



AGIOxx

Central-i I/O Module

Product Manual



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Member of Akribis Systems group

Revision History

Version	Description	Date
1.3	Updated electrical interface connection diagrams and pinout drawings. Revised the connector pin names to match the terminal names of electrical interface connection diagrams.	4 August 2025
1.2	Updated connector pin information	7 April 2025
1.1	Updated pinout descriptions	13 March 2025
1.0	Initial release	3 February 2023

Contact Information

Manufacturer Agito Akribis Systems Ltd., Member of Akribis Systems Group
 Address 56 Serangoon North Avenue 4, Singapore 555851
 Email info@akribis-sys.com
 Website www.agito-akribis.com

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Warranty

This product is warranted to be free of defects in material and workmanship and conforms to the specifications listed in this manual, for a period of 12 months from the shipment date from factory.

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1 Product Description

1.1 General Description

The AGIOxx is a series of Central-i remote I/O modules. They are used to expand the number of I/O interfaces in the Central-i network. These adapters enable the Central-i master controller to read from and write to both digital and analog I/Os.

The I/Os are configurable either by hardware or software.

- AGIO01-CI is an I/O module that supports up to 16 digital inputs, 8 digital outputs, 4 analog inputs (16-bit), and 3 differential bi-directional I/Os.
- AGIO02-CI is an I/O module that supports up to 32 digital inputs, 16 digital outputs, 4 analog inputs (12-bit) and 2 analog outputs (16-bit).

Most of the inputs are configurable to connect NPN or PNP sensors. Most of the outputs are software configurable to sink or source current. Typically, each output can sink up to 500 mA and source 300 mA, which is sufficient current to operate most relays and solenoids.



Figure 1. AGIOxx I/O Modules

1.2 Part Numbering

AGIOxx Product Variants

Product Description	Part Number Format
Central-i I/O remote module: <ul style="list-style-type: none"> 16 digital inputs and 8 digital outputs 4 analog inputs (16-bit) 3 bi-directional differential I/Os 	AGIO01-CI-1608
Central-i I/O remote module: <ul style="list-style-type: none"> 32 digital inputs and 16 digital outputs 4 analog inputs (12-bit) and 2 analog outputs (16-bit) 	AGIO02-CI-3216

CI: Central-i communication

1.3 System Design

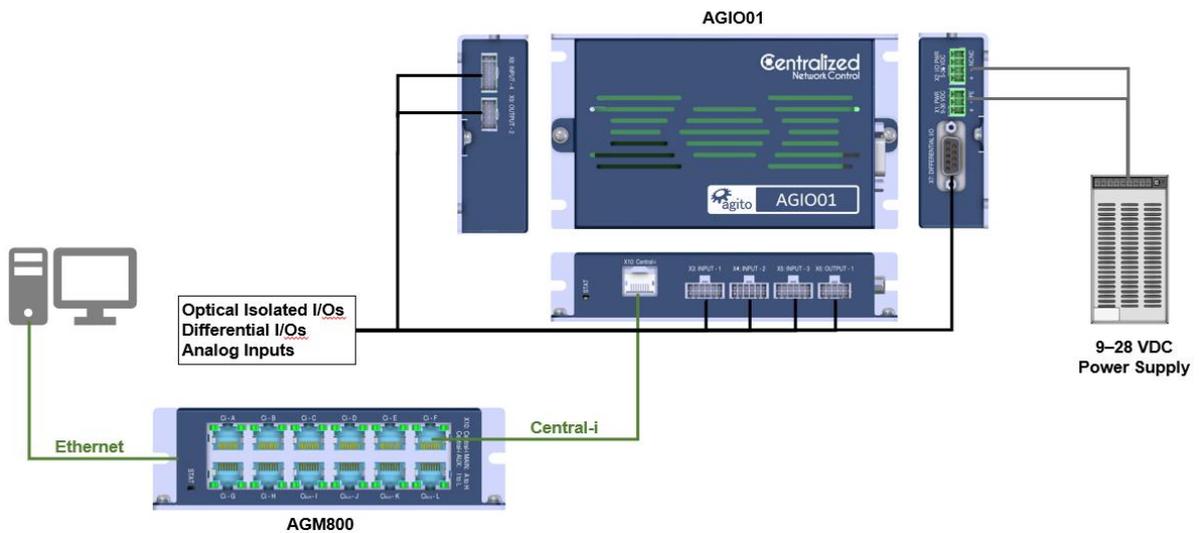


Figure 2. AGIO01 System

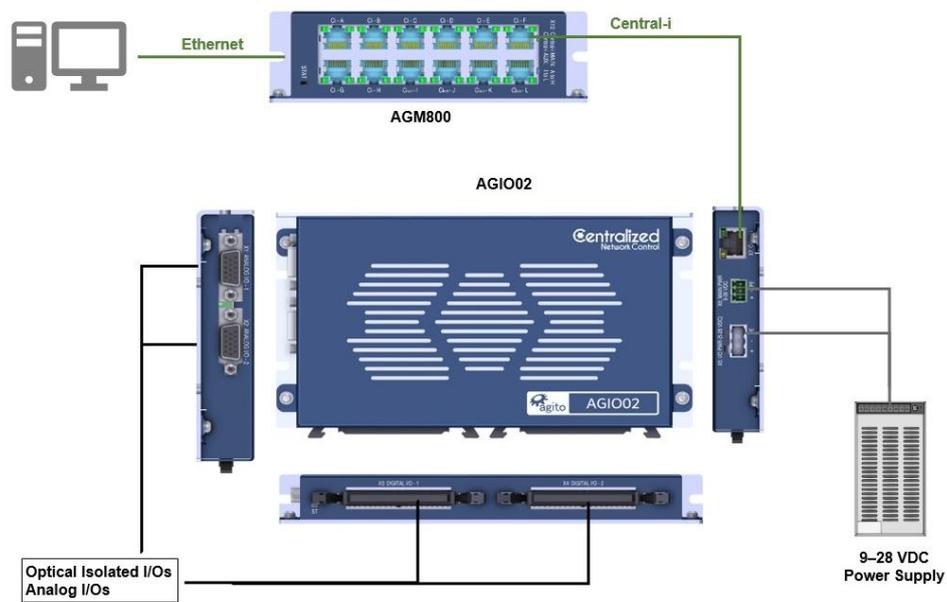


Figure 3. AGIO02 System

1.4 Technical Specifications

Electrical/Mechanical Specifications

Feature	AGIO01-CI-1608	AGIO02-CI-3216
Power supply	9–36 VDC	9–36 VDC
Communication	Central-i	Central-i
Sampling rate	16 kHz	16 kHz
Isolated digital inputs	16	32
Isolated digital outputs	8	16
Analog inputs	4 (16-bit resolution)	4 (12-bit resolution)
Analog outputs	0	2 (16-bit resolution)
Bi-directional differential I/Os	3	0

Note 1: Isolated digital inputs can be configured as NPN or PNP, in groups of 3 or 4.

Note 2: Isolated digital outputs can sink up to 500 mA or source up to 300 mA.

I/O Specifications

Feature	Specification
Power supply for optically isolated I/Os	Voltage: 5–28 VDC
Optically isolated digital inputs	Type: PNP/NPN Propagation delay: 10 μ s Max. frequency: 100 kHz

Feature	Specification
Optically isolated digital outputs	Type: Sink/Source Max current: 0.5A (for Sink type), 0.3A (for Source type) Propagation delay: 10 μ s Max. frequency: 100 kHz
Bi-directional differential I/Os (AGIO01 only)	Hardware: Differential RS422 Termination: 120 Ω Propagation delay: 100 ns Max. frequency: 5 MHz Direction: Input or output, set by Agito PCSuite Bi-dir differential output voltage: 2.3 VDC
Analog inputs	Operational voltage: \pm 10V Resolution AGIO01 : 16 bits Resolution AGIO02 : 12 bits
Analog outputs	Operational voltage: \pm 10V Resolution AGIO02 : 16 bits

Central-i Specifications

Feature	Specification
Topology	Star (peer to peer)
Cycle time	61 μ s
Connector type	RJ-45 (Cat5e cable)
Cable length	Up to 20 m Longer cables, up to 100 m, are possible with special hardware
Physical layer	Dual channel RS485 full duplex
Baud rate	20 Mbps (per channel)
Synchronization between nodes	8 nanoseconds

Dimensions and Weight

Feature	AGIO01	AGIO02
Unit dimensions (max)	H=151 mm, W=30.5 mm, D=86 mm	H=208.4mm, W=24 mm, D=115.2 mm
Package dimensions	H=210mm x W=49 mm x D=139mm	H=255 mm x W=35 mm x D=154 mm
Unit weight	334g	550.5g
Shipping weight	231.5g	387.5g

