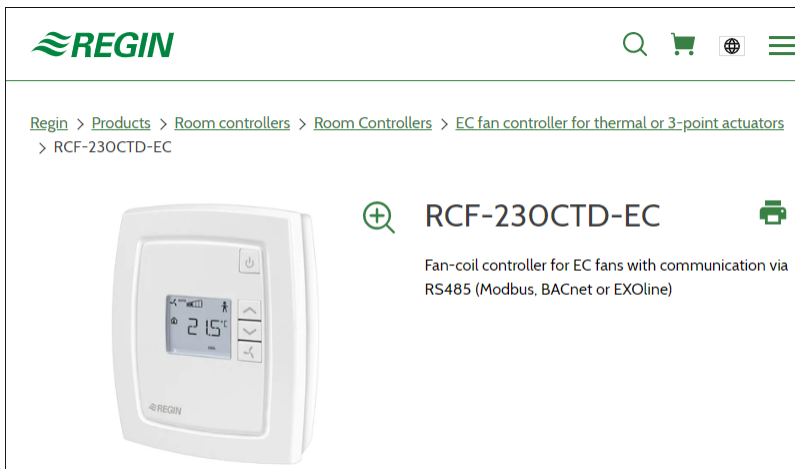


TT230504 – OFXL - Modbus Module Multiple Devices

1. In most of the projects, you will have many Modbus devices which are the same, and you need to setup the device's parameters for all of them. For example, we want to set the below room controller to cooling only (default is auto heating/cooling).

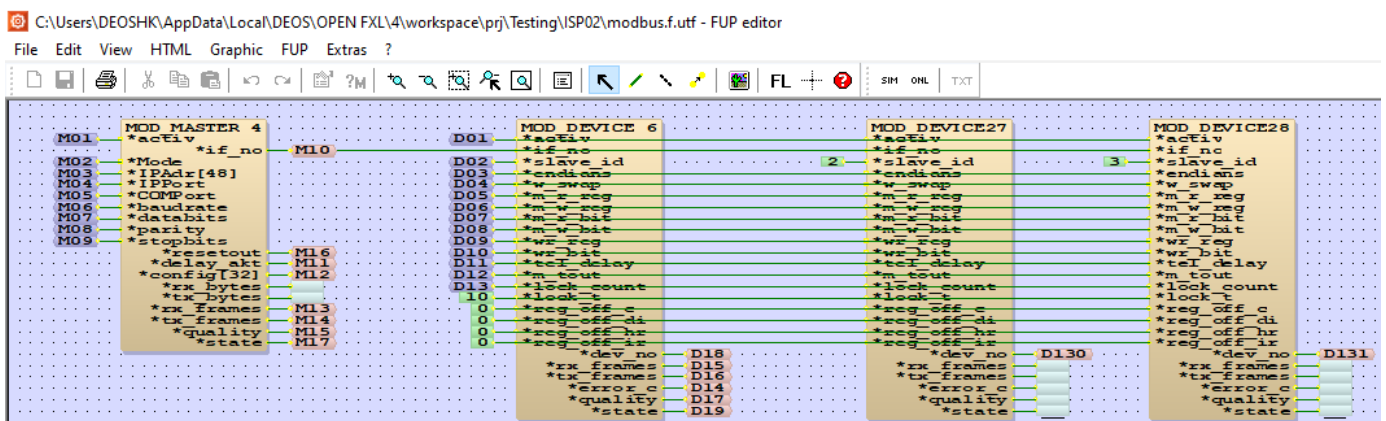


2. In this document, we will show you how to change all the devices settings easily with the new Modbus modules. In this case, we will need to change the Modbus holding register address 13 with a value of 1.

Holding register

Name of signal	Type	Modbus address	Default setting	Description
RC_Setp_X.RegioChangeOverSelect	X,3	13	RCFM-230Cxx = 0 RCF-230Cxx = 2	Manual/Auto Change-over (0=Heating, 1=Cooling, 2=Auto)

3. We continue from the last few TT regarding the new Modbus module. This time, we add 2 more Modbus devices to the 2nd Modbus master module.



