DATASHEET

Tropos
TRO610 Series

Cellular Field Area Network Router

TRO610 is a low cost, small form-factor cellular router. It provides industry-standard local interfaces and cellular backhaul for Utilities, Smart Cities, Oil & Gas, and Mining.

The TRO610 is ideal for connecting one or two client devices. It is tailored for large scale industrial IoT deployments, within an extended fleet ecosystem.

Product overview

TRO610 is an addition to the Hitachi Energy TRO600 cellular portfolio, providing reliable and secure communications for industrial applications.

TRO610 provides a wide variety of local protocol options over serial and Ethernet IP, routing those over several cellular options.

Security is incorporated throughout both hardware and software design – firmware images are delivered encrypted and authenticated prior to loading. With device certificates, Integrated zone-based firewall and VPN tunnel options, TRO610 provides critical infrastructure grade security.

Business benefits

TRO610 delivers an "always-on," highly available, connection to cellular networks. It is specifically designed for Field Area Network applications.

As active members of the 450MHz Alliance, the Anterix Active Ecosystem, and other industry initiatives, Hitachi Energy brings the experience and expertise to serve mission critical applications with the TRO610.

Wireless networks ensure that the optimal level of service can be achieved by providing several options for reliable and resilient communications.

Hitachi Energy

Product specifications

Software feature highlights

Security
- Support for X.509 PKI Certificates
- Encrypted device management interfaces
- Role-based access using centralized RADIUS authentication or local user database
- IKEv2 IPsec VPN (IPv4, IPv6)
- AES-128, AES-256 encryption schemes
- SHA-384, SHA-512 hashing algorithms
- Integrated Zone-based Firewall and MAC address filtering
- Every software release tested for robustness of the communication stack and externally accessible communication interfaces
- 802.1x authentication for Ethernet clients

Provisioning support
- Device management using secure HTTPS web interface
- Central FCAPS, firmware management, low-touch deployment using Supros

Monitoring
- Supros, Hitachi Energy's Network Element Manager
- SNMP
- Syslog

Availability
- Dual boot partitions
- Over-the-air firmware upgrades
- Dual SIMs for automatic failover to alternative cellular network

Routing and IP services
- IPv4 and IPv6
- Border Gateway Protocol (BGP)
- Generic Routing Encapsulation (GRE)
- Network Address Translation (NAT)
- Dynamic Host Configuration Protocol (DHCP) Server
- Access Control Lists (ACL)
- Raw and interpreted serial data encapsulation in IP
- System time from GPS or from built-in NTP Client
- NTP, SNTP server (IPv4, IPv6)
- Port Forwarding

Ethernet services
- Untagged and 802.1q VLAN tagged (access and trunk modes). Maximum of 32 VLANs

Hardware characteristics

Physical characteristics
- Weight excluding antennas and mounting accessories: 488 g / 17.2 oz
- Dimensions excluding antenna jacks and mounting accessories: 120 x 46 x 85 mm / 4.7 x 1.8 x 3.3 in W x H x D
- Options for DIN-Rail mounting and wall mounting

Environmental specifications
- Operating temperature range:-40°C to 70°C / -40°F to 158°F
- Storage temperature range: -40°C to 85°C / -40°F to 185°F
- IP30 rated enclosure: UL579/IEC 60529
- Shock & vibration: MIL-STD-810G; 514.7

Power
- Input voltage range: 7-32 Volts DC

Power consumption

TRO610 model	IDLE	Typical	High	Max (bootup)
Cellular Only models	1,5 W	2,2 W	3,5 W	4,6 W
Cellular + Bluetooth models	1,5W	2,3W	3,7	4,7

Processing environment
- Main CPU: Single core 600 MHz, 32-bit ARM-processor
- Operating Memory: 1 GB DRAM
- Storage: 4 GB Flash

Location (GNSS) receiver
- Supports GPS (1575.42 MHz), GLONASS
- (1602 MHz), Beidou (1561.098 MHz), Galileo (1575.42 MHz), QZSS (1575.42 MHz)
- Acquisition time: 32 sec or less (cold start)
- Location reporting accuracy: < 2 m (50%); < 5 m (90%);
- GNSS antenna connector: SMA Female

