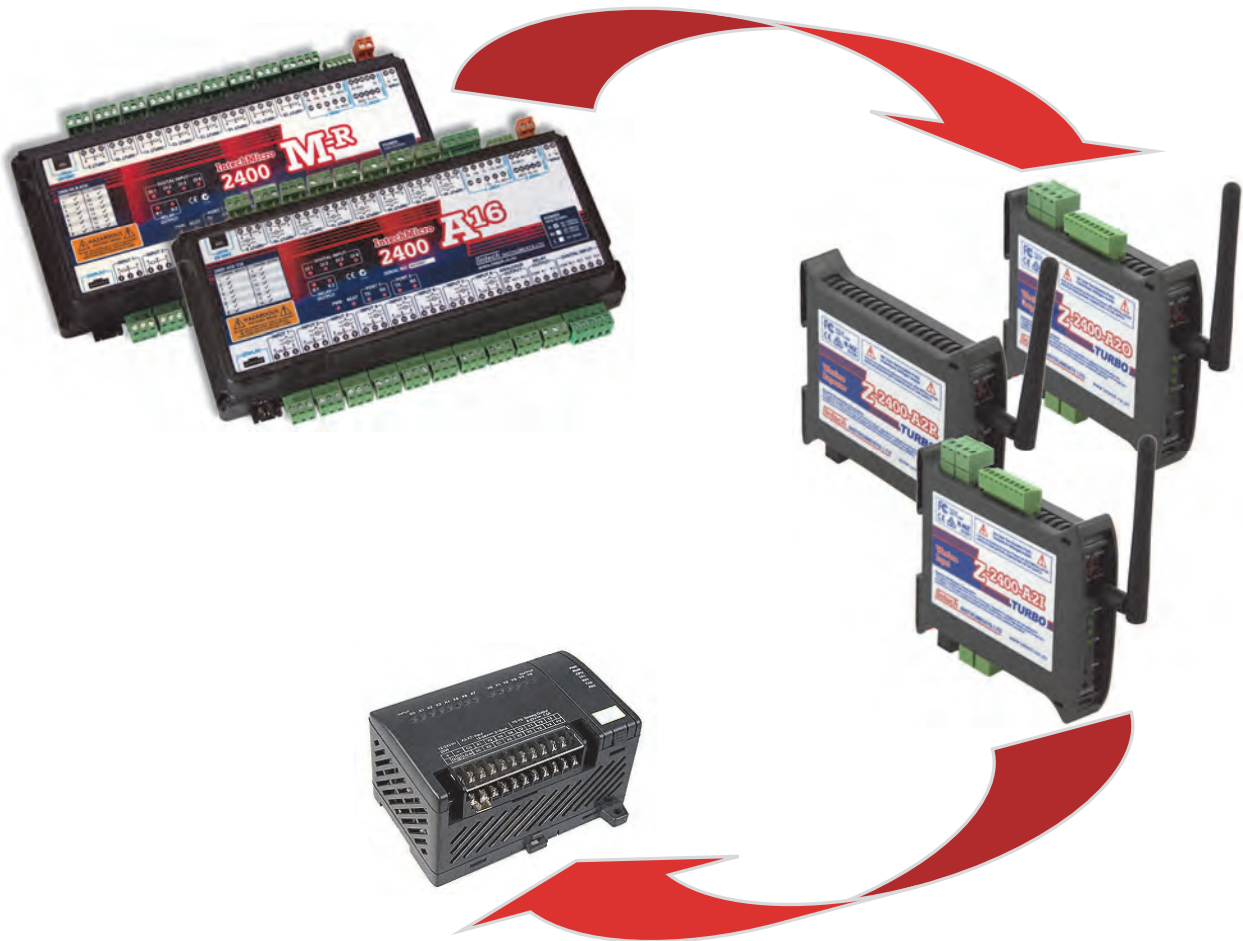


## Z-2400-A2 Wireless Connections

Connecting a 2400-A16/PLC to  
2400-A16/2400-M-R Multiplexers.



**Supplementary Guide.**

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# Z-2400-A2 Wireless Connections.

## Connecting a 2400-A16/PLC to a 2400-A16/2400-M-R Multiplexers.

### Description.

Cost saving tools for PLC integrators has been made easier with the new feature to separate the multiplexers from the PLC (or 2400-A16) via a wireless link. Where the expense of cable installation becomes uneconomical, the Z-2400-A2IO wireless link is a low cost solution for 2400-A16 / 2400-M-R multiplexers.

