CG9104-900MT
User Manual

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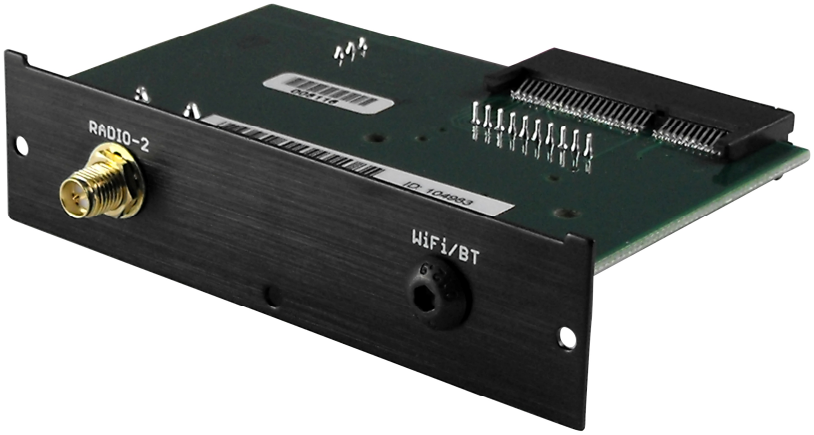

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WARRANTY:

BiPOM Electronics warrants CG9104-900MT for a period of 3 years. If the board becomes defective during this period, BiPOM will at its option, replace or repair the board. This warranty is voided if the product is subjected to physical abuse or operated outside stated electrical limits. BiPOM Electronics will not be responsible for damage to any external devices connected to CG9104-900MT. BiPOM Electronics disclaims all warranties express or implied warranties of merchantability and fitness for a particular purpose. In no event shall BiPOM Electronics be liable for any indirect, special, incidental or consequential damages in connection with or arising from the use of this product. BiPOM Electronics' liability is limited to the purchase price of this product.

Overview

CloudGate is an intelligent 3G or LTE M2M gateway and wireless Linux computer from Option®. CloudGate provides cell modem, LAN to WWAN routing and GPS functionality in a single basic unit for remote monitoring and control applications.

On top of the basic functionality, CloudGate can be tailored to meet specific industrial requirements by adding additional software and peripheral boards. CG9104-900MT is one such peripheral board for CloudGate.

CG9104-900MT is a miniature interface board, containing a Monnit RFSC access point (APN) to connect CloudGate to a variety of Monnit modules. RFSC stands for RF Sensor Core and operates at 900MHz.

CG9104-900MT is fully backed by a 3-year warranty, technical support and application assistance from BiPOM.

Specifications

- Monnit RFSC access point module on the board
- 4-wire serial port (UART4) connected to Monnit RFSC
- Reverse SMA antenna connector
- 3.3VDC/1A on-board power supply to power the Monnit RFSC
- Powers from CloudGate
- Low power consumption: Under 1mA when idle
- Protected against Electrostatic Discharge (ESD)
- FCC Certified

Target Applications:

- Oil and Gas Monitoring
- Irrigation Generator Set Monitoring
- Energy Monitoring
- Utility Meter Remote Monitoring
- Factory Automation
- Vibration Monitoring
- Sensor Networks
- Medical Devices
- Asset Tracking

Ordering Information

CG9104-900MT is the official part number for ordering for the peripheral board. 900MT signifies 900MHz radio frequency for use in North America.

Contact BiPOM for alternative frequencies such as 868MHz and 433MHz.

CloudGate Monnit Starter Kit is the official part number for ordering a complete system that consists of:

- CloudGate 3G with CG9104-900MT Board
- Preinstalled Developer Image
- AC Adapter
- 3G Cellular Antenna
- 900 MHz Antenna
- Dry Contact Sensor
- Temperature Sensor

Block Diagram

CloudGate Monnit system consists of a CloudGate gateway with a plugged in CG9104-900MT board, loaded with the proper software (Developer Image) and communicating over a 900MHz link to satellite Monnit sensors, as shown in Figure 1. Each sensor has a unique Monnit ID to distinguish the sensor from other sensors. Radio connection is point to point. In other words, each sensor communicates with CloudGate. Sensors do not communicate with each other.

