I. QUICK GUIDE

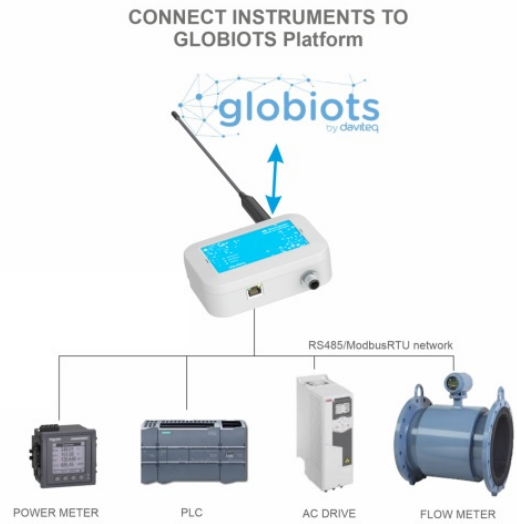
1. Introduction

1.1 Introduction

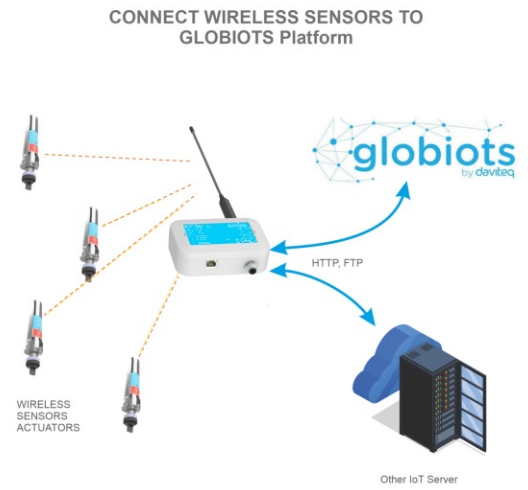
STHC-WET is a Smart IoT Gateway, aka iConnector, a main component in any IoT application. iConnector has a role to connect the real World's things like sensors, meters, machines...to server system for data logging, data analytics, monitoring & controls...iConnector support multiple Industrial Fieldbus like Modbus RTU, Ethernet IP, Wireless sensor network...It connects to server system via LAN/WAN as Ethernet, WiFi.

1.2 System architecture

1.2.1. Connect instruments to GLOBIOTS Platform



1.2.2. Connect wireless sensor to GLOBIOTS Platform



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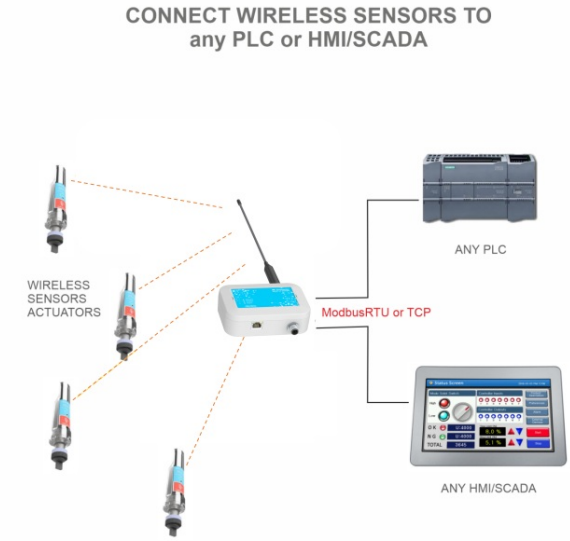
1.2.2. Connect wireless sensor to any PLC or HMI/SCADA



STHC-ISG02DB-WS433-CL-04-H4.PNG

2. Application note

- **Typical Application:** Energy management, environment monitoring, smart building, smart factory,...
- **Multi-Protocol Support**: Modbus RTU/TCP, EthernetIP, Sub-GHz
- **Flexible Connectivity:** Ethernet, WiFi
- **Features:** Automatically collect parameters and energy data; Unified and centralized management of all energy types in a single system; Many prominent features, such as users grouping and management, data visualization, and automatic reporting; Flexible investment options and easy system expansion.

3. iConnector communication

3.1. Slave device communication

3.1.1. Modbus RTU Master

In this function, iConnector work as a Modbus RTU Master. It can poll for data from and write data to external Modbus Slaves connected to it through RS485 physical protocol.

3.1.2. Wireless co-ordinator

Thanks to the wireless co-ordinator has been integrated in the iConnector, it is able to connect with any Daviteq Sub-GHz devices. By the Sub-Ghz technology from Texas Instruments, it is easy to establish multiple networks in same area without interference or channel conflict. One co-ordinator can handle maximum of 40 end nodes in its network. Prefer the link below to reach more detail information of this function

Long Range Wireless Co-ordinator WS433-CL manual

3.2 Host communication

The iConnector are designed to connect to Daviteq Platform, aka Vizuo Globiots. Vizuo Globiots is a web-based software application to remotely configure device, parameter, alarm and event. In addition, Vizuo displays current values, historical values of parameters as well as events, alarms. Values of parameter are stored on database of GLOBIOTS server.

In additional, iConnector is able to send data to any servers via common protocols such as HTTP, FTP, UDP/IP,...

Refer ***Section 10. How to connect device to Back-end/ Server*** to see more detail instruction.

4. Default Configuration

4.1. UDP Server

The iConnection was configured to connect to Daviteq's platform

Parameters	Default value
UDP_SERVER_HOST	dataengine.globiots.com
UDP_SERVER_PORT	9000
DRM_TIMEOUT (sec)	20
TIME_ZONE	7

4.2. Main network

In default mode, the iConnector connects to server through WIFI. Refer section**7.1** to see how to change the network mode.

