SMT-770 / EC-02
Communications Addendum
Version 4.6

Ver.2.31 Firmware 1/03/12

Preface
The SMT-770 thermostat from Smart Temp Australia is a standalone 24V thermostat with integrated RTU communications. This capability enables the SMT-770 to be networked back to a suitably equipped DDC master system for control.

The EC-02 is an optional module that provides 0-10V outputs for Heating & Cooling valve control **OR** 0-10V outputs for economy cycle damper control and High Voltage high current volt free relays when switching line voltage is required.

When the SMT-770 and EC-02 are "paired" they appear as one device on the network therefore this document treats both the SMT-770 and EC-02 as if it is a single device when paired. In these circumstances the End Of Line (EOL) resistor switch on the SMT-770 should be OFF and if necessary only the EOL should be used on the EC-02.

The information provided in this addendum should be used in conjunction with the SMT-770 thermostat and EC-02 installer manuals.

Note:
Although you can poll the SMT-770 and discover 225 points with active data listed in the tables below, there are many more points within the SMT-770 not listed here. Many of these unlisted locations are used as internal flags or for service and advanced function testing and diagnosis. IF you alter any value not listed below erratic thermostat response may be experienced requiring a factory reset. There may be a fee for this service.

SMT-770   Slave device

EC-02   Port 1 Slave Port (for connection to DDC master network)
                 Port 2 Master Port (for connection to SMT-770 thermostat ONLY)


Protocol – Both devices
 RTU Half Duplex
9600 Baud   (4800 or 19200 can also be selected if required   - see product installer manuals)
 8 data bits
 No parity
 1 stop bit


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Wiring Overview

Three typical wiring diagrams are provided below as examples of <u>wiring only</u>. Please refer to the specific manual for each device for wiring to the various outputs of the devices to control equipment, vales or actuators etc.

Network of SMT-770's only per node
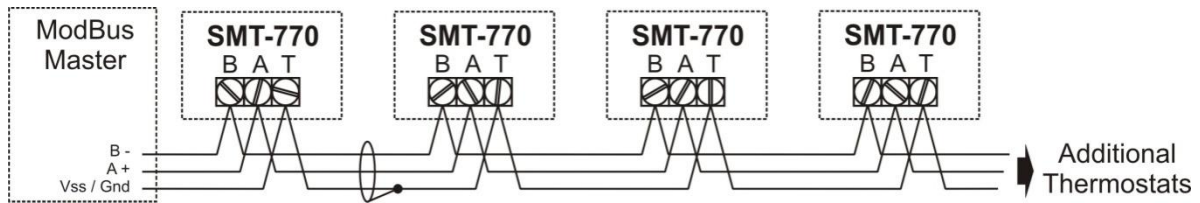
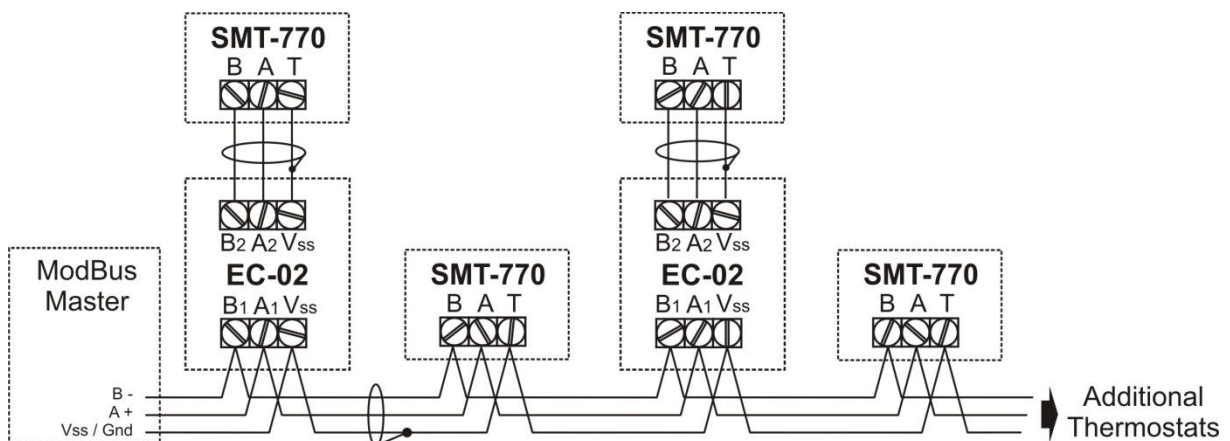The last SMT-770 may require the End Of line (EOL) resistor in circuit.

Network of SMT-770, each with EC-02 Modules
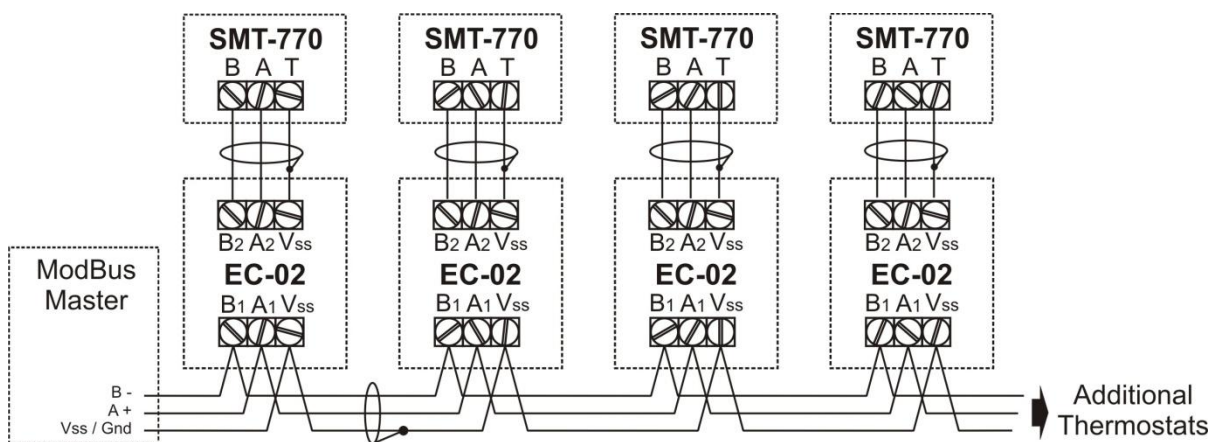
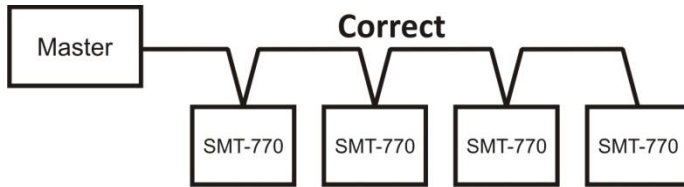The Last EC-02 may require the End Of line (EOL) resistor in circuit.
All SMT-770 EOL are OFF

