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E. Electrical Modules

X7GL—Electrical Module

1. Product Overview

The X7GL modules provide a connection to customer tooling. When the modules are coupled, the V-ring seal forms a water resistant but not waterproof seal.

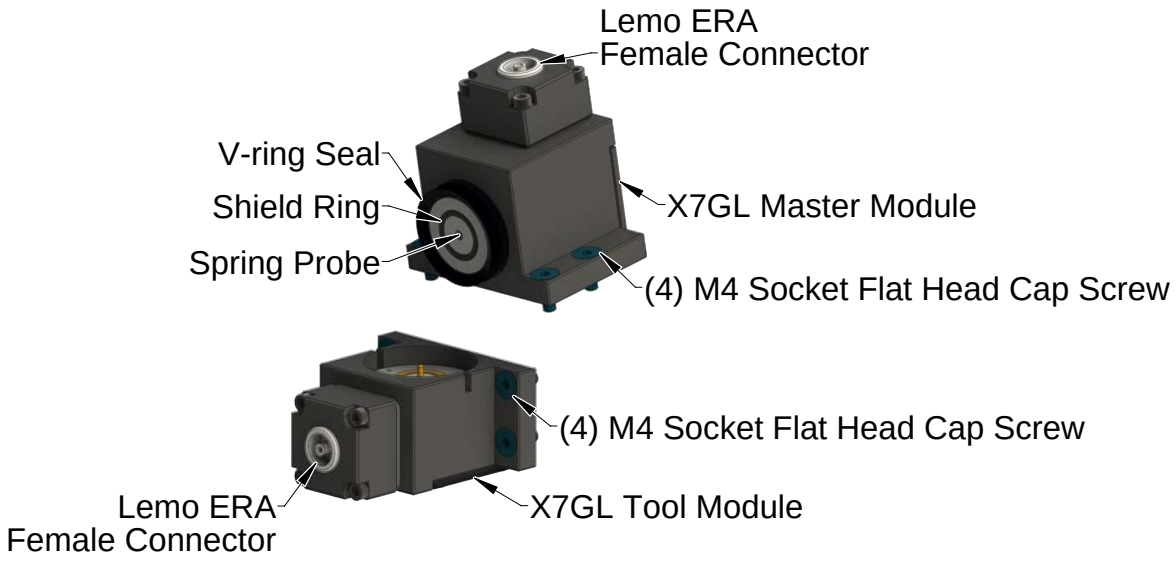
1.1 X7GL Master Module

The X7GL Master module includes: (1) Lemo ERA female connector and a V-ring seal. Refer to *Section 8—Drawings* for additional information and connector details.

1.2 X7GL Tool Module

The X7GL Tool module includes: (1) Lemo ERA female connector. Refer to *Section 8—Drawings* for additional information and connector details.

Figure 1.1—X7GL Modules



2. Installation

Electrical modules are typically installed by ATI prior to shipment. Installation and removal are outlined in the following section. For wiring information, refer to *Section 8—Drawings*.

WARNING: Do not perform maintenance or repair(s) on the Tool Changer or modules unless the Tool is safely supported or placed in the tool stand, all energized circuits (for example: electrical, air, water, etc.) are turned off, pressurized connections are purged and power is discharged from circuits in accordance with the customer specific safety practices and policies. Injury or equipment damage can occur with the Tool not placed and energized circuits on. Place the Tool in the tool stand, turn off and discharge all energized circuits, purge all pressurized connections, and verify all circuits are de-energized before performing maintenance or repair(s) on the Tool Changer or modules.

CAUTION: Thread locker applied to fasteners must not be used more than once. Fasteners might become loose and cause equipment damage. Always apply new thread locker when reusing fasteners.

