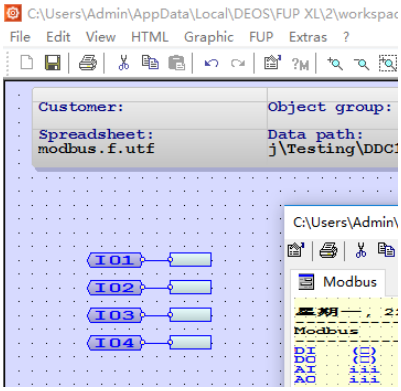
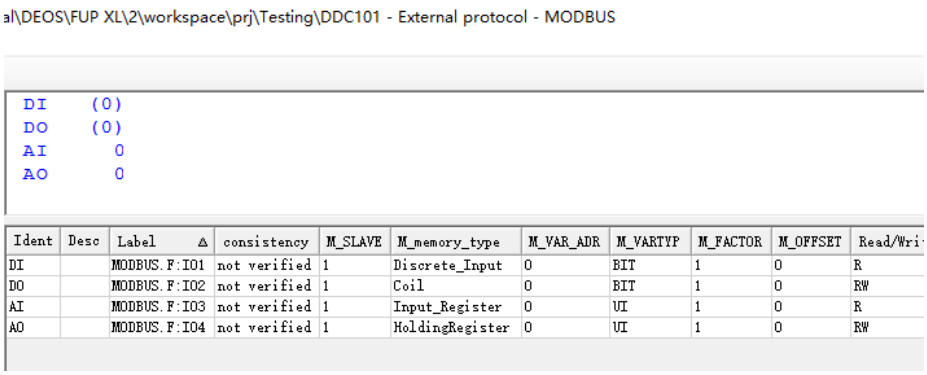
TT211201 – FUP - Modbus Control Logic

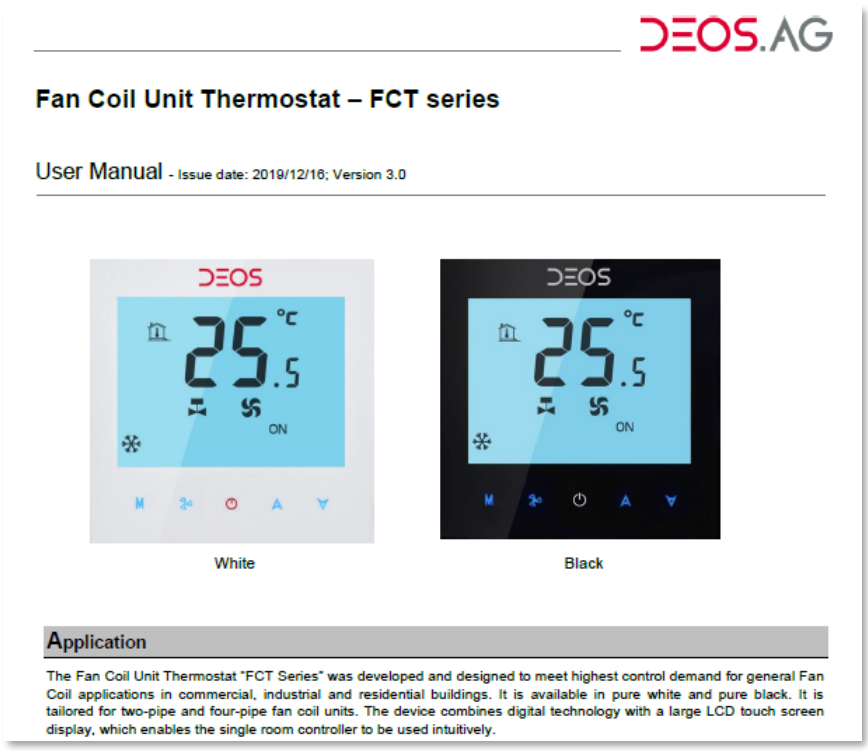
1. In TT190801, we show you how to integrate a Modbus device in FUP, so you can view the Modbus points and also command the points manually in OPENview.
2. To do this, you can easily add some “Input” in FUP editor, and then map them to the Modbus registers in “System Integration”, “Modbus”, like this