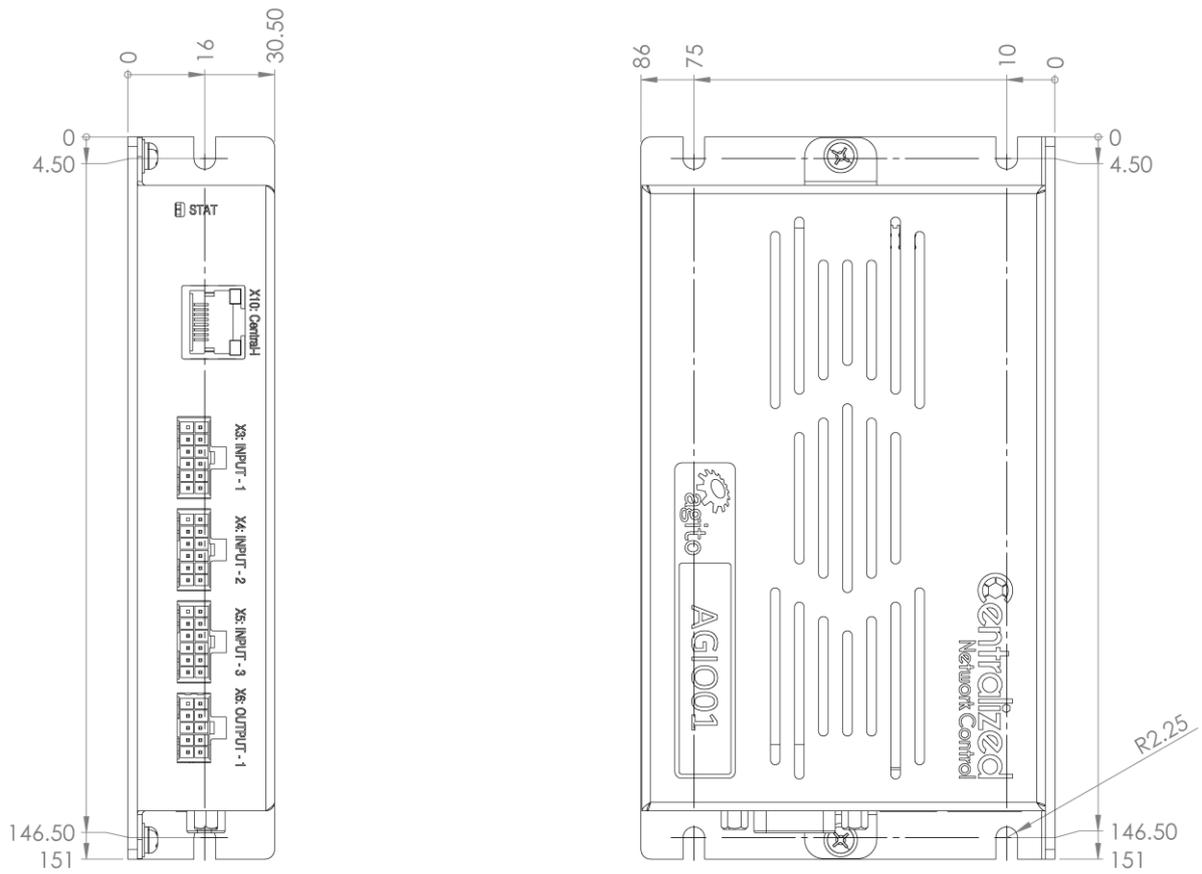


Figure 4. AGIO01 Dimensions (mm)

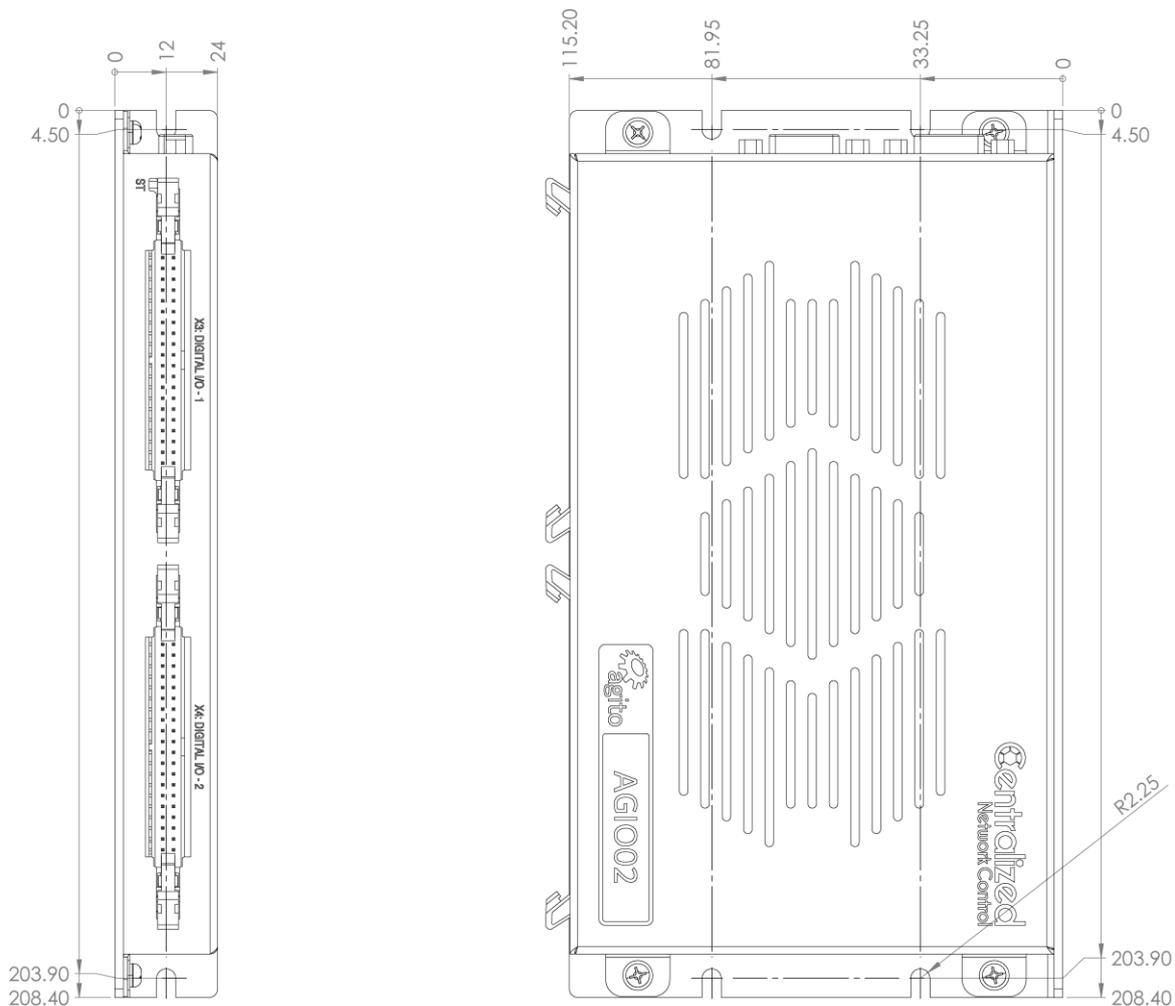


Figure 5. AGIO02 Dimensions (mm)

1.5 Environmental Specifications

The operational range may be additionally limited by the internal temperature protection of the product. It is the user's responsibility to avoid operating the product in environmental conditions that do not conform to the defined limits.

Environmental Specifications

Feature	Specification
Operating (ambient) temperature	0°C to 45°C
Storage temperature	-20°C to 70°C
Operating humidity	< 90%
Storage humidity	< 40%
Pollution degree	2
Vibration	per 1G @ 150 Hz according to IEC 60068-2-6
Operating conditions	IP20

2 Safety

2.1 Safety Symbols

Safety symbols indicate a potential for personal injury or equipment damage if the prescribed precautions and safe operating practices are not followed.

The following safety symbols are used in the product documentation.

Safety Symbols

Symbol	Meaning	Description
	Hazardous voltage	Indicates hazards arising from dangerous voltages.
	Earthing PE (protective earth)	Identifies any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.
	Caution, hot surface	Indicates the marked item can be hot and should not be touched without taking care.

2.2 Safety Guidelines

To achieve optimum and safe operation of the product, it is important to follow the safety procedures specified in this manual.

- Only qualified personnel may install, maintain, or repair the product. Before starting installation, maintenance, or operation, ensure that all system components are connected to protective earth ground (PE).
- The PE wire must be colored green-yellow, in accordance with local electrical wiring standards.
- This product contains electrostatic-sensitive components. Proper handling procedures must be observed to avoid damage to the product.
- To avoid electric arcing and hazards, never connect or disconnect any connector while the power source is on.
- The maximum power supply voltage connected to the product must comply with the ratings provided in this manual.
- Always disconnect the power cables before servicing the product.
- Pay attention to safety symbols on the product or in the manual. Follow proper safety precautions when installing or operating the product.



Attention

All power connectors must be securely tightened before any operation.



Attention

Do not attempt to hinder or override the product's or system's fault detection or protection circuits. You must determine the cause of a fault and correct it before you attempt to operate the system. Failure to correct the fault could result in personal injury and/or damage to equipment.

2.3 Compliance

Standards Compliance

Description	Standard
Safety requirements – Electrical, thermal and energy	IEC-61800-5-1
EMC requirements and specific test methods	IEC-61800-3

This product is intended to operate in a machine or equivalent end-product. The machine or end-product must comply with any necessary safety standard as typically required for the same type of machine or end-product. It is the responsibility of the machine or end-product manufacturer to ensure the final machine or end-product meets the requirement of any safety and EMC regulations.

3 Installation

3.1 Unpacking and Packing

Save the original box and packing materials in case you need to pack and return the product to the manufacturer.

To unpack the product:

1. Carefully remove the product from the box and the packing materials.
2. Visually inspect the product to ensure that there is no damage. If any damage has occurred, report it immediately to the carrier that delivered the package.
3. After unpacking, locate the part number label on the product, and make sure it matches the product you ordered, and that the voltage meets your specific requirements.

3.2 Mounting

The heatsink on the back of the AGIOxx includes holes/slots for mounting the unit.

