

# I. QUICK GUIDE

## 1. Introduction

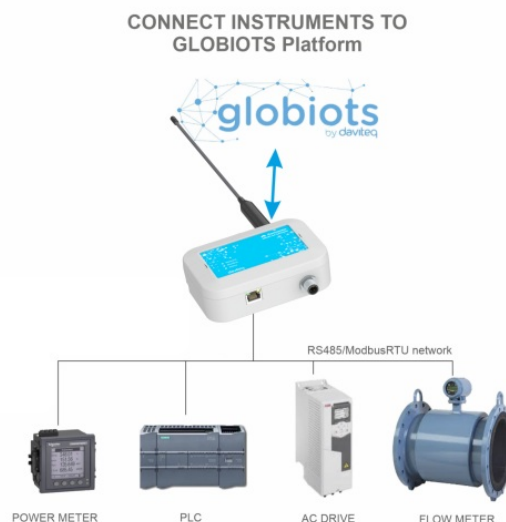
### 1.1 Introduction

STHC 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, EthernetIP, Wireless sensor network...It connects to server system via LAN/WAN as Ethernet, WiFi or Cellular.



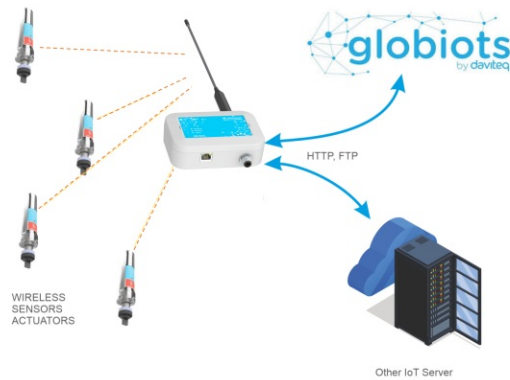
### 1.2 System architecture

#### 1.2.1. Connect instruments to GLOBIOTS Platform



#### 1.2.2. Connect wireless sensor to GLOBIOTS Platform

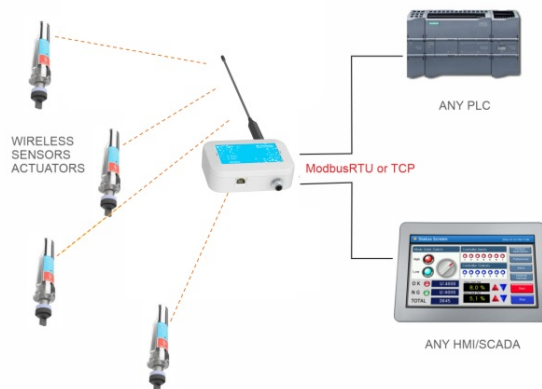
#### CONNECT WIRELESS SENSORS TO GLOBIOTS Platform



STHC-ISG02DB-WS433-CL-04-H2.PNG

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

##### CONNECT WIRELESS SENSORS TO any PLC or HMI/SCADA



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

## 2. Application note

## 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,...

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

## 4. Default Configuration

### 4.1. UDP Server

**i** 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 **xx.xx** 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?

## 7. Guide for Quick Test

### 7.1. Connecting the iConnector to the Daviteq

# Platform

Refer section x.xx 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**

DEVICE	UDP_SERVER	TELECOM	WIFI	ETHERNET	ENABLE	MODBUS	HTTP	FTP	SMS_ALARM	LEVEL
Name	Value on Memmap									
SERIAL_NUMBER	ISGW2400063									
FCC	2177									
MODEL	STHC-ISGWET-WS433-CL									
MFG_DATE	23/12/2024									
FW_VERSION (read only)	e1.5210422									
HW_VERSION	1.0									
MEMMAP_VERSION	4.9									
NETWORK_STATUS	0									
NETWORK_CONNECTING	0									
CONNECTOR_IP	192.168.1.5									
EPOCH_GMT	0									
POWER_SUPPLY	12.2095985412598									
BATTERY_VOLTAGE	4.16422891616821									
BOARD_TEMPERATURE	40									
TELECOM_SIGNAL_QUALITY	0									
WIFI_RSSI	0									
MODEM_RESET_COUNTER	176									
TELECOM_STATUS	0									
GPS_STATUS	0									
MODBUS_STATUS	0									
HTTP_STATUS	0									
NUM_OF_UDP_LOG_DATA_IN_FLASH	0									
NUM_OF_HTTP_LOG_DATA_IN_FLASH	0									
NUM_OF_FTP_FILE_IN_FLASH	0									

