HAGIWARA Solutions

Gateway & Board Catalog

Vol.3

HAGIWARA Solutions

**Memory & Flash Storage Solutions for Mission Critical Systems
in Industrial Applications and Social Infrastructures**

A pioneer manufacturer of flash storage devices for industrial equipment with over 20 years of experience. After the acquisition of business from Japan Data System, from 2018 we provide a lineup of embedded computers, motherboards and IoT gateways for industrial equipment.

Strong security feeling created by combination with our flash storage products for industrial equipment and highly appreciated by our customers allowed Hagiwara Solution to greatly expand the range of proposed industrial solutions.

Company Profile

Company Name	Hagiwara Solutions Co., Ltd.
Headquarters	8th Floor, Pacific Square Nagoya Nishiki, 2-5-12 Nishiki, Naka-ku, Nagoya, Aichi 460-0003 Japan
Established	July 2011
Capital	JPY 50,000,000
Shareholder	Elecom Co., Ltd. (100%)
President and CEO	Junji Hada
Number of Employees	81 (as of Dec. 2019)
Fiscal Year End	March

Features

Our industrial grade controllers & Gate Way computers are from Japan.
Our memories & storages support stable and long term system operations for your IoT and M2M solutions.

1 Offering products complete with storage memory

We offer products with our storage memory. This not only reduces the costs of evaluation of memory and storage products by customer, but also helps to reduce time required isolate the cause of failure.

2 Industrial grade

We provide long-term supply of environmental-resistant models that operate even in harsh environments, perform shipping tests and issue comprehensive PCN / EOL notifications.

3 Group Synergy

By combining a wide range of solutions and products from Elecom Group companies, we are able to provide reliable and higher value-added system solutions for embedded computing market.

Memory products Reliable memories & storages support stable industrial equipment operations.

SSD

SATA 6.0Gbps					PATA	
2.5inch	CFast	M.2	mSATA	HalfSlim	2.5inch	CompactFlash

SD Card

SD Card	microSD Card	eSD

DIMM

USB

Security

Group Synergy

Artificial Intelligence

Supercomputer

Ultrasonic Diagnostics LSI

Deterioration Prediction Algorithms

Inter-board Wireless Communication

Ultra-low Power Pacemaker

Analog Sensors

Holter Monitor

AR Glass Module

Industrial Board

Digital Signage

Industrial PC/Tablet

Security Memory

Logitec

HAGIWARA Solutions

Industrial SSD

NAS

VR/AR

Low Frequency Medical Instrument

Wearable Measuring Instrument

AV Equipment

Smartphone/Tablet-related

Game-related

Memory/HDD

Network Equipment

EMS

Healthcare

PC-related

D-CLUE Technologies

DX ANTENNA

LoRa/ Sigfox

V-low Multicast

Network Camera

Media Gateway

EOC Coaxial Modem

Telecommu-nications

Wi-Fi Equipment

ELECOM LIFESTYLE INNOVATION

Elecom Group Companies

ELECOM LIFESTYLE INNOVATION

Elecom Co., Ltd.
www.elecom.co.jp

ELECOM is a fabless manufacturer of PC peripherals listed on the Tokyo Stock Exchange and a parent company of the ELECOM Group Companies. ELECOM's mission is to bridge innovation and people's lifestyles.

・Planning, development, manufacturing and sales of PC / Smartphone / tablet PC peripherals, Network related equipment, Office furniture.
・Network equipment installation service
・Cloud storage service

Logitec

Logitec INA Solutions Co., Ltd.
www.logitec.co.jp/inas

Business Line
・Development, design, manufacture and sale of PCs, PC peripherals and communication devices
・Data recovery service
・PC maintenance and repair service

DX ANTENNA

DX Antenna Co., Ltd.
www.dxantenna.co.jp

Business Line
・Various antennas and TV Receivers & Accessories
・CATV related devices
・Information transmission system related devices
・Security system related devices

D-CLUE Technologies

D-Clue Technologies Co., Ltd.
www.d-clue.com

Business Line
・Cutting-edge analog design services and solutions
・Optimal platforms and system solutions
・Research and development of high-performance analog and RF analog circuits
・Development and provision of platform products combining analog and firmware technologies

Gateway

TXPC-RAPLM-N3350 Series
（Supported Windows 10 IoT Tiny Gateway）

New

Small Form Factor	Fanless	Multiple Connectivity	Industrial Grade
Operating Temperature 0 to 55 ℃	Operating Voltage 9 to 36 V DC	Wireless *1	Security *1 *2

Apollo Lake	Supply term:Until 2026 *As of November, 2019

*Unexpected matters may change the supply term.
*1: Depends on models. *2: Secure boot function.

Specifications		TXPC-RAPLM-N3350-F1 (Mini-PCIe extension slot installed model)	TXPC-RAPLM-N3350-F1V1 (Wireless LAN & Bluetoothsupport model)
System	Main Processor	Intel® Celeron® Processor N3350, 2 Core, 1.1 GHz, 2 MB cache	
	Chipset	Integrated with CPU	
	System Memory	Onboard, 1x LPDDR3, 1866 MHz, 4 GB	
	Storage	Onboard, eMMC, 32 GB	
	IO Chip	-	
	BIOS	Insyde UEFI	
	Watchdog Timer	Programmable 256 levels, timer interval 1 to 255 sec.	
	H/W Monitor	CPU Temperature monitoring, Voltages monitoring	
Expansion	Mini PCIe slot	1x Full-size Mini PCIe	1x Full-size Mini PCIe (Used)
	SD/SDHC	-	
I/O (Front)	SATA	-	
	USB	2x USB 3.0, 4x USB 2.0 (Option)	
	COM	3x RS-232/422/485 (Option)	
	LPT	-	
	LAN port	2x RJ-45	
	Display	1x HDMI	
	GPIO	Input 8 bit, Output 8 bit (Option)	
	PS/2	-	
	Audio In/Output	-	
	Switch/LED	Power button, Reset button, 1x Power LED	
	Others	-	
	Codec	-	
	Amplifier	-	
	LAN Controller	2x Intel® i210	
Display	Resolution	HDMI : Max. Resolution 1920 x 1080 @60 Hz, 3840 x 2160 @30 Hz	
	LVDS	-	
OS	OS Support	Windows® 10 IoT Enterprise 2016 LTSB, 64 bit, (Japanese/English) Ubuntu® 18.04 64 bit (Operation confirmed) (*2)	
Other	Power Requirement	+9 Vdc, +36 Vdc	
	Power Type	2-pin terminal block	
	Operate temp (*1)	0 to 55 °C	
	Storage temp	-10 to 65 °C	
	Operate humidity	30 to 90 %rh (w/o Condensation)	
Certification	EMC & Safety	CE, FCC, VCCI	
Accessories	-	1x Power supply terminal block, 1x Harness, 1x DC adapter jack (*3), 2x Wireless antenna (*4)	
Size/weight	W/D/H, weight	100 mm x 70 mm x 31 mm, 0.30 kg (*5)	100 mm x 70 mm x 31 mm, 0.32 kg (*5)

