Hydro-View / Hydro-Hub Profinet Configuration Guide

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Table of Contents

Chapter 1 Introduction 11

Chapter 2 Electrical Wiring 13
1 Hydronix PROFINET Module 13
2 Wiring 14

Chapter 3 Configure PLC PROFINET Master 17
1 PLC Requirements 17
2 Add Hydro-Hub PROFINET Slave 17
3 Install the Hydronix PROFINET Slave 18

Chapter 4 Hydro-Hub Setup 23

Chapter 5 I/O Data 25
1 Example Transactions 27

Chapter 6 Using the Data 29
1 Configure the I/O Tags in the PLC 29
2 Testing the Connection 30

Appendix A Document Cross Reference 35
1 Document Cross Reference 35

Table of Figures

Figure 1: Hydro-Hub PROFINET Module 11
Figure 2: Hydro-Hub (L), Hydro-View (R) 11
Figure 3: Siemens S7-1200 PLC 11
Figure 4: System Overview 12
Figure 5: PROFINET Module 13
Figure 6: Protection Cover 13
Figure 7: Installing the Hydro-Hub PROFINET Module 13
Figure 8: Hydro-Hub PROFINET Module Installed 13
Figure 9: Line Topology 14
Figure 10: Star Topology 14
Figure 11: PLC CPU Setup 17
Figure 12: Installed GSD File 17
Figure 13: Network View 18
Figure 14: Hardware Catalogue 18
Figure 15: Hydro-Hub Slave added to Network 18
Figure 16: Hydro-Hub and PLC PROFINET Link 19
Figure 17: PROFINET Name and IP Address 19
Figure 18: Slave Device Window 19
Figure 19: Hydronix PROFINET I/O Modules 20
Figure 20: Online & Diagnostics 20
Figure 21: Assign PROFINET Name 21
Figure 22: Update Name 21
Figure 23: Download To CPU 21
Figure 24: Search for Device 22
Figure 25: Stop All 22
Figure 26: Fieldbus IP Address 23
Figure 27: Hydro-Hub PROFINET Module Correctly Configured (Connector Not Shown) 23
Figure 28: PLC Project Tree View 29
Figure 29: PLC Tags (L), PROFINET Slave I/O (R) 29
Figure 30: Watch Table 30
Figure 31: Watch Table Monitor All 30
Figure 32: Get Live Sensor Values 31
Figure 33: Get Live Sensor Values Modify All 31
Figure 34: Returned Values 31
Figure 35: Get Averaging Status 32
Figure 36: Get Averaging Status Modify All 32
Figure 37: Averaging Status 32
Figure 38: Activate Averaging 33
Figure 39: Activate Averaging Modify All 33

Figure 40: Start Sensor Search 34
Figure 41: Sensor Search Commenced 34
Figure 42: Sensors on the Network 34

Chapter 1 Introduction

This guide details the installation and configuration of the optional Hydronix Hydro-Hub PROFINET Module. The module enables PROFINET communication between the Hydro-Hub/Hydro-View and a PROFINET Master.

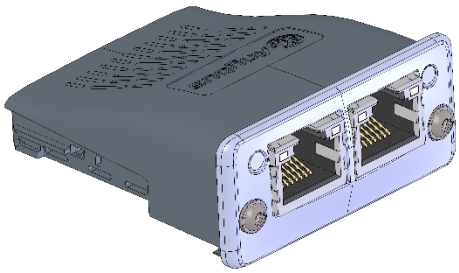


Figure 1: Hydro-Hub PROFINET Module

Using the Hydronix PROFINET module will provide direct access to any Hydronix Sensor connected to the Hydro-Hub/Hydro-View network from the PLC.

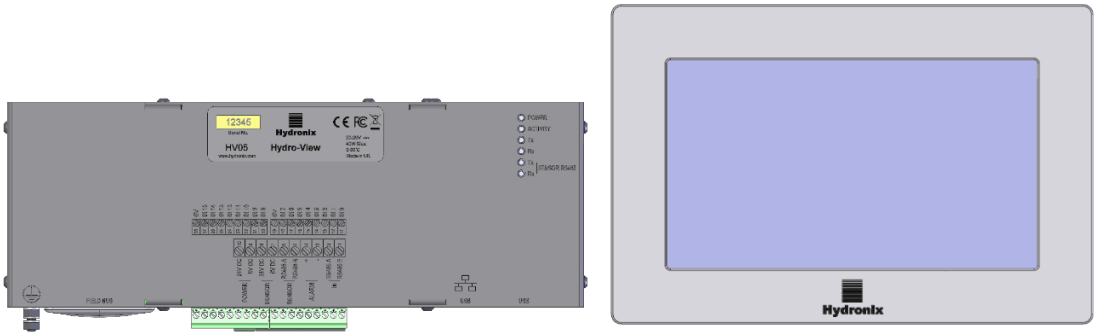


Figure 2: Hydro-Hub (L), Hydro-View (R)

In this guide the PLC in use is the Siemens S7 1200. Siemens TIA Portal v14 software has been used to configure the PLC.

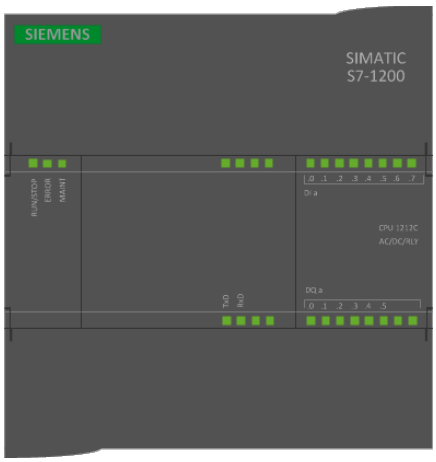


Figure 3: Siemens S7-1200 PLC

Previous knowledge of PROFINET, Siemens PLC and TIA portal v14 are required as this document is intended as a basic guide only.

For detailed Hydro-Hub/Hydro-View instructions see the Hydro-Hub/Hydro-View user guide HD0864

All references to a Hydro-Hub PROFINET Module in the guide are valid for the Hydro-Hub and Hydro-View hardware. The electrical connections and configuration of the Hydro-Hub and Hydro-View are identical.

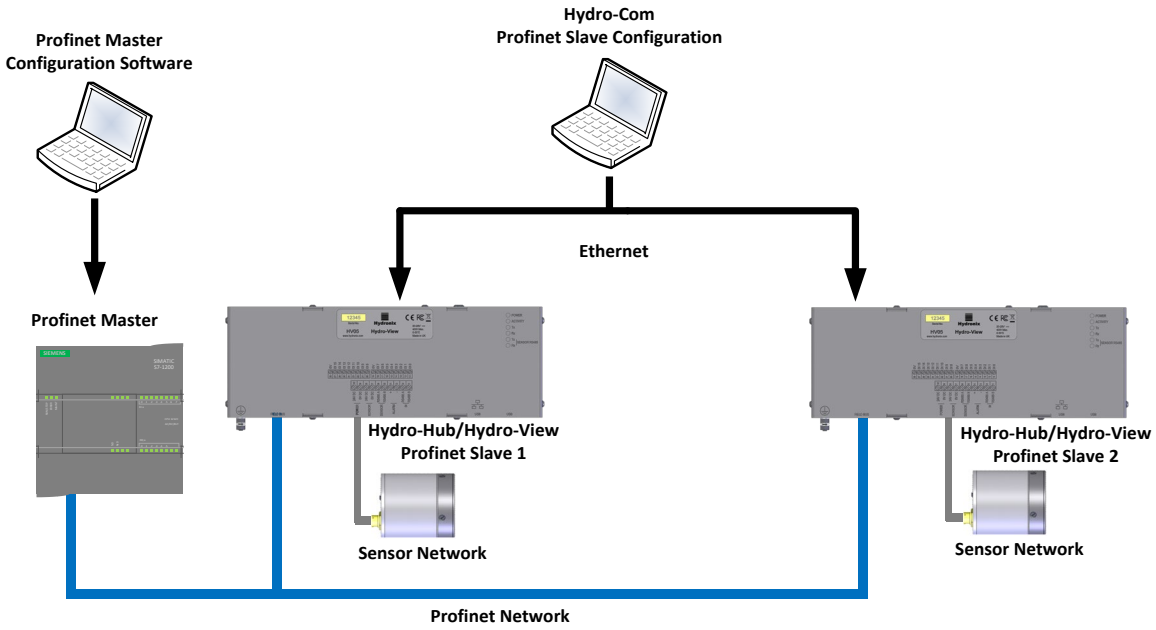


Figure 4: System Overview

1 Hydronix PROFINET Module

To enable PROFINET communication with the Hydro-Hub/Hydro-View the optional Hydronix PROFINET Module must be installed.

