BOX-PC
Fanless Atom x5-E3940 1.6GHz
BX-T210 Series

This product is a fan-less computer for embedded applications with an Intel Atom processor x5-E3940 (1.6GHz). It provides an ultra-compact design with a capability of operating in a wide temperature range (between -20 and + 70°C in an airflow environment of 0.7m/s).
Addition to DisplayPort, a wide variety of interfaces including USB3.2 Gen1 (USB3.0) x 4, LAN x 2 are provided. Furthermore, the product models with wireless LAN function and Bluetooth are ready for connecting digital devices with ease, and they are ideal as IoT gateway terminals that can link to peripheral devices.
Embedded-type CPU has been adopted. The use of readily available parts ensures the product to be applied easily. In addition, CONTEC-customized BIOS allows support to be provided at the BIOS level.

* The contents in this document are subject to change without notice.
* Visit the CONTEC website to check the latest details.
* Visit the CONTEC website to check the latest OS.
* The information in the data sheets is as of July 2022

Features

- **Ultra-compact design about as large as A5 size contributes to space-saving**
With a space-saving design of a thickness of 30.3 mm, a width of 182 mm, and a depth of 155 mm that is about A5 size.

- **Operation capable in a wide temperature range between -20 and + 70°C**
Achieves stable operation in a wide temperature range of -20 to +70°C *1

- **"Power failure protection system" features power-off without OS shutdown**
Equipped with the "Power failure protection system" function that protects data and prohibits writing to storage in the event of power failure. Along with the lockdown (disk writing suppression) function of Windows IoT Enterprise, power can be safely turned off without a shutdown process. Moreover, file system damage or data damage caused by sudden power failure can be avoided.

- **High-security design contributes to a highly reliable system**
The latest security functions such as TPM2.0 and Secure Boot, as well as CONTEC's original functions including the USB Boot Protect are provided. This product is designed with the high security required for industrial applications in mind.

- **CONTEC-customized BIOS provides useful utility**
Useful utility of BIOS*2 customized by CONTEC is provided. The "CONTEC Fast Boot" achieves Windows startup in 10 seconds.*3 The "Disk Copy" function provides secure disk backup at the BIOS level, and also supports backup in file format or compressed file format. We also offer the CONTEC tools "BIOS update tool" for updating BIOS.*4

- **Helps reduce running costs and energy consumption**
This product uses the x5-E3940 low power consumption Intel Atom processor platform to achieve low power consumption while still providing sufficient performance.

- **Fan-less design reduces maintenance work**
The product is fan-less to ensure a totally spindle-less design that simplifies maintenance, relieving the concern about dust or foreign matter to get into the product. Moreover, along with minimized use of degrading parts greatly reduce maintenance work.

- **Rich interfaces for easy connection to various peripherals**
In addition to DisplayPort x1, USB3.2 Gen1 (USB3.0) x 4, USB2.0 x 2, and LAN x 2, Analog RGB port and RS-232C x 2 (one port can be used as RS-422A or 485) are equipped. The CFast card slot, which is easily replaceable, is used for storage and can be used as a writing area for logs and collected data. The wireless model (BX-T210R) can be connected to wireless LAN and Bluetooth compatible devices.

*1 In an airflow environment of 0.7m/s
*2 For details, see "BIOS Setup" in the manual.
*3 It is the actual measured value when Windows 10 and HORM function are enabled at the factory. Time may vary depending on configuration. Note that TXE, TPM, Network Stack, and SMART Self Test are not supported when the CONTEC Fast Boot is enabled.
*4 Contact your retailer for more information.

