UCM/Modbus Programming Manual

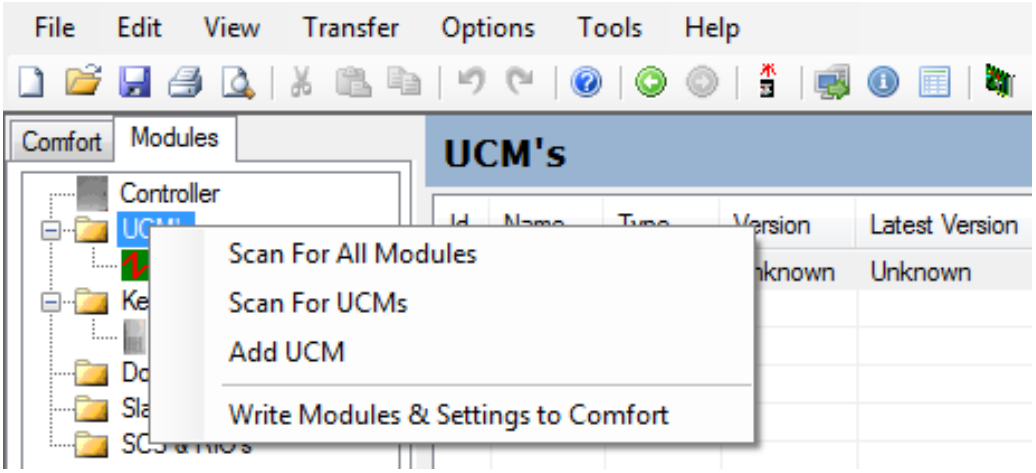
INTRODUCTION

Please read the UCM/Modbus Quick Start Guide for Introduction, Installation, Setup and Specifications. Please download http://www.cytech.biz/ucmmodbus-485.html

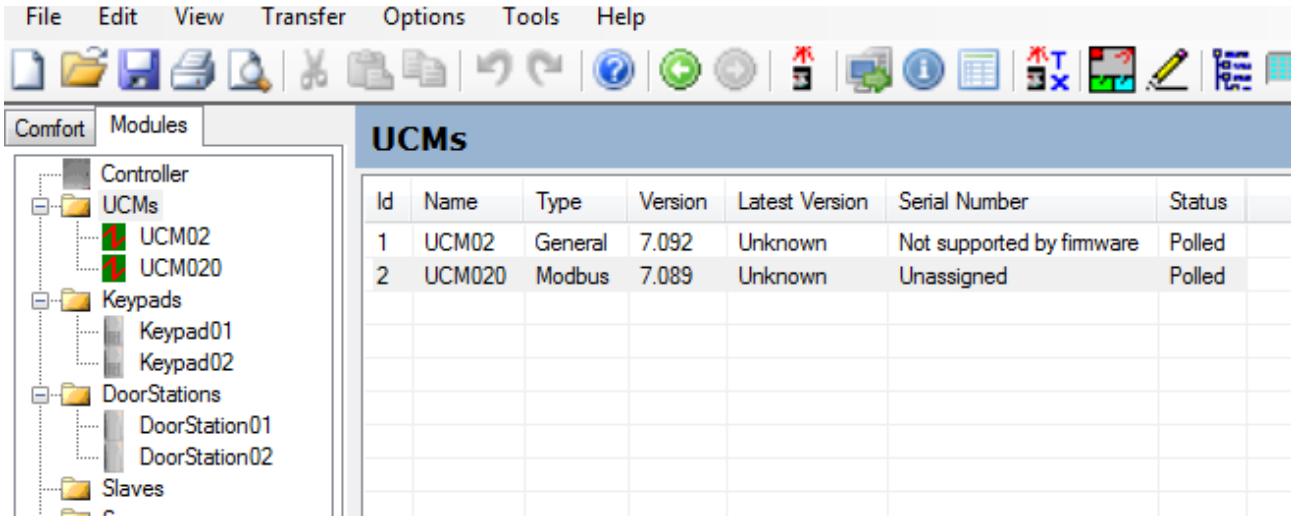
CONFIGURATION

Using Comfigurator

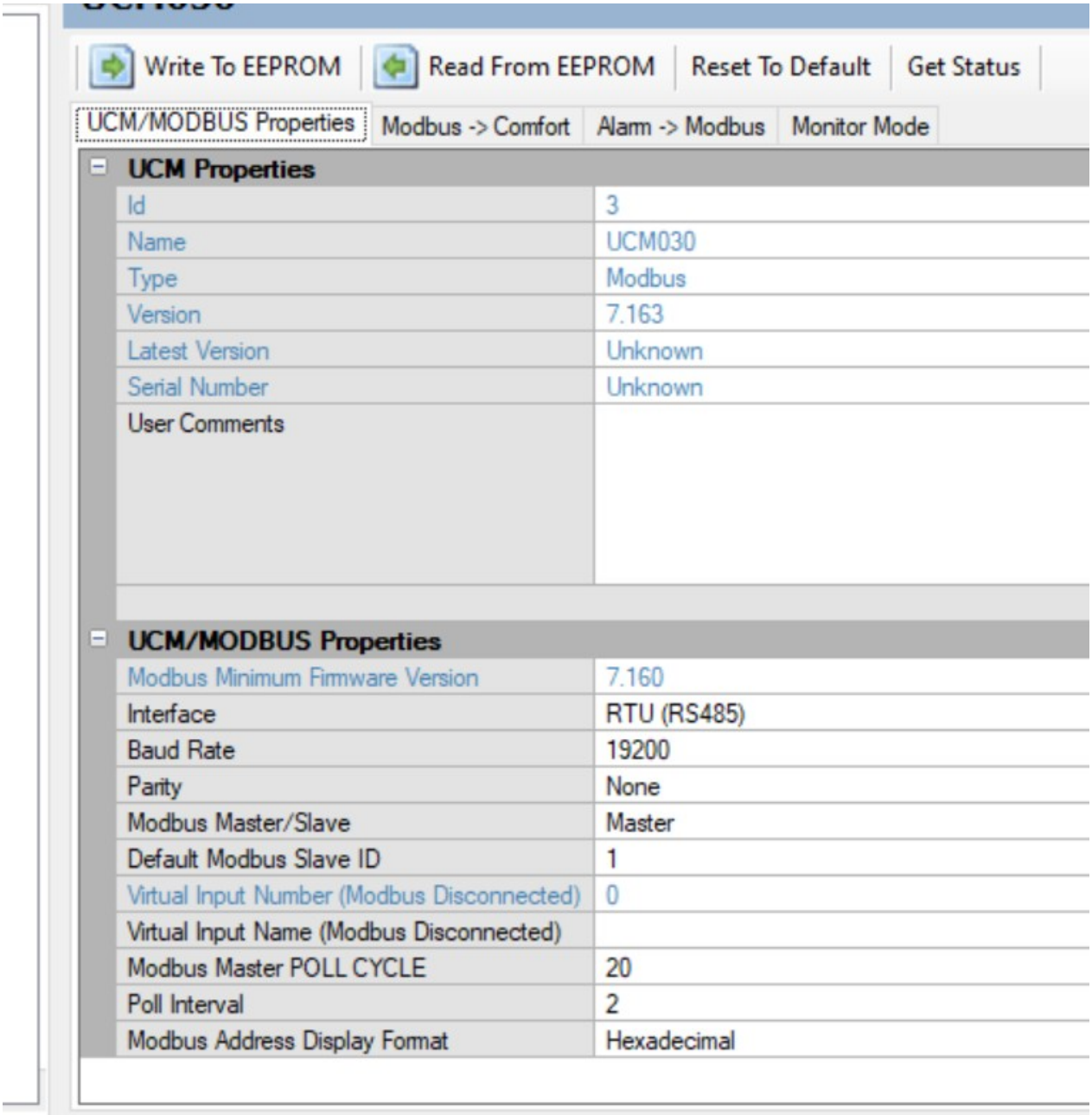
Use the latest Comfigurator to configure UCM/Modbus. The software can be downloaded from http://www.cytech.biz/comfigurator.html
A UCM/USB or UCM/Ethernet is required to connect to the computer running Comfigurator. Run Comfigurator, go to the Modules Tab and right-click on UCMs folder symbol as shown below.