Ident	Desc	Label	consistency	M_SLAVE	M_memory_type	M_VAR_ADR	M_VARTYP	M_FACTOR	M_OFFSET	Read/Wri
DI		MODBUS.F:I01	not verified	1	Discrete_Input	0	BIT	1	0	R
DO		MODBUS.F:I02	not verified	1	Coil	0	BIT	1	0	RW
AI		MODBUS.F:I03	not verified	1	Input_Register	0	UI	1	0	R
AO		MODBUS.F:I04	not verified	1	HoldingRegister	0	UI	1	0	RW

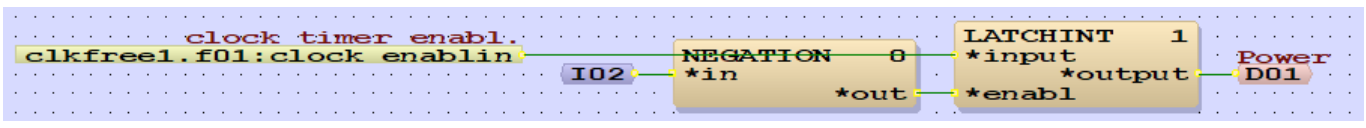
3. In this document, we will show you how to perform some automatic control logic for Modbus device, e.g. the FCT.



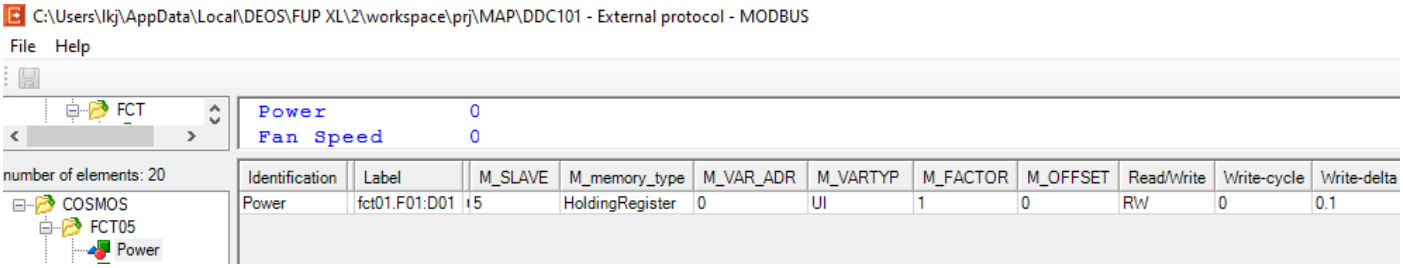
4. We will create a FUP page to control the On/Off of the FCU (i.e. Power) by the clock timer macro. The user also has the option to enable/disable the automatic control.

Power 0 - Off 1 - On	DEOS: 0 (Modbus: 40001)

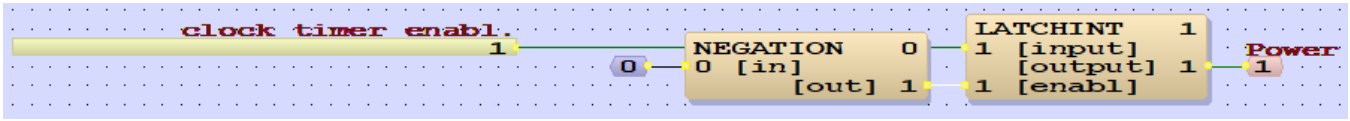
5. First, add the below logic to your FUP page. “I02” is auto/manual selector and when it is 1 (i.e. manual), the clock timer output is blocked by the “LATCHINT” module.