Specification

Function Specifications

Item		Description
CPU		Intel Atom ® x5-E3940 Processor 1.6GHz
BIOS		BIOS (mfd. by AMI)
Memory		8GB (204-pin SO-DIMM), PC3L-12800 (DDR3L-1600) ECC
Graphics Controller		Intel ® HD Graphics 500 (CPU integrated)
System Resolution	DisplayPort	800 x 600, 1,024 x 768, 1,152 x 864, 1,280 x 600, 1,280 x 720, 1,280 x 768, 1,280 x 800, 1,280 x 960, 1,280 x 1,024, 1,360 x 768, 1,366 x 768, 1,400 x 1,050, 1,440 x 900, 1,600 x 900, 1,600 x 1,200, 1,680 x 1,050, 1,792 x 1,344, 1,856 x 1,392, 1,920 x 1,080, 1,920 x 1,200, 1,920 x 1,440, 1,920 x 2,160, 2,048 x 1,152, 2,048 x 1,536, 2,560 x 1,080, 2,560 x 1,440, 2,560 x 1,600, 2,560 x 1,920, 2,560 x 2,048, 3,840 x 2,160 (16,770,000 colors)
	Analog RGB	800 x 600, 1,024 x 768, 1,152 x 864, 1,280 x 600, 1,280 x 720, 1,280 x 768, 1,280 x 800, 1,280 x 960, 1,280 x 1,024, 1,360 x 768, 1,366 x 768, 1,400 x 1,050, 1,440 x 900, 1,600 x 900, 1,600 x 1,200, 1,680 x 1,050, 1,920 x 1,080, 1,920 x 1,200 (16,770,000 colors)
Audio		HD Audio compliant, LINE OUT x 1, MIC IN x 1
M.2 Card Slot		1 slot, M.2 2242 Key M, SATAIII BX-T210x-J104xxx : - BX-T210x-J104P03xxx : M.2 built-in SSD (iSLC, 32GB, 1 partition) *1 BX-T210x-J104M05xxx : M.2 built-in SSD (MLC, 64GB, 1 partition) *1 BX-T210x-J104L07xxx : M.2 built-in SSD (TLC, 128GB, 1 partition) *1 BX-T210x-J104L09xxx : M.2 built-in SSD (TLC, 256GB, 1 partition) *1
		1 slot, M.2 2230/2280, Key E, PCIe(x2) 1 port, USB2.0 1 port BX-T210R-J104xxxxxx : M.2 Wireless LAN card built-in
CFast Card Slot		1 slot, CFast CARD Type I, bootable
LAN		Intel ® I210 controller 1000BASE-T/100BASE-TX/10BASE-T x 2 ports RJ-45 connector (supports Wake On LAN)
USB		USB 3.2 Gen1 (USB3.0) compliant 4ports USB 2.0 compliant 2ports
Serial		RS-232C/422/485 1port, RS-232C 1port Baud rate: 50 - 115,200bps
Wireless LAN *3		IEEE 802.11ac/a/b/g/n
Bluetooth *3		4.2
General Purpose I/O		Non-isolated type : I/O 6 channels, switch signal
Security (TPM)		TCG TPM2.0
Hardware monitoring		Monitoring CPU temperature, board temperature, and power voltage
Watchdog timer (WDT)		Software programmable, 255 level (1sec - 255sec), Time up allows reset
Real Time Clock		Lithium backup battery life: 10 years or more *2 The real-time clock is accurate within ±3 minutes (at 25°C) per month (CPU integrated RTC).
Power Management		Power management setup via BIOS Power On by Ring/Wake On LAN Supports ACPI Power management
Interface	Display	DisplayPort (v1.2) x 1, Analog RGB x 1
	Audio	LINE OUT: 3.5φ Stereo mini jack, MIC IN: 3.5φ Stereo mini jack
	M.2 Card Slot	1 slot, M.2 2242, Key M 1 slot, M.2 2230/2280, Key E
	CFast Card Slot	1 slot, CFast CARD Type I
	LAN	2-port (RJ-45 connector)

Item		Description
	USB	USB3.2 Gen1 (USB3.0) compliant 4ports (TYPE-A connector) USB2.0 compliant 2port (TYPE-A connector)
	RS-232C/ 422/485	1 port (9pin D-SUB connector [Male])
	RS-232C	1 port (9pin D-SUB connector [Male])
	DIO	1 port (9pin D-SUB connector [Female])
Power supply	Rated Voltage Range	12 - 24VDC ±10% *4
	Input Voltage Range	10.8 - 31.2VDC
	Current Consumption (Max.)	12V 3.6A, 24V 1.9A
	External Device Power Supply Capacity	M.2 slot Key M : +3.3V : 2.5A (2,500mAx1) M.2 slot Key E : +3.3V : 2.0A (2,000mAx1) CFast card slot : +3.3V 0.5A (500mAx1) USB3.2 Gen1 (USB3.0) I/F : +5V : 3.6A (900mAx4 per port) USB2.0 I/F : +5V : 1.0A (500mAx2 per port)
Physical dimensions (mm)		182(W) x 155(D) x 30.3(H) (Not including the attachment fitting or protrusions)
Weight		1.3kg (approx.) (Not including the attachment fitting)

