INTECH Micro
2100-A4 REV 1.1

Installation Guide.

Section A. Description, Ordering and Specifications.
2100-A4 Installation Guide Index.

INTECH Micro

2100-A4.Rev 1.1

4 Universal Analogue Inputs.
2 Analogue Outputs.
2100-A4: 4 Digital Inputs. 4 Relay Outputs.
2100-A4e: 4 Digital Inputs. 8 Relay Outputs.

Features.

- **4 Universal Analogue Inputs.**
- **Each Input Individually Selected & Scaled.**
- **12 Bit Resolution.**
- **Inputs for T/C, mV, V, & mA.**
  - **T/C: E, K, J, N, T.**
  - **RTD: -50~140C to -50~850C.**
  - **mV: 0~75mV to 0~300mV.**
  - **V: 0~2.5V to 0~10V.**
  - **mA: 0~10mA to 0~20mA.**
- **Four Digital, Isolated, Optocoupler Inputs.**
- **Two 12bit Analogue Outputs.**
- **A4: Four Digital, Isolated, Relay Outputs.**
- **A4e: Eight Digital, Isolated, Relay Outputs.**
- **RS422/RS485 Up to 1200m.**
- **RS232 Cost Effective Radio Installation.**
- **RS232 Cost Effective PC or PLC AI Expansion.**
- **Clock/Reset Drive up to Four 2100-Ms.**
- **Selectable Baud Rates.**
- **Digital Inputs: - State or Count.**
  - Speeds to 50Hz.
- **Interface for 2100-R (16 Relays) or 2100-ME (Memory).**
- **Easy Programming Via Microscan Maps.**
- **Programmable Station Number.**
- **Programmable Relay States - NO or NC.**
- **Comms Failure Time-out Using Relay 4.**
- **Comms TXE and TX Delay Programming.**
- **Programming Information Retained on Power Down.**
- **Universal AC/DC Power Supply.**
- **Easy to Install.**
- **Compact DIN Rail Mount Enclosure**

Z985

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-R :16 Relay Expansion for 2100-A.
2100-RL2 :2 Relay Expansion for 2100-A.

Note: All 2100-A4 data applies to both the 2100-A4 and the 2100-A4e models, unless otherwise specified.

Ordering Information.

2100-A4-X Standard Unit: 4 Analogue Inputs Pt100, -50~140C, 4 Digital Inputs, 2 Analogue Outputs 4~20mA, Clock/Resest Ouputs, 4 Relay Outputs, RS485 Comms, 85~265Vac/dc PSU.

2100-A4e-X Standard Unit: 4 Analogue Inputs Pt100, -50~140C, 4 Digital Inputs, 2 Analogue Outputs 4~20mA, Clock/Resest Ouputs, 8 Relay Outputs, RS485 Comms, 85~265Vac/dc PSU.

2100-A4 –□–□–□–□ (O AO C PS) **OR** **2100-A4e** –□–□–□–□ (O AO C PS)

Ranging Options for 2100-A4							
Supplied with Option	**O**	**Analogue Output**	**AO**	**COMMS**	**C**	**Power Supply (5)**	**PS**
2100-R 16 Relay Expander	R	4~20mA	A	RS232(1)	232	85~264Vac/dc	H
Winery Option	W	0~10V	V	RS422	422	23~90Vdc	M
%RH Humidity Software(4)	HWD			RS485	485	10~28Vac/dc	L
No Options	N						

Note 1. The RS232 Comms. version comes complete with a RS232 kit, required for connecting the 2100-A4 to a PC, etc. The kit contains: 1 x 5m RS232 cable; (2,10 & 15m available.) 1 x 9pin D type (25pin D type available).
Note 2: The 2100-A4 is factory set to RS232 or RS422/485. The 2100-A4-X is field selectable for RS422 or RS485, and H or M power supply.
Note 3: The winery option is not fitted with the 2 Analogue Outputs, 4 Digital Inputs, and Clock/Reset Outputs.
Note 4. The %RH Software option is only available in the 2100-A4 and does not have PLC Retransmission Software. Refer to 2100-A4-HWD Section for more details.
Note 5. Power supply 'H' is field selectable for 'M', and 'M' for 'H'. Power supply 'L' must be ordered separately.

Ordering Examples.

1/ 2100-A4-N-A-232-L 2100-A4; 4 Relay Outputs; 4~20mA Out; RS232 Comms; 10~28Vac/dc Power Supply.
2/ 2100-A4e-N-V-485-H 2100-A4e; 8 Relay Outputs; 0~10V Out; RS485 Comms; 85~265Vac/dc 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-A4 Input Specifications.

The four inputs can be individually software and hardware selected & scaled within the span limits listed below.

Input Resolution	12 Bits, 4,000 Steps Typical. (Some ranges may differ.)
Input Type	All Inputs are single ended.

mV / V Inputs

- Input Impedance	>300kΩ.
- Maximum Over-range	18Vdc Continuous.
- mV Ranges	0~75mV, 0~150mV, 0~300mV.
- V Ranges	0~2.5V, 0~5V, 0~10V.

mA Inputs

- Input Resistance	250Ω.
- Maximum Over-range	30mAdc Continuous.
- mA Ranges	0~10mA, 0~20mA, 4~20mA.

3-wire RTD Inputs:[note 2]

All temperature probes must be isolated from each other and earth.

- Inputs	Single Ended RTD Inputs. All 2nd 'B' Terminals Connected.
- Pt100 RTD Type	3 Wire Pt100 RTD DIN 43760:1980 Standard Input.
- Sensor current	1mA.
- Lead resistance	5Ω/Lead Maximum Recommended.
- Sensor Fail	Upscale Drive.
- RTD Ranges	-50~140C (-50~280F), -50~350C (-50~650F), -50~850C (-50~1500F).

Thermocouple Inputs:[note 2]

All temperature probes must be isolated from each other and earth.
Mineral Insulated Thermocouples With Isolated Junction Recommended.

- Cold Junction Comp.	0~60C.
- CJC Drift	<0.03C/C Typical.
- Sensor Fail	Downscale Drive. (Within 10% of Zero Typically.)
- T/C Lead Resistance	100Ω Maximum.
- Input Resistance	>300kΩ.
- Accuracy	±0.1% FSO ±1C Typical.
- Type E Ranges	100~1000C (220~1800F).
- Type J Ranges	100~1200C (220~2150F).
- Type K Ranges	100~1300C (220~2350F).
- Type N Ranges	100~1300C (220~2350F).
- Type T Ranges	100~400C (220~750F).

Digital Inputs:		4 Opto Isolated Inputs with LED Indication of Each Input.
-Functions		ON / OFF, Count, and Flow Metering.
		Count to 16383 & Rolls Over. Over Flow Detection.
-Input Voltage		5~30Vdc.
-Threshold		4.6V Typical.
-Load	@ 5V	1.1mA per Channel.
	@ 12Vdc	4.2mA per Channel.
	@ 24Vdc	9.6mA per Channel.
-Frequency		0~50Hz.

CAUTION: Dangerous voltages may be present. The 2100-A4 has no user serviceable parts.
Protective enclosure only to be opened by qualified personnel.
Remove ALL power sources before removing protective cover.

2100-A4 Output Specifications.

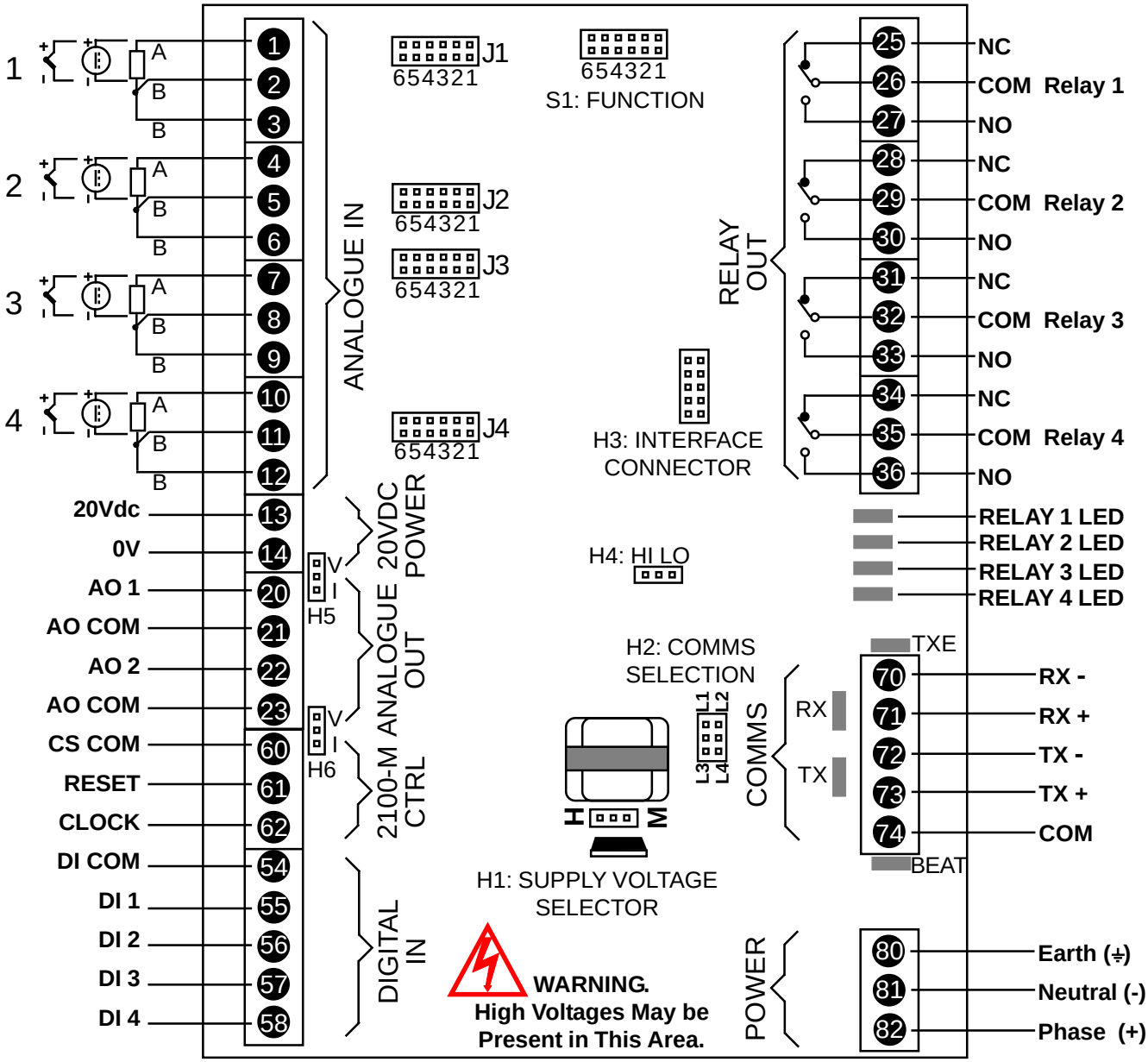
Dual Analogue Outputs:			
	-Resolution	Two outputs, 12bits, 4000 steps typical. (Some ranges may differ.)	
	-V Ranges	0~10V, 2~10V. Output Drive = 4mA Maximum. (2k5 @ 10V)	
	-mA Ranges	0~20mA, 4~20mA. Output Drive = 12V Maximum. (600Ω @ 20mA)	
Digital Outputs:	-2100-A4	4 Individually Isolated Changeover Relays with LED Indication of Each Output.	
	-2100-A4e	8 Individually Isolated Changeover Relays with LED Indication of Each Output.	
	-Functions	The on Board Controllers (16 additional relays with 2100-R), Can be used as Set Point (SV), Switching Differential, Auto/Manual, Manual Output Setting, Dual Action Control, Single Action Control, Heat / Cool, Heat Only, Cool 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	

2100-A4 General Specifications.

