

X80

Quantum to X80 I/O Modernization

Instruction Sheet

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05/2022

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As part of a group of responsible, inclusive companies, we are updating our communications that contain non-inclusive terminology. Until we complete this process, however, our content may still contain standardized industry terms that may be deemed inappropriate by our customers.

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

Document Scope

This guide describes the Foundation Quantum I/O to X80 chassis and I/O adapter installation process.

Validity Note

The technical characteristics of the devices described in the present document also appear online. To access the information online, go to the Schneider Electric home page www.se.com/ww/en/download/.

The characteristics that are described in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

I/O Modernization

Quantum to X80 I/O Modernization

The X80 Automation Series supports a full range of high performance I/O modules designed to interface with a wide variety of field devices. Schneider Electric Services offers a series of Evolution products to ease the migration from Quantum I/O to X80 I/O.

⚠ WARNING

RISK OF UNINTENDED OPERATION

X80 I/O analog modules come with default factory software settings. Failure to configure these settings to match the settings of the Quantum module being replaced can lead to unintended system operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Analog modules require configuration parameters to be set that replicate the functionality of the Quantum module being replaced. For additional information refer to the publication *Modicon X80 Analog Input/Output Modules User Manual* (Document Number 35011978).

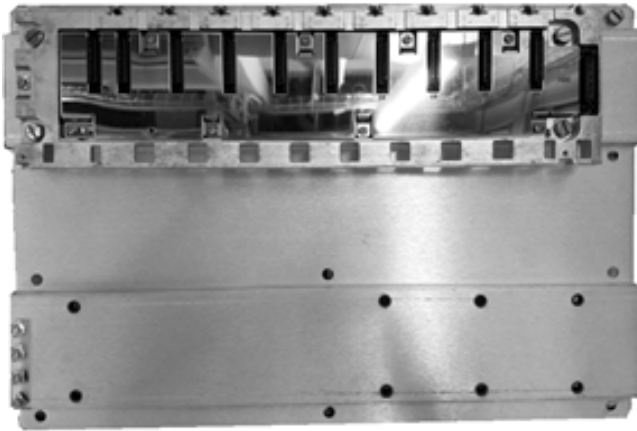
There are two different Quantum to X80 modernization mounting solutions available in the Evolution offer, the Mounting Plate and the Chassis Assembly.

Their use is independent of each other, the Quantum system hardware makeup will determine which solution can be used.

Mounting Plate Solution

The Quantum to X80 PLC-I/O Mounting Plate (Figure 1) is an aluminum plate that looks very similar to the Quantum Backplane (minus the backplane PCB). It is compatible with the existing Quantum System footprint and mounting hole pattern. The mounting plate is available in 6, 10, and 16 slot backplane sizes.

Figure 1 displays a mounting plate with one X80 backplane installed in the upper position. A second X80 backplane can be mounted in the lower position.

Figure 1:

NOTE: The X80 backplanes are not included as part of the Evolution PLC-I/O Mounting Plate. You will need to determine the proper size and type of backplanes your application requires, then add the part number(s) and quantities to your Bill of Materials.

Refer to the list of Evolution Backplane Mounting Plate part numbers, page 31.

The mounting plate is used in cases where the wiring adapters are not desired. This includes:

- When there are no I/O modules in the existing Quantum Chassis, for example a local drop with only a CPU, power supply and communication modules.
- When there is sufficient time to rewire the Quantum I/O terminal blocks to the new X80 terminal blocks and then test the design.
- When the existing Quantum system uses Cablefast interposing terminal blocks.
- When the existing Quantum chassis uses only 96 point I/O modules, which enable the use of the 990ADQUAX80246 front mounted adapter assembly.

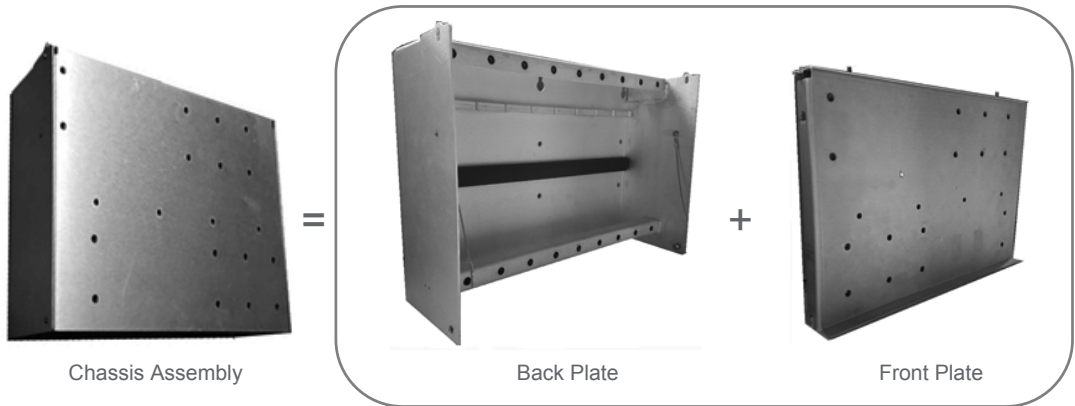
The mounting plate is not designed to be used with I/O adapter assemblies. If I/O Adapter Assemblies are required, use the Chassis assembly.

For additional information reference document Quantum to X80 Backplane Mounting Plate Installation Guide (MFR38561).

Chassis Assembly Solution

The Quantum to X80 PLC-I/O Chassis (Figure 2) consists of a back plate and a front plate. This assembly is designed to fit on the same footprint, and use the same mounting hardware, as the Quantum backplane. The assembly is made of aluminum and is available in sizes that match Quantum 6, 10, and 16 slot backplane sizes.

Figure 2:



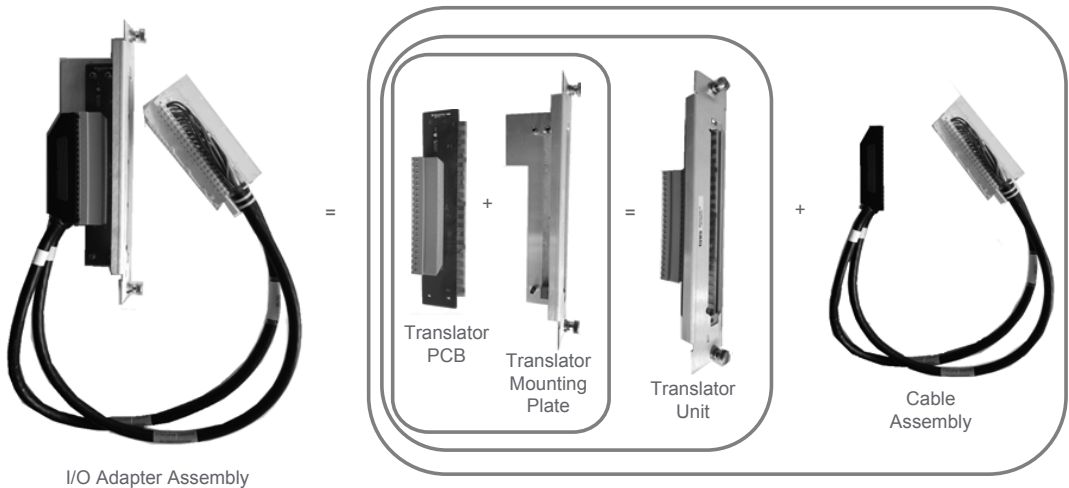
NOTE: The X80 backplanes are not included as part of the Evolution PLC-I/O Chassis assembly. You will need to determine the proper size and type of backplanes your application requires, then add the part number(s) and quantities to your Bill of Materials.

Refer to the list of Quantum to X80 PLC-I/O Chassis part numbers, page 29.

Adapter Components

The Evolution I/O adapter assembly offer consists of a translator unit and cables to route the field wiring from the Quantum field connector to the X80 I/O module. The parts that make up the I/O adapter assembly are shown in Figure 3, below:

Figure 3:



Mounting Products

The following types of Evolution adapter assemblies are available for mounting the new X80 I/O modules:

- **Dedicated I/O adapter:** The translator PCB performs the wiring translations from the Quantum field connector pins to the X80 field connector pins. These assemblies use the dedicated cables (X80 connector wired to the cable). (Figure 4)
- **Generic I/O adapter:** The translator PCB does not perform the wiring translation from the Quantum connector pins to the X80 field connector pins. These adapters use pig-tail cables, which require wiring to the X80 connector (supplied). (Figure 5)

NOTE: Installers of generic I/O adapters are strongly advised to pre-wire and test each generic I/O adapter before entering the site where the adapter is to be installed. In the absence of pre-wiring, you may experience unwanted delay in completing the task of mounting the X80 I/O modules.

- **Front Mount I/O adapter:** This style of adapter does not mount within the chassis assembly. These adapter assemblies connect directly to X80 modules that use the 40-pin FCN connector.(Figure 6)

⚠ CAUTION

LOSS OF INPUT/OUTPUT FUNCTION

Generic I/O adapters do not contain fuses or other measures to help protect against external events, such as circuit overload, short circuit, or sensor/pre-actuator voltage errors. Confirm that sufficient module protection measures are in place. Refer to the *Modicon X80 Discrete Input/Output Modules User Manual (35012474)* for details regarding X80 module external protection recommendations.

Failure to follow these instructions can result in injury or equipment damage.

Figure 4 (dedicated I/O adapter):

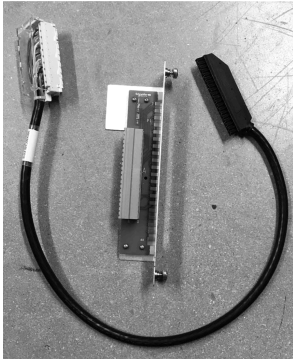
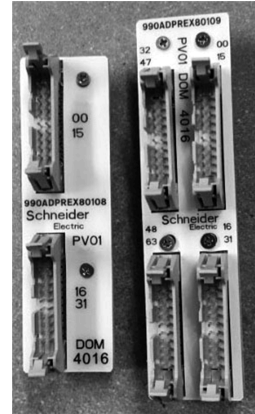


Figure 5 (generic I/O adapter):



Figure 6 (front mount I/O adapter):



All of these assemblies let you connect the existing Quantum field wiring to X80 I/O, without altering existing field wiring connections.

Safety Precautions

DANGER

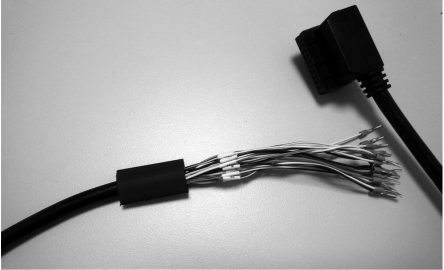
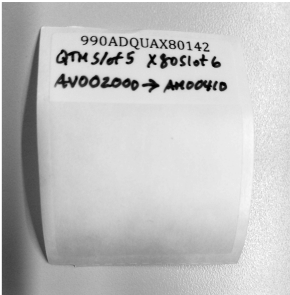
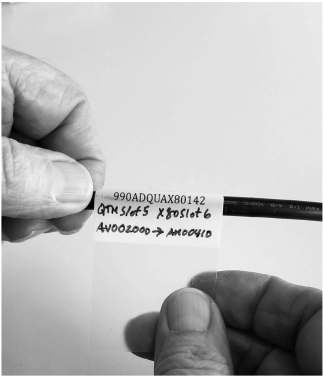
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

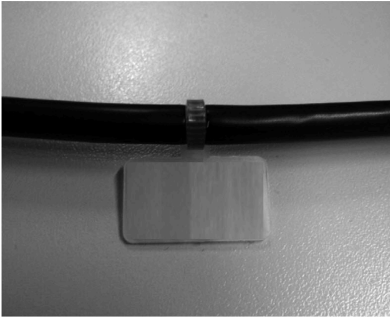
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. Follow local electrical codes and standards.
- Turn OFF all power before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm that power is OFF.

Failure to follow these instructions will result in death or serious injury.

Assembling Cables

If you are using a generic I/O adapter in the modernization, assemble all of these cables (using the appropriate wiring guide) before beginning the modernization:

Step	Action	
1	<p>Before wiring the X80 connector to the cable, place the supplied shrink tube over the cable (Figure 7).</p>	<p>Figure 7:</p> 
2	<p>Connect the cable wires to the X80 connector as indicated in the appropriate wiring guide. After all wiring is completed, Schneider Electric recommends that you trim back the unused wires at the outer jacket.</p>	<p>Figure 8:</p> 
3	<p>After the X80 connector wiring is completed, shrink the tubing over the end of the cable jacket and wires. Then secure the cable to the connector with the supplied tie-wrap. Schneider Electric recommends that the tie-wrap connection point be on the cable jacket and not the individual wires.</p>	
4	<p>Each generic cable comes with a Brady label (Figure 8) included in the package. This label includes the I/O adapter commercial reference number, and also provides space for you to add additional information. For example, you can add reference to the previous and new backplane positions, plus legacy and new module numbers. Schneider Electric recommends that you install this label on the cable approximately one foot from the X80 connector (Figure 9).</p>	<p>Figure 9:</p> 

Step	Action
5	<p data-bbox="292 180 736 293">Optional: Each generic cable comes with a marking flag (Figure 10) included in the package. This marking flag can be used to add information in addition to the information on the Brady label for ease of identification.</p> <p data-bbox="776 217 901 245">Figure 10:</p> 

Removing Existing Modules and Backplane

⚡⚠ DANGER

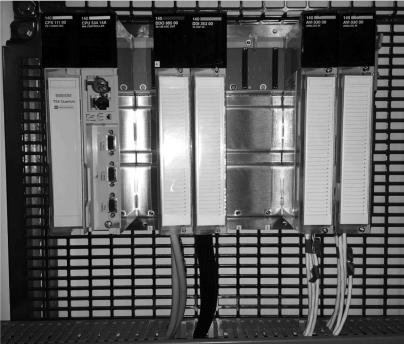
RISK OF ELECTRIC SHOCK



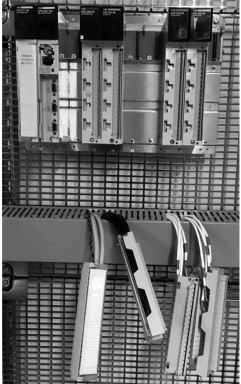
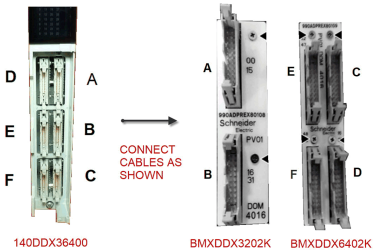
Before removing existing modules and backplane, turn off all power to the Quantum system including rack power, and I/O field power.

If there are unused Quantum AC or DC connections, disconnect the wires at the source (terminal strip, etc.) so the power is no longer present on the Quantum field connector.

Failure to follow these instructions will result in death or serious injury.

To remove existing modules and backplane:

Step	Action	
1	Turn off all power to the Quantum rack, including rack power, I/O field power, and so forth (Figure 11).	<p>Figure 11:</p> 
2	Remove any communications cabling from the PLC system and set them aside (if applicable).	
3	Schneider Electric recommends that you check each field wire connection to confirm that its wires are tightly fastened.	
4	(Optional) Label the Quantum field connector with its original slot number and module part number.	
5	<p>Remove the Quantum I/O module field connectors. Select the following process that is appropriate for your connectors:</p> <p>A. For modules with a removable terminal block:</p> <ol style="list-style-type: none"> 1. Loosen the fastening screws on the top and bottom of the field wiring connector (Figure 12). 2. Remove the field connector by pulling it straight out from the module (Figure 13). Let the field connectors hang down (Figure 14). 	

Step	Action	
	<p>B. For 140DDO36400 (96 point output) and 140DDI36400 (96 point input) modules with 20 position high density connectors:</p> <ol style="list-style-type: none"> 1. Identify the current 20 position high density connector cable location (A...F). 2. Disengage the two locking latches. 3. Pull to remove the 20 position high density connector (Figure 15), and connect to the corresponding adapter connector. 	
<p>5 (cont)</p>	<p>Figure 12:</p> 	<p>Figure 13:</p> 
	<p>Figure 14:</p> 	<p>Figure 15:</p>  <p style="text-align: center; color: red;">CONNECT CABLES AS SHOWN</p> <p style="text-align: center;"> 140DDX36400 BMXDDX3202K BMXDDX6402K </p>

Step	Action
6	Remove the Quantum I/O modules: <ol style="list-style-type: none"> Loosen the module retaining screw located at the lower section of the module. Grasp the bottom of the I/O module and rotate it up to disengage the backplane connection. Remove the module.
7	Remove the Quantum backplane mounting hardware, and then remove the backplane. <p>NOTE: If the mounting hardware are machine screws, retain them for re-use. If the mounting hardware are bolts, it is recommended to replace them with machine screws when installing the Evolution chassis.</p>



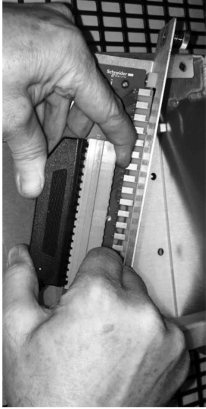
Installing the Evolution PLC/IO Chassis Base Plate and Chassis Door

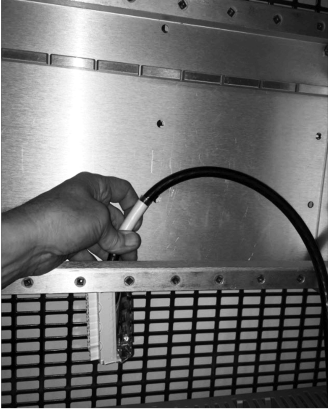
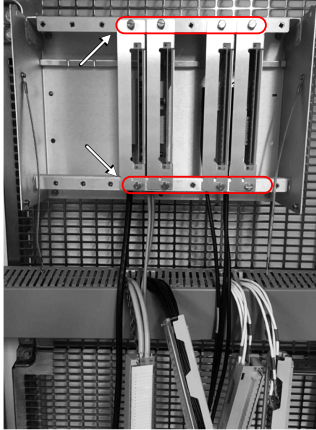

To install the Evolution PLC/IO Chassis base plate:


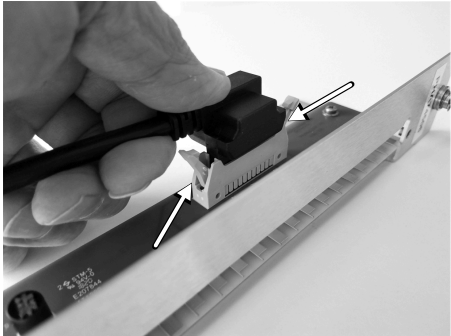
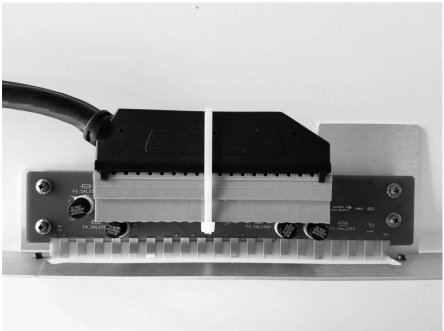
Step	Action
1	The Evolution PLC/IO Chassis assembly is shipped with the front plate attached to the back plate. For ease of installation, you can detach the front plate before installing the base plate. To detach the front plate: <ol style="list-style-type: none"> Disengage each “L” shaped spring latch (one on each end of the front plate) by using your fingers to move them toward the center of the front plate, then pull it forward to the locking position (Figure 16). Swing the front plate open, and remove the retaining cables from the front plate (Figure 17). Slide the front plate off its pivot points (Figure 18).