The 2400 stations have all the friendly features of programmable input/outputs, using the user friendly Station Programmer software (free to download).

### Connection Types.

#### 2400-M-R Multiplexers to a 2400-A16 Station.



#### PLC to 2400-A16/M-R Multiplexers Clock & Reset.



#### PLC to 2400-A16/M-R Multiplexers BCD Channel Select.



**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 on-going 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 independent fail-safe back-up system must always be implemented.

## Ordering Information.

### Z-2400 Wireless.

- **Z-2400-A2IO** One Wireless Output node and One Input node Paired & supplied as a Kit:
  - ⇒ **Z-2400-A2O** Output Base Wireless node. 2x 4~20mA Outputs, 4x Digital I/O.
  - ⇒ **Z-2400-A2I** Input Remote Wireless node. 2x Isolated Universal Inputs, 4x Digital I/O.
- **Z-2400-A2R** Repeater node for Wireless Extension.

**PSW-10-F** Instrument Quality Power Supply: Output Voltage: 24Vdc, 1.0A.

### 2400 Stations.

All 2400 stations come standard (Default ex factory calibration) with:

- ⇒ All Input Channels Configured to RTD Pt100 0~100°C.
- ⇒ 4 Dedicated Digital Inputs.
- ⇒ 2 Analogue 4~20mA Outputs.
- ⇒ 2 Relay Outputs.
- ⇒ RS485 or RS232 on Comms Port 2.

ITEM	CODE			DESCRIPTION
SERIES	<b>2400-A16-</b>			
Input Channel Options	<b>I16-</b>			16 Isolated Universal Input Channels.
	<b>I8-</b>			8 Isolated Universal Input Channels.
	<b>Custom-</b>			Custom mix of Isolated and/or Non-Isolated Channels. Please contact Intech.
Comms Options (Port 1)	<b>485-</b>			Port 1 Fitted with RS422/RS485 Comms.
	<b>NET-</b>			Port 1 Fitted with Ethernet TCP/IP Comms.
Power Supply Options		<b>H</b>		85~265Vac, 95~370Vdc.
		<b>M</b>		24~48Vac, 17~72Vdc.
		<b>L</b>		10~30Vdc.
SERIES	<b>2400-M-R-</b>			
Input Channel Options	<b>N16-</b>			16 Non-Isolated RTD Pt100/Pt1000 Input Channels.
	<b>N8-</b>			8 Non-Isolated RTD Pt100/Pt1000 Input Channels.
Comms (Port 1)		<b>485-</b>		Port 1 Fitted with RS422/RS485 Comms.
Power Supply Options		<b>H</b>		85~265Vac, 95~370Vdc.
		<b>M</b>		24~48Vac, 17~72Vdc.
		<b>L</b>		10~30Vdc.

### Ordering Examples.

**2400-A16-I16-485-L:** 2400-A16 with 16 Isolated Universal Input Channels, RS422/RS485 Comms, 10~30Vdc Power Supply.

**2400-M-R-N16-485-H:** 2400-M-R with 16 Non-Isolated RTD Pt100/Pt1000 Input Channels, RS422/RS485 Comms, 85~265Vac Power Supply.

<b>XU-USB (Rev 1)</b>	USB Programming Key for programming Z-2400-A2 Series using <b>uP Configure</b> Programming software. Also used for programming 2400-A16 / 2400-M-R using <b>Station Programmer</b> software. (Same Key as used for programming XU Series transmitters, Z-2400-Sleeper and IN-uP4.)
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### Other 2400 Models Include:

- 2400-IS: Isolated Auto-Detecting USB/RS232 to RS485/422/232 Converter.
- 2400-R2: 16 Channel Relay Output Expander.
- Z-2400-RB: MicroScan Wireless Base/Remote for RS485/422/232 Comms.
- Z-2400-TCP: MicroScan Wireless Base only for Ethernet TCP/IP Comms.
- Z-2400-Sleeper: MicroScan Wireless battery option for 2 Universal Inputs.