- 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

DEVICE	UDP_SERVER	TELECOM	WIFI	ETHERNET	ENABLE	MODBUS	HTTP	FTP	SMS_ALARM	LEVEL
Name	Value on Memmap									
WIFI_NAME	DAV-Guest									
WIFI_PASSWORD	Dvt@1977									
WIFI_STATIC_IP	255.255.255.255									
WIFI_GATEWAY	255.255.255.255									
WIFI_MAC_ADDRESS	2A:B:4C:C8:5:20									
WIFI_DNS_SERVER	255.255.255.255									
WIFI_DHCP_ENABLE	255									
AUTO_RESET_POWER_ETH_WIFI	0									
NETWORK_CONNECT_TIMEOUT (min)	255									
MAIN_NETWORK_RECONNECT_CYCLE (min)	255									
MAIN_NETWORK	1									
SUB_NETWORK	255									

## 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 screenshot shows the iConnector Config FW7 interface. The 'WIFI' tab is selected. The 'Status' is 'Connected'. The 'Tx' and 'Rx' LEDs are green. The 'Poll' table shows: POLL (2123), RECEIVE (2053), CRC\_OK (2035), CRC\_ERROR (18), TIME\_OUT (69). The 'Value defined by' section has 'Save' and 'Load' buttons. The 'DEVICE' tab is selected, showing a table of parameters:

Name	Value on Memmap	CLEAR	Value defined by user	Sync
WIFI_NAME	DAV-Guest			<input type="checkbox"/>
WIFI_PASSWORD	Dvt@1977			<input type="checkbox"/>
WIFI_STATIC_IP	255.255.255.255			<input type="checkbox"/>
WIFI_GATEWAY	255.255.255.255			<input type="checkbox"/>
WIFI_MAC_ADDRESS	2A:B:4C:C8:5:20			<input type="checkbox"/>
WIFI_DNS_SERVER	255.255.255.255			<input type="checkbox"/>
WIFI_DHCP_ENABLE	255			<input type="checkbox"/>
AUTO_RESET_POWER_ETH_WIFI	0			<input type="checkbox"/>
NETWORK_CONNECT_TIMEOUT (min)	255			<input type="checkbox"/>
MAIN_NETWORK_RECONNECT_CYCLE (min)	255			<input type="checkbox"/>
MAIN_NETWORK	2			<input type="checkbox"/>
SUB_NETWORK	255			<input type="checkbox"/>

The screenshot shows the iConnector Config FW7 interface. The 'ETHERNET' tab is selected. The 'Status' is 'Connected'. The 'Tx' and 'Rx' LEDs are green. The 'Poll' table shows: POLL (2245), RECEIVE (2170), CRC\_OK (2152), CRC\_ERROR (18), TIME\_OUT (74). The 'Value defined by' section has 'Save' and 'Load' buttons. The 'DEVICE' tab is selected, showing a table of parameters:

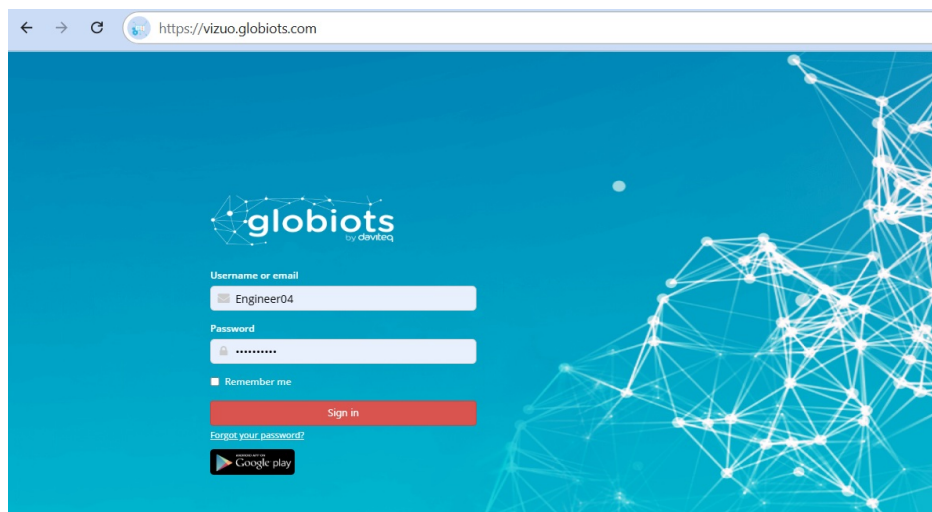
Name	Value on Memmap	CLEAR	Value defined by user	Sync
ETHERNET_STATIC_IP	192.168.1.5			<input type="checkbox"/>
ETHERNET_GATEWAY	192.168.1.1			<input type="checkbox"/>
ETHERNET_MAC_ADDRESS	2A:B:4C:C8:5:20			<input type="checkbox"/>
ETHERNET_DNS_SERVER	8.8.8.8			<input type="checkbox"/>
ETHERNET_DHCP_ENABLE	0			<input type="checkbox"/>



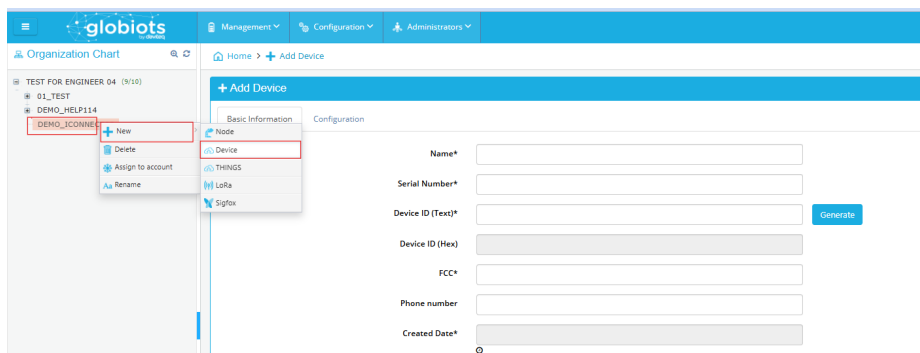
The parameter **MAIN\_NETWORK** is located in the WIFI tab of the software, while other parameters are in the **ETHERNET** tab.

## 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.

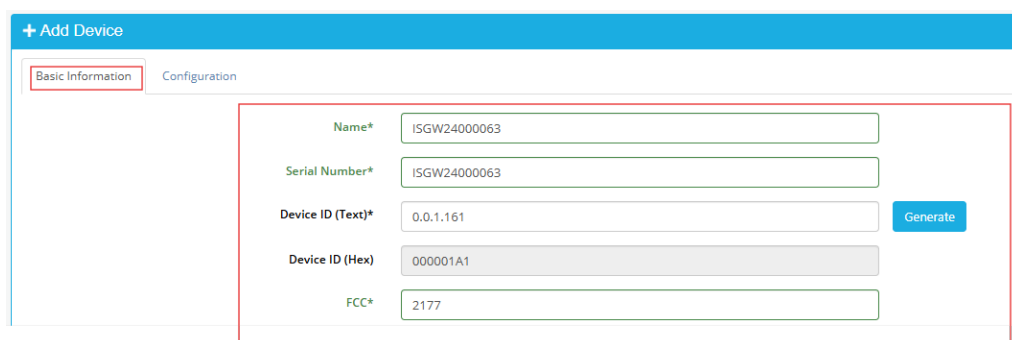


- Register the iConnector into Globiots
  - **RIGHT-CLICK** on the corresponding site in the **Organization Chart** => **New=>Device**



