## **NX-series Analog Input Unit**

## NX-AD

CSM NX-AD DS F 1 1

# Analog Inputs to meet all machine control needs; from general-purpose inputs to high-speed synchronous, high-resolution units

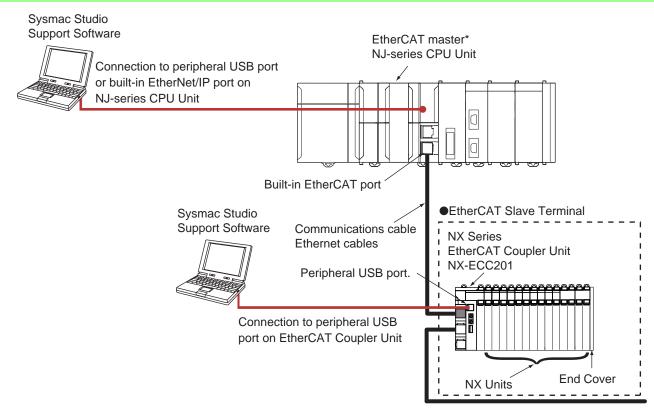
- Analog Input Units for the NX-series modular I/O system.
- Connect to other NX-series I/O Units and EtherCAT Coupler units using the high-speed NX-bus.
- Separate modules for voltage- and current inputs.



#### **Features**

- Up to eight analog inputs per unit.
- Free-run refreshing or synchronous I/O refreshing can be selected using the NX-series EtherCAT Coupler.
- Input update cycles of 10µs per channel, and a resolution of 1/30000, ideal for high-speed measurement and, high-precision control.
- All basic models are available as single-ended and differential-input types.
- The screwless terminal block is detachable for easy commissioning and maintenance.
- · Screwless push-in terminal block significantly reduces wiring work.
- All models are just 12 mm wide, saving space in your cabinet.

#### **System Configuration**



<sup>\*</sup> OMRON CJ1W-NC 81/ 82 Position Control Units cannot be connected to the EtherCAT Slave Terminal even though they support EtherCAT.

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## **Ordering Information**

#### **International Standards**

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, CE: EC Directives, and KC: KC Registration.
- Contact your OMRON representative for further details and applicable conditions for these standards.

#### **Analog Input Unit**

			Specification											
Unit type	Product Name	Capacity	Input range	Resolution	Conversion value, decimal number (0 to 100%)	Over all accuracy (25°C)	Input method	Conversion time	Input impedance	I/O refreshing method	NX Unit power consum ption	Model	Stand ards	
				_1	-4000 to	±0.2%	Single- ended input 250 μs/		Free-Run	1.05W max.	NX-AD2603			
				1/8000	4000	(full scale)	Differential Input	point		refreshing	1.05W max.	NX-AD2604		
		2 points		1/30000	-15000 to 15000	±0.1% (full scale)	Differential Input	10 μs/ point			Selectable Synchronous I/O refreshing or Free-Run refreshing	1.05W max.	NX-AD2608	
	Voltage Input				-4000 to	±0.2%	Single- ended input	250 μs/		Free-Run	1.10W max.	NX-AD3603		
	Unit		-10 to	1/8000	4000	(full scale)	Differential Input	point		refreshing	1.10W max.	NX-AD3604		
		4 points	+10V	1/30000	-15000 to 15000	±0.1% (full scale)	Differential Input	10 μs/ point	1MΩ min.	Selectable Synchronous I/O refreshing or Free-Run refreshing	1.10W max.	NX-AD3608		
		8 points			-4000 to	±0.2%	Single- ended input	250 μs/	r	Free-Run refreshing	1.15W max.	NX-AD4603		
				1/8000	4000	(full scale)	Differential Input	point			1.15W max.	NX-AD4604		
NX Series				1/30000	-15000 to 15000	±0.1% (full scale)	Differential Input	10 μs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	1.15W max.	NX-AD4608	UC1,	
Analog Input Unit		2 points			1/8000	0 to 8000	±0.2% (full scale)	Single- ended input Differential Input	250 μs/ point		Free-Run refreshing	0.90W max. 0.90W max.	NX-AD2203 NX-AD2204	CE, KC
				1/30000	0 to 30000	±0.1% (full scale)	Differential Input	10 μs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	0.90W max.	NX-AD2208		
	Current Input					±0.2%	Single- ended input	250 μs/	250Ω	Free-Run	0.90W max.	NX-AD3203		
	Unit		4 to	1/8000	0 to 8000	(full scale)	Differential Input	point			0.90W max.	NX-AD3204	=	
		/ nointe	points 4 to 20mA	Differential Input	10 μs/ point	Selectable Synchronous I/O refreshing or Free-Run refreshing	0.95W max.	NX-AD3208						
						±0.2%	Single- ended input	250 μs/		Free-Run	1.05W max.	NX-AD4203	1	
				1/8000	0 to 8000	(full scale)	Differential Input	point		refreshing	1.05W max.	NX-AD4204	=	
		8 points		1/30000	0 to 30000	±0.1% (full scale)	Differential Input	10 μs/ point	85Ω	Selectable Synchronous I/O refreshing or Free-Run refreshing	1.10W max.	NX-AD4208		

