BeiJer

ELECTRONICS

CloudVPN Router

English

Installation manual for CloudVPN Router

Foreword

The CloudVPN Routers are developed to satisify the demands of remote access of systems. Built-in functions such as VPN connectivity, cloud based VNC and much more.

The CloudVPN Router is easy to setup and use and provides a secure connection to your machines.

Order no: MAEN327

Contents

1   Introduction

Thank you for purchasing the CloudVPN Router. The CloudVPN Router is the standard and most supported hardware for Beijer Electronics's acirro+ remote access. The CloudVPN Router makes it convenient to remotely connect to your equipment, while the built-in firewall keeps your equipment safe from outside threats.

Configuration is as easy as inserting a USB flash drive, which contains your configuration file, into the CloudVPN Router's USB port. The configuration file can be generated from the [Tools] page on the acirro+ remote access.

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1.1   Technical support

If for any reason you need technical assistance, please have a look at our easy-to-read and exhaustive online support articles and guides (*support.global@beijerelectronics.com*). Our technical support is available from 8:00 to 17:00 Central European Time, Monday through Friday, and will answer your questions as soon as possible.

If you have a comment, question, or suggestion about any of our products, services, or manuals, don't hesitate to let us know.

2   Product overview

Seamlessly integrated with the acirro+ remote access, the CloudVPN Router is the fastest and safest way to connect your machine to the cloud.

2.1   Product family

The CloudVPN Router is available in several variations. No matter your situation, you can always connect your machine to the cloud.

Article no.	Ethernet	3G (Global)	LTE (Global)	WiFi
600-0001	X			
600-0002	X	X		
600-0003	X		X	
600-0004	X	x	x	X

Note:
The 3G, 4G, and Wi-Fi models require antennas, purchased separately. SIM cards for the 3G, 4G models can be purchased through a telecom provider.

2.2   What's in the box?

The following list describes the contents of the package:
*   CloudVPN Router
*   Female 4-pin plug-in connector with screw connection. (model: Weidmuller BL 5.08/04/180 SN BK BX or equivalent)

2.3   Hardware overview

The CloudVPN Router is created with performance and a multitude of hardware capabilities in mind.

Factory Reset Button

SIM card slot (size 2FF)
Pushdown to eject

SMA antenna connector*

Power input

USB

Wireless connection strength LED (Signal LED)

Status LED

4 x 1 Gbps LAN ports

Internet / WAN port

* The function and number of antenna connectors varies with the CloudVPN router model:
- Eth – no connector
- Eth+LTE – 2x SMA Connectors (MAIN, DIV)
- Eth+WiFi – 1x RP-SMA Connector
- Eth+WiFi+LTE

Note:

4G SMA connectors

CloudVPN Router 4G variants have 2 SMA antenna connectors. The one closest to the power connector is the MAIN. The other connector is the DIV. Always connect an antenna to the MAIN. Connecting an antenna to the DIV is optional.

Note:

4G & Wi-Fi SMA connectors

The 4G & Wi-Fi variant has 2 SMA antenna connectors. The one closest to the power connector is for 4G. The other connector is for Wi-Fi.

2.4 Label

The label can be found on the left side of the CloudVPN Router.

2.5   Specifications

The specifications below are applicable for all CloudVPN routers. The LTE and
Wi-Fi variants each have additional specifications, listed separately.

Specification	
Power supplu (recommended)	12-24 VDC +/- 20% LPS 2A
Power consumption	10W max, about 2.5-5W* idle
Operating temperature	-20°C to +65°C
Relative humidity	10 to 95% non-condensing
Operating altitude	Up to maximum 2000m
Storage temperature	-20°C to +65°C
Storage humidity	10 to 95% non-condensing
Storage altitude	Up to maximum 3000m
Ethernet ports	Five 1 Gbps (4x LAN, 1x WAN)
USB	USB 2.0
Processor	MIPS 800 MHz
Digital Input	Yes
Degree of protection	IP20
Mounting	DIN rail
Size	95 x 116 x 28mm (excl. DIN rail clip)
Weight	270-310 gram
Certifications	CE, cULus Listing, FCC Verification, REACH
Warranty	2 years