The AGIOxx is mounted using M4 screws. Mounting requires either 2 or 4 screws depending on orientation. It is important to mount the product on metal panel for both grounding and secure connections.

The heatsink of the AGIOxx is electrically conductive and serves as the protective earth (PE) ground of the product. However, it is critical to ensure the PE is electrically conducting between the PE terminals of AGIOxx and the PE of main power supply in the system. For details, refer to the section Grounding.

All cables connected to the product must be securely constrained to avoid vibration that causes stress concentration at the cables or connectors which may result in breakage of electrical conductivity.



Warning – Metal Base Plate for Heat Dissipation

The product is supplied with the mounting plate built into the heatsink. At full power operation, the heat sink can be quite warm, around 45°C. It is recommended to mount the product on a large metal panel to help dissipate the heat generated in the product.

3.2.1 Mounting Multiple AGIOxx Units

When mounting multiple AGIOxx units within a cabinet, clearance between units must be at least 5 mm. In addition, top and bottom clearance must be at least 50 mm.

Ambient temperature in the cabinet must not exceed limit defined in the section *Environmental Specifications*.

If adapters are mounted on a backplane, the backplane temperature must not exceed the ambient limit defined in the section *Environmental Specifications*.

It is recommended to install a cooling fan at the bottom of the cabinet for best circulation.

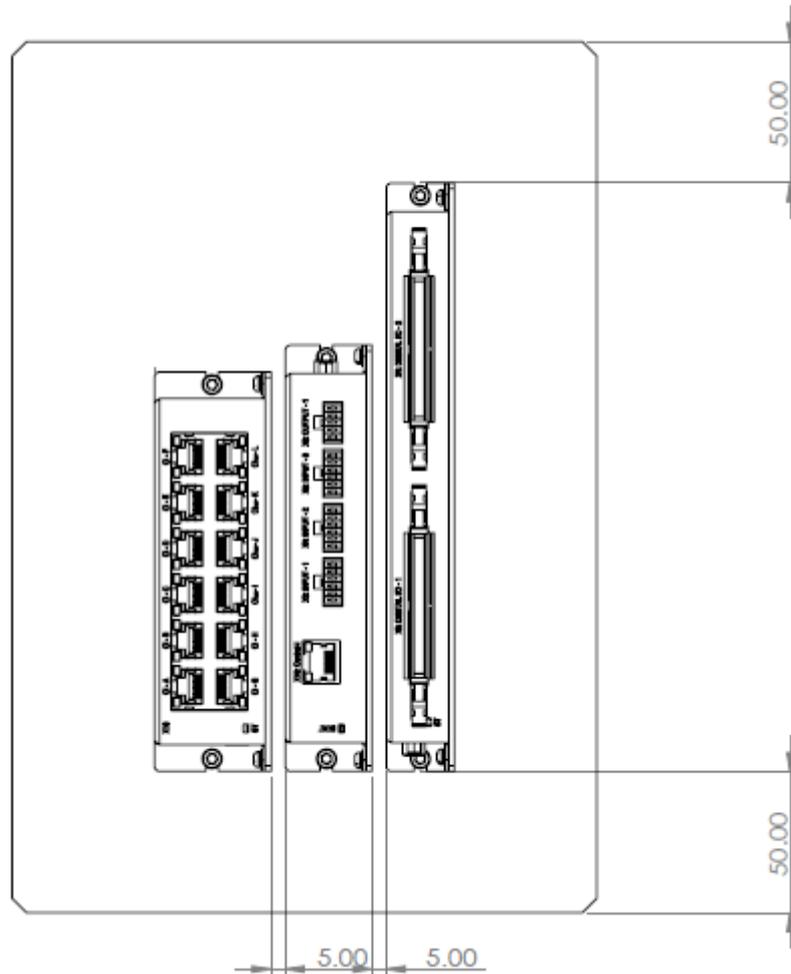


Figure 6. Mounting Multiple Units within Cabinet

3.3 Electrical Installation

3.3.1 Power Supplies

The power sources provide power to the logic and I/O circuits.

Power Source	Description	AGL101	AGL102
Logic power	Supplies power to the logic and I/O circuits.	9–36 VDC	9–36 VDC
Isolated I/Os power	Supplies power to the optically isolated I/O circuits.	5–28 VDC	5 -28 VDC

3.3.2 Grounding

It is recommended to install the AGIOxx on a metal base plate for better power dissipation, reduced EMI, and grounding connection. Make sure the plate is not painted.

The heatsink of the AGIOxx is electrically conductive and serves as the protective earth (PE) ground of the product. However, it is critical to ensure the PE is electrically conducting between the PE terminals of AGIOxx and the PE of main power supply in the system.

The power input (PWR) connector includes a PE pin. Make sure to connect PE to this pin.

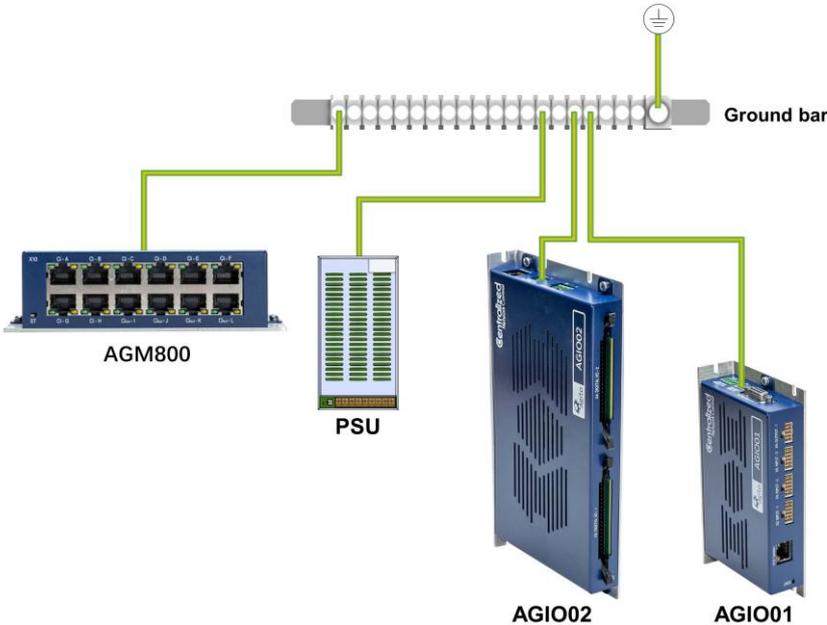


Figure 7. System Grounding

Ground Domains

The following table shows the ground domains in the AGIOxx system:

- GND. Reference voltage for digital/analog circuits and signals.
- General. Usually at DC potential close to GND, but not connected internally.

Ground Domains

Name	Ground Domain	Notes
DC power input	GND (I/O return)	External DC power supply
Central-i communication	General	Isolated for Central-i remote devices
Isolated digital inputs/outputs	General	Isolated
Differential inputs/outputs (not isolated)	GND	
Analog inputs/outputs (not isolated)	GND	

Grounding Policy

Grounding of the product must comply with the following guidelines:

- The enclosures and other external parts that may be touched by the user are in the safe domain.
- The AGIOxx must be connected to protective earth (PE) and connected to the building's ground. PE is protected with an earth-leakage circuit breaker (ELCB); hence it is safe to touch. Refer to Figure 7.
- Digital ground (GND) is assumed to have the same potential as the PE. That means GND is connected to the PE at some point in the system.
- All shielded cables have their shield connected to PE as part of the external metal enclosure.
- It is critical to avoid ground loops in the system. A ground loop allows currents to return by two or more different paths, causing electromagnetic interference or even damage to wires.
- The system designer must carefully examine all GND connections in the system to ensure that no loops are created, and that all GND-referenced signals have a GND wire nearby (for both return currents and common mode voltage).

3.3.3 Wire and Cable Guidelines



Warning - Hot plugging is forbidden!

Plug or unplug the power connector only when power is off! Plugging the power connector when power is on may cause power surges through connected devices and possibly damage them.

To prevent EMI and ensure high performance of the system, be sure to comply with the following guidelines:

- Use twisted pair shielded wires for the control, feedback, and communication.
- Always use shielded cables for motor connection.
- Keep all wires and cables as short as possible.

- Keep the motor cables as far as possible from the control, feedback and communication lines and cables.
- Wire impedance must be as low as possible. Refer to the wire gauge definitions for each electrical interface.

3.4 Communication – Central-i

The AGIOxx modules use Central-i for communication with a centralized controller module.

The Central-i motion control platform includes a multi-axis motion controller, distributed adapters and sensors, and control software. The master controller performs all the control functions, including trajectory and position, velocity, and current loops. The Central-i digital protocol enables communication and synchronization of the remote devices.

A bi-color LED, marked **STAT** on AGIO01 and **ST** on AGIO02, shows the status of communication between the AGIOxx and the Central-i master controller.