"Scan for All Modules" will automatically detect all UCMs including the UCM/Modbus if the ID is set correctly without any conflict with other UCMs.
"Add UCM" allows you to manually add a UCM/Modbus if not currently connected to Comfort, i.e. when doing programming off-line.
The result of scanning or adding a UCM/Modbus is shown below for UCM Id 2. The UCM/USB or UCM/Ethernet at ID-1 is also shown.



Click on the Modbus UCM on the left pane. This brings up the Modbus Configurator as shown below;



UCM/Modbus Properties

UCM Properties

ID	1 to max for UCM RS485 ID
Name	as in Modules > UCM
Type	Modbus (subtype 27)
Version	UCM/Modbus firmware version eg 7.096

UCM/Modbus Properties

Parameter	**Description**
Interface	RTU(RS485) or TCP
Baud Rate	2400, 4800, 9600, 19200, 38400, 76800 **Select Baud rate of Modbus/RTU**

Parameter	Description only
Parity	Even, Odd, None
Modbus Master/Slave	Master or Slave. Master will communicate with Modbus Slave. A Slave will communicate with a Modbus Master.
Default Modbus Slave ID	1 to 247. Modbus ID of Slave when UCM is Master, or Modbus ID of UCM/Modbus UCM when UCM/Modbus is Slave. **NOTE THAT THIS IS NOT THE SAME AS THE UCM ID on the Comfort RS485 Bus**
Virtual Input Name (Modbus Disconnected)	Select a Virtual Input which is activated when UCM/Modbus Master does not get any reply from the Modbus Slave. This can trigger an Alarm
Modbus Master Poll Cycle	Time between each cycle of polls for entire Modbus to Comfort table to Slave in 50 ms interval (UCM/Modbus 7.163 required).
Poll Interval	Time between Polls to Slave in 50 ms units Comfigurator 3.13.7, Modbus 7.148 required
Modbus Address Display Format	Select Decimal or Hexadecimal display format for the Modbus Registers

Comfort Server Manager (ETH03) - Modbus TCP

This is seen only when TCP is selected. It opens the Comfort Server manager for selection of TCP Address and Port and selection of Client (Modbus Master) or Server (Modbus Slave) Mode

Notes

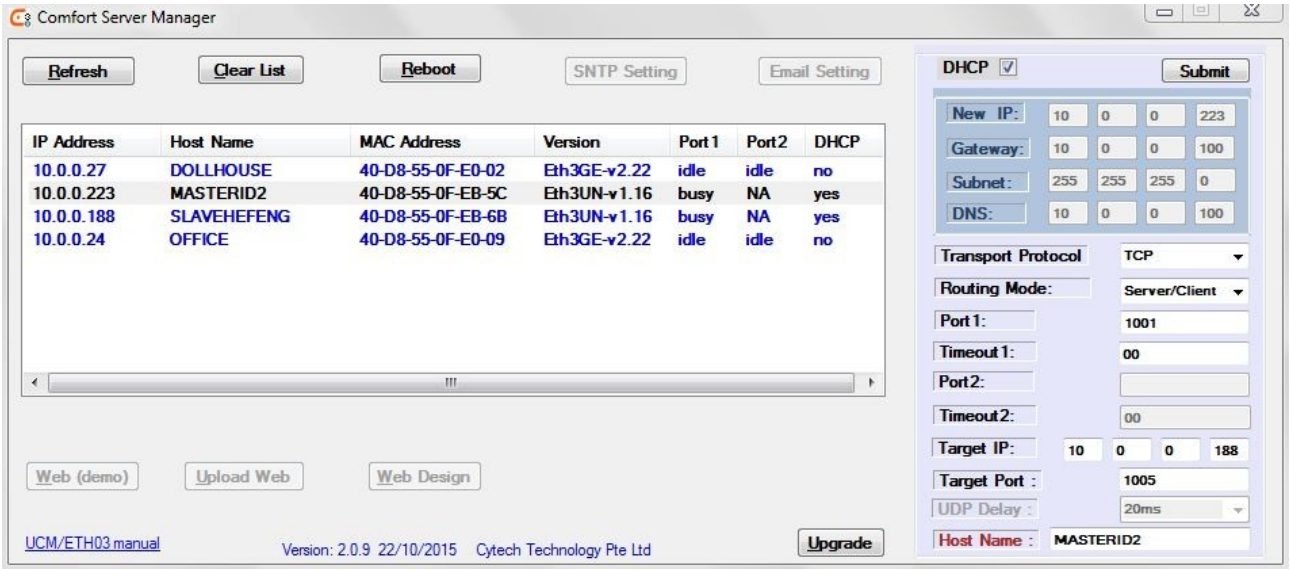
In general, if Comfort is controlling another Modbus device, UCM/Modbus should be a Master, and the other device should be a Slave. If another device is controling Comfort, then UCM/Modbus should be a Slave and the other device a Master. Modbus Software with GUI functions are normally Masters. One master can be in the same Modbus network with many Modbus Slaves.
For UCM/Modbus as Slave, Modbus to Comfort and Alarm To Modbus Tabs are not applicable. See the section on UCM/Modbus as Server/Slave in this manual. UCM/Modbus can either be Master or Slave at any one time.

Notes for Modbus/TCP Master Mode

*** For Modbus/TCP ignore Baud Rate.**
For Modbus/TCP, the Master is also referred to as Client and the Slave is referred to as Server.
The Modbus/TCP Master should set the Target IP and Port to the Modbus Slave which it is communicating with.
For TCP Interface, the ETH03 Universal 1.16 Firmware or above (not ETH03-General) must be used (this is preinstalled in the ETH03 for UCM/Modbus/ETH03).

In Comfigurator > Options> Settings, select Network (Local) and click on Comfort Server Manager to select the IP address and Port for the ETH03. The screen below should pop up. The screenshot shows 4 ETH03 devices in the same network, the 2nd item is ETH03 Universal Firmware version 1.16 with IP address 10.0.0.233, which is the UCM/ETH03 used as Modbus Master and ignore the other ETH03s if present. Click on this line to show the parameters on the right pane.
In Transport Protocol select TCP. In Routing Mode, select Server/Client or Client.

Port 1001 is the port used by ETH03 – enter any port >= 1001. For Timeout, enter 0 (can ignore as Client Mode does not time out).
Target IP and Port – enter the IP address and Port of the Modbus Slave device. This allows the UCM/Modbus master to talk to the Modbus Slave. Note that the Slave Modbus devices must comply to the Modbus/TCP standard.



