CTHINGS.CO®
EDGE IOT SOLUTIONS

EDGE IOT GATEWAY (S)

Datasheet. Release 1.2

Remote monitoring of critical infrastructure with edge computing

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.

CTHINGS.CO® Edge IoT Gateway (S) connects whatever data customer needs to process directly at the edge, reducing latency and relieving connectivity networks, with full support of Orchestra Platform.

The 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 0°C and 50°C.

The design provides the flexibility needed while still keeping it simple! Based on the concept of modularity, it may operate with many wireless technologies without PCB redesign requirements. As of now, support for major cellular and other radio connectivity standards like Bluetooth 5.0, LTE, Wirepas 2.4GHz Mesh, Wi-Fi 802.11 a/b/g/n/ac, etc. are assured that will open up tremendous possibilities.

To ease deployment of use cases and solutions, the Edge IoT Gateway (S) is designed alongside CTHINGS.CO® Orchestra, a state-of-the-art networking solution making provisioning and maintenance of private networks as simple as a few clicks. Additionally, we open the possibility for curated backend systems including open APIs for connecting external systems, as well as data visualisation capabilities through our interfaces and supported protocols.

PROPERTY	VALUE
Hardware Features	Industrially certified hardware for enhanced Edge Computing • NXP i.MX 8M Nano Arm Cortex A53 Single core @1500MHz • ARM® Cortex®-M7 real-time co-processor, 650 MHz • DDR4 RAM: 1 GB • Built-in eMMC flash storage 8 GB • Customizable* with LTE Cat. 4 • Customizable* with Wirepas® 2.4GHz Mesh • Wi-Fi 802.11 a/b/g/n/ac • Bluetooth 5.0 • On-board hardware watchdog & support for secure boot • Operating temperature range: 0 °C to +50 °C • Small and lightweight: 150 x 85 x 40 mm • Plastic casing with internal Wi-Fi/BT antenna • Widely certified, IP20 protection class, RoHS compliant device
Physical Interfaces	• 1x USB 2.0 High-Speed Ports; Type-A • 1x 1000 Mbps Ethernet port; • 1x 802.3af Type-1 PoE; RJ-45 • Customizable* 1x RS-485*; galvanic isolation • Customizable* 1x CAN* bus port; galvanic isolation • 3x general-purpose user-controlled LEDs • 1x Nano-SIM Card
Electrical Specification	• DC supply voltage: 9 V to 36 V • IEEE 802.3af Type-I Power over Ethernet (PoE) supply* • Ultra-low power consumption: typically 5W • EMI/ESD protected device; power supply protection features • FCC, CE, UK CA; EMC EN 55032/5, EN 61000-6-3 certification • EN/UL/IEC 62368-1 safety certification • RoHs compliant
Variants	A) EDGEIOTGS-SRG0401.02SW (IoT Compact BLE) Wi-Fi + Bluetooth + Wirepas 2.4GHz Mesh B) EDGEIOTGS-SRG0405.02SW (IoT Compact Extended LTE) LTE Cat4. + Wi-Fi + Bluetooth + Wirepas 2.4GHz Mesh 1x RS485 + 1x CAN

** depending on system configuration*

Other features

PROPERTY	VALUE
Connectivity	Full flexibility which allows plug-and-play exchange of connectivity modules to meet requirements. Bandwidth overview and connectivity technologies: • Rel. 8 **LTE Cat. 4**: LTE-FDD: 150 Mbps (DL); 50 Mbps (UL) LTE-TDD: 130 Mbps (DL); 30 Mbps (UL) • Rel. 7 **HSPA+**: WCDMA: Max. 42 Mbps (DL); Max. 5.76 Mbps (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) 5.0 / 5.3** • **Wirepas 2.4 GHz MESH**
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 • OpenWRT capable • Flexible I/O operations • Upgrade Over-The-Air (OTA) • Support for CTHINGS.CO® Orchestra

