000 to ₹21,000	RAK now on Amazon India; Dragino LSN50 at ₹6,245 via Bengaluru sellers	medium
SenseGiz Technologies Belgaum	direct	COIN BLE mesh devices for condition monitoring, asset and people tracking, cold chain	Quote-based	Indian; ₹1.7 Cr revenue FY2025	low
Shelly (Allterco) Sofia, Bulgaria	direct	Plus 1PM and Pro DIN-rail relays with power metering, local MQTT and REST	₹2,200 to ₹8,000	Sold through Indian resellers	low
Sixth Energy Technologies Bengaluru	direct	ATM remote site monitoring with integrated sensors and computer vision; energy efficiency monitoring	Quote-based	Indian full-stack IoT company with ATM site monitoring, energy and asset solutions	medium
TagBox Solutions Bengaluru	direct	AssetLens platform with Tag360 temperature, door and energy sensors and TagHub gateways for cold rooms, kitchens and reefers	Quote-based; software-led subscription	Indian; claims 50+ organisations across India and APAC; Rebel Foods reference	high
Teltonika Networks Vilnius	direct	TRB140 LTE gateway, RUT routers, RMS remote management	₹11,000 to ₹18,000 per gateway	Multiple Indian distributors; TRB140 at ₹11,000 to ₹17,999	high
Testo India (Saveris 2) Lenzkirch, Germany; Testo India, Pune	direct	Wi-Fi temperature and humidity loggers with cloud, DIN EN 12830, 802.1X	₹35,000 to ₹70,000 per logger	Indian subsidiary and dealer network; Saveris 2-H1 listed at ₹69,500 on IndiaMART	medium
Vaisala (viewLinc, VaiNet) Vantaa, Finland; Vaisala India, Pune	direct	viewLinc continuous monitoring, DL and RFL LoRa loggers for fridges, freezers, cold rooms, warehouses	Premium; system sale with validation	India office; claims 3,200 life-science customers globally and 1,400 installed systems	low
Zenatix by Schneider Electric Gurugram	direct	WattMan and ZenConnect wireless mesh energy, temperature and asset monitoring for retail, QSR and bank branches	Per-site subscription; 12 to 14 month ROI claim	Indian; acquired by Hero Electronix 2018, now branded with Schneider; 50,000+ connected assets in 2022	high
Bosch Rexroth (ctrlX IOT) Lohr am Main; Bosch India	indirect	ctrlX CORE as IEC 62443-certified Linux IoT gateway with app store	Quote-based	Bosch India presence	low
ifm electronic (moneo) Essen; ifm India, Kolhapur	indirect	moneo IIoT platform with IO-Link sensors, PLC-independent condition monitoring	Sensor plus licence; quote-based	Indian subsidiary and sales network	low
Schneider Electric (EcoStruxure, EcoXpert) Rueil-Malmaison; Schneider India	indirect	EcoStruxure Machine Advisor, power monitoring, building management	Quote-based	4,000+ EcoXpert partners globally; Machine Advisor sold in India; owns Zenatix brand	medium

COMPETITOR	TYPE	PRODUCTS IN INDIA	PRICE BAND	INDIA PRESENCE	THREAT
Siemens (Insights Hub, SIMATIC IOT2050) Munich; Siemens India	indirect	IOT2050 edge gateway, Insights Hub platform with partner apps	Quote-based; free start tier	Indian partner ecosystem incl. IndX	low
Smart Joules New Delhi	indirect	DeJoule IoT platform plus JoulePays efficiency-as-a-service and JouleCool cooling-as-a-service	No upfront capital; savings share	Indian; $10M Series B December 2025; ₹266 Cr customer savings claimed	medium
Yokogawa India (Sushi Sensor) Tokyo; Yokogawa India, Bengaluru	indirect	XS770A LoRaWAN wireless vibration sensor with 10-year battery and asset-performance software	Premium; quote-based	Sold and supported in India	low
112 India app and ERSS New Delhi (MHA)	substitute	Free SOS by pressing the power button three times; volunteer alerts; accepts IoT-based signals	Free	All 36 states and UTs; 50 lakh+ downloads	high
AWS IoT Core and Azure IoT Hub Seattle and Redmond	substitute	Managed MQTT brokers, device registry, rules; AWS about $0.042 per device per year connectivity plus $1 per million messages	Usage-based	Mumbai and Pune regions	low
Blynk New York	substitute	Low-code IoT platform from $29 to $1,099 a month; white-label enterprise	$29 to $1,099 per month	Used by Indian startups	low
Bytebeam Bengaluru	substitute	Device management, OTA and analytics backend for EV and industrial IoT	Quote-based	Indian; $3.25M seed	low
In-house ESP32, Arduino and Raspberry Pi builds Everywhere	substitute	Custom boards built by integrators or plant engineers	₹2,000 to ₹15,000 per point	Chennai integrators publish component costs: ESP32 ₹400 to ₹1,200, sensors ₹150 to ₹5,000	high
Manual logging, spreadsheets and WhatsApp Everywhere	substitute	Paper temperature logs, once-a-day readings, WhatsApp photos to supervisors	Near zero	Universal	high
PLC and SCADA vendors and panel builders Various	substitute	Wired I/O, PLCs, SCADA and BMS that already capture the signals Rax's devices would send	₹25,000 per month upward for BMS	Every SIPCOT and MIDC estate has panel builders; BMS integrators quote ₹25,000 to ₹3.5 lakh per month in Chennai	medium
ThingsBoard Kyiv and New York	substitute	Open-source IoT platform; Cloud from $10 to $749 a month; PE self-managed from $10; perpetual from $4,999	$149 per month for 100 devices on Cloud	Used by Indian integrators; Community Edition free	medium
Tuya IoT Developer Platform Hangzhou	substitute	IoT Core with USD 3.15 per million API calls; SmartLife app SDK USD 5,000 first year	Usage plus app licence	Used by Indian consumer brands	low
Bharti Airtel IoT New Delhi	partner-competitor	IoT SIMs, connectivity management platform, NB-IoT and LTE-M, solutions for utilities and retail	SIM ₹450 to ₹699 per year on open market; platform quote-based	62% of M2M SIMs; 48 million devices; 11,000 customers	medium
Blue Star (commercial refrigeration) Mumbai	partner-competitor	Deep freezers, pharmacy refrigerators, ice-lined refrigerators, cold rooms with remote monitoring	Freezers ₹16,000 to ₹34,000	300,000 freezers a year from Wada; IoT-enabled modular cold rooms	medium
Cattleya Technosys Bengaluru	partner-competitor	Central monitoring, asset control, telematics products	Quote-based	Indian IoT and e-surveillance product company; an existing Rax account	low
CRI Pumps (IoT-enabled pumps) Coimbatore	partner-competitor	Pumps with IoT drives and controllers, app monitoring	Bundled in pump price	Claims 60,000 IoT-enabled smart pumps and 50,000 IoT solar pumps supplied	medium
DATOMS (Phoenix Robotix) Bhubaneswar and Bengaluru	partner-competitor	White-label IoT platform for OEMs and integrators: DG, solar, compressor, chiller, cold storage and CPCB compliance monitoring	Quote-based; per-device platform	Indian; Series A; Nalco reference	high

COMPETITOR	TYPE	PRODUCTS IN INDIA	PRICE BAND	INDIA PRESENCE	THREAT
Elecbits New Delhi	partner-competitor	IoT product development and manufacturing services, XOR platform	Quote-based NRE plus unit price	Indian ODM and OEM platform	medium
Jio Platforms IoT Mumbai	partner-competitor	4G and 5G IoT core, platform with ATOM analytics, devices	Quote-based	19% of M2M SIMs; NB-IoT and Cat-M core	low
Tata Communications (MOVE, LoRaWAN) Mumbai	partner-competitor	MOVE connectivity, eSIM, LoRaWAN, managed IoT	Quote-based	13 million SIMs managed globally; LoRaWAN network offer in India	low
Tech4LYF Corporation Chennai	partner-competitor	Sensors, ESP32 and 4G gateways, dashboards, ERP integration; ₹50,000 to ₹30 lakh projects	₹50,000 to ₹30 lakh per project	Chennai integrator claiming 90+ factory deployments	medium

Competitor profiles

– **Adaptek Automation Technology** direct · threat medium Publicly observed | S86

Chennai · Chennai IndiaMART seller · ₹6,000 per unit

STRENGTHS

- Local, cheap, GSM-based

WEAKNESSES

- Commodity product with no platform

– **Advantech (WISE and ADAM)** direct · threat high Publicly observed | S98 | S99

Taipei; Advantech India, Bengaluru · Indian office and resellers; WISE-4050 at ₹14,533 · ₹14,500 to ₹1 lakh

STRENGTHS

- CE, FCC, RoHS; Modbus/TCP, MQTT, REST
- Global support

WEAKNESSES

- Imported; price above Indian boards

– **Augury** direct · threat low Publicly observed | S92

New York · Global vendor selling to multinational plants in India · Quote-based enterprise subscription

STRENGTHS

- $1B valuation, deep reliability content

WEAKNESSES

- Enterprise-only; no MSME motion

– **Ecolibrium (SmartSense)** direct · threat medium Publicly observed | S61

Ahmedabad and London · Indian-founded; 80+ clients and 500+ sites claimed; ISO 27001 · Quote-based subscription

STRENGTHS

- Decade of references, awards
- Analytics library of 100+ applications

WEAKNESSES

- Positioned as decarbonisation platform; heavier than Rax's buyers need

– **ELPRO-BUCHS AG** direct · threat medium Publicly observed | S81

Buchs, Switzerland · Global GxP monitoring vendor selling to Indian pharma through distributors · Premium; pay-per-sensor cloud

STRENGTHS

- GxP validation packs, calibration traceability, audit trail
- Cellular loggers that work without site Wi-Fi

WEAKNESSES

- Priced for regulated pharma, not chemists or QSRs
- No Indian manufacturing

– **FluxGen Sustainable Technologies** direct · threat medium Publicly observed | S120

Bengaluru · Indian; ₹28 Cr Series A 2025; Tata Steel and Microsoft named · Quote-based subscription

STRENGTHS

- Funded, enterprise references

WEAKNESSES

- Enterprise focus

– **GND Solutions** direct · threat medium Publicly observed | S88

India · Indian cold-chain IoT vendor exhibiting at AICCS 2026 · Quote-based

STRENGTHS

- Sector messaging tied to revised Schedule M and ALCOA+
- Reefer fleet plus warehouse coverage

WEAKNESSES

- No published prices or references

– **Hygroman India** direct · threat high Publicly observed | S82

Mumbai · Indian manufacturer; sells direct and online · ₹12,500 to ₹22,000 plus GST per logger

STRENGTHS

- Made in India, published specification and accuracy
- Dual Wi-Fi or SIM option

WEAKNESSES

- Small brand
- Cloud storage only 3 months

– **Infinite Uptime** direct · threat high Publicly observed | S89

Pune and Alpharetta · Indian-founded; 800 plants in about 30 countries; $35M Series C March 2025 · Per-plant subscription; quote-based

STRENGTHS

- Scale, funding, cash-flow positive
- Proprietary sensors rated for high temperature

WEAKNESSES

- Targets heavy industry, not MSMEs

– **Instrukart TAM1-IoT and other GSM temperature monitors on Amazon.in** direct · threat high Publicly observed | S85 | S87 | S190

India and China (various) · Sold on Amazon.in and IndiaMART with Indian sellers · ₹6,500 to ₹20,000

STRENGTHS

- Calibration certificate bundled as a selling point
- Available next day on marketplaces

WEAKNESSES

- No cloud history on cheaper units
- SIM and SMS pack in buyer's scope

– **ITEAD (SONOFF) and Tuya white-label devices** direct · threat high Publicly observed | S102 | S103 | S105 | S106

Shenzhen · Sold on Amazon.in, Flipkart, IndiaMART and ITEAD's India B2B store · ₹500 to ₹3,649 per device

STRENGTHS

- Price floor of the category; huge review base
- Alexa and Google integration

WEAKNESSES

- Cloud dependence, 2.4 GHz-only drop-outs
- No industrial certification or support in India

– **Kritsnam Technologies** direct · threat medium Publicly observed | S118 | S119

Hyderabad · Indian; 2,000+ facilities claimed; TDB funded; Legal Metrology licence · Meters ₹25,000 to ₹75,000; service ₹18 to 30 lakh per plant per year

STRENGTHS

- OIML R49 type approval, NABL calibration, CGWA-ready
- Sells an audited outcome, not a device

WEAKNESSES

- Flow only; not pH or ORP

– **Leaf Wearables (SAFER)** direct · threat low Publicly observed | S121

New Delhi · Indian; won $1M Women's Safety XPrize; sold on Amazon and Flipkart · About ₹2,402 planned for SAFER PRO

STRENGTHS

- Brand recognition in women's safety

WEAKNESSES

- Phone-dependent; limited recent activity

– **LogicLadder (The Sustainability Cloud)** direct · threat high Publicly observed | S164

Gurugram · Indian; OCEMS, CGWA, energy and CCTS compliance software; CPCB data push · Product pricing pages; quote-based

STRENGTHS

- Regulator-facing integrations and compliance breadth

WEAKNESSES

- Software-led; relies on third-party analysers

- **LoudCell** direct · threat low Publicly observed S165

Gurugram and Santa Clara · Indian DG fuel and energy monitoring since 2013; Bharti as logo customer · Quote-based

STRENGTHS

- Focused DG niche with bank references

WEAKNESSES

- Small, dated web presence

- **Marketplace GPS SOS trackers (DrRing, AUSHA GF-07 and others)** direct · threat medium Publicly observed S122 S123

Shenzhen and Indian brands · Amazon.in · ₹2,000 to ₹15,000

STRENGTHS

- Instant availability

WEAKNESSES

- Unverified quality; no DPDP posture

- **Maximus Infoware (OverSite)** direct · threat medium Publicly observed S251

India · Indian ATM site monitoring software and hardware vendor · Quote-based

STRENGTHS

- Built for ATM sites, the exact estate Rax reaches through integrators
- Energy and equipment performance reporting

WEAKNESSES

- Scale and references not public
- Hardware specifications not published

- **Milesight** direct · threat medium Publicly observed S97 S160

Xiamen · Indian resellers; UG65 at ₹45,068 · Gateway ₹25,000 to ₹45,000; sensors USD 65 to 105

STRENGTHS

- Full LoRaWAN kit with Node-RED and Python SDK

WEAKNESSES

- Chinese origin can be a tender issue

- **Moxa** direct · threat medium Publicly observed S159

Taipei · Indian distributors; UC-8100 at ₹68,000 · ₹68,000 per gateway

STRENGTHS

- Certification depth industrial buyers demand
- 5-year warranty, MTBF published

WEAKNESSES

- Six times the price of an Indian gateway

- **Nanoprecise Sci Corp** direct · threat medium Estimated S90

Edmonton; India operations · Sells in India across metals, cement, chemicals, pharma · Estimated $40 to $120 per asset per month plus $300 to $1,200 per sensor

STRENGTHS

- Energy-centred maintenance positioning
- Cloud analytics with AWS and Azure integration

WEAKNESSES

- Price opaque; import dependence

- **Petasense** direct · threat low Publicly observed S91

Bengaluru and California · Indian R&D base; annual licence plus maintenance model · Annual licence per asset

STRENGTHS

- Early Indian mover with references

WEAKNESSES

- Smaller than Infinite Uptime; limited recent news

- **RAKwireless and Dragino** direct · threat medium Publicly observed S100 S101

Shenzhen · RAK now on Amazon India; Dragino LSN50 at ₹6,245 via Bengaluru sellers · ₹6,000 to ₹21,000

STRENGTHS

- Cheapest route to LoRaWAN

WEAKNESSES

- Developer-grade; no Indian support

– **SenseGiz Technologies** direct · threat low Publicly observed | S116

Belgaum · Indian; ₹1.7 Cr revenue FY2025 · Quote-based

STRENGTHS

- Broad use-case list, awards

WEAKNESSES

- Very small revenue; proves how hard device-led IoT is in India

– **Shelly (Allterco)** direct · threat low Publicly observed | S104 | S105

Sofia, Bulgaria · Sold through Indian resellers · ₹2,200 to ₹8,000

STRENGTHS

- Local control without cloud; open API

WEAKNESSES

- Thin Indian distribution

– **Sixth Energy Technologies** direct · threat medium Publicly observed | S252

Bengaluru · Indian full-stack IoT company with ATM site monitoring, energy and asset solutions · Quote-based

STRENGTHS

- Claims 150,000 deployments globally
- Combines security, energy and site health in one offer

WEAKNESSES

- Deployment claim unaudited
- Pricing opaque

– **TagBox Solutions** direct · threat high Publicly observed | S51

Bengaluru · Indian; claims 50+ organisations across India and APAC; Rebel Foods reference · Quote-based; software-led subscription

STRENGTHS

- Named QSR reference with FSSAI compliance framing
- Integrated sensor, gateway and analytics stack
- Angel and IAN funded, National Startup Award 2021

WEAKNESSES

- Small company; pricing opaque
- Depends on customer Wi-Fi or its own gateways

– **Teltonika Networks** direct · threat high Publicly observed | S93 | S94 | S95 | S96

Vilnius · Multiple Indian distributors; TRB140 at ₹11,000 to ₹17,999 · ₹11,000 to ₹18,000 per gateway

STRENGTHS

- MQTT, SNMP, VPN, RutOS, 5-year design
- Deep distributor network

WEAKNESSES

- Reviews cite buggy software and thin documentation

– **Testo India (Saveris 2)** direct · threat medium Publicly observed | S15 | S203

Lenzkirch, Germany; Testo India, Pune · Indian subsidiary and dealer network; Saveris 2-H1 listed at ₹69,500 on IndiaMART · ₹35,000 to ₹70,000 per logger

STRENGTHS

- Accuracy and calibration pedigree pharma QA trusts
- Wide Indian dealer base

WEAKNESSES

- Wi-Fi only on Saveris 2
- Price 10x Indian loggers

– **Vaisala (viewLinc, VaiNet)** direct · threat low Publicly observed | S204

Vantaa, Finland; Vaisala India, Pune · India office; claims 3,200 life-science customers globally and 1,400 installed systems · Premium; system sale with validation

STRENGTHS

- Top-50 pharma references
- Mapping, validation and calibration services

WEAKNESSES

- Enterprise-only; no fit for small pharmacies or QSRs

– **Zenatix by Schneider Electric** direct · threat high Publicly observed | S59 | S60 | S176

Gurugram · Indian; acquired by Hero Electronix 2018, now branded with Schneider; 50,000+ connected assets in 2022 · Per-site subscription; 12 to 14 month ROI claim

STRENGTHS

- Multi-site references in retail and banking
- Schneider channel and brand

WEAKNESSES

- Enterprise multi-site focus, not single plants

– **Bosch Rexroth (ctrlX IOT)** indirect · threat low Publicly observed | S115

Lohr am Main; Bosch India · Bosch India presence · Quote-based

STRENGTHS

- IEC 62443 certification

WEAKNESSES

- Tied to automation stack

– **ifm electronic (moneo)** indirect · threat low Publicly observed | S112

Essen; ifm India, Kolhapur · Indian subsidiary and sales network · Sensor plus licence; quote-based

STRENGTHS

- Sensor pedigree and plant-floor trust

WEAKNESSES

- Locked to ifm sensors

– **Schneider Electric (EcoStruxure, EcoXpert)** indirect · threat medium Publicly observed | S113 | S209

Rueil-Malmaison; Schneider India · 4,000+ EcoXpert partners globally; Machine Advisor sold in India; owns Zenatix brand · Quote-based

STRENGTHS

- Channel depth and brand

WEAKNESSES

- Not a fit for sub-₹10,000 devices

– **Siemens (Insights Hub, SIMATIC IOT2050)** indirect · threat low Publicly observed | S16 | S114

Munich; Siemens India · Indian partner ecosystem incl. IndX · Quote-based; free start tier

STRENGTHS

- Brand and OT integration

WEAKNESSES

- Enterprise pricing and partner-led delivery

– **Smart Joules** indirect · threat medium Publicly observed | S57 | S58

New Delhi · Indian; $10M Series B December 2025; ₹266 Cr customer savings claimed · No upfront capital; savings share

STRENGTHS

- Removes capex barrier for hospitals and factories
- Backed by SBI Ventures and Waaree

WEAKNESSES

- Service model needs balance sheet; not a device seller

– **Yokogawa India (Sushi Sensor)** indirect · threat low Publicly observed | S161

Tokyo; Yokogawa India, Bengaluru · Sold and supported in India · Premium; quote-based

STRENGTHS

- Process-industry credibility

WEAKNESSES

- Large-plant focus

– **112 India app and ERSS** substitute · threat high Verified | S198 | S199

New Delhi (MHA) · All 36 states and UTs; 50 lakh+ downloads · Free

STRENGTHS

- Government-run, integrated with police dispatch

WEAKNESSES

- Smartphone-dependent; login issues reported

– **AWS IoT Core and Azure IoT Hub** substitute · threat low Publicly observed | S110 | S111

Seattle and Redmond · Mumbai and Pune regions · Usage-based

STRENGTHS

- Elastic, secure, cheap at the messaging layer

WEAKNESSES

- No application layer; engineering effort

- **Blynk** substitute · threat low Publicly observed S166

New York · Used by Indian startups · $29 to $1,099 per month

STRENGTHS

- No-code app builder, OTA, SOC 2

WEAKNESSES

- Per-device tiers escalate

- **Bytebeam** substitute · threat low Publicly observed S117

Bengaluru · Indian; $3.25M seed · Quote-based

STRENGTHS

- Indian data residency and support

WEAKNESSES

- Early stage

- **In-house ESP32, Arduino and Raspberry Pi builds** substitute · threat high Publicly observed S187

Everywhere · Chennai integrators publish component costs: ESP32 ₹400 to ₹1,200, sensors ₹150 to ₹5,000 · ₹2,000 to ₹15,000 per point

STRENGTHS

- Cheapest possible; matches Rax's own board economics

WEAKNESSES

- No certification, no support

- **Manual logging, spreadsheets and WhatsApp** substitute · threat high Publicly observed S51 S150 S88

Everywhere · Universal · Near zero

STRENGTHS

- Free and accepted by many inspectors today

WEAKNESSES

- No alarm at 2 am; fails ALCOA+ and revised Schedule M expectations

- **PLC and SCADA vendors and panel builders** substitute · threat medium Publicly observed S208

Various · Every SIPCOT and MIDC estate has panel builders; BMS integrators quote ₹25,000 to ₹3.5 lakh per month in Chennai · ₹25,000 per month upward for BMS

STRENGTHS

- Already installed; trusted by plant electricians

WEAKNESSES

- Expensive to extend; no cloud by default

- **ThingsBoard** substitute · threat medium Publicly observed S108 S109

Kyiv and New York · Used by Indian integrators; Community Edition free · $149 per month for 100 devices on Cloud

STRENGTHS

- Free, mature, MQTT/CoAP/HTTP, white-label
- Predictable per-tier pricing

WEAKNESSES

- Rax would still own operations

- **Tuya IoT Developer Platform** substitute · threat low Publicly observed S167

Hangzhou · Used by Indian consumer brands · Usage plus app licence

STRENGTHS

- Fastest route to a branded app

WEAKNESSES

- Data outside India; consumer positioning

- **Bharti Airtel IoT** partner-competitor · threat medium Publicly observed S30 S37 S38 S168

New Delhi · 62% of M2M SIMs; 48 million devices; 11,000 customers · SIM ₹450 to ₹699 per year on open market; platform quote-based

STRENGTHS

- Network reach and enterprise sales force

WEAKNESSES

- Not a device maker; needs hardware partners

- **Blue Star (commercial refrigeration)** partner-competitor · threat medium Publicly observed S194

Mumbai · 300,000 freezers a year from Wada; IoT-enabled modular cold rooms · Freezers ₹16,000 to ₹34,000

STRENGTHS

- Owns the freezer buyer; already offers IoT on cold rooms

WEAKNESSES

- Could embed a competitor's monitoring

– **Cattleya Technosys** partner-competitor · threat low Publicly observed S200

Bengaluru · Indian IoT and e-surveillance product company; an existing Rax account · Quote-based

STRENGTHS

- Existing relationship with Rax

WEAKNESSES

- Can build its own boards

– **CRI Pumps (IoT-enabled pumps)** partner-competitor · threat medium Publicly observed S193

Coimbatore · Claims 60,000 IoT-enabled smart pumps and 50,000 IoT solar pumps supplied · Bundled in pump price

STRENGTHS

- Owns the pump buyer and the installed base

WEAKNESSES

- Would embed its own or partner electronics

– **DATOMS (Phoenix Robotix)** partner-competitor · threat high Publicly observed S158 S210

Bhubaneswar and Bengaluru · Indian; Series A; Nalco reference · Quote-based; per-device platform

STRENGTHS

- Built for OEMs to embed, exactly the softener and vending buyers Rax serves
- Environmental compliance module

WEAKNESSES

- Could replace RT-SW-FIOT and then Rax's board

– **Elecbits** partner-competitor · threat medium Publicly observed S205

New Delhi · Indian ODM and OEM platform · Quote-based NRE plus unit price

STRENGTHS

- Design-to-manufacture packaging for startups

WEAKNESSES

- Competes for the same DDP work

– **Jio Platforms IoT** partner-competitor · threat low Publicly observed S40

Mumbai · 19% of M2M SIMs; NB-IoT and Cat-M core · Quote-based

STRENGTHS

- Scale and price aggression

WEAKNESSES

- Consumer and CSP focus

– **Tata Communications (MOVE, LoRaWAN)** partner-competitor · threat low Publicly observed S39

Mumbai · 13 million SIMs managed globally; LoRaWAN network offer in India · Quote-based

STRENGTHS

- Enterprise trust and global roaming

WEAKNESSES

- Sells to large enterprises only

– **Tech4LYF Corporation** partner-competitor · threat medium Publicly observed S162 S187

Chennai · Chennai integrator claiming 90+ factory deployments · ₹50,000 to ₹30 lakh per project

STRENGTHS

- Local, publishes prices, offline-first pitch

WEAKNESSES

- Builds on commodity boards; could buy Rax boards or compete

07 Pricing and unit economics

KEY TAKEAWAYS

- Forty-six observed price points across seven categories put an Indian connected sensing point between ₹950 (Tuya module) and ₹22,000 (Hygroman logger), an industrial gateway between ₹11,000 (Teltonika) and ₹68,000 (Moxa), and a GxP logger at ₹69,500 (Testo). Publicly observed | S103 | S82 | S93 | S159 | S203
- Rax's only observed FIoT prices are ₹6,000 for THAPS and THOPS sensors and ₹3,450 to ₹5,940 for OEM controller cards; those sit in the right band for OEM boards and at the low end for branded sensors. Rax-supplied | S2
- The platform layer has collapsed to cents: AWS IoT Core connectivity is about $0.042 per device per year, ThingsBoard Cloud is $149 a month for 100 devices, and a Chennai integrator quotes cloud hosting from ₹2,000 a month; RT-SW-FIOT cannot be a paid line item. Publicly observed | S110 | S108 | S187
- The money in this market is in service, not devices: Kritsnam charges ₹18 to 30 lakh per plant per year, Chennai BMS integrators ₹25,000 a month, Nanoprecise an estimated $40 to $120 per asset per month. Publicly observed | S118 | S208 Estimated | S90
- Rax's COGS for any FIoT model is Unknown; the plan only works if a ₹6,000 sensor carries at least 45 percent gross margin after calibration and SIM, which nobody has yet checked. Unknown

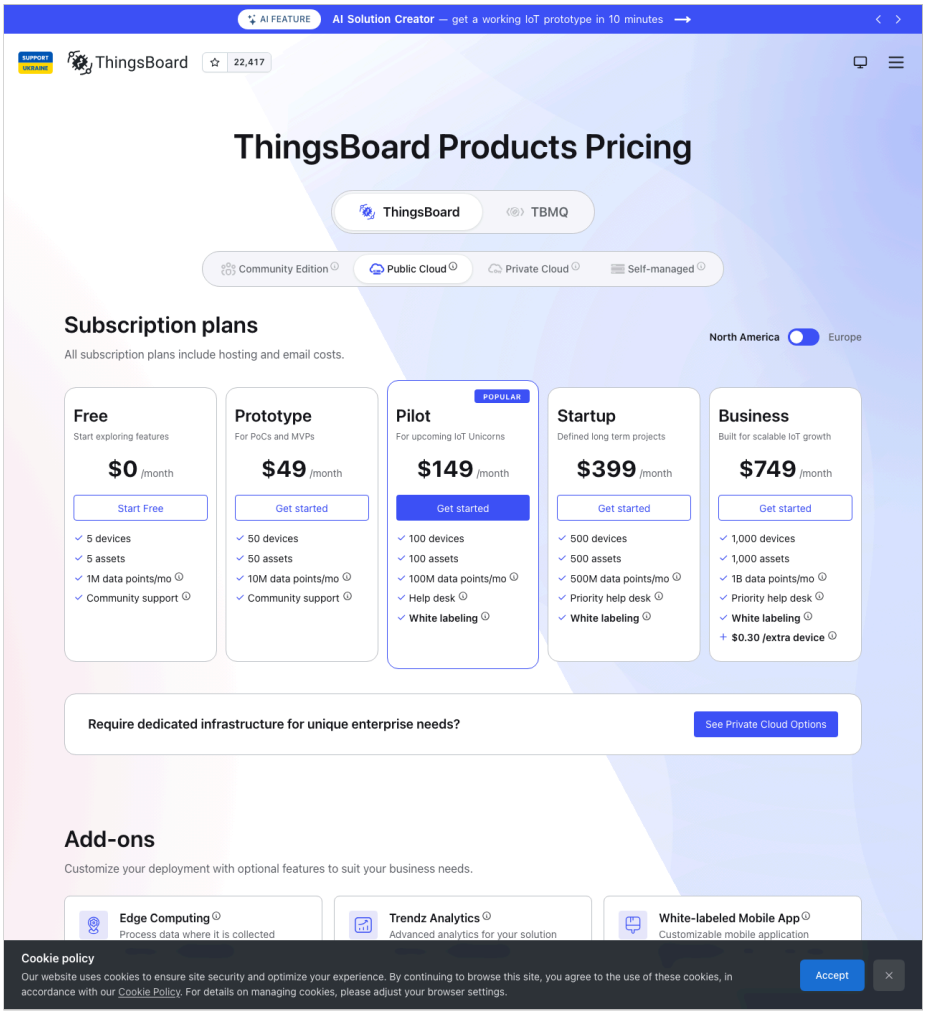
Observed price points by category

The price file records forty-six points, each with a URL and date. The table below condenses them to the ranges a buyer would see when comparing a Rax quote with the open market. Publicly observed | S82 | S93 | S102 | S108 | S118

CATEGORY	LOW	TYPICAL	HIGH	WHAT THE HIGH END INCLUDES
Cold-chain and environment logger	₹2,489 Amazon Wi-Fi sensor	₹6,000 to ₹20,000 GSM loggers on IndiaMART	₹69,500 Testo Saveris 2-H1	Accuracy certificate, GxP-ready cloud, dealer support
Industrial gateway and I/O	₹6,245 Dragino LoRa node	₹11,000 to ₹18,000 Teltonika TRB140; ₹14,533 Advantech WISE-4050	₹68,000 Moxa UC-8100	UL and IEC ratings, Debian, five-year warranty
Energy and load control	₹950 Tuya module	₹2,200 to ₹3,649 Shelly and Sonoff metering relays	₹26,500 three-phase 500 A smart meter	Current transformers, three-phase metering
Platform and connectivity	$0.042 per device per year AWS connectivity	$29 to $149 per month Blynk and ThingsBoard tiers	₹550 per SIM per year Airtel M2M	120 MB and 200 SMS a year
Condition monitoring and managed service	₹50,000 project for 1 to 3 machines	₹25,000 per month BMS service	₹18 to 30 lakh per plant per year Kritsnam	Type-approved meters, signed monthly statement
Personal safety	₹0 (112 India app); ₹999 Tuya Wi-Fi SOS button	₹2,000 to ₹4,099 pendants, kids' trackers and AIS 140 trackers	₹5,990 GSM van panic alarm; ₹15,000 marketplace trackers	GPS, SMS and call alerts, RTO approval, subscription
OEM controller board	₹400 ESP32 module	₹3,450 to ₹5,940 Rax cards	₹8,500 Inforob solar card	Firmware, enclosure, tooling amortisation

Sources by row: Amazon and IndiaMART loggers; Dragino, Teltonika, Advantech, Moxa; Tuya, Shelly, Sonoff, Buildingpulse; AWS, Blynk, ThingsBoard, Airtel; Tech4LYF, Dhonaadhi, Kritsnam; 112, Leaf, Helplocal, TradeIndia and IndiaMART safety listings; Tech4LYF components and the Rax order book.