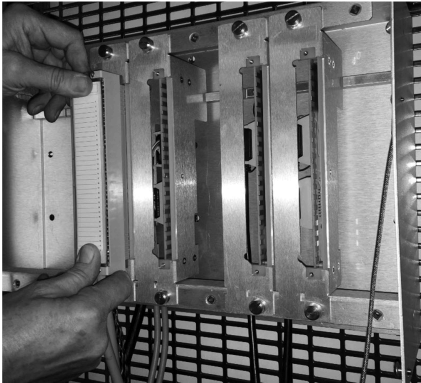
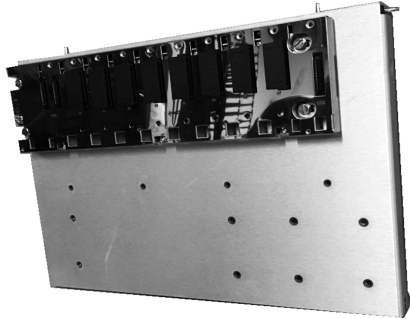
Figure 16:

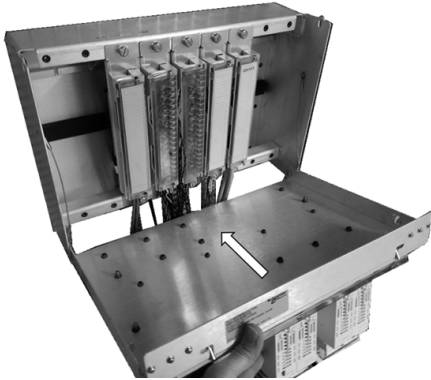
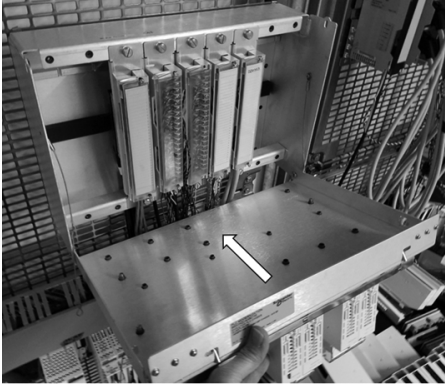
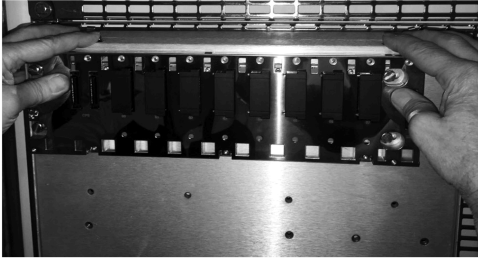
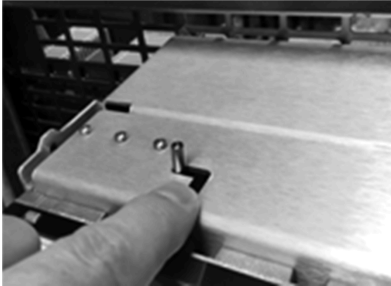


Step	Action
	<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>Figure 17:</p>  </div> <div style="width: 45%;"> <p>Figure 18:</p>  </div> </div>
2	<p>Securely fasten the back plate in the former Quantum backplane location.</p> <p>NOTE: Given the proximity of the chassis wall to the mounting hole location, it is recommended that you use machine screws, instead of bolts, as your mounting hardware.</p>
3	<p>Attach the interconnecting cables to the translator unit.</p> <p>Method 1:</p> <ol style="list-style-type: none"> 1. Attach the cables to the translator unit, verifying that cables A and B are inserted securely into the correct translator unit connector (Figure 19). 2. Carefully route the X80 connectors behind the lower I/O adapter fastening bar of the backplate (Figure 20). 3. Insert the I/O adapter assembly in the desired backplane slot and tighten the fastening screws to 2.4...3.6 N•m (21...31 lb-in) (Figure 21). <div style="text-align: right;"> <p>Figure 19:</p>  </div>

Step	Action
	<p data-bbox="276 217 404 245">Figure 20:</p>  <p data-bbox="780 217 908 245">Figure 21:</p> 
<p data-bbox="189 732 247 776">3 (cont)</p>	<p data-bbox="276 732 370 748">Method 2:</p> <ol data-bbox="297 764 758 1084" style="list-style-type: none">1. Carefully route the cable's translator unit connector end (not the X80 connector end) from beneath the back plate and behind the lower I/O adapter fastening bar of the backplate (Figure 22).2. Attach the cables to the translator unit verifying that cables A and B are inserted securely into the correct adapter's mating connector (Figure 23).3. Insert the I/O adapter assembly in the desired backplane slot and secure it by tightening the securing screws to 2.4...3.6 N•m (21...31 lb-in) (Figure 21). <p data-bbox="780 769 908 797">Figure 22:</p> 

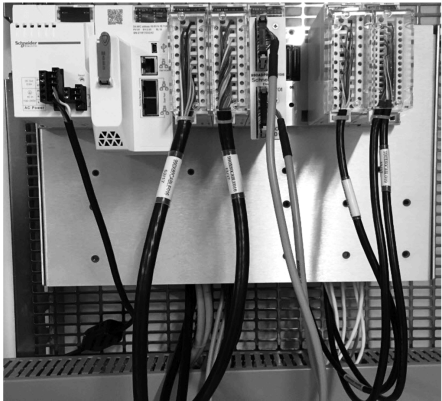
Step	Action
	<p data-bbox="780 217 908 245">Figure 23:</p> 
<p data-bbox="189 662 247 708">3 (cont)</p>	<p data-bbox="319 672 388 695">NOTE:</p> <ul data-bbox="337 708 753 1097" style="list-style-type: none"> • If the connectors are 20 position high density connectors, after inserting the cable connector into the headers, squeeze two locking latches to verify that they are securely latched (Figure 24). • If the I/O adapter assembly is for analog, attach the cable assembly ring lug shield connection to the ground standoff on the I/O adapter card. • If the I/O adapter assembly connectors are High Power, after inserting the cable connector into the translator unit connectors you can then install the supplied cable tie as an additional fastening device (Figure 25). <p data-bbox="780 699 908 727">Figure 24:</p>  <p data-bbox="780 1138 908 1166">Figure 25:</p> 

Step	Action	
4	<p>Install the Quantum field connector(s) (detached in Step 5 of the <i>Remove Existing Modules and Backplane procedure</i>, page 16) onto the correct I/O adapter assembly in reverse order. Fasten the Quantum field connectors to the adapters by tightening the connector securing screws to 0.5...0.8 N•m (4.43...7.08 lb-in). (Figure 26)</p>	<p>Figure 26:</p> 
5	<p>Attach the X80 backplane(s) to the door (Figure 27). The recommended tightening torque for the mounting hardware is 2.4...3.6 N•m (21...31 lb-in).</p> <p>NOTE:</p> <ul style="list-style-type: none"> • If an Ethernet X80 backplane or a non-Ethernet backplane (PV02 or higher) is being installed, use the flat washers and the shorter 16 mm (0.630 in) mounting screws that are supplied with the Chassis assembly. • If a non-Ethernet X80 backplane (PV01 only) is being installed, use the flat washers and the longer 20 mm (0.787 in) mounting screws that were supplied. 	<p>Figure 27:</p> 
6	<p>If you removed the front plate, reattach it by:</p> <ol style="list-style-type: none"> 1. Sliding the front plate onto the backplate's lower pivoting points (Figure 28). 2. Attach the retaining cables (Figure 29). 3. Rotate the front plate up until it is closed (Figure 30). 4. Push the spring pins toward the back to disengage them from the open/locking position. Push outward on them to verify that they are completely engaged to the back plate (Figure 31). 	

Step	Action
	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p data-bbox="275 215 403 248">Figure 28:</p>  </div> <div style="width: 48%;"> <p data-bbox="779 215 907 248">Figure 29:</p>  </div> </div>
	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p data-bbox="275 719 403 751">Figure 30:</p>  </div> <div style="width: 48%;"> <p data-bbox="779 719 907 751">Figure 31:</p>  </div> </div>

Installing the X80 System

To install the X80 system:

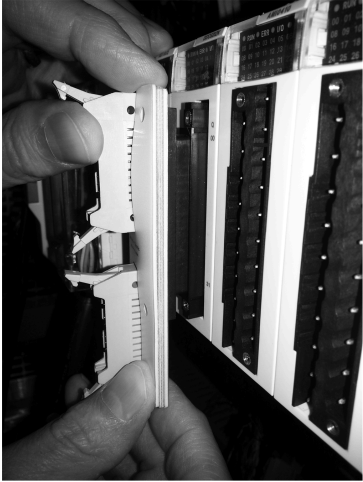

Step	Action
1	<p>Mount all the X80 modules required by your application (power supply, CPU, I/O, etc.) into the correct slots in the backplane. Fasten each module by tightening the captive Phillips/slot combination screw at the top of the module (Figure 32). The recommended tightening torque for this screw is 1.2...1.5 N•m (10.6...13.3 lb-in).</p>  <p>Figure 32:</p>
2	<p>Insert each X80 I/O field connector into its corresponding I/O module.</p> <p>NOTE: X80 module I/O connector keying is recommended. Refer to the analog I/O (35011978) and discrete I/O (35012474) user guides for I/O connector key instructions.</p> <p>Tighten the captive Phillips head screw at the top and bottom of each connector. The recommended tightening torque for these screws is 0.3...0.4 N•m (2.7...3.5 lb-in).</p>

NOTICE

RISK OF MODULE SEPARATION

Do not tighten the top and bottom securing screws beyond the recommended tightening torque settings described in step 3, below.

Failure to follow these instructions can result in equipment damage.

Step	Action
3	<p>For 32 and 64 point X80 modules:</p> <ol style="list-style-type: none"> 1. Install the front mount adapter and tighten the top and bottom securing screws. The recommended tightening torque for these screws is 0,3...0,4 N•m (2.7...3.5 lb-in). 2. If not already connected, connect field wiring cable by pushing each of the six Quantum I/O cable's 20 position socket connector (Figure 34) inwards into its corresponding X80 modules front mount adapters 20 position high density connectors. Verify that the two locking latches are engaged by squeezing the locking tabs. <p>NOTE: For 96 point modules, insert the Quantum I/O cable's 20 position socket connector (Figure 15) into the correct (A...F) module connectors and verify that the two locking latches are engaged by squeezing them.</p>
	<div style="display: flex; justify-content: space-around;"> <div data-bbox="266 505 628 1040"> <p>Figure 33:</p>  </div> <div data-bbox="756 505 1016 1040"> <p>Figure 34:</p>  </div> </div>
4	Re-attach any other communications cables that previously had been detached.
5	<p>Optional: The cable management system can be installed on the upper X80 backplane to position and affix its cables to allow viewing of the lower X80 backplanes I/O modules display block (I/O channel indicators). This system is similar to the X80 shielding connection kit. For installation instructions, refer to the <i>Shielding Connection Kit</i> section of the <i>X80 Racks and Power Supplies Hardware Reference Manual</i> (EIP000002626).</p>

Additional Information



I/O Adapter Replacement Cables:

You can also obtain replacement cables from Americas MRO. For part numbers, refer to the list of I/O Adapter Replacement Cables, page 34.

Fuse Replacement Procedure:

Some translator units have replaceable fuses. The translator units with fuses include a spare fuse on the translator units, which is labeled SPARE or F100 on the PCB. The fuses on the translator units are inaccessible when the system is assembled. If fuse replacement is required, the I/O adapter assembly needs to be removed from the Evolution chassis for fuse access:

Step	Action
1	Remove power from the system.
2	To access the I/O adapter assembly, disengage the "L" shape spring latch by moving towards the center of the front plate then pulling forward to the locking position then open the assembly (Figure 16).
3	Remove the Quantum I/O module field connectors: <ol style="list-style-type: none"> 1. Loosen the fastening screws on the top and bottom of the field wiring connector (Figure 9). 2. Remove the field connector by pulling it straight out from the module (Figure 10). Let the field connectors hang down (Figure 11).
4	Unscrew the adapters securing screws.
5	Partially remove the I/O adapter assembly from the chassis assembly, then remove the cables from the translator unit.
6	Remove the translator unit from the chassis assembly.
7	Replace the blown fuse: <ol style="list-style-type: none"> 1. Pull the blown fuse straight out to remove it. 2. Line up the two pins of the new fuse with the socket on the adapter board, then push into place. <p>Helpful Hint: Some fuses may be difficult to remove due to their positioning (Figure 35). Using a tool such as a needle tweezer (Figure 36), with its tips covered with shrink tubing or electrical tape, will make removing and inserting the fuse easier.</p>

Step	Action
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Figure 35:</p>  </div> <div style="text-align: center;"> <p>Figure 36:</p>  </div> </div>
8	<p>Install the translator unit in the reverse order (steps 6 through 2, above).</p> <p>NOTE: When replacing the cables (step 4), verify that the cables are connected to the correct mating connector.</p>

⚠ WARNING

RISK OF UNINTENDED OPERATION

When replacing the cables (step 4), verify that the cables are connected to the respective mating connector (cable A to connector A and cable B to connector B).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Step	Action
9	Close the chassis front plate and secure: push the "L" shaped spring latch towards the back to disengage from the locked position. The "L" shape spring latch will move outward to the locked position after they engage into the backplate. (Figure 28). Push outwards to confirm that they are fully engaged.
10	Apply power to the system and verify that it operates as intended.

Hardware References, Wiring Maps, and Wiring Guides

Quantum to X80 I/O Adapter Hardware References

Fuse Part Numbers

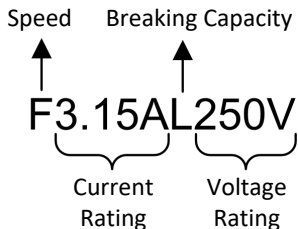
Replacement fuses can be purchased from the following manufacturers:

Fuse Description	Where used	Fuse Rating (TR5 package)	Manufacturer Littelfuse (370 series)	Manufacturer Schurter (MSF 250 series)
0.5 Amp, 250 Volt	990ADQUAX80130/131	F0.5AL250V	370 0500 0410	0034 6011
	990ADQUAX80100/101			
	990ADQUAX80110/111			
	990ADQUAX80136/137			
	990ADQUAX80204/205			
	990ADQUAX80120/121			
	990ADQUAX80132/133			
	990ADQUAX80150/151			
	990ADQUAX80152/153			
	990ADQUAX80154/155			
3.15 Amp, 250 Volt	990ADQUAX80214/215	F3.15AL250V	370 1315 0410	0034 6019
	990ADQUAX80228/229			
4.0 Amp, 250 Volt	990ADQUAX80140/141	F4AL250V	370 1400 0410	0034 6020
	990ADQUAX80134/135			
6.3 Amp, 250 Volt	90ADQUAX80206/207	F6.3AL250V	370 1630 0410	—

Note: Fuse lead length = 4.3 mm.

Fuse Rating

The components of the fuse rating are explained below, using the example F3.15AL250V:



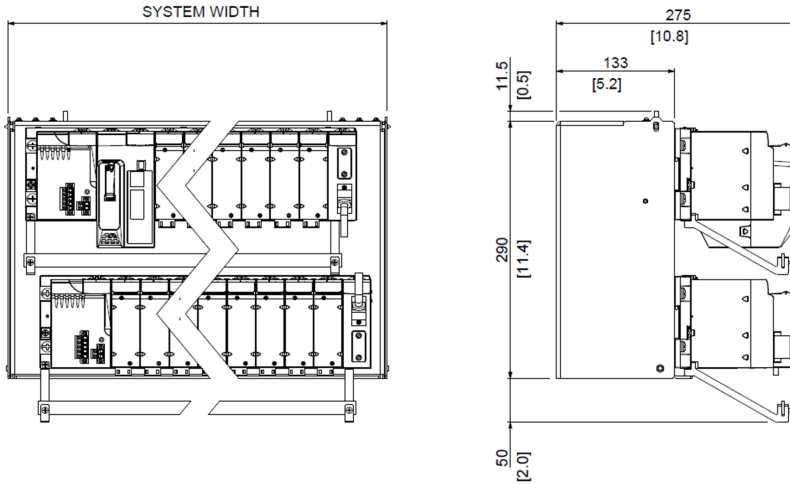
Fuse Speed		Fuse Breaking Capacity	
Speed Symbol	Description	Breaking Symbol	Description
FF	Very Fast Acting	H	High Breaking Capacity
F	Fast Acting	L	Low Breaking Capacity
M	Medium Acting		
T	Slow Acting		
TT	Very Slow Acting		

Evolution PLC-I/O Chassis

From Quantum	I/O Chassis Part Number	Available Backplanes
140XBP00600 (6 slot)	990CHQUAX80060	BM●XBP0400
140XBP01000 (10 slot)	990CHQUAX80100	BM●XBP0400, BMXXBP0600, BM●XBP0800, BMEXBP0602
140XBP01600 (16 slot)	990CHQUAX80160	BM●XBP0400, BMXXBP0600, BM●XBP0800, BMEXBP0602, BMEXBP1002, BM●XBP1200

Chassis Dimensions

Figure 37:



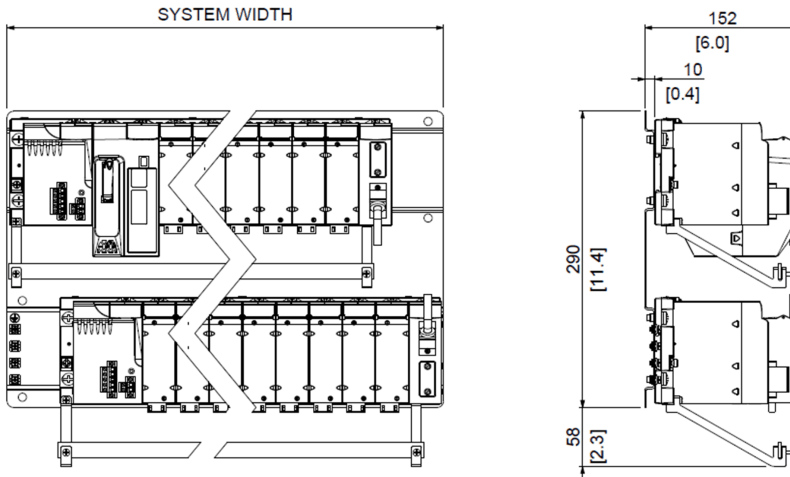
Part Number	Dimensions					
	Width	Height			Depth	
		Chassis alone	Chassis + latch	Chassis + latch + cable management kit	No M580 System	With M580 CPU System
990CHQUAX80060	265 mm (10.4 in)	290 mm (11.4 in)	301.5 mm (11.9 in)	351.5 mm (13.9 in)	133 mm (5.2 in)	275 mm (10.8 in)
990CHQUAX80100	428 mm (16.8 in)					
990CHQUAX80160	670 mm (26.4 in)					

Evolution Backplane Mounting Plate

From Quantum	Mounting Plate Part Number	Available Backplanes
140XBP00600 (6 slot)	990CHQUAX80061	BMxXBP0400
140XBP01000 (10 slot)	990CHQUAX80101	BM●XBP0400, BMXXBP0600, BM●XBP0800, BMEXBP0602
140XBP01600 (16 slot)	990CHQUAX80161	BM●XBP0400, BMXXBP0600, BM●XBP0800, BMEXBP0602, BM●XBP1200, BMEXBP1002

Mounting Plate Dimensions

Figure 38:



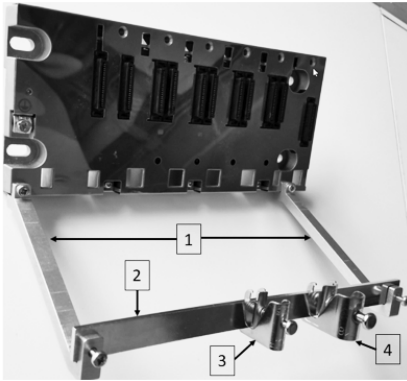
Part Number	Dimensions				
	Width	Height		Depth	
		Mounting plate alone	Mounting plate + cable management kit	No M580 System	With M580 CPU System
990CHQUAX80061	265 mm (10.4 in)	290 mm (11.4 in)	348.0 mm (13.7 in)	10 mm (0.4 in)	152 mm (6 in)
990CHQUAX80101	428 mm (16.8 in)				
990CHQUAX80161	670 mm (26.4 in)				

X80 Backplanes

I/O Slots	Part Number
X Bus Only Racks ¹ (M340/M580 Main and Extended Racks):	
4	BMXXBP0400
6	BMXXBP0600
8	BMXXBP0800
12	BMXXBP1200
Ethernet + X-Bus Racks (M580 Main Racks):	
4	BMEXBP0400
8	BMEXBP0800
12	BMEXBP1200
Dual Power Supply Ethernet + X-Bus Racks (M580 Main Racks):	
6	BMEXBP0602
10	BMEXBP1002
1. Product Version (PV) 02 or later.	

