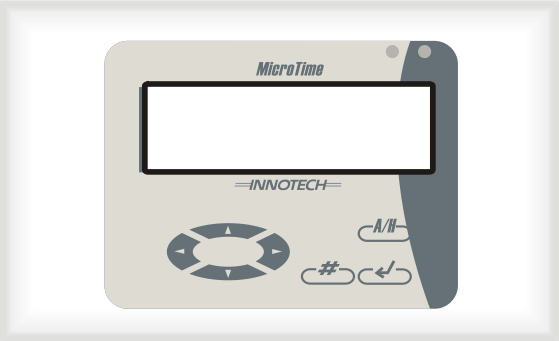
MODELS:
MTC01 – 1 Speed Fan, 2 Cool and 2 Heat Controller with Time Clock

MTC01 Micro Controller

Overview
The Innotech ***MicroTime MTC01*** temperature controller features simple and user friendly programming for easy operation. The MicroTime MTC01 is used for temperature control in commercial applications.



Features
- 4 line, 80 character backlit Liquid Crystal Display (LCD)
- 2 status LEDs
- Displays temperature, setpoint, current time and date
- Menu based programming of parameters and schedules
- 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 Restart Time, and Setpoint Range
- Can operate as 2 cool, 2 electric heating, or as reverse cycle heating or cooling
- Programmable 365 day battery backed Real Time Clock with daylight saving
- Programmable weekly schedule with up to 16 On/Off events
- Public holiday schedule with 16 holidays
- After hours Run Timer activated by push button
- Vent Mode Only operation
- Enable and disable Timeclock Function
- Configurable power On settings
- A/C Fault, Condenser Water Interlock, Heater Fault inputs
- Door Input with adjustable Standby Dead Band function
- Permanently saved time accumulators for After Hours Run Time, Total Run Time, and Compressor Run Time
- All configuration is done from control station
- All parameters and schedules are saved in non-volatile RAM

Applications
The Innotech MicroTime Controller is designed to be used in domestic, hotel, and commercial applications to provide complete control of air conditioning systems.

Approvals
The INNOTECH MicroTime Controller conforms to the requirements per European Consortium Standards EN55011:1998 (Emissions), Class B, Group 1, EN50082-1:1997, EN61000-4-2 (Electrostatic Discharge), EN61000-4-3 (Radiated RF Immunity), ENV50204 (Radiated RF Immunity-Keyed Carrier), EN61000-4-4 (Electrically Fast Transients 1kV), EN61000-4-5 (Surge), EN61000-4-6 (Conducted RF Immunity), ICE1000-4-11 (Main Variations) for purposes of CE certification and also the requirements of the Australian/New Zealand standard AS/NZS 2064 1/2:1992 Class B Group 1 for purposes of C-Tick certification.

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

Inputs
10k Ω Thermistor temperature sensor
Switched contact for A/C Fault
Switched contact for After Hours operation
Switched contact for Heater Fault
Switched contact for C/Water Interlock or Door Input

Outputs
Relay 1, 2, 3, 4 and 5 are normally open (NO)
Voltage free relay contacts:
a. 16 amps resistive
b. 6 amps inductive

Battery
Contains a lithium type battery, dispose of properly.
(In accordance with local regulations)
- Type CR-2032 Lithium Battery
- Nominal voltage 3 Volts
- Shelf life 5 years, dependent on ambient temperature

Caution: Risk of Explosion if battery is replaced by an incorrect type.

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

Enclosure
The *MicroTime* consists of 3 units. 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 plastic which meets the requirements of AS/NZS4695.

