

BOX-PC Fanless, Atom E3845 1.9GHz BX-320 Series



* Specifications, color and design of the products are subject to change without notice.

This product is a small, fanless PC for embedding with a palm-size body that can be mounted on a 35mm DIN rail.

This product is the successor to the previous BX-300 microcontroller products and it meets the needs of replacing the BX-300 in systems. The exterior of this product has the same dimensions. The functionality of this product can also be expanded in ways such as adding digital I/O by connecting F&EIT Series device modules. * This product utilizes the Intel® Atom™ Processor E3845 for the CPU. This product is equipped with an external expansion connector that can be connected by cable to an expansion chassis for PCI/PCI Express expansion boards.

* Windows Embedded Standard 7 32bit only

- * The contents in this document are subject to change without notice.
- * Visit the CONTEC website to check the latest details in the document.
- * Visit the CONTEC website to check the latest OS.
- * The information in the data sheets is as of October, 2020.

Product Lineup

Model	CPU	Memory	Display I/F	Pre-Install / OS (Storage)
BX-320-DC700000	Atom E3845 1.9GHz	4GB	Analog RGB×1 (15pin, HD-SUB connector)	Without OS, without CFast Card
BX-320-DC731314				Windows Embedded Standard 7 32bit (Japanese, English, Chinese, Korean), CFast Card (SLC) 16GB
BX-320-DC781724				Windows 10 IoT Enterprise LTSB 2016 64bit (Japanese, English, Chinese, Korean), CFast Card (Q-MLC) 32GB

Features

Contributes to reducing running costs and energy efficiency

While inheriting the basic functionality of the previous BX-300 Series, this product achieves further decreases in power usage and increases in speed while maintaining sufficient performance by employing a low power platform featuring the Intel® Atom™ Processor E3845 for the CPU.

Contributes to equipment miniaturization. PC functionality and expandability concentrated into a small form (94.0 (W) x 120.0 (D) x 74.7 (H))

The small chassis (94.0 (W) x 120.0 (D) x 74.7 (H)) is equipped with a variety of interfaces including VGA, USB3.0 x 1, USB 2.0 x 3, RS-232C x 2, LAN x 2 (1000BASE-T, 100BASE-TX), Audio, and the F&EIT I/F (for F&EIT Series device modules). This product is also equipped with a PCIe connector that can be connected to an external expansion chassis. This product has the same dimensions as the previous BX-300 Series products, so it can be swapped into existing systems.

Fanless design reduces maintenance and inspection work

This product features a completely spindle-free design that eliminates the CPU fan and uses a CFast card for storage. The use of components that deteriorate with age has been held down as much as possible, which greatly reduces the burden of maintenance and inspection work.

Remote power management functions that save operational labor

This product supports Wake On LAN to externally start the PC via the network and Power On by Ring to start the PC by the modem receiving a call. This makes it capable of providing large operational labor savings.

Freely expandable peripherals. Twin CFast card slots and other abundant interfaces

This product is equipped with expandable interfaces including 1000BASE-T x 2, USB 3.0 x 1, USB 2.0 x 3, and serial interfaces (RS-232C) x 2. It is also equipped with two CFast card slots (one slot is internal) so the data and operating system can be separated. This is very convenient for forms of operation such as using one slot to run the system and one slot for maintenance, or using one slot to take home system logs and sampled data.

Usable as a controller for F&EIT Series measurement, control, and communication devices *1

This product can be used as a controller for F&EIT Series measurement, control, and communication devices. Device modules including digital I/O, analog I/O, and serial communication can be used as measurement, control, and communication devices.

Up to eight F&EIT Series device modules can be connected to the F&EIT I/F *1

The F&EIT I/F can accommodate up to eight F&EIT Series device modules (maximum total current of each module is 3A or less).

*1 Windows Embedded Standard 7 32bit only

Expandable with PCI boards and/or PCI Express boards

With a single separately sold cable, this product can connect to a PCI Express Cable expansion chassis which enables expansion by PCI/PCI Express boards.

