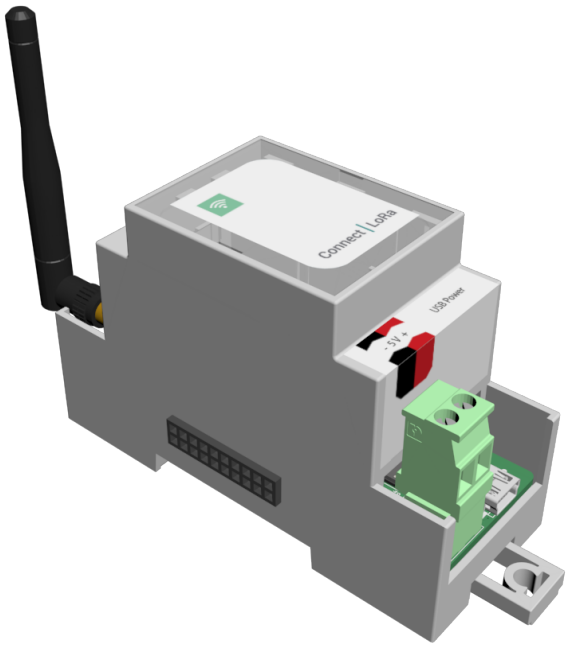
LoRa Connect Specifications (Hardware V2.0)

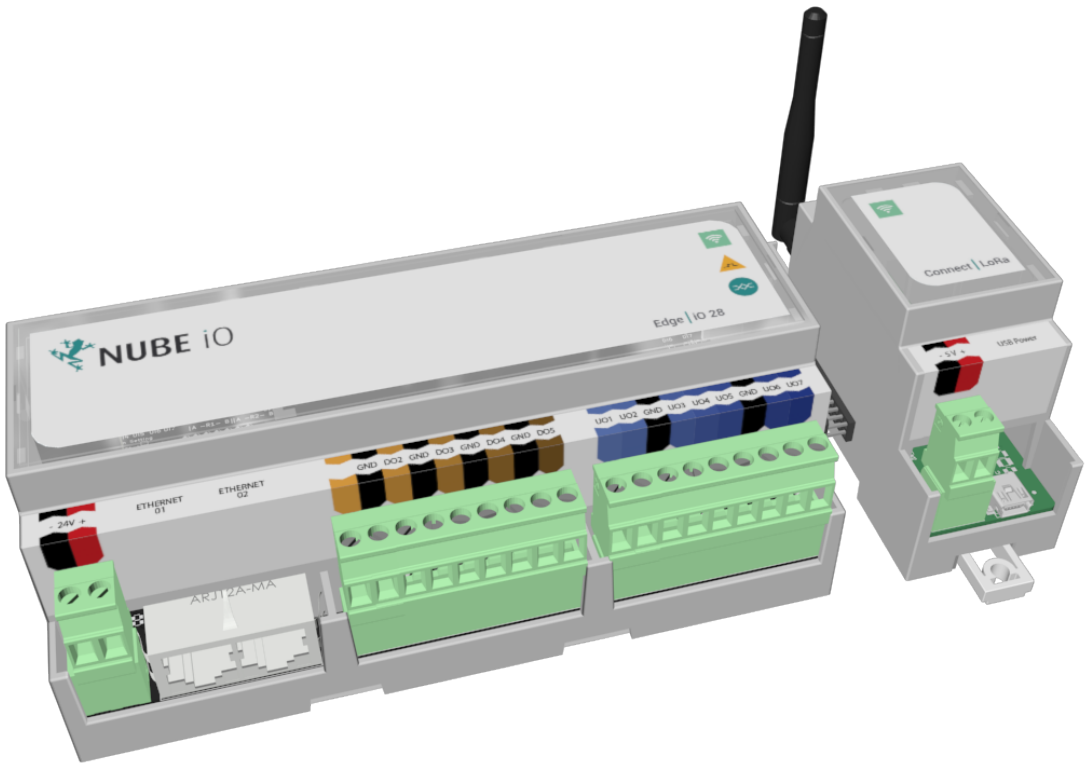


Power Options and Requirements:	
Via Edge Connect	Edge Connect Pins (5V)
Via USB	5V 500mA
Via Terminal	5V DC wired

