

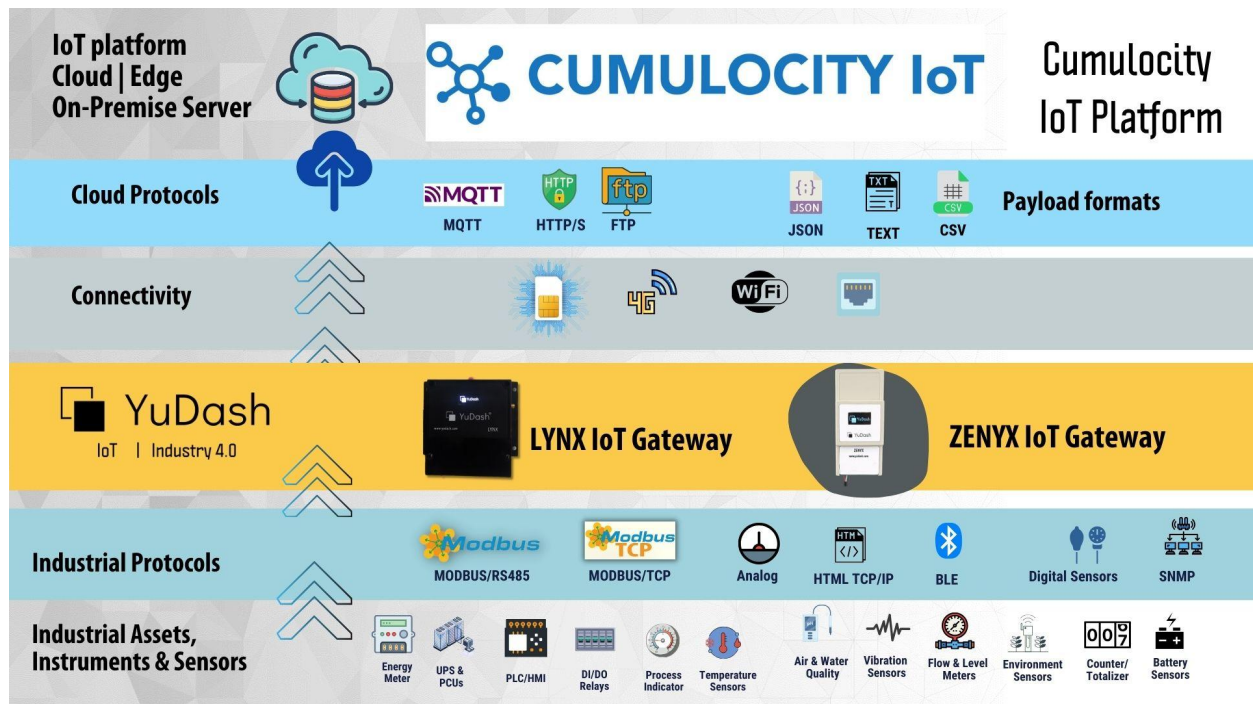


Integration of YuDash LYNX with Cumulocity IoT platform using MQTT

October 16, 2023 | Version 0.90 (Draft) | Sunand Mittal (sunand@yudash.com)

Introduction

This document describes the capability of YuDash LYNX integration with [Cumulocity IoT platform](#) through MQTT. Following diagram describes the general architecture of data flow.



Description

[YuDash LYNX](#) IoT gateway is a flexible Industrial IoT gateway. Following are key components:

- Field data read: LYNX read various industrial sensors/instrumentation over different protocols (Modbus RS485, analog inputs, Modbus TCP/IP, I2C sensors, and many more).
- Network Connectivity: LYNX can connect to the network through WiFi / Ethernet LAN or 4G/LTE Sim card. Network can be cloud OR on-premise solution
- IoT server: The server on which field data will be stored. It supports [HTTP POST](#) API and [MQTT](#) to send data to the server.
- YuDash provides a variety of flexible payload formats to support all popular IoT platforms and use-cases.
- User need to fill in basic settings of MQTT Server and credentials in YuDash LYNX.

