



Industrial IEC 61850-3 Cellular Router

Merlin 4600 Series

- Versatile Cat 4 LTE router for energy, industrial and trackside applications
 - Complies with IEC 61850-3 Class 1 for medium voltage substations
 - EN 50121-4 track side approval
 - Zero-touch large scale deployment
 - Multi-service support: LTE, Fast Ethernet/GbE SFP, Digital I/Os, RS-232/485
 - Ports have high level of galvanic isolation
 - Industrial protocol gateway and conversion
- · Best-in-class Cybersecurity
 - · Secure Boot ensures software is authentic and unmodified
 - Trusted Platform Module keeps cryptographic keys secure
 - Cybersecurity suite: 802.1X, IPSec encryption, stateful firewall





IEC 61850-3
Substation Automation

EN 50121-4 Railway Trackside EN 61000-6-2 Industrial Immunity EN 61000-6-3
Residential Emission

EN 61000-6-4

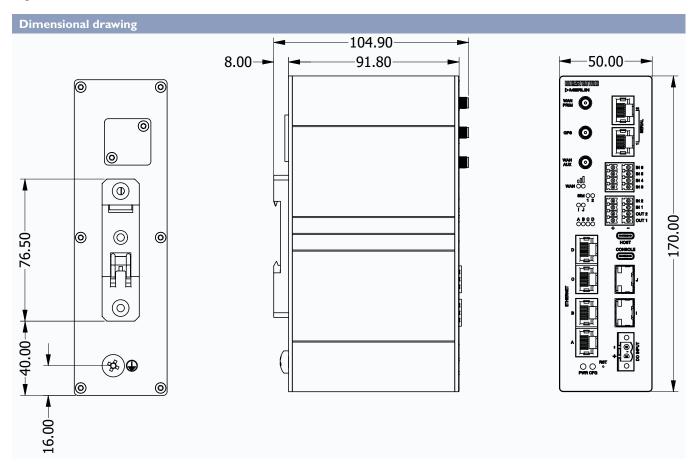
The Merlin 4600 series of versatile cellular routers provide high speed data network connectivity for demanding industrial, smart grid and trackside applications. Coupled with the Zero Touch deployment software Activator, it provides cost-effective, reliable, and consistent onboarding of routers in large-scale projects.

This compact, rugged unit is suited to tight spaces. It meets the requirements of IEC 61850-3 Class 1 Medium Voltage substation and also railway trackside EN 50121-4. The power supply and Ethernet ports benefit from a high level of galvanic isolation, up to 4 kVrms. Its high MTBF and wide temperature range support maximum service life.

To achieve best-in-class cybersecurity, the Merlin 4600 series is equipped with a TPM (Trusted Platform Module) chip that keeps cryptographic keys secure. Secure Boot ensures that the unit boots using only software that is signed and trusted by manufacturer. A set of cybersecurity tools is available as standard including VPN and stateful Firewall support for data security and user authentication.

The built-in industrial protocol gateway enables several devices using different protocols to be accessed via a common protocol interface. The unit supports up to 6 digital inputs and 2 outputs for local control or monitoring. Support for more digital inputs and outputs is possible using external modules.

Specifications - Merlin 4600 Series



| Housing | |
|------------------------------------|--|
| Dimensions $(W \times H \times D)$ | $50 \times 170 \times 100 \text{ mm} (2.0 \times 2.8 \times 3.9 \text{ inches})$ |
| Housing | Full metal |
| Weight | 750 g |

| Power parameters | | | | |
|-------------------|--|--|--|--|
| Rated voltage | 12 to 48 VDC | | | |
| Operating voltage | 9.6 to 60 VDC | | | |
| Power consumption | 7 W | | | |
| Hold up time | 100 msec | | | |
| Isolation | 4.0 kVrms galvanic isolation on power port | | | |

| Environmental | |
|------------------------------------|------------------------------|
| Temperature, operating | -40 to +70°C (-40 to +158°F) |
| Temperature, storage and transport | -50 to +85°C (-58 to +185°F) |
| Ingress protection | IP40 |
| Humidity, operating | 5-95% relative humidity |

| Interface | | | | |
|--------------------|--|--|--|--|
| Ethernet | Ethernet $4 \times 10/100$ Mbit/s, Ethernet TX, RJ45 Up to 2×1000 Mbit/s, SFP 4.0 kVrms galvanic isolation on the RJ45 Ethernet ports | | | |
| Mobile | LTE Cat 4 | | | |
| GNSS | GPS, GLONASS, BeiDou, Galileo | | | |
| SIM cards | 2 x Mini-SIM (2FF) card slots to rear, covered by metal plate | | | |
| Antenna connectors | 3 x SMA compatible connectors | | | |
| Console | USB type-C. Router acts as device | | | |
| USB host | Type-C. Router presents as host. Provides power at 5V @ 500mA | | | |
| Serial | Up to 2 serial ports, each software configurable for RS232/RS485 | | | |
| Digital inputs | Up to 6 digital inputs for detecting remote contact open/close | | | |
| Digital outputs | Up to 2 relay contact outputs. 220V DC, 2 Amp rating | | | |