LoRa Capabilities:	
Supported Frequencies	868/915Mhz
Spreading Factor	6-12
Bandwidth	7.8 - 500 kHz
Effective Bitrate	.018 - 37.5 kbps
Est. Sensitivity	-111 to -148 dBm

Communication Options:	
Serial over USB	Modem will print received messages to serial bus
Edge Connect Module	Modem will print received messages over the “Edge Connect” Serial bus address.

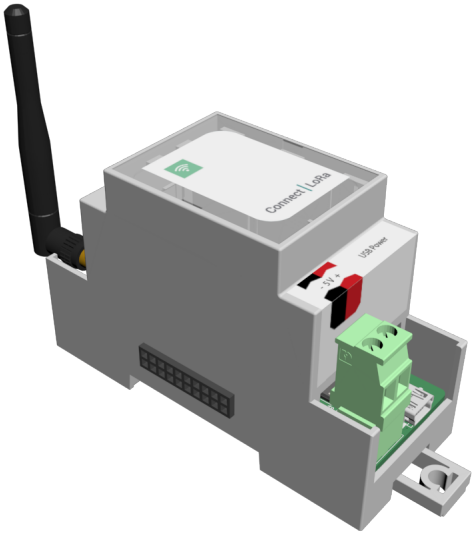
RTC:	
Battery	CR1220
Serial over USB	Modem will print received messages to serial bus
Edge Connect Module	Modem will print received messages over the “Edge Connect” Serial bus address.



Physical Dimensions and Installation

The Edge connect can be installed as a standalone device, interfaced with USB, or directly with an Nube iO Edge-28 Building Controller. The case is Din-Rail mountable (2 Slot) and the antenna is interchangeable for different applications.

Length	36 mm
Width	90 mm
Height	58 mm
Material Type	Plastic (Polycarbonate)
UL Rating	UL94-V0
IP Rating	IP20
Mounting	DIN Mount



Overview

The Nube-iO LoRa Connect is a general purpose receiver for LoRa signals. It enables Low-Power wireless communications in 2 primary formats:

- LoRa Nodes (Wireless Sensor) - > LoRa Connect
- LoRa-Connected Nube-IO Edge unit < - > LoRa Connect

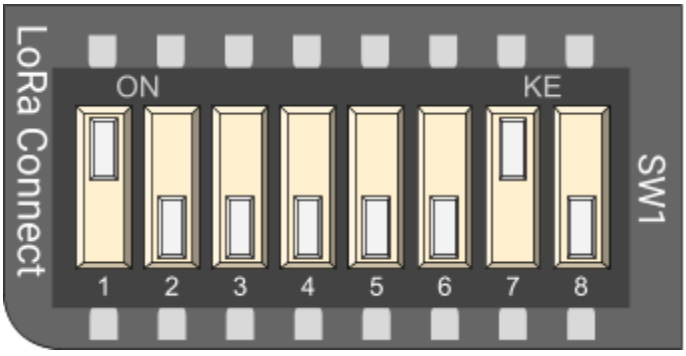
The primary function of the LoRa Connect is to receive, interpret, and then send to a local server or the cloud. The Gateway can be integrated into an Edge device, via the *Connect* port, to send and receive values from another gateway, removing the need to provide network connectivity to every building controller.

Providing wireless connectivity with minimal overhead, reducing time and costs involved with wired infrastructure. Our LoRa Gateway can be integrated in a variety of different ways, providing substantial flexibility when integrating BMS systems. The system supports multiple gateways, meaning a structure can be completely covered no matter the size or type of infrastructure.

About LoRa

LoRa is a Low-Power, Long-Range wireless technology designed for the Internet of Things. Compared to WiFi, it requires less power and is less affected by buildings and other obstructions, with one Gateway generally being able to provide coverage for a 70mx70m 3-story building.

