BOX-PC
Fanless, Atom E3845 1.91GHz
BX-220 Series

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

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

Intel, Intel Core and Celeron are registered trademarks of Intel Corporation. MS, Microsoft and Windows are trademarks of Microsoft Corporation. Other brand and product names are trademarks of their respective holder.

Features

Contributing to reduction of running cost and promotion of energy efficiency
It adopts the low-power platform with Intel (R) Atom(TM) Processor E3845 that realizes lower power consumption while ensuring sufficient performance.

Contributing to compact device design. Ultra-small PC is roughly the same area as a paperback book
It is the smallest [178 (W) x 115 (D) x 29 (H)] and lightest [800g] PC in the series, and can be installed almost anywhere. Can be installed in spaces only 50-mm thick with roughly the same area as a paperback book. It largely serves downsizing of your equipment, fits any area with the aestheticness kept.

Slitless/fanless design that reduces maintenance work
This product's spindleless design eliminates the heat dissipating slit and CPU fan and adopts CFast card for the storage. There is no need to worry about the intrusion of dust or foreign objects, and the use of parts that degrade over time is minimized to facilitate maintenance.

Remote power management function to reduce operation tasks
Supports system startup by external device over network (Wake-on-LAN), by general purpose input (power on by GPI), and by modem reception (power on by ring). It encourages significant labor saving in operation.

Major types of peripherals are supported with rich interfaces including the two CFast card slots
It has a variety of extended interface such as DVI-I x 1, Display Port x 1, 1000BASE-T x 2, USB3.0 x 1, serial (RS-232C) x 2.It has two CFast card slots (one built into main unit), providing the ability to separate data from the operating system, as well as the convenience of being able to use one slot for system startup and the other for maintenance or for taking home system logs or collected data

This product is a fanless computer for embedded applications. It features an Intel Atom processor E3845 chipset. Thanks to a quad-core CPU, simultaneous stable high-speed processing for four applications is possible with four cores. This CPU also allows for computing power almost four times that of conventional products in addition to three times the graphics performance, a significant improvement. Moreover, power consumption has been significantly reduced, resulting in nearly double the power efficiency compared with the previous generation's architecture.It combines sufficient performance and low power consumption in a space-saving design that can be installed in spaces only 50-mm thick with roughly the same area as a paperback book. This "resource-saving PC" helps you design more compact, energy efficient equipment to reduce running costs and promote energy efficiency.

It has extension interfaces such as DVI-I, Display Port, 1000BASE-T, USB 3.0, and serial. It employs a CFast card for storage and is fanless to ensure a totally spindleless design that simplifies maintenance.
In addition, this product is equipped with a proprietary extended RAS*1 function independent of the main computer functions. This feature provides various functions to increase system reliability by automatically restarting the system when detecting errors such as frozen programs, operating system startup faults, and a rise in internal temperature, and by saving detailed logs of the occurrence of errors, which can be useful in failure analysis.

Embedded-type CPU have been adopted. The use of readily available parts ensures the ease of the use of the product. In addition, the use of Contec-customized BIOS allows support to be provided at the BIOS level.

*1 Reliability Availability and Serviceability: Support functions for stable system operation.

Built-in monitoring function for improved reliability of industrial equipments
The built-in sub-CPU for monitoring offers the ability to save failure logs documenting such information as start-up failures, abnormal temperatures, abnormal OS operation, and recording media swapped while powered up, as well as the ability to restart the OS or the device. Recording the power-on time and the operation time allows for proactive predictions of malfunctions due to parts having reached their service life. This ability makes it possible to construct stable and highly reliable industrial systems.

Falling-off prevention tools and fixing clamps provided to avoid trouble caused by disconnected cable
This product stays trouble-free, being equipped with USB removal prevention fitting and cable clamp for connectors with no locking mechanism, such as USB cable, and with hardware to properly mount and avoid falling out of CFast card.

Safety design required for embedded applications
For Windows Embedded Standard installed model or Windows 10 IoT Enterprise LTSB 2016 installed model, it is possible to use the WF*1 function of OS. It is designed for safety required for embedding purpose, for example, prohibiting unwanted writing to the CF card with EWF function will relieve the concern about the writing limits to the CF card and prevent an unintentional system alteration.