Notes:

- When the UCM/Modbus-ETH03 is communicating with the other Modbus/TCP device, the status in Comfort Server Manager will be BUSY
- Ensure that the other Modbus/TCP Slave device allows the UCM/Modbus IP address to connect with it. There may be settings for the allowable Modbus Master IP Addresses which are allowed.
- Fot Modbud/TCP, the "Slave ID" in Modbus Properties is the "Unit Identifier" of the Modbus Slave device

Menu Bar

Write to EEPROM

This writes the configuration into the UCM/Modbus. This is different from Write to Comfort

Read from EEPROM

This reads the data from UCM/Modbus and displays the data on screen. This is differet fro Tread from Comfort

Reset to Default

This clears all the data in the Modbus configuration to unused, but does not write any data to EEPROM. (after clearing, prompt "Write to eeprom? " should be seen")

Get Status

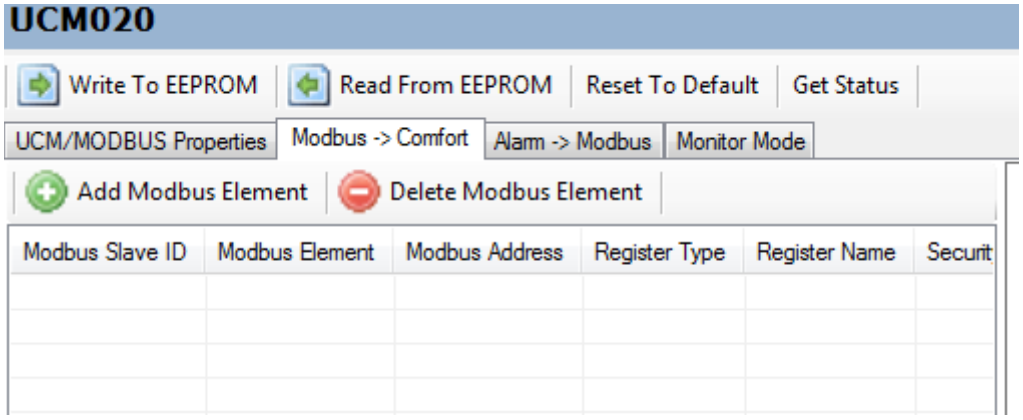
The Get status button causes the UCM/Modbus status to be shown on the status bar on bottom left

- "Normal/No error"
- "EEPROM missing/faulty"
- "EEPROM insufficent capacity"
- "EEPROM data invalid"

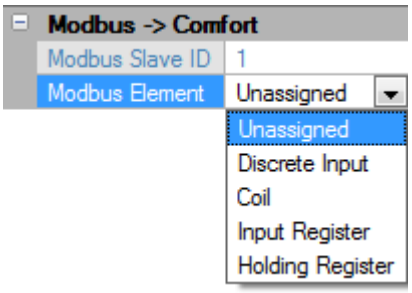
When the cursor is moved away from the UCM/Modbus screen, Get status is automatically turned off, and when the cursor is on the UCM/Modbus screen the get status function is turned on if Comfigurator is logged in

Modbus to Comfort

This is applicable for UCM/Modbus as Master only, not as Slave.
In this tab, the Modbus addresses to be polled are defined and mapped to Comfort registers (Counters, Flags, Sensors, Outputs, Arm Security, Panic, Bypass Zones).
Up to 256 Modbus addresses can be mapped to Comfort



The initial Modbus to Comfort screen is shown above. Press Add Modbus Element



Modbus Slave ID

Select the Modbus Slave ID for each Modbus address. Different Modbus Slave IDs can be selected (UCM/Modbus 7.143). The default Slave ID is specifed in Modbus Properties.

Modbus Element

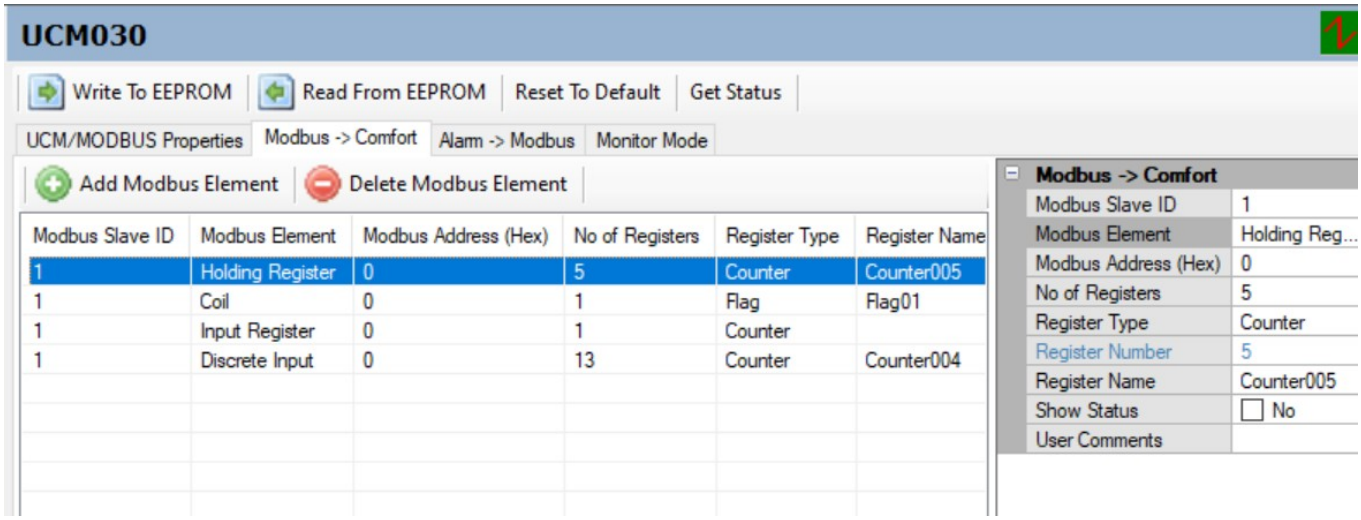
For each line, select the Modbus Element Type from

- Discrete Input
- Coil
- Input Register
- Holding Register

These elements are standard Modbus terminology. Refer to the documentation of the Modbus product that is being interfaced to see what Modbus element type and Register numbers need to be connected to Comfort.

Modbus Address

After selecting the Modbus element (Coil, Discrete Input, Input Register, Holding Register), enter the Modbus Address in Decimal or Hexadecimal notation (depending on the setting in Properties). Modbus Registers have a range from 0 to FFFF Hexadecimal or 0 to 65535 in Decimal.



Avoid entering the same Register number for the same Modbus element type, eg Coil 1000 is entered in the table it should not be duplicated in any of the tables to avoid conflict. Every Modbus device will have a table showing the Modbus element and address and the function related to it, so that other Modbus devices acting as Master can read and/or write to the correct Register.

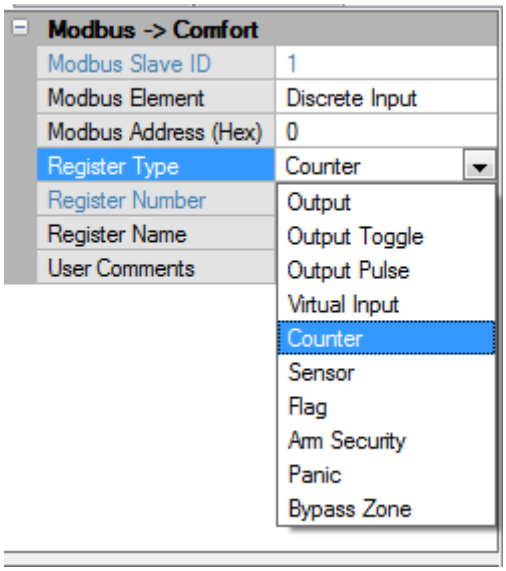
Number Of Registers

The Number of Registers is the number of sequential Modbus registyers to be polled. For example, if Number of Registers = 5, and Modbus Address = 0 (as above), Modbus Registers 0,1,2,3,4 will be polled. The Comfort Register will also be assigned sequentially eg Counter 5, 6,7,8,9 will be mapped to Modbus Holding registers 0 to 4. This speeds up the modbus polling compared to the single register polling method in older UCM/Modbus firmware. UCM/Modbus 7.163 minimum firmware is required.

