HARTING MICA® CISS Complete IIoT Starter Kit - Data Sheet

Advantages

- All hardware and software components included to start your industrial condition monitoring application in under 10min
- Built and Tested in accordance to industry transportation standards for the harshest conditions
- Embedded non-proprietary vendor agnostic, open dynamic, scalable future proof middleware software stack architecture
- Robust, adaptable, upgradeable hardware
- IP-rated Industrial connectors
- Power over Ethernet 48 V PoE or 12/24 V DC for quick network deployment
- Integration of IP and non-IP devices creating an open best of breed architecture at the edge level

General description

- MICA is an extremely robust IoT edge computer hardware/software that is engineered and designed to meet the standards, and requirements for critical infrastructures in Data Centers, Automation, Oil & Gas, Industrial Automation, Facilities, and Healthcare environments. MICA is tested in accordance to IP67 standards providing a modular world class hardware chassis.
- MICA hardware components are carefully engineered for an extensive life cycle in critical and harsh environments where reliability and uptime are crucial.
- MICA modular hardware and software design enables IoT architects, Integrators, development engineers and end-users, to unleash their systems potential. This is accomplished through a powerful blend of a web-based non-proprietary open source architecture.
- MICA applications include, Asset Tracking, Condition Monitoring/Control, and System Integration-Digital Retro-fits/migrations of proprietary protocols.
- The BOSCH “Connected Industrial Sensor Solution” (CISS) boasts 8 different environmental sensors in one: temperature, humidity, accelerometer, pressure, light, acoustic, gyroscope, and a magnetometer.

Technical characteristics (MICA)

System performance	1 GHz ARM processor 1 GB RAM 4 GB eMMC up to 32 GB Flash (via Micro SD Card)
Interfaces	Ethernet (TCP/IP) 10/100 Mbit/s; Full Spec. 802.3 2 USB A Push-Pull
Inputs / Outputs	up to 8 configurable IOs (12 / 24 V)
Power supply	
Power supply	12/24 V DC (± 5 %) / Power over Ethernet (PoE)
Current consumption	max. 500 mA
Diagnosis (LED)	2 LEDs to visualize the device status
Protocol	Embedded middleware functionality 1.1 standard – Web services – http telegrams – TCP telegrams – UDP telegrams – MySQL database support – MQTT
Operating system	Linux (Kernel 3.x.x)
Design features	
Material of housing	corpus: Aluminum, powder coated front cover: fiberglass reinforced high performance plastic
Dimensions (W x H x D)	132 x 86 x 35 mm
Installation on DIN rail	DIN rail mounting kit (see optional accessories)
Environmental conditions	
Operating temperature	-25 °C ... +75 °C
Storage temperature	-25 °C ... +85 °C
Relative humidity	5 % ... 95 % (non-condensing)
Vibration	EN 60 068-2-6 10 Hz to 150 Hz: 0.075 mm / 1g
Shock	EN 60 068-2-27 Acceleration: 30 g
Norms & safety	
EMC	EN 301 489
Low voltage	EN 60 950
Human exposure	EN 50 364
RoHS compliant	
Railway	tested according to EN 50155 (Q2 2016)

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Description	Part number	Drawing	Dimensions in mm
HARTING MICA CISS Complete IIoT Starter Kit	73460000007		
Kit Components:			
HARTING IIC MICA USB	2095000000200		
M12 X coded PushPull cable assembly,1m	09488223756010		
M12 Cable Assembly A-cod st/- m/- 1,0m	21348400C79010		
BOSCH "Connected Industrial Sensor Solution" (CISS)			
HARTING USB PushPull CISS-cable			
12V, 1A Power Supply			

Pushing Performance

People | Power | Partnership

HARTING MICA®
CISS Complete IIoT Starter Kit
Setup Guide

Edition 2018, 07/27

Abstract

The HARTING MICA CISS Complete IIoT Starter Kit is designed to give you a jump start in developing Industry 4.0 condition monitoring applications. The HARTING MICA edge computing device is paired with the BOSCH “Connected Industrial Sensor Solution” (CISS) to deliver an extremely robust platform for the processing and monitoring of environmental data. Software has been preloaded onto the HARTING MICA to assist in the translation of sensor data from the CISS, to a real-time visual dashboard.

