

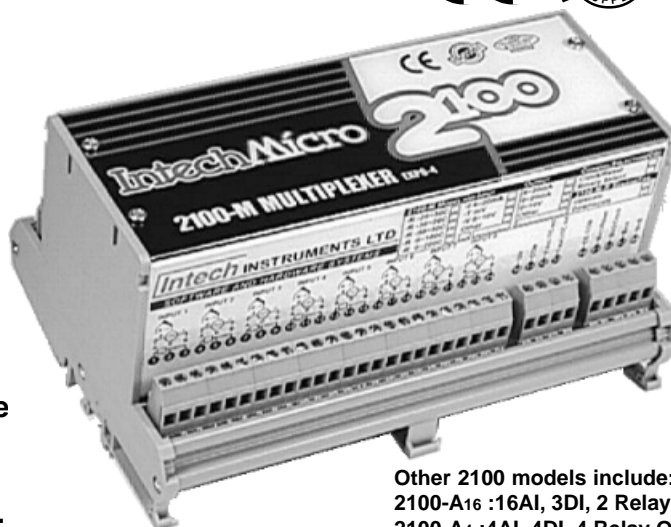
INTECH Micro 2100-M. Installation Guide.

16 Channel
Programmable
Multiplexer.



Features.

- 16 Channel Multiplexer.
- Field Programmable Inputs.
- Field Programmable Output.
- Input Types Available:
 - MilliAmp;
 - Pt100 RTD;
 - Thermocouple;
 - Volts and Millivolts;
- Clock/Reset Channel Selection, or Binary Channel Selection.
- High Accuracy 0.1%.
- Compact DIN Rail Mount Enclosure
- Easy to Install.
- Low Cost Expansion for PLCs.
- Solid State Switches for Reliability.



Other 2100 models include:
 2100-A16 :16AI, 3DI, 2 Relay Out;
 2100-A4 :4AI, 4DI, 4 Relay Out;
 2100-A4e :4AI, 4DI, 8 Relay Out;
 2100-D :12DI, 12 Relay Out;
 2100-IS :Isolated RS232 to RS422/485;
 2100-ME :Memory Expansion for 2100-A;
 2100-NS :Non-Isolated RS232 to RS422;
 2100-R :16 Relay Expansion for 2100-A.

Description.

The 2100-M (previously the EXPO-3) can multiplex up to 16 inputs, into one output, selectable by a PLC or a Data Logging System. It uses solid state switches, making it extremely reliable and durable.

The PLC only requires two digital outputs and one analogue input to select and receive data from the 2100-M. For each additional 2100-M added to the system only one more analogue input is required. (The typical fan-out for most PLC's digital outputs is eight 2100-Ms) The 2100-M-I, the 2100-M-R and the 2100-M-V are on board input / output programmable.

The 2100-M is used extensively in industrial plants, with proven reliability and accuracy. It comes complete and ready to operate in a compact DIN rail mount enclosure.

Ordering Information.

2100-M - - - - - - PS
 M IR AO CS SB

Ranging Options of 2100-M									
Input Model	M	Input - IR			Output - AO	Channel Selection	CS	Sensor Break	SB
		Standard	or Specify Within	Minimum ¹⁾					
mA	I	4~20mA	0~20mA	2mA	4~20mA	Clock / Reset	blank	Upscale	blank
RTD	R	0~100C	-200~600C	20C	0~20mA	Binary	BIN	Downscale	DS
Thermocouple	T	K, 0~1200C	T/C Type & Range.	200C	0~10Vdc				
mV & V	V	0~10Vdc	0~10Vdc	200mV	0~5Vdc				
Note 1) Minimum Range = Signal High - Signal Low.					Specify				

Power Supply		PS
230/115Vac 50/60Hz Linear Power Supply - Standard Option		blank
24Vac Power Supply		X

Ordering Examples.

- 1/ 2100-M-I 4/20mA 4/20mA 4~20mA Input; 4~20mA Output; Linear Power Supply.
 2/ 2100-M-V 0/10V 0/20mA 0~10V Input; 0~20mA Output; Linear 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-M Installation Guide Index.

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Common 2100-M Specifications.

Inputs	16 inputs. Refer next page for individual model specifications.		
Output	-Programmable	0~20mA	500Ω Load Maximum.
		4~20mA	500Ω Load Maximum.
		0~10mA	1000Ω Load Maximum.
		2~10mA	1000Ω Load Maximum.
		0~5Vdc	Maximum Output Drive = 4mA.
		1~5Vdc	Maximum Output Drive = 4mA.
	0~10Vdc	Maximum Output Drive = 4mA.	
	2~10Vdc	Maximum Output Drive = 4mA.	

Note: The 2100-M-T is NOT input / output programmable. Refer to 2100-M-T specifications on the next page.

Power	-Standard Linear	230/115±10%Vac; 50/100mA; 50/60Hz; Refer to Wiring and Installation , for voltage selection instructions.	
	-Low Voltage Linear	24±2Vac; 1A; 50/60Hz.	

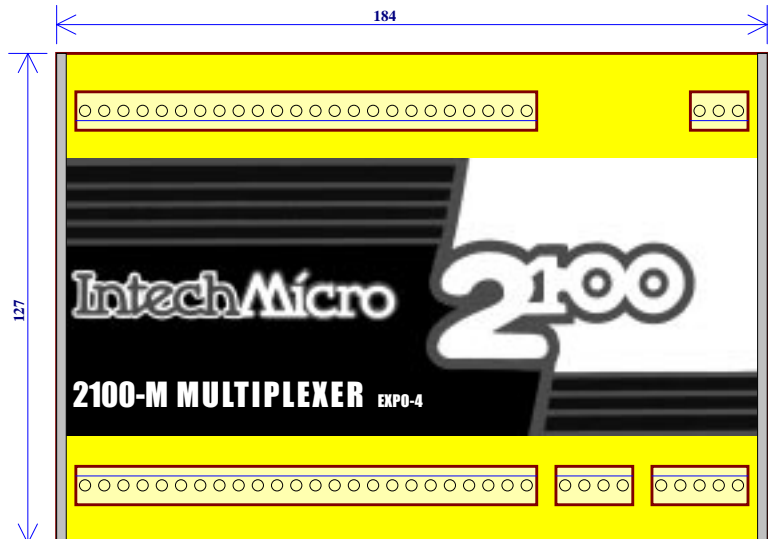
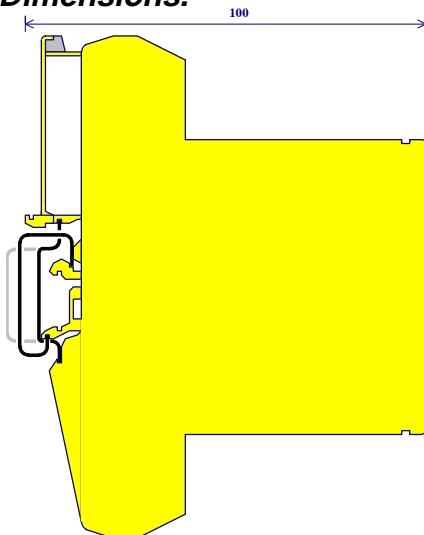
EMC Emissions Compliance	EN 55022-A
EMC Immunity Compliance	EN 50082-1
Safety Compliance.	EN60950

Accurate to	<±0.1% FSO Typical.
Linearity & Repeatability	<±0.1% FSO Typical.
Channel Separation	<±0.1% FSO Typical.
Ambient Drift	<±0.01%/C FSO Typical.
Isolation Voltage	1000Vac/dc for 1min between channel control and input / output circuitry. Input/Output isolation is not provided. Isolation units are available. - Refer to the connection diagrams.

