INTECH Micro
2100-R2 REV 1.0

Installation Guide.

Section A. Description, Ordering and Specifications.
2100-R2 Installation Guide Index.

INTECH Micro
2100-R2 Rev 1.0

16 Channel Relay Ouput Expander.

Z985

Features.

- **16 Digital, Isolated, Relay Outputs.**
- **Cascade option for a 2nd 2100-R2.**
  - **Enables 32 Digital, Isolated, Relay Outputs.**
- **Cost Effective Output Expansion for 2100-A16 and 2100-A4.**
- **Easy Programming Via Microscan Maps.**
- **Programmable Relay States - NO or NC.**
- **Universal AC/DC Power Supply.**
- **Easy to Install.**
- **Compact DIN Rail Mount Enclosure**

2100 models include:
2100-4S : RS422 to RS485 Converter.
2100-A16 :16AI, 4DI, 2 Relay Out, 2 AO.
2100-A4 :4AI, 4DI, 4 Relay Out, 2 AO.
2100-A4e :4AI, 4DI, 8 Relay Out, 2 AO.
2100-AO :8 AO, 8 AI, 12 DI, 2 Relay Out.
2100-D :12DI, 12 Relay Out.
2100-IS :Isolated RS232 to RS422/485.
2100-M :16AI Multiplexer.
2100-ME :Memory Expansion for 2100-A.
2100-NET :Isolated Ethernet to RS232/422/485.
2100-NS :Non-Isolated RS232 to RS422/485.
2100-R2 :16 Relay Expansion for 2100-A.
2100-RL2 :2 Relay Expansion for 2100-A.

Description.

The 2100-R2 16 Channel Relay Output Expansion Module is used in conjunction with the 2100-A16. This allows the 2100-A16 to stand alone as a 16 channel controller / alarm unit. A second 2100-R2 can be then connected to the first 2100-R2, creating a 32 channel controller / alarm unit. The 2100-R2 relay outputs can be used for any combination of control and alarm functions. The control parameters for each of the 16 controllers is downloaded from user friendly Microscan Sofware, and stored in permanent memory on the 2100-A16. These parameters include Setpoint (SV), Switching Differential, Auto / Manual, Manual Output Setting, Dual Action Control, Single Action Control, Heat / Cool, Heat Only, Cool Only.

The 16 controller alarms will operate unaffected by computer power downs, reboots, etc. The relay outputs can also be accessed directly from the Scada. The 2100-R2 can also be used in conjunction with the 2100-A4 for general purpose alarms, generated by the Scada.

Ordering Information.

2100-R2-X Standard Unit: 85~264Vac/dc Power Supply.

2100-R2 – ☐
PS

Ranging Options for 2100-R2	
Power Supply	**PS (2)**
85~264Vac/Vdc	H
23~90Vdc	M
10~28Vac/dc	L

Note 1) The 2100-R2-X is field selectable for H or M power supply.
Note 2) Power supply ‘H’ is field selectable for ’M’, and ‘M’ for ‘H’. Power supply ‘L’ must be ordered separately.

Ordering Examples.

1/ 2100-R2-M 2100-R2; 23~90Vdc Power Supply.

Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant long term reliability of the instrument. This instrument has been designed and built to comply with EMC and Safety Standards requirements.

2100-R2 Specifications.

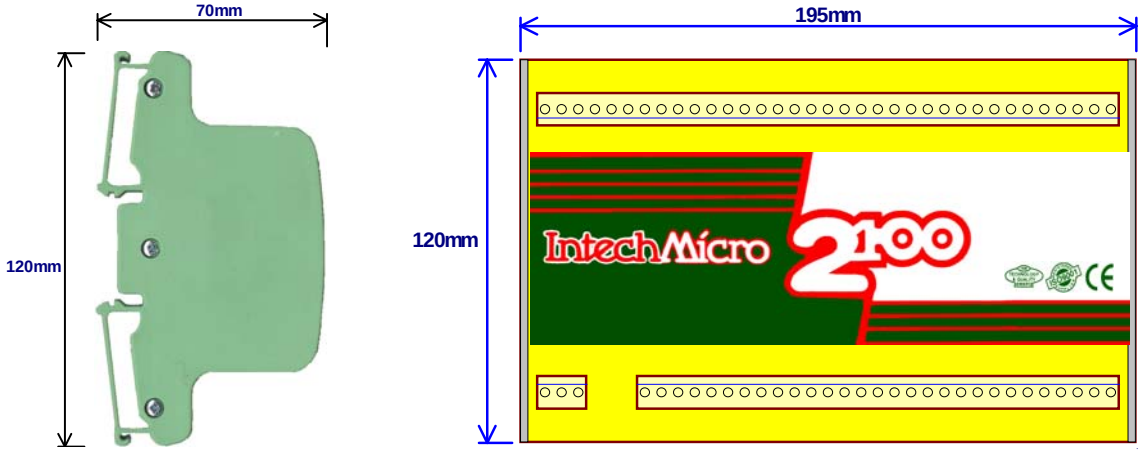
Input:		Interfaced with the 2100-A16 or 2100-A4.	
Digital Outputs:		16 Individually Isolated Changeover Relays with LED Indication of Each Output.	
	-Functions	When used with a 2100-A16, the relays can be used as Set Point (SV) Switching Differential, Auto/Manual, Manual Output Setting, Dual Action Control, Single Action Control, Heat/Cool, Cool Only, Heat Only.	
	-Contact Material	Silver Alloy	
	-Relay Ratings	Maximum Rating	Approved to Standard
		250Vac, 2A	UL
		125Vac, 2A	CSA
		110Vdc, 0.3A;	
		30Vdc, 2A;	
		250Vac,1/6hp;	
		125Vac, 1/10hp.	
	-Number of Operations	2 x 10^5 Min, at 1A, 250Vac Resistive Load.	
Power:	-H	85~264Vac/dc; 50/60Hz; 10VA.	
	-M	23~90Vdc; 10VA.	
	-L	10~28Vac/dc; 50/60Hz; 10VA.	
		Refer to '*2100-R2 H1 Power Supply Settings'* for voltage selection instructions.	
Safety and EMC Compliances:			
EMC Emissions Compliance		EN 55022-A.	
EMC Immunity Compliance		EN 50082-1.	
Safety Compliance		EN 60950.	
Mains Isolation		250Vac.	
Mains Isolation Test Voltage		-To all Inputs and Outputs:	3000Vac 50Hz for 1min.
		-To Earth:	1500Vac 50Hz for 1min.
Isolation Test Voltages:		-Interface to Outputs	3000Vac 50Hz for 1min.
		-Between Outputs:	1500Vac 50Hz for 1min.
General Specifications: (Unless otherwise stated in other input specifications.)			
RF Immunity		<±1% Effect FSO Typical.	
Operating Temperature		0~60C.	
Storage Temperature		-20~80C.	
Operating Humidity		5~85%RH Max. Non-Condensing.	
Housing	-Material	ABS Inflammability V0 (UL94)	
	-Dimensions	L=195, W=120, H=70mm.	
	-Mounting	35mm Symmetrical Mounting Rail.	
	-Weight	800g. Includes Packaging.	