*1 With Air flow
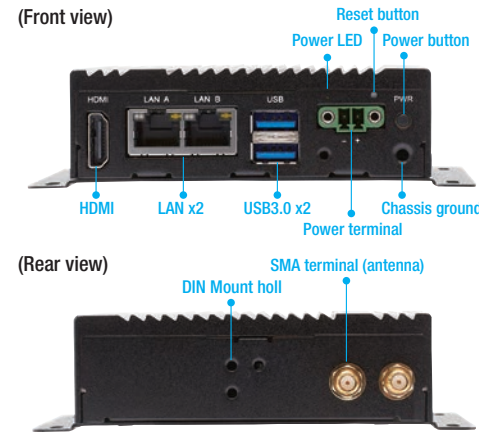*2 It is necessary for the OS to be installed by the customer.
*3 The AC adapter is sold separately. *4 Only supports TXPC-RAPLM-N3350-F1V1.
*5 Does not include protrusions. The weight varies by product.

Operating System

Windows 10 IoT 64 bit *Operation confirmed with Ubuntu 18.04 64 bit

Interface

(Front view)

Reset button
Power LED Power button
HDMI LAN x2 USB3.0 x2 Chassis ground
Power terminal

(Rear view)

SMA terminal (antenna)
DIN Mount holl

Option

*AC power code
*DIN Mounting Stay
*As of November, 2019

Multi-connectivity Design

Stackable housing supports additional Interfaces.
Your gateway must be proper for your own application.

The following extension options can be installed.
*Shipped with the extension options installed.

Extension options	Remarks
USB2.0	4-ports
COM	3x RS232/422/485
Digital I/O	16 channels

*As of November, 2019

Gateway

BXPC-CARA-MX6DL

Small Form Factor	Fanless	Multiple Connectivity	Industrial Grade
Operating Temperature -40 to 70 ℃	Operating Voltage 12 to 26 V DC	Wireless	Security

ARM	Supply term:Until 2026 *As of November, 2019

*Unexpected matters may change the supply term.

Specifications		BXPC-CARA-MX6DL
System	Main Processor	NXP i.MX6 Multimedia Processor (2 Core 800 MHz)
	Chipset	i.MX6
	System Memory	1x Onboard DDR3 1 GB
	Storage	Onboard eMMC 4 GB
	IO Chip	-
	BIOS	-
	Watchdog Timer	Yes
	H/W Monitor	CPU Temperature monitoring
Expansion	Mini PCIe slot	1x Half-size Mini PCIe
	PCI / PCIe slot	-
	M.2 slot	-
	SD/SDHC	1x micro SD/micro SDHC/micro SDXC
	CF/CFast	-
	Others	-
I/O	SATA	-
	USB (Front)	2x USB 2.0
	USB (Rear)	-
	COM	1x Debug Port (3-pin UART)
	LPT	-
	LAN port	1x RJ-45
	Display	1x HDMI
	GPIO	-
	PS/2	-
	Audio In/Output	1x Line-out
	Switch/LED	-
	Others	1x USBOTG
Display	Resolution	HDMI : Max. resolution 1920×1080 @60 Hz
		-
		-
		-
	LVDS	-
OS	OS Support	Ubuntu® 16.04 32 bit
Audio	Codec	WM8962
	Amplifier	-
Ethernet	LAN Controller	-
Power	Power Requirement	+12 V, +26 V
	Power Type	AT
Environment	Operate temp (*1)	-40 to 70 °C
	Storage temp	-40 to 70°C
	Operate humidity	30 to 90 %rh (W/O Condensation)
Accessories	-	1x AC Adapter (*2), 1x AC Code, 1x Wall mount Kit, 1x Screw Set
Size/weight	W/D/H, weight	153 mm x 107.8 mm x 30 mm, 1.5 kg

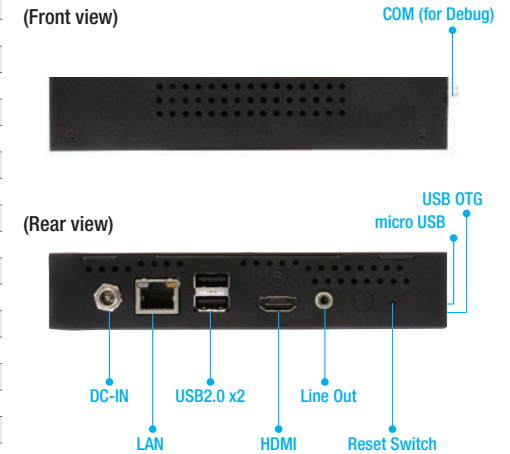*1 With Air flow
*2 AC Adapter operate temperature is 0 to 40 °C.

