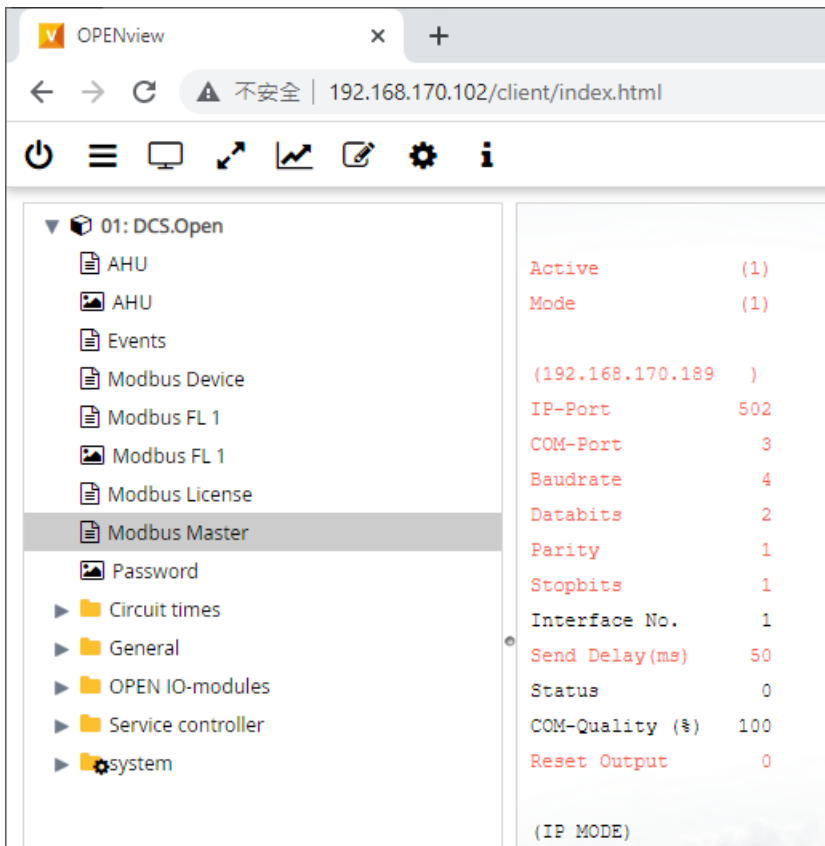


TT230403 – OFXL - Modbus Module Operation

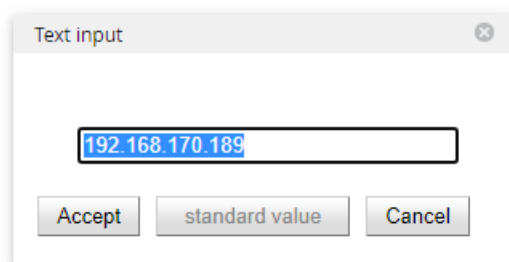
1. In TT230402, we show you how to configure the new Modbus module in OPEN FXL 4. In this document, we will show you how to operate it. If you've done a "Preset" after loading the controller, you should see like below in the "Modbus Master" HTML page.



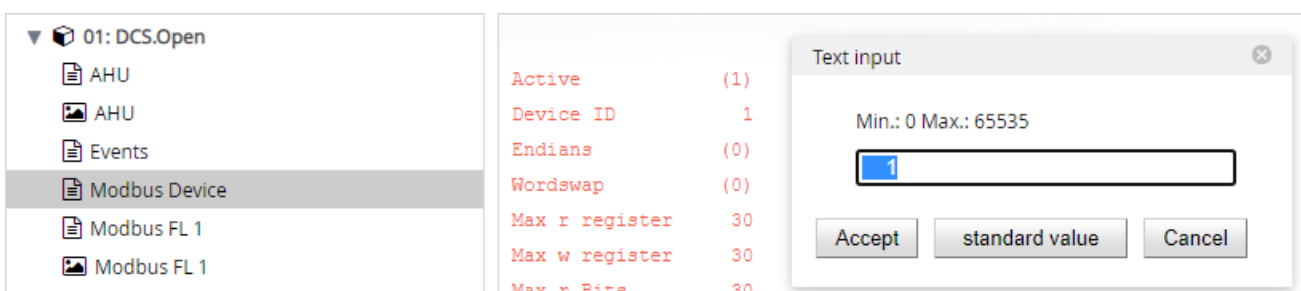
2. These are the default values we set in the FUP page. The "Mode" is set to 1 which means it's communicating through Modbus IP. The best thing for this new Modbus module is that you can change everything online. To change the Modbus device IP, click on it and change it directly.

