

RFID Reader

Fixed UHF RFID reader — long range and short range

Product Datasheet



Long Range · LR

Impinj E710 · integrated 9 dBi panel — dock doors, gates, portals.



Short Range · SR

Impinj E310 · 3 dBi antenna, 16×2 LCD, relay — POS, doors, asset desks.



USB Desktop

The same inventory engine on the bench · 90×90×30 mm, bus-powered.

700 /s
PEAK TAG READ RATE

Gen2 X
EPC PROTOCOL

5
UPLINKS — BLE/WI-FI/4G/
ETH/USB

IP68
OPTIONAL OUTER ENCLOSURE

OVERVIEW

The IoTReady RFID Reader is a fixed UHF station built on one hardware and firmware platform, ordered in the configuration a site needs. The **Long Range** unit pairs an Impinj E710 module with a 9 dBi antenna for dock doors, vehicle gates and portal choke points. The **Short Range** unit pairs an Impinj E310 module with a 3 dBi antenna for point-of-sale, access-controlled doors and desk-level asset check-in. A **Multi-Antenna** unit, also on the E710 module, adds four switched antenna ports with per-antenna signal-level comparison for direction and lane identification.

All three run the same EPC Gen2/Gen2X inventory engine, the same on-station status hardware and the same event payload — only the RF front end and the read envelope change. Inventory runs entirely on the device: tag reads are captured, chunked and timestamped on the reader itself, so the station keeps working the instant a link drops and resumes streaming once it returns. Each unit is ordered with the uplink its site needs — Bluetooth LE to a handheld or PDA gateway, Wi-Fi or 4G to your network and the cloud, wired Ethernet where RF is congested or not permitted, or USB for desktop and POS integration. The event a host system receives is identical across every uplink.

CHOOSE YOUR RANGE

Long Range · LR

IMPINJ E710 · 9 DBI ANTENNA

UHF module	Impinj E710
Antenna gain	9 dBi
RF output power	Up to 33 dBm, adjustable
Receive sensitivity	-88 dBm
Display	20×4 character LCD
Typical read range*	Up to 15 m

Best for: dock doors, vehicle and forklift gates, yard and portal choke points

Short Range · SR

IMPINJ E310 · 3 DBI ANTENNA

UHF module	Impinj E310
Antenna gain	3 dBi
RF output power	Up to 33 dBm, adjustable
Receive sensitivity	-75 dBm
Display	16×2 character LCD
Typical read range*	Up to 5 m

Best for: point-of-sale and kiosk read points, access-controlled doors, desk-level asset check-in

*Typical read range with representative Gen2 tags, unobstructed line of sight and antenna-boresight orientation; actual range depends on tag type, orientation, the RF environment and the region's permitted transmit power.

APPLICATIONS

Long Range

- Warehouse dock-door and inbound/outbound portals
- Vehicle, forklift and pallet-gate checkpoints
- Yard management and wide-aisle choke points

Short Range

- Retail point-of-sale and self-checkout read points
- Access-controlled doors and security checkpoints
- Desk-level asset check-in, kiosks and smart shelving

Multi-Antenna

- Multi-lane portal direction-of-travel detection
- Dock-door in/out counting on a shared opening
- Zone-level analytics across a wide opening

KEY FEATURES

One platform, three configurations

Order the RF front end the site needs — Long Range, Short Range or Multi-Antenna. The command grammar and event payload are identical across all three.

Edge-resident inventory

Tags are read, chunked and timestamped on the reader itself. A link outage never stalls the antenna — only the upload, which resumes the moment the link returns.

Uplink matched to the site

Bluetooth LE peripheral out of the box, with Wi-Fi (2.4/5 GHz), 4G/GSM or wired Ethernet variants publishing the same event straight to your network.

Built for commissioning

A 20×4 (LR) or 16×2 (SR) character LCD, multi-colour status LED and buzzer give at-a-glance state in the field, plus a dry relay output for a barrier, stack light or door interlock.

Signed, reversible firmware

OTA updates arrive over whichever link the unit has — including Bluetooth LE, the only link a BLE-only reader has — and roll back automatically on a failed update.

Healthcheck and fleet management

Every scan lands as the same tag / timestamp event regardless of transport. Built-in healthcheck and remote configuration ship via IoTReady Engine, or integrate with your own platform over the open API.