Note 1. Contact INTECH INSTRUMENTS for more detailed programming information.

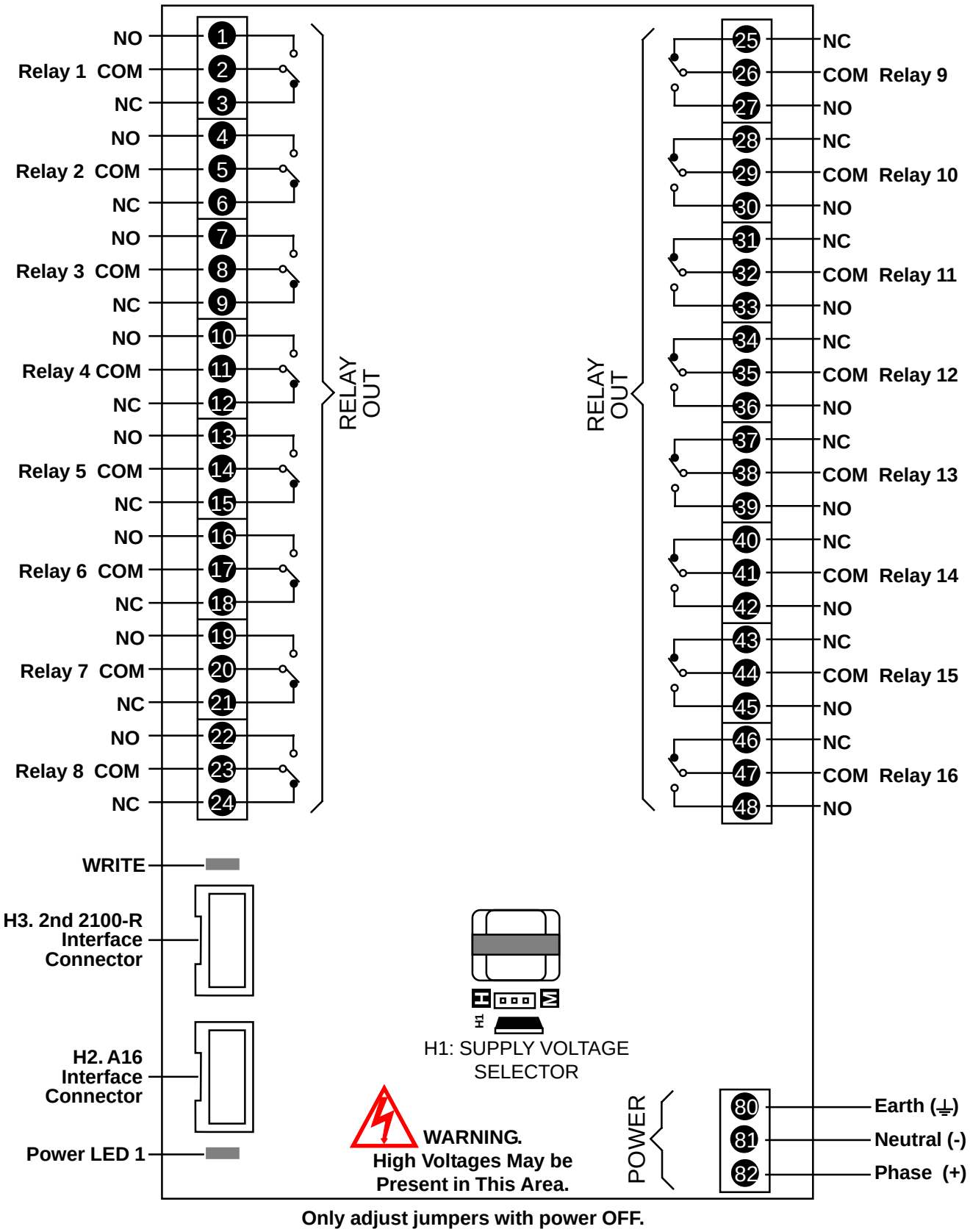
Product Liability. This information describes our products. It does not constitute guaranteed properties and is not intended to affirm the suitability of a product for a particular application. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification. Regrettably, omissions and exceptions cannot be completely ruled out. No liability will be accepted for errors, omissions or amendments to this specification. Technical data are always specified by their average values and are based on Standard Calibration Units at 25C, unless otherwise specified. Each product is subject to the 'Conditions of Sale'.
Warning: These products are not designed for use in, and should not be used for patient connected applications. In any critical installation an independant fail-safe back-up system must always be implemented.