Central-i Status LED indicator

Color	LED	Meaning
Green	On steady	Adapter communicating with master controller
Red	On steady	Adapter not communicating with master controller

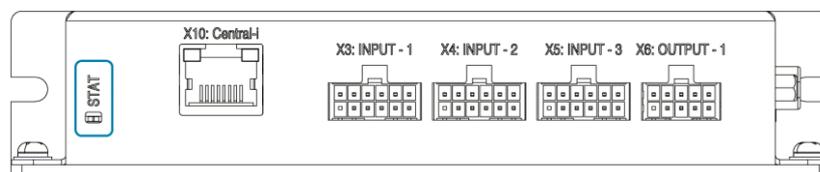


Figure 8. Status (LED) Indicator of AGIO01

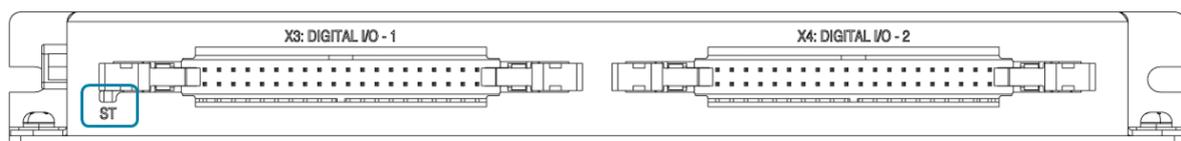


Figure 9. Status (LED) Indicator of AGIO02

3.5 AGIO01 – Electrical Interfaces

3.5.1 Interface X1: Main Power

Connector X1 is used to supply 9–36 VDC to the **AGIO01**.

The adapter includes protection to prevent damage if polarity is inverted at the power input.

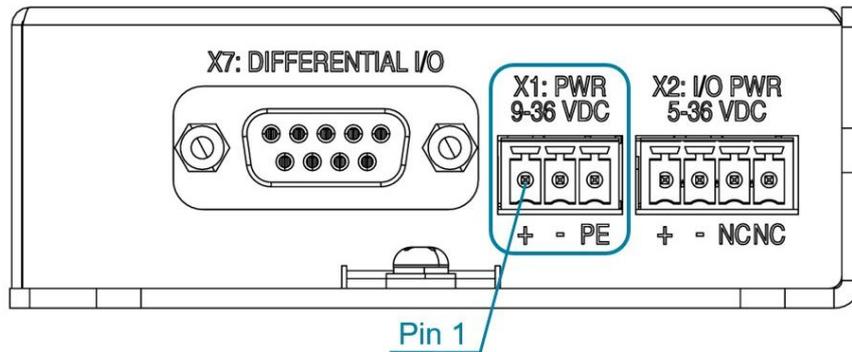


Figure 10. Main Power Connector

Connector X1: PWR

Pin #	Label	Name	Description
1	+	VIN_EXTERNAL	Power input: 9–36V, up to 1A continuous
2	-	GND	Ground – power return
3	PE	GND_EARTH	Protective earth

Connector (on controller)	Degson	15EDGRC3.5-03P-14-00AH
Mating connector options	Degson	15EDGK-3.5-03P-14-00A (H)
	Phoenix	1840379
	Wurth	691361300003
Wiring	28–16 AWG, insulation rated for 160V	



Warning - Hot plugging is forbidden!

Plug or unplug the power connector only when power is off! Plugging the power connector when power is on may cause power surges through connected devices and possibly damage them.

3.5.2 Interface X2: I/O Power

Connector X2 supplies DC power supply to the isolated inputs and outputs.

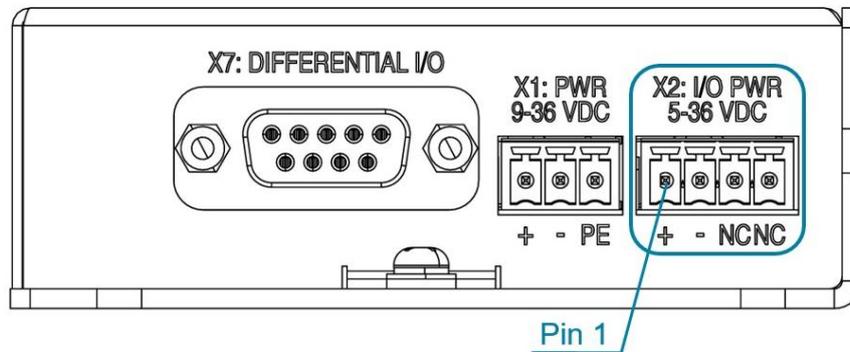


Figure 11. I/O Power Connector

Connector X2: I/O PWR

Pin #	Label	Name	Description
1	+	I/O Power	5 to 28 VDC – user supplied isolated I/O power supply input, up to 2A
2	-	I/O Power Return	Ground – isolated I/O power supply return
3	NC	Not connected	Not in use
4	NC	Not connected	Not in use

Connector (on controller)	Degson	15EDGRC-3.5-04P-14-00AH
Mating connector options	Degson	15EDGK-3.5-04P-14-00A (H)
	Phoenix	1840382
	Wurth	691361300004
Wiring	28–16 AWG, insulation rated for 160V	



Attention

The input voltage range for isolated digital inputs and outputs is 5V to 28V maximum.

3.5.3 Interface X10: Central-i

Connector X10 is used for communication with the Central-i master controller, such as the AGM800, and other remote Central-i devices.

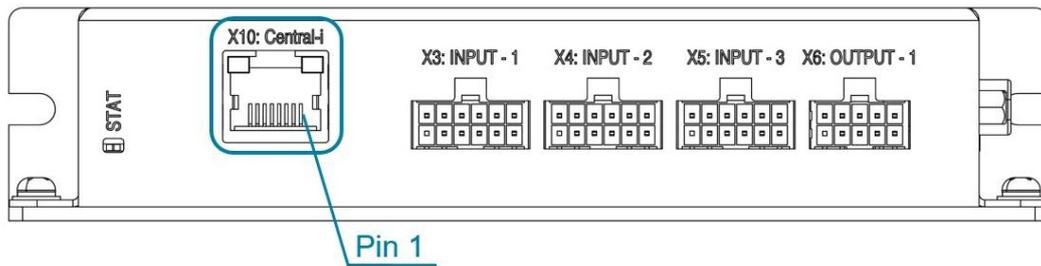


Figure 12. Communication Connector (Central-i)

Connector X10: Central-i (RJ45)

Pin #	Name	Description
1	DATA_0+	Data channel 0+
2	DATA_0-	Data channel 0-
3	DATA_1+	Data channel 1+
4	DATA_2-	Data channel 2-
5	DATA_2+	Data channel 2+
6	DATA_1-	Data channel 1-
7	V_REMOTE	Power supply to remote unit’s communication module
8	GND	GND

Connector (on controller)	RJ45 LAN 10/100Base-T connector
Mating connector options	Any CAT5e compatible shielded connector
Cable options	CAT5e or higher, standard Ethernet straight cable

3.5.4 Interface X3: Input 1 – Digital and Analog Inputs

Connector X3 is used for connecting up to four digital inputs and one analog input to the module.

For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

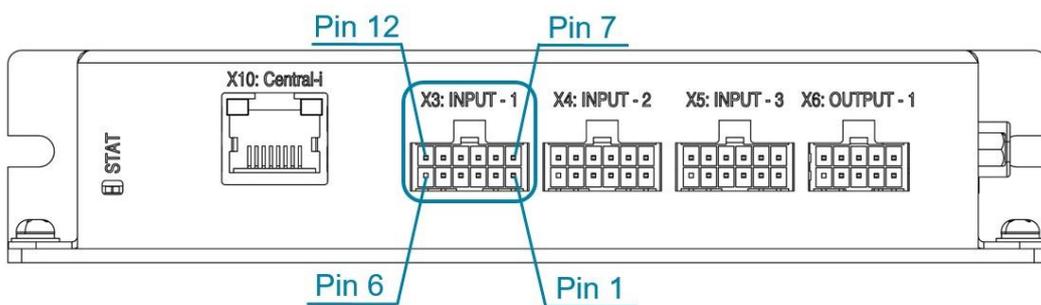


Figure 13. Input-1 Connector

Connector X3: INPUT-1

Pin #	Name	Software Representation	Description
1	I/O Power Return		Connected internally to X2: I/O PWR pin 2, I/O Power Return
2	I/O Power		Connected internally to X2: I/O PWR pin 1, I/O Power
3	Digital Input 4	DInPort.bit(3)	Isolated digital input 4 (NPN or PNP, depending on the connection of the group's common pin).
4	Digital Input 2	DInPort.bit(1)	Isolated digital input 2 (NPN or PNP, depending on the connection of the group's common pin).
5	Digital Input Common (1 to 4)		Isolated digital input common pin for digital inputs 1 to 4.
6	Analog Input 1	AInPort[1]	Analog input 1, $\pm 12V$, 16 bits
7	PE		Protective earth
8	GND		Ground
9	5V_SW1		5V power supply for other components
10	Digital Input 3	DInPort.bit(2)	Isolated digital input 3 (NPN or PNP, depending on the connection of the group's common pin).
11	Digital Input 1	DInPort.bit(0)	Isolated digital input 1 (NPN or PNP, depending on the connection of the group's common pin).
12	Analog Input Return 1		Analog input 1 return. Must be connected to GND if analog input is single-ended.

Connector (on controller)	Samtec Inc.	IPL1-106-01-L-D-RA-K
Mating connector	Samtec Inc.	IPD1-06-D-K
Crimp pin	Samtec Inc.	CC79L-2630-01-L
Wiring	26 AWG, insulation rated for 100V	

**Note – 5V supply limitation**

Limit the usage of the 5V supply provided on pin 9 to 0.5A. The maximum total current provided by all the 5V_SW1 pins in the product is limited to 1.25A.

3.5.5 Interface X4: Input 2 – Digital and Analog Inputs

Connector X4 is used for connecting up to four digital inputs and one analog input to the adapter.