Every scenario below is the same on-device inventory engine, differing only in where the antenna points, what triggers a read and where the event lands — so a unit bought for one flow can be redeployed to another by configuration, not hardware.

Dock-door portal

LONG RANGE · WAREHOUSE INBOUND/OUTBOUND

- 1 Reader is mounted at the door with its 9 dBi antenna aimed across the opening.
- 2 Async inventory starts on a schedule or a host command over the ordered uplink.
- 3 Every EPC crossing the portal is read, chunked and timestamped on-device.
- 4 The relay output can be wired to a barrier, stack light or door interlock for a pass/fail signal at the door.

Result: A complete tag manifest of everything that crossed the opening, with no manual scanning.

Vehicle and forklift gate

LONG RANGE · YARD AND PALLET MANAGEMENT

- 1 Unit is mounted at a yard gate or forklift aisle, oriented along the vehicle's path.
- 2 Tags on pallets or vehicle-mounted badges are read as they pass the 9 dBi antenna's field.
- 3 Reads are timestamped and grouped per inventory cycle before upload.
- 4 Yard-management or WMS systems receive the crossing event over the ordered uplink.

Result: Automated yard visibility without a fixed scanning stop for every vehicle.

Point-of-sale / kiosk read

SHORT RANGE · RETAIL AND SELF-CHECKOUT

- 1 Unit sits at a counter or kiosk with its 3 dBi antenna aimed at the read zone.
- 2 Customer presents an item; the reader's short field reads only tags placed in that zone.
- 3 The scan is stamped and pushed the instant it completes.
- 4 POS or self-checkout software reconciles the read against the basket.

Result: Item-level verification at the point of sale, without reading the next aisle over.

Access-controlled door

SHORT RANGE · SECURITY AND FACILITIES

- 1 Unit is mounted beside a controlled door with its short-field antenna aimed at the badge point.
- 2 A tag presented within range is read and reported over the ordered uplink.
- 3 An access-control host matches the tag against its credential list.
- 4 The relay output can drive the strike or an indicator directly from the reader.

Result: Proximity-scoped credential reads that don't pick up badges further down the corridor.

Handheld / PDA gateway (Bluetooth LE)

BENCH AND MOBILE PAIRING · EITHER RANGE

- 1 An IoTReady PDA discovers the reader by its advertised BLE service UUID.
- 2 The configured reader id disambiguates which unit to pair with on a multi-reader site.
- 3 The PDA drives start/stop of the reader's async scan over the RFID CMD characteristic.
- 4 Every batch notified on the Scan characteristic is republished to the Engine over the PDA's own uplink.

Result: A BLE-only reader gets a full cloud uplink through the PDA it's paired with — no network on the reader itself.

Cloud-integrated portal

WI-FI / 4G / ETHERNET VARIANTS · DIRECT-TO-NETWORK SITES

- 1 Unit is ordered with the network uplink the site already has — Wi-Fi, cellular or wired Ethernet.
- 2 The reader authenticates to the fleet channel directly; no gateway device is in the path.
- 3 Scans publish as the same event schema the BLE-linked gateway would have republished on its behalf.
- 4 Configuration, diagnostics and firmware updates are managed remotely across every site.

Result: One less device to deploy and maintain at sites where a network uplink is already available.

Direction-of-travel portal

MULTI-ANTENNA (4-PORT) · MULTI-LANE AND ZONE ANALYTICS

- 1 Unit is mounted with its four antenna ports covering each lane or side of a shared opening.
- 2 Every tag read is attributed to the antenna port that captured it, along with its signal level.
- 3 Comparing per-antenna levels resolves direction of travel and which lane a tag crossed.
- 4 The event carries the antenna index on every read, so host logic derives direction without extra hardware.

Result: Lane and direction analytics from a single unit, without deploying a separate reader per lane.

Desktop encoding and POS entry

USB DESKTOP · HID AND JSON API MODES

- 1 The 90×90×30 mm unit connects to a PC or POS terminal over USB.
- 2 HID mode types each read as keystrokes into the focused POS field — no driver or integration.
- 3 JSON API mode streams the same event schema as the network uplinks, for a custom desktop or Android app.
- 4 The desktop and Android companion apps also drive tag-write and other interactive encoding flows.

Result: Drop-in RFID entry for any POS or desktop workflow, with a full read/write toolkit when one is needed.

DEPLOYMENT TOPOLOGY

RFID Reader

Reads, chunks and timestamps EPC Gen2/Gen2X tags on-device. Relay, LED and buzzer report status locally.