Colour: Grey
Dimensions: 107mm X 89mm X 69mm

Terminal Identification

Power Supply

- 240V — 240VAC supply
- E — Earth
- N — Neutral supply

Sensor Input

- TH1 — Temperature sensor input
- TH2 — Temperature sensor input (10kΩ thermistor)
- SHLD — Cable shield for temperature sensor

Digital Inputs

- DI#n+ — Digital Input positive (12VDC or 24VAC)
- DI#n- — Digital Input negative

Output Relays

- NO — Normally open contact
- Com — Common contact

Connection between Controller and Control Station

5 way connection via 4 core plus screen cable

- 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

Wiring

1. Connect the 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 control station and the controller are wired correctly. Failure to do so will result in malfunctioning, and may damage either or both of the units.
5. The maximum wire length between the control station and the controller should not exceed 50 metres. The wiring between these devices should not be run in parallel with conductors carrying high current.

Installation

1. The MicroTime should be mounted in a dry and reasonably clean location that is free of excessive vibration.
2. The MicroTime should be wired in accordance with connection diagrams in this datasheet and local bylaws. Contact the local distributor for more information.

This product should only be installed by qualified personnel.

Digital Inputs

DI1 – A/C Fault

When the A/C Fault Function is ON, the MicroTime will display *A/C Fault* and the fault LED will flash.

DI2 – After Hours

When the After Hours input receives a pulse, the MicroTime will run for the time period configured with Parameter 7.
If a pulse is received while the MicroTime is in after hours mode it will toggle off.

DI3 – Heater Fault

If the Heater Fault input is ON, the MicroTime will display *Heater Fault* and the fault LED will flash. However, the controller will continue to operate in it's current state.

DI4 – Condenser Water (c/water) Interlock or Door Switch

The C/Water Interlock and a Door Switch input can be selected by configuring Parameter 10 as described below:

Condenser Water Fault

If *C/Water* is selected in Parameter 10 and Input DI4 is ON, the MicroTime will shut down all outputs, except for the Fan. *C/Water Fault* will be displayed and the fault LED will flash. After the fault is rectified the MicroTime will continue to operate in it's previous state.

Door Open Switch

If *Door* is selected in Parameter 10 and Input DI4 is ON for the time set in Parameter 8, then the MicroTime will display *Door Open*, the fault LED will flash, and it will go into StandBy Mode. In Standby Mode the Dead Band is increased by the adjustable value in Parameter 9. (If Parameter 9 reads 10°C, there is a 5°C dead band either side of the setpoint. However if Parameter 9 is set to 0 (0ff) then the MicroTime will shutdown all outputs. After the door is closed the MicroTime will continue to operate in it's previous state.

All Inputs have a 5 second delay before they are registered

Faults

The following error codes are displayed on the LCD and can assist with fault finding:

Sensor Fault

This indicates either a faulty sensor or faulty sensor wiring.

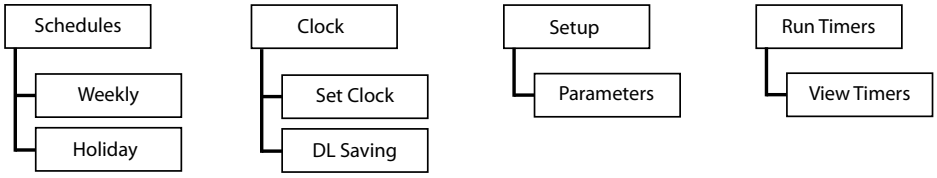
Comms Fault

This indicates communication problems between the control station and the controller. Verify that all cabling and sensor wiring is correct and there is no visible damage. Contact the local Innotech distributor for further assistance.

User Interface

The MicroTime is equipped with a 4 line, 20 character backlit LCD and keypad. The keypad consists of an After Hours button, along with six navigational push buttons to provide for easy control.

Using the buttons provides access to the menu structure as illustrated below.



Status LEDs

The two LEDs at the top right of the control station indicate the following:

Fault LED: When this is flashing red the controller is in a fault state. The actual fault will be displayed on the LCD.

Run LED: When this is green the controller has initiated the Fan. When it is off the controller is OFF.

Schedules

The MicroTime offers two types of schedules as described below. These schedules can be added, edited, and/or deleted from the Schedules Menu.