CLOCK and RESET Pulse Length	20msec. Min.
Channel Selection Pulse Amplitude	7~30Vdc.
Settling Time Before Reading	100msec. 600msec for 2100-M-T. - Multiple readings with averaging recommended.

Operating Temperature	0~60C.
Storage Temperature	-20~80C.
Operating Humidity	90%RH Max. Non-Condensing.
Housing	DIN & EN Rail Mount. L=184, W=127, H=100mm.

Dimensions.



Individual 2100-M Model Specifications.

2100-M-I, mA Inputs

Inputs	16 Single Ended Inputs. All -Ve Terminals Connected.
Ranging	Field Programmable Within 0 to 20mA. Minimum Range = 2mA.
Input Resistance	100Ω.
Maximum Over-range	35mA Continuous.

2100-M-R, 3-wire RTD Inputs

Inputs	16 Single Ended RTD Inputs. All 2nd 'B' Terminals Connected.
RTD Type	3 Wire Pt100 RTD DIN 43760:1980 Standard Input. Other RTD input types available on request. (eg Ni100, Cu10, etc.)
Ranging	Field Programmable Within -200C to 600C. Minimum Range = 20C.
Sensor current	1mA Multiplexed.
Lead resistance	10Ω/Lead Maximum Recommended. 100Ω/Lead Absolute Maximum.
	All temperature probes must be isolated from each other and earth.
Sensor Fail -Upscale:	>110%FSO. (Load Dependant.)
-Downscale:	≤0%FSO.

2100-M-T, Thermocouple Inputs:

Mineral Insulated Thermocouples With Isolated Junction Recommended.

Inputs	16 Differential Inputs. Types B, E, J, K, N, R, S, T. Minimum Range = 200C.
Differential Voltage	Maximum of 10Vpeak Between Any Thermocouples. ie Maximum of 10Vdc, 7Vac or 10Vpeak Sum of any Vac and Vdc.
Connection	The 2100-M-T works in conjunction with the LPI-T, or PI-T programmable thermocouple isolation transmitter. The 2100-M-T operates as a thermocouple multiplexer only. The output of the 2100-M-T is wired directly into the LPI-T, or PI-T, which is mounted adjacently. Refer to the LPI-T, or PI-T data sheets for further specifications.

-LPI-T and PI-T. (Brief)

Isolating Thermocouple Transmitter.

Thermocouple Types	J, K, N, R, T. Minimum Range = 200C.
Cold Junction Comp.	0~70C.
CJC Drift	<0.03C/C Typical.
Sensor Fail	Upscale Drive. (Downscale Selectable.)
T/C Lead Resistance	100Ω Maximum.
Input Resistance	1MΩ Minimum.
Linearisation	<±0.25% for type J & K thermocouples. <±0.5% for all Other Types.
-Isolation Voltage	>2kVac/dc (>1.6kVac/dc for PI-T) Input to Output for 60sec.
-Operating Temperature	0~70C.

2100-M-V, Voltage Inputs

Inputs	16 Single Ended Inputs. All -Ve Terminals Connected.
Ranging	Field Programmable Within 0 to 10Vdc. Minimum Range = 200mV.
Input resistance	200kΩ.
Maximum Over-range	26Vdc Continuous.

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

Note 2. Specifications based on Standard Calibration Units, unless otherwise specified.

Note 3. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification.

No liability will be accepted for errors, omissions or amendments to this specification.



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



2100-M Input Programming - Notes for Programming all Models.

For ALL programming tables.

Switch Status: 0=OFF 1=ON X=Don't Care.

If a gain value of 28 is required, put DIP switch No's 3, 4, 5 OFF (ie, gains of 4 + 8 + 16 = 28) and all the other DIP switches ON.

Enter the Zero or Span gain value into the appropriate Zero or Span DIP switch. Dip switches are accessed by removing the cover.

Important: Once a range has been selected on the DIP switches the 2100-M should be checked using the appropriate signal levels. DIP switch settings will normally be accurate to 1%. (This can be greater for smaller ranges.) Use the Zero and Span trimpots in the 2100-M to finely calibrate the desired range. Using a small screwdriver turn the trimpots clockwise to increase the output, and anticlockwise to decrease the output.

Note: Do not adjust the NULL trimpot. This is factory set.

2100-M-R Input Programming.

If the input range is not listed in the programming table, use the following formulae to work out the Zero and Span switch Gain Values. Use the table at the top of this page to calculate DIP switch settings from the calculated gain values.

$$\text{deg C Span Gain} = \frac{1200}{\text{deg C High} - \text{deg C Low}}$$

$$\text{deg F Spain Gain} = \frac{2400}{\text{deg F High} - \text{deg F Low}}$$

$$\text{deg C Zero Gain} = \frac{\text{deg C Low}}{5}$$

$$\text{deg F Zero Gain} = \frac{\text{deg F Low}}{10}$$

If Zero Gain is
 1/ +ve Put S4-1 OFF (Positive Offset)
 2/ -ve Put S4-1 ON (Negative Offset)