Possibly installed in 35mmDIN rail

A detachable metal installation part for attaching the main unit to a 35mm DIN rail is bundled by default, which can be used according to the installation conditions. The system features a unique configuration for its connection to a module on the side in a stacking manner, which allows you to configure the system simply and elegantly without using backplanes and other connecting devices.

Safety design required for embedded applications

For Windows Embedded Standard installed model or Windows 10 IoT Enterprise LTSB 2016 64bit installed model, it is possible to use the WF *2 function of OS. It is designed for safety required for embedding purpose, for example, prohibiting unwanted writing to the CFast card with EWF function will relieve the concern about the writing limits to the CFast card and prevent an unintentional system alteration.

*2 EWF (Enhanced Write Filter) is a function of Windows Embedded Standard. UWF(Unified Write Filter) is a function of Windows 10 IoT Enterprise LTSB 2016. They protect the disk from being actually written by redirecting the writing to RAM.

A wide range of power supplies (10.8 - 31.2VDC) supported

As the product supports a wide range of power (10.8 - 31.2VDC), it can be used in a variety of power environments.

Supported OS

Windows Embedded Standard 7 32bit (Japanese, English, Chinese, Korean)

Windows 10 IoT Enterprise LTSB 2016 64bit (Japanese, English, Chinese, Korean)

Specifications

Function specifications

Model	BX-320-DC7xxxx
CPU	Intel® Atom™ Processor E3845 1.91GHz
BIOS	BIOS (mfd. by AMI)
Memory	4GB, 204pin SO-DIMM socket x 1, PC3-10600(DDR3L 1333) ECC
Graphic	Intel® HD Graphics (built-in CPU)
System resolution	640×480, 800×600, 1,024×768, 1,152×864, 1,280×600, 1,280×720, 1,280×768, 1,280×800, 1,280×960, 1,280×1,024, 1,360×768, 1,366×768, 1,400×1,050, 1,440×900, 1,600×900, 1,680×1,050, 1,920×1,080, 1,920×1,200 (16,770,000 colors)
Audio	HD Audio compliant, LINE OUT x 1, MIC IN x 1
CFast card slot	2 slot, CFast CARD Type I x 2 bootable BX-320-DC73131x: Built-in CFast card slot (SLC) (16GB, 1 partition) *1 BX-320-DC781724: Built-in CFast card slot (Q-MLC) (32GB, 1 partition) *1 Other models: none
LAN *2	Intel I210T Controller 1000BASE-T/100BASE-TX/10BASE-T port (Wake On LAN support)
USB	USB 3.0 compliant 1 port USB 2.0 compliant 3 port
Serial I/F	RS-232C (general-purpose): 2 port (SERIAL PORTA, B), 9pin D-SUB connector (male) Baud rate: 50 - 115,200bps
Watchdog timer	Software programmable, 255 level (1sec - 255 sec) Causes a reset upon time-out.
Hardware monitoring	Monitoring CPU temperature, power voltage
RTC/CMOS	Lithium backup battery life: 10 years or more. The real-time clock is accurate within ±3 minutes (at 25°C) per month
Power Management	Power management setup via BIOS, Power On by Ring / Wake On LAN, Supports PC98/PC99 ACPI Power management
Security (TPM)	TCG TPM2.0
F&EIT *3	It can be accommodated up to 8 F&EIT series device modules (Max3A)
BUS EXPANDER(PCIe)	PCI Express 1.0a (x1) compliant PCI Express cable port
Interface	
Display	Analog RGB x 1 (15pin D-SUB connector)
Audio	LINE OUT : 3.5p Stereo mini jack, Full-scale output level 1.4Vrms(Typ.) MIC IN : 3.5p Stereo mini jack, Full-scale input level 1.4Vrms(Typ.)
CFast card slot	2 slot, CFast CARD Type I x 2, bootable BX-320-DC700000: - BX-320-DC73131x: Built-in CFast card slot contains a CFast card (SLC). (16GB, 1 partition)*1 BX-320-DC781724: Built-in CFast card slot contains a CFast card (Q-MLC). (32GB, 1 partition)*1
LAN *2	2 port (RJ-45 connector)
USB	USB3.0 compliant 1 port (TYPE-A connector x1) USB2.0 compliant 3 port (TYPE-A connector x3)
RS-232C	2 port (9pin D-SUB connector [male])
F&EIT *3	1 port
PCI Express cable	1 port (18pin PCI Express External Cabling connector)
Power supply	
Rated input voltage	12 - 24VDC *4
Range of input voltage	10.8 - 31.2VDC
Power consumption	12V 1.5A, 24V 0.9A (When no using USB-powered or F&EIT-powered peripherals) 12V 4.2A, 24V 2.2A (When using USB-powered or F&EIT-powered peripherals)
External device power supply capacity	CFast card slot: +3.3V: 1A(500mA x2) USB3.0 I/F: +5V: 0.9A(900mA x1) USB2.0 I/F: +5V: 1.5A(500mA x3) F&EIT I/F: +5V: 3A
Physical dimensions (mm)	94 (W) x 120(D) x 74.7(H) (No protrusions)
Weight	About 1.0kg (Excluding attachment fittings)