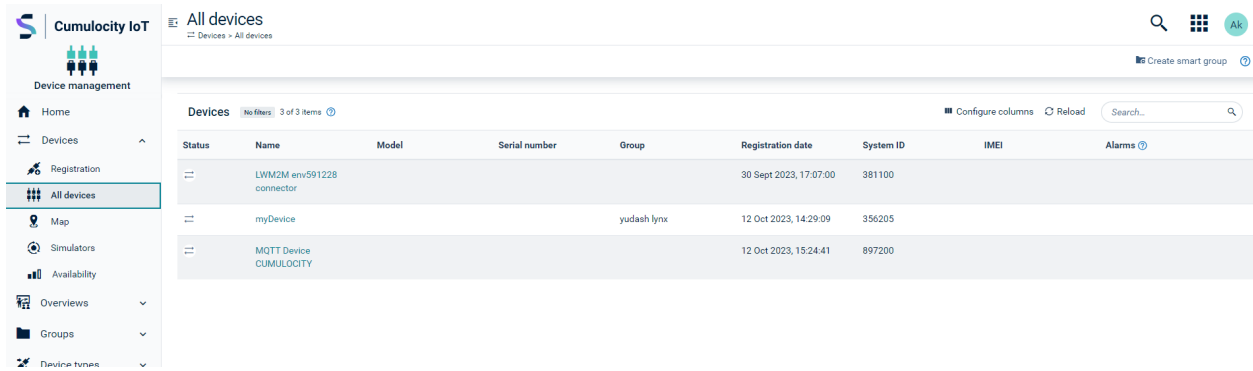
The image is a composite graphic. At the top left is the **CUMULOCITY IoT** logo. Below it, on a yellow background, is the **YuDash** logo and the text **YuDash LYNX IoT Gateway to Cumulocity IoT Platform**. To the right of this text is a cloud icon with an upward arrow. Below the text are icons for **LTE**, **4G**, a mobile phone with a globe, **WiFi**, and an Ethernet port. To the right of the text and icons is a laptop displaying the YuDash web dashboard with three data cards showing values 236.9, 1,792.2, and 50.1, and a line graph. Below the laptop is a photograph of the YuDash LYNX hardware unit connected to an industrial energy meter.

YuDash LYNX IoT gateway connected to Industrial energy meter over MODBUS RS485. LYNX connected to the Cumulocity IoT platform over 4G/LTE network (or WiFi or Ethernet).

Sample LYNX Configuration with Cumulocity IoT platform using MQTT

In this example, we will send energy parameters from an energy meter to the Cumulocity IoT platform.

- 1) Create a device (myDevice created within room2) within the Cumulocity IoT platform.



- 2) Configure YuDash LYNX to send data to Cumulocity IoT over MQTT and enable MODBUS/RS485

Save/Load Settings

Modbus Settings

Analog Input Settings

DataScale Settings

Advance Feature Settings

Cloud Settings

Payload Settings

Ethernet Settings

Modbus TCP Settings

HTML Parser Settings

SNMP Settings

I/O Extension Settings

4G Diagnostics

LYNX Settings

Read LYNX Config
Update and Preview
Write LYNX Config

General Settings

Loop Delay (sec)

Device Name:

Feature Settings

Modbus (RS485) <input checked="" type="checkbox"/>	Analog Inputs <input type="checkbox"/>
Digital IOs <input type="checkbox"/>	Digital Sensors <input type="checkbox"/>
Data Scaling <input checked="" type="checkbox"/>	Modbus TCP/IP <input type="checkbox"/>
Ethernet/LAN <input type="checkbox"/>	HTML Parser <input type="checkbox"/>
SNMP <input type="checkbox"/>	

Cloud/Network Server

Use YuDash Cloud

Custom Cloud

<input type="radio"/> YuDash	<input type="radio"/> Ubidots	<input type="radio"/> Offline
<input checked="" type="radio"/> MQTT	<input type="radio"/> HTTP	<input type="radio"/> FTP
<input type="radio"/> Multiple Servers		

3) Cumulocity IoT MQTT credential settings in YuDash LYNX as per device information:

Custom MQTT Server Settings

MQTT Server (Broker)	<input type="text" value="env591228.eu-latest.cumulocity.com"/>
MQTT Port	<input type="text" value="1883"/>
MQTT User name	<input type="text" value="env591228/sunand123"/>
MQTT Password	<input type="text" value="YuDash1#CM123"/>
MQTT Client Id	<input type="text" value="yudash"/>
MQTT Publish Topic:	<input type="text" value="s/us"/>
MQTT Platform Name	<input type="text" value="CUMULOCITY"/>

4) Payload settings to send process parameters to Cumulocity IoT. YuDash IoT devices provide generic text payload generator to create CSV payload as per Cumulocity. It also supports various pre-defined JSON formats.

Payload Settings

Payload Format	<input type="text" value="TEXT_FORMAT_20"/>
Payload Gen Key#1	<input type="text"/>
Payload Gen Key#2	<input type="text"/>
Payload Gen Key#3	<input type="text"/>
Payload Gen Key#4	<input type="text"/>



YuDash Text Generator

Enable YuDash Text

Text Key Name

YuDash Text Encoder

```
200,room2,## yu1_vfn ##,## yu1_vfv ##
```

Using the above text generator format, the CSV payload with actual variable name and value for each input is created. For instance ***200,room2,volt1_in,223.56***

Generic LYNX Settings and Features:

- 1) The variable names (fields) are filled in Modbus settings of LYNX. This is a generic Modbus/RS485 setting of LYNX. Similar to Modbus/RS485, we can use MODBUS/TCPIP, Analog inputs and many other protocols
- 2) In this example, the variable names **volt1_in**, **freq_in** and **kwh** are sent to the Cumulocity IoT platform by YuDash LYNX IoT gateway.