LTE additional specifications:

Specification	
Power supply (recommended)	12-24 VDC +/- 20% LPS 2A
Power consumption	10W max, about 2.5-5W* idle
Operating temperature	-20°C to +65°C

Specification	
Relative humidity	10 to 95% non-condensing
Operating altitude	Up to maximum 2000m
Storage temperature	-20°C to +65°C
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Specification	
4G-G protocols and frequencies (Global)	FDD-LTE - B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B25, B26, B28
	TDD-LTE - B38, B39, B40, B41WCDMA - B1, B2, B4, B5, B6, B8, B19
	GSM/GPRS/EDGE - 850, 900, 1800, 1900 MHz
Speed	LTE-FDD - Max.100Mbps (DL)/Max.50Mbps (UL)
	LTE-TDD - Max.61Mbps (DL)/Max.18Mbps (UL)
	DC-HSPA+ - Max.42Mbps (DL)/Max.5.76Mbps (UL)
	TD-SCDMA - Max.4.2Mbps (DL)/Max.2.2Mbps (UL)
	WCDMA - Max.384Kbps (DL)/Max.384Kbps (UL)
	EDGE - Max.236.8Kbps (DL)/Max.236.8Kbps (UL)
	GPRS - Max.85.6Kbps (DL)/Max.85.6Kbps (UL)
	CSD - 14.4Kbps
SIM size	Standard SIM card (size 2FF)
FCC ID (4G-A only)	XMR201903EG25G
FCC ID (4G-A only)	XMR201605EC25A

LTE additional specifications:

Specification	
WI-FI IEEE 802.11 version	b/g/n
WI-FI modes	Station (Client) Mode and Access Point
Speed	72Mbps
FCC ID	XPYLILYW1

2.6 Dimensions

The CloudVPN Router is designed to be easily installed on a standard DIN rail. The small size of the CloudVPN Router allows you to make efficient use of space. (Unit of measurement: millimeter.)

Side view   Front view   Top view
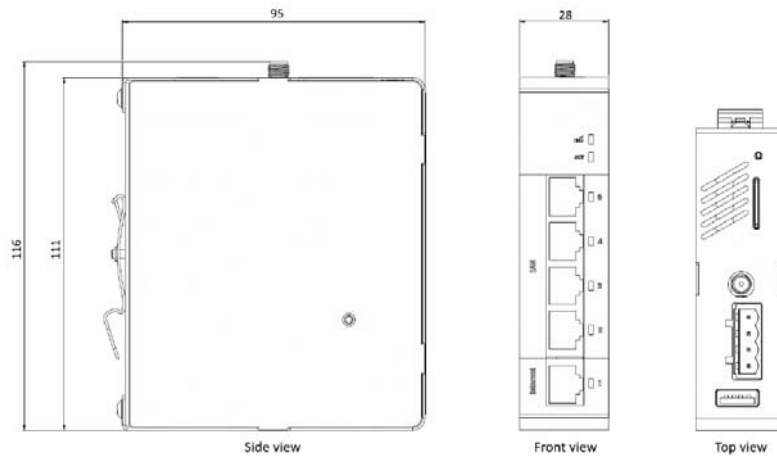
3 Installation

Note:

Install in an enclosure

These devices are open-type and are meant to be installed in an enclosure which is only accessible with the use of a tool and suitable for the environment.

When designing the layout of your system, always separate the devices that generate high voltage and high electrical noise from the low-voltage, logic-type devices such as the CloudVPN Router.

Also consider the heat-generating devices and locate the electronic-type devices in the cooler areas of your cabinet. Reducing the exposure to a high-temperature environment will extend the operating life of the CloudVPN Router.

Consider also the routing of the wiring for the devices in the panel. Avoid placing low-voltage signal wires and communications cables in the same tray with AC power wiring and high-energy, rapidly-switched DC wiring.

The CloudVPN Router is designed to be cooled using natural convection. For proper cooling, you must provide a clearance of at least 25 mm above and below the device. Also, allow at least 25 mm of depth between the front of the device and the inside of the enclosure.

