Models:
M2K05: 3 Speed FAN, 1 COOL, 1 HEAT & 2 Zone Controller, 7 day - 4 Event Time Clock or Timer

M2K05
Micro2000 Controller

The Clock is not battery backed. Time and Date will need to be set every time power is cycled if the Time Clock function is enabled. Schedules and Parameters are saved even if power is lost.

Specifications

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

Inputs
- 10kΩ thermistor temperature sensor for air temperature (5°C to 35°C range)
- Switched contact

Outputs

Relay # 1:	Voltage free relay contacts:	
	Normally Open	16A resistive
		6A inductive
Relay # 2, 3, 4:	Voltage free relay contacts:	
	Normally Open	10A resistive
		6A inductive
Relay # 5, 6, 7:	Voltage free relay contacts:	
	Normally Open	2A resistive
		0.5A inductive

Connection Between Controller and Control Station
- 4 way connection via 3 core plus screen cable

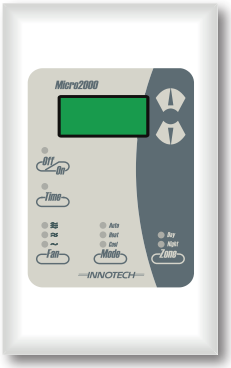
Control Station Terminal Identification
- IN 1 Day Zone Temperature and External Start
- IN 2 Night Zone Temperature and External Start
- GND Common for Inputs and Cable Shield
- +12V Power from Controller
- Comms Comms to Controller
- GND Ground from Controller

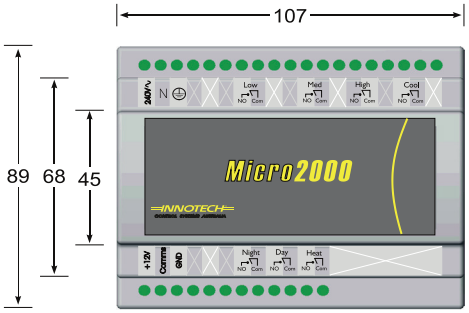
Controller Terminal Identification
240 Volt Power connection to Control Unit:
- ⏚ Earth
- N Neutral supply
- 240V~ Mains 240VAC Supply

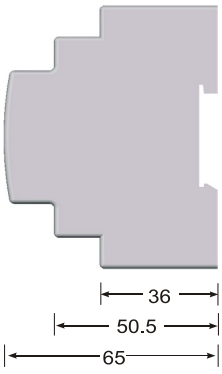
Output Relays
- NO Normally open contact
- COM Common contact

Comms Terminals
- +12V Power to Control Station
- Comms Comms from Control Station
- GND Ground to Control Station

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







Application
The Innotech M2K05 Controller is designed to provide complete control of air conditioning systems for commercial applications, where control over two zones (eg: Day / Night) is required.

Features
- LED Display of Temperature and Program functions
- Control Station fits standard electrical wall plates
- Two core screened cable simplifies connection between the control station and controller
- Adjustable Proportional Band, Dead Zone, Compressor Restart Time and Setpoint Range
- Able to operate as 1 cool, 1 electric heating or as reverse cycle heating or cooling
- 7 Day 24hr Real Time Clock or Adjustable Timer function
- Programmable Schedules, 4 events per day
- Two Zone (Day / Night) control with option of 1 or 2 temperature sensors
- Adjustable auto zone change over times
- External A/C fault and Start/Zone change inputs
- All adjustments from the control station

Approvals

The *Micro2000* series controllers conform to:

- Electromagnetic emission and immunity requirements according to standards EN55011 (CISPR11) and EN50082 for CE Marking and C-Tick Labelling.

Installation

1. The *Micro2000* should be mounted on DIN rail in cabinets approved for switchgear or industrial control equipment. It should be mounted in a dry and clean location, free of excess vibration. Maximum terminal cable entry is 1.5mm^2 wire.
2. Wire in accordance with INNOTECH connection diagrams and local bylaws or refer to your local distributor.
3. Connect the 240VAC supply to the correct terminals on the controller, observing the correct polarity of the connections. Connect the EARTH to the correct terminals on all units.
4. 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.