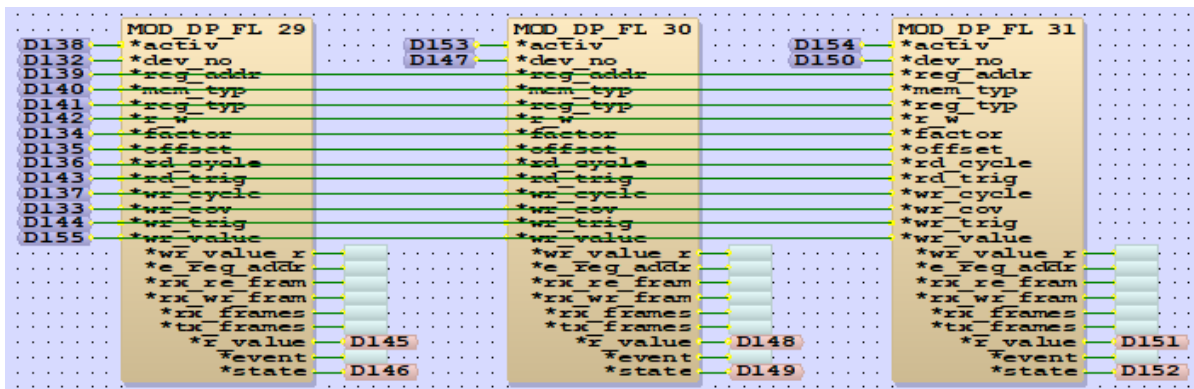
4. Since these Modbus devices are all the same, so the settings in the Modbus device module should also be the same. Therefore, we can just connect the “Input” together, except for the “slave_id”. To make it simple for testing, we use “Constant” and set them to 2 and 3 respectively.
5. In the HTML page, we put the 2 “dev_no” to the bottom right corner. This is used to show the “dev_no” for these 2 new Modbus device modules.

Modbus Device

Wednesday, 26.04.2023, 14:29

Modbus Device		Modbus Device		Modbus Device	
Active	(0)	Active	(0)	Active	(0)
Device ID	iiii	Device ID	iiii	Device ID	iiii
Endians	(0)	Endians	(0)	Endians	(0)
Wordswap	(0)	Wordswap	(0)	Wordswap	(0)
Max r register	iii	Max r register	iii	Max r register	iii
Max w register	iii	Max w register	iii	Max w register	iii
Max r Bits	iiii	Max r Bits	iiii	Max r Bits	iiii
Max w Bits	iiii	Max w Bits	iiii	Max w Bits	iiii
Reg. write Mode	(0)	Reg. write Mode	(0)	Reg. write Mode	(0)
Coil write Mode	(0)	Coil write Mode	(0)	Coil write Mode	(0)
Telegram delay	iiii	Telegram delay	iiii	Telegram delay	iiii
Max Timeout	iiii	Max Timeout	iiii	Max Timeout	iiii
Lock count	iiii	Lock count	iiii	Lock count	iiii
Rx Teleg.	iiii	Rx Teleg.	iiii	Rx Teleg.	iiii
Tx Teleg.	iiii	Tx Teleg.	iiii	Tx Teleg.	iiii
COM-Quality	iiii	COM-Quality	iiii	COM-Quality	iiii
Status	iii	Status	iii	Status	iii
Faulty Teleg.	iiii	Faulty Teleg.	iiii	Faulty Teleg.	iiii
Device Number	iiii	Device Number	iiii	Device Number	iiii

6. Now we add 3 "MOD_DP_FL" modules and connect them like below.



7. Set the HTML page like below.

Modbus Multiple

Wednesday, 26.04.2023, 14:36

Modbus Multiple		Modbus Multiple	
Register Ad.	iiii	Active	(0)
Data type	iiii	Device No.	iiii
Point type	iiii	FL Value	-ffff,f
Read/Write	iiii	Status:	iiii
Factor	-ffff,f	Active	(0)
Offset	-ffff,f	Device No.	iiii
Read cycle	iiii	FL Value	-ffff,f
Read Trigger	(0)	Status:	iiii
Write cycle	iiii	Active	(0)
Write COV	-ffff,f	Device No.	iiii
Write Value	-ffff,f	FL Value	-ffff,f
Write Trigger	(0)	Status:	iiii

8. Here are the default settings we used in this example. We set "r_w" to 3 as we want to write to the register. Also, we want to write to the register only when we trigger it manually (via "wr_trigger"). So, we set "wr_cov" to a very high value, such that it won't trigger the write automatically. We also don't want to write to the registers accidentally, so we set "active" to 0 by default.