Cable Management Kits (CMK)

Figure 39:



Item	Description
1	Sub-base
2	Metallic bar
3	Spring clamp ring, small
4	Spring clamp ring, large

Description	Part Number
CMK for 4 slot X80 backplane	990CMQUAX80040
CMK for 6 slot X80 backplane	990CMQUAX80060
CMK for 8 slot X80 backplane	990CMQUAX80080
CMK for 12 slot X80 backplane	990CMQUAX80120
CMK for 6 slot X80 backplane with dual power supplies	990CMQUAX80080
CMK for 10 slot X80 backplane with dual power supplies	990CMQUAX80120
Optional Spring Clamping Rings, small (lots of 10)	STBXSP3010
Optional Spring Clamping Rings, large (lots of 10)	STBXSP3020

I/O Adapter Replacement Cables

X80 Replacement Cables	
Description	Part Number
High Power I/O Adapter Replacement Cable 2 ft	990X80CABLE016
High Power I/O Adapter Replacement Cable 5 ft	990X80CABLE516
High Power I/O Adapter Replacement Pig Tail Cable 2 ft	990X80CABL016PT
High Power I/O Adapter Replacement Pig Tail Cable 5 ft	990X80CABL516PT
High Density I/O Adapter Replacement Cable 2 ft	990X80CABLE017
High Density I/O Adapter Replacement Cable 5 ft	990X80CABLE517
High Density I/O Adapter Replacement Pig Tail Cable 2 ft	990X80CABL017PT
High Density I/O Adapter Replacement Pig Tail Cable 5 ft	990X80CABL517PT
Analog/ Shielded I/O Adapter Replacement Cable 2 ft	990X80CABLE018
Analog/ Shielded I/O Adapter Replacement Cable 5 ft	990X80CABLE518
Analog/ Shielded I/O Adapter Replacement Pig Tail Cable 2 ft	990X80CABL018PT
Analog/ Shielded I/O Adapter Replacement Pig Tail Cable 5 ft	990X80CABL518PT
Analog/ Shielded I/O Adapter Replacement Cable 28 pin conn., 2 ft	990X80CABL019
Analog/ Shielded I/O Adapter Replacement Cable 28 pin conn., 5 ft	990X80CABL519
High Power I/O Adapter Replacement Cable 40 pin conn., 2 ft	990X80CABL021
High Power I/O Adapter Replacement Cable 40 pin conn., 5 ft	990X80CABL521
High Density I/O Adapter Replacement Cable 40 pin conn., 2 ft	990X80CABL023
High Density I/O Adapter Replacement Cable 40 pin conn., 5 ft	990X80CABL523

I/O Adapter Replacement Cable Details

990X80CABL family of cables:

High Power 990X80CABLEx16 990X80CABLx16PT 990X80CABLEx21 ¹ 990X80CABLx21PT ¹		High Density 990X80CABLEx17 990X80CABLx17PT 990X80CABLEx23 ²		Analog 990X80CABLE- x18990X80CABLx18PT990X80CA- BLEx19	
Wire #	Wire Color	Wire #	Wire Color	Wire #	Wire Color
1	Black	1	Black	1	Black
2	Brown	2	Brown	2	Brown
3	Red	3	Red	3	Red
4	Orange	4	Orange	4	Orange
5	Yellow	5	Yellow	5	Yellow
6	Green	6	Green	6	Green
7	Blue	7	Blue	7	Blue
8	Purple	8	Purple	8	Purple
9	Gray	9	Gray	9	Gray
10	White	10	White	10	White
11	Pink	11	White - Black	11	White - Black
12	Light Green	12	White - Brown	12	White - Brown
13	Black - White	13	White - Red	13	White - Red
14	Brown - White	14	White - Orange	14	White - Orange
15	Red - White	15	White - Yellow	15	White - Yellow
16	Orange - White	16	White - Green	16	White - Green
17	Green - White	17	White - Blue	17	White - Blue
18	Blue - White	18	White - Violet	18	White - Violet
19	Yellow - White	19	White - Gray	19	White - Gray
20	Purple - White	20	Brown - Black	20	Brown - Black
-	-	-	-	None (Shield)	Black Wire with Ring Lug

1. Cable 990X80CABLx21 has two cables that connect to the 40 pin X80 field connector. The second cable(B) has the same wire # and color but connected to pins 21...40 of the X80 field connector.

2. Cable 990X80CABLx23 has two cables that connect to the 40 pin X80 field connector. The second cable(B) has the same wire # and color but connected to pins 21...40 of the X80 field connector.

BMXFCW301S cable:

40 Position High Density Connector Pin Number	Wire Color
B19	White - Blue
A19	White - Amber
B18	Blue - White
A18	Amber - White
B17	White - Brown
A17	Brown - White
B16	White - Green
A16	Green - White
B12	Red - Blue
A12	Blue - Red
B11	White - Gray
A11	Gray - White
B7	Red - Green
A7	Green - Red
B6	Red - Amber
A6	Amber - Red
B2	Red - Gray
A2	Gray - Red
B1	Red - Brown
A1	Brown - Red
NOTE: 40 position high density connector pin numbers not listed do not have wires connected.	

Module Replacement Table

Quantum #	X80 #	I/O Adapter part number 2FT/5FT	I/O Adapter Type	Wiring Map	Wiring Guide
140ACI03000 ²	BMXAMI0810	990ADQUAX80112/113	I/O Adapter and cable [2FT (61 cm), 5FT (152 cm)]	A	—

Quantum #	X80 #	I/O Adapter part number 2FT/5FT	I/O Adapter Type	Wiring Map	Wiring Guide
	BMXAMI0800		I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	A	—
140ACI04000 ²	(x2) BMXAMI0810	990ADQUAX80226/227	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	B	—
	(x2) BMXAMI0800		I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	B	—
140AVI03000	BMXAMI0810	990ADQUAX80112/113	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	A	—
140ARI03010	BMXART0814	990ADQUAX80102	I/O Adapter and BMXFCW301S cable (FCN40 style)	—	2
140ATI03000	BMXART0814	990ADQUAX80102	User defined ¹	—	—
140ACO02000	BMXAMO0410	990ADQUAX80122/123	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	C	—
140ACO13000	BMXAMO0802	990ADQUAX80138/139	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	D	—
140AVO02000	BMXAMO0410	990ADQUAX80142/143	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	1
140AMM09000 ²	BMXAMM0600	990ADQUAX80142/143	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	10
140DAI34000	BMXDAI1602	990ADQUAX80130/131	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	E	—
	BMXDAI1603		I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	E	—
140DAI35300	(x2) BMXDAI1602	990ADQUAX80100/101	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	F	—
140DAI44000	BMXDAI1603	990ADQUAX80130/131	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	E	—
140DAI45300	(x2) BMXDAI1603	990ADQUAX80100/101	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	F	—
140DAI54000	BMXDAI1614	990ADQUAX80110/111	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	G	—
140DAI54300	BMXDAI1614	990ADQUAX80136/137	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	H	—
140DAI55300	(x2) BMXDAI1604	990ADQUAX80204/205	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	I	—

Quantum #	X80 #	I/O Adapter part number 2FT/5FT	I/O Adapter Type	Wiring Map	Wiring Guide
140DAI74000	BMXDAI1615	990ADQUAX80110/111	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	G	—
140DAI75300	(x2) BMXDAI1615	990ADQUAX80218/219	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	3
140DDI35300	(x2) BMXDDI1602	990ADQUAX80100/101	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	F	—
	BMXDDI3202K	990ADQUAX80120/121	Front Mount Adapter	J	—
	BMXDDI3232	990ADQUAX80150/151	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	S	—
140DDI35310	(x2) BMXDAI1602	990ADQUAX80224/225	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	4
	BMXDDI3232	990ADQUAX80152/153	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	T	—
140DDI67300	(x2) BMXDDI1604T	990ADQUAX80216/217	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	5
140DDI84100	BMXDDI1602	990ADQUAX80132/133	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	K	—
	BMXDDI1603		I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	K	—
140DDI85300	(x2) BMXDDI160224 VDC	990ADQUAX80100/101	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	F	—
	(x2) BMXDDI160348 VDC		I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	F	—
	BMXDDI3232< 45 VDC	990ADQUAX80150/151	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	S	—
	BMXDDI3203≥ 45 VDC	990ADQUAX80154/155	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	U	—
140DAO84000	BMXDAO1615	990ADQUAX80108/109	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	L	—
140DAO84010	BMXDAO1615	990ADQUAX80108/109	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	L	—
140DAO84210	BMXDAO1615	990ADQUAX80140/141	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	M	—
140DAO84220	BMXDAO1615	990ADQUAX80140/141	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	M	—
140DAO85300	(x2) BMXDAO1605	990ADQUAX80214/215	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	N	—

Quantum #	X80 #	I/O Adapter part number 2FT/5FT	I/O Adapter Type	Wiring Map	Wiring Guide
140DDO35300	(x2) BMXDDO1602	990ADQUAX80206/207	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	O	—
140DDO35301	(x2) BMXDDO1602	990ADQUAX80206/207	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	O	—
140DDO35310	(x2) BMXDDO1612	990ADQUAX80206/207	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	O	—
140DDO84300	BMXDDO1602	990ADQUAX80116/117	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	6
	(x2) BMXDRA0815	990ADQUAX80216/217	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	7
140DDO88500	(x2) BMXDRA0815	990ADQUAX80216/217	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	8
140DRA84000	(x2) BMXDRA0815	990ADQUAX80228/229	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	P	—
140DRC83000	BMXDRC0805	990ADQUAX80134/135	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	Q	—
140DDO36400	BMXDDO3202K and BMXDDO6402K	990ADQUAX80246	Front Mount Adapters	R	—
140DDI36400	BMXDDI3202K and BMXDDI6402K	990ADQUAX80246	Front Mount Adapters	R	—
140DDM39000	(x2) BMXDDM16022	990ADQUAX80224/225	I/O Adapter and cable[2FT (61 cm), 5FT (152 cm)]	—	9
140EHC10500	BMXEHC0200	N/A	—	—	—
140EHC20200	BMXEHC0200	N/A	—	—	—
140ESI06210	BMXNOM0200	N/A	—	—	—
140ERT85410	BMXERT1604T	N/A	—	—	—
140ERT85420	BMXERT1604T	N/A	—	—	—

1: In some cases X80 module BMXART0814 may be a suitable replacement for the 140ATI03000. The Cold Junction differences must be evaluated prior to the modernization. If the user *determines* that the BMXART0814 is an acceptable replacement for their installation, they can use Generic Adapter 990ADQUAX80102 for the modernization. The user will need to determine the appropriate wiring for their installation.

2: The Quantum module is HART tolerant, the recommended X80 module is not. The X80 module is not recommend for direct replacement of the Quantum module where HART is incorporated into the analog channel wiring. The X80 module can be used if additional filtering is incorporated into the analog channel wiring, or the X80 HART module can be used. (Contact ModiconMigrations@schneider-electric.com for additional information).

Quantum I/O Modules with No X80 replacement:

Quantum I/O Reference	Description
140AI33000	Intrinsically Safe Analog Input Module
140AI33010	Intrinsically Safe Current Input Module
140AI033000	Intrinsically Safe Analog Output Module
140DAM59000	Quantum Input/Output AC Input 115 Vac 2x8 / AC Output 115 Vac (2x4)
140DDM69000	125 VDC Input/High Power Output Module
140DDI15310	Input 5 V TTL 4x8 Source Module
140DSI35300	DC 24V Supervised Input Module
140DII33000	Intrinsically Safe Discrete Input Module
140DDO15310	5 V TTL 4x8 Sink Module
140DVO85300	Verified 10-30 VDC Output Module
140DIO33000	Intrinsically Safe Discrete Output Module
140DCF07700	DCF Clock
140ERT85410	Time Stamp Module
140ERT85420	Smart Time Module IRIGB/ DCF77
140HLI34000	High Speed Interrupt Module
140MSB10100	Quantum Single Axis Motion Modules
140MSC10100	Quantum Single Axis Motion Modules
140MMS42501	Quantum Multi Axis Sercos Motion Modules
140MMS53502	Quantum Multi Axis Sercos Motion Modules

Dedicated I/O Adapter Wiring Maps

Wiring Map A: Quantum to 990ADQUAX80112, 990ADQUAX80113

NOTE: This Quantum module is HART compatible; the recommended X80 module is not. The X80 module is not recommend for direct replacement of the Quantum module where HART is incorporated into the analog channel wiring. The X80 module can be used if additional filtering is incorporated into the analog channel wiring.

Wiring Map A 990ADQUAX80112/113 140Axl03000 -> BMXAMI08x0 Analog Input, 8 Channel 990X80CABLx19 Analog Cable, 28 pin X80 connector				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
In 1 +	1	->	3	VI0
In 1 -	2	->	2	COM0
In 1 Sense	3	->	1 ¹	II0
N/C	4		-	-
In 2 +	5	->	4	VI1
In 2 -	6	->	5	COM1
In 2 Sense	7	->	6 ¹	II1
N/C	8		-	-
N/C	9		-	-
N/C	10		-	-
In 3 +	11	->	9	VI2
In 3 -	12	->	8	COM2
In 3 Sense	13	->	7 ¹	II2
N/C	14		-	-
In 4 +	15	->	10	VI3
In 4 -	16	->	11	COM3
In 4 Sense	17	->	12 ¹	II3
N/C	18		-	-
N/C	19		-	-
N/C	20		-	-

Wiring Map A 990ADQUAX80112/113 140AxI03000 -> BMXAMI08x0 Analog Input, 8 Channel 990X80CABLx19 Analog Cable, 28 pin X80 connector				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
In 5 +	21	->	17	VI4
In 5 -	22	->	16	COM4
In 5 Sense	23	->	15 ¹	II4
N/C	24		-	-
In 6 +	25	->	18	VI5
In 6 -	26	->	19	COM5
In 6 Sense	27	->	20 ¹	II5
N/C	28		-	-
N/C	29		-	-
N/C	30		-	-
In 7 +	31	->	23	VI6
In 7 -	32	->	22	COM6
In 7 Sense	33	->	21 ¹	II6
N/C	34		-	-
In 8 +	35	->	24	VI7
In 8 -	36	->	25	COM7
In 8 Sense	37	->	26 ¹	II7
N/C	38		-	-
N/C	39		-	-
N/C	40		-	-

1. If the jumper is installed on the Quantum field connector the jumper connection is brought over to this X80 module pin via PCB/ cable wiring.

Wiring Map B: Quantum to 990ADQUAX80226, 990ADQUAX80227

NOTE: This Quantum module is HART compatible; the recommended X80 module is not. The X80 module is not recommend for direct replacement of the Quantum module where HART is incorporated into the analog channel wiring. The X80 module can be used if additional filtering is incorporated into the analog channel wiring.

Wiring Map B 990ADQUAX80226/227 140ACI04000 -> (x2) BMXAMI08x0 Analog Input, 16 Channel 990X80CABLx19 Analog Cable, 28 pin X80 connector						
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	CABLE	MODULE
In 1 +	1	->	1,3	II0	A1	X80 MODULE 1
In 1 -	2	->	2	COM0		
In 2 +	3	->	4,6	II1		
In 2 -	4	->	5	COM1		
In 3 +	5	->	7,9	II2		
In 3 -	6	->	8	COM2		
In 4 +	7	->	10,12	II3		
In 4 -	8	->	11	COM3		
N/C	9		-	-	B1	
N/C	10		-	-		
In 5 +	11	->	15,17	II4		
In 5 -	12	->	16	COM4		
In 6 +	13	->	18,20	II5		
In 6 -	14	->	19	COM5		
In 7 +	15	->	21,23	II6		
In 7 -	16	->	22	COM6		
In 8 +	17	->	24,26	II7		
In 8 -	18	->	25	COM7		
N/C	19		-	-		
N/C	20		-	-		

Wiring Map B 990ADQUAX80226/227 140ACI04000 -> (x2) BMXAMI08x0 Analog Input, 16 Channel 990X80CABLx19 Analog Cable, 28 pin X80 connector						
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	CABLE	MODULE
In 9 +	21	->	1,3	II0	A2	X80 MODULE 2
In 9 -	22	->	2	COM0		
In 10 +	23	->	4,6	II1		
In 10 -	24	->	5	COM1		
In 11 +	25	->	7,9	II2		
In 11 -	26	->	8	COM2		
In 12 +	27	->	10,12	II3		
In 12 -	28	->	11	COM3		
N/C	29		-	-		
N/C	30		-	-		
In 13 +	31	->	15,17	II4	B2	
In 13 -	32	->	16	COM4		
In 14 +	33	->	18,20	II5		
In 14 -	34	->	19	COM5		
In 15 +	35	->	21,23	II6		
In 15 -	36	->	22	COM6		
In 16 +	37	->	24,26	II7		
In 16 -	38	->	25	COM7		
N/C	39		-	-		
N/C	40		-	-		

Wiring Map C: Quantum to 990ADQUAX80122, 990ADQUAX80123

NOTICE

RISK OF UNINTENDED OPERATION

The current loops on this X80 module are self-powered by the output channels and do not require any external supplies. Disconnect each of the analog output channel wires from its loop power supply, then connect the individual channel wires together.