Comms:	-Protocols	RS422/RS485 or RS232	
	-Baud Rate	Selectable 2400, 4800, 9600. (Default = 9600).	
	-Format	8 bit, No Parity, 1 Stop.	
Power:	-H	85~264Vac/dc; 50/60Hz; 10VA.	
	-M	23~90Vdc; 10VA.	
	-L	10~28Vac/Vdc; 50/60Hz; 10VA.	
		Refer to '*2100-A4 H1 Power Supply Settings'* for voltage selection instructions.	
Transmitter Power Supply **note 3**		20Vdc±5%; Max. Load=80mA; Ripple<20mVrms; Common to Analogue Inputs.	
Safety and EMC Compliances:			
EMC Compliances		Emissions EN 55022-A. Immunity 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.
Input/Output Isolation Test Voltages		-Digital Inputs to Analogue Input/Outputs:	1000Vdc peak for 1min.
		-Comms to Analogue Input/Outputs:	1000Vdc peak for 1min.
		-Comms to Digital Inputs:	1000Vdc peak for 1min.
		-Relay Outputs to All Other Terminals:	3000Vac 50Hz for 1min.
		-Between Relay Outputs:	1500Vac 50Hz for 1min.
General Specifications: (Unless otherwise stated in other input specifications.)			
Accurate to		<±0.1% FSO Typical. (Unless otherwise stated in input specifications.)	
Linearity & Repeatability		<±0.1% FSO Typical.	
Channel Separation		<±0.1% FSO Typical.	
Ambient Drift		<±0.01%/C FSO Typical.	
RF Immunity		<±1% Effect FSO Typical.	
CLOCK and RESET		25msec. Nominal Pulse Length.	
		20V Nominal Amplitude Through Current Limiting Resistor.	
		Settling Time and Averaging Software Selectable.	
Permanent Memory (E^2ROM)		10,000 Writes per Input Parameter.	
		10 Year Data Retention.	
Operating Temperature		0~60C.	
Storage Temperature		-20~80C.	
Operating Humidity		5~85%RH Max. Non-Condensing.	
Housing	-Material	ABS Inflammability V0 (UL94)	
	-Dimensions	L=153, W=120, H=70mm. (2100-A4e L=195)	
	-Mounting	35mm Symmetrical Mounting Rail.	
	-Weight	900g, Including Packaging and RS232 Kit.	

Note 1. Contact INTECH INSTRUMENTS for more detailed programming information.
Note 2. The 2100-A4 is C and F selectable. This selection affects all temperature readings. (CJC must be calibrated in C.)
Note 3. If the 2100-A4e is used on the 'M' P/S option the max. Tx. P/S load is 40mA, with no AO. If AO is used do not use the Tx. P/S.

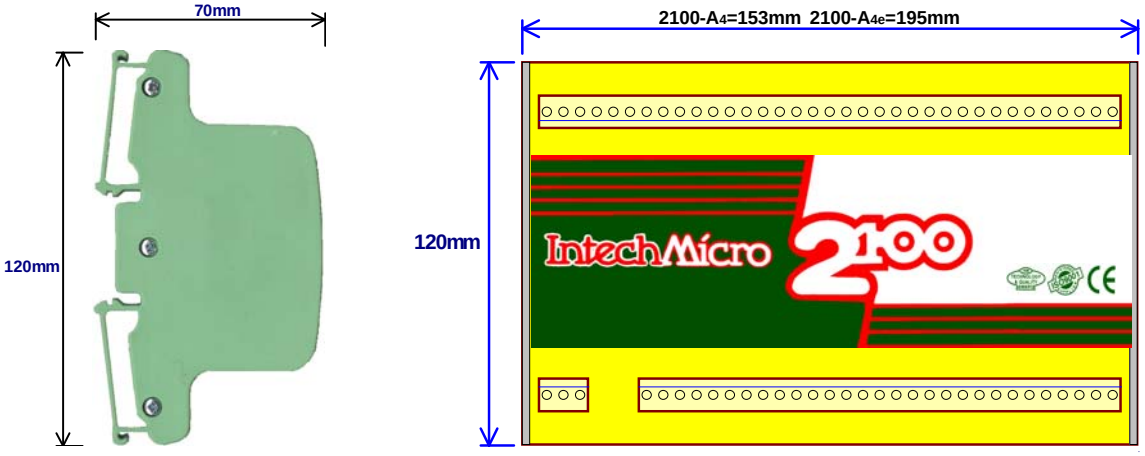
2100-A4 Terminals and Layout.



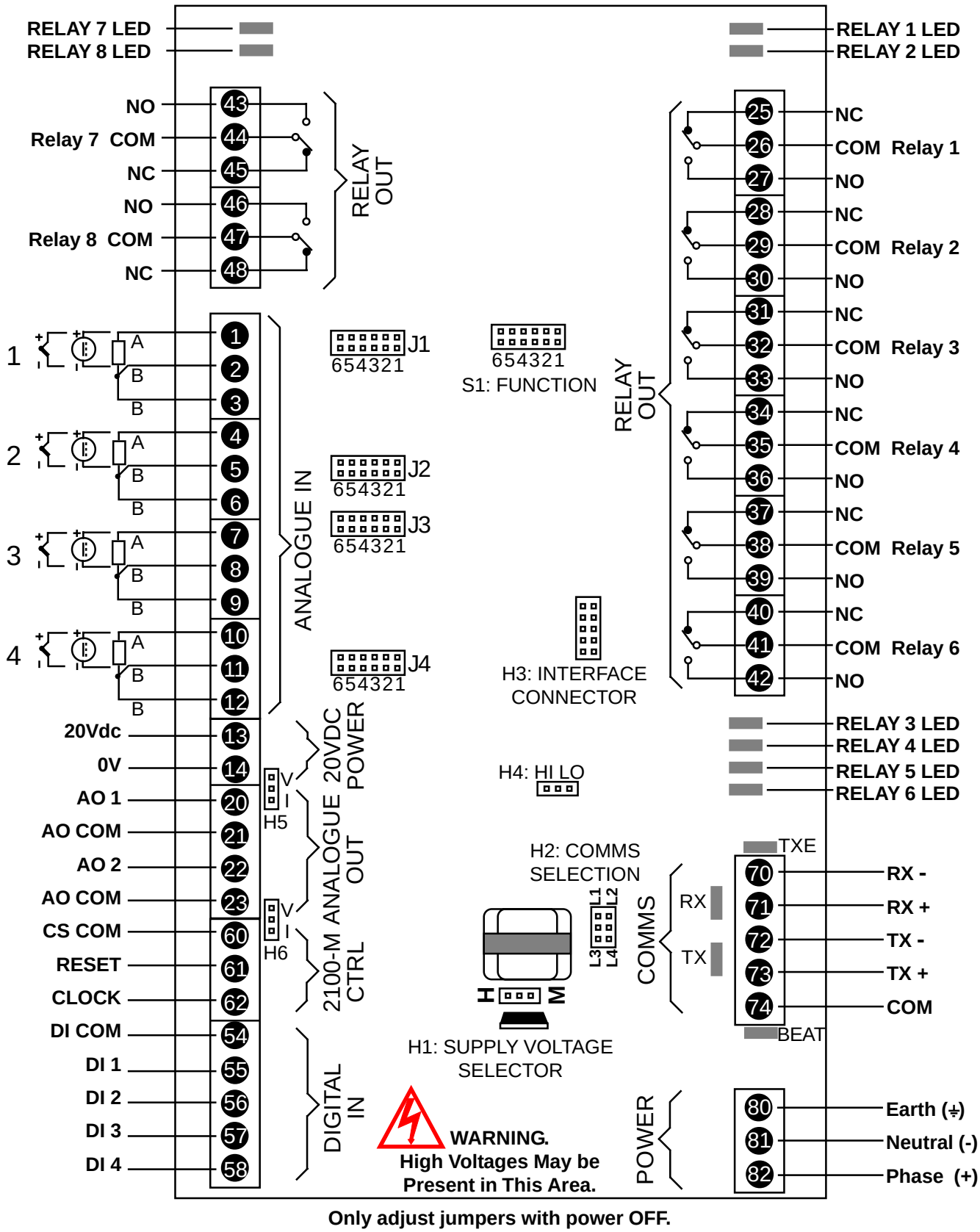
Only adjust jumpers with power OFF.

Note. The 2100-A4-W (Winery Option) has 4 Analogue Inputs, 4 Relay Outputs, RS422 Comms, 85~264Vac/dc Power Supply. The 2 Analogue Outputs, 4 Digital Inputs, and Clock/Reset Outputs are not fitted.

2100-A4 Rev1.1 Dimensions.



2100-A4e Terminals and Layout.



Only adjust jumpers with power OFF.

Note 1. The 2100-A4e-W (Winery Option) has 4 Analogue Inputs, 8 Relay Outputs, RS422 Comms, 85~264Vac/dc Power Supply. The 2 Analogue Outputs, 4 Digital Inputs, and Clock/Reset Outputs are not fitted.

Note 2. The %RH Software option is only available in the 2100-A4 and does not have PLC Retransmission Software. Refer to 2100-A4-HWD Section for more details.

Section B. 2100-A4 Jumpers and LED Functions Tables.

CAUTION: Dangerous voltages may be present. The 2100-A4 has no user serviceable parts.
Protective enclosure only to be opened by qualified personnel.
Remove ALL power sources before removing protective cover.

*** For ALL programming tables.** Jumper Status: **0=JUMPER NOT INSERTED 1=JUMPER INSERTED.**

* Refer to *'2100-A4 Terminals and Layout'* for the location of the following jumpers.

2100-A4 S1 Function Settings.

Function Jumper Settings						
Function	**S1-1**	**S1-2**	**S1-3**	**S1-4**	**S1-5**	**S1-6**
9600baud note1	0	0	0	0	0	0
4800baud	0	1	0	0	0	0
2400baud	1	1	0	0	0	0
Test Mode note2	0	0	1	0	0	0

Note 1. Factory Default.
Note 2. Factory use ONLY.

2100-A4 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-A4 H2 Comms Settings.

COMMS Jumper Settings				
Protocol	**L1**	**L2**	**L3**	**L4**
RS232 STD	0	0	1	0
RS232 RADIO	1	0	0	0
RS422	1	1	0	0
RS485	0	0	1	1

Linking for RS422

Linking for RS485

Note 1. RS232 must be ordered separately to RS422/485.
Note 2. RS422 can be jumpered for RS485, and vice versa.

2100-A4 LED Descriptions.

LED Descriptions	
LED Name	**LED Function**
RX	Active when Station is receiving serial data.
TX	Active only when Station is transmitting serial data.
TXE	Active only when Station is ready to transmit data.
BEAT	Heart beat. Continual flashing indicates Station healthy
Digital Output	Indicates when their respective output relay is energized.
Digital Input	Indicates when their respective input is energized, or counting.
Clock / Reset	Indicates when respective Clock or Reset for multiplexer is active.

