# Cellular Modules Overview

**SECTRON**



Telit Cinterion is an IoT Enabler providing IoT modules, edge-to-cloud services including connectivity plans, IoT SIMs, IoT embedded software and PaaS IoT deployment managed services. It operates two business units: IoT modules and subscriptions & managed services.

Telit Cinterion offers a broad portfolio of solutions, services and platforms for M2M and IoT applications, enabling businesses and people to trust in our connected world. Telit Cinterion offers the technology elements that customers need to simplify and to accelerate the development and ensure the security, reliability and longevity of M2M and IoT solutions.

**Telit Cinterion**



# Approach to Security

**Security begins at the edge layer**
Portfolio of Telit Cinterion certified cellular IoT modules provides state of the art implementation with a blend of secure hardware and software features to protect critical data, safeguard identity and credentials, run trusted software and encrypt communications.
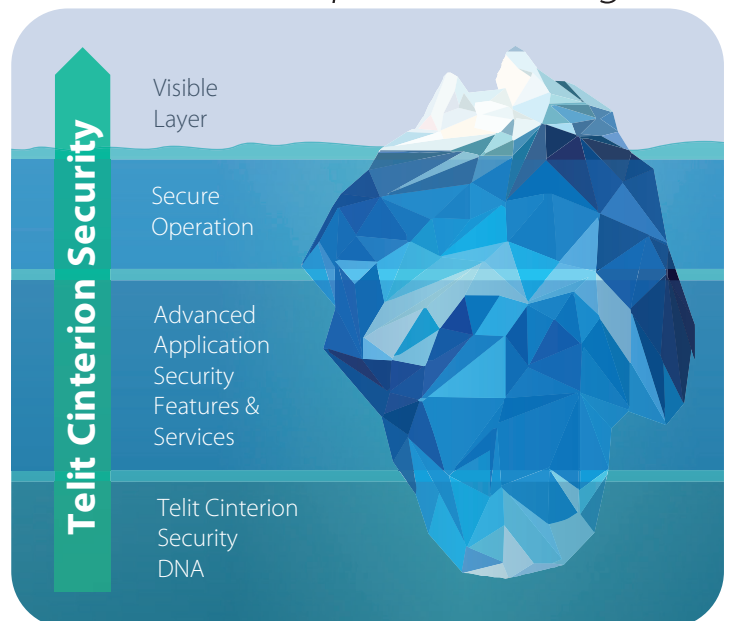
**Data protection across the enterprise is vital**
Telit Cinterion's IoT mobile core network, NExT™, is fully georedundant and provides scalable global connectivity management with enterprise grade security, including VPN and private APN, secure activation and switching between networks, network based security rules.
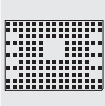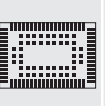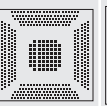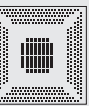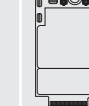
**Sound business relies on trusted data and applications**
DeviceWISE® and OneEdge™ provide secure and robust tools for deployment management and integration into your enterprise systems. secureWISE® empowers semiconductor OEMs with secure remote connectivity to monitor and access equipment in fabrication plants.

## *Security consists of more than the visible tip of the Iceberg*



Telit Cinterion Security

Visible Layer

Secure Operation

Advanced Application Security Features & Services

Telit Cinterion Security DNA

# Cellular IoT Module Overview

| Product types | LGA Modules | | | | | | | Adapter Cards | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Compact | | Classic | | | Smart | Advanced | mPCIe | | M.2 | |
| **5G Broadband 5G eMBB** | | | | | | | FE990B* | | | FN990B* FN990A FN980 | MV32 MV31 |
| **LTE Broadband LTE Cat 6 to Cat 18** | | | | | | | | LM960A18 | | LN920 | |
| **Performance IoT LTE Cat 1, Cat 4, 5G RedCap** | Coming soon | | ELS62 ELS63* | FE910C04* LE910C4/1 LE910R1 LE910Q1* | PVR81* PLS83 PLS63 | SE250B4 | | LE910 mPCIe | mPLS83 mPLS63 | FN920C04* | |
| **Cellular LPWA LTE-M, NB-IoT** | ME310M1* ME310G1 NE310L2 | TX82 TX62 TN23 | EXS82 EXS62 | ME910G1 ME910C1 | | | | ME910 mPCIe | | | |
| **Footprint** | xE310 | Tx | Ex | xE910 | Px | xE250 | xE990 | mPCIe | mPLS | xN | MVx |