Figure 1

Board Layout

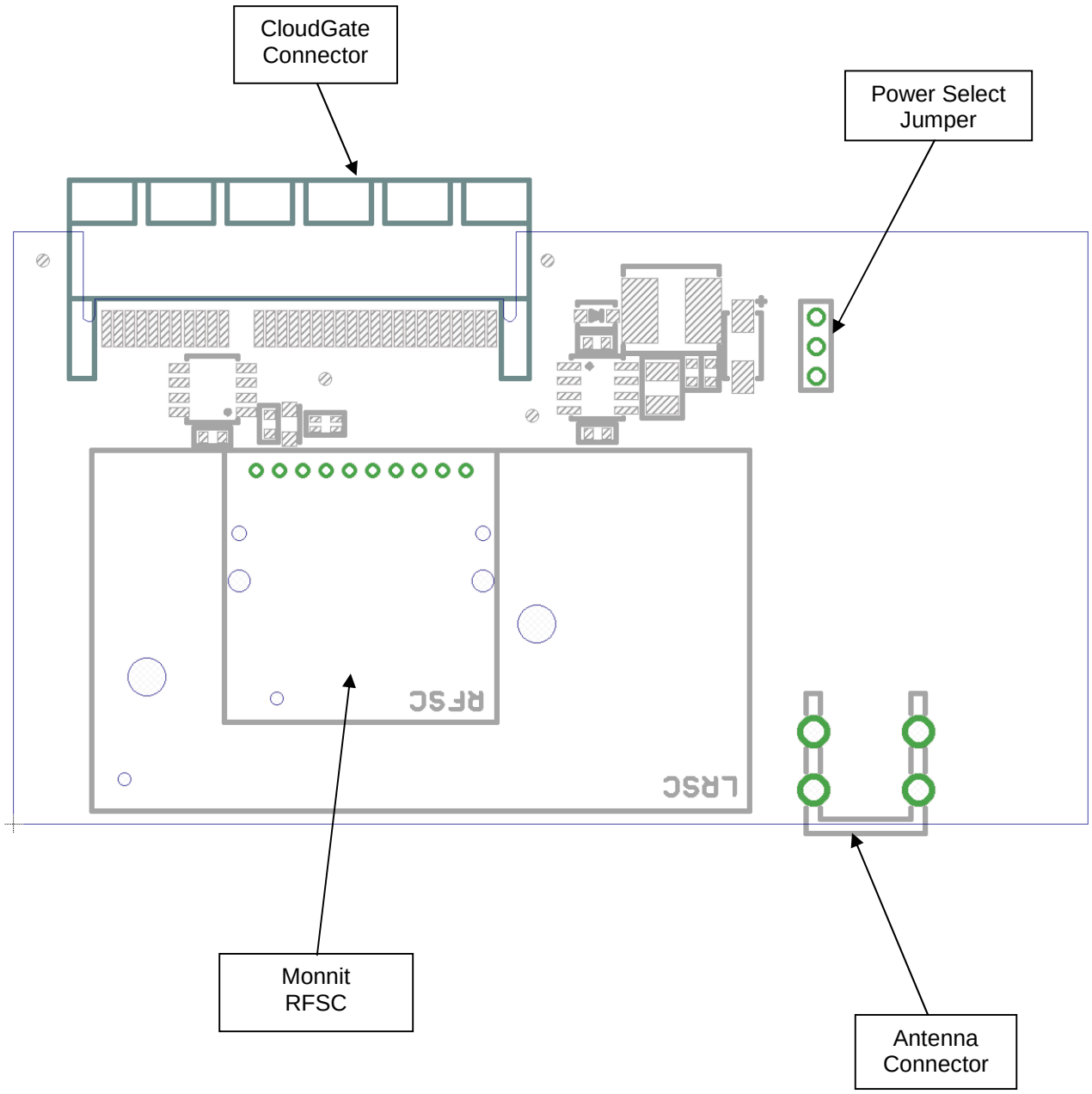
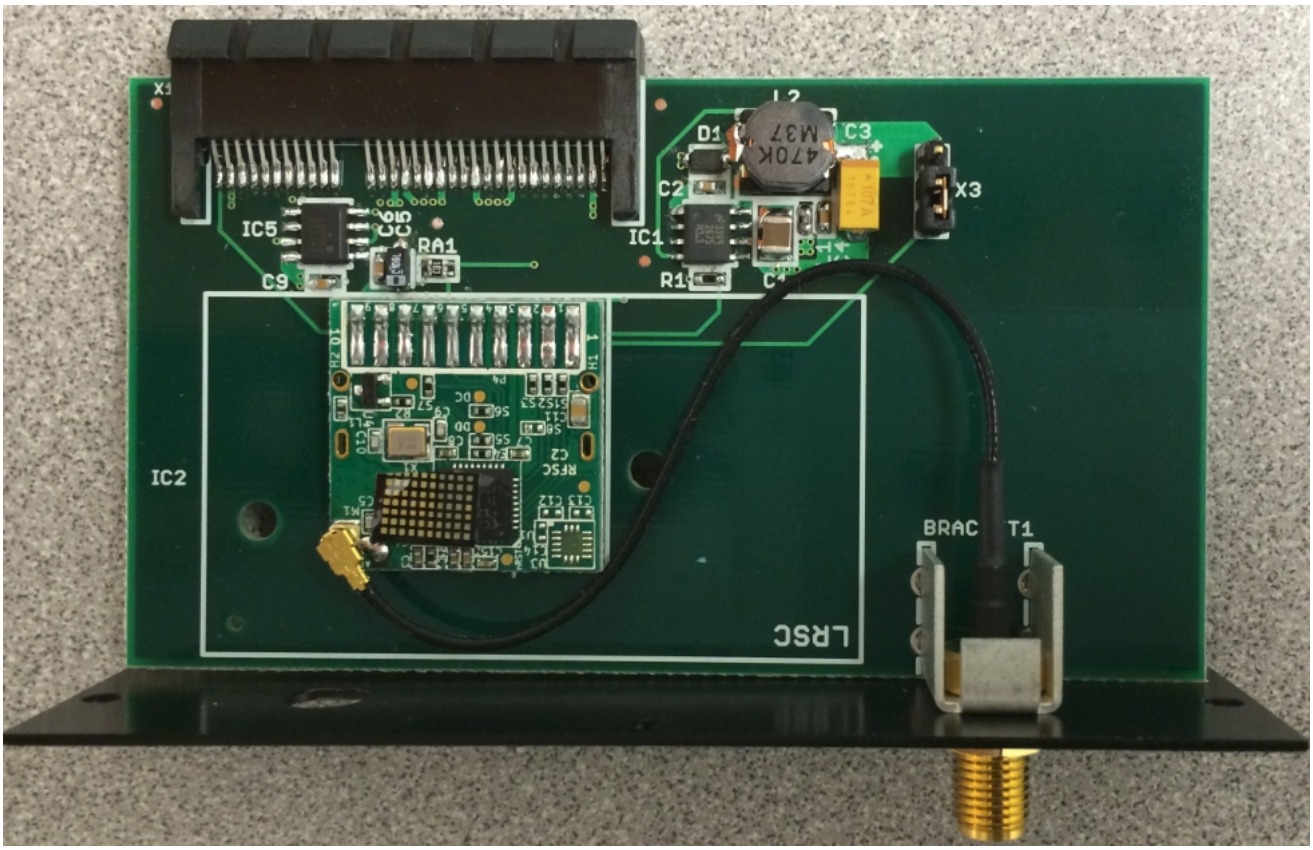