Comfort Register Mapping

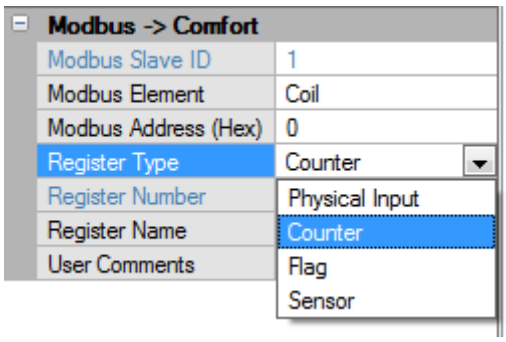
Modbus Registers can be mapped to Comfort Registers. Each Modbus Element Type mapping to Comfort is described below;

Discrete Input

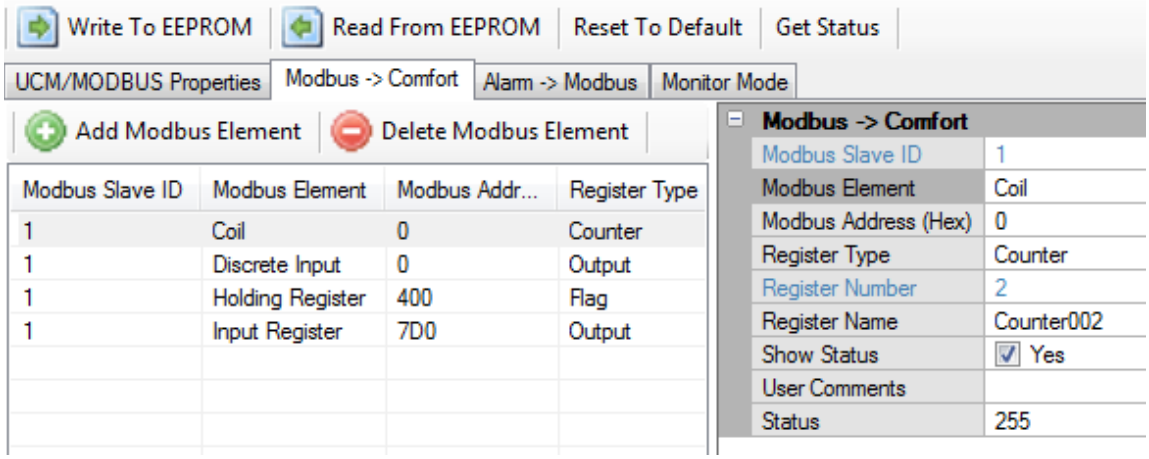


Modbus Discrete Inputs are 1 bit (on/off) registers that can be mapped to Counters, Sensors, Virtual Inputs, Flags, Outputs, Output Toggle, Output Pulse, Arm Security, Panic, Bypass Zone. When mapped to Counters and Sensors, the OFF state is converted to 0, and the On state is converted to 255. When mapped to Counters and Sensors, the Counter or Sensor Response is triggered which can perform programmed functions in Comfort. Modbus Input registers are read only, and cannot be changed by the mapped Comfort register.

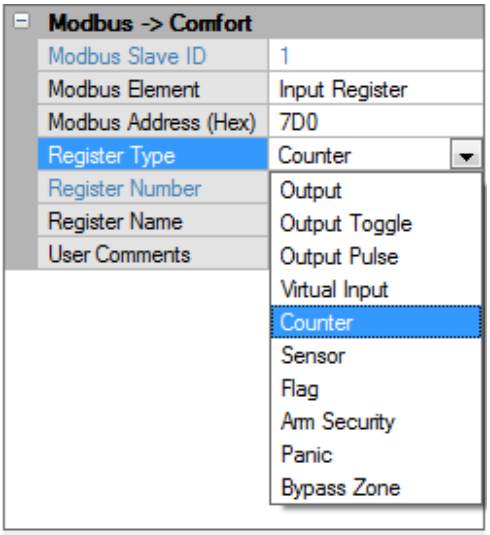
Coil



Modbus Coils are 1 bit (on/off) registers that can be mapped to Counter, Physical Input, Flag or Sensor. When mapped to Counters and Sensors, the Counter or Sensor Response is triggered which can perform programmed functions in Comfort. When mapped to Counters and Sensors, the modbus register value greater than 0 will be converted to 255.

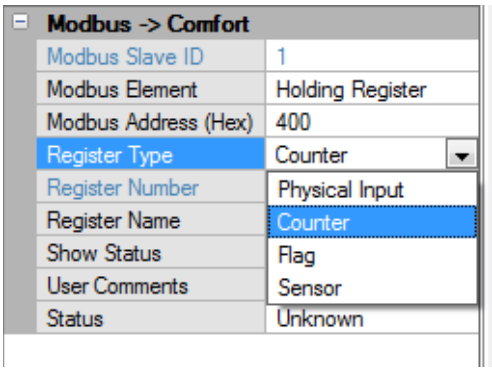


Input Register



Modbus Input Registers are 16-bit registers that can be mapped to Counters, Sensors, Virtual Inputs, Flags, Outputs, Output Toggle, Output Pulse, Arm Security, Panic, Bypass Zone. When mapped to Comfort 1-bit registers (Virtual Inputs, Flags, Outputs, Output Toggle, Output Pulse, Arm Security, Panic, Bypass Zone), any value of the Modbus Input register greater than 0 will be considered to be 1 or ON. When mapped to Counters and Sensors, the Counter or Sensor Response is triggered which can perform programmed functions in Comfort
Modbus Input registers are read only, and cannot be changed by the mapped Comfort register.

Holding Register



Modbus Holding Registers 16-bit registers can be mapped to Counters, Sensors, Physical Inputs, and Flags. Modbus Holding registers are read/write registers and can be changed by any changes in the mapped Comfort registers. When mapped to Counters and Sensors, the Counter or Sensor Response is triggered which can perform programmed functions in Comfort. When mapped to Comfort 1-bit registers (Physical Inputs, Flags) any value greater than 0 is convertred to 1 or ON value for the Physical Input or Flag

The Comfort Register Types are described below

Counter

If Modbus 1-bit (Discrete Inputs, Coils) are mapped to Counter, it means the Modbus Input state Off sets the mapped counter value to 0 and Modbus Input On sets the counter value to 255. The Counter Response (if assigned) is triggered. This allows the Modbus Discrete Input state change to cause a Response to be executed. The Response can check the counter value,

```
eg If Counter 001 = 0 then .
        Do this
        else
        Do that
    endif
```

Modbus Holding and Input Registers are 16 bit registers that can be mapped to Comfort Counters. The 16 bit value from Modbus is written into the mapped Counter register.
Modbus Holding Registers and read/write, and any change in the mapped Comfort counter is also updated to the Modbus Register.
Modbus Input Registers are read only, so changes in Comfort Counters are not updated to the Modbus Register.

Virtual Input

When a 1-bit (On/Off) Modbus register (Coil, Discrete input) is mapped to a Virtual Input, the Modbus register can act like an alarm Input which can cause an alarm when armed, Select a Zone/Input which is not used otherwise. The zone/input can be any unsed zone, even when it is not physically on Comfort or Slave, eg Comfort with only 16 zones, Virtual Input can be on any unused zone from 1 to 16 or >16. When a zone is a virtual input due to mapping by Modbus discrete input, the physical input will not work.

Flag

When When a 1-bit (On/Off) Modbus register (Coil, Discrete input) is mapped to a Flag, the state of the Flag will follow that of the Modbus element On or Off. If the flag state is changed, this causes the mapped Holding Register and Coils to be affected as well. Changes in Flags do not affect Modbus Input Registers and Discrete Inputs.

Output

When When a 1-bit (On/Off) Modbus Discrete Input Register is mapped to an Output, the state of the Output will follow that of the Modbus Element On or Off.
Select Output number.

Output Toggle

When a 1-bit (On/Off) Modbus Discrete Input register is mapped to an Output Toggle, the state of the Output will toggle ie invert state when the Modbus Element turns on.
Select Output number.

Output Pulse

When a 1-bit (On/Off) Modbus Discrete Input register is mapped to an Output Pulse the state of the Output will Pulse on for 1 second when the Modbus Element turns on.
Select Output number.