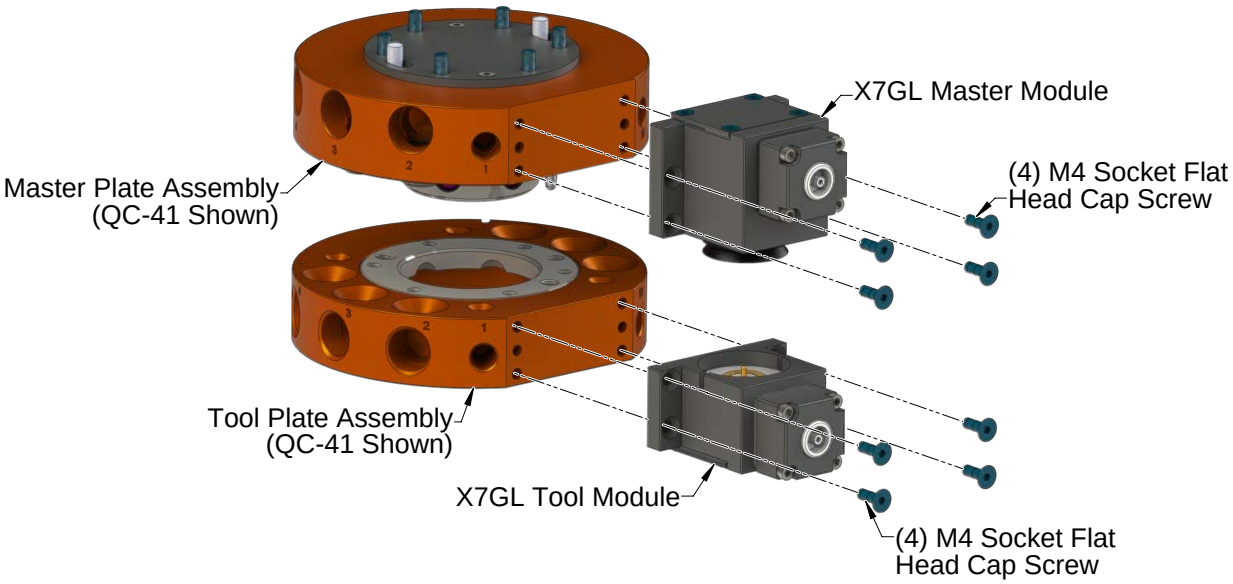
2.1 Module Installation

Tools required: *2.5 mm hex key, torque wrench*

Supplies required: *Clean rag, Loctite® 222*

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. Clean the mounting surfaces.
5. Align the optional module on the Master or Tool plate as shown in *Figure 2.1*.
6. Apply Loctite 222 to (4) M4 socket flat head cap screws.
7. Secure module with (4) M4 mounting fasteners using a 2.5 mm hex key and tighten to 10 in-lbs (1.13 Nm).
8. Safely resume normal operation.

Figure 2.1—Module Installation



2.2 Module Removal

Refer to *Figure 2.1*

Tools required: *2.5 mm hex key*

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. Disconnect any cables, air line, etc (if required).
5. Using a 2.5 mm hex key, remove the (4) M4 socket flat head cap screws and lift the module from the Master or Tool plate.

3. Operation

To maximize the service life of these components, the following points should be observed:

CAUTION: Never couple or uncouple the modules unless electrical power has been disconnected and discharged both upstream and downstream from the modules. Arcing and contact damage occur during coupling or uncoupling if power is not removed and discharged. Always disconnect and discharge power from upstream and downstream of the modules before coupling or uncoupling.

CAUTION: Improper cable routing can result in wires and cables being pinched in the joint between the Tool Changer plates and premature failure of the electrical connectors. Properly route and secure all cables, particularly on the Master side.

4. Maintenance

Under normal conditions, no special maintenance is necessary; however, it is recommended that periodic inspections be performed to assure long-lasting performance and that unexpected damage has not occurred. The modules are not designed to be field serviced as all point-to-point wiring connections are soldered.



DANGER: This module has a voltage of 50V or greater; always remove power before contacting the module. Arcing and damage occur if power is not removed from the module during maintenance or service. Always remove power before attaching or disconnecting cables, separating or inserting the mating couplers, or making any contact with the Tool Changer or Utility Coupler.



WARNING: Do not perform maintenance or repair(s) on the Tool Changer or modules unless the Tool is safely supported or placed in the tool stand, all energized circuits (for example: electrical, air, water, etc.) are turned off, pressurized connections are purged and power is discharged from circuits in accordance with the customer specific safety practices and policies. Injury or equipment damage can occur with the Tool not placed and energized circuits on. Place the Tool in the tool stand, turn off and discharge all energized circuits, purge all pressurized connections, and verify all circuits are de-energized before performing maintenance or repair(s) on the Tool Changer or modules.