#### Option

Product Name	Specification	Model	Standards
Unit/Terminal Block Coding Pins	For 10 Units (Terminal Block: 30 pins, Unit: 30 pins)	NX-AUX02	

#### **Accessories**

Not included.

## **General Specification**

	Item	Specification			
Enclosure		Mounted in a panel			
Grounding me	ethod	Ground to 100 $\Omega$ or less			
	Ambient operating temperature	0 to 55°C			
	Ambient operating humidity	10% to 95% (with no condensation or icing)			
	Atmosphere	Must be free from corrosive gases.			
	Ambient storage temperature	−25 to 70°C (with no condensation or icing)			
	Altitude	2,000 m max.			
	Pollution degree	2 or less: Conforms to JIS B3502 and IEC 61131-2.			
Operating environment	Noise immunity	2 kV on power supply line (Conforms to IEC61000-4-4.)			
environinient	Overvoltage category	Category II: Conforms to JIS B3502 and IEC 61131-2.			
	EMC immunity level	Zone B			
	Vibration resistance	Conforms to IEC 60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz, acceleration of 9.8 m/s², 100 min each in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)			
	Shock resistance	IConforms to IEC 60068-2-27. 147 m/s², 3 times each in X, Y, and Z directions			
Applicable standards		cULus: Listed UL508 and ANSI/ISA 12.12.01 EC: EN 61131-2 and C-Tick, KC Registration			

## **Analog Input Unit Specifications**

## Analog Input Unit (voltage input type) 2 points NX-AD2603

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD2603
Capacity	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing		· ·
_	TS indicator	Input method	Single-ended input
	AD2603	Input range	-10 to +10 V
	■TS	Input conversion range	-5 to 105% (full scale)
		Absolute maximum rating	±15 V
Indicator		Input impedance	1 MΩ min.
		Resolution	1/8000 (full scale)
		Overall 25°C	±0.2% (full scale)
		accuracy 0 to 55°C	±0.4% (full scale)
		Conversion time	250 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
Insulation resistance	$20~\text{M}\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.05 W max.	I/O current consumption	No consumption
Weight	70 g max.		
Circuit layout	Terminal block Input1+ to 2+  IOG  NX bus connector (left) I/O power supply +	AMP 1 MΩ  AG  AG: Analog circuit in	I/O power supply + NX bus connector (right)
Installation orientation and restrictions	Installation orientation: Possible in 6 orienta Restrictions: No restrictions	ations.	
Terminal connection diagram	Additional I/O Power Supply Unit  A1 B1  IOV IOV  IOV IOV  IOG IOG  A8 B8	NC NC	Input + 24 V (Sensor power supply +) 0 V (Sensor power supply – / Input –) e-wire sensor
Input disconnection detection	Not supported.		

## Analog Input Unit (voltage input type) 2 points NX-AD2604

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD2604		
Capacity	2 points	External connection	Screwless clamping terminal block (8		
I/O refreshing method	Free-Run refreshing	terminals	terminals)		
70 refreshing method	TS indicator	Input method	Differential Input		
	AD2604	Input range	-10 to +10 V		
	■TS	Input conversion range	-5 to 105% (full scale)		
		Absolute maximum			
In all and a m		rating	±15 V		
Indicator		Input impedance	1 MΩ min.		
		Resolution	1/8000 (full scale)		
		Overall 25°C	±0.2% (full scale)		
		accuracy 0 to 55°C	±0.4% (full scale)		
		Conversion time	250 μs/point		
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)		
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.		
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals		
NX Unit power consumption	1.05 W max.	I/O current consumption	No consumption		
Weight	70 g max.				
Circuit layout	Terminal block  Input1+ to 2+  Input1− to 2−  AG  NX bus connector (left)  I/O power supply +  I/O power supply −	I/O power supply + NX bus connector (right)			
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.			
Terminal connection diagram	Voltage Input Unit NX-AD2604  A1				
Input disconnection detection	Not supported.				