Weekly

The Weekly schedule allows the user to enter up to 16 On/Off events per week. For example if a schedule was added for Monday from 7:30 to 17:30 the controller would turn on at 7:30 and turn off at 17:30 every Monday.

Holiday

The Holiday schedule can be used to force the controller Off for up to a total of 16 holidays in a year. When a Holiday schedule is active it will override the weekly schedules and force the controller Off for the entire day. This is very helpful on public holidays when the controller is required to be off for the whole day.

Run Timers

Run Timers on MicroTime help with system performance and usage. Three types of Run Timers are available as described below:

Total Run Time: This is the total amount of time in hours that the controller has been ON.

After Hours Time: This is the total amount of time in hours the controller has been running in After Hours Mode.

Compressor Run Time: This is the total of time the compressor (Relay 3) has been ON in minutes.

All Timers are cumulative and saved in non-volatile RAM, so they do not lose their values in if power is lost.

Timers can only be reset in Supervisor Mode.

Operating Modes

The MicroTime has various modes of operation. The current mode of operation will be shown in the top right hand corner of the LCD.

The programmed schedules can be enabled and disabled by using the Auto/Off mode. This is toggled by pressing and holding the button for 5 seconds and releasing.
In Auto mode the programmed schedules are enabled.
In Off mode the schedules are disabled.

The function of the button can be configured with Parameter 7 as either After Hours or a Manual Override.
Selecting After Hours allows the controller to run for the time programmed in Parameter 6 and then turn off.
In Manual Override the controller will run continuously until the button is pressed again.

The MicroTime has a Vent Mode Only function which is toggled On/Off by pressing and holding the button for 5 seconds and releasing. The LCD will show *Vent Mode Only* and the Heat and Cool outputs will be disabled.

To disable the MicroTime for several days, you can set the operating mode to Off. When returning to work simply set the controller back to Auto mode.

Start Up Default Settings

The MicroTime can be configured to start in certain operation modes. To select the start up defaults, configure the MicroTime as desired, and then simultaneously press and hold the and buttons for 5 seconds. The LCD will show *Saved* indicating that the new settings have been saved.

Vent Mode cannot be saved as the start-up default. When the MicroTime is in Manual Mode, ON cannot be the default Start Up setting.

Supervisor Mode

Various settings and parameters can only be edited in Supervisor Mode. To access Supervisor Mode, press and hold the and buttons for 5 seconds and release. Supervisor Mode is indicated by a * character in the top right of the LCD.

When in Supervisor Mode the button zeros the accumulated Values.

Setup Parameters

The setup parameters can be configured from the Setup Menu.

Setup parameters can only be edited in Supervisor Mode.

Parameter 0 – **Calibration Offset**
The LCD will show the current temperature.
The range of the Calibration Offset is -10.0 to 10.0 °C.
The factory default setting is 0.0°C.

Parameter 1 – **Minimum Setpoint**
The LCD will show the Minimum Setpoint for temperature.
The range of the Minimum Setpoint is 0 to 100°C.
The factory default setting is 15°C.

Parameter 2 – **Maximum Setpoint**
The LCD will show the Maximum Setpoint for temperature.
The range of the Maximum Setpoint is 0 to 100°C.
The factory default setting is 30°C.

Parameter 3 – **Dead Band**
The LCD will show the Dead Band setting.
The range of the Dead Band is 0 to 10.0°C.
The factory default setting is 1.0°C.

Parameter 4 – **Proportional Band**
The LCD will show the Proportional Band Setting.
A Proportional Band setting of 2°C will result in a differential of 2°C for heating and 2°C for cooling.
The range of Proportional Band is 0.5 to 10.0°C.
The factory default setting is 1.0°C.

Parameter 5 – **Compressor Minimum Off Time**
The LCD 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 100 minutes.
The factory default setting is 4 minutes.

