INNOTECH®

DS 2.70
August 2013

Models:
MS01-01: 3 Speed FAN, 1 COOL & 1 HEAT Controller

MS01-01
Microcontroller

Specifications

Power Supply
Voltage: 240VAC ±10% @ 50/60Hz
Power Consumption: 7VA Max.

Input
10kΩ Thermistor temperature sensor - 0°C to 50°C range
Switched contact for AC Unit disable
Switched contact for Timeclock input
Switched contact for After Hours operation
Switched contact for Heat/Cool disable

Outputs
Relay 1 to 5 Voltage free relay contacts:
Normally Open: - 16A resistive
- 6A inductive

Connection between Controller and Control Station
5 way connection via 4 core plus screen cable

Control Terminal Identification

TH1	Temperature Sensor Input
TH2	Temperature Sensor Input (10kΩ thermistor)
SHLD	Cable Shield for Temperature Sensor
DI#n+	Digital Input - positive
DI#n-	Digital Input - negative
P+	12VDC to Control Station
P-	0VDC to Control Station
C+	RS485 Comms + to Control Station
C-	RS485 Comms - to Control Station
SHLD	Wall Panel Cable Shield

Input Terminal Identification
240V Power connection to Control Station:

E	Earth
N	Neutral supply
240V	Mains 240VAC Supply

Output Relays

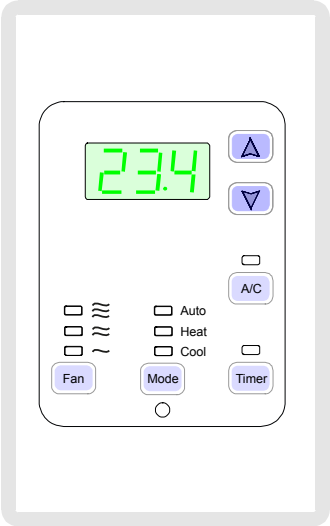
NO	Normally Open contact
Com	Common contact

Temperature Ratings
Storage: 0-50°C non-condensing
Operating: 0-40°C non-condensing

Enclosure
The control is provided in three parts. The wall mounted Control Station, the Remote Controller and a Bead Type Return Air Detector.

Control Station
HPM or Clipsal style switchplate
Dimensions: 115mm x 72mm x 30mm

Controller
Plastic enclosure manufactured from an ignition resistant grade of ABS which meets the requirements of AS2420.
Colour: Grey
Dimensions: 107mm x 89mm x 69mm



Application

The INNOTECH Microstat Controller is designed to be used in commercial applications to provide complete control for air conditioning systems.

Features
- LED Display of Temperature, Set Point and Program Functions
- Control Station fits standard electrical wall plates
- Four core screened cable simplifies connection between the control station and controller
- Adjustable Proportional Band, Dead Zone, Compressor Off Time and Setpoint Range
- Able to operate as 1 cool, 1 electric heating or as reverse cycle heating or cooling
- Remote disable, Timeclock Override, After Hours functions and Heat/Cool disable functions
- Display auto-dims when the lights are out
- Timer to start or stop
- Configurable Power On settings
- All adjustments are made from the Control Station

Installation

1. Mount in a dry and reasonable clean location free of excessive vibration.
2. Wire in accordance with INNOTECH connection diagrams and local bylaws or refer to your local distributor.

This product should only be installed by qualified personnel.

Wiring

1. Connect 240VAC supply to the correct terminals on the controller, observing the correct polarity of the connections.
2. Connect the EARTH to the correct terminals on all units.
3. DO NOT connect 240VAC to the control terminals.
4. Ensure that the wiring between the control station and the controller is correctly connected. Failure to do so will result in malfunctioning and may damage either or both units.
5. The maximum wire length between the control station and controller should not exceed 50 metres. The wiring between these devices should not be run in parallel with conductors carrying high current.

Digital Inputs

DI1 Timeclock

The Microcontroller is equipped with a remote timeclock enable function.

When the time clock input (DI1) is "ON", the Microcontroller will run in A/C mode.