Because Beijer Electronics's CloudVPN Router is essentially a small computer, the CloudVPN Router can be used for many different purposes. You can, for example, access, program and control industrial machines around the globe. Do not use the CloudVPN Router unless you've received proper training or have proper knowledge about the CloudVPN Router and its capabilities. It is expected that the user is knowledgeable about networking settings and is aware of the potential consequences on i.e. security.

3.1 Installing and removing from DIN rail

The CloudVPN Router can be easily installed on a standard DIN rail. (1) Hang the device on the rail and (2) push the unit down until you feel a click. To remove the unit, (A) pull/rotate the device up and (B) lift off the rail.
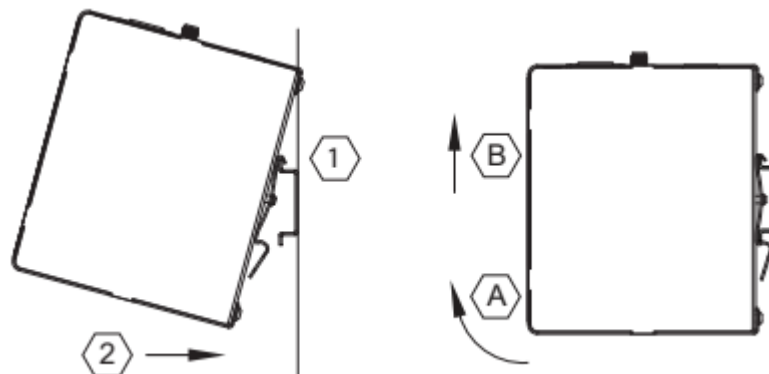
3.2 Installing a SIM card

The SIM card slot suits a standard SIM card (size 2FF).

To insert, push the SIM card into the slot until you feel a click. This is approximately 1 mm inside the device. Release the card and the card will stay in the device. The end of the SIM card should be aligned with the outside of the enclosure.

To remove, push the SIM card firmly into the slot until you hear a click. Releasing will cause the SIM card to partially eject, allowing you to easily take out the card.

3.3 Power supply

The CloudVPN Router must be powered by an IEC/UL/EN/60950-1 certified Limited Power Supply (LPS) or for the United States a Class 2 power supply. The LPS power supply is not included in this package.

Power supply	12-24 VDC +/- 20% LPS 2A
Internal voltage protection	29V max
Input protection	Protected against polarity inversion
Isolation	1.5 kV

3.4   Wiring

Proper grounding and wiring of all electrical equipment are important to help ensure the optimum operation of the CloudVPN Router and to provide additional electrical noise protection for your application.

The CloudVPN Router comes with a female 4-pin plug-in connector with screw connection (type: Weidmuller BL 5.08/04/180 SN BK BX). The optimal wire diameter is 1.5mm² (16AWG - 12AWG).

Wire size range	18 – 12 AWG
Wire strip length	7 mm
Terminal screw torque	0.4 N m
Max wire length	3 m
Min ground conductor	16 AWG
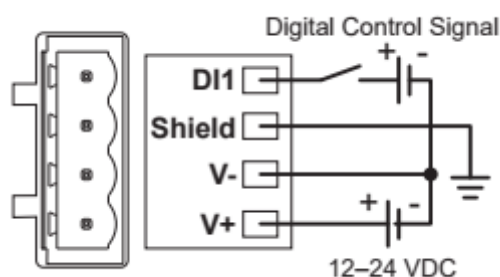
3.5   Digital input

By default, the Digital Input is not configured and doesn't need to be wired. The digital input provides a way to locally manage the CloudVPN Router's VPN connection (ON/OFF). The wiring is depicted in the image above..

Type	Optocoupler
Voltage range	0-29 VDC
Voltage range (OFF state)	0-3 VDC
Voltage range ON state)	7-29 VDC
Current voltage (ON state)	2-5 mA (typically)

3.6   Shield

Connect the Shield pin of the CloudVPN Router with the protective earth conductor (PE), min. core diameter Cu 1.5 mm².