Serial protocols
- Raw UDP and TCP IP transport
- Interpreted Terminal, Modbus (RTU, ASCII), DNP3, PG&E2179 and Mirrored Bits
- IEC 101 / IEC 104 conversion

Ethernet ports
- One or two RJ45 10/100/1000BASE-T IEEE 802.3
  - Auto-negotiated duplex mode and speed
  - LEDs for link and activity

Serial ports
- Speeds: 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
- Parameters: 7 or 8 bits data, Odd/Even/No parity
- One RS-232 port
  - 3-wire interface: TX, RX and GND connections
- One RS-485 port
  - 3-wire interface: +, - and GND connections

Analog and digital inputs
- Information from analog and digital inputs is delivered by SNMP traps
- One battery voltage monitor input:
  - Input voltage range: 1-50V DC to common ground
  - Configurable voltage reporting interval
  - Configurable critical voltage threshold
- One contact closure input:
  - Input open or closed to common ground
  - Configurable reporting for transitions

USB service port
Secure service port (future). Not for communication purposes.

Cellular radio options
The following cellular radios are available for TRO610. Refer to ordering information section for ordering numbers. Cellular antenna connectors are SMA Female jacks. Refer to the accessories section for remote-mount antenna options, RF surge protectors and RF cables.

Model D1
- 4G LTE Cat-4, Rel 10
  - Supported bands: B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B19, B20, B26, B28
- UMTS
  - Supported bands: B1, B2, B4, B5, B8, B19
- GSM/EDGE
  - Supported bands: B2, B3, B5, B8
- Regulatory approvals: FCC, CE, UKCA, GCF
- Carrier certifications: pending
- Anterix support

Model D2
- 4G LTE Cat-M1 / Cat-NB2 Rel 14
  - Supported bands: B1, B3, B8, B20, B28, B31, B72, B87
- Regulatory approvals: CE, UKCA, GCF
- Carrier certifications: pending

Bluetooth radio option B1
2.4 GHz Bluetooth radio (future)

Certifications and compliance
- Safety:
  - UL 62368-1
  - CSA 22.2 No. 62368-1
  - IEC/EN 62368-1
- EMC - Electromagnetic Compatibility:
  - FCC CFR 47 Part 15
  - Industry Canada RSS 247
  - EN 300 328
  - EN 301 489
  - EN 303 413
  - EN 55032
  - EN 55035
  - IEEE 1613 / IEC 61850
- Environmental
  - EN 61000
  - ANSI/ISA 12.12.01 (Class 1, Div 2)
  - CSA 213 (Class 1, Div 2)
  - ATEX Zone 2 (UL 60079-0, UL60079-15)

- Industry and carrier certifications for cellular radios are listed in the cellular radio options section.