Operating System

Ubuntu 16.04 32 bit

Interface

(Front view)

COM (for Debug)

(Rear view)

USB OTG
micro USB
DC-IN USB2.0 x2 Line Out
LAN HDMI Reset Switch

Gateway

BXPC-RSKLM Series
（Intel Skylake-U installed temperature extension fanless BoxPC）

Virtual Write Filter

| Small Form Factor | Fanless | Multiple Connectivity | Industrial Grade |
| Operating Temperature -20 to 60 ℃ | Operating Voltage 9 to 32 V DC | Wireless | Security |

| Skylake | Supply term:Until 2026 *As of November, 2019 |

*Unexpected matters may change the supply term.

Specifications

Specifications		BXPC-RSKLM-6600U	BXPC-RSKLM-6300U	BXPC-RSKLM-6100U	BXPC-RSKLM-3955U
	Main Processor	Intel® Core™ i7-6600U Processor, 2 Core, 2.6 GHz, 4 MB cache	Intel® Core™ i5-6300U Processor, 2 Core, 2.4 GHz, 3 MB cache	Intel® Core™ i3-6100U Processor, 2 Core, 2.3 GHz, 3 MB cache	Intel® Celeron® Processor 3955U, 2 Core, 2.0 GHz, 2 MB cache
System	Chipset	Integrated with CPU			
	System Memory	1x 260-pin, SO-DIMM, DDR4, 2133 MHz, Supports up to 16 GB (*2)			
	IO Chip	-			
	BIOS	AMI UEFI			
	Watchdog Timer	H/W Reset, 1 sec. - 65535 sec./min.1 sec. or 1 min. Step			
	H/W Monitor	CPU Temperature Monitoring, Voltages Monitoring, CPU Fan Speed Control			
Expansion	Mini PCIe slot	-			
	PCI / PCIe slot	-			
	M.2 slot	1x M.2 (B-Key, 2242, 3042)			
	SD/SDHC	-			
	CF/CFast	-			
	Others	-			
I/O (Rear)	SATA	1x 2.5" Drive Bay			
	USB (Front)	2x USB 3.0			
	USB (Rear)	2x USB 3.0, 2x USB 2.0 (Option)			
	COM	2x RS-232/422/485 (Rear, Multi-function cable is required)			
	LPT	-			
	LAN port	2x RJ-45			
	Display	1x DP, 1x HDMI (Option), 1x DVI-D (Option)			
	GPIO	Input 6 bit, Output 6 bit (Multi-function cable is required)			
	PS/2	1x Keyboard & Mouse (Multifunction Cable is required)			
	Audio In/Output	1x Mic-in, 1x Line-out, 1x Line-in (Multifunction Cable is required)			
	Switch/LED	Power button, Reset button, 1x Power LED, 1x HDD LED			
	Others	-			
Display	Resolution	DP: Max. resolution 4096 x 2304 @60 Hz			
		HDMI: Max. resolution 1920 x 1080 @60 MHz (Option)			
		DVI-D: Max. resolution 1920 x 1080 @60 MHz (Option)			
		-			
		-			
	LVDS	-			
OS	OS Support	Windows® 10 IoT Enterprise 2016 LTSB, 64 bit, (Japanese/English)			
Audio	Codec	Realtek® ALC892 HD Audio Codec			
	Amplifier	-			
Ethernet	LAN Controller	1x Intel® I219LM Gigabit Ethernet PHY, 1x Intel® I211AT PCI-e Gigabit Ethernet			
Power	Power Requirement	+12 Vdc, +24 Vdc			
	Power Type	AT/ATX (ATX is default) , 2-pin terminal block			
Environment	Operate temp (*1)	-20 to 60 °C (with SSD)			
	Storage temp	-40 to 75 °C			
	Operate humidity	30 to 90 %rh (w/o Condensation)			
Accessories	-	1x Screw set, 1x Wall mount kit, 1x Multi-function cable, 1x DP to VGA cable, 1x DC adaptre jack			
Size/weight	W/D/H, weight	240 mm x 151 mm x 45 mm, 1.6 kg (*3)　*with optional I/O ports 240 mm x 151 mm x 75 mm, 1.7 to 1.9 kg			

*1 With Air flow　　　　　*2 The Celeron® 3955U Processor model is not compatible with 16 GB.　*3 Does not include protrusions.

Operating System

Windows 10 IoT 64 bit

Interface

(Front view)

Power button　USB3.0 x2　2.5"Driver Bay　Terminal block of external power switch
Reset button

(Rear view)

DP　USB3.0 x2　COM
LAN x2　Multi-Function Port　Power terminal

Memory & Storage

DIMM
4/8/16 GB
*The Celeron® 3955U Processor model is not compatible with 16 GB.

Storage
2.5 inch
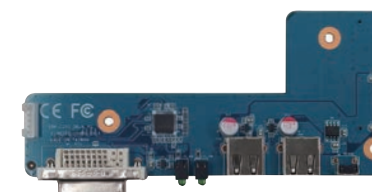| MLC | 30/60/120 GB |
| Q-MLC | 30/60/120 GB |

Multi-connectivity Design

Stackable housing supports additional Interfaces.

Option Parts 1
1x HDMI
2x USB 2.0

Option Parts 2
DVI-D
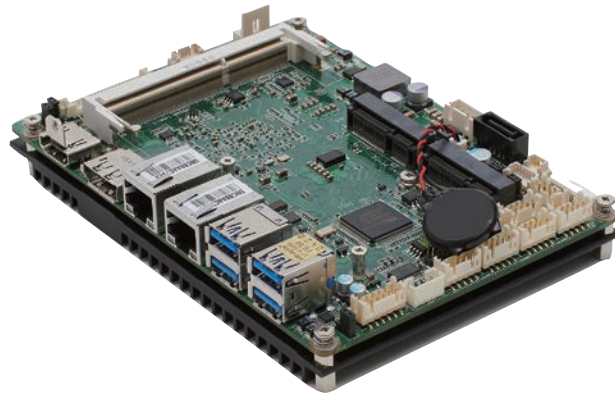2x USB 2.0

Option Parts 3
4x RJ-45 (PoE)
2x USB 2.0

No extended options

With extended option

3.5inch SBC (3.5"Single board computer)

MBC-BSWM-N3010

Small Form Factor	Fanless	Multiple Connectivity	Industrial Grade
Operating Temperature -10 to 60 ℃	Operating Voltage 9 to 36 V DC	Wireless	Security

| Braswell | Supply term:Until 2026 *As of November, 2019 |

*Unexpected matters may change the supply term.