Input Range C (Put S5-2 OFF)	Input Range F (Put S5-2 ON)	S2-Span						S3-Zero						S4-Function			
		1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4
0~20C	0~40F	1	1	0	0	0	0	1	1	1	1	1	1	X	SET TO '1' FOR FAHRENHEIT.	Set to '1' for DOWNSCALE Sensor Break	Set to '1' for Clock/Reset Channel Selection
0~25C	0~50F	1	1	1	1	0	0	1	1	1	1	1	1	X			
0~30C	0~60F	1	1	1	0	1	0	1	1	1	1	1	1	X			
0~40C	0~80F	1	0	0	0	0	1	1	1	1	1	1	1	X			
0~50C	0~100F	1	1	1	0	0	1	1	1	1	1	1	1	X			
0~60C	0~120F	1	1	0	1	0	1	1	1	1	1	1	1	X			
0~70C	0~140F	0	1	1	1	0	1	1	1	1	1	1	1	X			
0~75C	0~150F	1	1	1	1	0	1	1	1	1	1	1	1	X			
0~80C	0~160F	0	0	0	0	1	1	1	1	1	1	1	1	X			
0~90C	0~180F	0	1	0	0	1	1	1	1	1	1	1	1	X			
0~100C	0~200F	1	1	0	0	1	1	1	1	1	1	1	1	X			
0~110C	0~220F	0	0	1	0	1	1	1	1	1	1	1	1	X			
0~120C	0~240F	1	0	1	0	1	1	1	1	1	1	1	1	X			
0~125C	0~250F	1	0	1	0	1	1	1	1	1	1	1	1	X			
0~150C	0~300F	1	1	1	0	1	1	1	1	1	1	1	1	X			
0~200C	0~400F	1	0	0	1	1	1	1	1	1	1	1	1	X			
0~250C	0~500F	0	1	0	1	1	1	1	1	1	1	1	1	X			
0~300C	0~600F	1	1	0	1	1	1	1	1	1	1	1	1	X			
0~400C	0~800F	0	0	1	1	1	1	1	1	1	1	1	1	X			
0~600C	0~1200F	1	0	1	1	1	1	1	1	1	1	1	1	X			
-10~10C	-20~20F	1	1	0	0	0	0	1	0	1	1	1	1	1			
-10~20C	-20~40F	1	1	1	0	1	0	1	0	1	1	1	1	1			
-10~40C	-20~80F	1	1	1	0	0	1	1	0	1	1	1	1	1			
-20~20C	-40~40F	1	0	0	0	0	1	1	1	0	1	1	1	1			
-20~30C	-40~60F	1	1	1	0	0	1	1	1	0	1	1	1	1			
-25~25C	-50~50F	1	1	1	0	0	1	0	1	0	1	1	1	1			
-25~50C	-50~100F	1	1	1	1	0	1	0	1	0	1	1	1	1			
-30~20C	-60~40F	1	1	1	0	0	1	1	0	0	1	1	1	1			
-50~50C	-100~100F	1	1	0	0	1	1	1	0	1	0	1	1	1			
-50~100C	-100~200F	1	1	1	0	1	1	1	0	1	0	1	1	1			
-50~150C	-100~300F	1	0	0	1	1	1	1	0	1	0	1	1	1			
-100~100C	-200~200F	1	0	0	1	1	1	1	1	0	1	0	1	1			
-100~200C	-200~400F	1	1	0	1	1	1	1	1	0	1	0	1	1			
-200~200C	-400~400F	0	0	1	1	1	1	1	1	1	0	1	0	1			
-200~400C	-400~800F	1	0	1	1	1	1	1	1	1	0	1	0	1			
20~40C	40~80F	1	1	0	0	0	0	1	1	0	1	1	1	0			
50~100C	100~200F	1	1	1	0	0	1	1	0	1	0	1	1	0			
50~150C	100~300F	1	1	0	0	1	1	1	0	1	0	1	1	0			
100~200C	200~400F	1	1	0	0	1	1	1	1	0	1	0	1	0			
100~500C	200~1000F	0	0	1	1	1	1	1	1	0	1	0	1	0			

2100-M-I Input Programming.

If the input range is not listed in the programming table, use the following formulae to work out the Zero and Span switch Gain Values. Use the table at the top of the previous page to calculate DIP switch settings from the calculated gain values.

$$\text{Span Gain} = \frac{80}{\text{signal high} - \text{signal low}}$$

$$\text{Zero Gain} = \text{signal low} \times 4$$

Note: Eg. Enter 20mA as 20.

Input Range mAdc	S2-Span						S3-Zero						S4-Function			
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4
0~2mA	1	1	1	0	1	0	1	1	1	1	1	1	x	0	x	Set to '0' for binary channel selection. Set to '1' for clock/reset channel selection.
0~4mA	1	1	0	1	0	1	1	1	1	1	1	1	x	0	x	
0~5mA	1	1	1	1	0	1	1	1	1	1	1	1	x	0	x	
0~8mA	1	0	1	0	1	1	1	1	1	1	1	1	x	0	x	
0~10mA	1	1	1	0	1	1	1	1	1	1	1	1	x	0	x	
0~16mA	0	1	0	1	1	1	1	1	1	1	1	1	x	0	x	
0~20mA	1	1	0	1	1	1	1	1	1	1	1	1	x	0	x	
1~5mA	1	1	0	1	0	1	1	1	0	1	1	1	0	0	x	
2~10mA	1	0	1	0	1	1	1	1	1	0	1	1	0	0	x	
4~12mA	1	0	1	0	1	1	1	1	1	0	1	1	0	0	x	
4~20mA	0	1	0	1	1	1	1	1	1	0	1	1	0	0	x	
12~20mA	1	0	1	0	1	1	1	1	1	0	0	0	0	0	x	

2100-M-V Input Programming.

If the input range is not listed in the programming table, use the following formulae to work out the Zero and Span switch Gain Values. Use the table at the top of the previous page to calculate DIP switch settings from the calculated gain values.

$$\text{For V input: Span Gain} = \frac{40}{\text{signal high} - \text{signal low}}$$

$$\text{Zero Gain} = \text{signal low} \times 8$$

Note: Eg. Enter 2V as 2.

$$\text{For mV input: Span Gain} = \frac{10,000}{\text{signal high} - \text{signal low}}$$

$$\text{Zero Gain} = \frac{\text{signal low}}{25}$$

Note: Eg. Enter 200mV as 200.

Input Range Vdc	S2-Span						S3-Zero						S4-Function			
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4
0~200mV	1	1	1	0	1	0	1	1	1	1	1	1	x	0	x	Set to '0' for binary channel selection. Set to '1' for clock/reset channel selection.
0~400mV	1	1	0	1	0	1	1	1	1	1	1	1	x	0	x	
0~500mV	1	1	1	1	0	1	1	1	1	1	1	1	x	0	x	
0~800mV	1	0	1	0	1	1	1	1	1	1	1	1	x	0	x	
0~1000mV	1	1	1	0	1	1	1	1	1	1	1	1	x	0	x	
0~1V	1	1	1	0	1	0	1	1	1	1	1	1	x	1	x	
0~2V	1	1	0	1	0	1	1	1	1	1	1	1	x	1	x	
0~2.5V	1	1	1	1	0	1	1	1	1	1	1	1	x	1	x	
0~4V	1	0	1	0	1	1	1	1	1	1	1	1	x	1	x	
0~5V	1	1	1	0	1	1	1	1	1	1	1	1	x	1	x	
0~8V	0	1	0	1	1	1	1	1	1	1	1	1	x	1	x	
0~10V	1	1	0	1	1	1	1	1	1	1	1	1	x	1	x	
100~500mV	1	1	0	1	0	1	1	1	0	1	1	1	0	0	x	
200~1000mV	1	0	1	0	1	1	1	1	1	0	1	1	0	0	x	
0.5~2.5V	1	1	0	1	0	1	1	1	0	1	1	1	0	1	x	
1~5V	1	0	1	0	1	1	1	1	1	0	1	1	0	1	x	
2~6V	1	0	1	0	1	1	1	1	1	1	0	1	0	1	x	
2~10V	0	1	0	1	1	1	1	1	1	0	1	1	0	1	x	
6~10V	1	0	1	0	1	1	1	1	1	1	0	0	0	1	x	

2100-M-T Input Programming.