- 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 <i>*Taken from step 1</i>
Device ID	Click <b>Generate</b> button in the software
FCC	FCC of iConnector <i>*Taken from step 1</i>
Memmap	Choose <b>SUB-GHZ VIEW 2</b>
Logging send frequency	Choose <b>3 minutes</b>
Health send frequency	Choose <b>5 minutes</b>



**+ Add Device**

Basic Information | **Configuration**

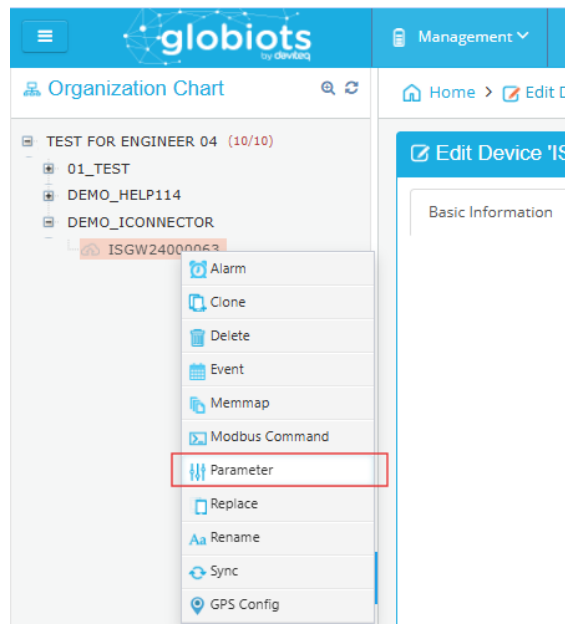
Memmap\* SUB GHZ VIEW 2

Logging send frequency\* 3 minutes

Health send frequency\* 5 minutes

**Save**

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



- Click **Import Parameter** button

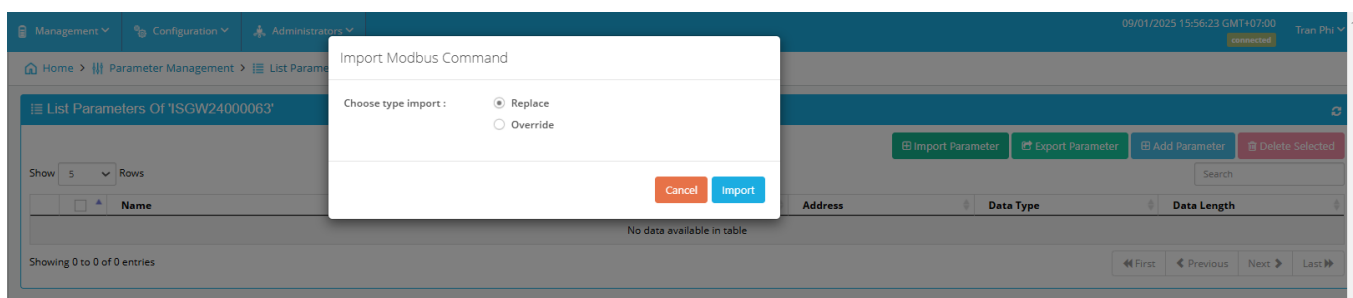
**Import Parameter** **Export Parameter** **Add Parameter** **Delete Selected**

