Allen-Bradley 1746-NI16I

01 Preserve the acquisition map

1 Identify the actual host

Record the processor, local or remote chassis, adapter, module slot and hardware series. Retain the accepted project before removing the old module.

2 Capture class and channel settings

Record interface class, module ID, channel enable, current range, data format and group filter. In Class 1 retain the data/status bank-selection logic; in Class 3 retain all scaling limit words.

Class 1	ID 3504; eight input and eight output words
Class 3	ID 10403; 32 input and 32 output words
Slot	I/O position other than processor slot 0

Class-specific acceptance

A Class 1 replacement must retain bank and data/status selection behavior. A Class 3 replacement must expose all data and status words at the addresses expected by the program. Successful insertion alone does not verify the image interpretation.

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02 Prove the external current circuit

1 Separate measurement from loop supply

The module does not furnish transmitter power. Confirm external supply polarity and available voltage across every series burden before reconnecting the field loop.

2 Inspect the reference and shield

Trace each signal return to analog common. The two analog common terminals are internally connected. Terminate shields according to the installation design and keep signal wiring away from electrical noise sources.

Input burden	249 Ω per current input
At 20 mA	Calculated module drop 4.98 V
Unused inputs	Connect to analog common as instructed

Powered-circuit check

Measure loop voltage under actual current load. An open-circuit supply measurement may look normal while transmitter voltage collapses at higher current. Use an appropriate current calibrator and observe the approved isolation procedure.

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03 Restore converter-group configuration

1 Allocate channels by converter

Map inputs into 0–3, 4–7, 8–11 and 12–15. Review enabled-channel distribution when timing matters; a cluster on one converter can determine the scan period.

2 Apply the controlling filter choices

Restore filter selections in channels 0, 4, 8 and 12. Verify current range and data format for every enabled channel. Do not assume a copied project has the same image allocation as the installed host.

Group A	Inputs 0–3; filter selected in channel 0
Group B	Inputs 4–7; filter selected in channel 4
Group C	Inputs 8–11; filter selected in channel 8
Group D	Inputs 12–15; filter selected in channel 12

Channel distribution example

For twelve measurements at a 40 Hz filter, enabling 0–2, 4–6, 8–10 and 12–14 gives approximately 75 ms update. Enabling only channels 0–11 leaves three converters fully loaded and does not achieve the same reduction.

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04 Test scale and diagnostic response

1 Inject meaningful current points

For an approved 4–20 mA loop, apply 4, 12 and 20 mA and compare the input data with the selected format and application engineering values. Confirm that neighboring channels remain unaffected.

2 Exercise the broken-loop case

With the process protected and the test authorized, open an enabled 4–20 mA channel and observe its returned value and fault status. Restore the circuit and confirm self-clearing channel diagnostics; do not hide the fault by disabling the channel.

Lower / midpoint / upper	Confirm the intended engineering scale
Status	Valid channel associated with each measured word
Recovery	Correct value and healthy status after reconnection

Diagnostic evidence

A disabled channel resets its status. Re-enable it after correcting the circuit and allow configuration processing to finish. A healthy group indicator does not replace checking the individual channel status and actual measured value.

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05 Release the restored input system

1 Check dynamic behavior

Apply a representative changing signal and observe the response through acquisition, controller execution and the displayed engineering value. Record the enabled-channel pattern and filter settings with the timing result.

2 Reinstate the production circuit

Remove temporary sources, restore field transmitters and compare actual process values with retained references. Remove test forces and bypasses under the approved procedure before release.

Electrical	Loops, commons and shields restored
Configuration	Accepted class, range, format and filters retained
Acceptance	Data, status and process response recorded

Retained handover information

Record the module identity, class, group filters, enabled channels and test results together. This links the accepted process response to the configuration that produced it, rather than preserving only a photograph of the hardware.

Related automation references

Foxboro P0922YU FPS400-24

Honeywell 10302/2/1

Honeywell TC-IAH161

Separate product references, not substitutes for this module.