

# tBOX324-894-FL

Fanless Embedded System with 7th/6th Gen Intel® Core™ i7/i5/i3 & Celeron® Processor for Railway, Vehicle and Marine PC

## Features

- CE, LVD, FCC, EN 50155, EN 45545-2, E-Mark, DNV 2.4 and IEC 60945 certified
- 7th/6th gen Intel® Core™ i7/i5/i3 & Celeron® processors
- Fanless and wide operating temperatures from -40°C to +70°C
- 2 DDR4-1866/2133 SO-DIMM for up to 32GB of memory
- Typical 12/24/110 VDC power supply
- Intelligent solution of vehicle power management (ACC ignition)
- 2 swappable 2.5" SATA drives
- 3 PCI Express Mini Card slots and 1 SIM card slot



▲ Front view



▲ Rear view

## Specifications

Standard Color	Silver black																
Construction	Aluminum extrusion and heavy-duty steel, IP30																
CPU (supports Kaby Lake-U & Skylake-U platform)	Intel® Core™ i7-7600U 2.8 GHz*/i7-6600U 2.6 GHz* Intel® Core™ i5-7300U 2.6 GHz*/i5-6300U 2.4 GHz* Intel® Core™ i3-7100U 2.4 GHz*/i3-6100U 2.3 GHz* Intel® Celeron® 3965U 2.2 GHz*/3955U 2.0 GHz* *2 Core @TDP: 15W																
Chipset	SoC integrated																
System Memory	2 x DDR4-1866/2133 SO-DIMM, up to 32GB																
BIOS	AMI																
System I/O Outlet	<table border="0"> <tr> <td>Serial</td> <td>1 x DB9 isolated RS-232/422/485 2 x Terminal block isolated RS-232/422/485 (isolation voltage: 2 kV)</td> </tr> <tr> <td>CANBus</td> <td>1 x DB9 isolated CANBus 2.0 A/B (isolation voltage: 2 kV)</td> </tr> <tr> <td>Display</td> <td>1 x DVI-I (up to 1920 x 1200 @60Hz, 1 x VGA and 1 x DVI-D included) 1 x VGA</td> </tr> <tr> <td>Audio</td> <td>1 x Mic-in, 1 x Line-out</td> </tr> <tr> <td>Ethernet</td> <td>Railway: 4 x M12 A-coded 10/100/1000 Mbps Ethernet (Intel® i210-IT) Marine/Vehicle: 4 x RJ-45 10/100/1000 Mbps Ethernet (Intel® i210-IT)</td> </tr> <tr> <td>USB</td> <td>4 x USB 3.0</td> </tr> <tr> <td>DIO</td> <td>1 x Terminal block isolated DIO 4-in/4-out (isolation voltage: 2 kV)</td> </tr> <tr> <td>Others</td> <td>1 x Reset button 1 x Remote switch 3 x Antenna opening</td> </tr> </table>	Serial	1 x DB9 isolated RS-232/422/485 2 x Terminal block isolated RS-232/422/485 (isolation voltage: 2 kV)	CANBus	1 x DB9 isolated CANBus 2.0 A/B (isolation voltage: 2 kV)	Display	1 x DVI-I (up to 1920 x 1200 @60Hz, 1 x VGA and 1 x DVI-D included) 1 x VGA	Audio	1 x Mic-in, 1 x Line-out	Ethernet	Railway: 4 x M12 A-coded 10/100/1000 Mbps Ethernet (Intel® i210-IT) Marine/Vehicle: 4 x RJ-45 10/100/1000 Mbps Ethernet (Intel® i210-IT)	USB	4 x USB 3.0	DIO	1 x Terminal block isolated DIO 4-in/4-out (isolation voltage: 2 kV)	Others	1 x Reset button 1 x Remote switch 3 x Antenna opening