Active (1)
Mode (1)

(192.168.170.189)
IP-Port 502
COM-Port 3
Baudrate 4
Databits 2
Parity 1
Stopbits 1



3. Now take a look at the "Modbus Device". The default ID is 1, and you can change it if required.



4. These are the default settings for the Modbus device module. Normally, you can just leave them as default.

▼ 01: DCS.Open

- AHU
- AHU
- Events
- Modbus Device**
- Modbus FL 1
- Modbus FL 1
- Modbus License
- Modbus Master
- Password
- ▶ Circuit times
- ▶ General
- ▶ OPEN IO-modules
- ▶ Service controller
- ▶ system

Active	(1)	Devie Number	1000
Device ID	1		
Endians	(0)		
Wordswap	(0)		
Max r register	30		
Max w register	30		
Max r Bits	30		
Max w Bits	30		
Reg. write Mode	(0)		
Coil write Mode	(0)		
Telegram delay	50		
Max Timeout	200		
Lock count	20		
Lock Time	10		
Rx Telegr.	39		
Tx Telegr.	39		
COM-Quality	100		
Status	0		
Faulty Telegr.	0		

5. This is the Modbus point module. The default setting is to read the “Holding Register” (Data type 3) address 1 (which is 0 in our controller) as type UI (Point type 1). So, if everything corrects, you should see the point value in “FL Value”.

▼ 01: DCS.Open

- AHU
- AHU
- Events
- Modbus Device
- Modbus FL 1**
- Modbus FL 1
- Modbus License
- Modbus Master
- Password
- ▶ Circuit times
- ▶ General
- ▶ OPEN IO-modules
- ▶ Service controller
- ▶ system

Active	(1)	DP01 Dirw	0.000
		DP01 Dlea:	0
Register Ad.	0	DP01 Dlea:	136
Data type	3	DP01 Dlea:	0
Point type	1	DP01 Dlea:	136
Read/Write	1	DP01 Dlea:	136
Factor	1.0	DP01 Event:	1
Offset	0.0		
Read cycle	2		
Read Trigger	(0)		
Write cycle	0		
Write COV	0.1		
Write Trigger	(0)		
FL Value	123.0		
Status:	0		

6. Last one is the “Modbus License” module, which shows your licensed and enabled points, etc.

▼ 01: DCS.Open

- AHU
- AHU
- Events
- Modbus Device
- Modbus FL 1
- Modbus FL 1
- Modbus License**

Modbus Activation	(1)
Point Exceeded	(0)
Enabled points	1
Licensed Points	100

7. Now we can start testing it using the Modbus point graphic. In this example, the value we read from the Modbus device is 123.

▼ 01: DCS.Open	Active	<input checked="" type="checkbox"/>	Device Settings	
AHU	Address	0	Word Swap	<input type="checkbox"/>
AHU	Point Type	Holding Register	Endians	<input type="checkbox"/>
Events	Data Type	UI	Write Multiple Registers	<input type="checkbox"/>
Modbus Device	Read/Write	Read	Write Multiple Bits	<input type="checkbox"/>
Modbus FL 1	Factor	1.00		
Modbus FL 1	Offset	0.00		
Modbus License	Read Cycle	2		
Modbus Master	Read Trigger	<input type="checkbox"/>		
Password	Write Cycle	0		
Circuit times	Write COV	0.10		
General	Write Trigger	<input type="checkbox"/>		
OPEN IO-modules	Value	123.00		
	Status	OK		

8. As explained, you can change everything online with the new Modbus module. For example, set the “Factor” to 0.1 and now the value become “12.3”.