Figure 1


X1
L2
D1
M37
470K
C3
C2
X3
IC5
IC1
RA1
C9
R1
C4
IC2
BRAC
T1
LRSC

Antenna

The placement of antenna connector on the front panel is shown on Figure 2:

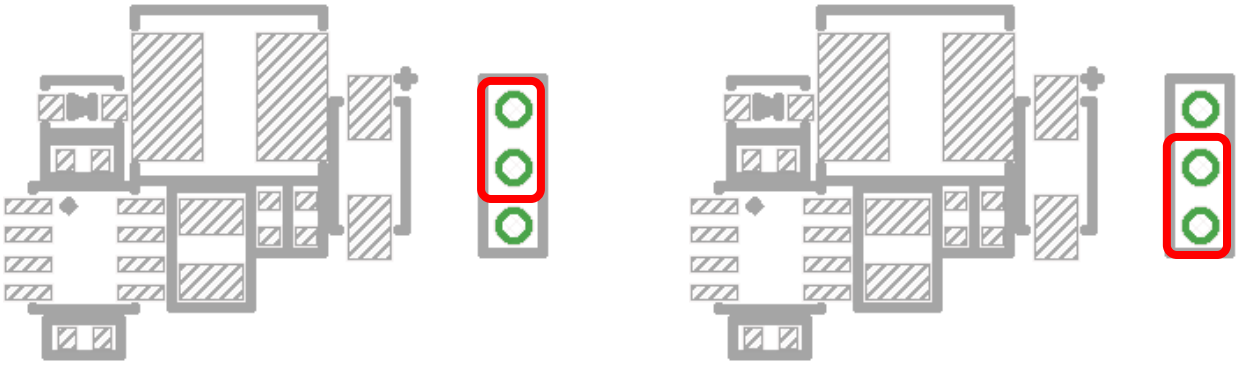
Figure 2

Any 900MHz antenna with a reverse SMA (RPSMA) connector can be used. BiPOM recommends one of the following antennas:

- Linx ANT-916-CW-HW
- SKYWAVE 11-1035-A

Power Select Jumper

CG9104-900MT can be powered either from its on-board power supply, or from CloudGate 3.4V.
Figure 2 shows how Jumper X1 is used to switch between these two options:



Internal Power Supply

Power supply from CloudGate 3.4V

Figure 3

Software

1. Status

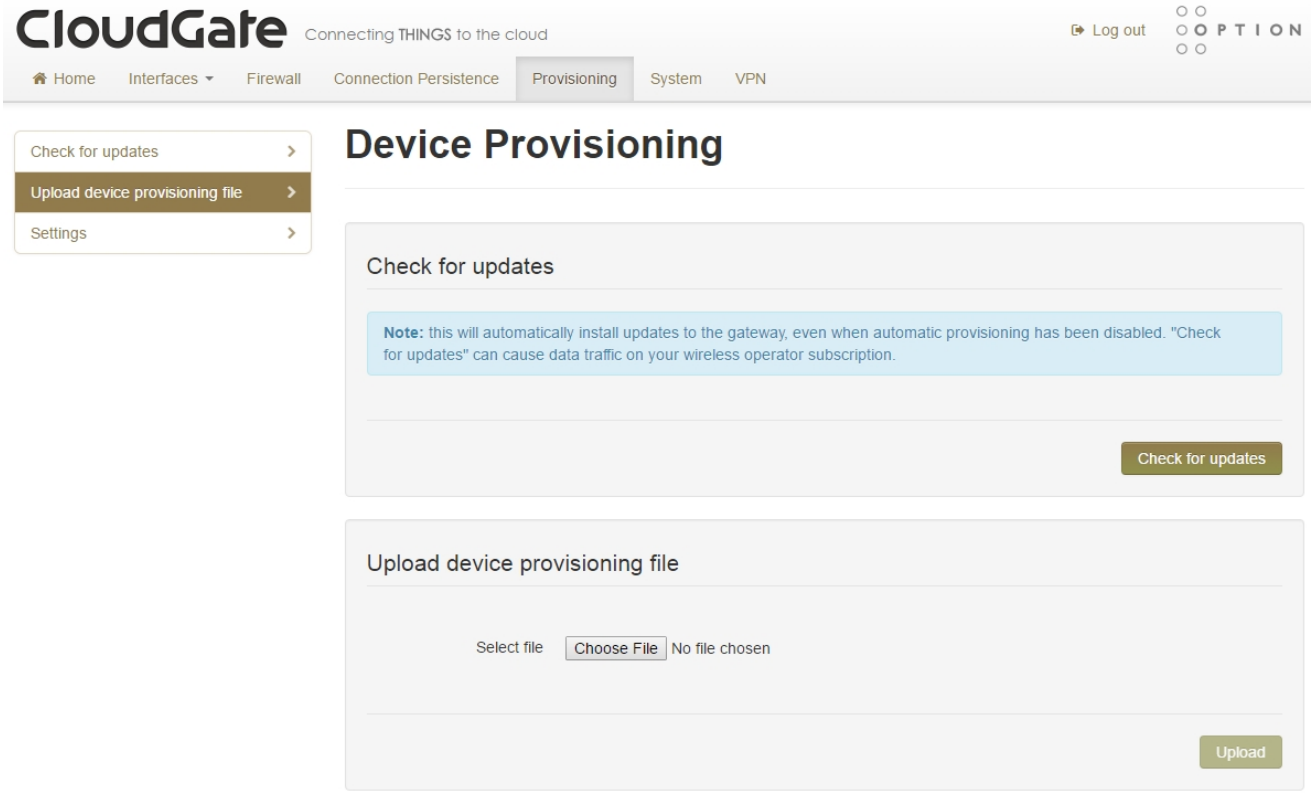
BiPOM provides a CloudGate developer image for configuring CG9104-900MT. Through this developer image, various Monnit sensors can be added to the system and the frequency and target of data push from sensors can be defined.

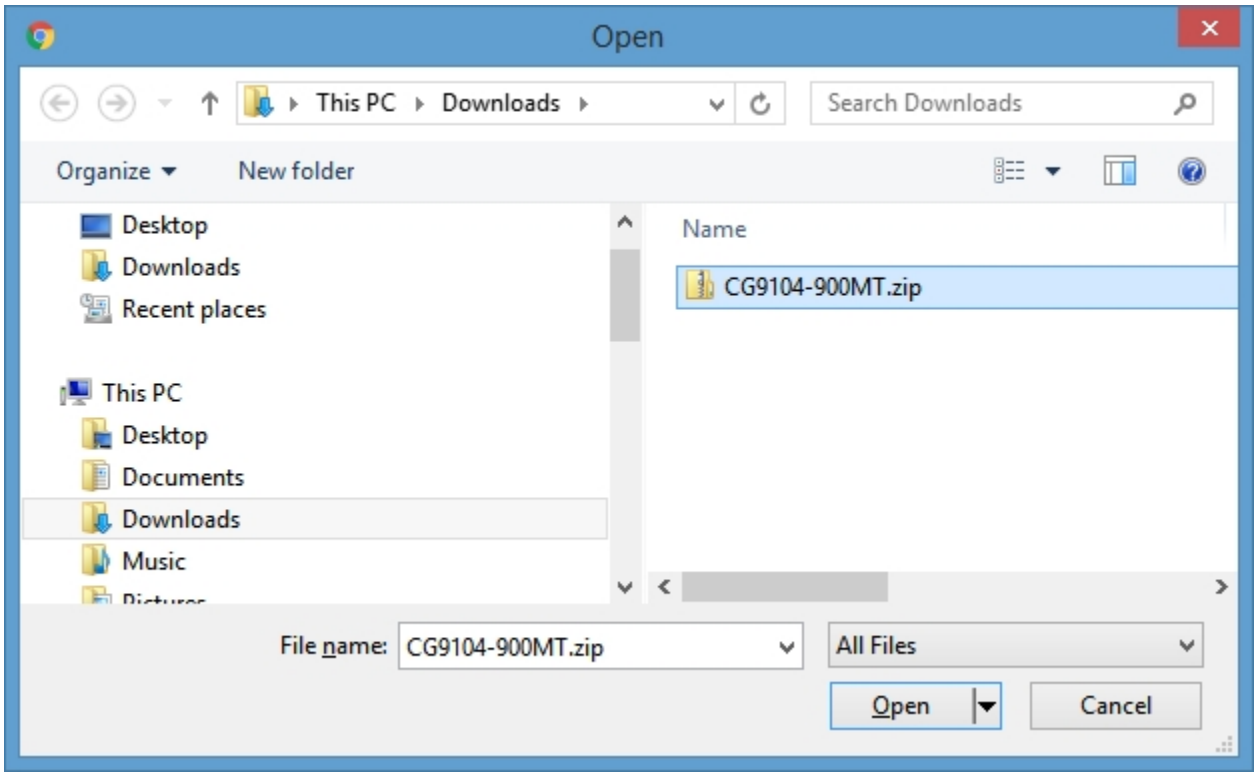
Download the CG9104-900MT Developer Image from BiPOM web site at:

www.bipom.com/web_softwares/4381365.html

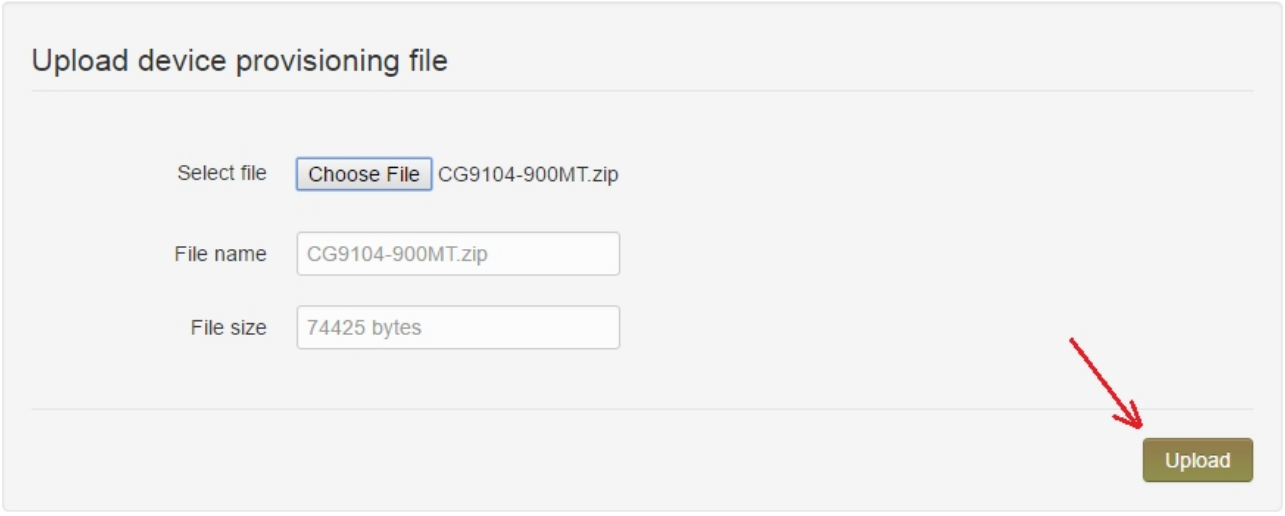
Connect to CloudGate either through Ethernet, 3G or Wi-Fi connection. Log in to CloudGate by entering the username and password.

Select the Provisioning tab and click Choose File to select the CG9104-900MT developer image:





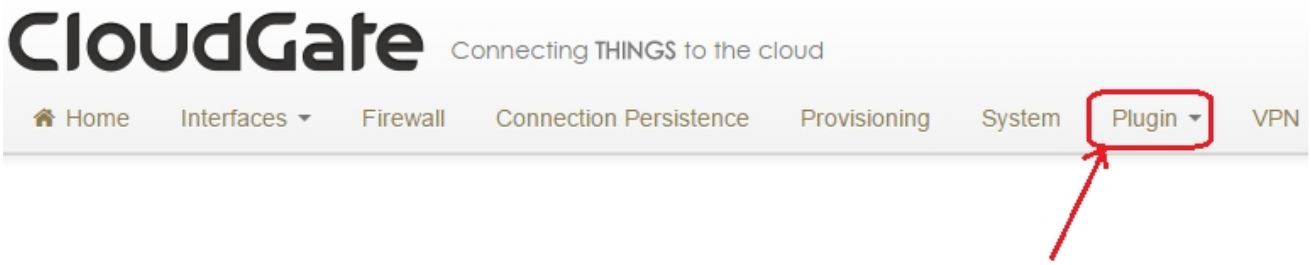
Click Open and then click Upload:



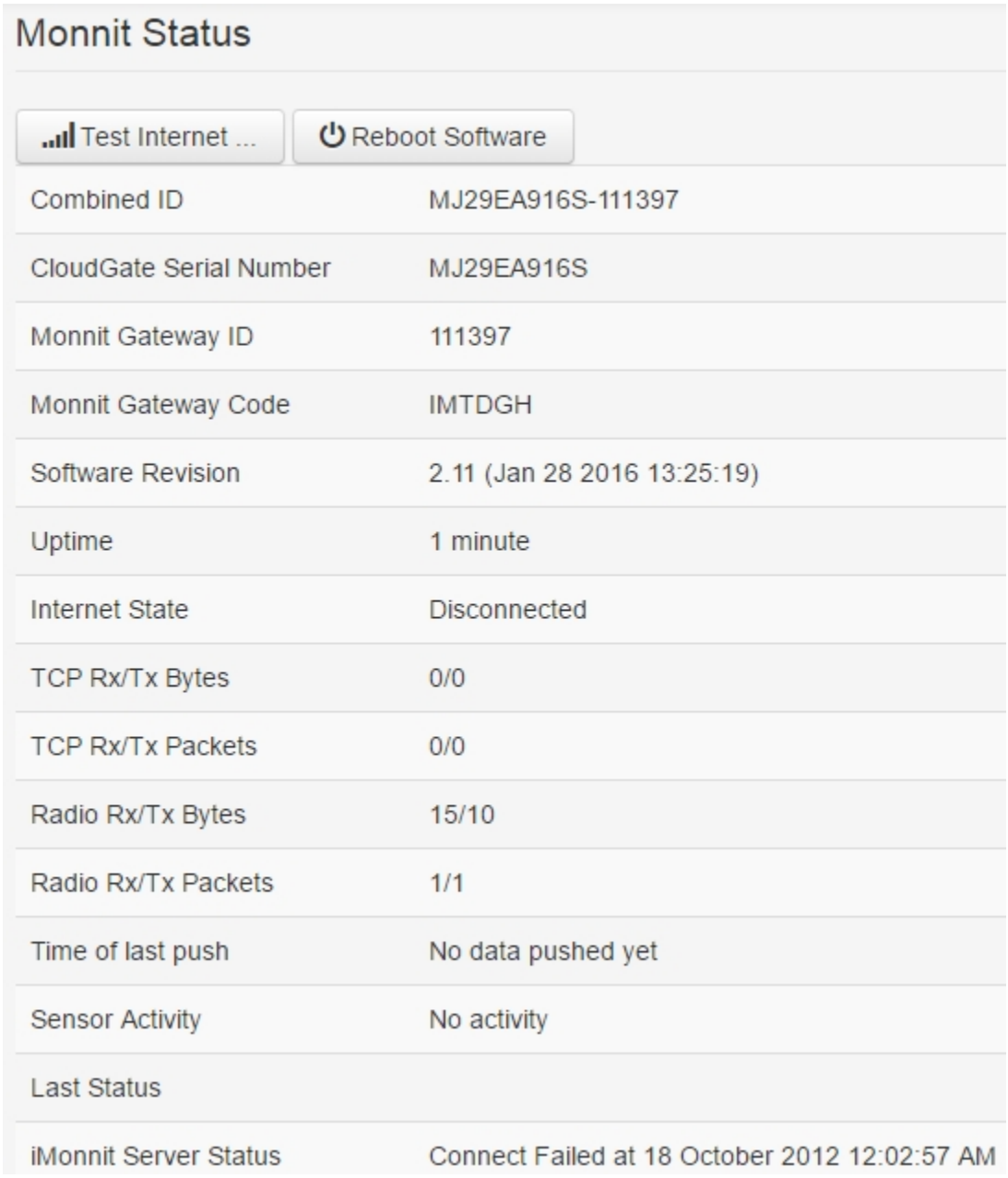
After a few seconds, the developer image will be loaded to CloudGate and you will be asked to restart CloudGate. Click Restart.

A down count will start:

After 2 minutes, CloudGate will have been restarted. A new tab called Plugin should appear on the CloudGate web interface as shown:

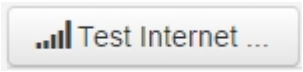


Click the Plugin tab. Select Monnit Service Status. This should show that CloudGate is connected to the internet (this is needed to be able to push data from Monnit sensors to the cloud) and the status of the CG9104-900MT board.



Monnit Gateway ID shows the unique identifier of the Monnit RFSC on the CG9104-900MT board. Combined ID is a unique identifier formed by combining the CloudGate serial number (which is also unique) with the Monnit Gateway ID. In this example, MJ29EA916S-111397 is the Combined ID where MJ29EA916S is the CloudGate serial number and 111397 is the Monnit Gateway ID. MJ29EA916S-111397 is used for pushing Monnit data to web portals such as the BiPOM web portal. Through this unique ID, the web portal knows how to identify various CloudGate devices installed in the field.

Internet Connectivity of CloudGate can be checked by clicking the Test Internet button:



Internet test is performed by pinging various servers on public internet:

If CloudGate is not connected to the internet, the results will show as FAILED.

If CloudGate is connected to the internet, the results will show as OK.

Connecting CloudGate to a Local Area Network (LAN) does not mean that CloudGate is connected to the internet. A CloudGate is typically connected to the internet using a 3G or LTE connection. To connect CloudGate to the internet while it is on a LAN, CloudGate should be configured for WAN under Main Ethernet settings.

When Monnit sensors send data to CloudGate, the latest activity is shown on the Sensor Activity and Last Status fields:

Time of last push	No data pushed yet
Sensor Activity	No activity
Last Status	
iMonnit Server Status	Connect Failed at 18 October 2012 12:02:57 AM

If a web portal has been selected, CloudGate pushes the data to the portal. Time of last push to portal as well as the portal (server) status is shown.