| MTBF hours | |
|------------|---------------|
| Telcordia | 825.000 hours |

| Approvals | |
|--|---|
| EMC | EN/IEC 61000-6-2, Immunity industrial environments EN/IEC 61000-6-3, Emission residential environments EN/IEC 61000-6-4, Emission industrial environments EN 50121-4, Railway signalling and telecommunications apparatus IEC 61850-3, Communication networks and systems for power utility automation – Part 3: General requirements |
| Safety | EN 62368-1, Safety Communication TechnologyUL 62368 (pending) |
| North American standards/ approvals | UL 62368-1, FCC, PTCRB, AT&T, Verizon, T-Mobile (all pending) |

| Software Features | | | | | | |
|---------------------------|--|--|--|--|--|--|
| Management | Web interface (HTTPS), SMS management support, CLI via console, SSHv2, TFTP, SNMPv1/v2c/3, Secure Copy (SCP), Flexible alarm and event system, Port monitoring | | | | | |
| Monitoring | Built-in diagnostics and packet tracing, event logging, SNMP Traps, Syslog | | | | | |
| IP Routing | IPv4 and IPv6, DHCP, DynDNS, NAT, NAT Traversal, NTP Client, VLAN support, Packet filtering, Port forwarding, BGPv4, OSPF, RIP (v1 and v2), IPSec/L2TP/GRE, DMVPN, SNMP v1/v2/v3, TLS 1.2, 802.1x authentication, IEC104, QoS, VRRP, VRF | | | | | |
| Firewall | Stateful inspection firewall | | | | | |
| IPSec VPN | IKE Version 2, X.509 certificates, ECC, SHA2_512 support, AES_CBC (256), PFS, SCEP, DH_8192 | | | | | |
| SCADA Protocol Conversion | Control of I/O from SCADA master, IEC 60870-5-104, IEC 60870-5-101, IEC 61850, Modbus RTU, Modbus TCP, Modbus RTU to TCP conversion, DNP3, Serial to Ethernet | | | | | |
| RTU Functionality | Monitoring and Control of I/O from SCADA master, Protocol conversion, Basic PLC functions | | | | | |

| Mobile Frequency Bands | | | | | | |
|------------------------|----------|------------|-------------------------------------|--------------|------|--|
| Region | 2G Bands | 3G Bands | LTE Bands | LTE Category | GNSS | |
| EMEA | 900/1800 | B1, B8 | B1, B3, B7, B8, B20, B28 | 4 | Yes | |
| North America | - | B2, B4, B5 | B2, B4, B5, B12, B13, B14, B17, B66 | 4 | Yes | |
| Asia Pacific | 900/1800 | B1, B8 | B1, B3, B5, B8, B40, B41 | 4 | Yes | |
| Australia | - | B1, B5, B8 | B1, B3, B5, B7, B8, B28 | 4 | Yes | |

| Warranty | |
|----------|---------|
| Validity | 5 years |

| Art.no. | Product | Ethernet | Serial | Fibre SFP | USB host | Digital Inputs | Digital Outputs | Region |
|------------|--|----------|--------|--------------|-------------|-------------------|--------------------|------------------|
| 3460-00001 | Merlin-4609-F2G-T4-S2-D16- DO2-LV-QFZ | 4 | 2 | 2 | 1 | 6 | 2 | EMEA |
| 3460-00002 | Merlin-4609-F2G-T4-S2-D16- DO2-LV-PFG | 4 | 2 | 2 | 1 | 6 | 2 | North America |
| 3460-00003 | Merlin-4609-F2G-T4-S2-D16- DO2-LV-PFI | 4 | 2 | 2 | 1 | 6 | 2 | Asia Pacific |
| 3460-00004 | Merlin-4609-F2G-T4-S2-D16- DO2-LV-PFJ | 4 | 2 | 2 | 1 | 6 | 2 | Australia |
| 3460-00011 | Merlin-4607-T4-S2-LV-QFZ | 4 | 2 | - | - | - | - | EMEA |
| 3460-00013 | Merlin-4607-T4-S2-LV-PFI | 4 | 2 | - | _ | - | - | Asia Pacific |
| 3460-00014 | Merlin-4607-T4-S2-LV-PFJ | 4 | 2 | - | - | - | - | Australia |
| 3460-00021 | Merlin-4605-T4-DI6-DO2-LV- QFZ | 4 | _ | - | - | 6 | 2 | EMEA |
| 3460-00023 | Merlin-4605-T4-DI6-DO2-LV- PFI | 4 | - | - | - | 6 | 2 | Asia Pacific |
| 3460-00024 | Merlin-4605-T4-DI6-DO2-LV- PFJ | 4 | - | - | - | 6 | 2 | Australia |
| 3460-00031 | Merlin-4605-T4-LV-QFZ | 4 | - | - | - | - | - | EMEA |
| 3460-00033 | Merlin-4605-T4-LV-PFI | 4 | - | - | - | - | - | Asia Pacific |
| 3460-00034 | Merlin-4605-T4-LV-PFJ | 4 | - | - | - | - | - | Australia |

| Accessories | |
|-------------|--|
| 3125-0150 | PS-60, power supply. DIN-mounted. Input voltage: 100 to 240 VAC, 50 to 60 Hz or 110 to 250 VDC |