Search

Address	Data Type	Data Length

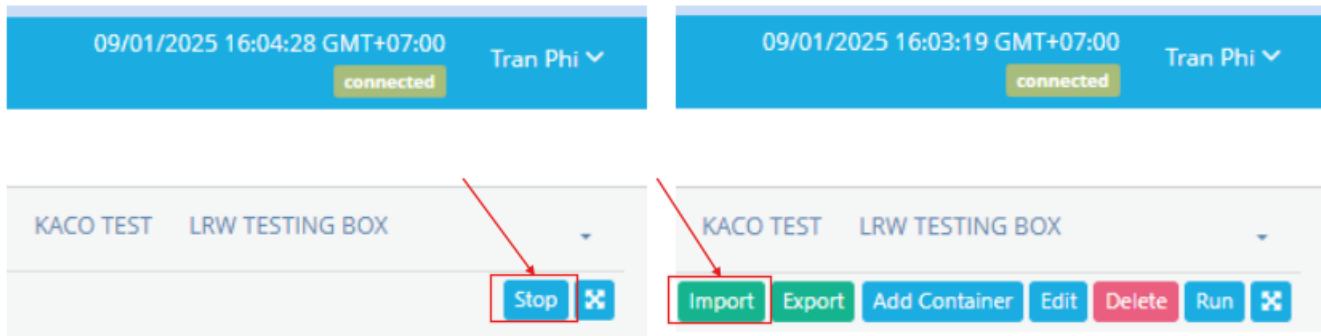
« First Previous Next Last »

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

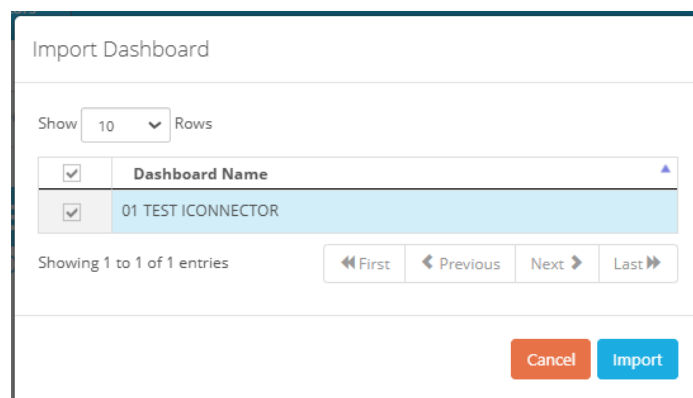


Refer the link below to see more detail of parameter configuration  
<https://daviteq.com/en/manuals/books/user-guides-for-vizuo-software-on-web/page/vizuo-software-on-web#bkmrk-5.4-configure-parame>

- Add basic dashboard to show data of the iConnector
  - Download the dashboard file in link **xxxxx**
  - 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

- Open software=> import template
- Install the batteries to the wireless sensor, then touch the sensor to the iConnector's antenna. If the iConnector sound "beep", it mean the paring process is successful.

Step 2: Read data from Daviteq Platform

- Create the parameter
- Create the modbus command
- Add the basic dashboard to show data

## 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

- wiring
- get modbus information of slave devices

Step 2: Read data from Daviteq Platform


- Create the parameter
- Create the modbus command
- Add the basic dashboard to show data

## 7.4. Modbus TCP/IP converter function

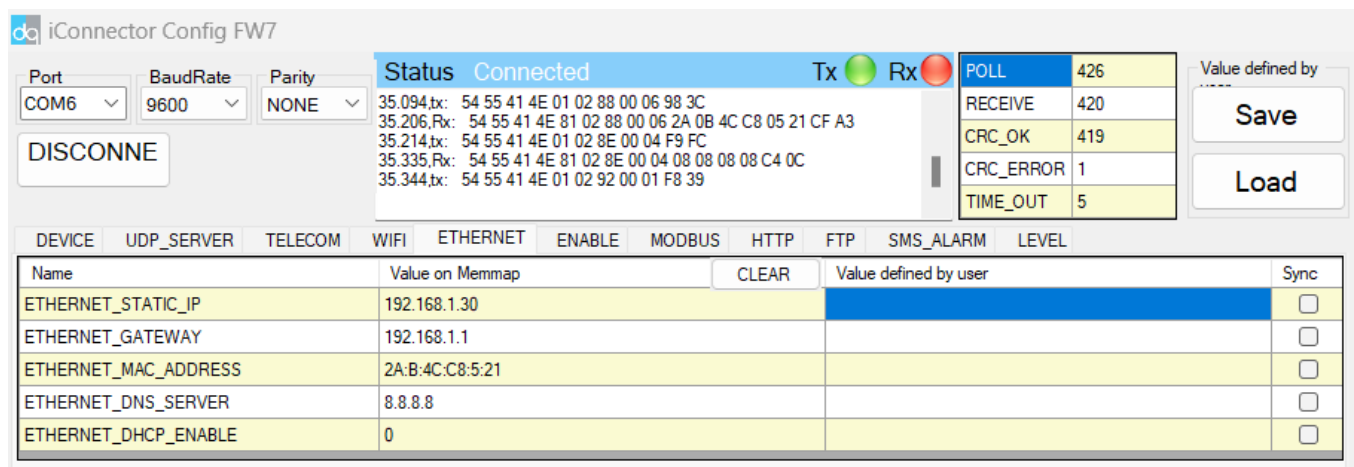
Principle Flow of this function as below