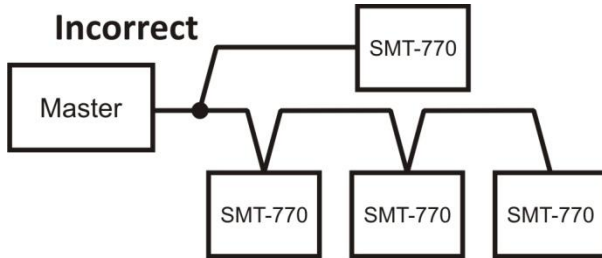**Mixed network of SMT-770 and EC-02 Modules**

The last device in the network may require the End Of Line (EOL) resistor in circuit.

Wiring Examples

When wiring the SMT-770, it is important that you use screened cables. All screens should be joined together and grounded in 1 location only.

For long runs, the last device ONLY on any node should have the EOL (End Of line) resistor in circuit.

If the last device on the network is a SMT-770 & EC-02 matched pair, then ONLY, then the EC-02 has the responsibility of having the EOL resistor in circuit.
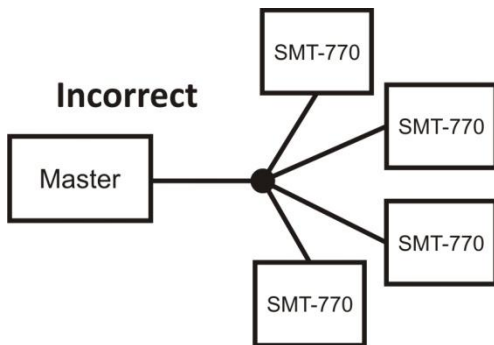
The SMT-770 the EOL is located on the PCB near the connector pins. Switch 1&2 should be on to place the EOL resistor in circuit.

The EC-02 EOL resistor switch is located near the sensor and fault input terminals. Turn switch 1 on to place the EOL resistor in circuit.

Every device on the network should have a unique network address so that it can be identified and individually controlled by the Master device. If two devices share the same network address the network may not function.

Depending on a number of network conditions, a maximum of 32 SMT-770 (with or without the EC-02 modules) can be on any single node.

Setting Network Address in the SMT-770 *(See the SMT-770 Installer manual for more detailed information)*

1. Enter the Installer Menu Option by pressing and holding the **"O/Ride"** button for 15 seconds.

2. When the LCD changes to read "*88:15*", use the "**+**"or "**−**" button to change the display to read "*88:21*" or your previously selected personal user number.

3. Tap the mode button to enter the Installer Menu Option and advance through the available installer options until you reach the menu item "*AD XX*" . This is the current Address (Factory default is 7). Use the "**+**"or "**−**" button to change this number to your desired address for this thermostat.

4. Tap the fan button to exit the Installer Menu Option
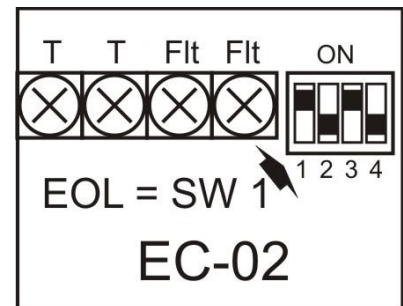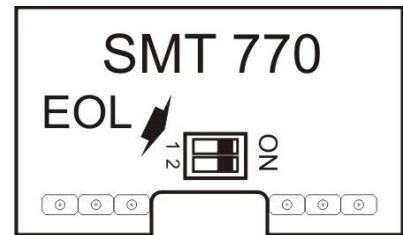
Setting the Address in the EC-02 module *(See the EC-02 Installer manual for more detailed information)*

1. Simply apply power to the EC-02 (or cycle power to theEC-02) after the address has been set on the SMT-770. The EC-02 will query the SMT-770 and match address and Baud rate with the thermostat.

2. After approximately 30 seconds the SMT-770 & EC-02 will "pair" and appear as one device on a network.

3. If pairing is successful the green status LED on the EC-02 will blink on and off in a regular cycle. If the Status LED blinks 3 times then pauses, pairing is not yet complete or has been lost.

4. If pairing has not been confirmed after 2 or 3 minutes, cycle the power to the EC-02 to force a re-initialisation of the device

   (Note other blink codes indicate other faults - 3 blinks indicates loss of communications)

Object List

Note:
The data provided below is dependant on the various operational modes of the SMT-770 thermostat and/or EC-02 Module, for example if hardware switch on the SMT-770 - SW1 =OFF (Single indoor fan speed mode) then setting the values of register 40010 (fan speed select) will have no effect on the operation of the SMT-770 thermostat or the EC-02 module connected to it.

