

Introduction



TSM01 with FR1-E2-AL frame



TSM01 with FR1-ES-WG frame



TSM01 with surface mount backbox

The TSM01 is a versatile Temperature Sensing and Control module with a Temperature Alarm Monitoring mode.

Features

- External TH1 Thermistor Sensor connected by Terminal block.
- Display of Temperature in Celsius, mapped to Comfort Sensor
- Display of Setpoint mapped to Comfort Counter. Enable or disable Setpoint is mapped to a Comfort Flag.
- Up/down keys adjust the Setpoint and enable/disable the setpoint.
- Assignment of Comfort Output to control relay to achieve setpoint.
- Heating or Cooling Mode.
- Programmable Hysteresis
- Temperature Alarm Monitoring by mapping to Virtual Input in Comfort. This allows a Temperature alarm to be activated when the temperature

exceeds the setpoint by programmable alarm offset. The Alarm can dial to mobile phones or trigger SMS messages via the UCM/GSM module. Restore Temperature by SMS is possible.

- Calibration of Temperature reading is possible
- in-wall or surface mount backboxes are available
- Standard 1 gang 55 x 55 size European frame from many manufacturers like Merten, Gira, Jung, ABB etc
- Up to 15 TSMs in a network.
- Configurator is used to program TSM01 and upgrade firmware.

Specifications

- Units: deg Celsius
- Resolution 1 degree C
- Accuracy +/- 1 degree C
- Range 0 deg to 60 degrees C
- Up to 15 TSM01s in a Comfort, Logic Engine or UCM/Logic network.
- Current : 20 mA Idle

Items Included

The package includes

- TSM01 module



- TH01 Thermistor sensor



- Single-gang Back Box



Setup

- Connect 4 wires from the Controller – 12V, COM, KA, KB to the green pluggable terminal blocks at the back.
- Connect the TH01 Thermistor sensor to the unmarked 2 pins of the green terminal block at the back. The wiring should be extended as necessary so the the Thermistor is placed at a suitable location for monitoring temperature. The length of wire can be up to 200 meters.



- If the controller is on, the temperature should appear on the display.
- Set the TSM ID on the Rs485 Comfort Bus – press and holding UP at reset for 3 seconds. This will cause the TSM01 to enter the ID setting mode, where the ID is displayed (Default is 1). Then pressing and releasing the UP button will increment the ID until it reaches 15. The ID will roll over to 1 if it is incremented past 15. Releasing the UP button for 2 seconds will exit the ID setting mode. **Note that if connected to Comfort, the engineer sign-in must be enabled, by pressing F0 on the keypad.**
- The TSM can detect if the external sensor is connected. If it is not connected, it displays - - instead of the temperature.
- The TSM can operate in standalone mode without connecting the RS485 bus. In this case it displays temperature only and not setpoint, and the up/down buttons have no effect.

System Requirements

- Comfort II, firmware 7.090 minimum
- TSM firmware 7.003 minimum
- Configurator Version 3.11.9 minimum