Active	<input checked="" type="checkbox"/>	Device Settings	
Address	0	Word Swap	<input type="checkbox"/>
Point Type	Holding Register	Endians	<input type="checkbox"/>
Data Type	UI	Write Multiple Registers	<input type="checkbox"/>
Read/Write	Read	Write Multiple Bits	<input type="checkbox"/>
Factor	0.10		
Offset	0.00		
Read Cycle	2		
Read Trigger	<input type="checkbox"/>		
Write Cycle	0		
Write COV	0.10		
Write Trigger	<input type="checkbox"/>		
Value	12.30		

9. You can use it to read any register in your Modbus device. For example, address 190 is reading the value “12345”.

Active	<input checked="" type="checkbox"/>	Device Settings	
Address	190	Word Swap	<input type="checkbox"/>
Point Type	Holding Register	Endians	<input type="checkbox"/>
Data Type	UI	Write Multiple Registers	<input type="checkbox"/>
Read/Write	Read	Write Multiple Bits	<input type="checkbox"/>
Factor	1.00		
Offset	0.00		
Read Cycle	2		
Read Trigger	<input type="checkbox"/>		
Write Cycle	0		
Write COV	0.10		
Write Trigger	<input type="checkbox"/>		
Value	12345.00		

10. To write to the Modbus device, you can set it to “Read/Write” or “Write”. Change the value directly and then press “Enter” to write to the Modbus register.

Active	<input checked="" type="checkbox"/>	Device Settings	
Address	190	Word Swap	<input type="checkbox"/>
Point Type	Holding Register	Endians	<input type="checkbox"/>
Data Type	UI	Write Multiple Registers	<input type="checkbox"/>
Read/Write	Read/Write	Write Multiple Bits	<input type="checkbox"/>
Factor	1.00		
Offset	0.00		
Read Cycle	2		
Read Trigger	<input type="checkbox"/>		
Write Cycle	0		
Write COV	0.10		
Write Trigger	<input type="checkbox"/>		
Value	1234.00		

11. Change the “Data Type” to “FL” if you want to read a 32-bits floating point value. Please note that you may get an error (like below in “Status”) if you want to read/write (or write) to the FL point.

Active	<input checked="" type="checkbox"/>	Device Settings	
Address	190	Word Swap	<input type="checkbox"/>
Point Type	Holding Register	Endians	<input type="checkbox"/>
Data Type	FL	Write Multiple Registers	<input type="checkbox"/>
Read/Write	Read/Write	Write Multiple Bits	<input type="checkbox"/>
Factor	1.00		
Offset	0.00		
Read Cycle	2		
Read Trigger	<input type="checkbox"/>		
Write Cycle	0		
Write COV	0.10		
Write Trigger	<input type="checkbox"/>		
Value	123.60		
Status	Singel write is set on the associated device module		

12. This is because 32-bits floating point use 2 Modbus registers, so you have to enable “Write Multiple Registers” in the Modbus device module (like below) to make it working without error.

Active	<input checked="" type="checkbox"/>	Device Settings	
Address	190	Word Swap	<input type="checkbox"/>
Point Type	Holding Register	Endians	<input type="checkbox"/>
Data Type	FL	Write Multiple Registers	<input checked="" type="checkbox"/>
Read/Write	Read/Write	Write Multiple Bits	<input type="checkbox"/>
Factor	1.00		
Offset	0.00		
Read Cycle	2		
Read Trigger	<input type="checkbox"/>		
Write Cycle	0		
Write COV	0.10		
Write Trigger	<input type="checkbox"/>		
Value	123.60		
Status	OK		

13. This new Modbus module supports many different data types, including 64-bits floating point and integer. Please note that the 64-bits Modbus value are convert to 32-bits floating point in our controller, so the accuracy is not as accurate as in the Modbus device. (**Note:** DO NOT write to 64-bits Modbus registers using this module).