For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

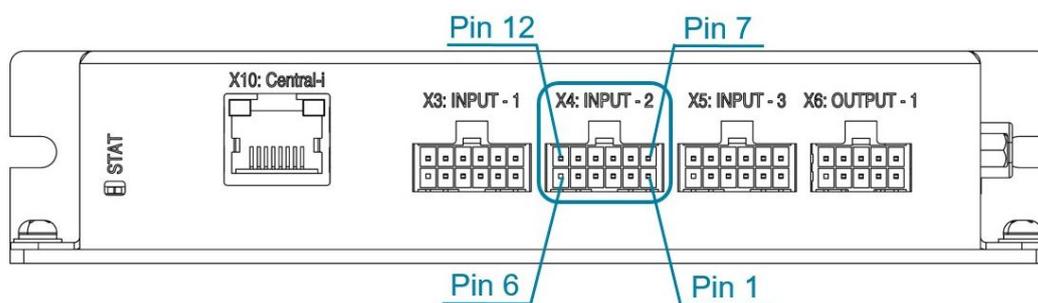


Figure 14. Input-2 Connector

Connector X4: INPUT-2

Pin #	Name	Software Representation	Description
1	I/O Power Return		Connected internally to X2: I/O PWR pin 2, I/O Power Return
2	I/O Power		Connected internally to X2: I/O PWR pin 1, I/O Power
3	Digital Input 8	DInPort.bit(7)	Isolated digital input 8 (NPN or PNP, depending on the connection of the group’s common pin).
4	Digital Input 6	DInPort.bit(5)	Isolated digital input 6 (NPN or PNP, depending on the connection of the group’s common pin).
5	Digital Input Common (5 to 8)		Isolated digital input common pin for digital inputs 5 to 8.
6	Analog Input 2	AInPort[2]	Analog input 2, ±12V, 16 bits
7	PE		Protective earth
8	GND		Ground
9	5V_SW1		5V power supply for other components
10	Digital Input 7	DInPort.bit(6)	Isolated digital input 7 (NPN or PNP, depending on the connection of the group’s common pin).
11	Digital Input 5	DInPort.bit(4)	Isolated digital input 5 (NPN or PNP, depending on the connection of the group’s common pin).
12	Analog Input Return 2		Analog input 2 return. Must be connected to GND if analog input is single-ended.

Connector (on controller)	Samtec Inc.	IPL1-106-01-L-D-RA-K
Mating connector	Samtec Inc.	IPD1-06-D-K
Crimp part number	Samtec Inc.	CC79L-2630-01-L
Wiring	26 AWG, insulation rated for 100V	



Note – 5V supply limitation

Limit the usage of the 5V supply provided on pin 9 to 0.5A. The maximum total current provided by all the 5V_SW1 pins in the product is limited to 1.25A.

3.5.6 Interface X5: Input 3 – Digital and Analog Inputs

Connector X5 is used for connecting up to four digital inputs and one analog input to the adapter.

For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

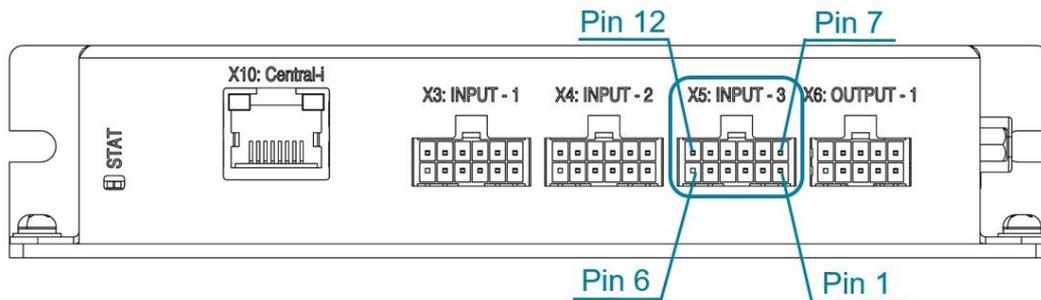


Figure 15. Input-3 Connector

Connector X5: INPUT-3

Pin #	Name	Software Representation	Description
1	I/O Power Return		Connected internally to X2: I/O PWR pin 2, I/O Power Return
2	I/O Power		Connected internally to X2: I/O PWR pin 1, I/O Power
3	Digital Input 12	DInPort.bit(11)	Isolated digital input 12 (NPN or PNP, depending on the connection of the group's common pin).
4	Digital Input 10	DInPort.bit(9)	Isolated digital input 10 (NPN or PNP, depending on the connection of the group's common pin).
5	Digital Input Common (9 to 12)		Isolated digital input common pin for digital inputs 9 to 12.
6	Analog Input 3	AInPort[3]	Analog input 3, ±12V, 16 bits
7	PE		Protective earth
8	GND		Ground
9	5V_SW1		5V power supply for other components
10	Digital Input 11	DInPort.bit(10)	Isolated digital input 11 (NPN or PNP, depending on the connection of the group's common pin).
11	Digital Input 9	DInPort.bit(8)	Isolated digital input 9 (NPN or PNP, depending on the connection of the group's common pin).
12	Analog Input Return 3		Analog input 3 return. Must be connected to GND if analog input is single-ended.

Connector (on controller)	Samtec Inc.	IPL1-106-01-L-D-RA-K
Mating connector	Samtec Inc.	IPD1-06-D-K
Crimp pin	Samtec Inc.	CC79L-2630-01-L

Wiring	26 AWG, insulation rated for 100V
--------	-----------------------------------



Note – 5V supply limitation

Limit the usage of the 5V supply provided on pin 9 to 0.5A. The maximum total current provided by all the 5V_SW1 pins in the product is limited to 1.25A.

3.5.7 Interface X8: Input 4 – Digital and Analog Inputs

Connector X8 is used for connecting up to four digital inputs and one analog input to the adapter. For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

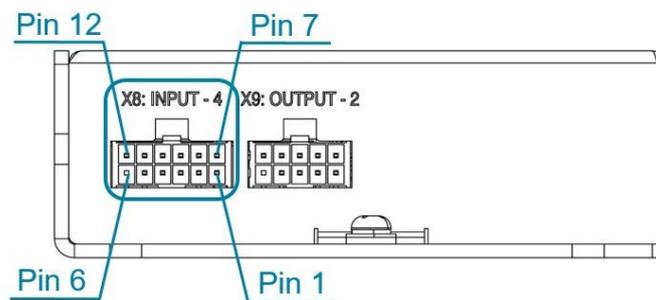


Figure 16. Input-4 Connector

Connector X8: INPUT-4

Pin #	Name	Software Representation	Description
1	I/O Power Return		Connected internally to X2: I/O PWR pin 2, I/O Power Return
2	I/O Power		Connected internally to X2: I/O PWR pin 1, I/O Power
3	Digital Input 14	DInPort.bit(13)	Isolated digital input 14 (NPN or PNP, depending on the connection of the group's common pin).
4	Digital Input 16	DInPort.bit(15)	Isolated digital input 16 (NPN or PNP, depending on the connection of the group's common pin).
5	Digital Input Common (13 to 16)		Isolated digital input common pin for digital inputs 13 to 16.
6	Analog Input 4	AInPort[4]	Analog input 4, ±12V, 16 bits
7	PE		Protective earth
8	GND		Ground
9	5V_SW1		5V power supply for other components
10	Digital Input 15	DInPort.bit(14)	Isolated digital input 15 (NPN or PNP, depending on the connection of the group's common pin).
11	Digital Input 13	DInPort.bit(12)	Isolated digital input 13 (NPN or PNP, depending on the connection of the group's common pin).

Pin #	Name	Software Representation	Description
12	Analog Input Return 4		Analog input 4 return. Must be connected to GND if analog input is single-ended.

Connector (on controller)	Samtec Inc.	IPL1-106-01-L-D-RA-K
Mating connector	Samtec Inc.	IPD1-06-D-K
Crimp pin	Samtec Inc.	CC79L-2630-01-L
Wiring	26 AWG, insulation rated for 100V	



Note – 5V supply limitation

Limit the usage of the 5V supply provided on pin 9 to 0.5A. The maximum total current provided by all the 5V_SW1 pins in the product is limited to 1.25A.

3.5.8 Interface X6: Output 1 – Digital Outputs

Connector X6 is used for connecting up to four digital outputs to the adapter.