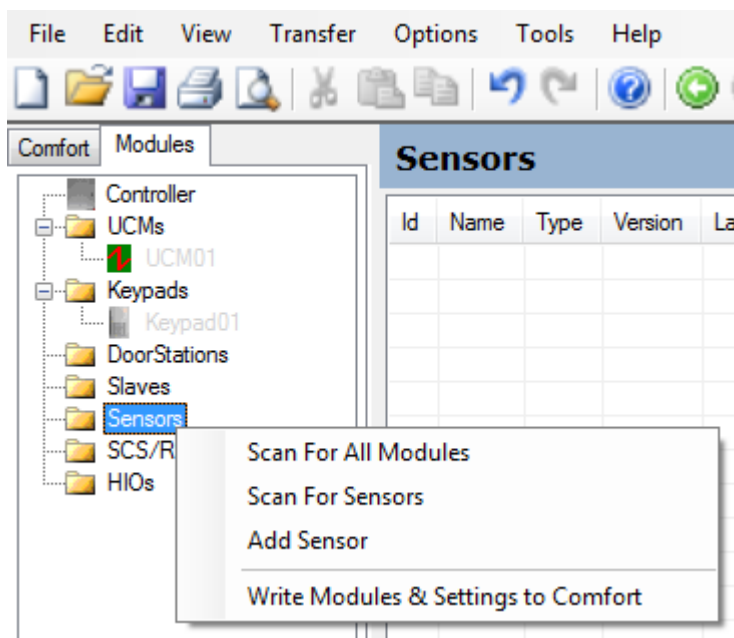
LED Indicators

- Internal Red and Green LEDs show the RS485 communication status like the UCM D9 and D10 leds..

Using Comfigurator

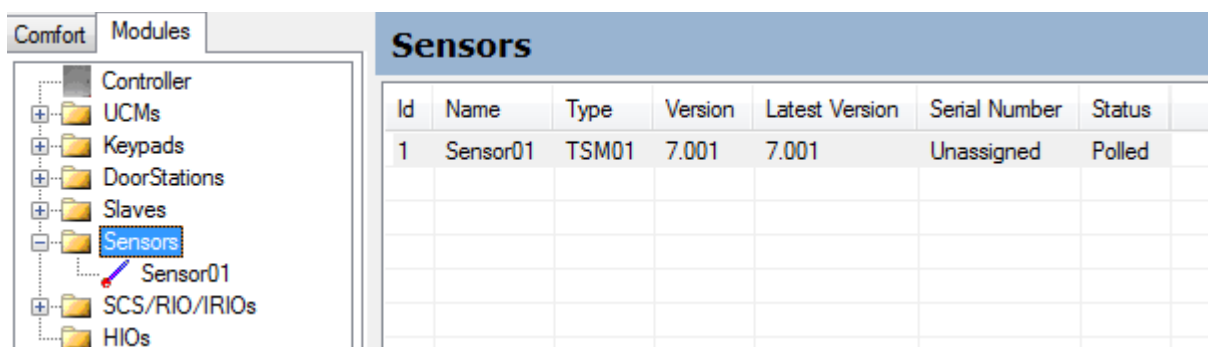
Use Comfigurator software version 3.11.9 or above to configure TSM01. The software can be downloaded from <http://www.cytech.biz/comfigurator.html>. A UCM/USB, UCM/Ethernet, or UCM/Logic is required to connect to the computer running Comfigurator.

Run Comfigurator, go to the Modules Tab and right-click Controller or Sensor folder symbol as shown below. Select Scan for All Modules or Scan for Sensors. This will scan the network for TSM01.



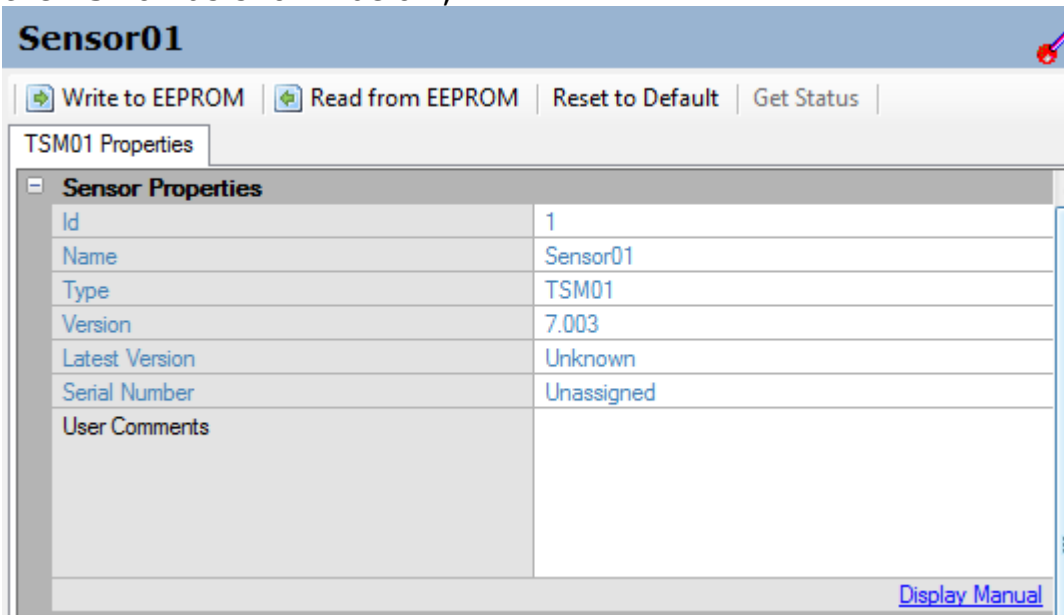
“Add Sensor” allows you to manually add a TSM01 if not currently connected to Comfort, i.e. when doing programming off-line.