4.3. Wireless co-ordinator

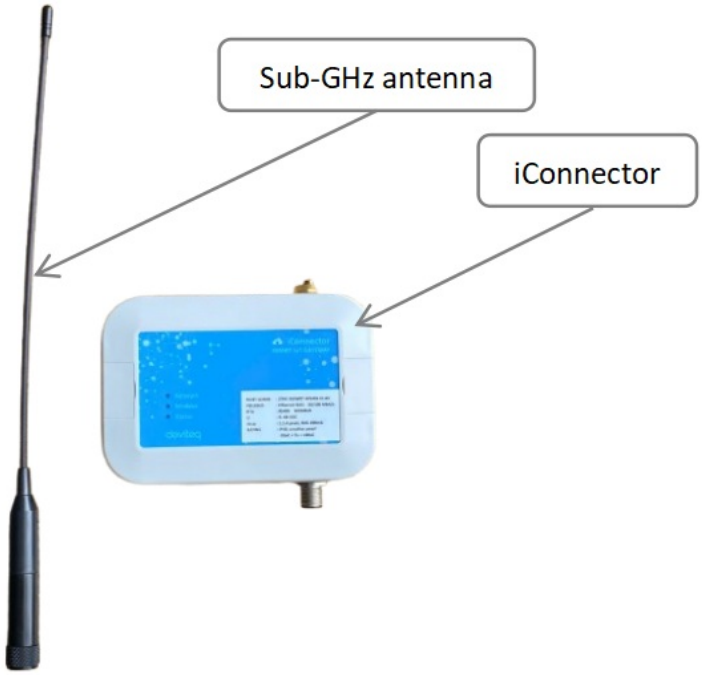
Parameters	Default value
Modbus address	1
Modbus baudrate	9600 bps
Modbus parity	none
Radio frequency	433.92 MHz
Tx power	15 dBm
Data rate RF	50 kbps

5. Battery/ Power Supply

iConnectors are powered via M12 Male connector. The power supply range is 7..48VDC, avg 200mA, peak 1.5A

Detail wiring instruction, please refer section 8. Installation and wiring.

6. What's in the Package?



The packages include:
01 x iConnector
01 x Sub-GHz antenna

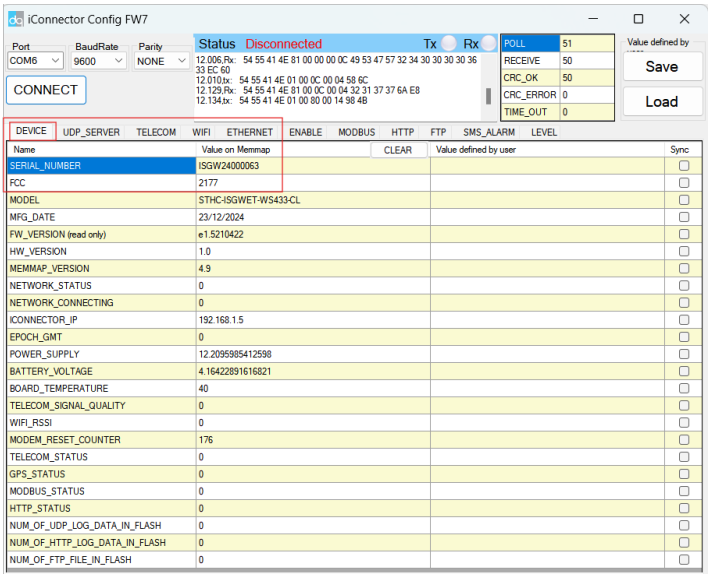
7. Guide for Quick Test

7.1. Connecting the iConnector to the Daviteq Platform

Refer section **3.2.2 Offline configuration** to see how to use the iConfig software

Step 1: Configure the iConnector via iConfig software

- Get basic information of the iConnector to register it into Daviteq Platform including **Serial number & FCC**

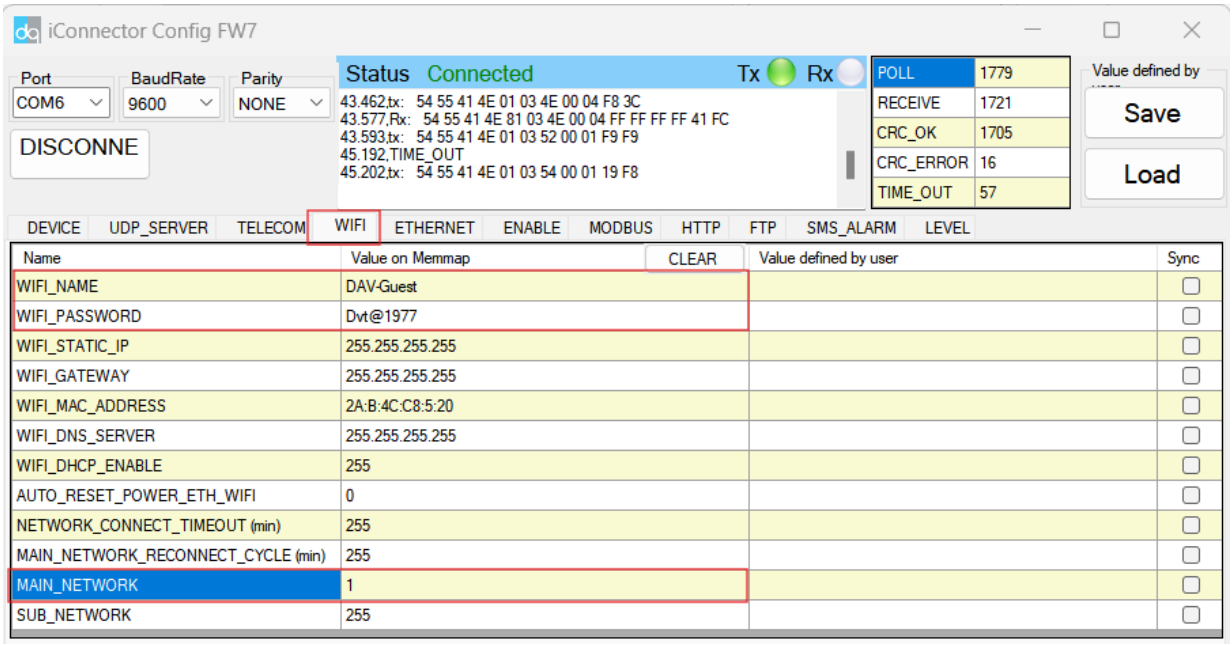


- Setup network information in order that the iConnector can go online in the internet. Base on your application, you should configure wifi or ethernet information.