Parameter 6 – **Fan Run On Time**
The LCD will show the Fan Run On Time.
This is the length of time the fan will run to remove any residual heat where electric heating is utilized.
The range of the Run On Time is 0 to 100 seconds.
The factory default setting is 30 seconds

Parameter 7 – **After Hours Run Time**
The LCD will show the After Hours Run Time.
This is the length of time the unit will run if the A/H button is pressed, or if an after hours pulse is received.
The range of the After Hours Run Time is 0 to 24 hours.
The factory default setting is 1.0 hour.

The After Hours Run Time can be set to Manual Override mode by increasing the value above 24 hours. The LCD will show *Man*. See section on operating modes for more information.

Parameter 8 – **Door Timer**
The LCD will show the Door Timer time.
This is the length of time the door can remain open before being detected by the controller.
The range of the Door Timer is 0 to 100 seconds.
The factory default setting is 30 seconds.

Parameter 9 – **Door Reset Dead Band**
The LCD will show the current Door Reset Dead Band setting.
If the Door Reset Dead Band is set to Off, the MicroTime will turn off when the door is left open.
If the Door Reset Dead Band is set to any other value, the MicroTime will use that value as the Dead Band to maintain the temperature.
The range of the Door Reset Dead Band is Off to 10.0°C
The factory default setting is Off.

Parameter 10 – **Input 4**
The LCD will show the chosen function of Input 4.
Input 4 has two modes of operation:
C/Water Condenser Water Fault Input
Door Door Input
(Refer to the Digital Inputs section for more information)
The factory default setting is *C/Water*.

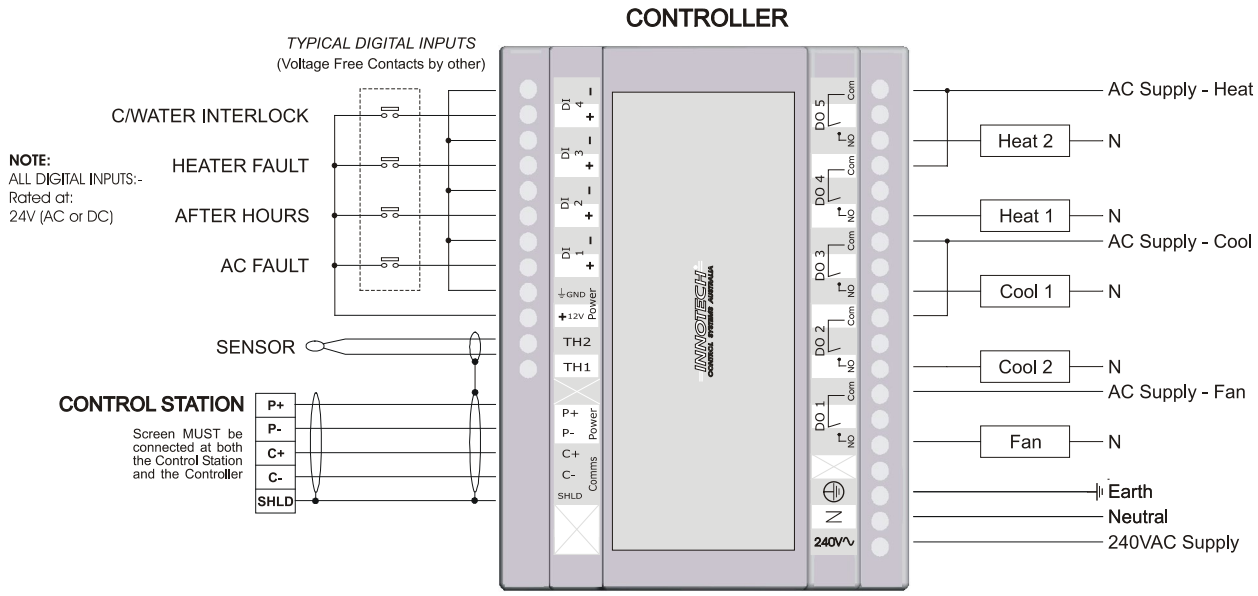
Parameter 11 – **Default Display**
The LCD will show the current selected Default Display mode. The two selectable options are:
Setpoint current temperature setpoint
Temp current temperature
The factory default setting is *Temp.*

Parameter 12 – **Control**
The LCD will show the current selected Control mode.
The two options in Control mode are:
Electric Heat heat and cool relays operate independently of each other.
RevCycle cool relay controls the compressor in both cooling and heating operations. The heat relay operates the reversing valve.
The factory default setting is *Electric Heat*.