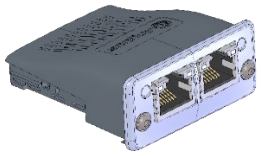


Figure 5: PROFINET Module

1. Switch off the Hydro-Hub/Hydro-View
2. Remove the protection cover from the Hydro-Hub/Hydro-View

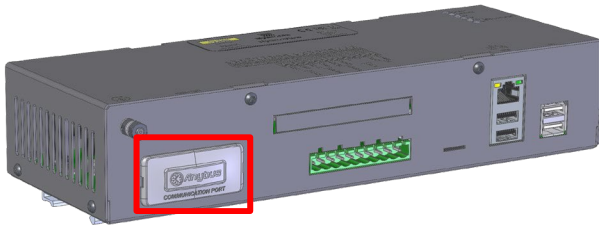


Figure 6: Protection Cover

3. Insert the Hydro-Hub PROFINET Module as show in Figure 7. Ensure the connector is correctly positioned.

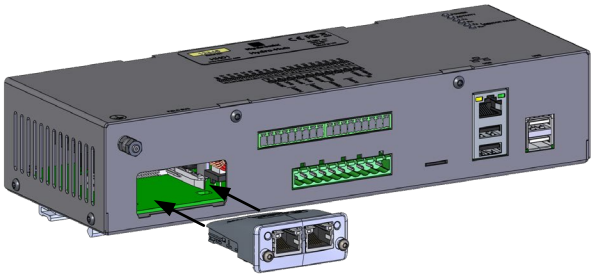


Figure 7: Installing the Hydro-Hub PROFINET Module

4. Tighten the two anti-tamper screws.

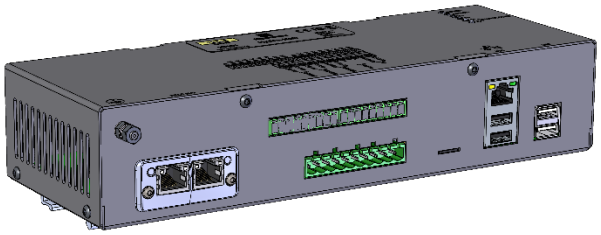


Figure 8: Hydro-Hub PROFINET Module Installed

2 Wiring

The Hydronix PROFINET module supports Star and Line topologies.

2.1 Line Topology

In this setup the PLC (Controller) connects to one port on the Hydronix PROFINET Module via a network switch (if required). The second port on the module is then connected to an additional Hydro-Hub/Hydro-View. This setup can be repeated as required.

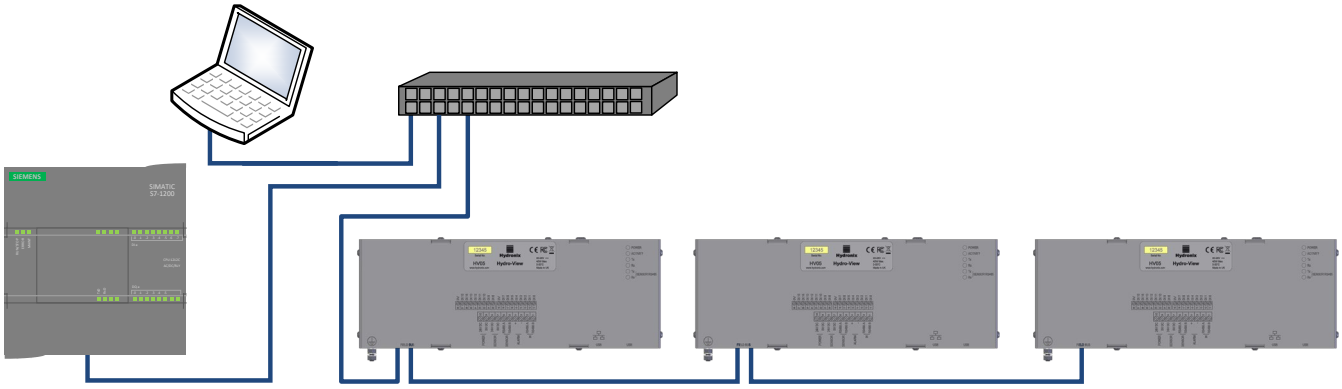


Figure 9: Line Topology

Note: Each additional Hydro-Hub/Hydro-View added to the network in this manner will increase the delay time. If a module is faulty or is disconnected all communication beyond this point will cease.

2.2 Star Topology

When using a Star topology, the PLC (controller) and all Hydronix PROFINET Modules are connected to a central network switch.

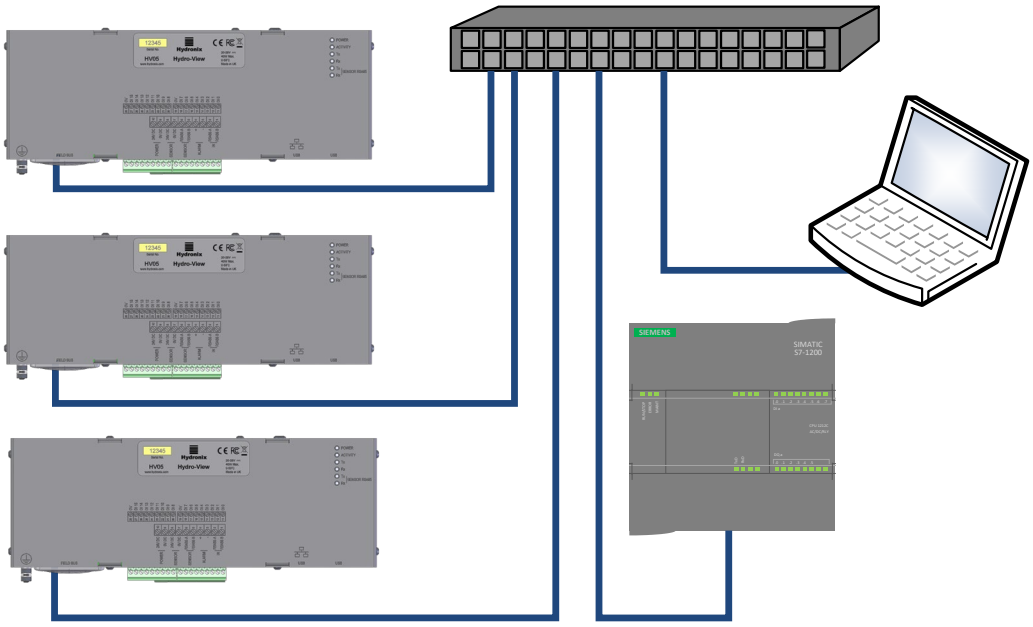


Figure 10: Star Topology

Note: To enable remote access to the Hydro-Hub/Hydro-View, the main ethernet communication port must also be connected to the network switch (connection not shown).

2.3 Cables

The Hydronix PROFINET Module utilises a RJ45 connector. It is recommended that industrial grade connectors and shielded cabling are used with this device (not supplied). To avoid electrical interference all PROFINET cabling must be run separately from any mains and motor cabling. A segregation of at least 200mm between the PROFINET cabling and any high voltage/current wiring must be provided.

In situations where the 200mm segregation cannot be provided, for example when cables must cross, ensure they pass at 90° (never parallel).

In arears at risk of lightning strikes, protection should be provided to shield the PROFINET module and the Hydro-View/Hydro-Hub from damage.

Note: For additional PROFINET cabling guidance see the appropriate PROFINET standards documentation.

All wiring must be performed by persons holding the required qualifications for the local area.

1 PLC Requirements

All Hydronix Hydro-Hub/Hydro-View units with the Hydro-Hub PROFINET Module installed are configured to act as slaves on the PROFINET network. Therefore, the PLC must be configured as a master to enable communication. The PLC in this example is a S7 1200 CPU 1212C.

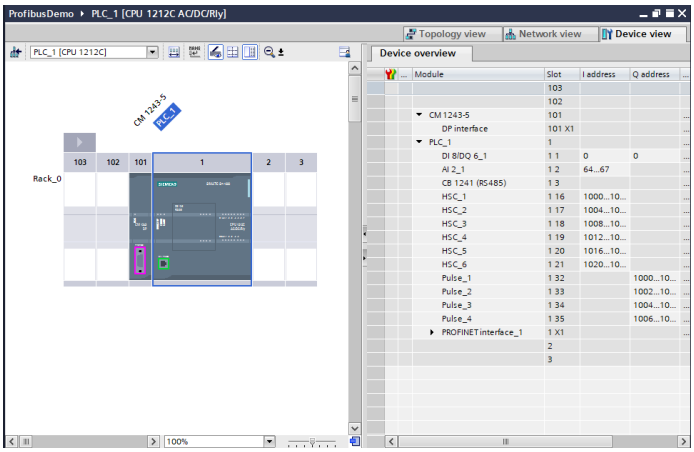


Figure 11: PLC CPU Setup

2 Add Hydro-Hub PROFINET Slave

To add the Hydronix PROFINET slave to the PLC network the appropriate GSD file must be added to the PLC project. The GDS file is available from the Hydronix web site: www.hydronix.com

2.1 Install the GSD file

1. Download the GSD file from the Hydronix Web site
2. Open TIA Portal and select “Options>Manage general station description files (GSD)” from the main taskbar
3. Select the Source Path to the downloaded GSD file and click Install.
4. The GSD will be added to the Installed GSD list.