WIFI mode

In this mode, there are three parameters must be configured, including MAIN_NETWORK , WIFI_NAME, WIFI_PASSWORD

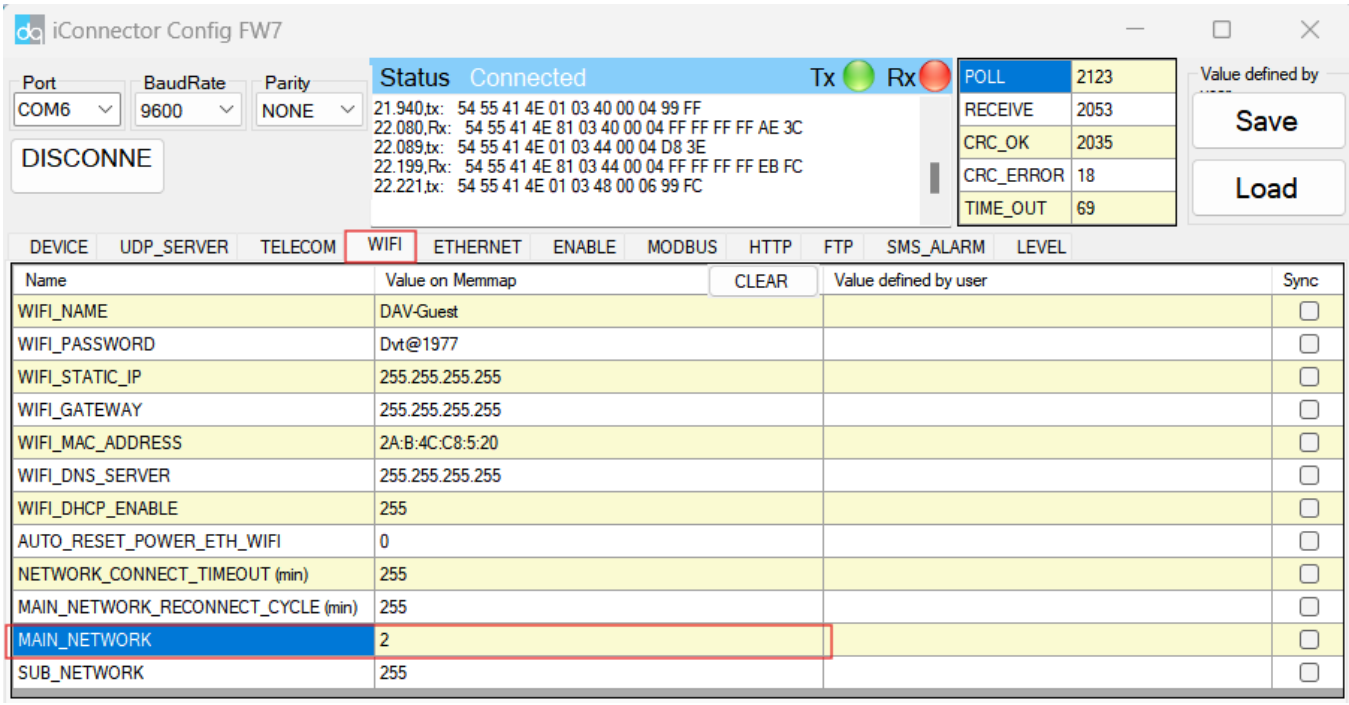
Parameters	Description
MAIN_NETWORK	1: WIFI mode 2: ETHERNET mode
WIFI_NAME	Wifi name of WIFI network
WIFI_PASSWORD	Password of WIFI network

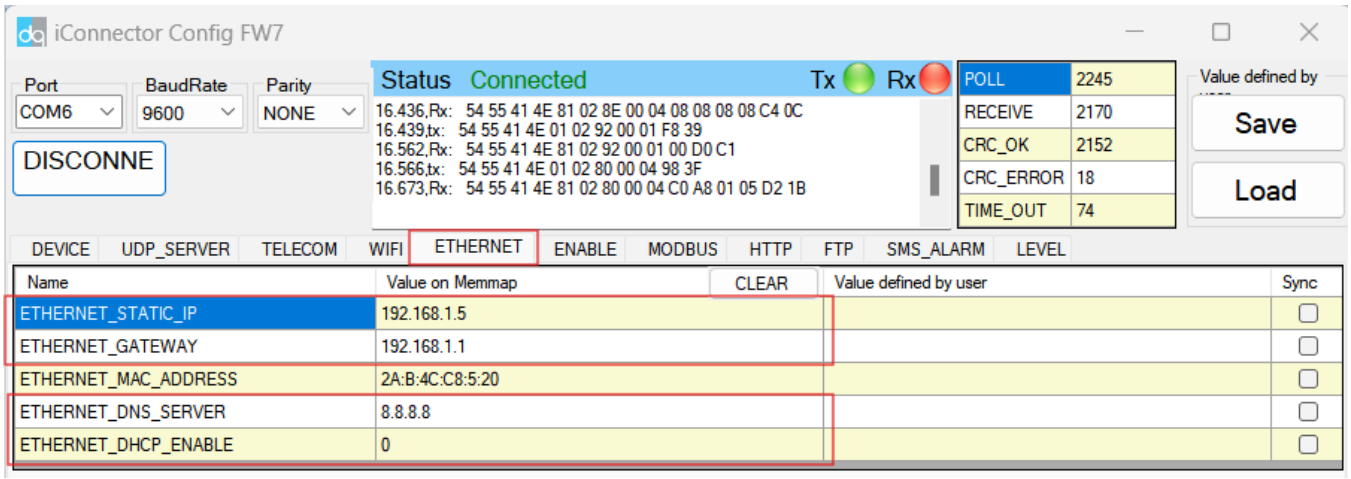


ETHERNET mode

In this mode, there are five parameters should be configured, including MAIN_NETWORK , ETHERNET_STATIC_IP, ETHERNET_GATEWAY, ETHERNET_DNS_SERVER, ETHERNET_DHCP_ENABLE