## Analog Input Unit (voltage input type) 2 points NX-AD2608

Unit name	Analog Input Unit (voltage input type)	Model		NX-AD260	08
Capacity	2 points	External co	onnection	Screwless terminals)	s clamping terminal block (8
I/O refreshing method	d Selectable Synchronous I/O refreshing or Free-Run refreshing				
	TS indicator	Input method		Differentia	al Input
	AD2608	Input range	е	-10 to +10	) V
	■TS	Input conv	ersion range	-5 to 105%	6 (full scale)
		Absolute n	naximum	±15 V	
Indicator		Input impe	dance	1 MΩ min.	:
		Resolution	1	1/30000 (f	full scale)
		Overall	25°C	±0.1% (ful	ll scale)
		accuracy	0 to 55°C	±0.2% (ful	ll scale)
		Conversion	n time	10 μs/poir	nt
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation m	nethod	= Transfor	the input and the NX bus: Power rmer, Signal = Digital isolator (no between inputs)
Insulation resistance	$20~\text{M}\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric s	strength		between isolated circuits for 1 a leakage current of 5 mA max.
I/O power supply method	No supply		pacity of I/O ply terminal	Without I/0	O power supply terminals
NX Unit power consumption	1.05 W max. I/O current consumption			No consur	mption
Weight	70 g max.				
Circuit layout	Terminal block  Input1+ to 2+  AG  AG  AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -  I/O power supply -  I/O power supply -				connector
Installation orientation and restrictions	Installation orientation: Possible in 6 orienta Restrictions: No restrictions	ations.			
Terminal connection diagram	Voltage Input Unit NX-AD2608  A				
Input disconnection detection	Not supported.				

## Analog Input Unit (voltage input type) 4 points NX-AD3603

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD3603
Capacity	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing		1
	TS indicator	Input method	Single-ended input
	AD3603	Input range	-10 to +10 V
	■TS	Input conversion range	-5 to 105% (full scale)
		Absolute maximum	±15 V
Indicator		rating	1 MΩ min.
		Input impedance Resolution	1/8000 (full scale)
		0500	±0.2% (full scale)
		Overall 25°C accuracy 0 to 55°C	±0.4% (full scale)
		Conversion time	250 µs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no
	20 M $\Omega$ min. between isolated circuits (at		isolation between inputs) 510 VAC between isolated circuits for 1
Insulation resistance	100 VDC)	Dielectric strength	minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.10 W max.	I/O current consumption	No consumption
Weight	70 g max.		
Circuit layout	Terminal block  Input1+ to 4+  IOG  AG  AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -		
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.	
Terminal connection diagram	Additional I/O Power Supply Unit  A1 B1  OIOV IOV  IOV IOV  IOG IOG  A8 B8	Voltage Input Unit NX-AD3603  A1 B1 Input1+ Input2+ IOV IOV IOG IOG Input3+ Input4+ IOV IOV IOG IOG IOG IOG  A8 B8	Input +  24 V (Sensor power supply +)  0 V (Sensor power supply - / Input -)  ire sensor
Input disconnection detection	Not supported.		

## Analog Input Unit (voltage input type) 4 points NX-AD3604

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD3604	
Capacity	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)	
I/O refreshing method	Free-Run refreshing			
	TS indicator	Input method	Differential Input	
	AD3604	Input range	-10 to +10 V	
	■TS	Input conversion range	-5 to 105% (full scale)	
		Absolute maximum rating	±15 V	
Indicator		Input impedance	1 MΩ min.	
		Resolution	1/8000 (full scale)	
		Overall 25°C	±0.2% (full scale)	
		accuracy 0 to 55°C	±0.4% (full scale)	
		Conversion time	250 μs/point	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals	
NX Unit power consumption	1.10 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	Terminal block Input1+ to 4+  Input1- to 4-  AG  NX bus connector (left)  I/O power supply + I/O power supply -	AMP AG AG: Analog circuit inter	I/O power supply + NX bus connector (right)	
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.		
Terminal connection diagram	Voltage Input Unit NX-AD3604  A1 Input1+ Input2+ Input1- Input2- Input3- Input4- AG AG AG AG AG AG  AG terminal is connected to 0 V of analog circuit inside the Unit.  A8 B8 It is not necessary to wire AG terminal normally.			
Input disconnection detection	Not supported.			