Verified | S180 | S86 | S203 | S100 | S93 | S98 | S159 | S103 | S104 | S102 | S138 | S110 | S166 | S108 | S168 | S187 | S208 | S118 | S198 | S121 | S122 | S211 | S212
Rax-supplied | S2



The platform price ceiling that RT-SW-FIOT would have to sell under: $149 a month buys 100 devices on a mature white-label platform. Source S108

Rax's current pricing and how it compares

The order book gives five Rax IoT price points. FIOT-THAPS and FIOT-THOPS sold at ₹6,000 each to APAR Innosys in November 2025. The Energy Gateway with sensors sold at ₹3,450 to ₹3,900 to ANG across about a hundred units. Softener controller cards sold at ₹4,600 to Ion Exchange and Nuetech, solar-robot cards at ₹5,450 to ₹8,500 to Inforob, and the vending V5 card at ₹5,940 to SSP Beverage. Rax-supplied | S2

Against the market, ₹6,000 for a Wi-Fi temperature and humidity sensor is at the top of the Amazon range (₹2,489) and at the bottom of the IndiaMART GSM logger range (₹6,000 to ₹20,000), but those GSM loggers include a SIM slot, SMS alarms and in some cases a calibration certificate that THAPS does not. Publicly observed | S180 | S86 | S190 Rax-supplied | S2

The OEM card prices compare well. A Chennai integrator's published component band puts an ESP32 module at ₹400 to ₹1,200 and a 4G gateway board at ₹2,000 to ₹6,000; Rax's ₹3,450 to ₹5,940 cards sit inside that band while including firmware and enclosure, which is why OEMs keep reordering. Publicly observed | S187 Rax-supplied | S2

There is no Rax price list for RT-RC01, RT-RC03, RT-LS08, RT-DFI, RT-WQF, RT-ATU, RT-Z01, RT-Z03, RT-SOS, RT-IEI or RT-ICM in the record, and the website carries no prices. Where the Saudi dossiers estimated prices they were explicit that the figures were assumptions. Unknown Rax-supplied | S13

Price architecture options

Four architectures exist in the observed market, and each fits a different Rax segment. Inferred

ARCHITECTURE	OBSERVED EXAMPLE	FITS
Device plus annual calibration and SIM	Instrukart-class loggers bundling a calibration certificate; Airtel SIM at ₹550 a year	RT-DFI and THAPS into pharmacies, blood banks, QSRs
Per-site monthly subscription with devices included	Zenatix, TagBox, Chennai BMS at ₹25,000 a month	Multi-site chains, only with a service partner

ARCHITECTURE	OBSERVED EXAMPLE	FITS
Per-unit OEM board with NRE	Rax's own softener, solar and vending cards	Every OEM account; the proven model
Managed compliance outcome per plant per year	Kritsnam at ₹18 to 30 lakh	Not reachable by Rax without type approval

Sources: marketplace listings, Airtel SIM, Zenatix and TagBox, Chennai BMS directory, Rax order book, Kritsnam.
Publicly observed | S190 | S168 | S60 | S51 | S208 | S118 Rax-supplied | S2

The recommended architecture for the one branded family worth pursuing is device plus service: a ₹9,000 to ₹12,000 THAPS or DFI unit with a SIM option and a calibration certificate, plus ₹150 to ₹250 a month for SIM, cloud and alerting, sold to compliance owners in pharmacies, blood banks and QSR kitchens. That lands below Hygroman on device price and far below Testo, while carrying the three things buyers ask for.
Recommendation Publicly observed | S82 | S203

> $0.042 per device per year is what AWS charges to keep a device connected to IoT Core around the clock; the entire platform layer for 1,000 Rax devices would cost less than one THAPS unit. Publicly observed | S110

Cost-to-serve and margin hypotheses

COGS for every FIoT model is Unknown; the internal record contains no bill of materials. What can be bounded from public component prices is the floor: an ESP32 module at ₹400 to ₹1,200, a temperature and humidity sensor at ₹150 to ₹5,000 depending on grade, an enclosure and power supply, and a 4G modem board at ₹2,000 to ₹6,000. Unknown Publicly observed | S187

Working from that floor, a ₹6,000 THAPS unit built on ESP32 with a mid-grade sensor is plausibly at 40 to 55 percent gross margin before calibration, packaging and warranty; a SIM variant at ₹9,000 to ₹12,000 with a ₹2,000 to ₹3,000 modem retains a similar margin. The plan needs at least 45 percent gross on hardware and 60 percent on the service line for the pilot to carry a support engineer. Estimated | S187
Recommendation

Calibration is the hidden cost. Instrukart-class listings bundle a twelve-month factory calibration certificate; a NABL-traceable certificate from a third-party lab is a per-unit cost and an annual recurrence that the buyer will expect Rax to organise. The amount is Unknown and must be quoted from a Chennai lab before any price is set. Publicly observed | S190 Unknown

Subsidy and scheme effects

Three schemes change the buyer's effective price. ADEETIE offers interest subvention on energy-efficiency equipment for MSMEs, which lowers the cost of a monitored retrofit rather than the device. Tamil Nadu's capital subsidy for scaling MSMEs and the RAMP programme fund modernisation projects into which an IoT line item can be written. None of them names IoT devices specifically. Verified | S151 | S184 | S157
Inferred

Jal Jeevan Mission's sensor-based IoT monitoring and the Nirbhaya Fund's Safe City projects are public procurements with their own specifications and empanelments; they are reachable only through a system integrator, and pricing there is tender-driven.
Verified | S25 | S145 | S69

Tender pricing dynamics

Tender aggregators list 1,365 IoT-based tenders in India for 2025 and 75 live smart-water-meter tenders in 2026. Awards are L1 after technical qualification, and the technical qualification is where Rax fails today: tenders ask for BIS, WPC, MTCTE or CE evidence, type approval for meters, and past-performance certificates. Without those, the price is irrelevant. Verified | S148 | S27 Rax-supplied | S3 Inferred

GeM catalogue prices for IoT loggers and gateways were not captured in this pass; the aggregator listings above are the closest proxy and are logged as a gap. Unknown

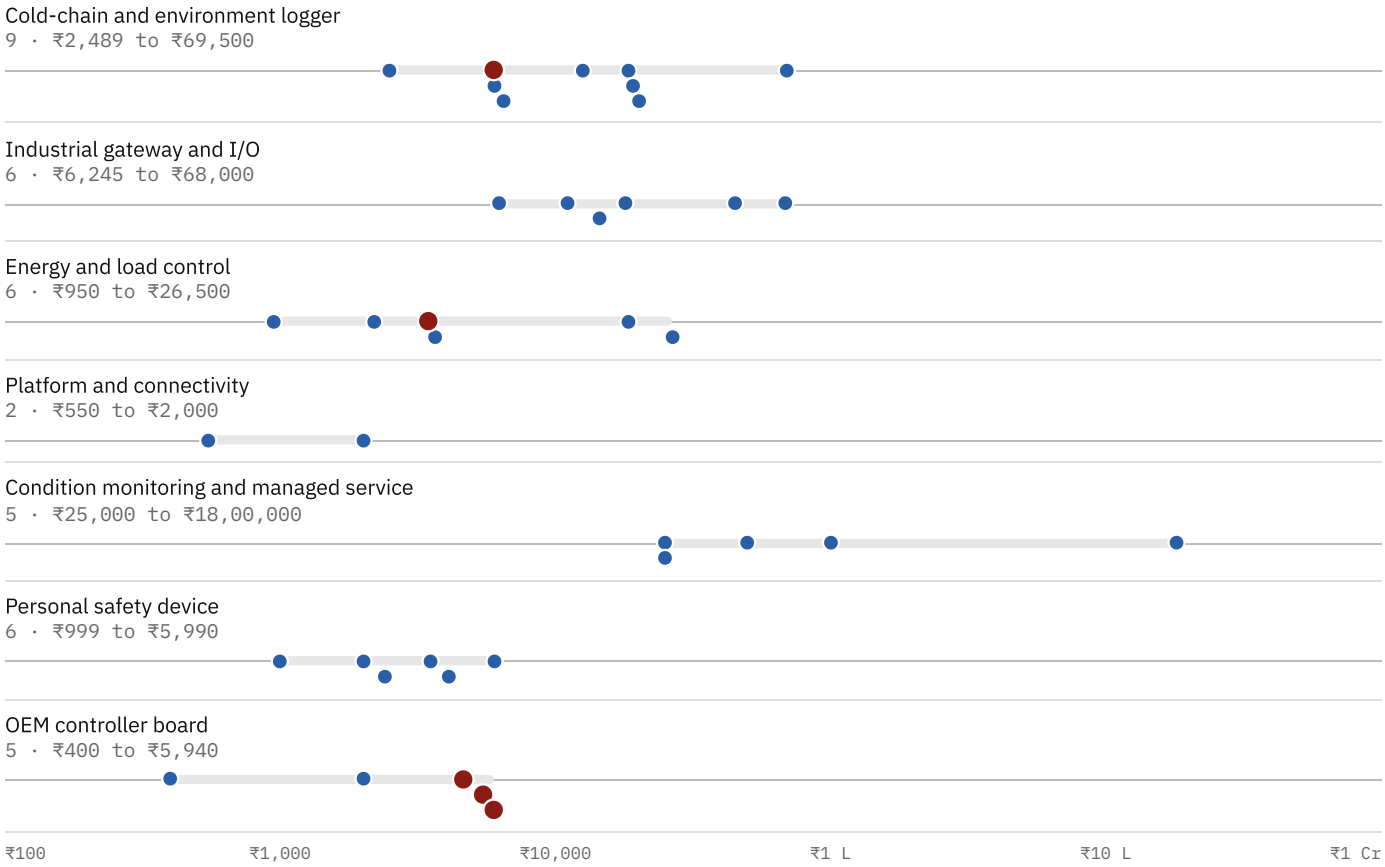
Payment terms and receivable risk by segment

OEM accounts pay on delivery or thirty days; the order book shows repeat orders from Ion Exchange, Nuetech and ANG, which is the lowest receivable risk Rax has. Pharmacy and hospital chains pay on sixty to ninety days and expect annual contracts. Public tenders pay after inspection and can stretch past 120 days. Single MSME plants pay on delivery but churn on service. Rax-supplied S2 Inferred

SO WHAT FOR RAX

Price is not what stops Rax selling FIoT devices; the ₹6,000 sensor and ₹4,600 board are competitive. What stops the sale is the absence of the certificate, the SIM option and the service line that every buyer above the Amazon tier now assumes are included in the price.

Recommendation



Rax · Observed market price · Observed range

Log scale, INR. Hover or tap a point for item, vendor, basis and date; every point is listed in the table below.

CATEGORY	ITEM	PRICE	BASIS	EVIDENCE
Cold-chain and environment logger	Wi-Fi temperature and humidity sensor (Amazon's Choice) Amazon.in marketplace seller	₹2,489 per unit	observed 2026-09-15	Publicly observed S180
Cold-chain and environment logger	FIOT-THAPS and FIOT-THOPS environment sensors sold to APAR Innosys Rax Tech International	₹6,000 per unit	observed 2025-11-18	Rax-supplied S2
Cold-chain and environment logger	S130 GSM data logger Adaptek Automation Technology, Chennai (IndiaMART)	₹6,000 per unit	published 2026-09-15	Publicly observed S86
Cold-chain and environment logger	GSM-20E SMS alarm temperature and humidity logger VEGA Calibration and Validation (IndiaMART)	₹6,500 per unit	published 2026-09-15	Publicly observed S85

CATEGORY	ITEM	PRICE	BASIS	EVIDENCE
Cold-chain and environment logger	Hygroman IoT data logger (Wi-Fi or SIM), lower bound Hygroman India	₹12,500 per unit plus GST	published 2026-09-15	Publicly observed S82
Cold-chain and environment logger	Temperature and humidity logger with SMS alert and server Innovator Automation (IndiaMART)	₹18,500 per unit	published 2026-09-15	Publicly observed S84
Cold-chain and environment logger	GSM temperature data logger Pyrotronics India (IndiaMART)	₹19,000 per unit	published 2026-09-15	Publicly observed S83
Cold-chain and environment logger	SMS-based temperature and humidity monitor for server rooms Ace Instruments, Hyderabad (IndiaMART)	₹20,000 per unit	published 2026-09-15	Publicly observed S87
Cold-chain and environment logger	Testo Saveris 2-H1 Wi-Fi logger Shakti Sales, Mumbai (IndiaMART)	₹69,500 per unit	published 2026-09-15	Publicly observed S203
Condition monitoring and managed service	Nanoprecise subscription, third-party estimate lower bound Nanoprecise (Software Finder estimate)	USD 40 per asset per month	estimated 2026-09-15	Estimated S90
Condition monitoring and managed service	Dhaara Smart ultrasonic flow meter, lower bound Kritsnam Technologies	₹25,000 per meter	quoted 2022-08-29	Publicly observed S119
Condition monitoring and managed service	Building management system service in Chennai, lower bound Dhonaadhi Hitec Innovations (IndiaMART)	₹25,000 per month	published 2026-09-15	Publicly observed S208
Condition monitoring and managed service	Basic monitoring of 1 to 3 machines, lower bound Tech4LYF Corporation	₹50,000 per project	quoted 2026-03-07	Publicly observed S187
Condition monitoring and managed service	Standalone IoT monitoring for a small factory, lower bound Tech4LYF Corporation	₹1,00,000 per project	quoted 2026-03-06	Publicly observed S162
Condition monitoring and managed service	Dhaara water accounting managed service, lower bound Kritsnam Technologies	₹18,00,000 per plant per year	published 2026-09-15	Publicly observed S118
Energy and load control	Tuya wireless Wi-Fi switch module Genius Technologies, Bengaluru (IndiaMART)	₹950 per unit	published 2026-09-15	Publicly observed S103
Energy and load control	Shelly Plus 1PM metering relay Cybervirtu (IndiaMART)	₹2,200 per unit	published 2026-09-15	Publicly observed S104
Energy and load control	Energy Gateway unit with TLS sensors sold to ANG Rax Tech International	₹3,450 per unit	observed 2024-12-05	Rax-supplied S2
Energy and load control	SONOFF POWR320D Elite 20 A Wi-Fi metering switch Amazon.in	₹3,649 per unit	published 2026-09-15	Publicly observed S102
Energy and load control	IoT-based smart energy monitoring system Eleics Design, Gandhinagar (IndiaMART)	₹18,500 per unit	published 2026-01-01	Publicly observed S137
Energy and load control	500 A 3-phase smart energy meter Buildingpulse Energy Consulting, Mumbai (IndiaMART)	₹26,500 per unit ex tax	published 2026-09-15	Publicly observed S138

CATEGORY	ITEM	PRICE	BASIS	EVIDENCE
Industrial gateway and I/O	RAK7268 WisGate Edge Lite 2, IN865 without LTE RAKwireless store	USD 154 per unit	published 2026-09-15	Publicly observed S101
Industrial gateway and I/O	Dragino LSN50-V2 LoRa sensor node Suveechi Technologies, Bengaluru (IndiaMART)	₹6,245 per unit	published 2026-09-15	Publicly observed S100
Industrial gateway and I/O	Teltonika TRB140 4G IoT gateway Samptel Technologies, Ahmedabad (IndiaMART)	₹11,000 per unit	published 2026-09-15	Publicly observed S93
Industrial gateway and I/O	Advantech WISE-4050 Wi-Fi 4DI 4DO module ITG Software Engineering, Jaipur (IndiaMART)	₹14,533 per unit	published 2026-09-15	Publicly observed S98
Industrial gateway and I/O	Teltonika TRB140 retail Flipkart	₹17,999 per unit	published 2026-09-15	Publicly observed S95
Industrial gateway and I/O	Milesight UG65 LoRaWAN gateway Tynatech Ingenious, Noida (IndiaMART)	₹45,068 per unit	published 2026-09-15	Publicly observed S97
Industrial gateway and I/O	Moxa UC-8100 IoT gateway S.N. Enterprises (IndiaMART)	₹68,000 per unit	published 2026-09-15	Publicly observed S159
OEM controller board	ESP32 microcontroller module (component cost) Tech4LYF Corporation (component price band, lower bound)	₹400 per unit	quoted 2026-03-07	Publicly observed S187
OEM controller board	4G IoT gateway board (SIM7600 class), lower bound Tech4LYF Corporation (component price band)	₹2,000 per unit	quoted 2026-03-07	Publicly observed S187
OEM controller board	Water softener controller card for Ion Exchange and Nuetech Rax Tech International	₹4,600 per card	observed 2025-09-06	Rax-supplied S2
OEM controller board	Solar panel cleaner card for Inforob Rax Tech International	₹5,450 per card	observed 2026-04-18	Rax-supplied S2
OEM controller board	PSIP vending V5 card for SSP Beverage Rax Tech International	₹5,940 per card	observed 2023-10-10	Rax-supplied S2
Personal safety device	112 India app SOS Ministry of Home Affairs	₹0 per user	published 2026-09-15	Verified S198
Personal safety device	Tuya smart SOS emergency button (Wi-Fi / 433 MHz) D&V Engineering, New Delhi (IndiaMART)	₹999 per unit	observed 2026-09-15	Publicly observed S212
Personal safety device	GPS SOS tracker for seniors, lower bound of marketplace range Amazon.in and international marketplaces (Helplocal survey)	₹2,000 per unit	observed 2026-09-15	Publicly observed S122
Personal safety device	SAFER PRO women's safety device, planned price Leaf Wearables	₹2,402 per unit	quoted 2018-07-11	Publicly observed S121
Personal safety device	Kids GPS tracking device with handheld panic button Listed on TradeIndia	₹3,500 per unit	observed 2026-08-28	Publicly observed S211

CATEGORY	ITEM	PRICE	BASIS	EVIDENCE
Personal safety device	GAGAN-01 AIS 140 IRNSS GPS tracker with SOS panic button, RTO approved Listed on TradeIndia	₹4,099 per unit	observed 2026-08-28	Publicly observed S211
Personal safety device	Van panic alarm, GSM Mishi Electro Softec, New Delhi (IndiaMART)	₹5,990 per unit	observed 2026-09-15	Publicly observed S212
Platform and connectivity	AWS IoT Core connectivity per device per year (24x7) Amazon Web Services	USD 0.042 per device per year	published 2026-09-15	Publicly observed S110
Platform and connectivity	Tuya IoT Core API calls, Flagship edition outside China Tuya	USD 3.15 per million API calls	published 2026-07-28	Publicly observed S167
Platform and connectivity	Blynk Starter plan Blynk	USD 29 per month	published 2026-09-15	Publicly observed S166
Platform and connectivity	ThingsBoard Cloud Pilot plan, 100 devices ThingsBoard Inc	USD 149 per month	published 2026-09-15	Publicly observed S108
Platform and connectivity	Airtel IoT M2M SIM, yearly, 120 MB and 200 SMS LRK Groups, New Delhi (IndiaMART)	₹550 per SIM per year	published 2026-09-15	Publicly observed S168
Platform and connectivity	Cloud hosting for a small factory deployment (Chennai integrator quote) Tech4LYF Corporation	₹2,000 per month, lower bound	quoted 2026-03-07	Publicly observed S187

08 Channels and go-to-market

KEY TAKEAWAYS

- Every FIoT sale in the order book came through an organisation that already bought from Rax: equipment OEMs for controller cards and e-surveillance integrators for site sensors; no route that depends on new end-user demand has produced a sale. Rax-supplied | S2 | S3
- The e-surveillance cross-sell route is real but narrow: bank RFPs have carried AC control, mains and UPS sensing and thermal sensors as line items since at least 2015, yet as optional rentals decided by the integrator, on an ATM estate that shrank to 2,51,057 in March 2025. Verified | S249 | S250 Publicly observed | S253
- Twenty-two named intermediaries were assessed; the eight worth a meeting in the next ninety days are Ion Exchange, Nuetech, SSP, Inforob, Vendekin, Elanpro, SIS and APAR Innosys. Inferred
- Channel partners with their own sales teams failed at Rax before; the routes proposed here differ because the partner buys a component for its own product rather than reselling a Rax product. Rax-supplied | S3 Recommendation
- Tenders and GeM are not a route for FIoT in the next twelve months: technical qualification asks for past performance, calibration and radio or telecom certificates Rax does not hold. Verified | S242 | S249 Rax-supplied | S3

The constraint that shapes every route

Rax has two full-time salespeople and one part-time technical person, inbound enquiries arrive through Google and IndiaMART, new-customer prospecting is effectively nil, referrals are dead by the sales lead's own account, and digital marketing agencies and channel partners with their own sales teams have both been tried and failed. Hardware and firmware engineering is booked while software engineering has free bandwidth. Rax-supplied | S3 Rax states that it is actively trying to grow FIoT and regards it as a strategic priority. Rax-supplied | S3 The design problem for go-to-market is therefore how to grow FIoT revenue without adding a sales force and without exposing the brand to end users before the reliability record is fixed. Recommendation

Every route, assessed

ROUTE	INTERMEDIARIES	ECONOMICS FOR RAX	CYCLE	WHAT RAX MUST PROVIDE	EVIDENCE IT WORKS HERE	VERDICT
OEM and white-label controllers	Ion Exchange, Nuetech, SSP, Inforob, Vendekin, Elanpro	₹3,450 to ₹8,500 a card plus design fee; repeat POs	3 to 6 months to first PO	Firmware ownership, delivery dates, change control, white-label app	1,000 softener cards and 270 other cards invoiced	Lead route Rax-supplied | S2
Existing-account expansion (e-surveillance integrators)	SIS, Securens, APAR, ANG, Cattleya	₹3,450 to ₹6,000 a unit; possible monthly rental line	1 to 3 months inside an existing contract	Integration into the integrator's CMS, reliability evidence	ANG 100 gateways, APAR 8 sensors; bank RFP line items	Second route, after a reliability fix Rax-supplied | S2 Verified | S249
Refrigeration OEMs	Elanpro, Blue Star, second-tier freezer and cold-room makers	Module price inside a ₹16,000 to ₹34,000 freezer	6 to 12 months with field trial	4G module, calibration, brand-neutral app	Elanpro and Coca-Cola connected coolers	Build in year one Publicly observed | S220 | S221 | S194
Scheme vendors (PM-KUSUM RMS)	TEDA-empanelled pump vendors	RMS board per pump; volume swings with scheme windows	6 to 12 months; tied to state tenders	Indigenous controller, MNRE data format, service in each district	RMS mandatory; big OEMs in-house	Opportunistic only Verified | S213 Publicly observed | S217 | S219
System integrators	Tech4LYF, BMS integrators, DATOMS partners	Device sale at integrator margin; integrator owns the customer	3 to 9 months per project	Open MQTT or Modbus, integrator pricing, stock	Chennai integrators publish project bands, build on ESP32	Supply devices on request, do not chase Publicly observed | S187 | S158
Distributors and dealers	IndiaMART traders, electronics distributors	20 to 35% channel margin (assumed)	Slow; needs brand pull	Stock, listings, datasheets	Failed before at Rax	Do not re-propose Rax-supplied | S3
Tenders and GeM	Hospitals, blood banks, smart cities via SIs	L1 price after technical qualification	3 to 9 months plus payment delay	Certificates, past performance, EMD	GeM BOQ items for loggers in ones and threes	Not in twelve months Publicly observed | S247

ROUTE	INTERMEDIARIES	ECONOMICS FOR RAX	CYCLE	WHAT RAX MUST PROVIDE	EVIDENCE IT WORKS HERE	VERDICT
Associations and cooperatives	CODISSIA, TANSTIA, AIOCD chemist network	Access to members; no revenue by itself	Event-driven	A clear offer and a reference	Large memberships; no IoT programme found	Use for OEM prospecting Publicly observed S244 S245 Verified S132
Marketplaces	IndiaMART (existing inbound), Amazon Business	Low-ticket, price-led	Immediate	Public prices, specs, reviews	Competing listings from ₹950 upward	List OEM design services, not devices Rax-supplied S3 Publicly observed S103
Platform partners	Airtel IoT, ThingsBoard, DATOMS	SIM bundle or platform referral	3 to 6 months	Certified modules, open protocols	Airtel 48 million devices; Milesight and ThingsBoard partnership	Partner for connectivity; not a sales route Publicly observed S37 S238
Export via group entities	Gulf Connect, iibdaei, RaxTech Europe	Unknown	12 months+	SABER, CST, CE and RED cybersecurity evidence	Saudi dossiers: 0 of 13 full verdicts	See section 09 Publicly observed S13 S142

The e-surveillance cross-sell route, tested

Rax states that it is a major e-surveillance player, and its customer base of ATM and bank e-surveillance service companies is the most obvious place to cross-sell FIoT devices. Rax-supplied S3 The evidence supports a real but narrow opportunity.

For it: bank RFPs have asked e-surveillance vendors for exactly the functions the FIoT line provides. Central Bank of India's 2017 RFP for 3,000 ATM sites specified an ATM thermal sensor, mains and UPS power sensing, and "remote control of ACs and power consuming equipments" as an optional item priced as a monthly rental. UCO Bank's 2015 techno-functional BOQ included daily remote on and off of signage and air conditioners at each site. Verified S249 S250 Rax has already sold Energy Gateway units to ANG and environment sensors to APAR, both e-surveillance integrators. Rax-supplied S2 Bank branches grew 2.8% to 1.64 lakh in FY2024-25, and RBI's 2026 technology risk directions ask banks to monitor breaches of environmental controls including temperature, water, smoke and power supply at data-centre and disaster-recovery sites, which is the rack-monitoring report's territory. Publicly observed S253 Verified S255

Against it: the ATM estate is shrinking, from 2,53,417 to 2,51,057 in FY2024-25, with private banks cutting fastest. Publicly observed S253 The site-energy functions are optional line items, and specialist vendors already sell them: Maximus Infoware's OverSite monitors UPS, batteries, power, AC and temperature at ATM sites, and Sixth Energy sells ATM site monitoring with integrated sensors. Publicly observed S251 S252 The integrator, not Rax, decides whether the line item is bid, and the largest integrator account to reduce purchases in FY2025-26, ANG, did so over quality and service failures. Rax-supplied S3

> SO WHAT FOR RAX
>
> Treat the e-surveillance base as a route for a bank-site energy and environment kit (RC03 for AC control, LS08 for power, THAPS for temperature) that the integrator bids as a monthly rental; start with the two integrators who already bought FIoT hardware, and only after a 90-day reliability report on the units already installed. Recommendation

Twenty-two intermediaries assessed

#	ORGANISATION	TYPE	WHY IT MATTERS	RISK	PRIORITY
1	Ion Exchange (India)	Water-treatment OEM	Existing card buyer; consumer products growing	Single-product dependence	High Rax-supplied S2 Publicly observed S127
2	Nuetech Solar Systems	Softener OEM	Existing card buyer	Small volumes	High Rax-supplied S2
3	SSP Beverage	Vending operator	Existing V5 card buyer	Unknown scale	High Rax-supplied S2
4	Inforob	Solar robot OEM	Existing card buyer, rising unit prices	Niche market	High Rax-supplied S2 Publicly observed S201
5	Vendekin Technologies	Vending OEM	Own IoT cloud; needs boards	May design in-house	Medium Publicly observed S222
6	Elanpro	Refrigeration OEM	Connected refrigerators already launched	Has Vendekin alliance	High Publicly observed S220
7	Blue Star	Refrigeration OEM	3 lakh freezer capacity; IoT cold rooms	Large-company procurement	Medium Publicly observed S194

#	ORGANISATION	TYPE	WHY IT MATTERS	RISK	PRIORITY
8	SIS	E-surveillance integrator	Largest Rax account; bank sites	Reputation after support issues	High Rax-supplied S3
9	APAR Innosys	E-surveillance integrator	Bought THAPS and THOPS	Small first order	High Rax-supplied S2
10	Securens	E-surveillance integrator	Existing account	No FIoT purchase yet	Medium Rax-supplied S3
11	ANG India	E-surveillance integrator	Bought 100 Energy Gateway units	Churned on quality	Medium, repair first Rax-supplied S2 S3
12	Cattleya Technosys	IoT and e-surveillance vendor	Existing account that sells central monitoring	Competes as well as buys	Low Publicly observed S200
13	DATOMS (Phoenix Robotix)	White-label platform	Sells to the OEMs Rax supplies	Takes the platform margin	Partner Publicly observed S158
14	Bharti Airtel IoT	Connectivity	SIM and management for any 4G variant	Hardware from partners	Partner Publicly observed S37 S38
15	Tech4LYF	Chennai integrator	Publishes project bands; local	Builds its own boards	Low Publicly observed S187
16	TEDA	State nodal agency	Runs PM-KUSUM tenders in Tamil Nadu	Tender calendar controls volume	Watch Publicly observed S219
17	CODISSIA	Association	7,000+ Coimbatore members	No purchasing power	Use Publicly observed S244
18	TANSTIA	Association	Apex Tamil Nadu SSI body	No purchasing power	Use Publicly observed S245
19	AIOCD	Chemist federation	12.4 lakh chemists	Not a buyer; awareness only	Low Verified S132
20	IndiaMART	Marketplace	Existing inbound channel	Price-led buyers	Keep Rax-supplied S3
21	Kaynes and Syrma SGS	Design-led EMS	Competitors and possible overflow manufacturers	Could take OEM accounts	Watch Publicly observed S234 S233
22	Gulf Connect, Muscat	Group entity	One OEM client in Oman	No FIoT sales	Low Rax-supplied S3

Procurement mechanics

OEM accounts buy through a letter of intent, a purchase order per lot and, for a new design, an engineering or NRE agreement; the Ion Exchange order began with an LOI. Rax should add written change-control and firmware-ownership terms, because the order book does not show who owns the design. Rax-supplied S2 Unknown

