

## Tropos TRO620 Series 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 ABB Power Grids patented private broadband mesh\* network, providing unparalleled flexibility in field area network design.

### 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.

\* Broadband mesh functionality available in Q4 2021

### 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.

# 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
- Integrated IKEv2 IPsec VPN
- 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

### Provisioning Support

- Device management using secure HTTPS web interface
- Central FCAPS and firmware management using Supros

### Availability

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

### Routing and IP Services

- Border Gateway Protocol (BGP)
- Generic Routing Encapsulation (GRE)
- Network Address Translation (NAT)
- Dynamic Host Configuration Protocol (DHCP) Server
- Access Control Lists (ACLs)
- Raw and interpreted serial data encapsulation in IP
- System time from GPS or from built-in NTP Client

### 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 IP30
- 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)
Cellular only models	3.1 W	3.6 W	3.8 W	6.2 W
Cellular, 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
- Edge Compute ready

### 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
  - Max transmit power: 23 dBm conducted
- 3G HSPA+ (up to 42 Mbps down, 5.8 Mbps up)
  - Supported bands: B1, B2, B4, B5, B6, B8, B9, B19
  - Max transmit power: 23 dBm conducted
- Regulatory approvals: FCC, PTCRB, GCF
- Carrier certifications: AT&T; FirstNet; Verizon

**Model C2 (Europe)**

- 4G LTE Cat-4
  - Supported bands: B1, B3, B7, B8, B20, B28
  - Max transmit power: 24 dBm conducted
- 3G UMTS, HSPA+ (up to 42 Mbps down, 5.8 Mbps up)
  - Supported bands: B1, B8
  - Max transmit power: 24 dBm conducted
- 2G EDGE, GSM, GPRS (up to 384 Kbps)
  - Supported bands: E-GSM 900, DCS 1800
  - Max transmit power: 33 dBm (E-GSM 900), 30 dBm (DCS 1800) conducted
- Regulatory approvals: CE, GCF
- Carrier certifications: pending

**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
  - Max transmit power: 23 dBm conducted
- 3G HSPA+ (up to 42 Mbps down, 5.8 Mbps up)
  - Supported bands: B1, B2, B4, B5, B6, B8, B9, B19
  - Max transmit power: 23 dBm conducted
- Regulatory approvals: GCF
- Carrier certifications: pending

## 802.11 Radios Option

Broadband mesh functionality is available as a software update with a mesh license in Q4 2021.

2.4 GHz and 5GHz 802.11 3x3 MIMO radios are available as an option for TRO620. Refer to ordering information section for ordering numbers.

802.11 antenna connectors are three RP-SMA female. Note that dual band 2.4 GHz and 5 GHz antennas are required. 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.

### 2.4 GHz 802.11 Radio for Tropos Mesh and WiFi Access

- Supported radio technologies:
  - 802.11b with MRC across 3 receivers
  - 802.11g with MRC across 3 receivers
  - 802.11n supporting up to three spatial streams (3x3 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 conducted transmitted power: 26 dBm per chain, 30 dBm total
- Maximum transmitted EIRP: 31 dBm per chain, 34 dBm total, assuming 5dBi antennas
- A country selector function will adjust the maximum transmitted power to comply with regulations.

### 5 GHz 802.11 Radio for Tropos Mesh and WiFi Access

- Supported radio technologies:
  - 802.11a with MRC across 3 receivers
  - 802.11n supporting up to three spatial streams (3x3 MIMO)
  - 802.11ac supporting up to three spatial streams (3x3 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 (UNII-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, 80 MHz, 160 MHz (Tropos mesh connections and WiFi access)
- Maximum conducted transmitted power: 24 dBm per chain, 28 dBm total
- Maximum transmitted EIRP: 32 dBm per chain, 36 dBm total, assuming 8 dBi antennas
- A country selector function will adjust the maximum transmitted power to comply with regulations.

## 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 301 489
  - EN 55032
  - EN 55035
- Industry and carrier certifications for cellular radios are listed in the cellular radio options section.

### Planned Certifications:

- IEEE 1613 / IEC 61850 (in progress)
- EN 61000-4 (in progress)
- EN 300 328
- EN 301 893
- 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
T6200C100D201010	TRO620 DIN Rail Mount Router, Cat-12 LTE (AT&T, FirstNet, Verizon, CBRS)
T6225C100D201010	TRO620 DIN Rail Mount Router, 2.4GHz, 5GHz, Cat-12 LTE (AT&T, FirstNet, Verizon, CBRS)
T6200C200D202010	TRO620 DIN Rail Mount Router, Cat-4 LTE (Europe)
T6225C200D202010	TRO620 DIN Rail Mount Router, 2.4GHz, 5GHz, Cat-4 LTE (Europe)
T6200C500D200010	TRO620 DIN Rail Mount Router, Cat-12 LTE (Global, CBRS)
T6225C500D200010	TRO620 DIN Rail Mount Router, 2.4GHz, 5GHz, Cat-12 LTE (Global, CBRS)
T62250000D200010	TRO620 DIN Rail Mount Router, 2.4GHz, 5GHz (Global)

## Accessories

### Accessory Kits

Product number	Product description
ANKITV3DBW2LTE1G	Vehicular mount kit for TRO620 – 2.4 GHz, 5 GHz, Cellular, GNSS
ANKITR3DBW1G	Remote antenna mount kit for TRO620 – 2.4 GHz, 5 GHz, GNSS
ANKITR3DBW2LTE1G	Remote mount kit for TRO620 – 2.4 GHz, 5 GHz, Cellular, GNSS
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
AN05DBW	Set of three 802.11 dual-band antennas, 5/7 dBi omnidirectional, N-male connectors
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
ANC3DBW1G	All-in-one antenna, triple 802.11 dual-band, GNSS, four 1m / 3ft cables with matched SMA and RP-SMA male connectors, 25mm / 1 in mounting hole
ANC3DBW2LTE1G	All-in-one antenna, triple 802.11 dual-band, dual cellular multiband, GNSS, six 1m / 3ft cables with matched SMA and RP-SMA male connectors, 25mm / 1 in mounting hole
ANCM3DBW2LTE1G	All-in-one antenna, triple 802.11 dual-band, dual cellular multiband, GNSS, six 5m / 17ft cables with matched SMA and RP-SMA male connectors, magnetic mount
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.

## 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.

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.

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