*1 The capacity of storage device in the OS pre-installed type is a value when 1GB is calculated by 1 billion bytes.
  The capacity that can be recognized from OS might be displayed fewer than an actual value.
*2 It is when the power is disconnected for 16 hours a day.
*3 Wireless LAN and Bluetooth are only available in the wireless models.
*4 Use a power cable of 3 meters or shorter.

Environment Requirements

Item		Description
Operating temperature *5		-20 - +50°C no airflow -20 - +70°C airflow 0.7m/s
Storage Temperature *5		-20 - +70°C
Humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Line-noise resistance	Line noise	AC Line /±2kV *6, Signal line /±1kV (IEC61000-4-4 Level 3, EN61000-4-4 Level 3)
	Static electricity resistance	Contact discharge /±4kV (IEC61000-4-2 Level 2, EN61000-4-2 Level 2) Air discharge /±8kV (IEC61000-4-2 Level 3, EN61000-4-2 Level 3)
Vibration resistance	Sweep resistance	10 - 57Hz /semi-amplitude vibration 0.375mm, 57 - 150Hz/5.0G 60minutes each in X, Y, and Z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
Impact resistance		100G half-sine shock for 6ms in X, Y, and Z directions (JIS C 60068-2-27-compliant, IEC 60068-2-27-compliant)
Grounding		Class D grounding, SG-FG / continuity
Standard		VCCI Class A, FCC Class A, CE Marking (EMC Directive Class A, RoHS Directive) *7, UKCA *7, TELEC (set with the certified wireless module) *8, UL/c-UL *7, CCC *9, KC *7, BSMI *7

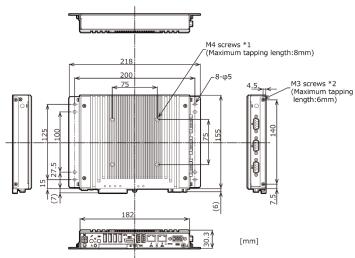*5 The ambient temperature should be 0°C and higher when using or storing the audio.
*6 It is when the product is used with AC adapter PWA-65AWD1.
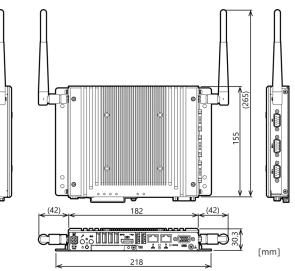*7 The wireless model is excluded from CE Standard, UKCA, c-UL, KC and BSMI.
*8 The wireless module is set only in the wireless models.
*9 The Base models and the wireless models are excluded from CCC.

Physical Dimension

BX-T210-J104xxxxxx

BX-T210R-J104xxxxxx

[mm]

Packing List

Name	BX-T210-J104xxx [Base Model] Pcs.	BX-T210-J104xxxxxx [OS Pre-install Model] Pcs.	BX-T210R-J104xxx [Wireless Model] Pcs.	BX-T210R-J104xxxxxx [OS Pre-install , Wireless Model] Pcs.
The Main Body	1	1	1	1
The Attachment Fitting	2	2	2	2
USB Removal Prevention Fitting	6	6	6	6
Cable Clamp	2	2	2	2
Washer Assembled Screw (M3x5)	6	6	6	6
Washer Assembled Screw (M3x6, Black)	4	4	4	4
Washer Assembled Screw for Attachment (M4x10, Black)	4	4	4	4
Screw for M.2 Device (M3x6)	1	1	-	-
Spacer for M.2 Device	1	1	-	-
Power Supply Connector Complete Set — Power Connector	1	1	1	1
Power Supply Connector Complete Set — Contact	4	4	4	4
Logo Label	1	1	1	1
Antenna	-	-	2	2
Product Guide	1	1	1	1
IPC Precaution List *1	1	1	1	1
Warranty Certificate *1	1	1	1	1
Serial Number Label	1	1	1	1
MICROSOFT SOFTWARE LICENSE TERMS *1	-	1	-	1
Recovery Disk *1	-	1	-	1
Precautions on using Wireless LAN	-	-	1	1

*1 It is not packed to the Ubuntu types and M.2 SSD 512GB(TLC) types.