- *1 The capacity of CFast 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 If you use the 1000BASE-T, be careful of the operating temperature. For more details on this, refer to chapter3, Installation Requirements.
- *3 Windows Embedded Standard 7 32bit only
- *4 Use a power cable shorter than 3m.

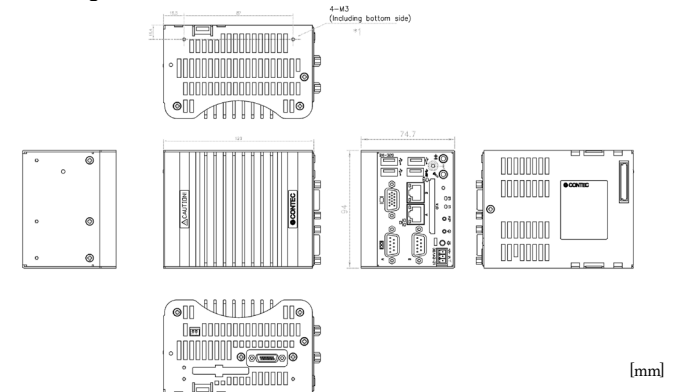
Ambient Specifications

Model	BX-320-DC7xxxx
Operating temperature *5	0 - 60°C (With 1000BASE-T: 0 - 55°C), airflow 0.7m/s 0 - 50°C (With 1000BASE-T: 0 - 45°C), no airflow
Storage temperature	-10 - 60°C
Humidity	10 - 90%RH (No condensation)
Floating dust particles	Not to be excessive
Corrosive gases	None
Line noise	AC line / ±2kV (IEC61000-4-4 Level 3, EN61000-4-4 Level 3)*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) Atmospheric discharge / ±8kV (IEC61000-4-2 Level 3, EN61000-4-2 Level 3)
Sweep resistance	10 - 57Hz/semi-amplitude 0.15 mm 57 - 150Hz/2.0G 40 min. each in x, y, and z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
Impact resistance	15G, half-sine shock for 11 ms in x, y, and z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
Grounding	Class D grounding, SG-FG / continuity
Standard	VCCI Class A, FCC Class A, CE Marking (EMC Directive Class A, RoHS Directive)

- *5 Derating occurs due to the way of installation. For more details on this, refer to the "Installation Requirements" in User's Manual.
- *6 When AC-DC power supply unit "DLP75-24-1 (manufactured by TDK-Lambda)" is used.

