DATA SHEET

Tropos TRO620

Cellular Router

The TRO620 DIN-rail mounted cellular router provides a reliable and secure connection over public and private cellular infrastructures. This advanced communications platform comes with an option to combine cellular communications with Hitachi Energy's patented private broadband mesh* network, providing unparalleled flexibility in field area

Product overview
The TRO620 is built specifically for utility, oil and gas, mining and industrial applications that monitor and control field automation endpoints such as intelligent electrical devices, industrial process controllers and SCADA devices. It supports contemporary applications like video surveillance and other streaming applications, while the Ethernet and Serial interfaces support a wide variety of current and legacy protocols.

Security is a common theme throughout both hardware and software design. From a highly secure service port, to an integrated Trusted Platform Module (TPM 2.0), to device certificates, Integrated zone-based firewall and VPN tunnel options, TRO620 provides critical infrastructure grade security.

* WiFi and Broadband mesh functionality available in Q2 2023

Business benefits
TRO620 delivers an "always-on," highly available, high performance wireless network, specifically designed to enable utility, oil, and gas, mining and smart city applications.

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 & Wireless clients

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

Monitoring
- 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
- Per port untagged and 802.1q VLAN access and trunk modes, maximum of 32 VLANs

Serial
- Raw UDP and TCP IP transport
- Interpreted Terminal, Modbus (RTU, ASCII), DNP3 and Mirrored Bits

Hardware Characteristics

Physical Characteristics
- Weight: 1,250g / 2lbs 12 oz
- Dimensions: 185 x 130 x 54 mm / 7.25 x 5.12 x 2.12 in

Environmental specifications
- Operating temperature range: -40°C to 75°C / -40°F to 167°F
- Storage temperature range: -40°C to 85°C / -40°F to 185°F
- Ingress protection: IEC 60529 IP10
- Shock & vibration: MIL-STD-810G; 514.7
- Transportation: ISTA 2A

NOTE: Operating temperature ranges exclude cellular modems which may have operating temperature ranges different from the TRO620. Such deviations are indicated in the cellular options section.

Power
- Input voltage range: 7-32 Volts DC
- Common Chassis Ground

Power Consumption

TRO620 model	IDLE	Typical	High	Max (bootup)
LTE Only models	3.1 W	3.6 W	3.8 W	6.2 W
LTE, 2.4 GHz and 5 GHz 802.11 models	6.0 W	7.5 W	12.3 W	31 W

Processing environment
- Main CPU: Dual core 1.4 GHz, 32-bit ARM-processor
- Operating Memory: 1 GB DRAM
- Storage: 4 GB Flash, external SD card slot

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%).
- Antenna connector: SMA Female

Ethernet ports

- Four RJ45 10/100/1000BASE-T IEEE 802.3
- Ethernet interfaces
  - Auto-negotiated duplex mode and speed
  - LEDs for link and activity
- One 100Mbps/1Gbps SFP port

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
- Two RS-485 ports
  - 3-wire interface: +, - and GND connections

Analog and digital inputs

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

USB service port

- Secure service port. Not for communication purposes.

Cellular radio options

The following cellular radios are available for TRO620.
Refer to ordering information section for ordering numbers. Cellular antenna connectors are two SMA Female. Refer to accessories section for antennas, RF surge protectors and cables.

Model C1 (US)

- 4G LTE Cat-12
  - Supported bands: B1, B2, B3, B4, B5, B7, B8, B9, B12, B13, B14, B18, B19, B20, B26, B29, B30, B32, B41, B42, B43, B46, B48, B66
- 3G HSPA+ (up to 42 Mbps down, 5.8 Mbps up)
  - Supported bands: B1, B2, B4, B5, B6, B8, B9, B19
- Regulatory approvals: FCC, PTCRB, GCF
- Carrier certifications: AT&T; Verizon
- FirstNet® Ready™

Model C5 (global)

- 4G LTE Cat-12
  - - Supported bands: B1, B2, B3, B4, B5, B7, B8, B9, B12, B13, B18, B19, B20, B26, B28, B29, B30, B32, B41, B42, B43, B46, B48, B66
- 3G HSPA+ (up to 42 Mbps down, 5.8 Mbps up)
  - Supported bands: B1, B2, B4, B5, B6, B8, B9, B19
- Regulatory approvals: GCF
- Carrier certifications: pending

Model D1 (Global)