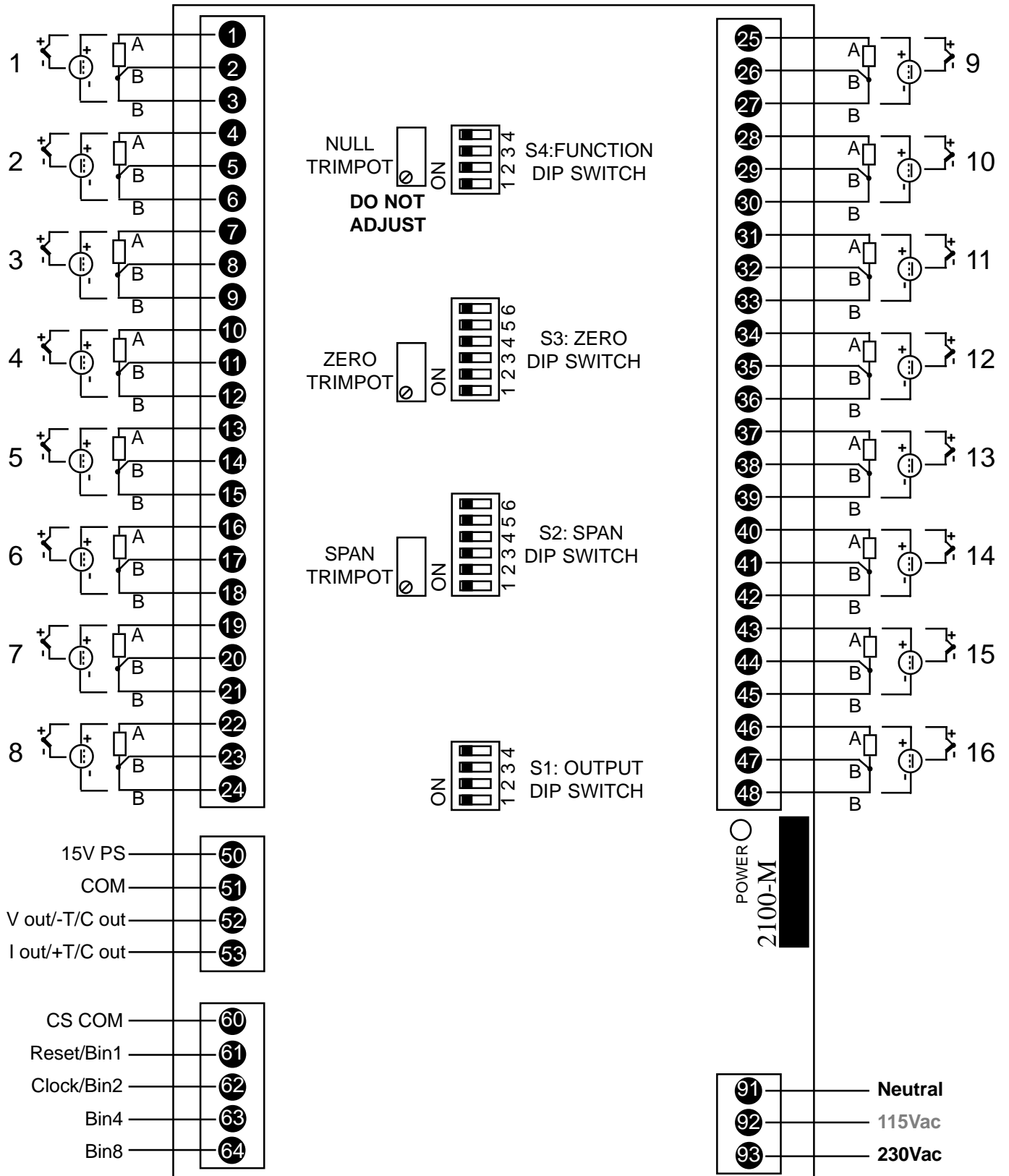
The only input programming required for the 2100-M-T is channel selection programming.

S4-4: Set to '0' for binary channel selection. Set to '1' for clock/reset channel selection.

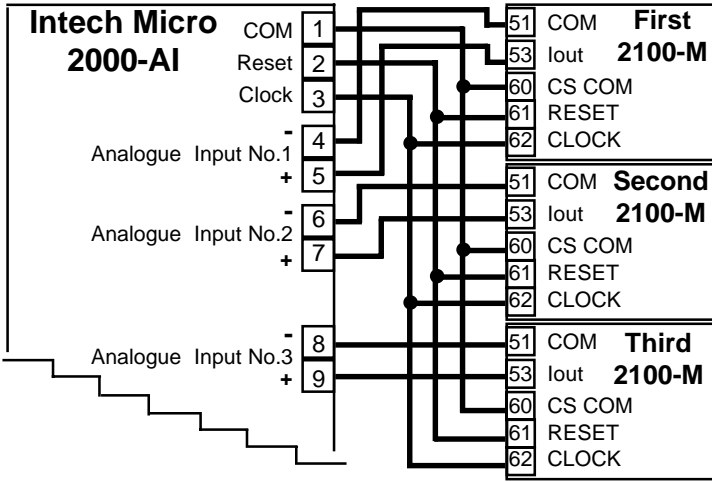
2100-M Output Programming.

Iout	Vout	S1-Output			
		1	2	3	4
4~20mA	2~10V	1	1	1	0
0~20mA	0~10V	0	0	0	0
2~10mA	1~5V	1	1	1	1
0~10mA	0~5V	0	0	1	1

2100-M Terminals and Layout.

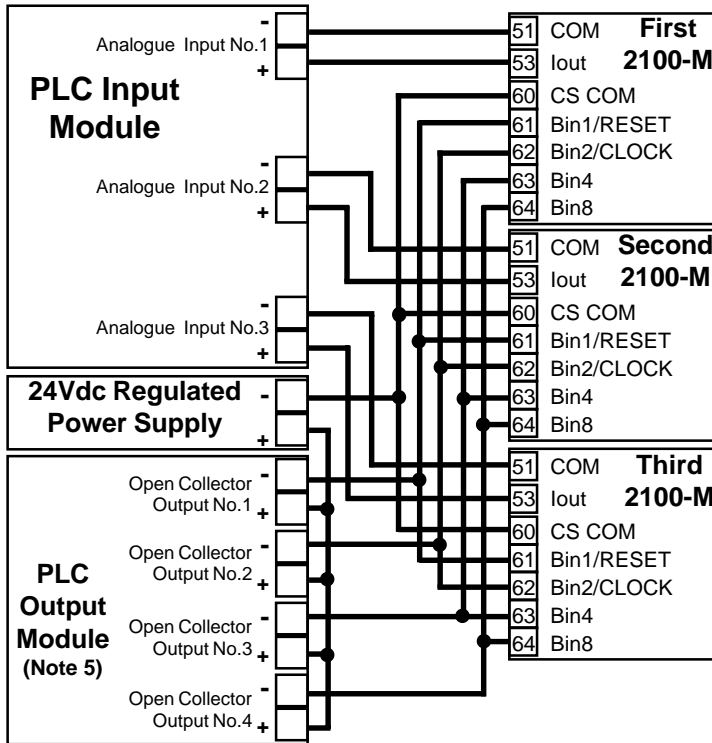


Note: When using the following diagrams for the 2100-M-T, wire the T/C output as shown on page 15.01-9 **2100-M to IN-2000-AI Remote Station Connection Diagram.**