*1 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. The separately available AC adapter adds support for 100VAC power.

Specifications

Function specifications

| Model	BX-220D-DCxxxxxx
CPU	Intel® Atom™ Processor E3845 1.91GHz
BIOS	BIOS (mfd. by AMI)
Memory	BX-220D-DC8xxxxx: 8GB, 204pin SO-DIMM socket x 1, PC3-10600(DDR3L 1333) ECC BX-220D-DC7xxxxx: 4GB, 204pin SO-DIMM socket x 1, PC3-10600(DDR3L 1333) ECC BX-220D-DC6xxxxx: 2GB, 204pin SO-DIMM socket x 1, PC3-10600(DDR3L 1333) ECC
Graphic	Intel® HD Graphics (built-in CPU)
System resolution — Analog RGB	640x480, 800x600, 1,024x768, 1,152x864, 1,280x600, 1,280x720, 1,280x768, 1,280x800, 1,280x960, 1,280x1,024, 1,360x768, 1,400x1,050, 1,440x900, 1,600x900, 1,680x1,050, 1,920x1,080, 1,920x1,200 (16,770,000 colors)
System resolution — DVI-D	640x480, 800x600, 1,024x768, 1,152x864, 1,280x600, 1,280x720, 1,280x768, 1,280x800, 1,280x960, 1,280x1,024, 1,360x768, 1,366x768, 1,400x1,050, 1,440x900, 1,600x900, 1,680x1,050, 1,920x1,080, 1,920x1,200 (16,770,000 colors)
System resolution — Display Port	640x480, 800x600, 1,024x768, 1,152x864, 1,280x600, 1,280x720, 1,280x768, 1,280x800, 1,280x960, 1,280x1,024, 1,360x768, 1,366x768, 1,400x1,050, 1,440x900, 1,600x900, 1,680x1,050, 1,920x1,080, 1,920x1,200 (16,770,000 colors)
Audio	HD Audio compliant, LINE OUT x 1, MIC IN x 1
CFast card slot	2slot, CFast CARD Type I x 2 bootable BX-220D-DC73121x : Built-in CFast card slot (SLC) (16GB, 1 partition) *1 BX-220D-DCx61xxx : Built-in CFast card slot (MLC) (32GB, 1 partition) *1 BX-220D-DC781724: Built-in CFast card slot (Q-MLC) (32GB, 1 partition) *1 Other models : none
LAN *2	Intel I210IT Controller 1000BASE-T/100BASE-TX/10BASE-T 2 port (Wake On LAN support)
USB	USB 3.0 compliant 1 port, USB 2.0 compliant 2 port
Serial I/F	RS-232C (general-purpose) : 2port (SERIAL PORT A, B) 9pin D-SUB connector (male) Baud rate : 50 - 115,200bps RS-422/485 (general-purpose) 1port, Baud rate : 50 - 115,200bps
RAS	WDT : Software programmable, 1sec - 255sec (Time up allows reset, interrupt, or external output) Remote reset: Input signal from external device
General-purpose I/O	Photocoupler insulation inputs/outputs (3 of each) (One output used for WDT external output, one input switched between remote reset or remote power on.)
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℃) per month (US15WP integrated RTC).
Power Management	Power management setup via BIOS, Power On by Ring / Wake On LAN, Supports PC98/PC99 ACPI Power management
Interface — Display	DVI-I x 1 (29pin DVI-I connector), Display Port x1
Interface — Audio	LINE OUT : 3.5φ Stereo mini jack, Full-scale output level 1.4Vrms (Typ.) MIC IN : 3.5φ Stereo mini jack, Full-scale input level 1.4Vrms (Typ.)
Interface — CF card slot	2 slot, CFast CARD Type I x 2, bootable BX-220D-DCx00000 : -, BX-220D-DC73121x : Built-in CFast card slot contains a CFast card (SLC). (16GB, 1 partition)*1 BX-220D-DCx6121x : Built-in CFast card slot contains a CFast card (MLC). (32GB, 1 partition)*1 BX-220D-DC781724 : Built-in CFast card slot contains a CFast card(Q-MLC). (32GB, 1 partition)*1
Interface — LAN *2	2 port (RJ-45 connector)
Interface — USB	USB3.0 compliant 1port (TYPE-A connector x1) USB2.0 compliant 2port (TYPE-A connector x2)
Interface — RS-232C	2 port (9pin D-SUB connector [male])
Interface — RS-422/485/ General-purpose I/O /RAS	1 port (15pin D-SUB connector [femaie])
Power supply — Rated input voltage	12 - 24VDC *3
Power supply — Range of input voltage	10.8 - 31.2VDC
Power supply — Power consumption	12V 2.6A, 24V 1.5A
Power supply — External device power supply capacity	CFast card slot : 3.3V : 1A (500mAx2) USB3.0 I/F : +5V : 0.9A (900mAx1) USB2.0 I/F : +5V : 1A (500mAx2)
Physical dimensions (mm)	178 (W) x 115(D) x 29(H) (No protrusions)
Weight	About 0.8kg (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 Use a power cable shorter than 3m.

