Expand Your Edge Applications With Wireless IIoT Gateways

LTE Cat. 4

LTE Cat. 1

LTE Cat. M1

NB-IoT

WI-FI

GPS

Rugged Arm-based Cellular IIoT Gateways for
Uninterrupted Connectivity

Remote or distributed outdoor IIoT applications such as in solar energy, oil and gas, and water/wastewater require reliable IIoT gateways with low-to-high bandwidth cellular connectivity to collect and transfer edge data. The Moxa UC series Arm-based computers are ideal for these applications with their wide variety of cellular connectivity options, compact size for cabinet installation, wide-operating temperature range, and hazardous location certifications. Furthermore, these computers have been deployed in a wide selection of edge application scenarios in IIoT projects around the world.

Wireless Ready

- Cellular, Wi-Fi, and GPS connectivity
- Low-to-high bandwidth options: NB-IoT, LTE Cat. M1, Cat. 1, and Cat. 4
- RF type approvals: FCC, PTCRB, RED, and RCM
- Carrier approvals: Verizon and AT&T
- Easy-to-use cellular management API

OT-to-Cloud Connectivity Ready

- Rich OT communication interfaces: LAN, serial, CAN, and DI/DO ports
- MQTT support and easy cloud connectivity to AWS, Azure, Ignition, and Alibaba Cloud IoT Platform with ThingsPro software*

Compact and Rugged

- Palm-sized form factor for easy installation
- Fanless design with -40°C to 85°C operating temperature range (-40 to 70°C with LTE module)
- Hazardous location certifications: C1D2, ATEX Zone 2, and IECEx

Long-term Support

- Moxa Industrial Linux with 10-year long-term support**
- Industry-leading 5-year hardware warranty

*Applies to select models. Refer to the ThingsPro product page for details.

**Terms and conditions apply. Contact Moxa for details.

Global Success in Industrial Applications

▶ Renewable Energy

Application	Cloud Service	Region/Country
Residential solar monitoring and billing system	AWS	USA
Residential solar monitoring and billing system	Private cloud	USA
Commercial solar monitoring	Private cloud	Europe and USA
Utility-scale solar power monitoring	Private cloud	Taiwan
Grid-connected and distributed solar power system	Private cloud	Taiwan
Wind turbine SCADA system	Private database	Europe
EV charging pole monitoring and billing system	Private cloud	China

▶ Oil & Gas

Application	Cloud Service	Region/Country
Upstream dry pump condition monitoring	AWS	USA
Upstream artificial lift condition monitoring	Azure	USA
Upstream oil well condition monitoring	Ignition Sparkplug	USA
Midstream pipeline condition monitoring	AWS	USA
Downstream oil tank monitoring	Azure	USA
Gas production monitoring	Azure	Russia

▶ Water and Wastewater

Application	Cloud Service	Region/Country
Industrial wastewater pipeline monitoring	AWS	USA
Organic waste-treatment system	Azure	USA
Remote pump station monitoring	Ignition	USA
Wastewater plant quality monitoring and analysis system	Azure	Europe
Water treatment SCADA system	Private Database	Russia

▶ Machine Monitoring and Facility Management

Application	Cloud Service	Region/Country
HVAC OEM Equipment Monitoring	AWS	USA
Building energy monitoring	Private cloud	Europe
Pump system status monitoring	Azure	Europe
Machinery status monitoring	Private Cloud	Taiwan
Semiconductor production line monitoring	Private Database	Taiwan
Lighting & HVAC condition monitoring & control system	Azure	Taiwan