Arm Security

When a 1-bit (On/Off) Modbus register (Discrete input) is mapped to Arm Security, the security system will arm to the security mode when the Modbus Element turns on. Select the Security Mode to arm to (Away, Night, Day, Vacation).

Panic

When a 1-bit (On/Off) Modbus register (Discrete input) is mapped to Panic, the Modbus element Input will trigger a Panic Alarm when turned on.

Bypass Zone

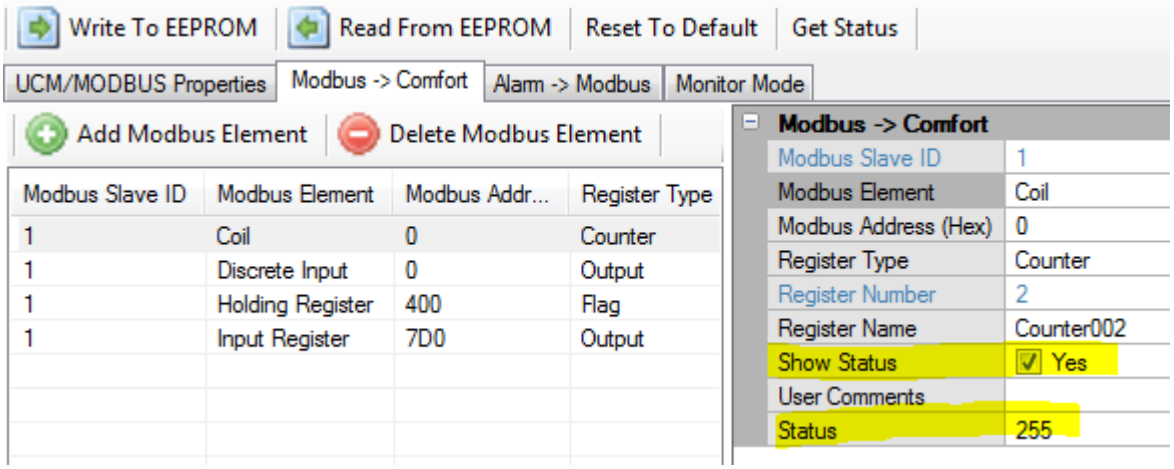
When a 1-bit (On/Off) Modbus register (Discrete input) is mapped to Bypass zone, the Modbus element Input will bypass the zone when turned on and unbypass when turned off.
Select a Zone/Input.

Note

Comfort Registers cannot be duplicated in the Modbus to Comfort table. For example you cannot map the same Counter to 2 Modbus registers

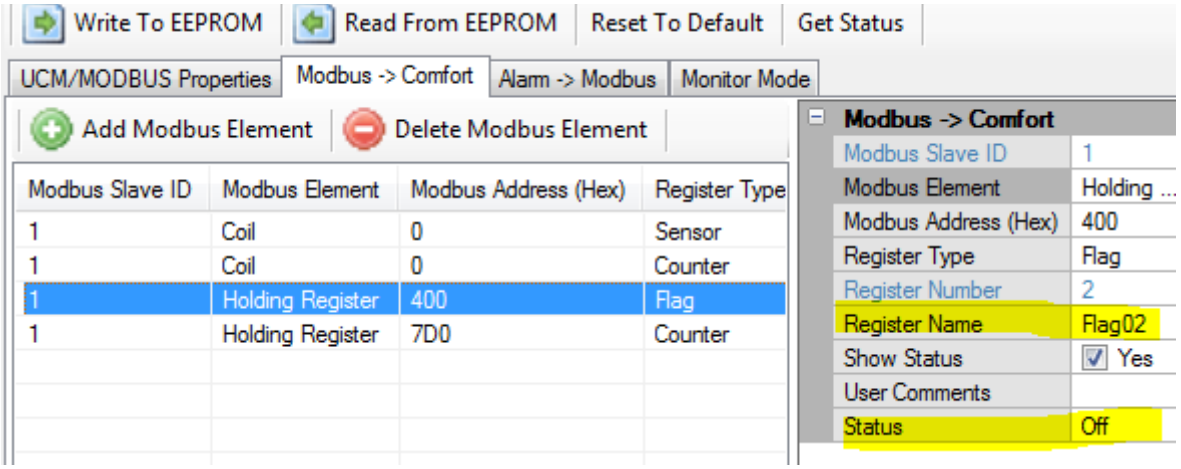
Show Status

For each Modbus to Comfort mapping, the “Show Status” boxs allows the mapped Comfort register state to be seen, and changed if desired. This is a very useful tool for testing the Modbus integration.



In the example of mapped Counter002, the real time status is 255. The counter value can be changed by entering a new value 0 to 255 in the Status Field so the effect on the mapped Modbus Register can be tested.

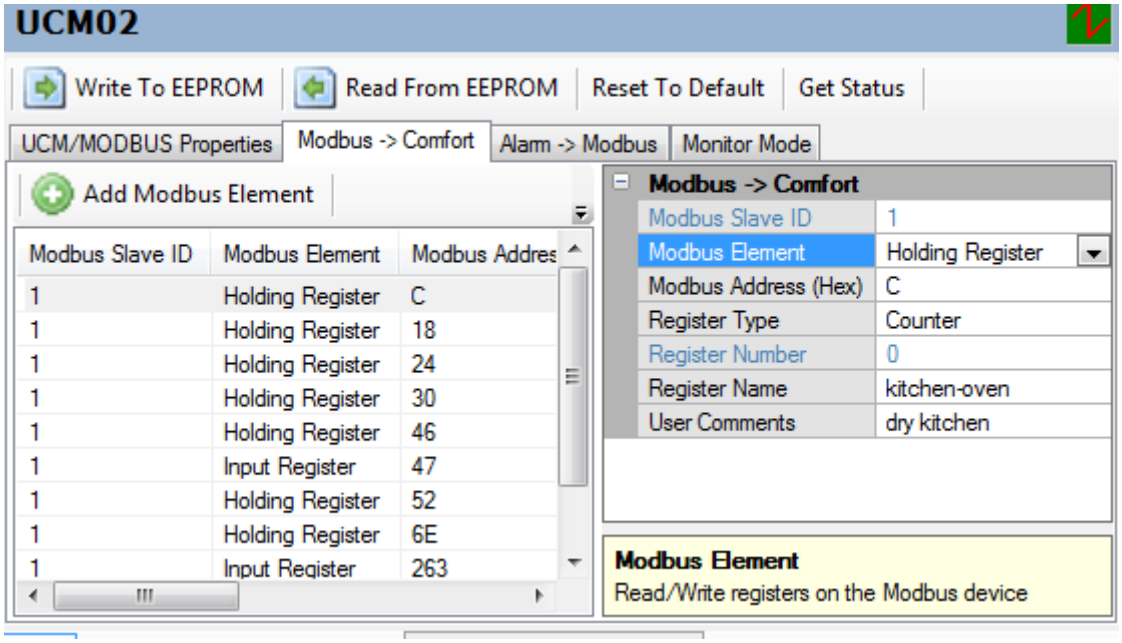
In the example below, the Modbus Holding Register is mapped to Flag02.



The value of Flag 2 can be seen, and the flag state can be changed by clicking on the Status field
Changing the value of comfort register mapped to Modbus Input Registers and Discrete Inputs (Read Only) will have no effect.
Comfigurator Comfort Registers > Comfort Register Monitor can be used to monitor the relevantr registers affected by Modbus.

Comments Field

Enter maximum 16 characters in the comments field to describe the Modbus register. This field has no function and is saved in the UCM/Modbus EEPROM so it can be read back to show optional information.



Alarm To Modbus

This is applicable for UCM/Modbus as Master only, not as Slave.