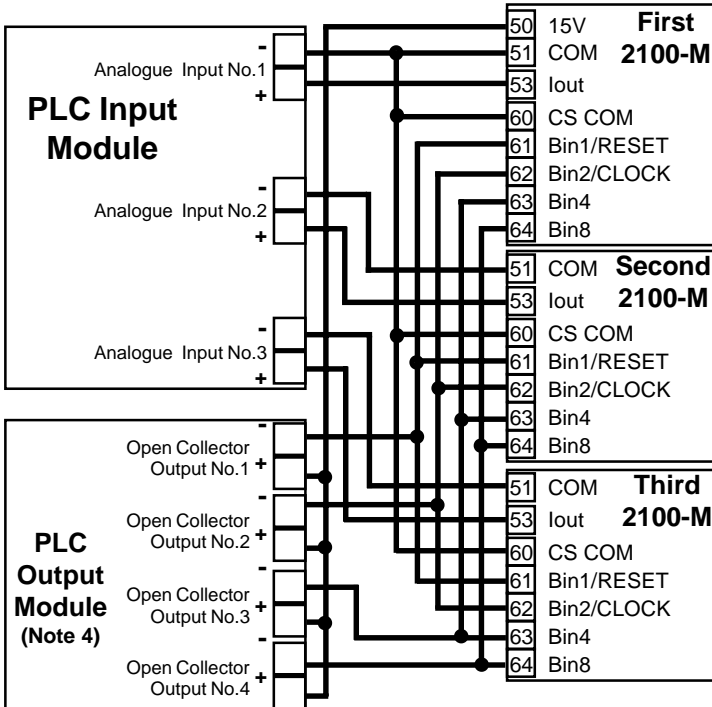
- Note 1. Up to three 2100-M multiplexers can be connected to one IN-2000-AI.
 - Note 2. The remaining IN-2000-AI inputs (4 to 8) can be used for normal 4~20mA input signals.
 - Note 3. All cables must be screened, and the screen earthed at one end only
- Important:** Do not use the 2100-M power supply to power up any transmitter or other equipment. An external power supply must be used for this purpose. The 15V supply is for the Channel Selection only.

2100-M to PLC Connection Diagram Using External Power Supply and 24V Common Open Collectors.



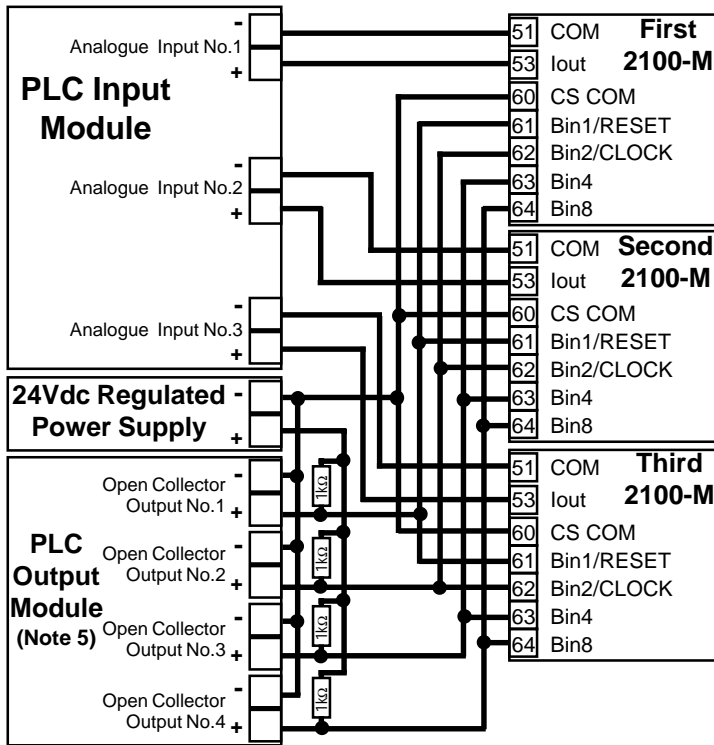
- Connection of a 2100-M to a PLC with open collectors, commoned to +24V of an external power supply.
- Note 1. In this configuration the 2100-M CS COM and Channel Selection inputs are isolated from the 2100-M inputs and outputs. The 24V external power supply can therefore be used to power transmitters connected to the 2100-M inputs.
 - Note 2. There is no limit to the number of 2100-Ms that can be connected, except the power supply and open collector outputs must be able to handle the load.
 - Note 3. Each Channel Selection input draws 10mA at 24Vdc.
 - Note 4. All cables must be screened, and the screens earthed at one end only.
 - Note 5. For Clock/Reset Channel Selection DO NOT connect PLC outputs 3 and 4 to Bin 4 and Bin 8 of the 2100-M.
- Important:** Do not use the 2100-M power supply to power up any transmitter or other equipment. An external power supply must be used for this purpose. The 15V supply is for the Channel Selection only.

2100-M to PLC Connection Diagram Using 2100-M Power Supply and 15V Common Open Collectors.



- Connection of a 2100-M to a PLC with open collectors, commoned to the 15V of the first 2100-M power supply.
- Note 1. Using this configuration, up to four 2100-Ms can be connected using Clock/Reset mode, or 2 using Binary Channel Selection mode, provided the open collector outputs can handle the load.
 - Note 2. Each Reset and each Clock input draws 6mA at 15Vdc.
 - Note 3. All cables must be screened, and the screens earthed at one end only.
 - Note 4. For Clock/Reset Channel Selection DO NOT connect PLC outputs 3 and 4 to Bin 4 and Bin 8 of the 2100-M.
- Important:** Do not use the 2100-M power supply to power up any transmitter or other equipment. An external power supply must be used for this purpose. The 15V supply is for the Channel Selection only.

2100-M to PLC Connection Diagram Using External Power Supply and 0V Common Open Collectors.



Connection of a 2100-M to a PLC with open collectors commoned to 0V of an external power supply.

Note 1. This configuration reverses the logic so when the PLC digital output is off, the 2100-M is on.

Note 2. With 1kΩ resistor, up to four 2100-Ms can be connected in this configuration, provided the open collector outputs can handle the load.

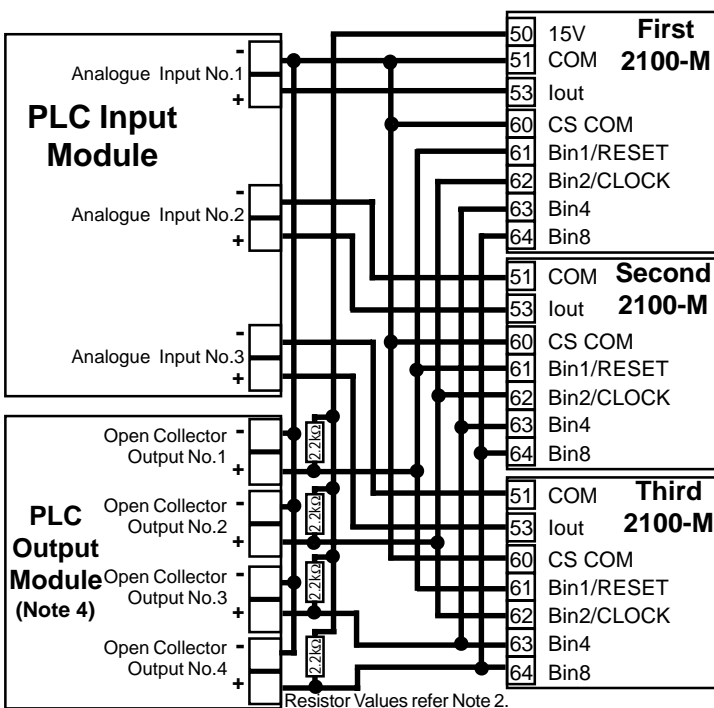
Note 3. Each Channel Selection input draws 10mA at 24Vdc.

