tBOX400-510-FL

Fanless Embedded System with 7th Gen Intel® Core™ i7/i5/i3 & Celeron® Processors, Built-in Layer 2 Managed PoE Switch for Railway PC

Features

- CE, LVD and FCC certified; EN 50155 and EN 45545-2 compliant
- 7th gen Intel® Core™ i7/i5/i3 & Celeron® processors (Kaby Lake)
- Fanless and wide operating temperature from -40°C to 70°C
- Power supply: 24 to 110 VDC for Railway version
- Built-in layer 2 managed PoE switch
- PoE power budget up to 120W by 8 ports
- Optimized network performance with QoS, VLAN and PoE scheduling, etc.

Specifications

- **Standard Color**: Silver
- **Construction**: Aluminum extrusion and heavy-duty steel, IP30
- **CPU**
  - Intel® Core™ i7-7500U 2C @2.7 GHz TDP: 15W
  - Intel® Core™ i5-7300U 2C @2.6 GHz TDP: 15W
  - Intel® Core™ i3-7100U 2C @2.4 GHz TDP: 15W
  - Intel® Celeron® 3965U 2C @2.2 GHz TDP: 15W
- **Chipset**: SoC integrated
- **System Memory**: 2 x DDR4-1866/2133 SO-DIMM slot, up to 32G
- **BIOS**: AMI
- **TPM**: TPM 2.0 (optional)
- **System I/O Outlet**
  - Serial: 1 x DB9 serial console or RS-232/422/485
  - Display: 1 x DVI-I (up to 1920 x1200 @60Hz, 1 x VGA and 1 x DVI included)
  - Audio: 1 x Mic-in, 1 x Line-out
  - Ethernet: 8 x M12 D-coded 10/100 Mbps Ethernet
  - 2 x M12 A-coded 10/100/1000 Mbps Ethernet
  - 1 x RJ-45 10/100/1000 Mbps Ethernet (Intel® i210-IT)
- **USB**: 4 x USB 3.0
- **Others**: 1 x Reset button
- **Expansion Interface**: 3 x Full-size Rev.1.2 PCI Express Mini Card slot:
  - 1 x mSATA/PCIe
  - 2 x USB/PCIe with SIM socket
- **Storage**
  - SATA Drive: 2 x Swappable 2.5" SATA drive (9.5 mm height), Intel® RAID 0/1 supported
  - mSATA: 1 x mSATA (occupied 1 x PCI Express Mini Card slot)
- **Watchdog Timer**: 255 levels, 1 to 255 sec.
- **Power**
  - Power Supply: Railway: 1 x M12, 24 to 110 VDC
  - Power Consumption: 24V~110V, 3.5A ~ 0.7A

PoE (PSE, Power Sourcing Equipment)

- **PoE Power Source**: 1 x M12 PoE power-in with PSU120-259
- **PoE Performance** (Layer 2 Managed PoE Switch)
  - **PoE** (802.3af 15.4W/port)
  - **PoE+** (802.3at 30W/port)
- **To be used with PSU120-259 series (optional, see ordering info)**

System Indicator

- 1 x LED indicator for SATA drive activity
- 1 x LED indicator for power
- 2 x Programmable

Operating Temperature

- -40°C to +70°C (-40°F to +158°F) with W.T. peripheral*
- -40°C to +60°C (-40°F to +140°F) with external PoE PSU & W.T. peripheral*

Humidity

0% to 95%, non-condensing

Dimensions

321 mm (12.64") (W) x 210.2 mm (8.28") (D) x 73.3 mm (2.89") (H) (without wall mount)

Mounting

Wall mount

Weight (net/gross)

3.5 kg (7.72 lb)/5.17 kg (11.40 lb)

Certifications

- CE (Class A), LVD and FCC (Class A) certified; EN 50155 and EN 45545-2 compliant
- ENMC
  - CE/FCC EN 61000-6-4 (Class A), EN 61000-6-2, FCC part 15 B (Class A)
  - EN50155
    - EN50121-3-2, IEC 62236-3-2 compliant
  - LVD EN 62368-1
  - AIM EX 01:2016 (IEC 60950-1:2001 Ed. 2.10:2017)