CAUTION: Dangerous Voltages may be present. The 2100-R2 has no user serviceable parts.
Protective enclosure only to be opened by qualified personnel.
Remove ALL power sources before removing protective cover.

2100-R2 Dimensions.



2100-R2 Terminals and Layout.



Only adjust jumpers with power OFF.

Section B. 2100-R2 Jumpers and LED Functions Tables.

CAUTION: Dangerous voltages may be present. The 2100-R2 has no user serviceable parts.
Protective enclosure only to be opened by qualified personnel.
Remove ALL power sources before removing protective cover.

* Refer to *'2100-R2 Terminals and Layout'* for the location of the following jumpers.

2100-R2 H1 Power Supply Settings.

Power Supply Jumper Settings	
H1	**Power Supply Voltage Range**
H	Jumper for 85~264Vac/dc
M	Jumper for 23~90Vdc

Note 1. Power must be OFF before changing H1's position.
Note 2. Exceeding these parameters may damage the unit.
Note 3. Ensure the enclosure label is correctly labelled for the jumper position.
Note 4. Low Voltage Power Supply version is fixed, and has no jumper. This must be ordered separately.

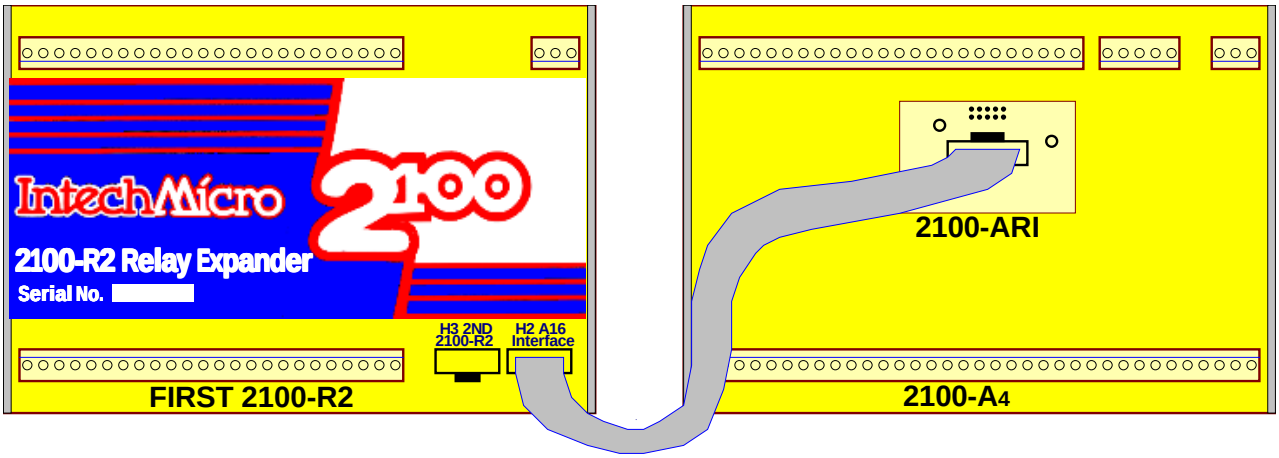
2100-R2 LED Descriptions.

LED Descriptions	
LED Name	**LED Function**
2100-A Write	Active only when 2100-R2 is receiving serial data.
2100-A Power	Indicates 2100-A power supply is on.
2100-R Power	Indicates 2100-R2 power supply is on.
Output 1~16	Indicates when their respective output relay is energized.

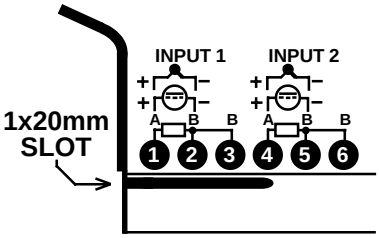
Section C. Output Connection Diagrams.

2100-A4 Relay Output Expansion - Using 2100-R2 Relay Expansion.

Output relay expansion is available using the 2100-R2, 16 relay output expansion module. These relay outputs can only be used as general purpose alarms generated by the Scada.



WARNING: The 2100-ARI is STATIC SENSITIVE.
Only touch the edges of the PCB.
Ensure standoffs lock firmly into the 2100-A4 board.