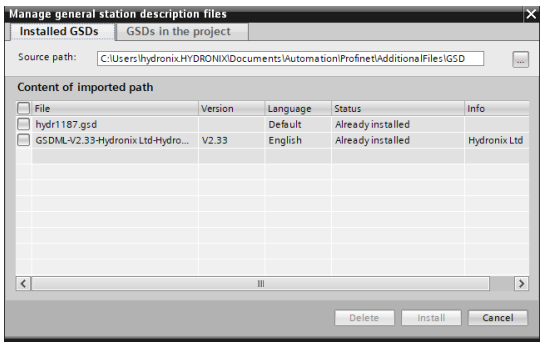


Figure 12: Installed GSD File

3 Install the Hydronix PROFINET Slave

To add the Hydronix PROFINET slave to the network “Select Devices and Networks” and open the Network View.

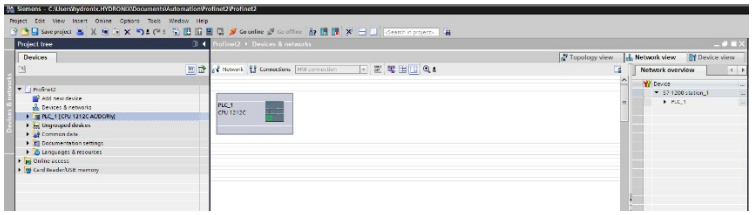


Figure 13: Network View

On the right-hand task bar select “Hardware Catalogue”.

Navigate to: “Other Field Devices>PROFINET IO>Gateway>Hydronix Ltd>Hydronix PROFINET MODULE”.

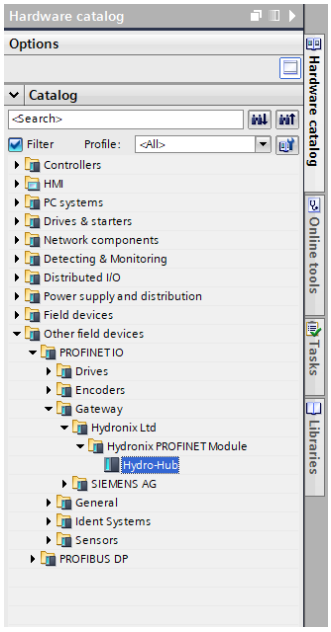


Figure 14: Hardware Catalogue

Click on the Hydronix PROFINET module and drag it onto the “Devices and Networks” view next to the PLC CPU.

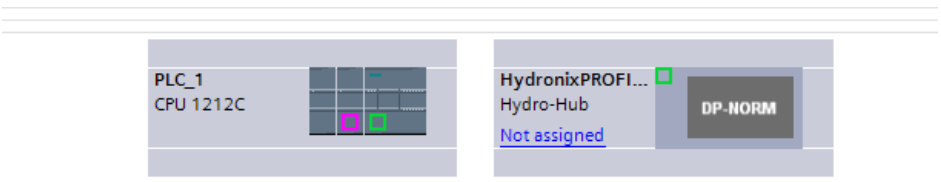


Figure 15: Hydro-Hub Slave added to Network

To provide a connection to the PLC, click on the “Not Assigned” label on the Hydronix PROFINET Module and select the PLC.

The PLC and the Hydronix PROFINET module are now linked

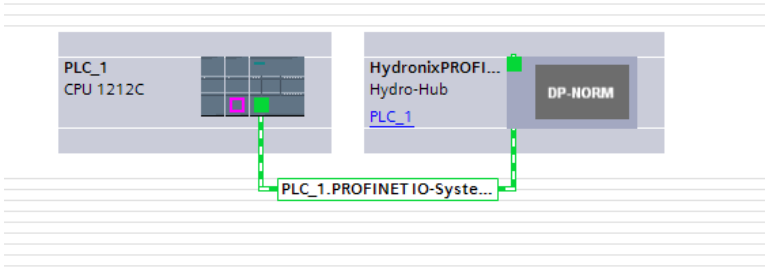


Figure 16: Hydro-Hub and PLC PROFINET Link

Click on the Hydronix PROFINET module to open the Properties window and select PROFINET interface.

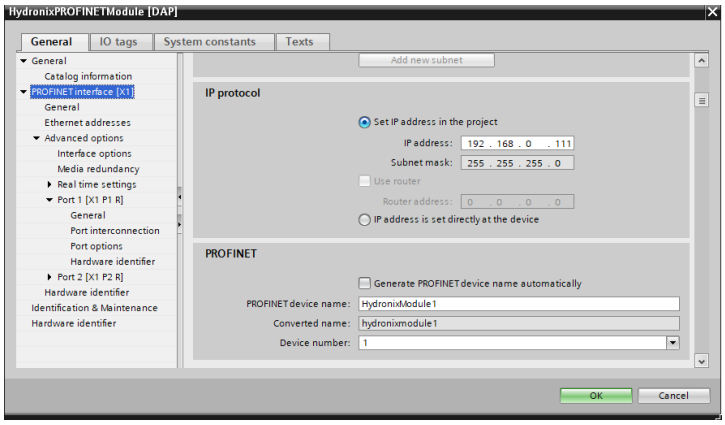


Figure 17: PROFINET Name and IP Address

Each PROFINET device on the network must have a unique name and IP Address. Set the Hydronix PROFINET module address and name. Select “Set IP address in the project”, this will ensure the PLC controls the configuration of Hydronix Profinet Module.

The Hydronix PROFINET module communicates using pre-set communication pathways. These are detailed in the GSD file. Double click on the Hydronix PROFINET module to access the Slave device window (Figure 18). Each of the communication pathways are automatically assigned.

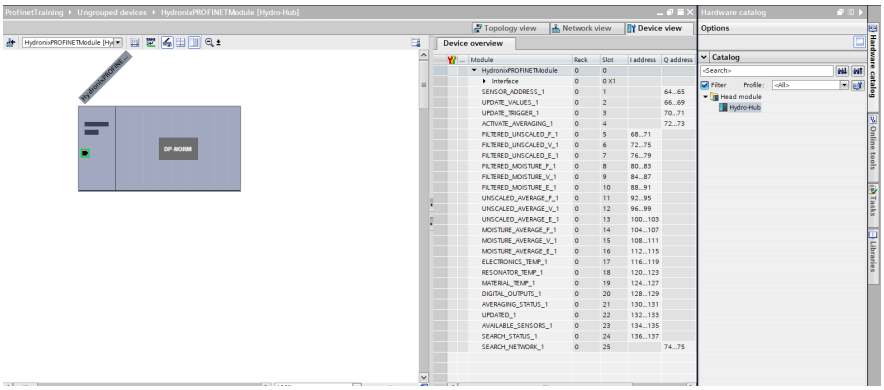
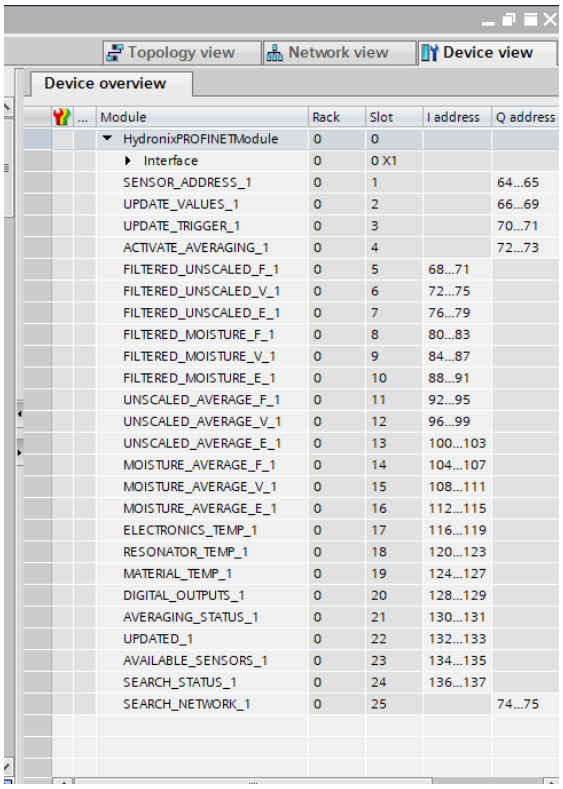


Figure 18: Slave Device Window

All I/O Modules in the Input and Output sections are required for the Hydronix PROFINET module to operate.

For each I/O the PLC will allocate an appropriate address (Figure 19).

Note: Every module must be in the correct order with no spaces



Module	Rack	Slot	I address	Q address
HydronixPROFINETModule	0	0		
Interface	0	0 X1		
SENSOR_ADDRESS_1	0	1		64...65
UPDATE_VALUES_1	0	2		66...69
UPDATE_TRIGGER_1	0	3		70...71
ACTIVATE_AVERAGING_1	0	4		72...73
FILTERED_UNSCALED_F_1	0	5	68...71	
FILTERED_UNSCALED_V_1	0	6	72...75	
FILTERED_UNSCALED_E_1	0	7	76...79	
FILTERED_MOISTURE_F_1	0	8	80...83	
FILTERED_MOISTURE_V_1	0	9	84...87	
FILTERED_MOISTURE_E_1	0	10	88...91	
UNSCALED_AVERAGE_F_1	0	11	92...95	
UNSCALED_AVERAGE_V_1	0	12	96...99	
UNSCALED_AVERAGE_E_1	0	13	100...103	
MOISTURE_AVERAGE_F_1	0	14	104...107	
MOISTURE_AVERAGE_V_1	0	15	108...111	
MOISTURE_AVERAGE_E_1	0	16	112...115	
ELECTRONICS_TEMP_1	0	17	116...119	
RESONATOR_TEMP_1	0	18	120...123	
MATERIAL_TEMP_1	0	19	124...127	
DIGITAL_OUTPUTS_1	0	20	128...129	
AVERAGING_STATUS_1	0	21	130...131	
UPDATED_1	0	22	132...133	
AVAILABLE_SENSORS_1	0	23	134...135	
SEARCH_STATUS_1	0	24	136...137	
SEARCH_NETWORK_1	0	25		74...75

Figure 19: Hydronix PROFINET I/O Modules

Open Distributed I/O in the Project Tree and right click on the Hydronix PROFINET module. Select Online & Diagnostics.