Failure to follow these instructions can result in equipment damage.

Wiring Map C
990ADQUAX80122/123
140ACO02000 -> BMXAMO0410
Analog Output, 4 Channel
990X80CABLEx18 Analog Cable, 20 pin X80 connector

Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
Monitor 1	1		-	-
I Source 1 -	2	->	1	COM0
N/C	3		-	-
I Source 1 -	4	->	1	COM0
N/C	5		-	-
N/C	6		-	-
N/C	7		-	-
N/C	8		-	-
I Sink 1 +	9	->	2	U/I0
I Source 1 -	10	->	1	COM0
Monitor 2	11		-	-
I Source 2 -	12	->	7	COM1
N/C	13		-	-
I Source 2 -	14	->	7	COM1
N/C	15		-	-
N/C	16		-	-
N/C	17		-	-
N/C	18		-	-
I Sink 2 +	19	->	8	U/I1

Wiring Map C 990ADQUAX80122/123 140ACO02000 -> BMXAMO0410 Analog Output, 4 Channel 990X80CABLEx18 Analog Cable, 20 pin X80 connector				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
I Source 2 -	20	->	7	COM1
Monitor 3	21		-	-
I Source 3 -	22	->	11	COM2
N/C	23		-	-
I Source 3 -	24	->	11	COM2
N/C	25		-	-
N/C	26		-	-
N/C	27		-	-
N/C	28		-	-
I Sink 3 +	29	->	12	U/12
I Source 3 -	30	->	11	COM2
Monitor 4	31		-	-
I Source 4 -	32	->	17	COM3
N/C	33		-	-
I Source 4 -	34	->	17	COM3
N/C	35		-	-
N/C	36		-	-
N/C	37		-	-
N/C	38		-	-
I Sink 4 +	39	->	18	U/13
I Source 4 -	40	->	17	COM3
NOTE: Remove the loop supply. The X80 module has a built in loop supply.				

Wiring Map D: Quantum to 990ADQUAX80138, 990ADQUAX80139

NOTICE

RISK OF UNINTENDED OPERATION

The current loops on this X80 module are self-powered by the output channels and do not require any external supplies. Disconnect each of the analog output channel wires from its loop power supply, then connect the individual channel wires together.

Failure to follow these instructions can result in equipment damage.

Wiring Map D
990ADQUAX80138/139140ACO13000 => BMXAMO0802
Analog Ouput, 8 Channel
990X80CABLE018 Analog Cable, 20 pin X80 connector

Quantum Signal	Quantum Pin #	=>	X80 Pin #	X80 Signal
Monitor 1	1			
Ret	2	=>	3	I 0
N/C	3			
O 1 Sink	4	=>	4	Com 0
Monitor 2	5			
Ret	6	=>	5	I 1
N/C	7			
O 2 Sink	8	=>	6	Com 1
N/C	9			
N/C	10			
Monitor 3	11			
Ret	12	=>	7	I 2
N/C	13			
O 3 Sink	14	=>	8	Com 2
Monitor 4	15			
Ret	16	=>	9	I 3
N/C	17			
O 4 Sink	18	=>	10	Com 3
N/C	19			

Wiring Map D 990ADQUAX80138/139140ACO13000 => BMXAMO0802 Analog Ouput, 8 Channel 990X80CABLE018 Analog Cable, 20 pin X80 connector				
Quantum Signal	Quantum Pin #	=>	X80 Pin #	X80 Signal
N/C	20			
Monitor 5	21			
Ret	22	=>	11	I 4
N/C	23			
O 5 Sink	24	=>	12	Com 4
Monitor 6	25			
Ret	26	=>	13	I 5
N/C	27			
O 6 Sink	28	=>	14	Com 5
N/C	29			
N/C	30			
Monitor 7	31			
Ret	32	=>	15	I 6
N/C	33			
O 7 Sink	34	=>	16	Com 6
Monitor 8	35			
Ret	36	=>	17	I 7
N/C	37			
O 8 Sink	38	=>	18	Com 7
N/C	39			
N/C	40			
NOTE: Remove the loop supply, The X80 module has a built in loop supply.				

Wiring Map E: Quantum to 990ADQUAX80130, 990ADQUAX80131

⚠ CAUTION

RISK OF UNINTENDED OPERATION

This I/O adapter assembly combines all Quantum input point VAC Neutrals (Returns). The X80 replacement module has one group of 16 inputs, unlike the Quantum module which has 16 isolated inputs. Verify that the point neutrals can be connected together. If not, do not use this I/O adapter.

Failure to follow these instructions can result in injury or equipment damage.

Wiring Map E 990ADQUAX80130/131 140DAI34000/44000 -> BMXDAI1602/1603 Discrete Input 16 point Isolated (16x1), 24/48 VAC 990X80CABLEx17 High Density Cable, 20 pin X80 connector Fused: F0.5AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
In 1	1	->	1	I0
Ret 1	2	->	17,19	Neu/Return
In 2	3	->	2	I1
Ret 2	4	->	17,19	Neu/Return
In 3	5	->	3	I2
Ret 3	6	->	17,19	Neu/Return
In 4	7	->	4	I3
Ret 4	8	->	17,19	Neu/Return
N/C	9		–	–
N/C	10		–	–
In 5	11	->	5	I4
Ret 5	12	->	17,19	Neu/Return
In 6	13	->	6	I5
Ret 6	14	->	17,19	Neu/Return
In 7	15	->	7	I6
Ret 7	16	->	17,19	Neu/Return
In 8	17	->	8	I7

Wiring Map E 990ADQUAX80130/131 140DAI34000/44000 -> BMXDAI1602/1603 Discrete Input 16 point Isolated (16x1), 24/48 VAC 990X80CABLEx17 High Density Cable, 20 pin X80 connector Fused: F0.5AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
Ret 8	18	->	17,19	Neu/Return
N/C	19		-	-
N/C	20		-	-
In 9	21	->	9	I8
Ret 9	22	->	17,19	Neu/Return
In 10	23	->	10	I9
Ret 10	24	->	17,19	Neu/Return
In 11	25	->	11	I10
Ret 11	26	->	17,19	Neu/Return
In 12	27	->	12	I11
Ret 12	28	->	17,19	Neu/Return
N/C	29		-	-
N/C	30		-	-
In 13	31	->	13	I12
Ret 13	32	->	17,19	Neu/Return
In 14	33	->	14	I13
Ret 14	34	->	17,19	Neu/Return
In 15	35	->	15	I14
Ret 15	36	->	17,19	Neu/Return
In 16	37	->	16	I15
Ret 16	38	->	17,19	Neu/Return
N/C	39		-	-
N/C	40	F1	18,20 ¹	AC Hot

1. The X80 module requires the connection of AC Hot to operate. Connect either to the Quantum field connector to utilize the on-board fuse, or directly to the X80 module, in which case it is recommended that an external fuse be installed (consult X80 I/O module manual for details).

Wiring Map F: Quantum to 990ADQUAX80100, 990ADQUAX80101

⚠ CAUTION

RISK OF UNINTENDED OPERATION

This I/O adapter assembly combines the Quantum groups A & B VAC Neutrals/ DC commons and groups C & D VAC Neutrals/ VDC commons. Each of the two X80 replacement module has one group of 16 inputs, unlike the Quantum module which had 4 groups of 8 inputs. Verify that the point neutrals/commons can be connected together. If not, do not use this I/O adapter.

Failure to follow these instructions can result in injury or equipment damage.

<p style="text-align: center;">Map F 990ADQUAX80100/101 140DAI35300/45300 -> (x2) BMXDAI1602/1603 OR 140DDI35300/85300 -> (x2) BMXDDI1602/1603 Discrete Input 32 point (4x8), 24 VAC, 24 VDC or 10...60 VDC 990X80CABLEx17 High Density Cable, 20 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module #
In 1	1	->	1	I0	X80 MODULE 1
In 2	2	->	2	I1	
In 3	3	->	3	I2	
In 4	4	->	4	I3	
In 5	5	->	5	I4	
In 6	6	->	6	I5	
In 7	7	->	7	I6	
In 8	8	->	8	I7	
Com. Group A	9	->	17,19	Neu/Return	
N/C	10	F1	18,20 ¹	AC Hot, DC +	
In 9	11	->	9	I8	
In 10	12	->	10	I9	
In 11	13	->	11	I10	
In 12	14	->	12	I11	
In 13	15	->	13	I12	
In 14	16	->	14	I13	
In 15	17	->	15	I14	
In 16	18	->	16	I15	
Com. Group B	19	->	17,19	Neu/Return	
N/C	20	F1	18,20 ¹	AC Hot, DC +	

Map F 990ADQUAX80100/101 140DAI35300/45300 -> (x2) BMXDAI1602/1603 OR 140DDI35300/85300 -> (x2) BMXDDI1602/1603 Discrete Input 32 point (4x8), 24 VAC, 24 VDC or 10...60 VDC 990X80CABLEx17 High Density Cable, 20 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module #
In 17	21	->	1	I0	X80 MODULE 2
In 18	22	->	2	I1	
In 19	23	->	3	I2	
In 20	24	->	4	I3	
In 21	25	->	5	I4	
In 22	26	->	6	I5	
In 23	27	->	7	I6	
In 24	28	->	8	I7	
Com. Group C	29	->	17,19	Neu/Return	
N/C	30	F2	18,20 ¹	AC Hot, DC +	
In 25	31	->	9	I8	
In 26	32	->	10	I9	
In 27	33	->	11	I10	
In 28	34	->	12	I11	
In 29	35	->	13	I12	
In 30	36	->	14	I13	
In 31	37	->	15	I14	
In 32	38	->	16	I15	
Com. Group D	39	->	17,19	Neu/Return	
N/C	40	F2	18,20 ¹	AC Hot, DC +	

1. The X80 module requires the connection of AC Hot or DC+ to operate. Connect either to the Quantum field connector to utilize the on-board fuse, or directly to the X80 module, in which case it is recommended that an external fuse be installed (consult X80 I/O module manual for details).

Wiring Map G: Quantum to 990ADQUAX80110, 990ADQUAX80111

Map G 990ADQUAX80110/111 140DAI54000/74000 -> BMXDAI1614/1615 Discrete Input 16 point Isolated (16x1), 115 VAC or 220 VAC Discrete 990X80CABLx21 High Power Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
In 1	1	F1	1	I0
Ret 1	2	->	2	Neu0
In 2	3	F2	3	I1
Ret 2	4	->	4	Neu1
In 3	5	F3	5	I2
Ret 3	6	->	6	Neu2
In 4	7	F4	7	I3
Ret 4	8	->	8	Neu3
N/C	9	->	9	-
N/C	10	->	10	-
In 5	11	F5	11	I4
Ret 5	12	->	12	Neu4
In 6	13	F6	13	I5
Ret 6	14	->	14	Neu5
In 7	15	F7	15	I6
Ret 7	16	->	16	Neu6
In 8	17	F8	17	I7
Ret 8	18	->	18	Neu7
N/C	19	->	19	-
N/C	20	->	20	-
In 9	21	F9	21	I8
Ret 9	22	->	22	Neu8
In 10	23	F10	23	I9
Ret 10	24	->	24	Neu9
In 11	25	F11	25	I10

Map G 990ADQUAX80110/111 140DAI54000/74000 -> BMXDAI1614/1615 Discrete Input 16 point Isolated (16x1), 115 VAC or 220 VAC Discrete 990X80CABLx21 High Power Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
Ret 11	26	->	26	Neu10
In 12	27	F12	27	I11
Ret 12	28	->	28	Neu11
N/C	29	->	29	-
N/C	30	->	30	-
In 13	31	F13	31	I12
Ret 13	32	->	32	Neu12
In 14	33	F14	33	I13
Ret 14	34	->	34	Neu13
In 15	35	F15	35	I14
Ret 15	36	->	36	Neu14
In 16	37	F16	37	I15
Ret 16	38	->	38,40	Neu15
N/C	39	->	39 ¹	-
N/C	40	->	-	AC Hot

1. The X80 module requires the connection of AC Hot to operate. Connect either to the Quantum field connector to utilize the on-board fuse, or directly to the X80 module, in which case it is recommended that an external fuse be installed (consult X80 I/O module manual for details).

Wiring Map H: Quantum to 990ADQUAX80136, 990ADQUAX80137

Map H 990ADQUAX80136/137 140DAI54300 -> BMXDAI1614 Discrete Input 16 point (2x8), 120 VAC 990X80CABLEx21 High Power Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
In 1	1	->	1	I0
N/C	2		-	-
In 2	3	->	3	I1
N/C	4		-	-
In 3	5	->	5	I2
N/C	6		-	-
In 4	7	->	7	I3
N/C	8		-	-
N/C	9		-	-
N/C	10		-	-
In 5	11	->	11	I4
N/C	12		-	-
In 6	13	->	13	I5
N/C	14		-	-
In 7	15	->	15	I6
N/C	16		-	-
In 8	17	->	17	I7
N/C	18		-	-
Ret A	19	F1	2,4,6,8,12,14,16,18	Neu0-7
N/C	20		-	-
In 9	21	->	21	I8
N/C	22		-	-
In 10	23	->	23	I9
N/C	24		-	-
In 11	25	->	25	I10

Map H 990ADQUAX80136/137 140DAI54300 -> BMXDAI1614 Discrete Input 16 point (2x8), 120 VAC 990X80CABLEx21 High Power Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
N/C	26		-	-
In 12	27	->	27	I11
N/C	28		-	-
N/C	29		-	-
N/C	30		-	-
In 13	31	->	31	I12
N/C	32		-	-
In 14	33	->	33	I13
N/C	34		-	-
In 15	35	->	35	I14
N/C	36		-	-
In 16	37	->	37	I15
N/C	38		-	-
Ret B	39	F2	22,24,26,28,32,34,36,38	Neu8-15
N/C	40	F3	39 ¹	AC Hot
1. The X80 module requires the connection of AC Hot to operate. Connect either to the Quantum field connector to utilize the on-board fuse, or directly to the X80 module, in which case it is recommended that an external fuse be installed (consult X80 I/O module manual for details).				

Wiring Map I: Quantum to 990ADQUAX80204, 990ADQUAX80205

⚠ CAUTION

RISK OF UNINTENDED OPERATION

This I/O adapter assembly combines the Quantum groups A & B VAC Neutrals and C & D VAC Neutrals. The X80 replacement modules have one group of 16 inputs, unlike the Quantum module which had 2 groups of 8 inputs. Verify that the point neutrals can be connected together. If not, do not use this I/O adapter.

Failure to follow these instructions can result in injury or equipment damage.

Map I 990ADQUAX80204/205 140DAI55300 -> (x2) BMXDAI1604 Discrete Input 32 point (4x8), 115 VAC 990x80CABLEX16 High Power Cable, 20 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	MODULE
In 1	1	->	1	I0	X80 MODULE 1
In 2	2	->	2	I1	
In 3	3	->	3	I2	
In 4	4	->	4	I3	
In 5	5	->	5	I4	
In 6	6	->	6	I5	
In 7	7	->	7	I6	
In 8	8	->	8	I7	
Group A Com	9	->	17,19	Neu	
N/C	10	F1 ¹	18,20	AC Hot	
In 9	11	->	9	I8	
In 10	12	->	10	I9	
In 11	13	->	11	I10	
In 12	14	->	12	I11	
In 13	15	->	13	I12	
In 14	16	->	14	I13	
In 15	17	->	15	I14	
In 16	18	->	16	I15	
Group B Com	19	->	17,19	Neu	
N/C	20	F1 ¹	18,20	AC Hot	

<p align="center">Map I 990ADQUAX80204/205 140DAI55300 -> (x2) BMXDAI1604 Discrete Input 32 point (4x8), 115 VAC 990x80CABLEX16 High Power Cable, 20 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	MODULE
In 17	21	->	1	I0	X80 MODULE 2
In 18	22	->	2	I1	
In 19	23	->	3	I2	
In 20	24	->	4	I3	
In 21	25	->	5	I4	
In 22	26	->	6	I5	
In 23	27	->	7	I6	
In 24	28	->	8	I7	
Group C Com	29	->	17,19	Neu	
N/C	30	F2 ¹	18,20	AC Hot	
In 25	31	->	9	I8	
In 26	32	->	10	I9	
In 27	33	->	11	I10	
In 28	34	->	12	I11	
In 29	35	->	13	I12	
In 30	36	->	14	I13	
In 31	37	->	15	I14	
In 32	38	->	16	I15	
Group D Com	39	->	17,19	Neu	
N/C	40	F2 ¹	18,20	AC Hot	

1. The X80 module requires the connection of AC Hot to operate. Connect either to the Quantum field connector to utilize the on-board fuse, or directly to the X80 module, in which case it is recommended that an external fuse be installed (consult X80 I/O module manual for details).