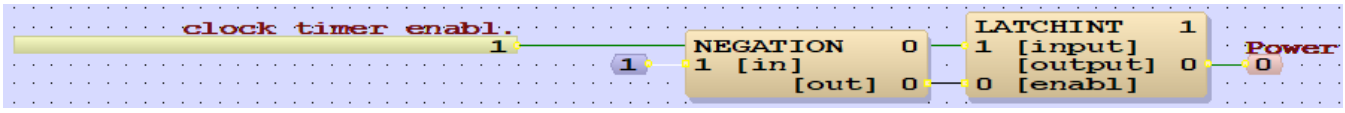
6. Save and close the FUP page. Click the controller, right click, select “System Integration”, “Modbus”. Drag the “Display” and map the Modbus address accordingly.



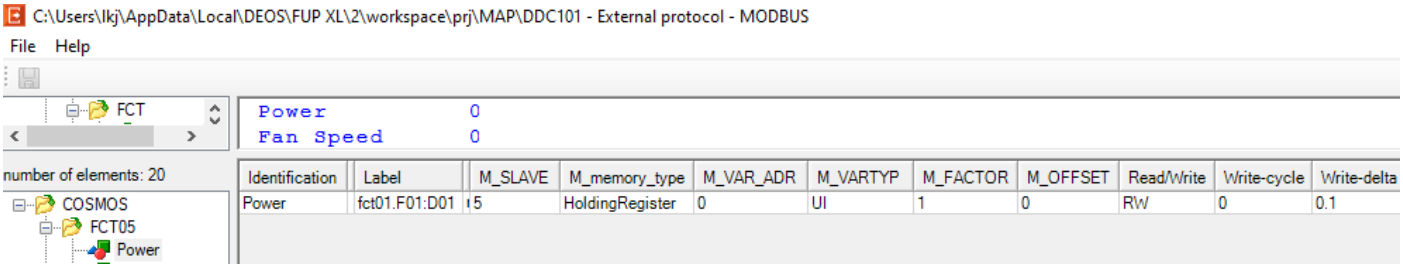
7. Remember to set “Read/Write” to “RW” so that the controller can also write the On/Off command to the FCT. This allows the controller to monitor the Modbus point status, as well as commanding the Modbus point. Now you can compile and upload the controller for testing.
8. When it’s in auto mode, the clock timer output will send directly to the FCT to turn it On/Off.



9. When it is in manual mode, the clock timer output is blocked, so no command will be sent from the controller. Now, the user can manually turn the FCT On/Off from the FCT thermostat.



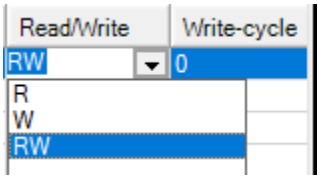
10. In the Modbus integration, we set the “Write-cycle” parameter to 0. This means our controller will only send the command to the Modbus device once when the value is change. This allows the controller to turn the FCT On/Off based on the time schedule, and the user can also turn it On/Off manually from the FCT thermostat.



11. If you don’t want the user to change it manually, you can set the “Write-cycle”, so that the controller will command the output periodically. In the below example, the output is overriding every 30 seconds.

Identification	Label	M_SLAVE	M_memory_type	M_VAR_ADR	M_VARTYP	M_FACTOR	M_OFFSET	Read/Write	Write-cycle	Write-delta
Power	fct01.F01:D01	5	HoldingRegister	0	UI	1	0	RW	30	0.1

12. The “Write-delta” parameter is the value that is changed so that the command will send to the Modbus device once automatically.
13. You may notice that there is an option “W” in the “Read/Write” parameter. This is used when you don’t need to monitor the value in the Modbus device (or it is not supported in the device). For example, you’re using the Modbus device as an IO module.



14. In this case, you can always set the “Write-cycle” so that the controller will send the command periodically, to make sure the Modbus device can get the command in all conditions (e.g. communication not stable, or when the device is restarted).
15. The same way can be used to control analog points in Modbus. Please note that you need to change the “Write-delta” based on your requirement, otherwise the Modbus communication will be very slow if you’re commanding many analog points and the “Write-delta” is setting too low (default is 0.1). It’s a good practice to set it to at least 1 or even more for analog points (e.g. VFD command).