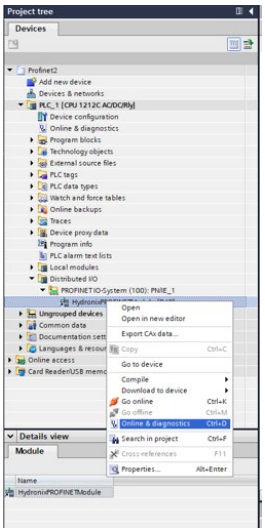


Figure 20: Online & Diagnostics

Select Functions>Assign PROFINET device name. Ensure the correct PROFINET name is shown and click update list

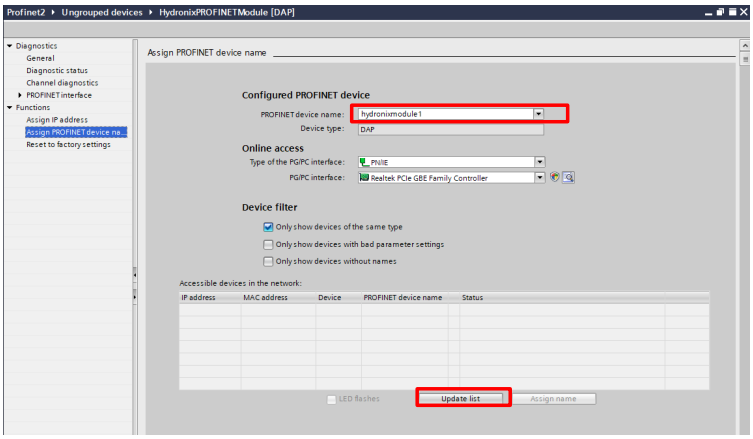


Figure 21: Assign PROFINET Name

The software will search for all available PROFINET modules on the network. In the list select the correct module and click Assign name. If more than one PROFINET module is on the network, select the required module using the MAC address (printed on the module).

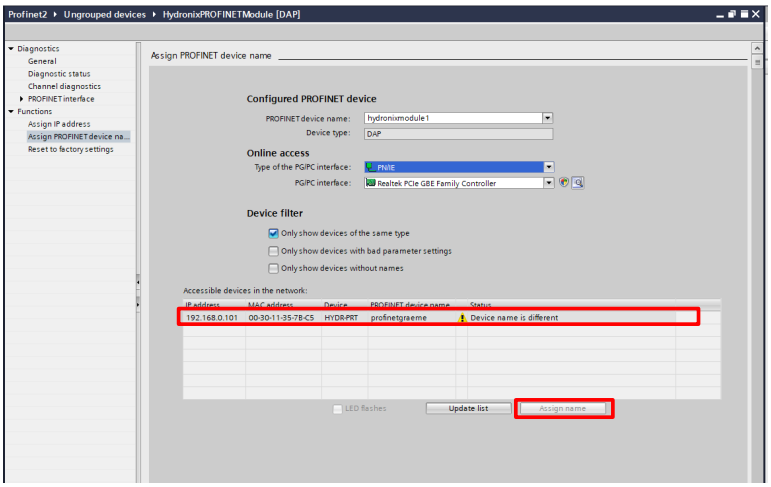


Figure 22: Update Name

Select Network View and click on the PLC CPU. Compile the software and then download to the PLC.

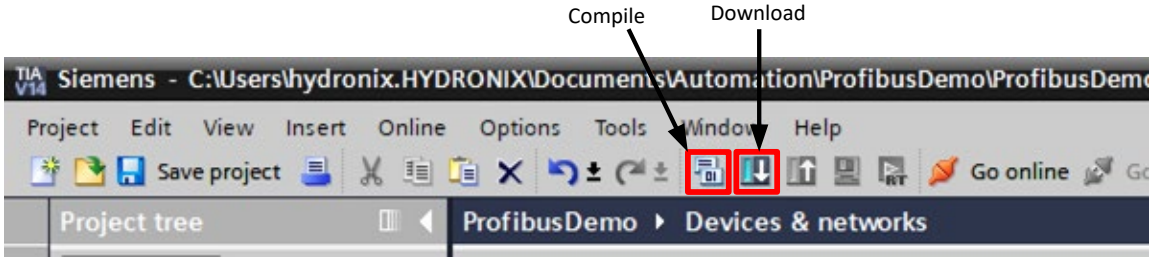


Figure 23: Download To CPU

If connecting to the PLC for the first time the search for device screen will show.

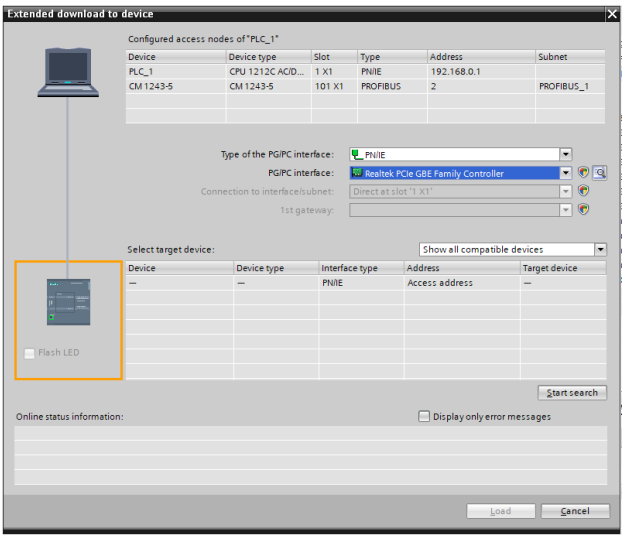


Figure 24: Search for Device

Select the connection method from the “Type of GP/PC interface” selector and click search.

Once the PLC is found click Load

In the Load Preview page ensure” Stop all” is selected. This will stop the PLC running and overwrite any existing programmes.

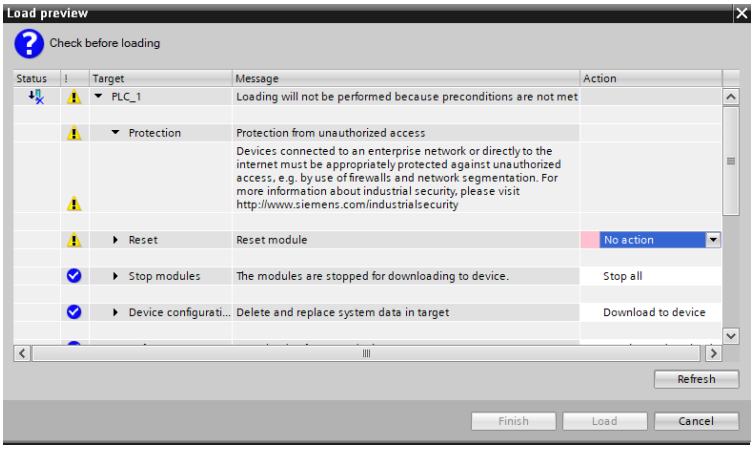


Figure 25: Stop All

Once loaded both LEDs on the PROFINET module will turn green to indicate that the connection is setup correctly.

There are no configuration settings required in the Hydro-View/Hydro-Hub to setup a PROFINET connection. The IP address shown on the System settings page is for display only (Figure 26). The IP address of the unit is configured by the PLC. If the IP address is displayed as 0.0.0.0 a connection has not been established with the PLC.

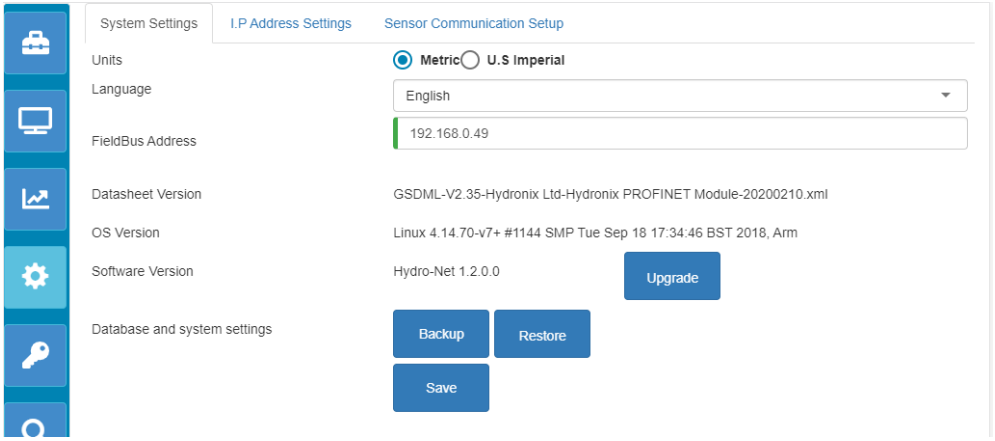


Figure 26: Fieldbus IP Address

When a connection has been successfully established both lights on the Hydro-Hub PROFINET Module will be green (Figure 27)

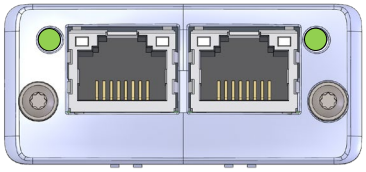


Figure 27: Hydro-Hub PROFINET Module Correctly Configured (Connector Not Shown)

Chapter 5 I/O Data

The I/O data available using the Hydronix PROFINET module is detailed below.

