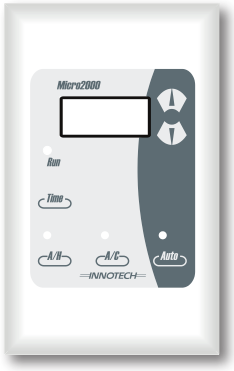
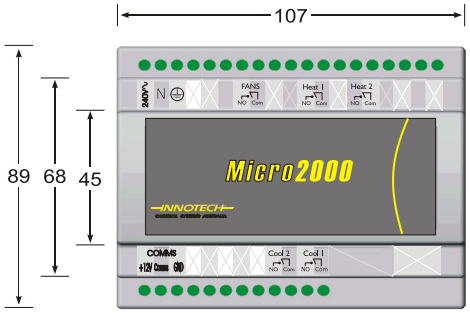
Models:
M2K01 v2: 1 Speed FAN, 2 COOL and 2 HEAT Controller,
7 Day - 4 Event Time Clock

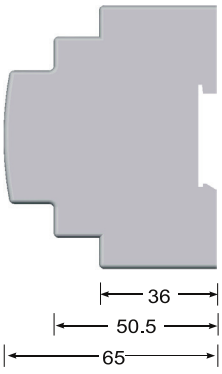
M2K01 v2
Micro2000 Controller

This datasheet is for use with the M2K01 Controller with Version 2 options loaded. For Version 1 M2K01 Controllers without these options, use Datasheet 9.00.

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
- Digital Input for Switched contact

Outputs

Relay # 1:	Voltage free relay contacts:	
	Normally Open	240VAC, 16A resistive
		240VAC, 6A inductive
Relay # 2, 3:	Voltage free relay contacts:	
	Normally Open	240VAC, 10A resistive
		240VAC, 6A inductive
Relay # 4, 5:	Voltage free relay contacts:	
	Normally Open	240VAC, 2A resistive
		240VAC, 0.5A inductive

Connection Between Controller and Control Station
- 3 way connection via 2 core plus screen cable

Control Station Terminal Identification
- TEMP — Temperature Sensor input
- AHRS — Digital Input for Switched Contact
- +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
- Sensor Input: 5 to 35°C

Application
The Innotech Micro2000 Series Controllers are designed to be used in commercial applications to provide complete control for air conditioning systems.

Features
- LED Display of Temperature 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 Restart Time, After hours Timer and Setpoint Range
- Able to operate as 2 cool, 2 electric heating or as reverse cycle heating or cooling
- After Hours function
- 7 day, 24hr Real Time Clock
- Programmable Schedules, 4 events per day
- Storage of Accumulated After Hours Run Time
- 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 FAIL", this is due to an open circuit room Temperature Detector. To test the detector, disconnect it from the room and connect it directly to the controller.

Inputs

1. INPUT 1 Temperature Sensor Input: (Range 5 - 35°C.)
   This input is used to read the current temperature.
2. INPUT 2 - Selectable Dry Contact Digital Input:
   Using Parameter 14, Input 2 can be either be a Door Switch, AC Fault Input, a External Disable Input, or a Condenser Water Fault Input.

AC Fault
If "AC" is selected in Parameter 14 and Input 2 is "ON" the *Micro2000* will display "AC FAIL" and continue to operate in it's current mode. After the fault is rectified, the display will revert back to its previous state.

External Disable
If "dIS" is selected in Parameter 14 and Input 2 is "ON" the *Micro2000* will shut down all outputs and display "OFF". After the disable input is removed, the *Micro2000* will continue to operate in its previous state.

External Afterhours
If "AH" is selected in Parameter 14, Input 2 is used as an external toggle After Hours switch. It operation is the same as the A/H button on the front panel. See Push buttons section for more information.