Bank e-surveillance RFPs set eligibility at the integrator level: Central Bank of India required the bidder to be providing e-surveillance at a minimum of 1,000 sites of at least two scheduled banks, a daily health check of every sensor through central monitoring and a quarterly physical check. A Rax device reaches a bank only as a component in that integrator's bid, and it must report into the integrator's central monitoring system. Verified S249

PM-KUSUM requires vendors to provide RMS, submit performance data online in the MNRE format, keep a service centre in each district and use indigenous controllers; the state agency tenders supply and installation to empanelled vendors. Verified S213 Publicly observed S219 Telecom-connected devices notified under MTCTE cannot be sold without a certificate, which matters for any gateway or cellular unit sold under Rax's own name. Verified S242

Pilot-to-scale norms in the evidence are unforgiving: practitioners warn that a pilot of "six months on two machines that don't fail" proves nothing, and CEEW found that RMS units went silent once vendors were paid. A Rax pilot must define the alert owner, uptime target and paid conversion before installation. Publicly observed S163 Verified S216

What was tried before and why this differs

Channel partners with their own sales teams failed because Rax asked them to create demand for Rax products. The OEM and integrator routes ask partners to buy a component for demand they already have: Ion Exchange sells softeners, SIS bids bank sites. Digital marketing failed because FIoT had nothing a buyer could verify; the proposal here is to publish verifiable assets (corrected datasheets, a calibration certificate, a reliability report) on IndiaMART and rax-tech.com, not to buy traffic. Rax-supplied S3 Recommendation

Sales motion for two people

WEEK	SALESPERSON 1 (OEM ROUTE)	SALESPERSON 2 (INTEGRATOR ROUTE)	PART-TIME TECHNICAL
1 to 4	Account reviews with Ion Exchange, Nuetech, SSP, Inforob: next-generation needs, 4G variant, volumes	Reliability review of ANG and APAR units; service log	Datasheet corrections; remove CE claim
5 to 8	Introductions to Elanpro and two second-tier freezer makers with a module sample	Bank-site energy kit demo to SIS and APAR	Demo kit: RC03, LS08, THAPS on 4G gateway
9 to 13	Design-fee proposal to one refrigeration OEM	Paid pilot of 20 sites with one integrator	Pilot dashboard and weekly uptime report

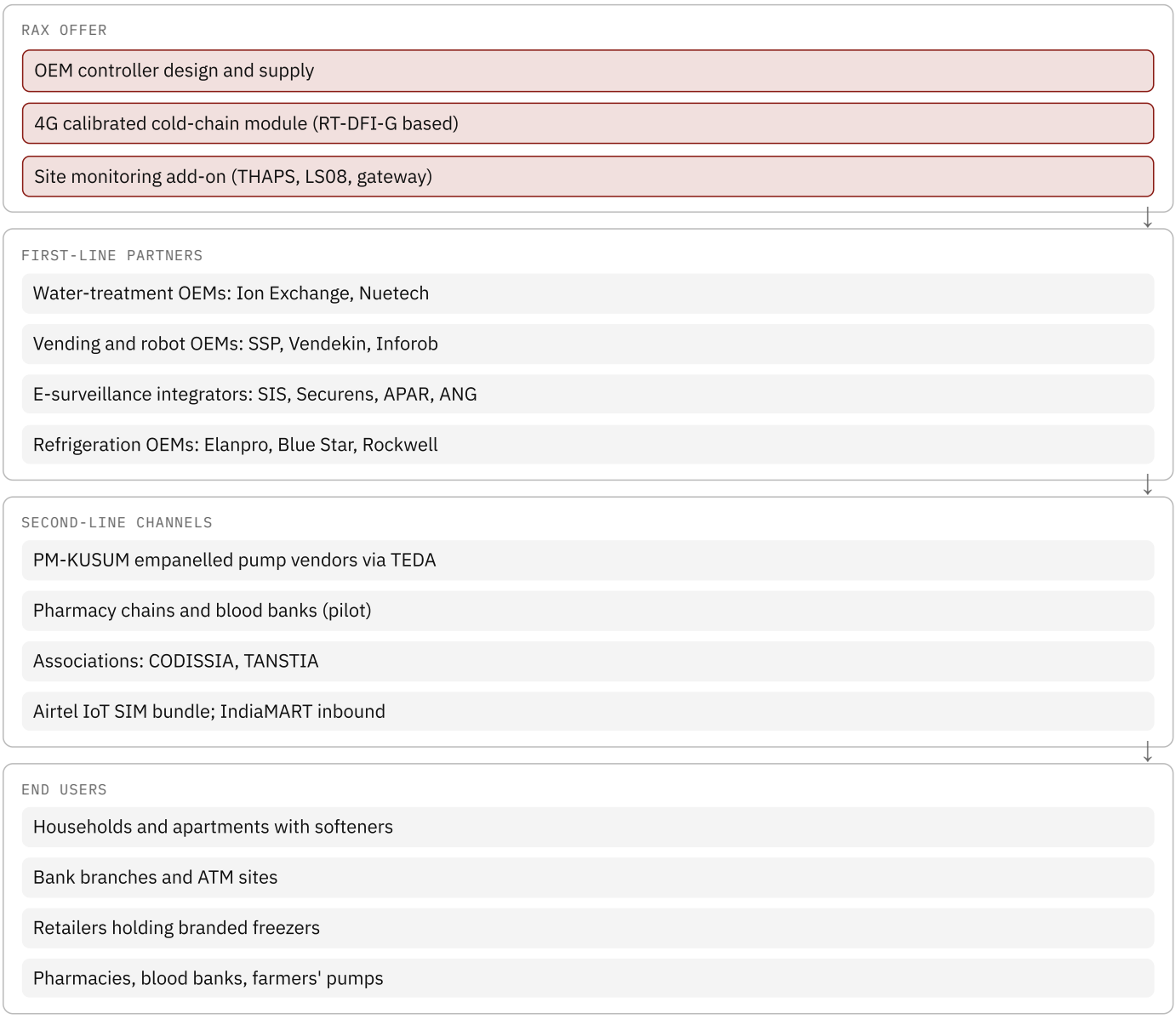
Proof assets needed before any meeting: a one-page OEM design-services sheet listing the cards shipped (with customer permission), a corrected datasheet per model in the kit, a reliability report on installed units, and a white-label app demo account. Recommendation

Marketing that matches how these buyers find suppliers

OEM engineering buyers find design partners through existing supplier networks, association contacts and search; Rax's inbound already arrives through Google and IndiaMART, so the change is to list "IoT controller design and manufacture" as a service with the shipped-card evidence rather than list devices against ₹950 Tuya modules. Rax-supplied S3 Publicly observed S103 Integrators respond to a bid-ready kit with a monthly rental price they can put into an RFP line. Verified S249 Recommendation

> **2,51,057**
>
> ATMs in India at 31 March 2025, down from 2,53,417: the e-surveillance cross-sell base is large but shrinking, so bank branches and server rooms matter more than ATM kiosks. Publicly observed S253

Routes to market ranked for a two-person sales team



Rax sells through the organisations that already own the end customer: equipment OEMs and existing e-surveillance integrators first, refrigeration OEMs and scheme vendors second; direct sales only as a paid pilot. ● Recommendation

09 Geographic priorities

KEY TAKEAWAYS

- Tamil Nadu ranks first by a wide margin: 15.66% of India's factories, about 40% of Indian EMS output, the Coimbatore pump cluster and Rax's own service team within a day's drive. Verified S78 S173 Estimated S235
- Maharashtra ranks second because 16 of Rax's 38 e-surveillance accounts and Ion Exchange's headquarters are in Mumbai, which makes it the centre of the cross-sell route rather than of new demand. Rax-supplied S3 Publicly observed S127
- Gujarat and Telangana hold the regulated pharma and effluent demand (280 and 131 WHO-GMP units; 517 and 344 OCEMS industries) but are out of reach until the cold-chain family is certified. Verified S80 S21
- Export is not a twelve-month route for FIoT: the July 2026 Saudi research gave no model a full verdict, UAE and Oman need accredited RF, EMC and safety reports Rax does not have, and EU wireless devices need RED cybersecurity conformity since August 2025. Verified S13 S240 S142 Publicly observed S241
- Expansion should follow the OEM customer: when a Chennai or Bengaluru OEM ships a Rax-controlled product elsewhere, service follows the OEM's network, not Rax's. Recommendation

How states were scored

Each state was scored on four weighted factors: OEM and factory density (35 points), existing Rax accounts and service reach from Chennai (30), regulated monitoring demand in cold chain, pharma and effluent (20) and scheme activity (15). The weights reflect the segment ranking in section 05, where the top routes run through OEMs and existing integrators rather than through regulated end users. Scores are estimates from the cited state data. Estimated S78 S80 S21 S3 Inferred

RANK	STATE	SCORE	DECIDING FACTS
1	Tamil Nadu	90	15.66% of factories; about 40% of EMS; Coimbatore makes nearly 40% of India's pump sets; 304 licensed blood banks (2015); Chennai service base
2	Maharashtra	72	16 Rax integrator accounts in Mumbai; Ion Exchange HQ; 222 WHO-GMP units; 506 OCEMS industries
3	Karnataka	68	Nuetech and Bengaluru IoT ecosystem; 3 Rax accounts; overnight from Chennai
4	Gujarat	62	280 WHO-GMP units; 517 OCEMS industries; 969 cold storages
5	Telangana	58	131 WHO-GMP units; 344 OCEMS industries; MedPlus and Kritsnam
6	Delhi	52	8 Rax accounts; Safe City and panic-button procurement
7	Andhra Pradesh	48	296 OCEMS industries; state solar pump RMS mandate since 2015
8	Kerala	42	2 Rax accounts; 199 cold storages
9	Puducherry	40	Same-day pilot reach from Chennai
10	Uttar Pradesh	36	Largest OCEMS and cold-storage pool, but 704 defaulting units and far from service
11	Haryana	34	812 defaulting grossly polluting units; no Rax account

Sources in row order: ASI, P&S, SAMEEEKSHA, blood-bank data; context file, CDSCO WHO-GMP list, CPCB OCEMS reply; Nuetech; cold storage replies; MedPlus and Kritsnam; ACB audit and NGT order; CEEW; CPCB and cold storage data. Verified S78 S173 S80 S21 S186 Estimated S235 Publicly observed S243 S202 S196 S118 S223 S227 Rax-supplied S3 Verified S216 S48

Tamil Nadu in detail

Tamil Nadu is where every priority segment overlaps with Rax's ability to service a device. The state has 15.66% of India's registered factories and 15% of factory employment, 41.6 lakh Udyam-registered MSMEs, SIPCOT's 50 industrial parks, and a state electronics hardware policy with capital incentives. Verified S78 S174 S141 Publicly observed S139 Coimbatore alone has about 600 pump manufacturers and 400 ancillary units making nearly 40% of India's pump sets, and a secondary source citing CRISIL puts 38% of new pump set-ups with smart controls. Verified S173 Estimated S183

The regulated demand is real but secondary: 304 licensed blood banks in 2015, the highest of any state, 72 WHO-GMP pharma units, 239 OCEMS industries and Tiruppur's 20 CETPs under zero-liquid-discharge orders. TEDA runs PM-KUSUM and sought approval for a 20,000-pump Component C programme. Publicly observed S243 S219 S254 Verified S80 S21 S197

Chennai city ranks first for the pilot because a service engineer can reach a failed unit the same day, which the context file identifies as the weakness behind Rax's e-surveillance churn. Coimbatore ranks second for OEM prospecting through CODISSIA's 7,000 members. Hosur and Sriperumbudur follow for EMS and appliance OEMs. Rax-supplied | S3 Publicly observed | S244 Inferred

> SO WHAT FOR RAX
>
> The first twelve months of FIoT growth should be won within 500 km of Chennai, where Rax can meet a service-level commitment. Any pilot outside Tamil Nadu, Karnataka and Puducherry should be run through a partner who owns the field service. Recommendation

Other Indian states

Maharashtra is the headquarters state for the e-surveillance cross-sell route and for Ion Exchange, so account management happens in Mumbai even when devices are installed elsewhere. Karnataka is the other half of the OEM cluster: Nuetech, several IoT competitors and a denser startup buyer base, reachable overnight. Gujarat and Telangana hold India's pharma manufacturing base (280 and 131 WHO-GMP units in the CDSCO list) and large OCEMS pools; they become priorities only once a certified, calibrated cold-chain product exists. Rax-supplied | S3 Publicly observed | S202 Verified | S80 | S21

Uttar Pradesh and Haryana look large on paper, with 855 and 174 OCEMS industries and a CPCB defaulter list of 704 and 812 grossly polluting units, but the demand is for type-approved effluent analysers that FIoT does not make. Verified | S21 Publicly observed | S227

Export: GCC

The July 2026 IIBDAEI research built a Saudi dossier for each IoT model and found 0 full, 6 conditional, 4 bundle-only and 3 insufficient verdicts; no model had independently verified performance, Saudi conformity, a cybersecurity pack and local pilot evidence. It recommended leading with RT-DFI-W and RT-DFI-G as one calibrated cold-chain assurance offer, then RT-IEI-E-G0 as a brownfield factory pilot, with RC01, RC03, Z01 and Z03 kept as engineered components. Rax-supplied | S13 | S15 | S16 | S18

The Saudi view adds three requirements India does not yet impose: SABER product certification and CST type approval for wireless devices, NCA IoT cybersecurity guidance (unique credentials, encryption, signed updates, SBOM, vulnerability handling), and for industrial gateways OTCC and IEC 62443-aligned hardening. Its bottom-up scenarios were small: 300 qualified refrigerated vehicles at SAR 10,000 each for the cold-chain offer and 600 qualified brownfield factories at SAR 35,000 for the gateway. Publicly observed | S144 | S15 | S16

Beyond Saudi Arabia, UAE type approval requires registration as a telecom supplier, an official datasheet and RF, EMC and safety reports from an ILAC-accredited laboratory, with a review fee of AED 500, a certificate fee of AED 200 and optional TDRA Wi-Fi inspection at AED 8,100. Oman requires a local representative, accredited test reports, an import permit through Bayan and three to four weeks, with four-year validity. Verified | S240 Publicly observed | S241 Gulf Connect in Muscat has one small OEM client, which is the only group foothold in the GCC. Rax-supplied | S3

Export: Europe

RaxTech Europe has traded since November 2025 with no sales. Any wireless FIoT device placed on the EU market has needed RED cybersecurity conformity (EN 18031) since 1 August 2025, and the Cyber Resilience Act adds vulnerability reporting from 11 September 2026 and full compliance by 11 December 2027. The CE claim printed on current datasheets would be tested the moment a European distributor asked for the declaration of conformity. Rax-supplied | S3 | S5 Publicly observed | S142 Publicly observed | S143

The realistic European route is not FIoT devices but the OEM design capability, sold to a European equipment maker that carries its own CE marking; that is a different offer and is not evidenced in this research. Unknown Inferred

Sequence and expansion triggers

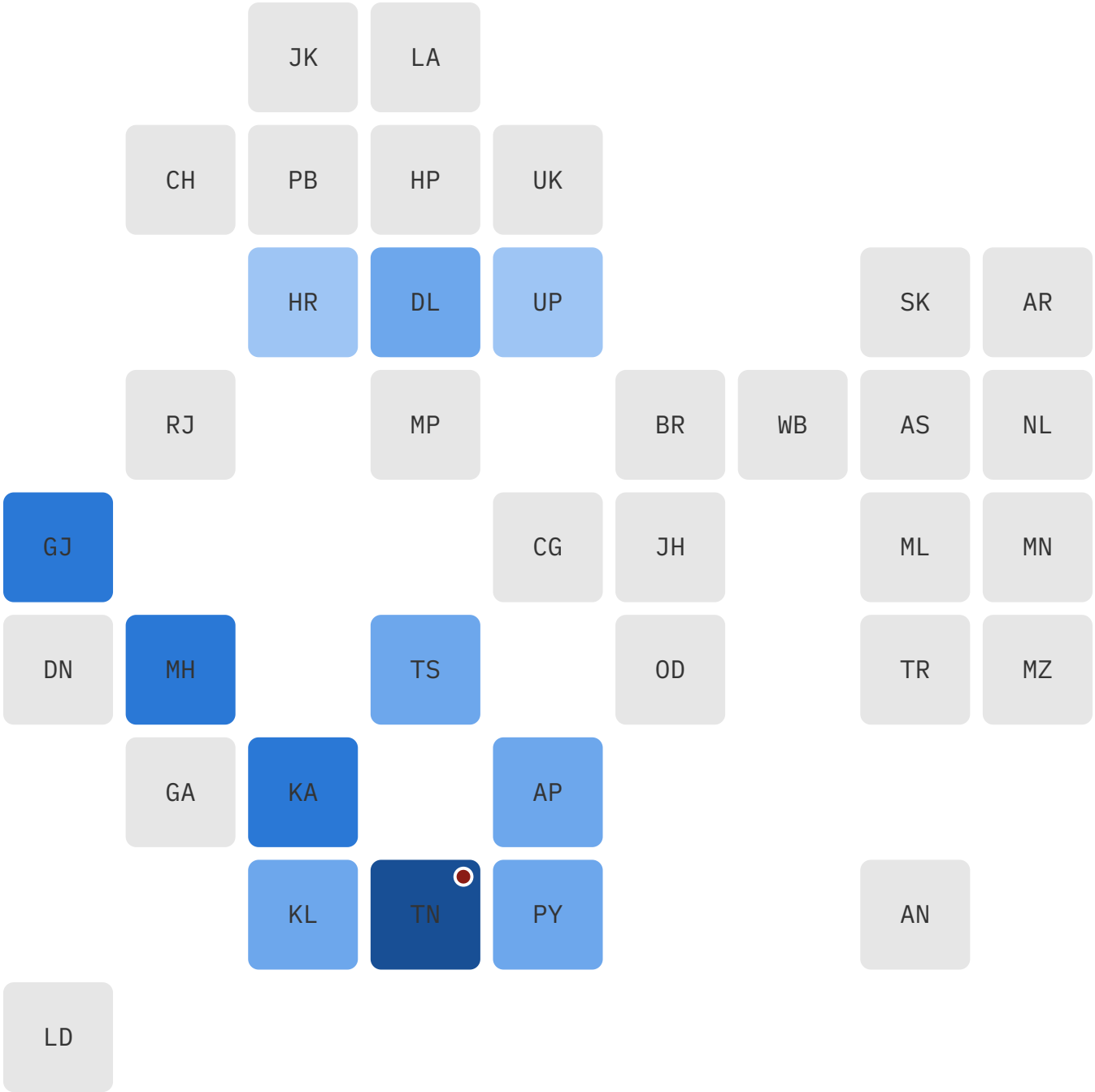
STAGE	WHERE	WHAT HAPPENS	TRIGGER TO MOVE ON
Months 0 to 6	Chennai, Coimbatore, Bengaluru	OEM account development; integrator bank-site kit; 20-site cold-chain pilot in Chennai	Two paying OEM design-ins and 97% data uptime on pilot units
Months 6 to 12	Mumbai (account management), Hyderabad	Integrator rollout through Mumbai head offices; pharmacy chain pilot	Signed integrator rate card; calibration and ETA evidence published
Months 12 to 24	Gujarat, Telangana, Maharashtra field sites via partners	Cold-chain module through refrigeration OEMs' dealer networks	Partner service agreement; field failure rate under 2% a year
Months 24 to 36	Oman and Saudi Arabia via Gulf Connect and iibdaei	Cold-chain assurance pilot on the Saudi dossier design	SABER, CST and NCA evidence complete; one Indian reference willing to be named

Sources: segment and route analysis; Saudi dossier recommendations. Recommendation Rax-supplied | S13

15.66%

Tamil Nadu's share of India's registered factories in 2022-23, the highest of any state, within service reach of Rax's Chennai base.

Verified | S78



1. TN Tamil Nadu 90
   Chennai base and service team; 15.66% of India's factories; about 40% of Indian EMS; Coimbatore makes about 40% of India's pump sets; 304 licensed blood banks (2015, highest in India); TEDA runs PM-KUSUM; 4 Rax e-surveillance accounts in Chennai
2. MH Maharashtra 72
   16 of 38 Rax e-surveillance accounts are in Mumbai; Ion Exchange headquarters; 222 WHO-GMP pharma units; 506 OCEMS industries; largest bank head-office concentration
3. KA Karnataka 68
   Bengaluru OEM accounts (Nuetech) and IoT competitors (TagBox, SenseGiz, Sixth Energy); 3 Rax accounts; 246 OCEMS industries; overnight service reach from Chennai
4. GJ Gujarat 62
   280 WHO-GMP pharma units, the most of any state; 517 OCEMS industries; 969 cold storages; unified solar pump data portal; far from Chennai service
5. TS Telangana 58
   131 WHO-GMP pharma units; 344 OCEMS industries; MedPlus and Kritsnam based in Hyderabad; direct rail and road link to Chennai
6. DL Delhi 52
   8 Rax e-surveillance accounts; panic-button and Safe City procurement; NCR commercial refrigeration and IoT vendors; OCEMS defaulter list of 149 units
7. AP Andhra Pradesh 48

296 OCEMS industries; RMS mandated for state solar pumps since 2015; shares cold storage capacity reporting with Telangana; adjacent to Chennai

8. KL Kerala 42
   2 Rax e-surveillance accounts; 199 cold storages; seafood and pharmacy cold chain; near Coimbatore
9. PY Puducherry 40
   Within 160 km of Chennai; small industrial base; useful as a same-day pilot site for Tamil Nadu pharmacy and food units
10. UP Uttar Pradesh 36
    Largest OCEMS pool (855) and cold storage capacity (150.9 lakh MT) but 704 defaulting GPIs, far from service capacity and outside the priority segments

Tile cartogram, priority score 0 to 100; darker is higher. The red dot marks Chennai. Weighted on four factors: OEM and factory density (35), existing Rax accounts and service reach from Chennai (30), regulated monitoring demand in cold chain, pharma and effluent (20), and scheme activity (15). Scores are estimates from the cited state data, not measured demand.

10 Voice of customer

KEY TAKEAWAYS

- Thirty-three sourced signals were collected from forums, buyer reviews, bank RFPs, RBI directions, scheme guidelines, audit reports, trade press and job descriptions; the two largest themes are connectivity and power failures, and deployments that stop working once installed. Publicly observed | S106 | S163 | S216 | S225
- Buyers do not ask for sensors; they ask for a complete record an inspector accepts and an alert that reaches a named person. Publicly observed | S51 | S206 | S150
- Public buyers write the requirement into the contract: PM-KUSUM makes remote monitoring mandatory, and bank e-surveillance RFPs list AC control and power sensing as line items. Verified | S213 | S249 | S250
- Platform lock-in is a live complaint: solar pump data sits in seven controller makers' portals, and gateway buyers skip the vendor's paid management cloud. Verified | S216 Publicly observed | S96
- No public review, complaint or case study names a FIoT model; the only public signal about Rax's IoT line is its own website and flyers, which carry avoidable errors. Unknown Rax-supplied | S4

Where the signals came from

The quote file holds thirty-three verbatim signals with source, date and theme. They were gathered from Reddit device forums, verified buyer reviews on a Teltonika distributor's site, bank RFPs and pre-bid responses, MNRE scheme guidelines, CAG audit findings reported by national newspapers, a CEEW study of solar pump remote monitoring, trade-press interviews with Rebel Foods, Coca-Cola India and Elanpro, a Chennai practitioner's field notes, a cold-storage owner's forum answer and an Abbott quality-assurance job description. Vendor statements are labelled as vendor views and used only where they describe the buyer's status quo. Publicly observed | S106 | S96 | S163 | S51 | S221 | S220 | S229 | S206 Verified | S249 | S213 | S216

India carries the set: 30 of 33 signals are Indian; the three non-Indian signals (a Sonoff forum post and two Teltonika buyer reviews) describe devices sold in India at scale. Inferred

What buyers complain about

Connectivity and power come first. A Sonoff user on 2.4 GHz Wi-Fi writes, "I have to pair all devices every day, it's frustrating." A Chennai practitioner who builds condition-monitoring systems puts the industrial version bluntly: "plants are hostile to wireless. Metal, motors and concrete kill signals in ways no site survey fully predicts." The Jal Jeevan Mission pilot lead said field monitoring needs "RF and cellular for communications" and "solar or battery-based powering mechanisms for difficult to access locations". A cold-storage owner notes that running on a diesel generator raises operating cost by almost 20 percent. Publicly observed | S106 | S163 | S26 | S229

> *Connectivity – plants are hostile to wireless. Metal, motors and concrete kill signals in ways no site survey fully predicts.*
>
> Omega Matrix, Chennai industrial IoT practitioner, August 2026 Publicly observed | S163

The second theme is deployments that stop working. The CAG found GPS devices live in only 21 of 35 ambulances in a Karnataka smart city and "infructuous expenditure of Rs 2.6 cr on environmental sensors" in Dehradun. Delhi's Anti-Corruption Branch found "no control room is being operated to monitor the panic button alarms", and Maharashtra's transport commissioner reported nearly 40,000 inoperative vehicle panic buttons. CEEW found that of 1,306 solar pumps that had once reported data, only 446 were still transmitting, and that for about 80 percent the geotag was missing or pointed at the controller maker's headquarters. Publicly observed | S225 | S226 | S223 | S224 Verified | S216

Third, software, support and lock-in. A verified buyer of Teltonika's TRB140 writes that "Software-wise the device is buggy" and that support redirects to a forum "which has no people there"; another buyer skipped the vendor's paid remote management and "Built our own monitoring". CEEW's finding that solar pump data "is fragmented across multiple portals maintained by different controller manufacturers" is the public-sector version of the same complaint. Publicly observed | S96 Verified | S216

Fourth, cost and readiness. Pharma MSMEs sought more time under revised Schedule M because of "the need to arrange finances"; the Jal Jeevan Mission team had to keep IoT below 10 to 15 percent of scheme capex; and the Chennai practitioner warns that "Vendors sell stage 4" while most Indian plants belong at stage 2 or 3, and that "Alert fatigue kills it in month three." Publicly observed | S44 | S26 | S163

SO WHAT FOR RAX

The complaints are not about sensor accuracy or features; they are about devices that go silent, alarms nobody owns and data trapped in a vendor portal. Those are exactly the gaps a Chennai manufacturer with a local service team and free software engineers could close, and exactly the failures that caused Rax's e-surveillance churn. Rax-supplied | S3 Inferred

What buyers say they want

Buyers describe the job as a record plus an alert. Rebel Foods' engineering head said FSSAI "requires us to monitor and log the temperature of our cold storage equipment once per day" and that the value was "automated alerts sent to the kitchen staff and maintenance personnel in the event of any deviations". Abbott's QA manager job includes "Reviewing temperature data of data loggers of imported cold chain products" and approving excursions. Vendors selling into this buyer use the same language: "A piece of paper cannot send an SMS to the facility manager at 2:00 AM if the power fails." Publicly observed | S51 | S206 | S150

Asset owners want to see assets they do not control. Elanpro said brands give refrigerators free to retailers with "no system currently supports tracking of the equipment and its location", and Coca-Cola India's CIO called the connected cooler "the next milestone in our journey towards digitizing the marketplace". A multiplex chain told Zenatix its problem was "Unpredictable breakdowns due to a lack of visibility into asset health". Publicly observed | S220 | S221 | S231

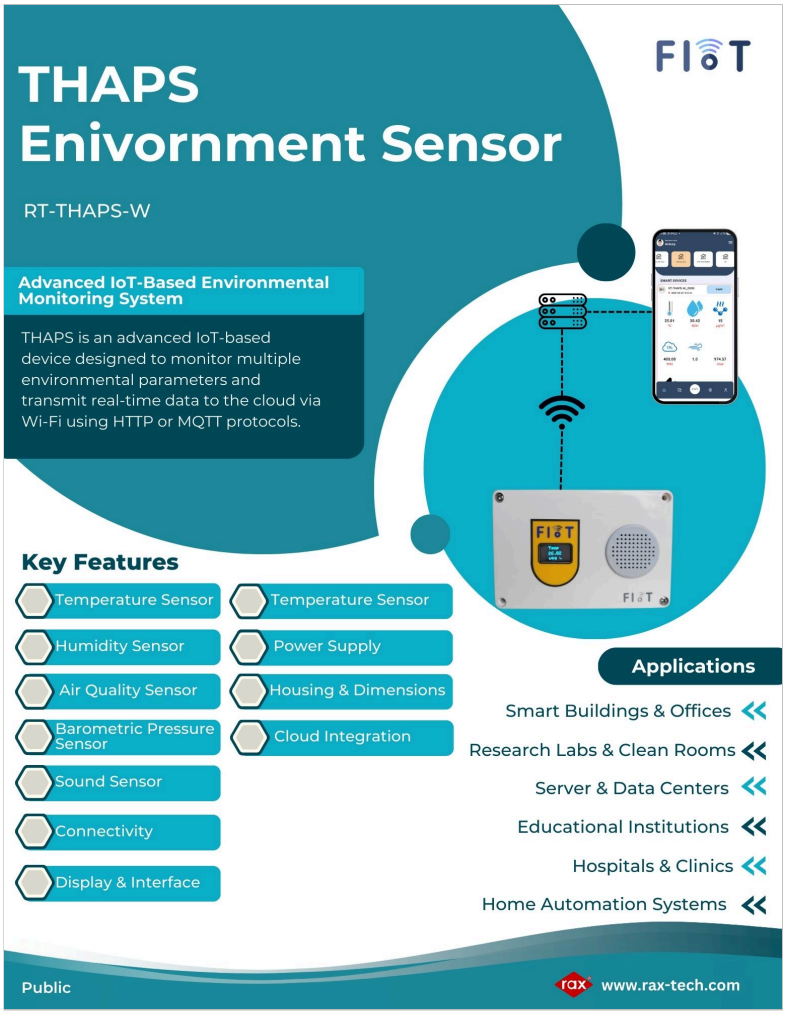
Requirements observed in contracts and rules

BUYER OR RULE	CLAUSE-LEVEL REQUIREMENT	SOURCE
PM-KUSUM (MNRE)	"All solar agriculture pumps sanctioned under the Programme shall be provided with remote monitoring system by the vendor"; data to MNRE in prescribed format; indigenous controllers; service centre per district	Verified | S213
Chhattisgarh solar pumps (CREDA)	Monitoring link, on-site storage for one year of data, RMS login to be handed to the agency	Verified | S216
Central Bank of India e-surveillance RFP	ATM thermal sensor; mains and UPS power sensing; optional remote control of ACs and power equipment as a monthly rental; daily sensor health check through central monitoring	Verified | S249
UCO Bank e-surveillance RFP	Remote signage and air-conditioner on and off daily at each site	Verified | S250
RBI technology risk directions 2026, para 61	Banks to monitor breaches of environmental controls including temperature, water, smoke, access alarms and power and telecom availability at DC and DR sites	Verified | S255
CDSCO Good Distribution Practices (draft)	Calibrated monitoring devices, defined checking intervals, records for shelf life plus one year	Verified | S42
FSSAI	Temperature monitoring and logging of cold storage at least daily (as described by Rebel Foods)	Publicly observed | S51
DoT MTCTE	No notified telecom equipment sold or deployed without a valid certificate	Verified | S242
CPCB OCEMS	Data to CPCB and SPCB servers, 85% data availability, tamper-proofing	Verified | S22