Serial	1 x DB9 isolated RS-232/422/485 2 x Terminal block isolated RS-232/422/485 (isolation voltage: 2 kV)																
CANBus	1 x DB9 isolated CANBus 2.0 A/B (isolation voltage: 2 kV)																
Display	1 x DVI-I (up to 1920 x 1200 @60Hz, 1 x VGA and 1 x DVI-D included) 1 x VGA																
Audio	1 x Mic-in, 1 x Line-out																
Ethernet	Railway: 4 x M12 A-coded 10/100/1000 Mbps Ethernet (Intel® i210-IT) Marine/Vehicle: 4 x RJ-45 10/100/1000 Mbps Ethernet (Intel® i210-IT)																
USB	4 x USB 3.0																
DIO	1 x Terminal block isolated DIO 4-in/4-out (isolation voltage: 2 kV)																
Others	1 x Reset button 1 x Remote switch 3 x Antenna opening																
Expansion Interface	3 x Full-size Rev.1.2 PCI Express Mini Card slot: • 2 x USB/PCIe • 1 x USB/PCIe with SIM socket																
Storage	<table border="0"> <tr> <td>SATA Drive</td> <td>2 x Swappable 2.5" SATA drive (9.5 mm height), Intel® RAID 0/1 supported</td> </tr> <tr> <td>CFast</td> <td>1 x CFast™</td> </tr> </table>	SATA Drive	2 x Swappable 2.5" SATA drive (9.5 mm height), Intel® RAID 0/1 supported	CFast	1 x CFast™												
SATA Drive	2 x Swappable 2.5" SATA drive (9.5 mm height), Intel® RAID 0/1 supported																
CFast	1 x CFast™																
Watchdog Timer	255 levels, 1 to 255 sec.																
Power	<table border="0"> <tr> <td>Power Supply</td> <td>Railway: 1 x M12, 24/110 VDC Vehicle: 1 x terminal block, 12/24 VDC with ACC ignition Marine: 1 x terminal block, 24 VDC</td> </tr> <tr> <td>Power consumption</td> <td>24V/2.2A, 110V/0.7A</td> </tr> </table>	Power Supply	Railway: 1 x M12, 24/110 VDC Vehicle: 1 x terminal block, 12/24 VDC with ACC ignition Marine: 1 x terminal block, 24 VDC	Power consumption	24V/2.2A, 110V/0.7A												
Power Supply	Railway: 1 x M12, 24/110 VDC Vehicle: 1 x terminal block, 12/24 VDC with ACC ignition Marine: 1 x terminal block, 24 VDC																
Power consumption	24V/2.2A, 110V/0.7A																