2100-A4 Analogue Input Programming.

Analogue Input Programming								
Range	**H4 LO/HI Range Selection**		**J1, J2, J3, & J4 Jumper Programming.**					
	Jumper in LO	**Jumper in HI**	**1 ÷2**	**2 Diff In.**	**3 Isource B**	**4 0V**	**5 Isource A**	**6 mA 250R**
Pt100	-50~140C	-50~350C	0	1	1	0	1	0
Pt100	-50~350C	-50~850C	1	1	1	0	1	0
Thermocouples	All Ranges	-	0	1	0	1	0	0
mV	0~75mV	0~150mV	0	1	0	1	0	0
mV	0~150mV	0~300mV	1	1	0	1	0	0
V	0~2.5V	0~5V	0	0	0	1	0	0
V	0~5V	0~10V	1	0	0	1	0	0
mA	0~10mA	0~20mA	0	0	0	1	0	1
mA	0~20mA	-	1	0	0	1	0	1
Thermistor	25~100	-50~100	1	0	0	1	1	0

Note 1. H4 LO/HI jumpers affect all ranges.
Note 2. Each input can be programmed to a different range. (As long as all the input ranges fall within the same H4 LO/HI column.)
Note 3. Input ranges also need to be selected in software.

2100-A4 Analogue Output Programming.

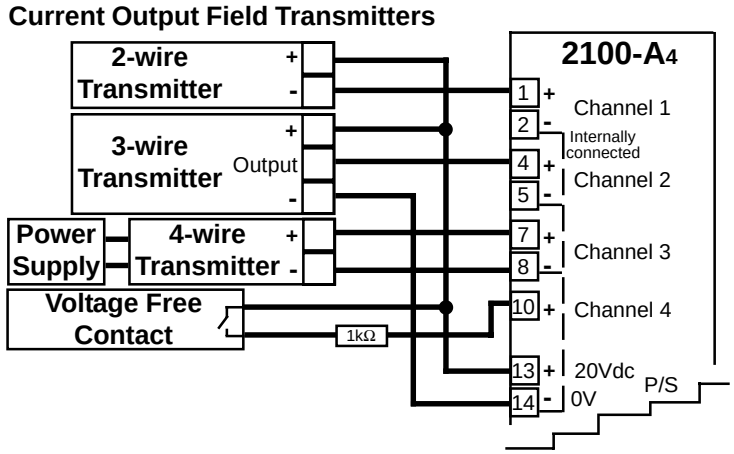
H5, H6 Analogue Output Jumper Programming				
Range	H5 Analogue Output 1		H6 Analogue Output 2	
	I	V	I	V
Volts (0~10V, 2~10V)	0	1	0	1
milliAmps (0~20mA, 4~20mA)	1	0	1	0

Note 1. Each output can be programmed to a different range.
Note 2. Output ranges also need to be selected in software.

Section C. Input and Output Connection Diagrams.

2100-A4 Input Connection Diagram for mA Inputs.

Connection configuration for 2 wire, 3 wire and 4 wire transmitters, and digital inputs.



Note 1. Maximum load on 20V P/S = 80mA.

Note 2. All inputs need to be programmed. Refer to Analogue Input Programming.

Note 3. Inputs can be used as digital inputs, for sensing voltage free field contacts.

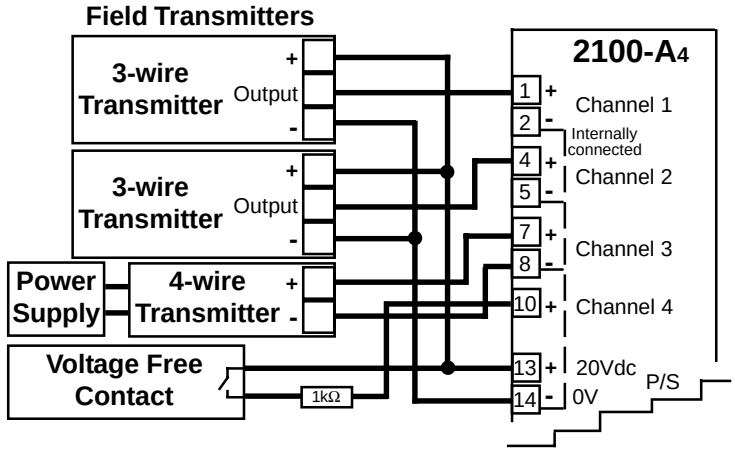
Note 4. All cables must be screened, and the screens earthed at one end only.

Note 5. All 2100-A4 inputs are single ended. (i.e., all negative inputs are internally connected.

Note 6. Voltage free contact values must be brought in through 'tags' in the Scada Software.

2100-A4 Input Connection Diagram for Millivoltage and Voltage Inputs.

Connection configuration for 3 wire and 4 wire transmitters, and digital inputs.



Note 1. Maximum load on 20V P/S = 80mA.

Note 2. All inputs need to be programmed. Refer to Analogue Input Programming.

Note 3. Inputs can be used as digital inputs, for sensing voltage free field contacts.

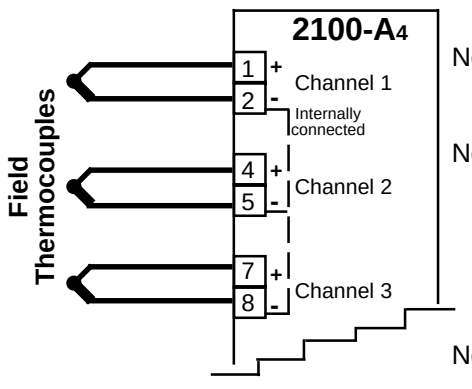
Note 4. All cables must be screened, and the screens earthed at one end only.

Note 5. Input voltages must not exceed 18V.

Note 6. All 2100-A4 inputs are single ended. (i.e., all negative inputs are internally connected.

Note 7. Voltage free contact values must be brought in through 'tags' in the Scada Software.

2100-A4 Input Connection Diagram for Thermocouple Inputs.



Note 1. All thermocouple inputs are single ended. (ie, all negative inputs are internally connected.

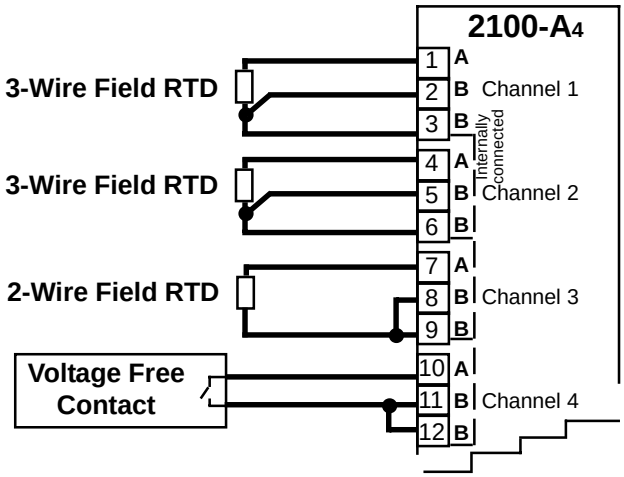
Note 2. It is recommended that the thermocouples be isolated from each other and earth. Isolated junction, mineral insulated thermocouples are recommended.

Note 3. For accurate thermocouple measurement, especially low temp:
*The cover must be fitted.
*Avoid drafts and temperature differences across terminals.
*Once installation is complete, close the cabinet door and allow the cabinet to reach equilibrium. This may take several hours.
*Place all the thermocouple probes into a calibrated thermal bath at the temperature of interest. Any errors can be zeroed out in software.

Note 4. All thermocouples are referenced to the cold junction compensation temperature sensor, located behind terminal 13.

Note 5. All cables must be screened, and the screens earthed at one end only.

2100-A4 Input Connection Diagram for RTD Inputs.



Note 1. All RTD inputs are single ended. ie all the 2nd 'B' terminals are internally connected.

Note 2. It is recommended that the RTDs be isolated from each other and earth.

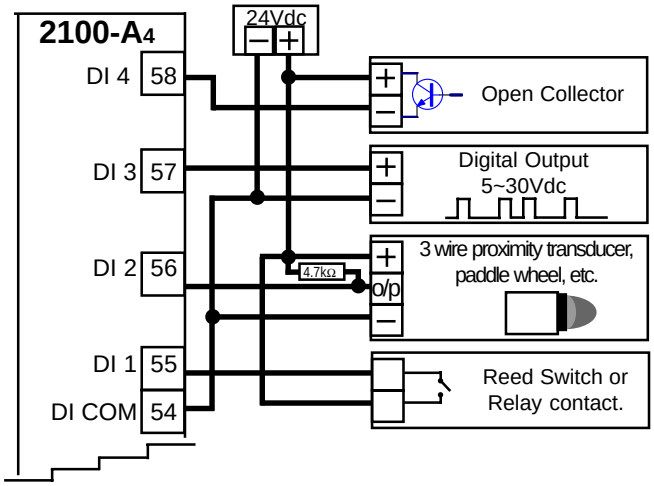
Note 3. Inputs can be used as digital inputs for sensing a clean, voltage free, field contact.

Note 4. All RTD cables must be screened, and the screens earthed at one end only. All the three wires must be the same resistance. (ie. the same type and size.) Refer to 'Wiring and Installation' for recommended types.

Note 5. To minimise lead resistance errors, 3 wire RTDs should be used. If 2 wire RTDs are used small offset errors can be compensated for in software.

Note 6. For voltage free contacts use RTD6 0 to 850 for pseudo digital input in the Scada Software.

2100-A4 Connection Example Diagram for Digital Inputs.



Note 1. Inputs can be:
State - i.e. ON or OFF.
Count - 0~50Hz

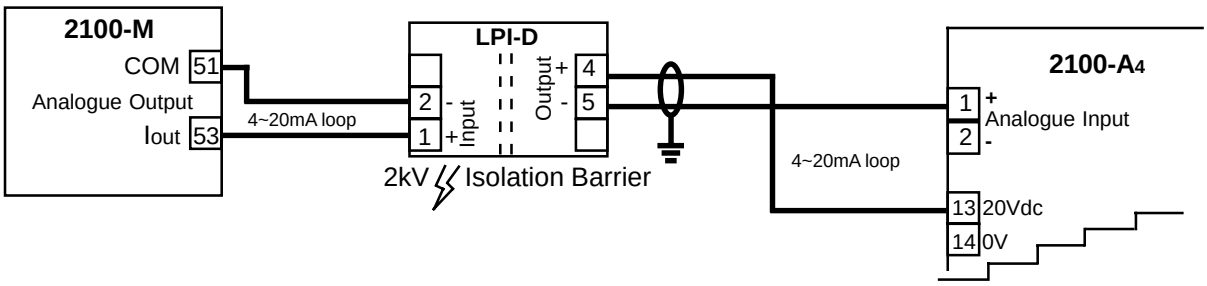
Note 2. LED indication per input. LED intensity depends on voltage level at the input terminals. Refer to '*Specifications*' for input loads.

Note 3. For scaling of counter inputs, totalising and flow data conversion, refer to Microscan Configuration Manual, line setup/counter scaling.