Specifications — MBC-BSWM-N3010

		MBC-BSWM-N3010
System	Main Processor	Intel® Celeron® Processor N3010, 2 Core, 1.04 GHz, 2 MB cache
	Chipset	Integrated with CPU
	System Memory	1x 204-pin, SO-DIMM, DDR3L, 1600/1333 MHz, Supports up to 8 GB
	IO Chip	Fintek F81866AD-I
	BIOS	AMI UEFI
	Watchdog Timer	H/W Reset, 1 sec. - 65535 sec./min.1 sec. or 1 min. Step
	H/W Monitor	CPU Temperature Monitoring, Voltages Monitoring, CPU Fan Speed Control
Expansion	SATA	1x SATA 6 Gbps
	Mini PCIe slot	1x Full-size Mini PCIe with mSATA supported, 1x Full-size Mini PCIe
	PCIe slot	-
	M.2 slot	-
	PCI slot	-
	SD/SDHC	-
	CF/CFast	-
	Others	-
I/O (Rear)	USB	4x USB 3.0
	LAN	2x RJ-45
	Display	1x DP, 1x HDMI
I/O (Internal)	USB	2x USB 2.0
	COM	1x RS-232/422/485, 3x RS-232
	LPT	-
	GPIO	Input 6 bit, Output 6 bit
	PS/2	1x Keyboard/Mouse
	Audio	1x Mic-in, 1x Line-in, 1x Line-out, 2x Amplifer out
	Front Panel I/F	Power switch, Reset switch, 1x Power LED, 1x HDD LED
Display	Resolution	HDMI: Max. Resolution 2560 x 1600 @60 Hz, 3840 x 2160 @30 Hz DP: Max. Resolution 2560 x 1600 @60 Hz, 3840 x 2160 @30 Hz LVDS: Max. Resolution 1920 x 1080 @60 Hz 2 simultaneous display on screen
	LVDS	Dual Channel 18/24-bits LVDS
OS	OS Support	Windows® 10 IoT Enterprise 2016 LTSB, 64 bit, (Japanese/English)
Audio	Codec	Realtek® ALC887-VD2-CG HD Audio Codec
	Amplifier	2x 3 W Amplifier
Ethernet	LAN Controller	2x Realtek® RTL8111G GbE LAN
Power	Power Requirement	+9 Vdc, +36 Vdc
	Power Type	AT/ATX, 4-pin type
Environment	Operate temp	-10 to 60 °C
	Storage temp	-40 to 80 °C
	Operate humidity	10 to 90 %rh (w/o Condensation)
Accessories	-	1x SATA + SATA Signal Cable, 1x Power Supply Cable, 1x USB Cable, 1x COM Cable
Size/weight	W/D, weight	146 mm x 102 mm, 0.3 kg (*1)

*1 Does not include protrusions.

Operating System
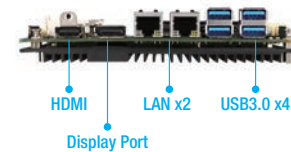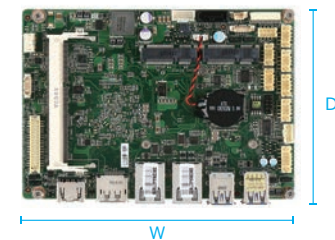
Windows 10 IoT 64 bit

Memory & Storage

DIMM
4/8 GB

Storage

2.5 inch | MLC 30/60/120 GB
| Q-MLC 30/60/120 GB

mSATA | MLC 30/60/120 GB

Interface

HDMI   LAN x2   USB3.0 x4
Display Port

Top view

D
W

3.5inch SBC (3.5"Single board computer)

MBC-APLE-E3940

Under Dev

Virtual Write Filter

Small Form Factor	Fanless	Multiple Connectivity	Industrial Grade
Operating Temperature -40 to 85 ℃	Operating Voltage 12 to 24 V DC	Wireless	Security

| Apollo Lake- I | Supply term:Until 2026 *As of November, 2019 |

*Unexpected matters may change the supply term.