The result of scanning or adding a TSM01 is shown below .



Sensor01 appears on the left pane and the summary properties is shown on the right pane. Click on Sensor01 on the left pane to show the Properties of

the TSM01 as shown below;



Sensor Properties

"ID" is the TSM ID 1 to 15

"Name" is any text description for the TSM used to identify it and serves no other function.

"Type" is the Sensor Type

"Version" is the firmware version which in this example shows 7.001. If the TSM01 was manually added instead of being scanned, the firmware information will not appear.

"Latest Version" is the latest release version available when internet connection is present.

"Serial Number" is the electronic serial number which is not used at present

"Status" shows the status of TSM01 It is '**Polled**' when the TSM is found in the network and is polled. '**Not Polled**' will be displayed when the TSM is detected by scanning but the number of TSMs programmed is less than the TSM01 Id.

'Not Found' is shown when the TSM01 is not connected to Comfort when scanning is done.

TSM01 Properties	
Max Setpoint	30
Min Setpoint	5
On/Off Map To Flag Number	63
On/Off Map To Flag Name	Flag63
External Sensor Map To Comfort Sensor Number	Unassigned
External Sensor Map To Comfort Sensor Name	
Setpoint Map To Counter Number	63
Setpoint Map To Counter Name	Counter063
Backlight	Automatic
Backlight Off Level	1
Contrast	37
Heating/Cooling	0
Hysteresis	1
Heating/Cooling Output Number	255
Heating/Cooling Output Name	
Virtual Input Number	255
Virtual Input Name	
Virtual Input Alarm Offset	0
On/Off control of Virtual Input	0
Calibration Offset	0

TSM01 Properties

Parameter	Values	Default	Help
Max Setpoint	0-99	30	Maximum Temperature Setpoint
Min Setpoint	0-99	5	MinimumTemperature Setpoint
On/Off Map to Flag	0 to 254, blank if not used.	63	Map On/Off control/status to Comfort Flag
External Sensor Map to Comfort Sensor	0 to 31, blank if not used.	Blank	Map TSM External sensor to Comfort sensor
Setpoint map to Counter	0 to max 254, blank if not used.	63	Map Setpoint to Comfort Counter
Backlight	Always Off, Always On, Automatic	Automatic	Backlight Behaviour
Backlight Off Level	0 to 31	1	Brightness level when LCD is off
Contrast	0 to 63	37	LCD Contrast
Heating/Cooling	Heating or Cooling	Cooling	Select Heating or Cooling mode
Hysteresis	0 to 10	0	Hysteresis for Temperature Setpoint and Virtual Input
Heating/ Cooling Output	1 to number of Outputs	255	Turn on Output to achieve setpoint depending on Heating or cooling mode
Virtual Input	0- numzones	255	Virtual Input is set by temperature too high for cooling, or too low for heating, based on

Parameter	Values	Default	Help
			Alarm Offset to Setpoint, and is restored when the temperature reaches the alarm offset +/- hysteresis. This controls an Input on Comfort to activate High/Low Temperature alarm.
Virtual Input Alarm Offset	0 to 30	0	Offset between Control setpoint and Alarm setpoint, when Virtual Input is activated
On/Off Control of Virtual Input	0 = On/Off does not affect Virtual Input. 1 = On/off controls Virtual Input	0	Determines if On/Off control also affects Virtual Input. If 0, Virtual Input function is always enabled. If 1, On/Off also enable/disable Virtual Input
Calibration Offset	-5 to +5	0	This value is added to the temperature reading for calibration

Menu Bar

The TSM menu items are; Write to EEPROM, Read from EEPROM, Reset to Default, Get Status.