System Indicator	4 x LED indicator for LAN activity 4 x LED indicator for LAN linked 1 x LED indicator for SATA drive activity 1 x LED indicator for power												
Operating Temperature	-40°C to +70°C (-40°F to +158°F) with W.T. peripheral*												
Humidity	0% to 95%, non-condensing												
Dimensions	288.5 mm (11.36") (W) x 211.3 mm (8.32") (D) x 85.75 mm (3.38") (H) (without wall mount)												
Mounting	Wall mount												
Weight (net/gross)	5 kg (11.02 lb)/6.65 kg (14.66 lb)												
Certifications	CE (Class A), FCC (Class A), EN 50155, EN 45545-2**, E-Mark, DNV 2.4 and IEC 60945 certified												
EMC	<table border="0"> <tr> <td>CE/FCC</td> <td>EN 61000-6-4 (Class A), EN 61000-6-2, FCC part 15 B (Class A)</td> </tr> <tr> <td>EN 50155</td> <td>EN 50121-3-2, IEC 62236-3-2</td> </tr> <tr> <td>DNV 2.4</td> <td>IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-4</td> </tr> <tr> <td>IEC 60945</td> <td></td> </tr> <tr> <td>E-Mark</td> <td>ECE-R10</td> </tr> </table>	CE/FCC	EN 61000-6-4 (Class A), EN 61000-6-2, FCC part 15 B (Class A)	EN 50155	EN 50121-3-2, IEC 62236-3-2	DNV 2.4	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-4	IEC 60945		E-Mark	ECE-R10		
CE/FCC	EN 61000-6-4 (Class A), EN 61000-6-2, FCC part 15 B (Class A)												
EN 50155	EN 50121-3-2, IEC 62236-3-2												
DNV 2.4	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-4												
IEC 60945													
E-Mark	ECE-R10												
LVD	EN 60950-1												
Vibration Endurance	<table border="0"> <tr> <td>3 Grms w/ SSD (5 to 500Hz, X/Y/Z direction; random, operating)</td> <td></td> </tr> <tr> <td>1 Grms w/ HDD (5 to 500Hz, X/Y/Z direction; random, operating)</td> <td></td> </tr> <tr> <td>2 Grms w/ HDD &amp; Anti-Vibration Kit (5 to 500Hz, X/Y/Z direction; random, operating)</td> <td></td> </tr> <tr> <td>MIL-STD-810G, Method 514.6C-VI Category 4 compliant</td> <td></td> </tr> <tr> <td>EN 50155</td> <td>EN(IEC) 61373 category 1 class B</td> </tr> <tr> <td>DNV 2.4/IEC 60945</td> <td>IEC 60068-2-6</td> </tr> </table>	3 Grms w/ SSD (5 to 500Hz, X/Y/Z direction; random, operating)		1 Grms w/ HDD (5 to 500Hz, X/Y/Z direction; random, operating)		2 Grms w/ HDD & Anti-Vibration Kit (5 to 500Hz, X/Y/Z direction; random, operating)		MIL-STD-810G, Method 514.6C-VI Category 4 compliant		EN 50155	EN(IEC) 61373 category 1 class B	DNV 2.4/IEC 60945	IEC 60068-2-6
3 Grms w/ SSD (5 to 500Hz, X/Y/Z direction; random, operating)													
1 Grms w/ HDD (5 to 500Hz, X/Y/Z direction; random, operating)													
2 Grms w/ HDD & Anti-Vibration Kit (5 to 500Hz, X/Y/Z direction; random, operating)													
MIL-STD-810G, Method 514.6C-VI Category 4 compliant													
EN 50155	EN(IEC) 61373 category 1 class B												
DNV 2.4/IEC 60945	IEC 60068-2-6												
Shock (operating)	<table border="0"> <tr> <td>EN 50155</td> <td>EN (IEC) 61373 category 1 class B, half-sine pulse, 5g, 30ms (longitudinal direction), 3g, 30ms (vertical/transverse direction)</td> </tr> <tr> <td>DNV 2.4</td> <td>IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-30</td> </tr> <tr> <td>IEC 60945</td> <td></td> </tr> </table>	EN 50155	EN (IEC) 61373 category 1 class B, half-sine pulse, 5g, 30ms (longitudinal direction), 3g, 30ms (vertical/transverse direction)	DNV 2.4	IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-30	IEC 60945							
EN 50155	EN (IEC) 61373 category 1 class B, half-sine pulse, 5g, 30ms (longitudinal direction), 3g, 30ms (vertical/transverse direction)												
DNV 2.4	IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-30												
IEC 60945													
EOS Support	Windows® 10 64-bit, Windows® 7 64/32-bit (for 6th gen Intel® CPU), Ubuntu 18.04												
Software Support	AMS.AXView												