Module Name	Input/ output	Data Type	Description	Data Range
Sensor Address	Output	Word	Node address of the Connected sensor	1 to16 16#0001 to 16#0010
Update Values	Output	DWord	Configures the Update Mode to enable reading of the Averaging Status and/or the Digital Outputs for each connected sensor	16#0000_0000= None 16#0000_0001=Digital Outputs 16#0000_0002=Averaging Status 16#0000_0003=Both **Sensor Address must be set to 16#0000 for this request to work**
Update Trigger	Output	Word	Update Trigger initiates a sensor update command	The Hydro-Hub will initiate the communication with a sensor whenever the Update Trigger value changes. (Positive Edge)
Activate Averaging	Output	Word	Activate the averaging in a single or multiple connected sensors	Each bit in the 16bit word will active the sensor with the corresponding node address (1-16) **Sensor Address must be set to 16#0000 for this request to work**
Filtered Unscaled F	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Filtered Unscaled Mode F”	
Filtered Unscaled V	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Filtered Unscaled Mode V”	
Filtered Unscaled E	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Filtered Unscaled Mode E”	
Filtered Moisture F	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Filtered Moisture Mode F”	

Filtered Moisture V	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Filtered Moisture Mode V”	
Filtered Moisture E	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Filtered Moisture Mode E”	
Unscaled Average F	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Average Unscaled Mode F”	
Unscaled Average V	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Average Unscaled Mode V”	
Unscaled Average E	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Average Unscaled Mode E”	
Moisture Average F	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Average Moisture Mode F”	
Moisture Average V	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Average Moisture Mode V”	
Moisture Average E	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Average Moisture Mode E”	
Electronics Temp	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Electronic Temperature”	
Resonator Temp	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Resonator Temperature”	

Material Temp	Input	DWord	Floating point Number 2 decimal place precision. Sensor output value “Material Temperature”	
Digital Outputs	Input	Word	Current status of the connected sensor(s) digital output	Each bit in the 16bit word will indicate the digital output status of the sensor with the corresponding node address (1-16)
Averaging Status	Input	Word	Averaging status of the connected sensors	Each bit in the 16bit word will indicate the averaging status of the sensor with the corresponding node address (1-16)
Updated	Input	Word	Updated is incremented when the Hydro-Hub has completed a message transaction	Rolling increment from: 16#0001 to 16#00FF If an error has occurred the Updated will be set to: 16#0000
Available Sensors	Input	Word	Current sensors available on the network	Each bit in the 16bit word represents a sensor node address (1-16)
Search Status	Input	Word	Indicates if a search of the sensor network is in progress	0= No search in progress 1= Search in progress
Search Network	Output	Word	Start a search of the network	1= Start Search Increment the Trigger Word to initiate the search

Table 1: Hydronix PROFINET slave I/O

1 Example Transactions

To retrieve data from a sensor, a Search Network command must be completed. A search of the network is automatically started when the Hydro-View/Hydro-Hub is switched on. If a new sensor is added to the network a new search, using the Hydro-View/Hydro-Hub, must be performed. Alternatively, the network can be searched using the Search Network command.

1.1 Sensor Live Values

To retrieve the current live values from a sensor the “Sensor Address” value must be set to match the sensor node address. The command is activated by incrementing the “Update Tigger” word. The “Updated” value will be incremented by 1 on completion of the request.

1.2 Current Digital output status

To retrieve the current digital output status the “Sensor Address” output must be set to 0. The “Status Update Value” is set to 16#0000_0001 and the “Trigger” bit is incremented. Each bit of

the 16bit “Digital Outputs” input is set to represent a sensor on the network based on the node address. The “Update Status” value will be incremented by 1 on completion of the request.

The following message indicates that the digital outputs on sensors 3, 12 and 16 are active.

1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0

1.3 Current Averaging Status

To retrieve the current “Averaging Status” of the sensors on the network the “Sensor Address” output must be set to 16#0000. “Update Values” is set to 16#0000_0002 and the “Update Trigger” bit is incremented. Each bit of the 16bit “Averaging Status” is set to represent a sensor on the network based on the node address. The “Updated” value will be incremented by 1 on completion of the request.

The following message indicates that sensors 1, 2, 3 and 8 are currently averaging.

0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1

1.4 Activate Averaging

To command a sensor to start averaging the “Sensor Address” output must be set to 16#0000. The averaging for a sensor is configured by setting the appropriate bit in the 16bit “Activate Averaging” output. The “Update Trigger” bit is then incremented. The “Updated” value will be incremented by 1 on completion of the request. The “Activate Averaging” message is sent every time the “Trigger” is incremented and the sensor address is also set to 0.

The following message will start averaging a sensor with a node address of 1.

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

To stop averaging the previously active bit is set to 0 and the “Trigger” bit incremented.

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1.5 Search Network

To initiate a search of the sensor network, set “Search Network” to 1 and increment the “Update Trigger” word. During the search cycle the “Search Status” word will be set to 1. Once the search has completed the “Search Status” word will return to 0.

The available sensors on the network are indicated by the “Available Sensors” word. Each bit in the “Available Sensors” word is set if a sensor is available. Each bit represents a sensor node address (1-16). The LSB represents address 1.

The following message shows there are 5 sensors on the network. The available sensors have node address’: 1, 5, 9, 10 and 16.

1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1

This section will demonstrate the retrieval of data from a sensor. For these examples a watch table will be used to force the PLC values to replicate a user programme.

Connect the Hydro-Hub to the PLC using a suitable PROFINET cable and connector. Ensure both lights on the Hydronix PROFINET module are green and not flashing. If the lights are flashing, ensure the IP address and name have been set correctly (see page 17). Also check the IO modules have been added in the correct order (See 20).

1 Configure the I/O Tags in the PLC

To configure the tags in the PLC, expand PLC Tags from the project tree view and add a new Tag folder.

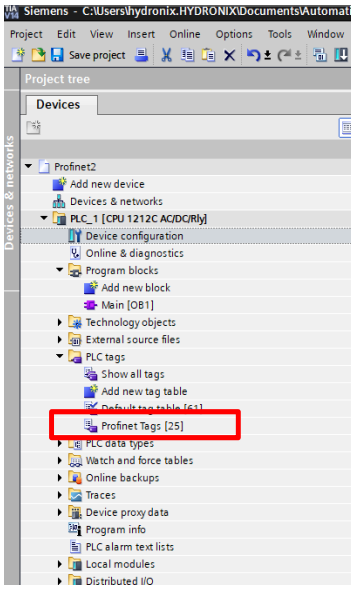


Figure 28: PLC Project Tree View

In the Tags section, add each of the Hydronix PROFINET Slave modules to the tags list and assign them to the address allocated by the PLC. Ensure they are of the correct data type.

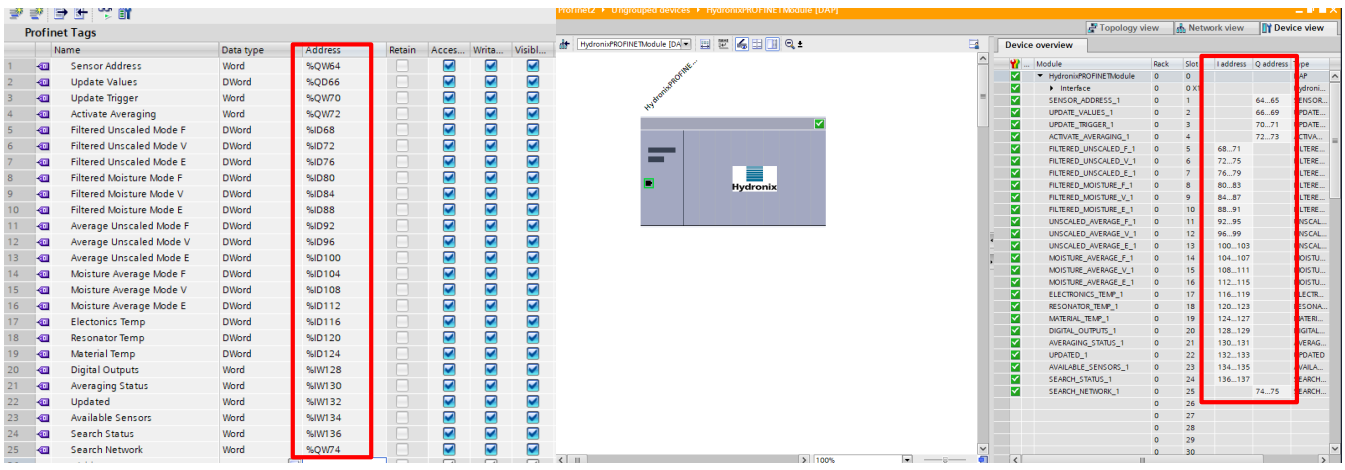


Figure 29: PLC Tags (L), PROFINET Slave I/O (R)

Add a watch table to the project. Expand Watch and Force Tables in the project tree view. Select “Add New Watch Table”.