# 2400-A16/2400-M-R Station Programming and Setup.

## 2400 Station Programmer Software.

Station Programmer can be downloaded for free from the 'Downloads' area of the Intech website:  
[www.intech.co.nz/downloads](http://www.intech.co.nz/downloads)

1. Once Station Programmer has been installed, the 2400 station can be connected to your PC (Connection to the 2400 Station's USB Port 3 is Recommended). Start by opening the Station Programmer application.
2. There are two connection tabs: 'Serial Connection - COM/USB' or 'Network Connection - Ethernet'. Select the tab which corresponds to your current station's connection. Next click on the 'Auto Detect 2400 Station' button.  
**Note:** the 'Auto Detect' can only be used to connect to a single 2400 station at a time, i.e. it should not be used on a data loop with multiple 2400 stations attached.
3. Once your computer has found the 2400 station and has finished receiving setup data, you are able to change the necessary channels to the input ranges you require from the drop down menus.

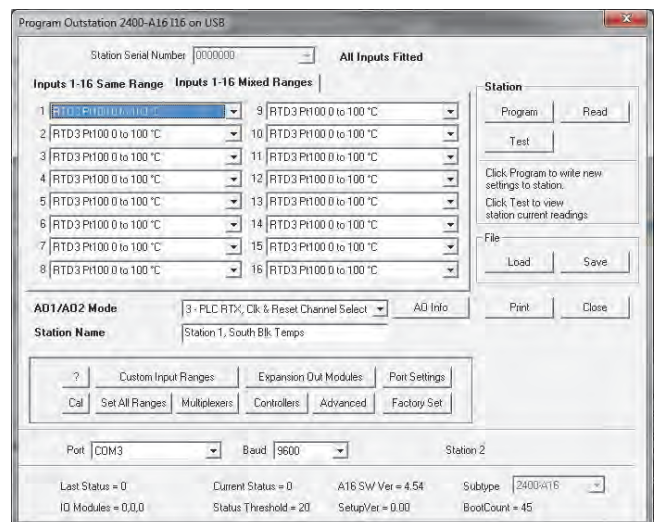
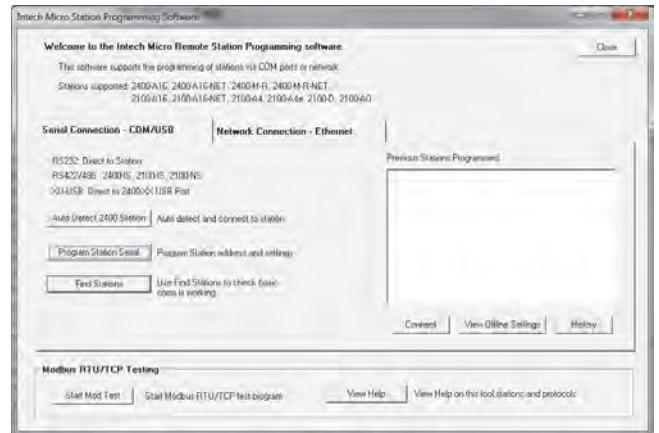
**Note 1:** It is good practice to check that the serial number at the top of the window matches the 2400 station you are trying to program.

**Note 2:** 'Same Range' tab sets all channels to the same range, 'Mixed Ranges' tab allows you to set the channels individually.

**Note 3:** The 'Station Name' field can be set to identify the station with a user friendly custom name.

**Note 4:** See the 2400 station's installation guide for selecting RTD Pt1000 inputs.

4. When you have finished making the required changes to your 2400 station, click 'Program'; this will program your custom settings into the station's memory.
5. Now that the station is programmed, you can click the 'Close' button to finish.



Note: Once you have programmed a 2400 Station for the first time, the Name and Serial number will be stored in your history and will appear in the 'Previous Stations Programmed' dialog box. This allows you to simply select the identified station and click 'Connect'.

For more detailed programming information, refer to 'View Help'.

## Programming a 2400-A16/2400-M-R for Analogue Input Expansion over a Z-2400-A2IO Wireless Link.

### 2400-A16 Setup

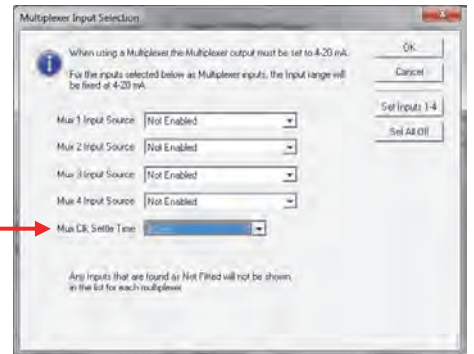
1. The clock and reset pulses are output from the 2400-A16s analogue outputs. To select the analogue output drive for a 2400-M-R, click on the drop down menu next to 'AO1/AO2 Mode' and select mode 1: '2400-M-R / 2100-M Driver'.



