

TC-6110 Series

EN 50155-compliant x86 train computer with dual LAN ports, dual power inputs, USB, VGA, serial port, CompactFlash, and 4 expansion slots



- > Durable, fanless design for rolling stock applications
- > Modular design for easy storage and peripheral expansion
- > Comes with Moxa SafeGuard™, for HDD in wide temperature and high vibration environments
- > Compact rackmount 3U housing, wide 24 to 110 VDC isolated power supply
- > Supports SNMP-based system configuration, control, and monitoring
- > Complies with all EN 50155 mandatory test items*
- > Conformal coating models available

*This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf



Introduction

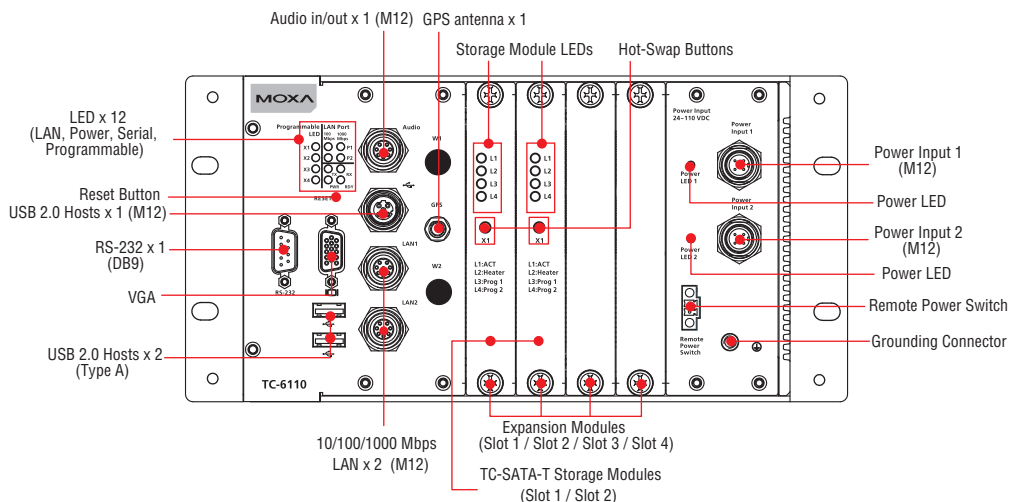
TC-6110 train computers are designed specifically for car-borne train automation like network video recorders, passenger information systems, condition monitoring, and train-to-ground communications. The computers come with two gigabit LAN ports, one RS-232 serial port, three USB 2.0 ports, and two TC-SATA-T storage modules, giving customers a versatile solution for on-board train computing.

Designed for high reliability in the demanding conditions experienced in on-board train environments, TC-6110 computers come with M12 connectors on both the gigabit LAN ports and dual power inputs, and

an additional M12 USB port. The TC-6000 Series expansion modules further allow for highly flexible, convenient integration into a variety of systems. Users can easily add storage modules for additional capacity, gigabit switch modules to expand network connectivity and/or bandwidth, serial and CAN bus modules for additional serial/CAN device connectivity, or mini PCIe modules for additional peripheral communications.

For the strongest component protection in harsh environments, TC-6110 Series computers are available with conformal coating.

Appearance



Hardware Specifications

Computer

CPU: Intel Atom D525, dual-core 64-bit threaded 1.8 GHz, 1 MB for L2 cache

OS: Windows Embedded Standard 7 or Linux

Note: The OS is pre-installed.