Signals about Rax specifically

No public review, forum post, tender award, case study or complaint names any FIoT model; searches on model numbers, "FIoT app" and "Rax Tech IoT" returned only Rax's own pages. Unknown The only external signal is indirect: Ion Exchange allows its softener controller to be shown on rax-tech.com. Publicly observed | S12

Rax's own public material sends signals a technical evaluator will notice. The THAPS flyer misspells "Environment" in its title and lists "Temperature Sensor" twice; the DFI flyers carry the same model code for Wi-Fi and GSM variants; and the gateway and SOS datasheets print a CE claim the internal record says is not held. Rax-supplied | S4 | S5 | S6 | S3



The RT-THAPS-W flyer: MQTT or HTTP over Wi-Fi to the FIoT app, with applications from clean rooms to hospitals, but a misspelt title, a duplicated feature and no accuracy, range or calibration figures. Source S4

Patterns and what they imply

PATTERN IN THE SIGNALS	IMPLICATION FOR FIOT POSITIONING AND PRODUCT
Wi-Fi drops and power cuts dominate	Ship 4G or LoRa variants with local buffering and battery backup as the default for commercial sites
Deployments die after handover	Sell uptime, not devices: publish a data-availability figure and report it monthly
Alerts nobody acts on	Name the alert owner in every order; escalate by SMS and call
Data trapped in vendor portals	Offer open MQTT, Modbus and REST output and let OEMs white-label; do not sell RT-SW-FIOT as a lock-in
Rules and RFPs specify the function	Bid through the integrator or OEM who holds the contract; match clause language in datasheets
Cost ceilings in schemes and MSMEs	Keep device prices near the ₹3,500 to ₹6,000 band already achieved in OEM work

Sources: the quote file and the requirement table above. Publicly observed S106 S225 S223 S96 Verified S216 S213 S249 Recommendation

> **446 of 1,306**
>
> Solar pumps still sending remote monitoring data in CEEW's Chhattisgarh sample: two in three connected devices had gone silent, which is the failure every Indian IoT buyer now expects. Verified S216

THEMES Tender and certification clauses6 · Connectivity and power4 · Deployments not maintained4 · Cost and budget3 · Compliance drives the purchase3 · Alerts to the right person3 · Asset visibility across sites3 · Platform lock-in and subscriptions2 · Manual logging is the incumbent2 · Oversold analytics and weak pilots2 · Support and software quality1

> *I have to pair all devices every day, it's frustrating.*

Sonoff user with M5 wall switches and DualR3 shutters on 2.4 GHz Wi-Fi · Reddit r/sonoff thread 'Devices keep going offline' · 2023-06-11 · source Publicly observed S106 `Connectivity and power`

> *Software-wise the device is buggy. Documentation is very high level and in case of troubles you will be redirected into community support forum, which has no people there.*

Verified buyer review of the Teltonika TRB140 4G gateway · Getic, official Teltonika distributor, Trustpilot-collected review · undated · source Publicly observed S96 `Support and software quality`

> *Don't use the expensive RMS tho. Built our own monitoring.*

Verified buyer (Keith) of the Teltonika TRB140 · Getic, Trustpilot-collected review · 2023-02-03 · source Publicly observed S96 `Platform lock-in and subscriptions`

> *The main reasons for seeking an extension were the need to arrange finances and more time for implementing the required changes*

Industry expert on MSME pharma units under revised Schedule M · Business Standard · 2025-01-04 · source Publicly observed S44 `Cost and budget`

> *This is also mandated by FSSAI, which requires us to monitor and log the temperature of our cold storage equipment once per day.*

Uday Mahajan, SVP Engineering, Rebel Foods · PR Newswire release on the TagBox deployment · 2022-05-16 · source Publicly observed S51 `Compliance drives the purchase`

> *With TagBox, we are able to eliminate this manual process and achieve real time accurate temperature monitoring of our equipment, with automated alerts sent to the kitchen staff and maintenance personnel in the event of any deviations.*

Uday Mahajan, SVP Engineering, Rebel Foods · PR Newswire release on the TagBox deployment · 2022-05-16 · source Publicly observed S51 `Alerts to the right person`

> *companies are still reliant on local staff to monitor temperature of chillers, freezers or cold rooms manually and record it in a register for audit purposes. This method is prone to manual errors, data recording gaps, data loss, or worse, data tampering.*

Adarsh Kumar, CEO, TagBox (vendor view of the buyer's status quo) · PR Newswire release · 2022-05-16 · source Publicly observed S51 `Manual logging is the incumbent`

> *Most Indian industrial clients we work with belong at stage 2 or 3. Vendors sell stage 4. That gap is where budgets die.*

Omega Matrix, Chennai industrial IoT practitioner · Omega Matrix blog, 'AI + IoT: where predictive maintenance actually pays off in India' · 2026-08-30 · source Publicly observed S163 `Oversold analytics and weak pilots`

> *Connectivity — plants are hostile to wireless. Metal, motors and concrete kill signals in ways no site survey fully predicts.*

Omega Matrix, Chennai industrial IoT practitioner · Omega Matrix blog · 2026-08-30 · source Publicly observed S163 `Connectivity and power`

> *Alert fatigue kills it in month three.*

Omega Matrix, Chennai industrial IoT practitioner · Omega Matrix blog · 2026-08-30 · source Publicly observed S163
Alerts to the right person

> *The pilot proves nothing. Six months on two machines that don't fail. No failures avoided, no ROI, project cancelled.*

Omega Matrix, Chennai industrial IoT practitioner · Omega Matrix blog · 2026-08-30 · source Publicly observed S163
Oversold analytics and weak pilots

> *It requires using a combination of technologies such as RF and cellular for communications, and using solar or battery-based powering mechanisms for difficult to access locations.*

Siddhant Masson, project lead, IoT based Smart Water Management, Tata Consultancy (TCIT), Jal Jeevan Mission pilots · ETGovernment · 2021-04-01 · source Publicly observed S26 Connectivity and power

> *One of the key challenges posed to the team was to develop a robust solution at a fraction of the water infrastructure costs (<10-15% of total scheme capex) without compromising on quality or functionality.*

Jal Jeevan Mission IoT pilot team · ETGovernment · 2021-04-01 · source Publicly observed S26 Cost and budget

> *A piece of paper cannot send an SMS to the facility manager at 2:00 AM if the power fails.*

Samyak Instrumentation (vendor audit guide for pharma and FMCG facilities) · samyak.co.in · 2026-06-06 · source Publicly observed S150
Manual logging is the incumbent

> *Handwritten logs are increasingly viewed by auditors as a significant compliance risk.*

GND Solutions (cold-chain monitoring vendor) · gndsolutions.in cold chain page · 2026 · source Publicly observed S88
Compliance drives the purchase

> *Reviewing temperature data of data loggers of imported cold chain products and further sharing approvals to import department*

Job description, Manager Quality Assurance, Abbott India · Freehire job aggregator · undated · source Publicly observed S206
Compliance drives the purchase

> *no control room is being operated to monitor the panic button alarms in DIMTS*

Delhi Anti-Corruption Branch audit report, as quoted · The Times of India · 2023-07-31 · source Publicly observed S223
Alerts to the right person

> *All our e-buses can be tracked via GPS and have a panic button which, if pressed, passes the information to the nearest police station. There is no such system in the regular buses as of now.*

Pramod Nehul, divisional controller, Pune MSRTC · The Times of India · 2024-12-19 · source Publicly observed S228 Deployments not maintained

Audit observed (July 2024) that GPS devices were live only in 21 out of 35 Ambulances.

Comptroller and Auditor General of India, Smart Cities Mission audit in Karnataka, as quoted · The Indian Express · 2026-02-02 · source
Publicly observed | S225 Deployments not maintained

Cases of infructuous expenditure of Rs 2.6 cr on environmental sensors and Rs 3.2 cr on multi utility ducts were also found

Comptroller and Auditor General of India, Smart Cities Mission audit in Dehradun, as quoted · The Times of India · 2026-03-10 · source
Publicly observed | S226 Deployments not maintained

We find that the data is fragmented across multiple portals maintained by different controller manufacturers.

CEEW study of solar pump remote monitoring systems in Chhattisgarh · CEEW Centre for Energy Finance brief · 2021-09-27 · source
Publicly observed | S216 Platform lock-in and subscriptions

for about 80 per cent of the pumps, the geotag was missing or pointing to the controller manufacturer's headquarters.

CEEW study of solar pump remote monitoring systems · CEEW Centre for Energy Finance brief · 2021-09-27 · source Publicly observed | S216
Deployments not maintained

Controller must have Remote Monitoring Arrangement as per MNRE & CREDA guidelines. System Integrators shall have to provide a link for monitoring of installed SPV Pumps and on-site data storage sufficient to log & store 1-year data...Login ID & Password of RMS must be submitted to CREDA as and when required.

Chhattisgarh Renewable Energy Development Agency solar pump scheme clause, as quoted by CEEW · CEEW brief · 2021-09-27 · source
Publicly observed | S216 Tender and certification clauses

All solar agriculture pumps sanctioned under the Programme shall be provided with remote monitoring system by the vendor.

Ministry of New and Renewable Energy, PM-KUSUM implementation guidelines · MNRE guideline PDF · 2024-01 · source Verified | S213
Tender and certification clauses

As big brands offer the refrigerators free of cost to retail vendors, there is no system currently supports tracking of the equipment and its location.

Elanpro (commercial refrigeration OEM) on its connected refrigerator launch · ET HospitalityWorld · 2020-03-09 · source Publicly observed | S220
Asset visibility across sites

The connected cooler is the next milestone in our journey towards digitizing the marketplace and establishing a connected environment with our consumers.

Sanjay Rawal, CIO, Coca-Cola India and South-West Asia · ET Telecom · 2018-10-23 · source Publicly observed | S221
Asset visibility across sites

If cold storage machines are made to operate on generator (diesal) the operating cost hikes to almost 20 percent

Saurabh Gupta, owner, Annapurana Cold Storage · Quora answer · 2019 · source Publicly observed | S229 Connectivity and power

> *In cold storage units owners are not willing to accept the technology changes .They continue to run their plants with older technology.*

Saurabh Gupta, owner, Annapurana Cold Storage · Quora answer · 2019 · source Publicly observed S229 Cost and budget

> *No telecommunication equipment notified under MTCTE, shall be sold or deployed in any telecommunication network, or otherwise be used in India, unless it has a valid Certificate of Conformity Assessment.*

Department of Telecommunications · DoT eServices MTCTE page · undated · source Verified S242 Tender and certification clauses

> *Unpredictable breakdowns due to a lack of visibility into asset health and predictive maintenance*

Zenatix case study, challenges stated for a national multiplex chain · zenatix.com case study · undated · source Publicly observed S231 Asset visibility across sites

> *Remote control of ACs and Power Consuming Equipments (Optional item).*

Central Bank of India, scope of work for integrated e-surveillance at 3,000 ATM locations · RFP Ref CO:ATM:17-18:224 · 2017-08-07 · source Verified S249 Tender and certification clauses

> *The Techno Functional BOQ will also include remote facility of Signage on / off, Air conditioner(s) on /off on daily basis at each site as per Bank's requirement.*

UCO Bank, pre-bid response on its e-surveillance RFP · RFP UCO/DIT/625/2015-16 pre-bid responses · 2015-07-16 · source Verified S250 Tender and certification clauses

> *The bank shall put in place mechanisms for monitoring of breaches of environmental controls including temperature, water, smoke, access alarms, service availability alerts (power supply, telecommunication, servers), and access logs.*

Reserve Bank of India, paragraph 61 of the 2026 technology risk directions for commercial banks · RBI Master Direction RBI/DoS/2026-27/410 · 2026-07-31 · source Verified S255 Tender and certification clauses

11 Risks and compliance

KEY TAKEAWAYS

- The largest risk is reputational, not regulatory: FIoT's working routes run through e-surveillance integrators and OEMs who already know Rax's quality and delivery record, and a monitoring device that goes silent is visible to their customers. Rax-supplied | S3 | S2
- Two self-inflicted compliance exposures should be fixed within a month at almost no cost: the CE claim printed on datasheets and the "no field calibration" claim on devices sold into cold chain. Rax-supplied | S5 | S6 | S3 Verified | S42
- Radio and telecom approvals are cheap for the kit Rax should sell: WPC ETA is a ₹10,000 self-declaration per model with an RF report, and ETA-holding modules avoid separate approval; MTCTE is needed only for a gateway sold under Rax's name. Verified | S169 | S63 | S242
- The binding operational constraint is engineering capacity: hardware and firmware are booked, so every new OEM design-in competes with existing work. Rax-supplied | S3
- Eighteen risks are registered; five score 16 or more on likelihood times impact. Estimated | S3 | S4 | S106

The register in brief

The data file holds eighteen risks with likelihood, impact, mitigation and owner. The table lists those with a combined score of 12 or more. Estimated | S3 | S2 | S4

RISK	CATEGORY	L	I	OWNER
Quality and service reputation carries over to FIoT add-ons at integrators	Reputational	4	5	MD and Quality
CE claim printed but not held	Regulatory	4	4	Quality
Wi-Fi-only designs fail in the field	Product	4	4	Engineering
Hardware engineering booked; design-ins slip	Operational	4	4	Engineering
Component dependency delays OEM repeat orders	Operational	4	4	Operations
Radio and telecom approvals missing	Regulatory	3	4	Quality
OEMs take electronics in-house or second-source	Competitive	3	4	Sales
COGS unknown; margin below plan	Financial	3	4	Finance
Calibration claim conflicts with cold-chain rules	Regulatory	3	4	Quality
Platform security undocumented	Product	3	4	Software
Commodity price pressure on Wi-Fi controllers	Competitive	4	3	Sales

Sources: context file, order book, flyers, forum and practitioner evidence, Shakti and Kirloskar in-house RMS, CDSCO guideline, Saudi platform dossier. Rax-supplied | S3 | S2 | S4 Publicly observed | S106 | S163 | S217 Verified | S42 | S14

Compliance map

REQUIREMENT	APPLIES TO	ISSUING BODY	RAX STATUS	COST AND LEAD TIME	COMPETITORS HOLDING IT
WPC ETA	Every 2.4 GHz Wi-Fi, BLE and 865 to 867 MHz LoRa device sold in India	DoT Wireless Planning and Coordination	Not held	₹10,000 a model by self-declaration with an ISO 17025 RF report; none needed if an ETA-holding module is used unchanged	Most imported modules; not stated by Indian logger sellers
TEC MTCTE	IoT gateways and cellular equipment in notified categories	TEC, DoT	Not held	About ₹10,000 administrative and ₹50,000 evaluation fee plus lab testing; 6 to 8 weeks; 10-year validity	IoT gateways appear on TEC's certified list
BIS CRS	Notified electronics and IT goods (over 60 categories); only if a FIoT product falls in one	BIS	Applied, in process	₹50,000 processing including one test report; 20 to 40 working days; two-year validity	Not applicable to most monitoring devices

REQUIREMENT	APPLIES TO	ISSUING BODY	RAX STATUS	COST AND LEAD TIME	COMPETITORS HOLDING IT
TEC security by design (TEC 31328:2023)	IoT device security expectations, SBOM, secure update	TEC	No evidence	Documentation effort; voluntary security certification for gateways	Not observed for Indian competitors
DPDP Act and Rules 2025	SOS tracking, any personal location or contact data	MeitY	No documentation	Process and legal cost; penalties up to ₹250 Cr	Not stated
Calibration traceability (CDSCO GDP)	Cold-chain monitors in pharma distribution, pharmacies, blood banks	CDSCO, state drug controllers	Datasheets claim no field calibration	Per-unit certificate from an ISO 17025 or NABL lab; cost Unknown	Instrukart-class listings, Kritsnam (NABL)
MNRE RMS specification	Remote monitoring on PM-KUSUM pumps	MNRE, state agencies	Not engaged	Data format compliance; district service centres	Shakti, Kirloskar, CRI in-house
CPCB OCEMS	Effluent analysers and data acquisition for 17 categories	CPCB, SPCBs	Not applicable to current products	Type-approved analysers; third-party audit	LogicLadder and analyser makers
CE with RED cybersecurity (EN 18031)	Any wireless device sold in the EU from 1 August 2025	EU	Not held; claim printed	Accredited LVD, EMC, RED and cybersecurity testing; Cyber Resilience Act reporting from 11 September 2026	Teltonika, Advantech, Moxa, Milesight
SABER, CST, NCA IoT guidance, OTCC	Saudi import and industrial deployments	SASO, CST, NCA	Not held	Per-model classification and approval; cybersecurity pack	Saudi-listed incumbents
UAE TDRA and Oman TRA type approval	Any radio device sold in the UAE or Oman	TDRA, TRA	Not held	AED 700 review and certificate fees plus accredited reports (UAE); local representative, 3 to 4 weeks (Oman)	Global gateway brands

Sources in row order: WPC guides and fee note; TEC list, guides and DoT MTCTE page; BIS CRS guides; TEC security standard; DPDP Rules; CDSCO GDP and marketplace calibration listings; PM-KUSUM guidelines and pump OEM RMS pages; CPCB guidelines; RED and CRA guides; Saudi dossiers; TDRA and Oman TRA. Verified S62 S63 S169 S65 S171 S172 S242 S64 S170 S66 S67 S42 S213 S22 S142 S144 S240 Publicly observed S190 S119 S217 S143 S241 Rax-supplied S3

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Equipment certified under MTCTE

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Show 10 entries Search:

S.No.	Company Name	Product Name	Product Variant	OEM Name	Product Model Name	Product Model No.
1	Allied Telesis India Pvt. Ltd.	LAN Switch	L3 LAN Switch	Allied Telesis Inc	AT-x530L-52GPX	AT-x530L-10GHXm,AT-x530L-18GHXm,AT-x530L-28GPX,AT-x5 52GTX
2	Brand Liaison India Private Limited	Equipments Operating in 2.4 GHz and 5 GHz Band	Wifi Access Points and CPE	Ubiquiti Inc.	UX	
3	Belden India Private Limited	LAN Switch	L3 LAN Switch	Hirschmann Automation and Control GmbH	GRS106	GRS104,GRS105
4	ERICSSON INDIA PRIVATE LIMITED	5G Core	AMF	Telefonaktiebolaget LM Ericsson	PCC	
5	Sophos Technologies Private Limited	IP Security Equipment	Firewall Equipment	Sophos Limited	Sophos XGS Series 2U	XGS 5500,XGS 6500
6	RADISYS INDIA LIMITED	Equipments Operating in 2.4 GHz and 5 GHz Band	PTP PMP Wireless Access Equipment 2.4 or 5 GHz	Mimosa Networks Inc	A5c	
7	Zen Exim Pvt. Ltd.	Equipments Operating in 2.4 GHz and 5 GHz Band	Wifi Access Points and CPE		QQ-IW-235	
8	Nisha Enterprises	LAN Switch	L2 Unmanaged	Titan Commerce Continental Service	TCXK-ISW15004-12	

The TEC register of MTCTE-certified equipment, where IoT gateways and 2.4 and 5 GHz Wi-Fi equipment appear as certified categories: the list a buyer or integrator checks before accepting a gateway sold under an Indian brand. Source S65

> SO WHAT FOR RAX
>
> Certification is not the barrier it looks like for the recommended kit. Using ETA-holding modules, withdrawing the CE and calibration claims, and filing ETA self-declarations for a handful of models costs lakhs, not crores; MTCTE and export conformity should wait until a gateway or export buyer commits. Recommendation | Publicly observed | S63 | S169

How the reputation constraint affects FIoT specifically

The context file records frequent support calls including at installation, sample-based QC on large orders, missed urgent deliveries from component dependency, and a sales lead who says nobody will refer Rax. It attributes about ₹3.22 Cr of the FY2025-26 revenue decline to quality and service failures at ANG, ITAS and Soteria. Rax-supplied | S3 FIoT makes this worse in one way and better in another. Worse, because monitoring devices generate alarms and dashboards the end customer watches; an offline sensor is a visible failure every day, unlike an alarm panel that is silent until an incident. Better, because the OEM route puts Rax's electronics inside another company's product, tested by that company, which is how Ion Exchange and Nuetech have kept reordering. Rax-supplied | S2 Inferred

The mitigation is to change the QC model for IoT units before growing volume: full burn-in and functional test rather than sample QC, a published data-availability figure for every installed unit, and a 48-hour Chennai replacement promise that the service team can actually keep. Recommendation

Dependencies

DEPENDENCY	WHY IT MATTERS	EXPOSURE
Radio modules (Wi-Fi, 4G, LoRa)	Long lead times caused missed deliveries in e-surveillance	High
Airtel or other SIM provider	Every 4G variant needs a managed SIM; Airtel holds about 62% of M2M connections	Medium

DEPENDENCY	WHY IT MATTERS	EXPOSURE
Two OEM accounts	Ion Exchange and Nuetech account for most IoT card revenue	High
Existing integrators	The bank-site route exists only through SIS, APAR, Securens and ANG	High
PM-KUSUM scheme money	RMS demand depends on scheme windows	Medium
Calibration laboratory	Cold-chain units need traceable certificates	Medium

Sources: context file, TRAI, order book, PM-KUSUM, CDSCO GDP. Rax-supplied S3 S2 Verified S30 S213 S42

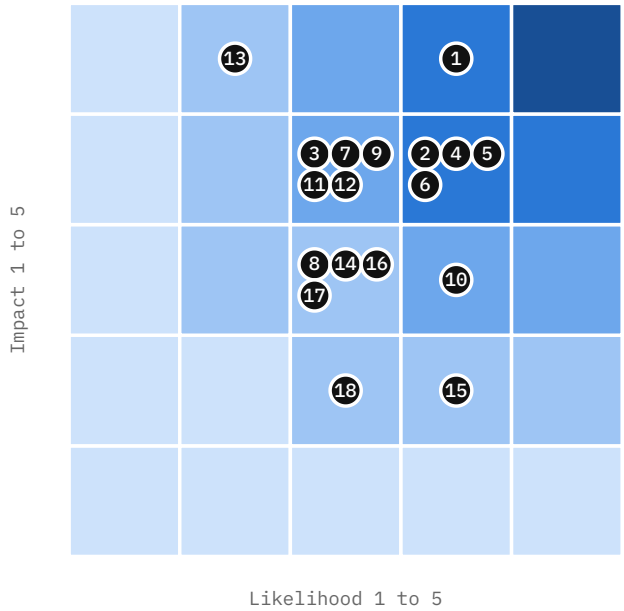
Early-warning indicators

INDICATOR	THRESHOLD THAT SHOULD TRIGGER ACTION	SOURCE OF THE SIGNAL
Data availability of installed FIoT units	Below 97% in any month	Platform uptime report
Support calls per 100 installed IoT units	More than 5 a month	Service log
OEM repeat order interval	Any account more than 6 months late	Order book
On-time delivery on OEM orders	Below 90%	Order book
Gross margin per SKU	Below 35%	Costed BOM
Integrator feedback on bank-site kit	Any integrator declines to bid it after a pilot	Account reviews
PM-KUSUM or successor notification	Scheme not renewed by March 2027	MNRE

Sources: operational measures recommended here, context file and scheme status. Recommendation Rax-supplied S3 Publicly observed S219

₹10,000

Government fee per model for a WPC ETA self-declaration: the certificate gap for Wi-Fi and LoRa devices is a paperwork cost, not a crore-scale barrier. Publicly observed S169



Numbers refer to the register below. Shade deepens with likelihood × impact.

#	RISK	L	I	MITIGATION
1	**The e-surveillance quality and service reputation carries over to FIoT add-ons: a monitoring device that drops offline at a bank site is seen by the bank and the integrator, and ANG already reduced purchases over quality failures** reputational · owner Managing Director and Quality head	4	5	Reliability report on installed ANG and APAR units before any new integrator offer; 100% burn-in and functional test for IoT units instead of sample QC; named service engineer and 48-hour Chennai replacement promise (Rax-supplied | S3 | S2)
2	**Datasheets print CE certification the internal record says is not held; a buyer, auditor or export customs check exposes it** regulatory · owner Quality head	4	4	Remove the CE line from every FIoT datasheet in the next revision; obtain LVD, EMC and RED test reports before reinstating it for export models (Rax-supplied | S3 | S5 | S6)
3	**Radio and telecom approvals missing: Wi-Fi and LoRa models sold under Rax's name need WPC ETA, and cellular gateways notified under MTCTE cannot be sold without a certificate** regulatory · owner Quality head	3	4	Use ETA-holding radio modules; file ETA self-declaration (₹10,000 a model) for the kit models; budget MTCTE (6 to 8 weeks, about ₹60,000 plus lab testing) only for a gateway sold under Rax's name (Verified | S62 | S63 | S169 | S171 | S172 | S242)
4	**Wi-Fi-only designs fail in the field: nine of thirteen models rely on 2.4 GHz Wi-Fi, which buyers and practitioners describe as the leading cause of offline devices** product · owner Engineering head	4	4	Make a 4G variant with local buffering the default for commercial and bank sites; keep Wi-Fi only for OEM products where the OEM controls installation (Publicly observed | S4 | S106 | S163)
5	**Hardware and firmware engineering is fully booked, so OEM design-ins and the 4G module slip and customers go to Kaynes, Syrma SGS or Elecbits** operational · owner Engineering head	4	4	Cap new OEM design-ins at one a quarter; reuse the IEI gateway and softener card as reference designs; move app and cloud work to the free software team; contract overflow layout to a Chennai design house (Rax-supplied | S3 | S233 | S234 | S205)
6	**Component dependency causes missed deliveries on OEM repeat orders, the one route that works today** operational · owner Operations head	4	4	Buffer stock of long-lead radio modules for committed OEM volumes; second-source approved modules; written delivery schedules in OEM agreements (Rax-supplied | S3)
7	**OEM customers bring electronics in-house or second-source the card, as large pump OEMs already do with their own RMS dongles** competitive · owner Sales	3	4	Written supply agreements with volume tiers and notice periods; firmware updates and white-label app as retained services; widen to eight or more OEM accounts so no one exceeds 25% of FIoT revenue (Publicly observed | S217 | S218 | S2)
8	**Firmware and design IP ownership is not documented in OEM orders, so Rax cannot reuse designs or charge for changes** financial · owner Managing Director	3	3	Standard design agreement: Rax retains platform firmware and reference design, OEM owns product-specific configuration; NRE and change-request rates (Unknown)
9	**COGS and margin per model are unknown; a ₹6,000 sensor or ₹4,600 card may earn under the 45% hardware margin the plan assumes** financial · owner Finance and Engineering	3	4	Costed BOM for the five kit and OEM products before any price list; stop any SKU under 35% gross margin (Unknown)
10	**Commodity price pressure from Tuya, Sonoff and marketplace devices at ₹950 to ₹3,649 undercuts any branded Wi-Fi controller** competitive · owner Sales	4	3	Do not sell RC01 or RC03 as standalone products; compete on 4G, service and OEM customisation rather than device price (Publicly observed | S102 | S103 | S104)
11	**Cold-chain buyers require calibration traceability, while the datasheets claim no field calibration is ever needed** regulatory · owner Quality head	3	4	Withdraw the claim; ship a calibration certificate from an ISO 17025 lab with each cold-chain unit and offer annual recalibration (Verified | S5 | S42 | S190)
12	**RT-SW-FIOT has no documented security model, hosting region, retention or API; a breach or outage at a customer site becomes a Rax incident** product · owner Software head	3	4	Publish a platform security note aligned to TEC security-by-design; unique device credentials, TLS, signed OTA; offer MQTT export so customers can use their own platform (Verified | S14 | S66)
13	**Personal data from SOS devices and tracking falls under the DPDP Rules, with penalties up to ₹250 Cr for failing reasonable security safeguards** regulatory · owner Managing Director	2	5	Retire RT-SOS-G from active sale; if any safety programme buys it, complete a data-protection assessment and breach procedure first (Verified | S67 | S68)
14	**PM-KUSUM remote monitoring demand depends on a scheme whose period ended in March 2026 and is being extended rather than renewed** market · owner Sales	3	3	Treat RMS as opportunistic; design the gateway so the same board serves vending, refrigeration and bank-site kits (Verified | S214 | S219)
15	**The ATM estate is shrinking, reducing the e-surveillance cross-sell base** market · owner Sales	4	2	Aim bank-site kits at branches (up 2.8% a year) and bank server rooms via the rack-monitoring offer rather than ATM kiosks alone (Publicly observed | S253)

#	RISK	L	I	MITIGATION
16	**Pilots that prove nothing: short pilots on assets that do not fail, alerts nobody owns and devices that go silent after handover** market · owner Sales and Software head	3	3	Pilot contracts with named alert owners, 97% data-availability target, weekly uptime reports and a paid conversion clause ● Publicly observed S163 S216 S223
17	**Export claims blocked by certification: SABER and CST in Saudi Arabia, TDRA and TRA in the UAE and Oman, RED cybersecurity and the Cyber Resilience Act in the EU** regulatory · owner Group entities	3	3	No FIoT export offer until an Indian reference exists; plan conformity per model only when a GCC or EU buyer commits ● Verified S144 S240 S142 S143
18	**Partner-competitors capture the platform and connectivity margin: DATOMS sells white-label platforms to the same OEMs and Airtel owns the SIM relationship** competitive · owner Software head	3	2	Offer the white-label app at low cost bundled with the card; integrate with DATOMS or ThingsBoard where the OEM prefers; resell SIMs only as a convenience ● Publicly observed S158 S37 S238

12 Strategy and recommendation

KEY TAKEAWAYS

- Rax has made FIoT a strategic priority; the evidence says the fastest way to grow it inside current capacity is to sell FIoT engineering as components through organisations that already buy from Rax, not to push the thirteen-model catalogue to end users. Rax-supplied | S3 | S2
- Recommended option: component-led growth on three motions (OEM controller design, a bank-site energy and environment kit through existing e-surveillance integrators, and one validated 4G cold-chain module through refrigeration OEMs), reaching about ₹3 Cr by 2028 and ₹8 Cr by 2031 in the base case. Estimated | S2 | S249 | S194
- Of the thirteen models, three receive investment (RT-DFI-G, RT-IEI-E-G0 as the kit and OEM reference board, RT-RMC-GX per the rack-monitoring report), six are folded into bundles, three are retired as catalogue SKUs and RT-ICM is frozen as unknown. Recommendation
- Keep the FIoT app, but as a free white-label layer with open MQTT and REST export; do not try to sell RT-SW-FIOT as a paid platform against ThingsBoard at $149 a month for 100 devices. Publicly observed | S108 Verified | S216 Recommendation
- The first-year cash outlay is estimated at ₹25 to 40 lakh, mostly test reports, calibration, pilot hardware and one contract embedded engineer; every motion has a written kill criterion. Estimated | S169 | S236 Recommendation

The question this section answers

Rax states that it is actively trying to grow FIoT and rack monitoring and that it regards itself as a major e-surveillance player. Rax-supplied | S3 This section therefore does not ask whether to keep FIoT. It asks how FIoT can grow with two salespeople, a booked hardware team, free software engineers, no radio or CE certificates and a quality reputation that has cost e-surveillance revenue, and which of the thirteen models deserve the scarce engineering time. Rax-supplied | S3

Three strategic options

OPTION	WHAT IT MEANS	INVESTMENT (YEAR ONE, ESTIMATED)	TIME TO REVENUE	WHAT MUST BE TRUE	VERDICT
A. Catalogue push	Market all thirteen models to end users through IndiaMART, digital campaigns and dealers; certify each model	₹60 lakh to ₹1 Cr: ETA and test reports per model, MTCTE for cellular models, marketing, dealer margins	12 to 24 months	End users trust a new IoT brand; Wi-Fi-only designs work in the field; digital marketing works this time	Loses: every signal says end users buy compliance outcomes and certified devices, and digital marketing and dealer channels already failed at Rax Rax-supplied | S3 Publicly observed | S82 | S106
B. Component-led growth (recommended)	OEM controller design as a service; a bank-site kit sold through existing integrators; one validated 4G cold-chain module through refrigeration OEMs; bundle or retire the rest	₹25 to 40 lakh: test reports and ETA for five SKUs, calibration, pilot hardware, reliability programme, one contract embedded engineer	0 to 6 months (OEM repeats), 6 to 12 months (kits and modules)	OEMs keep reordering; integrators will bid a rental line; reliability can be fixed before volume	Wins: builds on the only routes that have produced FIoT revenue Rax-supplied | S2 Verified | S249
C. Platform play	Turn RT-SW-FIOT into a paid multi-tenant platform using free software bandwidth; sell subscriptions to integrators and OEMs	₹30 to 50 lakh of software effort plus hosting and security certification	18 months or more	Buyers pay a small vendor for a platform when ThingsBoard, AWS, Tuya and DATOMS exist; security documentation passes enterprise review	Loses: the platform layer is priced in cents or tens of dollars and buyers already avoid vendor clouds Publicly observed | S108 | S110 Publicly observed | S96 | S158

Investment ranges are estimates built from the WPC fee, integrator cost bands and pilot unit prices; salaries, lab test fees and calibration fees were not found in public sources and are assumptions. Estimated | S169 | S236 | S2 Unknown

SO WHAT FOR RAX

Option B grows FIoT faster than option A because it sells into demand that already exists inside Rax's accounts, and it uses the free software team for what buyers value (white-label apps, open data export, uptime reporting) instead of a platform nobody will pay for. Recommendation

Why component-led growth fits Rax now

It is the only motion with repeat purchase orders: more than 1,000 softener cards to Ion Exchange and Nuetech at ₹4,600, vending cards to SSP at ₹5,940, robot cards to Inforob and 100 Energy Gateway units to ANG, against eight FIoT-branded sensors in two years. Rax-supplied | S2 It avoids the end-customer credibility test that Rax's reputation makes hard, because the OEM or integrator carries the brand and the customer

relationship. Rax-supplied S3 Inferred It matches what public buyers write into contracts: bank RFPs price AC control and power sensing as optional monthly rentals, PM-KUSUM makes the pump vendor responsible for remote monitoring, and brands ask refrigeration OEMs for connected coolers. Verified S249 S250 S213 Publicly observed S221 S220

Is OEM and contract IoT design a bigger market for Rax than its own catalogue?