Connecting the 2100-A4 to the 2100-R2.

1/ Power must be off before installing the 10 way ribbon cable and 2100-ARI board supplied with the 2100-R2.

2/ Remove the cover off the 2100-A4.

3/ An exchange cover, with a precut slot for the ribbon cable, is available free of charge from your supplier. P/N: 2100-A4-COVERSLOT.
Alternatively you may wish to modify the existing cover:
Cut a 1mm slot, 20mm deep, just below terminal numbers 1, 2 & 3.
Carefully smooth the edges of the cut so the ribbon cable does not get damaged.

4/ The 2100-ARI is supplied with the ribbon cable attached. Use antistatic precautions when installing. Carefully orientate the 2100-ARI board as shown above. Locate the two plastic standoffs over the corresponding holes in the 2100-A4, and the 10 pin connector. Once all three are aligned, push the 2100-ARI firmly into the 2100-A4.

5/ Connect the other end of the cable to the 2100-R2, 'H2 A16 Interface' connector. Ensure both ends of the cable are firmly connected.

6/ Slide the cable into the slot, and replace the cover on the 2100-A4.

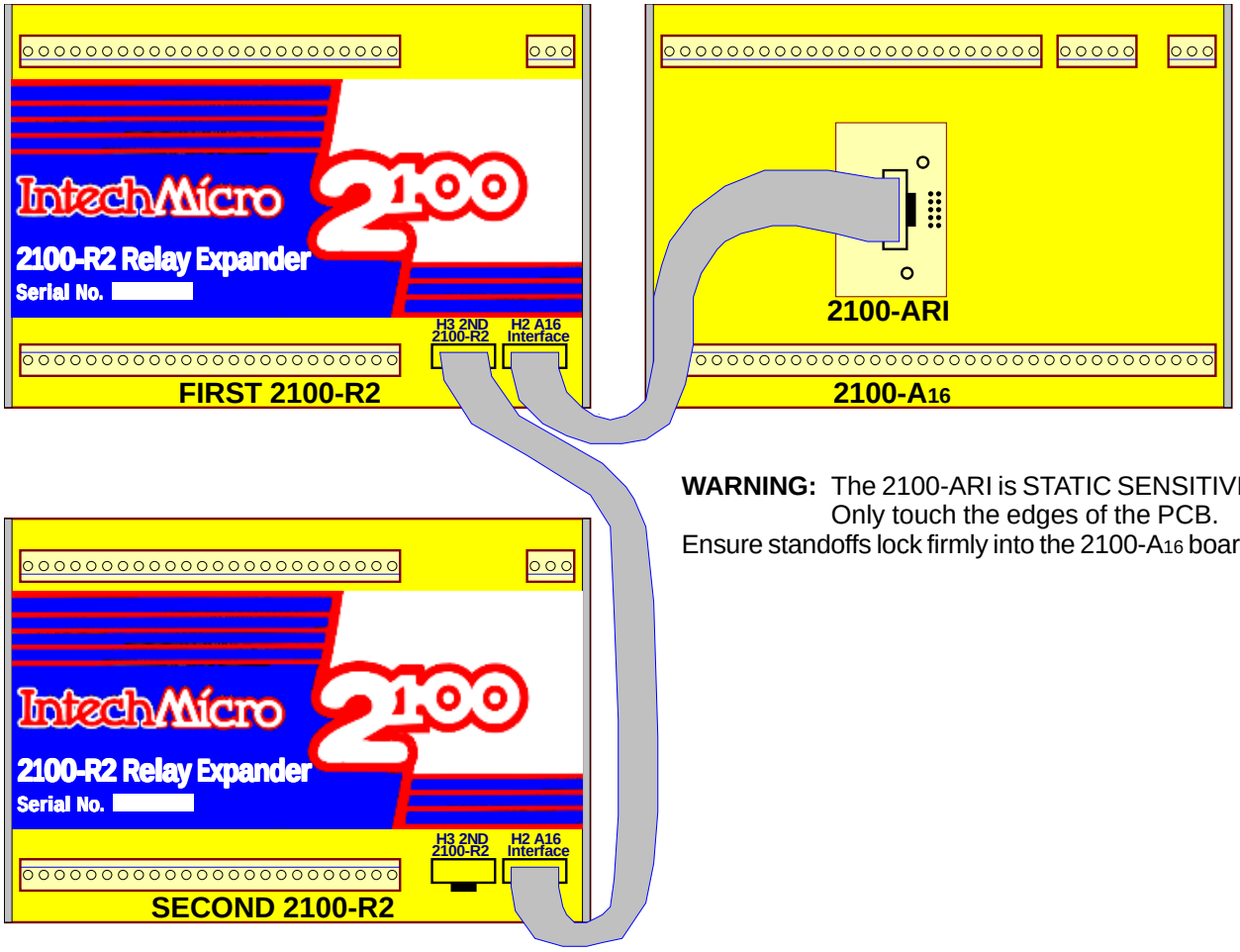
7/ If a 2nd 2100-R2 is used, connect the ribbon cable from the 'H3 2ND 2100-R2' header on the first 2100-R2, to the 'H2 A16 Interface' connector on the second 2100-R.

8/ The 2100-R2 must be enabled in the programming dialogue boxes. Advanced '2100-R2 Relay Expander' options. For detailed programming info, refer to
'Programming 2100-Series Remote Station' in the Microscan Manual.