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

Note 5. For Clock/Reset Channel Selection DO NOT connect PLC outputs 3 and 4 to Bin 4 and Bin 8 of the 2100-M.

Important: Do not use the 2100-M power supply to power up any transmitter or other equipment. An external power supply must be used for this purpose. The 15V supply is for the Channel Selection only.

2100-M to PLC Connection Diagram Using 2100-M Power Supply and 0V Common Open Collectors.



Connection of a 2100-M to a PLC with open collectors commoned to COM of the first 2100-M.

Note 1. This configuration reverses the logic so when the PLC digital output is off, the 2100-M is on.

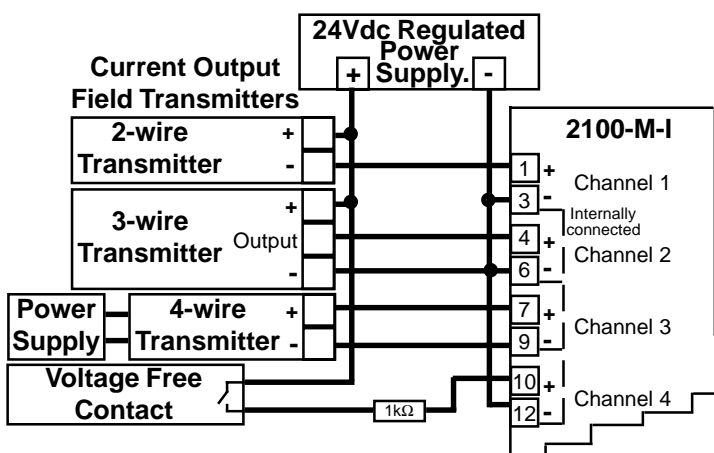
Note 2. For Clock/Reset Channel Selection the resistors = 1kΩ. Up to four 2100-Ms can be connected in this configuration provided the open collectors can handle the load. For Binary Channel Selection the resistor = 2.2kΩ. Up to two 2100-Ms can be connected in this configuration provided the open collectors can handle the load.

Note 3. All cables must be screened, and the screens earthed at one end only.

Note 4. For Clock/Reset Channel Selection DO NOT connect PLC outputs 3 and 4 to Bin 4 and Bin 8 of the 2100-M.

Important: Do not use the 2100-M power supply to power up any transmitter or other equipment. An external power supply must be used for this purpose. The 15V supply is for the Channel Selection only.

2100-M-I Input Connection Diagram for 4~20mA Inputs.



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

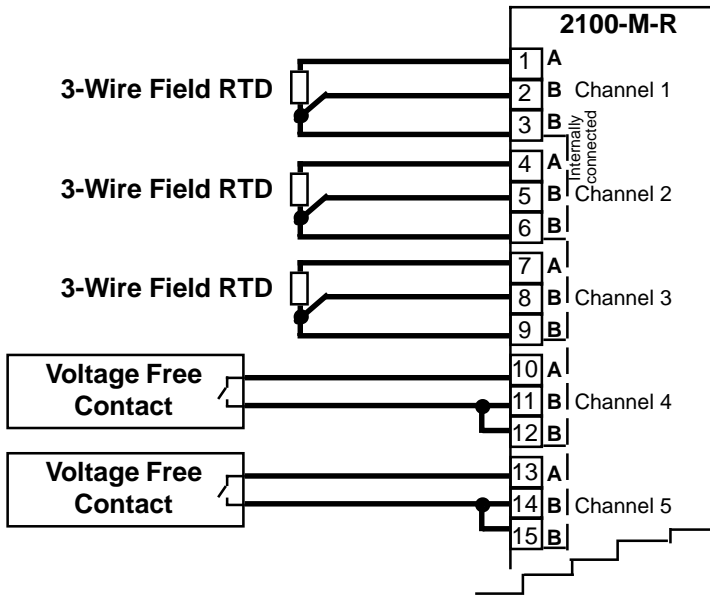
Note 1. All 2100-M-I inputs are single ended. (ie, all negative inputs are internally connected).

Note 2. Inputs can be used as digital inputs for sensing a clean, voltage free, field contact.

Note 3. All cables must be screened, and the screens earthed at one end only.

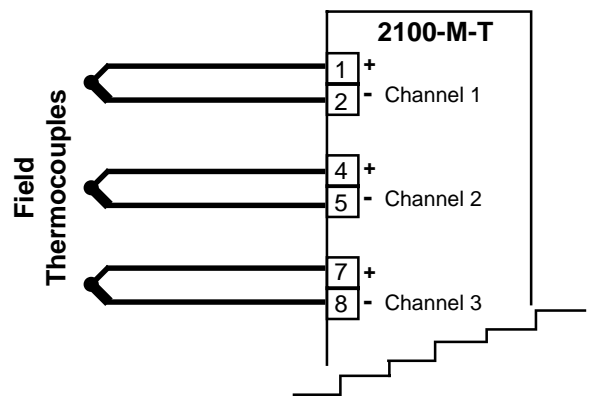
Important: Do not use the 2100-M power supply to power up any transmitter or other equipment. An external power supply must be used for this purpose. The 15V supply is for Channel Selection only.

2100-M-R Input Connection Diagram for RTD Inputs.



- Note 1. Inputs can be used as digital inputs for sensing a clean, voltage free, field contact. S4-3 must be set to '0'. (Upscale sensor break.)
 - Note 2. 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 3. It is recommended that only 3-wire RTDs are used. If 2-wire RTDs are used, lead resistances will not be compensated for, causing a zero offset error.
- Important:** All 2100-M-R inputs are single ended. ie all the 2nd 'B' terminals are internally connected.

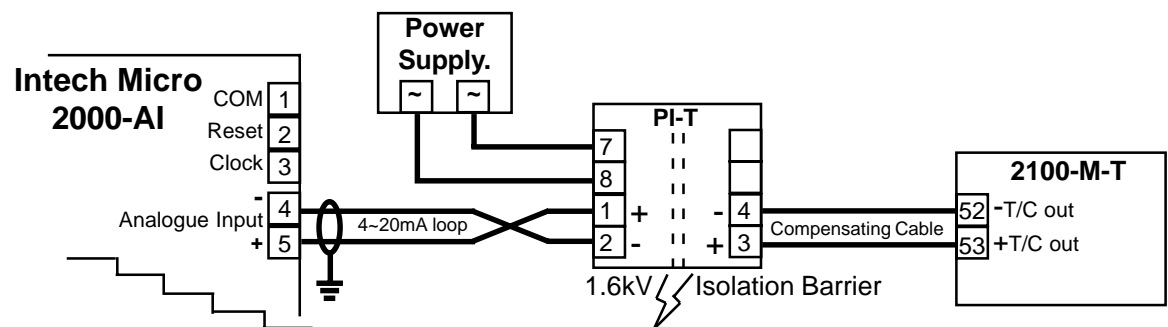
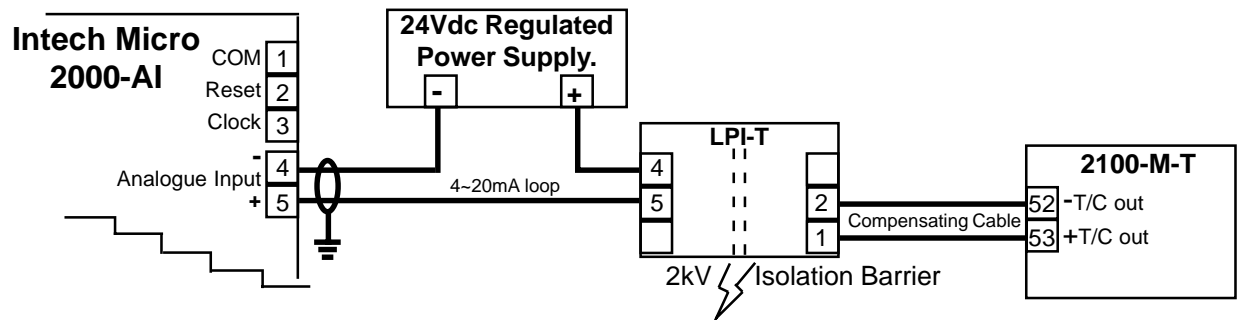
2100-M-T Input Connection Diagram for Thermocouple Inputs.