Modbus Multiple

Wednesday, 26.04.2023, 14:36

Modbus Multiple		Modbus Multiple	
Register Ad.	0	Active	(0)
Data type	3	Device No.	2000
Point type	1	FL Value	0.0
Read/Write	3	Status:	0
Factor	1.0	Active	(0)
Offset	0.0	Device No.	2001
Read cycle	0.2	FL Value	0.0
Read Trigger	(0)	Status:	0
Write cycle	(0)	Active	(0)
Write COV	99999.0	Device No.	2002
Write Value	1.0	FL Value	0.0
Write Trigger	(0)	Status:	0

9. The graphic page is setup like this.

C:\Users\DEOSHK\AppData\Local\DEOS\OPEN FXL\4\workspace\prj\Testing\ISP02\modbus.f.utf - FUP Graphic Editor

File Edit Element View Extras Help

Zoom 100%

Address	####
Point Type	Coil
Data Type	UI
Read/Write	Read
Factor	####
Offset	####
Read Cycle	####
Read Trigger	[]
Write Cycle	####
Write COV	####
Write Trigger	[]
Write Value	####

Active	[]
Device No.	####
Value	#####.##
Status	OK

Active	[]
Device No.	####
Value	#####.##
Status	OK

Active	[]
Device No.	####
Value	#####.##
Status	OK

10. Create and load the controller. You should see like below in the “Modbus Multiple” graphic page. If not, then you may need to do a “preset” of the controller.

▼ 01: DCS.Open

- AHU
- AHU
- Events
- Modbus Device
- Modbus FL 1
- Modbus FL 1
- Modbus FL 2
- Modbus FL 2
- Modbus License
- Modbus Master
- Modbus Multiple
- Modbus Multiple

Address	0
Point Type	Holding Register
Data Type	UI
Read/Write	Read/Write
Factor	1.00
Offset	0.00
Read Cycle	2
Read Trigger	[]
Write Cycle	0
Write COV	99999.00
Write Trigger	[]
Write Value	1.00

Active	[]
Device No.	2000
Value	0.00
Status	Modbus data point inactive

Active	[]
Device No.	2001
Value	0.00
Status	Modbus data point inactive

Active	[]
Device No.	2002
Value	0.00
Status	Modbus data point inactive

11. You can find the correct “Device No.” from the “Modbus Device” page.

▼ 01: DCS.Open

- AHU
- AHU
- Events
- Modbus Device
- Modbus FL 1
- Modbus FL 1
- Modbus FL 2
- Modbus FL 2
- Modbus License
- Modbus Master
- Modbus Multiple
- Modbus Multiple
- Modbus RCF-230C
- Modbus RCF-230C
- Modbus UI and ULI
- Modbus UL ad ULI
- Password
- Circuit times

Active	(1)	Active	(1)	Active	(1)
Device ID	1	Device ID	1	Device ID	1
Endians	(0)	Endians	(0)	Endians	(0)
Wordswap	(0)	Wordswap	(0)	Wordswap	(0)
Max r register	30	Max r register	30	Max r register	30
Max w register	30	Max w register	30	Max w register	30
Max r Bits	30	Max r Bits	30	Max r Bits	30
Max w Bits	30	Max w Bits	30	Max w Bits	30
Reg. write Mode	(0)	Reg. write Mode	(0)	Reg. write Mode	(0)
Coil write Mode	(0)	Coil write Mode	(0)	Coil write Mode	(0)
Telegram delay	50	Telegram delay	50	Telegram delay	50
Max Timeout	200	Max Timeout	200	Max Timeout	200
Lock count	20	Lock count	20	Lock count	20
Rx Telegr.	0	Rx Telegr.	519	Rx Telegr.	0
Tx Telegr.	0	Tx Telegr.	520	Tx Telegr.	0
COM-Quality	0	COM-Quality	100	COM-Quality	0
Status	8	Status	0	Status	0
Faulty Telegr.	0	Faulty Telegr.	0	Faulty Telegr.	0
Device Number	1000	Device Number	2000	Device Number	3000

12. Check if the device no. are correct, set the address correctly (13 - 1 = 12), and then set the points to “Active”. You should now see the parameter in each room controller. In this example, device 1 and 2 have different values and device 3 is offline.