Parameters	Description
MAIN_NETWORK	1: WIFI mode 2: ETHERNET mode
ETHERNET_STATIC_IP	The static IP of Ethernet network use for iConnector. If running DHCP mode, ignore this parameter
ETHERNET_GATEWAY	The default gateway of Ethernet network use for iConnector. If running DHCP mode, ignore this parameter
ETHERNET_DNS_SERVER	The DNS server of Ethernet network use for iConnector.
ETHERNET_DHCP_ENABLE	0 = DISABLE, 1 = ENABLE

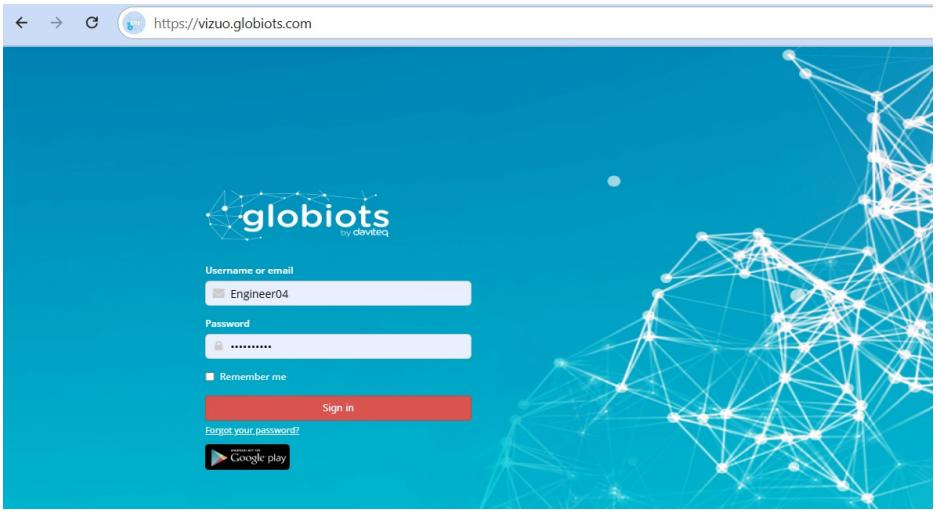




⚠ The parameter **MAIN_NETWORK** is located in the WIFI tab of the software, while other parameters are in the **ETHERNET** tab.

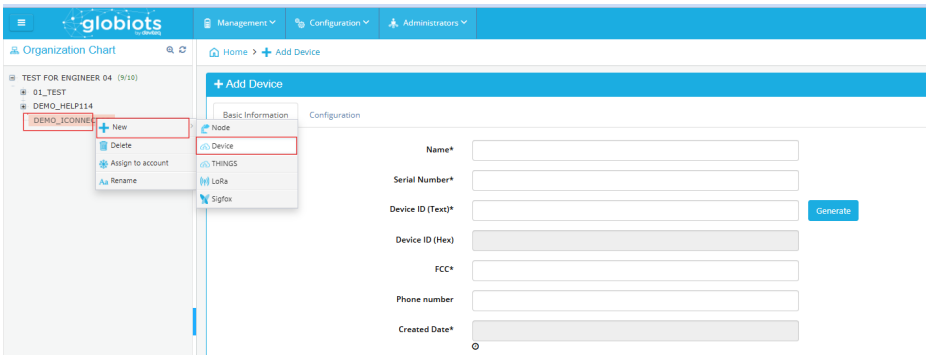
Step 2: Read data of iConnector from Daviteq Platform

- Access to Vizuo Globiots via the link ***https://vizuo.globiots.com*** and login to the system with the username and password supplied Daviteq.



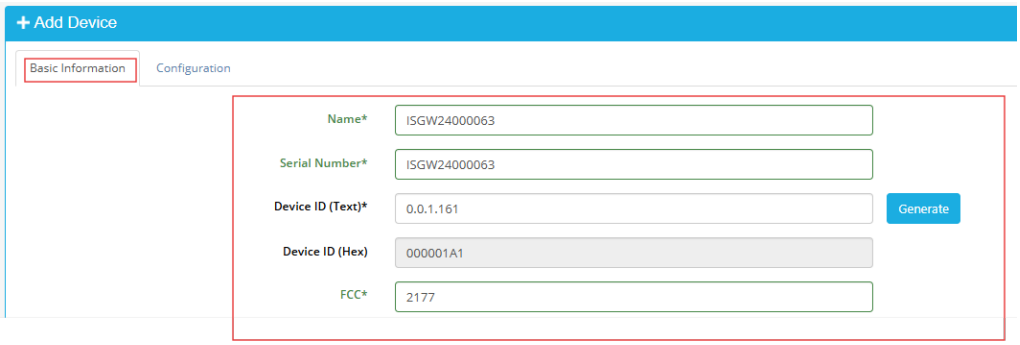
- Register the iConnector into Globiots

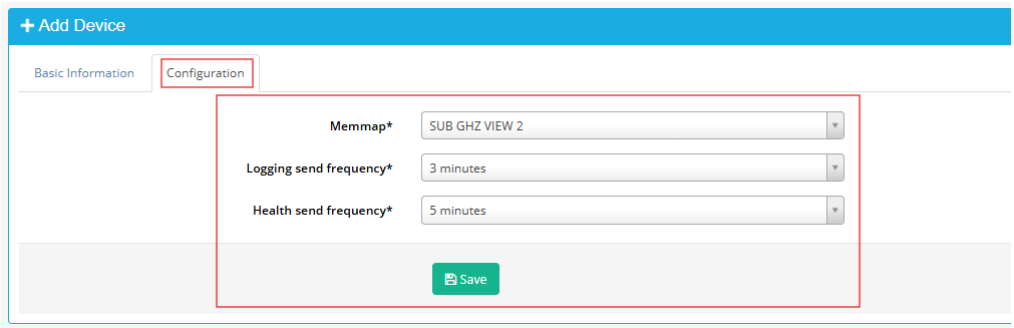
- **RIGHT-CLICK** on the corresponding site in the ***Organization Chart*** => ***New***=>***Device***