In the watch table add every I/O for the Hydronix PROFINET Module by entering the Address of the tag previously configured in the default tag table.

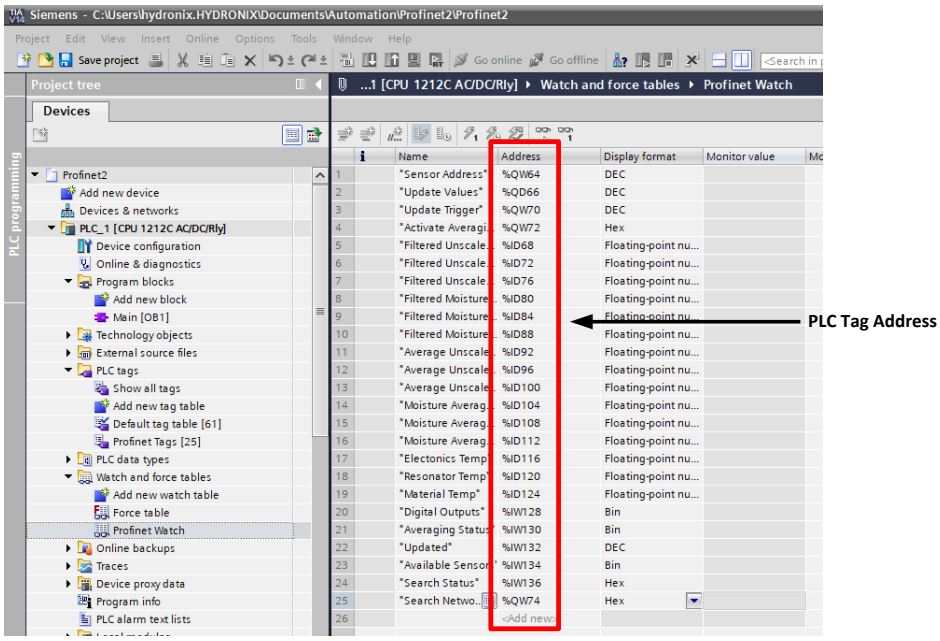


Figure 30: Watch Table

Compile and download the changes to the PLC.

The values displayed in the watch table can be converted to be displayed as Hex, Floating point, Binary or Decimal as required.

2 Testing the Connection

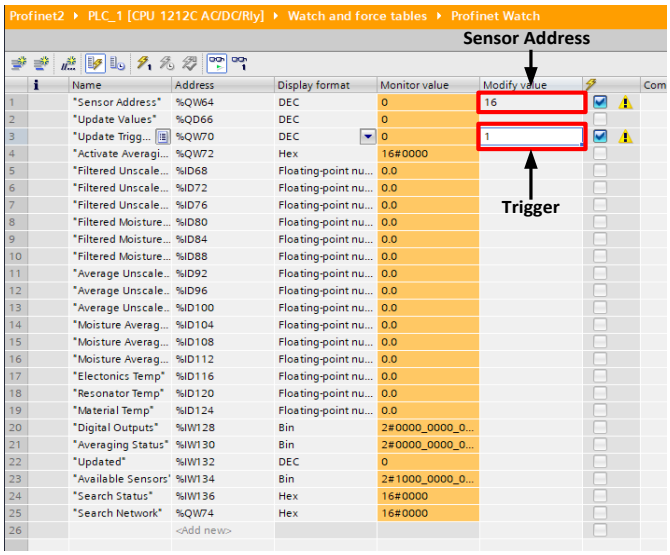
To test the communication with the Hydronix PROFINET module ensure a sensor is connected to the Hydro-Hub. Once the sensor is connected confirm the node address using the Sensor search facility in the Hydro-Hub software.

Click Monitor all from the task bar above the watch table. The screen will now go live

Figure 31: Watch Table Monitor All

2.1 Get Live Sensor Values

Set the Sensor Address tag value in the watch table so it matches the sensor node address. Now set the Trigger I/O so the number is high or lower than the current displayed value.



	Name	Address	Display format	Monitor value	Modify value
1	"Sensor Address"	%QW64	DEC	0	16
2	"Update Values"	%QD66	DEC	0	
3	"Update Trigg...	%QW70	DEC	0	1
4	"Activate Averagi...	%QW72	Hex	16#0000	
5	"Filtered Unscale...	%ID68	Floating-point nu...	0.0	
6	"Filtered Unscale...	%ID72	Floating-point nu...	0.0	
7	"Filtered Unscale...	%ID76	Floating-point nu...	0.0	
8	"Filtered Moisture...	%ID80	Floating-point nu...	0.0	
9	"Filtered Moisture...	%ID84	Floating-point nu...	0.0	
10	"Filtered Moisture...	%ID88	Floating-point nu...	0.0	
11	"Average Unscale...	%ID92	Floating-point nu...	0.0	
12	"Average Unscale...	%ID96	Floating-point nu...	0.0	
13	"Average Unscale...	%ID100	Floating-point nu...	0.0	
14	"Moisture Averag...	%ID104	Floating-point nu...	0.0	
15	"Moisture Averag...	%ID108	Floating-point nu...	0.0	
16	"Moisture Averag...	%ID112	Floating-point nu...	0.0	
17	"Electonics Temp"	%ID116	Floating-point nu...	0.0	
18	"Resonator Temp"	%ID120	Floating-point nu...	0.0	
19	"Material Temp"	%ID124	Floating-point nu...	0.0	
20	"Digital Outputs"	%IW128	Bin	2#0000_0000_0...	
21	"Averaging Status"	%IW130	Bin	2#0000_0000_0...	
22	"Updated"	%IW132	DEC	0	
23	"Available Sensors'	%IW134	Bin	2#1000_0000_0...	
24	"Search Status"	%IW136	Hex	16#0000	
25	"Search Network"	%QW74	Hex	16#0000	
26		<Add new>			

Figure 32: Get Live Sensor Values

Click “Modify all Selected Values” in the task bar

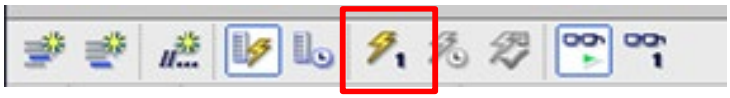
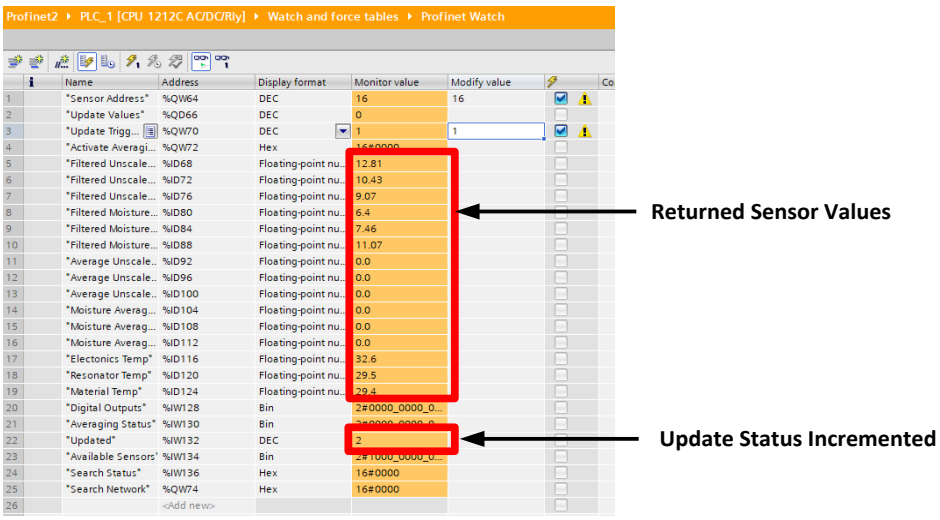


Figure 33: Get Live Sensor Values Modify All

The selected values will now be updated to the PLC.

If the message has been sent correctly the sensor values will update and the “Update Status” tag will increment by 1.