## Analog Input Unit (voltage input type) 4 points NX-AD3608

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD3608	
Canacity		External connection	Screwless clamping terminal block (12	
Capacity	4 points	terminals	terminals)	
I/O refreshing method	Selectable Synchronous I/O refreshing or F			
	TS indicator	Input method	Differential Input	
	AD3608	Input range	-10 to +10 V	
	=13	Input conversion range	-5 to 105% (full scale)	
Indicator		Absolute maximum rating	±15 V	
indicator		Input impedance	1 MΩ min.	
		Resolution	1/30000 (full scale)	
		Overall 25°C	±0.1% (full scale)	
		accuracy 0 to 55°C	±0.2% (full scale)	
		Conversion time	10 μs/point	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	$20~\text{M}\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals	
NX Unit power consumption	1.10 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	Terminal block Input1+ to 4+  AG  NX bus connector (left)  I/O power supply + I/O power supply -	AMP AG AG: Analog circuit inte	I/O power supply + NX bus connector (right)	
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.		
Terminal connection diagram	Voltage Input Unit NX-AD3608  A1			
Input disconnection detection	Not supported.			

## Analog Input Unit (voltage input type) 8 points NX-AD4603

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD4603	
Capacity	8 points	External connection terminals	Screwless clamping terminal block (16 terminals)	
I/O refreshing method	Free-Run refreshing			
	TS indicator	Input method	Single-ended input	
	AD4603	Input range	-10 to +10 V	
	<b>-</b> 13	Input conversion range	-5 to 105% (full scale)	
Indicator		Absolute maximum rating	±15 V	
indicator		Input impedance	1 MΩ min.	
		Resolution	1/8000 (full scale)	
		Overall 25°C	±0.2% (full scale)	
		accuracy 0 to 55°C	±0.4% (full scale)	
		Conversion time	250 μs/point	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOG: 0.1 A/terminal max.	
NX Unit power consumption	1.15 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	Terminal block Input1+ to 8+  IOG  NX bus connector (left) I/O power supply +  I/O power supply -	AMP AG AG: Analog circuit inte	ernal GND  I/O power supply + NX bus connector (right)	
Installation orientation and restrictions	Installation orientation: Possible in 6 orienta Restrictions: No restrictions	ations.		
Terminal connection diagram	Additional I/O Power Supply Connection Unit  A1 B1			
Input disconnection detection	Not supported.			

## Analog Input Unit (voltage input type) 8 points NX-AD4604

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD4604	
Capacity	8 points	External connection	Screwless clamping terminal block (16	
	·	terminals	terminals)	
I/O refreshing method	Free-Run refreshing	In most mostly and	Differential leave	
	TS indicator AD4604	Input method	Differential Input	
	AD4004	Input range	-10 to +10 V	
		Input conversion range	-5 to 105% (full scale)	
Indicator		Absolute maximum rating	±15 V	
indicator		Input impedance	1 MΩ min.	
		Resolution	1/8000 (full scale)	
		Overall 25°C	±0.2% (full scale)	
		accuracy 0 to 55°C	±0.4% (full scale)	
		Conversion time	250 μs/point	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals	
NX Unit power consumption	1.15 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	] ]	AMP AG AG: Analog circuit inte	I/O power supply + NX bus connector (right)	
Installation orientation and restrictions	Installation orientation: Possible in 6 orient Restrictions: No restrictions	ations.		
Terminal connection diagram	Voltage Input Unit NX-AD4604  A1			
Input disconnection detection	Not supported.			

## Analog Input Unit (voltage input type) 8 points NX-AD4608

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD4608	
Capacity	8 points	External connection terminals	Screwless clamping terminal block (16 terminals)	
I/O refreshing method	Selectable Synchronous I/O refreshing or I	ree-Run refreshing	-	
	TS indicator	Input method	Differential Input	
	AD4608	Input range	-10 to +10 V	
	_13	Input conversion range	-5 to 105% (full scale)	
		Absolute maximum rating	±15 V	
Indicator		Input impedance	1 MΩ min.	
		Resolution	1/30000 (full scale)	
		Overall 25°C	±0.1% (full scale)	
		accuracy 0 to 55°C	±0.2% (full scale)	
		Conversion time	10 μs/point	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	$20~\text{M}\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals	
NX Unit power consumption	1.15 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	Terminal block Input1+ to 8+ Input1− to 8−	AMP \$510 KΩ  AG: Analog circuit inte	I/O power supply + NX bus connector (right)	
Installation orientation and restrictions	Installation orientation: Possible in 6 orient Restrictions: No restrictions	ations.		
Terminal connection diagram	Voltage Input Unit NX-AD4604  A1 B1 Input1+ Input2+ Input1- Input2- Input3+ Input4+ Input3- Input4- Input5- Input6+ Input5- Input6- Input7+ Input8+ Input7- Input8- A8 B8			
Input disconnection detection	Not supported.			

