Allen-Bradley 1746-NIO4I SLC 500 Analog Combination Module

IDENTITY, COMMERCIAL FACTS AND SPECIFICATION

PRODUCT ROLE

Allen-Bradley 1746-NIO4I is an SLC 500 analog combination module with two differential analog inputs and two current outputs. Each input can be configured for voltage or current; the outputs supply 0-20 mA signals. Match the rack power budget, channel wiring and PLC scaling before a replacement.

OFFERED PRODUCT

Manufacturer part number 1746-NIO4I	**Shipping** Swift global dispatch	**Condition** New, original product
Shipping size (est.) 3.5cm x 13cm x 14.5cm	**Country of Origin** USA	**Ship from** Xiamen, Fujian, China

PUBLISHED TECHNICAL SPECIFICATIONS

Manufacturer	Allen-Bradley
Product Category	PLC Systems
Spare Part Number	1746-NIO4I
Weight	0.2 kg
Tariff Code	8537101190
Module family	SLC 500 1746 analog I/O
Analog inputs	2 differential; voltage or current selectable per channel
Analog outputs	2 current outputs; 0-20 mA normal
Channel isolation	Inputs and outputs not individually isolated
Backplane 5 V draw	55 mA maximum
Backplane 24 V draw	145 mA maximum
Field-to-backplane isolation	500 V DC
SLC data format	16-bit two-complement binary
Analog update	512 microseconds for all channels in parallel
Current-input range	-20 to +20 mA normal
Current-input impedance	250 ohms
Current-input resolution	1.22070 microamps per LSB
Current-input accuracy at 25 C	+/- 0.365% of full scale maximum
Current-output range	0-20 mA; 5% overrange to 21 mA minus 1 LSB
Current-output resolution	14 bit; 2.56348 microamps per LSB
Current-output load	0-500 ohms
Current-output step response	2.5 ms to 95%
Current-output accuracy at 25 C	+/- 0.298% of full scale maximum
Removable terminal block	Yes
Recommended cable	Shielded Belden 8761
Maximum wire size	14 AWG
Operating temperature	0 to 60 C
Storage temperature	-40 to +85 C
Relative humidity	5-95% non-condensing
Manufacturer lifecycle	Discontinued 29 April 2021; engineering replacement
Item origin	USA, confirmed from supplied physical unit
Shipping package	3.5cm x 13cm x 14.5cm; 0.2kg

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BUYER INFORMATION AND SERVICE CONTEXT

OVERVIEW

Allen-Bradley 1746-NIO4I provides two selectable differential analog inputs and two current outputs in an SLC 500 1746 chassis slot.
Module type: Analog input/output combination
Field channels: 2 inputs and 2 current outputs
Chassis: 1746 SLC 500
Rockwell publication 1746-IN008C-EN-P lists 55 mA maximum draw from the 5 V backplane and 145 mA from the 24 V backplane for NIO4I. Check total rack supply loading and the fixed-controller expansion rules before choosing a slot.

Each input can be configured for voltage or current. Current inputs operate over -20 to +20 mA with 250 ohm impedance; the two outputs normally provide 0-20 mA with a 0-500 ohm load range. Verify process-transmitter wiring and PLC scaling for each channel.

The removable terminal block and shielded cable arrangement support field maintenance. Analog commons are internally connected and the channels are not isolated from each other. The 500 V DC isolation is from field wiring to the backplane; design grounding around this boundary.
Controller platform reference: Rockwell SLC 500 1746 I/O system. Preserve the installed program and four-channel wiring record.

APPLICATIONS / COMPATIBILITY

System fit: 1746-NIO4I combines analog acquisition and current-loop control in an SLC 500 chassis.

Application boundary: Match the actual rack, transmitter wiring, PLC program and output loads to the documented module limits.

Process-signal acquisition
Read two differential analog process inputs after confirming voltage/current selection and the controller scaling for each channel.

Current-loop actuation
Drive two 0-20 mA field loads while respecting the 0-500 ohm load range and the site wiring design.

SLC rack integration
Account for the module demand on both 5 V and 24 V backplane rails and retain the expected 1746 slot/I-O image.

Service replacement
Transfer terminal labeling, program settings and grounding practice, then prove each input and output with calibrated signals.

LIFECYCLE STATUS

1746-NIO4I: Rockwell Automation lists this exact catalog number as discontinued on 29 April 2021 with an Engineering Replacement category. Confirm current support and the approved alternative for the installed SLC configuration.

