

# Micros 411

## Broadband client node for wired IIoT clients



Micros 411 client nodes are used to connect wired Industrial Internet of Things, (IIoT) clients to Tropos broadband mesh networks. They enable cost-effective and highly secure IP communications for utility, oil and gas, mining and industrial applications

Micros 411 enables monitoring and control of field automation endpoints such as intelligent electrical devices, industrial process controllers and SCADA devices. Ethernet and serial interfaces supporting DNP3 and Modbus provide future-proof operation with new and legacy devices. An integrated firewall provides enterprise-class security. This enterprise security feature extends to the wired Ethernet and serial ports. An integrated GPS receiver greatly simplifies installation, commissioning and asset tracking.

### Wireless

- IEEE 802.11b/g/n radio
  - Modulation: 802.11g/n - OFDM (64-QAM, 16-QAM, QPSK, BPSK); 802.11b - DSSS (DBPSK, DQPSK, CCK)
  - TX Power (dBm EIRP):

Band (MHz)	FCC	ETSI	Brazil	ASEAN
2400-2473	20-36	N/A	N/A	N/A
2400-2483	N/A	5-20	11-26	5-20

assumes use of 7.4 dBi antennas

- 2x2 MIMO-antenna system: 2-TX x 2-RX
- Media access protocol: CSMA/CA with ACK
- RX sensitivity:
  - 99 dBm @ 1 Mbps
  - 95 dBm @ 6 Mbps
  - 80 dBm @ 54 Mbps
- Support for 802.11n MIMO
- Integrated GPS receiver

### Interfaces

- Full 802.11b/g/n wireless
- Serial: RS-232 and RS-485
- Four IEEE 802.3u autosensing 10/100BASE-T Ethernet ports
- Protocols: DNP3, Modbus (RTU), Modbus (ASCII), raw serial
- Two DC voltage monitoring ports (0-50 VDC)
- Two dry contact monitoring ports
- IPv4, IPv6 ready
- 802.1q VLAN support (ESSID and IP based tagging)
- Support for static and dynamic addressing for wired clients
- IP multicast forwarding, IGMPv3; IGMP proxy
- Automatic rate, power and channel control
- IEC 61850 GOOSE messaging
- Reliable broadcast
- Network Address Translation (NAT) support for wired clients

### Quality of service

- 802.11e WMM
- 802.1p/q with 4 queues per VLAN and ESSID
- 802.1p and DSCP

### Management

- Local and remote management tools via HTTPS
- Role-based authentication (four levels)
- Configuration save and restore
- Over-the-air software updates
- SNMPv3
- Wireless network and client monitoring and statistics
- SuprOS carrier class NMS support

### Security

- IPsec VPNs with tunnels to wired client interfaces using AES
- Authentication: WPA, WPA2, 802.11i, RADIUS, 802.1x (includes EAP-TLS, EAP-TTLS, EAP-SIM, PEAP)
- Encryption: open, WEP, TKIP, AES-CCM
- AES encryption of mesh and control traffic
- Technical controls required to achieve NERC CIP v5 compliance
- Multiple BSSIDs & ESSIDs (ESSID suppression)
- Integrated firewall
  - Packet filtering based on TCP/UDP port, protocol, SA, DA
  - Peer-to-peer blocking
  - Client access control lists
- Evil twin detection and reporting
- Denial of service (DoS) attack detection and reporting
- Jamming attack detection and reporting

### Environmental specifications

- Operating temperature range: -40°C to 75°C
- Storage temperature range: -40°C to 85°C
- IP10
- Vibration: MIL-STD-810G; 514.7
- Transportation: ISTA 2A

### Power

- 7-32 VDC
- Power consumption: 2 W typical
- Power-on/network status LED

### Physical

- Dimensions with connectors (RF connectors screw terminals DIN clip)
  - Height: 2.48" (63 mm)
  - Width: 4.11" (105 mm)
  - Depth: 6.28" (160 mm)
  - Weight: 1 lb (.45kg)
- DIN clip adds .31" (8mm) of thickness to mounting side
- DIN clip and terminal block plug included with each unit

### Wireless approvals

- FCC CFR 47 Part 15
- Industry Canada RSS 247
- EN 300 328 (pending)
- EN 301 489 (pending)

### Safety approvals

- UL 60950-1
- CSA 22.2 No. 60950-1
- IEC 60950-1
- EN 60950-1

### Protection

- Antenna protection:  $\leq 0.5 \mu\text{J}$  for 6kV/3kA @ 8/20  $\mu\text{s}$  waveform
- Electrical protection:
  - EN 61000-4-4 level 2 electrical fast transient burst immunity
  - EN 61000-4-3 level 2 EMC field immunity
  - EN 61000-4-2 level 2 (contact), level 3 (air) ESD immunity

### Warranty

- Five (5) year on parts and labor; return to point of purchase
- Software and hardware maintenance plans available

### Hazardous environment certification

Regulatory Domain	Certifications
Class I, Division 2, Groups A, B, C, and D (US, Canada)	UL 61010-1 (Ed.3)
	UL 60079-0 (Ed.6)
	UL 60079-15 (Ed.4)
	CAN/CSA-C22.2 No. 0-10
	CAN/CSA-C22.2 No. 61010-1-12
	CSA C22.2 No. 213-16
ATEX Zone 2	ANSI/ISA-12.12.01-2015
	CAN/CSA-C22.2 No. 60079-0:15
	CAN/CSA-C22.2 No. 60079-15:16
	EN 60079-0:2012/A11:2013
	EN 60079-15:2010

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