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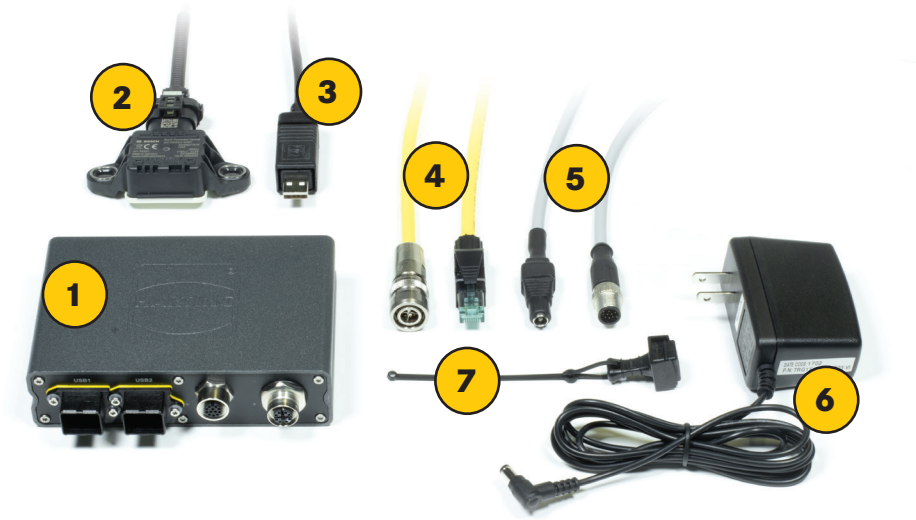
Contents:

Parts Included



# on Photo	Part Number	Description
1	20911051101	HARTING MICA® USB
2		BOSCH "Connected Industrial Sensor Solution" (CISS)
3	20932040131	HARTING USB PushPull CISS-cable
4	20932010504	M12 X coded PushPull LAN-cable
5	21348400C79010	M12 A coded GPIO-cable
6		12V 1A Power Supply
7	09458450009	HARTING PushPull protection cover

1 The CISS Gateway

The Bosch CISS Sensor contains an Accelerometer, Temperature sensor, Humidity sensor, Digital light sensor, Gyroscope, Magnetometer, Pressure sensor and Acoustic sensor.

For further information about the Bosch CISS Sensor refer to:
https://www.bosch-connectivity.com/products/ connected-industrial-sensor-solution/

The IIoT kit provides multiple data points and is intended to show how easy publishing this data to different subscribers (that have their own requirements) can be. This kit provides an example using NodeRed to display sensor data (via MQTT) in a user friendly way.

2 Getting started

2.1 Overview

The MICA CISS IIoT Kit contains a MICA USB, a M12 X coded PushPull LAN-cable, M12 A coded GPIO-cable, 12V Power Supply, and a BOSCH “Connected Industrial Sensor Solution” (CISS). The MICA USB comes preinstalled with the “CISS Gateway”, “MQTT” and “NodeRed” containers.

2.2 Hardware setup

Click on the “Management” page to setup the reader hardware and read RFID tags for testing purposes.

To get started with the MICA® CISS IoT Kit, follow the instructions below:

1. Connect the CISS Sensor to a USB port of your MICA.
2. Connect the M12 I/O connector of the GPIO-cable to the MICA I/O socket.
3. Connect the Barrel Jack of the GPIO-cable to the Power Supply.
4. Connect the M12 PushPull connector of the LAN-cable to MICA PushPull socket.
5. Connect the RJ-45 Ethernet connector of the LAN-cable to your PC or Switch.