Object List for Function 1 "Coil Status" registers

Function group	Coil Status	
Type	Read only	
	Read / write (2.19+ firmware)	
Address	00001	0 = G1 relay Off
		1 = G1 relay On
	00002	0 = G2/Y2 relay Off
		1 = G2/Y2 relay On
	00003	0 = G3/W2/OB relay Off
		1 = G3/W2/OB relay On
	00004	0 = Y1 relay Off
		1 = Y1 relay ON
	00005	0 = W1 relay Off
		1 = W1 relay ON

Address	40002
Function	Thermostat Mode
Type	Read / Write
Values	0= Thermostat Mode is OFF
	2= Thermostat Mode is Heat Only Mode
	3=Thermostat Mode is Cool Only Mode
	4=Thermostat Mode is Auto season Change over Mode
	5=Thermostat Mode is Emergency Heat Mode
	6= Cool & Dry (Version 2.3+)
	7= Auto & Dry (Version 2.3+)

Comments

Changing this register value is dependent on other register values and hardware switches within the thermostat being set correctly, for example selecting value "1"(emergency Heat mode) will have no effect if register 40042 does not have value "1" set – Emergency Heat mode enable. Likewise, if register 4041 is set for cooling only mode then this is the only value than can be selected from this register. Also, if hardware switch 2 is OFF, (heat with add on cool mode), then register value 1 will have no effect. Invalid calls are ignored. In summary, changing values in this register may have no effect if other register or hardware switches conflict with those changes.

Address	40003
Function	Fan Mode
Type	Read / Write
Values	0= Fan Mode is Auto (Cycles with heat and cool)
	1= Fan Mode is ON

Address	40004
Function	Program Hold
Type	Read / Write
Values	0 = Hold function OFF
	1 = Temporary Hold
	2 = Permanent Hold

Comment

This register only has effect if hardware DIP switch 6 & 8 is ON – Thermostat in residential Programmable mode

Address	40005
Function	Heat Set Temperature HOLD value
Type	Read / Write
Values	Deg C Subtract 20 from value then divide by 2 to get Deg C value.
	Deg F 1:1

Comments

This register is only used when the thermostat is in manual or programmable **TWO** set point mode. See Installer manual

Address	40006
Function	Cool Set Temperature HOLD value
Type	Read / Write
Values	Deg C Subtract 20 from value then divide by 2 to get Deg C value.
	Deg F 1:1

Comments

This register is only used when the thermostat is in manual or programmable **TWO** set point mode. See Installer manual

Address   40010

Function	Fan Speed
Type	Read / Write
Values	1 = Low Speed
	2 = Medium Speed
	3 = High Speed
	4 = Auto Speed

Comments
Thermostat hardware switch must be ON – 3 speed fan mode for this register to have effect. Values in this register are stored until DIP switch 1 is in the correct position.

Address   40011

Function	Day Cool Set Temp
Type	Read / Write
Values	Range deg C 30~94 255=OFF
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 41 ~ 98 255=OFF 1:1

Comments
Thermostat hardware DIP switch 6 must be off and 8 must be on for this function to have effect. Manual Day/Night mode

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Address   40012

Function	Day Heat Set Temp
Type	Read / Write
Values	Range deg C 20~90 0=OFF
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 32 ~ 95 0=OFF 1:1

Comments
Thermostat hardware DIP switch 6 must be off and 8 must be on for this function to have effect. Manual Day/Night mode

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Address   40013

Function	Night Cool Set Temp
Type	Read / Write
Values	Range deg C 30~94 255=OFF
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 41 ~ 98 255=OFF 1:1

Comments
Thermostat hardware DIP switch 6 must be off and 8 must be on for this function to have effect. Manual day/Night Mode

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Address   40014

Function	Night Heat Set Temp
Type	Read / Write
Values	Range deg C 20~90 0=OFF
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 32 ~ 95 0=OFF 1:1

Comments
Thermostat hardware DIP switch 6 must be off and 8 must be on for this function to have effect. Manual Day Night Mode

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Address   40015

Function	Single temperature Set point / Manual mode
Type	Read / Write
Values	Range deg C 30~90
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 41 ~ 95

Comments
Thermostat hardware DIP switch 6 &8 must be off for this function to have effect.

Address   40016

Function	8 DIP switch settings
Type	Read Only
Values	Sw1 On = 1
	Sw2 On = 2
	Sw3 On = 64
	Sw4 On = 4
	SW5 On = 8
	SW6 **OFF** = 16
	Sw7 On = 128
	SW8 **OFF** = 32

Comments
This is a simple binary count. The order and function of the switches need to be considered, as they are not logical. Some switch functions add to the sum, others subtract from the sum. This is as a consequence of the internal decoding of these switches for thermostat operation.

Address   40017

Function	Single temperature Set point / Start –Stop Programmable mode
Type	Read / Write
Values	Range deg C 30~90
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 41 ~ 95

Comments
The thermostat must be in Commercial start / stop programmable mode. Thermostat hardware DIP switch 6 must be ON and 8 must be off for this function to have effect.

Address   40018

Function	Start / Stop after hours initiate
Type	Read / Write
Value	0 = Timer OFF
	1 = Timer Running

Comments
The thermostat must be in Commercial start / stop programmable mode. Thermostat hardware DIP switch 6 must be ON and 8 must be off for this function to have effect.

Address   40019

Function	Current running program
Type	Read only
Value	0 = Thermostat is in manual mode
	1 = Program event 1
	2 = Program event 2
	3 = Program event 3
	4 = Program event 4
	5 = Program event "Start"
	6 = Program event "Stop"

Address   40020

Function	SMT-770 Sentinel Point.
Type	Read only
Value	Pre 2.17 = 77
	2.17+ = 78

Comments
This register is to permit suitably programmed master devices to automatically identify the SMT-770 on a network.