This product should only be installed by qualified personnel.

Fault Representation

1. If the Control Station display reads "HELP", this is due to a communications error between the Controller and the Control Station. Check the interconnecting 2 core screened cable for continuity or short circuits. As a result of this failure the controller will shutdown after 1 minute.
2. If the Control Station reads "SEN 1 FAIL", this is due to an open circuit Sensor on Input 1. The fault occurs if an open circuit has been detected at Input 1 for more than 20 seconds. As a result of the failure, the controller will shut down. In this mode, the fan can still be turned on (Vent Mode).
3. If the Control Station reads "SEN 2 FAIL", this is due to an open circuit Sensor on Input 2. The fault occurs if an open circuit has been detected at Input 2 for more than 20 seconds. As a result of the failure, the controller will shut down. In this mode, the fan can still be turned on (Vent Mode).
4. If the Control Station reads "FAIL", this is due to an open circuit being detected on Input 1 & 2 at the same time. This is a generic fault and can be used to shut the controller down via an external relay (See wiring diagram for more details). As a result of the failure, the controller will shut down and flash "FAIL" on the display.

Inputs & Outputs

Universal Inputs

UI 1	Zone 1 Thermistor (Innotech SENx) and External Start Zone change (Momentary Push Button)
UI 2	Zone 2 Thermistor (Innotech SENx) and External Start Zone change (Momentary Push Button)

Digital Outputs

DO 1	Fan Low (16A Relay. Common and Normally Open Contact)
DO 2	Fan Mid (10A Relay. Common and Normally Open Contact)
DO 3	Fan High (10A Relay. Common and Normally Open Contact)
DO 4	Cool (10A Relay. Common and Normally Open Contact)
DO 5	Night Zone (2A Relay. Common and Normally Open Contact)
DO 6	Day Zone (2A Relay. Common and Normally Open Contact)
DO 7	Heat (2A Relay. Common and Normally Open Contact)

Inputs

There are two multipurpose inputs which are used as described below.

The primary use of Input 2 is a 10kΩ Temperature sensor. If one sensor is chosen in Parameter 12, the temperature sensed on input 2 is used to control both zones (Day and Night). If two sensors are chosen then Input 2 is used for the Night Zone and Input 1 for the Day Zone.

Both Inputs have multiple uses. If two sensors are chosen, both inputs can be used as momentary push buttons as well as 10kΩ Sensors. These push buttons are used as an external way to start the controller as well as changing the zone to be controlled.

For example: a push button can be placed in the main bedroom of the House/Apartment. This enables the user to start the controller and change the zone without having to walk to the main Control Station.

It will not stop the system if it is already running. It is only for external start and changing the zone.

If one sensor is chosen in Parameter 12, then only Input 2 can use the momentary push button start.

Push Buttons

The normal control button use is described below:

1. Fan The "Fan" button is used to change the current fan speed. The fan speed is indicated by 3 LEDs above the button. If the controller is not running (Off), the Fan button can be used to turn the Fan on only (Vent Mode).
2. Mode The "Mode" button allows you to change the mode of the controller between Auto, Heat and Cool.
3. Zone The "Zone" Button allows you to change which zone is to be Air Conditioned. Pressing the button toggles between each of the zones. When "On" is selected in Parameter 11 (Enable Both Zones), both zones can be turned on at once.
   When this occurs, the controller will use the average of both sensors and the Day Setpoint to maintain temperature. This only occurs when there are two sensors fitted and/or two setpoints chosen.
4. Time This button has two selectable modes of operation. The operation of the button can be changed by using Parameter 9 to either Time Clock mode or Timer mode.

Time Clock Mode

When Parameter 9 is set to "On", the Time button allows you to enable or disable the Time Clock. Any Schedules that have been programmed will not function unless the Time LED is On. When the Time button is pressed, the current time is displayed for 5 seconds and then reverts back to the current temperature.