DI2 After Hours

The Microcontroller is equipped with an After Hours timer.

When a pulse is received on the After Hours input (DI2), the unit will run in A/C mode for the period set in Program Parameter 7.

If a pulse is received while the Microcontroller is in After Hours mode, it will toggle off.

DI3 Unit Disable

The Microcontroller is equipped with an AC unit disable function.

If the disable input (DI3) is "ON" for the period set in Program Parameter 8, the Microcontroller will shut down the Air Conditioning unit. When the Microcontroller is disabled, the A/C LED will flash to indicate that the Microcontroller is being overridden.

When the remove disable input is opened, the unit can be restarted by pressing the A/C button.

DI4 Device Disable

The Microcontroller is equipped with a Heat/Cool disable.

If the remote disable input (DI4) is "ON" for the period set in Parameter A, the Microcontroller will shut down the specified A/C devices (Heat only, Cool only or Heat and Cool) as indicated in Parameter 9.

When the input is turned off, the unit will restart the A/C devices as required.

Digital Display

The digital display will show the following error codes to assist with fault finding.

- Display Reads "99.9"
  This indicates either a faulty sensor or faulty sensor cabling.

- Display Reads "HLP"
  This indicates that communication between the control station and controller is not operating.

First check the interconnecting cabling and if this is OK, contact your local Innotech Distributor.

Adjustable Parameters

Jumper Settings on the Control Station

Jumper #1 (JP1 Rev)
This jumper is used to select Electric Heat or Reverse Cycle operation.

When the link is open, the heat and cool relays operate independently of each other.

When the link is closed, the cool relay controls the compressor in both cooling and heating operations. The heat relay operates the reversing valve.

Jumper #2 (JP2 H/C)
This jumper is used to select if the reversing valve is energised for cooling or energised for heating.

When the link is open, the heat relay will close during cooling.

When the link is closed, the heat relay will close during heating.

This function is only effective if Jumper #1 is set for Reverse Cycle operation.

Jumper #3 (JP3 Fan)
This jumper is used to select continuous fan operation or fan cycles with heating.

When the link is closed, the fan runs continuously on cooling and cycles with heating.

Jumper settings will not take effect until supply power is reset to the controller.

Program Functions on the Control Station

All variable settings for the Microcontroller are adjusted at the Control Station.

Programming Mode

To enter Programming Mode, depress and hold the  and  buttons for 5 seconds. The display will become blank indicating that you are in the Programming Mode. Release both keys and the display will show parameter 0.

While in the programming mode, the following buttons are active:

 Change to the next parameter

 Increase the current parameter value

 Decrease the current parameter value

To Exit the Programming Mode, depress the  and  buttons and the new setting will be saved.

Parameter 0 - Sensor Calibration
The Display will show the sensor temperature. To offset the sensor temperature, adjust using the or buttons.

- The range of the Offset is ± 9.9°C
- The factory default setting is 0.0°C

Parameter 1 - Minimum Setpoint
The display will show the Minimum Setpoint to which the controller can be set.

- The range of the Minimum Setpoint is 0 to 99°C
- The factory default setting is 15°C

Parameter 2 - Maximum Setpoint
The display will show the Maximum Setpoint to which the controller can be set.

- The range of the Maximum Setpoint is 0 to 99°C
- The factory default setting is 30°C

Parameter 3 - Dead Band
The display will show the Dead Band setting.

- The range of the Dead Band is 0 to 9.9°C
- The factory default is 1.0°C

Parameter 4 - Proportional Band
The display will show the Proportional Band (PB) setting. A PB setting of 2°C will result in a differential of 2°C for heating and 2°C for cooling.

- The range of the Proportional Band is 0 to 9.9°C
- The factory default is 1.0°C

Parameter 5 - Compressor Minimum Off Time
The display will show the Compressor Minimum Off Time.

This is the period the compressor must remain off before it can restart.

- The range of the Off Time is 0 to 99 minutes
- The factory default is 4 minutes

Parameter 6 - Fan Run On Time
The display will show the Fan Run On Time.