## Analog Input Unit (current input type) 2 points NX-AD2203

Unit name	Analog Input Unit (current input type)	Model	NX-AD2203
Capacity	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing		
	TS indicator	Input method	Single-ended input
	DA2203	Input range	4 to 20 mA
	■TS	Input conversion range	-5 to 105% (full scale)
		Absolute maximum rating	±30 mA
Indicator		Input impedance	250 $\Omega$ min.
		Resolution	1/8000 (full scale)
		Overall 25°C	±0.2% (full scale)
		accuracy 0 to 55°C	±0.4% (full scale)
		Conversion time	250 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	0.90 W max.	I/O current consumption	No consumption
Weight	70 g max.		
Circuit layout	Terminal block Input1+ to 2+ IOG AG AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply + I/O power supply - I/O power supp		
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.	
Terminal connection diagram	Additional I/O Power Supply Unit NX-AD2203  A1 Input + Input + Input + 24 V (Sensor power supply +) IOV IOV IOV IOV IOG IOG NC NC  A8 B8 B8 B8 The NC terminal is not connected to the internal circuit.		
Input disconnection detection	Supported.		

## Analog Input Unit (current input type) 2 points NX-AD2204

Unit name	Analog Input Unit (current input type)	Model	NX-AD2204	
Capacity	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)	
I/O refreshing method	Free-Run refreshing			
70 refreshing method	TS indicator	Input method	Differential Input	
	AD2204	Input range	4 to 20 mA	
	■TS	Input conversion range	-5 to 105% (full scale)	
		Absolute maximum	±30 mA	
Indicator		rating		
maioator		Input impedance	250 Ω min.	
		Resolution	1/8000 (full scale)	
		Overall 25°C accuracy 0 to 55°C	±0.2% (full scale)	
		7   7 10 00 0	±0.4% (full scale)	
		Conversion time	250 μs/point  Between the input and the NX bus: Power	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	= Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	20 $M\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals	
NX Unit power consumption	0.90 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	Terminal block Input1+ to 2+  AG  NX bus connector (left)  I/O power supply +  I/O power supply -	I/O power supply + NX bus connector (right)		
Installation orientation and restrictions	Installation orientation: Possible in 6 orienta Restrictions: No restrictions	ations.		
Terminal connection diagram	Current Input Unit NX-AD2204  A1 Input1+ Input2+  Input1- Input2-  AG AG  NC NC  AG terminal is connected to 0 V of analog circuit inside the Unit.  It is not necessary to wire AG terminal normally.			
Input disconnection detection	Supported.			

## Analog Input Unit (current input type) 2 points NX-AD2208

Unit name	Analog Input Unit (current input type)	Model	NX-AD2208	
	External connection		Screwless clamping terminal block (8	
Capacity	2 points terminals		terminals)	
I/O refreshing method	Selectable Synchronous I/O refreshing or F	ree-Run refreshing		
	TS indicator	Input method	Differential Input	
	AD2208 ■TS	Input range	4 to 20 mA	
		Input conversion range	-5 to 105% (full scale)	
la dia stan		Absolute maximum rating	±30 mA	
Indicator		Input impedance	250 Ω	
		Resolution	1/30000 (full scale)	
		Overall 25°C	±0.1% (full scale)	
		accuracy 0 to 55°C	±0.2% (full scale)	
		Conversion time	10 μs/point	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	$20~\text{M}\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals	
NX Unit power consumption	0.90 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	Terminal block  Input1+ to 2+  AG  AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -		I/O power supply + NX bus connector	
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.		
Terminal connection diagram	Current Input Unit NX-AD2208  A1 Input1+ Input2+ Input1- Input2- Input1- Input2- AG AG  NC NC  AG terminal is connected to 0 V of analog circuit inside the Unit.  It is not necessary to wire AG terminal normally.			
Input disconnection detection	Supported.			