Parameter 13 – **Rev Valve**
The LCD will show the current setting for the reversing valve.
When Parameter 12 is set to *Rev Cycle,* this parameter is used to select whether the reversing valve is energised for cooling, or energised for heating.
Heating heat relay will close during heating.
Cooling heat relay will close during cooling.
The factory default setting is *Heating*.

Parameter 14 – **Fan Cycle**
The LCD will show the Fan Cycle during the heating cycle.
Off fan runs continuously.
On fan runs continuously during cooling, and cycles during heating.
The factory default setting is *Off.*

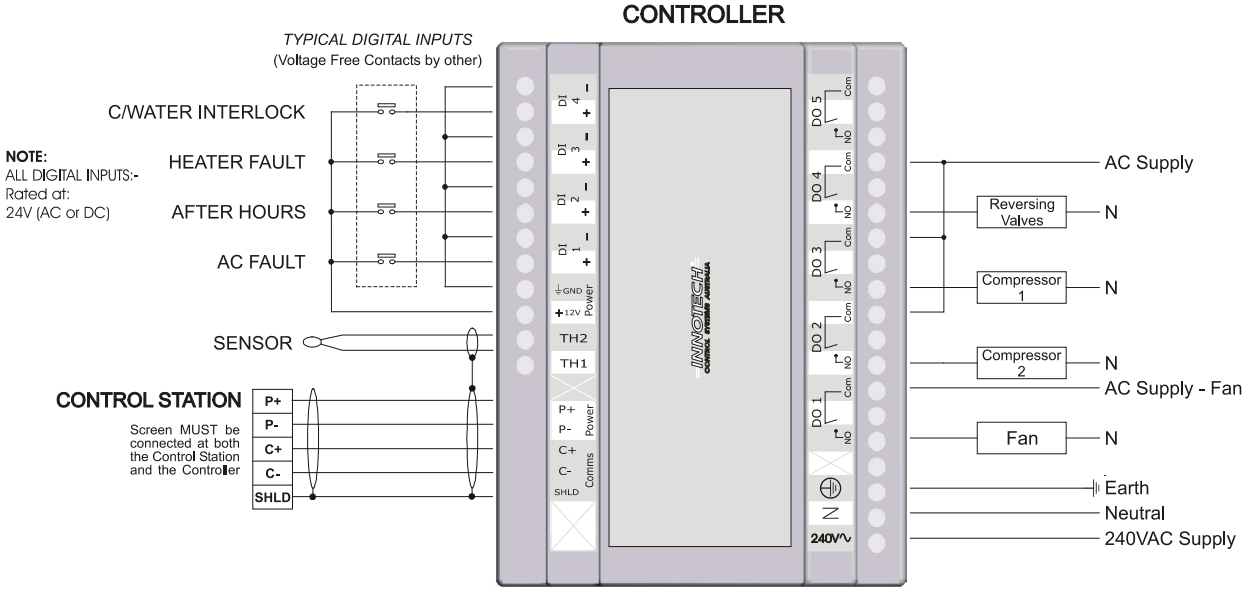
STANDARD CONNECTION



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

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

REVERSE CYCLE CONNECTION



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*** IN THIS MODE RELAYS 4 & 5 ENERGISE TOGETHER.**

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

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INNOTECH®

Australian Owned, Designed & Manufactured
by Mass Electronics Brisbane

Phone: +61 7 3421 9100 **Fax:** +61 7 3421 9101
Email: sales@innotech.com.au www.innotech.com.au

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