\*Wide Temperature. All W.T. supported products have to be sorted by Axiomtek.  
\*\*For EN45545-2, test report is available exclusively

## Ordering Information


Standard	
tBOX324-894-FL-Cel/i3/i5/i7-DIO-24MRDC-CAN (P/N: E26N324103) for i7-7600U (P/N: E26N324102) for i5-7300U (P/N: E26N324101) for i3-7100U (P/N: E26N324100) for 3965U	Fanless embedded system with 7th gen Intel® Kaby Lake Core™ i7/i5/i3 & Celeron® for railway PC, 4 USB 3.0, DVI-I, 4 M12 GbE LANs, 3 COM, CAN, DIO, Mic-in & Line-out, two 2.5" SATA trays, M12 DC-in, and 24/110 VDC
tBOX324-894-FL-Cel/i3/i5/i7-DIO-110MRDC-CAN-G (P/N: E26N324121) for i7-7600U (P/N: E26N324120) for i5-7300U (P/N: E26N324119) for i3-7100U (P/N: E26N324118) for 3965U	Fanless embedded system with 6th gen Intel® Skylake Core™ i7/i5/i3 & Celeron® for railway PC, 4 USB 3.0, DVI-I, 4 M12 GbE LANs, 3 COM, CAN, DIO, Mic-in & Line-out, two 2.5" SATA trays, M12 DC-in, and 110 VDC
tBOX324-894-FL-Cel/i3/i5/i7-DIO-TVDC-CAN-GND (P/N: E26N324112) for i7-7600U (P/N: E26N324111) for i5-7300U (P/N: E26N324110) for i3-7100U (P/N: E26N324109) for 3965U	Fanless embedded system with 7th gen Intel® Kaby Lake Core™ i7/i5/i3 & Celeron® for vehicle PC, 4 USB 3.0, DVI-I, 4 RJ-45 GbE LANs, 3 COM, CAN, DIO, Mic-in & Line-out, two 2.5" SATA trays, terminal block DC-in, ACC ignition, and 12/24 VDC
tBOX324-894-FL-Cel/i3/i5/i7-DIO-TMDC-CAN-GND (P/N: E26N324117) for i7-7600U (P/N: E26N324115) for i5-7300U (P/N: E26N324114) for i3-7100U (P/N: E26N324113) for 3965U	Fanless embedded system with 7th gen Intel® Kaby Lake Core™ i7/i5/i3 & Celeron® for marine PC, 4 USB 3.0, DVI-I, 4 RJ-45 GbE LANs, 3 COM, CAN, DIO, Mic-in & Line-out, two 2.5" SATA trays, terminal block DC-in, and 24 VDC

*Kaby Lake Platform* 

*Skylake Platform* 



\*MRDC: M12 DC-in connector, railway SKU, DC voltage input  
 \*TVDC: terminal block DC-in connector, vehicle SKU, DC voltage input  
 \*TMDC: terminal block DC-in connector, marine SKU, DC voltage input  
 \*GND or G: with grounding opening & screw

Optional	
Anti-vibration Kit (P/N: 8816N5008A0E)	For in-vehicle/rolling stock which improves HDD stability in NVR applications 
Communication Modules	8816N3239A0E 3G UC20GKit for tBOX/UST (3G ANT) (E) 8816N3235A0E 3G/GPS UC20GKit tBOX/UST (3G/GPS ANT) (E) 8812C1201A0E AP12356 with WT Wi-Fi kit for tBOX/ICO SFP (E) 881745001A0E GPS Kit M8N w/o adapter for tBOX/UST SFP (E) 88160620BA0E LTE SIMCOM SIM7100 (EU) for tBOX/UST SFP (E) 881745000A0E LTE+GPS SIM7100EU kit for tBOX/UST SFP (E) 8816N5005A0E LTE+GPS SIM7100C (TW) kit tBOX(20) SFP (E) 8816N5007A0E LTE+GPS SIM7100 (JPE) kit tBOX (20) SFP (E)
AC to DC Adapter	50906D24000E Adapter 24V/120W, wire only, FSP120-AAAN3 50966224010E Adapter 24V 90W, M12 A-code 5P FSP090AAAN3

\*Specifications and certifications may vary based on different requirements.

## Power Protection

OCP (over current protection)  
 OVP (over voltage protection)  
 UVP (under voltage protection)  
 RPP (reverse polarity protection)  
 ISO 7637-2 pulse 1, 2a, 2b, 3a, 3b, 4 (vehicle version)  
 Setting for in-vehicle battery protection: system will be automatically turned down at low voltage level  
 Setting for ignition control: system will activate a counter while in-vehicle battery at low voltage, ACC-ON delay and shut down delay

## Dimensions