Further diagnostic information can be seen under radio activity fields:

TCP Rx/Tx Bytes	0/0
TCP Rx/Tx Packets	0/0
Radio Rx/Tx Bytes	15/10
Radio Rx/Tx Packets	1/1

These fields are typically updated when Monnit sensors send data to CloudGate.

2. Configuration

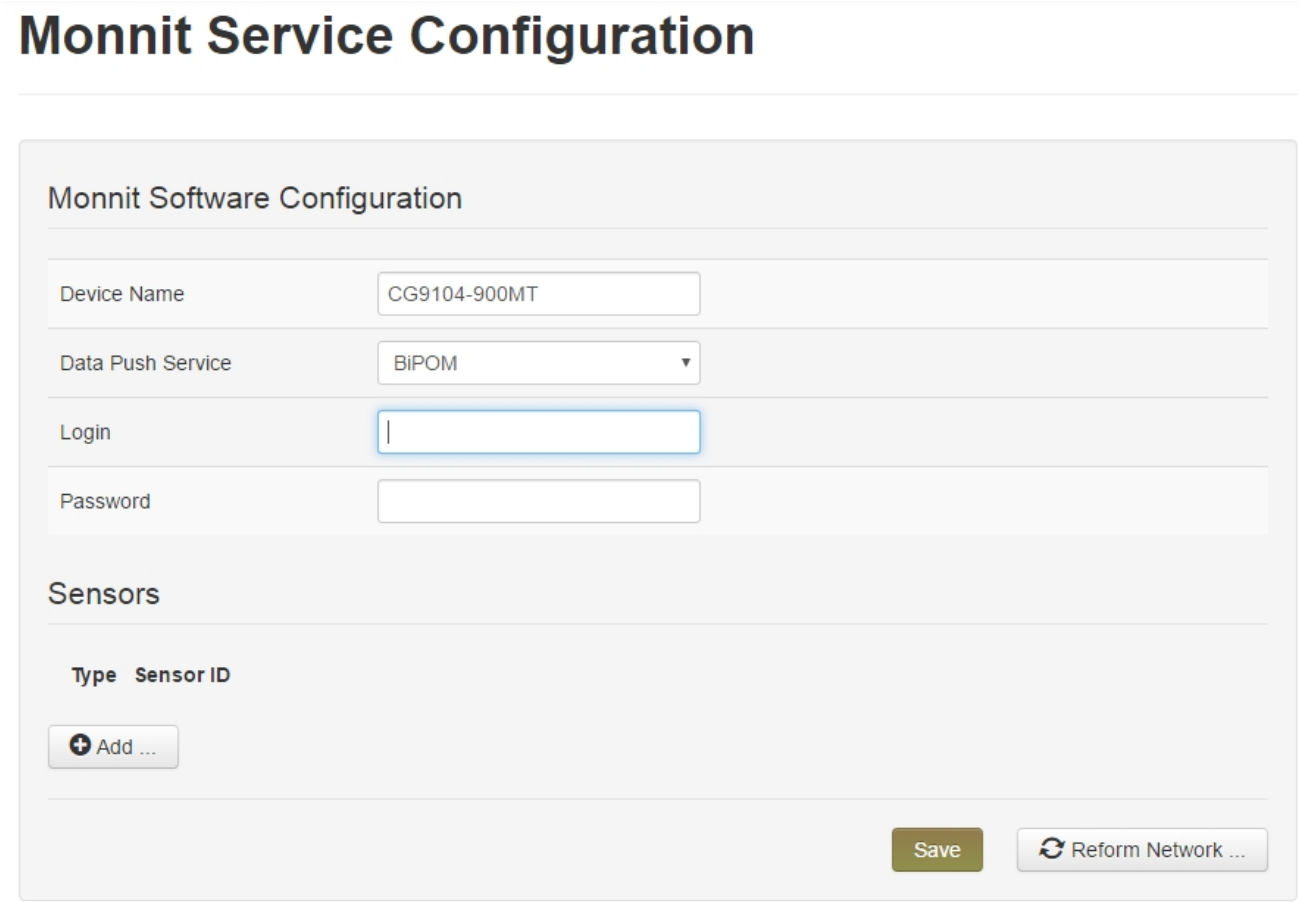
System configuration consists of:

a) Selecting a web portal for data push (Data Push Service)
b) Defining the Heartbeat (how often CloudGate will check in to the web portal)
c) Defining the Monnit sensors in the system if the web portal is other than iMonnit

A typical Heartbeat is 10 minutes.

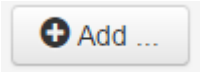
When Data Push Service is iMonnit, all sensor configurations are done through iMonnit web portal.

When Data Push Service is BiPOM, New Boundary or some other web portal, additional information should be entered:

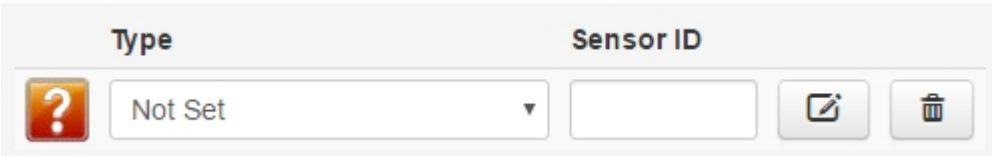


Login and Password fields are for the BiPOM web portal. These come from BiPOM when the web portal account is created and ready for pushing the Monnit data. Web portal will reject data from Monnit sensors if the credentials do not match.