## Analog Input Unit (current input type) 4 points NX-AD3203

Unit name	Analog Input Unit (current input type)	Model	NX-AD3203	
	External connection		Screwless clamping terminal block (12	
Capacity	4 points terminals		terminals)	
I/O refreshing method	Free-Run refreshing			
	TS indicator	Input method	Single-ended input	
	AD3203	Input range	4 to 20 mA	
		Input conversion range	-5 to 105% (full scale)	
		Absolute maximum rating	±30 mA	
Indicator		Input impedance	250 Ω min.	
		Resolution	1/8000 (full scale)	
		Overall 25°C	±0.2% (full scale)	
		accuracy 0 to 55°C	±0.4% (full scale)	
		Conversion time	250 μs/point	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max., IOG: 0.1 A/terminal max.	
NX Unit power consumption	0.90 W max.	max. I/O current consumption		
Weight	70 g max.			
Circuit layout	Terminal block Input1+ to 4+ IOG AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply + I/O power supply - I/O power supply			
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram	Additional I/O Power Supply Unit NX-AD3203  A1			
Input disconnection detection	Supported.			

## Analog Input Unit (current input type) 4 points NX-AD3204

Unit name	Analog Input Unit (current input type)	Model	NX-AD3204	
Capacity	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)	
I/O refreshing method	Free-Run refreshing			
	TS indicator	Input method	Differential Input	
	AD3204	Input range	4 to 20 mA	
	-13	Input conversion range	-5 to 105% (full scale)	
la dia stan		Absolute maximum rating	±30 mA	
Indicator		Input impedance	250 $\Omega$ min.	
		Resolution	1/8000 (full scale)	
		Overall 25°C	±0.2% (full scale)	
		accuracy 0 to 55°C	±0.4% (full scale)	
		Conversion time	250 μs/point	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals	
NX Unit power consumption	0.90 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	Terminal block Input1+ to 4+  AG  NX bus connector (left)  I/O power supply + I/O power supply - I/O power			
Installation orientation and restrictions	Installation orientation: Possible in 6 orienta Restrictions: No restrictions	ations.		
Terminal connection diagram	Current Input Unit NX-AD3204  A1 B1 Input1+ Input2+ Input1- Input2- Input3+ Input4+ Input3- Input4- AG AG AG AG AG AG BB  AG terminal is connected to 0 V of analog circuit inside the Unit. It is not necessary to wire AG terminal normally.			
Input disconnection detection	Supported.			

## Analog Input Unit (current input type) 4 points NX-AD3208

Unit name	Analog Input Unit (current input type)	Model	NX-AD3208
		External connection	Screwless clamping terminal block (12
Capacity	4 points terminals		terminals)
I/O refreshing method	Selectable Synchronous I/O refreshing or F		
	TS indicator	Input method	Differential Input
	AD3208	Input range	4 to 20 mA
		Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±30 mA
Indicator		Input impedance	250 $\Omega$ min.
		Resolution	1/30000 (full scale)
		Overall 25°C	±0.1% (full scale)
		accuracy 0 to 55°C	±0.2% (full scale)
		Conversion time	10 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals
NX Unit power consumption	0.95 W max.	I/O current consumption	No consumption
Weight	70 g max.		
Circuit layout	Terminal block Input1+ to 4+  AG  NX bus connector (left)  I/O power supply +  I/O power supply -  I/O po		
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.	
Terminal connection diagram	Current Input Unit NX-AD3208  A1		
Input disconnection detection	Supported.		

## Analog Input Unit (current input type) 8 points NX-AD4203

Unit name	Analog Input Unit (current input type) Model		NX-AD4203
Capacity	8 points	External connection terminals Screwless clamping terminal blot terminals)	
I/O refreshing method	Free-Run refreshing		
	TS indicator	Input method	Single-ended input
	AD4203 ■TS	Input range	4 to 20 mA
	-15	Input conversion range	-5 to 105% (full scale)
		Absolute maximum rating	±30 mA
Indicator		Input impedance	85 Ω
		Resolution	1/8000 (full scale)
		Overall 25°C	±0.2% (full scale)
		accuracy 0 to 55°C	±0.4% (full scale)
		Conversion time	250 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max.
NX Unit power consumption	1.05 W max. I/O current consumption		No consumption
Weight	70 g max.		
Circuit layout	Terminal block Input1+ to 8+  NX bus connector (left)  NX bus connector (left)  NX bus connector (left)  NX bus connector (left)  NX bus connector (right)		I/O power supply + 7 NX bus connector
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.	
Terminal connection diagram	Additional I/O Power Supply Unit NX-AD4203  A1 B1 IOG		
Input disconnection detection	Supported.		