Timer Mode

When Parameter 9 is set to "Off", the Time button is used as a adjustable On or Off timer. When pressed, the display will show the time in hours before the controller will change state.

0.1 hours = 6 minutes.

If the unit is off, the controller will display the time till the unit will turn on. If the unit is on, it will display the time it will turn off.

The time displayed may be adjusted by pressing the ▲ and ▼ buttons until you have adjusted to the time required. If no buttons are pressed for 5 seconds, the display will revert back to the current temperature. When the timer has been set, the Time LED will be lit.

In Timer Mode, the Automatic Day / Night Change Over functionality is not available.

5. Off/On The On / Off button is used to change the current state of the controller. It can be used to override either the Time Clock or Timer depending on which mode is selected.

If the controller has been turned on by the Time Clock Schedule, the Off/On is used to force the controller off till the next scheduled "On" time. Similarly, if the controller is Off, the Off/On can be used to force the controller on until the next scheduled "Off" time.

6. The Up and Down buttons can be used to change the current Setpoint.

Programming Schedules / Clock

The function of the buttons while in programming mode is shown below.

Time Enter Fan Back

Mode Delete Zone Copy

1. To enter the CLOCK / SCHEDULE programming mode, press and hold the Time Button for 5 seconds. When the screen becomes blank, stop holding down the button.
2. When you have entered the programming mode, "CLO" will be displayed.
   Use the and buttons to select a programming mode:

Programming Modes	
"CLO"	Clock
"SCH"	Schedules
"_d_n"	Auto Day / Night Zone Change

   To Select press the Time button.

To exit out of Schedules / Clock programming mode at any time, press and hold the Time Button for 5 sec then release.

3. If "CLO" was selected, the Current Time will be displayed. Use the and buttons to adjust the current time and press Time. The day is then displayed, use the and buttons to select the required day. Day 1-7 = Monday-Sunday. Press the Time button to select or Fan button to go back to programming mode selection.
4. If "SCH" was selected in step 2, you can now set / edit the schedules. The display will initially show "Day1". Use the and arrows to select which Day you wish to view. Press the Time button to select or Fan button to go back.
5. After you have selected the day, the display will initially show "SCH1". Use the and buttons to select which schedule you wish to view. Press the Time button to select or Fan button to go back to Step 2.
6. After selection, you can now set the On and Off times for selected Day and Schedule. Use the and buttons to set the time. Press the Time button to accept or the Fan button to go back.
7. A Schedule can be deleted by pressing the Mode button when viewing the "On" time for the particular schedule you wish to delete.
8. A copy function is available to copy a previous days schedule (Sch1 or Sch2). This can be done by pressing the Zone button while viewing the "On" time for the Schedule you wish to set.
9. If "_d_n" was selected in Step 2, you can program the Auto Zone Change Over setting. The Display will initially show "A_00". Use the and arrows to cycle through the three settings. Press the Time button to select and edit the setting.

0	Enable / Disable Automatic Day / Night Change
1	Time to change from Day to Night
2	Time to change from Night to Day

These settings are used to automatically change the zone over at the time programmed. If the Automatic Change Over is enabled, then regardless of the Day and whether the controller is running or not, the zone will be changed from Day to Night and Night to Day at the programmed times.

The Auto Zone Change Over can only be used when the controller is in Time Clock mode, set in Parameter 9.

Programming Your Controller

To enter into the programming mode, press and hold the Time button and the arrow for 5 seconds. When the screen becomes blank, release the buttons.

- When you have entered the programming mode, "P 00" will be displayed (P=Parameter, 00=Parameter 0).
- In the programming mode, the and buttons select which Parameter is to be edited. (From Parameter 00 to 16).
- When you have selected the correct Parameter, press the Time button. The value of that Parameter may then be altered by pressing the or buttons. When you have adjusted the Parameter to the desired setting, press the Time button to confirm the changes.
- After confirming the changes (above), you will be back at the Parameter selection stage once again. Select and change parameters until have adjusted all Parameters you require.
- To EXIT the programming mode and SAVE your new settings, press and hold the Time button for 5 seconds. When the screen becomes blank, release the button.