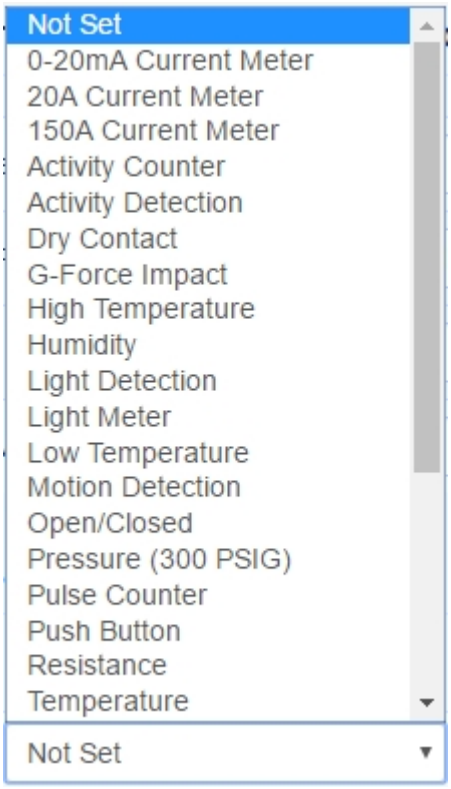
New sensors can be added by clicking the Add button:



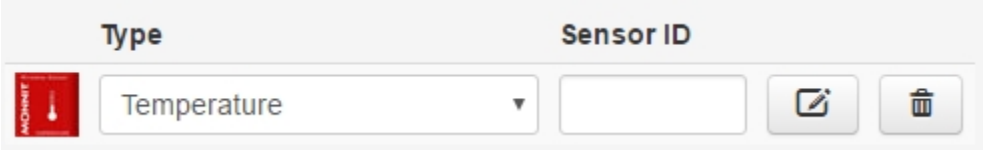
When the Add button is clicked, entry fields are shown to select the first Monnit sensor:



A large variety of sensors are supported. The full selection can be seen by clicking on the Type pulldown:

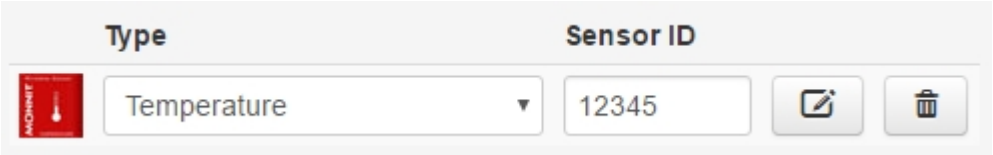


Select the sensor that matches your first sensor. For example, a Temperature sensor:

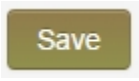


For a visual verification, the icon of the temperature sensor is shown.

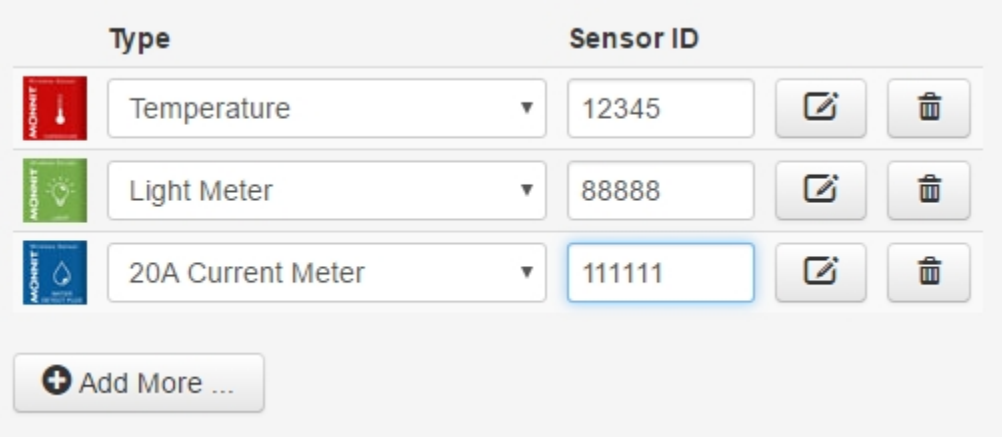
Enter the Monnit ID of the temperature sensor to the Sensor ID field. Only the Monnit ID should be entered, not the Monnit Code. The Monnit ID is found on the label that is attached to the bottom of the Monnit sensor.



Click the Save button to save the changes:



More Monnit sensors can be added by clicking the Add button:



Click the Save button to save the changes:

The system is now ready to push data to web portal of your choice. As the sensors generate data and notifications these will be sent to CloudGate and CloudGate will send these to the web portal provided that the web portal is account is configured and CloudGate has internet connectivity.