It is important to connect the CISS Sensor to the USB port before powering on the MICA!

2.3 Connecting to the web interface

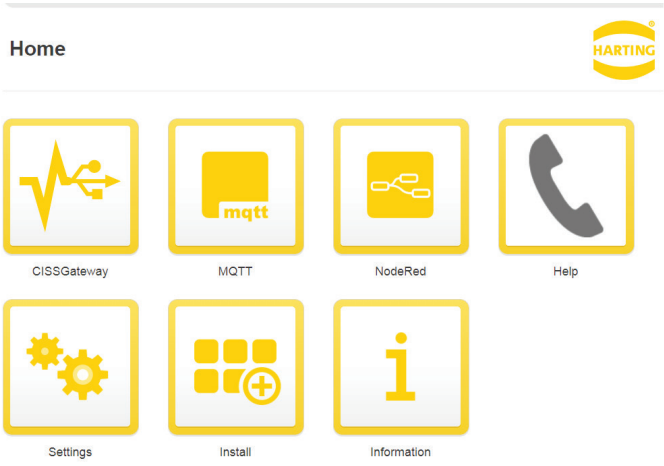
As soon as you have connected your MICA to your Network or PC and the I LED has turned green, your MICA has fully booted and you can now log into the device. You will need to change the static ip address of your personal computer to be within the range of the MICA. Because the MICA’s ip address defaults to 10.10.10.10, the static ip of your machine should be 10.10.10.x (e.g. 10.10.10.121) with a subnet of 255.255.255.0. Next, open your browser and enter: https://10.10.10.10. Alternatively the MICA is reachable at: https://<device-name>.

The device name along with your login password, MAC address, and serial number (S/N) can be found on your MICA’s product label.

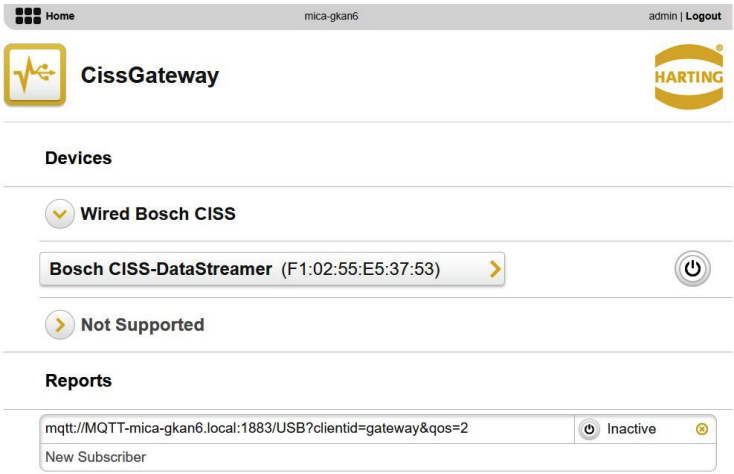
When you first attempt to access the MICA in your web browser, you may receive a certificate/security notification. This is actually expected behavior, because there is not a registered security certificate associated with the webserver on your MICA. You can safely ignore this warning and proceed to the MICA’s website. The login screen should appear where you can enter the credentials shown on the MICA’s product label.

2.4 Gateway Configuration

After logging in to the MICA's web interface, click on the "CISS Gateway" icon and it will take you to the CISS Gateway UI.