4 Operation

4.1 Configure the CloudVPN Router

To configure your CloudVPN Router, log in to your acirro+ remote access account and navigate to the [Tools] page. Here you can generate an CloudVPN Router configuration file by following a few simple steps. You can then download the configuration file, which must be copied onto a USB flash drive. After supplying power to the CloudVPN Router, insert this USB flash drive in the USB port. The CloudVPN Router will register itself to Beijer Electronics's acirro+ remote access and set up a secure VPN connection. You can further configure the CloudVPN Router via the acirro+ remote access (https://cloudvpn.acirroplus.com).

4.2 LED status indicators

The CloudVPN Router has two LEDs for router status: one signal LED (3G, 4G, Wi-Fi signal) and one activity LED. The CloudVPN Router requires approximately **2 minutes** to boot up and set up a secure connection.
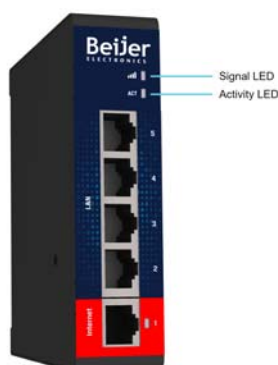
Signal LED

Signal	Colour	Description
	Blinking blue	Initializing cellular module
	Blinking red 1 pulse	No reception or unable to connect to network (APN or SSID may be incorrect)
	Blinking red 2 pulses	PIN invalid or PUK required (a phone is required to unlock SIM card with PUK)
	Blinking red 4 pulses	SIM card is invalid or missing

Signal	Colour	Description
█████████	Constant red	Connected, poor reception
█████████	Constant purple	Connected, medium reception
█████████	Constant blue	Connected, good reception

* Variant dependent: Ethernet only (2.5W), other variants (5W)

Activity LED

Signal	Colour	Description
█████████	Constant red	Booting up *(may take 1-2 min)* or not yet registered
▌ ▌ ▌ ▌ ▌ ▌	Blinking red 1 pulse	Waiting for internet access
▌▌ ▌▌ ▌▌	Blinking red 3 pulses	LAN/WAN conflict (conflicting subnets)
▌▌▌ ▌▌▌ ▌	Blinking red 4 pulses	Removed from the platform (re-insert USB flash drive to register again)
▌▌▌▌ ▌▌▌▌	Blinking red 5 pulses	Previously registered to the acirro+ remote access (remove from the acirro+ remote access and register again)
▌ ▌ ▌ ▌ ▌ ▌	Blinking blue 1 pulse	Connecting to the acirro+ remote access
▌▌ ▌▌ ▌▌ ▌	Blinking blue 2 pulses	Setting up a VPN connection
█████████	Constant blue	Active VPN connection to the acirro+ remote access

⚠ **Warning:**
This action cannot be undone! All settings will be reset to factory default.

The CloudVPN Router can be reset to the factory default settings by pressing and holding the reset button on top for 5 seconds. The ACT LED will blink while the reset button is pressed. Upon release of the button, the ACT LED will rapidly blink if the button was pressed long enough to trigger a reset. Wait for the CloudVPN Router to restart. You can then configure the CloudVPN Router again.

Note:
Remove previous registration
If the CloudVPN Router was previously registered on the acirro+ remote access you'll have to remove it from the acirro+ remote access before you can register it again.

5 Connectivity requirements (for local IT)

The CloudVPN Router uses an outgoing port to establish a secure connection to our acirro+ remote access. This means there is no need to open any incoming ports in your firewall.

5.1 Overview

Below is an overview of the outgoing ports and protocols that the CloudVPN Router utilizes.

Port	Transport	Application
443, 8443(1)	TCP	HTTPS, MQTT (TLS), OpenVPN
53(2)	TCP and UDP	DNS

(1) Port 8443 is only used when stealth mode is active for connectivity via a censored internet connection (i.e. when located in China). (2) DNS requests are often handled by local DNS servers. In those cases, the listed DNS port can be ignored.