Address   **4021**

Function   Installer menu security PIN
Type   Read / Write
Values   Range 00 ~ 99   2 digits only
                       Enter Decimal Value for PIN

Address   **40022**

Function   ModBus Address
Type   Read / Write
Values   Range 1 – 32 (Zero is prohibited)
                       Enter Decimal Value for Address

Comments
Changing this value via the network will require your network to be reset to the to the new value

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Address   **40023**

Function   Lock Level
Type   Read / Write
Values   Range 0 to 6 (see installer manual for lock values)

Address   **40024**

Function   Thermostat Temperature display mode
Type   Read / Write
Values   0 = Display room and set temperature on LCD
                       1 = Display set temperature only on LCD

Address   **40025**

Function   Room Sensor Calibration value
Type   Read / Write
Values   Deg C range 0-90= +/- 4.5c in 0.1 deg steps. (value 45 = No offset)
Deg F range 0-90 = +/- 9F in 0.2 deg steps. (value 45 = No offset)

Address   **40026**

Function   TT terminal Functions
Type   Read / Write
Values   0 = Outside Air Temperature Display
                       1 = Remote Temperature Input
                       2 = Averaging Temperature sensor Input
                       3 = Thermostat remote On/Off mode
                       4 = Thermostat Occupancy input Mode
                       5= Duct Air sensor reading (supply air temperature monitoring)
                       6= 2 Pipe mode. -Remote sensor temp sets t'stat mode) (2.19+ firmware)

Comments
Value 5 is intended to permit the SMT-770 to broadcast the A/C system supply air temperature to the network so that correct A/C operation can be verified remotely.

Address   **40027**

Function   (un) occupied mode Heat set point
Type   Read / Write
Values   Range deg C 20~90   0=OFF
                       Subtract 20 from value then divide by 2 to get Deg C value
                       Range deg F   32 ~ 95 0=OFF 1:1

Address	**40028**
Function	(un) occupied mode Cool set point
Type	Read / Write
Values	Range deg C 30~94 100=OFF
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 32 ~ 95 100=OFF 1:1

Address	**40029**
Function	Thermostat Display Units
Type	Read / Write
Values	0 = Deg F
	1 = Deg C

Address	**40030**
Function	Heating (or High) Set Limit
Type	Read / Write
Values	Range deg C 20~90
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 32 ~ 95 1:1

Address	**40031**
Function	Cooling (or Low) Set Limit
Type	Read / Write
Values	Range deg C 30~94
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 32 ~ 95 1:1

Address	**40032**
Function	Thermostat Stage 1 Span (Hysteresis)
Type	Read / Write
Values	1= +/- 0.5C (1F)
	2 = +/- 1.0c (2F)
	3= +/- 1.5c (3F)

Address	**40033**
Function	Thermostat Stage 2 Span (Hysteresis)
Type	Read / Write
Values	1= +/- 0.5C (1F)
	2 = +/- 1.0c (2F)
	3= +/- 1.5c (3F)

Address	**40034**
Function	Optimised Start (Adaptive Recovery)
Type	Read / Write
Values	0 = Off
	1 = ON

Address	**40035**
Function	Anti freeze function
Type	Read / Write
Values	0 = Off
	1 = ON (room temp will not be permitted to fall below 5c / 41f)

Address   40036

Function   Filter Waring Reminder
Type   Read / Write
Values   0 = Off (9max)
                       Register value X 100 hours

Address   40037

Function   Fan Options
Type   Read / Write
Values   0 = No advanced fan option selected
                       1 = Fan will continue to run after cooling but stop after heating
                       2 = Fan will continuously run from Start or 1st to stop or 4th program.
                       3 = Combination of both 1 & 2 mode above.

Comments
Fan must be in Fan On mode for this register to have effect. Register 4003 must ="1"

Address   40038

Function   Fan Purge Period
Type   Read / Write
Values   0 to 5 minutes (0 = off)

Address   40039

Function   After hours / Program override period
Type   Read / Write
Values   0 to 24 (12 hours in 30 minute intervals)

Comments
Thermostat hardware DIP sw6 must be ON for this function to operate.
Used to set after hours run period in commercial mode (Sw 6 = ON Sw 8=OFF)
Used to select the program override period in residential mode Sw6 = ON Sw8=ON   Selecting "0" sets override to expire at next program change.

Address   40040

Function   Dead Band
Type   Read / Write
Values   C = 0~5c in 0.5c steps (eg 3=1.5c)
                       F = 0~9F in 1 deg F steps

Address   40041

Function   Thermostat permitted Modes
Type   Read / Write
Values   0 = Auto (Both Heat & Cool modes can be selected
                       1 = Cool only operation permitted
                       2 = Heat only operation permitted
                       3 = Manual mode (Heat & Cool – Auto NOT permitted) (2.19+ firmware)
                       4 = Cool &Dry / Auto & dry Permitted (2.3+ firmware)
                       5 = Cool & Dry permitted (2.3+ firmware)
                       6 = Manual Mode plus Cool dry permitted (2.3+ firmware)

Comments
The SMT-770 does NOT have a dry function, however when connected to a BMS or other MODbus device fitted with a dry function, this register permits the user to select a dry mode and to be read by the MODbus master on register 40002

Address 40042

Function	W2 Relay Function (Heat Pump mode only)
Type	Read / Write
Values	0 = 3rd Stage Heat
	1 = Emergency Heat Mode
	2 = Add on heat mode
	3=Both electric and fossil fuel control.
	4=Fossil Fuel Function

Address 40043

Function	Clock type
Type	Read / Write
Values	0 = 12 hour (AM/PM)
	1 = 24 hour
	2= Clock display not shown on the LCD

Comments
Selecting value "2" will still broadcast the thermostat clock to the network. It is simply hidden on the LCD.

