Installation Guide

INSTALL_GATEWAY-V5

2019/01 Edition

Related HIKOB products:

GATEWAY H-GW103A
GATEWAY H-GW103D-G
INJ PH-AC100A
INJ RH-AC100A
ARM RH-AC100A
ARM H-AC100A-ARM

HIKOB

Table of contents

1   Introduction

When using GATEWAY, safety precautions must be taken to avoid injury and damages. Please read this guide before installing, using the product, or performing any maintenance operation. Failure to read, understand and follow herein instructions may result in personal injury. In no event shall HIKOB be held liable for any damages arising out of or related to misunderstanding instructions detailed in this manual.

1.1   Symbols and conventions used in this guide

Read entirely this guide before using the product GATEWAY and keep it handy for reference

Caution – Indicates a potentially hazardous situation which, if instructions are not followed, may result in damage to the equipment.

Electrical Hazard – Indicates a dangerous condition such that, if instructions are not followed may result in electric shock and physical injury.

- Carefully follow instructions and warnings given in this guide, as well as instructions indicated on the product.
- Make sure you understand all instructions: refer to symbols definitions and conventions used in the documentation.
- Should you have questions on using the product GATEWAY once you have completely read this guide, contact the HIKOB support or your vendor.

1.2   Safety instructions

It is forbidden to install the product in a location accessible to the public. Please refer to the installation section.

Do not disassemble or attempt to open the product. It does not contain any serviceable parts inside. Only qualified staff is allowed to perform maintenance operations on the GATEWAY product. Opening a GATEWAY will void the warranty.

Do not overheat, do not dispose in fire, do not crush. Do not heat above the product maximum operating temperature, incinerate, or expose content to water. GATEWAY.

Modifications or changes on the product is strictly prohibited if it is   not expressly approved by HIKOB. Modifications or changes performed on GATEWAY will void the user's authority to operate the equipment.

1.3 Compliance and conformity

1.3.1 Europe

HIKOB SAS declares that the HIKOB GATEWAY LITE product is in accordance with stipulations of the RED 2014/53/UE, CEM 2014/30/UE and 2014/35/UE directives.

1.3.2 USA

Information to user: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply 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 instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in an installation. If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct interference by one or more of the following measures:

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

RF exposure: This device complies with FCC RF radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

1.4 WEEE

Information on disposal for users of waste electrical electronical equipment:

This symbol on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge. Alternatively, in some countries you may be able to return your products to your local retailer upon purchase of an equivalent new product. Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

1.5 Technical Support

HIKOB SAS
55 chemin du Vieux Chêne
38240 MEYLAN
FRANCE
Phone: +33 4 28 29 54 50
support@hikob.com

2   General description

2.1   HIKOB Wireless sensor network acquisition system

The GATEWAY is one of the elements that constitutes the HIKOB wireless sensor radio network. This system is a set of wireless sensors doing multi-point distributed measures in various domains. These sensors radio transmit their acquired data to the GATEWAY, possibly via LION routers, depending on environment constraints for radio transmission. This local radio network operates in the 2.4GHz ISM bandwidth and implements the standardized IEEE 802.15.4e protocol. The GATEWAY provides the user with these acquisitions through its embedded software: NETPULSE, which makes the interface to any TCP/IP network.

HIKOB systems cover data acquisitions such as vehicle detection for controlled traffic or parking management.
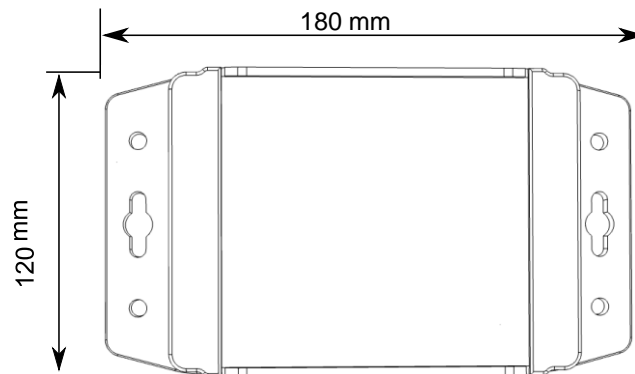
2.2   GATEWAY overview

Figure 1 – External view of GATEWAY dimensions: 180x120x37.2 mm

GATEWAY interfaces the 2.4Ghz ISM HIKOB radio network by providing connection with any TCP/IP network. It receives and treats sensors measurements that are broadcasted through the multi-hop wireless network formed by HIKOB sensors and LION routers. These measurements are available, either displayed on a web page, or via APIs exposed by an embedded REST server. Information exposed by the GATEWAY can therefore be integrated in a 3rd party information system. GATEWAY provides services as well to configure HIKOB sensors, and to perform basic maintenance such as firmware update.

The GATEWAY is not energy-autonomous: it is powered by the PoE technology (Power over Ethernet) through an Ethernet cable.

Models A and B of the GATEWAY can be installed and used outdoor. The GATEWAY casing is water resistant with an IP65 protection. The first number 6 identifies protection against complete

ingress of dust, the second number 5, identifies protection against the effects of spraying water. Should you decide to perform cleaning tasks on the GATEWAY, don't perform high pressure cleaning, prefer wiping with a dry cloth, or with a neutral agent.

Radio and GPS antennas are integrated into the envelope of the GATEWAY, which are delivered all assembled and ready to be fastened on a pole or a wall, please refer to the Installation section for details.