System Chipset: ICH8-M

System Memory: 4 GB capacity, 2 GB pre-installed: 2 slots of 2 GB DDR3-1066 204 pin SO-DIMM SDRAM

USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up; D-coded, 5-pin, female M12 connectors x 1)

Storage

Built-in: 8 GB onboard industrial CompactFlash card for operating system storage

HDD Support: 2 removable TC-SATA-T storage trays, for 2.5-inch SSD or HDD storage drive (with Intelligent Heating Solution)

Other Peripherals

Audio: 1 line in / line out interface with A-coded, 8-pin, female M12 connector

Independent Sensors: Accelerometer (G-sensor), thermometer (T-sensor)

Display

Graphics Controller: Integrated Intel GMA 3150 (Pineview) Graphics Engine

VGA Interface: Up to 2048 x 1536 resolution at 75 Hz, DB9 female connector

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (A-coded, 8-pin, female M12) x 2

GPS Module

Receiver Types: 50 channels, GPS L1 C/A code, SBAS (WAAS), EGNOS, MSAS, GAGAN

Acquisition:

- Cold start: 29 s
- Warm start: 29 s
- Aided start: 1 s
- Hot start: 1 s

Sensitivity:

- Tracking & Navigation: -160 dBm
- Reacquisition: -160 dBm
- Cold start: -147 dBm

Accuracy:

- Autonomous: 2.5 m
- SBAS: 2.0 m

Protocols: NMEA, UBX binary, max. update rate: 5 Hz (ROM version)

Time Pulse: 0.25 Hz to 1 kHz

Velocity Accuracy: 0.1 m/s

Heading Accuracy: 0.5°

A-GPS: AssistNow Online/Offline, SUPL (Open Mobile Alliance) compliant

Operational Limits:

- Dynamics ≤ 4 g
- Altitude 50,000 m
- Velocity 500 m/s

Connector Type: QMA

WLAN Module (Available on request)

Standards: IEEE 802.11 a/b/g/n for wireless LAN

Security: WEP, TKIP, and AES hardware encryption

Antenna Type: 2 QMA connectors (female type)

Mode: Client (default), Access Point (available on request)

Serial Interface

Serial Standards: 1 RS-232 port (DB9 male)

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS

Baudrate: Up to 115.2 kbps

Serial Signals

RS-232: Tx/D, Rx/D, DTR, DSR, RTS, CTS, DCD, GND

LEDs

System: Independent “Power” and “System Ready” signals

LAN: 100M/Link x 2, 1000M/Link x 2

Serial: TX x 1, RX x 1

Other: Programmable x 4

Physical Characteristics

Housing: Aluminum and SECC sheet metal (1 mm)

Weight: 5 kg (11.11 lb)

Dimensions:

- Without ears: 210 x 222 x 133 mm (8.27 x 8.74 x 5.24 in)
- With ears: 210 x 269 x 133 mm (8.27 x 10.60 x 5.24 in)

Mounting: Rack

Environmental Limits

Operating Temperature:

- Standard models: -25 to 55°C (-13 to 140°F), (EN 50155 Class T1)
- Wide temp. models: -40 to 70°C (-40 to 158°F), (EN 50155 Class Tx)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-Vibration: Meets EN 50155 standard

Anti-Shock: Meets EN 50155 standard

Power

Reset Button: For warm reboot (front panel)

Input Voltage: 24 to 110 VDC; A-coded, 5-pin, male M12 connector

Power Consumption: 32 W (without heater), 62 W (with heater), no SSD/HDD attached

Note: 24 VDC and 110 VDC compliant with EN 50155

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1

EMC: EN 55032:2010 Class A, EN 55024:2010, FCC CFR Title 47 Part 15 Subpart B: 2011 Class A, CISPR 32:2008, ANSI C63.4:2009, ICES-003 Issue 5:2012 Class A

RF: EN 62311:Jan 2008, ETSI EN 301 489-1:V1.9.2 (2011-09), ETSI EN 301 489-3:V1.4.1 (2002-08), ETSI EN 301 893:V1.6.1 (2011-11), ETSI EN 300 328:V1.7.1 (2006-10), ETSI EN 300 440-1:V1.6.1 (2010-08), ETSI EN 300 440-2:V1.4.1 (2010-08)