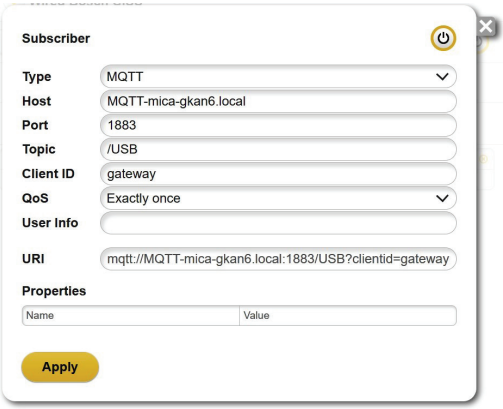


You should see the connected CISS-Sensor in the "Devices" section. To activate the sensor click on the button. If the sensor is working correctly, the activation button will turn yellow and an icon will appear. Clicking on the connected device will allow you to label it. In the "Reports" section you can add a set of subscriber endpoints. To configure your MICA for the IoT kit, please create a new subscriber endpoint with the following settings (click the words "New Subscriber"):



1. Type: Choose MQTT as endpoint type
2. Host: Enter: MQTT-<device-name>.local
3. Port: Use the port 1883
4. Topic: Enter: /USB, This is the topic that will be used when publishing reports.
5. Client ID: Enter: gateway
6. QoS: Choose: Exactly once

Click the “Apply” button to save this configuration and click the button to activate your new subscriber endpoint.



You can find your (device-name) listed on your MICA’s product label

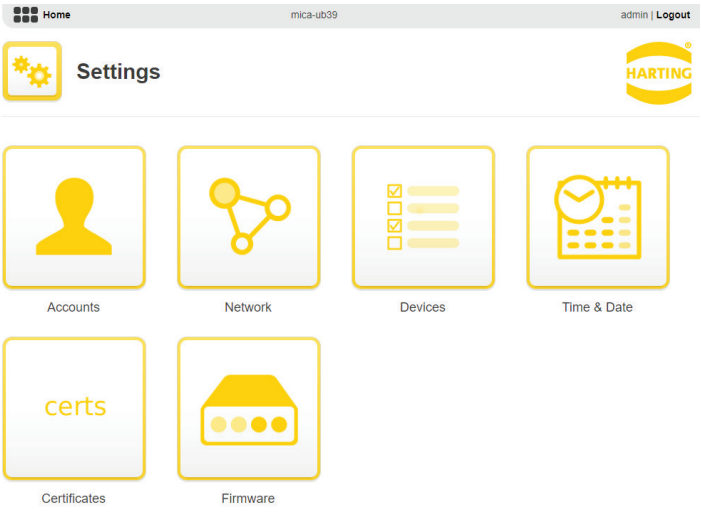
An example of the report sent to MQTT is shown below:

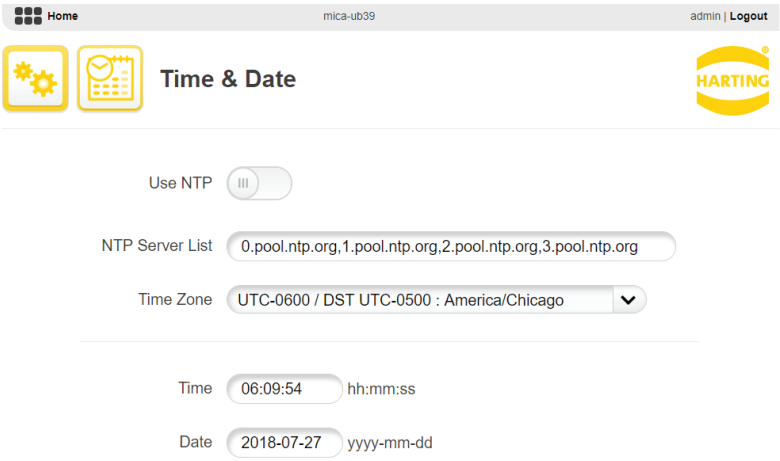

```
{
“applicationId”:”Serial CISS Gateway”,
“reportName”:”Bosch CISS-DataStreamer”,
“date”:”2018-03-05T11:59:47.073”,
“totalMilliseconds”:988,
“initiation”:”REAPEAT_PERIOD”,
“initiator”:null,
“termination”:”DURATION”,
“terminator”:null,
“devices”:[
{
“name”:”Bosch CISS-DataStreamer (F1:02:55E5:37:53)”,
“fields”:[
{
“name”:”Temperature”,
“value”:27.8,
“date”:”2018-03-05T11:59:46.264”
},
{
“name”:”Pressure”,
“value”:991.58,
“date”:”2018-03-05T11:59:46.264”
},
{
“name”:”Humidity”,
“value”:46.63,
“date”:”2018-03-05T11:59:46.264”
}, {
“name”:”Light”,
“value”:0.0,
“date”:”2018-03-05T11:59:46.264”
}, {
“name”:”Accelerometer”,
```

```
“value”:{,
”x”:0,
”y”:0,
”z”:0
},
“date”:”2018-03-05T11:59:46.798”
}, {
“name”:”Magnetometer”,
“value”:{,
”x”:-470,
”y”:-1966,
”z”:-147
},
“date”:”2018-03-05T11:59:46.799”
}, {
“name”:”Gyroscope”,
“value”:{,
”x”:0,
”y”:0,
”z”:0
}, “date”:”2018-03-05T11:59:46.799”
},
} ...
```