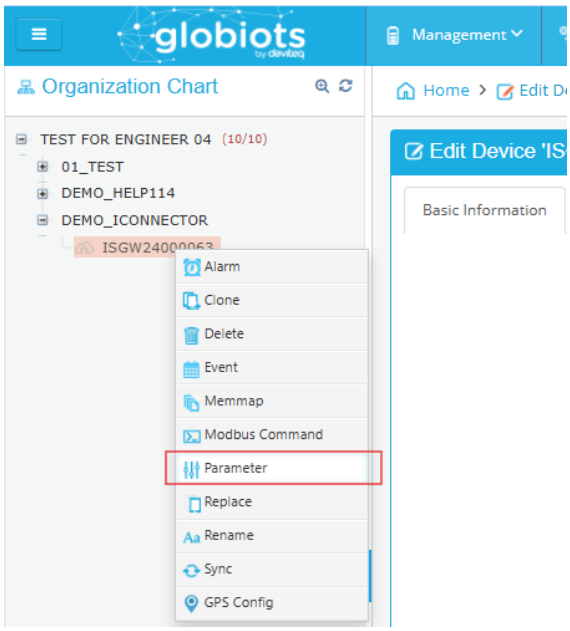
- There are some fields must be configured, including**Name, Serial number, Device ID, FCC, Memmap, Logging send frequency, Health send frequency.** After the fields were configured => Click***Save*** button

Fields	**Description**
Name	Optional name, must be 12 characters
Serial number	Serial number of iConnector **Taken from step 1*
Device ID	Click ***Generate*** button in the software
FCC	FCC of iConnector **Taken from step 1*
Memmap	Choose ***SUB-GHZ VIEW 2***
Logging send frequency	Choose ***3 minutes***
Health send frequency	Choose ***5 minutes***

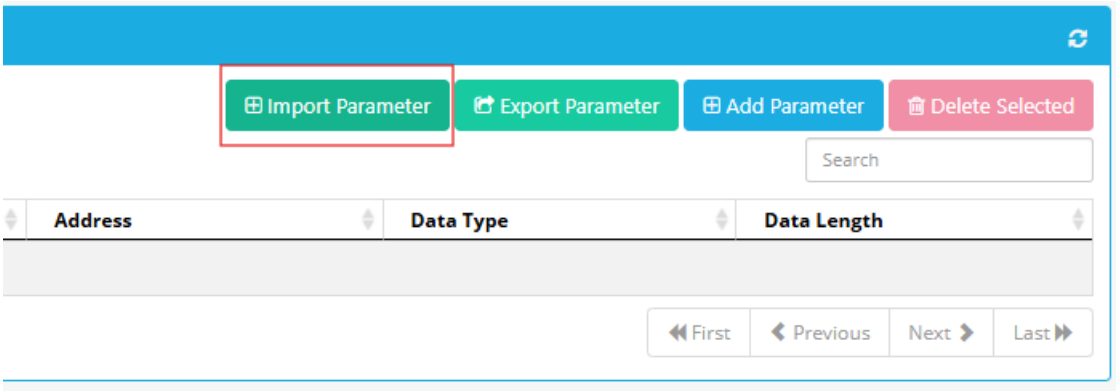




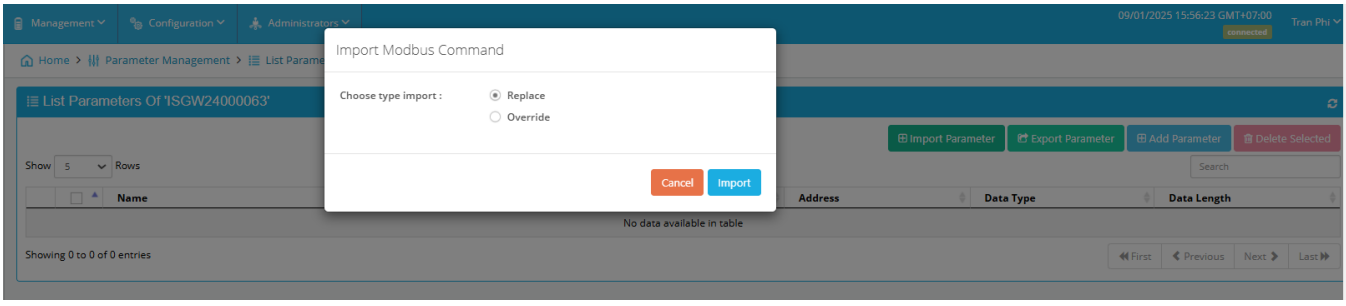
- Add parameter to read data from the iConnector
  - Download the parameter file in link
  - Right-click on the device=>***Pararameter***



- Click ***Import Parameter*** button

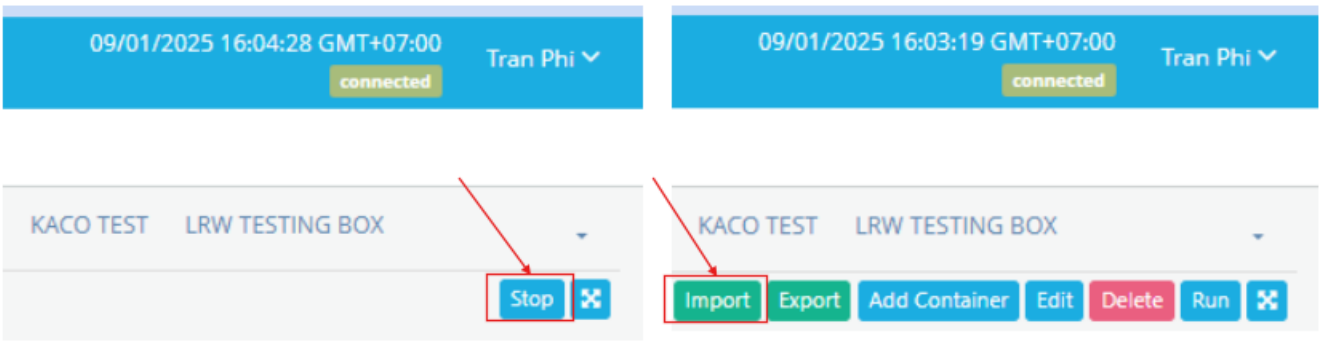


- Choose the parameter file=> Tick ***Replace*** option=> Click ***Import*** button

