

# HTM FS Optional MODBUS Module

## General Description

The Hybrid Thermal Mixing (HTM) system from Monodraught is designed to provide natural ventilation, hybrid ventilation (incorporating mixed tempered air for winter periods), secure night time cooling and boosted levels of ventilation during summer. The HTM FS systems are designed to work in conjunction with natural ventilation and can be used in single sided and cross flow ventilation strategies.

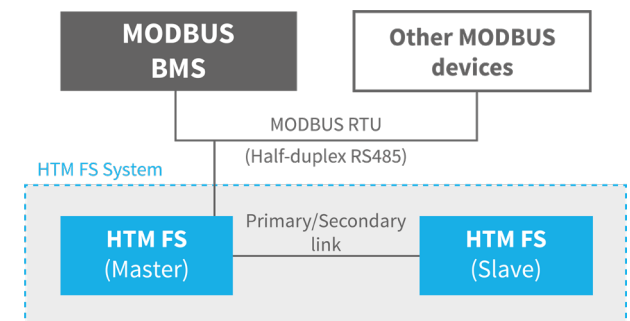
The MODBUS module allows a HTM FS system to be installed on to a MODBUS RTU network and make visible a number of system variables to the master MODBUS device.

## Technical Details

The MODBUS module for HTM FS plugs into the Control Board and interfaces with the on-board microcontroller to provide MODBUS RTU visibility of the HTM FS system over a half-duplex RS485 link.

Each HTM FS system has its own unique MODBUS number allocated 1 to 247 within the configuration header of the HTM FS. HTM FS units are usually linked in a Primary/Secondary configuration to form one system. In this instance the Primary unit will collate the information from the Secondary unit and present the collated information on the MODBUS network.

The MODBUS module requires a 1.5 or 2 pair shielded cable daisy chained between each of the Modbus modules located in the Primary units. Cable is to be supplied and installed by others.



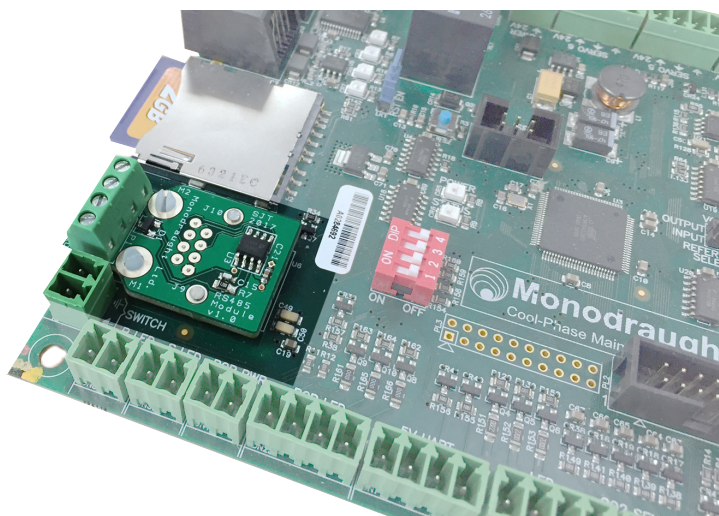
# HTM FS Optional MODBUS Module

## MODBUS DETAILS

### Wiring Requirements

MODBUS RTU over RS485 (Half-Duplex) connection wiring as follows:

- A 1.5 or 2 pair shielded cable (nominal characteristic impedance – 120 Ohms, such as a Belden 9842 cable or Alpha Wire 6413) daisy chained between each of the modbus modules located in the master units . Cable to be supplied and installed by others.
- Shield to only be terminated at one end.
- Use spare conductors for GND reference connection, as long as there will be low ground currents. For high ground differentials, please use an isolator.
- Units at the ends of the daisy-chain to have 120Ω terminators (this can be enabled on the module using the DIP switches).



### Input Registers

Address #	Description	Units
0	Serial number high word	N/A
1	Serial number low word	N/A
2	Year	Years
3	Month	Months
4	Day	Days
5	Hour	Hours
6	Minute	Minutes
7	Operating mode	N/A (See #)
8	Fan speed	N/A
9	Room temperature	° C
10	Room CO <sub>2</sub>	ppm
11	System code indicating specific faults present	N/A (See †)

### (#) OPERATING MODE Object Values Descriptions

Values	Mode
0	Unknown
1	Off
2	Idle
3	Natural Ventilation Mode
4	Natural Ventilation + Windows Mode
5	Boost Mode
6	Mixed Mode
7	Seasonal Night Cooling Mode
8	Slave Mode
9	Acoustic Test Mode
10	Self-Test Mode
11	Control Mode

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## MODBUS DETAILS

### (†) FAULT\_CODE Object Values Description

The FAULT\_CODE object is a numeric value that indicates any fault present on the system. Each fault has a unique code allocated to it (2(n-1) where n is the fault number) which are added together to form the FAULT\_CODE. So if there was a fault with the SD card, UI and MVHR, the fault code would be 21 (1 + 4 + 16).

Fault Number	Hex Code	Decimal Code	Fault
1	0x0001	1	SD card
2	0x0002	2	Header file
3	0x0004	4	User Interface
4	0x0008	8	Primary Fan
5	0x0010	16	Secondary Fan
6	0x0020	32	T5 (External air temperature sensor)
7	0x0040	64	T6 (Recirculated air temperature sensor)
8	0x0080	128	T7 (Mixed air temperature sensor)
9	0x0100	256	Servo 1 (Primary external air intake damper)
10	0x0200	512	Servo 2 (Primary recirculated air intake damper)
11	0x0400	1024	Servo 3 (Secondary external air intake damper)
12	0x0800	2048	Servo 4 (Secondary recirculated air intake damper)
13	0x1000	4096	Servo 5 (Additional damper)
14	0x2000	8192	Master error
15	0x4000	16384	Slave error

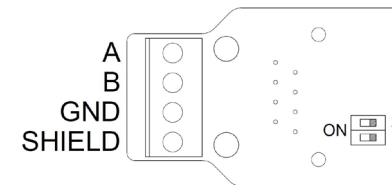
### Coils

Address #	Function	Description
0	Enable	Setting this to 0 turns off the unit



### Connection Settings

- **Baud Rate:** 19200
- **Framing:** 8-bits, Even Parity, 1 Stop bit
- **Note:** Other settings may be available on request.



### DIP Switches

1	2	Effect
Off	Off	No Terminator
On	Off	RC Terminator
On	On	120Ω Terminator





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