For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

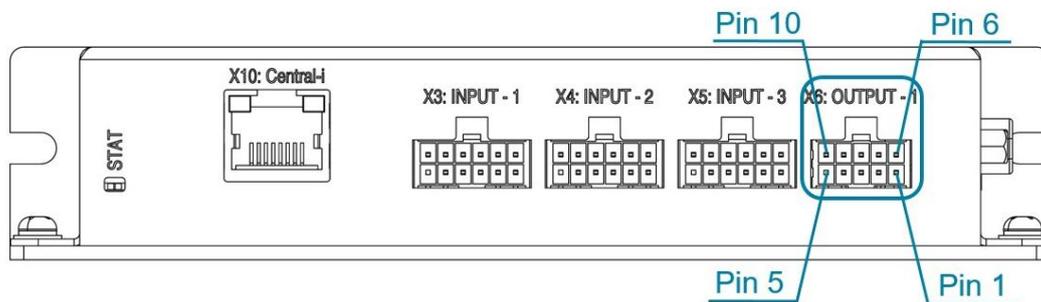


Figure 17. Output-1 Connector

Connector X6: OUTPUT-1

Pin #	Name	Software Representation	Description
1	I/O Power Return		Connected internally to X2: I/O PWR pin 2, I/O Power Return
2	I/O Power		Connected internally to X2: I/O PWR pin 1, I/O Power
3	Digital Output 4	DOutPort.bit(3)	Isolated digital output 4, programmable sink or source
4	Digital Output 2	DOutPort.bit(1)	Isolated digital output 2, programmable sink or source
5	Digital Output Common Power (1 to 4)		Isolated digital output common power pin for isolated digital outputs 1 to 4

Pin #	Name	Software Representation	Description
6	GND		Ground
7	5V_SW2		5V power supply for other components
8	Digital Output 3	DOutPort.bit(2)	Isolated digital output 3, programmable sink or source
9	Digital Output 1	DOutPort.bit(0)	Isolated digital output 1, programmable sink or source
10	Digital Output Common Return (1 to 4)		Isolated digital output common return pin for isolated digital outputs 1 to 4

Connector (on controller)	Samtec Inc.	IPL1-105-01-L-D-RA-K
Mating connector	Samtec Inc.	IPD1-05-D-K
Crimp pin	Samtec Inc.	CC79L-2630-01-L
Wiring	26 AWG, insulation rated for 100V	



Note – 5V supply limitation

Limit the usage of the 5V supply provided on pin 9 to 0.5A. The maximum total current provided by all the 5V_SW2 pins in the product is limited to 1.25A.



Note – Digital Output Common Power in source mode limitation

When using Digital Output Common Power in source mode with the 5V supply, high current (but less than the absolute maximum value of 250 mA) can be driven. However, the output voltage will drop significantly. To maintain output high voltage at > 4.5V, limit the current to 60 mA.

3.5.9 Interface X9: Output 2 – Digital Outputs

Connector X9 is used for connecting up to four digital outputs to the adapter.

For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

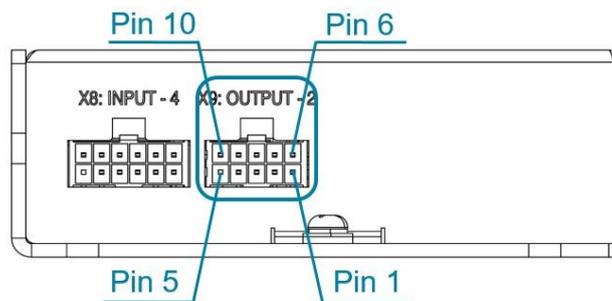


Figure 18. Output-2 Connector

Connector X9: OUTPUT-2

Pin #	Name	Software Representation	Description
1	I/O Power Return		Connected internally to X2: I/O PWR pin 2, I/O Power Return
2	I/O Power		Connected internally to X2: I/O PWR pin 1, I/O Power
3	Digital Output 8	DOutPort.bit(7)	Isolated digital output 8, programmable sink or source
4	Digital Output 6	DOutPort.bit(5)	Isolated digital output 6, programmable sink or source
5	Digital Output Common Power (5 to 8)		Isolated digital output common power pin for isolated digital outputs 5 to 8
6	GND		Ground
7	5V_SW2		5V power supply for other components
8	Digital Output 7	DOutPort.bit(6)	Isolated digital output 7, programmable sink or source
9	Digital Output 5	DOutPort.bit(4)	Isolated digital output 5, programmable sink or source
10	Digital Output Common Return (5 to 8)		Isolated digital output common return pin for isolated digital outputs 5 to 8

Connector (on controller)	Samtec Inc.	IPL1-105-01-L-D-RA-K
Mating connector	Samtec Inc.	IPD1-05-D-K
Crimp pin	Samtec Inc.	CC79L-2630-01-L
Wiring	26 AWG, insulation rated for 100V	



Note – 5V supply limitation

Limit the usage of the 5V supply provided on pin 9 to 0.5A. The maximum total current provided by all the 5V_SW2 pins in the product is limited to 1.25A.



Note – Digital Output Common Power in source mode limitation

When using Digital Output Common Power in source mode with the 5V supply, high current (but less than the absolute maximum value of 250 mA) can be driven. However, the output voltage will drop significantly. To maintain output high voltage at > 4.5V, limit the current to 60 mA.

3.5.10 Interface X7: Bi-directional Differential Inputs and Outputs

Connector X7 is used for connecting up to three differential bi-directional I/Os to the adapter.

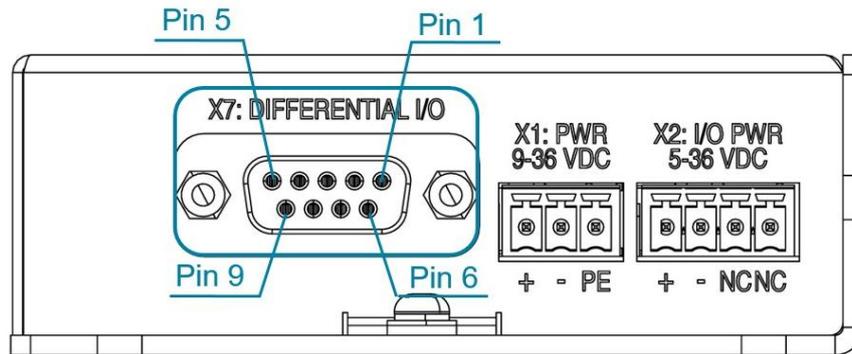


Figure 19. Differential I/O Connector

Connector X7: DIFFERENTIAL I/O

Pin #	Name	Software Representation	Description
1	Bi-Dir Diff I/O 1 +	DInPort.bit(16) DOutPort.bit(8)	Bi-directional differential I/O 1+
2	Bi-Dir Diff I/O 2 +	DInPort.bit(17) DOutPort.bit(9)	Bi-directional differential I/O 2+
3	Bi-Dir Diff I/O 3 +	DInPort.bit(18) DOutPort.bit(10)	Bi-directional differential I/O 3+
4	5V_SW2		5V power supply for other components
5	PE		Protective earth
6	Bi-Dir Diff I/O 1 -		Bi-directional differential I/O 1-
7	Bi-Dir Diff I/O 2 -		Bi-directional differential I/O 2-
8	Bi-Dir Diff I/O 3 -		Bi-directional differential I/O 3-
9	GND		Ground

Connector (on controller)	MH Connectors	MHDB9SP
Mating connector	MH Connectors	MHCCOV-9SC-MP
Wiring	26 AWG, insulation rated for 100V	



Note – Differential vs Single-ended

Differential input (-) and differential output (-) are not GND. They must be connected to the negative (-) side of a differential pair in the customer’s machine.

I/O Connection Diagram Example

Isolated Digital Inputs 1 to 4, 5 to 8, 9 to 12 and 13 to 16

- Isolated digital inputs are organized as groups with a dedicated common pin. This enables connection to different voltage supplies. Each group is fully isolated and independent of the other groups.

- Digital Input Common are grouped by digital inputs 1 to 4, digital inputs 5 to 8, digital inputs 9 to 12 and digital inputs 13 to 16.
- Each group can be connected as NPN or PNP interfaces, depending on the wiring of the group's common pin. If the common pin is connected to power (5V to 28V), then the inputs of this group can be used with external NPN devices (external current sinking devices). If the common is connected to the GND of some external power, then the inputs can be used with external PNP devices (external current sourcing devices).
- The input circuit of the opto-couplers includes two diodes. This enables use as NPN or PNP.
- One group can be wired to interface external NPN devices and another group can be wired to interface PNP devices. However, within a group, all interfaces (NPN or PNP) must be the same, as they are based on the connection of the group's common pin.



Attention

The input voltage range for isolated digital inputs and outputs is 5V to 28V maximum.