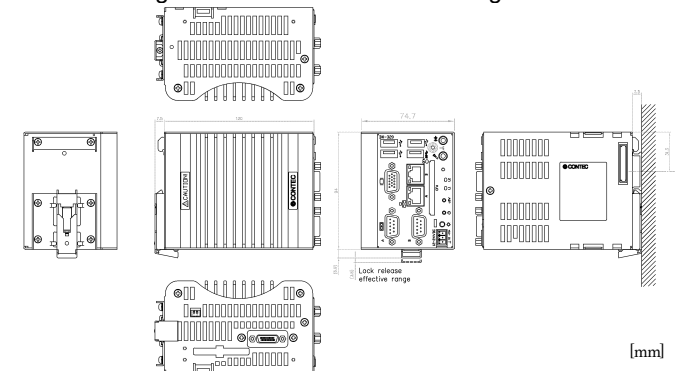
Physical Dimensions

Including screw hole dimensions *1



- *1 Ensure that the penetration depth (L) from the chassis surface to the screw tip is 3 mm or lower for the top and bottom and 4 mm or lower for the back.

When mounting the DIN rail installation metal fittings *2



- *2 To secure this product with the included fittings, use the included screws (M3x7). In other situations, use screws with a penetration depth (L) from the chassis surface to the screw tip of 3 mm or lower.

Packing List

	BX-320-DCxxxxx [Base Model]	BX-320-DCxxxxx*1 [OS Pre-installed Model]
Name	Pcs.	Pcs.
The main body	1	1
DIN rail attachment fittings set	1*2	1*2
F&EIT module metal fittings	2	2
Rubber foot	4	4
Washer assembled screw (M3 x 7)	6	6
Countersunk screw (M3 x 5)	3	3
Connector cover	1*2	1*2
Cfast card removal prevention fitting	1	1
Cfast card removal prevention fitting (bottom face side)	1*2	1*2
Cable clamp	1	1
Power connector	1	1
Product guide	1	1
IPC Precaution List	1	1
Warranty Certificate	1	1
Serial number label	1	1
Royalty consent contract (OS)	-*3	1
Setup Procedure Document	-*3	1
Recovery Media	-*3	1
Cfast User's Guide	-*4	1*4

- *1 Except for base model.
 *2 It is attached to the main body.
 *3 It is not packed to the Base model.
 *4 Come with Windows 10 install model only
 * The User's Guide of this product is offered as the PDF file in our web page. With it, since information such as a setup of hardware, each component function and BIOS setup is indicated, please refer to it if needed.
 * User's manual or driver library for using F&EIT Series device module is not attached to this product. Downloading them from the CONTEC Website is needed.

Support Software

Driver library API-SBP(W32) (Available for downloading (free of charge) from the CONTEC web site.)

It is the Windows version driver library software that provides stack-connected commands to F&EIT series measurement/control/communication device module in the form of Win32 API functions (DLL). Various programming languages such as Visual Basic and Visual C++ can be used to create high-speed application software which maximizes the features of the F&EIT module. In addition, a diagnostic program, which is useful for operation verification, is also provided.

* API-SBP(W32) and API-PAC(98/PC) cannot be used at the same time. Use the WDM driver of API-PAC.

List of Options

Cfast Card (SLC)

CFS-4GB-A	4GB Cfast Card
CFS-8GB-A	8GB Cfast Card
CFS-16GB-A	16GB Cfast Card

Cfast Card (MLC)

CFS-32GBM-A	32GB Cfast Card
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Cfast Card (Q-MLC)

CFS-16GBQ-A	16GB Cfast Card
CFS-32GBQ-B	32GB Cfast Card (Higher environmental resistance type)

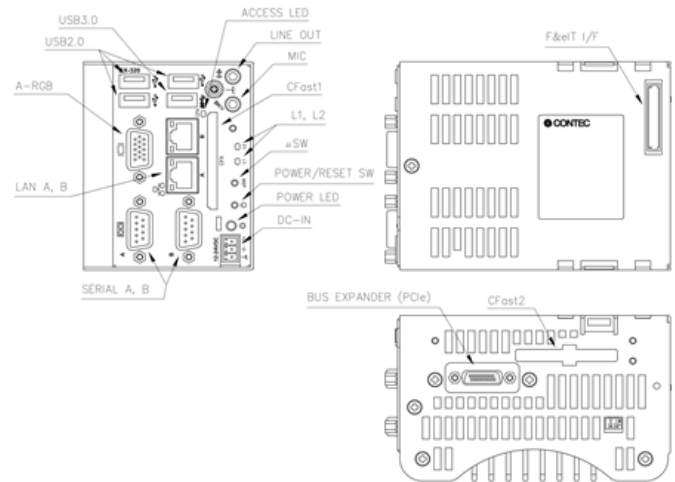
Expansion Chassis

ECH-PCI-CE-H4D	Short size x 4, DIN rail attachment is possible. Connection Conversion Shield Cable (100P 37P D-SUB x 2)
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CAUTION