Door Switch
If "Door" is selected in Parameter 14 and Input 2 is "ON" for the time set in Parameter 15 (Door Open Time), then the *Micro2000* will display "Door" and will go into Standby Mode. In Standby mode the Dead Band is increased by the adjustable value in Parameter 16 (Door Reset Dead Band). If Parameter 16 reads 10°C, there is a 5°C dead band either side of the setpoint. However if Parameter 16 is set to 0 (Off) then the *Micro2000* will shutdown all outputs. After the door is closed the *Micro2000* will continue to operate in is previous state.

All Digital Inputs have a 5 second delay before they are registered.

Outputs

Relay #1	Fan (16A Relay. Common and Normally Open Contact)
Relay #2	Heat 1 (10A Relay. Common and Normally Open Contact)
Relay #3	Heat 2 (10A Relay. Common and Normally Open Contact)
Relay #4	Cool 2 (2A Relay. Common and Normally Open Contact)
Relay #5	Cool 1 (2A Relay. Common and Normally Open Contact)

Push Buttons

The normal control button use is described below:

1. Auto The "Auto" button is used to enable or disable the programmed schedules. When the Auto "LED" is on the schedules are enabled, when it is off they are disabled.
2. A/H This button has three selectable modes of operation.

Normal After Hours
If Parameter 6 (After Hours Adjustable) is set to "Off" , pressing the A/H button will instruct the Controller to run for the time set in Parameter 5 (After Hours Run Time).

Adjustable After Hours Run Time
When the button is pressed and Parameter 6 is set to "On", the controller will display the amount of time in hours it will run for. The user can adjust this time by using the ▼ and ▲ buttons. The Controller will run for the amount of time chosen after the A/H button is pressed again or a period of 5 seconds where no buttons are pressed.

Manual Override
When Parameter 5 is set to "On", the A/H button can be used to change the current state of the controller. It can be used to override any programmed schedules. For example if the Controller has been turned on by a Schedule, the A/H button can be used to force the controller Off until the next scheduled "On" time. Similarly if the controller is Off, the A/H button can be used to force the controller On, until the next scheduled "Off" time.

If the Schedules are disabled via the Auto button, the A/H button has a normal On/Off function.

3. A/C This button can be used to select either Vent mode (Fan only runs) or Condition Mode (Full control).
4. Time By pressing this button the Current Time will be displayed for 10 seconds before returning to the default display. If pressed again then the Current Date will be displayed for 10 seconds.
5. ▼ ▲ The Up and Down buttons can be used to change the current Setpoint.

After Hours Run Time

To view the accumulative After Hours Run Time, press and hold the A/H and Time buttons for 5 seconds. The displayed value is the total after hours run time up to the previous hour. A total of 9999 hours may be accumulated.
To reset the After Hours Run Timer, simply press and hold the ↓ and ↑ buttons until the display reverts to 00.
To exit the After Hours Mode, press and hold the Time button for 5 seconds again. The display will revert back to the default display.

Start Up Default Settings

The *Micro2000* can be set to start in certain modes of operation. To set the start up defaults, adjust the controller to the desired settings and then press and hold the Time and ↑ buttons for 5 seconds. When the screen becomes blank, release the buttons and the new Start Up Defaults will be saved.

Programming Schedules / Clock

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

Time	Enter	A/H	Back
A/C	Delete	Auto	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 either:

   "CLO" Clock "SCH" Weekly Schedules

   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 "SCH" was selected in step 2, you can now set / edit the weekly 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 A/H button to go back to mode selection.
4. 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 A/H button to go back to Step 2.
5. After selection, you can now set the On and Off times for that Day and Schedule. Use the ↓ and ↑ buttons to set the time. Press the Time button to accept or the A/H button to go back.
6. A Schedule can be deleted by pressing the A/C button when viewing the "On" time for the particular schedule you wish to delete.
7. A copy function is available to copy a previous days schedule (Sch1 or Sch2). This can be done by pressing the Auto button while viewing the "On" time for the Schedule you wish to set.