2. Depending on the number of 2400-M-R expansion station units you are using (up to four per 2400-A16), the analogue input from the 2400-M-R needs to be assigned to a channel on the 2400-A16. Start by clicking on 'Multiplexer' to bring up the 'Multiplexer Input Selection' screen. Here you can select which input channel you are assigning each 2400-M-R to from the four drop down menus.

**Important:** Because of the slower speeds of the Z-2400-A2 wireless, the 'Mux Clk Settle Time' needs to be set to '4 Sec'.

Note: Longer settling times may be required if a number of wireless repeaters are used. Max settle time = 7 Sec.



3. Now the Multiplexer input setup is complete. Make sure to click 'Program' to store the settings into the 2400-A16's memory. Then click 'Close'.

### 2400-M-R Setup

1. To set the analogue output for clock and reset to an 2400-A16, click on the drop down menu next to 'PLC RTX Mode (AO1)' and select mode 2: 'PLC RTX Clk & Reset Channel Select'.
2. Now the Multiplexer setup is complete. Make sure to click 'Program' to store the settings into the 2400-M-R's memory. Then click 'Close'.

## Programming a 2400-A16/2400-M-R for Clock & Reset Communications to a PLC over a Z-2400-A2IO Wireless Link.

### 2400-A16 Setup

1. To set clock and reset analogue output to the PLC, click on the drop down menu next to 'AO1/AO2 Mode' and select mode 3: 'PLC RTX Clk & Reset Channel Select'.
2. Now the 2400-A16 setup is complete. Make sure to click 'Program' to store the settings into the 2400-A16's memory. Then click 'Close'.

### 2400-M-R Setup

1. To set clock and reset analogue output to the PLC, click on the drop down menu next to 'PLC RTX Mode (AO1)' and select mode 2: 'PLC RTX Clk & Reset Channel Select'.
2. Now the Multiplexer setup is complete. Make sure to click 'Program' to store the settings into the 2400-M-R's memory. Then click 'Close'.

## Programming a 2400-A16/2400-M-R for BCD Communications to a PLC over a Z-2400-A2IO Wireless Link.

### 2400-A16 Setup

1. To set clock and reset analogue output to the PLC, click on the drop down menu next to 'AO1/AO2 Mode' and select mode 4: 'PLC RTX BCD Channel Select'.
2. Because the Z-2400-A2 wireless is using relays to the 2400-A16's digital inputs 1&2, the Debounce needs to be set. Click on 'Advanced' and then at the bottom of the 'Advanced Options' window, select 'Relay Debounce (100Hz Max)'.
3. Now the 2400-A16 setup is complete. Make sure to click 'Program' to store the settings into the 2400-A16's memory. Then click 'Close'.

### 2400-M-R Setup

1. To set clock and reset analogue output to the PLC, click on the drop down menu next to 'PLC RTX Mode (AO1)' and select mode 3: 'PLC RTX BCD Channel Select'.
2. Because the Z-2400-A2 wireless is using relays to the 2400-M-R's digital inputs 1&2, the Debounce needs to be set. Click on 'Advanced' and then at the bottom of the 'Advanced Options' window, select 'Relay Debounce (100Hz Max)'.
3. Now the Multiplexer setup is complete. Make sure to click 'Program' to store the settings into the 2400-M-R's memory. Then click 'Close'.