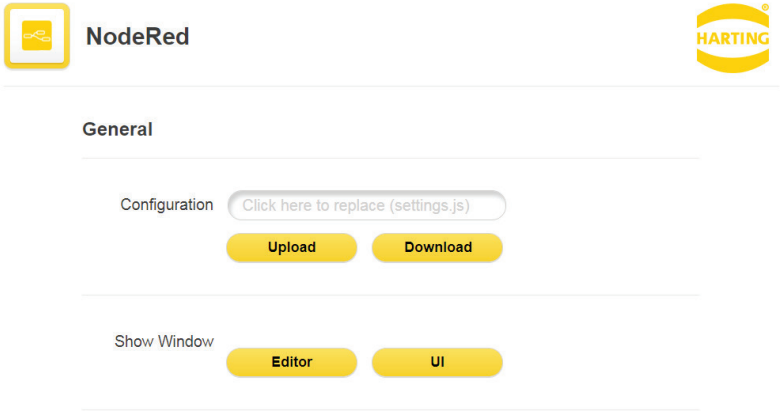

2.5 Dashboard

For proper function of the dashboard you should use the same time zone for your PC and MICA. (Whenever possible, use NTP on both devices). To change the time zone settings on your MICA navigate to the Settings page from the home page of the MICA’s web interface. Click on the “Time & Date” button and apply any changes.

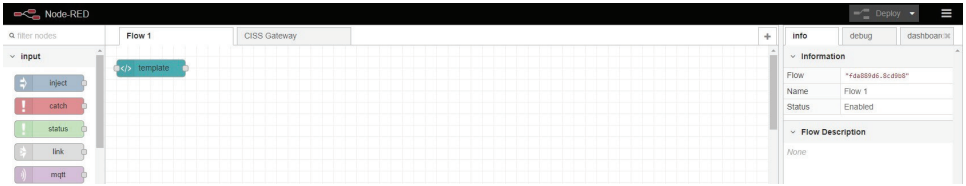




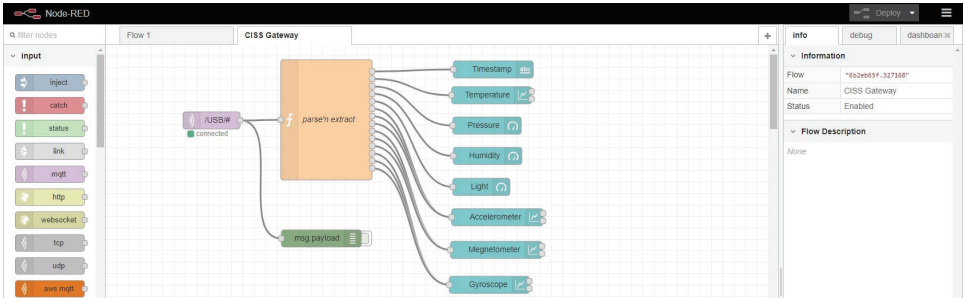
The dashboard setup should only be done after the Gateway configuration process has been completed. To reach the dashboard editing screen, go back to the home screen of the MICA web interface, open the NodeRed container, and click on the “Editor” button.