All Time Clock functions can be disabled by setting Parameter 13 (Time Clock Enable to "OFF". In this mode, the clock will not run and access to the Schedule / Clock Menu is blocked.

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: Sensor Calibration
The display will show the sensor temperature. 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 1: Minimum Setpoint
The display will show the Minimum Setpoint to which the controller can be set.
- The range of Minimum Setpoint is 5 to 35°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 Maximum Setpoint is 5 to 35°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 10.0°C
- The factory default setting is 0.5°C

Parameter 4: 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 to 10.0°C
- The factory default setting is 1.0°C

Parameter 5: 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 1 to 24 hours to 'On'
- The factory default setting is 2 hours

Parameter 6: After Hours Adjustable
The display will show the After Hours Adjustable setting.
- On: After hours timer will be adjustable
- Off: After hours timer will use the value in Parameter 5
- The factory default setting is Off

Parameter 7: 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 500 seconds
- The factory default setting is 30 seconds

Parameter 8: 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 9: 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 10: 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 9 is set for Reverse Cycle Operation.

Parameter 11: 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 12: 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 13: Enable Time Clock
The display will show either On or Off.
- On: Time Clock functions enabled
- Off: Time Clock functions disabled
- The factory default setting is On

Parameter 14: Input 2 Function
The display will show the current function of input 2.
- door: Door input
- AC: AC Fault input
- dIS: External Disable input
- AHRS: External After Hours input
- The factory default setting is AC

Parameter 15: Door Open Time
The display will show the Door Open Time.
This is the period the Door must be open before it is registered.
- The range of the Run On Time is 0 to 500 seconds
- The factory default setting is 30

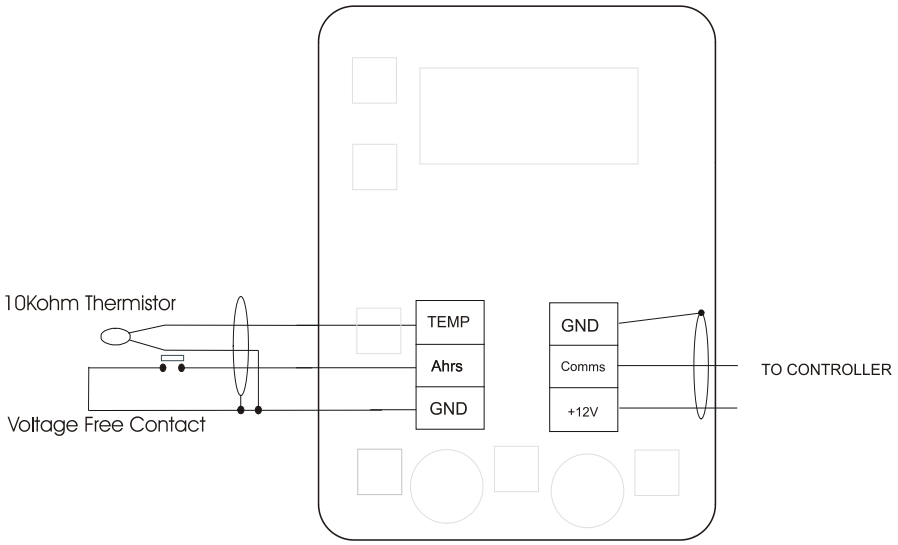
Parameter 16: Door Reset Dead Band
The display will show the Door Reset Dead Band Setting.
- The range of the Dead Band is OFF to 10.0°C
- See section 'Inputs' for more information
- The factory default setting is OFF

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.