Wireless-ready Arm-based Computers

Built-in cellular or Wi-Fi module, RF type approvals, and carrier approvals

	Built-in LTE Cat. M1/NB-IoT	Built-in LTE Cat. M1/NB-IoT	Built-in LTE Cat.1	Built-in LTE Cat.1 and Wi-Fi	Built-in LTE Cat.1 and Wi-Fi	Built-in LTE Cat. 4	Built-in LTE Cat.4 with Wi-Fi expansion
Series	UC-2100-W Series		UC-3100 Series			UC-8100A-ME-T Series	UC-8200 Series
Model	UC-2114	UC-2116	UC-3101	UC-3111	UC-3121	UC-8112A	UC-8220
Computer							
CPU	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A7 dual core, 1 GHz
Memory	512 MB	512 MB	• 512 MB • 1 GB (US model)	• 512 MB • 1 GB (US model)	• 512 MB • 1 GB (US model)	1 GB	2 GB
Storage Preinstalled	8 GB	8 GB	• 4 GB • 8 GB (US model)	• 4 GB • 8 GB (US model)	• 4 GB • 8 GB (US model)	8 GB	8 GB
Storage Slot	1 x microSD	1 x microSD	–	1 x SD	1 x SD (US model)	1 x SD	1 x microSD
OS	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)
TPM	–	–	–	–	–	–	TPM 2.0 built-in
Ethernet Ports	1 x GbE LAN, 1 x LAN	1 x GbE LAN, 1 x LAN	2 x LAN	2 x LAN	2 x LAN	2 x LAN	2 x GbE LAN
Serial Ports (RS-232/422/485)	2	2	1	2	1	2	2
CAN Ports	2	2	–	–	1	–	1
DI/DO	–	–	–	–	–	–	4 x DI, 4 x DO
USB Ports	–	–	1	1	1	1	1
Wireless							
Wireless Expansion Slot	–	–	–	–	–	–	1 x mPCIe slot
Cellular Connectivity	Built-in LTE Cat. M1/NB-IoT[1]	Built-in LTE Cat. M1/NB-IoT[1]	Built-in LTE Cat. 1[1]	Built-in LTE Cat. 1[1]	Built-in LTE Cat. 1[1]	Built-in LTE Cat. 4[1]	Built-in LTE Cat. 4[1]
SIM Slots	2 x nano-SIM	2 x nano-SIM	2 x nano-SIM	2 x nano-SIM	2 x nano-SIM	1 x mini-SIM	2 x nano-SIM
Wi-Fi	–	–	–	Built-in 802.11a/b/g/n[1]	Built-in 802.11a/b/g/n[1]	–	Expandable[2]
GPS	–	Yes	US model only	US model only	US model only	Yes	Yes
Standards and Certifications							
Safety/EMC/RF	CE, FCC, UL, IC, EAC, RCM	CE, FCC, UL, IC, EAC, RCM	CE, FCC, UL, IC, EAC, RCM	CE, FCC, UL, IC, EAC, RCM	CE, FCC, UL, IC, EAC, RCM	CE, FCC, UL, IC, EAC, RCM, KC, NCC	CE, FCC, UL, IC, EAC, RCM, KC, NCC
Carrier Approval	Verizon, AT&T	Verizon, AT&T	Verizon, AT&T	Verizon, AT&T	Verizon, AT&T	Verizon, AT&T	Verizon, AT&T
Hazardous Locations	ATEX, C1D2, IECEx	ATEX, C1D2, IECEx	ATEX, C1D2, IECEx	ATEX, C1D2, IECEx	ATEX, C1D2, IECEx	ATEX, C1D2, IECEx	ATEX, C1D2, IECEx
Environmental Limits and Power Parameters							
Operating Temperature	-40 to 75°C	-40 to 75°C	• -40 to 70°C (US model) • -30 to 70°C (Other)	• -40 to 70°C (US model) • -30 to 70°C (Other)	• -40 to 70°C (US model) • -30 to 70°C (Other)	-40 to 70°C	-40 to 70°C
Power Consumption (max.)	5.8 W	5.8 W	6 W	9 W	9 W	8 W	10 W
IIoT Software							
ThingsPro	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. Wireless module is built-in. Refer to the *Wireless Connection and Expansion Modules* section for details.
2. Wireless module must be purchased separately. Refer to the *Wireless Connection and Expansion Modules* section for details.