Important Notes For Programming

- If you do not save your alterations, by holding the Time button for 5 seconds, the controller will revert to the last saved settings.
- If you are in the process of adjusting a Parameter (Using the and buttons), and do not press any buttons for 30 seconds, the controller will revert back to the Parameter selection screen. (Eg. P 00)
- If the Parameter selection screen (Eg. P 00) is left unaltered for 60 seconds, the controller will revert to the last saved setting, and exit the programming mode.

Parameters

Parameter 0: Minimum Setpoint
The display will show the Minimum Setpoint to which the controller can be set.
- The range of Minimum Setpoint is 0 to 50°C
- The factory default setting is 15°C

Parameter 1: Maximum Setpoint
The display will show the Maximum Setpoint to which the controller can be set.
- The range of Maximum Setpoint is 0 to 50°C
- The factory default setting is 30°C

Parameter 2: 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 setting is 0.5°C

Parameter 3: Proportional Band
The display 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 9.9°C
- The factory default setting is 1.0°C

Parameter 4: 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 setting is 4 minutes

Parameter 5: Fan Run On Time
The display will show the Fan Run On Time. This is the period the fan will run for if it is operating in heating 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 6: EDH / REV
The display will show either EDH or REV to select which mode the controller will operate.
- Electric Heat mode (EDH): the heat and cool relays operate independently of each other.
- Reverse Cycle mode (REV): the cool relay controls the compressor in both cooling and heating operations. The heat relay operates the reversing valve.
- The factory default setting is EDH.

Parameter 7: HEA / COOL
The Display will show either HEA or COOL to select if the reversing valve is energised for cooling or energised for heating.
- COOL: the heat relay will close during cooling
- HEA: the heat relay will close during heating
- The factory default setting is HEA

ℹ This parameter is only effective if Parameter 6 is set for Reverse Cycle Operation.

Parameter 8: Fan Cycle
The Display will show either On or Off to select continuous fan operation or fan cycles with heating.
- On: Fan cycles with heating
- Off: Fan runs continuously
- The factory default setting is Off

Parameter 9: Time Clock Function
The display will show either On or Off. This is used to enable or disable the Time Clock function.
- On: Time Clock function Enabled
- Off: Time Clock Disabled - Timer Function used
- The factory default setting is Off

See "Time" button functionality for more information.

Parameter 10: Setpoint Display Only
The display will show either On or Off.
- On: The setpoint is displayed
- Off: The current temperature is displayed
- The factory default setting is Off

Parameter 11: Enable Both Zones
The display will show either On or Off. This is used to enable the option of having both zones on at once.
- On: Enable both zones
- Off: Disable both zones
- The factory default setting is On

Parameter 12: Number of Sensors
The display will show the number of sensors used.
- One or two sensors can be selected
- The factory default setting is 1

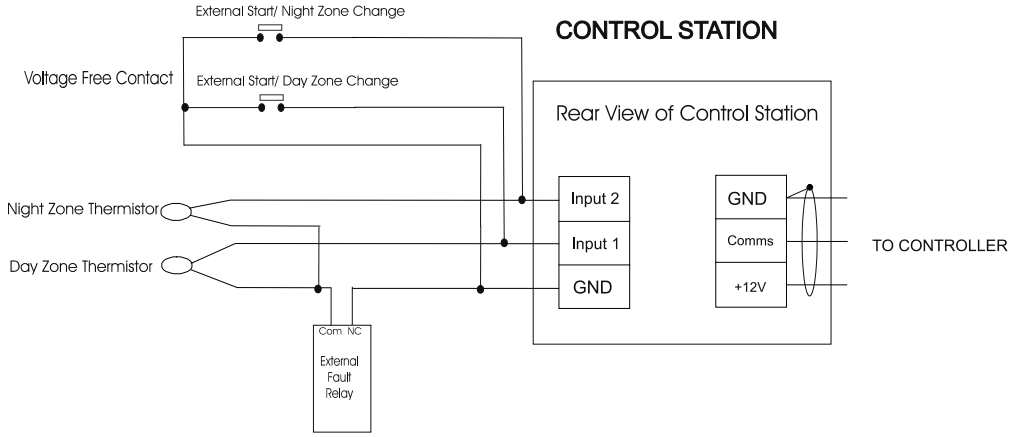
Parameter 13: Number of Setpoints
The display will show the number of Setpoints used.
- 1 Setpoint used for both zones
- 2 Setpoints - each zone has its own setpoint
- The factory default setting is 1