In revenue Rax can actually capture in the next three years, yes. The OEM controller pool is about ₹160 Cr a year, smaller than cold chain (₹384 Cr) or energy and site monitoring (₹344 Cr), but Rax can take a share of it without certification, references or brand pull, while its catalogue families need all three first. Estimated S2 S132 S253 Design-led EMS is where Indian electronics value is moving: PCBA-only contract manufacturing earns 2 to 4% EBITDA with no IP, design and engineering is the fastest-growing EMS service, and Syrma SGS expects ₹1,100 to 1,200 Cr of ODM revenue in FY27. Estimated S125 S235 Publicly observed S233

Buyers are mid-size OEMs without electronics teams: water treatment (Ion Exchange, Nuetech), vending (SSP, Vendekin), solar robots (Inforob), commercial refrigeration (Elanpro, Blue Star's second-tier peers), kitchen equipment and pump makers below the scale of Shakti or Kirloskar, who build their own RMS. Rax-supplied S2 Publicly observed S222 S220 S217 S218 Competitors are Kaynes and Syrma SGS at the large end, Elecbits as an ODM platform, and Chennai design houses such as MN Engineering Solutions and Tech4LYF at the small end. Publicly observed S234 S233 S205 S237 S187

Pricing norms in public sources: a prototype IoT device costs ₹5 to 15 lakh to develop and a mid-scale industrial IoT product ₹20 to 60 lakh, while production cards in Rax's order book sell at ₹3,450 to ₹8,500. Rax should charge a design fee within the prototype band, keep firmware ownership, and price production cards to recover tooling over the first lot. Publicly observed S236 Rax-supplied S2 Recommendation

The platform decision

Keep the FIoT app, change what it is for. Evidence on what buyers and competitors do points one way:

EVIDENCE	WHAT IT SHOWS
ThingsBoard Cloud at $149 a month for 100 devices; AWS IoT Core connectivity about $0.042 a device a year; Tuya OEM app from USD 0 to 10,000	The platform layer is nearly free to a device maker Publicly observed S108 S110 Publicly observed S239
Milesight integrates its gateways and sensors with ThingsBoard under a technical partnership	Device makers win by fitting into customer platforms Publicly observed S238
A Teltonika buyer skipped the paid RMS cloud and "Built our own monitoring"	Buyers resist vendor subscriptions Publicly observed S96
CEEW found solar pump data "fragmented across multiple portals maintained by different controller manufacturers"	Proprietary portals become a public-sector complaint Verified S216
DATOMS sells a white-label platform to OEMs	The OEM wants its own brand on the app Publicly observed S158
The Saudi platform dossier found RT-SW-FIOT insufficient: no protocol list, architecture, security model or price	The platform cannot pass an enterprise review today Rax-supplied S14

Decision: RT-SW-FIOT becomes a white-label app and device-management layer given free with Rax hardware, with documented MQTT, Modbus TCP and REST export so OEMs and integrators can push data into their own CMS, ThingsBoard or AWS. The free software team builds the white-label theming, uptime reporting, alert escalation to named owners, and a security note aligned to TEC security by design. Rax charges for hardware, design and optional hosting, not for the platform. Recommendation Verified S66

Model dispositions

MODEL	DISPOSITION	REASON	CONDITION TO REVISIT
RT-DFI-G (4G freezer monitor)	Invest	Base of the calibrated 4G cold-chain module for refrigeration OEMs and a Chennai pilot; cellular answers the Wi-Fi complaint	Retire if the pilot misses its gates
RT-DFI-W (Wi-Fi freezer monitor)	Bundle	Becomes the Wi-Fi option of the DFI-G module for OEM products installed where Wi-Fi exists	None
RT-IEI-E-G0 (edge gateway)	Invest, as a reference board	4G and RS-485 gateway inside the bank-site kit and OEM RMS designs; not marketed as a catalogue gateway against Teltonika	MTCTE only if sold under Rax's name
RT-RMC-GX (rack monitoring controller)	Invest	Paying FUJI account; owned by the rack-monitoring report, which classifies it Pilot first	See that report
RT-RC03-W (3-channel controller)	Bundle	AC and signage control in the bank-site kit, matching bank RFP clauses; ZenCampus classroom control	None

MODEL	DISPOSITION	REASON	CONDITION TO REVISIT
RT-LS08-W (8-channel load sensing)	Bundle	Power and UPS sensing in the bank-site kit; ZenCampus energy module	None
RT-Z01-W and RT-Z03-W (digital input units)	Bundle	Merge into one input module for door, panic and fault contacts inside kits	None
RT-RC01-W (1-channel 20 A controller)	Retire as a SKU	Priced against ₹3,649 Sonoff and ₹950 Tuya devices with no differentiator; firmware reused in OEM work	Only if an OEM asks for it
RT-WQF-W (pH, ORP, flow)	Retire as a SKU	Cannot meet OCEMS or Kritsnam-grade expectations; pH and ORP inputs offered inside OEM water-treatment controllers	An OEM water-treatment design-in
RT-ATU-W (asset run status)	Retire	No buyer evidence; substitutes are cheap current sensors and people	None
RT-SOS-G (personal safety)	Retire	Competes with the free 112 India app; DPDP exposure; unmaintained panic-button estates	A funded programme with a data-protection design
RT-ICM (AI condition monitoring)	Unknown, frozen	No datasheet or evidence; competitors are funded specialists with 946 plants	Retire by March 2027 unless a datasheet and one field trial exist
RT-SW-FIOT (platform)	Bundle	Free white-label layer with open export	None
RT-THAPS-W and RT-THOPS-W (HSE sensors on the FIoT app)	Bundle (THAPS); Unknown (THOPS)	THAPS joins the bank-site kit and cold-chain pilot; THOPS needs a named gas and range	THOPS: a buyer with a defined analyte

Sources: order book, flyers and datasheets; marketplace prices; bank RFPs; OCEMS and Kritsnam; 112 India and DPDP; Infinite Uptime; Saudi dossiers; rack-monitoring cross-reference. Rax-supplied S2 S4 S5 Publicly observed S102 S103 S118 S198 S232 Verified S249 S22 S67 S13 S19 Recommendation

The ninety-day plan

#	ACTION	OWNER	COST (ESTIMATED)	RESULT THAT PROVES IT
1	Withdraw the CE and "no field calibration" claims; publish corrected datasheets with tolerances for DFI-G, IEI, RC03, LS08, THAPS	Quality head	Staff time	Revised datasheets on rax-tech.com
2	Account reviews with Ion Exchange, Nuetech, SSP and Inforob: 2027 volumes, 4G variant, written design and supply agreement	Salesperson 1	Travel	Two written volume forecasts; one signed design agreement
3	Reliability audit of the ANG Energy Gateways and APAR THAPS units already installed	Service lead with software team	Staff time	Uptime and failure report shared with both integrators
4	Build the bank-site kit (RC03, LS08, THAPS on a 4G IEI) with integrator CMS export and a monthly rental price	Engineering and software heads	₹2 to 3 lakh of kit hardware	Demo to SIS and APAR; letter of intent for a 20-site paid pilot
5	DFI-G 4G unit with calibration certificate and ETA self-declaration; sample to one refrigeration OEM	Engineering and Quality	₹3 to 6 lakh for reports, calibration and 20 units	ETA acknowledgement; OEM sample accepted for trial
6	Costed BOM for the five invested and bundled products	Finance with Engineering	Staff time	Margin table; any SKU under 35% flagged

The twelve-month plan

QUARTER	MILESTONES	KPIS
Q1 (Oct to Dec 2026)	Ninety-day actions complete; one OEM design agreement; kit demo	Datasheets published; reliability report delivered
Q2 (Jan to Mar 2027)	20-site integrator pilot live; 20-unit Chennai cold-chain pilot live; second OEM design-in	97% data availability; fewer than 5 support calls per 100 units a month
Q3 (Apr to Jun 2027)	Integrator rate card signed or kit dropped; refrigeration OEM field trial of 200 modules	One integrator bidding the kit; OEM trial acceptance
Q4 (Jul to Sep 2027)	Third and fourth OEM accounts; RT-ICM decision; cold-chain scale or stop	FIoT revenue run-rate of ₹1.8 Cr; gross margin 45% or better on hardware

KPIs follow the early-warning thresholds in section 11 and the base-case sizing in section 04. Estimated | S2 Recommendation

Proof pilots

Integrator bank-site pilot. Twenty bank branches or ATM sites with SIS or APAR; the kit reports AC state, power and UPS status and temperature into the integrator's central monitoring system; 90 days; success is 97% data availability, every alert acknowledged by a named person, and the integrator agreeing to bid the kit as a rental line in its next bank RFP. The Central Bank of India RFP shows the line item such a rental would fill. Verified | S249 Recommendation

Cold-chain pilot. Twenty refrigerators across a Chennai pharmacy chain store cluster and a licensed blood bank from the Tamil Nadu list; calibrated 4G DFI-G units with SMS and call escalation; 90 days; success is complete temperature records an inspector would accept, alert response within 30 minutes and two paying references at ₹9,000 to ₹12,000 a unit plus a monthly fee. Verified | S248 | S42 Recommendation

OEM design-in pilot. One refrigeration or vending OEM takes 200 modules with a white-label app; success is acceptance testing passed first time, on-time delivery and a production order. Recommendation

Investment and the revenue it supports

YEAR	CASH OUTLAY (ESTIMATED)	FIOT REVENUE IN BASE CASE	MAIN SOURCE
2026-27	₹25 to 40 lakh	₹1.8 Cr	OEM repeats, first design fees, pilots
2027-28	₹20 to 30 lakh	₹3.0 Cr	Six OEM accounts, integrator rentals
2030-31	Funded from margin	₹8.0 Cr	Twelve OEM accounts, 7,000 kit sites, two refrigeration OEMs

The revenue path is the SOM series in section 04; the low case with only four OEM accounts reaches ₹4.8 Cr by 2031. Estimated | S2 | S249 | S194

Dependencies on other Rax lines

Rack monitoring shares sensors, the central-software pattern and the bank buyer: RBI's 2026 directions require banks to monitor breaches of environmental controls at data-centre and disaster-recovery sites, which makes the rack controller the natural upsell above the bank-site kit, and that report owns RT-RMC-GX. E-surveillance supplies the integrator accounts and must lend its service team to the kit pilot. ZenCampus is the bundle outlet for RC03, LS08 and THAPS in campuses. X-Lite's emergency-light IoT unit sold to MRS shows the same component logic in another line. Rax-supplied | S3 | S2 Verified | S255 | S19

Kill criteria

MOTION	STOP IF
OEM controller design	No new OEM design agreement signed by June 2027, or on-time delivery below 90% for two quarters
Integrator bank-site kit	Installed-unit data availability below 95% after fixes by March 2027, or no integrator agrees to bid the kit after the pilot
Cold-chain module	Fewer than two paying references after the pilot, or calibration and 4G cost push the unit price above ₹12,000
Any SKU	Gross margin below 35% on the costed BOM
RT-ICM	No datasheet and field trial by March 2027
The whole plan	FIoT revenue below ₹1 Cr in FY2027-28, which would mean the component route cannot carry the engineering cost

₹25 to 40 lakh

Estimated first-year outlay for component-led growth, against a base case of ₹1.8 Cr of FIoT revenue in 2026-27 and ₹8 Cr by 2031.

Estimated | S2 | S169

Validation path for the one branded family worth testing

1 **Fix the datasheet**
Engineering and quality
Accuracy, logging interval, battery, 4G variant; remove the CE claim

2 **Certify and calibrate**
Quality with an ISO 17025 lab
WPC ETA self-declaration, calibration certificate per unit

3 **OEM design-in**
One refrigeration OEM
White-label module on 200 units

4 **Paid pilot**
20 pharmacies or blood banks in Chennai
90 days, uptime and alert-response KPIs

5 **Scale or stop**
Managing Director
Scale only with 97% data uptime and two paying references

Each gate needs evidence before money moves to the next; the kill criteria in section 12 apply at every gate. ● Recommendation

13 Evidence gaps

KEY TAKEAWAYS

- The most load-bearing unknowns are internal: costed bills of materials, field failure and uptime data for installed IoT units, and who owns the firmware in OEM orders; Rax holds all three. Unknown
- No public evidence of any FIoT deployment, review or tender award exists; the absence was checked by model number, product name and marketplace searches. Unknown
- Four sizing inputs rest on assumptions without a primary source: water-treatment controller volume, vending volume, the share of bank sites served by Rax's integrators and the monitored-point service fee. Estimated | S126 | S3
- GeM catalogue prices, tender award values and calibration and test-lab fees were not captured and would sharpen pricing and investment figures. Unknown

Internal facts Rax must supply

GAP	WHY IT MATTERS	WHO HOLDS IT
Costed BOM and gross margin for DFI-G, IEI, RC03, LS08, THAPS and the OEM cards	The plan assumes 45% hardware margin; a SKU under 35% should be dropped	Engineering and finance
Uptime, failure and support-call data for ANG Energy Gateways and APAR THAPS units	Decides whether the integrator route can open without damaging the accounts	Service team
Firmware and design IP terms with Ion Exchange, Nuetech, SSP, Inforob and Pradeep Kitchen	Decides whether designs can be reused and changes charged	Managing Director
Controlled datasheets with accuracy, range, operating temperature, EMC and module part numbers	Needed for ETA filings, OEM qualification and every buyer conversation	Engineering
RT-SW-FIOT architecture, hosting region, tenancy, retention and API	Needed for the white-label and open-export decision and enterprise review	Software team
Certificates or test reports behind the printed CE claim	Decides whether the claim can stay or must be withdrawn	Quality head
Installed base and customer list per FIoT model, if any beyond the order book	Tests the finding that only eight branded units sold	Sales
RT-ICM technical definition	Decides the frozen model's fate	Engineering

Sources: context file, order book, flyers and datasheets, Saudi platform dossier. Rax-supplied | S3 | S2 | S4 | S5 Rax-supplied | S14

External unknowns and the searches already run

UNKNOWN	SEARCHES RUN	WHAT WOULD CLOSE IT
Any public FIoT deployment, review or tender award	"Rax Tech IoT", "FIoT app", each model code, IndiaMART and GeM catalogue searches, Parallel and web search	A Rax-supplied reference list or a signed pilot
GeM catalogue and award prices for IoT loggers and gateways	GeM advance search pages and tender aggregators; GeM pages did not return item prices to the fetch tools	A logged-in GeM buyer view or awarded bid documents
Calibration fee per cold-chain logger at a NABL lab in Chennai	NABL calibration provider pages	A written quote from a Chennai lab
RF, EMC and safety test-lab fees for ETA and export	Consultancy fee pages; only government fees are public	Quotes from two ISO 17025 labs
Tamil Nadu licensed blood banks after 2015	Indiastat and Drugs Control Department list; totals not extractable	The state list counted, or a current National Health Profile table
Placed freezer and cooler counts for ice-cream and beverage brands in India	Trade press on connected coolers and ice-cream freezers	Brand or bottler disclosures, or an OEM conversation
Share of bank sites served by SIS, Securens, APAR and ANG	Bank RFPs and integrator pages	Integrator disclosures or account reviews
IEC 62443 certification cost for a gateway	Certification body pages; no public price	Quote from a certification body, needed only for export

UNKNOWN	SEARCHES RUN	WHAT WOULD CLOSE IT
Five-year history for energy, water and personal safety families	TRAI, ASI, CPCB and scheme sources; only M2M connections and cold storages have clean series	Annual BEE, CPCB or MoHUA statistics if published

Sources: search trail recorded in gaps.md. Unknown

Load-bearing assumptions not yet verified

ASSUMPTION	USED IN	SENSITIVITY
One new OEM design-in a quarter is achievable with current staff	SOM 2027 to 2031	Low case of four accounts halves 2031 SOM to ₹4.8 Cr
Integrators will bid a rental line for AC, power and temperature	Bank-site SAM and kit pilot	Removing it cuts 2031 SOM to ₹6.5 Cr
₹4,400 a monitored point a year, including ₹200 a month service	Cold-chain TAM	A ₹100 fee cuts the cold-chain pool by about a quarter
50% of PM-KUSUM RMS demand sits outside OEMs that build in-house	OEM TAM	Unverified; large OEMs visibly build their own
Vending volume read as a base rather than annual sales	OEM TAM	Could move vending from ₹15 Cr to about ₹115 Cr
₹86 to the US dollar	Top-down cross-check only	No effect on bottom-up figures

Sources: sizing and segment assumptions. Estimated S126 S213 S217 S249 Inferred

SO WHAT FOR RAX

Three internal documents (a costed BOM, a reliability report on installed units and the OEM contract terms) would do more to firm up this verdict than any further market research, and all three can be produced inside the first ninety days. Recommendation

Recommended next research actions

1. Obtain the costed BOMs and the installed-unit reliability data from Rax, and re-score readiness and margin. Recommendation
2. Hold account reviews with Ion Exchange, Nuetech and SSP to confirm 2027 volumes and whether they would accept a 4G variant. Recommendation
3. Ask SIS and APAR which bank RFPs in 2025 and 2026 carried AC, power or temperature line items and at what rental. Recommendation
4. Get calibration and RF test quotes from two Chennai labs to replace the investment estimates. Recommendation
5. Pull awarded GeM bids for temperature loggers and IoT gateways to add public price discovery. Recommendation
6. Revisit PM-KUSUM after the March 2027 extension date to decide whether RMS boards deserve design time. Recommendation

14 Sources and method

KEY TAKEAWAYS

- 257 sources were registered: 59 primary, regulatory or dataset sources, 88 vendor pages and listings, 36 news reports, 33 references, 17 analyst estimates, 15 internal documents, 8 forum sources and one academic study. Verified S31 S213 S249 Rax-supplied S2
- India carries 218 of the 257 sources; 39 concern Saudi Arabia, the GCC, Europe or global platforms, within the one-fifth guide. Inferred
- Two passes were run: a first draft across six phases, then a gap audit against every section brief and prompt question, followed by re-verification of ten load-bearing numbers against primary documents. Inferred
- The Browser pane and logged-in browser identities were reserved by the lead; public pages were read through search and fetch tools, and screenshots were taken with the headless snapshot script. Inferred

Search strategy

Research ran in six phases: product truth from the internal product master, order book, flyers, datasheets, rax-tech.com and the July 2026 Saudi dossiers; demand, growth and regulation from regulators and ministries; competitors and prices from vendor sites, IndiaMART, TradeIndia, Amazon.in, Flipkart and distributor stores; buyers, channels and voice of customer from bank RFPs, scheme guidelines, audit reporting, forums, reviews and job descriptions; the platform, OEM-design and export questions; then sizing, risks, scoring and strategy. Rax-supplied S1 S2 S4 Rax-supplied S13

Query families were written in buyer language: "temperature data logger GSM", "cold room monitoring FSSAI", "OCEMS", "RMS solar pump PM-KUSUM", "ATM site monitoring AC UPS", "e-surveillance RFP remote control of AC", "IoT gateway MTCTE", "WPC ETA fee", "panic button not working", "predictive maintenance India pays off", "IoT product development cost India", and each FIoT model code. Portals and databases included TRAI press releases, PIB and Lok Sabha replies, CPCB, CDSCO, FSSAI, MNRE, DoT and TEC, RBI master directions, bank RFP archives, GeM and tender aggregators, the CDSCO WHO-GMP list, the Tamil Nadu Drugs Control directory, company sites and funding coverage. The date range covered is 2014 (CPCB OCEMS direction) to September 2026. Verified S22 S31 S213 S255 S249 S248

Source mix and confidence

TYPE	COUNT	HOW IT WAS USED
Primary, regulatory and dataset	59	Rules, clauses, statistics; labelled Verified when opened
Vendor pages and marketplace listings	88	Prices, product claims and competitor facts; labelled Publicly observed
News	36	Funding, audits, deployments; Publicly observed or Verified when quoting an official record
Reference and explainer	33	Certification process and fee guides; cross-checked where possible
Analyst	17	Top-down triangulation only
Internal	15	Order book, product master, flyers, datasheets, context file and Saudi dossiers; labelled Rax-supplied
Forum and academic	9	Voice of customer and the CEEW remote-monitoring study

Confidence was assigned per source: high for regulators, statutes, official statistics and company filings; medium for established news, vendor pages and consultancies; low for marketplace listings, third-party price estimates, forum posts and internally inconsistent reports. 72 sources are high, 125 medium and 60 low. Inferred

Limits and workarounds

Paywalled analyst reports were used only through their public summary figures. GeM item and award prices could not be read through the fetch tools, so aggregator listings stand in and the gap is logged. IndiaMART and Amazon product pages did not render in the headless screenshot tool, and pib.gov.in returned an access-denied page to it, so regulatory figures were captured from CPCB and TEC pages instead. The CPCB national STP inventory PDF could not be text-extracted. No logged-in browser identity, form, message or purchase was used. Unknown Verified S23 S65

The hero image was supplied by the lead from a generated illustration; every evidence image in the report is a flyer, datasheet page or public web page screenshot with its source cited. Rax-supplied S4 S5 Publicly observed S82 S118 S108

Changes between the first and second pass

The gap audit against the section briefs and the twelve prompt questions found five shortfalls, all closed in the second pass: the e-surveillance cross-sell route had no primary evidence (bank RFPs from Central Bank of India and UCO Bank and RBI's 2026 directions were added); the PM-KUSUM volume rested on a secondary summary (replaced with PIB Lok Sabha replies to December 2025); the personal-safety price category had three points (four marketplace prices added); two competitors that sell ATM site monitoring were missing (Maximus Infoware and Sixth Energy added); and one geography claim cited the wrong source (corrected). Verified S249 S250 S255 S256 Publicly observed S211 S212 S251 S252 S254

Ten load-bearing numbers were re-verified against primary or original documents: M2M connections at June 2026 and May 2024 (TRAI), factories and Tamil Nadu's share (ASI via PIB), chemists represented by AIOCD, cold storages (PIB), Indian IoT device revenue (Grand View), Blue Star's freezer capacity, the WPC ETA fee, PM-KUSUM installations (PIB) and the order-book quantities and prices for every IoT line (deduplicated across monthly sheets). All held; the vending volume input was downgraded to low confidence because its source is internally inconsistent. Verified S31 S29 S78 S132 S135 S256 Estimated S33 S126 Publicly observed S194 S169 Rax-supplied S2

Source list

S1 Rax product master, 57 models (FIOT rows 1 to 13, RT-SW-FIOT, HSE rows) landings/_rax-data/_analysis/rax-product-master.csv
Rax Tech International (internal extract) · 2026-08-04 · accessed 2026-09-15 · India · internal · confidence high · Thirteen FIOT models plus RT-SW-FIOT, RT-THAPS-W, RT-THOPS-W, RT-WAC-W-G0 and customer-usecase RT-CP-WSI, RT-CP-WAC

S2 Rax order book FY2024-25 and FY2025-26 (926 lines) landings/_rax-data/_analysis/rax-orderbook.csv
Rax Tech International (internal extract) · 2026-08-04 · accessed 2026-09-15 · India · internal · confidence high · Only IoT lines: FIOT-THAPS and FIOT-THOPS to APAR Innosys at ₹6,000 (Nov 2025); Energy Gateway to ANG at ₹3,450 to ₹3,900; water softener cards to Ion Exchange and Nuetech at ₹4,600; vending and solar cards

S3 Rax Tech verified internal context (CONTEXT-RAX.md and RAX-GROUND-TRUTH.md) rax-market-research/charter/CONTEXT-RAX.md
Rax Tech International (internal analysis) · 2026-08-05 · accessed 2026-09-15 · India · internal · confidence high · Turnover series, vertical split, certification position, sales capacity, quality reputation, OEM and DDP business

S4 FIoT flyer datasheets (JPEG): RC01, DFI-W, DFI-G, LS08, IEI, ATU, WQF, Z01, Z03, SOS, THAPS, THOPS landings/_rax-data/114911_Data_Sheets/unz_IoT/IoT Technical and Flyer Design Datasheets/
Rax Tech International (internal) · 2026-01 · accessed 2026-09-15 · India · internal · confidence medium · One-page marketing flyers dated 3 January 2026; features and applications only, few electrical specifications

S5 Industrial Edge IoT Gateway technical datasheet RTS-IEI-XX-G0-R02 landings/_rax-data/114911_Data_Sheets/unz_Automation_Technical_Datasheets/Automation Technical Datasheets/Updated Industrial Edge IOT Gateway Technical Datasheet 2025 .pdf
Rax Tech International (internal) · 2025-07-14 · accessed 2026-09-15 · India · internal · confidence medium · 4 DI, 2 relay DO, 2 AI 4-20 mA, 1 AO, PWM, RS-485, MQTT/TCP/HTTP, LoRaWAN 1.0.3 class A/B/C, Wi-Fi b/g/n, 4G, BLE 4.0, 9 to 36 V DC, IP65; states CE and RoHS and one-year warranty

S6 SOS Tracking Emergency Safety Device technical datasheet RT-SOS-G0-R0 landings/_rax-data/114911_Data_Sheets/unz_HSE_Datasheets/HSE Datasheets/Updated SOS Tracking Emergency Safety Device Technical Data Sheet Doc 2025 Version.pdf
Rax Tech International (internal) · 2025-12-20 · accessed 2026-09-15 · India · internal · confidence medium · GPRS and GSM SMS plus voice call, 3-press SOS, two preset contacts, 15-day standby, 45-minute charge, GPS location, OTA, -10 to +55 C; states CE and RoHS

S7 WiFi Audio Clock technical datasheet RTS-WAC-W-G0-R0 landings/_rax-data/114911_Data_Sheets/unz_HSE_Datasheets/HSE Datasheets/WiFi Audio Clock Technical Data Sheet Doc Version 2026.pdf
Rax Tech International (internal) · 2026-01 · accessed 2026-09-15 · India · internal · confidence medium · 2.4 GHz Wi-Fi only, DHCP router required, 100 schedules, MP3 upload

S8 IoT products category page https://rax-tech.com/products/category/iot
Rax Tech International · undated · accessed 2026-09-15 · India · vendor · confidence medium · Lists the thirteen FIOT models with one-line descriptions; Rack Monitoring Controller listed as RT-RMC-GX; datasheets published only for SOS and RMC

S9 HSE products category page https://rax-tech.com/products/category/hse
Rax Tech International · undated · accessed 2026-09-15 · India · vendor · confidence medium · THAPS, THOPS, SOS and Wi-Fi clock described as running on the FIOT app

S10 Software products category page https://rax-tech.com/products/category/software
Rax Tech International · undated · accessed 2026-09-15 · India · vendor · confidence medium · RT-SW-FIOT described only as IoT platform software and mobile app; no catalogue

S11 Custom software development services page https://rax-tech.com/services/software-development
Rax Tech International · undated · accessed 2026-09-15 · India · vendor · confidence low · Site claims 49 shipping products, 25+ product collaborations, 2M+ units sold, 1200+ customers; unaudited marketing figures

S12 IoT products page with custom solutions (Water Softener IoT, courtesy Ion Exchange) https://rax-tech.com/products/iot
Rax Tech International · undated · accessed 2026-09-15 · India · vendor · confidence medium · Custom solutions section lists RT-CP-WSI water softener IoT with mobile app and RT-CP-WAC water treatment controller

S13 IoT and edge research-v2 completion summary, 13 products, Saudi market landings/IIBDAEI-Saudi-Market-Research-2026/research-v2/manifests/iot-edge-summary.md
IIBDAEI Saudi market research 2026 (internal) · 2026-07-19 · accessed 2026-09-15 · Saudi Arabia · internal · confidence high · Verdicts: 0 FULL, 6 CONDITIONAL, 4 BUNDLE-ONLY, 3 INSUFFICIENT; eight evidence gaps to request from Rax

S14 RT-SW-FIOT IoT Platform Saudi dossier landings/IIBDAEI-Saudi-Market-Research-2026/research-v2/products/rt-sw-fiot.md
IIBDAEI Saudi market research 2026 (internal) · 2026-07-19 · accessed 2026-09-15 · Saudi Arabia · internal · confidence high · Verdict INSUFFICIENT; no protocol list, architecture, security model or price; competitor set ThingsBoard, ThingWorx, Insights Hub, AWS IoT Core, Ignition