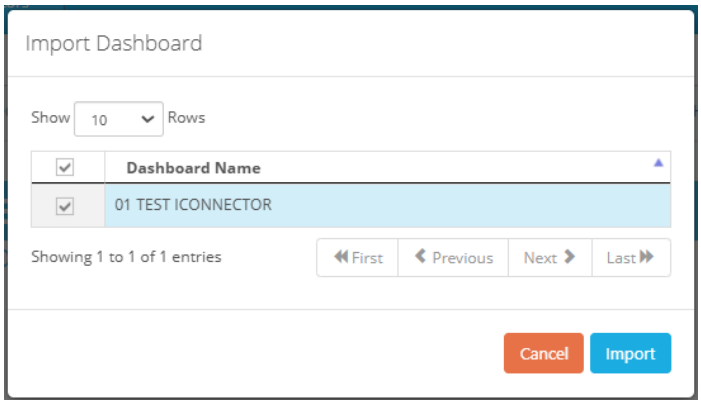


> Refer the link below to see more detail of parameter configuration
> *https://daviteq.com/en/manuals/books/user-guides-for-vizuo-software-on-web/page/vizuo-software-on-web#bkmrk-5.4-configure-parame*

- Add basic dashboard to show data of the iConnector
  - Download the dashboard file in the link
  - In Home screen, select ***Management =>*** select sub-menu ***Dashboard***
  - Click ***Stop*** button=> Click ***Import*** button



- Choose the Dashboard file=> Tick ***01 TEST ICONNECTOR*** => Click ***Import*** button



7.2. Read data of Wireless sensors from Globiots

Make sure the process in section 7.1 was completed successfully.

Step 1: Add Sub-GHz sensor to the iConnector

> Refer Section **5.1 Add sensors node to Co-ordinator WS433-CL** in **the link**

Step 2: Read data from Daviteq Platform

> Refer section **5. Configure Device** of the Globiots manual in**the link** to get the instruction of configurating the iConnector in Globiots

7.3. Read data of Modbus slave from Globiots

> Make sure the process in section 7.1 was completed successfully.

Step 1: Establish the RS485 network among iConnector and modbus slaves

Step 2 : Get modbus information of slave devices

Step 3: Read data from Daviteq Platform

> Refer section **5. Configure Device** of the Globiots manual in**the link** to get the instruction of configurating the iConnector in Globiots

7.4. Modbus TCP/IP converter function

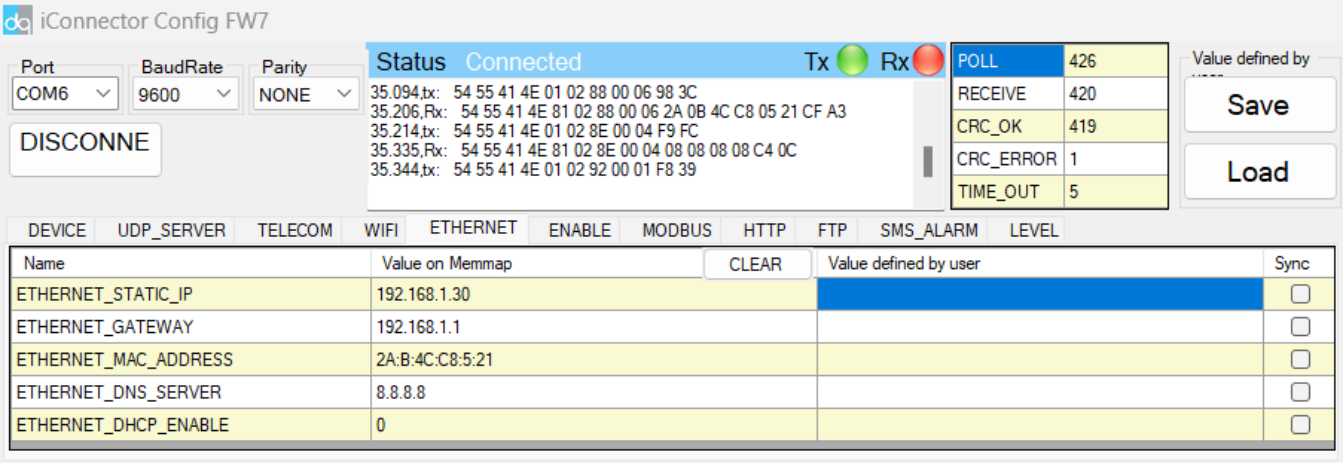
Principle Flow of this function as below

- iConnector is connected to the Modbus RTU slave as with electric meters, devices, ... via RS485 port;
- Software / device / PLC ... with Modbus TCP Client connected to iConnector (role as TCP Server)
- TCP Client sends command to iConnector;
- iConnector transfers commands from Modbus TCP to RTU and sends to devices via RS485 port;
- iConnector waits for the devices to respond;
- iConnector transfers the response from the RTU to the Modbus TCP and then sends it back to the TCP Client;
- TCP Client actively closes the connection if it no longer sends command to iConnector.