Wiring Map J: Quantum to 990ADQUAX80120, 990ADQUAX80121

Map J 990ADQUAX80120/121 140DDI35300 => BMXDDI3202K Discrete Input 32 point (2x16) Sink, 24 VDC TSXCDP102 (1M)/TSXCDP202 (2M) FCN40 Connector Cable Fuse = F0.5AL250V (TR5 Package style) Pin B20 is top left, Pin A20 is top right on X80's FCN40 Conn.					
Quantum Signal	Quantum Pin #	=>	X80 PIN #	X80 Signal	Connections
In 1	1	=>	B20	I 0	Cable A I/O Adapter conn. A => 990AD- PREX80108 Top conn.
In 2	2	=>	A20	I 1	
In 3	3	=>	B19	I 2	
In 4	4	=>	A19	I 3	
In 5	5	=>	B18	I 4	
In 6	6	=>	A18	I 5	
In 7	7	=>	B17	I 6	
In 8	8	=>	A17	I 7	
Com. Grp A	9	=>	A12, A11	SPS 1-	
N/C	10 ¹	F1	B12, B11	SPS 1+	
In 9	11	=>	B16	I 8	
In 10	12	=>	A16	I 9	
In 11	13	=>	B15	I 10	
In 12	14	=>	A15	I 11	
In 13	15	=>	B14	I 12	
In 14	16	=>	A14	I 13	
In 15	17	=>	B13	I 14	
In 16	18	=>	A13	I 15	
Com. Grp B	19	=>	A12, A11	SPS 1-	
N/C	20 ¹	F1	B12, B11	SPS 1+	

<p align="center">Map J 990ADQUAX80120/121 140DDI35300 => BMXDDI3202K Discrete Input 32 point (2x16) Sink, 24 VDC TSXCDP102 (1M)/TSXCDP202 (2M) FCN40 Connector Cable Fuse = F0.5AL250V (TR5 Package style) Pin B20 is top left, Pin A20 is top right on X80's FCN40 Conn.</p>					
Quantum Signal	Quantum Pin #	=>	X80 PIN #	X80 Signal	Connections
In 17	21	=>	B10	I 16	<p align="center">Cable B</p> <p align="center">I/O Adapter conn. B => 990AD- PREX80108 Bottom conn.</p>
In 18	22	=>	A10	I 17	
In 19	23	=>	B9	I 18	
In 20	24	=>	A9	I 19	
In 21	25	=>	B8	I 20	
In 22	26	=>	A8	I 21	
In 23	27	=>	B7	I 22	
In 24	28	=>	A7	I 23	
Com. Grp C	29	=>	A2, A1	SPS 2-	
N/C	30 ¹	F2	B2, B1	SPS 2+	
In 25	31	=>	B6	I 24	
In 26	32	=>	A6	I 25	
In 27	33	=>	B5	I 26	
In 28	34	=>	A5	I 27	
In 29	35	=>	B4	I 28	
In 30	36	=>	A4	I 29	
In 31	37	=>	B3	I 30	
In 32	38	=>	A3	I 31	
Com. Grp D	39	=>	A2, A1	SPS 2-	
N/C	40	F2	B2, B1 ¹	SPS 2+	

1. The X80 module requires the connection of +24 VDC to operate. Connect either to the Quantum field connector to utilize the on-board fuse, or directly to the X80 module, in which case it is recommended that an external fuse be installed (consult X80 I/O module manual for details).

Wiring Map K: Quantum to 990ADQUAX80132, 990ADQUAX80133

⚠ CAUTION

RISK OF UNINTENDED OPERATION

This I/O adapter assembly combines the Quantum groups A,B,C,D,E,F,G & H +24 VDCs. It also combines the Quantum groups A,B,C,D,E,F,G & H Returns. The X80 replacement module has one group of 16 inputs, unlike the Quantum module which had 8 groups of 2 inputs. Verify that the point commons can be connected together. If not, do not use this I/O adapter.

Failure to follow these instructions can result in injury or equipment damage.

Map K
990ADQUAX80132/133
140DDI84100 -> BMXDDI1602/ 1603
Discrete Input 16 point (8x2) Sink, 10-60 VDC
990X80CABLEx17 High Density Cable, 20 pin X80 connector
Fuse = F0.5AL250V(TR5 Package style)

Quantum Signal	Quantum Pin #		X80 Pin #	X80 Signal
In 1	1	->	1	I0
In 2	2	->	2	I1
Group A Com	3	->	17,19	Ret
Group A Supply	4	F1	18,20	DC+
In 3	5	->	3	I2
In 4	6	->	4	I3
Group B Com	7	->	17,19	Ret
Group B Supply	8	F1	18,20	DC+
N/C	9		-	-
N/C	10		-	-
In 5	11	->	5	I4
In 6	12	->	6	I5
Group C Com	13	->	17,19	Ret
Group C Supply	14	F1	18,20	DC+
In 7	15	->	7	I6
In 8	16	->	8	I7

Map K 990ADQUAX80132/133 140DDI84100 -> BMXDDI1602/ 1603 Discrete Input 16 point (8x2) Sink, 10-60 VDC 990X80CABLEx17 High Density Cable, 20 pin X80 connector Fuse = F0.5AL250V(TR5 Package style)				
Quantum Signal	Quantum Pin #		X80 Pin #	X80 Signal
Group D Com	17	->	17,19	Ret
Group D Supply	18	F1	18,20	DC+
N/C	19		-	-
N/C	20		-	-
In 9	21	->	9	I8
In 10	22	->	10	I9
Group E Com	23	->	17,19	Ret
Group E Supply	24	F1	18,20	DC+
In 11	25	->	11	I10
In 12	26	->	12	I11
Group F Com	27	->	17,19	Ret
Group F Supply	28	F1	18,20	DC+
N/C	29		-	-
N/C	30		-	-
In 13	31	->	13	I12
In 14	32	->	14	I13
Group G Com	33	->	17,19	Ret
Group G Supply	34	F1	18,20	DC+
In 15	35	->	15	I14
In 16	36	->	16	I15
Group H Com	37	->	17,19	Ret
Group H Supply	38	F1	18,20	DC+
N/C	39		-	-
N/C	40		-	-

Wiring Map L: Quantum to 990ADQUAX80108, 990ADQUAX80109

Map L 990ADQUAX80108/109 (with MOV's) 140DAO840x0 -> BMXDAO1615 Discrete Output 16 point Isolated (16x1), 24...230 VAC 990X80CABLEx21 High Power Cable, 40 pin X80 connector				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
Out 1	1	->	1	Q0
Out 1 line	2	->	2	CO
Out 2	3	->	3	Q1
Out 2 line	4	->	4	C1
Out 3	5	->	5	Q2
Out 3 line	6	->	6	C2
Out 4	7	->	7	Q3
Out 4 line	8	->	8,10	C3
N/C	9		-	-
N/C	10		-	-
Out 5	11	->	11	Q4
Out 5 line	12	->	12	C4
Out 6	13	->	13	Q5
Out 6 line	14	->	14	C5
Out 7	15	->	15	Q6
Out 7 line	16	->	16	C6
Out 8	17	->	17	Q7
Out 8 line	18	->	18,20	C7
N/C	19		-	-
N/C	20		-	-
Out 9	21	->	21	Q8
Out 9 line	22	->	22	C8
Out 10	23	->	23	Q9
Out 10 line	24	->	24	C9
Out 11	25	->	25	Q10
Out 11 line	26	->	26	C10

Map L 990ADQUAX80108/109 (with MOV's) 140DAO840x0 -> BMXDAO1615 Discrete Output 16 point Isolated (16x1), 24...230 VAC 990X80CABLEx21 High Power Cable, 40 pin X80 connector				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
Out 12	27	->	27	Q11
Out 12 line	28	->	28,30	C11
N/C	29		-	-
N/C	30		-	-
Out 13	31	->	31	Q12
Out 13 line	32	->	32	C12
Out 14	33	->	33	Q13
Out 14 line	34	->	34	C13
Out 15	35	->	35	Q14
Out 15 line	36	->	36	C14
Out 16	37	->	37	Q15
Out 16 line	38	->	38,40	C15
N/C	39		-	-
N/C	40		-	-

Wiring Map M: Quantum to 990ADQUAX80140, 990ADQUAX80141

Map M 990ADQUAX80140/141 140DAO842x0 -> BMXDAO1615 Discrete Output 16 point Grouped (4x4), 24...115 VAC or 100...230 VAC 990X80CABLEx21 High Power Cable, 40 pin X80 connector Fuse = F4AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
Out 1	1	F1	1	Q0
N/C	2		-	-
Out 2	3	F2	3	Q1
N/C	4		-	-
Out 3	5	F3	5	Q2
N/C	6		-	-
Out 4	7	F4	7	Q3
N/C	8		-	-
Group A Com	9		-	-
Group A Hot	10	->	2,4,6,8	C0,C1,C2,C3
Out 5	11	F5	11	Q4
N/C	12		-	-
Out 6	13	F6	13	Q5
N/C	14		-	-
Out 7	15	F7	15	Q6
N/C	16		-	-
Out 8	17	F8	17	Q7
N/C	18		-	-
Group B Com	19		-	-
Group B Hot	20	->	12,14,16,18	C4,C5,C6,C7
Out 9	21	F9	21	Q8
N/C	22		-	-
Out 10	23	F10	23	Q9
N/C	24		-	-
Out 11	25	F11	25	Q10

Map M 990ADQUAX80140/141 140DAO842x0 -> BMXDAO1615 Discrete Output 16 point Grouped (4x4), 24...115 VAC or 100...230 VAC 990X80CABLEx21 High Power Cable, 40 pin X80 connector Fuse = F4AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
N/C	26		-	-
Out 12	27	F12	27	Q11
N/C	28		-	-
Group C Com	29		-	-
Group C Hot	30	->	22,24,26,28	C8,C9,C10,C11
Out 13	31	F13	31	Q12
N/C	32		-	-
Out 14	33	F14	33	Q13
N/C	34		-	-
Out 15	35	F15	35	Q14
N/C	36		-	-
Out 15	37	F16	37	Q15
N/C	38		-	-
Group D Com	39		-	-
Group D Hot	40	->	32,34,36,38	C12,C13,C14,C15

Wiring Map N: Quantum to 990ADQUAX80214, 990ADQUAX80215

Map N 990ADQUAX80214/215 140DAO85300 -> (x2) BMXDAO1605 Discrete Output 32 point Grouped (4x8), 230 VAC 990X80CABLEx16 High Power Cable, 20 pin X80 connector Fuse = F3.15AL250V(TR5 Package style)					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
Out 1	1	->	1	Q 0	X80 MODULE 1
Out 2	2	->	2	Q 1	
Out 3	3	->	3	Q 2	
Out 4	4	->	4	Q 3	
Out 5	5	->	6	Q 4	
Out 6	6	->	7	Q 5	
Out 7	7	->	8	Q 6	
Out 8	8	->	9	Q 7	
N/C	9		-	-	
Group A Hot	10	F1	5	AC Hot Group 1	
		F2	10	AC Hot Group 2	
Out 9	11	->	11	Q 8	
Out 10	12	->	12	Q 9	
Out 11	13	->	13	Q 10	
Out 12	14	->	14	Q 11	
Out 13	15	->	16	Q 12	
Out 14	16	->	17	Q 13	
Out 15	17	->	18	Q 14	
Out 16	18	->	19	Q 15	
N/C	19		-	-	
Group B Hot	20	F3	15	AC Hot Group 3	
		F4	20	AC Hot Group 4	

<p align="center">Map N 990ADQUAX80214/215 140DAO85300 -> (x2) BMXDAO1605 Discrete Output 32 point Grouped (4x8), 230 VAC 990X80CABLEx16 High Power Cable, 20 pin X80 connector Fuse = F3.15AL250V(TR5 Package style)</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
Out 17	21	->	1	Q 0	X80 MODULE 2
Out 18	22	->	2	Q 1	
Out 19	23	->	3	Q 2	
Out 20	24	->	4	Q 3	
Out 21	25	->	6	Q 4	
Out 22	26	->	7	Q 5	
Out 23	27	->	8	Q 6	
Out 24	28	->	9	Q 7	
N/C	29		-	-	
Group C Hot	30	F5	5	AC Hot Group 1	
		F6	10	AC Hot Group 2	
Out 25	31	->	11	Q 8	
Out 26	32	->	12	Q 9	
Out 27	33	->	13	Q 10	
Out 28	34	->	14	Q 11	
Out 29	35	->	16	Q 12	
Out 30	36	->	17	Q 13	
Out 31	37	->	18	Q 14	
Out 32	38	->	19	Q 15	
N/C	39		-	-	
Group D Hot	40	F7	15	AC Hot Group 3	
		F8	20	AC Hot Group 4	

Wiring Map O: Quantum to 990ADQUAX80206, 990ADQUAX80207

⚠ CAUTION

RISK OF UNINTENDED OPERATION

This I/O adapter assembly combines the Quantum groups A & B +24 VDCs and also combines Quantum groups C & D +24 VDCs. It also combines the Quantum groups A & B and it combines C & D Returns. The X80 replacement modules (2) have one group of 16 outputs, unlike the Quantum module which had 4 groups of 8 outputs. Verify that the point commons can be connected together. If not, do not use this I/O adapter.

Failure to follow these instructions can result in injury or equipment damage.

<p style="text-align: center;">Map O 990ADQUAX80206/207 140DDO3530x => (x2) BMXDDO1602 OR 140DDO35310 => (x2) BMXDDO1612 990X80CABLEx16 High Power Cables, 20 pin X80 connector Fuse = F6.3AL250V (TR5 Package style)</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
Out 1	1	->	1	Q0	X80 MODULE 1
Out 2	2	->	2	Q1	
Out 3	3	->	3	Q2	
Out 4	4	->	4	Q3	
Out 5	5	->	5	Q4	
Out 6	6	->	6	Q5	
Out 7	7	->	7	Q6	
Out 8	8	->	8	Q7	
Group A Com	9	->	17,19	Ret	
Group A Supply	10	F1	18,20	DC+	
Out 9	11	->	9	Q8	
Out 10	12	->	10	Q9	
Out 11	13	->	11	Q10	
Out 12	14	->	12	Q11	
Out 13	15	->	13	Q12	
Out 14	16	->	14	Q13	
Out 15	17	->	15	Q14	
Out 16	18	->	16	Q15	
Group B Com	19	->	17,19	Ret	
Group B Supply	20	F1	18,20	DC+	

<p style="text-align: center;">Map O 990ADQUAX80206/207 140DDO3530x => (x2) BMXDDO1602 OR 140DDO35310 => (x2) BMXDDO1612 990X80CABLEx16 High Power Cables, 20 pin X80 connector Fuse = F6.3AL250V (TR5 Package style)</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
Out 17	21	->	1	Q0	X80 MODULE 2
Out 18	22	->	2	Q1	
Out 19	23	->	3	Q2	
Out 20	24	->	4	Q3	
Out 21	25	->	5	Q4	
Out 22	26	->	6	Q5	
Out 23	27	->	7	Q6	
Out 24	28	->	8	Q7	
Group C Com	29		17,19	Ret	
Group C Supply	30	F2	18,20	DC+	
Out 25	31	->	9	Q8	
Out 26	32	->	10	Q9	
Out 27	33	->	11	Q10	
Out 28	34	->	12	Q11	
Out 29	35	->	13	Q12	
Out 30	36	->	14	Q13	
Out 31	37	->	15	Q14	
Out 32	38	->	16	Q15	
Group D Com	39		17,19	Ret	
Group D Supply	40	F2	18,20	DC+	

Wiring Map P: Quantum to 990ADQUAX80228, 990ADQUAX80229

Map P 990ADQUAX80228/229 (with MOVs) 140DRA84000 -> (x2) BMXDRA0815 Relay Output 16 points Normally Open, 20...250 VAC or 5...30 VDC 990X80CABLEx16 High Power Cable, 20 pin X80 connector Fuse = F3.15AL250V (TR5 Package style)					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
Out 1	1	->	1	Q0	X80 MODULE 1
Relay 1 Com	2	F1	2	C0	
Out 2	3	->	3	Q1	
Relay 2 Com	4	F2	4	C1	
Out 3	5	->	5	Q2	
Relay 3 Com	6	F3	6	C2	
Out 4	7	->	7	Q3	
Relay 4 Com	8	F4	8	C3	
N/C	9		-	-	
N/C	10		-	-	
Out 5	11	->	9	Q4	
Relay 5 Com	12	F5	10	C4	
Out 6	13	->	11	Q5	
Relay 6 Com	14	F6	12	C5	
Out 7	15	->	13	Q6	
Relay 7 Com	16	F7	14	C6	
Out 8	17	->	15	Q7	
Relay 8 Com	18	F8	16	C7	
N/C	19		-	-	
N/C	20		-	-	

<p style="text-align: center;">Map P 990ADQUAX80228/229 (with MOVs) 140DRA84000 -> (x2) BMXDRA0815 Relay Output 16 points Normally Open, 20...250 VAC or 5...30 VDC 990X80CABLEx16 High Power Cable, 20 pin X80 connector Fuse = F3.15AL250V (TR5 Package style)</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
Out 9	21	->	1	Q0	X80 MODULE 2
Relay 9 Com	22	F9	2	C0	
Out 10	23	->	3	Q1	
Relay 10 Com	24	F10	4	C1	
Out 11	25	->	5	Q2	
Relay 11 Com	26	F11	6	C2	
Out 12	27	->	7	Q3	
Relay 12 Com	28	F12	8	C3	
N/C	29		-	-	
N/C	30		-	-	
Out 13	31	->	9	Q4	
Relay 13 Com	32	F13	10	C4	
Out 14	33	->	11	Q5	
Relay 14 Com	34	F14	12	C5	
Out 15	35	->	13	Q6	
Relay 15 Com	36	F15	14	C6	
Out 16	37	->	15	Q7	
Relay 16 Com	38	F16	16	C7	
N/C	39		-	-	
N/C	40		-	-	

Wiring Map Q: Quantum to 990ADQUAX80134, 990ADQUAX80135

Map Q 990ADQUAX80134/135 (with MOVs) 140DRC83000 -> BMXDRC0805 Relay Output 8 points Normally Open/ Normally Closed, 20...250 VAC or 5...30 VDC 990X80CABLEx21 High Power Cable, 40 pin X80 connector Fuse = F4AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
Out 1 N.O.	1	->	1	NO0
N/C	2		-	-
Out 1 N.C.	3	->	3	NC0
Relay 1 Com	4	F1	2,4	COM0
Out 2 N.O.	5	->	5	NO1
N/C	6		-	-
Out 2 N.C.	7	->	7	NC1
Relay 2 Com	8	F2	6,8	COM1
N/C	9		-	-
N/C	10		-	-
Out 3 N.O.	11	->	11	NO2
N/C	12		-	-
Out 3 N.C.	13	->	13	NC2
Relay 3 Com	14	F3	12,14	COM2
Out 4 N.O.	15	->	15	NO3
N/C	16		-	-
Out 4 N.C.	17	->	17	NC3
Relay 4 Com	18	F4	16,18	COM3
N/C	19		-	-
N/C	20		-	-
Out 5 N.O.	21	->	21	NO4
N/C	22		-	-
Out 5 N.C.	23	->	23	NC4
Relay 5 Com	24	F5	22,24	COM4

Map Q 990ADQUAX80134/135 (with MOVs) 140DRC83000 -> BMXDRC0805 Relay Output 8 points Normally Open/ Normally Closed, 20...250 VAC or 5...30 VDC 990X80CABLEx21 High Power Cable, 40 pin X80 connector Fuse = F4AL250V (TR5 Package style)				
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal
Out 6 N.O.	25	->	25	NO5
N/C	26		-	-
Out 6 N.C.	27	->	27	NC5
Relay 6 Com	28	F6	26,28	COM5
N/C	29		-	-
N/C	30		-	-
Out 7 N.O.	31	->	31	NO6
N/C	32		-	-
Out 7 N.C.	33	->	33	NC6
Relay 7 Com	34	F7	32,34	COM6
Out 8 N.O.	35	->	35	NO7
N/C	36		-	-
Out 8 N.C.	37	->	37	NC7
Relay 8 Com	38	F8	36,38	COM7
N/C	39		-	-
N/C	40		-	-