Specifications — MBC-APLE-E3940

		MBC-APLE-E3940
System	Main Processor	Intel® Atom® x5-E3940 Processor, 4 Core, 1.6 GHz, 2 MB cache
	Chipset	Integrated with CPU
	System Memory	1x 204-pin, SO-DIMM, DDR3L, 1600/1866 MHz, Supports up to 8 GB
	IO Chip	Fintek F81867D-I
	BIOS	AMI UEFI
	Watchdog Timer	H/W Reset, 1 sec. - 255 sec.,1 sec./step
	H/W Monitor	Supports Monitoring System Tempretuer and Voltage
Expansion	SATA	1x SATA 6 Gbps
	Mini PCIe Slot	2x Full-size (Mini PCIe1 Slot w/ NANO SIM-Holder) (Mini PCIe2 Slot w/ mSATA)
	PCIe Slot	-
	M.2 Slot	-
	PCI Slot	-
	SD/SDHC	1x Micro SD Socket
	CF/CFast	-
	Others	-
I/O (Rear)	USB	4x USB 3.0
	LAN	2x RJ-45
	Display	1x DP, 1x HDMI
I/O (Internal)	USB	2x USB 2.0
	COM	1x RS-232/422/485, 5x RS-232
	LPT	-
	GPIO	Input 8 bit, Output 8 bit
	PS/2	-
	Audio	1x Mic-in, 1x Line-in, 1x Line-out, 2x Amplifier out
	Front Panel I/F	Power switch, Reset switch, 1x Power LED, 1x HDD LED
Display	Resolution	HDMI: Max. Resolution 1920 x 1080 @60 Hz, 3840 x 2160 @30 Hz DP: Max. Resolution 4096 x 2160 @60 Hz LVDS: Max. Resolution 1920 x 1080 @60 Hz 3 simultaneous display on screen (LVDS/HDMI/Display Port/eDP)
	LVDS	Dual Channel 18/24-bit
OS	OS Support	Windows® 10 IoT Enterprise 2019 LTSC, 64 bit, (Japanese/English) Ubuntu® 18.04 64 bit (Operation confirmed) (*1)
Audio	Codec	Realtek® ALC887-VD2-CG HD Audio Codec
	Amplifier	2x 3 W Amplifier
Ethernet	LAN Controller	2 x Intel® I210-IT Gigabit Ethernet
Power	Power Requirement	+12 Vdc, +24 Vdc
	Power Type	AT/ATX, 2-pin terminal block
Environment	Operate temp	-30 to 85 °C
	Storage temp	-40 to 85 °C
	Operate humidity	30 to 90 %rh (w/o Condensation)
Accessories	-	1x USB Cable, 1x SATA Signal + SATA Power Supply Cable, 1x COM Cable, 1x Power Supply Cable
Size/weight	W/D, weight	146 mm x 102 mm, 0.6 kg (*2)

*1 It is necessary for the OS to be installed by the customer.
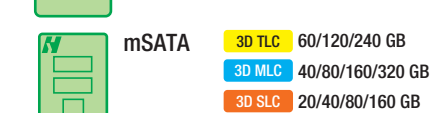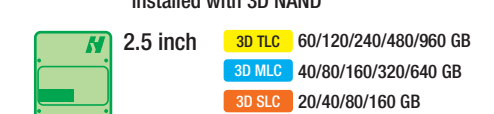*2 Does not include protrusions.

Operating System

Windows 10 IoT 64 bit

*Operation confirmed with Ubuntu 18.04 64 bit

Memory & Storage

DIMM
4/8 GB

Storage   *Only compatible with products installed with 3D NAND

2.5 inch | 3D TLC 60/120/240/480/960 GB
| 3D MLC 40/80/160/320/640 GB
| 3D SLC 20/40/80/160 GB

mSATA | 3D TLC 60/120/240 GB
| 3D MLC 40/80/160/320 GB
| 3D SLC 20/40/80/160 GB

Interface

Display Port   USB3.0 Ports
HDMI   RJ45 GbE LAN Ports

Top view

D
W

3.5inch SBC (3.5"Single board computer)

MBC-SKLM Series

Under Dev

Virtual Write Filter

| Small Form Factor | Fanless | Multiple Connectivity | Industrial Grade |
| Operating Temperature -10 to 60 °C | Operating Voltage 12 to 24 V DC | Wireless | Security |

Skylake   Supply term:Until 2026
*As of November, 2019

*Unexpected matters may change the supply term.

Specifications		MBC-SKLM-6600U	MBC-SKLM-6300U	MBC-SKLM-6100U	MBC-SKLM-3955U
System	Main Processor	Intel® Core™ i7-6600U Processor, 2 Core, 2.6 GHz, 4 MB cache	Intel® Core™ i5-6300U Processor, 2 Core, 2.4 GHz, 3 MB cache	Intel® Core™ i3-6100U Processor, 2 Core, 2.3 GHz, 3 MB cache	Intel® Celeron® Processor 3955U, 2 Core, 2.0 GHz, 2 MB cache
	Chipset	Integrated with CPU			
	System Memory	1x 260-pin, SO-DIMM, DDR4, 2133 MHz, Supports up to 16 GB (*1)			
	IO Chip	Fintek F81866AD-I			
	BIOS	AMI UEFI			
	Watchdog Timer	H/W Reset, 1 sec. - 255 sec.,1 sec./step			
	H/W Monitor	Supports Monitoring System Tempretuer and Voltage			
	SATA	1x SATA 6 Gbps			
Expansion	Mini PCIe Slot	2x Full-size (Mini PCIe1 Slot w/ NANO SIM-Holder) (Mini PCIe2 Slot w/ mSATA)			
	PCIe Slot	-			
	M.2 Slot	-			
	PCI Slot	-			
	SD/SDHC	1x Micro SD Socket			
	CF/Cfast	-			
	Others	-			
I/O (Rear)	USB	4x USB 3.0			
	LAN	2x RJ-45			
	Display	1x DP, 1x HDMI			
I/O (Internal)	USB	2x USB 2.0			
	COM	1x RS-232/422/485, 5x RS-232			
	LPT	-			
	GPIO	Input 8 bit, Output 8 bit			
	PS/2	-			
	Audio	1x Mic-in, 1x Line-in, 1x Line-out, 2x Amplifier out			
	Front Panel I/F	Power switch, Reset switch, 1x Power LED, 1x HDD LED			
Display	Resolution	HDMI: Max. Resolution 3840 x 2160 @24 Hz DP: Max. Resolution 3840 x 2160 @60 Hz LVDS: Max. Resolution 1920 x 1200 @60 Hz			
	LVDS	Dual Channel 18/24-bit			
OS	OS Support	Windows® 10 IoT Enterprise 2019 LTSC, 64 bit, (Japanese/English) Ubuntu® 18.04 64 bit (Operation confirmed) (*2)			
Audio	Codec	Realtek® ALC887-VD2-CG HD Audio Codec			
	Amplifier	2x 3 W Amplifier			
Ethernet	LAN Controller	LAN1: Intel® I219LM GbE-PHY LAN LAN 2 : Intel® I210-AT GbE LAN			
Power	Power Requirement	+12 Vdc, +24 Vdc			
	Power Type	AT/ATX, 4-pin type			
Environment	Operate temp	-10 to 60 °C			
	Storage temp	-20 to 80°C			
	Operate humidity	30 to 90 %rh (w/o Condensation)			
Accessories	-	1x USB Cable, 1x SATA Signal + SATA Power Supply Cable, 1x COM Cable, 1x Power Supply Cable			
Size/weight	W/D, weight	146 mm x 102 mm, 0.6 kg (*3)			

*1 The Celeron® 3955U Processor model is not compatible with 16 GB.
*2 It is necessary for the OS to be installed by the customer. *3 Does not include protrusions.