9/ A 2100-R2 connected to the 2100-A4 must share the same power supply disconnect device and over current device. Both units must be powered and unpowered at the same time to prevent indeterminate relay states.

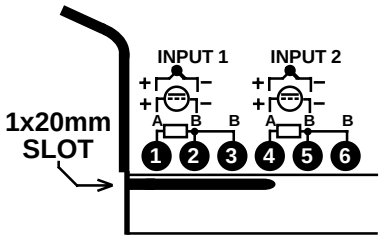
2100-A16 Rev1.1 Relay Output Expansion - Using 2100-R2 Relay Expansion.

Output relay expansion is available using the 2100-R2, 16 relay output expansion module. This allows the 2100-A16 to stand alone as a 16 channel controller / alarm unit. The 2100-R2 relay outputs can be used for any combination of control and alarm functions. The control parameters for each of the 16 controllers is downloaded from user friendly Microscan Software, and stored in permanent memory on the 2100-A16. These parameters include Setpoint (SV), Output Switching Differential, Auto / Manual, Manual Output Setting, , Dual Action Control, Single Action Control, Heat / Cool, Heat Only, Cool Only. The 16 controller / alarms will operate unaffected by computer power downs, reboots, etc. The relay outputs can also be accessed directly from the Scada.



WARNING: The 2100-ARI is STATIC SENSITIVE. Only touch the edges of the PCB.
Ensure standoffs lock firmly into the 2100-A16 board.

Connecting the 2100-A16 to the 2100-R2.



1/ Power must be off before installing the 10 way ribbon cable and 2100-ARI board supplied with the 2100-R2.

2/ Remove the cover off the 2100-A16.

3/ An exchange cover, with a precut slot for the ribbon cable, is available free of charge from your supplier. P/N: 2100-A16-COVERSLOT.
Alternatively you may wish to modify the existing cover:
Cut a 1mm slot, 20mm deep, just below terminal numbers 1, 2 & 3.
Carefully smooth the edges of the cut so the ribbon cable does not get damaged.

4/ The 2100-ARI is supplied with the ribbon cable attached. Use antistatic precautions when installing. Carefully orientate the 2100-ARI board as shown above. Locate the two plastic standoffs over the corresponding holes in the 2100-A16, and the 10 pin connector. Once all three are aligned, push the 2100-ARI firmly into the 2100-A16.

5/ Connect the other end of the cable to the 2100-R2. Ensure both ends of the cable are firmly connected.

6/ Slide the cable into the slot, and replace the cover on the 2100-A16.

7/ If a 2nd 2100-R2 is used, connect the ribbon cable from the 'H3 2ND 2100-R2' header on the first 2100-R2, to the 'H2 A16 Interface' connector on the second 2100-R.

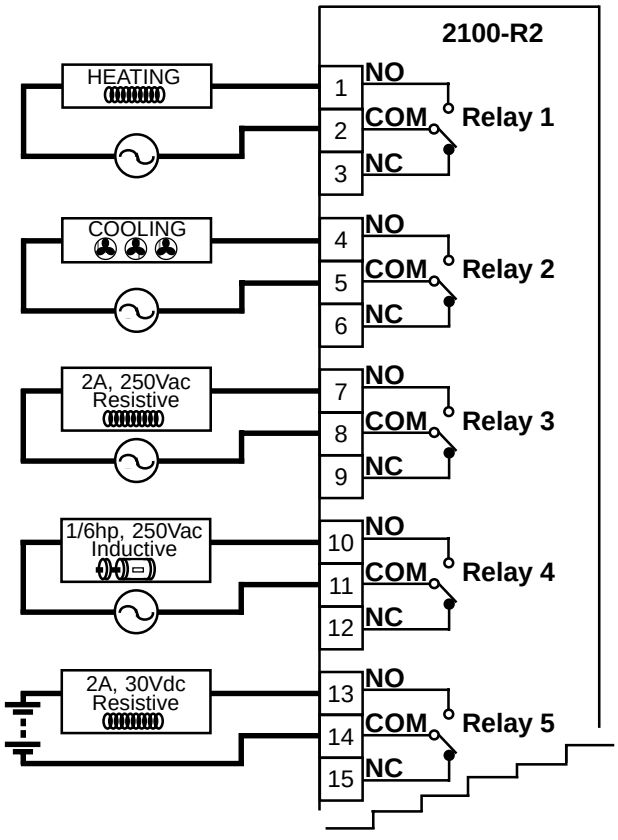
8/ The 2100-R2 must be enabled in the programming dialogue boxes. Advanced '2100-R2 Relay Expander' options. For detailed programming info, refer to
'Programming 2100-Series Remote Station' in the Microscan Manual.

9/ A 2100-R2 connected to the 2100-A16 must share the same power supply disconnect device and over current device. Both units must be powered and unpowered at the same time to prevent indeterminate relay states.

2100-R2 with 2100-A16 Relay Output Allocation Table for Single Action Controller.
16 controllers, one relay per controller.