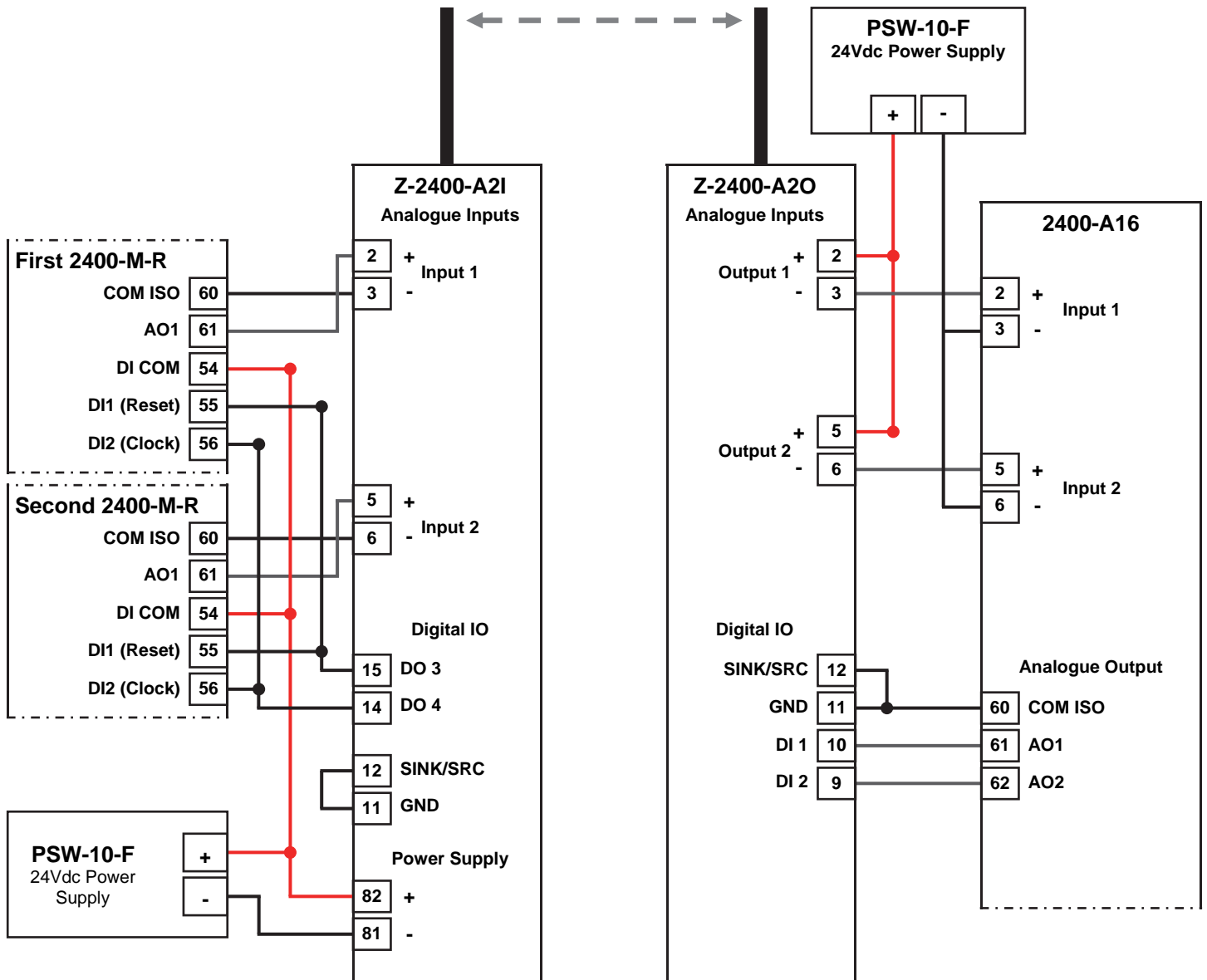
## Connecting a 2400-M-R to a 2400-A16 over a Z-2400-A2IO Wireless Link - MicroScan SCADA.

For full wiring connection diagrams to the 2400-A16's and 2400-M-R's, refer to their supplied Installation Guides.

### 2400-A16 Analogue Input Expansion using 2400-M-Rs over a Z-2400-A2IO Wireless Link.

Analogue input expansion on the 2400-A16 can be achieved using up to four 2400-M-R's (RTD inputs only) and two Z-2400-A2IO wireless links. This gives a total of 76 analogue inputs.

Channel select control for the 2400-M-R is through the Analogue Output 1 and Analogue Output 2 on the 2400-A16. One 2400-A16 and Z-2400-A2I analogue input is required per 2400-M-R and each 2400-M-R input must be of the same type and range. The remaining 2400-A16 analogue inputs can be used for any other type of input.



**Note 1.** A Second set of Z-2400-A2IO wireless nodes are required to connect a third and fourth 2400-M-R to the 2400-A16.

**Note 2.** Recommend full signal strength between all Z-2400-A2 nodes. (Four signal LEDs light up continuously.)

**Note 3.** All cable must be screened and the screens earthed at one end only.

## Connecting a 2400-A16/2400-M-R to a PLC over a Z-2400-A2IO Wireless Link - Clock & Reset.

**2400-A16:** Mode 3 - Clock and Reset Channel Selection Mode, PLC Installation Guide.

**2400-M-R:** Mode 2 - Clock and Reset Channel Selection Mode, PLC Installation Guide.

PLC RTX, Clock & Reset Channel Select.

DI COM = CS COM.

DI 1 = RESET Input.