## Analog Input Unit (current input type) 8 points NX-AD4204

Unit name	Analog Input Unit (current input type) Model NX-AD4204				
Capacity	8 points	External connection terminals	Screwless clamping terminal block (16 terminals)		
I/O refreshing method	Free-Run refreshing				
	TS indicator	Input method	Differential Input		
	AD4203	Input range	4 to 20 mA		
	■TS	Input conversion range	-5 to 105% (full scale)		
		Absolute maximum rating	±30 mA		
Indicator		Input impedance	85 Ω		
		Resolution	1/8000 (full scale)		
		Overall 25°C	±0.2% (full scale)		
		accuracy 0 to 55°C	±0.4% (full scale)		
		Conversion time	250 μs/point		
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)		
Insulation resistance	20 $\text{M}\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.		
I/O power supply method	No supply	Current capacity of I/O power supply terminal	Without I/O power supply terminals		
NX Unit power consumption	1.05 W max. I/O current consumption		No consumption		
Weight	70 g max.				
Circuit layout	Terminal block Input1+ to 8+    Input1- to 8-   S510 KΩ   S510 KΩ     AG: Analog circuit internal GND     I/O power supply +   NX bus connector (left)     I/O power supply -   I/O power supply -   I/O power supply -     I/O power supply -   I/O power supply -     I/O power supply -   I/O power supply -   I/O power supply -     I/O power supply -   I/O power supply -   I/O power supply -     I/O power supply -   I/O power supply -   I/O power supply -     I/O power supply -   I/O power supply -   I/O power supply -     I/O power supply -   I/O power supply -   I/O power supply -   I/O power supply -     I/O power supply -   I/O pow				
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.			
Terminal connection diagram	Current Input Unit NX-AD4204  A1 B1 Input1+ Input2+ Input1- Input2- Input3+ Input4+ Input3- Input4- Input5- Input6+ Input5- Input6- Input7+ Input8+ Input7- Input8- A8 B8				
Input disconnection detection	Supported.				

#### Analog Input Unit (current input type) 8 points NX-AD4208

Unit name	Analog Input Unit (current input type)	Model		NX-AD	04208
Capacity				Screwless clamping terminal block (16 terminals)	
I/O refreshing method	Selectable Synchronous I/O refreshing or F	ree-Run refr	reshing		
	TS indicator	Input method Dif		Differe	ential Input
	AD4208	Input range 4		4 to 20	) mA
	■TS	Input conv	ersion range	-5 to 1	05% (full scale)
		Absolute r	naximum	±30 m.	A
Indicator		Input impe	dance	85 Ω	
		Resolution	1	1/3000	00 (full scale)
		Overall	25°C	±0.1%	(full scale)
		accuracy	0 to 55°C	±0.2%	(full scale)
		Conversio	n time	10 μs/j	· · · · · · · · · · · · · · · · · · ·
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation n	nethod	Betwe	en the input and the NX bus: Power sformer, Signal = Digital isolator (no on between inputs)
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric	strength		AC between isolated circuits for 1 e at a leakage current of 5 mA max.
I/O power supply method	No supply		pacity of I/O ply terminal	Withou	ut I/O power supply terminals
NX Unit power consumption	1.10 W max.		nsumption		
Weight	70 g max.				
Circuit layout	Terminal block Input1+ to 8+			connector	
Installation orientation and restrictions	Installation orientation: Possible in 6 orienta Restrictions: No restrictions	ations.			
Terminal connection diagram	Current Input Unit NX-AD4208  A1  Input1+ Input2+ Input1- Input2- Input3+ Input4+ Input3- Input4- Input5+ Input6+ Input5- Input6- Input7+ Input8- Input7- Input8- Inpu				
Input disconnection detection	Supported.				

#### **Version Information**

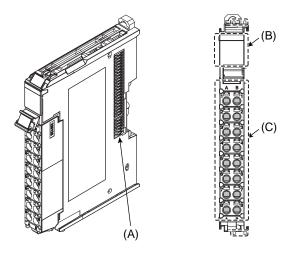
#### **NX Series Analog Input Unit and Sysmac Studio**

NX Series Analog Output Unit	Sysmac Studio		
NA Series Analog Output Onit	Version 1.05 or lower	Version 1.06 or higher	
NX-AD	Not supported	Supported	

#### **External Interface**

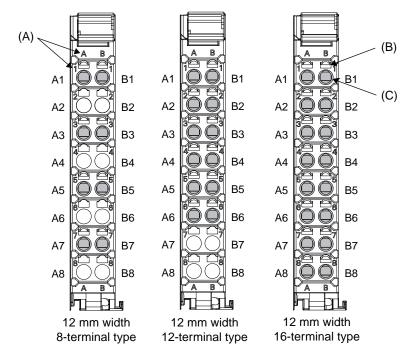
#### **Analog Input Unit**

NX-AD□□□□ 12mm Width



Symbol	Name	Function
(A)	NX bus connector	This connector is used to connect each Unit.
(B)	Indicators	The indicators show the current operating status of the Unit.
(C)	Terminal block	The terminal block is used to connect external devices. The number of terminals depends on the type of Unit.

