



Pervasive computing systems are capable of collecting, processing and communicating data, they can adapt to the data's context and activity. That means, in essence, a network that can understand its surroundings and improve the human experience and quality of life.

This Multi-Module gateway is based on Linux. It provides tremendous possibilities opening up the entire embedded applications ecosystem. It supports industry standard specifications like mission-critical operation in temperatures ranging between -30 °C and +70 °C

The CTHINGS.CO® Edge IoT Gateway (M Din Rail) also sports a large expansion system in order to enable plug-in modules for resilient industrial interfaces (digital and analog IOs, current measurement, high-current sourcing or sinking, galvanic isolation, relays, etc.).

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SPECIFICATIONS

Hardware Features	Industrially certified hardware for enhanced Edge Computing • NXP i.MX8M Plus Quad, quad-core ARM Cortex-A53, 1.8GHz • Memory RAM: 1GB – 8GB, LPDDR4, • Storage: 16GB – 128GB eMMC flash, • Dimensions: 110 x 30 x 95 mm (main unit) • Dimensions: 110 x 20 x 95 mm (extension modules) • Operating temperature range: -30 °C to +70 °C • Passively cooled • CE/FCC/UKCA certified & RoHS compliant device
Internal Interfaces	• 1x mini-PCIe full size connector with USB 2.0 • 1x M.2 Key-E up to 2230, PCIe Gen 3 x1 + USB 2.0 (as an external module attached to the main unit)
Physical Interfaces	• 2x 1 Gbps RJ-45 Ethernet • 1x RS485, 2-wire half-duplex • 1x RS232, Rx/Tx • 1x CAN bus port • 2x digital outputs + 2x digital inputs (Isolated, 24V, EN 61131-2) • 1x serial console via UART-to-USB bridge, micro-USB connector • 1x USB3.0 port, type-A connector
Electrical Specification	• 12V-24V DC (-20%/+20%) • Terminal block power input connector • EMI/ESD protected device • Myriad of power supply protection features: UVLO, OVP, OCP, RPP, surge/transients, soft-start, and more • CE, FCC, UKCA compliant

SPECIFICATIONS

Connectivity (options)	Full flexibility which allows plug and play exchange of connectivity modules to meet requirements: Bandwidth overview per connectivity technology: • Rel. 14 LTE Cat. 20: LTE-FDD: Max. 2.0 Gbps (DL); Max. 200 Mbps (UL) • Rel. 7 HSPA+: WCDMA: Max. 42 Mbps (DL); Max. 5.76 Mbps (UL) • Rel. 14 LTE Cat NB2: Max. 127 Kbps (DL); Max. 158.5 Kbps (UL) • Rel. 14 LTE Cat M1 with CE Mode B: Max. 588 Kbps (DL); Max. 1119 Kbps (UL) • EDGE: 296kbps (DL), Max. 236.8kbps (UL) • GPRS: 107kbps (DL), Max. 85.6kbps (UL) • GPS, GLONASS, Galileo, BeiDou/Compass, QZSS, Cell ID/Wi-Fi positioning • Wi-Fi 6E (a/b/g/n/ac/ax 2.4/5/6 GHz): Max. 2.4 Gbps • Bluetooth Low Energy (BLE) 5.3 • Wirepas 2.4 GHz MESH • Wirepas 5G NR+ • Zigbee / Thread
Use Cases	The gateways supports vast range of usage across industries. Application examples: • Smart Retail: monitoring stock, goods rotation, sales • Smart Logistics: tracking distribution and transport • Smart Product: embedded intelligence and compute • Industry 4.0: digital retrofitting, enhanced maintenance, remote operations, automation • Smart Metering: remote and wireless data collection
Software Features	• Linux® OS • Debian® • Yocto • Flexible I/O operations • Upgrade Over-The-Air (FOTA) • Support for CTHINGS.CO® Orchestra

Certifications

The CTHINGS.CO® Edge IoT Gateway Is CE Class-A & EU RoHS Directive Compliant. The Device Has Been Tested To Meet The Following Electromagnetic Compatibility Standards:

Electromagnetic emissions

- Conducted emission: EN 55022, EN 55014-1, EN 55011
- Radiated emission up to 6 GHz
- Harmonic current emission: EN 61000-3-2
- Voltage fluctuations and flicker: EN 61000-3-3

Immunity to electromagnetic interference (EMI):

- Electrostatic discharge (ESD) immunity: EN 61000-4-2
- Radiated electromagnetic field immunity: EN 61000-4-3
- Electrical fast transient / burst immunity: EN 61000-4-4
- Surge immunity: EN 61000-4-5
- Conducted disturbance immunity: EN 61000-4-6
- Power frequency magnetic field immunity: EN 61000-4-8
- Pulse magnetic field immunity: EN 61000-4-9
- Voltage dips & short interruptions: EN 61000-4-11

Extensive Connectivity

LTE Cat. 20, Cat. M, NB-IoT, EGPRS, Wi-Fi 6ax, BLE 5.3, Wirepas 2.4GHz MESH, Wirepas 5G NR+

Rich Software Ecosystem

Linux® OS (Yocto® and Debian®), Mainline Linux, FreeRTOS®

Vast IoT Protocol Suite

Native support of modern IoT Protocols: i.e. MQTT/-SN, Modbus TCP/RTU, Profinet, etc.

OA&M Linux OS

Remote operations, administration, and maintenance

Localisation

GPS, GLONASS, Galileo, BeiDou, COMPASS, Cell ID/Wi-Fi positioning, Wirepas 2.4/5G

RESTful

Multipurpose computing, hybrid data processing in edge, public or private cloud

Wide array of industrial IO Protocols

RS485, 2-wire half-duplex, 1x RS232, Rx/Tx, 1x CAN bus port, 2x digital outputs + 2x digital inputs (Isolated, 24V, EN 61131-2)

MPU

Expandable with additional modules to support more RS485, RS232, CAN, and GPIO channels

External appearance



I/O Modules (optional)

RS485

4x RS485 ports, 2-wire
Programmable baud rate of up to 4Mbps
Galvanically isolated from main unit

2 x 10-pin socket with push-in spring contacts

Up-to 3x RS485 or RS232 or MESH modules



WB

802.11ax WiFi and Bluetooth 5.3 BLE
Implemented with Intel WiFi 6E AX210 module

2x RP-SMA connectors

Up-to 1x WB module can be installed in stack
Must be installed in position A (next to main gateway)



MESH

Wirepas, DECT NR+, Bluetooth mesh, Thread, Zigbee
Implemented with Nordic Semiconductor nRF52/nRF91 modules

1x RP-SMA connectors

Up-to 3x RS485 or RS232 or MESH modules



I/O Modules (optional)

DI8O8

8x digital inputs, compliant with EN 61131-2
8x digital outputs, compliant with EN 61131-2
Galvanically isolated from main system

2 x 10-pin socket with push-in spring contacts

12 - 24 VDC from external source
4-pin socket with screw-type terminal

Up-to 4x DI8O8 modules



ADC8

8x analog input channels
Configurable 4...20mA | 0...10 V

2 x 10-pin socket with push-in spring contacts

Up-to 1x ADC8 module can be installed in stack



RS232

4x RS232 ports, RX/TX only
Programmable baud rate of up to 250kbps
Galvanically isolated from main unit

2 x 10-pin socket with push-in spring contacts

Up-to 3x RS485 or RS232 or MESH modules



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