Wireless-optional Arm-based Computers

Flexibility to add cellular or Wi-Fi capability when needed

1 mPCIe for cellular/Wi-Fi	1 mPCIe for cellular/Wi-Fi	1 mPCIe for cellular/Wi-Fi	1 mPCIe for cellular/Wi-Fi	1 mPCIe for cellular/Wi-Fi	1 mPCIe for cellular 1 mPCIe for Wi-Fi	1 mPCIe for cellular/Wi-Fi

Series	UC-2100 Series	UC-5100 Series		UC-8100 Series	UC-8100A-ME-T	UC-8200 Series	UC-8410A Series
Model	UC-2104	UC-5102	UC-5112	UC-8112	UC-8112A-ME-T-LX	UC-8220	UC-8410A
Computer							
CPU	Arm Cortex-A8 600 MHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A7 dual core, 1 GHz	Arm Cortex-A7 dual core, 1 GHz
Memory	256 MB	512 MB	512 MB	512 MB	1 GB	2 GB	1 GB
Storage Preinstalled	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB
Storage Slot	–	1 x SD	1 x SD	1 x SD	1 x SD	1 x microSD	1 x SD, 1 x mSATA
OS	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Linux Debian 8 (Kernel 4.1)
Ethernet Ports	1 x LAN	2 x LAN	2 x LAN	2 x LAN	2 x LAN	2 x GbE LAN	3 x GbE LAN
Serial Ports (RS-232/422/485)	–	4	4	2	2	2	8
CAN Ports	–	–	2	–	–	1	–
DI/DO	–	4 x DI, 4 x DO	4 x DI, 4 x DO	–	–	4 x DI, 4 x DO	4 x DI, 4 x DO
USB Ports	–	1	1	1	1	1	2
Wireless[1]							
Wireless Expansion Slot	1 x mPCIe slot	1 x mPCIe slot	1 x mPCIe slot	1 x mPCIe slot	1 x mPCIe slot	2 x mPCIe slot	1 x mPCIe slot
SIM Slots	1 x mini-SIM	2 x micro-SIM	2 x micro-SIM	1 x mini-SIM	1 x mini-SIM	2 x nano-SIM	1 x mini-SIM
Standards and Certifications							
Safety/EMC/RF	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM, KC	CE, FCC, UL, EAC, RCM, KC	CE, FCC, UL, EAC, RCM
Hazardous Locations	–	–	–	–	ATEX, C1D2, IECEx	ATEX, C1D2, IECEx	–
Environmental Limits and Power Parameters							
Operating Temperature	-10 to 70°C	• -40 to 85°C • -40 to 70°C (with LTE) • -10 to 70°C (with Wi-Fi)	• -40 to 85°C • -40 to 70°C (with LTE) • -10 to 70°C (with Wi-Fi)	-10 to 60°C	• -40 to 85°C • -40 to 70°C (with LTE/Wi-Fi)	• -40 to 85°C • -40 to 70°C (with LTE/Wi-Fi)	• -40 to 75°C • -40 to 70°C (with Wi-Fi)
Power Consumption (max.)	4 W	11 W	11 W	5.4 W	6 W	8 W	19 W
IIoT Software							
ThingsPro	Yes	Yes	Yes	Yes	Yes	Yes	–

1. Wireless module must be purchased separately. Refer to the *Wireless Connection and Expansion Modules* section for details.