Vibration Endurance

3 Grms w/ SSD (5 to 50Hz, X/Y/Z direction; random, operating):
- MIL-STD-810G, Method 514.6-V
- EN50155
  - EN (IEC) 61373 category 1 class B compliant

Shock

EN 50155
- EN (IEC) 61373 category 1 class B, half-sine pulse, 5g, 30ms (longitudinal direction), 3g, 30ms (vertical/transverse direction) compliant

EOS support

Windows® 10 64-bit, Linux

Software Support

AMS AXView2.0

*Wide operating temperature peripheral
**Ethernet Software Features**

**Management**
- Interface: CLI, Telnet and Web Browser, SNMP v1/v2c/v3
- Firmware and configuration upgrade and backup via TFTP
- Supports DHCP Server/Client
- RMON (Remote Monitoring): group 1, 2, 3, 9
- Port mirroring: TX/RX and both
- NTP (Network Time Protocol) time synchronization
- IEEE 802.1ab LLDP (Link Layer Discovery Protocol)

**Security**
- MAC address filtering
- Enable/disable port
- Storm control (broadcast and multicast types)
- IEEE 802.1x LAN access control
- Remote authentication through RADIUS
- SSH for CLI and Telnet security
- SSL for web security
- System log (remote/local): ACL

**Quality of Service (QoS)**
- Priority Queues: 4 queues per port
- Traffic classification based on IEEE 802.1p CoS, DSCP, WRR (weighted round robin) and strict mode
- Rate Limiting (ingress/egress)

**Network Redundant**
- IEEE 802.1D Spanning Tree Protocol (STP)
- IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- EtherWAN’s Alpha-Ring network fault recovery (<15ms)

**Software**
- Auto-negotiation for port speed and duplex mode:
  - Flow Control
  - IEEE 802.3z full duplex mode
  - Back Pressure half duplex mode
- VLANs:
  - IEEE 802.1Q Tag VLANs (128 groups, 4096 VID)
- GVRP (GARP VLAN Registration Protocol)
- GMRP (GARP Multicast Registration Protocol)
- Link Aggregation:
  - Static Trunk (4 groups, support MAC base)
  - IEEE 802.3ad Link Aggregation Control Protocol
  - IGMP Snooping
  - IGMP snooping v1/v2/v3

**Dimensions**

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**Ordering Information**

**System**
- Fanless railway embedded system, layer 2 managed PoE switch, Intel® Celeron® 3965U/Core™ i3-7100U/i5-7300U/i7-7600U processor, 4 USB 3.0, DVI-I, LAN, serial console or RS-232/422/485, Mic-in & Line-out, two 2.5” SATA trays, M12 A-code DC-in, and 24 to 110 VDC

**PSU120-259**
- Fanless IEC 60945 certified/EN 50155 compliant DC-DC adapter
- Supports 24/48/60/110V-in
- Power output max. 120W
- Temperature range: -40°C to +60°C (-40°F to +140°F)
- For tBOX400

**Optional**
- Communication modules:
  - 8816N2232A0E 3G UC20GKit for tBOX/UST (3G ANT) (E)
  - 8816N2232A0E 3G/GPS UC20GKit tBOX/UST (3G/GPS ANT) (E)
  - 8816N5002A0E AP12356 WT Wi-Fi kit for tBOX/UST SFP (E)
  - 8816N5002A0E LTE M7455(US) kit for tBOX/UST SFP (E)
  - 8816N5002A0E LTE SIM7100GC kit for tBOX, JPN SFP (E)
  - 8816N5002A0E LTE SIM7100U kit for tBOX, JPN SFP (E)
  - 8816B020A0E LTE SIM7100UC (LPE) kit tBOX (30) SFP (E)
  - 8816B020A0E LTE SIM7100UC (LPE) kit for tBOX/UST SFP (E)
  - 881745000A0E LTE SIM7100EU kit for tBOX/UST SFP (E)
  - 8816N5004A0E LTE SIM7100 (EU) kit tBOX (30) SFP (E)
  - 59866242011E AC to DC adapter 24V 90W, M12 A-code 5P

*Specifications and certifications may vary based on different requirements.

**Power Protection**
- SCP (short circuit protection)
- OVP (over voltage protection)
- UVP (under voltage protection)
- RVP (reverse voltage protection)