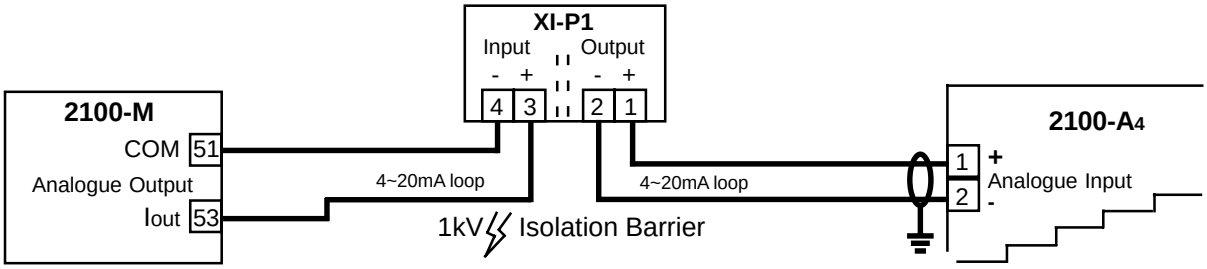
Note 4. All cables must be screened, with screen earthed at one end only. Refer 'The Proper Installation & Wiring of the 2100-A4.'

Note 5. Do not fit the 4K7 resistor for 3 wire PNP transducers.

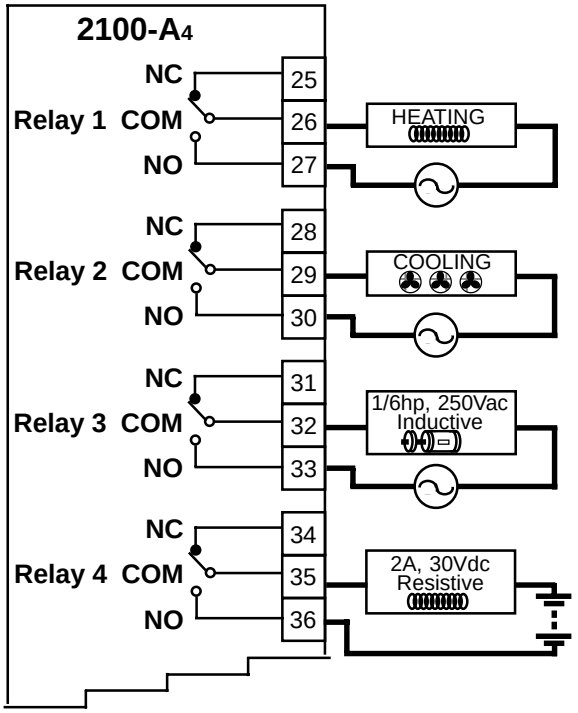
2100-A4 Connection Diagram Using an LPI-D Current Loop Isolator on the Input.



2100-A4 Connection Diagram Using an XI-P1 Current Loop Isolator on the Input.



2100-A4 Relay Output Connection Example for Single Action Controllers.
* Four controllers, one relay per controller.



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-R. Refer to MicroScan Configuration Manual.

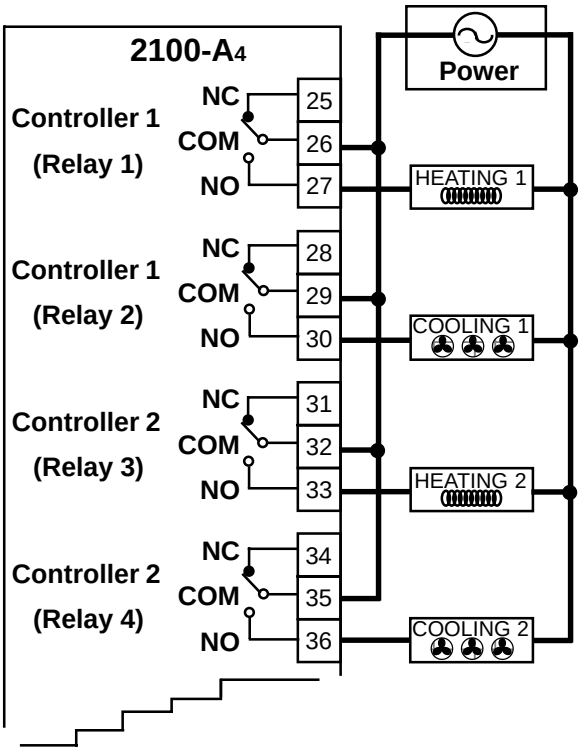
Note 4. LED indication on each output when each relay is energized.

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

2100-A4 & 2100-A4e Relay Output Allocation for Single Action Controllers.

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

2100-A4 Relay Output Connection Example for Dual Action Contollers.
* Two controllers, two relays per controller.



*These notes apply to both the 2100-A4 and 2100-A4e Relay Output Connection Examples.

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 'Normall OFF' output state. (E.g. for fail safe operation.) The 'NormallyON/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-R. Refer to MicroScan Configuration Manual.

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

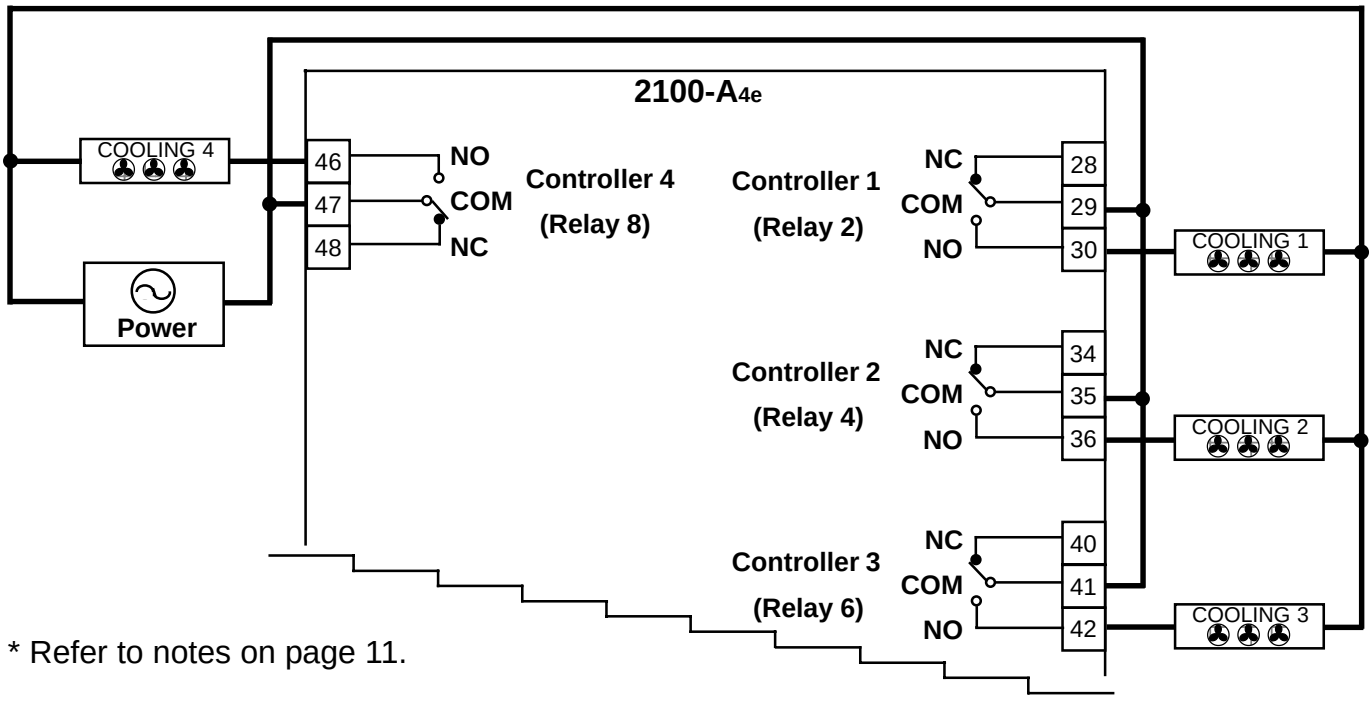
Note 5. In Dual Action mode, if the controller is set to heat only, the cool relay is always off. If the controller is set to cool only, the heat relay is always off. Likewise when using Manual Mode in the heat only mode, only the state of the heat relay can be changed, and on the cool only mode, only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

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

2100-A4 Relay Output Allocation for Dual Action Controllers.

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	2	1 Heat
		2			2 Cool
2	2	3	3	4	3 Heat
		4			4 Cool

2100-A4e Relay Output Connection Example for Single Action Cooling Controllers.
*** Four controllers, one relay per controller.**



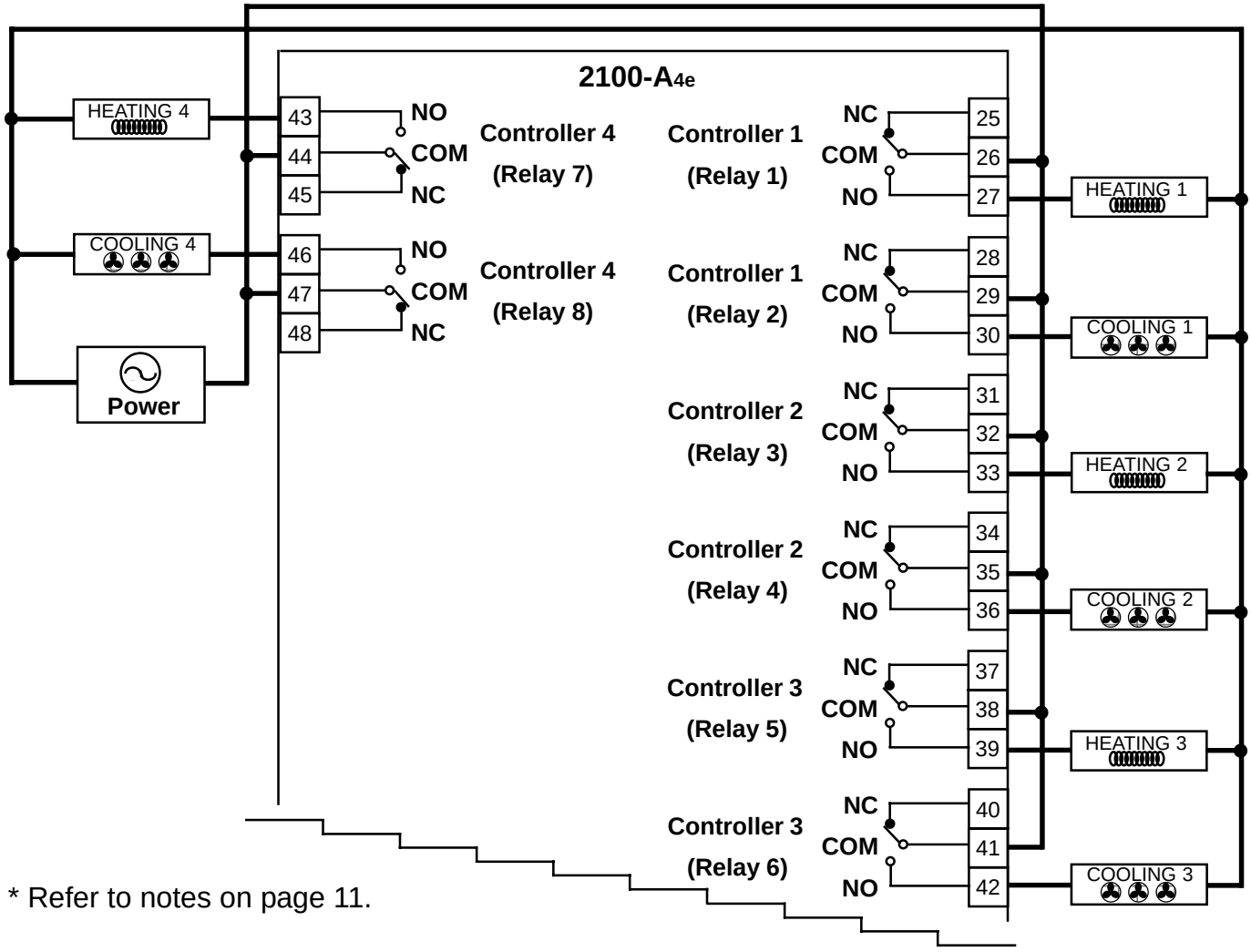
* Refer to notes on page 11.