#### **Terminal Blocks**



Symbol	Name	Function
(A)	Terminal number indications	Terminal numbers for which A to D indicate the column, and 1 to 8 indicate the line are displayed. The terminal number is a combination of column and line, so A1 to A8 and B1 to B8 are displayed. The terminal number indications are the same regardless of the number of terminals on the terminal block.
(B)	Release holes	Insert a flat-blade screwdriver into these holes to connect and remove the wires.
(C)	Terminal holes	The wires are inserted into these holes.

#### **Applicable Wires**

#### **Using Ferrules**

If you use ferrules, attach the twisted wires to them.

Observe the application instructions for your ferrules for the wire stripping length when attaching ferrules.

Always use one-pin ferrules. Do not use two-pin ferrules.

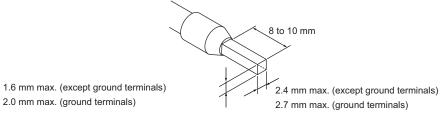
The applicable ferrules, wires, and crimping tool are given in the following table.

Terminal types	Manufacturer	Ferrule model number	Applicable wire (mm² (AWG))	Crimping tool
Terminals other than ground terminals	Phoenix Contact	AI0,34-8	0.34 (#22)	Phoenix Contact (The figure in parentheses is the applicable wire size.) CRIMPFOX 6 (0.25 to 6 mm², AWG24 to 10)
		AI0,5-8	0.5 (#20)	
		AI0,5-10		
		AI0,75-8	0.75 (#18)	
		AI0,75-10		
		AI1,0-8	1.0 (#18)	
		AI1,0-10		
		AI1,5-8	1.5 (#16)	
		AI1,5-10		
Ground terminals		Al2,5-10	2.0 *	
Terminals other than ground terminals	Weidmuller	H0.14/12	0.14 (#26)	Weidmuller (The figure in parentheses is the applicable wire size.) PZ6 Roto (0.14 to 6 mm², AWG 26 to 10)
		H0.25/12	0.25 (#24)	
		H0.34/12	0.34 (#22)	
		H0.5/14	0.5 (#20)	
		H0.5/16		
		H0.75/14	0.75 (#18)	
		H0.75/16		
		H1.0/14	1.0 (#18)	
		H1.0/16		
		H1.5/14	1.5 (#16)	
		H1.5/16		

<sup>\*</sup> Some AWG 14 wires exceed 2.0 mm<sup>2</sup> and cannot be used in the screwless clamping terminal block.

When you use any ferrules other than those in the above table, crimp them to the twisted wires so that the following processed dimensions are achieved.

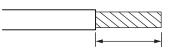
Finished Dimensions of Ferrules



#### **Using Twisted Wires/Solid Wires**

If you use the twisted wires or the solid wires, the applicable wire range and conductor length (stripping length) are as follows. Use the twisted wires to connect the ground wire to a ground of  $100 \Omega$  or less. Do not use the solid wires.

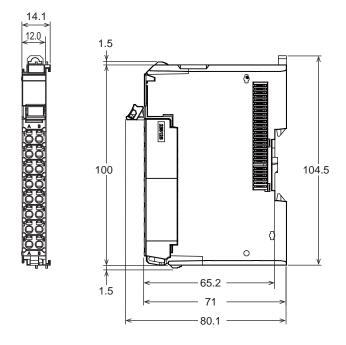
Terminal types	Applicable wires	Conductor length (stripping length)
Ground terminals	2.0 mm <sup>2</sup>	9 to 10 mm
Terminals other than ground terminals	0.08 to 1.5 mm <sup>2</sup> AWG28 to 16	8 to 10 mm



Conductor length (stripping length)

**Dimensions** (Unit/mm)

## Analog Input Unit NX-AD□□□□ 12 mm Width



## **Related Manuals**

Cat. No.	Model number	Manual name	Application	Description
W522	NX-AD NX-DA NX-TS	NX-series Analog I/O Units User's Manual		The hardware, setup methods, and functions of the NX- series Analog I/O Units and Temperature Input Units are described.

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