conga-IoT Gateway

congatec IoT Evaluation Gateway

Quick Start Guide

Revision 1.0

1 General Information

To reduce the risk of personal injury, electric shock or equipment damage, users must observe the following instructions before connecting and operating the conga-IoT Evaluation Gateway.

1.1 Safety Instructions

- Due to heat build-up, the gateway may overheat and be damaged. To prevent overheating:
  - Place your gateway in a vertical position (the mounting holes are located on the bottom panel of the device)
  - Do not obstruct the ventilation openings of the gateway. Make sure the gateway is provided with sufficient ventilation.
  - Allow sufficient space for ventilation.
  - Do not cover or put the gateway in an enclosure.
  - Do not place the gateway on a heat sensitive surface

- Moisture or liquids that penetrates the gateway can cause electric shocks or short circuit:
  - Operate the gateway indoors.
  - Mount the gateway in a water-free area.
  - Never let liquids get inside the gateway.

- Operate the gateway only from an electrical outlet with the correct power source as indicated on the adapter.

1.2 Handling and Maintenance

- The gateway contains sensitive components and should only be opened by authorized repair technicians.
  - Do not open the gateway housing. Doing so can lead to EMC/ESD damage and cooling system degradation.
  - If the gateway needs to be repaired, take it to an authorized vendor.

- Unplug the gateway before dusting or cleaning.
  - Use a damp cloth to clean the equipment.
  - Do not use liquid/aerosol cleaners or magnetic/static cleaning devices.

- Keep sufficient distance from potential sources of interference such as microwave devices or electric devices with large metal housings.

2 Introduction

This guide gives a brief overview of the features and interfaces of the conga-IoT Evaluation Gateway and how to install, configure and operate it.

2.1 Product Overview

The conga-IoT Evaluation Gateway provides a standardized platform for creating interoperable products that can discover, connect and communicate directly with other devices, systems and services in an intelligent way, regardless of brand.

The conga-IoT contains amongst other components, the conga-QA3 module. The module features the Intel® Atom™ E3845 Quad Core processor with 1.91 GHz frequency, 4 GB dual channel DDR3L-1333 memory and onboard 32 GB eMMC.

> **Note**
>
> 1. *The conga-IoT Gateway is for evaluation or development purposes only and is provided "as is".*
>
> 2. *The gateway is shipped without operating system.*

2.2 What is in the Package

The conga-IoT Gateway package includes the following items:

- conga-IoT Evaluation Gateway
- Power supply (19V @ 3.42A) attached with a power cord
- Eight antennas (two LTE ,four Wi-fi and two extension card antennas)
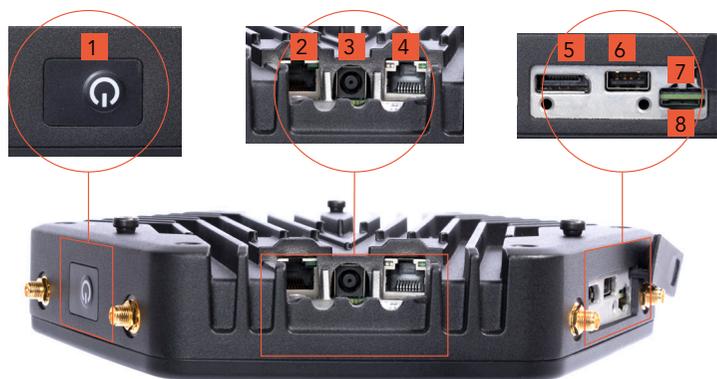- Wall mounting plate pre-attached to the back cover of the gateway

> **Note**
>
> *SIM cards are not included in the package.*

> **Note**
>
> *To prevent overheating, mount the gateway in a vertical position, with the mounting plate.*

2.3 Ports, Interfaces, Buttons and LEDs

No	Function	Remark
1	Power Button	To shut down the gateway, press and hold the power button for 5 seconds
2	Ethernet	Supports Power over Ethernet (PoE)
3	DC Jack	
4	Ethernet	Does not support PoE
5	DisplayPort	
6	USB 2.0	Type A connector
7	SIM Card Slot	Upper slot
8	SD Card Slot	Lower slot
9	LEDs	Power LED: power indicator Cloud LED: can be programmed to indicate cloud connection Sensor LED: can be programmed to indicate sensor connection

> **Note**

The DC Jack and Ethernet interfaces are secured with a cover. To have access to these interfaces, remove the cover.