- 4G LTE Cat-4
  - - Supported bands: B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B26, B19, B20, B28
- 3G HSPA+
  - Supported bands: B1, B2, B4, B5, B8, B19
- Regulatory approvals: FCC, PTCRB, GCF
- ANTERIX ACTIVE™ - 900 MHz PLTE network support
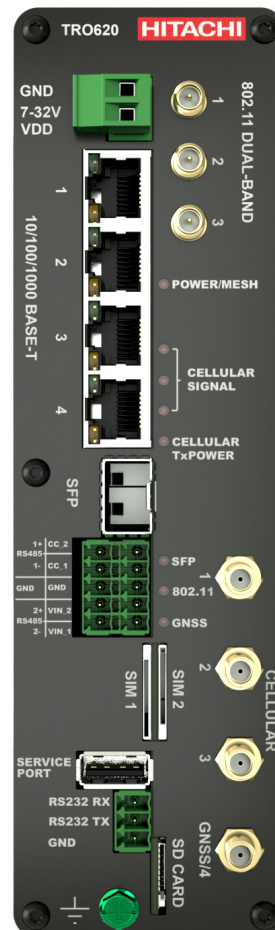
802.11 radios option

2.4 GHz and 5GHz 802.11 2x2 MIMO radios are available as an option for TRO620. Refer to ordering information section for ordering numbers.

802.11 antenna connectors are four RP-SMA Female – two 2.4 GHz and two 5 GHz antennas are required for optimal performance. Refer to accessories section for antennas, RF surge protectors and cables

The information provided below represents the maximum technical capabilities of the radios.

Compliance with country-specific regulations is accomplished through a country selector function in the user interface.

The country selector may restrict output power, prohibit the use of certain channels, channel widths and/or bands, and manipulate the DFS functions of both 802.11 radios. WiFi and Broadband mesh functionality available in Q2 2023

2.4 GHz 802.11 radio for Tropos Mesh and WiFi access

- Supported radio technologies:
  - 802.11b with MRC across 2 receivers
  - 802.11g with MRC across 2 receivers
  - 802.11n supporting up to two spatial streams (2x2 MIMO)
- Receiver and transmitter center frequency range: 2.412 – 2.484 GHz
- Channel width options:
  - 5 MHz, 10 MHz (Tropos mesh connections only)
  - 20 MHz, 40 MHz (Tropos mesh connections and WiFi access)
- Maximum transmitted EIRP: 36 dBm total, assuming 7.4dBi antennas
- A country selector function will adjust the maximum transmitted power to comply with regulations. WiFi and Broadband mesh functionality available in Q2 2023

5 GHz 802.11 radio for Tropos Mesh and WiFi access

- Supported radio technologies:
  - 802.11a with MRC across 2 receivers
  - 802.11n supporting up to two spatial streams (2x2 MIMO)
  - 802.11ac supporting up to two spatial streams (2x2 MIMO)
- Receiver and transmitter center frequency ranges:
  - 5.150 – 5.250 GHz (UNII-1)
  - 5.250 – 5.350 GHz (UNII-2A)
  - 5.470 – 5.725 GHz (UNI-2C)
  - 5.725 – 5.875 GHz (UNII-3)
- Minimal center frequency spacing: 5 MHz
- Channel width options:
  - 5 MHz, 10 MHz (Tropos mesh connections only)
  - 20 MHz, 40 MHz, (Tropos mesh connections and WiFi access)
- Maximum transmitted EIRP: 36 dBm total, assuming 8 dBi antennas
- A country selector function will adjust the maximum transmitted power to comply with regulations. WiFi and Broadband mesh functionality available in Q2 2023

Certifications and compliance

- Safety:
  - IEC 60950-1
  - 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 55032
  - EN 55035
  - IEEE 1613 / IEC 61850
- Industry and carrier certifications for cellular radios are listed in the cellular radio options section.

Planned certifications

- 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)

Ordering information

TRO620 Models

Product number	Product description
T6200C100D201011	TRO620 DIN Rail Mount Router, Cat-12 LTE (AT&T, FirstNet Ready, Verizon, CBRS)
T6200C500D200011	TRO620 DIN Rail Mount Router, Cat-12 LTE (Global, CBRS)
T6200C500D204011	TRO620 DIN Rail Mount Router, Cat-12 LTE (Russia)
T6200D100D201011	TRO620 DIN Rail Mount Router,Cat-4 LTE (ANTERIX ACTIVE™)

Accessory Kits

Product number	Product description
ANKITR2LTE1G	Remote mount kit for TRO620 – Cellular, GNSS

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
ANC2LTE1G	All-in one antenna, dual cellular multiband, GNSS, three 1m / 3ft cables with matched SMA and RP-SMA male connectors, 25mm / 1 in mounting hole
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

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.

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