*\* New or in development*

## IoT AppZone - Embedded Processing, where and what?

- AppZone Linux, complete OS + C language + others
- AppZone C, lean embedded RTOS + C language
- Android, full comprehensive OS + Apps + more
- IoT SDK C, lean embedded RTOS + C language
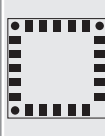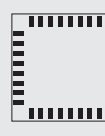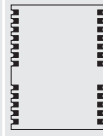
# IoT Gateway Overview
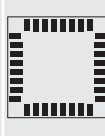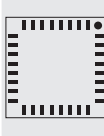
| Product types | Smart Gateway | | Efficient Gateway |
|---|---|---|---|
| | **Rugged cellular IoT gateways with embedded processing** | | **Configurable cellular IoT gateways with flexible interfacing options** |
| **Performance IoT LTE Cat 4** | | • LTE Cat 4<br>• RS 232 / RS 485*<br>• USB, Wi-Fi*, LAN*, GNSS*, PoE<br>• Cinterion IoT SDK<br>• GPIO/I2C/SPI | |
| **Performance IoT LTE Cat 1** | | | |
| **Cellular LPWA LTE-M, NB-IoT** | • LTE Cat M1, NB1/2<br>• USB<br>• GNSS<br>• Cinterion IoT SDK<br>• GPIO/I2C/SPI | | • LTE Cat M1, NB1/2<br>• 2G fallback<br>• RS232/RS485/USB<br>• Power over USB<br>• Cinterion IoT SDK |
| **Footprint** | SGX31-W USB (with RS232; GNSS) based on EXS82-W Rel. 1.2. | SGL81-W USB (with RS232)<br>SGL81-W LAN (with RS232; PoE)<br>SGL81-W RS485 (with USB)<br>all above variants with GNSS optional<br><br>SGL81-W WiFi (with LAN; RS232, WiFi; PoE)<br>all based on PLS83-W Rel.2.0 | EGX81 RS232<br>EGX81 RS485<br>EGX81 USB (with RS232)<br>all based on EXS82-W Rel.1.2 |

# Wi-Fi / Bluetooth Module Overwiew

| Product types | IoT MCU Modules | | | | | Companion Modules | | |
|---|---|---|---|---|---|---|---|---|
| **Streams** | 1×1 | | | | | 1×1 | 2×2 | TBD |
| **Bands** | 2.4 GHz | | 2.4 / 5.0 GHz | | | 2.4 / 5.0 GHz | | 2.4 / 5.0 / 6.0 GHz |
| **BT/BLE** | BLE 5.0 | BLE 5.4 | BLE 5.0 | BLE 5.4 | BLE 5.4 | BT/BLE 5.0 | BT/BLE 5.2 | BT/BLE 5.x |
| **Triple radio** | | | | | 802.15.4 | | | |
| Wi-Fi 7 802.11 be | | | | | | | | Concept |
| Wi-Fi 6 802.11 ax | | Concept | | Concept | Concept | | WE310K6-P | |
| Wi-Fi 5 802.11 a/b/g/n/ac | | | | | | WE866C6-P | | |
| Wi-Fi 4 802.11 be | WE310F5-I WE310F5-P | | WE310G4-I WE310G4-P | | | | | |

Certified Wi-Fi and Bluetooth technology modules provide faster development times and market availability. They are compliant with industry standards and global regulatory and industry certification requirements. Flexible options are available: standalone MCU modules or companion transceivers, which can be used in combination with our cellular modules to build Wi Fi to cellular gateways.

# GNSS Module Overwiew

| Product types | SE873 1.8 V | SL871 3.3 V | | SE868 1.8 V | | | | | SL869 3.3 V | SE878 3.3 V | SE868 1.8 V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SE873K5 | SL871L-S | SL871L-S | SE868K5-D • Dual Band (L1+L5) | SE868K5-SF | SE868K5-I | SE868SY-D • Dual Band (L1+L5) • Timing | SE868SY-SF | SL869L-V2 | SE878K3-A • Patch antenna 17×17 mm • Switch for external antenna | SE868K5-RTK |
| GPS L1 | | | | | | | | | | | |
| QZSS L1 | | | | | | | | | | | |
| Glonass G1 | | | | | | | | | | | |
| Galileo E1 | | | | | | | | | | | |
| Beidou B1 | | | | | | | | | | | |
| NavIC L5 | | | | | | | | | | | |
| GPS L5 | | | | | | | | | | | |
| QZSS L5 | | | | | | | | | | | |
| Galileo E5 | | | | | | | | | | | |
| Beidou B2 | | | | | | | | | | | |
| Footprint | SE873 | SL871 | | SE868 | | | | | SL869 | SE878 | SE868 |

🔵 AIROHA   ⚪ SONY   🟠 MEDIATEK (Legacy)