2.3.1 Antennas

You can attach up to eight configurable external antennas (two LTE, four Wi-fi and two extension card antennas) to the gateway. The functions of these antennas are described in the table below:

No.	Function	Description
1, 2	LTE	Two antennas connected to LTE modem
3, 6	Add-on [1]	Two antennas for extension cards (SMA).
4, 7	Wi-fi	Two antennas for secondary Wi-fi (RF-SMA) communication
5, 8	Wi-fi	Two antennas for primary Wi-fi (RP-SMA) commnunication

> **Note**

1. *The gateway does not ship with any extension card.*

2.3.2 Internal Components

Component	Description
Qseven Module	congatec conga-QA3 Qseven module *http://www.congatec.com/en/products/qseven/conga-qa3.html*
Gateway Carrier Board	Customized congatec IoT gateway
LTE Modem	Huawei ME936, EU/US, M.2 (3042-S3-B) *http://consumer.huawei.com/en/solutions/m2m-solutions/products/tech-specs/me936-en.htm*
Primary Wi-fi Adapter	Intel® Dual Band Wireless-AC 7260 *http://ark.intel.com/products/75439/Intel-Dual-Band-Wireless-AC-7260?wapkw=7260.hmwg.nvr*
Secondary Wi-fi Adapter	Intel® Dual Band Wireless-AC 7260 *http://ark.intel.com/products/75439/Intel-Dual-Band-Wireless-AC-7260?wapkw=7260.hmwg.nvr*
TPM	Infineon Optiga TPM (SLB 9665, TT2.0, FW5.51) *http://www.infineon.com/cms/en/product/security-and-smart-card-solutions/optiga-embedded-security-solutions/optiga-tpm/SLB+9665+TT20+FW551/productType.html?productType=5546d462 50cc1fdf0150d371824765eb*

2.4   Mounting Procedure
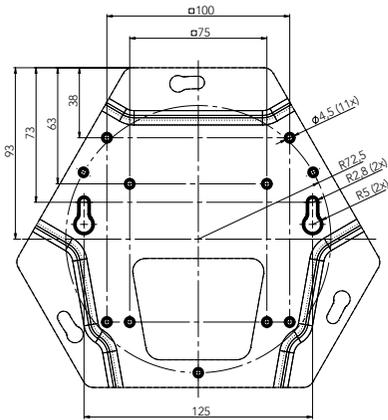
Bracket Screw (3 x M5)
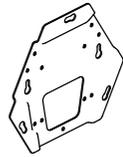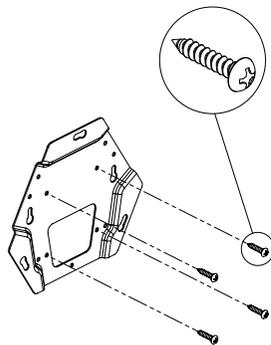
Wall Bracket

Mount Screws (4 x 30 mm)

Step 1: Observe the distances between the mounting holes (see below).

Step 2: Determine the mounting location and make sure the surface is flat, dry and sturdy.

Step 3: Mount the bracket to the wall.

– Drill four holes in the wall where you will mount the gateway.
– Put screw anchors in the holes.
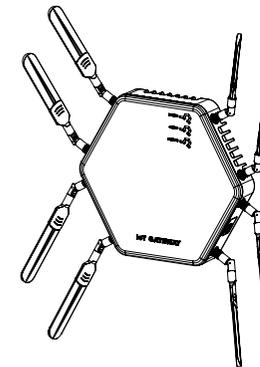– Use pan head wood screws DIN 7996 (4 x 30 mm) to mount the wall bracket.

Step 4: Place the gateway onto the wall bracket.

– Position the gateway so the wall bracket slots line up with the three M5 screws.
– Lock the assembly by turning it in a counter-clockwise direction.