3 Technical information

3.1 Global

Power supply	Power over Ethernet with RJ45 connector following the 802.3at, 802.3af norm. (which corresponds for this product to 36 - 57 VDC, 0.1Amax).
Power consumption	< 3W
Dimensions	22 x 12 x 3.8 cm
Type of fixing	Pole
Weight	360g
Operating temperature	Operating and Storage -20°C +60°C
Water index	IP65

3.2 Radio

3.2.1 HIKOB network

Frequency band	2.45GHz ISM
Protocol	IEE 802.15.4e
Number of channels	16
Antenna gain	+3dBi
Output power	+4dBm
Input level sensibility	-101dBm
Range	30m to a buried sensor

3.2.2 Maintenance

Frequency band	[13.553MHz – 13.567MHz]
Protocol	NFC
Type of receiver	Passive
Usage	Only for HIKOB maintenace

3.3 GPS

Constellation	GPS L1
Antenna type	Active patch
Antenna gain	+25dB

3.4 Connections

Number of connectors	1
Type	Ethernet + PoE

4   Installation

4.1   Overall Methodology

Installing an HIKOB radio network requires a good topology analysis of your site to maximize radio transmission quality by optimizing positions and numbers of HIKOB nodes in the network. A preliminary study done with your vendor determines elements that will constitute your HIKOB radio network acquisition.

Draw a site map: position your stationary sensors on parking places for WISECOW-P; on the way where passing vehicles should be controlled for WISECOW-T; where road temperature have to be measured for WISECOW-W; and so on with other sensors types. Then you can determine the number of routers you need for your network following these rules:

- The maximum distance between buried sensors and the GATEWAY is 30m.
- The maximum distance between a LION and a GATEWAY, varies between 100 and 300m, depending on the terrain topology.
- A GATEWAY hosts 80 elements in all, and 30 as direct children in the multi hop radio network.
- The LION, the HIKOB router hosts 16 sensors or other routers.

For good radio transmission, both GATEWAY and LION need to be installed on elevated spots, around 5m high. You will have better signal transmission with routers close to sensors and far from other routers or GATEWAY.

Keep In mind that RF waves quality heavily rely on the environment they propagate in. Identify the most distant sensors, and zones where you suspect waves will propagate painfully, like having metal or concrete obstacles in the way.

The GATEWAY provides useful user information to appraise the radio signal quality between elements of the HIKOB network. Refer to section Radio quality link in the NETPULSE manual for that.

4.2   GATEWAY power supply

The GATEWAY is powered via Ethernet using the PoE technology (Power over Ethernet) based on the 802.3af-2003 and 802.3af-2009 standards. This allows both data and power delivery over category 5e or better cables. So ideally your site has an Ethernet network carrying cables providing PoE.

If your site does not provide a connection insuring the standard PoE technology, then you need to use a PoE injector that must be compliant with the 802.3af-2003 and 802.3af-2009 norm. This standard ensures interoperability between your power sourcing equipment and the powered device GATEWAY.

- The PoE connector stamped OUT goes to the GATEWAY.

- The PoE connector stamped IN goes to your IP network.
- You supply the PoE injector with cables and plugs following your country / area safety directives for electrical devices.

4.3   Outdoor deployment

The GATEWAY is suitable for outdoor use: the envelope has maximum protection against dust ingress and is water resistant (IP65).

⚠️ In case of an outdoor installation and power for the GATEWAY is supplied by a PoE injector, you will have to pay attention to the standard safety rules installing electrical devices outside.

Most likely you'll need a technical electrical enclosure to host the PoE, and to supply power. Some PoE are sold to be useable outdoor, some are sold with an extra IP66 enclosure, when choosing your equipment, pay attention to the 802.3af-2003 and 802.3af-2009 compatibility and to operating temperatures as well. HIKOB has some product references to advise, ask our vendors.

Consider as well other alternatives: you can have the GATEWAY installed outside, and the PoE inside.

4.3.1   Ethernet cable set up for outdoor use

HIKOB provides an industrial connector housing (Amphenol Socapex RJF RB 6, which is IP67), to be mounted on the Ethernet cable before connecting it to the GATEWAY. This is a protective sealed and hardened envelope which can be added around any standard RJ45 connector. Choose an Ethernet cable suitable for outdoor use. You don't need tools to equip your Ethernet cable, just follow these step by step graphical instructions:

Figure 3: Steps to dress the Ethernet cable with the Amphenol connector housing

Pull a Cat.5e Ethernet cable from your electrical cabinet, not going further than 100m long, to ensure data rate quality. Don't connect it while you're doing the installation.

Mount the Amphenol Socapex on the end of the cable that goes to the GATEWAY

HIKOB

Plug this set up connector to the female Ethernet connector on the back of the GATEWAY.

4.3.2 GATEWAY arm's mounting process

The GATEWAY is delivered ready to be installed. HIKOB highly recommends using RAM MOUNTS® products that can be optionally purchased with your GATEWAY, ask your vendor. This is a set of 3 elements:

RAP-379U-M616

A first ball joint with a male screw that does the female thread on any 4 holes of the GATEWAY casing.

RAM-2461U

A second ball joint, to be mounted on a wall or a pole. It can be either screwed or attached with plastic clamps, or any method that suits your environment constraints.

RAM-201U-B

And the double socket arm allowing good adjustment.

Figure 4 – View of the GATEWAY attached on a pole with RAM mount joints