Wiring Map R: Quantum to 990ADQUAX80246

Map R 990ADQUAX80246 140DDx36400 -> BMXDDx3202K and BMXDDx6402K Discrete Input or Output 96 point (8x16), 24 VDC Pin B20 is top left, Pin A20 is top right on X80's FCN40 Conn.					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
I/O 01	A 1	->	B 20	I/O00	X80 MODULE 1, BMXDDx3202K
I/O 02	A 2	->	A 20	I/O01	
I/O 03	A 3	->	B 19	I/O02	
I/O 04	A 4	->	A 19	I/O03	
I/O 05	A 5	->	B 18	I/O04	
I/O 06	A 6	->	A 18	I/O05	
I/O 07	A 7	->	B 17	I/O06	
I/O 08	A 8	->	A 17	I/O07	
I/O 09	A 9	->	B 16	I/O08	
I/O 10	A 10	->	A 16	I/O09	
I/O 11	A 11	->	B 15	I/O10	
I/O 12	A 12	->	A 15	I/O11	
I/O 13	A 13	->	B 14	I/O12	
I/O 14	A 14	->	A 14	I/O13	
I/O 15	A 15	->	B 13	I/O14	
I/O 16	A 16	->	A 13	I/O15	
N/C or +24 VDC	A 17	->	B 12 ¹	SPS1+	
Com	A 18	->	A 12	SPS1-	
N/C or +24 VDC	A 19	->	B 11 ¹	SPS1+	
Com	A 20	->	A 11	SPS1-	

<p style="text-align: center;">Map R 990ADQUAX80246 140DDx36400 -> BMXDDx3202K and BMXDDx6402K Discrete Input or Output 96 point (8x16), 24 VDC Pin B20 is top left, Pin A20 is top right on X80's FCN40 Conn.</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
I/O 17	B 1	->	B 10	I/O16	X80 MODULE 1, BMXDDx3202K
I/O 18	B 2	->	A 10	I/O17	
I/O 19	B 3	->	B 9	I/O18	
I/O 20	B 4	->	A 9	I/O19	
I/O 21	B 5	->	B 8	I/O20	
I/O 22	B 6	->	A 8	I/O21	
I/O 23	B 7	->	B 7	I/O22	
I/O 24	B 8	->	A 7	I/O23	
I/O 25	B 9	->	B 6	I/O24	
I/O 26	B 10	->	A 6	I/O25	
I/O 27	B 11	->	B 5	I/O26	
I/O 28	B 12	->	A 5	I/O27	
I/O 29	B 13	->	B 4	I/O28	
I/O 30	B 14	->	A 4	I/O29	
I/O 31	B 15	->	B 3	I/O30	
I/O 32	B 16	->	A 3	I/O31	
N/C or +24 VDC	B 17	->	B 2 ¹	SPS2+	
Com	B 18	->	A 2	SPS2-	
N/C or +24 VDC	B 19	->	B 1 ¹	SPS2+	
Com	B 20	->	A 1	SPS2-	

<p align="center">Map R 990ADQUAX80246 140DDx36400 -> BMXDDx3202K and BMXDDx6402K Discrete Input or Output 96 point (8x16), 24 VDC Pin B20 is top left, Pin A20 is top right on X80's FCN40 Conn.</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
I/O 33	C 1	->	Right B 20	I/O00	X80 MODULE 2, BMXDDx6402K
I/O 34	C 2	->	Right A 20	I/O01	
I/O 35	C 3	->	Right B 19	I/O02	
I/O 36	C 4	->	Right A 19	I/O03	
I/O 37	C 5	->	Right B 18	I/O04	
I/O 38	C 6	->	Right A 18	I/O05	
I/O 39	C 7	->	Right B 17	I/O06	
I/O 40	C 8	->	Right A 17	I/O07	
I/O 41	C 9	->	Right B 16	I/O08	
I/O 42	C 10	->	Right A 16	I/O09	
I/O 43	C 11	->	Right B 15	I/O10	
I/O 44	C 12	->	Right A 15	I/O11	
I/O 45	C 13	->	Right B 14	I/O12	
I/O 46	C 14	->	Right A 14	I/O13	
I/O 47	C 15	->	Right B 13	I/O14	
I/O 48	C 16	->	Right A 13	I/O15	
N/C or +24 VDC	C 17	->	Right B 12 ¹	SPS1+	
Com	C 18	->	Right A 12	SPS1-	
N/C or +24 VDC	C 19	->	Right B 11 ¹	SPS1+	
Com	C 20	->	Right A 11	SPS1-	

Map R 990ADQUAX80246 140DDx36400 -> BMXDDx3202K and BMXDDx6402K Discrete Input or Output 96 point (8x16), 24 VDC Pin B20 is top left, Pin A20 is top right on X80's FCN40 Conn.					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
I/O 49	D 1	->	Right B 10	I/O16	X80 MODULE 2, BMXDDx6402K
I/O 50	D 2	->	Right A 10	I/O17	
I/O 51	D 3	->	Right B 9	I/O18	
I/O 52	D 4	->	Right A 9	I/O19	
I/O 53	D 5	->	Right B 8	I/O20	
I/O 54	D 6	->	Right A 8	I/O21	
I/O 55	D 7	->	Right B 7	I/O22	
I/O 56	D 8	->	Right A 7	I/O23	
I/O 57	D 9	->	Right B 6	I/O24	
I/O 58	D 10	->	Right A 6	I/O25	
I/O 59	D 11	->	Right B 5	I/O26	
I/O 60	D 12	->	Right A 5	I/O27	
I/O 61	D 13	->	Right B 4	I/O28	
I/O 62	D 14	->	Right A 4	I/O29	
I/O 63	D 15	->	Right B 3	I/O30	
I/O 64	D 16	->	Right A 3	I/O31	
N/C or +24 VDC	D 17	->	Right B 2 ¹	SPS2+	
Com	D 18	->	Right A 2	SPS2-	
N/C or +24 VDC	D 19	->	Right B 1 ¹	SPS2+	
Com	D 20	->	Right A 1	SPS2-	

<p align="center">Map R 990ADQUAX80246 140DDx36400 -> BMXDDx3202K and BMXDDx6402K Discrete Input or Output 96 point (8x16), 24 VDC Pin B20 is top left, Pin A20 is top right on X80's FCN40 Conn.</p>					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
I/O 65	E 1	->	Left B 20	I/O32	X80 MODULE 2, BMXDDx6402K
I/O 66	E 2	->	Left A 20	I/O33	
I/O 67	E 3	->	Left B 19	I/O34	
I/O 68	E 4	->	Left A 19	I/O35	
I/O 69	E 5	->	Left B 18	I/O36	
I/O 70	E 6	->	Left A 18	I/O37	
I/O 71	E 7	->	Left B 17	I/O38	
I/O 72	E 8	->	Left A 17	I/O39	
I/O 73	E 9	->	Left B 16	I/O40	
I/O 74	E 10	->	Left A 16	I/O41	
I/O 75	E 11	->	Left B 15	I/O42	
I/O 76	E 12	->	Left A 15	I/O43	
I/O 77	E 13	->	Left B 14	I/O44	
I/O 78	E 14	->	Left A 14	I/O45	
I/O 79	E 15	->	Left B 13	I/O46	
I/O 80	E 16	->	Left A 13	I/O47	
N/C or +24 VDC	E 17	->	Left B 12 ¹	SPS3+	
Com	E 18	->	Left A 12	SPS3-	
N/C or +24 VDC	E 19	->	Left B 11 ¹	SPS3+	
Com	E 20	->	Left A 11	SPS3-	

Map R 990ADQUAX80246 140DDx36400 -> BMXDDx3202K and BMXDDx6402K Discrete Input or Output 96 point (8x16), 24 VDC Pin B20 is top left, Pin A20 is top right on X80's FCN40 Conn.					
Quantum Signal	Quantum Pin #	->	X80 Pin #	X80 Signal	Module
I/O 81	F 1	->	Left B 10	I/O48	X80 MODULE 2, BMXDDx6402K
I/O 82	F 2	->	Left A 10	I/O49	
I/O 83	F 3	->	Left B 9	I/O50	
I/O 84	F 4	->	Left A 9	I/O51	
I/O 85	F 5	->	Left B 8	I/O52	
I/O 86	F 6	->	Left A 8	I/O53	
I/O 87	F 7	->	Left B 7	I/O54	
I/O 88	F 8	->	Left A 7	I/O55	
I/O 89	F 9	->	Left B 6	I/O56	
I/O 90	F 10	->	Left A 6	I/O57	
I/O 91	F 11	->	Left B 5	I/O58	
I/O 92	F 12	->	Left A 5	I/O59	
I/O 93	F 13	->	Left B 4	I/O60	
I/O 94	F 14	->	Left A 4	I/O61	
I/O 95	F 15	->	Left B 3	I/O62	
I/O 96	F 16	->	Left A 3	I/O63	
N/C or +24 VDC	F 17	->	Left B 2 ¹	SPS4+	
Com	F 18	->	Left A 2	SPS4-	
N/C or +24 VDC	F 19	->	Left B 1 ¹	SPS4+	
Com	F 20	->	Left A 1	SPS4-	

1. For Input modules, connect +24 VDC to X80 module pins B1,2,11 and 12 for the module to operate. The +24 VDC can be connected to the Telefast block. Please refer to the correct Telefast documentation to determine the correct pin to connect the +24 VDC.

Wiring Map S: Quantum to 990ADQUAX80150/151

Map S 990ADQUAX80150/151 140DDI35000 => BMXDDI3232 140DDI85000 => BMXDDI3232 Input 32 points True Low < 45 VDC 990X80CABLEx23 High Density Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)					
Quantum		PCB	Header/ Cable	X80	
Signal name	Pin	Fuse	Pin/ Wire	Pin	Signal name
I1	1	==>	A1	1	I0
I2	2	==>	A2	2	I1
I3	3	==>	A3	3	I2
I4	4	==>	A4	4	I3
I5	5	==>	A5	5	I4
I6	6	==>	A6	6	I5
I7	7	==>	A7	7	I6
I8	8	==>	A8	8	I7
Comm Group A	9	==>	A17	17	Comm A
N/C	10 ¹	F1	A18	18	SPS A
I9	11	==>	A9	9	I8
I10	12	==>	A10	10	I9
I11	13	==>	A11	11	I10
I12	14	==>	A12	12	I11
I13	15	==>	A13	13	I12
I14	16	==>	A14	14	I13
I15	17	==>	A15	15	I14
I16	18	==>	A16	16	I15
Comm Group B	19	==>	A19	19	Comm A
N/C	20 ¹	F1	A20	20	SPS A
I17	21	==>	B1	21	I16
I18	22	==>	B2	22	I17
I19	23	==>	B3	23	I18
I20	24	==>	B4	24	I19

Map S 990ADQUAX80150/151 140DDI35000 => BMXDDI3232 140DDI85000 => BMXDDI3232 Input 32 points True Low < 45 VDC 990X80CABLEx23 High Density Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)					
Quantum		PCB	Header/ Cable	X80	
Signal name	Pin	Fuse	Pin/ Wire	Pin	Signal name
I21	25	==>	B5	25	I20
I22	26	==>	B6	26	I21
I23	27	==>	B7	27	I22
I24	28	==>	B8	28	I23
Comm Group C	29	==>	B17	37	Comm B
N/C	30 ¹	F2	B18	38	SPS B
I25	31	==>	B9	29	I24
I26	32	==>	B10	30	I25
I27	33	==>	B11	31	I26
I28	34	==>	B12	32	I27
I29	35	==>	B13	33	I28
I30	36	==>	B14	34	I29
I31	37	==>	B15	35	I30
I32	38	==>	B16	36	I31
Comm Group D	39	==>	B19	39	Comm B
N/C	40 ¹	F2	B20	40	SPS B

1. To utilize the on-board fuse and the X80 module feature "Supply Monitoring", connect the groups +VDC to these Quantum field connector pins.

Wiring Map T: Quantum to 990ADQUAX80152/153

Map T 990ADQUAX80152/153 140DDI35010 => BMXDDI3232 Input 32 points True Low 24 VDC 990X80CABLEx23 High Density Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)					
Quantum		PCB	Header/ Cable	X80	
Signal name	Pin	Fuse	Pin/ Wire	Pin	Signal name
I1	1	==>	A1	1	I0
I2	2	==>	A2	2	I1
I3	3	==>	A3	3	I2
I4	4	==>	A4	4	I3
I5	5	==>	A5	5	I4
I6	6	==>	A6	6	I5
I7	7	==>	A7	7	I6
I8	8	==>	A8	8	I7
N/C	9 ¹	F1	A18	18	SPS A
PS + Group A	10	==>	A17	17	Comm A
I9	11	==>	A9	9	I8
I10	12	==>	A10	10	I9
I11	13	==>	A11	11	I10
I12	14	==>	A12	12	I11
I13	15	==>	A13	13	I12
I14	16	==>	A14	14	I13
I15	17	==>	A15	15	I14
I16	18	==>	A16	16	I15
N/C	19 ¹	F1	A20	20	SPS A
PS + Group B	20	==>	A19	19	Comm A
I17	21	==>	B1	21	I16
I18	22	==>	B2	22	I17
I19	23	==>	B3	23	I18
I20	24	==>	B4	24	I19
I21	25	==>	B5	25	I20

Map T 990ADQUAX80152/153 140DDI35010 => BMXDDI3232 Input 32 points True Low 24 VDC 990X80CABLEx23 High Density Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)					
Quantum		PCB	Header/ Cable	X80	
Signal name	Pin	Fuse	Pin/ Wire	Pin	Signal name
I22	26	==>	B6	26	I21
I23	27	==>	B7	27	I22
I24	28	==>	B8	28	I23
N/C	29 ¹	F2	B18	38	SPS B
PS + Group C	30	==>	B17	37	Comm B
I25	31	==>	B9	29	I24
I26	32	==>	B10	30	I25
I27	33	==>	B11	31	I26
I28	34	==>	B12	32	I27
I29	35	==>	B13	33	I28
I30	36	==>	B14	34	I29
I31	37	==>	B15	35	I30
I32	38	==>	B16	36	I31
N/C	39 ¹	F2	B20	40	SPS B
PS + Group D	40	==>	B19	39	Comm B

1. To utilize the on-board fuse and the X80 module feature "Supply Monitoring", connect the groups VDC Common to these Quantum field connector pins.

Wiring Map U: Quantum to 990ADQUAX80154/155

Map U 990ADQUAX80154/155 140DDI85000 => BMXDDI3203 Input 32 points True High ≥ 45 VDC 990X80CABLEx21 High Power Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)					
Quantum		PCB	Header/ Cable	X80	
Signal name	Pin	Fuse	Pin/ Wire	Pin	Signal name
I1	1	==>	A1	1	I0
I2	2	==>	A2	2	I1
I3	3	==>	A3	3	I2
I4	4	==>	A4	4	I3
I5	5	==>	A5	5	I4
I6	6	==>	A6	6	I5
I7	7	==>	A7	7	I6
I8	8	==>	A8	8	I7
Comm Group A	9	==>	A17	17	Comm A
PS + Group A	10	F1	A18	18	SPS A
I9	11	==>	A9	9	I8
I10	12	==>	A10	10	I9
I11	13	==>	A11	11	I10
I12	14	==>	A12	12	I11
I13	15	==>	A13	13	I12
I14	16	==>	A14	14	I13
I15	17	==>	A15	15	I14
I16	18	==>	A16	16	I15
Comm Group B	19	==>	A19	19	Comm A
PS + Group B	20	F1	A20	20	SPS A
I17	21	==>	B1	21	I16
I18	22	==>	B2	22	I17
I19	23	==>	B3	23	I18
I20	24	==>	B4	24	I19

Map U 990ADQUAX80154/155 140DDI85000 => BMXDDI3203 Input 32 points True High ≥ 45 VDC 990X80CABLEx21 High Power Cable, 40 pin X80 connector Fuse = F0.5AL250V (TR5 Package style)					
Quantum		PCB	Header/ Cable	X80	
Signal name	Pin	Fuse	Pin/ Wire	Pin	Signal name
I21	25	==>	B5	25	I20
I22	26	==>	B6	26	I21
I23	27	==>	B7	27	I22
I24	28	==>	B8	28	I23
Comm Group C	29	==>	B17	37	Comm B
PS + Group C	30	F2	B18	38	SPS B
I25	31	==>	B9	29	I24
I26	32	==>	B10	30	I25
I27	33	==>	B11	31	I26
I28	34	==>	B12	32	I27
I29	35	==>	B13	33	I28
I30	36	==>	B14	34	I29
I31	37	==>	B15	35	I30
I32	38	==>	B16	36	I31
Comm Group D	39	==>	B19	39	Comm B
PS + Group D	40	F2	B20	40	SPS B

Generic I/O Adapter Wiring Guides

Wiring Guide 1: 990ADQUAX80142, 990ADQUAX80143

Wiring Guide 1 140AVO02000 -> BMXAMO0410 Analog Output, 4 Channel 990ADQUAX80142/143 990X80CABLx18PT Analog cable					
Quantum Signal	Quantum Pin #	Cable-Wire #/ Wire Color		X80 Pin #	X80 Signal
Out 1 (+)	1	A-1/ Black	->	1	U/I 0
Common 1 (-)	2	A-2/ Brown	->	2	Comm0
R1 (Out 1)	3	-		-	-
Common 1 (-)	4	A-4/ Orange	->	2	Comm0
Control 1	5	-		-	-
N/C	6	-		-	-
Reference 1	7	-		-	-
Master Override	8	-		-	-
N/C	9	-		-	-
Common 1 (-)	10	A-10/ White	->	2	Comm0
Out 2 (+)	11	A-11/ White-Black	->	7	U/I 1
Common 2 (-)	12	A-12/ White-Brown	->	8	Comm1
R2 (Out 2)	13				
Common 2 (-)	14	A-14/ White-Orange	->	8	Comm1
Control 2	15	-		-	-
N/C	16	-		-	-
Reference 2	17	-		-	-
Master Override	18	-		-	-
N/C	19	-		-	-
Common 2 (-)	20	A-20/ Brown-Black	->	8	Comm1
Out 3 (+)	21	B-1/ Black	->	11	U/I 2
Common 3 (-)	22	B-2/ Brown	->	12	Comm2

Wiring Guide 1 140AVO02000 -> BMXAMO0410 Analog Output, 4 Channel 990ADQUAX80142/143 990X80CABLx18PT Analog cable					
Quantum Signal	Quantum Pin #	Cable-Wire #/ Wire Color		X80 Pin #	X80 Signal
R3 (Out 3)	23	–		–	–
Common 3 (-)	24	B-4/ Orange	->	12	Comm2
Control 3	25	–		–	–
N/C	26	–		–	–
Reference 3	27	–		–	–
Master Override	28	–		–	–
N/C	29	–		–	–
Common 3 (-)	30	B-10/ White	->	12	Comm2
Out 4 (+)	31	B-11/ White-Black	->	17	U/I 3
Common 4 (-)	32	B-12/ White-Brown	->	18	Comm3
R3 (Out 4)	33	–		–	–
Common 4 (-)	34	B-14/ White-Orange	->	18	Comm3
Control 4	35	–		–	–
N/C	36	–		–	–
Reference 4	37	–		–	–
Master Override	38	–		–	–
N/C	39	–		–	–
Common 4 (-)	40	B-20/ Brown-Black	->	18	Comm3
<p>NOTE:</p> <ul style="list-style-type: none"> For the channel commons (-), the user can decide to bring all 3 to the X80 pin or just the one(s) that have a connection on the Quantum connector. The X80 module only has ranges of $\pm 10V$, 0-20 mA and 4-20 mA. 					