- 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



The screenshot shows the iConnector Config FW7 interface. At the top, there are settings for Port (COM6), BaudRate (9600), and Parity (NONE). A 'DISCONN' button is visible. The main area displays the 'Status' as 'Connected' with Tx and Rx indicators. Below this, there is a table of Modbus data points with their values and a 'CLEAR' button. To the right, there is a table of system parameters including POLL, RECEIVE, CRC\_OK, CRC\_ERROR, and TIME\_OUT. At the bottom, there is a table for Ethernet configuration with columns for Name, Value on Memmap, CLEAR, Value defined by user, and Sync. The table includes rows for ETHERNET\_STATIC\_IP, ETHERNET\_GATEWAY, ETHERNET\_MAC\_ADDRESS, ETHERNET\_DNS\_SERVER, and ETHERNET\_DHCP\_ENABLE.

Name	Value on Memmap	CLEAR	Value defined by user	Sync
ETHERNET_STATIC_IP	192.168.1.30			<input type="checkbox"/>
ETHERNET_GATEWAY	192.168.1.1			<input type="checkbox"/>
ETHERNET_MAC_ADDRESS	2A:B:4C:C8:5:21			<input type="checkbox"/>
ETHERNET_DNS_SERVER	8.8.8.8			<input type="checkbox"/>
ETHERNET_DHCP_ENABLE	0			<input type="checkbox"/>

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

#### • Configure the iConnector at Modbus tab

**iConnector Config FW7**

Port: COM6 BaudRate: 9600 Parity: NONE

**CONNECT**

Status: **Disconnected** Tx Rx

37.797.tx: 54 55 41 4E 01 08 03 00 01 AA 0C  
 37.928.Rx: 54 55 41 4E 81 08 03 00 01 00 64 3C  
 37.933.tx: 54 55 41 4E 01 08 05 00 02 0A 0C  
 38.052.Rx: 54 55 41 4E 81 08 05 00 02 03 E8 45 55  
 38.055.tx: 54 55 41 4E 01 08 07 00 04 2B CE

POLL	876
RECEIVE	870
CRC_OK	869
CRC_ERROR	1
TIME_OUT	5

Value defined by

**Save** **Load**

DEVICE	UDP_SERVER	TELECOM	WIFI	ETHERNET	ENABLE	MODBUS	HTTP	FTP	SMS_ALARM	LEVEL
Name	Value on Memmap		CLEAR		Value defined by user		Sync			
MODBUS_BAUD_RATE (0 = '4800', 1 = '9600'....	1						<input type="checkbox"/>			
MODBUS_PARITY (0 = NONE, 1= ODD, 2 = E...	0						<input type="checkbox"/>			
MODBUS_TIMEOUT (ms)	1000						<input type="checkbox"/>			
MODBUS_POLL_CYCLE (sec)	1						<input type="checkbox"/>			
MB_TCP_SERVER_PORT	502						<input type="checkbox"/>			
MB_TCP_SERVER_ENABLE_TRANSPAREN...	1						<input type="checkbox"/>			
MB_TCP_SERVER_TIMEOUT_RS485 (ms)	1000						<input type="checkbox"/>			

Name	Description
MODBUS_BAUD_RATE	Configure the modbus baudrate to <b>9600 bps</b>
MODBUS_PARITY	Configure the parity to <b>none</b>
MODBUS_TIMEOUT	Configure the modbus timeout to <b>1000 ms</b>
MODBUS_POLL_CYCLE	Configure the modbus poll cycle to <b>1s</b>
MB_TCP_SERVER_PORT	Configure the receiving port to <b>502</b>
MB_TCP_SERVER_ENABLE_TRANSPARENT	Configure to <b>1</b> : 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

**i** 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 Address 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.