The uplink you ordered

Bluetooth LE to a handheld or PDA gateway, Wi-Fi / 4G / Ethernet direct to your network, or USB to a PC or POS terminal. Specified per unit.



Wherever the event is needed

PDA gateway app · POS field (USB HID) · WMS, ERP or access-control host over REST/JSON or WebSocket · webhook or MQTT feed · IoTReady Engine.

PAYLOAD BY UPLINK

Bluetooth LE — native

GATT PERIPHERAL · SCAN CHARACTERISTIC · NOTIFY, CHUNKED EVERY 4 TAGS

```
{
  "device_id": "d4e9f48506e2",
  "timestamp": "1721160000000",
  "group_id": "aB3xZ9",
  "tags": [
    {
      "tag": "E28011700000020F4C9A1234",
      "rssi": -65,
      "antenna": 1
    }
  ]
}
```

Consumed by a paired handheld, PC or PDA gateway app. No pairing, encryption or whitelist — connect and subscribe.

Wi-Fi — 802.11 b/g/n/ac, 2.4/5 GHz

AUTHENTICATED FLEET WEBSOCKET · REST/JSON FOR CONTROL

```
{
  "method": "device.scan.rfid",
  "params": {
    "scans": [
      {
        "scanned_id": "E28011700000020F4C9A1234",
        "type": "epc-gen2",
        "ts": "1721160000000"
      }
    ]
  }
}
```

The same event schema a BLE-linked gateway republishes on the reader's behalf — a Wi-Fi unit publishes it directly.

4G / GSM — cellular

CELLULAR PPP DATA UPLINK · SAME FLEET CHANNEL

```
{
  "method": "device.scan.rfid",
  "params": {
    "scans": [
      {
        "scanned_id": "E28011700000020F4C9A1234",
        "type": "epc-gen2",
        "ts": "1721160000000"
      }
    ]
  }
}
```

For yards, checkpoints and sites with no fixed network. Customer-supplied SIM with a data plan.

Ethernet — wired, PoE

802.3 WIRED UPLINK · SAME FLEET CHANNEL

```
{
  "method": "device.scan.rfid",
  "params": {
    "scans": [
      {
        "scanned_id": "E28011700000020F4C9A1234",
        "type": "epc-gen2",
        "ts": "1721160000000"
      }
    ]
  }
}
```

Built in order for sites where RF spectrum is congested or Wi-Fi is not permitted on the plant network.

USB — JSON API mode

USB CDC/SERIAL · SAME EVENT SCHEMA AS NETWORK UPLINKS

```
{
  "method": "device.scan.rfid",
  "params": {
    "scans": [
      {
        "scanned_id": "E28011700000020F4C9A1234",
        "type": "epc-gen2",
        "ts": "1721160000000"
      }
    ]
  }
}
```

A second USB mode, HID, types each read as keystrokes into whatever POS field has focus — no JSON, no integration. JSON mode also carries the desktop/Android tag-write commands.

PAYLOAD NOTES

- rssi and antenna are omitted entirely when metadata reporting is off — never written as zero.
- On the Multi-Antenna variant, antenna identifies which of the four ports captured each read — the same field every variant's payload already carries.
- group_id is a fresh id per inventory cycle; every chunk of one cycle shares it.
- A chunk that would exceed the link's frame limit is dropped and counted, never notified truncated.
- Network-linked units (Wi-Fi, 4G, Ethernet) stamp ts from a network-synced clock; a Bluetooth-only reader has no network, so its own clock is uptime-relative — the pairing PDA supplies the real timestamp on uplink.
- The command grammar (start/stop scan, set filter, set power, read diagnostics) is the same JSON shape on every uplink.
- Tag-write and other interactive encoding commands are exposed only through the USB Desktop unit's JSON API mode and its desktop/Android apps — the fixed units are read-only.

RF AND RANGE

PARAMETER	LONG RANGE (LR)	SHORT RANGE (SR)
UHF module	Impinj E710	Impinj E310
Antenna gain	9 dBi	3 dBi
RF output power	Up to 33 dBm, adjustable	Up to 33 dBm, adjustable
Receive sensitivity	-88 dBm	-75 dBm
Protocol	EPC Class 1 Gen 2 (ISO 18000-6C), Gen2X	EPC Class 1 Gen 2 (ISO 18000-6C), Gen2X
Peak tag read rate	Up to 700 tags/s	Up to 700 tags/s
Display	20×4 character LCD	16×2 character LCD
Typical read range*	Up to 15 m	Up to 5 m
Best for	Dock doors, vehicle gates, portals	POS, access control, asset desks

*Typical read range with representative Gen2 tags, unobstructed line of sight and antenna-boresight orientation; actual range depends on tag type, orientation, the RF environment and the region's permitted transmit power.