S15 RT-DFI-W and RT-DFI-G Deep Freezer IoT Saudi dossiers landings/IIBDAEI-Saudi-Market-Research-2026/research-v2/products/rt-dfi-w.md
IIBDAEI Saudi market research 2026 (internal) · 2026-07-19 · accessed 2026-09-15 · Saudi Arabia · internal · confidence high · CONDITIONAL; model-number conflicts between site and flyers; accuracy, calibration, logging interval and battery backup unknown; competitors testo Saveris 2, Monnit, Airthings

S16 RT-IEI-E-G0 Industrial Edge IoT Gateway Saudi dossier landings/IIBDAEI-Saudi-Market-Research-2026/research-v2/products/rt-iei-e-g0.md
IIBDAEI Saudi market research 2026 (internal) · 2026-07-19 · accessed 2026-09-15 · Saudi Arabia · internal · confidence high · CONDITIONAL; scenario 600 brownfield factories x SAR 35,000; competitors Siemens IOT2050, Advantech ADAM-6700, Teltonika TRB140

S17 RT-ICM AI condition monitoring Saudi dossier (JSON) landings/IIBDAEI-Saudi-Market-Research-2026/research-v2/products/rt-icm.json
IIBDAEI Saudi market research 2026 (internal) · 2026-07-19 · accessed 2026-09-15 · Saudi Arabia · internal · confidence high · CONDITIONAL; MCSA claim; competitors Samotics SAM4, Artesis e-MCM, ABB Ability Smart Sensor, SKF Enlight; no product specification supplied

S18 RT-RC01-W, RT-RC03-W, RT-Z01-W, RT-Z03-W Saudi dossiers landings/IIBDAEI-Saudi-Market-Research-2026/research-v2/products/rt-rc01-w.md
IIBDAEI Saudi market research 2026 (internal) · 2026-07-19 · accessed 2026-09-15 · Saudi Arabia · internal · confidence high · BUNDLE-ONLY: commodity competition, electrical liability and weak standalone economics

S19 RT-RMC-GX rack monitoring controller Saudi dossier (JSON) landings/IIBDAEI-Saudi-Market-Research-2026/research-v2/products/rt-rmc-gx.json
IIBDAEI Saudi market research 2026 (internal) · 2026-07-19 · accessed 2026-09-15 · Saudi Arabia · internal · confidence high · Cross-reference only; the rack-monitoring report owns this model

S20 RT-THAPS-W, RT-THOPS-W and RT-WQF-W Saudi dossiers landings/IIBDAEI-Saudi-Market-Research-2026/research-v2/products/rt-thaps-w.md
IIBDAEI Saudi market research 2026 (internal) · 2026-07-19 · accessed 2026-09-15 · Saudi Arabia · internal · confidence high · CONDITIONAL; air-quality analyte, sound metric and pH/ORP ranges undefined; competitors testo, Vaisala, Hach-class instruments

S21 Online Monitoring of Pollution (Lok Sabha reply with sector-wise and state-wise OCEMS tables) https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1813174
Press Information Bureau, Ministry of Environment, Forest and Climate Change · 2022-04-04 · accessed 2026-09-15 · India · primary · confidence high · 3,535 of 4,247 targeted units connected 2014 to 2022; 4,433 industries in 17 categories: UP 855, Gujarat 517, Maharashtra 506, Telangana 344, AP 296, Karnataka 246, TN 239, Rajasthan 197, Odisha 186, Haryana 174; pharma 774 targeted, 673 connected; automatic SMS alert on exceedance

S22 First revised guidelines for Continuous Emission Monitoring Systems https://cpcb.nic.in/upload/thrust-area/revised-ocems-guidelines-29.08.2018.pdf
Central Pollution Control Board · 2018-08 · accessed 2026-09-15 · India · regulatory · confidence high · Direction B-29016/04/06PCI-1/5401 of 5 February 2014 to 17 categories, CETPs, STPs, incinerators; vendors must push data to CPCB and SPCB servers, 85% data availability, 7-year spares, third-party performance audit

S23 OCEMS documentation index, including 2014 effluent guidelines and 2018 tampering caution notice https://cpcb.nic.in/ocems1/
Central Pollution Control Board · 2020-09 · accessed 2026-09-15 · India · regulatory · confidence high · Lists the 7 November 2014 effluent online-monitoring guidelines, the 8 May 2018 caution notice on OCEMS tampering and the 2017 real-time data policy

S24 CPCB OCEMS guidelines for industries explained https://spans.co.in/knowledge/cpcb-ocems-guidelines-industries/
Spans Envirotech · 2026-06-28 · accessed 2026-09-15 · India · vendor · confidence low · Vendor explainer; deliberate tampering prosecuted under EPA section 15 and Water Act section 43; CPCB publishes non-compliance lists

S25 Jal Jeevan Mission deploys sensor-based IoT devices to monitor rural drinking water supply https://www.pib.gov.in/PressReleasePage.aspx?PRID=1708701&reg=48&lang=2
Press Information Bureau, Ministry of Jal Shakti · 2021-03-31 · accessed 2026-09-15 · India · primary · confidence high · Pilots with Tata Community Initiatives Trust in five states; sensor cost target under 10 to 15% of scheme capex; states tendering 500-village to district roll-outs

S26 Jal Jeevan Mission: sensor-based IoT devices installed (TCIT project lead quoted) https://government.economictimes.indiatimes.com/news/policy/jal-jeevan-mission-sensor-based-iot-devices-installed-to-monitor-rural-drinking-water-supply-systems/81814178
ETGovernment (Economic Times) · 2021-04-01 · accessed 2026-09-15 · India · news · confidence medium · Flow meters, groundwater level, chlorine analysers, pressure sensors, pump controllers; RF plus cellular and solar power; Gujarat, Bihar, Haryana, Arunachal tenders

S27 Smart water meters tenders in India 2026 (75 live) https://www.tenderdetail.com/Indian-tender/smart-water-meters-tenders
TenderDetail · 2026-07 · accessed 2026-09-15 · India · dataset · confidence low · Aggregator count; 75 live smart-water-meter tenders in July 2026, mostly under ₹10 lakh, Gujarat 16, Chhattisgarh 10, Maharashtra 9

S28 Telecom subscription data as on 31 May 2025 (Press Release 51/2025) https://www.trai.gov.in/sites/default/files/2025-06/PR_No.51of2025_0.pdf
Telecom Regulatory Authority of India · 2025-06-27 · accessed 2026-09-15 · India · dataset · confidence high · 73.91 million M2M cellular connections at end May 2025; Airtel 54.31%, Vi 22.74%, Jio 18.31%, BSNL 4.63%

S29 Telecom subscription data as on 31 May 2024 (Press Release 40/2024) https://www.trai.gov.in/sites/default/files/2024-08/PR_No.40of2024.pdf
Telecom Regulatory Authority of India · 2024-08 · accessed 2026-09-15 · India · dataset · confidence high · 52.30 million M2M cellular connections at end May 2024

S30 Telecom subscription data as on 31 March 2026 (Press Release 53/2026) http://www.trai.gov.in/sites/default/files/2026-04/PR_No.53of2026.pdf
Telecom Regulatory Authority of India · 2026-04 · accessed 2026-09-15 · India · dataset · confidence high · M2M connections rose from 118.47 million (February 2026) to 123.88 million (March 2026)

S31 Telecom subscription data at end of June 2026 (Press Release 104/2026) https://trai.gov.in/sites/default/files/2026-07/PR_No104of2026_0.pdf
Telecom Regulatory Authority of India · 2026-07-28 · accessed 2026-09-15 · India · dataset · confidence high · M2M connections 134.73 million at end June 2026, up from 131.11 million in May 2026

S32 Recommendations on usage of embedded SIM for M2M communications https://www.trai.gov.in/sites/default/files/2024-09/Recommendations_21032024_0.pdf
Telecom Regulatory Authority of India · 2024-03-21 · accessed 2026-09-15 · India · regulatory · confidence high · Cites more than 34 million M2M connections at the time of drafting and TEC 31328:2023 Security by Design; business-connection category replaced bulk SIMs in August 2023

S33 India IoT devices market size and outlook 2025 to 2030 https://www.grandviewresearch.com/horizon/outlook/iot-devices-market/india
Grand View Research (Horizon Databook) · 2025 · accessed 2026-09-15 · India · analyst · confidence medium · USD 2,885.5 million in 2024 to USD 10,276.8 million by 2030, 23.2% CAGR; sensors 40.78% of 2024 revenue; edge devices fastest

S34 India IoT market 2025 to 2030 https://www.marketsandmarkets.com/Market-Reports/geography/internet-of-things-market/india
MarketsandMarkets · 2026-07-20 · accessed 2026-09-15 · India · analyst · confidence low · USD 50.1 billion 2025 to USD 95.8 billion 2030, 13.8% CAGR; broad definition including services

S35 India industrial IoT market 2026 to 2032 https://www.psmarketresearch.com/market-analysis/india-industrial-iot-market-report
P&S Market Research · 2025-12-08 · accessed 2026-09-15 · India · analyst · confidence low · USD 10.1 billion 2025 to USD 22.1 billion 2032, 12.1% CAGR; Maharashtra largest state, Karnataka fastest; predictive maintenance about 30% of applications

S36 India industrial IoT market 2024 to 2029 https://www.marketsandmarkets.com/Market-Reports/geography/industrial-internet-of-things-market/india
MarketsandMarkets · 2026-08-22 · accessed 2026-09-15 · India · analyst · confidence low · USD 14.1 billion 2024 to USD 23.3 billion 2029, 10.5% CAGR

S37 Airtel Business accelerates IoT growth: 48 million devices connected https://telecomtalk.info/airtel-business-accelerates-iot-5g-redcap-usecases/994460/
TelecomTalk · 2025-05-17 · accessed 2026-09-15 · India · news · confidence medium · Over 48 million IoT devices connected on Airtel; investment in proprietary IoT platform

S38 Airtel IoT connectivity management platform page https://www.airtel.in/b2b/iot-connectivity
Bharti Airtel · 2026-06-01 · accessed 2026-09-15 · India · vendor · confidence medium · 11k+ customers, 99.99% platform uptime, 13-digit IoT SIMs, 95% pan-India coverage claims

S39 Tata Communications MOVE IoT and mobility platform https://www.tatacommunications.com/move
Tata Communications · undated · accessed 2026-09-15 · Global · vendor · confidence medium · 13+ million SIMs managed globally, 100+ enterprise customers, LoRaWAN network offer for India

S40 Jio Platforms smart IoT solutions https://www.jio.com/platforms/offerings/smart-iot-solutions
Jio Platforms · undated · accessed 2026-09-15 · India · vendor · confidence medium · NB-IoT and Cat-M core, IoT platform pre-integrated with ATOM analytics; enterprise and CSP offer

S41 Improving vaccination systems: eVIN https://www.undp.org/india/projects/improving-vaccination-systems-evin
United Nations Development Programme India · undated · accessed 2026-09-15 · India · primary · confidence high · Nearly 25,000 temperature loggers installed for real-time monitoring of vaccine storage; over 80% reduction in stock-outs

S42 Draft guidelines on Good Distribution Practices for pharmaceutical products https://cdsco.gov.in/opencms/resources/UploadCDSCOWeb/2018/UploadPublic_NoticesFiles/Notice-25.09.2018_Draft%20Guidelines%20on%20Good%20Distribution%20Practices%20for%20Pharmaceutical%20Products.pdf
Central Drugs Standard Control Organisation · 2018-09-25 · accessed 2026-09-15 · India · regulatory · confidence high · Clause 10.4 to 10.6: temperature monitoring records reviewable, defined checking intervals, storage areas temperature mapped, monitoring equipment calibrated, records kept shelf life plus one year

S43 Timeline for revised Schedule M implementation extended to December 2025 https://qvents.in/news/cdsco-dcgi-health-ministry-india-timeline-revised-schedule-m-implementation-extension-december-2025/
Qvents · 2025-12-26 · accessed 2026-09-15 · India · news · confidence medium · G.S.R. 922(E) published 5 January 2024; large units by 4 July 2024; MSMEs with turnover under ₹250 Cr extended to 31 December 2025 on application in Form A by 4 April 2025

S44 MSME pharma units get breather as govt extends Schedule M deadline https://www.business-standard.com/industry/news/msme-pharma-units-get-breather-as-govt-extends-schedule-m-deadline-125010400719_1.html
Business Standard · 2025-01-04 · accessed 2026-09-15 · India · news · confidence medium · About 10,500 pharmaceutical units, 8,500 in the MSME sector, about 2,000 MSME units WHO-GMP certified; CDSCO inspected over 800 units; industry cites finance and time as reasons for extension

S45 India's pharma compliance overhaul 2026: revised Schedule M and CDSCO reforms https://www.imarcengineering.com/news/india-pharma-compliance-overhaul-revised-schedule-m-cdsco-reforms
IMARC Engineering · 2026-05-29 · accessed 2026-09-15 · India · analyst · confidence medium · Only an estimated 11% of Himachal MSME units applied for the extension; DCGI directive of 7 November requiring monthly state inspection reports; computerised system validation and environmental monitoring among required upgrades

S46 Complete guide for Schedule M compliance https://www.pharmaguideline.com/2010/10/schedule-m.html
Pharmaguideline · 2026-09-10 · accessed 2026-09-15 · India · reference · confidence low · Revised Schedule M requires environmental controls such as temperature, humidity and pressure differential to be monitored and recorded

S47 India: NCCD reports a 2.2% CAGR in cold storage capacity https://iifiir.org/en/news/india-nccd-reports-a-2-2-compound-annual-growth-rate-in-cold-storage-capacity
International Institute of Refrigeration (citing PIB and NCCD) · 2026-02-24 · accessed 2026-09-15 · India · news · confidence medium · As of 30 June 2025 India had 8,815 cold storages with 402.18 lakh MT capacity; about 10,000 reefer vehicles against a need of 62,000; NCCD projects 33,000 reefers by 2031

S48 Rajya Sabha unstarred question 2954: integrated cold chain infrastructure (state-wise cold storage capacity as on 31 May 2024) https://www.mofpi.gov.in/sites/default/files/_annex_266_au2954_9twhtb.pdf
Ministry of Food Processing Industries · 2024-12-20 · accessed 2026-09-15 · India · primary · confidence high · State-wise cold storage MT: UP 150.9 lakh, WB 59.5 lakh, Gujarat 40.4 lakh, Punjab 26.1 lakh, AP and Telangana 19.1 lakh, Bihar 14.8 lakh, MP 13.6 lakh, Maharashtra 11.7 lakh, Karnataka 8.5 lakh, TN 4.0 lakh; total 395.96 lakh MT; scheme grants ₹2,095.73 Cr released to 286 projects, 474 cold storages and 1,477 reefer vehicles

S49 India cold chain logistics market https://www.mordorintelligence.com/industry-reports/india-cold-chain-logistics-market
Mordor Intelligence · 2026 · accessed 2026-09-15 · India · analyst · confidence low · USD 23.28 billion 2025, 5.91% CAGR to 2031; pharma and biologics fastest at 6.20%; NCCD 2024 guidelines recommend centralised IoT dashboards

S50 A growing market: increase in cold chain capacity and demand https://indianinfrastructure.com/2024/02/17/a-growing-market-increase-in-cold-chain-capacity-and-demand/
Indian Infrastructure · 2024-03-05 · accessed 2026-09-15 · India · news · confidence medium · 8,653 cold storages with 39.42 million tonnes as of 31 January 2024; UP, Gujarat and Punjab hold 54.8% of capacity; cold storage count CAGR 1.28% 2018-19 to 2022-23

S51 Rebel Foods deploying real-time cold chain monitoring system from TagBox https://www.prnewswire.com/in/news-releases/rebel-foods-deploying-real-time-cold-chain-monitoring-system-from-tagbox-893361121.html
TagBox via PR Newswire · 2022-05-16 · accessed 2026-09-15 · India · news · confidence medium · Rebel Foods SVP Engineering: FSSAI requires monitoring and logging of cold storage temperature once per day; TagBox claims 50+ organisations across India and APAC

S52 Meat and poultry cold storage: FSSAI compliance and best practices https://rinac.com/blog/meat-poultry-cold-storage-fssai-compliance-best-practices/
Rinac India · 2026-03-06 · accessed 2026-09-15 · India · vendor · confidence low · FSSAI temperature zones 0 to 4 C chilled and -18 C frozen under FSS Regulations 2011; HACCP critical control points; 35 to 50% subsidy under PMFME and MoFPI schemes

S53 The Energy Conservation (Amendment) Bill, 2022 https://prsindia.org/billtrack/the-energy-conservation-amendment-bill-2022
PRS Legislative Research · 2022-12 · accessed 2026-09-15 · India · reference · confidence high · Passed Lok Sabha 8 August 2022 and Rajya Sabha 12 December 2022; carbon credit trading scheme; ECSBC applies to buildings with connected load of 100 kW or above; penalties up to ₹10 lakh

S54 Indian Carbon Credit Trading Scheme (ETS factsheet) https://icapcarbonaction.com/en/ets/indian-carbon-credit-trading-scheme
International Carbon Action Partnership · 2025 · accessed 2026-09-15 · India · reference · confidence medium · CCTS built on the PAT scheme covering more than 1,000 entities in 13 energy-intensive sectors; annual emissions reporting to BEE and state designated agencies

S55 Compliance obligations under India's CCTS enter into force for seven sectors https://icapcarbonaction.com/en/news/compliance-obligations-under-indias-carbon-credit-trading-scheme-enter-force-seven-sectors
International Carbon Action Partnership · 2026-03-30 · accessed 2026-09-15 · India · news · confidence medium · About 490 entities in seven sectors have binding GHG intensity targets for 2025-26 and 2026-27; Indian Carbon Market portal launched 21 March 2026

S56 Designated Consumers under the Energy Conservation Act https://beeindia.gov.in/show_content.php?lang=1&level=3&lid=19&ls_id=168
Bureau of Energy Efficiency · undated · accessed 2026-09-15 · India · regulatory · confidence high · S.O. 394(E) of 12 March 2007 notified designated consumers in nine sectors; mandatory energy audit notified by S.O. 1378(E) of 27 May 2014

S57 Energy efficiency solutions firm Smart Joules raises $10 million; Ministry of Power ADEETIE programme https://www.mercomindia.com/energy-efficiency-solutions-firm-smart-joules-raises-10-million
Mercom India · 2025-12-11 · accessed 2026-09-15 · India · news · confidence medium · Smart Joules Series B; Ministry of Power programme ADEETIE with ₹1,000 Cr outlay for MSME energy efficiency 2025-26 to 2027-28, ₹875 Cr interest subvention

S58 Smart Joules raises $10 mn Series B (Outlook Business) https://www.outlookbusiness.com/corporate/smart-joules-raises-10-mn-series-b-led-by-sbi-ventures-for-ai-driven-energy-efficiency-expansion-in-india
Outlook Business · 2025-12-10 · accessed 2026-09-15 · India · news · confidence medium · Claims 32.1 crore kWh conserved and ₹266 Cr customer savings; efficiency-as-a-service model with no upfront capital for the customer

S59 Zenatix company profile https://www.cbinsights.com/company/zenatix-solutions
CB Insights · 2026 · accessed 2026-09-15 · India · analyst · confidence medium · Founded 2014, Gurgaon; acquired by Hero Electronix May 2018; raised $1.73M; ZenConnect wireless mesh, 12 to 14 month ROI claim; multi-site retail, QSR and bank branches; 50,000+ connected assets in 2022

S60 Zenatix by Schneider Electric home page https://www.zenatix.com/
Zenatix · undated · accessed 2026-09-15 · India · vendor · confidence medium · Site now branded Zenatix by Schneider Electric; claims up to 20% energy savings; the ownership change is visible on the site

S61 Ecolibrium company profile https://www.crunchbase.com/organization/ecolibrium
Crunchbase · 2025 · accessed 2026-09-15 · India · analyst · confidence medium · SmartSense platform; 80+ clients, 500+ sites, ISO 27001; claims 20% energy reduction and 27% maintenance cost reduction

S62 WPC ETA licence: mandatory product list and self-declaration https://www.wedoimport.com/compliance/wpc-eta-license-mandatory-product-list/
WeDoImport (regulatory explainer) · 2023-12-27 · accessed 2026-09-15 · India · reference · confidence low · 865 to 867 MHz and 2400 to 2483.5 MHz are licence-exempt; ETA through self-declaration for low-power licence-exempt devices with an ISO 17025 RF report; wireless home automation listed

S63 A guide to WPC and ETA certification https://www.graniteriverlabs.com/en-us/market-access-services/country/india/wpc-mark
Granite River Labs · undated · accessed 2026-09-15 · India · reference · confidence medium · ETA per model, no expiry; Indian-made products fitted with an ETA-holding RF module need no separate ETA; self-declaration via Saral Sanchar

S64 BIS Compulsory Registration Scheme in India https://www.tuv.com/market-access-services/en/certification-filter/bis-compulsory-registration-scheme.html
TUV Rheinland · 2026 · accessed 2026-09-15 · India · reference · confidence medium · Over 60 electronics and IT goods plus 5 solar products under CRS as of 2026; phase 5 from 1 October 2021 added wireless microphones, smart speakers, Bluetooth speakers, dimmers

S65 Equipment certified under MTCTE https://tec.gov.in/Equipment-certified-under-MTCTE
Telecommunication Engineering Centre · undated · accessed 2026-09-15 · India · regulatory · confidence medium · IoT Gateway and Wi-Fi access points appear in the list of equipment types certified under MTCTE

S66 Security by Design for IoT device manufacturers, TEC 31328:2023 https://www.itu.int/cities/wp-content/uploads/2023/05/Security-by-design-for-IoT-device-manufacturers.pdf
Telecommunication Engineering Centre · 2023-03-28 · accessed 2026-09-15 · India · regulatory · confidence high · MTCTE under G.S.R. 1131(E) of 5 September 2017; IoT device hardware tested to Essential Requirements covering EMC, safety, interfaces, IP, SAR and security (ITSAR); SBOM and secure update expectations

S67 DPDP Rules, 2025 notified http://pib.gov.in/PressReleasePage.aspx?PRID=2190655
Press Information Bureau, Ministry of Electronics and IT · 2025-11-17 · accessed 2026-09-15 · India · primary · confidence high · Rules notified 14 November 2025 (G.S.R. 846(E) of 13 November); 18-month phased compliance; penalties up to ₹250 Cr for failing reasonable security safeguards, ₹200 Cr for breach notification and children's data

S68 DPDP Rules 2025 compliance guide https://www.seclore.com/fundamentals/dpdp-rules-2025-compliance-guide/
Seclore · 2026-03-20 · accessed 2026-09-15 · India · reference · confidence low · Gazette G.S.R. 846(E) of 13 November 2025; obligations for every organisation processing personal data; 72-hour breach notice

S69 Utilisation of Nirbhaya Fund (Lok Sabha unstarred question 35) https://www.sansad.in/getFile/loksabhaquestions/annex/1715/AU35.pdf?source=pqals
Ministry of Women and Child Development · 2024-02-01 · accessed 2026-09-15 · India · primary · confidence high · Project-wise releases: ERSS ₹364.03 Cr, Safe City for 8 cities, state-wise Vehicle Tracking Platform ₹213.88 Cr, TSRTC vehicle tracking with SOS button ₹11.53 Cr, One Stop Centres ₹853.78 Cr

S70 Utilisation of Nirbhaya Fund (Lok Sabha unstarred question 1017) https://www.sansad.in/getFile/loksabhaquestions/annex/185/AU1017_WRirQI.pdf?source=pqals
Ministry of Women and Child Development · 2025-07-25 · accessed 2026-09-15 · India · primary · confidence high · ₹440.3 Cr released for women's safety in public transport; Safe City project for 8 cities appraised at ₹2,919.55 Cr

S71 Government utilises nearly 76% of Nirbhaya Fund https://pib.gov.in/PressReleasePage.aspx?PRID=2110881
Press Information Bureau · 2025-03 · accessed 2026-09-15 · India · primary · confidence high · Safe City sub-projects implemented in Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Kolkata, Lucknow and Mumbai

S72 Ahmedabad takes lead in women's safety with video panic button project https://www.freepressjournal.in/india/ahmedabad-takes-lead-in-womens-safety-with-first-of-its-kind-video-panic-button-project
Free Press Journal · 2024-03-11 · accessed 2026-09-15 · India · news · confidence medium · Fixed video panic boxes designed by L&T; 80 installed, 3,000 planned; part of ₹2,300 Cr Safe City funding for eight cities

S73 What is AIS 140 standard (vendor explainer) https://www.blackboxgps.net/what-is-ais-140-standard/
Blackbox GPS Technology · 2023-10-28 · accessed 2026-09-15 · India · vendor · confidence low · AIS 140 vehicle location tracking with panic button mandated for public transport vehicles; ARAI certification

S74 OSH Code central rules 2026 notified https://www.sansalegal.com/post/osh-code-central-rules-2026-notified-by-ministry-on-may-9
Sansa Legal · 2026-07-05 · accessed 2026-09-15 · India · reference · confidence medium · OSH Code in force from 21 November 2025; central rules G.S.R. 345(E) of 8 May 2026; state rules pending in most states

S75 Section 41B, Factories Act 1948 (compulsory disclosure by occupier of hazardous process) https://indiankanoon.org/doc/1155991
Indian Kanoon · undated · accessed 2026-09-15 · India · primary · confidence high · On-site emergency plan and disaster control measures required with Chief Inspector approval; hazardous-process factories must inform the Chief Inspector

S76 SAMARTH Udyog Bharat 4.0 https://heavyindustries.gov.in/en/samarth-udyog-bharat-40
Ministry of Heavy Industries · undated · accessed 2026-09-15 · India · primary · confidence high · Five Industry 4.0 demonstration centres (C4i4 Pune, IITD-AIA, IISc, CMTI, 10 further centres); no direct subsidy to MSMEs

S77 SAMARTH Udyog Bharat 4.0 initiative (exam explainer citing ministry reply) https://vajiramandravi.com/upsc-daily-current-affairs/prelims-pointers/samarth-udyog-bharat-40-initiative/
Vajiram and Ravi · 2025-04-08 · accessed 2026-09-15 · India · reference · confidence low · No financial assistance to any industry including MSME for adopting Industry 4.0 under SAMARTH centres

S78 Annual Survey of Industries 2022-23 results https://www.pib.gov.in/PressReleasePage.aspx?PRID=2060292&reg=48&lang=2
Press Information Bureau, MoSPI · 2024-09-30 · accessed 2026-09-15 · India · dataset · confidence high · 2,53,334 factories; Tamil Nadu 15.66% of factories and 15% of factory employment; Maharashtra, Gujarat, TN, Karnataka, UP top five in GVA (54%)

S79 Tamil Nadu tops in factory employment: ASI 2022-23 (explainer) https://www.tnpscthervupettagam.com/articles-detail/annual-survey-of-industries-asi-2022-23
TNPSC Thervupettagam · 2024-10 · accessed 2026-09-15 · India · reference · confidence low · Factories rose from 2.49 lakh (2021-22) to 2.53 lakh (2022-23); 1.84 crore persons engaged

S80 Manufacturing units granted Certificate of Pharmaceutical Products (WHO-GMP) by state https://cdsco.gov.in/opencms/resources/UploadCDSCOWeb/2018/UploadIndustryCommon/COPPListupdated_12052017_7.pdf
Central Drugs Standard Control Organisation · 2017-05-12 · accessed 2026-09-15 · India · primary · confidence medium · 1,314 WHO-GMP units: Gujarat 280, Maharashtra 222, Himachal 134, Telangana 131, Uttarakhand 97, TN 72, Karnataka 68; dated list, newer editions exist on the CDSCO site to December 2025

S81 Elpro GxP-compliant monitoring for pharma https://www.elpro.com/en/
ELPRO-BUCHS AG · undated · accessed 2026-09-15 · Global · vendor · confidence medium · elproMONITOR cloud with pay-per-sensor model; LIBERO cellular real-time loggers; ECOLOG-PRO 1TGi for freezers

S82 Hygroman IoT data logger (Wi-Fi or SIM) price https://www.hygromanindia.in/humidity-data-logger.htm
Hygroman India, Mumbai · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹12,500 to ₹22,000 plus GST per unit; -40 to +120 C, ±0.5 C, 4000 mAh backup, 150 days storage, IP64, hooter

S83 GSM temperature data logger, Pyrotronics India https://www.indiamart.com/proddetail/gsm-temp-data-logger-2851939877730.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹19,000 per unit, New Delhi seller

S84 Temperature and humidity data logger with SMS alert and server, Innovator Automation https://www.indiamart.com/proddetail/temperature-and-humidity-monitoring-data-logger-with-sms-alert-and-server-based-24200433148.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹18,500 per piece, Indore seller

S85 GSM-20E SMS alarm temperature and humidity data logger, VEGA Calibration https://www.indiamart.com/proddetail/gsm-20e-sms-alarm-data-logger-22126763197.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹6,500 per piece, Mumbai seller; imported LCD logger

S86 S130 GSM data logger, Adaptek Automation Technology, Chennai https://www.indiamart.com/proddetail/s130-gsm-data-logger-4458575473.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹6,000 per piece; a Chennai competitor for GSM temperature logging

S87 SMS-based temperature and humidity monitor for server rooms, Ace Instruments https://www.indiamart.com/proddetail/sms-based-temperature-humidity-monitor-9169781188.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹20,000 per piece, Hyderabad seller

S88 Smart and compliance-ready cold chain monitoring in India 2026 https://www.gndsolutions.in/cold-chain-solutions-india-pharma-dairy-fmcg
GND Solutions · 2026-02-10 · accessed 2026-09-15 · India · vendor · confidence low · Vendor argues handwritten logs are no longer audit-compliant under revised Schedule M and ALCOA+; BLE and LoRaWAN sensors; a single deviation can cost ₹20 to 50 lakh

S89 Infinite Uptime bags $35M to help factories optimise equipment usage https://techcrunch.com/2025/03/10/infinite-uptime-bags-35m-to-help-factories-optimize-equipment-usage/
TechCrunch · 2025-03-10 · accessed 2026-09-15 · India · news · confidence high · Series C led by Avataar; 800 plants in about 30 countries; total raised about $65M; founder says battery MEMS sensors do not work for high-temperature applications; operationally cash-flow positive

S90 Nanoprecise pricing estimate https://softwarefinder.com/facility-management-software/nanoprecise
Software Finder · 2026 · accessed 2026-09-15 · Global · analyst · confidence low · Third-party estimate $40 to $120 per asset per month plus $300 to $1,200 per sensor and $10,000+ implementation; vendor does not publish prices

S91 Bengaluru-based IoT startup Petasense turns machine saver https://yourstory.com/2018/02/bengaluru-iotplayer-petasense
YourStory · 2018-02 · accessed 2026-09-15 · India · news · confidence low · Annual licence fee plus maintenance model; Cattleya Technosys (a Rax customer) named as a larger peer billing about ₹100 Cr

S92 Augury condition monitoring for industrial bearings https://www.augury.com/use-cases/asset-condition-monitoring/condition-monitoring-for-industrial-bearings
Augury · 2024-11-04 · accessed 2026-09-15 · Global · vendor · confidence medium · Claims 99.9%+ diagnostic accuracy; pricing page exists but is quote-based; $73M raised Feb 2025 at $1B valuation per TechCrunch