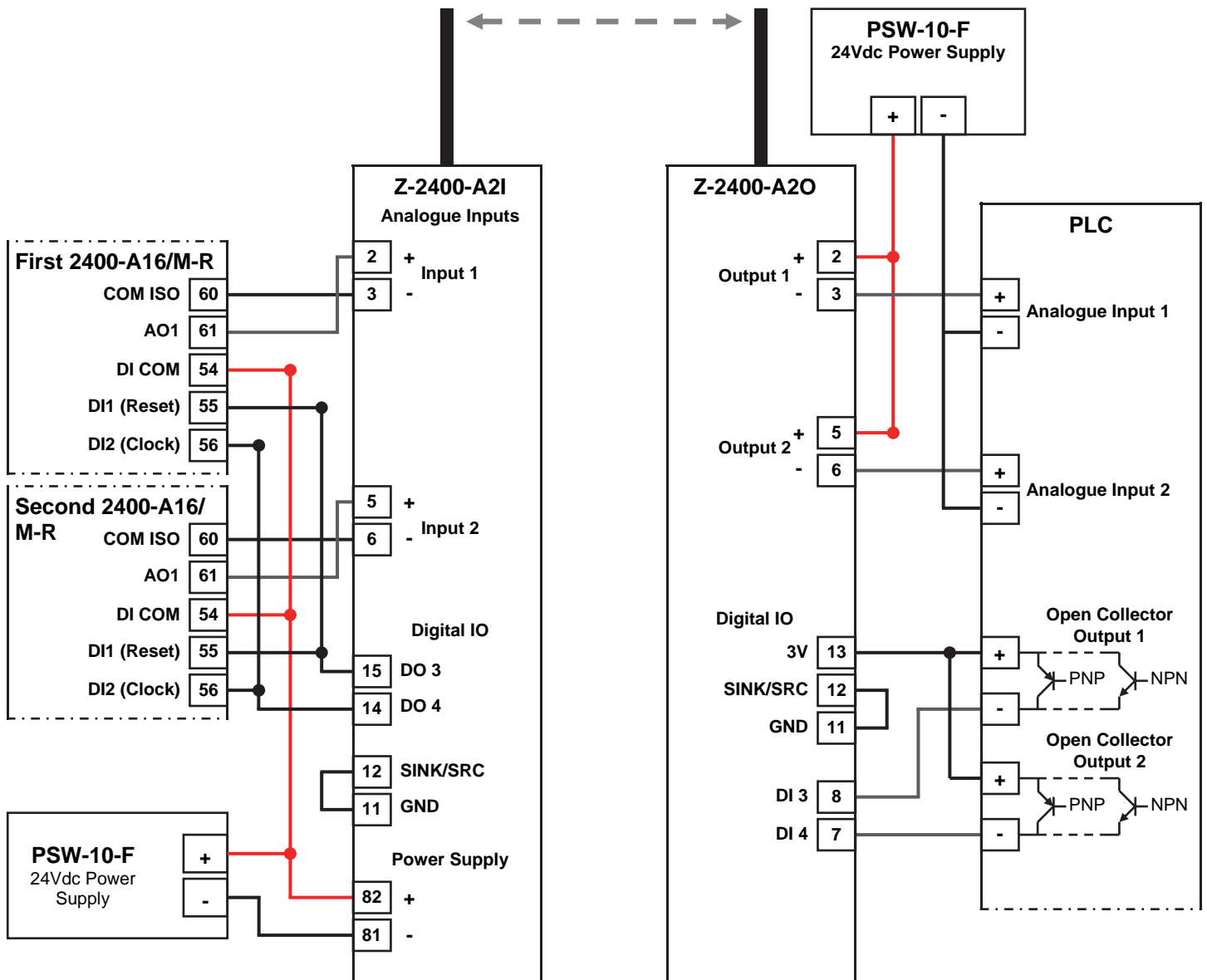
DI 2 = CLOCK Input.

Issue a RESET pulse to select channel 1.

Issue a CLOCK pulse to advance to the next channel.

### Specifications.

Clocking Speed	-Reset pulse length	20msec.
	-Clock pulse length	20msec.
Setting Times Before Reading	4sec Min. Multiple readings with averaging recommended. Note: Longer times may be required for higher resolution.	
Signal Magnitude	-All modes	5~30Vdc.
Cycle Time	64 seconds minimum to cycle through all 16 inputs.	
Resolution	12Bits, 4000 steps typical.	