Operating System

Windows 10 IoT 64 bit   *Operation confirmed with Ubuntu 18.04 64 bit
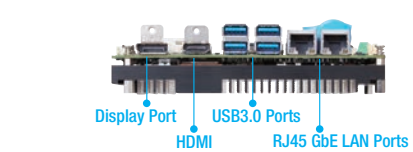
Memory & Storage

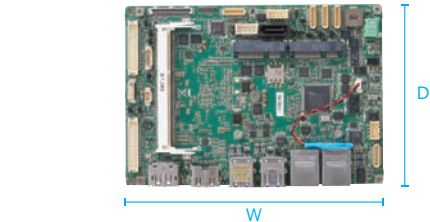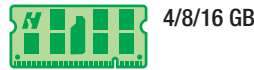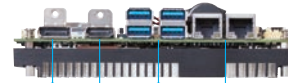**DIMM**   4/8/16 GB

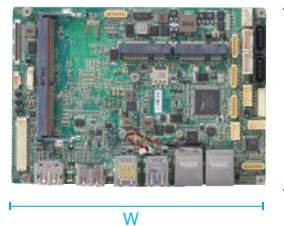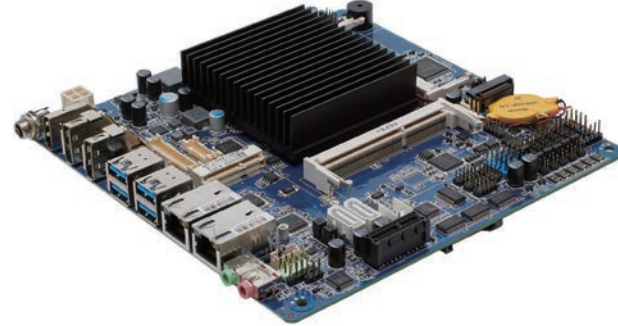*The Celeron® 3955U Processor model is not compatible with 16 GB.

Storage   *Only compatible with products installed with 3D NAND

2.5 inch
3D TLC	60/120/240/480/960 GB
3D MLC	40/80/160/320/640 GB
3D SLC	20/40/80/160 GB

mSATA
3D TLC	60/120/240 GB
3D MLC	40/80/160/320 GB
3D SLC	20/40/80/160 GB

Interface

Display Port   USB3.0 Ports
HDMI   RJ45 GbE LAN Ports

Top view

W / D

Mini-ITX Mother board

MBM-APLM-N4200

| Small Form Factor | Fanless | Multiple Connectivity | Industrial Grade |
| Operating Temperature | Operating Voltage 12 to 24 V DC | Wireless | Security |

Apollo Lake   Supply term:Until 2026
*As of November, 2019

*Unexpected matters may change the supply term.

Specifications		MBM-APLM-N4200
System	Main Processor	Intel® Pentium® Processor N4200, 4 Core, 1.1 GHz, 2 MB cache
	Chipset	Integrated with CPU
	System Memory	2x 204-pin, SO-DIMM, DDR3L, 1600/1333 MHz, Supports up to 16 GB
	IO Chip	iTE IT8528
	BIOS	AMI UEFI
	Watchdog Timer	H/W Reset, 1 sec. - 65535 sec./min. and 1 sec. or 1 min./step
	H/W Monitor	CPU Temperature Monitoring, Voltages Monitoring, CPU Fan Speed Control
Expansion	SATA	2x SATA 6 Gbps
	Mini PCIe Slot	1x Full-size Mini PCIe support mSATA, 6 Gbps
	PCIe Slot	1x PCIe［x1] slot
	M.2 Slot	1x M.2 (Type A 2230 WiFi module)
	PCI Slot	-
	SD/SDHC	-
	CF/Cfast	-
	Others	-
I/O(Rear)	USB	4x USB 3.0
	LAN	2x RJ-45
	Display	2x DP, 1x HDMI
	Audio	1x Mic-in, 1x Line-out
I/O(Internal)	USB	5x USB 2.0
	COM	1x RS-232/422/485, 5x RS-232
	LPT	-
	GPIO	Input 8 bit, Output 8 bit
	PS/2	-
	Audio	1x Mic-in, 1x Line-in, 1x Line-out, 1x Digital Mic-in, 2x Amplifier out, 1x S/PDIF
	Front Panel I/F	Power switch, Reset switch, 1x Power LED, 1x HDD LED
Display	Resolution	DP++: Max. resolution 4096 x 2160 @60 Hz (1x HDMI/DP, 1x DP++) HDMI: Max. resolution 3840 x 2160 @30 Hz, 2560 x 1600 @30 Hz DP:Max. resolution 3840 x 2160 @30 Hz, 2560 x 1600 @30 Hz LVDS: Max. Resolution 1920 x 1080 3 simultaneous display on screen
	LVDS	Dual channel 18/24-bits LVDS
OS	OS Support	Windows® 10 IoT Enterprise 2016 LTSB, 64 bit, (Japanese/English)
Audio	Codec	Realtek® ALC662 HD Audio Codec
	Amplifier	2x 3 W Amplifier
Ethernet	LAN Controller	2x Intel® I211AT Gigabit Ethernet
Power	Power Requirement	+12 Vdc, +24 Vdc
	Power Type	AT/ATX, 4-pin type and DC-jack
	Operate temp	0 to 60 °C
Environment	Storage temp	-40 to 75 °C
	Operate humidity	30 to 90 %rh (w/o Condensation)
Accessories	-	2x SATA cable, 1x SATA power cable, 1x I/O Shield panel
Size/weight	W/D, weight	170 mm x 170 mm, 0.4 kg (*1)

*1 Does not include protrusions.