Step 1: Configure the iConnector via iConfig software

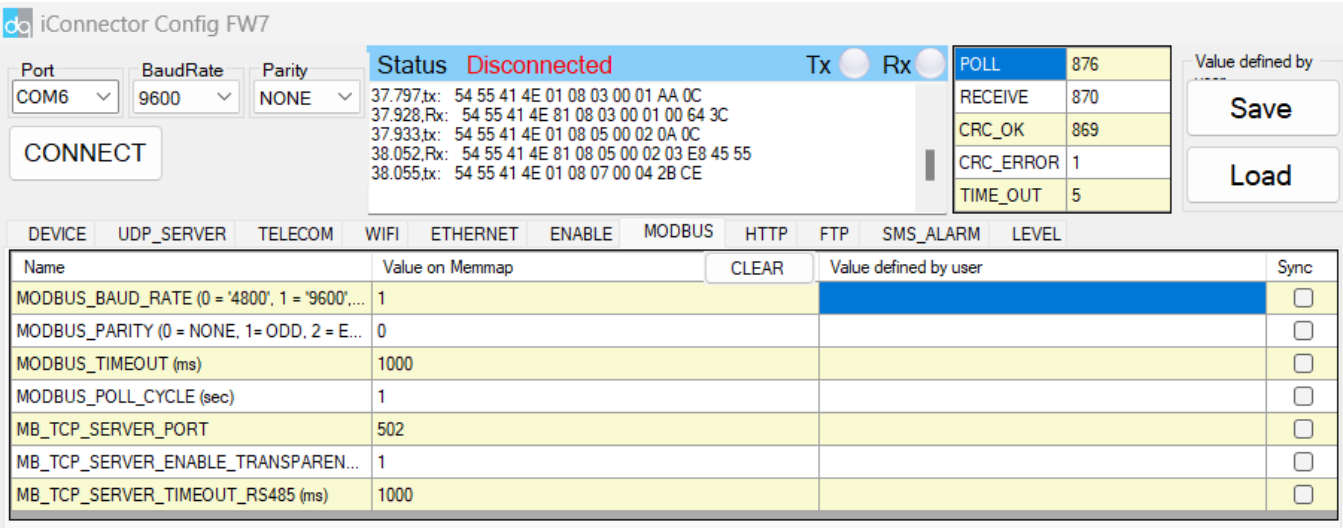
> Refer section x.xx to see how to use the iConfig software

- **Configure the iConnector at Ethernet tab**



Name	Description
IP	Static IP configuration for iConnector.**Example:** 192.168.1.30
Gateway	Configure gateway
DNS Server	Configure DNS Server
DHCP	Configure to **0**, it's mean **Not using DHCP → Static IP**

- **Configure the iConnector at Modbus tab**



Name	Description
MODBUS_BAUD_RATE	Configure the modbus baudrate to**9600 bps**

MODBUS_PARITY	Configure the parity to **none**
MODBUS_TIMEOUT	Configure the modbus timeout to **1000 ms**
MODBUS_POLL_CYCLE	Configure the modbus poll cycle to **1s**
MB_TCP_SERVER_PORT	Configure the receiving port to **502**
MB_TCP_SERVER_ENABLE_TRANSPARENT	Configure to **1** : To run transparent, interrupt modbus RTU poll.
MODBUS_TCP_SERVER_TIMEOUT	Used for modbus TCP Server

Step 2: Read data of iConnector from TCP/IP Client software

> In this guide, we use Easy Modbus Client software. You can use any other Modbus TCP/IP client software

- Connect the iConnector to the PC via LAN cable.
- Connect the Modbus RTU slave to the iConnector via RS485 cable.
- Power on the devices
- In TCP/IP Client software, input correct Server IP Adresss and Port that configured in step 1. Then, click Connect button. If the status at the bottom show "Connected to server", it means the successful connection.

> Ensure that the IP address of the PC is configured within the same subnet as the TCP/IP server address set on the iConnector in Step 1.

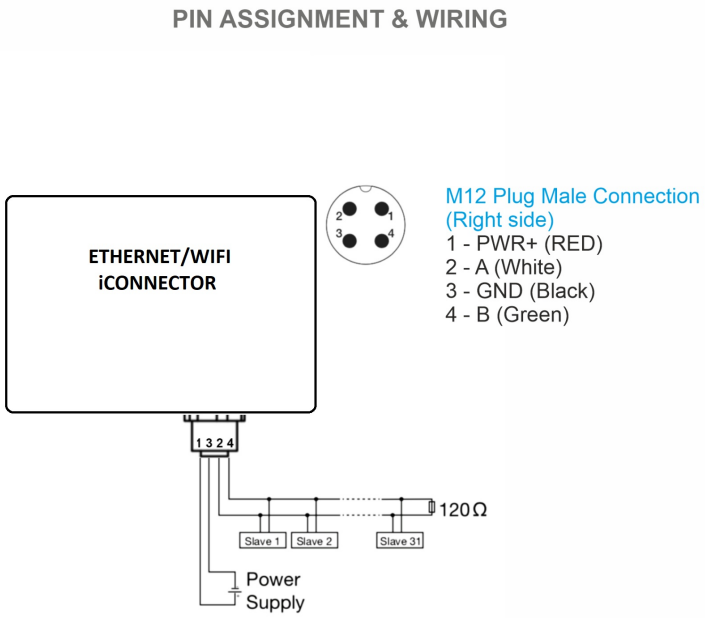
- Read a parameter base on the modbus memory map of slave device. For example, read a register 30001 of the Modbus slave

8. Installation and wiring

8.1.Installation and wiring for iConnector

There are 02 holes for screwing at the left and right of housing.
These holes are covered by the cover.
Open the cover, you can access the hole for screwing.
Using screw with size 4mm diameter maximum.

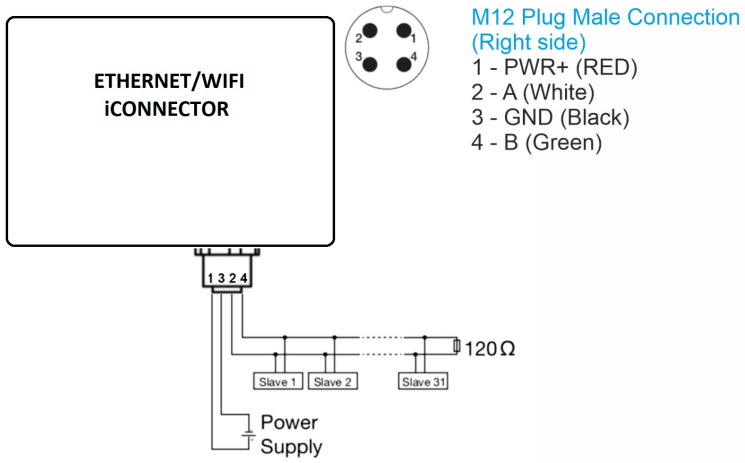
Power the iConnector on via M12 Port. Pin 1 is PWR+ , Pin 3 is GND.