Frequencies	915Mhz or 918Mhz
Expected Range	Dependant on installation environment, up to 1Km.
RTC	Sent as a "HeartBeat" over Serial, when there is no other messages being received.
Communication	Via Serial (pre-programmed on the Edge-28 as *"/dev/loraconnect"*
Watchdog	RTC Messages can be used, along with standard LoRa Messages, to reset the device if necessary.



Dip Switch Settings:

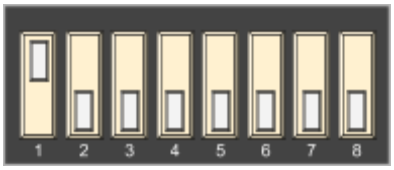
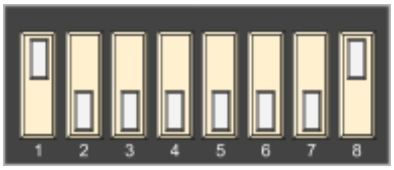
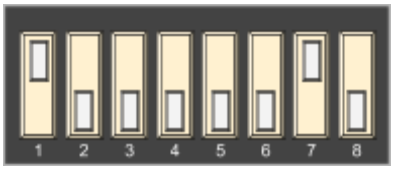
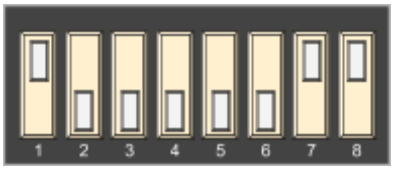
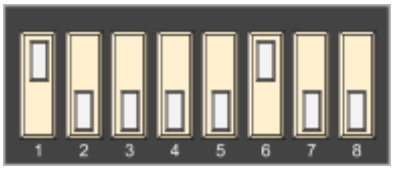
Dip switches are used to configure a variety of things, including the frequency it needs to listen on and to enable programming or RTC only modes. There are 8 Dip Switches, each with two positions, On/Off. The following table specifies special modes that the modem recognizes, the *setting* refers to which switches are set to On. All others should be in the Off position. EG: In the following diagram, the *setting* is (1,7).

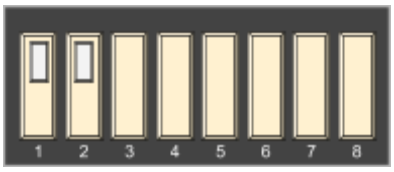
Enabling Modes:

In order to enable a new mode you will have to first disconnect the Connect module from the Edge 28 board (or disconnect from any power if required). After the device has powered down set the dip switches to your desired configuration. Then connect your device again to the Edge 28 board and the device will reconfigure during startup.

Special Modes:

The first switch defines if the LoRa Connect is in a special operation mode or not. If it is on, the Connect will be in one of the following modes. More modes may become available through firmware updates.

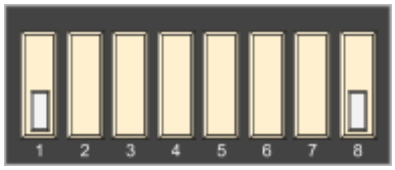
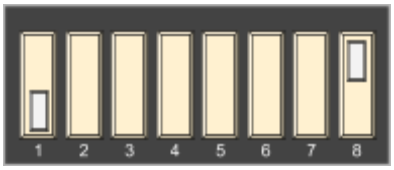
Mode	Purpose	Setting
OFF	Don't do anything. Preserve Battery and Sleep.	**1** 
Reprogram	Flashing new firmware to the LoRa Modem, either with USB or the Edge Connect.	**1,8** 
RTC Only	Disable the LoRa modem functionality and only provide RTC functionality for the Edge Connect.	**1,7** 
***Edge* Mode (Coming Soon)**	All communication parameters are defined via the Edge controller. This is used to enable Edge-to-Edge only communication.	**1,7,8** 
***LoRaWAN* Mode (Coming Soon)**	Allows the Edge Controller to upload Data to The Things Network LoRaWAN Network. Requires providing the Modem with additional parameters from the TTN Console.	**1,6** 
Master Receiver Mode (Coming Soon)	The LoRa Connect is used to receive both Edge and Droplet Data. This special mode will have its own Parameters for defining Frequency,	**1,2 & Parameter Based**

	Spreading Factor and Site ID. However is only available on only two Spreading factors.	