Operating System

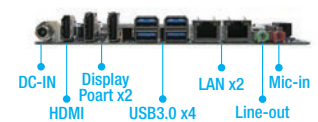**Windows 10 IoT 64 bit**

Memory & Storage

DIMM   4/8 GB

Storage

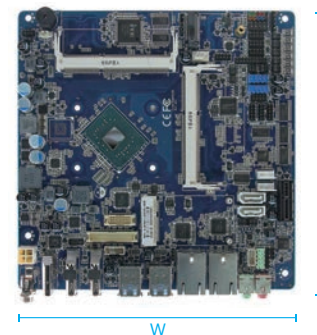2.5 inch
| MLC | 30/60/120 GB |
| Q-MLC | 30/60/120 GB |

mSATA
| MLC | 30/60/120 GB |

Interface

DC-IN   Display Poart x2   LAN x2   Mic-in
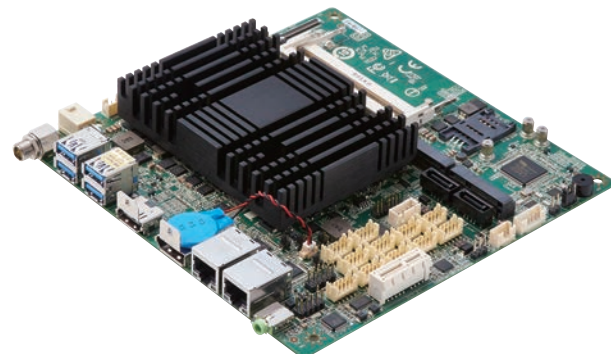HDMI   USB3.0 x4   Line-out

Top view

W / D

MBM-APLE-E3940

Under Dev

Virtual Write Filter

Small Form Factor	Fanless	Multiple Connectivity	Industrial Grade
Operating Temperature −40 to 85 ℃	Operating Voltage 12 to 24 V DC	Wireless	Security

Apollo Lake- I	Supply term:Until 2026 *As of November, 2019

*Unexpected matters may change the supply term.

Specifications		MBM-APLE-E3940
System	Main Processor	Intel® Atom® x5-E3940 Processor, 4 Core, 1.6 GHz, 2 MB cache
	Chipset	Integrated with CPU
	System Memory	2x 204-pin, SO-DIMM, DDR3L, 1600/1866 MHz, Supports up to 8 GB
	IO Chip	Fintek F81867D-I
	BIOS	AMI UEFI
	Watchdog Timer	H/W Reset, 1 sec. - 255 sec.,1 sec./step
	H/W Monitor	Supports Monitoring System Tempretuer and Voltage
Expansion	SATA	2x SATA 6 Gbps
	Mini PCIe slot	2x Full-size (Mini PCIe1 Slot w/ NANO SIM-Holder) (Mini PCIe2 Slot w/ mSATA)
	PCIe slot	1x PCIe x 1 slot
	M.2 slot	-
	PCI slot	-
	SD/SDHC	-
	CF/CFast	-
	Others	-
I/O(Rear)	USB	4x USB 3.0
	LAN	2x RJ-45
	Display	1x DP, 1x HDMI
	Audio	1x Line-out
I/O(Internal)	USB	6x USB 2.0
	COM	2x RS-232/422/485, 4x RS-232
	LPT	-
	GPIO	2x Connector (Input 4 bit, Output 4 bit)
	PS/2	1x Keyboard/Mouse
	Audio	1x Mic-in, 1x LINE-in, 2x Amplifier out, 1x S/PDIF
	Front Panel I/F	Power switch, Reset switch, 1x Power LED, 1x HDD LED
Display	Resolution	HDMI: Max. Resolution 1920 x 1080 @60 Hz, 3840 x 2160 @30 Hz DP: Max. Resolution 4096 x 2160 @60 Hz LVDS: Max. Resolution 1920 x 1080 @60 Hz 3 simultaneous display on screen (LVDS/HDMI/Display Port/eDP)
	LVDS	Dual Channel 18/24-bit
OS	OS Support	Windows® 10 IoT Enterprise 2019 LTSC, 64 bit, (Japanese/English) Ubuntu® 18.04 64 bit (Operation confirmed) (*1)
Audio	Codec	Realtek® ALC887-VD2-CG HD Audio Codec
	Amplifier	2x 3 W Amplifier
Ethernet	LAN Controller	2x Intel® I210-IT GbE LAN
Power	Power Requirement	+12 Vdc, +24 Vdc
	Power Type	AT/ATX, 4-pin type and DC-jack
Environment	Operate temp	-30 to 85 °C
	Storage temp	-40 to 85 °C
	Operate humidity	30 to 90 %rh (w/o Condensation)
Accessories	-	1x twin COM cable with shell, 1x SATA Signal + SATA power cable, 1x I/O Shield panel
Size/weight	W/D, weight	170 mm x 170 mm, 0.5 kg (*2)

*1 It is necessary for the OS to be installed by the customer.
*2 Does not include protrusions.