	Name	Address	Display format	Monitor value	Modify value
1	"Sensor Address"	%QW64	DEC	16	16
2	"Update Values"	%QD66	DEC	0	
3	"Update Trigg...	%QW70	DEC	1	1
4	"Activate Averagi...	%QW72	Hex	16#0000	
5	"Filtered Unscale...	%ID68	Floating-point nu...	12.81	
6	"Filtered Unscale...	%ID72	Floating-point nu...	10.43	
7	"Filtered Unscale...	%ID76	Floating-point nu...	9.07	
8	"Filtered Moisture...	%ID80	Floating-point nu...	6.4	
9	"Filtered Moisture...	%ID84	Floating-point nu...	7.46	
10	"Filtered Moisture...	%ID88	Floating-point nu...	11.07	
11	"Average Unscale...	%ID92	Floating-point nu...	0.0	
12	"Average Unscale...	%ID96	Floating-point nu...	0.0	
13	"Average Unscale...	%ID100	Floating-point nu...	0.0	
14	"Moisture Averag...	%ID104	Floating-point nu...	0.0	
15	"Moisture Averag...	%ID108	Floating-point nu...	0.0	
16	"Moisture Averag...	%ID112	Floating-point nu...	0.0	
17	"Electonics Temp"	%ID116	Floating-point nu...	32.6	
18	"Resonator Temp"	%ID120	Floating-point nu...	29.5	
19	"Material Temp"	%ID124	Floating-point nu...	29.4	
20	"Digital Outputs"	%IW128	Bin	2#0000_0000_0...	
21	"Averaging Status"	%IW130	Bin		
22	"Updated"	%IW132	DEC	2	
23	"Available Sensors'	%IW134	Bin		
24	"Search Status"	%IW136	Hex	16#0000	
25	"Search Network"	%QW74	Hex	16#0000	
26		<Add new>			

Figure 34: Returned Values

2.2 Get Averaging Status

Set the “Sensor Address” tag value in the watch table to 0. Set “Update Value” to 2 and increment the “Update Trigger” tag.

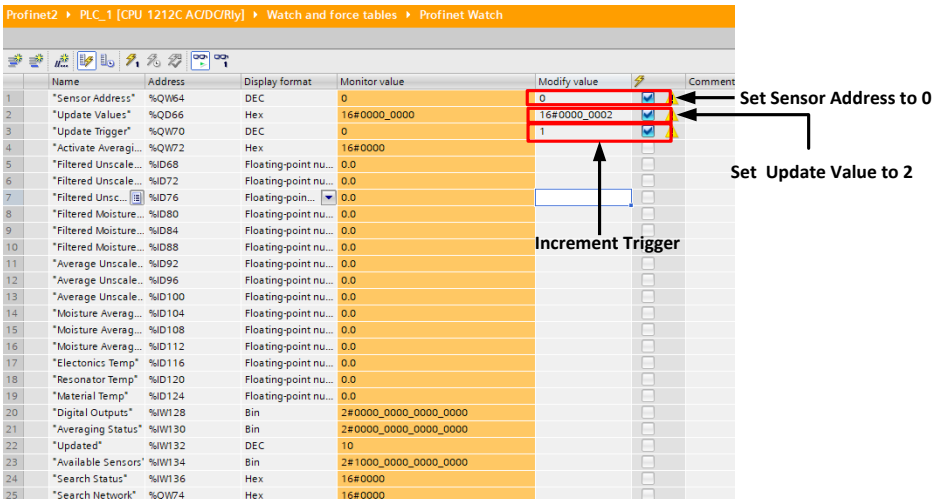


Figure 35: Get Averaging Status

Click Modify all Selected Values in the task bar

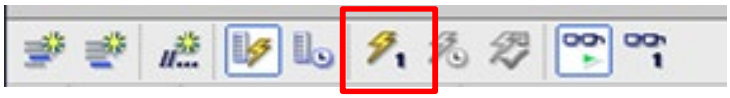


Figure 36: Get Averaging Status Modify All

The selected values will now be updated to the PLC.

If the message has been sent correctly the “Averaging Status” tag will be updated and the “Update Status” tag will increment by 1. In Figure 37 a sensor with the node address of 16 is averaging.

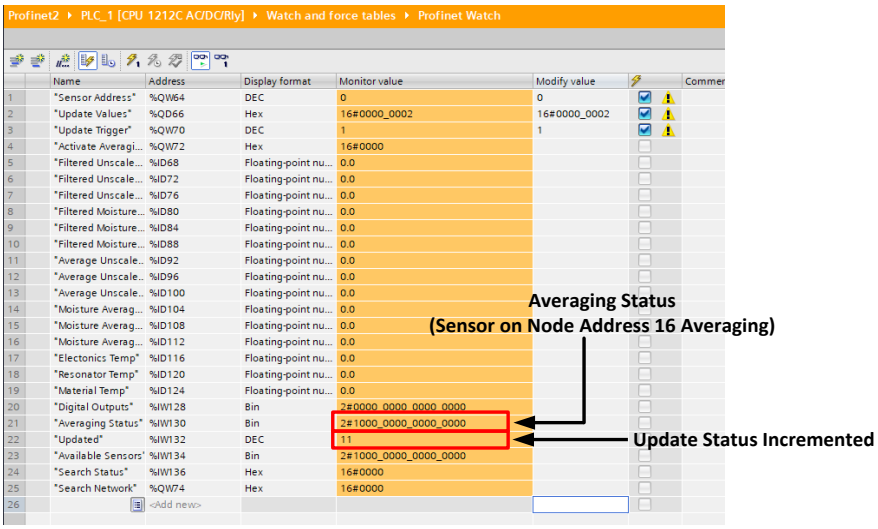


Figure 37: Averaging Status

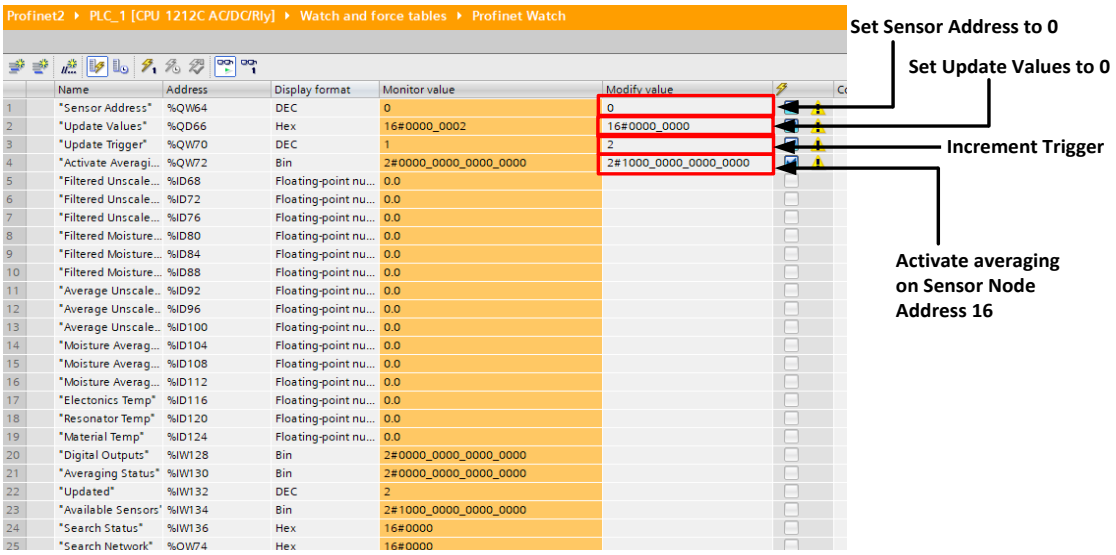
2.3 Activate Averaging

Set the “Sensor Address” tag in the watch table to 0. Set “Update Values” to 0 and set the appropriate bit in the “Activate Averaging” tag to active averaging on a sensor on the Hydro-Hub network.

In this example a sensor on node address 16 will be set to start averaging.

1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Increment the “Update Trigger” tag.



	Name	Address	Display format	Monitor value	Modify value
1	"Sensor Address"	%QW64	DEC	0	0
2	"Update Values"	%QD66	Hex	16#0000_0002	16#0000_0000
3	"Update Trigger"	%QW70	DEC	1	2
4	"Activate Averagi...	%QW72	Bin	2#0000_0000_0000_0000	2#1000_0000_0000_0000
5	"Filtered Unscale...	%ID68	Floating-point nu...	0.0	
6	"Filtered Unscale...	%ID72	Floating-point nu...	0.0	
7	"Filtered Unscale...	%ID76	Floating-point nu...	0.0	
8	"Filtered Moisture...	%ID80	Floating-point nu...	0.0	
9	"Filtered Moisture...	%ID84	Floating-point nu...	0.0	
10	"Filtered Moisture...	%ID88	Floating-point nu...	0.0	
11	"Average Unscale...	%ID92	Floating-point nu...	0.0	
12	"Average Unscale...	%ID96	Floating-point nu...	0.0	
13	"Average Unscale...	%ID100	Floating-point nu...	0.0	
14	"Moisture Averag...	%ID104	Floating-point nu...	0.0	
15	"Moisture Averag...	%ID108	Floating-point nu...	0.0	
16	"Moisture Averag...	%ID112	Floating-point nu...	0.0	
17	"Electonics Temp"	%ID116	Floating-point nu...	0.0	
18	"Resonator Temp"	%ID120	Floating-point nu...	0.0	
19	"Material Temp"	%ID124	Floating-point nu...	0.0	
20	"Digital Outputs"	%IW128	Bin	2#0000_0000_0000_0000	
21	"Averaging Status"	%IW130	Bin	2#0000_0000_0000_0000	
22	"Updated"	%IW132	DEC	2	
23	"Available Sensors"	%IW134	Bin	2#1000_0000_0000_0000	
24	"Search Status"	%IW136	Hex	16#0000	
25	"Search Network"	%OW74	Hex	16#0000	

