

Allen-Bradley 1746 1747 Series Service Manual

1746-NIO4V

1. Description

The Allen-Bradley 1746-NIO4V is an SLC500 analog combination module. This module features Two (2) differential, voltage or current selectable per channel with input signal ranges of -20 to +20 mA (or) -10 to +10V dc and Two (2) current outputs with signal range of 0 to +20 mA. Technical specifications for 1746-NIO4V

2. Specifications

Specification	Value
Manufacturer	Rockwell Automation
Module	Type Analog combination module
Series	SLC500
Part	Number/Catalog No. 1746-NIO4V
Brand	Allen-Bradley
No.	of inputs Two (2) Differential Voltage / Current inputs
Current	Input range -20 to 20 mA
Current	input resolution 1.22070 μ A per LSB
Voltage	Input range -10 to +10V dc - 1 LSB
Voltage	input resolution 305.176 μ V per LSB
No.	of Outputs Two (2) non-isolated voltage outputs
Output	Voltage range -10 to +10 volts
Output	voltage resolution 1.22070 mV per LSB
Backplane	Current at 5.1 Volts 0.55 mA
Backplane	Current at 24 Volts 115 mA
Inputs	2
Outputs	2
Backplane	Current (5 Volts) 55 milliamps
Backplane	Current (24 Volts) 115 milliamps
Bandwidth	10 Hertz
Update	Time 512 microseconds
Resolution	16 bits in, 14 bits out
Step	Response 60 milliseconds in, 2.1 milliseconds out
Mounting	Rack mount
UPC	10662073735899 Description
The	1746-NIO4V SLC 500 Analog Combination I/O Module by Allen-Bradley is an I/O module installed on the 1746 Chassis that has 2 user

3. Product Information

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Manufacturer Rockwell Automation

Module Type Analog combination module

Series SLC500

Part Number/Catalog No. 1746-NIO4V

Brand Allen-Bradley

No. of inputs Two (2) Differential Voltage / Current inputs

Current Input range -20 to 20 mA

Current input resolution 1.22070 μ A per LSB

Voltage Input range -10 to +10V dc - 1 LSB

Voltage input resolution 305.176 μ V per LSB

No. of Outputs Two (2) non-isolated voltage outputs

Output Voltage range -10 to +10 volts

Output voltage resolution 1.22070 mV per LSB

Backplane Current at 5.1 Volts 0.55 mA

Backplane Current at 24 Volts 115 mA

Inputs 2

Outputs 2

Backplane Current (5 Volts) 55 milliamps

Backplane Current (24 Volts) 115 milliamps

Bandwidth 10 Hertz

Update Time 512 microseconds

Resolution 16 bits in, 14 bits out

Step Response 60 milliseconds in, 2.5 milliseconds out

Mounting Rack mount

UPC 10662073735899 Description

The 1746-NIO4V SLC 500 Analog Combination I/O Module by Allen-Bradley is an I/O module installed on the 1746 Chassis that has 2 user-selectable (per channel) current or voltage inputs and 2 voltage outputs. It has 2 current-loop inputs with a normal rating of -20 to 20mA at a 250 Ohm impedance and an input accuracy of +/- 0.642% at a drift rate of 79 ppm/5 degrees Celsius. Its two input points also have voltage ratings of -10 to 10 Volts DC with an impedance of 1M Ohm and a 10 Volt DC full-scale resolution of 305.176 μ V per LSB. The voltage inputs have an accuracy of +/-0.504%, an overall drift accuracy of +/- 63 ppm/degree Celsius, and a maximum gain error of +/- 0.461%. The inputs have an offset error of +/- 14 LSB at 0 to 60 degrees Celsius, and the 1746-NIO4V maximum overvoltage protection across the input terminals comes in at either 220 Volts AC or 220 Volts DC. It uses the R-2R Ladder Digital-to-Analog Converter (DAC) with a converter resolution of 14 bits at its voltage output and a response time of 2 milliseconds. The output has a load range greater than 1KOhms with a load reactance of 1 μ F and an overall output range of -10 to 10 Volts. The voltage has an overall accuracy of +/- 0.384% of a 10 Volt DC full-scale voltage and a maximum drift accuracy of +/- 54 ppm per degree Celsius. The 1746-NIO4V also has a maximum gain error of +/- 0.374% with a drift error of $\pm$ 47 ppm/ degree Celsius and an output offset error of +/-11 LSB. The 1746-NIO4V offers Field Wiring-to-Backplane Isolation at 500 Volts DC and uses the Shielded Belden #8761 recommended cable with a rated 14 AWG size.

The Allen-Bradley 1746-NIO4V is an analog I/O combination module. This module features Two (2) input channels and Two (2) output channels. The input channels features compatibility with differential voltage and current inputs that are individually configurable. For current input configuration, accepted signal range is -20 to +20 mA with a resolution of 16-bit with repeatability of $\pm$ 1 LSB and non-linearity of 0.01%. It uses Delta-Sigma modulation conversion method. When configured for voltage input, the accepted voltage signal range is -10 to +10V dc - 1 LSB with resolution of 305.176 μ V per LSB.

The output channels of the 1746-NIO4V does not come with isolation. It can provide an output current range of 0-20 mA with resolution of 14-bit, using R-2R Ladder conversion method. It has a step response of 2.5 ms (at 95%).

This combination I/O module has a backplane current draw of 55 mA at 5.1 VDC and 145 mA at 24VDC. It occupies single slot of the chassis and comes with a removable terminal block for terminating signal wires to and from the module.

Additionally, the 1746-NIO4V may become part of the CompactLogix and ControlLogix Programmable Automation Controllers (PAC), acting as a distributed I/O module.