Write to EEPROM

This writes the properties into the TSM

Read from EEPROM

This reads the data from TSM and displays the data on screen

Reset to Default

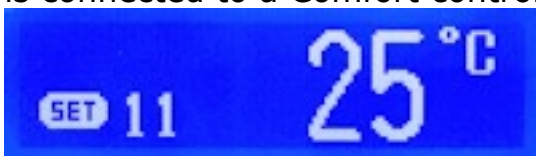
This clears all the data in the properties to default, but does not write any data to EEPROM.

Get Status

The Get status button currently has no function.

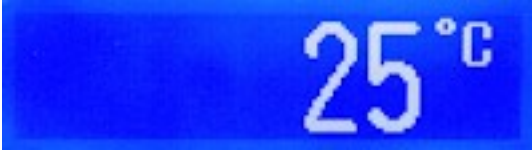
Operation

The LCD shows the temperature in Celsius together with the setpoint if TSM01 is connected to a Comfort controller.

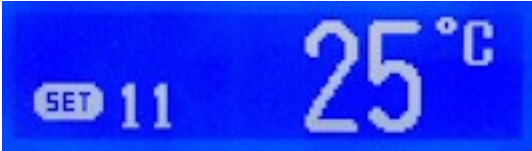


Pressing the Up or Down buttons will display and change the setpoint.

The setpoint is mapped to a Counter. If the Counter is not mapped, or TSM011 is operating as standalone mode, then the setpoint is not shown.



Pressing and holding Up and Down buttons together will alternately switch on and off the mode. The On/Off mode is mapped to a Flag.



The ON/Off mode for the setpoint is toggled by pressing on both up and down buttons at the same time. If the mode is OFF the Flag that is mapped to On/Off Mode is cleared. This acts to turn off the thermostat function in RIO or Comfort logic and if the mode is on, the mapped flag is set to enable the thermostat function. Changing the flag to on or off in Comfort also changes the display mode of TSM01.

If the External themistor is not connected, the LCD shows "- -"

Temperature Control Output

The TSM can be used to maintain the temperature at the setpoint. The TSM can be mapped to an Output in Comfort. The Heating/Cooling Output is turned on when the TSM temperature reading is outside the Setpoint, depending on Heating or Cooling Mode. The output can be used to drive a Relay to control a valve or fan.

TSM01 Properties	
Max Setpoint	30
Min Setpoint	5
On/Off Map To Flag Number	63
On/Off Map To Flag Name	Flag63
External Sensor Map To Comfort Sensor Number	5
External Sensor Map To Comfort Sensor Name	TSM
Setpoint Map To Counter Number	11
Setpoint Map To Counter Name	C11Msetpoint
Backlight	Automatic
Backlight Off Level	1
Contrast	37
Heating/Cooling	Cooling
Hysteresis	2
Heating/Cooling Output Number	11
Heating/Cooling Output Name	TSMOutput
Virtual Input Number	32
Virtual Input Name	Temp
Virtual Input Alarm Offset	1
On/Off control of Virtual Input	1
Calibration Offset	0

The Output is turned on when the Temperature is higher than Setpoint in Cooling Mode, or lower than setpoint in Heating Mode. The Output is turned off when the Temperature is lower than Setpoint – Hysteresis in Cooling Mode, or higher than setpoint+ hysteresis in Heating Mode.