Rail Traffic: EN 50155:2007*, EN 50121-1:2006 for EMC test, EN 50121-4:2006, EN 5011:2009+A1:2010, EN 61000-6-4:2007, CISPR 16-1-2:2003/A2:2006, CISPR 16-2-1:2003+A1:2005, CISPR 16-2-3:2006, EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999

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Environmental Tests: EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting system reset with software programmable time intervals of 1-255

MTBF (mean time between failures)

Time: 360,616 hrs

Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

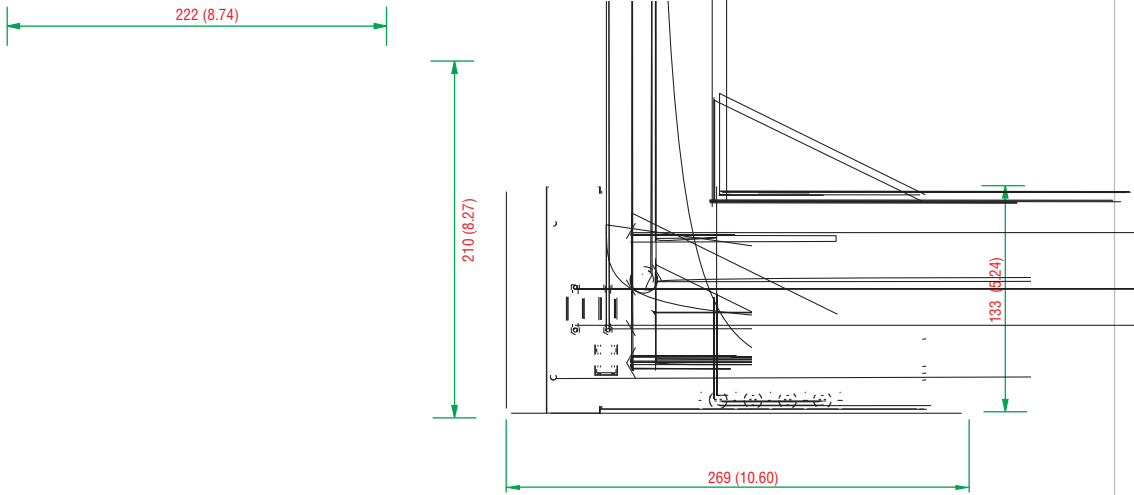
Warranty Period: 3 years

Details: See www.moxa.com/warranty

Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Embedded Features:

- Enhanced Write Filter(EWF)
- File-Based Write Filter (FBWF)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

File Systems and Data Storage:

- Windows Data Access Components
- Windows Backup and Restore

Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

TC-6110-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Win7 Embedded (32-bit), -25 to 55°C operating temperature range, compliant with EN 50155 Class T1

TC-6110-T-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Win7 Embedded (32-bit), -40 to 70°C operating temperature range, compliant with EN 50155 Class TX

TC-6110-CT-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Win7 Embedded (32-bit), -25 to 55°C operating temperature range, compliant with EN 50155 Class T1

TC-6110-CT-T-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Win7 Embedded (32-bit), -40 to 70°C operating temperature range, compliant with EN 50155 Class TX

TC-6110-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Linux Debian 7, -25 to 55°C operating temperature range, compliant with EN 50155 Class T1

TC-6110-T-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Linux Debian 7, -40 to 70°C operating temperature range, compliant with EN 50155 Class TX

TC-6110-CT-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Linux Debian 7, -25 to 55°C operating temperature range, compliant with EN 50155 Class T1

TC-6110-CT-T-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Linux Debian 7, -40 to 70°C operating temperature range, compliant with EN 50155 Class TX

Package Checklist

- TC-6110 train computer
- Rackmount kit
- Power switch with cable extender
- M12 connector (M12A-5P-IP68)
- Power cable (CBL-Power Jack to M12)
- Quick installation guide (printed)
- Documentation and software CD or DVD
- Warranty card