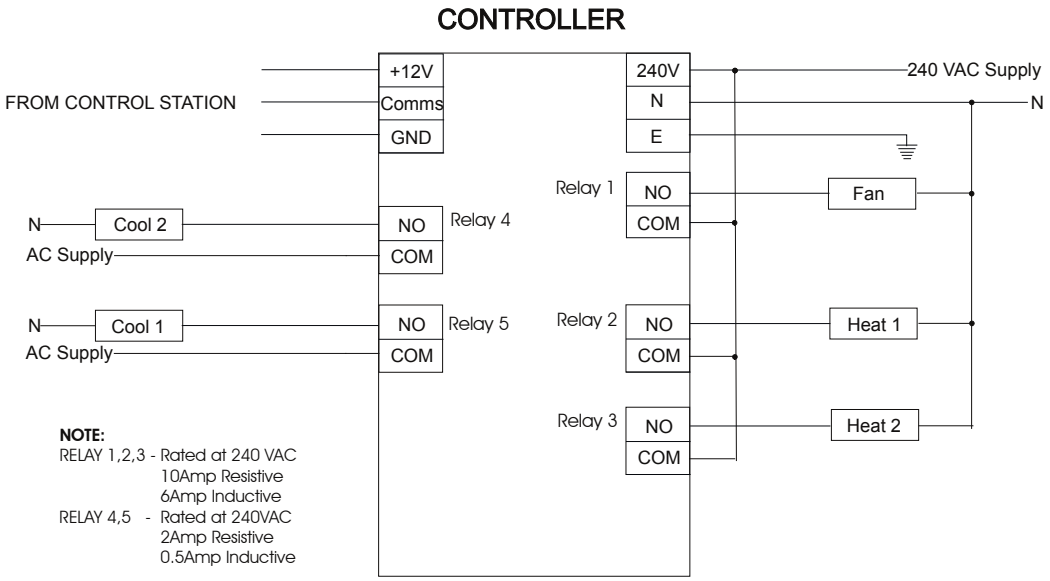
STANDARD CONNECTION

CONTROL STATION

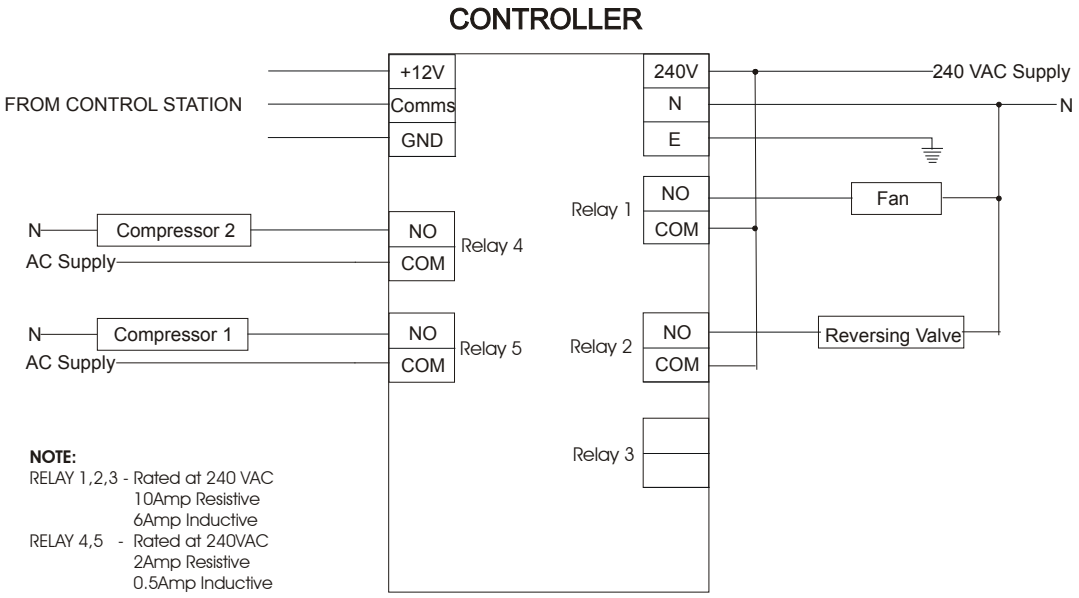


Rear View of Control Station

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