EasyModbus Client

ModbusTCP (Ethernet) <http://www.EasyModbusTCP.net>

Server IP-Address: 192.168.1.5 Server Port: 502

**Read values from Server**

Read Coils - FC1 Starting Address: 1

Read Discrete Inputs - FC2 Number of Values: 1

Read Holding Registers - FC3

Read Input Registers - FC4

**Write values to Server**

Write Single Coil - FC5

Write Single Register - FC6 Starting Address: 1

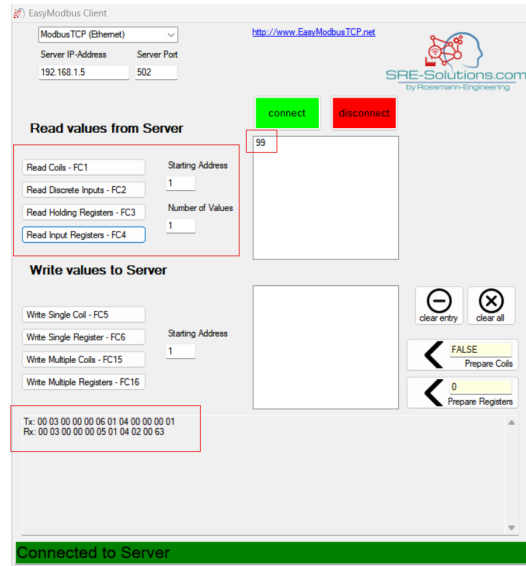
Write Multiple Coils - FC15

Write Multiple Registers - FC16

**Connected to Server**

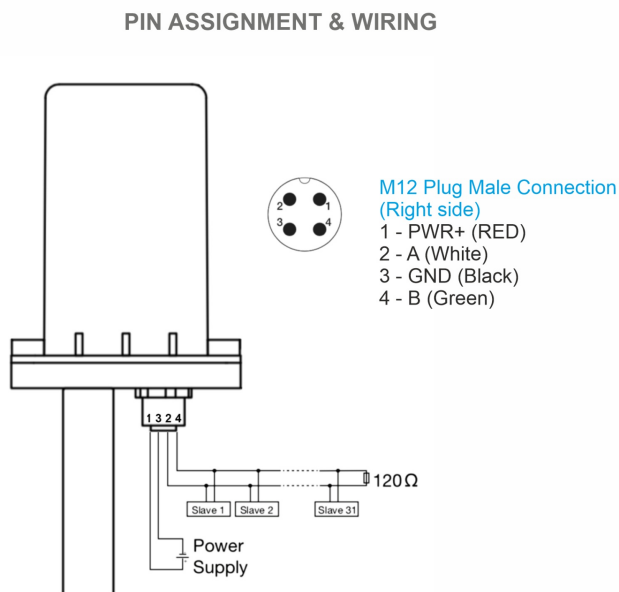
**w** Ensure that the IP address of the PC is configured within the same subnet as the TCP/IP server address set on the iConnector in Step 1.

- 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



STHC-ISG02DB-WS433-CL-04-H5.PNG

### 8.2 Installation and wiring for wired slave device

### 8.3 Installation and wiring for wireless sensor

### 8.4 Installation and wiring for host Modbus TCP/IP

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

## 9. Payload Document and Configuration Tables

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

10.1 How to connect device to Globiots platform

10.2 How to connect device to http server

10.3 How to connect device to Modbus TCP/IP server (only for ...with Ethernet connection)

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🕒 Revision #13

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