Ambient Specifications

Model	BX-220D-DCxxxxxx	
Operating temperature *4		0 - 60℃ (With 1000BASE-T: 0 - 55℃), airflow 0.7m/s 0 - 50℃ (With 1000BASE-T: 0 - 45℃), no airflow
Storage temperature		-10 - 60℃
Humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Line-noise resistance	Line noise	AC line / ±2kV *5, 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)
Vibration resistance	Sweep resistance	10 - 57Hz/semi-amplitude 0.375 mm 57 - 500Hz/5.0G 60 min. each in x, y, and z directions (JIS C60068-2-6compliant, IEC68-2-6-compliant)
Impact resistance		100G, half-sine shock for 6 ms in x, y, and z directions (JIS C0041-compliant, IEC68-2-27-compliant)
Grounding		Class D grounding, SG-FG / continuity
Certification		VCCI Class A, FCC Class A CE Marking (EMC Directive Class A, RoHS Directive), UL/c-UL, CCC *6*7

*4 For more details on this, please refer to chapter 3, "Installation Requirements".
*5 When AC adapter "IPC-ACAP12-04" is used.
*6 If consumers use the power adapter for charging, they should purchase the power adapter with CCC certification and the adapter shall meet the GB standard requirement.
*7 The models of BX-220D-DC700000、BX-220D-DC600000、BX-220D-DC800000 are excluded from CCC.

Physical Dimensions
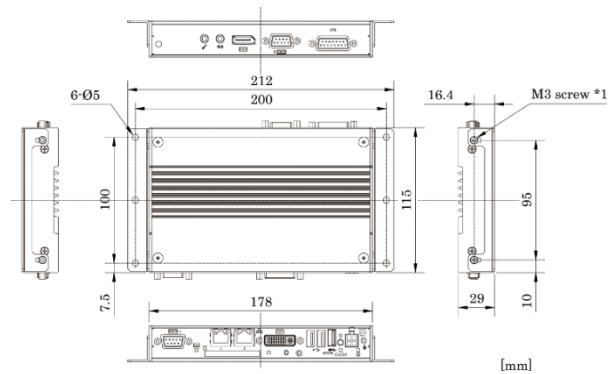
*1 When you fasten the bundled attachment fittings to be fixed to the body, you should use the attached screws (M3 x 6).Otherwise, the length (L) from the surface of the cabinet to the screw tip should be 4mm or less.

Supported OS

・Windows Embedded Standard 7 32bit (Japanese)
・Windows Embedded Standard 7 32bit (English)
・Windows 10 IoT Enterprise LTSB 2016 64bit (Japanese, English, Chinese, Korean)

Packing List

Name		BX-220D-DCx0000	BX-220D-DCxxxxxx *1 [OS PreInstall Model]
		Pcs.	Pcs.
BOX-PC		1	1
The attachment fittings		2	2
CF card removal prevention fitting		1	1
USB removal prevention fitting		1	1
USB removal prevention clamp		1	2
DVI-analog RGB conversion adapter		1	1
Washer assembled screw (M3 x 6)		6	6
Washer assembled and cross recessed hexagonal bolt (M4 x 10, black)		4	4
Cable clamp		1	2
Power supply connector complete set	Power connector	1	1
	Contact	4	4
Product guide (this sheet)		1	1
IPC Precaution List		1	1
Serial number label		1	1
Royalty consent contract(For OS)		1	1
Royalty consent contract (For Recovery Soft)		NONE *2	1
Setup Procedure Document		NONE *2	1
Recovery Media		NONE *2	1
CFast User's Guide		NONE *3	1 *3