<div> <div>ARU</div> <div> <div>Events</div> <div>Modbus Device</div> <div>Modbus FL 1</div> <div>Modbus FL 1</div> <div>Modbus FL 2</div> <div>Modbus FL 2</div> <div>Modbus License</div> <div>Modbus Master</div> <div>Modbus Multiple</div> <div>Modbus Multiple</div> <div>Modbus RCF-230C</div> </div> </div>	<table> <tr> <td>Address</td> <td>12</td> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Point Type</td> <td>Holding Register</td> <td>Device No.</td> <td>2000</td> </tr> <tr> <td>Data Type</td> <td>UI</td> <td>Value</td> <td>1.00</td> </tr> <tr> <td>Read/Write</td> <td>Read/Write</td> <td>Status</td> <td>OK</td> </tr> <tr> <td>Factor</td> <td>1.00</td> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Offset</td> <td>0.00</td> <td>Device No.</td> <td>2001</td> </tr> <tr> <td>Read Cycle</td> <td>2</td> <td>Value</td> <td>2.00</td> </tr> <tr> <td>Read Trigger</td> <td><input type="checkbox"/></td> <td>Status</td> <td>OK</td> </tr> <tr> <td>Write Cycle</td> <td>0</td> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Write COV</td> <td>99999.00</td> <td>Device No.</td> <td>2002</td> </tr> <tr> <td>Write Trigger</td> <td><input type="checkbox"/></td> <td>Value</td> <td>0.00</td> </tr> <tr> <td>Write Value</td> <td>1.00</td> <td>Status</td> <td>Reply Timeout, reply of the Modbus station too late</td> </tr> </table>	Address	12	Active	<input checked="" type="checkbox"/>	Point Type	Holding Register	Device No.	2000	Data Type	UI	Value	1.00	Read/Write	Read/Write	Status	OK	Factor	1.00	Active	<input checked="" type="checkbox"/>	Offset	0.00	Device No.	2001	Read Cycle	2	Value	2.00	Read Trigger	<input type="checkbox"/>	Status	OK	Write Cycle	0	Active	<input checked="" type="checkbox"/>	Write COV	99999.00	Device No.	2002	Write Trigger	<input type="checkbox"/>	Value	0.00	Write Value	1.00	Status	Reply Timeout, reply of the Modbus station too late
Address	12	Active	<input checked="" type="checkbox"/>																																														
Point Type	Holding Register	Device No.	2000																																														
Data Type	UI	Value	1.00																																														
Read/Write	Read/Write	Status	OK																																														
Factor	1.00	Active	<input checked="" type="checkbox"/>																																														
Offset	0.00	Device No.	2001																																														
Read Cycle	2	Value	2.00																																														
Read Trigger	<input type="checkbox"/>	Status	OK																																														
Write Cycle	0	Active	<input checked="" type="checkbox"/>																																														
Write COV	99999.00	Device No.	2002																																														
Write Trigger	<input type="checkbox"/>	Value	0.00																																														
Write Value	1.00	Status	Reply Timeout, reply of the Modbus station too late																																														