2100-A4e Relay Output Allocation for Single Action Cooling Controllers.

Input to Output Control Configuration			
Controller	**Analogue Input**	**Relay**	**Control Mode**
1	1	2	Cool Only
2	2	4	Cool Only
3	3	6	Cool Only
4	4	8	Cool Only

2100-A4e Relay Output Connection Example for Dual Action Controller.

*** Four controllers, two relays per controller.**

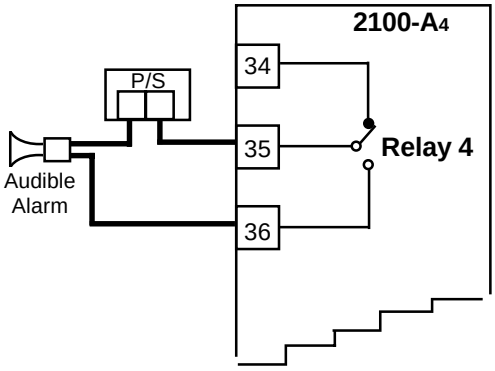


* Refer to notes on page 11.

2100-A4e Relay Output Allocation for Dual Action Controllers.

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

2100-A4 Connection Example Diagram for Relay 4, Comms Failure Timeout Alarm.



Note1. Relay 4 can be selected as a Comms failure time-out alarm. The relay is normally active and deactivates after 5mins if no Comms messages are received. This function does not detect microprocessor failure. When used for this function the relay cannot be used for any other function.

Note 2. This overrides the controller action on relay 4.

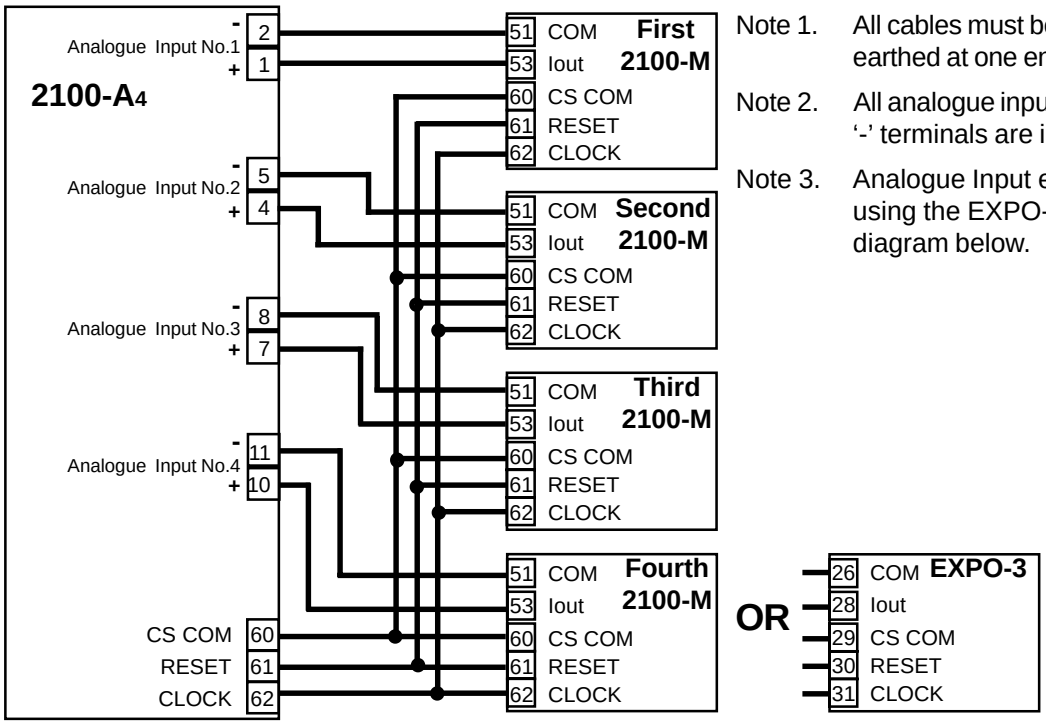
Section D. 2100-A4 Connection to a Microscan Scada System.

2100-A4 Analogue Input Expansion - Using 2100-M Analogue Input Multiplexer.

Analogue input expansion can be achieved using up to four 2100-M, 16 Channel, Analogue Input Multiplexers. This gives a total of 64 analogue inputs. Control for the 2100-M is through the Clock and Reset outputs on the 2100-A4. One analogue input is required per 2100-M, and each 2100-M input must be of the same type and range. The remaining 2100-A4 analogue inputs can be used for any other type of input.

Option 1. 5 Wire Connection Diagram.

This uses 5 wires for the first 2100-M, with 2 additional wires for each additional 2100-M.



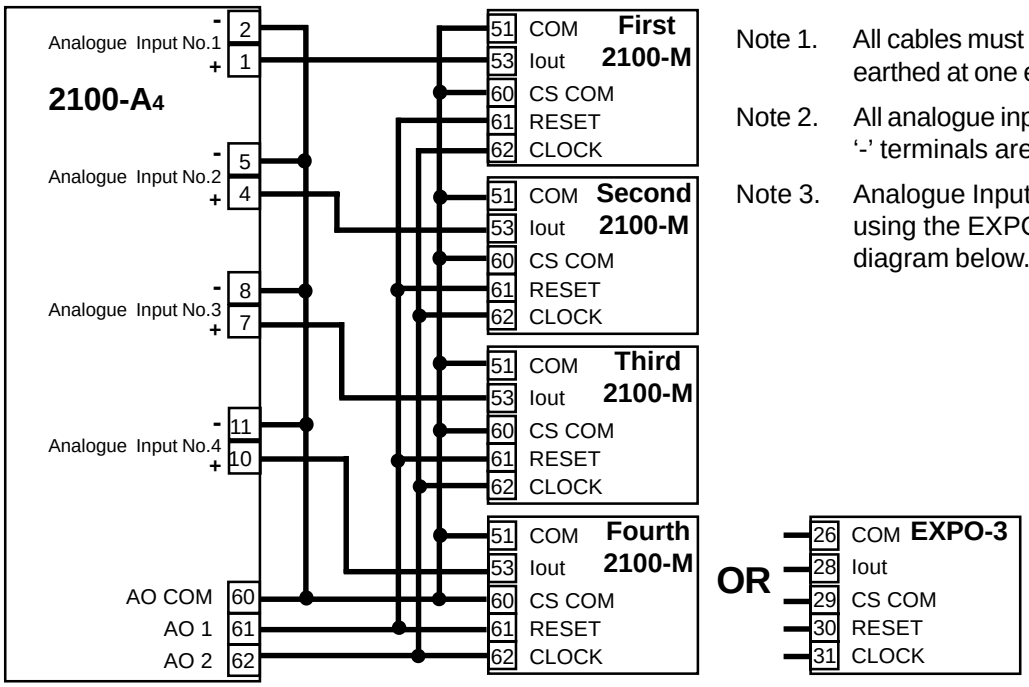
Note 1. All cables must be screened, and the screens earthed at one end only.

Note 2. All analogue inputs are single ended.ie all the '-' terminals are internally connected.

Note 3. Analogue Input expansion is also possible using the EXPO-3. Refer to the connection diagram below.

For detailed programming info, refer to 'Programming 2100-Series Remote Station' in the Microscan Manual.

Option 2. 4 Wire Connection Diagram.
This uses 4 wires (2 pair) for the first 2100-M, with 1 additional wire for each additional 2100-M.



Note 1. All cables must be screened, and the screens earthed at one end only.

Note 2. All analogue inputs are single ended.ie all the '-' terminals are internally connected.

Note 3. Analogue Input expansion is also possible using the EXPO-3. Refer to the connection diagram below.

For detailed programming info, refer to 'Programming 2100-Series Remote Station' in the Microscan Manual.

2100-A4 Analogue Output Mode.

The analogue output mode is set in the Station Advanced Dialogue Box 'Analog Output Mode'
*Requires Station Software 024 onwards.
For detailed programming info, refer to 'Programming 2100-Series Remote Station' in the Microscan Manual.

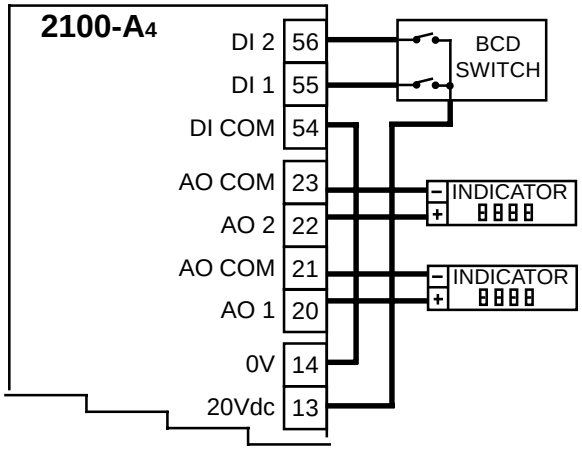
1. Scada Outputs AO 1 & AO 2 are controlled by the Scada Software.
   12 bit output nominally = 0~4095 for 4~20mA (or 0~10V etc.) out:
   0bit = 4mA (0V);
   2048 = 12mA (5V);
   4095 = 20mA (10V).

2. RTX Input, Setpoint, Binary Select.
   AO 1 = Retransmission of input process value 1~4.
   AO2 = Retransmission of controller setpoints 1~4.
   Binary Channel Selection is by digital inputs 1 & 2.

Channel Selection		Retransmission Channel
DI 1	DI 2	
0	0	1
1	0	2
0	1	3
1	1	4

The input and output always share the same range. Eg. If input 1 is ranged -50~140C and retransmission channel 1 is selected on DI 1 & DI 2, then AO 1 & AO 2 are both transmitted as 4~20mA (or 0~10V etc) = -50~140C. Similarly if input 2 is ranged for -50~350C, then AO 1 & AO 2 are transmitted as -50~350C.