5.2 Servers and DNS requests

Via these outgoing ports the CloudVPN Router connects to different Beijer Electronics servers: REST API, MQTT, and OpenVPN servers. The IP addresses of these servers, as well as the number of servers, may change over time and are thus not pre-defined. What is pre-defined is the domain of these servers. This domain will always end with ".ixon.net" (i.e. am01.ixon.net). The CloudVPN Router attempts to resolve these addresses by doing DNS requests. If it can't perform DNS requests, it can't connect to our servers.

5.3 MAC or IP address filter

The local IT department may choose to only grant specific devices internet access, based on the MAC address or IP address of the device. The MAC address can be obtained from the label on the side of the CloudVPN Router. The IP address can be set to a static IP address. However, by default the IP address is set to be assigned dynamically via DHCP.

6   Compliance

6.1   Applicable European directives

The CloudVPN Router is in conformity with the provisions of the following European Directives.

Directive	Description
EMC Directive 2014/30/EU	Product safety
Radio Equipment Directive 2014/53/EU	Use of the radio spectrum
RoHS Directive 2015/863	Restriction of hazardous substances
REACH Directive 1907/2006	Regulation and registration of chemicals
WEEE Directive 2012/19	Waste of electronic equipment

6.2   Applicable safety standards

The CloudVPN Router was tested and passed the following standards.

Standard	Description
EN 55032:2012/AC:2013	Electromagnetic Compatibility of Multimedia. Equipment
EN 301 489-1 V1.9.2 (2011-09)	EMC Standard for Radio Equipment and Services, Part 1: Common technical requirements
EN 301 489-3 V1.4.1 (2002-08)	EMC Standard for Radio Equipment and Services, Part 3: Specific conditions for Short-Range devices.
EN 61000-6-1:2007	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
EN 61000-6-3:2007/A1:2011/AC:2012	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
EN 61000-6-2:2005/AC:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

Standard	Description
EN 61000-6-4:2007 + A1:2011	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
EN 61000-4-2:2009	Electrostatic discharge immunity test
EN 61000-4-3:2006 + A1:2008 + A2:2010	Radiated, Radio-frequency, Electromagnetic Field Immunity Test 80-1000 MHz
EN 61000-4-4:2012	Burst Immunity Test
EN 61000-4-5:2014 + A1:2017	Surge Immunity Test
EN 61000-4-6:2014	Immunity to Conducted Disturbances, Induced by Radio-frequency Fields
IEC 60950-1:2006 + A1:2009 + A2:2013	Information Technology Equipment Safety, Part 1: General Requirements - Edition 2
EN 62368-1:2014/AC:2015	Audio/video, information and communication technology equipment - Part 1: Safety requirements
EN 50581:2012	Restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment
UL 60950-1	Information Technology Equipment Safety, Part 1: General Requirements - Edition 2
CSA C22.2 No. 60950-1-07 + Amendment 1 and Amendment 2	Information Technology Equipment Safety, Part 1: General Requirements - Edition 2

6.3   FCC compliance

The base equipment (an unintentional radiator) has been tested and complies with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or TV reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note:
Changes or modifications of this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The CloudVPN Router contains different FCC certified modules, depending on the variant.

Article Number.	Enclosed module	FCC IDs (LTE)	FCC IDs (Wi-Fi)
600-0001	-	-	-
600-0002	4G (Global)	XMR201903E-G25G	-
600-0003	Wi-Fi	-	XPYLILYW1
600-0004	4G (Global) and Wi-Fi	XMR201903E-G25G	XPYLILYW1

6.3.1 Additional information for variants with wireless capabilities

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

The antenna(s) used with this transmitter must be installed with a separation distance of at least 20cm from all persons and must not be co-located or operated in conjunction with any other antennas or transmitters. Only those antenna(s) tested with the wireless transmitters or similar antenna(s) with equal or lesser gain may be used.

6.4 Certifications

The CloudVPN Router has been certified for:
- CE certification (for more information, see our Declaration of Conformity).

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- FCC verification

- cULus listing (ID #E492721)

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