S93 Teltonika 4G industrial IoT gateway TRB140, Samptel Technologies https://www.indiamart.com/proddetail/industrial-iot-gateway-trb140-23705015530.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹11,000 per piece, Ahmedabad

S94 Teltonika TRB140 LTE router, Digitage Infocom https://www.indiamart.com/proddetail/teltonika-trb-140-lte-router-22915851797.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹13,000 per piece, New Delhi

S95 Teltonika TRB140 industrial rugged LTE gateway https://www.flipkart.com/teltonika-trb140-industrial-rugged-lte-gateway-150-mbps-4g-router/p/itmd7aa735f67321
Flipkart listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹17,999 retail

S96 Teltonika TRB140 product page and customer reviews https://www.getic.com/product/teltonika-trb140-lte-router-housing
Getic (official Teltonika distributor) · undated · accessed 2026-09-15 · Europe · forum · confidence medium · EUR 108.98 ex VAT; verified reviews: one calls the software buggy with documentation redirecting to an empty forum; another built their own monitoring instead of paying for RMS

S97 Milesight UG65 LoRaWAN gateway, Tynatech Ingenious https://www.indiamart.com/proddetail/lorawan-gateway-2853005984273.html
IndiaMART listing · 2022-12-08 · accessed 2026-09-15 · India · vendor · confidence medium · ₹45,068 per piece, Noida

S98 Advantech WISE-4050 remote I/O module, ITG Software Engineering https://www.indiamart.com/proddetail/advantech-wise-4050-remote-i-o-modules-advantech-24126529755.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹14,533 per piece, Jaipur; 4 DI 4 DO Wi-Fi with Modbus/TCP and MQTT

S99 Advantech WISE-4050 product page https://www.advantech.com/en-us/products/229f9f5b-d073-4cc2-ac54-d90147e04c12/wise-4050/mod_645b1bf7-82b2-4d6b-a381-b5848c29d0ab
Advantech · undated · accessed 2026-09-15 · Global · vendor · confidence high · CE, FCC, RoHS certified; Modbus/TCP, MQTT, RESTful API; -25 to 70 C; 10,000 data points local store

S100 Dragino LSN50-V2 LoRa sensor node, Suveechi Technologies https://www.indiamart.com/proddetail/dragino-lsn50-v2-wireless-lora-sensor-node-23466140230.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹6,245 per piece, Bengaluru

S101 RAKwireless WisGate Edge Lite 2 RAK7268 store page https://store.rakwireless.com/products/rak7268-8-channel-indoor-lorawan-gateway
RAKwireless · 2025 · accessed 2026-09-15 · Global · vendor · confidence high · IN865 variants USD 154 to 247; RAKwireless products now sold on Amazon India (July 2025 bulletin)

S102 SONOFF POWR320D Elite 20A smart power meter switch https://www.amazon.in/POWR320D-Historical-Overload-Protection-Notification/dp/B09XB3RZB9
Amazon.in listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹3,649, 4.4 stars from 737 ratings; 20 A Wi-Fi switch with energy monitoring, the closest white-label analogue to RT-RC01-W

S103 Tuya wireless Wi-Fi switch module, Genius Technologies https://www.indiamart.com/proddetail/wifi-switch-module-22982383997.html
IndiaMART listing · 2020-12-23 · accessed 2026-09-15 · India · vendor · confidence medium · ₹950 per piece, Bengaluru

S104 Shelly Plus 1PM, Cybervirtu https://www.indiamart.com/proddetail/shelly-plus-1pm-27280502655.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹2,200 per unit

S105 Best Wi-Fi smart switches India: Sonoff vs Shelly compared https://zbotic.in/best-wifi-smart-switches-india-sonoff-vs-shelly-compared
Zbotic · 2026-03-11 · accessed 2026-09-15 · India · reference · confidence low · Indian price bands: Sonoff Basic ₹500 to 700, Mini R4 ₹800 to 1,000, 4CH Pro ₹2,500 to 3,000, POW Elite ₹1,800 to 2,200; Shelly 1PM ₹2,200 to 2,600; notes 5 GHz-only Wi-Fi will not work

S106 r/sonoff: devices keep going offline https://www.reddit.com/r/sonoff/comments/1470x64/devices_keep_going_offline/
Reddit · 2023-06-11 · accessed 2026-09-15 · Global · forum · confidence medium · Users report daily offline events on 2.4 GHz Wi-Fi, needing daily re-pairing

S107 How to fix Sonoff device offline in eWeLink https://www.trunetto.com/troubleshooting/smart-switches/sonoff/how-to-fix-sonoff-device-offline-in-ewelink
Trunetto · undated · accessed 2026-09-15 · Global · reference · confidence low · Offline usually a Wi-Fi issue: weak signal, band-steering routers pushing to 5 GHz, IP churn

S108 ThingsBoard pricing https://thingsboard.io/pricing
ThingsBoard Inc · 2026 · accessed 2026-09-15 · Global · vendor · confidence high · Cloud: Maker $10, Prototype $149 (100 devices), Startup $399 (500 devices), Business $749 (1,000 devices) per month; PE self-managed from $10 to $499; perpetual from $4,999

S109 ThingsBoard pricing 2026: editions, licences and real cost https://wz-it.com/en/knowledge/iot/thingsboard-pricing
WZ-IT · 2026-06-30 · accessed 2026-09-15 · Global · reference · confidence medium · Worked example: 5,000 devices costs about $23,400 a year on ThingsBoard Cloud, $10,800 plus infrastructure on PE self-managed, infrastructure only on Community Edition

S110 AWS IoT Core pricing https://aws.amazon.com/iot-core/pricing
Amazon Web Services · 2026 · accessed 2026-09-15 · Global · vendor · confidence high · Connectivity $0.08 per million connection-minutes (about $0.042 per device per year); messaging $1 per million messages for the first billion; free tier covers about 50 devices

S111 Azure IoT Hub pricing https://azure.microsoft.com/en-us/pricing/details/iot-hub
Microsoft · 2026 · accessed 2026-09-15 · Global · vendor · confidence high · Standard S1 tier priced per unit per month with 400,000 messages a day; Device Update priced separately

S112 moneo IIoT platform overview https://www.ifm.com/de/en/shared/industry-4-0-moneo/overview
ifm electronic · 2026 · accessed 2026-09-15 · Global · vendor · confidence medium · Plug-and-work condition monitoring connecting directly to ifm IO-Link sensors, PLC-independent; ifm has an Indian subsidiary

S113 EcoStruxure Machine Advisor, Schneider Electric India https://www.se.com/in/en/work/services/field-services/industrial-automation/oem/machine-advisor.jsp
Schneider Electric · undated · accessed 2026-09-15 · India · vendor · confidence medium · Cloud services platform for machine builders; distributor locator for India

S114 Insights Hub partners https://www.siemens.com/en-us/products/insights-hub/partners/
Siemens Digital Industries Software · undated · accessed 2026-09-15 · Global · vendor · confidence medium · Partner ecosystem model; IndX and other Indian integrators are certified partners

S115 ctrlX IOT and Bosch Rexroth IoT Gateway https://apps.boschrexroth.com/microsites/ctrlx-automation/en/portfolio/ctrlx-iot/
Bosch Rexroth · 2026 · accessed 2026-09-15 · Global · vendor · confidence medium · IEC 62443 certified architecture; Linux IoT gateway with app store; Java apps for sensor connection

S116 SenseGiz company page and Tracxn profile https://sensegiz.com/about/
SenseGiz Technologies, Belgaum · 2022-11-09 · accessed 2026-09-15 · India · vendor · confidence medium · COIN BLE mesh devices for condition monitoring, asset and people tracking, cold chain; Tracxn reports annual revenue ₹1.7 Cr for FY ending March 2025

S117 Bytebeam funding and profile https://www.ipoplatform.com/startup-business-funding/iotexpress-technologies-private-limited/102818
IPO Platform · 2026-04-02 · accessed 2026-09-15 · India · analyst · confidence low · Bengaluru IoT backend platform founded 2019; $3.25M seed from Accel Atoms; device management, OTA, analytics for EV and industrial IoT

S118 Dhaara Smart water accounting system https://kritsnam.com/product/ultrasonic-water-flow-meter
Kritsnam Technologies, Hyderabad · 2026 · accessed 2026-09-15 · India · vendor · confidence medium · OIML R49 type-approved ultrasonic meters, dual-SIM 4G, 2,000+ active facilities claimed (Havells, DMart); managed service ₹18 to 30 lakh per plant per year; TDB funded

S119 IIT startup wins Rs 3 crore funding for Dhaara smart flowmeter https://thebetterindia.com/296000/iit-kanpur-startup-gets-funding-for-dhaara-smart-flowmetre-to-manage-groundwater
The Better India · 2022-08-29 · accessed 2026-09-15 · India · news · confidence medium · Device price ₹25,000 to ₹75,000 by size; co-founder quoted on the business-route challenge and customer pull for water efficiency

S120 FluxGen about page https://fluxgen.com/about
FluxGen Sustainable Technologies, Bengaluru · 2025 · accessed 2026-09-15 · India · vendor · confidence medium · AquaGen water IoT; Series A ₹28 Cr in 2025; Tata Steel and Microsoft named; claims up to 30% water reduction

S121 Leaf Wearables wants to make attacks on women a concern of the past https://www.gadgets360.com/wearables/features/leaf-wearables-safer-pro-womens-safety-1881436
Gadgets 360 · 2018-07-11 · accessed 2026-09-15 · India · news · confidence medium · SAFER PRO planned at about ₹2,402; Leaf won the $1M Women's Safety XPrize; sold via Amazon and Flipkart

S122 Medical alert systems for seniors' safety in India (cost included) https://helplocal.in/blog/medical-alert-systems-seniors-safety-cost/
Helplocal India · undated · accessed 2026-09-15 · India · reference · confidence low · GPS SOS trackers for seniors priced between ₹2,000 and ₹15,000 on Amazon and international marketplaces

S123 Wearable GPS tracker for elderly search results https://www.amazon.in/wearable-gps-tracker-for-elderly/s?k=wearable+gps+tracker+for+elderly
Amazon.in · undated · accessed 2026-09-15 · India · vendor · confidence low · DrRing SOS pendant with WhatsApp alerts and 12-month subscription; AUSHA GF-07 magnetic GPS tracker; mass-market price tier

S124 Electronics System Design and Manufacturing industry report https://www.ibef.org/industry/electronics-system-design-manufacturing-esdm
India Brand Equity Foundation · 2026-09 · accessed 2026-09-15 · India · analyst · confidence medium · ESDM about US$220 billion by FY25; design segment about 22% of ESDM growing 20.1%; ₹40,000 Cr ECMS outlay in Budget 2026-27

S125 India's Electronic Manufacturing Services (EMS) opportunity https://assets.kpmg.com/content/dam/kpmgsites/in/pdf/2026/06/indias-electronic-manufacturing-services-ems-opportunity.pdf
KPMG in India · 2026-06 · accessed 2026-09-15 · India · analyst · confidence medium · Indian EMS market about USD 40 to 45 billion FY25 to about USD 150 billion FY30; PCBA-only EBITDA 2 to 4% with nil IP; design and box-build models carry higher margins

S126 India vending machine market 2025 to 2030 https://www.nextmsc.com/report/india-vending-machine-market-4149
Next Move Strategy Consulting · 2026-05-27 · accessed 2026-09-15 · India · analyst · confidence low · USD 825.5 million 2024; 289 thousand units 2024 with a stated 15.53% volume CAGR; the page is internally inconsistent (358 thousand units in 2025 in the text, 832 thousand in the scope table), so volume is used only as a low-confidence input; IoT-integrated segment tracked

S127 Ion Exchange India Q1 FY27 results https://www.whalesbook.com/corporate-news/English/industrial-goodsservices/Ion-Exchange-India-Q1-FY27-Consolidated-PAT-at-indian-rupee31-crore-Order-Book-indian-rupee2473-crore/6a79824710bce1fd2047b379
Whalesbook (company filing summary) · 2026-08-10 · accessed 2026-09-15 · India · news · confidence medium · Consumer products revenue grew 33% in Q1 FY27; consolidated operating income ₹700.5 Cr; order book ₹2,473 Cr; Ion Exchange is an existing Rax OEM customer

S128 Indian predictive maintenance market growth drivers https://ifactoryapp.com/cmms-solution/indian-predictive-maintenance-market-growth-drivers
iFactory (vendor citing Grand View and P&S) · 2026-06-05 · accessed 2026-09-15 · India · vendor · confidence low · Cites USD 674M 2025 to USD 6.1B 2033 at 30 to 32% CAGR; payback claims of 6 to 9 months; Maharashtra, TN, Karnataka, Gujarat largest

S129 India predictive maintenance market size and outlook 2033 https://www.grandviewresearch.com/horizon/outlook/predictive-maintenance-market/india
Grand View Research (Horizon Databook) · 2026-01-15 · accessed 2026-09-15 · India · analyst · confidence medium · USD 6,145.9 million by 2033, 32.5% CAGR 2026 to 2033; India 4.7% of global 2025

S130 India electrical motor market https://www.kenresearch.com/industry-reports/india-electrical-motor-market
Ken Research · 2024-11-13 · accessed 2026-09-15 · India · analyst · confidence low · Market USD 2.8 billion; Maharashtra, Gujarat and Tamil Nadu dominant; BEE IE2/IE3 mandates and IE4 uptake

S131 How digital manufacturing can escape pilot purgatory https://www.mckinsey.com/capabilities/operations/our-insights/how-digital-manufacturing-can-escape-pilot-purgatory
McKinsey and Company · 2018-07-23 · accessed 2026-09-15 · Global · analyst · confidence medium · Survey of 700+ manufacturers including India: fewer than a third moved critical use cases to large-scale roll-out

S132 About AIOCD https://aiocd.org/about-us
All India Organisation of Chemists and Druggists · undated · accessed 2026-09-15 · India · primary · confidence medium · Represents 12.4 lakh chemists, pharmacists and distributors

S133 India has only 4,000 licensed blood banks https://medicalbuyer.co.in/india-has-only-4000-licensed-blood-banks/
Medical Buyer · 2023-08-10 · accessed 2026-09-15 · India · news · confidence low · About 4,000 licensed blood banks; each needs alarmed 2 to 6 C refrigeration under the Drugs and Cosmetics Rules

S134 Improving cold chain systems (UIP cold chain points) https://www.shankariasparliament.com/current-affairs/improving-cold-chain-systems
Shankar IAS Parliament (citing MoHFW) · 2022-05-18 · accessed 2026-09-15 · India · reference · confidence low · UIP comprises upwards of 27,000 functional cold chain points, 95% below district level

S135 From harvest to home: cold storage count as of 30 June 2025 https://pib.gov.in/PressReleasePage.aspx?PRID=2172351
Press Information Bureau · 2025-09 · accessed 2026-09-15 · India · primary · confidence high · 8,815 cold storages with 402.18 lakh MT capacity as of 30 June 2025; PMKSY and AIF support

S136 Sewage treatment plants in various states (Lok Sabha reply citing CPCB inventory of March 2021) https://pib.gov.in/PressReleasePage.aspx?PRID=2155020
Press Information Bureau · 2025 · accessed 2026-09-15 · India · primary · confidence medium · CPCB National Inventory of STPs, March 2021, gives state-wise operational and non-operational status

S137 IoT-based smart energy monitoring system, Eleics Design https://www.indiamart.com/proddetail/iot-based-smart-energy-monitoring-system-2852180208912.html
IndiaMART listing · 2026-01-01 · accessed 2026-09-15 · India · vendor · confidence medium · ₹18,500 per piece, Gandhinagar

S138 Digital 500A 3-phase smart energy meter, Buildingpulse Energy Consulting https://www.indiamart.com/proddetail/500a-3-phase-smart-energy-meter-2850444596555.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹26,500 per unit ex tax, Mumbai

S139 Tamil Nadu MSME statistics 2026: district-wise Udyam data https://datarankindia.com/tamil-nadu-msme-statistics
DataRank India · 2026-06 · accessed 2026-09-15 · India · reference · confidence low · 41,55,776 Udyam registrations in Tamil Nadu as of June 2026, 8.81% of India's 4.72 crore

S140 MSME Tamil Nadu department home page https://www.msmetamilnadu.tn.gov.in/
Government of Tamil Nadu · undated · accessed 2026-09-15 · India · primary · confidence medium · Tamil Nadu has the third-largest number of MSMEs with about five million enterprises

S141 Tamil Nadu Electronics Hardware Manufacturing Policy 2020 https://spc.tn.gov.in/policy/tamil-nadu-electronics-hardware-manufacturing-policy-2020
Government of Tamil Nadu, State Planning Commission · 2020 · accessed 2026-09-15 · India · primary · confidence medium · State ESDM policy with capital and R&D incentives; relevant to a Chennai IoT manufacturer's incentive claims

S142 Cybersecurity requirements for the Radio Equipment Directive https://www.tuvsud.com/en-in/services/product-certification/ce-marking/radio-equipment-directive/cybersecurity-for-radio-equipment-directive
TUV SUD · 2025 · accessed 2026-09-15 · Europe · reference · confidence medium · From 1 August 2025 all wireless devices placed on the EU market must meet RED articles 3.3(d), (e), (f) cybersecurity requirements; EN 18031 series

S143 Cyber Resilience Act 2026 guide for IoT devices https://wizzdev.com/blog/cyber-resilience-act-2026-guide-for-iot-devices
WizzDev · 2026 · accessed 2026-09-15 · Europe · reference · confidence low · Vulnerability reporting obligations from 11 September 2026; full CRA compliance by 11 December 2027

S144 SABER import and CST type approval services in Saudi Arabia https://thesaudigate.com/saber-import-and-cst-type-approval-services-in-saudi-arabia/
The Saudi Gate · 2025-07-07 · accessed 2026-09-15 · Saudi Arabia · reference · confidence low · Wireless IoT devices may need both SABER product certification and CST type approval

S145 Safe City project approved for eight cities https://pib.gov.in/newsite/PrintRelease.aspx?relid=188078
Press Information Bureau, Ministry of Home Affairs · 2019 · accessed 2026-09-15 · India · primary · confidence high · Empowered Committee approved pilot Safe City projects in Delhi, Kolkata, Mumbai, Chennai, Bengaluru, Hyderabad, Ahmedabad and Lucknow at ₹2,919.55 Cr

S146 Tamil Nadu launches AI-enabled panic button and CCTV in 500 Chennai buses https://indianexpress.com/article/cities/chennai/tamil-nadu-govt-launches-ai-enabled-panic-button-cctv-surveillance-in-500-chennai-buses-7917866/lite/
The Indian Express · 2022-05-15 · accessed 2026-09-15 · India · news · confidence medium · Nirbhaya Safe City project component launched by the Chief Minister; panic button raises an alarm at the control centre

S147 65 per cent of public vehicles in Tamil Nadu have no GPS or panic button; mandatory for new vehicles from 1 April https://www.newindianexpress.com/cities/chennai/2018/mar/29/65-per-cent-of-public-vehicles-in-tamil-nadu-have-no-gps-panic-button-to-be-made-mandatory-for-new-1794106.html
The New Indian Express · 2018-03-29 · accessed 2026-09-15 · India · news · confidence medium · New public transport vehicles not registered in Tamil Nadu from 1 April 2018 unless fitted with GPS and a panic button

S148 IoT-based tenders in India 2025 (1,365 listed) https://www.tenderdetail.com/Indian-tender/iot-based-tenders
TenderDetail · 2026 · accessed 2026-09-15 · India · dataset · confidence low · Aggregator count of 1,365 IoT-based tenders published in 2025

S149 GSM temperature alarm relay with power-failure SMS alert https://www.amazon.in/Temperature-Notification-Vegetable-Greenhouse-Household/dp/B09CM7G8GK
Amazon.in listing · undated · accessed 2026-09-15 · India · vendor · confidence low · Imported GSM temperature alarm with 200 authorised numbers, marketed for greenhouses, farms and factory buildings; the mass-market substitute for RT-DFI-G

S150 Temperature monitoring: the ultimate audit guide https://samyak.co.in/temperature-monitoring-systems/
Samyak Instrumentation · 2026-06-06 · accessed 2026-09-15 · India · vendor · confidence low · Vendor language: a piece of paper cannot send an SMS to the facility manager at 2 am if the power fails; 21 CFR Part 11 and FSSAI audit framing

S151 Union Minister launches ADEETIE scheme to accelerate industrial energy efficiency https://www.pib.gov.in/PressReleasePage.aspx?PRID=2144822
Press Information Bureau, Ministry of Power · 2025-07-15 · accessed 2026-09-15 · India · primary · confidence high · ₹1,000 Cr outlay FY2025-26 to 2027-28: ₹875 Cr interest subvention (5% micro and small, 3% medium), ₹50 Cr audits, ₹75 Cr handholding; 14 sectors incl. pharma, food processing, textiles, foundry; 60 clusters phase 1, 100 phase 2; expected ₹9,000 Cr investment

S152 Integrated Command and Control Centres (Lok Sabha reply) https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1947455
Press Information Bureau, Ministry of Housing and Urban Affairs · 2023-08-10 · accessed 2026-09-15 · India · primary · confidence high · 100 Smart Cities selected 2016 to 2018; ICCCs operational in all 100 and integrated with police, water, waste and traffic departments

S153 Direction to licensing authorities on fish and fish products storage temperature https://www.fssai.gov.in/upload/advisories/2022/12/638edf17bdbb2Direction_Licensing_28_11_2022_.pdf
Food Safety and Standards Authority of India · 2022-11-28 · accessed 2026-09-15 · India · regulatory · confidence high · Temperature at receiving and during storage 0 to 4 C, frozen products -18 C; retail of frozen fish requires deep freezers holding -18 C or lower

S154 Telecom subscription data as on 30 November 2025 (Press Release 156/2025) https://www.trai.gov.in/sites/default/files/2025-12/English%20Press%20Release%20of%20Telecom%20Subscription%20Data-November-25_English-31.12.2025_1815-sd.pdf
Telecom Regulatory Authority of India · 2025-12-31 · accessed 2026-09-15 · India · dataset · confidence high · M2M connections rose from 98.87 million (October 2025) to 103.48 million (November 2025); Airtel 60.96%, Jio 17.97%, Vi 17.55%

S155 National Inventory of Sewage Treatment Plants, March 2021 https://cpcb.gov.in/openpdffile.php?id=UmVwb3J0RmlsZXMvMTIyOF8xNjE1MTk2MzIyX21lZGlhcGhvdG85NTY0LnBkZg==
Central Pollution Control Board · 2021-03 · accessed 2026-09-15 · India · dataset · confidence medium · State-wise operational and non-operational STPs; the earlier 2014 inventory counted 816 STPs with 23,277 MLD capacity; the PDF could not be text-extracted in this session, so 2021 totals are not quoted

S156 India Ageing Report 2023 https://india.unfpa.org/sites/default/files/pub-pdf/20230926_india_ageing_report_2023_web_version_.pdf
United Nations Population Fund India · 2023-09-26 · accessed 2026-09-15 · India · primary · confidence high · 149 million persons aged 60+ in 2022 (10.5% of population); 347 million (20.8%) by 2050; southern states age fastest

S157 About the RAMP programme https://ramp.msme.gov.in/ramp/about-ramp.php
Ministry of MSME · undated · accessed 2026-09-15 · India · primary · confidence high · Raising and Accelerating MSME Performance: World Bank-supported, outlay ₹6,062.45 Cr (USD 808 million)

S158 DATOMS industrial IoT platform for OEMs and system integrators https://datoms.io/
Phoenix Robotix (DATOMS), Bhubaneswar and Bengaluru · 2025 · accessed 2026-09-15 · India · vendor · confidence medium · White-label IoT platform for OEMs: DG, solar inverter, compressor, chiller and environmental-compliance monitoring; Nalco case; Series A from YourNest and IvyCap

S159 Moxa UC-8100 IoT gateway, S.N. Enterprises https://www.indiamart.com/proddetail/moxa-uc-8100-iot-gateway-26307140973.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹68,000 per piece; Moxa datasheet gives UL 60950-1, EN 55032/24, IEC 61000 surge and ESD, 5-year warranty

S160 Milesight collection prices https://store.mcci.com/collections/milesight
MCCI store (Milesight reseller) · 2026 · accessed 2026-09-15 · Global · vendor · confidence medium · UG65 gateway from USD 467.50, UG56 from USD 290, UC300 controller from USD 175, EM300-TH temperature-humidity sensor from USD 65

S161 Sushi Sensor wireless IIoT solution, Yokogawa India https://www.yokogawa.com/in/solutions/products-and-services/information/asset-management/asset-performance-management/sushi-sensor
Yokogawa India · undated · accessed 2026-09-15 · India · vendor · confidence medium · XS770A LoRaWAN vibration sensor with 10-year battery, sold and supported in India

S162 Predictive maintenance for Indian SME factories: practical guide 2026 https://www.tech4lyf.com/blog/predictive-maintenance-sme-india/
Tech4Lyf · 2026-03-06 · accessed 2026-09-15 · India · vendor · confidence low · Vendor price bands: standalone IoT monitoring ₹1 to 3 lakh, unified ERP plus IoT ₹2 to 8 lakh, enterprise ₹25 to 50 lakh; claims average Indian factory loses ₹15 to 40 lakh a year to unplanned downtime

S163 AI plus IoT: where predictive maintenance actually pays off in India https://omegamatrix.in/blog/ai-iot-predictive-maintenance-india
Omega Matrix (Chennai software studio blog) · 2026-08-30 · accessed 2026-09-15 · India · forum · confidence low · Practitioner view that predictive maintenance is the most oversold phrase in industrial IoT and that most Indian factories cannot yet train a model

S164 Stack emission monitoring and CEMS page https://www.thesustainabilitycloud.com/blog/stack-emission-monitoring/
LogicLadder Technologies (The Sustainability Cloud), Gurgaon · 2025-06-19 · accessed 2026-09-15 · India · vendor · confidence medium · IIoT-based OCEMS data acquisition gateway pushing analyser data to CPCB; also CGWA water, energy and CCTS compliance modules; pricing pages exist per product

S165 LoudCell diesel generator and energy monitoring http://loudcell.com/
LoudCell Technologies, Gurgaon · undated · accessed 2026-09-15 · India · vendor · confidence low · IoT fuel and energy monitoring for DGs across retail, data centre, healthcare, banks; founded 2013; Bharti as a logo customer

S166 Blynk pricing https://www.blynk.io/pricing
Blynk · 2026 · accessed 2026-09-15 · Global · vendor · confidence high · Free $0, Starter $29, Prototype $99, Production $199 to $1,099 per month; Enterprise white-label custom; SOC 2 Type II

S167 Tuya Developer Platform IoT Core pricing https://developer.tuya.com/en/docs/iot/membership-service?id=K9m8k45jwvg9j
Tuya · 2026-07-28 · accessed 2026-09-15 · Global · vendor · confidence high · Flagship edition: USD 3.15 per million API calls and USD 1.24 per million messages outside China, up to 75,000 devices; SmartLife App SDK official edition USD 5,000 first year then USD 2,000

S168 Airtel IoT M2M SIM card yearly, LRK Groups https://www.indiamart.com/proddetail/airtel-iot-m2m-sim-card-yearly-25678478788.html
IndiaMART listing · undated · accessed 2026-09-15 · India · vendor · confidence medium · ₹550 per SIM per year with 120 MB data and 200 SMS; other listings ₹450 to ₹699

S169 WPC ETA certification: process, fees, documents https://www.standphillindia.in/wpc-eta-certification.php
Standphill India · 2026-06-22 · accessed 2026-09-15 · India · reference · confidence medium · Government fee ₹10,000 per product model for ETA by self-declaration, paid via BharatKosh and linked to Saral Sanchar; RF test reports for all modules

S170 BIS CRS registration in India: process and fees 2026 https://www.psrcompliance.com/bis-crs-registration
PSR Compliance · 2026 · accessed 2026-09-15 · India · reference · confidence medium · Processing fee ₹50,000 including one test report, ₹20,000 per additional report, 20% MSME discount; 20 to 40 working days; two-year validity

S171 TEC approval and MTCTE certification complete guide 2026 https://blogs.seyecs.com/tec-approval/
Seyecs · 2026-07-30 · accessed 2026-09-15 · India · reference · confidence medium · 6 to 8 weeks typical; certificate valid 10 years; Phase VI categories mandatory from 24 August 2025; security certification emphasised for IoT gateways; only TEC-designated Indian labs accepted

S172 TEC MTCTE approval: process, documents, fees https://alephindia.in/tec-mtcte-approval-process-document-fees.php
Aleph India · undated · accessed 2026-09-15 · India · reference · confidence low · Group A products: administrative fee about ₹10,000 and evaluation fee about ₹50,000 plus lab testing; IoT gateways and IoT devices listed under MTCTE and voluntary security certification

S173 Coimbatore pump set cluster profile https://sameeeksha.org/index.php?option=com_content&view=article&id=189&Itemid=502
SAMEEEKSHA (BEE and TERI MSME energy platform) · undated · accessed 2026-09-15 · India · dataset · confidence medium · About 600 pump manufacturers and 400 ancillary units in Coimbatore, nearly 40% of India's pump sets, 10.5 million pumps a year, ₹5,000 Cr turnover; 25,000+ MSMEs in the city

S174 SIPCOT industrial parks https://sipcotweb.tn.gov.in/
State Industries Promotion Corporation of Tamil Nadu · 2026 · accessed 2026-09-15 · India · primary · confidence high · 50 industrial parks including 8 SEZs across 24 districts on 48,926 acres; 3,390 industrial units established

S175 Tamil Nadu's industrial parks and SEZs under SIPCOT: a brief for investors https://www.india-briefing.com/news/tamil-nadu-industrial-parks-sezs-dta-under-sipcot-a-brief-for-investors-27024.html/
India Briefing (Dezan Shira) · 2023-01-27 · accessed 2026-09-15 · India · reference · confidence medium · Tamil Nadu has the largest number of factory units at 37,220 and about 20% of India's electronics production; SIPCOT park list (Sriperumbudur, Oragadam, Irungattukottai, Perundurai, Ranipet)

S176 Hero Electronix acquires Zenatix, forays into IoT space https://economictimes.indiatimes.com/tech/internet/hero-electronix-acquires-zenatix-forays-into-iot-space/articleshow/64370404.cms
The Economic Times · 2018-05-30 · accessed 2026-09-15 · India · news · confidence high · Acquisition of the IIT Delhi-founded energy IoT startup by Hero Electronix in May 2018

S177 Zenatix by Schneider Electric company overview and competitors https://leadiq.com/c/zenatix-by-schneider-electric/5a1d8d9e5400005900742ab2
LeadIQ · 2026 · accessed 2026-09-15 · India · reference · confidence low · Lists Indian energy-IoT peers Bidgely, Gram Power, Ecolibrium, LoudCell and LogicLadder; company now styled Zenatix by Schneider Electric

S178 IoT-based vaccine cold chain monitoring guide (south India distributor example) https://www.aeologic.com/blog/iot-based-vaccine-cold-chain-monitoring-guide/
Aeologic Technologies · 2026-02-19 · accessed 2026-09-15 · India · vendor · confidence low · Vendor case: distributor in south India with manual checks every 4 hours and 15 to 20% wastage before IoT, under 5% after; unverified