Wiring Guide 2: 990ADQUAX80102

Wiring Guide 2 140ARI03010 -> BMXART0814 Temperature RTD, 8 Input 990ADQUAX80102 BMXFCW301S, 40 position high density cable assembly Pin B20 is top left, Pin A20 is top right on X80 high density connector					
Quantum Signal	Quantum Pin #	Cable-Wire #/Wire Color		X80 Pin #	X80 Signal
I Source 1 -	1	A-1/ White-Green	->	Right B16	EX - 0
I Source 1 +	2	A-2/ Green-White	->	Right A16	EX + 0
V Sense 1 -	3	A-3/ White-Brown	->	Right B17	MS - 0
V Sense 1 +	4	A-4/ Brown-White	->	Right A17	MS + 0
I Source 2 -	5	A-5/ White-Gray	->	Right B11	EX - 1
I Source 2 +	6	A-6/ Gray-White	->	Right A11	EX + 1
V Sense 2 -	7	A-7/ Red-Blue	->	Right B12	MS - 1
V Sense 2 +	8	A-8/ Blue-Red	->	Right A12	MS + 1
Shield 1	9	-		-	-
Shield 2	10	-		-	-
I Source 3 -	11	A-11/ Red-Amber	->	Right B6	EX - 2
I Source 3 +	12	A-12/ Amber-Red	->	Right A6	EX + 2
V Sense 3 -	13	A-13/ Red-Green	->	Right B7	MS - 2
V Sense 3 +	14	A-14/ Green-Red	->	Right A7	MS + 2
I Source 4 -	15	A-15/ Red-Brown	->	Right B1	EX - 3
I Source 4 +	16	A-16/ Brown-Red	->	Right A1	EX + 3
V Sense 4 -	17	A-17/ Red-Gray	->	Right B2	MS - 3
V Sense 4 +	18	A-18/ Gray-Red	->	Right A2	MS + 3
Shield 3	19	-		-	-
Shield 4	20	-		-	-
I Source 5 -	21	B-1/ White-Green	->	Left B16	EX - 4
I Source 5 +	22	B-2/ Green-White	->	Left A16	EX + 4
V Sense 5 -	23	B-3/ White-Brown	->	Left B17	MS - 4
V Sense 5 +	24	B-4/ Brown-White	->	Left A17	MS + 4

Wiring Guide 2 140ARI03010 -> BMXART0814 Temperature RTD, 8 Input 990ADQUAX80102 BMXFCW301S, 40 position high density cable assembly Pin B20 is top left, Pin A20 is top right on X80 high density connector					
Quantum Signal	Quantum Pin #	Cable-Wire #/Wire Color		X80 Pin #	X80 Signal
I Source 6 -	25	B-5/ White-Gray	->	Left B11	EX - 5
I Source 6 +	26	B-6/ Gray-White	->	Left A11	EX + 5
V Sense 6 -	27	B-7/ Red-Blue	->	Left B12	MS - 5
V Sense 6 +	28	B-8/ Blue-Red	->	Left A12	MS + 5
Shield 5	29	-		-	-
Shield 6	30	-		-	-
I Source 7 -	31	B-11/ Red-Amber	->	Left B6	EX - 6
I Source 7 +	32	B-12/ Amber-Red	->	Left A6	EX + 6
V Sense 7 -	33	B-13/ Red-Green	->	Left B7	MS - 6
V Sense 7 +	34	B-14/ Green-Red	->	Left A7	MS + 6
I Source 8 -	35	B-15/ Red-Brown	->	Left B1	EX - 7
I Source 8 +	36	B-16/ Brown-Red	->	Left A1	EX + 7
V Sense 8 -	37	B-17/ Red-Gray	->	Left B2	MS - 7
V Sense 8 +	38	B-18/ Gray-Red	->	Left A2	MS + 7
Shield 7	39	-		-	-
Shield 8	40	-		-	-

Wiring Guide 3: 990ADQUAX80218, 990ADQUAX80219

Wiring Guide 3 140DAI75300 -> (x2) BMXDAI1615 Input 32 points (4x8), 230 VAC 990ADQUAX80218/219 990X80CABLEx21PT High Power Cable, 40 pin X80 connector						
Quantum Signal	Quantum Pin #	Cable-Wire #/ Wire Color		X80 Pin #	X80 Signal	Module
In 1	1	A-1/ Black	->	1	I0	X80 MODULE 1
In 2	2	A-2/ Brown	->	3	I1	
In 3	3	A-3/ Red	->	5	I2	
In 4	4	A-4/ Orange	->	7	I	
In 5	5	A-5/ Yellow	->	11	I4	
In 6	6	A-6/ Dark Green	->	13	I5	
In 7	7	A-7/ Blue	->	15	I6	
In 8	8	A-8/ Purple	->	17	I7	
Group A Com	9	A-9/ Gray	->	2,4,6,8,12,14,16,18	Neu	
N/C	10	-		-	-	
In 9	11	A-11/ Pink	->	21	I8	
In 10	12	A-12/ Light Green	->	23	I9	
In 11	13	A-13/ Black-White	->	25	I10	
In 12	14	A-14/ Brown-White	->	27	I11	
In 13	15	A-15/ Red-White	->	31	I12	
In 14	16	A-16/ Orange-White	->	33	I13	
In 15	17	A-17/ Green-White	->	35	I14	
In 16	18	A-18/ Blue-White	->	37	I15	
Group B Com	19	A-19/ Yellow-White	->	22,24,26,28,32,-34,36,38	Neu	
N/C	20	A-20/ Purple-White	->	39 ¹	AC Hot	

Wiring Guide 3 140DAI75300 -> (x2) BMXDAI1615 Input 32 points (4x8), 230 VAC 990ADQUAX80218/219 990X80CABLEx21PT High Power Cable, 40 pin X80 connector						
Quantum Signal	Quantum Pin #	Cable-Wire #/ Wire Color		X80 Pin #	X80 Signal	Module
In 17	21	B-1/ Black	->	1	I0	X80 MODULE 2
In 18	22	B-2/ Brown	->	3	I1	
In 19	23	B-3/ Red	->	5	I2	
In 20	24	B-4/ Orange	->	7	I3	
In 21	25	B-5/ Yellow	->	11	I4	
In 22	26	B-6/ Dark Green	->	13	I5	
In 23	27	B-7/ Blue	->	15	I6	
In 24	28	B-8/ Purple	->	17	I7	
Group C Com	29	B-9/ Gray	->	2,4,6,8,12,14,16,18	Neu	
N/C	30	-		-	-	
In 25	31	B-11/ Pink	->	21	I8	
In 26	32	B-12/ Light Green	->	23	I9	
In 27	33	B-13/ Black-White	->	25	I10	
In 28	34	B-14/ Brown-White	->	27	I11	
In 29	35	B-15/ Red-White	->	31	I12	
In 30	36	B-16/ Blue-White	->	33	I13	
In 31	37	B-17/ Green-White	->	35	I14	
In 32	38	B-18/ Blue-White	->	37	I15	
Group D Com	39	B-19/ Yellow-White	->	22,24,26,28,32,34,36,38	Neu	
N/C	40	B-20/ Purple-White	->	39 ¹	AC Hot	

1. Connect AC Hot to this X80 pin for the module to operate. Connection can be made on the Quantum connectors associated pin.

Wiring Guide 4: 990ADQUAX80224, 990ADQUAX80225

CAUTION

RISK OF UNINTENDED OPERATION

This wiring guide combines the Quantum groups A & B VDC commons and groups C & D VDC commons. Each of the two X80 replacement modules has one group of 16 inputs, unlike the Quantum module which had 4 groups of 8 inputs. Verify that the point commons can be connected together. If not, do not use this I/O adapter.

Failure to follow these instructions can result in injury or equipment damage.

Wiring Guide 4 140DDI35310 => (x2) BMXDAI1602 True Low Input 32 points (4x8), 24 VDC 990ADQUAX80224/225 990X80CABLEx17PT High Density Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Cable-Wire #/Wire Color	=>	X80 Pin #	X80 Signal	Module
In 1	1	A-1/ Black	=>	1	I0	X80 MODULE 1
In 2	2	A-2/ Brown	=>	2	I1	
In 3	3	A-3/ Red	=>	3	I2	
In 4	4	A-4/ Orange	=>	4	I3	
In 5	5	A-5/ Yellow	=>	5	I4	
In 6	6	A-6/ Dark Green	=>	6	I5	
In 7	7	A-7/ Blue	=>	7	I6	
In 8	8	A-8/ Purple	=>	8	I7	
N/C	9	A-9/ Gray	=>	18,20 ¹	Com	
+24 VDC	10	A-10/ White	=>	17,19	+24 VDC	
In 9	11	A-11/ White-Black	=>	9	I8	
In 10	12	A-12/ White-Brown	=>	10	I9	
In 11	13	A-13/ White-Red	=>	11	I10	
In 12	14	A-14/ White-Orange	=>	12	I11	
In 13	15	A-15/ White-Yellow	=>	13	I12	
In 14	16	A-16/ White-Green	=>	14	I13	
In 15	17	A-17/ White-Blue	=>	15	I14	
In 16	18	A-18/ White-Violet	=>	16	I15	
N/C	19	A-19/ White-Gray	=>	18,20 ¹	Com	
+24 VDC	20	A-20/ Brown-Black	=>	17,19	+24 VDC	

Wiring Guide 4 140DDI35310 => (x2) BMXDAI1602 True Low Input 32 points (4x8), 24 VDC 990ADQUAX80224/225 990X80CABLEx17PT High Density Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Cable-Wire #/Wire Color	=>	X80 Pin #	X80 Signal	Module
In 17	21	B-1/ Black	=>	1	I0	X80 MODULE 2
In 18	22	B-2/ Brown	=>	2	I1	
In 19	23	B-3/ Red	=>	3	I2	
In 20	24	B-4/ Orange	=>	4	I3	
In 21	25	B-5/ Yellow	=>	5	I4	
In 22	26	B-6/ Dark Green	=>	6	I5	
In 23	27	B-7/ Blue	=>	7	I6	
In 24	28	B-8/ Purple	=>	8	I7	
N/C	29	B-9/ Gray	=>	18,20 ¹	Com	
+24 VDC	30	B-10/ White	=>	17,19	+24 VDC	
In 25	31	B-11/ White-Black	=>	9	I8	
In 26	32	B-12/ White-Brown	=>	10	I9	
In 27	33	B-13/ White-Red	=>	11	I10	
In 28	34	B-14/ White-Orange	=>	12	I11	
In 29	35	B-15/ White-Yellow	=>	13	I12	
In 30	36	B-16/ White-Green	=>	14	I13	
In 31	37	B-17/ White-Blue	=>	15	I14	
In 32	38	B-18/ White-Violet	=>	16	I15	
N/C	39	B-19/ White-Gray	=>	18,20 ¹	Com	
+24 VDC	40	B-20/ Brown-Black	=>	17,19	+24 VDC	

1. Connect VDC common to this X80 pin for the module to operate. Connection can be made on the Quantum connectors associated pin.

Wiring Guide 5: 990ADQUAX80216/217

⚠ CAUTION

RISK OF UNINTENDED OPERATION

This wiring guide combines the Quantum groups A, B & C VDC commons. Each of the two X80 replacement modules has one group of 16 inputs, unlike the Quantum module which had 3 groups of 8 inputs. Verify that the point commons can be connected together. If not, do not use this I/O adapter.

Failure to follow these instructions can result in injury or equipment damage.

Wiring Guide 5 140DDI67300 -> (x2) BMXDDI1604T Input 24 points (3x8), 125 VDC 990ADQUAX80216/217 990X80CABLEx16PT High Power Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Cable-Wire #/ Wire Color		X80 Pin #	X80 Signal	Module
In 1	1	A-1/ Black	->	1	I0	X80 MODULE 1
In 2	2	A-2/ Brown	->	2	I1	
In 3	3	A-3/ Red	->	3	I2	
In 4	4	A-4/ Orange	->	4	I3	
In 5	5	A-5/ Yellow	->	5	I4	
In 6	6	A-6/ Dark Green	->	6	I5	
In 7	7	A-7/ Blue	->	7	I6	
In 8	8	A-8/ Purple	->	8	I7	
Group A Com	9	A-9/ Gray	->	17,19	Com	
N/C	10	-		-	-	
N/C	11	-		-	-	
N/C	12	-		-	-	
N/C	13	-		-	-	
N/C	14	-		-	-	
In 9	15	A-15/ Red-White	->	9	I8	
In 10	16	A-16/ Orange-White	->	10	I9	
In 11	17	A-17/ Green-White	->	11	I10	
In 12	18	A-18/ Blue-White	->	12	I11	
Group B Com	19	A-19/ Yellow-White	->	17,19	Com	
N/C	20	A-20/ Purple-White	->	18,20 ¹	+125 VDC	

Wiring Guide 5 140DDI67300 -> (x2) BMXDDI1604T Input 24 points (3x8), 125 VDC 990ADQUAX80216/217 990X80CABLEx16PT High Power Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Cable-Wire #/ Wire Color		X80 Pin #	X80 Signal	Module
In 13	21	B-1/ Black	->	1	I0	X80 MODULE 2
In 14	22	B-2/ Brown	->	2	I1	
In 15	23	B-3/ Red	->	3	I2	
In 16	24	B-4/ Orange	->	4	I3	
N/C	25	-		-	-	
N/C	26	-		-	-	
N/C	27	-		-	-	
N/C	28	-		-	-	
N/C	29	-		-	-	
N/C	30	-		-	-	
In 17	31	B-11/ Pink	->	5	I4	
In 18	32	B-12 / Light Green	->	6	I5	
In 19	33	B-13/ Black-White	->	7	I6	
In 20	34	B-14/ Brown-White	->	8	I7	
In 21	35	B-15/ Red-White	->	9	I8	
In 22	36	B-16/ Orange-White	->	10	I9	
In 23	37	B-17/ Green-White	->	11	I10	
In 24	38	B-18/ Blue-White	->	12	I11	
Group C Com	39	B-19/ Yellow-White	->	17,19	Com	
N/C	40	B-20/ Purple-White	->	18,20 ¹	+125 VDC	
<p>1. Connect +125 VDC to these X80 pins for the modules to operate. Connection can be made on the Quantum connectors associated pin.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Quantum Groups A,B and C Commons need to be commonized on the Quantum connector. The wiring is different for the two X80 modules, take care when wiring and installing the X80 connectors. 						

Wiring Guide 6: 990ADQUAX80116, 990ADQUAX80117

NOTICE

RISK OF UNINTENDED OPERATION

The X80 module does not have any surge suppression components for inductive loads. If the load is inductive, it is recommended either MOVs and/or RC snubbers be added externally. Refer to the Modicon X80 Discrete Input/Output Modules User Manual (35012474) for more details.

Failure to follow these instructions can result in equipment damage.

⚠ CAUTION

RISK OF UNINTENDED OPERATION

The output channels of this X80 module do not include fusing within the module or on the translator unit. It is recommended that external fusing be added for this module as detailed in the Modicon X80 Discrete Input/Output Modules User Manual (35012474).

Failure to follow these instructions can result in injury or equipment damage.

⚠ CAUTION

RISK OF UNINTENDED OPERATION

This wiring guide combines the Quantum groups A and B VDC supplies. It also combines the Quantum groups A and B commons. The X80 replacement module has one group of 16 outputs, unlike the Quantum module which had 2 groups of 8 outputs. Verify that the point commons can be connected together. If not, do not use this I/O adapter.

Failure to follow these instructions can result in injury or equipment damage.

Wiring Guide 6
140DDO84300 -> BMXDDO1602 (24 VDC usage)
Output module 16 points (2x8), 10...60 VDC
990ADQUAX80116/117
990X80CABLEx16PT High Power Cable, 20 pin X80 connector

Quantum Signal	Quantum Pin #	Wire #/ Wire Color		X80 Pin #	X80 Signal
Out 1	1	A-1/ Black	->	1	Q0
N/C	2	-		-	-
Out 2	3	A-3/ Red	->	2	Q1
N/C	4	-		-	-

Wiring Guide 6 140DDO84300 -> BMXDDO1602 (24 VDC usage) Output module 16 points (2x8), 10...60 VDC 990ADQUAX80116/117 990X80CABLEx16PT High Power Cable, 20 pin X80 connector					
Quantum Signal	Quantum Pin #	Wire #/ Wire Color		X80 Pin #	X80 Signal
Out 3	5	A-5/ Yellow	->	3	Q2
N/C	6	-		-	-
Out 4	7	A-7/ Blue	->	4	Q3
N/C	8	-		-	-
Group A Supply	9	A-9/ Gray	->	18,20	Supply +
N/C	10	-		-	-
Out 5	11	A-11/ Pink	->	5	Q4
N/C	12	-		-	-
Out 6	13	A-13/ Black-White	->	6	Q5
N/C	14	-		-	-
Out 7	15	A-15/ Red-White	->	7	Q6
N/C	16	-		-	-
Out 8	17	A-17/ Green-White	->	8	Q7
N/C	18	-		-	-
Group A Com	19	A-19/ Yellow-White	->	17,19	Supply -
N/C	20	-		-	-
Out 9	21	B-1/ Black	->	9	Q8
N/C	22	-		-	-
Out 10	23	B-3/ Red	->	10	Q9
N/C	24	-		-	-
Out 11	25	B-5/ Yellow	->	11	Q10
N/C	26	-		-	-
Out 12	27	B-7/ Blue	->	12	Q11
N/C	28	-		-	-
Group B Supply	29	B-9/ Gray	->	18,20	Supply +
N/C	30	-		-	-
Out 13	31	B-11/ Pink	->	13	Q12
N/C	32	-		-	-

Wiring Guide 6 140DDO84300 -> BMXDDO1602 (24 VDC usage) Output module 16 points (2x8), 10...60 VDC 990ADQUAX80116/117 990X80CABLEx16PT High Power Cable, 20 pin X80 connector					
Quantum Signal	Quantum Pin #	Wire #/ Wire Color		X80 Pin #	X80 Signal
Out 14	33	B-13/ Black-White	->	14	Q13
N/C	34	-		-	-
Out 15	35	B-15/ Red-White	->	15	Q14
N/C	36	-		-	-
Out 16	37	B-17/ Green-White	->	16	Q15
N/C	38	-		-	-
Group B Comm	39	B-19/ Yellow-White	->	17,19	Supply -
N/C	40	-		-	-

NOTE: The Group A and B DC power supplies are connected together on the X80 module.