Modbus RS485 Settings

BaudRate (bps)

Data Parity StopBit

Read Delay (ms)

Read Try Count

Modbus RS485 Slave Settings

Modbus Slaves :

Slave ID : No of Registers# 3

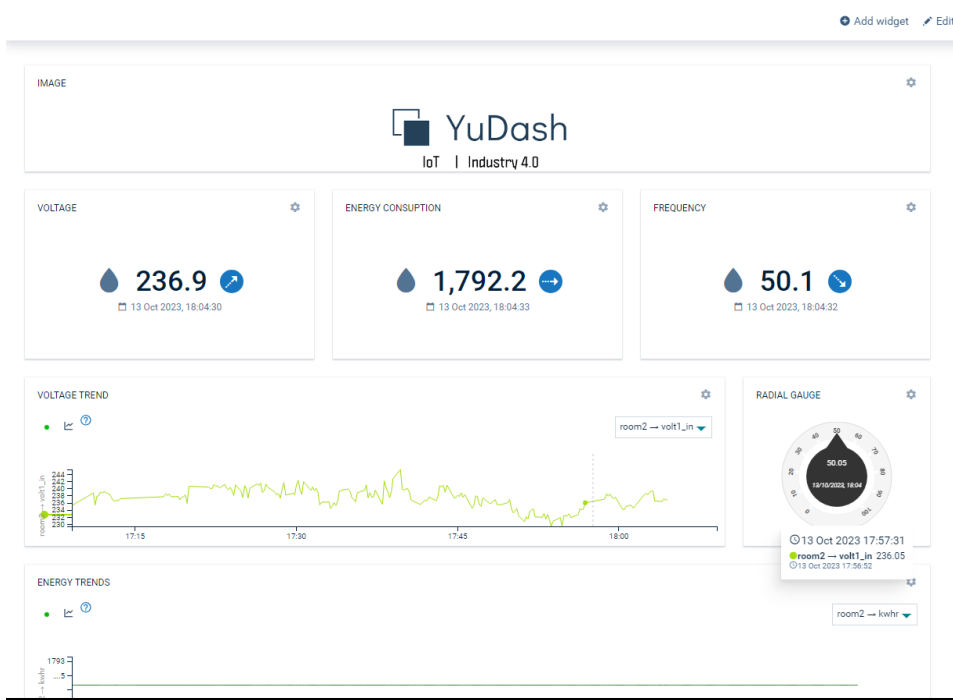
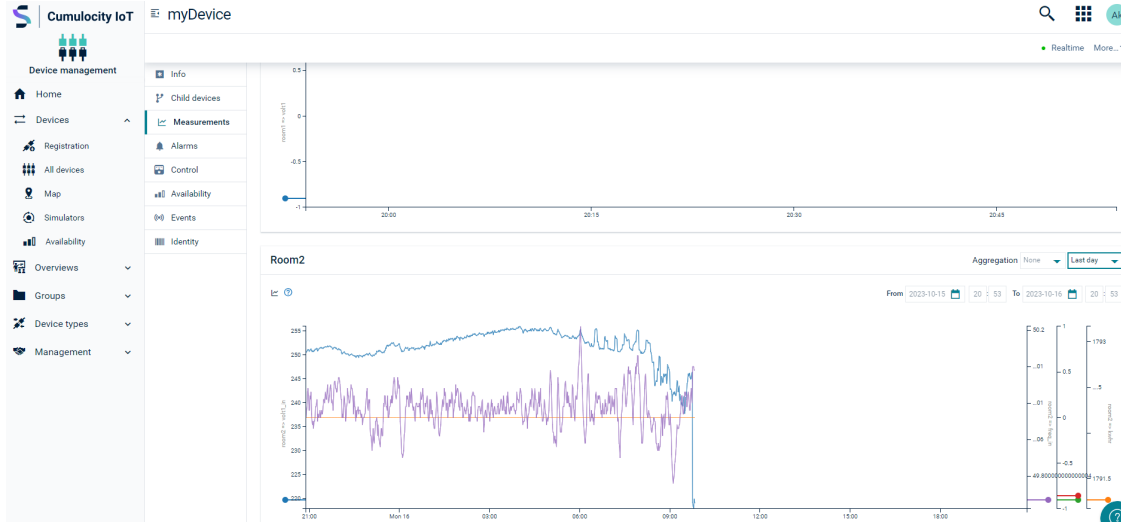
Variable Name	#Register No	Type	Factor
volt1_in	<input type="text" value="30020"/>	<input type="text" value="2"/>	<input type="text" value="1"/>
freq_in	<input type="text" value="30026"/>	<input type="text" value="2"/>	<input type="text" value="1"/>
kwhr	<input type="text" value="30000"/>	<input type="text" value="2"/>	<input type="text" value="1"/>

3) LYNX provides flexible network connectivity options: WiFi, Ethernet, 4/LTE SIM card.

Network Settings

Network Selection WiFi Ethernet 4G SIM None (Offline)

After configuration is completed, YuDash LYNX reads the MODBUS/RS485 instrument and sends data to the Cumulocity IoT cloud at the given time interval. Cool Dashboard boards can be created on Cumulocity IoT platform:



Please refer to www.yudash.com for details of YuDash IoT gateways and edge devices.

Help Section: <https://www.yudash.com/resources/help-section>

IoT platform: <https://www.yudash.com/resources/iot-platform-integration>

IoT Ecosystem Page: <https://www.yudash.com/partners>