Parameter 14: Sensor 1 Calibration
The display will show the actual temperature of sensor 1. To offset the sensor temperature, adjust using the up and down buttons.
- The range of offset is ± 10°C
- The factory default setting is 0.0°C

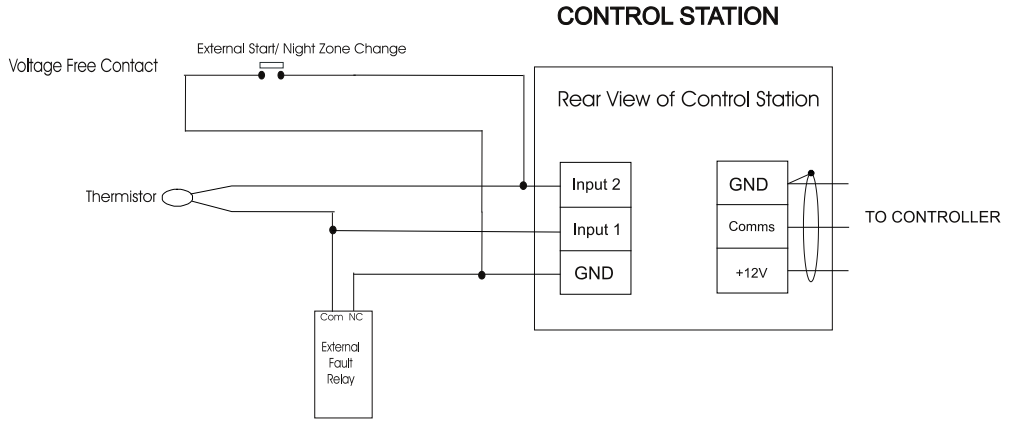
Parameter 15: Sensor 2 Calibration
The display will show the actual temperature of sensor 2. To offset the sensor temperature, adjust using the up and down buttons.
- The range of offset is ± 10°C
- The factory default setting is 0.0°C

Parameter 16: Standby Dead Band
The display will show the Standby Dead Band Setting.
- The range of the Standby Dead Band is OFF to 99.0°C
- If any value other than "Off" is selected and the controller is in an "Off" state, it will not switch off. The controller will instead go into a Standby mode. In this state the controller still maintains the temperature of the selected zone, however it will widen the control Dead Band by the selected amount. The fan will also cycle on and off with the heating and cooling and stay in low speed when in Standby.
- The factory default setting is OFF