Multi-Antenna (4-port) variant: same Impinj E710 module, sensitivity and range as Long Range, on 4 independently switched ports. Per-antenna signal-level comparison resolves direction of travel and lane — for multi-lane portals, dock in/out counting and zone-level analytics.

USB Desktop variant: Impinj E310 module in a 90×90×30 mm bus-powered enclosure. HID mode types reads straight into a POS field; JSON API mode carries the same event schema as the network uplinks plus tag-write and other interactive commands from the desktop/Android apps.

COMPUTE AND SOFTWARE

Firmware	Signed firmware image with automatic rollback on a failed update
Inventory engine	On-device EPC Gen2/Gen2X async inventory, chunked and timestamped locally
Diagnostics	Since-boot read / drop / link-health counters, queryable on demand
Configuration	Scan interval, timeout, TX power and EPC filter — read/write over the active uplink

ONBOARD STATUS AND I/O

Status LED / buzzer	Multi-colour LED and buzzer for at-a-glance state
Output	Dry relay contact — barrier, stack light or door interlock
Commissioning	Built-in HTTP server (Wi-Fi) or mobile app (Bluetooth) for setup and diagnostics

CONNECTIVITY

Radio option	Bluetooth LE, Wi-Fi, 4G/GSM, Ethernet, or USB — specified per unit at order
Bluetooth variant	Bluetooth LE 5, custom GATT service, notify-based streaming; no pairing required
Wi-Fi variant	802.11 b/g/n/ac, dual-band 2.4 GHz and 5 GHz; WPA2-Personal/Enterprise
4G variant	Cellular modem, PPP data link; SIM not included
Ethernet variant	Wired 802.3, PoE (802.3af) available; built to order
USB variant	HID or JSON API mode; USB Desktop enclosure only, bus-powered
Event payload	Identical scanned-tag / timestamp schema across every uplink
Fleet management	Built-in healthcheck and remote configuration via IoTReady Engine, or your own platform

ELECTRICAL AND MECHANICAL

Supply	7 V to 24 V DC, wide-input adapter; PoE (802.3af) available on the Ethernet variant
Battery	Optional battery pack — up to 16 h continuous scanning
Antenna connector	SMA
Mounting	Panel, wall or pole mount, configured to the application
Operating temperature	0 °C to 45 °C, indoor / covered installation
Storage temperature	–20 °C to 60 °C
Humidity	10 % to 90 % RH, non-condensing
Ingress protection	IP20 standard; IP68 outer enclosure optional

ORDERING INFORMATION

ORDER CODE	DESCRIPTION	NOTES
RFR-LR- [B/W/G/E]	RFID Reader, Long Range — Impinj E710, 9 dBi antenna	Suffix selects the uplink — B Bluetooth LE, W Wi-Fi, G 4G/GSM, E Ethernet
RFR-SR- [B/W/G/E]	RFID Reader, Short Range — Impinj E310, 3 dBi antenna	Same uplink options as LR
RFR-MA- [B/W/G/E]	RFID Reader, Multi-Antenna — Impinj E710, 4 ports	Same uplink options as LR
RFR-USB- [H/J]	RFID Reader, USB Desktop — Impinj E310, 90×90×30 mm	H HID mode, J JSON API mode with tag-write apps
RFR-ENC-IP68	IP68 outer enclosure	Optional; outdoor / washdown sites
RFR-BAT	Battery pack, up to 16 h continuous scanning	Optional; add to any order code
RFR-ENG-1Y	IoTReady Engine subscription, one device, one year	Optional; BYO platform needs none
RFR-SVC-1Y	Extended warranty and commissioning support, one year	Optional

Specifications are subject to change without notice. RF output power and read range are subject to the regulatory limits of the region of installation. Receive sensitivity is quoted for the UHF module in FCC dense-reader mode at 1% packet error rate. Ethernet variant requires a to-order build; GSM/4G variant requires a customer-supplied SIM with a data plan. © 2026 IoTReady Solutions. All rights reserved.