Temperature Alarm Monitoring

The TSM01 is able to monitor the temperature and trigger a Temperature alarm if the temperature is above or below an alarm setpoint based on heating or cooling mode. Heating Mode means that the alarm is triggered if the temperature is lower than the alarm setpoint. Cooling mode means that the alarm is triggered if the temperature is higher than the alarm setpoint. This is done by mapping the TSM01 to a Virtual Input in Comfort Alarm. Then the temperature exceeds the setpoint (in the direction determined by heating/cooling mode), the Virtual Input is set to the On state and vice versa.

TSM01 Properties	
Max Setpoint	30
Min Setpoint	5
On/Off Map To Flag Number	63
On/Off Map To Flag Name	Flag63
External Sensor Map To Comfort Sensor Number	5
External Sensor Map To Comfort Sensor Name	TSM
Setpoint Map To Counter Number	11
Setpoint Map To Counter Name	C11Msetpoint
Backlight	Automatic
Backlight Off Level	1
Contrast	37
Heating/Cooling	Cooling
Hysteresis	2
Heating/Cooling Output Number	11
Heating/Cooling Output Name	TSMOutput
Virtual Input Number	32
Virtual Input Name	Temp
Virtual Input Alarm Offset	1
On/Off control of Virtual Input	1
Calibration Offset	0

A Virtual Input in Comfort is an input that is triggered by an external system like TSM01, UCM/KNX, UCM/Cbus etc.

Zones/Inputs

No	Name	Zone Type	Phrase
18	Zone18		
19	Zone19		
20	Zone20		
21	Zone21		
22	Zone22		
23	Zone23		
24	Zone24		
25	Zone25		
26	Zone26		
27	Zone27		
28	Zone28		
29	Zone29		
30	Zone30		
31	Zone31		
32	Temp	TempNO [22]	Temperature Alarm
33	StoreMainDoor	EntryDoor [2]	Store Main Door

Zone Properties

Number	32
Name	Temp
Zone Type	TempNO
Zone Word 1	Temperature
Zone Word 2	Alarm
Zone Word 3	
Zone Word 4	
Entry Path	☐ No
Restore	☒ Yes
Partition	0
EOL	Use Shunts
Virtual Input	☒ Yes
Announce	☐ No
On Response	NullResponse
Off Response	NullResponse
Show Status	☐ No

In all other ways the Virtual Input is just like a physical input except that the actual physical input is ignored. A virtual Input must be assigned to a Zone Type so that its behaviour in the alarm system is determined. For example, Zone Type 22 (TempNO) is a 24 hour zone type which causes a Temperature Alarm Type (Alarm Type 30). This allows TSM01's monitoring different areas to trigger alarms based on the Virtual Zone settings.

Zone Types

No	Name	Sec. Off	Away	Night	Day
5	PIRNightAway	Disabled	Immediate	Immediate	Disa
6	AlertVibration	Disabled	Alert	Alert	Aler
7	ArmedVibration	Disabled	Immediate	Immediate	Imm
8	SwitchNO	Disabled	Disabled	Disabled	Disa
9	MonitorNO	Immediate	Immediate	Immediate	Imm
10	FireNO	Immediate	Immediate	Immediate	Imm
11	GasNC	Immediate	Immediate	Immediate	Imm
12	Panic	Immediate	Immediate	Immediate	Imm
13	ArmedTamper	Disabled	Immediate	Immediate	Imm
14	PerimNightAway	Disabled	Perimeter	Perimeter	Disa
15	GlassBreak	Immediate	Immediate	Immediate	Imm
16	PerimVibration	Disabled	Perimeter	Perimeter	Peri
17	MonitorNC	Immediate	Immediate	Immediate	Imm
18	PIRAway	Disabled	Immediate	Disabled	Disa
19	24HrVibration	Immediate	Immediate	Immediate	Imm
20	24HrTamper	Immediate	Immediate	Immediate	Imm
21	DoorBell	Disabled	Immediate	Disabled	Disa
22	TempNO	Immediate	Immediate	Immediate	Imm

Zone Type Properties

Number	22
Name	TempNO
Security Off	Immediate
Away	Immediate
Night	Immediate
Day	Immediate
Entry Door	☐ No
Normally Open	☒ Yes
24 Hour	☐ No
Digital	☐ No
Sensitivity	500
Alarm Type Normal	Temperature
Alarm Type Trouble	Zone Trouble

The Alarm Type can be configured to dial to the selected combination of 8 phone numbers.