- Note 1. Used in conjunction with an LPI-T or PI-T thermocouple transmitter.
 - Note 2. Maximum permissible voltage between thermocouple inputs is 10Vpeak.
 - Note 3. Isolated junction, mineral insulated thermocouple recommended.
 - Note 4. There are no adjustments in the 2100-M-T.
- Important:** The '+' and '-' of any unused inputs must be shorted together.

2100-M-T Connection Diagram for Use With a Thermocouple Isolator on the Output.

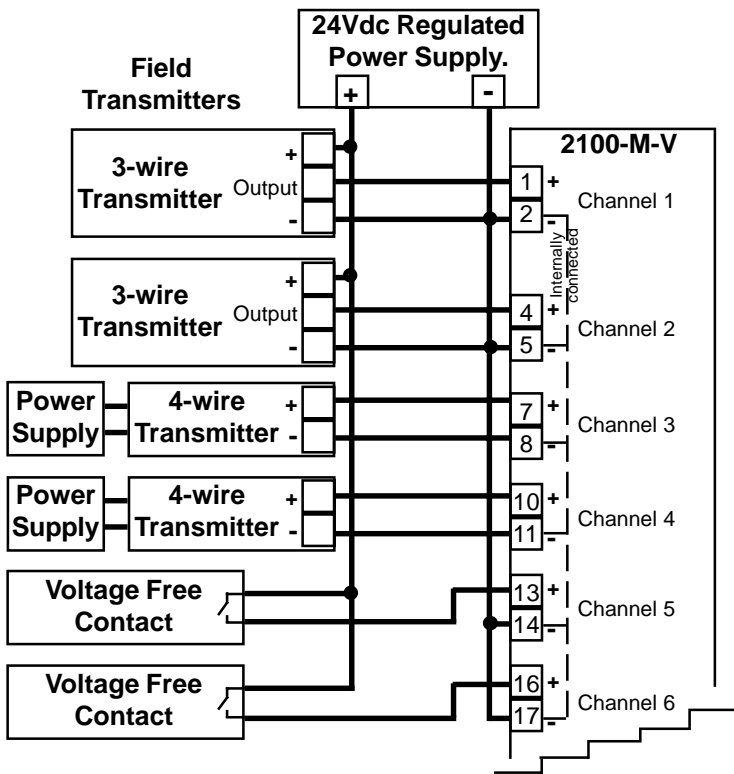
The 2100-M-T works in conjunction with the model LPI-T or PI-T programmable thermocouple isolating transmitter. The 2100-M-T operates as a thermocouple multiplexer only.



Note: For accurate cold junction compensation the LPI-T or PI-T must be mounted as close as possible to the 2100-M-T.

2100-M-V Input Connection Diagram for Voltage Inputs.

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



Note 1. All 2100-M-V inputs are single ended. (ie, all negative inputs are internally connected).

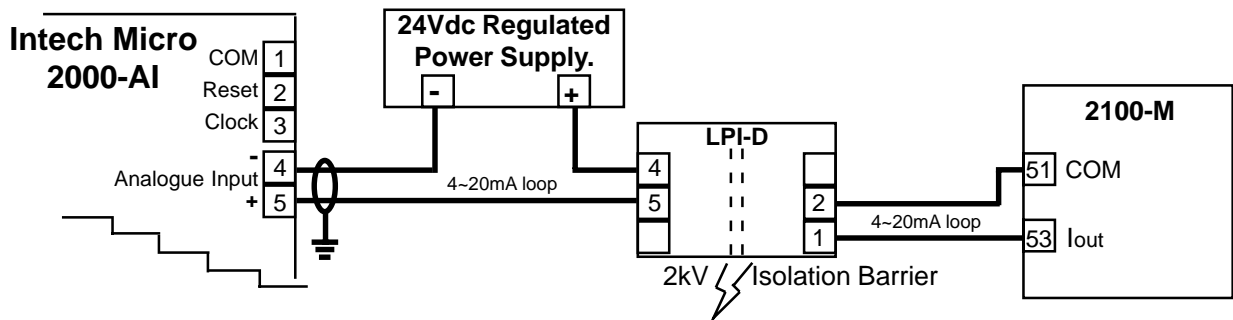
Note 2. Inputs can be used as digital inputs for sensing a clean, voltage free, field contact.

Note 3. All cables must be screened, and the screens earthed at one end only.

Important: 1/ Do not use the 2100-M power supply to power up any transmitter or other equipment. An external power supply must be used for this purpose. The 15V supply is for the Channel Selection only.

2/ Input voltages must not exceed 26V.

2100-M Connection Diagram for Use With an LPI-D Current Loop Isolator on the Output.



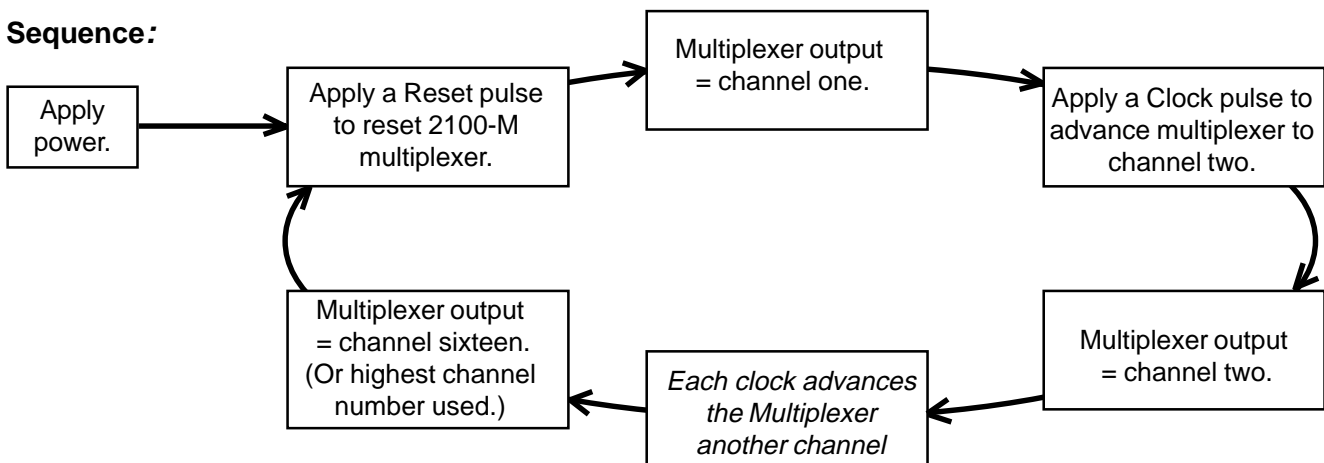
2100-M Clock/Reset Mode, PLC installation Guide.