UCM/MODBUS Properties | Modbus -> Comfort | Alarm -> Modbus | Monitor Mode

Event	Name	Modbus Element	Modbus Address
0	N/A		
1	N/A		
2	Zone Not Ready (1 bit)	Unassigned	
3	Armed State	Coil	0
4	Alarm State	Coil	4
5	Panic State	Holding Register	3
6	Tamper State	Unassigned	
7	Line Cut State	Unassigned	
8	AC Failure State	Unassigned	
9	Arm Failure State	Unassigned	
10	Low Battery State	Unassigned	
11	Alarm Type	Unassigned	
12	N/A		
13	N/A		
14	N/A		
15	N/A		
16	Security Mode	Unassigned	
17	N/A		
18	Alarm Zone	Unassigned	
19	Alarm User	Unassigned	
20	Alarm ID	Unassigned	
21	RS485 Comms Fail	Unassigned	
22	Bypass	Unassigned	
23	Entry Alert	Unassigned	
24	Fire	Unassigned	
25	Alarm State (Value)	Unassigned	
26	Intruder Alarm	Unassigned	
27	Zone Not Ready (Value)	Unassigned	

This is for signalling of Alarm conditions to Modbus. Map the alarm condition to a

Modbus element for notification of alarm conditions.
The alarm conditions are listed below;

- Zone Not Ready (1 bit): Zone Open during arming
- Arm state: Off (disarned), On (armed)
- Alarm state: Off (No alarm), On (full alarm). Trouble, alert is not alarm.
- Panic: Panic alarm
- Tamper: Tamper alarm
- Line Cut: Phone Trouble/Line Cut
- AC Failure: Power /AC Failure
- Arm Failure: Failed to Arm
- Low Battery
- Alarm Type: see Alarm Types in Comfigurator > Security Types
- Security Mode: 0=Security Off, 1=Away, 2=Night, 3=Day, 4=Vacation
- Alarm Zone: Last zone which caused alarm
- Alarm User: User armed and disarmed
- Alarm RS485 ID: Communications Failure Module ID
- RS485 Comms fail: Communications Failure state
- Bypass: Zone Number bypassed
- Entry Alert: Entry alert in progress
- Fire: Fire alarm active
- Alarm State (Value): 0 – Idle, 1 = Trouble, 2= Alert, 3 = Alarm
- Intruder Alarm- Intruder Alarm Active
- Zone Not Ready (value): Zone number which is open in alarm
- Security Off (1-bit): Security Off state On/Off
- Away Mode (1-bit): Away Mode On/Off
- Night Mode (1-Bit): Night Mode On/Off
- Day Mode (1-Bit): Day Mode On/Off
- Vacation Mode (1 bit):Vacation Mode On/Off

UCM/MODBUS AS SLAVE

In UCM/Modbus Properties, set Modbus Master/Slave as Slave. Modbus Slave ID in this mode is the Modbus ID of the UCM/Modbus. The other Tabs Modbus > Comfort and Alarm> Modbus are not applicable in this mode.
In this mode, third party devices and software are able to control Comfort by sending commands and getting responses. UCM/Modbus is a Slave and the Modbus device is Master. In Comfigurator, the Modbus Master/Slave is set to Server/Slave. The Modbus ID field applies to the UCM/Modbus Modbus ID as a Slave.
The following Modbus functions are supported

Function Code	Function	Parameters	
1	Read Coils	Read from starting address, no of addresses	
2	Read Discrete Inputs	Read from starting address, no of addresses	
3	Read Holding Registers	Read from starting address, no of addresses	
4	Read Input Registers	Read from starting address, no of addresses	
5	Write Single Coil	Write from Address, Value	
6	Write Single Holding Register	Write from Address, Value	

Write Multiple Coils and Write Multiple Holding Registers are not supported

The table below shows the Modbus Registers that are supported by UCM/Modbus.

Modbus Element	Comfort Function	Read/ Write	Register Range	Value	Modbus addresses	Comments
Discrete Inputs	Inputs	Read	1 - 96	0=off, 1 = on	0 - 0x005F	Read the state of Comfort Input/zone
Coils	Outputs	R/W	1 - 96	0=off, 1 = on	0x0000 - 0x00FF OR 0x1000 - 0x10FF	Read/write state of Comfort Output
	Flags	R/W	1 - 254	0=off, 1 = on	0x100 - 0x1FF OR 0x1100 - 0x11FF	Read/write state of Comfort Flag
	Bypass Inputs	R/W	1 to 96	0= bypass off, 1= bypass on	0x0200 - 0x025F OR 0x1200 - 0x125F	Read Write bypass state for zone
Input Registers	Sensors	Read	0 to 31	0 to 65535	0x0000 - 0x001F	Read Comfort Sensor Values Comfort Sensors can also be accessed by Holding Registers 0x200 to 0x21F
	Security Mode	Read	0-4	0= Sec off, 1= Away, 2= Night, 3= day, 4= vacation	0x2000	Read Security Mode

Modbus Element	Comfort Function	Read/ Write	Register Range	Value	Modbus addresses	Comments
	Armed	Read		0 = Off, 1 = armed	0x2001	Read Armed state On/off
	Alarm Zone	Read	1-96	zone	0x2002	Read last alarm zone
	Alarm User	Read	1-16	user	0x2003	Read user for alarm
	Alarm ID	Read		id	0x2004	Read Alarm ID
	Comms Fail	Read		1 = comms fail	0x2005	Read Comms Fail ID
	Phone trouble	Read		1 = phone trouble	0x2006	Read Phone Trouble On/Off
	Alarm State	Read	0-3	0= idle, 1= trouble, 2=alert, 3= alarm	0x2007	Read Alarm State
	Zone Not Ready	Read	0-96	Zone no	0x2008	Read Zone Open while arming
	AC Fail	Read		1 = AC Fail	0x2009	Read Ac Fail On/off
	Low Batery	Read		1 - Low Battery	0x2010	Read Low Battery On/off
Holding Registers	Counters	R/W	0 - 254	0-0xFFFF	0x0000 - 0x000FF OR 0x3000-0x30FF	Read/Write Counter
	Sensors	R/W	0 - 31	0-0xFFFF	0x0200 - 0x02FF OR 0x3200-0x32FF	Read/write Sensors Sensor Registers can also be accessed by Inout Rergisters 0 to 1FH (31)
	Key Arm Security	Write	1-4	1= Away, 2= Night, 3= day, 4= vacation	0X0400 OR 0x3400	Key Arm to Security Mode
	Autoarm Security	Write	1-4		0x0401 OR 0x3401	Auto-arm to security mode
	Keypad	Write	0-9,26	0-9, 26=Enter	0x0402 OR 0x3402	Enter Keypad Key

Note: From Modbus 7.148, each Modbus Register Type has an alternative Address range starting from 0x0000. This is to allow some Modbus Masters who have restricted address ranges to work with UCM/Modbus in Slave Mode. Note that Input Registers Addresses 0x0000 to 0x001F have been also mapped to Sensor Registers (Read Only), although Comfort Sensors are also mapped to Holding Registers (Read/Write) 0x200 to 0x21F. This is for better flexibility to suit other Modbus Masters

Please refer to the document Modbus Slave Addresses for the complete table for Modbus Registers in Slave Mode

When Modbus Slave is selected, the screen below should be seen in the Modbus Server Tab
This is a convenient lookup reference table which shows the Modbus Addresses in Decimal and Hexadecimal format of all the Comfort events and registers that are exposed to Modbus.

UCM02

Write To EEPROM | Read From EEPROM | Reset To Default | Get Status

UCM/MODBUS Properties | Modbus Slave | Monitor Mode

Modbus Element	Comfort Function	Reg No	Reg Name	M/Add Dec	M/Addr Hex	Help
Discrete Inputs						
Coils (Outputs)						
Coils (Flags)						
Coils (Bypass Inputs)						
Input Registers						
Holding Registers (Counters)						
Holding Registers (Sensors)						
Holding Registers (Security)						

Each of the items above is a Category that can be expanded by selecting the item

Zones/Inputs

Comfort Zones/Inputs are mapped to Modbus discrete Inputs.