Address 40044

Function	TT Terminal sensor calibration
Type	Read / Write
Values	Deg C range 0-90= +/- 4.5c in 0.1 deg steps. (value 45 = No offset)
	Deg F range 0-90 = +/- 9F in 0.2 deg steps. (value 45 = No offset)

Comments
This register only applies when register 40026 is set for value "0", "1","2" or "5"

Address 40045

Function	Cool Inhibit on outside air temp
Type	Read / Write
Range	0~37C (32 ~ 99F)
Values	Deg C Subtract 20 from value then divide by 2 to get Deg C value.
	Deg F 1:1

Comments
Register 40026 must be set for value "0" and the outside air sensor must be fitter for this function to operate.

Address 40046

Function	Heat Inhibit on outside air temp
Type	Read / Write
Range	0~37C (32 ~ 99F)
Values	Deg C Subtract 20 from value then divide by 2 to get Deg C value.
	Deg F 1:1

Comments
Register 40026 must be set for value "0" and the outside air sensor must be fitter for this function to operate.

Address 40047

Function	High Balance Point
Type	Read / Write
Range	0~37C (32 ~ 99F) 200 = Function off (2.19+ firmware)
Values	Deg C Subtract 20 from value then divide by 2 to get Deg C value.
	Deg F 1:1

Comments
Register 40026 must be set for value "0" and the outside air sensor must be fitter for this function to operate.

Address   40048

Function	Low Balance Point
Type	Read / Write
Range	-9.5~25C (15 ~ 77F) 0 = Function off (2.19+ firmware)
Values	Deg C Subtract 20 from value then divide by 2 to get Deg C value.
	Deg F 1:1

Comments
Register 40026 must be set for value "0" , the outside air sensor must be fitter and register 40042 must also be set for value "2"for this function to operate.

Address   40049

Function	Stop Mode Cooling
Type	Read / Write
	Range deg C 30~94 200=OFF
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 41 ~ 98 100=OFF 1:1

Comments
Thermostat hardware 6 must be on and hardware switch 8 must be off (commercial programmable mode) to use this function.

Address   40050

Function	Stop Mode Heating
Type	Read / Write
	Range deg C 20~90 0=OFF
	Subtract 20 from value then divide by 2 to get Deg C value
	Range deg F 32 ~ 95 0=OFF 1:1

Comments
Thermostat hardware 6 must be on and hardware switch 8 must be off (commercial programmable mode) to use this function.

Address   40051

Function	Service Mode
Type	Read / Write
	0 = Service Mode OFF
	1 = Service Mode On

Address   40052

Function	Timed upstage Delay period
Type	Read / Write
	0~90 minutes in 5 minute steps

Address   40054

Function	Day / Night mode change
Type	Read / Write
	0 = Night Mode
	1 = Day Mode

Comments
Thermostat hardware switch 6 must be off and switch 8 must be on (2 set point manual mode) to use this function.

Address   40055

Function	Display firmware revision number
Type	Read Only

Address	40057
Function	Remote OFF Status
Type	Read Only
	0 = Mode is selected by user
	1= Thermostat held OFF (word OFF flashing in LCD)

Comments
Only valid when TT=OFF.

Address	40058
Function	Start Stop Mode Override
Type	Read / Write
	0= Normal (thermostat internal time clock schedule running)
	1 = Start Mode (thermostat locked into Start Program)
	2 = Stop Mode (thermostat locked into Stop Program)

Comments
Thermostat hardware DIP switch 6 must be on and 8 must be off to use this function.

Address	40059
Function	Thermostat Sample Rate
Type	Read / Write
	1 = 10mS Sample Rate (64 seconds temperature averaging period)
	2 = 20mS Sample Rate (2 min 8 seconds temperature averaging period)
	3~8 ….
	9=90mS Sample Rate (9 min 36 seconds temperature averaging period)

Comments
The SMT-770 thermostat takes 640 room temperature readings (samples) and uses the running averaging of these samples for the room temperature. The longer the sample rate setting the slower the thermostat response to room temperature fluctuations. Default is 4

Address	40060
Function	Thermostat Baud Rate
Type	Read / Write
	1 = 4.8K
	2 = 9.6K
	3 = 19.2K

Comments
Note: Changing this value via will disconnect this device from the network. All devices on a network should use the same network settings. This includes the maser and all slaves.

Address	40061	(2.19+ firmware)
Function	Start Program default Start Temperature	
Type	Read / Write	
	Range deg C 15~35 0=OFF	
	Subtract 20 from value then divide by 2 to get Deg C value	
	Range deg F 1:1 59 ~ 95 0=OFF	

Address	40062	(2.2+ firmware)
Function	Coil Override mode	
Type	Read / Write (2.2+ Firmware)	
	0 = Thermostat controls coils	
	1 = Modbus controls coils	

Comments
A "1" must be sent to the thermostat at least once every 4 minutes to hold this function.
Loss of Modbus for 5 for minutes (or loss of power) auto resets this menu to "0" – thermostat controls coils

Address	**40064**	(2.2+ firmware)
Function		Stage 3 (heating) Span
Type		Read / Write
		1= +/- 0.5C (1F)
		2 = +/- 1.0c (2F)
		3= +/- 1.5c (3F)

Address	**40065**	(2.2+ firmware)
Function		Smart Upstage delay period
Type		Read / Write
		0 (Function Off) to 15 mins

Comments
This sets the minimum amount of time the SMT-770 thermostat will wait before bringing on subsequent stages of heating and cooling.

Address	**40066**	(2.2+ firmware)
Function		Temperature Overshoot setting
Type		Read / Write
		Adjustable in 0.1c increments. 0 = no overshoot.