This is the period that fan will run for if it is operating in heating mode and the controller is turned off. This is to remove any residual heat where electric heating is used.

- The range of the Run On Time is 0 to 99 seconds.
- The factory default setting is 30 seconds.

Parameter 7 - After Hours Timer
The display will show the After Hours Time.

This is the period the unit will run for if an After Hours pulse is received.

- The range of the After Hours Time is 0 to 9.9 hours.
- The factory default setting is 1 hour.

Parameter 8 - Remote AC Unit Disable Timer
The display will show the Remote Disable Time.

This is the time that the controller must see the Remote Disable input for before it turns off.

- The range of the Disable Timer is 0 to 99 minutes.
- The factory default setting is 1 minute.

Parameter 9 - Devices Disable
The display will show 4 settings of device disable.

- 0 - None, 1 - Heat, 2 - Cool, 3 - Heat and Cool
- The factory default setting is 3 - Heat and Cool.

Parameter A - Device Disable Timer
The display will show the Remote Device Disable Time. This is the time that the controller must see the remote device disable input for before it turns off the specified devices.

- The range of the Device Disable Timer is 0 to 99 seconds.
- The factory default setting is 0 seconds.

Timer Function
The Timer button when pressed will display the time in which the unit will change state. For example: if the unit is off, the unit will display the time till the unit will turn on. If the unit is on, it will display the time till it will turn off.

Continuously pressing the button will increase this time by 10 minutes until it reaches 24 hours, when it will then roll over and display the minimum time adjustment. The time is adjustable from 10 minutes to 24 hours. If left for 5 seconds, the display will revert to displaying the sensed temperature.

Mode Function
The Mode button will switch between Auto, Heat and Cool modes.

In Auto mode, the unit will heat and cool as required to maintain the setpoint conditions.

In heat mode, the cooling is disabled and the unit can only heat to maintain set point conditions (winter mode).

In cool mode, the heating is disabled and the unit can only cool to maintain conditions (summer mode).

Start Up Default Settings
The Microcontroller can be set to start in any mode of operation.

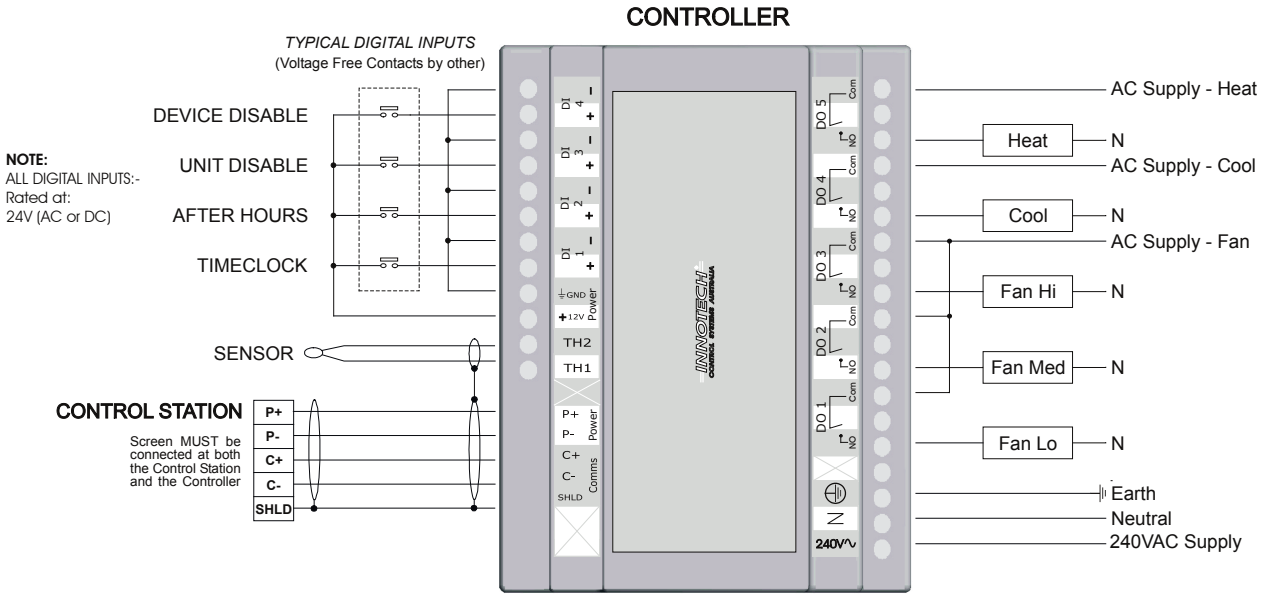
To set the start up default, adjust the Microcontroller to the desired settings and then press and hold the A/C and buttons for 5 seconds.