Wiring Guide 7: 990ADQUAX80216, 990ADQUAX80217

NOTICE
<p>RISK OF UNINTENDED OPERATION</p> <p>The X80 module does not have any surge suppression components for inductive loads. If the load is inductive, it is recommended either MOVs and/or RC snubbers be added externally. Refer to the Modicon X80 Discrete Input/Output Modules User Manual (35012474) for more details.</p> <p>Failure to follow these instructions can result in equipment damage.</p>

⚠ CAUTION
<p>RISK OF UNINTENDED OPERATION</p> <p>The output channels of this X80 module do not include fusing within the module or on the translator unit. It is recommended that external fusing be added for this module as detailed in the Modicon X80 Discrete Input/Output Modules User Manual (35012474).</p> <p>Failure to follow these instructions can result in injury or equipment damage.</p>

Wiring Guide 7 140DDO84300 -> (x2) BMXDRA0815 (> 24 VDC usage) Output module 16 points (2x8), 10...60 VDC 990ADQUAX80216/217 990X80CABLEx16PT High Power Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Wire #/ Wire Color		X80 Pin #	X80 Signal	Module
Out 1	1	A-1/ Black	->	1	Q0	X80 MODULE 1
N/C	2	-		-	-	
Out 2	3	A-3/ Red	->	3	Q1	
N/C	4	-		-	-	
Out 3	5	A-5/ Yellow	->	5	Q2	
N/C	6	-		-	-	
Out 4	7	A-7/ Blue	->	7	Q3	
N/C	8	-		-	-	
Group A Supply	9	A-9/ Gray	->	2,4,6,8,10, 12,14,16	Supply +	
N/C	10	-		-	-	
Out 5	11	A-11/ Pink	->	9	Q4	
N/C	12	-		-	-	
Out 6	13	A-13/ Black-White	->	11	Q5	
N/C	14	-		-	-	
Out 7	15	A-15/ Red-White	->	13	Q6	
N/C	16	-		-	-	
Out 8	17	A-17/ Green-White	->	15	Q7	
N/C	18	-		-	-	
Group A Com	19	-		-	-	
N/C	20	-		-	-	

Wiring Guide 7 140DDO84300 -> (x2) BMXDRA0815 (> 24 VDC usage) Output module 16 points (2x8), 10...60 VDC 990ADQUAX80216/217 990X80CABLEx16PT High Power Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Wire #/ Wire Color		X80 Pin #	X80 Signal	Module
Out 9	21	B-1/ Black	->	1	Q0	X80 MODULE 2
N/C	22	-		-	-	
Out 10	23	B-3/ Red	->	3	Q1	
N/C	24	-		-	-	
Out 11	25	B-5/ Yellow	->	5	Q2	
N/C	26	-		-	-	
Out 12	27	B-7/ Blue	->	7	Q3	
N/C	28	-		-	-	
Group B Supply	29	B-9/ Gray	->	2,4,6,8, 10,12,14,16	Supply +	
N/C	30	-		-	-	
Out 13	31	B-11/ Pink	->	9	Q4	
N/C	32	-		-	-	
Out 14	33	B-13/ Black-White	->	11	Q5	
N/C	34	-		-	-	
Out 15	35	B-15/ Red-White	->	13	Q6	
N/C	36	-		-	-	
Out 16	37	B-17/ Green-White	->	15	Q7	
N/C	38	-		-	-	
Group B Comm	39	-		-	-	
N/C	40	-		-	-	

Wiring Guide 8: 990ADQUAX80216, 990ADQUAX80217

NOTICE

RISK OF UNINTENDED OPERATION

The X80 module does not have any surge suppression components for inductive loads. If the load is inductive, it is recommended either MOVs and/or RC snubbers be added externally. Refer to the Modicon X80 Discrete Input/Output Modules User Manual (35012474) for more details.

Failure to follow these instructions can result in equipment damage.

⚠ CAUTION

RISK OF UNINTENDED OPERATION

The output channels of this X80 module do not include fusing within the module or on the translator unit. It is recommended that external fusing be added for this module as detailed in the Modicon X80 Discrete Input/Output Modules User Manual (35012474).

Failure to follow these instructions can result in injury or equipment damage.

Wiring Guide 8 140DDO885000 => (x2) BMXDRA0815 Output module 12 points (2x8), 24...125 VDC 990ADQUAX80216/217 990X80CABLEx116PT High Power Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Wire #/Wire Color	=>	X80 Pin #	X80 Signal	Module
Out 1	1	A-1/ Black	=>	1	Q0	X80 MODULE 1
N/C	2					
N/C	3					
N/C	4					
Out 2	5	A-5/ Yellow	=>	3	Q1	
N/C	6					
Out 3	7	A-7/ Blue	=>	5	Q2	
N/C	8					
Group A Com	9					
Group A Supply	10	A-10/ White	=>	2,4,6,8,10,12	Supply +	
Out 4	11	A-11/ Pink	=>	7	Q3	
N/C	12					
N/C	13					
N/C	14					
Out 5	15	A-15/ Red-White	=>	9	Q4	
N/C	16					
Out 6	17	A-17/ Green-White	=>	11	Q5	
N/C	18					
N/C	19					
N/C	20					

Wiring Guide 8 140DDO885000 => (x2) BMXDRA0815 Output module 12 points (2x8), 24...125 VDC 990ADQUAX80216/217 990X80CABLEx116PT High Power Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Wire #/Wire Color	=>	X80 Pin #	X80 Signal	Module
Out 7	21	B-1/ Black	=>	1	Q0	X80 MODULE 2
N/C	22					
N/C	23					
N/C	24					
Out 8	25	B-5/ Yellow	=>	3	Q1	
N/C	26					
Out 9	27	B-7/ Blue	=>	5	Q2	
N/C	28					
Group B Com	29					
Group B Supply	30	B-10/ White	=>	2,4,6,8,10,12	Supply +	
Out 10	31	B-11/ Pink	=>	7	Q3	
N/C	32					
N/C	33					
N/C	34					
Out 11	35	B-15/ Red-White	=>	9	Q4	
N/C	36					
Out 12	37	B-17/ Green-White	=>	11	Q5	
N/C	38					
N/C	39					
N/C	40					

Wiring Guide 9: 990ADQUAX80224, 990ADQUAX80225

CAUTION

RISK OF UNINTENDED OPERATION

The output channels of this X80 module do not include fusing within the module or on the translator unit. It is recommended that external fusing be added for this module as detailed in the Modicon X80 Discrete Input/Output Modules User Manual (35012474).

Failure to follow these instructions can result in injury or equipment damage.

Wiring Guide 9 140DDM39000 => (x2) BMXDDM16022 Mixed Discrete 16 Input points (2x8) 8 Output points (2x4) module, 24 VDC 990ADQUAX80224/225 990X80CABLEx17PT High Density Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Wire #/Wire Color	=>	X80 Pin #	X80 Signal	Module
Out 1	1	A-1/ Black	=>	11	Q16	X80 MODULE 1
N/C	2					
Out 2	3	A-3/ Red		12	Q17	
N/C	4					
Out 3	5	A-5/ Yellow	=>	13	Q18	
N/C	6					
Out 4	7	A-7/ Blue	=>	14	Q19	
N/C	8					
Output Group A Com	9	A-9/ Gray	=>	19	Output Supply Com	
Output Group A Supply	10	A-10/ White	=>	20	Output Supply +	
In 1	21	B-1/ Black	=>	1	I0	
In 2	22	B-2/ Brown	=>	2	I1	
In 3	23	B-3/ Red	=>	3	I2	
In 4	24	B-4/ Orange	=>	4	I3	
In 5	25	B-5/ Yellow	=>	5	I4	
In 6	26	B-6/ Green	=>	6	I5	
In 7	27	B-7/ Blue	=>	7	I6	
In 8	28	B-8/ Purple	=>	8	I7	
Input Group A Com	29	B-9/ Gray	=>	9	Input Supply Com	
N/C	30	B-10/ White	=>	10 ¹	Input Supply +	

Wiring Guide 9 140DDM39000 => (x2) BMXDDM16022 Mixed Discrete 16 Input points (2x8) 8 Output points (2x4) module, 24 VDC 990ADQUAX80224/225 990X80CABLEx17PT High Density Cable, 20 pin X80 connector						
Quantum Signal	Quantum Pin #	Wire #/Wire Color	=>	X80 Pin #	X80 Signal	Module
Out 5	11	A-11/ White-Black	=>	11	Q16	X80 MODULE 2
N/C	12					
Out 6	13	A-13/ White-Red	=>	12	Q17	
N/C	14					
Out 7	15	A-15/ White-Yellow	=>	13	Q18	
N/C	16					
Out 8	17	A-17/ White-Blue	=>	14	Q19	
N/C	18					
Output Group B Com	19	A-19/ White-Gray	=>	19	Output Supply Com	
Output Group B Supply	20	A-20/ Brown-Black	=>	20	Output Supply +	
In 9	31	B-11/ White-Black	=>	1	I0	
In 10	32	B-12/ White_Brown	=>	2	I1	
In 11	33	B-13/ White-Red	=>	3	I2	
In 12	34	B-14/ White-Orange	=>	4	I3	
In 13	35	B-15/ White-Yellow	=>	5	I4	
In 14	36	B-16/ White-Green	=>	6	I5	
In 15	37	B-17/ White- Blue	=>	7	I6	
In 16	38	B-18/ White-Violet	=>	8	I7	
Input Group B Com	39	B-19/ White-Gray	=>	9	Input Supply Com	
N/C	40	B-20/ Brown-Black	=>	10 ¹	Input Supply +	

1. Connect +24 VDC to these X80 pins for the modules to operate. Connection can be made on the Quantum connectors associated pin.

Wiring Guide 10: 990ADQUAX80142, 990ADQUAX80143

The Quantum 140AMM09000 analog channels are differential, whereas the X80 BMXAMM0600 analog channels are single-ended. In some cases, the BMXAMM0600 will not be a suitable replacement for the 140AMM09000. In these cases, individual X80 analog input and output modules can be substituted for the BMXAMM0600 mixed module.

NOTE: This Quantum module is HART compatible, the recommended X80 module is not. The X80 module is not recommend for direct replacement of the Quantum module where HART is incorporated into the analog channel wiring. The X80 module can be used if additional filtering is incorporated into the analog channel wiring.

NOTICE

RISK OF UNINTENDED OPERATION

The current loops on this X80 module are self-powered by the output channels and do not require any external supplies. Disconnect each of the analog output channel wires from its loop power supply, then connect the individual channel wires together.

Failure to follow these instructions can result in equipment damage.

Wiring Guide 10 140AMM09000 -> BMXAMM0600 Analog Mixed, 2 Output Channels/ 4 Input Channels 990ADQUAX80142/143 990X80CABLx18PT Analog cable					
Quantum Signal	Quantum Pin #	Cable-Wire #/Wire Color		X80 Pin #	X80 Signal
Monitor 1	1	-		-	-
I Source 1 -	2	A-2/Brown	->	17 ¹	U/IO0
N/C	3	-		-	-
I Source 1 -	4	A-4/Orange	->	17 ¹	U/IO0
N/C	5	-		-	-
N/C	6	-		-	-
N/C	7	-		-	-
N/C	8	-		-	-
I Sink 1 +	9	A-9/Gray	->	18 ¹	Com0
I Source 1 -	10	A-10/White	->	17 ¹	U/IO0
Monitor 2	11	-		-	-
I Source 2 -	12	A-12/White-Brown	->	19 ¹	U/IO1

Wiring Guide 10 140AMM09000 -> BMXAMM0600 Analog Mixed, 2 Output Channels/ 4 Input Channels 990ADQUAX80142/143 990X80CABLx18PT Analog cable					
Quantum Signal	Quantum Pin #	Cable-Wire #/Wire Color		X80 Pin #	X80 Signal
N/C	13	–		–	–
I Source 2 -	14	A-14/White-Orange	->	19 ¹	U/IO1
N/C	15	–		–	–
N/C	16	–		–	–
N/C	17	–		–	–
N/C	18	–		–	–
I Sink 2 +	19	A-19/White-Gray	->	20 ¹	Com1
I Source 2 -	20	A-20/Brown-Black	->	19 ¹	U/IO1
In 1 +	21	B-1/Black	->	1	U0
In 1 -	22	B-2/Brown	->	5	Com0
Sense 1	23	B-3/Red	->	2	I0
N/C	24	–		–	–
In 2 +	25	B-5/Yellow	->	6	U1
In 2 -	26	B-6/Green	->	8	Com1
Sense 2	27	B-7/Blue	->	7	I1
N/C	28	–		–	–
N/C	29	–		–	–
N/C	30	–		–	–
In 3 +	31	B-11/White-Black	->	9	U2
In 3 -	32	B-12/White-Brown	->	11	Com2
Sense 3	33	B-13/White-Red	->	10	I2
N/C	34	–		–	–
In 4 +	35	B-15/White-Yellow	->	12	U3
In 4 -	36	B-16/White-Green	->	14	Com3
Sense 4	37	B-17/White-Blue	->	13	I3
N/C	38	–		–	–
N/C	39	–		–	–

Wiring Guide 10
140AMM09000 -> BMXAMM0600
Analog Mixed, 2 Output Channels/ 4 Input Channels
990ADQUAX80142/143
990X80CABLx18PT Analog cable

Quantum Signal	Quantum Pin #	Cable-Wire #/Wire Color		X80 Pin #	X80 Signal
N/C	40	-		-	-

1. Each Quantum analog output channel has 3 current source pin selections available on the Quantum connector. Locate the analog output channel I Source – pin and connect its wire #/color to the X80 connector U or I pin.

Glossary

C

Cable Management System:

An accessory that consists of a metal bar plus two sub-bases that are affixed to the X80 backplane. You can attach I/O adapter cables of X80 modules on the upper X80 backplane to the metal bar. This allows positioning and affixing of the upper module cables providing an unobstructed view of the display blocks (I/O channel indicators) of the I/O modules located in the lower X80 backplane. The cable management system can also be used to provide a ground connection for analog cable shielding.

Cables:

Used to connect the translator unit to the X80 module. Types include:

- **Dedicated Cables:** These cables have a molded connector on one end for connecting to the I/O adapter PCB and an X80 connector on the other end for connecting to the X80 I/O module. These cables are wired pin 1 to pin 1, pin 2 to pin 2, and so forth. Types include:
 - **High Power Cable:** These cables have larger gauged wire for high current and/or high voltage. They have an in-line 20 or 40 pin molded connector for connection to the adapter PCB.
 - **High Density Cable:** These cables have smaller gauged wired for low current and/ or low voltage. They have a 20 position high density connector for connection to the adapter PCB.
 - **Analog Cable:** These cables have smaller gauged wire for analog signals. They have a 20 or 28 position high density connector and a shield wire with ring lug for connection to the adapter PCB.
- **Pig Tail Cables:** These cables have a molded connector on one end for connecting to an I/O adapter PCB and pig tail wires (flying leads) on the other end. The pig tail wires are color coded and have wire number labels (1...20). The wires of the pig tail cable need to be connected to the X80 connector that is included in the I/O adapter assembly. Types include:
 - **High Power Pig Tail Cable:** These cables have larger gauged wire for high current and/or high voltage. They have an in-line 20 or 40 pin molded connector for connection to the adapter PCB and color-coded wires on the other. These wires are then connected to the X80 connector per the appropriate wiring guide.
 - **High Density Cable:** These cables have smaller gauged wire for low current and/ or low voltage. They have an HE20, 20 pin molded connector for connection to the adapter PCB and color-coded wires with ferrules on the other. These wires are then connected to the X80 connector per the appropriate wiring guide.
 - **Analog Cable:** These cables have smaller gauged wired for analog signals. They have a 20 or 28 position high density connector and a shield wire with ring lug for connection to the adapter PCB and color-coded wires with ferrules on the other. These wires are then connected to the X80 connector per the appropriate wiring guide.
- **Replacement Cables:** These cables are the same as listed in Dedicated and Pigtail sections, above with one exception: the Pig Tail replacement cables do not come with an X80 connector.

Chassis:

A two-piece metal assembly which allow the X80 PAC system to be mounted to it and houses the I/O adapters and Quantum field connectors. The parts include:

- Back plate: The back part of the chassis, which is mounted in the cabinet in the same location as the Quantum backplane. It houses the I/O adapters and Quantum field connectors.
- Front plate: The door on the front of the chassis, which opens and is removable. This is where the X80 backplanes are mounted.

I**I/O Adapter Assembly:**

Complete assembly that contains the translator unit and cable, which mount in the chassis and connects the field device wiring to the appropriate X80 module pins. Types include:

- Dedicated I/O Adapter: These assemblies mount to the chassis assembly and contain the PCB that performs the wiring translations from Quantum to X80 connector pins. These assemblies use the dedicated cables. Some adapters may require the addition of a power connection necessary for the X80 module. These connections can be added to the Quantum or X80 connector. Refer to the appropriate wiring maps for this information.
- Generic I/O Adapter: These assemblies mount to the chassis assembly and contain the I/O adapter PCBs that **do not** perform the wiring translation. The signal translation is performed by the cable wiring only.
- Front Mount Adapters: These adapter assemblies accept 20 position high density connectors and connect directly to X80 module high density connectors on the 32 and 64 channel X80 modules. The signal translations are performed by the PCB of the adapter.

M**Mounting Plate:**

A metal plate similar to a Quantum backplane, which provides hole patterns that allow two X80 backplanes to be mounted. There are three sizes of mounting plates: 6, 10 and 16 slot. Each has the same mounting hole pattern as the Quantum backplane it replaces. These mounting plates can be used when no I/O adapter assemblies are being used in the modernization, for example, if you rewire the field wiring or system that currently uses the Cablefast wiring systems.

T

Translator Unit:

Consists of a printed circuit board (PCB) assembly and a metal mounting plate. The PCB routes the Quantum field connections to the PCB mounting connector headers and the mounting plate holds the PCB and affixes it to the chassis.

W

Wiring Guide:

Tables for the Generic Adapters that provide the wiring instructions necessary to complete the required signal translations at the field connector(s). The adapter PCB does not provide the wiring translations from Quantum to X80 connector pins, only straight through connections.

NOTE: No circuit protection is provided by the generic I/O adapter PCB or cable.

Wiring Map:

Tables for the Dedicated Adapters that provide signal names and pin assignments from the Quantum module, to the X80 replacement module.

Schneider Electric
35 rue Joseph Monier
92500 Rueil Malmaison
France

+ 33 (0) 1 41 29 70 00

www.se.com

As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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