Alarm Types

No	Name	D/Out	Dial Indexes	D/Delay	Response
5	Zone Trouble	Yes	3,5,6,7,8	No	NullResponse
6	ZoneAlert	No		No	NullResponse
7	LowBattery	Yes	3,5,6,7,8	No	NullResponse
8	PowerFail	Yes	1,2,3,5,6,7,8	No	NullResponse
9	Panic	Yes	1,2,3,5,6,7,8	No	NullResponse
10	EntryAlert	No		No	EntryAlert
11	Tamper	Yes	1,2,3,5,6,7,8	No	NullResponse
12	Fire	Yes	1,2,3,5,6,7,8	No	NullResponse
13	Gas	Yes	1,2,3,4,5,6,7,8	No	NullResponse
14	FamilyCare	Yes	3	No	NullResponse
15	Perimeter	No		No	NullResponse
16	BypassZone	No		No	NullResponse
17	Disarm	Yes	3	No	Keypad
18	CMSTest	Yes	1,2	No	NullResponse
19	SystemArmed	Yes	3	No	NullResponse
20	AlarmAbort	No		No	NullResponse
21	EntryWarning	No		No	NullResponse
22	Siren Trouble	No		No	NullResponse
23	ForceArm	Yes	1,2,3,4,5,6,7,8	No	NullResponse
24	RS485Comms	No		No	NullResponse
25	Doorbell	No		No	NullResponse
26	HomeSafe	Yes	3	No	NullResponse
27	DialTest	Yes	1,3,4	No	NullResponse
28	SMSTrouble	No	1,2	No	NullResponse
29	NewMessage	Yes	1,2,3,4,5,6,7,8	No	NullResponse
30	Temperature	Yes	1	No	NullResponse

Alarm Type Properties

Number	30
Name	Temperature
Dial Out	☒ Yes
Dial Indexes	☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8
Dial Delay	☐ No
Response Name	NullResponse
Alarm Phrase	ZONE ALERT
Strobe	☐ No
Siren Type Name	Warning
Siren Delay	☐ No
State	Idle
Report Code	00
Restore Code	00
Class Code	6

The UCM/GSM4 is a very useful module in this application as it allows Comfort to send SMS messages to up to 8 mobile phones when the Temperature alarm occurs. The Zone Restore setting when checked in the Zone will cause a Restore Zone SMS to be sent when the temperature alarm is restored by the temperature going within the allowed limit. A typical SMS message is shown below.

10:25 Cytech
Technology-
Temperature-032
OffiiceTemp-
Partition#00

10:25 Cytech
Technology-
Temperature-032
OffiiceTemp-
Restore-
Partition#00

Virtual Input Alarm Offset

This is the temperature difference between the Setpoint and the Temperature alarm setpoint.

For example in Cooling Mode, the Setpoint is 22 degrees and the Virtual Input Offset is 2 degree and Hysteresis is 1 degree.

The Virtual Input will turn on when the temperature rises to 24 degrees (Setpoint + Virtual Input Offset).

The Virtual Input will turn off when the temperature drops below 22 degrees (Setpoint + Virtual Input Offset - Hysteresis)

Calibration Offset

This allows the TSM01 temperature to be adjusted by the value of the Calibration Offset. If Calibration Offset = 1 and the original TSM temperature is 20 degrees, then the temperature will be adjusted to 21 degrees. If the Calibration Offset = -1 degrees, then the adjusted temperature will be 19 degrees.



Document History

29 May 2016 – Initial Release

12 Jul 2016 – Thermistor part changed to TH01

4 Oct 2016 – added new properties for output, virtual input, calibration

12 Nov 2016 – updated Virtual Input, Virtual Input Offset