- Precautions when using products other than our options
 - If a product other than our option is used, the normal operation may be impaired or the functions may be limited.
 * Information about the option products, see the Contec's website.

Component Name



Name	Function
POWER LED	Power ON display LED
ACCESS LED	Cfast disk access display LED
L1, L2	User Programmable LED x 2
DC-IN	DC power input connector
POWER-SW	Power switch
uSW	User Programmable Switch
MIC IN	Mic in (ø3.5 PHONE JACK)
LINE OUT	Line out (ø3.5 PHONE JACK)
A-RGB	Display (15pin D-SUB, female)
USB3.0	USB3.0 port TYPE-A connector x 1
USB2.0	USB2.0 port TYPE-A connector x 3
LAN A	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector
LAN B	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector
Cfast1	Cfast card slot (SATA connection)
Cfast2	Cfast card slot (SATA connection)
SERIAL A	Serial port 1 connector (9pin D-SUB, male)
SERIAL B	Serial port 2 connector (9pin D-SUB, male)
BUS EXPANDER(PCIe)	PCI Express Cable port (18-pin PCI Express External Cabling connector x 1)
F&EIT I/F	Max. 8 units of F&EIT series device module is connectable

Differences between the BX-300 Series

	BX-300	BX-320
CPU	Intel Atom Processor Z530P 1.60GHz (FSB533MHz)	Intel Atom Processor Z3845 1.91GHz
Chipset	Intel US15WP	---
Memory	1GB PC2-4300(DDR2 533) DDR2 SDRAM 200-pin SO-DIMM socket x 1	4GB, 204pin SO-DIMM socket x 1, PC3-10600(DDR3L 1333) ECC
Graphic	Built-in chipset (GMA500)	Intel HD Graphics (built-in CPU)
Interface		
Card Slot	2 slots (CF CARD Type I) OS boot-support, Primary IDE Master/Slave connection	2 slot, Cfast CARD Type I x 2 bootable BX-320-DC7313 1x Built-in Cfast card slot (SLC) (16GB, 1 partition) *1 Other models: none
LAN	2 ports (Wake On LAN-support) 1000BASE-T(RJ-45) Intel 82574L controller	2 port (Wake On LAN support) 1000BASE-T(RJ-45) Intel I210ITL Controller
USB	4 ports USB 2.0 compliant (TYPE-A)	4 ports USB 3.0 compliant 1 port USB 2.0 compliant 3 port
Bus Expander	1 port PCI Express Cable-enabled, Dedicated to the expansion chassis connection	1 port PCI Express 1.0a (x1) compliant PCI Express cable port
WDT	1 - 65535sec (65535 level), Reboot at the time of time-up	Software programmable, 255 level (1sec - 255 sec) Causes a reset upon time-out
Power consumption (Max)	12V 1.8A, 24V 1.0A (When no using USB-powered or F&EIT-powered peripherals) 12V 4.3A, 24V 2.3A (When using USB- powered or F&EIT-powered peripherals)	12V 1.5A, 24V 0.9A (When no using USB- powered or F&EIT-powered peripherals) 12V 4.2A, 24V 2.2A (When using USB- powered or F&EIT-powered peripherals)
Supported OS	Windows Embedded Standard 2009	Windows Embedded Standard 7 32bit (Japanese, English, Chinese, Korean) Windows 10 IoT Enterprise LTSC 2016 64bit (Japanese, English, Chinese, Korean)