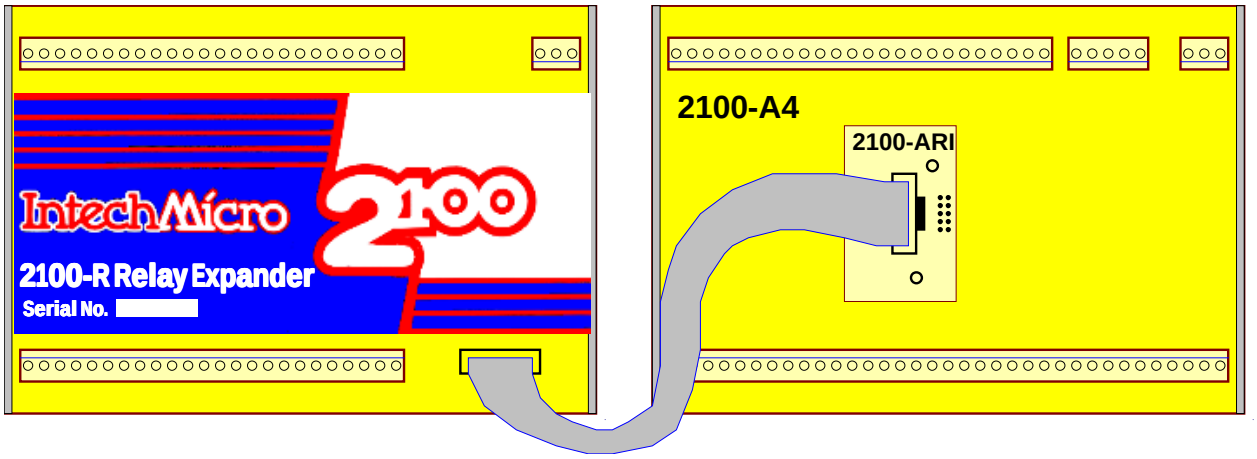
Notes 1/ If AO 1 process value or AO 2 setpoint are transmitted to an indicator, then all the inputs must be ranged the same.
2/ In the RTX Input, Setpoint, Binary Select Mode, AO 2 always retransmits the controller setpoint regardless if the controller is enabled or not.



Notes 1/ Maximum Load on 20V P/S=80mA
2/ For 4~20mA output, Loop Powered Indicators can be used. 12V maximum at 20mA (600Ω at 20mA)
3/ AO can be mA or V. (Refer Specs.)

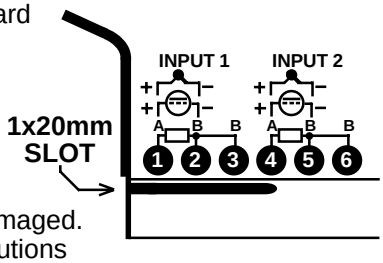
2100-A4 Rev1.1 Relay Output Expansion - Using 2100-R Relay Expansion.

Output relay expansion is available using the 2100-R, 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-A16 board.

Connecting the 2100-A4 to the 2100-R.



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

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-R. Ensure both ends of the cable are firmly connected.

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

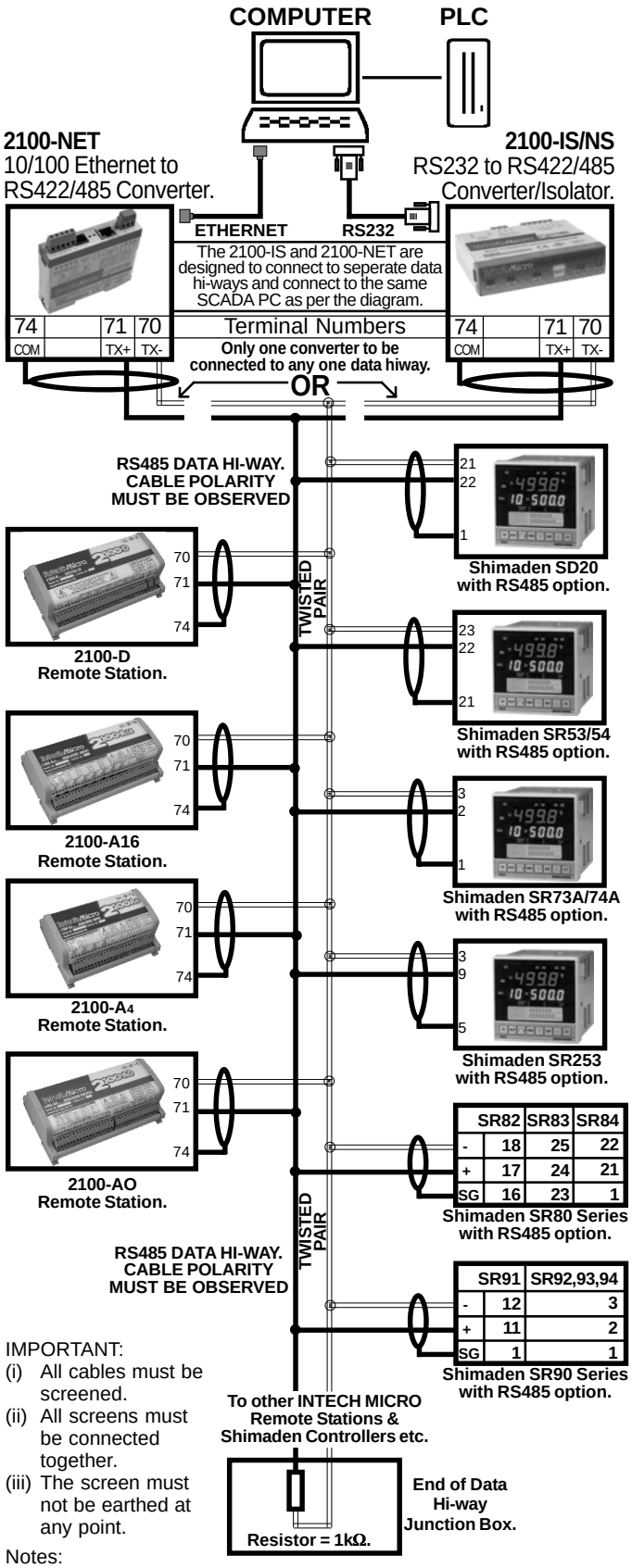
7/ The 2100-R must be enabled in the programming dialogue boxes. Advanced '2100-R Relay Expander' options. For detailed programming info, refer to 'Programming 2100-Series Remote Station' in the Microscan Manual.

8/ A 2100-R 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.

CAUTION: Dangerous Voltages may be present. The 2100-A4 has no user serviceable parts.
Protective enclosure only to be opened by qualified personnel.
Remove ALL power sources before removing protective cover.

DO NOT GUESS TX OR RX CONNECTIONS. FOLLOW THE TERMINAL NUMBERS IN THE SERIAL CONNECTION DIAGRAMS EXACTLY.

OUTSTATION LAYOUT. 2-Wire RS485 Serial Connections.



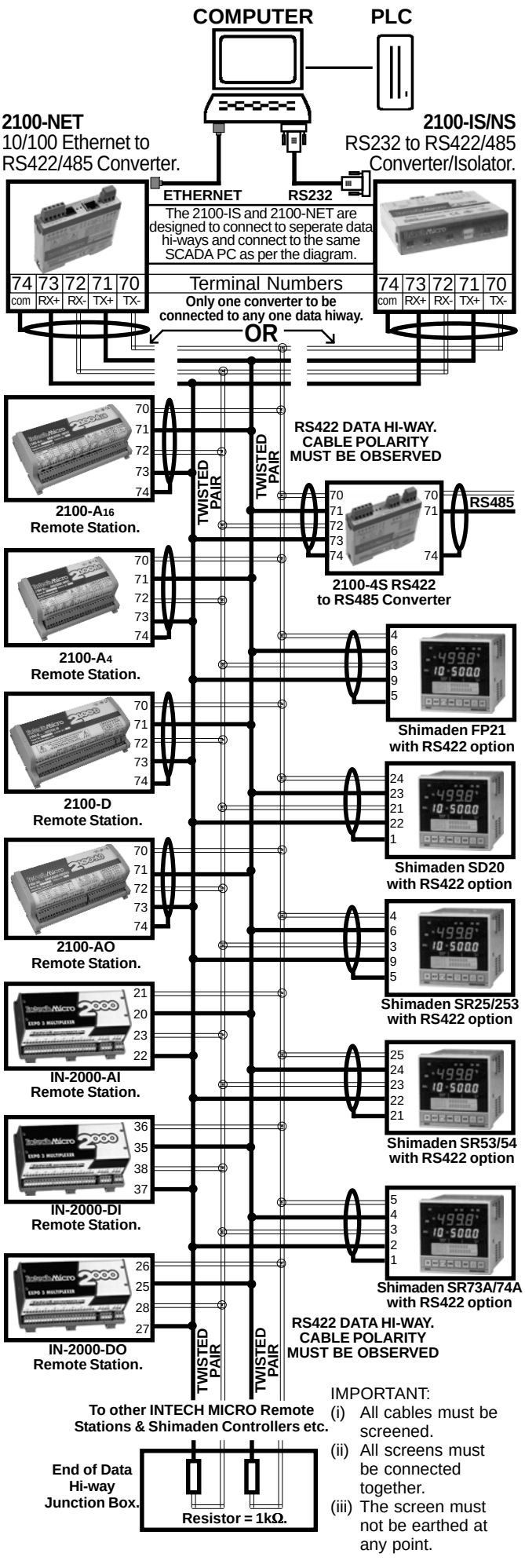
IMPORTANT:
(i) All cables must be screened.
(ii) All screens must be connected together.
(iii) The screen must not be earthed at any point.

Notes:
(i) RS485 can only be used with software release Ver. 4.02 onwards.
(ii) RS485 Data Hi-way is not compatible with RS422 Data Hi-way devices such as IN-2000-AI, IN-2000-AO, IN-2000-DI, IN-2000-DO, FP21, SR25, etc. Use a 2100-4S to interface an RS485 Data Hi-way to an existing RS422 Data Hi-way

RS232: 2100-IS convertor is not required to connect the 2100-232 directly to a PC. Use the RS232 kit to connect the 2100-232 directly to a PC. The PC requires one RS232 port per 2100.

RS485: If the outstation is using RS485, it cannot be connected to the same data hi-way as an outstations using RS422. In the 'programming' box, set the 'TX delay' box to 20. Set the Dip switches on the 2100-IS and the jumpers on the 2100 for RS485 operation.

OUTSTATION LAYOUT. 4-Wire RS422 Serial Connections.



IMPORTANT:
(i) All cables must be screened.
(ii) All screens must be connected together.
(iii) The screen must not be earthed at any point.

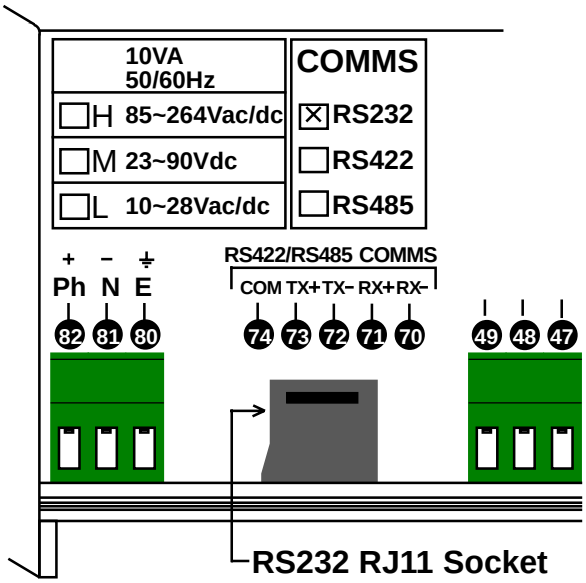
2100-A4 RS232 Serial Connection.

The 2100-A4 with RS232 comes complete with:

- **1 x 5m RJ11 RS232 Cable. (2, 10 & 15m available.)**
- **1 x 9 Pin D-type Connector. (25 pin D-type available.)**
- **USB to RS232 convertor available. Part No. BF-810.**

RS232 COMMS Hardware.

Location of RJ11 Socket on 2100-A4 Series.