Telit Cinterion's GNSS positioning and timing modules provide turnkey location and navigation technology. If used in combination with Telit Cinterion's cellular modules, they enable integrated, advanced location-based services. You can get your solution off the ground with high-precision positioning and high-speed navigation in a matter of days.
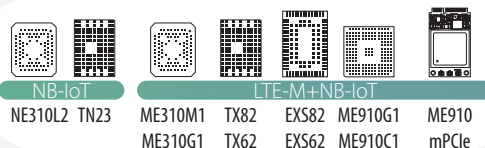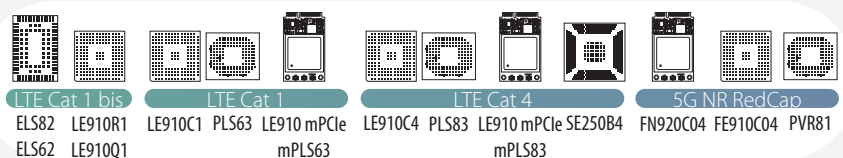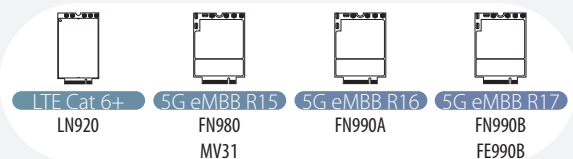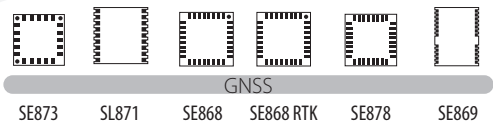
# 5G RedCap: Not just LTE Cat-4 Replacement

5G RedCap is the new technology that comes at a price premium over 4G LTE Cat-4.

## Main advantages

- Longer lifecycle
- Better user experience due to 20 MHz contiguous spectrum reserved by MNOs for 5G (e.g. C-band)
- Higher throughput, specially in uplink
- Lower latency, thanks to 5G SA
- Private 4G & 5G networking support for CBRS band B48/n48 and C-band n77/n78/n79
- Lower power due to advanced network features and also due to newer silicon process-node based chipsets

| Feature | LTE Cat 4 | 5G RedCap |
|---|---|---|
| Chipset Commercial Launch | 2014 | 2023 |
| Process Node | 28 nm | 4 nm |
| Apps CPU | 1.3 GHz Cortex-A7 | 1.9 GHz Cortex-A7 |
| Bandwidth (MHz)/Modulation | 20/64 QAM | 20/256 AQM |
| Carrier Aggregation | 1CA | 1CA |
| Peak Downlink (Mbps) | 150 | 220 |
| Peak Uplink (Mbps) | 50 | 100 |
| Core Network | 4G LTE | 5G Standalone |
| Band Support | 600 MHz to 2.5 GHz | 600 MHz to 7 GHz Module up to n79 |
| Power Saving Features | No | WUS, eDRX |
| CBRS / Private 4G/5G | Limited | Yes |
| C-band | No | Yes |
| Cost | $$ | $$$$ |
| Ecosystem / Product Readiness | Now | 2025 |

# Modules and Use Cases

| Metering & Sensing | Connected Assets, Status & Tracking | Remote Monito-ring& Control | Alerts & Supervision | Computing & Data Streaming | Highest Data Throughput | Critical, Industrial & Infrastructure |
|---|---|---|---|---|---|---|
| Smart Metering Smart Buildings, appliances Envitonmental monitoring Agricultural monitoring | Wearables Point of sale, vending Smart city Asset tracking & fleets | Precision farming Renewables, EV charging Telematics Smart Buildings | Alarm systems Smart grid monitoring Remote patient monitoring Security surveillance | Industrial handhelds Public Safety, Body cams Video telematics Connected machinery | Routers, Gateways, CPEs Video based applications Rugged computing Digital signage | First responder, defense Industrial & grid control, Automated guided vehicles Unmanned aerial vehicles |



**NB-IoT**
NE310L2  TN23

**LTE-M+NB-IoT**
ME310M1  TX82  EXS82  ME910G1  ME910
ME310G1  TX62  EXS62  ME910C1  mPCIe

**LTE Cat 1 bis**
ELS82  LE910R1
ELS62  LE910Q1

**LTE Cat 1**
LE910C1  PLS63  LE910 mPCIe
mPLS63

**LTE Cat 4**
LE910C4  PLS83  LE910 mPCIe  SE250B4
mPLS83

**5G NR RedCap**
FN920C04  FE910C04  PVR81

**LTE Cat 6+**
LN920

**5G eMBB R15**
FN980
MV31

**5G eMBB R16**
FN990A

**5G eMBB R17**
FN990B
FE990B

## Short Range Technology

Smart Home
Wearables
Smart Buildings
Security

| Wi-Fi 6 | Wi-Fi 6 | Wi-Fi 5 | Wi-Fi 4 | Wi-Fi 4 |
|---|---|---|---|---|
| WE310K6-P | WE310K6-P | WE866C6-P | WE310G4-I/P | WE310F5-I WE310F5-P |

## GNSS Technology

Tracking & Tracing
Smart Farming
Telematics
Smart City

**GNSS**
SE873  SL871  SE868  SE868 RTK  SE878  SE869