If the Tool Changer is used in dirty environments (for example: welding or deburring applications), limit the exposure of the Tool Changer. Idle Tool assemblies should be covered to prevent debris from settling on the mating surface. Also, the Master assembly should be exposed for only a short period of time during Tool change and down time. Perform the following visual inspections monthly:

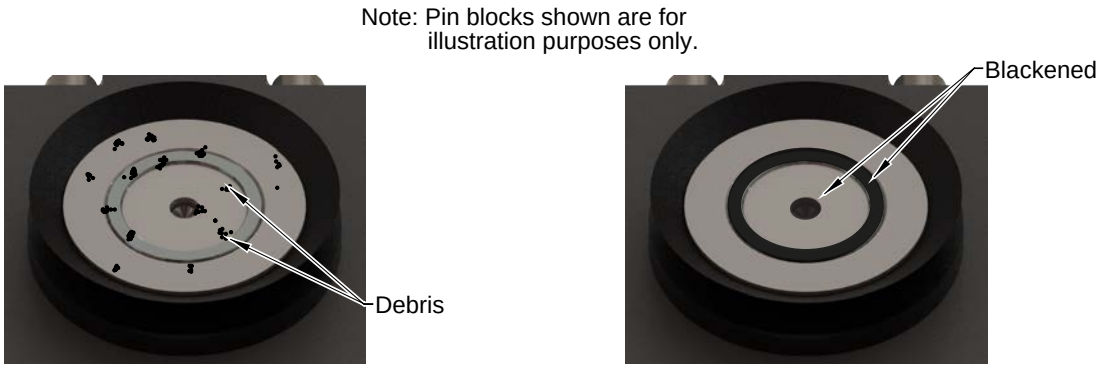
- Inspect mounting fasteners to verify they are tight. If loose, then tighten to the proper torque. Refer to *Section 2—Installation*.
- Cable connections should be inspected during maintenance periods to ensure they are secure. Loose connections should be cleaned and re-tightened, as appropriate. Inspect cable sheathing for damage and repair or replace damaged cabling. Loose connections or damaged cabling should not occur during normal operation and may indicate improper routing and/or strain relieving.
- Inspect the Master and Tool pin blocks for pin damage, debris or darkened pins. Refer to *Section 4.1—Cleaning Procedure*.
- Inspect V-ring seals for wear, abrasions, and cuts. If worn or damaged, replace. Refer to *Section 5.2.1—Seal Replacement*.

4.1 Cleaning Procedure

Tools required: *Nylon Brush (ATI Part Number 3690-0000064-60)*

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. Inspect the Master and Tool pin blocks for debris or blackened center pin and shielding ring.

Figure 4.1—Inspect Master and Tool Pin Blocks



5. If debris or blackened center pin and shielding ring are present, use a vacuum to remove the debris, and clean using a nylon brush (ATI Part Number 3690-0000064-60).

NOTICE: Do not use an abrasive media, cleaners, or solvents to clean the center pin and shielding ring. Using abrasive media, cleaners, or solvents will cause damage to the contact surface, or cause center pin and shielding ring to stick. Clean contact surfaces with a vacuum or non-abrasive media such as a nylon brush (ATI Part Number 3690-0000064-60)

Figure 4.2—Clean Pin Blocks with a Nylon Brush



6. Safely resume normal operation.

5. Troubleshooting and Service Procedures

The following section provides troubleshooting and service information to help diagnose conditions and repair the X7GL modules.

WARNING: Do not perform maintenance or repair(s) on the Tool Changer or modules unless the Tool is safely supported or placed in the tool stand, all energized circuits (for example: electrical, air, water, etc.) are turned off, pressurized connections are purged and power is discharged from circuits in accordance with the customer specific safety practices and policies. Injury or equipment damage can occur with the Tool not placed and energized circuits on. Place the Tool in the tool stand, turn off and discharge all energized circuits, purge all pressurized connections, and verify all circuits are de-energized before performing maintenance or repair(s) on the Tool Changer or modules.

5.1 Troubleshooting

Troubleshooting information is provided in the following table.