Comments
This causes the heating or cooling system to heat or cool past the user set point by this value.
USE WITH EXTREEM CAUTION

Address	**40068**	(2.31 + firmware)
Function		Modbus Parity adjustment
Type		Read / Write
		0 = No parity
		1 = Even Parity
		2 = Odd Parity

Comments
Chaing this value via modus will require the masters parameter to also be altered.

Address	**40070**	(2.2+ firmware)
Function		TT Input status
Type		Read Only
		0 = TT terminals Open circuit
		1 = TT terminals Shorted

Comments
This register permits the Modbus master to monitor the TT terminal status regardless of the TT function

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Address	**40305**	
Function		Day
Type		Read / Write
		0 = Monday ......
		6 = Sunday

Address	40306	
Function		Real Time Clock Hour
Type		Read / Write
		0 = 0....
		9=9am
		10 ~ 15 Not used
		16 = 10am....
		25 = 7pm
		26 ~ 31 Not used
		32 = 8pm....
		35 = 11pm
		See Appendix A below for more detail on this function.

Address	40307	
Function		Real Time Clock Minute
Type		Read / Write
		0 = 0min ....
		9=9 min
		10 ~ 15 Not used
		16 = 10 min....
		25 = 19 min
		26 ~ 31 Not used
		32 = 20 min......
		41=29 min
		42 ~47 Not Used
		48=30 min....
		57 = 39 min
		58 ~ 63 not used
		64 = 40
		73=49
		74 ~ 79 Not used
		80=50
		89 =59 mins
		See Appendix B below for more information on this function

Address	40308	
Function		Real Time Clock Seconds
Type		Read Only
		(See register 40307 above or appendix B below for a table of values)

Address	40310		
Function		Fitted Temperature Sensor Value Deg C	
Type		Read Only	
		Subtract 20 from register value then divide by 2 = room temp deg C	
Ver. 2.16+		Subtract 80 from register value then divide by 2 = room temp deg C	1

Address	40311	
Function		Fitted Temperature Sensor Value Deg F
Type		Read Only
		Displays Deg F value
Ver. 2.16+		subtract 40 from register value

Address	**40313**	
Function		Outside Air Temperature Sensor Deg C
Type		Read Only
		Subtract 20 from register value then by 2 = room temp deg C
Ver. 2.16+		Subtract 80 from register value then divide by 2 = room temp deg C

Address	**40314**	
Function		Outside Air Temperature Sensor Deg F
Type		Read Only
		Displays Deg F value
Ver. 2.16+		subtract 40 from register value

Address	**40316**	
Function		Room Temperature shown on LCD - Deg C (0.5c)
Type		Read Only
		Subtract 20 from register value then by 2 = room temp deg C
Ver. 2.16+		Subtract 80 from register value then divide by 2 = room temp deg C

Address	**40317**	
Function		Room Temperature shown on LCD -Deg F (0.5f)
Type		Read Only
		Displays Deg F value
Ver. 2.16+		subtract 40 from register value

Address	**40318**	
Function		Current ACTIVE thermostat set temp (both Deg C & F)
Type		Read Only
		C=Subtract 20 from register value then by 2 to get set temp in C
		F= 1:1

Address	**40319**	
Function		Current Cooling set temp (both Deg C & F)
Type		Read Only
		C=Subtract 20 from register value then by 2 to get set temp in C
		F= 1:1

Address	**40318**	
Function		Current Heating set temp (both Deg C & F)
Type		Read Only
		C=Subtract 20 from register value then by 2 to get set temp in C
		F= 1:1

Address	**40330**	
Function		Dec C room sensor RAW decimal value display
Type		Read Only
		22.3c= 3
		24.7c= 7 etc

Comments
This only displays the decimal value of any temperature – this register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

Address   **40331**

Function   Dec F room sensor RAW decimal value display

Type   Read Only

                       77.6F = 6

                       69.4F = 4 etc

<u>Comments</u>

This only displays the decimal value of any temperature – this register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

Address   **40332**– Valid only when EC-02 board fitted

Function   Dec C Outside Air sensor RAW decimal value display

Type   Read Only

                       22.3c = 3

                       24.7c = 7 etc

<u>Comments</u>

This only displays the decimal value of any temperature – this register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

Address   **40333**– Valid only when EC-02 board fitted

Function   Dec F Outside Air sensor RAW decimal value display

Type   Read Only

                       77.6F = 6

                       69.4F = 4 etc

<u>Comments</u>

This only displays the decimal value of any temperature – this register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

Address   **40334**

Function   Deg C room temp decimal value as shown on LCD

Type   Read Only

                       22.3c = 3

                       24.7c = 7 etc

<u>Comments</u>

This only displays the decimal value of any temperature – this register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

Address   **40335**

Function   Deg F room temp decimal value as shown on LCD

Type   Read Only

                       77.6F = 6

                       69.4F = 4 etc

<u>Comments</u>

This only displays the decimal value of any temperature – this register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

Address   **40339**

Function   Economy PCB call Economy Fan ON

Type   Read EC-02 – Write SMT-770

                       0= Economy Fan Off

                       1= Economy Fan On

<u>Comments</u>

This register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

Address   **40340**

Function   LCD Segments display

Type   Read EC-02 – Write SMT-770

Function called by EC-02 Board only

0=No message display

1= Economy mode active

2= Economy board fault is active

3 = Economy mode and fault is active.