Supported Frequencies

LTE / HSPA+ subsystem*

Band name	Transmit (MHz)	Receive (MHz)	LTE-FDD	LTE-TDD	UMTS	GSM
IMT (2100)	1920-1980	2110-2170	B1	–	B1	–
PCS (1900)	1850-1910	1930-1990	B2	–	B2	PCS1900
DCS (1800)	1710-1785	1805-1880	B3	–	B3	DCS1800
AWS	1710-1755	2110-2155	B4	–	B4	–
Cell (850)	824-849	869-894	B5	–	B5	GSM850
UMTS 800	830-840	875-885	–	–	B6	–
IMT-E	2500-2570	2620-2690	B7	–	–	–
EGSM (950)	880-915	925-960	B8	–	B8	EGSM900
700 low A-C	699-716	729-746	B12	–	–	–
700 upper C	777-787	746-756	B13	–	–	–
700 upper D	788-798	758-768	B14	–	–	–
B18	815-830	860-875	B18	–	–	–
B19	830-845	875-890	B19	–	–	–
EU800	832-862	791-821	B20	–	–	–
PCS + G	1850-1915	1930-1995	B25	–	–	–
B26	814-849	859-894	B26	–	–	–
700 APAC	703-748	758-803	B28	–	–	–
IMT-E (B38)	2570-2620	2570-2620	–	B38	–	–
S-band	2300-2400	2300-2400	–	B40	–	–
BRS (US)	2555-2655	2555-2655	–	B41	–	–
B66	1710-1780	1710-1780	B66	–	–	–
B71	663-698	617-652	B71	–	–	–

** depending on system configuration*

GNSS subsystem*

Type	Frequency (MHz)
GPS	1575.42 ± 1.023 (L1)
Galileo	1575.42 ± 2.046 (E1)
QZSS	1575.42 (L1)
GLONASS	1597.5-1605.8
BeiDou / COMPASS	1561.098 ± 2.046

GNSS acquisition performance:	
Cold start (open sky)	18.9 seconds typical
Warm start (open sky)	1.5 seconds typical
Hot start (open sky)	1.1 seconds typical
CEP-50 accuracy (open sky)	1 metre typical

** depending on system configuration*

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:

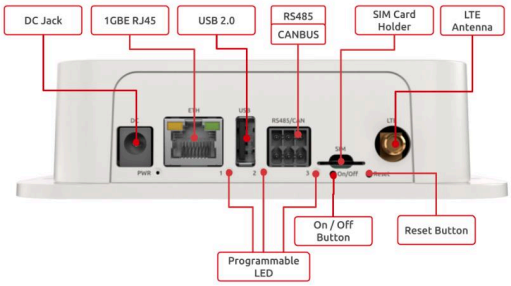
Electromagnetic emissions	• Conducted emission: EN 55022, EN 55014-1, EN 55011 • Radiated emission up to 6 GHz • Harmonic current emission: EN 61000-3-2 • Voltage fluctuations and flicker: EN 61000-3-3
Immunity to electromagnetic interference (EMI):	• Electrostatic discharge (ESD) immunity: EN 61000-4-2 • 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	Wireless connectivity via: LTE, 3G, EGPRS, Wi-Fi 6E, BLE 5.0, Wirepas 2.4GHz Mesh
Vast IoT Protocol Suite	Native support of modern IoT Protocols: i.e. MQTT/-SN, Modbus* RTU, Modbus* TCP, etc.
Localisation	GPS, GLONASS, Galileo, BeiDou, COMPASS, Cell ID/Wi-Fi positioning, Wirepas MESH
Interfaces	Vast integration of sensors network on common data bus: i.e. USB 2.0, CAN bus, RS485
Rich Software Ecosystem	Linux® OS (Yocto® and Debian®), Mainline Linux, FreeRTOS®, Ubuntu® Server, OpenWRT
OA&M Linux OS	Remote operations, administration, and maintenance
RESTful	Ease of data access via REST Web APIs
MPU	Multipurpose computing, hybrid data processing in edge, public or private cloud

External appearance

Edge IoT Gateway: Front Panel
(IoT Compact BLE)

Edge IoT Gateway: Front Panel
(IoT Compact Extended BLE + LTE)



Edge IoT Gateway: Panel
(IoT Compact Extended BLE + LTE)

Edge IoT Gateway
(IoT Compact Extended BLE + LTE)

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