*1 Except for base model.
*2 Not included in models without OS.
*3 Come with Windows 10 install model only
* The user's manual for this product is available as a PDF file through CONTEC's Web site.
The user's manual provides such information as hardware settings, functions for each component, and BIOS settings. Refer to it as necessary.

List of Options

AC adapter

ACAP19-01	AC adapter
	(Input:100-240VAC,Output:19VDC 3.42A)
PWA-90AWD1	AC adapter
	(Input: 100-240VAC, Output: 12VDC 7.5A)
PWA-65AWD1	AC adapter
	(Input: 100-240VAC, Output: 12VDC 5.41A)

Power supply unit

PWI-60D6D2	Power supply unit
	(Input: 12-24VDC, Output: 24VDC 2.5A)

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
CFS-32GBM2-A	32GB CFast Card

CFast Card (Q-MLC)

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

*   Information about the option products, see the Contec's website.

⚠ CAUTION

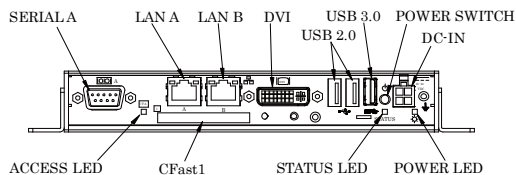Precautions when using products other than our options
- If a product other than our option is used, the normal operation may be impaired or the functions may be limited.
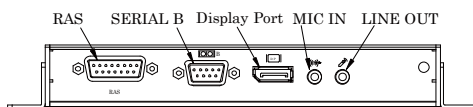
Product lineup

Model	CPU	Memory	CFast	OS
BX-220D-DC700000	Atom Processor E3845 1.91GHz	4GB ECC	None	None
BX-220D-DC731211			SLC 16GB	Windows Embedded Standard 7 32bit Japanese
BX-220D-DC731212				Windows Embedded Standard 7 32bit English
BX-220D-DC761211			MLC 32GB	Windows Embedded Standard 7 32bit Japanese
BX-220D-DC761212				Windows Embedded Standard 7 32bit English
BX-220D-DC781724			Q-MLC 32GB	Windows 10 IoT Enterprise LTSB 2016 64bit (Japanese, English, Chinese, Korean)
BX-220D-DC600000		2GB ECC	None	None
BX-220D-DC661211			MLC 32GB	Windows Embedded Standard 7 32bit Japanese
BX-220D-DC661212				Windows Embedded Standard 7 32bit English
BX-220D-DC800000		8GB ECC	None	None
BX-220D-DC861724			MLC 32GB	Windows 10 IoT Enterprise LTSB 2016 64bit (Japanese, English, Chinese, Korean)

Component Name

Front View

SERIAL A   LAN A   LAN B   DVI   USB 3.0   POWER SWITCH
USB 2.0   DC-IN

ACCESS LED   CFast1   STATUS LED   POWER LED

Rear View

RAS   SERIAL B   Display Port   MIC IN   LINE OUT

Name	Function
POWER LED	Power ON display LED
STATUS LED	Status LED
ACCESS LED	CFast disk access display LED
DC-IN	DC power input connector
POWER-SW	Power switch
MIC IN	Mike in (φ3.5 PHONE JACK)
LINE OUT	Line out (φ3.5 PHONE JACK)
DVI-I	Display (29 pin, female)
Display Port	Display (20 pin, female)
USB3.0	USB3.0 port TYPE-A connector x 1
USB2.0	USB2.0 port TYPE-A connector x 2
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 A connector (9pin D-SUB, male)
SERIAL B	Serial port B connector (9pin D-SUB, male)
RAS	RAS function and RS-422/485 connector (15 pin D-SUB, female)