Input to Output Control Configuration			
Controller	**Analogue Input**	**Relay No.**	**Control Mode.**
1	1	1	Heat Only or Cool Only
2	2	2	Heat Only or Cool Only
3	3	3	Heat Only or Cool Only
4	4	4	Heat Only or Cool Only
5	5	5	Heat Only or Cool Only
6	6	6	Heat Only or Cool Only
7	7	7	Heat Only or Cool Only
8	8	8	Heat Only or Cool Only
9	9	9	Heat Only or Cool Only
10	10	10	Heat Only or Cool Only
11	11	11	Heat Only or Cool Only
12	12	12	Heat Only or Cool Only
13	13	13	Heat Only or Cool Only
14	14	14	Heat Only or Cool Only
15	15	15	Heat Only or Cool Only
16	16	16	Heat Only or Cool Only

2100-R2 Relay Output Connection Example for Single Action Controllers.



Note 1. With relays NOT energized, and 'Normally Off' state selected (refer Note 3)
NO = Normally Open.
COM = Common.
NC = Normally Closed.
Heating Relay: NO, closes when heating required.
Cooling Relay: NO, closes when cooling required.

Note 2. All relays are change-over.

Note 3. Each relay can be configured for a 'Normally ON' or 'Normally OFF' output state. (E.g. for fail safe operation.) The 'Normally ON/OFF' settings are retained in software on power down, but the relays are de-energized. The 'Normally ON/OFF' state of the relay can be changed in the Advanced dialog box for the onboard relays, or using the Relay States dialog box for the 2100-R2. Refer to MicroScan Configuration Manual.

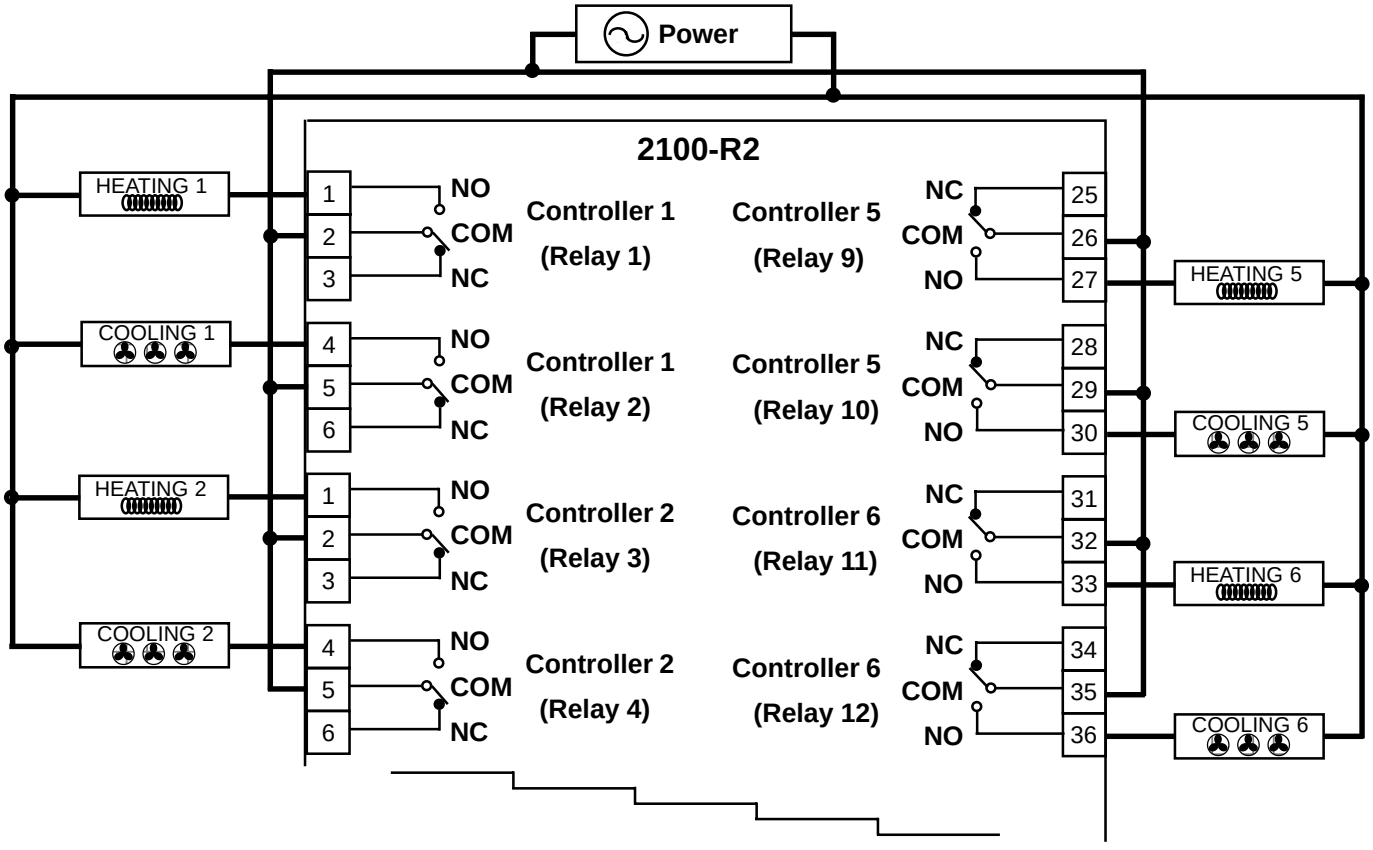
Note 4. LED indication on each output when each relay is energized.

Note 5. Single Action Setting is a global setting for the station.