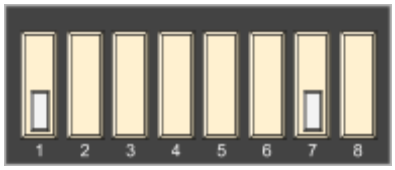
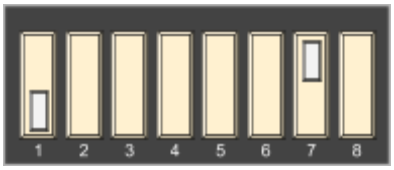
General Mode:

For general use, the dip switches define what frequency the modem should listen on and what “ID” should be used for the network. These settings would then need to be duplicated on the Droplet to enable communication between the two.
The rules for the settings are as follows:
The **first** DIP switch is to the special operation modes, so this should be off for general use.

8 is used for **Frequency**

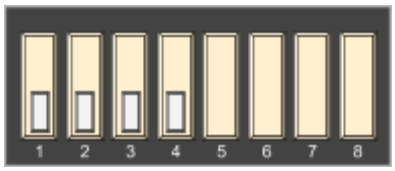
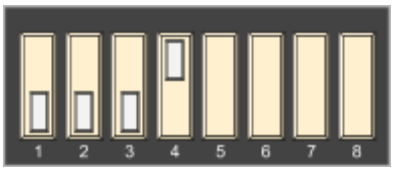
915		**918**	

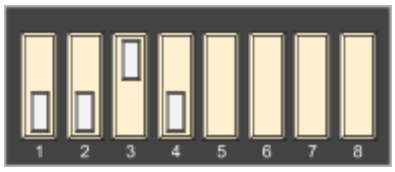
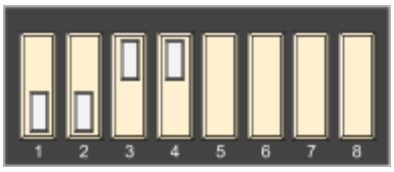
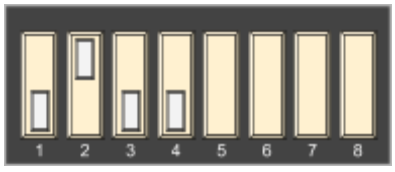
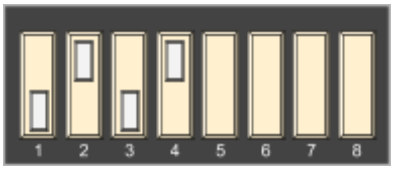
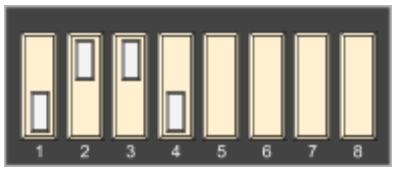
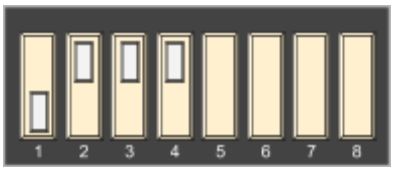
7 is used for **Spreading Factor:**

6		**9**	

5 and 6 are not used

2, 3 and 4 are for **“Channel”** (Used for separating close by networks):

AA		**AB**	

BB		**BC**	
CC		**CE**	
EE		**EF**	

About Nube iO

Designed by HVAC controls experts, Nube iO provides a reliable and economical platform to control and monitor your HVAC system. With emphasis on utilizing open platforms and device security Nube iO allows you to break free from restrictive BMS platforms without the huge cost of having to replace existing controllers.

Born in the age of IoT, Nube iO provides you with the ability to access your data from the web. No longer do you need hundreds of sensors or a huge budget in order to get your data online. Whether you have one sensor or thousands, the scalability of the platform makes it economical regardless of the size of your system.

To learn more about our products and solutions, visit: ***nube-io.com***