Comments

This register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module. It can also be used as a flag to indicate a Ec-02 fault input is active or the SMT-770/Ec-02 is using outside air for cooling (economy mode active)

Address   **40341**

Function   Enable outside air temperature display

Type   Read EC-02 – Write SMT-770

Writes the outside air temperature

Comments

This register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

Normally this register shows 255 = no sensor fitted. 1= show outside air temp. Outside air temperature value taken from register 40342

Address   **40342**

Function   EC-02 outside air Sensor Deg C

Type   Read EC-02 – Write SMT-770

Writes Outside air sensor reading to SMT-770 LCD

80 = 0C   +/- 2 for every +/-1C shown on LCD

Comments

This register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

40341 must be set to 1 for this register to function

Address   **40343**

Function   EC-02 outside air Sensor Deg F reading

Type   Read EC-02 – Write SMT-770

Writes Outside air sensor reading to SMT-770 LCD

40 = 0F   +/- 1 for every +/-1F shown on LCD

Comments

This register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

40341 must be set to 1 for this register to function

Address   **40344**

Function   EC-02 outside air Sensor Deg C decimal reading

Type   Read EC-02 – Write SMT-770

Writes Outside air sensor decimal 0.X reading to SMT-770 LCD

Comments

This register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

40341 must be set to 1 for this register to function

Address   **40345**

Function   EC-02 outside air Sensor Deg F decimal reading

Type   Read EC-02 – Write SMT-770

Writes Outside air sensor decimal 0.X reading to SMT-770 LCD

Comments

This register's primary function is for data exchange between the STM-770 thermostat and the EC-02 Module.

40341 must be set to 1 for this register to function

Address	40346	
Function		Factory Test Mode
Type		Read only
		0 = OFF
		1 = Display DIP Switch Configuration
		2 = Relay Test mode (Will cycle all 5 relays on and off sequentially)

Address	40347	(2.19+ Firmware)
Function		Display delta room / set temp
Type		Read only
		100 = set point = room temp
		+1 for every 0.1 C room temp is greater than set temp
		-1 for every 0.1C room temp is less than set temp

Address	40350	(2.17+ Firmware)
Function		Raw Room temperature in 0.1c Deg C
Type		Read only
		(Raw-400) / 10

Comments
This is the raw value as measured by the thermostat sensor, fast updating - this value may NOT be shown on the thermostat LCD

Address	40351	(2.17+ Firmware)
Function		Raw Room temperature in 0.1c Deg F
Type		Read only
		(Raw-400) / 10

Comments
This is the raw value as measured by the thermostat sensor, fast updating - this value may NOT be shown on the thermostat LCD

Address	40354	(2.17+ Firmware)
Function		Display Room in 0.1c Deg C
Type		Read only
		(Raw-400) / 10

Comments
This value is shown on the thermostat LCD

Address	40355	(2.17+ Firmware)
Function		Display Room in 0.1c Deg F
Type		Read only
		(Raw-400) / 10

Comments
This value is shown on the thermostat LCD

Address	40356	(2.2+ Firmware)
Function		TT terminal temperature value 0.1c Deg F
Type		Read only
		(Raw-400) / 10
		Range -30 to 95c (-20 to 200F)

Address	40513	
Function		Monday 1st Period (or Start Program) Hour
Type		Read / Write
		See setting hour in appendix A below

Address	40514
Function	Monday 1st Period (or Start Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	40515
Function	Monday 1st Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40516
Function	Monday 1st Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40519
Function	Monday 2ndPeriod Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	40520
Function	Monday 2ndPeriod Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	40521
Function	Monday 2ndPeriod Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40522
Function	Monday 2ndPeriod Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40525
Function	Monday 3rd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	40526
Function	Monday 3rd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	40527
Function	Monday 3rd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40528	
Function		Monday 3rd Period Heat Set Temperature
Type		Read / Write
		See setting Temperature in appendix C below

Address	40531	
Function		Monday 4th Period (Or Stop Program) Program Hour
Type		Read / Write
		See setting hour in appendix A below

Address	40532	
Function		Monday 4th Period (or Stop Program) Minute
Type		Read / Write See setting minute value in appendix B
below		

Address	40533	
Function		Monday 4th Period Cool Set Temperature
Type		Read / Write
		See setting Temperature in appendix C below

Address	40534	
Function		Monday 4th Period Heat Set Temperature
Type		Read / Write
		See setting Temperature in appendix C below

Address	40537	
Function		Tuesday 1st Period (or Start Program) Hour
Type		Read / Write
		See setting hour in appendix A below

Address	40538	
Function		Tuesday 1st Period (or Start Program) Minute
Type		Read / Write
		See setting minute value in appendix B below

Address	40539	
Function		Tuesday 1st Period Cool Set Temperature
Type		Read / Write
		See setting Temperature in appendix C below

Address	40540	
Function		Tuesday 1st Period Heat Set Temperature
Type		Read / Write
		See setting Temperature in appendix C below

Address	40543	
Function		Tuesday 2nd Period Program Hour
Type		Read / Write
		See setting hour in appendix A below

Address	40544	
Function		Tuesday 2nd Period Minute
Type		Read / Write
		See setting minute value in appendix B below

Address	**40545**
Function	Tuesday 2nd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40546**
Function	Tuesday 2nd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40549**
Function	Tuesday 3rd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40550**
Function	Tuesday 3rd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40551**
Function	Tuesday 3rd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40552**
Function	Tuesday 3rd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40555**
Function	Tuesday 4th Period (Or Stop Program) Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40556**
Function	Tuesday 4th Period (or Stop Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40557**
Function	Tuesday 4th Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40558**
Function	Tuesday 4th Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40561**
Function	Wednesday 1st Period (or Start Program) Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40562**
Function	Wednesday 1st Period (or Start Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40563**
Function	Wednesday 1st Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40564**
Function	Wednesday 1st Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40567**
Function	Wednesday 2nd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40568**
Function	Wednesday 2nd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40569**
Function	Wednesday 2nd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40570**
Function	Wednesday 2nd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40573**
Function	Wednesday 3rd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40574**
Function	Wednesday 3rd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40575**
Function	Wednesday 3rd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40576**
Function	Wednesday 3rd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40579**
Function	Wednesday 4th Period (Or Stop Program) Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40580**
Function	Wednesday 4th Period (or Stop Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40581**
Function	Wednesday 4th Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40582**
Function	Wednesday 4th Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40585**
Function	Thursday 1st Period (or Start Program) Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40586**
Function	Thursday 1st Period (or Start Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40587**
Function	Thursday 1st Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40588**
Function	Thursday 1st Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40591**
Function	Thursday 2nd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40592**
Function	Thursday 2nd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40593**
Function	Thursday 2nd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40594
Function	Thursday 2nd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40597
Function	Thursday 3rd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	40598
Function	Thursday 3rd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	40599
Function	Thursday 3rd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40600
Function	Thursday 3rd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40603
Function	Thursday 4th Period (Or Stop Program) Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	40604
Function	Thursday 4th Period (or Stop Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	40605
Function	Thursday 4th Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40606
Function	Thursday 4th Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40609
Function	Friday 1st Period (or Start Program) Hour
Type	Read / Write
	See setting hour in appendix A below