13. We want to set all of them to “Cooling”, so we set “Write Value” to 1 and then enable “Write Trigger”.

<table> <tr> <td>Address</td> <td>12</td> </tr> <tr> <td>Point Type</td> <td>Holding Register</td> </tr> <tr> <td>Data Type</td> <td>UI</td> </tr> <tr> <td>Read/Write</td> <td>Read/Write</td> </tr> <tr> <td>Factor</td> <td>1.00</td> </tr> <tr> <td>Offset</td> <td>0.00</td> </tr> <tr> <td>Read Cycle</td> <td>2</td> </tr> <tr> <td>Read Trigger</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Write Cycle</td> <td>0</td> </tr> <tr> <td>Write COV</td> <td>99999.00</td> </tr> <tr> <td>Write Trigger</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Write Value</td> <td>1.00</td> </tr> </table>	Address	12	Point Type	Holding Register	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	99999.00	Write Trigger	<input checked="" type="checkbox"/>	Write Value	1.00	<table> <tr> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Device No.</td> <td>2000</td> </tr> <tr> <td>Value</td> <td>1.00</td> </tr> <tr> <td>Status</td> <td>OK</td> </tr> <tr> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Device No.</td> <td>2001</td> </tr> <tr> <td>Value</td> <td>2.00</td> </tr> <tr> <td>Status</td> <td>OK</td> </tr> <tr> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Device No.</td> <td>2002</td> </tr> <tr> <td>Value</td> <td>0.00</td> </tr> <tr> <td>Status</td> <td>There is an error at the corresponding device modul</td> </tr> </table>	Active	<input checked="" type="checkbox"/>	Device No.	2000	Value	1.00	Status	OK	Active	<input checked="" type="checkbox"/>	Device No.	2001	Value	2.00	Status	OK	Active	<input checked="" type="checkbox"/>	Device No.	2002	Value	0.00	Status	There is an error at the corresponding device modul
Address	12																																																
Point Type	Holding Register																																																
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	99999.00																																																
Write Trigger	<input checked="" type="checkbox"/>																																																
Write Value	1.00																																																
Active	<input checked="" type="checkbox"/>																																																
Device No.	2000																																																
Value	1.00																																																
Status	OK																																																
Active	<input checked="" type="checkbox"/>																																																
Device No.	2001																																																
Value	2.00																																																
Status	OK																																																
Active	<input checked="" type="checkbox"/>																																																
Device No.	2002																																																
Value	0.00																																																
Status	There is an error at the corresponding device modul																																																

14. The controller will then write “1” to all the room controllers. After you see all “value” become 1, then you can disable “Write Trigger”. Now all room controllers are all in “Cooling” mode, except the one that are offline.

<table> <tr> <td>Address</td> <td>12</td> </tr> <tr> <td>Point Type</td> <td>Holding Register</td> </tr> <tr> <td>Data Type</td> <td>UI</td> </tr> <tr> <td>Read/Write</td> <td>Read/Write</td> </tr> <tr> <td>Factor</td> <td>1.00</td> </tr> <tr> <td>Offset</td> <td>0.00</td> </tr> <tr> <td>Read Cycle</td> <td>2</td> </tr> <tr> <td>Read Trigger</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Write Cycle</td> <td>0</td> </tr> <tr> <td>Write COV</td> <td>99999.00</td> </tr> <tr> <td>Write Trigger</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Write Value</td> <td>1.00</td> </tr> </table>	Address	12	Point Type	Holding Register	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	99999.00	Write Trigger	<input type="checkbox"/>	Write Value	1.00	<table> <tr> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Device No.</td> <td>2000</td> </tr> <tr> <td>Value</td> <td>1.00</td> </tr> <tr> <td>Status</td> <td>OK</td> </tr> <tr> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Device No.</td> <td>2001</td> </tr> <tr> <td>Value</td> <td>1.00</td> </tr> <tr> <td>Status</td> <td>OK</td> </tr> <tr> <td>Active</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Device No.</td> <td>2002</td> </tr> <tr> <td>Value</td> <td>0.00</td> </tr> <tr> <td>Status</td> <td>There is an error at the corresponding device modul</td> </tr> </table>	Active	<input checked="" type="checkbox"/>	Device No.	2000	Value	1.00	Status	OK	Active	<input checked="" type="checkbox"/>	Device No.	2001	Value	1.00	Status	OK	Active	<input checked="" type="checkbox"/>	Device No.	2002	Value	0.00	Status	There is an error at the corresponding device modul
Address	12																																																
Point Type	Holding Register																																																
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	99999.00																																																
Write Trigger	<input type="checkbox"/>																																																
Write Value	1.00																																																
Active	<input checked="" type="checkbox"/>																																																
Device No.	2000																																																
Value	1.00																																																
Status	OK																																																
Active	<input checked="" type="checkbox"/>																																																
Device No.	2001																																																
Value	1.00																																																
Status	OK																																																
Active	<input checked="" type="checkbox"/>																																																
Device No.	2002																																																
Value	0.00																																																
Status	There is an error at the corresponding device modul																																																

15. Since you can change the “Device No.” online, this means you can write to the room controllers on different channels (i.e. Modbus Master module) as well.
16. In this example, we change the “Device No.” of the 3rd device to 1000, which is connected through a Modbus RTU to IP Modbus router. In this example, the value in this room controller is 0 (i.e. heating).