Supported OS

Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)
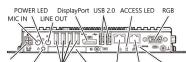
Optional Products

Item	Model	Description
AC adapter	PWA-65AWD1	Switching AC adapter 12VDC 5.417A
Storage	CFS-4GB-A	4GB SATA CFast card (SLC)
	CFS-8GB-A	8GB SATA CFast card (SLC)
	CFS-16GB-A	16GB SATA CFast card (SLC)
	CFS-32GBM2-A	32GB SATA CFast card (MLC)
	CFS-16GBQ-A	16GB SATA CFast card (Q-MLC)
	CFS-32GBQ-B	32GB SATA CFast card (Q-MLC) (Wide temperature range specification)
Antenna extension cable	IPC-RPSMA-2	RP-SMA connector coaxial cable
Bracket	BX-BKT-VESA02	Bracket for VESA ("75 x 75", "100 x 100")

CAUTION

If a product other than our optional one is used, the normal operation may be impaired or the functions may be limited.
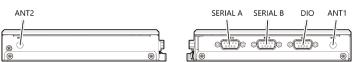
Nomenclature Of Product Components

Front

Side

Name	Function
Front	
DC-IN	DC power connector
POWER LED	Power ON display LED
ACCESS LED	SATA device access display LED
STATUS LED	Status LED
POWER SW	PC power switch
MIC IN	Mike in (3.5φPHONE JACK)
LINE OUT	Line out (3.5φ PHONE JACK)
USB 3.2 Gen1	USB 3.2 Gen1 (USB3.0) port connector x4
USB 3.1	USB 2.0 port connector x2
CFast	CFast card slot (SATA connection)
DisplayPort	Display (20-pin female)
LAN A	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector
LAN B	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector
RGB	Display (15-pin D-SUB, female)
Side	
SERIAL A	Serial port A connector (9-pin D-SUB, male) (RS-232C/422/485)
SERIAL B	Serial port B connector (9-pin D-SUB, male) (RS-232C)
DIO	GPIO port connector (9-pin D-sub male)
ANT1	Antenna connector (for both wireless LAN and Bluetooth) * 1
Side	
ANT2	Antenna connector (for wireless LAN) * 1

*1 Antenna connectors are available only on the wireless model.

Model

Model	Wireless	OS	Storage device
BX-T210-J104P03	None	None	M.2 SSD 32GB (iSLC)
BX-T210-J104P03W19		Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)	
BX-T210-J104P03U		None (Ubuntu Linux installed for operation check)	
BX-T210R-J104P03	IEEE 802.11ac/a/b/g/n Bluetooth 4.2	None	
BX-T210R-J104P03W19		Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)	
BX-T210-J104M05	None	None	M.2 SSD 64GB (MLC)
BX-T210-J104M05W19		Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)	
BX-T210-J104M05U		None (Ubuntu Linux installed for operation check)	
BX-T210R-J104M05	IEEE 802.11ac/a/b/g/n Bluetooth 4.2	None	
BX-T210R-J104M05W19		Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)	
BX-T210-J104L07	None	None	M.2 SSD 128GB (TLC)
BX-T210-J104L07W19		Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)	
BX-T210-J104L07U		None (Ubuntu Linux installed for operation check)	
BX-T210R-J104L07W19	IEEE 802.11ac/a/b/g/n Bluetooth 4.2	Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)	
BX-T210-J104L09	None	None	M.2 SSD 512GB (TLC)
BX-T210-J104L09W19		Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)	
BX-T210R-J104L09	IEEE 802.11ac/a/b/g/n Bluetooth 4.2	None	
BX-T210R-J104L09W19		Windows 10 IoT Enterprise 2019 LTSC 64bit (Japanese / English / Chinese / Korean)	