Address	40610
Function	Friday 1st Period (or Start Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40611**
Function	Friday 1st Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40612**
Function	Friday 1st Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40615**
Function	Friday 2nd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40616**
Function	Friday 2nd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40617**
Function	Friday 2nd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40618**
Function	Friday 2nd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40621**
Function	Friday 3rd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40622**
Function	Friday 3rd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40623**
Function	Friday 3rd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40624**
Function	Friday 3rd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40627**
Function	Friday 4th Period (Or Stop Program) Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	40628
Function	Friday 4th Period (or Stop Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	40629
Function	Friday 4th Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40630
Function	Friday 4th Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40633
Function	Saturday 1st Period (or Start Program) Hour
Type	Read / Write
	See setting hour in appendix A below

Address	40634
Function	Saturday 1st Period (or Start Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	40635
Function	Saturday 1st Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40636
Function	Saturday 1st Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40639
Function	Saturday 2nd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	40640
Function	Saturday 2nd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	40641
Function	Saturday 2nd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	40642
Function	Saturday 2nd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40645**
Function	Saturday 3rd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40646**
Function	Saturday 3rd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40647**
Function	Saturday 3rd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40648**
Function	Saturday 3rd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40651**
Function	Saturday 4th Period (Or Stop Program) Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40652**
Function	Saturday 4th Period (or Stop Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40653**
Function	Saturday 4th Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40654**
Function	Saturday 4th Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40657**
Function	Sunday 1st Period (or Start Program) Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40658**
Function	Sunday 1st Period (or Start Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40659**
Function	Sunday 1st Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40660**
Function	Sunday 1st Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40663**
Function	Sunday 2nd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40664**
Function	Sunday 2nd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40665**
Function	Sunday 2nd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40666**
Function	Sunday 2nd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40669**
Function	Sunday 3rd Period Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40670**
Function	Sunday 3rd Period Minute
Type	Read / Write
	See setting minute value in appendix B below

Address	**40671**
Function	Sunday 3rd Period Cool Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40672**
Function	Sunday 3rd Period Heat Set Temperature
Type	Read / Write
	See setting Temperature in appendix C below

Address	**40675**
Function	Sunday 4th Period (Or Stop Program) Program Hour
Type	Read / Write
	See setting hour in appendix A below

Address	**40676**
Function	Sunday 4th Period (or Stop Program) Minute
Type	Read / Write
	See setting minute value in appendix B below

Address   **40677**

Function   Sunday 4th Period Cool Set Temperature

Type   Read / Write

See setting Temperature in appendix C below

Address   **40678**

Function   Sunday 4th Period Heat Set Temperature

Type   Read / Write

See setting Temperature in appendix C below

Appendix A Setting the Hour value.

0 = 0 am	6 = 6 am	18 = 12 noon	24 = 6 pm (1800)
1 = 1 am	7 = 7 am	19 = 1 pm (1300)	25 = 7 pm (1900)
2 = 2 am	8 = 8 am	20 = 2 pm (1400)	32 = 8 pm (2000)
3 = 3 am	9 = 9 am	21 = 3 pm (1500)	33 = 9 pm (2100)
4 = 4 am	16 = 10 am	22 = 4 pm (1600)	34 = 10 pm (2200)
5 = 5 am	17 = 11am	23 = 5 pm (1700)	35 = 11 pm (2300)

Appendix B Setting the Minute value.

0 = 0 min	32 = 20 min	64 = 40 min
1 = 1 min	33 = 21 min	65 = 41 min
2 = 2 min	34 = 22 min	66 = 42 min
3 = 3 min	35 = 23 min	67 = 43 min
4 = 4 min	36 = 24 min	68 = 44 min
5 = 5 min	37 = 25 min	69 = 45 min
6 = 6 min	38 = 26 min	70 = 46 min
7 = 7 min	39 = 27 min	71 = 47 min
8 = 8 min	40 = 28 min	72 = 48 min
9 = 9 min	41 = 29 min	73 = 49 min
16 = 10 min	48 = 30 min	80 = 50 min
17 = 11 min	49 = 31 min	81 = 51 min
18 = 12 min	50 = 32 min	82 = 52 min
19 = 13 min	51 = 33 min	83 = 53 min
20 = 14 min	52 = 34 min	84 = 54 min
21 = 15 min	53 = 35 min	85 = 55 min
22 = 16 min	54 = 36 min	86 = 56 min
23 = 17 min	55 = 37 min	87 = 57 min
24 = 18 min	56 = 38 min	88 = 58 min
25 = 19 min	57 = 39 min	89 = 59 min

Appendix B Setting the Temperature value.

Deg C   Subtract 20 from value then divide by 2 to get Deg C value.
Deg F   1:1

If you change the register value in any address not listed above, extremely erratic thermostat response may result requiring a factory re-set of all thermostat functions.

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