The display will become blank indicating that the new settings are saved.

Factory Set Default Settings

Setpoint	22°C	(0.0 to 99.9°C)
Operating Mode	Off	(Off / On)
Fan Speed	High	(Low / Medium / High)
A/C Cycle	Auto	(Auto / Heat only / Cool Only)

STANDARD CONNECTION

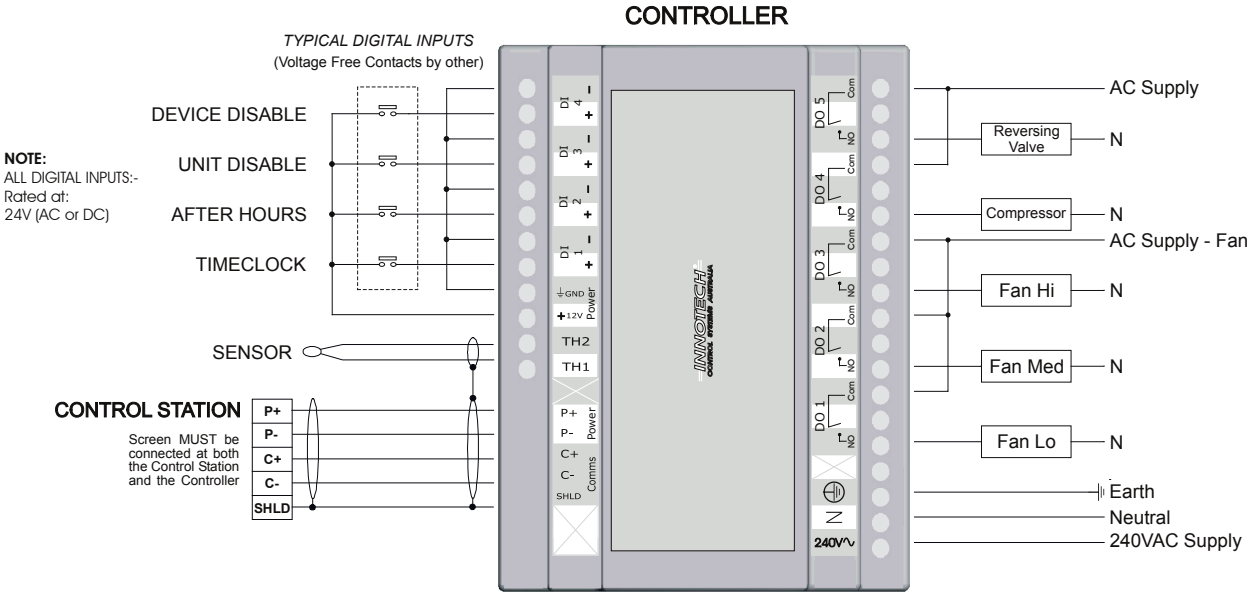


NOTE : "Com" = COMMON
"NO" = NORMALLY OPEN CONTACTS

*** OPEN JUMPER 1 ON THE CONTROL STATION.** (JP1 REV)

*** MAXIMUM CABLE LENGTH BETWEEN THE CONTROL STATION & CONTROLLER IS 50 METRES.**

REVERSE CYCLE CONNECTION



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*** CLOSE JUMPER 1 ON THE CONTROL STATION.** (JP1 REV)

*** MAXIMUM CABLE LENGTH BETWEEN THE CONTROL STATION & CONTROLLER IS 50 METRES.**

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