Specifications.

Clocking speed	-Reset pulse length	20msec.
	-Clock pulse length	20msec.
Settling times before reading	-All models (except 2100-M-T)	100msec Min*. (Multiple readings with averaging recommended.)
	-2100-M-T	600msec Min*.
Reset & Clock pulse magnitude	-All models	7~30Vdc Min*.

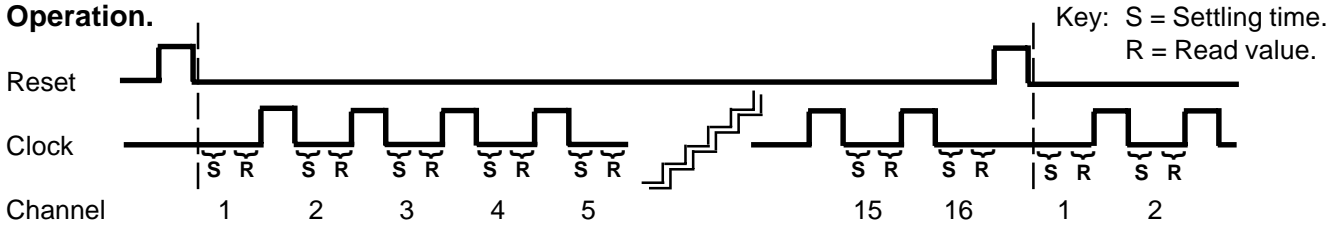
*Longer times may be required for longer cable lengths and higher resolution.

Sequence:



2100-M Clock/Reset Mode, PLC installation Guide Cont.

Operation.



2100-M Binary Channel Selection Mode, PLC installation Guide.

Specifications.

Settling times before reading	-All models (except 2100-M-T)	100msec Min*.	(Multiple readings with averaging recommended.)
	-2100-M-T	600msec Min*.	
Reset & Clock pulse magnitude	-All models	7~30Vdc Min*.	

*Longer times may be required for longer cable lengths and higher resolution.

2100-M Binary Channel Selection Mode Table.

Terminal Number				2100-M Channel Selectcd
61-Bin1	62-Bin2	63-Bin4	64-Bin8	
0	0	0	0	1
1	0	0	0	2
0	1	0	0	3
1	1	0	0	4
0	0	1	0	5
1	0	1	0	6
0	1	1	0	7
1	1	1	0	8
0	0	0	1	9
1	0	0	1	10
0	1	0	1	11
1	1	0	1	12
0	0	1	1	13
1	0	1	1	14
0	1	1	1	15
1	1	1	1	16

Notes

- '0' = no voltage on the terminal.
'1' = 7~30Vdc on the terminal.
- Ensure that if the analogue output from each 2100-M is fed into the same unit (eg PLC), then it is recommended the analogue inputs to the PLC, etc, be isolated.

2100-M Wiring and Installation.

THE 2100-M IS TO BE INSTALLED AND SERVICED BY SERVICE PERSONNEL ONLY. NO OPERATOR / USER SERVICABLE PARTS.

2100-M Mounting.

- Mount in a clean environment in an electrical cabinet on DIN or EN mounting rail.
- Do not subject to vibration or excess temperature or humidity variations.
- Avoid mounting in cabinets with power control equipment.
- To maintain compliance with the EMC Directives the 2100-Ms are to be mounted in a fully enclosed steel fire cabinet. The cabinet must be properly earthed, with appropriate input / output entry points and cabling.

2100-M Wiring.

- A readily accessible disconnect device and overcurrent device must be incorporated in the power supply wiring.
- For 230V supply, connect power to terminals 91 and 93. For 115V supply, connect power to terminals 91 and 92. To ensure compliance to CE Safety requirements, the orange terminal insulators must be fitted to ALL mains terminals after wiring is completed. (ie. terminals 91, 92 and 93.)
- All signal cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only.
- Signal cables should be laid a minimum distance of 300mm from any power cables.
- 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.
- It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
- Lightning arrestors should be used when there is a danger from this source.
- Refer to diagrams for connection information.

2100-M-R RTD'S.

- Avoid locating the RTD where it will be in a direct flame.
- Locate it where the average temperature will be measured. It should be representative of the mass.
- 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.

2100-M Wiring and Installation Cont.

2100-M-T THERMOCOUPLES.

- (1) Avoid locating the thermocouple where it will be in a direct flame.
- (2) Never insert a porcelain or refractory 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 that is conducted away from the junction causing 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.

2100-M-T 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-M Commissioning.

- (1) a) Check that the 2100-M has been set up to the right input and output ranges, and that it's new ranges have been calibrated accurately and checked. DIP switch settings will normally be accurate to 1%. (This can be greater for smaller ranges.
b) Use the Zero and Span trimpots in the 2100-M to finely calibrate the desired range. Using a small screwdriver turn the trimpots clockwise to increase the output, and anticlockwise to decrease the output.
Note: Do not adjust the NULL trimpot. This is factory set.
- (2) Once all the above conditions have been met, and the wiring checked, apply power to the 2100-M, the loops or sensors, and the IN-2000AI or PLC etc. controlling the 2100-M. Allow a 5 minute warm-up period.
- (3) For Clock/Reset Channel Selection only:
Check that the red LEDs on the 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-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.
For Binary Channel Selection only:
Use the table on page 15.01-11 to determine which LEDs should be on. Eg. If Channel 8 is selected the LEDs next to Bin1 terminal (61), Bin2 terminal (62), and Bin3 terminal (63) should be ON, and the LED next to Bin4 terminal (64) should be OFF. The LEDs will remain on while the selected channel is being read.
- (4) Take a reading of the value being measured on each channel, and ensure that this agrees with the level being indicated by the IN-2000-AI, Data Logger, or PLC, for that channel. Adjust for any differences in the software of the system, unless there is a constant error shift in each channel. In which case the Zero and Span trimpots on the 2100-M can adjust for the constant error.

Note1. 2100-M-R: 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-M has been operating for some time, there could be an earth loop between two or more RTD sensors on the 2100-M-R (or between other commoned 2100-M-Rs). Disconnect each RTD sensor individually from the 2100-M-R, 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-M-R. Damage to the 2100-M-R will result.

Note 2. 2100-M-T: 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 (whichever is greater) can occur. To check the variable being measured use a calibration standard thermocouple at the same immersion depth.

2100-M Maintenance.

2100-M-I and 2100-M-V.

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

2100-M-R.

- (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.

2100-M-T.

- (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.