**Note 1.** A Second set of Z-2400-A2IO wireless nodes are required to connect a third and fourth 2400-A16/2400-M-R to the PLC.

**Note 2.** Recommend full signal strength between all Z-2400-A2 nodes. (Four signal LEDs light up continuously.)

**Note 3.** All cable must be screened and the screens earthed at one end only.



## Connecting a 2400-A16/2400-M-R to a PLC over a Z-2400-A2IO Wireless Link - BCD.

**2400-A16: Mode 4 - BCD Channel Selection Mode, PLC Installation Guide.**

**2400-M-R: Mode 3 - 2400-A16 BCD Channel Selection Mode, PLC Installation Guide.**

PLC RTX, Bin Select Channel. Allows direct selection of input channel number.

Bin channel selection is by digital inputs D1~D4.

DI COM = CS COM.

DI 1 = BIN 1.

DI 2 = BIN 2.

DI 3 = BIN 4.

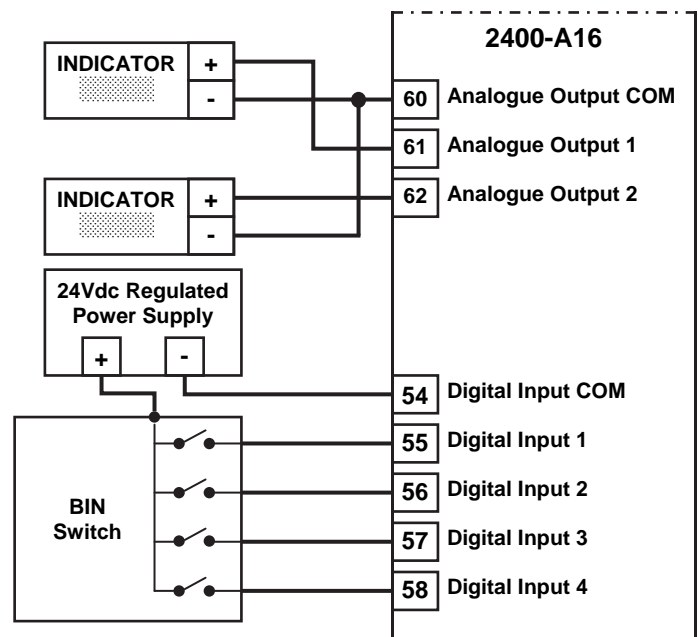
DI 4 = BIN 8.

### Specifications.

Setting Times Before Readings	-All modes	4sec Min. Multiple readings with averaging recommended. Note: Longer times may be required for higher resolution.
Binary Signal Magnitude	-All modes	5~30Vdc.
Cycle Time		64sec minimum to cycle through all 16 inputs.
Resolution		12Bits, 4000 steps typical.