Figure 38: Activate Averaging

Click Modify all Selected Values in the task bar

Figure 39: Activate Averaging Modify All

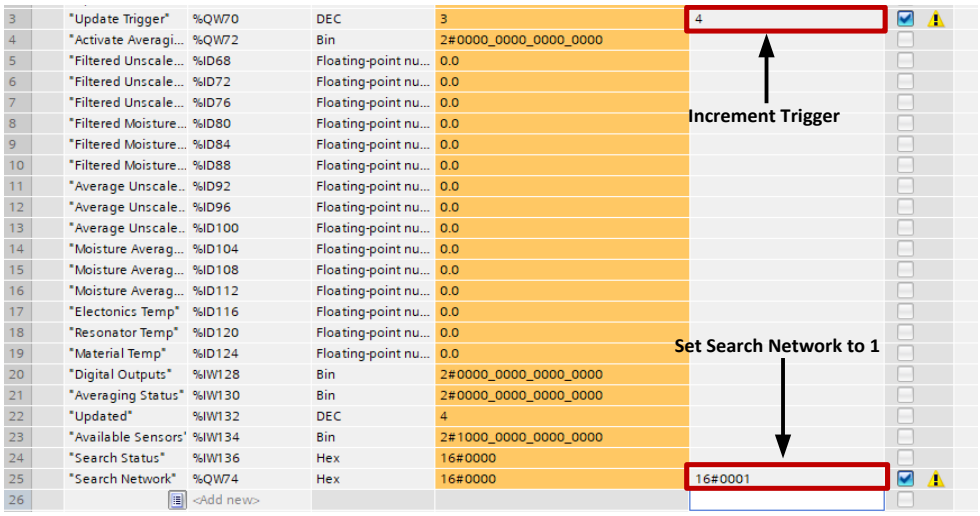
The selected values will now be updated to the PLC.

If the message has been sent correctly the sensor will start averaging and the “Updated” tag will increment by 1. To confirm the averaging status, perform an Averaging Status request.

Repeat the command, setting the required bit in the “Activate averaging” tag to 0, to stop the averaging.

2.4 Search Sensor Network

Set “Search Network” tagin the watch table to 1, then increment the “Update Trigger” tag.



3	"Update Trigger"	%QW70	DEC	3	4
4	"Activate Averagi...	%QW72	Bin	2#0000_0000_0000_0000	
5	"Filtered Unscale...	%ID68	Floating-point nu...	0.0	
6	"Filtered Unscale...	%ID72	Floating-point nu...	0.0	
7	"Filtered Unscale...	%ID76	Floating-point nu...	0.0	
8	"Filtered Moisture...	%ID80	Floating-point nu...	0.0	
9	"Filtered Moisture...	%ID84	Floating-point nu...	0.0	
10	"Filtered Moisture...	%ID88	Floating-point nu...	0.0	
11	"Average Unscale...	%ID92	Floating-point nu...	0.0	
12	"Average Unscale...	%ID96	Floating-point nu...	0.0	
13	"Average Unscale...	%ID100	Floating-point nu...	0.0	
14	"Moisture Averag...	%ID104	Floating-point nu...	0.0	
15	"Moisture Averag...	%ID108	Floating-point nu...	0.0	
16	"Moisture Averag...	%ID112	Floating-point nu...	0.0	
17	"Electonics Temp"	%ID116	Floating-point nu...	0.0	
18	"Resonator Temp"	%ID120	Floating-point nu...	0.0	
19	"Material Temp"	%ID124	Floating-point nu...	0.0	
20	"Digital Outputs"	%IW128	Bin	2#0000_0000_0000_0000	
21	"Averaging Status"	%IW130	Bin	2#0000_0000_0000_0000	
22	"Updated"	%IW132	DEC	4	
23	"Available Sensors'	%IW134	Bin	2#1000_0000_0000_0000	
24	"Search Status"	%IW136	Hex	16#0000	
25	"Search Network"	%QW74	Hex	16#0000	16#0001
26			<Add new>		

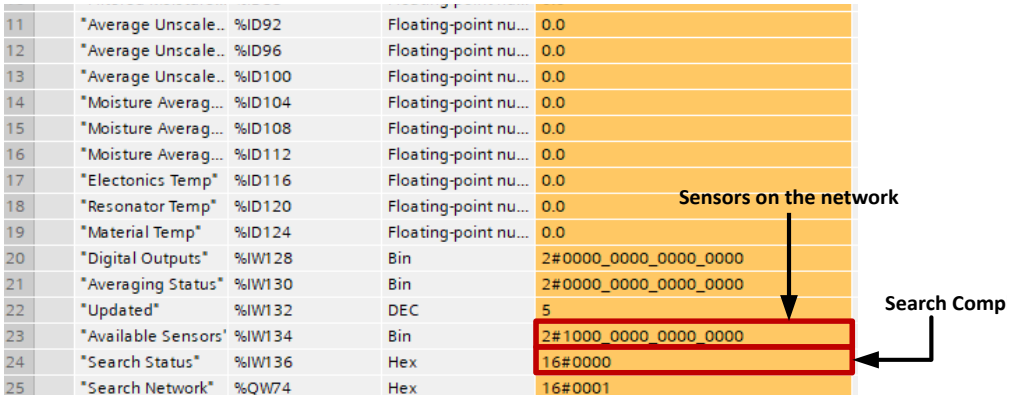
Figure 40: Start Sensor Search

Once the Search Sensor command has commenced the “Search Status” tag will be set to 1.

9	"Filtered Moisture...	%ID84	Floating-point nu...	0.0
10	"Filtered Moisture...	%ID88	Floating-point nu...	0.0
11	"Average Unscale...	%ID92	Floating-point nu...	0.0
12	"Average Unscale...	%ID96	Floating-point nu...	0.0
13	"Average Unscale...	%ID100	Floating-point nu...	0.0
14	"Moisture Averag...	%ID104	Floating-point nu...	0.0
15	"Moisture Averag...	%ID108	Floating-point nu...	0.0
16	"Moisture Averag...	%ID112	Floating-point nu...	0.0
17	"Electonics Temp"	%ID116	Floating-point nu...	0.0
18	"Resonator Temp"	%ID120	Floating-point nu...	0.0
19	"Material Temp"	%ID124	Floating-point nu...	0.0
20	"Digital Outputs"	%IW128	Bin	2#0000_0000_0000_0000
21	"Averaging Status"	%IW130	Bin	2#0000_0000_0000_0000
22	"Updated"	%IW132	DEC	4
23	"Available Sensors'	%IW134	Bin	2#0000_0000_0000_0000
24	"Search Status"	%IW136	Hex	16#0001
25	"Search Network"	%QW74	Hex	16#0001
26		<Add new>		

Figure 41: Sensor Search Commenced

On completion of the search, the “Sensor Status” tag will return to 0. The “Available Sensors” tag is updated to indicate the node address of each sensor on the network. In Figure 42, 1 sensor on node address 16 has been detected.



11	"Average Unscale...	%ID92	Floating-point nu...	0.0
12	"Average Unscale...	%ID96	Floating-point nu...	0.0
13	"Average Unscale...	%ID100	Floating-point nu...	0.0
14	"Moisture Averag...	%ID104	Floating-point nu...	0.0
15	"Moisture Averag...	%ID108	Floating-point nu...	0.0
16	"Moisture Averag...	%ID112	Floating-point nu...	0.0
17	"Electonics Temp"	%ID116	Floating-point nu...	0.0
18	"Resonator Temp"	%ID120	Floating-point nu...	0.0
19	"Material Temp"	%ID124	Floating-point nu...	0.0
20	"Digital Outputs"	%IW128	Bin	2#0000_0000_0000_0000
21	"Averaging Status"	%IW130	Bin	2#0000_0000_0000_0000
22	"Updated"	%IW132	DEC	5
23	"Available Sensors'	%IW134	Bin	2#1000_0000_0000_0000
24	"Search Status"	%IW136	Hex	16#0000
25	"Search Network"	%QW74	Hex	16#0001

Figure 42: Sensors on the Network

1 Document Cross Reference

This section lists all of the other documents that are referred to in this User Guide. You may find it beneficial to have a copy available when reading to this guide.

Document Number	Title
HD0864	Hydro-View / Hydro-Hub User Guide

Index

Electrical Wiring
  Wiring 14
Hydronix PROFINET Module 11, 13
I/O Parameters
  Current Averaging Status 28
  Current Digital output status 27
  Data Types 25
  Search Network 28
  Sensor Address 25
  Sensor Live Values 27
  Set Averaging 28
  Status Update Value 25
  Trigger 25
  Update Status 27
PLC
  Add a Slave 18
  GSD 17
  Module IP Address 19
  Module Name 19
  Requirements 17
  Tags 29
  Watch Table 30
System Overview 12
Testing the Connection 30
TIA portal v14 12