Operating System

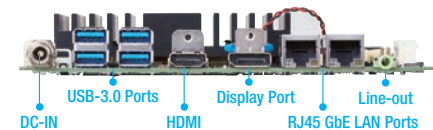**Windows 10 IoT 64 bit** *Operation confirmed with Ubuntu 18.04 64 bit

Memory & Storage

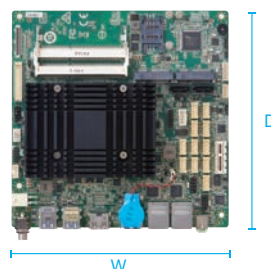**DIMM** 4/8 GB

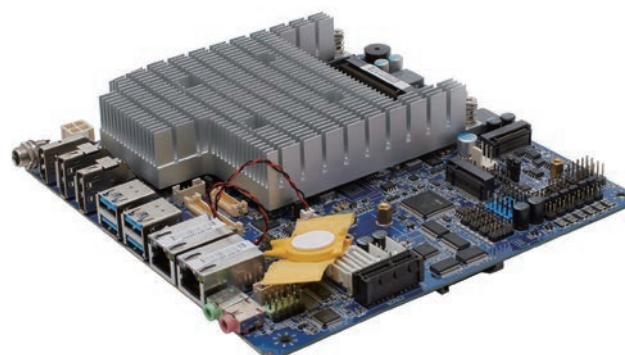**Storage** *Only compatible with products installed with 3D NAND

2.5 inch
3D TLC	60/120/240/480/960 GB
3D MLC	40/80/160/320/640 GB
3D SLC	20/40/80/160 GB

mSATA
3D TLC	60/120/240 GB
3D MLC	40/80/160/320 GB
3D SLC	20/40/80/160 GB

Interface

DC-IN | USB-3.0 Ports | Display Port | Line-out
HDMI | RJ45 GbE LAN Ports

Top view

D
W

MBM-SKLM Series

Small Form Factor	Fanless	Multiple Connectivity	Industrial Grade
Operating Temperature	Operating Voltage 12 to 24 V DC	Wireless	Security

Skylake	Supply term:Until 2026 *As of November, 2019

*Unexpected matters may change the supply term.

Specifications		MBM-SKLM-6600U	MBM-SKLM-6300U	MBM-SKLM-6100U	MBM-SKLM-3955U
System	Main Processor	Intel® Core™ i7-6600U Processor, 2 Core, 2.6 GHz, 4 MB cache	Intel® Core™ i5-6300U Processor, 2 Core, 2.4 GHz, 3 MB cache	Intel® Core™ i3-6100U Processor, 2 Core, 2.3 GHz, 3 MB cache	Intel® Celeron® Processor 3955U, 2 Core, 2.0 GHz, 2 MB cache
	Chipset	Integrated with CPU			
	System Memory	2x 260-pin, SO-DIMM, DDR4, 2133 MHz, Supports up to 32 GB (*1)			
	IO Chip	iTE IT8528E			
	BIOS	AMI UEFI			
	Watchdog Timer	H/W Reset, 1 sec. - 65535 sec./min.1 sec. or 1 min. Step			
	H/W Monitor	CPU Temperature Monitoring, Voltages Monitoring, CPU Fan Speed Control			
Expansion	SATA	2x SATA 6 Gbps			
	Mini PCIe slot	-			
	PCIe slot	1x PCIe [x1]			
	M.2 slot	1x M.2 (Type B 3042/2242/2260/2280), 1x M.2 (Type A)			
	PCI slot	-			
	SD/SDHC	1x SD/SDHC			
	CF/CFast	-			
	Others	-			
I/O (Rear)	USB	4x USB 3.0			
	LAN	2x RJ-45			
	Display	2x DP, 1x HDMI			
	Audio	1x Mic-in, 1x Line-out			
I/O (Internal)	USB	5x USB 2.0			
	COM	1x RS-232/422/485, 5x RS-232			
	LPT	-			
	GPIO	Input 8 bit, Output 8 bit			
	PS/2	-			
	Audio	1x Mic-in, 1x Line-in, 1x Line-out, 1x Digital Mic-in, 2x Amplifier out, 1x S/PDIF			
	Front Panel I/F	Power switch, Reset switch, 1x Power LED, 1x HDD LED			
Display	Resolution	DP++: Max. Resolution 4096 x 2160 @60 Hz (1x HDMI/DP, 1x DP++) HDMI: Max. Resolution 3840 x 2160 @30 Hz, 2560 x 1600 @30 Hz DP: Max. Resolution 3840 x 2160 @30 Hz, 2560 x 1600 @30 Hz LVDS: Max. Resolution 1920 x 1080 3 simultaneous display on screen			
	LVDS	Dual channel 18/24-bits LVDS			
OS	OS Support	Windows® 10 IoT Enterprise 2016 LTSB, 64 bit, (Japanese/English)			
Audio	Codec	Realtek® ALC892 HD Audio Codec			
	Amplifier	2x 6 W Amplifier			
Ethernet	LAN Controller	1x Intel® I219LM Gigabit Ethernet PHY, 1x Intel® I211AT PCI-e Gigabit Ethernet			
Power	Power Requirement	+12 Vdc, +24 Vdc			
	Power Type	AT/ATX, 4-pin type and DC-jack			
Environment	Operate temp	0 to 60 °C			
	Storage temp	-40 to 75 °C			
	Operate humidity	30 to 90 %rh (w/o Condensation)			
Accessories	-	1x SATA cable, 1x SATA power cable, 1x I/O Shield pannel			
Size/weight	W/D, weight	170 mm x 170 mm, 0.6 kg (*2)			

*1 The Celeron® 3955U Processor model is not compatible with 16 GB.
*2 Does not include protrusions.

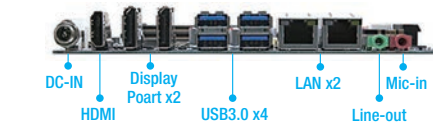## Operating System

Windows 10 IoT 64 bit

Memory & Storage

DIMM 4/8/16 GB

*The Celeron® 3955U Processor model is not compatible with 16 GB.

Storage
2.5 inch
| MLC | 30/60/120 GB |
| Q-MLC | 30/60/120 GB |

Interface

DC-IN | Display Poart x2 | LAN x2 | Mic-in
HDMI | USB3.0 x4 | Line-out

Top view

D
W