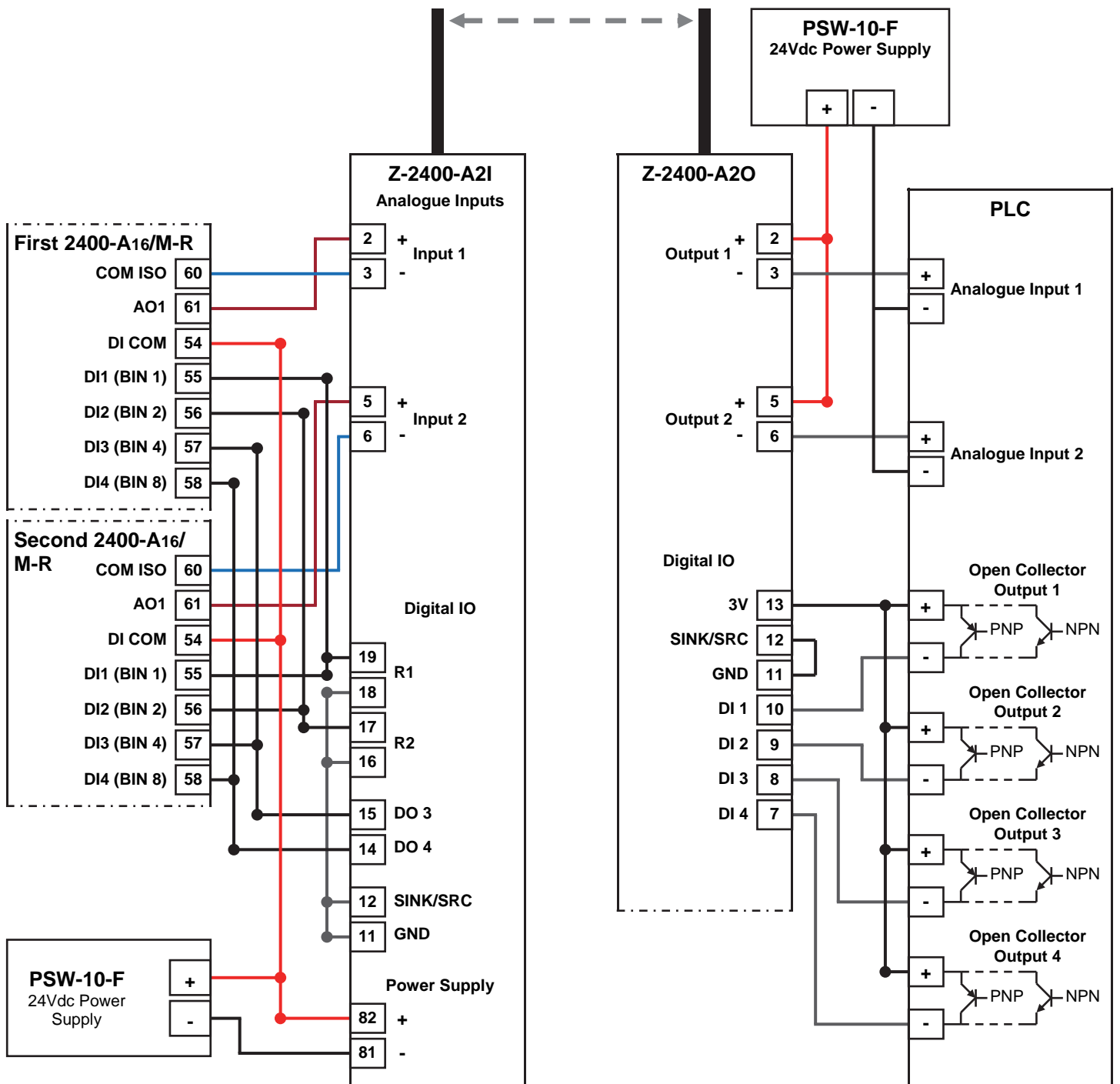
### 2400-A16 / 2400-M-R Binary Channel Selection Mode Table.

Bin Channel Selection				Retransmission Channel
DI 1 BIN 1	DI 2 BIN 2	DI 3 BIN 4	DI 4 BIN 8	
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:

- Note 1. '0' = No voltage on the terminal.  
'1' = 5~30Vdc on the terminal.
- Note 2. Ensure that if the analogue output from each 2400-A16 is fed into the same unit (e.g. PLC), then it is recommended that the analogue inputs to the PLC, etc, be isolated.
- Note 3. Analogue Output 1 = Retransmission of input process value 1~16.  
Analogue Output 2 = Retransmission of controller setpoints 1~16.
- Note 4. The input and output always share the same range.  
E.g. if input 1 is ranged 0~100°C and retransmission channel 1 is selected on Digital Input 1~4, then Analogue Outputs 1 & 2 are both transmitted as 4~20mA = 0~100°C.  
Similarly if input 2 is ranged for 0~250°C, then Analogue Outputs 1 & 2 are transmitted as 4~20mA = 0~250°C.
- Note 5. If Analogue Output 1 process value or Analogue Output 2 are transmitted to an indicator, then all inputs must be ranged the same, unless the indicator is ranged 0~100%.
- Note 6. The PLC RTX modes can operate simultaneously with the SCADA COMMS, allowing a PLC to read back data that the SCADA will be showing.
- Note 7. Digital inputs and digital outputs are not available in the mode.



**Note 1.** A Second set of Z-2400-A2IO wireless nodes are required to connect a third and fourth 2400-A16/2400-M-R to the PLC.

**Note 2.** Recommend full signal strength between all Z-2400-A2 nodes. (Four signal LEDs light up continuously.)

**Note 3.** All cable must be screened and the screens earthed at one end only.

## ***Achieving Good Wireless Signal Is Important.***

Even when all the precautions and good practices are taken into account for wireless node installation, there are many factors that could cause problems with wireless link quality.

The Z-2400-A2 Wireless Series provide a number of options to achieve a good quality, stable wireless link as follows:

1. Additional high gain antennas to give a strong signal path between antennas.
2. Adding interposing repeaters will improve the link quality. Repeaters are particularly good when transmitting past obstacles such as buildings and hills, plus also good through solid walls.

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