Images and Dimensions
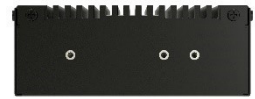
Projections

Top View

Front View

Bottom View – with wall
mount accessory
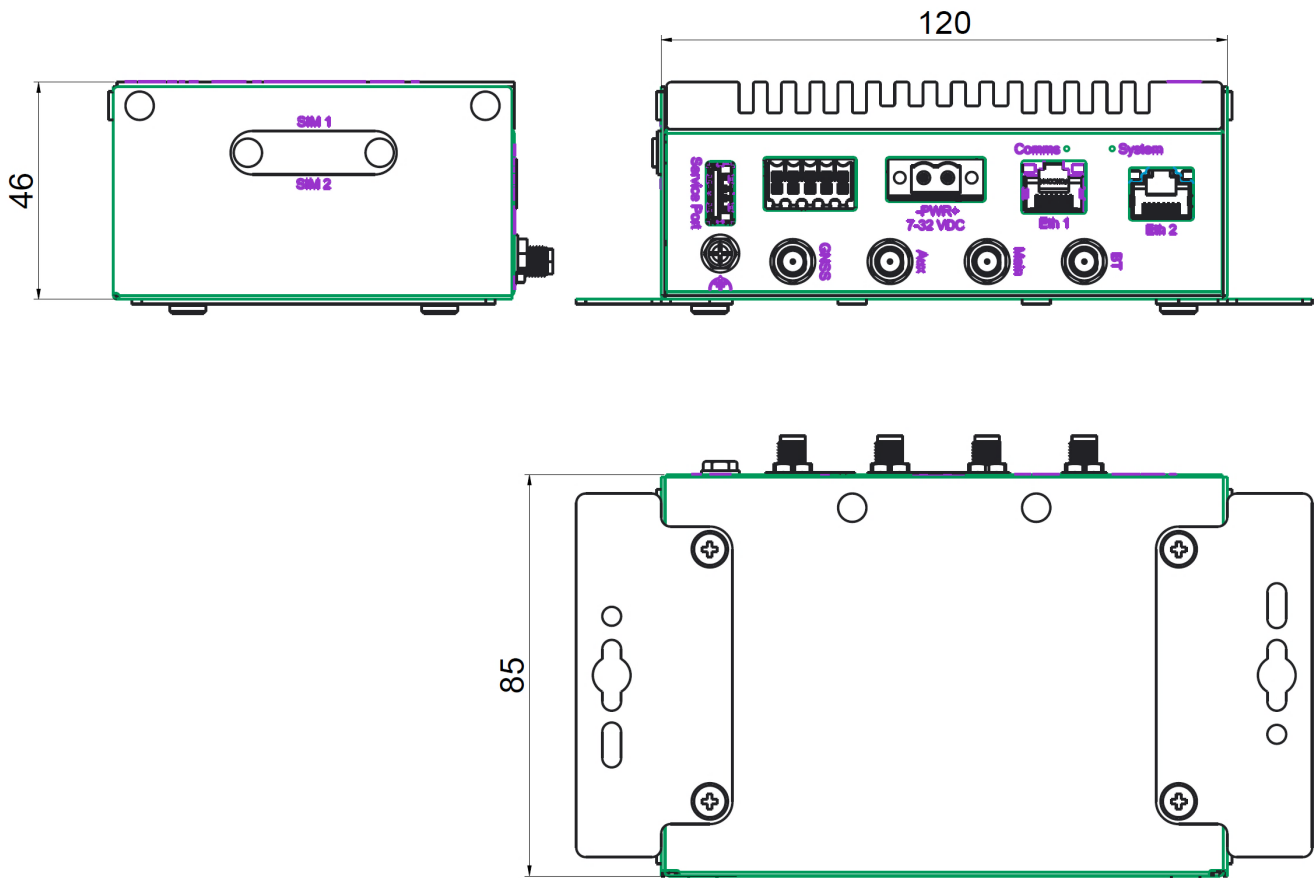

Isometric View - with
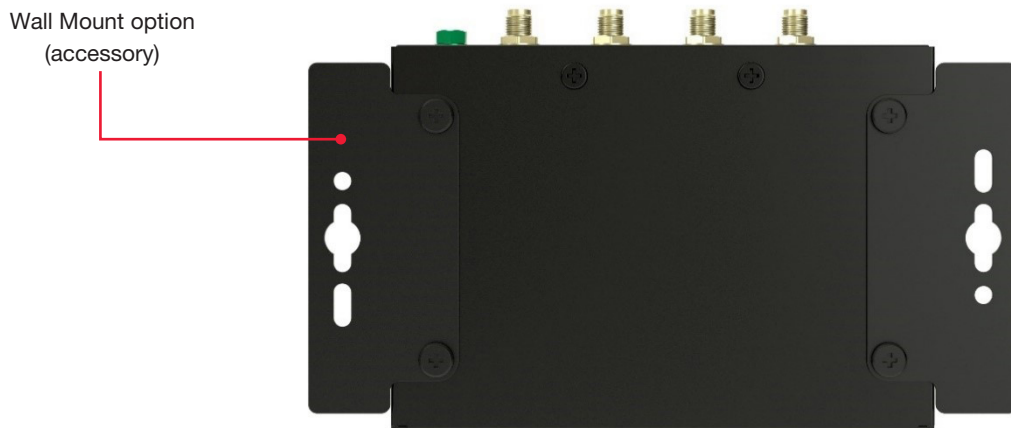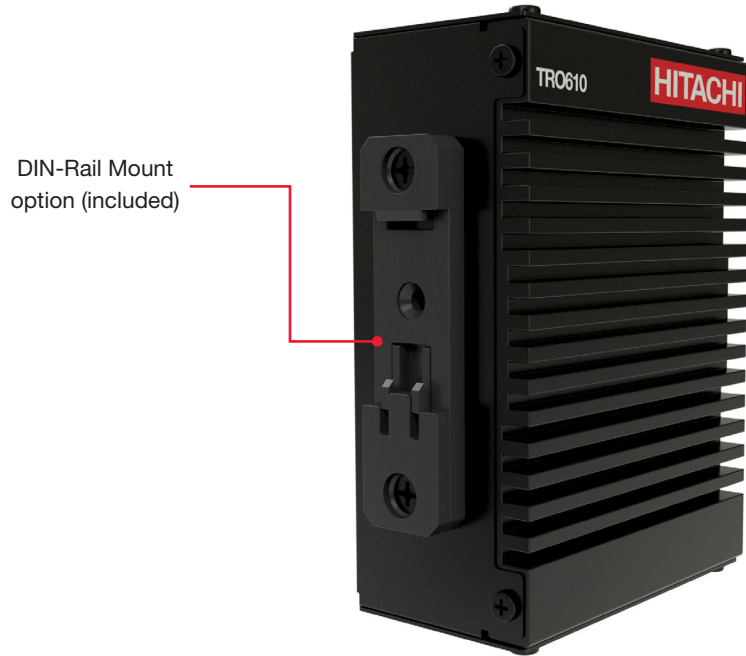wall mount accessory

Right Side View

Back View

Outer Dimensions excluding antennas and mounting accessories

Installation Support Highlights

DIN-Rail Mount
option (included)

Wall Mount option
(accessory)

Ordering information

TRO610 Models

Product number	Product description
T6100D100D200010	TRO610 Router, LTE Cat-4 / UMTS / GSM EDGE, Cat-NB2, 1 Eth, 1 RS232, 1 RS485, DC Power
T6100D1B1D200010	TRO610 Router, LTE Cat-4 / UMTS / GSM EDGE,, Bluetooth, 2 Eth, 1 RS232, 1 RS485, DC Power
T6100D200D200010	TRO610 Router, LTE Cat-M1 / Cat-NB2, 1 Eth, 1 RS232, 1 RS485, DC Power
T6100D2B1D200010	TRO610 Router, LTE Cat-M1 / Cat-NB2, Bluetooth, 2 Eth, 1 RS232, 1 RS485, DC Power

Accessories

Mounting Accessories

Product number	Product description
T61-WALLMTKIT1	Two wall mount brackets and four enclosure screws for TRO610

Antennas

Product number	Product description
AN02LTE	Set of two cellular multiband antennas, 2 dBi omnidirectional, N-male connectors
AN06CBRS	Set of two CBRS band antennas, 6 dBi omnidirectional, N-male connectors
AN06P2LTE	Cellular multiband antenna, 6/8 dBi directional panel, two N-female connectors, articulating mounting kit
AN05DBW	Set of three 802.11 dual-band antennas, 5/7 dBi omnidirectional, N-male connectors
ANGPS001	GNSS active antenna for GPS, Galileo, QZSS, GLONASS, Beidou, 5dBi (antenna), 40dBi (LNA), half-sphere directivity, one N-male connector

Remote Antenna Mounting Brackets

Product number	Product description
MBKIT004	Antenna mounting bracket kit, 2 holes
MBKIT005	Antenna mounting bracket, 3 holes, 20cm / 6in spacing

Warranty and Maintenance Plans

Hardware and software warranty

Hardware warranty up to five years from the date of shipment of the hardware; return to point of purchase.

Software warranty (90) days from the date of shipment of the hardware.

For additional details on hardware and software warranty, and how to submit a warranty claim, refer to Power Grids wireless standard hardware and software support agreement.

Complete care maintenance plans

Complete care maintenance plans for software and hardware available.

For additional details on complete care maintenance plans, refer to Power Grids wireless standard hardware and software support agreement.