Lock

Properly fixed unit
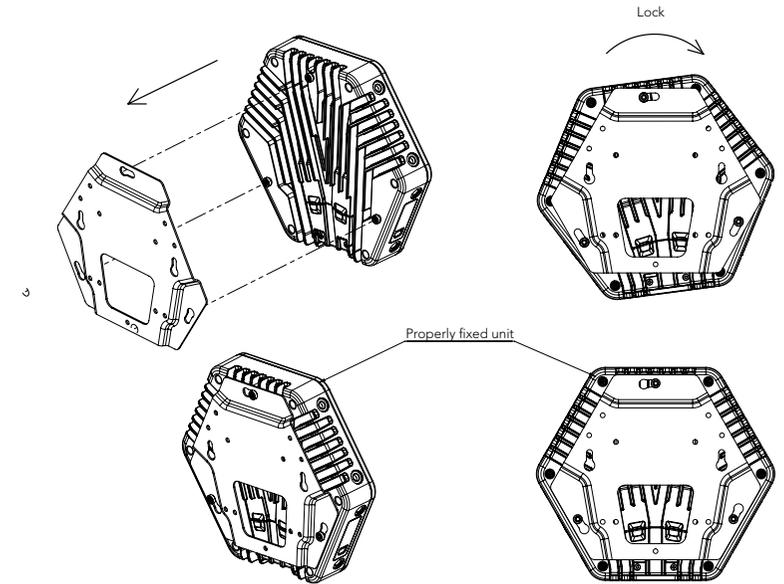
Step 5: Attach the LTE/Wifi antennas.

Note

To prevent overheating, mount the gateway in a vertical position, with the mounting plate.

3 Hardware and Software

3.1 Hardware Setup

1. Connect the eight antennas. See section 2.5 "Mounting Procedure" for instructions on how to connect the antennas.

2. Connect required peripherals.

3. Attach a bootable USB stick containing pre-installed operating system or installation files.

4. Connect the power supply:

    – Remove the two screws that secures the DC Jack and Ethernet cover.
    – Connect an external power supply to the DC jack or a PoE cable to the Ethernet interface if your network installation supports PoE.

5. Press the power button to turn on the gateway

6. Install the operating system on the internal eMMC storage.

Note

If no installation media is detected, the gateway displays the BIOS setup menu.

3.2 Supported Operating Systems

- Linux
- Yocto (BSP available on the congatec website)
- Microsoft Windows 7 / 8 / 10
- Microsoft Windows 8 Embedded
- Microsoft Windows 10 IoT

3.3 Install Sample Image on the eMMC

The steps below describes how to install congatec Yocto 2.2 BSP on the eMMC. The BSP provides congatec hardware specific settings, libraries and applications.

To install other supported operating systems, follow the standard installation process for the specific operating system.

Step 1: Deploy the Sample Image to USB Stick

On a Linux host machine (for example Ubuntu 14.04):

a. Download the latest evaluation image from the restricted area of the congatec website at: http://www.congatec.com/en/products/iot-gateway/conga-iot.html

b. Insert a USB stick to the host machine

c. Determine the name of the device node assigned to the USB device:

```
$ lsblk
```

d. Define the device node as a variable:

```
$ SD=/dev/SD?
```

e. Change to the directory where the sample image is stored:

```
$ cd ~/[sample image directory]
```

f. Define the image as a variable

```
$ IMAGE=core-image-sato-congatec-qa3-64-[yyymmddhrmmss].bz2
```

g. Deploy the image on the USB drive

```
$ sudo dd if=$IMAGE of=$SD bs=2048
$ sync
```

On a Windows host machine (for example Windows 10)

a. Download the latest evaluation image from the restricted area of the congatec website at: http://www.congatec.com/en/products/iot-gateway/conga-iot.html

b. Rename the downloaded xxx.hddimg.bz2 file to xxx.hddimg.tar.bz2

c. Unzip the xxx.hddimg.tar.bz2 file. This extracts the file xxx.hddimg

d. Transfer the extracted image file to a USB stick using a standard imaging tool (for example Win32DiskImager)

Step 2: Change the BIOS Settings

a. Insert the USB drive into the conga-IoT gateway and turn on the gateway.

b. Press DEL key to enter the BIOS setup menu

c. Select Advanced -> CSM Configuration:

    –   set "Video" to "UEFI"

d. Select Chipset -> South Bridge -> USB Configuration

    –   enable XHCI mode

e. Press F10 to save and exit.

f. Press DEL key to enter the BIOS setup menu the second time

g. Select Advanced -> CSM Configuration

    –   disable CSM support

h. Press F10 to save and Exit

Step 3: Deploy the Image to the eMMC

a. Press F11 to select boot device

b. Use the DOWN ARROW key to highlight the "install" option

c. Press key "E" to go to the command line parameters

d. Press END to go to the end of the command line parameters

    –   remove all options for serial console (for example console=tty0)
    –   Press ENTER to confirm the changes. The kernel starts.

e. When the options to deploy the sample image appears:

    –   type "mmcblk1" to confirm deployment on eMMC.
    –   Press ENTER. The installation on eMMC begins.
    –   Remove the USB stick and restart the conga-IoT gateway
    –   The Grub bootloader options displays. Select 'boot' to boot from the eMMC image.