S179 IoT sensors for hospital asset tracking, India guide https://nirmitee.io/blog/iot-sensors-hospital-asset-tracking-india/
Nirmitee · 2026-05-27 · accessed 2026-09-15 · India · vendor · confidence low · Cites a 600-bed Hyderabad hospital deploying IoT temperature sensors across 47 cold-chain units in early 2025; unverified

S180 Wi-Fi temperature and humidity sensor search results https://www.amazon.in/wifi-temperature-and-humidity-sensor/s?k=wifi+temperature+and+humidity+sensor
Amazon.in · 2026 · accessed 2026-09-15 · India · vendor · confidence medium · Amazon's Choice Wi-Fi temperature and humidity sensor at ₹2,489 (MRP ₹3,699), 4.4 stars from 1,900 ratings, 50+ bought in the past month

S181 r/homeassistant: Tuya smart Wi-Fi switch offline usage https://www.reddit.com/r/homeassistant/comments/147a2dy/tuya_smart_wifi_switch_offline_usage/
Reddit · 2023-06-12 · accessed 2026-09-15 · Global · forum · confidence medium · Users confirm Tuya Wi-Fi devices retain no logic offline and only act on instructions from the cloud or a local server

S182 r/smartlife: offline online offline online https://www.reddit.com/r/smartlife/comments/tik7lg/offline_online_offline_online/
Reddit · 2022-03-21 · accessed 2026-09-15 · Global · forum · confidence medium · Tuya devices flapping online and offline on a 2.4 GHz access point

S183 Industry report: pumps industry https://equityedgeresearch.substack.com/p/industry-report-pumps-industry
EquityEdge Research (Substack, citing Mordor, IMARC and TechSci) · 2025-04-30 · accessed 2026-09-15 · India · reference · confidence low · Coimbatore cluster 54% of India pump production with 1,200 support units; about 4,000 small manufacturers hold 35% of the agricultural pump market; 38% of new pump set-ups with smart controls (CRISIL cited)

S184 Capital subsidy for scaling up MSMEs https://msmeonline.tn.gov.in/incentives/html_cye_CS.php
MSME Department, Government of Tamil Nadu · undated · accessed 2026-09-15 · India · primary · confidence medium · 5% additional capital subsidy up to ₹25 lakh for micro and small manufacturers expanding; the state incentive route relevant to Rax's own capex

S185 Tamil Nadu Industrial Policy 2021 https://tnswp.com/DIGIGOV/TN-pages/industrial-policy.jsp?pagedisp=static
Government of Tamil Nadu (single window portal) · 2021 · accessed 2026-09-15 · India · primary · confidence medium · Capital subsidy 12% or 15% for projects above ₹50 Cr; district categories A, B, C for incentives

S186 Cold storage facilities in the country (Rajya Sabha reply with state-wise table as on 31 August 2020) https://www.pib.gov.in/PressReleasePage.aspx?PRID=1658114
Press Information Bureau, Ministry of Agriculture and Farmers Welfare · 2020-09-23 · accessed 2026-09-15 · India · primary · confidence high · 8,186 cold storages with 374.25 lakh MT; no real-time monitoring system maintained by the Ministry; state table: Gujarat 969, Punjab 697, Maharashtra 619, AP and Telangana 405, Haryana 359, Bihar 311, MP 302, Karnataka 223, Kerala 199

S187 IoT implementation cost in India (2026 guide) https://www.tech4lyf.com/blog/iot-implementation-cost-india/
Tech4LYF Corporation, Chennai · 2026-03-07 · accessed 2026-09-15 · India · vendor · confidence low · Chennai integrator price bands from 90+ deployments: basic 1 to 3 machines ₹50,000 to ₹2 lakh, department ₹2 to 8 lakh, full factory ₹8 to 15 lakh; 4G gateway ₹2,000 to 12,000; data SIM ₹200 to 800 per device per month; fewer than 10% of MSME factories have any IoT

S188 Fixing India's last-mile temperature control gap (opinion by Welspun One MD) https://www.biospectrumindia.com/views/17/27124/fixing-indias-last-mile-temperature-control-gap-a-logistics-blueprint-for-pharma-safety-and-speed.html
BioSpectrum India · 2025-12-26 · accessed 2026-09-15 · India · news · confidence medium · Pharma exports USD 30.47 billion 2024-25; last mile is the fragile link; IoT sensors help only inside purpose-built infrastructure

S189 Drug licence in India: process, types and documents guide 2026 https://www.imarcengineering.com/blog/how-to-get-a-drug-licence-in-india
IMARC Engineering · 2026-09-03 · accessed 2026-09-15 · India · reference · confidence low · Retail licences require refrigeration for temperature-sensitive medicines; about 12 lakh registered medical stores; wholesale needs cold-chain storage and SOPs; enforcement tightened post-2020

S190 Server room temperature monitor (SMS, 4G) with factory calibration certificate, model TAM1-IoT https://www.amazon.in/Temperature-Monitoring-Calibration-Certificate-INSTRUKART/dp/B08Q8K65RK
Amazon.in listing (Instrukart) · undated · accessed 2026-09-15 · India · vendor · confidence medium · Indian-made GSM temperature monitor sold with a 12-month calibration certificate traceable to national standards; SIM and SMS pack in buyer's scope

S191 Monitoring and evaluation tenders (aggregator listing including an online temperature monitoring system BOQ and an IoT-enabled solar AMC tender) https://www.tenderdetail.com/Indian-tender/monitoring-and-evaluation-tenders
TenderDetail · 2026-09 · accessed 2026-09-15 · India · dataset · confidence low · Live tenders in September 2026 include a Haryana substation BOQ line for an online temperature monitoring system with wireless sensors and a Jharkhand IoT-enabled asset and inventory system with a three-year comprehensive AMC

S192 Number of hospitals in India 2025 https://www.impactguru.com/info/number-of-hospitals-in-india/
ImpactGuru (citing MoHFW and WHO) · 2025-12-30 · accessed 2026-09-15 · India · reference · confidence low · About 70,000 hospitals, 43,486 private; used only as an order-of-magnitude denominator

S193 CRI Pumps press release: IoT-enabled smart pumps https://www.crigroups.com/press-release
C.R.I. Pumps, Coimbatore · 2021-08-13 · accessed 2026-09-15 · India · vendor · confidence medium · Claims over 60,000 IoT-enabled smart pumps and over 50,000 IoT-enabled solar pumps supplied; sells IoT drives and controllers; a Coimbatore OEM that already embeds connectivity

S194 Blue Star unveils new commercial refrigeration line-up https://themachinemaker.com/news/blue-star-unveils-new-lineup-of-commercial-refrigeration-products-to-strengthen-market-leadership/
The Machine Maker · 2025-04-12 · accessed 2026-09-15 · India · news · confidence medium · Modular cold rooms IoT-enabled with remote monitoring; pharmacy refrigerators and ice-lined refrigerators in the range; Wada plant capacity 300,000 freezers a year

S195 Apollo Pharmacy to add two stores a day; 7,000-store network https://www.business-standard.com/companies/news/apollo-pharmacy-expansion-7000-stores-network-125112800825_1.html
Business Standard · 2025-11-28 · accessed 2026-09-15 · India · news · confidence high · 7,000 stores in November 2025, target 10,600 by 2030; Chennai-headquartered chain, each store holding refrigerated stock

S196 MedPlus corporate site https://www.medplusindia.com/
MedPlus Health Services · 2024 · accessed 2026-09-15 · India · vendor · confidence medium · 5,500+ pharmacies across ten states including Tamil Nadu as of February 2024

S197 Assessment of textile dyeing units and ZLD at Tirupur (CPCB report, mirrored) https://www.scribd.com/document/381938199/Assesment-of-Textile-Dyeing-Units-and-ZLD-at-Tirupur-CPCB-pdf
Central Pollution Control Board via Scribd · undated · accessed 2026-09-15 · India · reference · confidence low · 20 CETPs and 66 individual ETPs treat Tiruppur dyeing effluent under zero-liquid-discharge orders

S198 Emergency Response Support System 112 https://112.gov.in/
Ministry of Home Affairs · 2026 · accessed 2026-09-15 · India · primary · confidence high · Nirbhaya-funded single emergency number; panic call by pressing the phone power button three times; ERSS accepts IoT-based signals as one of ten channels

S199 112 India app listing https://play.google.com/store/apps/details?hl=en_IN&id=in.cdac.ners.psa.mobile.android.national
Google Play (MHA, C-DAC) · 2025-10-28 · accessed 2026-09-15 · India · vendor · confidence medium · 50 lakh+ downloads, 3.8 stars from 11,200 reviews; free SOS app functional in all 36 states and UTs; the state-provided substitute for a paid SOS device

S200 Cattleya Technosys company site http://www.cattleyatech.com/
Cattleya Technosys, Bengaluru · undated · accessed 2026-09-15 · India · vendor · confidence low · IoT and e-surveillance product company with central monitoring and asset control; an existing Rax account that is itself an IoT vendor

S201 INFOROB solar panel cleaning robots https://inforob.co.in/
Inforob · undated · accessed 2026-09-15 · India · vendor · confidence low · SR 1.0 fully automatic PV cleaning robot; buys controller cards from Rax at ₹5,450 to ₹8,500

S202 Nuetech water softeners https://nuetechsolar.com/water-softener/
Nuetech Solar Systems, Bengaluru · 2022-04-09 · accessed 2026-09-15 · India · vendor · confidence low · Manual and automatic softeners for homes, apartments and industry; ordered 500 controller units from Rax at ₹4,600 in April 2026

S203 Testo Saveris 2-H1 Wi-Fi data logger, Shakti Sales https://www.indiamart.com/proddetail/testo-saveris-2-h1-wifi-data-logger-with-display-and-integrated-temperature-and-humidity-probe-23971409855.html
IndiaMART listing · 2022-02-21 · accessed 2026-09-15 · India · vendor · confidence medium · ₹69,500 per piece, Mumbai; the imported GxP-grade Wi-Fi logger benchmark

S204 Vaisala continuous monitoring system services https://www.vaisala.com/en/services/continuous-monitoring-system-services
Vaisala · 2026-07-01 · accessed 2026-09-15 · Global · vendor · confidence medium · Claims 3,200 life-science customers in 57 countries and over 1,400 installed systems; VaiNet LoRa loggers for fridges, freezers and cold rooms

S205 Elecbits: electronics manufacturing and supply chain solutions https://elecbits.in/
Elecbits (Azoox Technologies) · 2026-08-22 · accessed 2026-09-15 · India · vendor · confidence low · ODM and OEM IoT product development platform; a contract-design competitor to Rax's DDP business

S206 Manager Quality Assurance, Abbott (job description) https://freehire.me/jobs/manager-quality-assurance-abbott-4yu3q6mo
Freehire (job aggregator) · undated · accessed 2026-09-15 · India · forum · confidence low · Duties include reviewing temperature data of data loggers for imported cold-chain products and approving temperature excursions; shows the buyer role for cold-chain monitoring

S207 Vibration and condition monitoring jobs in India https://in.indeed.com/q-vibration-monitoring-jobs.html
Indeed India · 2025-07 · accessed 2026-09-15 · India · forum · confidence low · About 100 vibration-monitoring vacancies including Condition Monitoring Engineer roles in Chennai; evidence of in-house condition-monitoring staff as a substitute

S208 BMS and building management solution providers in Chennai https://dir.indiamart.com/chennai/building-management-solutions.html
IndiaMART directory · undated · accessed 2026-09-15 · India · vendor · confidence low · Chennai BMS integrators quote building management from ₹25,000 to ₹3,50,000 per month; the local integrator channel

S209 EcoXpert partner programme https://www.se.com/ww/en/partners/ecoxpert
Schneider Electric · 2026 · accessed 2026-09-15 · Global · vendor · confidence medium · More than 4,000 certified partner companies in 120 countries implementing EcoStruxure; the channel model Rax's devices would have to fit into

S210 IoT-powered cold storage monitoring for farmers and OEMs https://datoms.io/blogs/cold-chain/cold-storage-dark-stores/iot-cold-storage-monitoring-farmers-oems-installers
DATOMS blog · 2025-03-04 · accessed 2026-09-15 · India · vendor · confidence low · Argues cold-room OEMs and installers should embed monitoring and sell service; the OEM-embedding channel Rax could serve

S211 Panic button manufacturers, suppliers and prices (AIS 140 buttons, GPS personal trackers) https://www.tradeindia.com/manufacturers/panic-button.html
TradeIndia directory · 2026-08-28 · accessed 2026-09-15 · India · vendor · confidence medium · Directory updated 28 Aug 2026: AIS 140 buttons at Rs 120 to 150, GAGAN-01 AIS 140 tracker Rs 4,099, kids GPS tracker Rs 3,500, MyPin personal tracker Rs 2,832

S212 Panic button alarm latest price, manufacturers and suppliers https://dir.indiamart.com/impcat/panic-button-alarm.html
IndiaMART directory · undated · accessed 2026-09-15 · India · vendor · confidence medium · Tuya Wi-Fi SOS button Rs 999; GSM van panic alarm Rs 5,990 (Mishi Electro Softec); GPS panic button Rs 3,100 (3GB Technology); eGlu 865 MHz panic alarm Rs 5,500

S213 Guidelines for implementation of PM-KUSUM (solar pumps and grid-connected solar plants) https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2024/01/20240118413909461.pdf
Ministry of New and Renewable Energy · 2024-01 · accessed 2026-09-15 · India · regulatory · confidence high · Clause: all solar agriculture pumps sanctioned shall be provided with a remote monitoring system by the vendor; RMS may consist of smart meters, communication hardware or IoT devices, software, web and mobile app; controllers must be indigenously manufactured

S214 PM-KUSUM scheme page: components, targets and period https://mnre.gov.in/en/pradhan-mantri-kisan-urja-suraksha-evam-utthaan-mahabhiyaan-pm-kusum
Ministry of New and Renewable Energy · 2026 · accessed 2026-09-15 · India · primary · confidence high · Component B 14 lakh standalone pumps, Component C 35 lakh grid-connected pumps; central support Rs 34,422 Cr; period to 31 March 2026

S215 PM-KUSUM Yojana: progress in FY25 (4.4 lakh Component B pumps, over 10 lakh total) https://www.ibef.org/government-schemes/pm-kusum-yojana
India Brand Equity Foundation · 2025 · accessed 2026-09-15 · India · reference · confidence medium · Cites MNRE year-end review: 4.4 lakh Component B pumps installed in FY25, 2.6 lakh solarised under Component C, more than 10 lakh pumps in total; cross-checked against PIB replies of Feb 2024 (2.95 lakh Component B) and Mar 2026 (9.75 lakh Component B and 12.02 lakh Component C to 31 Dec 2025)

S216 Making remote monitoring of solar pumps work for states (Chhattisgarh RMS study) https://www.ceew.in/sites/default/files/ceew-study-on-solar-pumps-remote-monitoring-systems-in-india.pdf
Council on Energy, Environment and Water (CEEW) · 2021-09-27 · accessed 2026-09-15 · India · academic · confidence high · Seven controller-maker portals; only 446 of 1,306 pumps still transmitting by Dec 2020; about 80% geotags missing or pointing to maker HQ; quotes CREDA tender RMS clause

S217 Shakti RMS and IoT dongle (2G, 4G, Wi-Fi) for solar pumps https://shaktipumps.com/iot-dongle/
Shakti Pumps (India) Ltd · 2025-11-20 · accessed 2026-09-15 · India · vendor · confidence high · A listed pump OEM builds its own RMS dongles and portal; large OEMs are not buyers of third-party IoT boards

S218 Kirloskar Brothers KirloSmart IoT-based remote pump monitoring https://www.mmindia.co.in/article/921/kbl-kirlosmart--an-intelligent-iot-based-remote-pump-monitoring-system
Modern Manufacturing India · undated · accessed 2026-09-15 · India · news · confidence medium · KBL developed KirloSmart in-house: remote monitoring via web portal and mobile app

S219 KUSUM Tamil Nadu application 2026: TEDA and TANGEDCO process https://www.heavengreenenergy.com/blog/kusum-tamil-nadu-application
Heaven Green Energy (EPC explainer) · 2026-08-07 · accessed 2026-09-15 · India · reference · confidence medium · TEDA is state nodal agency; 60% subsidy; about 23.5 lakh agricultural pump sets in Tamil Nadu; vendor commissions pump with RMS; timelines extended to March 2027

S220 Elanpro introduces IoT-enabled connected refrigerators and AI vending machines https://hospitality.economictimes.indiatimes.com/news/operations/technology/elanpro-introduces-iot-enabled-connected-refrigerators-and-ai-vending-machines/74546770
ET HospitalityWorld · 2020-03-09 · accessed 2026-09-15 · India · news · confidence medium · Brands give refrigerators free to retailers with no tracking; Smart Hub monitors 20 units per store; alliance with Vendekin

S221 Coca-Cola partners Vodafone Idea, eBest IoT to introduce connected coolers https://telecom.economictimes.indiatimes.com/news/coca-cola-partners-vodafone-idea-ebest-iot-to-introduce-connected-coolers/66333447
ET Telecom (Economic Times) · 2018-10-23 · accessed 2026-09-15 · India · news · confidence high · Coca-Cola India CIO Sanjay Rawal quoted; sensor detects temperature, humidity, door; asset location tracking

S222 Ice cream vending machines with vNetra IoT monitoring https://www.vendekin.com/ice-cream-vending-machine
Vendekin Technologies · undated · accessed 2026-09-15 · India · vendor · confidence medium · Indian vending OEM with its own IoT cloud tracking temperature, door and machine health; the vending channel Rax supplies cards into

S223 Panic buttons in DTC buses, city cabs and autos raising no alarm: ACB https://timesofindia.indiatimes.com/city/delhi/panic-buttons-in-dtc-buses-city-cabs-autos-raising-no-alarm-acb/articleshow/102292410.cms
The Times of India · 2023-07-31 · accessed 2026-09-15 · India · news · confidence medium · Delhi Anti-Corruption Branch audit: no control room monitoring panic alarms; GPS and panic buttons in taxis yielded no response

S224 Panic buttons inoperational in nearly 40,000 buses, cabs and private taxis in Maharashtra https://timesofindia.indiatimes.com/city/mumbai/panic-buttons-inoperational-in-nearly-40000-buses-cabs-and-private-taxis-in-maharashtra-says-state-transport-commissioner/articleshow/125937285.cms
The Times of India · 2025-12-12 · accessed 2026-09-15 · India · news · confidence medium · State transport commissioner statement; alerts routed to owners then 112

S225 Smart but non-functional: CAG report on ICT solutions under Smart Cities Mission in Karnataka https://indianexpress.com/article/cities/bangalore/smart-but-non-functional-cag-report-says-utility-of-ict-solutions-negligible-under-smart-cities-mission-in-karnataka-10509037
The Indian Express · 2026-02-02 · accessed 2026-09-15 · India · news · confidence high · CAG: GPS devices live in only 21 of 35 ambulances in Belagavi; utility of ICT solutions negligible

S226 CAG finds irregularities in implementation of Smart Cities Mission in Dehradun https://timesofindia.indiatimes.com/city/dehradun/cag-finds-irregularities-in-implementation-of-smart-cities-mission-in-dehradun/articleshow/129411438.cms
The Times of India · 2026-03-10 · accessed 2026-09-15 · India · news · confidence medium · CAG: infructuous expenditure of Rs 2.6 Cr on environmental sensors

S227 NGT orders to ensure installation of OCEMS in grossly polluting industries in UP, Bihar, Delhi, Haryana https://www.business-standard.com/india-news/ngt-orders-to-ensure-installation-of-ocems-in-gpis-in-up-bihar-delhi-125110800923_1.html
Business Standard (ANI) · 2025-11-08 · accessed 2026-09-15 · India · news · confidence medium · Petition cites about 1,700 industries without mandatory OCEMS and CPCB list of 1,686 defaulting GPIs in four states

S228 Panic buttons in PMPML buses still a distant dream https://timesofindia.indiatimes.com/city/pune/panic-buttons-in-pmpml-buses-still-a-distant-dream/articleshow/116482256.cms
The Times of India · 2024-12-19 · accessed 2026-09-15 · India · news · confidence medium · MSRTC divisional controller quoted on e-buses having GPS and panic buttons, regular buses none

S229 What are the problems and solutions in India's cold storage? (answer by a cold storage owner) https://www.quora.com/What-are-the-problems-and-solutions-in-Indias-cold-storage
Quora · 2019 · accessed 2026-09-15 · India · forum · confidence low · Owner of Annapurana Cold Storage: diesel generator raises operating cost by almost 20%; owners not willing to accept technology changes

S230 Cold chain: how Apollo keeps your insulin and vaccines safe https://www.apollopharmacy.in/blogs/article/how-apollo-pharmacy-keeps-insulin-vaccines-safe
Apollo Pharmacy · 2026-07-13 · accessed 2026-09-15 · India · vendor · confidence medium · Chennai-headquartered chain describes cold-chain storage and power variability as a risk at every stage

S231 Zenatix case study: multiplex chain energy and asset monitoring https://www.zenatix.com/case-study/zenatix-at-multiplexes
Zenatix by Schneider Electric · undated · accessed 2026-09-15 · India · vendor · confidence medium · Customer challenges listed: no visibility of energy, manual operations, unpredictable breakdowns; 150+ multiplexes

S232 Infinite Uptime company page: 153 customers in 946 plants https://linkedin.com/company/infinite-uptime
Infinite Uptime (LinkedIn) · 2026 · accessed 2026-09-15 · India · vendor · confidence medium · Company self-description, September 2026

S233 Syrma SGS sharpens ODM capabilities as revenue doubles in Q1 https://www.thehindubusinessline.com/companies/syrma-sgs-sharpens-odm-capabilities-as-revenue-doubles-in-q1/article71313580.ece
The Hindu BusinessLine · 2026-08-08 · accessed 2026-09-15 · India · news · confidence high · Chennai EMS: ODM revenue Rs 269 Cr in Q1 FY27, 17% of revenue; expects Rs 1,100 to 1,200 Cr ODM in FY27

S234 Kaynes Technology: ODM and IoT solutions for OEMs https://www.kaynestechnology.co.in/
Kaynes Technology India Ltd · undated · accessed 2026-09-15 · India · vendor · confidence high · Design-led EMS offering embedded design, certification support and canvas-to-cloud IIoT for OEMs converting legacy products

S235 India electronics manufacturing services market report 2032 https://www.psmarketresearch.com/market-analysis/india-electronics-manufacturing-services-market-report
P&S Market Research · 2025-12-09 · accessed 2026-09-15 · India · analyst · confidence medium · USD 65.0 bn 2025, USD 75.7 bn 2026, 17.5% CAGR; design and engineering fastest-growing service; Tamil Nadu about 40% share

S236 IoT product development: process and cost in 2025 https://www.tech4lyf.com/blog/iot-product-development/
Tech4LYF Corporation, Chennai · 2025-08-29 · accessed 2026-09-15 · India · vendor · confidence medium · Prototype IoT device Rs 5 to 15 lakh; mid-scale industrial IoT product Rs 20 to 60 lakh; enterprise Rs 1 Cr+

S237 Embedded engineering services for OEM machinery manufacturers (Chennai) https://mnengineeringsolutions.com/product-engineering-solutions/embedded-engineering/iot-solutions
MN Engineering Solutions · undated · accessed 2026-09-15 · India · vendor · confidence low · Chennai embedded and IoT design house targeting machinery OEMs; a local contract-design competitor

S238 Milesight and ThingsBoard announce technical partnership https://thingsboard.io/blog/milesight-and-thingsboard-inc-announced-a-technical-partnership-to-provide-more-integrated-iot-solutions/
ThingsBoard Inc · 2024-09-03 · accessed 2026-09-15 · Global · vendor · confidence high · Device maker integrates gateways and sensors with an open platform instead of forcing its own cloud; ThingsBoard CEO says customers ask it to recommend hardware

S239 Tuya app development cost: OEM versus custom app https://zediot.com/blog/tuya-app-development-cost
ZedIoT · 2026-06-13 · accessed 2026-09-15 · Global · reference · confidence low · Tuya OEM app USD 0 to 10,000; custom Tuya SDK app USD 15,000 to 80,000+

S240 Register and approve telecommunication equipment (type approval service, fees) https://tdra.gov.ae/en/Services/register-and-approve-telecommunication-equipment
Telecommunications and Digital Government Regulatory Authority, UAE · 2026 · accessed 2026-09-15 · UAE · regulatory · confidence high · Review fee AED 500, certificate AED 200; Wi-Fi inspection AED 8,100 on request; ILAC-accredited RF, EMC and safety reports required; 1 to 10 working days

S241 Oman TRA type approval overview https://www.nanotechsol.com/oman-tra-type-approval
NanoTech Solutions (compliance consultancy) · undated · accessed 2026-09-15 · Oman · reference · confidence medium · Local representative required; RF, EMC and safety reports; 3 to 4 weeks; four-year validity since August 2024; Bayan import permit

S242 Mandatory Testing and Certification of Telecommunication Equipment (MTCTE) https://eservices.dot.gov.in/mandatory-testing-certification-telecommunication-equipment-mtcte
Department of Telecommunications eServices · undated · accessed 2026-09-15 · India · regulatory · confidence high · No telecommunication equipment notified under MTCTE shall be sold or deployed unless it has a valid certificate

S243 Out of 2,760 licensed blood banks, Tamil Nadu has the highest number https://www.thehealthsite.com/news/out-of-2760-licensed-blood-banks-tn-has-the-highest-number-331025
TheHealthSite (National Health Profile data) · 2015-09-23 · accessed 2026-09-15 · India · news · confidence medium · Tamil Nadu 304 licensed blood banks in 2015, 181 private and 96 government

S244 CODISSIA: The Coimbatore District Small Industries Association https://codissia.com/
CODISSIA · undated · accessed 2026-09-15 · India · primary · confidence medium · More than 7,000 members; Coimbatore pump and engineering MSMEs

S245 TANSTIA: Tamilnadu Small and Tiny Industries Association https://tanstia.org.in/
TANSTIA · 2026-07-11 · accessed 2026-09-15 · India · primary · confidence medium · Apex SSI association in Tamil Nadu since 1956, Guindy Chennai

S246 Temperature monitoring tenders in India (aggregator) https://www.tenderdetail.com/Indian-tender/temperature-monitoring-tenders
TenderDetail · 2026-09 · accessed 2026-09-15 · India · dataset · confidence low · Live Indian temperature-monitoring tenders across departments including GeM BOQ items

S247 Government temperature data logger online tenders https://www.tendersontime.com/government-tenders/temperature-data-logger-online-tenders
TendersOnTime · 2026-08 · accessed 2026-09-15 · India · dataset · confidence low · Indian GeM BOQ items for temperature and humidity data loggers in quantities of 1 to 3; blood bank equipment tenders such as RIMS Raichur

S248 Private blood banks licensed in Tamil Nadu (Form 28 C directory) https://drugscontrol.tn.gov.in/pages/manufacturers_directory/private_blood_banks.pdf
Drugs Control Department, Government of Tamil Nadu · undated · accessed 2026-09-15 · India · regulatory · confidence high · State list of licensed private blood banks with licence numbers and validity, including Indian Red Cross Society Tamil Nadu Branch; the named-account list for a Chennai blood-bank pilot

S249 RFP for integrated e-surveillance system at ATM locations on OPEX model (Ref CO:ATM:17-18:224) https://centralbank.bank.in/sites/default/files/2021-05/e_surevillance_final_Vetted_final.pdf
Central Bank of India · 2017-08-07 · accessed 2026-09-15 · India · primary · confidence high · 3,000 ATM sites; scope includes ATM thermal sensor, mains and UPS power sensing, and optional remote control of ACs and power-consuming equipment priced as a monthly rental; eligibility 1,000 sites at two banks

S250 RFP UCO/DIT/625/2015-16 e-surveillance pre-bid responses https://www.uco.bank.in/documents/20120/311566/Tender_finale_surveillanceresponses_11ce0a737d/e984f4ab-bd9e-5ebe-a2ac-874efe90806f
UCO Bank · 2015-07-16 · accessed 2026-09-15 · India · primary · confidence high · Techno-functional BOQ includes remote signage on/off and air conditioner on/off daily at each site

S251 ATM site monitoring (OverSite): UPS, batteries, power, AC and temperature 24x7 https://maximusinfoware.in/site-monitoring-oversite.html
Maximus Infoware · undated · accessed 2026-09-15 · India · vendor · confidence medium · Indian ATM site energy and environment monitoring product; a direct competitor for the e-surveillance cross-sell route

S252 ATM remote site monitoring https://www.6thenergy.com/atms-remote-site-monitoring/
Sixth Energy Technologies, Bengaluru · 2023-12-26 · accessed 2026-09-15 · India · vendor · confidence medium · Bengaluru full-stack IoT company monitoring ATM site performance, temperature and humidity; claims 150,000 deployments globally

S253 India is using fewer ATMs even as bank branches keep growing (RBI Trend and Progress of Banking 2024-25) https://www.financialexpress.com/business/news/india-is-using-fewer-atms-even-as-bank-branches-keep-growing-rbi-reveals/4092382/
The Financial Express · 2025-12-30 · accessed 2026-09-15 · India · news · confidence high · RBI data: 2,51,057 ATMs at 31 March 2025 versus 2,53,417 a year earlier; white-label ATMs 36,216; bank branches 1.64 lakh, up 2.8%

S254 TEDA tag archive: KUSUM Component C approval for 20,000 pump sets (TNERC order excerpt) https://www.eqmagpro.com/tag/teda/
EQ Magazine · undated · accessed 2026-09-15 · India · news · confidence low · Excerpt of a regulatory order: TEDA sought approval to implement KUSUM Component C in 20,000 pump sets of 7.5 HP with 11 kW solar PV each; order date not visible in the excerpt

S255 Reserve Bank of India (Commercial Banks – Cybersecurity, Technology: Risk, Resilience and Assurance Framework) Directions, 2026 https://www.rbi.org.in/Scripts/BS_ViewMasDirections.aspx?id=13643
Reserve Bank of India · 2026-07-31 · accessed 2026-09-15 · India · regulatory · confidence high · RBI/DoS/2026-27/410; para 60 physical and environmental controls for DC and DR sites; para 61 monitoring of breaches of environmental controls including temperature, water, smoke, access alarms and service availability alerts (power supply, telecommunication, servers)

S256 PM-KUSUM benefits reach over 21.77 lakh farmers across the country (Lok Sabha reply) https://www.pib.gov.in/PressReleasePage.aspx?PRID=2244667
Press Information Bureau, Ministry of New and Renewable Energy · 2026-03-24 · accessed 2026-09-15 · India · primary · confidence high · As reported by state agencies to 31 Dec 2025: Component B 9,75,227 pumps installed of 13,15,190 sanctioned; Component C 12,01,552 pumps of 35,82,884 sanctioned; 21,77,369 farmers benefited; state-wise table includes Tamil Nadu

S257 More than 2.95 lakh standalone off-grid solar water pumps installed under PM-KUSUM (Lok Sabha reply) https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2004183&reg=3&lang=2
Press Information Bureau, Ministry of New and Renewable Energy · 2024-02-08 · accessed 2026-09-15 · India · primary · confidence high · Progress to 31 Jan 2024: more than 2.95 lakh Component B pumps; scheme scaled up September 2023