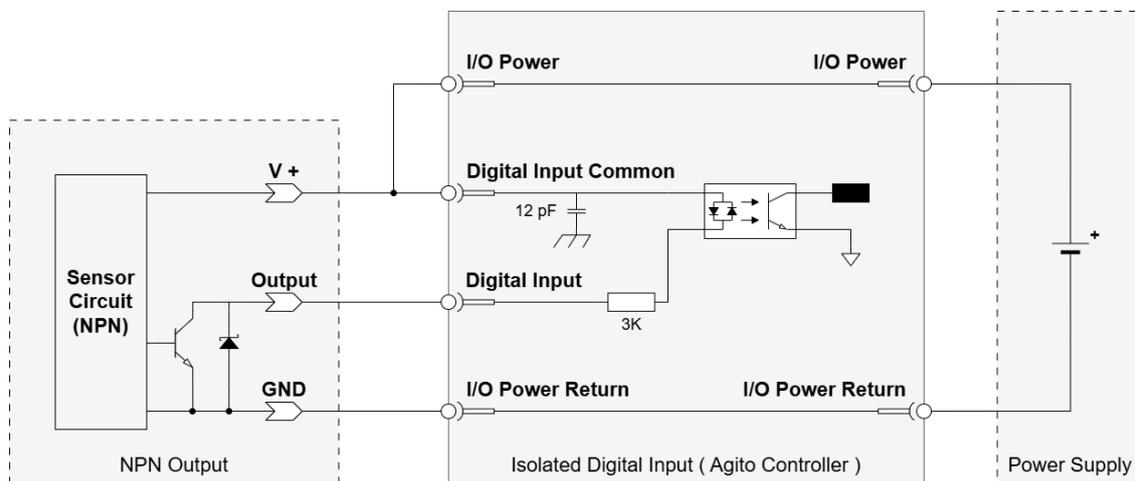


Figure 20. Digital Input with NPN Sensor

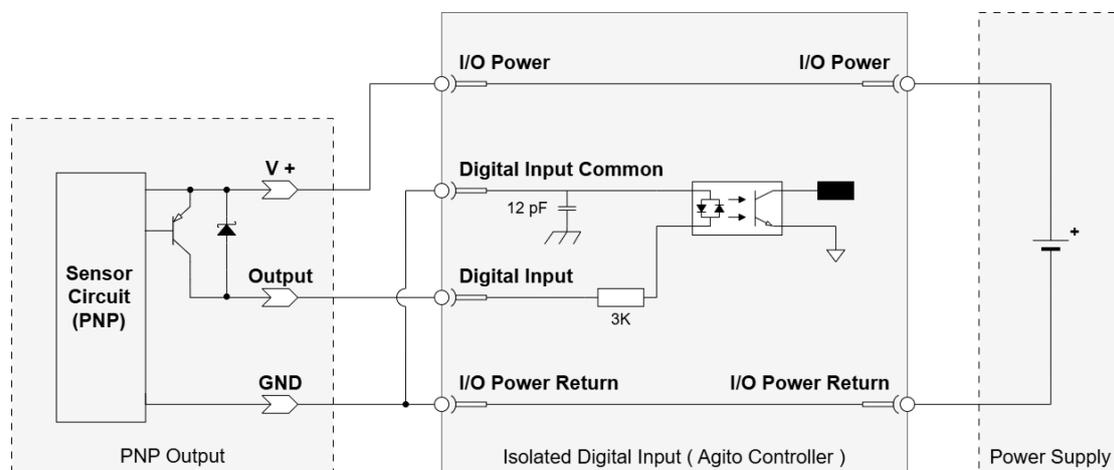


Figure 21. Digital Input with PNP Sensor

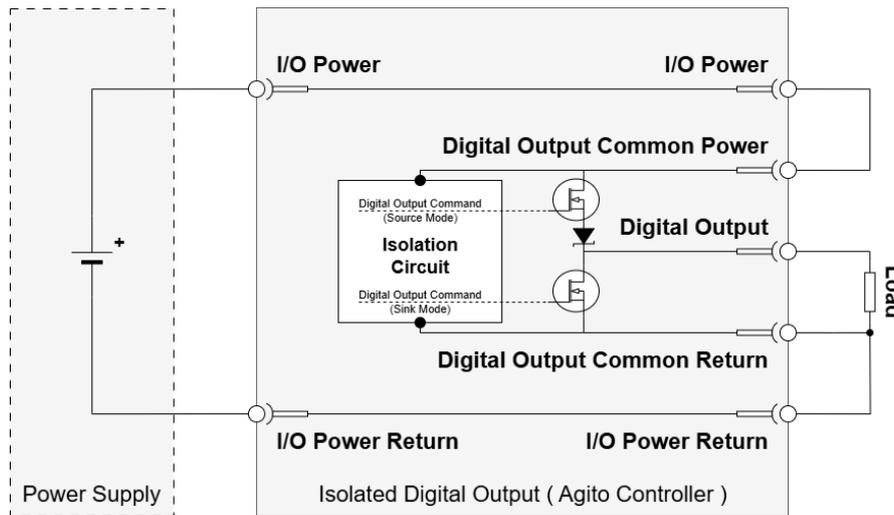


Figure 23. Digital Output (Source Mode)

Analog Inputs 1 to 4

- The electrical interfaces of all analog inputs are identical.
- The analog input range is -12V to +12V, and resolution is 16 bits.
- The analog input is designed for standard differential analog input, with a simple input circuit, having an input resistance of ~60 kΩ.
- For single-ended analog inputs, be sure to connect the return line to GND. Do not leave it unconnected.
- Input circuit bandwidth is 1 kHz, -40 dB/decade.
- The controller software provides the following parameters to control the analog input reading:
 - Filter
 - Offset
 - Deadband
 - Gain

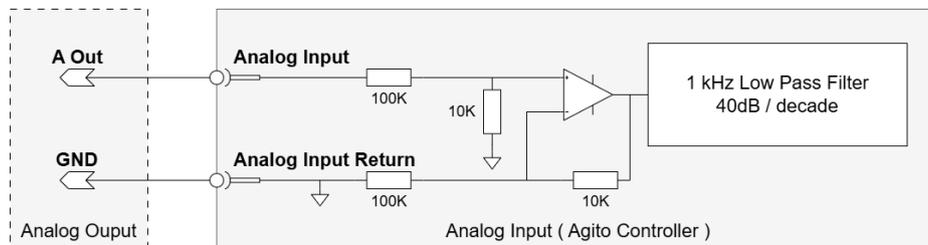


Figure 24. Analog Input

Bi-Directional Differential I/Os 1 to 3

- The bi-directional differential output is configurable by software to be differential output or differential input.
- Both + and - pins are pulled up to 3.3V.
- There is a 120Ω termination resistor between the + and - pins.

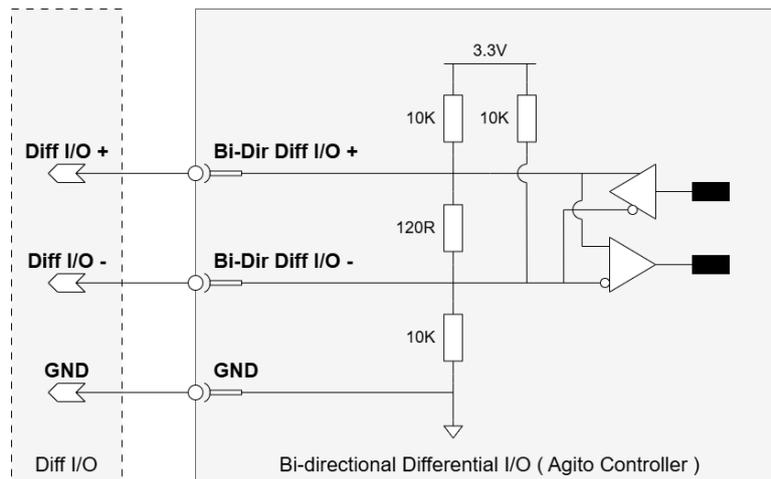


Figure 25. Bi-Directional Differential I/O

3.6 AGIO02 – Electrical Interfaces

3.6.1 Interface X6: Main Power

Connector X6 is used to supply 9–36 VDC to the **AGIO02**.

The adapter includes protection to prevent damage if polarity is inverted at the power input.

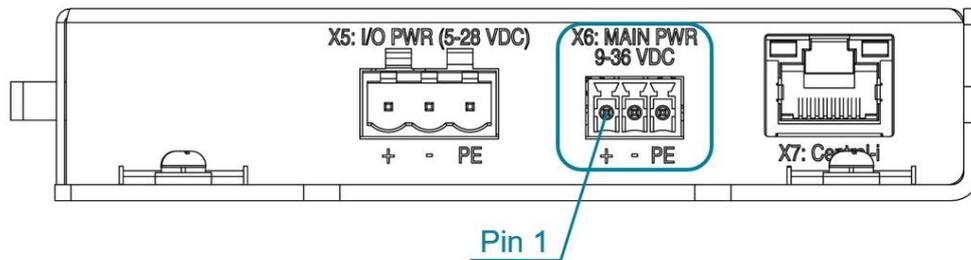


Figure 26. Main Power Connector

Connector X6: PWR

Pin #	Label	Name	Description
1	+	VIN_EXTERNAL	Power input: 9–36V, up to 1A continuous
2	-	GND	Ground – power return
3	PE	GND_EARTH	Protective earth

Connector (on controller)	Degson	15EDGRC3.5-03P-14-00AH
Mating connector options	Degson	15EDGK-3.5-03P-14-00A (H)
	Phoenix	1840379
	Würth	691361300003
Wiring	16–28 AWG, insulation rated for 160V	



Warning - Hot plugging is forbidden!

Plug or unplug the power connector only when power is off! Plugging the power connector when power is on may cause power surges through connected devices and possibly damage them.

3.6.2 Interface X5: I/O Power

Connector X5 supplies DC power supply to the isolated inputs and outputs.

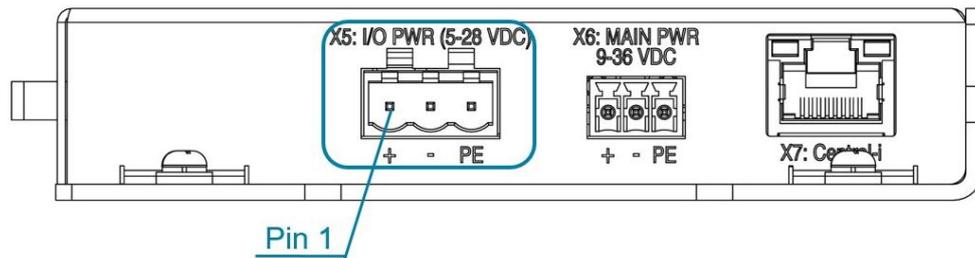


Figure 27. I/O Power Connector

Connector X5: I/O PWR

Pin #	Label	Name	Description
1	+	I/O Power	5 to 28 VDC – user supplied isolated I/O power supply input, up to 2A
2	-	I/O Power Return	Ground – Isolated I/O power supply return
3	PE	GND_EARTH	Protective earth

Connector (on controller)	Degson	2EDGK-5.08-03P-14-00AH
Mating connector options	Degson Phoenix Wurth	2EDGKF-5.08-03P-14-1000A (H) 1757022 691352710003
Wiring	16–28 AWG, insulation rated for 250 V	



Attention

The input voltage range for isolated digital inputs and outputs is 5V to 28V maximum.