Write To EEPROM | Read From EEPROM | Reset To Default | Get Status

UCM/MODBUS Properties | Modbus Server | Monitor Mode

Modbus Element	Comfort Functi...	Reg No	Reg Name	M/Add Dec	M/Addr Hex	Help
Discrete Inputs						
Discrete Inputs	Zone/Input	1	FrontDoor	00	0000	Read Discrete Inputs reads the state
		2	StudyWindow	01	0001	(On/Off) of range of Comfort Inputs.
		3	KitchenWindow	02	0002	
		4	HallMovement	03	0003	
		5	Safe	04	0004	
		6	BackDoor	05	0005	
		7	SmokeDetector	06	0006	
		8	Landing	07	0007	
		9	Zone09	08	0008	
		10	Zone10	09	0009	
		11	Zone11	10	000A	
		12	Zone12	11	000B	
		13	Zone13	12	000C	
		14	Zone14	13	000D	
		15	Zone15	14	000E	
		16	Zone16	15	000F	

Outputs

Comfort Outputs are mapped to Modbus Coils. Modbus Addresses 0x0000 to 0x005F or 0x1000 to 0x105F are alternative Modbus addesses for Outputs.

Write To EEPROM | Read From EEPROM | Reset To Default | Get Status

UCM/MODBUS Properties | Modbus Slave | Monitor Mode

Modbus Element	Comfort Function	Reg No	Reg Name	M/Add Dec	M/Addr Hex	Help
Discrete Inputs						
Coils (Outputs)						
Coils	Outputs	1	Output001	00	0000	Write Single Coi
		2	Output002	01	0001	Read Coils read
		3	Output003	02	0002	of Outputs.
		4	Output004	03	0003	
		5	Output005	04	0004	
		6	Output006	05	0005	
		7	Output007	06	0006	
		8	Output008	07	0007	
		9	Output009	08	0008	
		10	Output010	09	0009	
		11	Output011	10	000A	
		12	Output012	11	000B	
		13	Output013	12	000C	
		14	Output014	13	000D	
		15	Output015	14	000E	
		16	Output016	15	000F	

Flags

Comfort Flags are mapped to Modbus Discrete Inputs. Modbus Addresses 0x0100 to 0x01FF or 0x1100 to 0x11FF are alternative Modbus addresses for Flags.

Bypass Inputs

Bypass Inputs are mapped to Modbus Coils. Modbus Addresses 0x0200 to 0x025F or 0x1200 to 0x125F are alternative Modbus addresses for Bypass Inputs.

Counters

Comfort Counters are mapped to Modbus Holding Registers. Modbus Addresses 0x0000 to 0x00FF or 0x3000 to 0x30FF are alternative Modbus addresses for Counters.

UCM/MODBUS Properties | Modbus Server | Monitor Mode

Modbus Element	Comfort ...	Reg...	Reg Name	M/Add Dec	M/Addr H...	Help
Holding Registers (Counters) 0 -> 99						
Holding Registe...	Counters	0	Counter00	12288	3000	Read Holding Registers reads the Coun
		1	Counter001	12289	3001	value. Write Single Holding Register wri
		2	Counter002	12290	3002	the value into the selected Counter, and
		3	Counter003	12291	3003	activates a Counter Response.
		4	Counter004	12292	3004	
		5	Counter005	12293	3005	
		6	Counter006	12294	3006	
		7	Counter07	12295	3007	
		8	Counter008	12296	3008	
		9	Counter009	12297	3009	
		10	Counter010	12298	300A	
		11	Counter011	12299	300B	
		12	Counter012	12300	300C	
		13	Counter013	12301	300D	
		14	Counter014	12302	300E	

Sensors

Comfort sensors are mapped to Modbus Holding Regsters. Modbus Addresses 0x0000 to 0x001F or 0x3200 to 0x32FF are alternative Modbus addresses for Sensors.

Write To EEPROM | Read From EEPROM | Reset To Default | Get Status

UCM/MODBUS Properties | Modbus Server | Monitor Mode

Modbus Ele...	Comfort Func...	Re...	Reg Na...	M/Add Dec	M/Addr Hex	Help
Holding Regi...	Sensors	0	Sensor00	12800	3200	Read Holding Register reads the sensor
		1	Sensor01	12801	3201	value. Write Single Holding Register writes
		2	Sensor02	12802	3202	into the selected sensor and activates a
		3	Sensor03	12803	3203	Sensor Response.
		4	Sensor04	12804	3204	
		5	Sensor05	12805	3205	
		6	Sensor06	12806	3206	
		7	Sensor07	12807	3207	
		8	Sensor08	12808	3208	
		9	Sensor09	12809	3209	
		10	Sensor10	12810	320A	
		11	Sensor11	12811	320B	
		12	Sensor12	12812	320C	
		13	Sensor13	12813	320D	
		14	Sensor14	12814	320E	

Security

Comfort Security States and Events are mapped to Modbus Input Registers 0x2000 to 0x200A. Comfort Sensors 0 to 31 are mapped to Input Rrgisters 0x0000 to 0x001F

Write To EEPROM | Read From EEPROM | Reset To Default | Get Status

UCM/MODBUS Properties | Modbus Server | Monitor Mode

Modbus Ele...	Comfort Func...	Re...	Reg Na...	M/Add Dec	M/Addr Hex	Help
Input Registers						
InputRegister	Security Mode			8192	2000	Read Security Mode (0= Sec off, 1 = Away, 2= Night, 3= Day, 4 = Vacation)
InputRegister	Armed			8193	2001	Read armed/disarmed state 0=disarmed, 1 = armed.
InputRegister	Alarm Zone			8194	2002	Last alarm zone no.
InputRegister	Alarm User			8195	2003	Read last alarm user no.
InputRegister	Alarm ID			8196	2004	RS485 ID for alarm.
InputRegister	Comms Fail			8197	2005	RS485 Comms Fail state 0 = Normal, 1 = Comms Fail.
InputRegister	Phone Trouble			8198	2006	Phone Trouble state 0 = Normal, 1 = Phone Trouble.
InputRegister	Alarm State			8199	2007	Alarm state 0=idle, 1 = trouble, 2 = alert, 3 = alarm.
InputRegister	Zone Not Rea...			8200	2008	Zone No open while arming
InputRegister	AC Fail			8201	2009	AC Fail state On or Off
InputRegister	Low Battery			8202	200A	Low Battery state On or Off.

Security/Keypad commands

Key arm security and Autoarm security commands to Comfort are mapped to Holding Registers. Modbus Addresses 0x0400 to 0x0402 or 0x3400 to 0x3402 are alternative Modbus addresses for Securty/Keypad commands.