Active	<input checked="" type="checkbox"/>
Address	190
Point Type	Holding Register
Data Type	FL
Read/Write	UI
Factor	SI
Offset	ULI
Read Cycle	SLI
Read Trigger	UI64
Write Cycle	SI64
Write COV	FL
Write Trigger	FL64

14. Using this module, you can also read (and/or write) other Modbus tables like “Coil”, “Discrete Input” and “Input Register”.

Active	<input checked="" type="checkbox"/>	Device Settings	
Address	0	Word Swap	<input type="checkbox"/>
Point Type	Coil	Endians	<input type="checkbox"/>
Data Type	Coil	Write Multiple Registers	<input type="checkbox"/>
Read/Write	Discrete Input Holding Register Input Register	Write Multiple Bits	<input type="checkbox"/>
Factor	0.00		
Offset	0.00		
Read Cycle	2		
Read Trigger	<input type="checkbox"/>		
Write Cycle	0		
Write COV	0.10		
Write Trigger	<input type="checkbox"/>		
Value	1.00		
Status	OK		

15. If the Modbus device is offline, etc. You will see an error message in the “Status”.

Active	<input checked="" type="checkbox"/>	Device Settings	
Address	0	Word Swap	<input type="checkbox"/>
Point Type	Coil	Endians	<input type="checkbox"/>
Data Type	UI	Write Multiple Registers	<input type="checkbox"/>
Read/Write	Read/Write	Write Multiple Bits	<input type="checkbox"/>
Factor	1.00		
Offset	0.00		
Read Cycle	2		
Read Trigger	<input type="checkbox"/>		
Write Cycle	0		
Write COV	0.10		
Write Trigger	<input type="checkbox"/>		
Value	1.00		
Status	Reply Timeout, reply of the Modbus station too late or not received		

16. To use COM3 on the controller for Modbus RTU communication, set “Mode” to 0, like below. Then set the COM port, baudrate, etc.

The screenshot shows the '01: DCS.Open' configuration window. On the left is a tree view with the following items: AHU, AHU, Events, Modbus Device, Modbus FL 1, Modbus FL 1, Modbus License, Modbus Master (selected), Password, Circuit times, General, OPEN IO-modules, Service controller, and system. On the right is a list of settings for the selected 'Modbus Master' module:

Active	(1)
Mode	(0)
	(192.168.170.189)
IP-Port	502
COM-Port	3
Baudrate	4
Databits	2
Parity	1
Stopbits	1
Interface No.	1
Send Delay(ms)	50
Status	0
COM-Quality (%)	96
Reset Output	0
	(9600,8,N,1)

17. Another good thing for this new Modbus module is that we can now use Modbus IP, Modbus RTU at COM3 and Modbus RTU at COM2 and the same time.

18. With this new Modbus module, you can use this simple FUP program to test your Modbus device easily. Now you don't need to use any 3rd party software for testing anymore.

The screenshot shows the '01: DCS.Open' configuration window. On the left is a tree view with the following items: AHU, AHU, Events, Modbus Device, Modbus FL 1, Modbus FL 1 (selected), Modbus License, Modbus Master, Password, Circuit times, General, OPEN IO-modules. On the right is a 'Device Settings' dialog box with the following settings:

Active	<input checked="" type="checkbox"/>
Address	0
Point Type	Coil
Data Type	UI
Read/Write	Read/Write
Factor	1.00
Offset	0.00
Read Cycle	2
Read Trigger	<input type="checkbox"/>
Write Cycle	0
Write COV	0.10
Write Trigger	<input type="checkbox"/>
Value	1.00
Status	OK

On the right side of the dialog box, there are additional settings under the 'Device Settings' header:

Word Swap	<input type="checkbox"/>
Endians	<input type="checkbox"/>
Write Multiple Registers	<input type="checkbox"/>
Write Multiple Bits	<input type="checkbox"/>

19. Please note that all Modbus point value are convert to floating point in this module. So, if you're using integer type value, e.g. UI, ULI, etc., and don't want the conversion, we have 2 other modules for this purpose, and will explain them in another TT.