Table 5.1—Troubleshooting

Symptom	Possible Cause	Correction
Signal(s) malfunctioning	Contact pins are separating when Tool Changer is coupled.	Ensure that the Tool Changer has proper pneumatic connections and supplied air is to the proper specification. Refer to the Tool Changer section of this manual for air supply requirements.
	Tool Changer is coupling and uncoupling under a load.	Revise operating procedures to only couple/uncouple with power disconnected and discharged. Field replacement of module contacts is not possible.
	Cables are damaged, for example: pinched, torn, or fatigued	Examine cables for damage; perform a continuity test on cables and replace damaged cables
	Debris caught between the Master and Tool modules.	Clean probes and shield rings. Refer to *Section 4.1—Cleaning Procedure*

5.2 Service Procedures

Component replacement and adjustment procedures are provided in the following section.

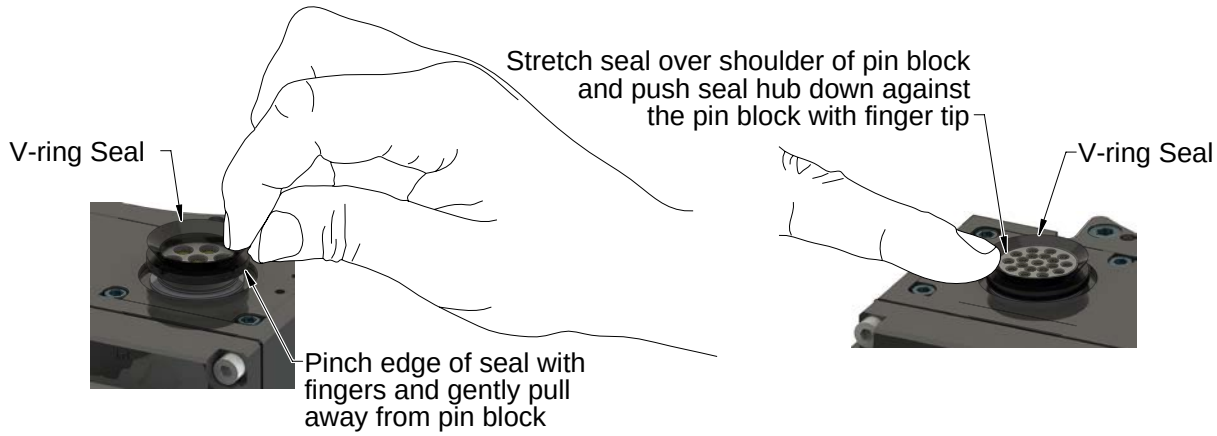
5.2.1 Seal Replacement

Parts required: *Refer to Section 8—Drawings.*

The seal protects the electrical connection between the Master and Tool module. Replace the seal if it becomes worn or damaged.

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. To remove the existing seal, pinch the edge of the seal and pull the seal away from the pin block on the Master module.
5. To install a new seal, stretch the new seal over the shoulder of the pin block.
6. Push the seal hub down against the pin block.
7. Safely resume normal operation.

Figure 5.1—V-ring Seal Replacement



6. Serviceable Parts

For mounting fasteners and accessories, refer to the following tables. For additional serviceable parts, refer to *Section 8—Drawings*.

6.1 Module Mounting Fasteners

Table 6.1—Master and Tool Module			
Item No.	**Qty**	**Part Number**	**Description**
*	4	3500-1262012-15A	M4x12 Flat Head Socket Cap Screw, 10.9, ISO10642/ DIN7991, ES-ATI-007, YL M-Spheres/IFI 525

6.2 Accessories

Table 6.2—Accessories			
Item No.	**Qty**	**Part Number**	**Description**
*	*	3690-0000064-60	Nylon Brush

7. Specifications

Table 7.1—Master Specifications	
9120-X7GL-M	High Voltage Master Module with Lemo connector for Ultrasonic Weld Applications
Connector(s)	(1) Lemo ERA female connector
Electrical Rating	4A, 1.4kV
Enclosure	IP40
Weight	TBD

Table 7.2—Tool Specifications	
9120-X7GL-T	High Voltage Tool Module with Lemo Connector for Ultrasonic Weld Applications
Connector(s)	(1) Lemo ERA female connector
Electrical Rating	4A, 1.4kV
Enclosure	IP40
Weight	TBD

8. Drawings

Drawings are available on the *ATI website* or by contacting an ATI representative.