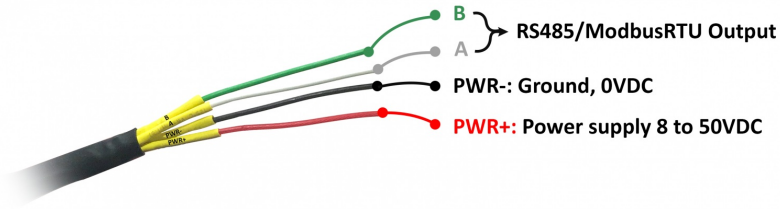
8.2 Installation and wiring for wired slave device

Connect the Modbus RTU slaves to the iConnector via RS485 protocol. Pin 2 is RS485+ (A), Pin 4 is RS485- (B)

PIN ASSIGNMENT & WIRING



Use M12 female connection cable to connect to iConnector



8.3 Installation and wiring for wireless sensor

⚠ **DO NOT** install the Wireless sensor or its antenna inside a completed**metallic** box or housing, because the RF signal can not pass through the metallic wall. The housing is made from Non-metallic materials like plastic, glass, wood, leather, concrete, cement...is acceptable.

8.4 Installation and wiring for host Modbus TCP/IP

ℹ Connect the iConnector with TCP/IP client via the LAN cable.

9. Payload Document and Configuration Tables

Download the iConnector Modbus Memory Map in **the link**

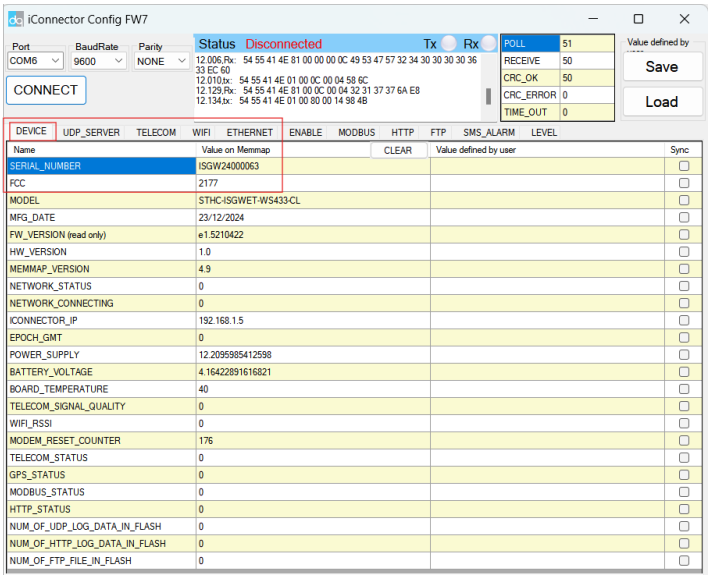
10. How to connect device to Back-end/ Server

10.1 How to connect device to Globiots platform

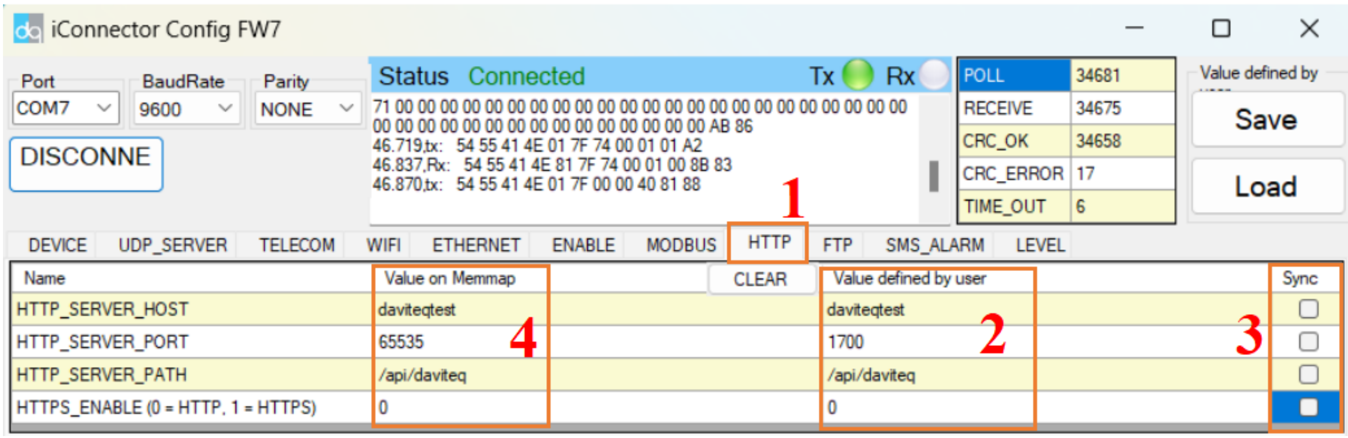
Read the section **7.1 Connecting the iConnector to the Daviteq Platform** to get the instruction of adding the iConnector to the Globiots platform.

10.2 How to connect device to http server

Step 1: Connect the iConnector to a PC via Modbus configuration cable, then open the iConfig software. After that, set up correct port, baud rate, parity and click **Connect** button



Step 2: Choose HTTP tab, fill in the information of HTTP sever, such as HTTP_SERVER_HOST, HTTP_SERVER_PORT, HTTP_SERVER_PATH, HTTPS_ENABLE (0 = HTTP, 1 = HTTPS) in **Value defined by user** column. Then, tick in the corresponding cell of these configuration in **Sync** column. After that, check the value in the**Value on memmap** column.



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