2100-R2 with 2100-A16 Relay Output Allocation for Dual Action Controller.
Eight controllers, two relays per controller.

Input to Output Control Configuration					
Controller	**Analogue Input**	**Relay**	**Control Action Heat Only Relay**	**Control Action Cool Only Relay**	**Control Action Heat/Cool Relay**
1	1	1	1		1 Heat
		2		2	2 Cool
2	2	3	3		3 Heat
		4		4	4 Cool
3	3	5	5		5 Heat
		6		6	6 Cool
4	4	7	7		7 Heat
		8		8	8 Cool
5	5	9	9		9 Heat
		10		10	10 Cool
6	6	11	11		11 Heat
		12		12	12 Cool
7	7	13	13		13 Heat
		14		14	14 Cool
8	8	15	15		15 Heat
		16		16	16 Cool

2100-R2 Relay Output Connection Example for Dual Action Contollers - Single 2100-R2.



Note 1. With relays NOT energized, and 'Normally Off' state selected (refer Note 3)
NO = Normally Open. COM = Common. NC = Normally Closed.
Heating Relay: NO, closes when heating required. Cooling Relay: NO, closes when cooling required.

Note 2. All relays are change-over.

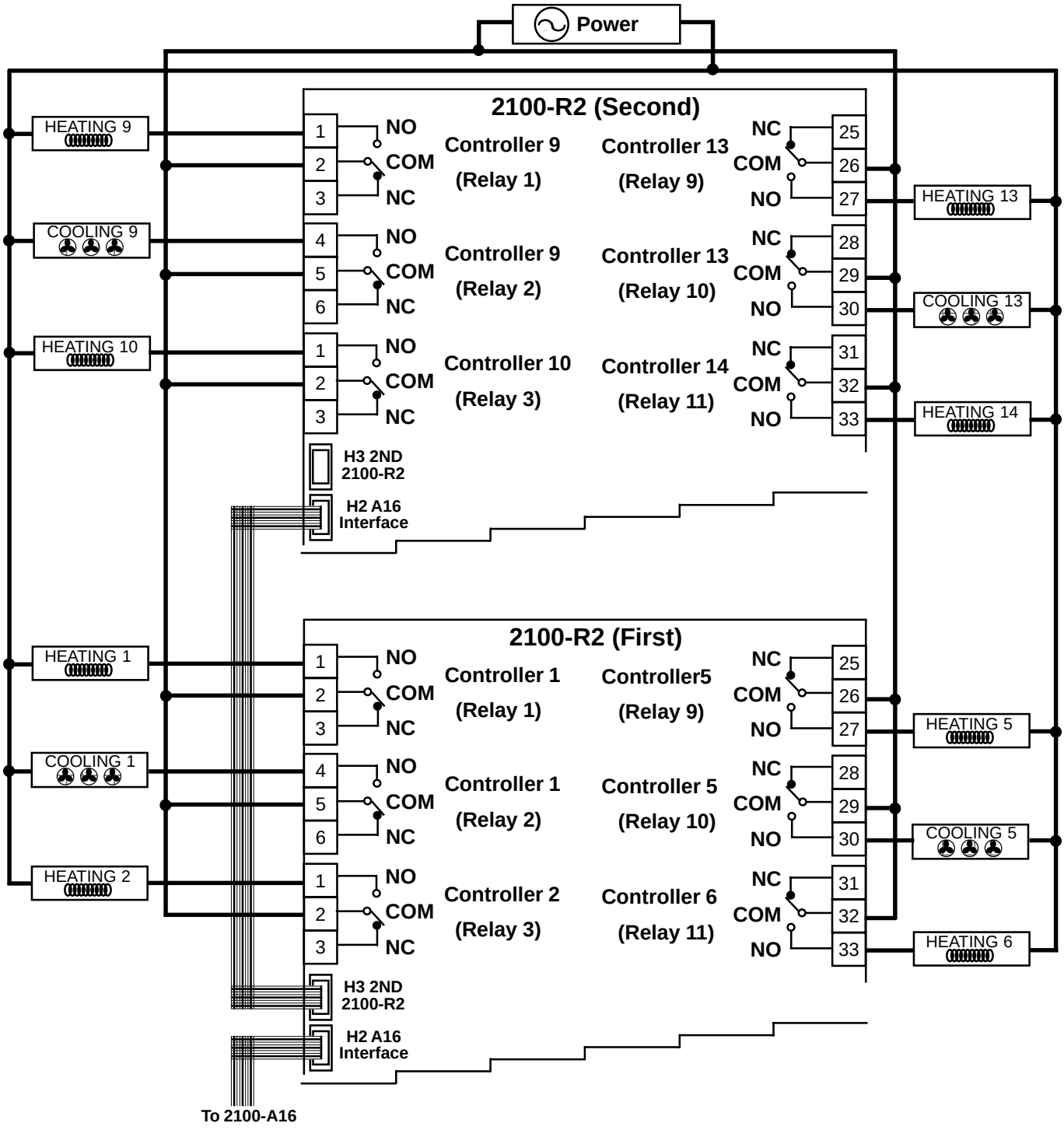
Note 3. Each relay can be configured for a 'Normally ON' or 'Normally OFF' output state. (E.g. for fail safe operation.) The 'Normally ON/OFF' settings are retained in software on power down, but the relays are de-energized. The 'Normally ON/OFF' state of the relay can be changed in the Advanced dialog box for the onboard relays, or using the Relay States dialog box for the 2100-R2. Refer to MicroScan Configuration Manual.