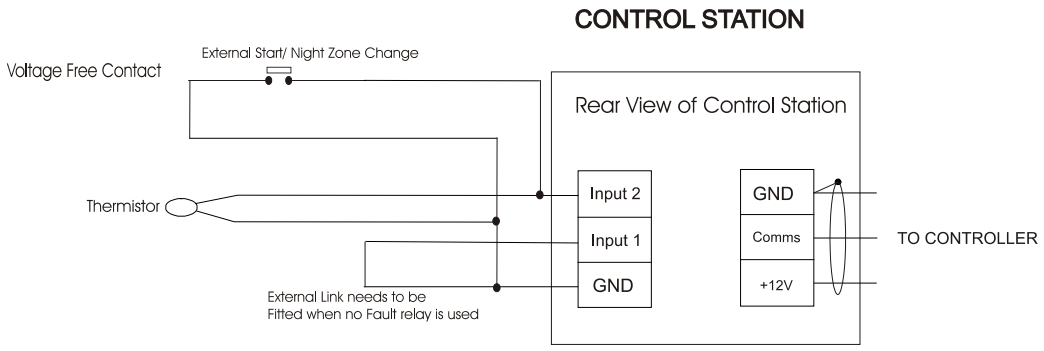
Two Sensors with Fault Relay



One Sensor with Fault Relay



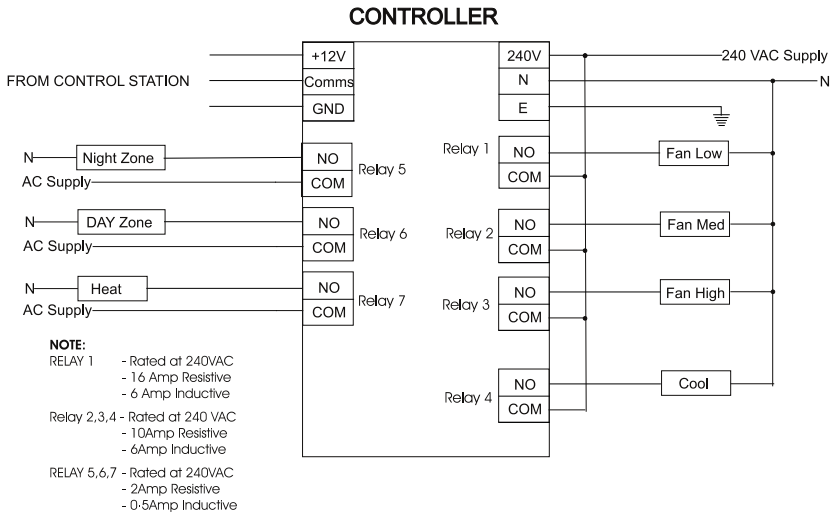
One Sensor with No Fault Relay



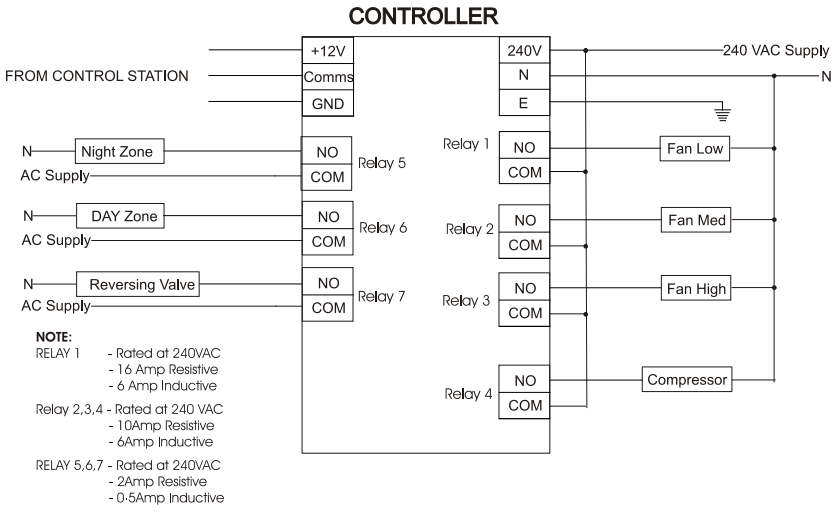
CAUTION **The following describes potentially hazardous situations which, if not avoided, could result in death, serious or minor injury, or property damage.**

1. Never touch the I/O terminals while power is being supplied.
2. Never attempt to disassemble the unit while power is being supplied.
3. Emergency stop circuits, limit circuits, interlock circuits and similar safety measures must be provided.
4. The Micro2000 outputs may remain On or Off due to burning or deposition of the output relays. External safety measures must be provided for such problems to ensure safety in the system.
5. Follow Innotech wiring diagrams and the installation / wiring instructions contained in this Datasheet.

ELECTRIC HEAT CONNECTION



REVERSE CYCLE CONNECTION



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

YOUR DISTRIBUTOR