System planning: Preserve the I/O image, mode selection, scaling and rack power budget. A substitute requires an application engineering check.

Supply: Apter Power availability is separate from manufacturer lifecycle status.

PRODUCT PRECAUTIONS

Treat 1746-NIO4I as an analog field interface. Check power, shield, channel mode and controller scaling before commissioning.

Isolate the rack and field circuits
Disconnect SLC power and any other field source before wiring or removing the analog module.

Check rack power margin
Include 55 mA at 5 V and 145 mA at 24 V in the installed supply calculation.

Confirm terminal and common wiring
Keep input and output returns aligned with the approved wiring diagram; analog commons are internally joined.

Manage shields deliberately
Use the manufacturer shield-grounding method and route analog cables away from noisy power conductors.

Limit current-output load
Measure the actual loop load and confirm that each output stays within 0-500 ohms.

Validate the PLC application
Restore slot, mode and scaling settings; inject known inputs and verify both field outputs before release.

DOWNLOADS

An applicable original manufacturer technical reference or an Apter Power technical reference is listed in Downloads, followed by the Apter Power engineering technical data PDF. The View PDF control opens this complete product information dossier.

AVAILABLE UNIT DETAILS

Identification: 1746-NIO4I is a two-input/two-current-output SLC 500 analog module. The physical supplied unit was confirmed as USA origin; Rockwell catalog listings cover multiple manufacturing locations.

Shipping: User-supplied package 3.5cm x 13cm x 14.5cm, 0.2kg. Condition: New, original product.

Acceptance: Confirm complete marking, removable terminal block and all four channel assignments before installation.

ALTERNATIVE NAMES

SLC 500 1746-NIO4I
1746 NIO4I analog combination module

TECHNICAL NOTES

Module: 1746-NIO4I combines two selectable voltage/current differential inputs with two analog current outputs. The analog channels are not individually isolated.

Power and wiring: Verify SLC 5 V and 24 V backplane capacity, field common, shield termination and 0-500 ohm current-output load before installation.

Technical source: Rockwell Automation 1746-IN008C-EN-P, May 2004; exact product record.

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ENGINEERING FAQ AND ORDERING CHECKS

ENGINEERING QUESTIONS

Q01 Why can an input reading drift on 1746-NIO4I while the transmitter current is stable?

Check shield grounding, analog common, loop supply, input mode and temperature. Trend a calibrated loop signal at the terminal block before replacing hardware.

Q02 How should a PLC engineer check the two input modes of 1746-NIO4I before replacement?

Compare the installed channel selection, terminal wiring and controller scaling with the application file. Prove each channel with a known current or voltage stimulus as appropriate.

Q03 What can make a current output on 1746-NIO4I saturate before reaching its commanded value?

Measure loop resistance and supply conditions at the actual load; confirm the 0-500 ohm specification, wiring polarity and output scaling.

Q04 How should backplane power be checked before adding 1746-NIO4I to a full SLC chassis?

Sum the rack 5 V and 24 V loads from the installed modules and compare with the supply margin.

Q05 What is the correct isolation assumption for channels on 1746-NIO4I?

Field wiring is isolated from the backplane but individual analog channels are not isolated from each other. Design grounding and common returns accordingly.

Q06 How can noise on 1746-NIO4I analog values be investigated?

Inspect shield termination, cable routing, analog common, grounding and transmitter supply; compare a stable reference input with live process readings.

Q07 What should be backed up before swapping 1746-NIO4I in an operating rack?

Record slot position, terminal labeling, channel mode and scaling, PLC program, fault history and as-found values for all four channels.

Q08 How should a replacement for discontinued 1746-NIO4I be validated?

Rockwell lists an engineering replacement category. Check controller, I/O image, wiring, scaling and application behavior with Rockwell guidance before selecting an alternative.

WHAT HAPPENS AFTER YOU ENQUIRE / ORDERING VERIFICATION

Review your reference

Share the complete 1746-NIO4I marking, visible series and installed SLC slot reference for an identity check.

Match the complete marking

Include 1746-NIO4I and any visible series or assembly marking in the enquiry and quotation.

Confirm the offer

We confirm the offered 1746-NIO4I revision, terminal-block inclusion and quantity in the written quotation.

Check the offered item before ordering

Request available label and terminal photographs. Have maintenance compare the offered reference with the installed SLC module and Rockwell documentation before ordering.

Arrange dispatch

After quotation approval, we confirm packing, dispatch timing and shipment details for the agreed module quantity.

Technical enquiry

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