COMMS Pinout Table		
RJ11	DB9	DB25
1:RTS	8	5
2:GND	5	7
3:TX	2	3
4:CTS	7	4
5:n/c	1	1
6:RX	3	2

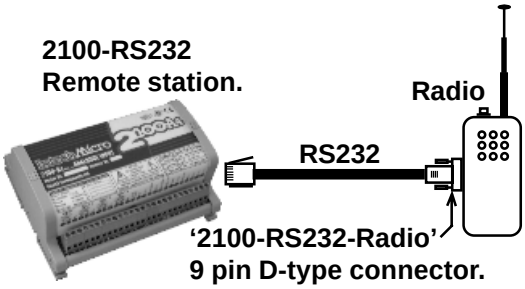
Installation.

Plug one end of the RS232 Comms cable into the RS232 RJ11 Socket on the 2100 Module. Plug the other end into either the 9 or 25 pin D-type connector. (Check for the correct D-type connector on the computer (or Omron PLC) RS232 port being used.) For further software and hardware information, Refer to the Microscan Manual 'Programming the 2100 Series Remote Station.'

2100-RS232 Kit-Omron

RS232 Kit for Omron PLC. Includes 2m cable & 9 pin D-type connector.

2100-A4 RS232 Radio Modem Serial Connection.



Note: The '2100-RS232-Radio' 9 pin D connector differs from the 2100-RS232 9 pin D supplied, and must be ordered seperately. It can be exchanged at no charge for the 9 pin and 25 pin D connectors supplied with the 2100-RS232 Remote Station.

1. Refer to Installation paragraph above.
2. Fit the '2100-RS232-Radio' 9 pin D connector between the Radio end of the RS232 comms cable, and the Radio. This connector will work with most types of radio, but this is not guaranteed. Pin2=TX; Pin3=RX; Pin5=GND; Pin7=RTS.
3. Refer to 'H2 Comms Settings.' to jumper as per RS232 Radio.
4. Refer to radio manual for hardware handshaking settings for TX control. TXE & TX delay may need to be altered in the Scada Station Advanced Dialog box to suit the radio. Best case TX speed is one transmission per second. (Depends on Radio.) Default settings are: TXE = 25ms; TX = 0ms.
5. If using more than one station at a remote radio site, **2100-RS422** Remote Stations with a 2100-IS with an adaptor kit must be used. (Do not use 2100-RS485.) Refer to 2100-IS installation Guide.

2100-A4 Station Number Programming and Serial Number.

Important: When commissioning remote stations, you must programme a unique station number before using the programme setup button in the Scada Software. Requires Microscan Version 4.02 onwards.
For detailed programming info, refer to 'Programming 2100-Series Remote Station' in the Microscan Manual.

1. Close the Microscan Scada down and turn the power off to the 2100 422/485 converter. Connect the new Remote Station, referring to '*Wiring and Installation*' and '*Commissioning*'
2. Turn power back on to the 2100 422/485 converter, and start the 'Setup Manager' in the Microscan Scada.
3. Select 'Recorder Setup', or 'Tag Setup'.
4. Select 'Program Address'. (Located in 'Station Programming Panel', at the bottom right of the window.
5. Enter the 2100-A4 serial number. (Written both on the 2100-A4 cover and the circuit board behind the power supply terminals. 80, 81 & 82. If the cover has been removed, the number on the circuit board is always correct. Replace with the correct cover to avoid future confusion.) Then enter the desired station number.
6. Select 'Program'. The station number will now be stored in 2100-A4 permanent memory.
7. A new station number will be created on the outstation map. This is ready for connection to tags or lines.
8. Restart the Microscan Scada.

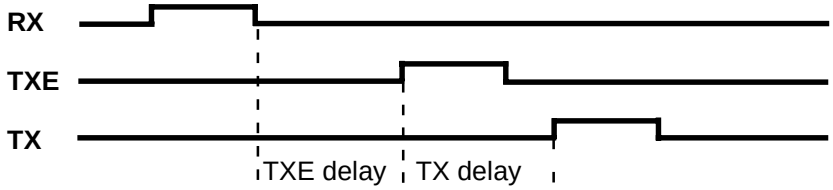
2100-A4 Station Software Programming.

*Requires Microscan Version 4.02 onwards.

1. If the system is already running, close the Scada down. Start the 'Setup Manager'.
2. Select 'Recorder Setup', or 'Tag Setup'.
3. Move to the required station number, using 'next' or 'prev' buttons.
4. Select 'Program Setup'. The serial number of the 2100-A4 will be recalled automatically. The software recalls the settings from the outstation, and displays them in the dialogue box.
5. Enter the required options and select 'Program' to write the data to the station.

2100-A4 TXE and TX Delay Settings.

The TXE and TX delays are software selectable in the MicroScan Outstation Programming Box. These delays are used for RS485/RS232 operation, to control the behaviour of the transmitter on the outstation, when it is ready to send data. The TXE delay controls how long the transmitter waits before turning on. The TX delay controls how long the transmitter waits before sending data. If the TXE delay is zero, the transmitter turns on immediately. If the TX delay is zero, the data is sent immediately, upon receiving a command.



The period is specified in units of 2.5ms.
i.e. 10units = 25ms

2100-A4 Delay Settings Table.

COMMS Delays Units (time)		
Protocol	**TXE Delay**	**TX Delay**
RS232 - to suit radio	10 (25ms)	20~200 (50~500ms)
RS422	0	0
RS485	0	20 (50ms)

Section E. Connecting to a PLC.

Communication Protocols.

PLC Message.

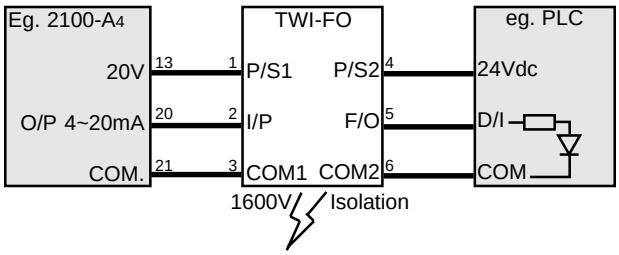
'Read Only From 2100-A4 ' and 'Read and Write to 2100-A4 ' Protocols are both available from Intech Instruments in 'WORD' format, free of charge.

Read Message is PLC compatible read DM area (AI1 to AI8 only). 2100-A4 protocol is the protocol used by Microscan to access data in stations. Both protocols use ASCII, except 2100-A4 uses IEEE754 to represent floating point numbers.

Analogue Signal Converted to Frequency for a PLC, using a TWI-FO.

Description.

The TWI-FO converts 4~20mA from a 2100-AO to a frequency output. (Typically 10~1010Hz, but this is rangeable.) A PLC with two digital outputs and one digital input can receive eight multiplexed analogue inputs.



Section F. 2100-A4-HWD. %RH Using a Wet and Dry Bulb.

Features.

- **Independant Temperature and Relative Humidity Outputs.**
- **%RH Accurate to 1.0%.**
- **Temperature Accurate to 0.1%.**
- **Low Cost.**
- **Easy to Install.**

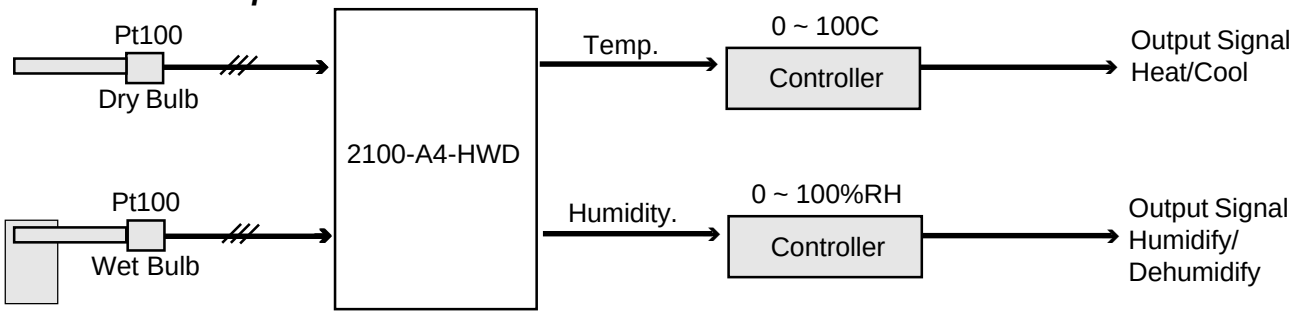
Notes:

1. This unit replaces the IN-HWD and uses the IN-HWD software in conjunction with the 2100-A4 software.
2. In addition to the standard IN-HWD features all the other features and options of the 2100-A4 can be used except the 2100-A4-HWD does not have PLC Retransmission Software.
3. %RH Software option is only available in the 2100-A4. It is not available in the 2100-A4e.
4. Analogue input 1 and analogue input 2 are available as Pt100, mV, V, mA and are all ranged 0/100C irrespective of the input type.
5. The standard analogue outputs are available.
6. The input signal can be calibrated using the zero offset software available in the Scada.
7. The Scada can read back %RH as the value of AO1 and Dry Bulb Temperature as the value of AO2.
8. The 2100-A4-HWD can run fully independent of a Data Hi-Way as a stand alone transmitter and or also on the Data Hi-Way.
9. In certain parts of the %RH curve a small change in temperature can cause a large change in Humidity and so the Software in the 2100-A4-HWD has the same damping function as the IN-HWD to ensure stable readings. In addition to this the standard 2100-A4 input averaging software is available.

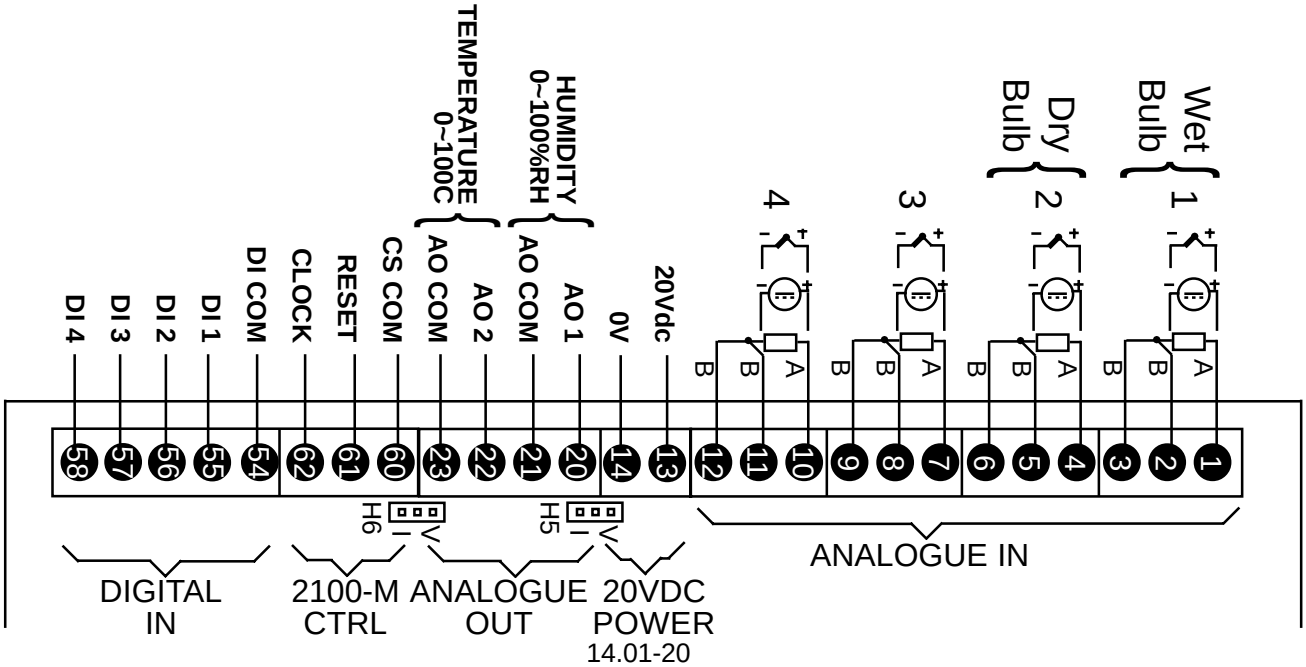
Specifications.

