tBOX400-510-FL NEW

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

**Features**

- CE (Class A), FCC certified; E-Mark, ISO 7637-2, EN 50155, EN 50121-3-2, EN 45545-2, DNV 2.4, and IEC 60945 compliance
- 7th gen Intel® Core™ i7/i5/i3 & Celeron® processors (Kaby Lake)
- Built-in managed layer 2 PoE switch
- PoE power budget up to 120W by 8 ports
- Optimized network performance with QoS, VLAN and PoE scheduling, etc.
- Fanless and wide operating temperature from -40°C to 60°C
- Power Input:
  - 24 to 110 VDC for Railway version
  - 12/24 VDC for Vehicle version
  - 24 VDC for Marine version

**Specifications**

| Standard Color | Silver |
| Construction | Aluminum extrusion and heavy-duty steel, IP30 |
| CPU | Intel® Core™ i7-7600U 2C@2.8 GHz
Intel® Core™ i5-7300U 2C@2.6 GHz
Intel® Core™ i3-7100U 2C@2.4GHz
Intel® Celeron® 3965U 2C@2.2GHz |
| Chipset | SoC integrated |
| System Memory | 2 x DDR4-1866/2133 SO-DIMM slot, up to 32G |
| BIOS | AMI |
| System I/O Outlet | Rear Side 1 x M12 DC-in (for railway version) or terminal block DC-in (for marine & vehicle version)
1 x PoE terminal block power-in
8 x M12 D-coded 10/100 Mbps PoE
2 x M12 A-coded 10/100/1000 Mbps Ethernet |
| | Front Side 4 x LED indicator
2 x Audio (Mic-in & Line-out)
1 x USB 3.0
1 x DVI-I
1 x DB9 serial console or RS-232/422/485
1 x Remote switch
1 x Reset bottom
2 x HDI/SSD tray |
| Watchdog Timer | 255 levels, 1 - 255 sec. |
| Storage | 2 x Swappable 2.5” SATA drive (9.5 mm height)
1 x mSATA (use 1 PCI Express Mini Card slot) |
| RAID Function | Intel® RAID Q1 |
| Expansion Interface | 3 x Full-size PCI Express Mini Card slot
2 x SIM card slot |

**System Indicator**

1 x LED indicator for system power
1 x LED indicator for HDD activities
2 x Programmable

**Power Supply**

Railway version DC-input: 24 to 110 VDC (tolerance: 16.8 to 137.5 VDC)
Vehicle version DC-input: 12/24 VDC (tolerance: 9 to 36 VDC, with ACC ignition)
Marine version DC-input: 24 VDC (tolerance: 14 to 32 VDC)

**Operating Temperature**

-40°C to +60°C (-40°F to +158°F) with W.T. SSD
-25°C to +55°C (-13°F to +131°F) with W.T. HDD

**Humidity**

10% - 95%, non-condensing

**Vibration Endurance**

3 G rms with SSD, 1.5 G rms with HDD (5-500Hz, X/Y/Z direction; random)
EN 61373 cat. 1 class B
IEC 60068-2-27
MIL-STD-810G, Method 514.6C, Procedure I, Category 4

**Shock (non-operating test)**

Shock optioning, 50 Gs, Half-sine 11ms duration
(with SSD, according to IEC 60068-2-27)

**Dimensions**

321 mm (12.64") (W) x 210.2 mm (8.28") (D) x 73.3 mm (2.89") (H)

**Weight/net/gross**

3.5 kg (7.72 lb)/4.5 kg (11.02 lb)

**Certifications**

CE (Class A), FCC certified; E-Mark, ISO 7637-2, EN 50155, EN 50121-3-2, EN 45545-2, DNV 2.4, and IEC 60945 compliance

**EOS support**

Windows® 10 64-bit, Linux
### 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 802.1 Tab 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 802.3x 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

### Power Protection

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

**Vehicle Version**
- ISO 7637-2 pulse 1/2/3/4
- Setting for battery protection: Low voltage or very low voltage
- Setting for ignition control: Low voltage counter, ACC-ON delay or shut down delay

### Packing List

1. x Quick installation guide
2. x Driver CD
3. x Foot pad
4. x Screw pack
5. x Wall mount kit
6. x DRAM thermal pad
7. x Terminal block DC-in connector for marine version
8. x HDD mylar
9. x SATA drive key

### Ordering Information

#### Standard
- tBOX400-510-FL-Celeron/i3/i5/i7-TVDC
  (By request)
  - Fanless railway embedded system with Intel® Celeron® 3965U/Core™ i3-7100U/i5-7300U/i7-7600U processor, 4 USB 3.0, DVI-I, RJ-45 LAN, serial console, Mic-in & Line-out, 2 2.5” SATA trays, 14 to 32 VDC

- tBOX400-510-FL-Celeron/i3/i5/i7-3TVDC
  (P/N: E26N400100) for i7-7600U

- tBOX400-510-FL-Celeron/i3/i5/i7-2TVDC
  (P/N: E26N400101) for i5-7300U

- tBOX400-510-FL-Celeron/i3/i5/i7-1TVDC
  (P/N: E26N400102) for i3-7100U

- tBOX400-510-FL-Celeron/i3/i5/i7-0TVDC
  (P/N: E26N400103) for Celeron® 3965U

- PSU120-259-Railway-24VDC-400
  (P/N: E276120105)

*Specifications and certifications may vary according to various options.
*TDC: Terminal Block DC-IN connector, Vehicle&Railway SKU, DC voltage input

#### Optional

- 2.5" SATA HDD/SSD: 128GB or above
- mSATA: 64GB or above
- DDR4 SO-DIMM: 4GB - 16GB
- 3G/4G/GPS module:
  - 826N3230060E, 826N3230100E, 826N3230110E, 826N3230120E
- Wi-Fi/Bluetooth module:
  - 826N3230060E, 826N3230100E, 826N3230110E, 826N3230120E
- DC-in cable:
  - 826B0102003E (M12 with ACC)
- LAN cable:
  - 594N3202730E (M12-A male 8-pin to RJ-45)
  - 594N3202710E (M12-D male 4-pin to RJ-45)
- Remote Switch Cable:
  - 594K3101020E
- AC to DC Adapter:
  - 59906000000E (EU), 59906000010E (JP), 59902000000E (US), 59904000000E (UK)
- Power cord:
  - 59903000000E (EU), 59906000010E (JP), 59902000000E (US), 59904000000E (UK)

### Dimensions

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