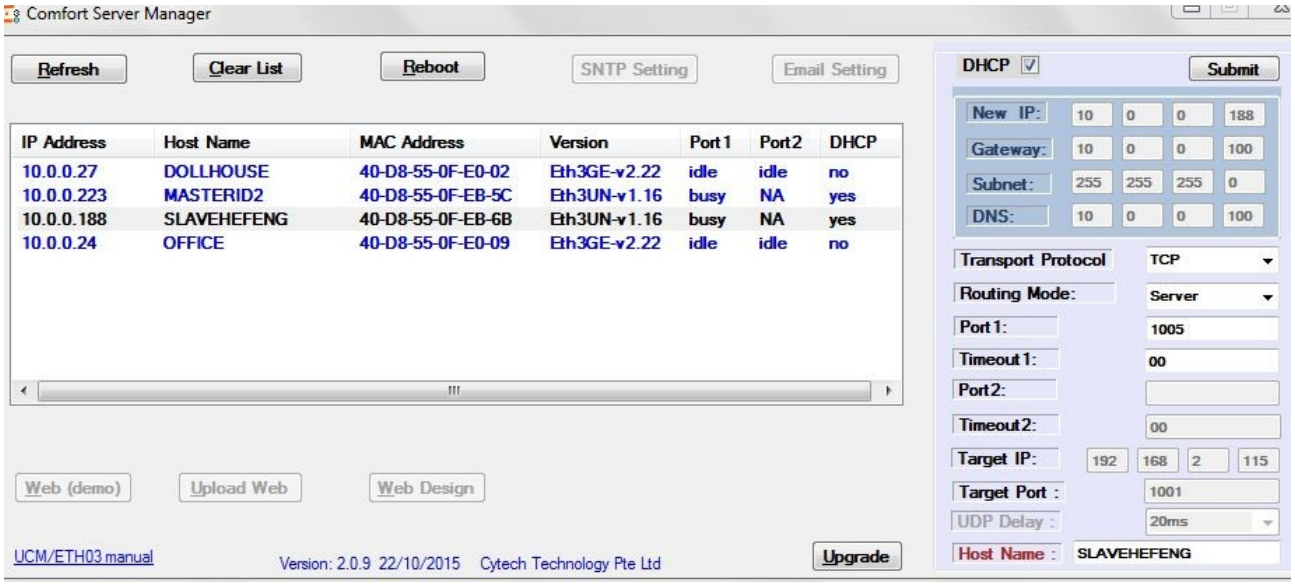
Holding Registers (Counters) 100 -> 199						
Holding Registers (Counters) 200 -> 254						
Holding Registers (Sensors)						
Holding Registers (Security)						
Holding Registe...	Key Arm Security			13312	3400	Write Holding Register Key arms security (1=away, 2=night, 3=day, 4= vacation)
Holding Registe...	Auto Arm Secur...			13313	3401	Write Holding Register Auto arms security (1=away, 2=night, 3=day, 4= vacation)
Holding Registe...	Keypad			13314	3402	Write Holding Register sends a keypad key to Comfort, 0 to 9, 26= Enter Key, 12 = Force Arm (arming), 16 = Panic, 17 = Fire.

Notes for Modbus/TCP Slave Mode

For Modbus/TCP, the Modbus Master is also referred to as Client, and the Slave as Server. A Modbus/TCP Slave has an IP address and Port. The Modbus/TCP Master (which is the other device communicating with the UCM/Modbus) should set the Target IP and Port to the UCM/Modbus.
If Modbus/TCP is used for the Server/Slave, the Properties page shall show a link to Comfort Server Manager

The Comfort Server Manager screenshots below show Modbus Slave (10.0.0.188), along with other ETH03 which may be in the same network (which can be ignored).

Note that the Modbus ETH03 should show Universal firmware 1.16
For the UCM/Modbus Slave, select the ETH03 on the left pane. Look at the IP address parameters on the right pane.



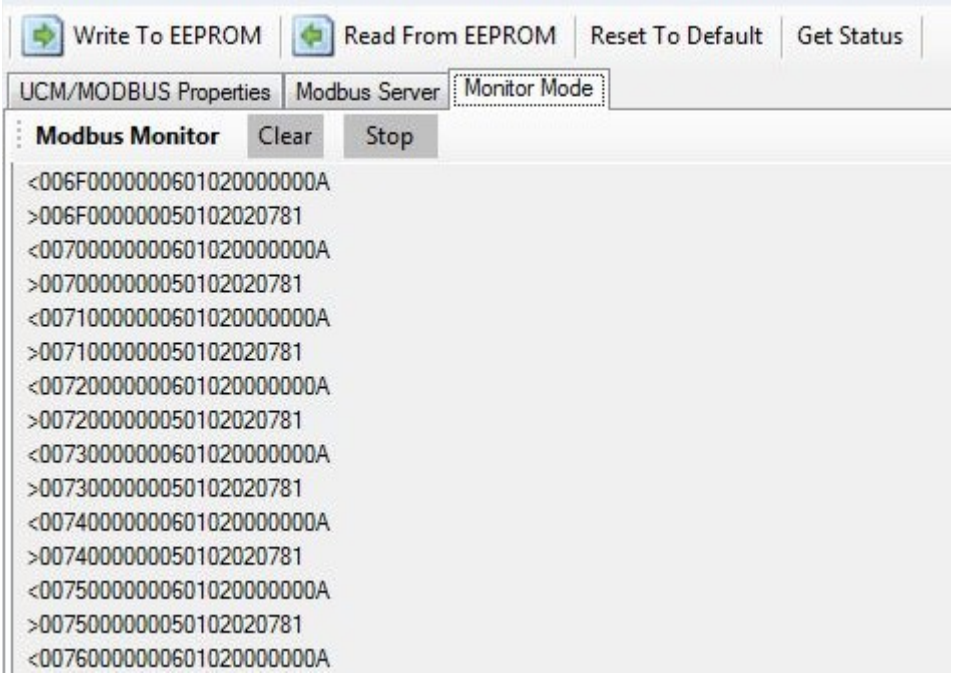
DHCP checkbox – This determines if the IP address for UCM/Modbus is to be assigned automatically by the DHCP server.
For Transport Protocol, select "TCP".
For Routing Mode, select "Server".
In Port 1, select the port number of the UCM/Modbus Server/Slave.

For the other modbus device which acts as the Master (client), enter the IP Address and Port number of the Slave (Server), in this example, 10.0.0.188 Port 1005. This will allow the external Modbus Master to talk to the Modbus Slave via the IP address and Port. Note that the Modbus Master must also comply to the Modbus/TCP standard in order to work with UCM/Modbus as Slave.

Note that if the Modbus/TCP is connected, the status on Comfort Server Manager will be **BUSY**

Modbus Monitor

The Modbus Monitor works for both Master and Slave Modes an d for Modbus TCP and RS485. This allows the Modbus Transmit (>) and Receive (<) data to be shown. This is extremely useful when testing the modbus communications especially for TCP where the IP addresses and Ports must be set correctly. For details about the meaning of the modbus data please refer to the Modbus standards.



Software Tools

- Radzio Modbus Master Simulator http://en.radzio.dxp.pl/modbus-master-simulator/ to test UCM/Modbus in Slave Mode. Works in RTU and IP modes
- QModbusMaster https://sourceforge.net/projects/qmodmaster/ to test UCM/Modbus in Slave Mode. The software can be set up as a Modbus Master to communicate with UCM/Modbus in Slave Mode. It works in RTU and IP modes.
- PyModSlave https://sourceforge.net/projects/pymodslave/files/ for testing UCM/Modbus in Master Mode. The software can be set up as a Modbus Slave to communicate with UCM/Modbus in Master Mode. It works in RTU and IP modes.

Please download the latest version of this manual from http://www.cytech.biz/ucmmodbus-485.html

Document History

10 Sept 2016 Initial Release
20 Jan 2017 – Added Expanded Table for Modbus Slave Addresses. Changed Slave Modbus assignment to Comfort Registers for Bypass zone and Flags.
27 March 2017 – Updated for Comfigurator 3.11.12
27 April 2017 – Comfigurator 3.11.13 changes in Modbus to Comfort Input Registers, Coils, Holding Registers, Discrete Inputs. For Modbus to Comfort, status of Comfort registers can be seen and changed.
27 Jan 2018 – revised, added Software Tools
24 December 2020 - added Alternate Modbus register ranges for Slave Mode for Modbus 7.143
1 September 2021 – Applicable Modbus 7.148, Comfigurator 3.13.7
26 August 2022 - added Modbus Master Poll cycle time, Number of Registers in Modbus to Master. Created UCM/Modbus Quick Start Guide

Size A5 Booklet