Humidity measuring range	0~100%RH Over 0~100C.
Humidity Accuracy & Linearity	to <±1% FSO Typical.
Temperature Measuring Range	0~100C.
Temperature Accuracy & Linearity	to <±0.1% FSO Typical.
Ambient Drift	<±0.01%/C FSO Typical for Temperature.
	<±0.02%/C FSO Typical for Humidity.

Connection Example.



2100-A4-HWD Terminals and Layout.



Formulae Information.

The 2100-A4-HWD formulae and look-up table is based on the ASTM Standards and takes the pyschometric constant:

$$A = 6.60 \times 10^{-4} (1 + 0.00115\ tw)$$

tw = Wet bulb temperature and the atmospheric pressure P = 101325 Pa.

Note: 'A' is still under dispute by different organisations.
Most relative humidity tables are within 1% of the ASTM relative humidity tables.

The Wet and Dry Bulb Installation.

The construction and installation of the wet and dry bulb is critical to the overall accuracy of the system.
A 0.1C error in reading between the wet and dry bulb can in the worst part of the curve at temperatures approaching 0C can cause up to approximately a 1.5% error in relative humidity.
Typical conditions leading to errors in the wet and dry bulb temperatures are listed below. This list is designed as a possible indication of error only as conditions can vary widely between different installations.

1. Mismatch between Pt100 RTD sensors or any other sensors.
   -It is recommended that band 5 Pt100 sensors be used to minimise this error.
2. Mismatch in the lead resistance of the conductors between the wet and dry bulb and the 2100-A4-HWD
3. Incorrect installation of the wet bulb covering.
   -Loose fitting, too short, too long, too thick or too thin.
4. A dirty or contaminated wet bulb covering.
5. Contamination of the water wetting the wet bulb covering.
6. Insufficient air flow, or the water reservoir obstructing the air flow.
   -Air flow should be typically 3~10m/s. Lower air speeds are permissible with bulbs of smaller diameter.
7. Moisture or heat generation from the wet bulb water reservoir.
   -If the reservoir has a continuous supply of water entering it, the flow should be regulated so that the tank water can be within 2C of the air temperature. If this is not possible it may be necessary to coil the water supply piping before entering the tank).
8. Effects from radiant heat.
9. Heating caused by a fan or motor etc.
10. Heating caused by direct sunlight.
    -Place the unit in a shaded location.
11. Before taking measurements ensure the wet and dry bulb have been exposed long enough to the atmosphere being measured.

Correction for Pressure Effects.

Table of corrections for pressure effects on relative humidity.

Wet bulb Depression from the dry bulb is 10°C for all values of dry bulb temperature Below.

Dry bulb Temperature	Pressure kPa					
	90.0	95.0	100.0	101.3	105.0	110.0
10C	6.1%	3.4%	0.7%	0.0%	-2.0%	-4.7%
20C	3.2%	1.7%	0.3%	0.0%	-1.1%	-2.5%
30C	1.7%	0.9%	0.2%	0.0%	-0.6%	-1.4%
40C	1.0%	0.5%	0.1%	0.0%	-0.4%	-0.8%
50C	0.6%	0.3%	0.0%	0.0%	-0.2%	-0.5%
60C	0.3%	0.2%	0.0%	0.0%	-0.2%	-0.3%
70C	0.2%	0.1%	0.0%	0.0%	-0.1%	-0.2%
80C	0.1%	0.0%	0.0%	0.0%	-0.1%	-0.2%
90C	0.1%	0.0%	0.0%	0.0%	-0.1%	-0.1%
100C	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%

Eg. For a dry bulb reading of 20C with a depression of 10C the relative humidity at 101.3kPa is 23.6%RH. Therefore at a pressure of 110.0kPa the true RH would be: 23.6 – 2.5 = 21.1%.

Section G. Wiring, Installation and Maintenance.

THE 2100-A4 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. Do not start the Microscan before programming in a unique station number. Refer 'Station Number Programming and Serial Number'.

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-A4 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-R connected to the 2100-A4, 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 terminal insulators must be fitted to ALL mains terminals after wiring is completed. (i.e. 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.

RS422/485 Comms Signal Cabling.
(1) Use only low capacitance, twisted pair, overall screened data cable. The cable must equal or better the following specifications.

Cable Specifications.		
Conductor Size.		7/0.20mm, 24AWG
Conductor Resistance @ 20C.		8.9Ω/100m
Max. Working Voltage.		300Vrms
Capacitance between wires of a pair.		50ρF/m
Capacitance between each wire to all others bunched together.		95ρF/m
Cross-talk between pairs:	@ 1kHz @ 100kHz	>-90dB/100m >-50dB/100m
Characteristic Impedance .	@ 100kHz	135Ω
Attenuation of a pair:	@ 1kHz @ 10kHz @ 100kHz @ 50kHz @ 1MHz @ 1.5MHz	0.15dB/100m 0.42dB/100m 0.8dB/100m 0.9dB/100m 1.9dB/100m 2.4dB/100m

NOTE: All cables are to be subject during manufacture to in-process spark testing @ 4kVrms.
All cables are to be tested between conductors and conductors to screen for 1min @ 1500Vrms.

(2) Minimum cable pairs: RS422 = 2. (Plus overall screen.) RS485 = 1. (Plus overall screen.)
(3) Take care not to stress or damage cables during installation.
(4) Total length of trunk line, including spurs, is not to exceed 1200m without isolating boosters.
(5) Terminating resistors -1kΩ.
(6) Cabling paths should avoid sources of radio frequency interferences such as fluorescent lights, variable speed motor drives, welding equipment, radio transmitters, etc.
(7) There should be a minimum of 200mm physical separation between power cables and data cables.
(8) Data cables should not be exposed to excessive heat or moisture, and should not be buried directly in the ground without protection.
(9) Avoid powering a remote station or controller from the same power supply as a variable speed drive.
(10) All unused twisted pairs should be terminated at both ends with 1kΩ resistors. DO NOT ground unused pairs.

2100-A4 Wiring, Installation and Maintenance Cont.

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 analogue signals 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.

RTDs.

(1) Avoid locating the RTD where it will be in a direct flame.
(2) Locate it where the average temperature will be measured. It should be representative of the mass.
(3) Immerse the RTD far enough so that the measuring point is entirely in the temperature to be measured; nine to ten times the diameter of the protection tube is recommended. Heat that is conducted away from the measuring point causes an error in reading.

Thermocouples.

(1) Avoid locating the thermocouple where it will be in a direct flame.
(2) Never insert a porcelain or refactory tube suddenly in a hot area. Pre-heat gradually while installing.
(3) Locate it where the average temperature will be measured. It should be representative of the mass. If necessary use several thermocouples to obtain the average temperature.
(4) Immerse the thermocouple far enough so that the measuring junction is entirely in the temperature to be measured: nine to ten times the diameter of the protection tube is recommended. Heat conducted away from the junction causes an error in reading.
(5) If the thermocouple is mounted horizontally and the temperature is above the softening point of the tube, a support should be provided to prevent the tube sagging. Otherwise install the tube vertically.
(6) Keep the junction head and cold junction in the approximation of the ambient temperature. Especially in the Noble Metal Class.

Thermocouple Extension Wire.

(1) Use the correct thermocouple extension or compensation cable. i.e. Thermocouple type, insulation type, correct colour coding.
(2) It is recommended to install extension or compensation cable in a grounded conduit by themselves, or use overall screened cable with the screen earthed at one end only. Never run electrical wires in the same conduit.
(3) All wires that must be spliced should be soldered, or a proper thermocouple termination block used.
(4) Lightning arrestors should be used if there is a chance from this source.

2100-A4 Commissioning.

(1) Check that the 2100-A4 has been set up to the right input ranges, and that it's new ranges have been checked.
(2) Once the above conditions have been met, and the wiring checked, apply power to the 2100-A4, the loops, sensors, 2100-Rs and 2100-Ms. Allow a 5 minute warm-up period - longer for thermocouples - refer to Input Connection Diagram for Thermocouple Inputs, Note 3 & 4.

Note 1. There is a 15sec initialisation period when the 2100-A4 is powered up, before it will communicate.
Note 2. For maximum accuracy allow a 1 hour warm up period.

(3) For Clock/Reset Channel Selection:
Check that the red LEDs on the 2100-A4 and 2100-M are flashing. The LED next to the Clock terminal (62) should flash 16 times faster than the LED next to the Reset terminal (61). For each Clock or Reset pulse received the respective LED on the 2100-A4 abd 2100-M will go from OFF to ON to OFF. If a Clock or Reset line is held high, the respective LED will remain ON If a Clock or Reset line is held low, the respective LED will remain OFF.
(4) Take a reading of the value being measured on each channel, and ensure that this agrees with the level being indicated by the Data Logger or PLC, for that channel. Adjust for any differences in the software of the system.

Note1. RTDs: A small error can occur due to differences in cable resistance in the RTD legs, and errors in the RTD itself. (Usually less than 0.5C). To check the variable being measured use a calibration standard RTD at the same immersion depth. If the Zero error is large, the readings are fluctuating or a Zero error has suddenly appeared after the 2100-A4 has been operating for some time, there could be an earth loop between two or more RTD sensors on the 2100-A4 (or between 2100-Ms if connected). Disconnect each RTD sensor individually from the 2100-A4, and 'Megger" the RTD by shorting all three wires together and testing from this point to earth. If a path to earth is found repair or replace the faulty RTD sensor or probe.

Warning: Do not 'Megger' the RTDs while connected to the 2100-A4. Damage to the 2100-A4 or 2100-M will result.

Note 2. Thermocouples: Due to the limits of error in a standard thermocouple probe, and standard extension wire and compensating wire, an error can occur. For example in a type K thermocouple installation an error of 2.2C or 0.75% FSO can occur (whichever is greater). To check the temperature being measured use a calibration standard thermocouple at the same immersion depth.

2100-A4 Maintenance.

Voltage and Current Inputs.

(1) Repeat (4) of commissioning. Do it regularly - at least once every twelve months.

RTD Inputs.

(1) Repeat (4) of commissioning. Do it regularly - at least once every six months.
(3) Replace defective protection tubes - even if they look good they may not be air or gas tight.
(4) Check cables entering the RTD sensor head.

Thermocouple Inputs.

(1) Repeat (4) of commissioning. Do it regularly - at least once a month.
(3) Replace defective protection tubes - even if they look good they may not be air or gas tight.
(4) Check extension and compensating cable circuits.
(5) Do not use the same chromel-alumel (Type K) thermocouple below 540C if it was used above 860C.

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