Allen-Bradley 1769-IQ32

01 Define the installation boundary

Purpose of this field guide

Use this guide to prepare, connect, replace and verify the 1769-IQ32 in a Compact I/O assembly. It focuses on field execution. Establish the actual controller configuration and field-circuit assignments before disturbing the installed system.

From field circuit to controller

01	A DC field device changes the voltage at one input terminal relative to its assigned group common.
02	The input circuit converts the electrical condition to an input state and provides front-panel indication.
03	The Compact I/O bus carries the input image to the host, where the application reads two sixteen-bit words.

Pre-work boundary

Item	Required check
Field supply	Keep AC power away from every input terminal.
Field-device polarity	Choose the arrangement separately for each eight-point group.
Power budget	Count the other modules as well as this module.
Position	Check physical order before locking the row.
Enclosure	Keep air paths clear and exclude conductive debris.

Power removal and handling

Remove power before inserting or removing the module. Removing only the controller supply does not establish that externally powered field wiring is de-energized. Identify the applicable field circuits before work. Discharge static electricity, avoid touching bus contacts and keep the module in appropriate protective packaging until it is installed.

Retain the circuit identity

Record the module position, both terminal-block positions and each connected device. Preserve the group assignments; a wire moved to a different common can change the circuit polarity or disable several inputs at once.

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02 Prepare the wiring

Four separate field-circuit groups

Input terminals	Common	Circuit grouping
IN 0-7	DC COM 1	First eight-point circuit
IN 8-15	DC COM 2	Second eight-point circuit
IN 16-23	DC COM 3	Third eight-point circuit
IN 24-31	DC COM 4	Fourth eight-point circuit

Choose polarity at group level

The isolated groups support sinking or sourcing arrangements. Keep the supply polarity consistent within an eight-point group. Isolation exists between groups and between the field side and Compact bus; it does not provide independent isolation between the eight points sharing one common.

Termination requirements

Connection item	Requirement
Solid copper	22-14 AWG; 90 °C wire rating
Stranded copper	22-16 AWG; 90 °C wire rating
Conductors per terminal	Up to two within the permitted conductor ranges
Terminal screw	0.68 N·m
RTB retaining screws	0.46 N·m
Replacement RTB	1769-RTBN18; one terminal block per kit

Secure the conductors

Keep the finger-safe cover in place. Route the conductor under the terminal pressure plate, tighten to the specified terminal torque and verify that the wire is retained. When two conductors share a terminal, check both individually; a secured first wire does not establish that the second is secure.

Before connecting field power

Compare the terminal labels with the wiring plan. Check for loose strands, debris and accidental contact with adjacent terminals. Confirm the correct common at every used group before connecting the DC supply.

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03 Assemble or replace the module

Replacement sequence

01	Isolate the system and relevant field circuits. Identify the existing left and right terminal blocks before detaching either one.
02	Loosen the upper and lower retaining screws and withdraw the removable terminal block without changing its wire assignments.
03	Release panel fasteners or DIN-rail latches as applicable. Unlock the target module bus lever by moving it to the right.
04	Unlock the bus lever of the adjacent module on the right so its connector no longer holds the target module.
05	Slide the target module forward. Align the replacement module using the upper and lower tongue-and-groove guides.
06	Seat the bus connection and move the bus lever fully left until it locks. Restore the neighboring connection and mounting.
07	Return each terminal block to its marked position, tighten its retaining screws and inspect every field-wire assignment.

Assembly acceptance

Check	Completed condition
Bus lever	Fully left and locked after connector alignment
End of row	Appropriate 1769-ECR right or 1769-ECL left end cap fitted and locked
Mounting	Module and adjacent units secure; grounded mounting maintained
Terminals	Finger-safe cover retained; field circuit labels readable

Keep the bus mechanically complete

Do not use the bus lever to force misaligned parts together. The guides establish mechanical alignment before the bus connector is locked. A row that looks complete still requires its appropriate end termination.

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04 Commission the input circuits

Staged functional checks

Stage	Action	Acceptance evidence
One input	Operate the connected field device while watching its input indicator.	The indication follows the applied DC state.
Data image	Observe both sixteen-bit words while exercising channels across the module.	All thirty-two point assignments are represented.
Group boundary	Test the last and first channel on each side of an eight-point boundary.	The correct common and channel label are used.
Polarity	Check the supply reference for every group used by the application.	Each field circuit has a complete, correctly polarized DC path.
Application	Compare the physical action with the controller logic that consumes the bit.	The intended equipment status changes; unrelated status stays unchanged.

Test across the complete channel range

Start with a known field device and its expected channel. Continue across all used points, including both sixteen-bit words and each common-group boundary. Record the input terminal, the controller bit and the resulting machine status together so that a labeling error is not mistaken for an electrical fault.

Electrical boundaries during testing

Item	Limit
ON condition	At least 10 V DC and 2 mA
OFF condition	No more than 5 V DC and 1.5 mA
Voltage versus temperature	10-30 V DC at 30 °C; 10-26.4 V DC at 60 °C
Response	Up to 8 ms ON delay and 8 ms OFF delay

Return to automatic operation

Remove temporary test conditions and restore the intended device states. Check the controller application after field testing, because a lit module indicator alone does not verify the application’s channel assignment. Release only the circuits whose physical and logical responses have both been checked.

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05 Diagnose and hand over

Localize the symptom

Observation	Investigation	Reason
Eight adjacent points unavailable	Examine the group common, its field supply and polarity.	A shared connection can affect all eight circuits.
An individual point stays OFF	Check field-device output, wire continuity and the voltage at that point relative to its own common.	Do not use another group common as the measurement reference.
An input stays ON after release	Check residual field-device current and terminal voltage.	Compare the OFF-state limits with the connected circuit.
Upper channels absent in logic	Inspect the second input word and application addressing.	Reading one word alone does not represent thirty-two points.

Capture a useful service record

Keep the affected input numbers, group common, measured DC conditions and controller word/bit together. Note whether the fault affects one point, one group or the complete module. This distinction directs the next inspection toward a field circuit, common connection or assembly interface.

After replacement

Recheck the terminal-block positions, bus-lever locks and input indication before repeating the functional test. Preserve the final field-device mapping with the controller project so a later replacement does not depend on undocumented wire colors or assumed channel order.

Related catalogue pages

Allen-Bradley 1769-IF8

Allen-Bradley 1769-OF8C

Allen-Bradley 1769-PA2

Reference identity

Technical basis: Rockwell Automation 1769-IN032A-EN-P (April 2003), pp. 3-15; 1769-TD006H-EN-P (November 2023), pp. 2, 14.