Standard Arm-based Computers

Low power consumption and small form factor

	1 LAN, 1 serial	2 LAN	2 LAN, 2 serial	2 LAN, 2 serial	2 LAN, 4 serial	2 LAN, 4 serial	2 LAN, 1 serial	2 LAN, 2 serial	3 LAN, 8 serial
Series	UC-2100 Series				UC-5100 Series		UC-8100 Series	UC-8200 Series	UC-8410A Series
Model	UC-2101	UC-2102	UC-2111	UC-2112	UC-5101	UC-5111	UC-8131	UC-8210	UC-8410A-NW
Computer									
CPU	Arm Cortex-A8 600 MHz	Arm Cortex-A8 600 MHz	Arm Cortex-A8 600 MHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 1 GHz	Arm Cortex-A8 300 MHz	Arm Cortex-A7 dual core, 1 GHz	Arm Cortex-A7 dual core, 1 GHz
Memory	256 MB	256 MB	512 MB	512 MB	512 MB	512 MB	256 MB	2 GB	1 GB
Storage Preinstalled	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB
Storage Slot	–	–	1 x microSD	1 x microSD	1 x SD	1 x SD	1 x SD	1 x microSD	1 x SD 1 x mSATA
OS	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Moxa Industrial Linux (Debian 9, Kernel 4.4)	Linux Debian 8 (Kernel 4.1)
TPM	–	–	–	–	–	–	–	TPM 2.0 built-in (S model only)	–
Ethernet Ports	1 x LAN	2 x LAN	2 x LAN	1 x GbE LAN, 1 x LAN	2 x LAN	2 x LAN	2 x LAN	2 x GbE LAN	3 x GbE LAN
Serial Ports (RS-232/422/485)	1	–	2	2	4	4	1	2	8
CAN Ports	–	–	–	–	–	2	–	1	–
DI/DO	–	–	–	–	4 x DI, 4 x DO	4 x DI, 4 x DO	–	4 x DI, 4 x DO	4 x DI, 4 x DO
USB Ports	–	–	–	–	1	1	1	1	2
Standards and Certifications									
Safety/EMC/RF	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM	CE, FCC, UL, EAC, RCM, KC	CE, FCC, UL, EAC, RCM
Hazardous Locations	–	–	–	ATEX, C1D2, IECEx	–	–	–	ATEX, C1D2, IECEx	–
Environmental Limits and Power Parameters									
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	• -40 to 75°C (T models) • -10 to 60°C	• -40 to 85°C (T models) • -10 to 60°C	• -40 to 85°C (T models) • -10 to 60°C	-10 to 60°C	-40 to 85°C	• -40 to 75°C (T models) • -10 to 60°C
Power Consumption (max.)	4 W	4 W	4 W	4 W	11 W	11 W	5.4 W	10 W	19 W
IIoT Software									
ThingsPro	Yes	Yes	Yes	Yes	Yes	Yes	–	Yes	–