Note 4. LED indication on each output when each relay is energized.

Note 5. In Dual Action mode, if the controller is set to heat only, the cool relay is always off. If the controller is set to cool only, the heat relay is always off. Likewise when using Manual Mode in the heat only mode, only the state of the heat relay can be changed, and on the cool only mode, only the state of the cool relay can be changed.

Note 6. Dual Action Setting is a global setting for the station.

2100-R2 Relay Output Connection Example for Dual Action Contollers - Cascaded 2100-R2s.



Note 1. With relays NOT energized, and 'Normally Off' state selected (refer Note 3)
NO = Normally Open. COM = Common. NC = Normally Closed.
Heating Relay: NO, closes when heating required. Cooling Relay: NO, closes when cooling required.

Note 2. All relays are change-over.

Note 3. Each relay can be configured for a 'Normally ON' or 'Normally OFF' output state. (E.g. for fail safe operation.) The 'Normally ON/OFF' settings are retained in software on power down, but the relays are de-energized. The 'Normally ON/OFF' state of the relay can be changed in the Advanced dialog box for the onboard relays, or using the Relay States dialog box for the 2100-R2. Refer to MicroScan Configuration Manual.

Note 4. LED indication on each output when each relay is energized.

Note 5. In Dual Action mode, if the controller is set to heat only, the cool relay is always off. If the controller is set to cool only, the heat relay is always off. Likewise when using Manual Mode in the heat only mode, only the state of the heat relay can be changed, and on the cool only mode, only the state of the cool relay can be changed.

Note 6. Dual Action Setting is a global setting for the station.

Section D. Wiring and Installation.
2100-R2 Wiring and Installation.

THE 2100-R2 IS TO BE INSTALLED AND SERVICED BY SERVICE PERSONNEL ONLY. NO OPERATOR / USER SERVICEABLE PARTS.
All power and signals must be de-energised before connecting any wiring, or altering any Jumpers or Dip Switches.

Mounting.
* Also refer to Connection Diagrams and Notes.
(1) Mount in a clean environment in an electrical cabinet on 35mm symmetrical mounting rail.
(2) Draft holes must have minimum free air space of 20mm. Foreign matter must not enter or block draft holes.
(3) Do not subject to vibration or excess temperature or humidity variations.
(4) Avoid mounting in cabinets with power control equipment.
(5) To maintain compliance with the EMC Directives the 2100-R2 is to be mounted in a fully enclosed steel fire cabinet. The cabinet must be properly earthed, with appropriate input / output entry points and cabling.

Cover Removal and Fitting.
To remove 2100 covers, firmly push down the button in the middle of one endplate, and pull the end plate outwards, while pulling the cover up and out.
To fit the cover, first make sure the cover is being fitted the correct way around, (Terminal 82 on the cover is above 82 on the board.) and that the serial number on the board matches the serial number on the cover (if applicable). Slide one end of the cover into the slot in the endplate. Pull the other endplate outwards and push the cover down until it slides into the slot of this endplate. Check both ends are firmly held.

Power Supply Wiring.
(1) A readily accessible disconnect device and a 1A, 250Vac overcurrent device, must be in the power supply wiring.
(2) Any 2100-A connected to the 2100-R2, must share the same disconnect device and overcurrent device
(3) For power supply, connect Phase (or +Ve) to terminal 82, Neutral (or -Ve) to 81, and Earth to 80. To ensure compliance to CE Safety requirements, the grey terminal insulators must be fitted to ALL mains terminals after wiring is completed. (ie. terminals 82, 81 and 80.) For Non Hazardous Voltage power supplies (not exceeding 42.4Vpeak or 60Vdc) terminals 81 and 80 may be linked together, instead of connecting an earth.

Analogue Signal Wiring.
(1) All signal cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only.
(2) Signal cables should be laid a minimum distance of 300mm from any power cables.
(3) For 2 wire current loops, 2 wire voltage signals or 2 wire current signals, Austral Standard Cables B5102ES is recommended. For 3 wire transmitters and RTDs Austral Standard Cables B5103ES is recommended.
(4) It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
(5) Lightning arrestors should be used when there is a danger from this source.
(6) Refer to diagrams for connection information.

Commissioning.
(1) Check that all the above conditions have been met, and the wiring checked, before applying power to the 2100-R2.
(2) Check each relay output functions correctly, and the relay specifications are not being exceeded.
(3) Check each digital input functions correctly, and the digital input specifications are not being exceeded.

2100-R2 Software Programming.
The 2100-R2 software setup is accessed via the attached 2100-A16 programming boxes, and associated Station Map. Refer to the 2100-A16 Installation Guide, and 'Programming 2100 Series Remote Station' in the Microscan Manual.

CAUTION: Dangerous voltages may be present. The 2100-R2 has no user serviceable parts.
Protective enclosure only to be opened by qualified personnel.
Remove ALL power sources before removing protective cover.

Intech INSTRUMENTS LTD
www.intech.co.nz
Christchurch Ph: +64 3 343 0646
Auckland Ph: 09 827 1930
Email: sales@intech.co.nz