Address	12	Active	<input checked="" type="checkbox"/>
Point Type	Holding Register	Device No.	2000
Data Type	UI	Value	1.00
Read/Write	Read/Write	Status	OK
Factor	1.00	Active	<input checked="" type="checkbox"/>
Offset	0.00	Device No.	2001
Read Cycle	2	Value	1.00
Read Trigger	<input type="checkbox"/>	Status	OK
Write Cycle	0	Active	<input checked="" type="checkbox"/>
Write COV	99999.00	Device No.	1000
Write Trigger	<input type="checkbox"/>	Value	0.00
Write Value	1.00	Status	OK

17. Now, trigger the write again, and it will become 1 as well (i.e. cooling). Note: remember to disable the trigger after finish writing each time.

Address	12	Active	<input checked="" type="checkbox"/>
Point Type	Holding Register	Device No.	2000
Data Type	UI	Value	1.00
Read/Write	Read/Write	Status	OK
Factor	1.00	Active	<input checked="" type="checkbox"/>
Offset	0.00	Device No.	2001
Read Cycle	2	Value	1.00
Read Trigger	<input type="checkbox"/>	Status	OK
Write Cycle	0	Active	<input checked="" type="checkbox"/>
Write COV	99999.00	Device No.	1000
Write Trigger	<input checked="" type="checkbox"/>	Value	1.00
Write Value	1.00	Status	OK

18. If you enter an incorrect "Device No.", you will see the below message.

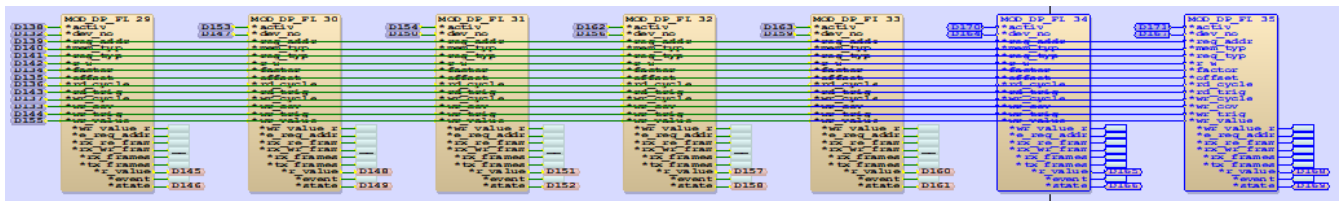
Active	<input checked="" type="checkbox"/>
Device No.	1234
Value	1.00
Status	No associated DEVICE module

19. You can now change other parameters in the room controllers by changing the address (e.g. PID parameters). You can also change the parameters in other point type, e.g. "Coil". Note: remember to set all the points to inactive if you've finished the setup, like below.

Address	16	Active	<input type="checkbox"/>
Point Type	Coil	Device No.	2000
Data Type	UI	Value	1.00
Read/Write	Read/Write	Status	Modbus data point inactive
Factor	1.00	Active	<input type="checkbox"/>
Offset	0.00	Device No.	2001
Read Cycle	2	Value	1.00
Read Trigger	<input type="checkbox"/>	Status	Modbus data point inactive
Write Cycle	0	Active	<input type="checkbox"/>
Write COV	99999.00	Device No.	1234
Write Trigger	<input type="checkbox"/>	Value	1.00
Write Value	1.00	Status	No associated DEVICE module

20. You can also use this to do many other things. For example, you can check all the room temperatures, by setting the "Point Type" to "Input Register", "Read/Write" to "Read", "Address" to 10, and "Factor" to 0.1.

21. You can expand this to read/write as many room controllers as you like, by simply copying and pasting the modules, like below.



22. With this new Modbus modules, you can easily set all the required parameters in all room controllers at the same time. You don't need to set them up one by one using the keypad on the room controller, or using a 3rd party Modbus tool any more.