Wireless Connectivity and Expansion Modules*

Detail cellular and Wi-Fi support list with Moxa's wireless module accessories

Connection	Series	Models	Wireless Module Model	Countries/Regions Supported	Wireless Standard	Supported Bands
Cellular	UC-2100	UC-2104-LX	UC-LTE-CAT1-EU	Europe, Taiwan	LTE Cat. 1	1, 3, 8, 20, 28
			UC-LTE-CAT1-AUS	Australia, New Zealand	LTE Cat. 1	3, 5, 8, 28
			UC-LTE-CAT4-CN	China	LTE Cat. 4	1, 3, 8, 39, 40, 41
	UC-2100-W	UC-2114/2116-T-LX	Built-in	USA, Europe, Taiwan, Australia, New Zealand	LTE Cat. M1/NB-IoT	2, 3, 4, 5, 8, 12, 13, 20, 28
	UC-3100	UC-3101/3111/3121-T-US-LX	Built-in	USA	LTE Cat. 1	2, 4, 5, 12, 13, 14, 66, 71
		UC-3101/3111/3121-T-EU-LX	Built-in	Europe, Taiwan	LTE Cat. 1	1, 3, 8, 20, 28
		UC-3101/3111/3121-T-AU-LX	Built-in	Australia, New Zealand	LTE Cat. 1	3, 5, 8, 28
	UC-5100	UC-5102/5112-LX, UC-5102/5112-T-LX	UC-LTE-CAT1-EU	Europe, Taiwan	LTE Cat. 1	1, 3, 8, 20, 28
			UC-LTE-CAT1-AUS	Australia, New Zealand	LTE Cat. 1	3, 5, 8, 28
			UC-LTE-CAT4-CN	China	LTE Cat. 4	1, 3, 8, 39, 40, 41
	UC-8100A-ME-T	UC-8112A-ME-T-LX-US	Built-in	USA	LTE Cat. 4	2, 4, 5, 13, 17
		UC-8112A-ME-T-LX-EU	Built-in	Europe	LTE Cat. 4	1, 3, 5, 7, 8, 20
		UC-8112A-ME-T-LX-AP	Built-in	Australia, New Zealand, Taiwan	LTE Cat. 4	1, 3, 5, 7, 8, 28
	UC-8200	UC-8220-T-LX-US-S	Built-in	USA	LTE Cat. 4	2, 4, 5, 13, 17
		UC-8220-T-LX-EU-S	Built-in	Europe	LTE Cat. 4	1, 3, 5, 7, 8, 20
		UC-8220-T-LX-AP-S	Built-in	Australia, New Zealand, Taiwan	LTE Cat. 4	1, 3, 5, 7, 8, 28
Wi-Fi	UC-2100	UC-2104-LX	UC-WiFi-USB	–	802.11 a/b/g/n/ac, 1T1R	2.4 GHz / 5 GHz
	UC-3100	UC-3111/3121-T-US-LX, UC-3111/3121-T-EU-LX, UC-3111/3121-T-AU-LX,	Built-in	–	802.11 a/b/g/n, 2T2R	2.4 GHz / 5 GHz
	UC-5100	UC-5102/5112-LX, UC-5102/5112-T-LX	UC-WiFi-USB	–	802.11 a/b/g/n/ac, 1T1R	2.4 GHz / 5 GHz
	UC-8100	UC-8112/8132/8162-LX	WiFi-BGN	–	802.11 a/b/g/n/ac, 1T1R	2.4 GHz / 5 GHz
	UC-8200	UC-8220-T-LX, UC-8220-T-LX-US-S, UC-8220-T-LX-EU-S, UC-8220-T-LX-AP-S	UC-8200 WiFi-AC	–	802.11 a/b/g/n/ac, 2T2R	2.4 GHz / 5 GHz
	UC-8410A	UC-8410A-LX, UC-8410A-T-LX	Wi-Fi-BGN(252NI)	–	802.11 a/b/g/n, 2T2R	2.4 GHz / 5 GHz

* Antennas must be purchased separately

Basic Antenna Accessories*

Antenna Type	Accessory Model Name	Gain	Frequency Bands	Countries/Regions Supported	Note
Cellular	ANT-LTE-ASM-04 BK	2 dBi	704 to 960 MHz / 1710 to 2690 MHz	All	–
Wi-Fi	ANT-WDB-ARM-02	2 dBi @ 2.4 GHz 0.5 dBi @ 5 GHz	2.4 GHz / 5 GHz	–	Included in the Wi-Fi module kit for the UC-8112, UC-8138, and UC-8162 models
	ANT-WDB-ARM-0202 plus ADP	2 dBi	2.4 GHz / 5 GHz	–	Supported on UC-2104, UC-5102, and UC-5112 models only
GPS	ANT-GPS-OSM-03-3m BK	3 dBi	1563 to 1610 MHz	All	–

*For a complete list of compatible antennas and their detailed charateristics, visit Moxa's website or check with your local representative.
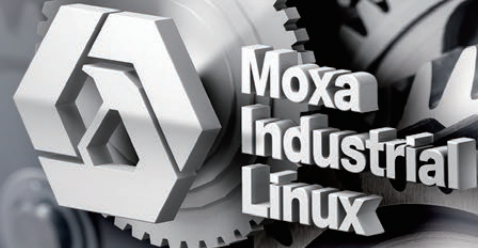
About Moxa Industrial Linux

Moxa Industrial Linux is a Debian-based distribution that runs on a standard Linux kernel and includes customized hardware-specific packages. The operating system comes with 10-year support that includes security patches and bug fixes, making your industrial projects secure and sustainable.

To learn more details, visit: http://www.moxa.com/MIL

Your Trusted Partner in Automation

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things (IIoT). With over 30 years of industry experience, Moxa has connected more than 65 million devices worldwide and has a distribution and service network that reaches customers in more than 80 countries. Moxa delivers lasting business value by empowering industries with reliable networks and sincere service. Information about Moxa's solutions is available at www.moxa.com.

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