A new browser tab will appear where you can configure the NodeRed container.



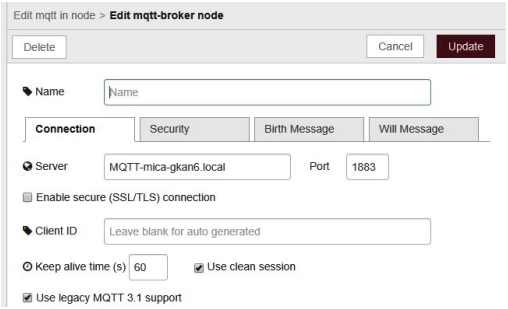
Click on the “CISS Gateway” tab in the NodeRed UI. This displays the NodeRed configuration for the CISS Gateway UI.



Double click the MQTT node icon  and a new field will appear (on the right side of the screen) where the MQTT connection settings can be configured. Click on the icon next to the server field. On the next page, enter the server and the port.

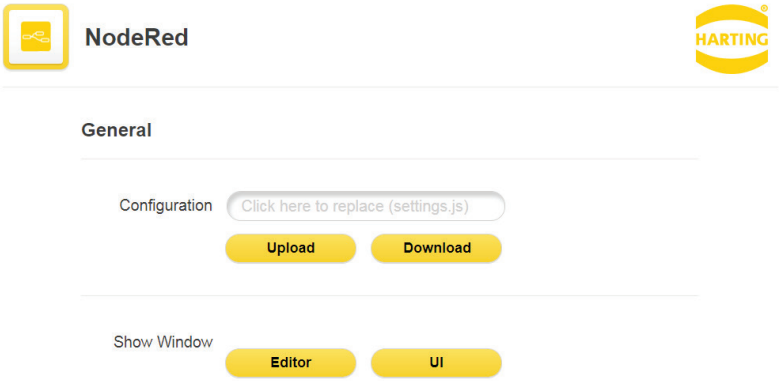
1. Server: Enter: MQTT-<device-name>.local
2. Port: Enter: 1883

You can find your (device-name) listed on your MICA’s product label

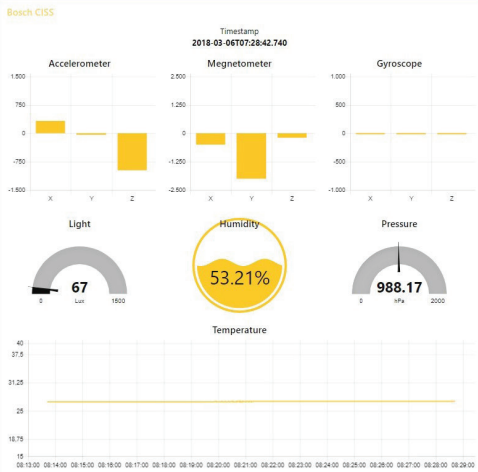


Click on Update and Done In the next step click on Deploy on the right side of the NodeRed window.

To view the CISS Gateway dashboard, go back to the NodeRed container and click on the UI button.



A new tab will appear with the Bosch CISS dashboard. Here you can see all of the monitored parameters of the CISS Sensor.



Next Steps

For whatever application you have in mind, HARTING MICA has the tools for you to build software to reach your end goal. One of the most powerful tools provided is the NodeRed container. The GPIO port on the MICA can be controlled via NodeRed, and most internet based protocols are also supported.

For ideas or support on how to continue developing your application, refer to the tutorials and examples at HARTINGMICAStarterKits.com or don't hesitate to reach out!

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Pushing Performance

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