3.6.3 Interface X7: Central-i

Connector X7 is used for communication with the Central-i master controller, such as the AGM800, and other remote Central-i devices.

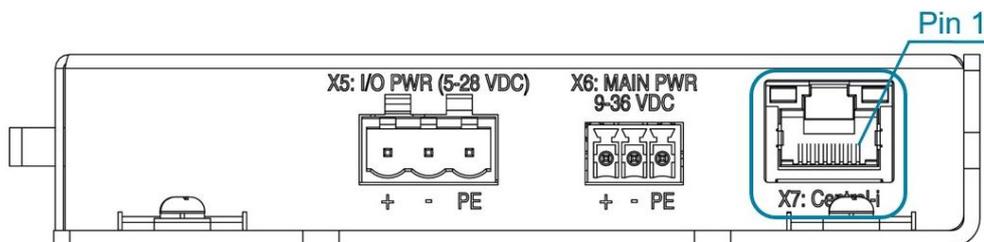


Figure 28. Communication Connector (Central-i)

Connector X7: Central-i (RJ45)

Pin #	Name	Description
1	DATA_0+	Data channel 0+
2	DATA_0-	Data channel 0-
3	DATA_1+	Data channel 1+
4	DATA_2-	Data channel 2-
5	DATA_2+	Data channel 2+
6	DATA_1-	Data channel 1-
7	V_REMOTE	Power supply to remote unit’s communication module
8	GND	GND

Connector (on controller)	RJ45 LAN 10/100Base-T connector
Mating connector options	Any CAT5e compatible shielded connector
Cable options	CAT5e or higher, standard Ethernet straight cable

3.6.4 Interface X3: Digital I/O - 1

Connector X3 is used for connecting up to 16 digital inputs and 8 digital outputs to the adapter. For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

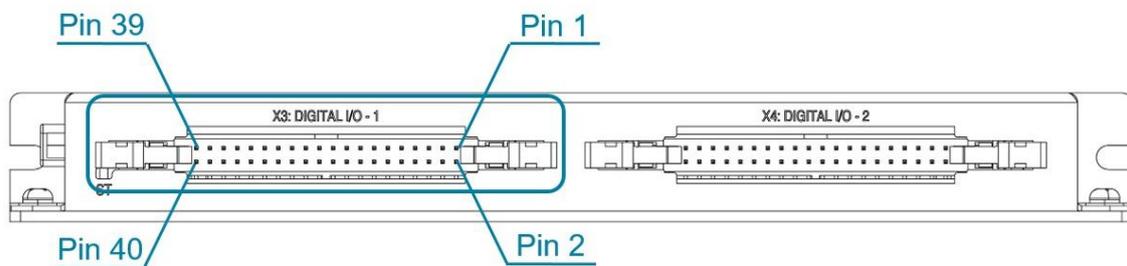


Figure 29. Digital I/O – 1 Connector

Connector X3: Digital I/O - 1

Pin #	Name	Software Representation	Description
1	I/O Power		Connected internally to X5: I/O PWR pin 1, I/O Power
2	I/O Power		Connected internally to X5: I/O PWR pin 1, I/O Power
3	I/O Power Return		Connected internally to X5: I/O PWR pin 2, I/O Power Return
4	I/O Power Return		Connected internally to X5: I/O PWR pin 2, I/O Power Return
5	Digital Input Common (1 to 8)		Isolated digital input common pin for isolated digital inputs 1 to 8

Pin #	Name	Software Representation	Description
6	Digital Input Common (9 to 16)		Isolated digital input common pin for isolated digital inputs 9 to 16
7	Digital Input 1	DInPort.bit(0)	Isolated digital input 1 (NPN or PNP, depending on the connection of the group's common pin)
8	Digital Input 9	DInPort.bit(8)	Isolated digital input 9 (NPN or PNP, depending on the connection of the group's common pin)
9	Digital Input 2	DInPort.bit(1)	Isolated digital input 2 (NPN or PNP, depending on the connection of the group's common pin)
10	Digital Input 10	DInPort.bit(9)	Isolated digital input 10 (NPN or PNP, depending on the connection of the group's common pin)
11	Digital Input 3	DInPort.bit(2)	Isolated digital input 3 (NPN or PNP, depending on the connection of the group's common pin)
12	Digital Input 11	DInPort.bit(10)	Isolated digital input 11 (NPN or PNP, depending on the connection of the group's common pin)
13	Digital Input 4	DInPort.bit(3)	Isolated digital input 4 (NPN or PNP, depending on the connection of the group's common pin)
14	Digital Input 12	DInPort.bit(11)	Isolated digital input 12 (NPN or PNP, depending on the connection of the group's common pin)
15	Digital Input 5	DInPort.bit(4)	Isolated digital input 5 (NPN or PNP, depending on the connection of the group's common pin)
16	Digital Input 13	DInPort.bit(12)	Isolated digital input 13 (NPN or PNP, depending on the connection of the group's common pin)
17	Digital Input 6	DInPort.bit(5)	Isolated digital input 6 (NPN or PNP, depending on the connection of the group's common pin)
18	Digital Input 14	DInPort.bit(13)	Isolated digital input 14 (NPN or PNP, depending on the connection of the group's common pin)
19	Digital Input 7	DInPort.bit(6)	Isolated digital input 7 (NPN or PNP, depending on the connection of the group's common pin)
20	Digital Input 15	DInPort.bit(14)	Isolated digital input 15 (NPN or PNP, depending on the connection of the group's common pin)
21	Digital Input 8	DInPort.bit(7)	Isolated digital input 8 (NPN or PNP, depending on the connection of the group's common pin)
22	Digital Input 16	DInPort. bit(15)	Isolated digital input 16 (NPN or PNP, depending on the connection of the group's common pin)
23	I/O Power		Connected internally to X5: I/O PWR pin 1, I/O Power
24	I/O Power		Connected internally to X5: I/O PWR pin 1, I/O Power
25	I/O Power Return		Connected internally to X5: I/O PWR pin 2, I/O Power Return
26	I/O Power Return		Connected internally to X5: I/O PWR pin 2, I/O Power Return

Pin #	Name	Software Representation	Description
27	Digital Output Common Power (1 to 4)		Isolated digital output common power pin for isolated digital outputs 1 to 4
28	Digital Output Common Power (5 to 8)		Isolated digital output common power pin for isolated digital outputs 5 to 8
29	Digital Output Common Return (1 to 4)		Isolated digital output common return pin for isolated digital outputs 1 to 4
30	Digital Output Common Return (5 to 8)		Isolated digital output common return pin for isolated digital outputs 5 to 8
31	Digital Output 1	DOutPort.bit(0)	Isolated digital output 1 (programmable sink or source)
32	Digital Output 5	DOutPort.bit(4)	Isolated digital output 5 (programmable sink or source)
33	Digital Output 2	DOutPort.bit(1)	Isolated digital output 2 (programmable sink or source)
34	Digital Output 6	DOutPort.bit(5)	Isolated digital output 6 (programmable sink or source)
35	Digital Output 3	DOutPort.bit(2)	Isolated digital output 3 (programmable sink or source)
36	Digital Output 7	DOutPort.bit(6)	Isolated digital output 7 (programmable sink or source)
37	Digital Output 4	DOutPort.bit(3)	Isolated digital output 4 (programmable sink or source)
38	Digital Output 8	DOutPort.bit(7)	Isolated digital output 8 (programmable sink or source)
39	PE		Ground earth connection
40	PE		Ground earth connection

Connector (on controller)	Würth	61204022921
Mating connector	Würth	61204023021
Cable	3M	3365/40 300
Wiring	28 AWG, insulation rated for 300V	

3.6.5 Interface X4: Digital I/O - 2

Connector X4 is used for connecting up to 16 digital inputs and 8 digital outputs to the adapter. For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

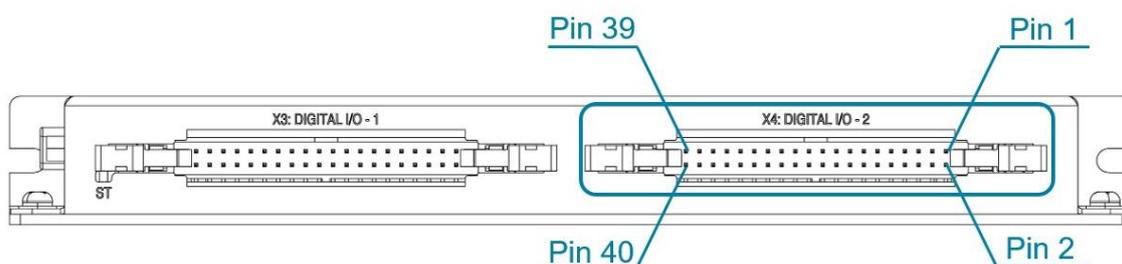


Figure 30. Digital I/O – 2 Connector

Connector X4: Digital I/O - 2

Pin #	Name	Software Representation	Description
1	I/O Power		Connected internally to X5: I/O PWR pin 1, I/O Power
2	I/O Power		Connected internally to X5: I/O PWR pin 1, I/O Power
3	I/O Power Return		Connected internally to X5: I/O PWR pin 2, I/O Power Return
4	I/O Power Return		Connected internally to X5: I/O PWR pin 2, I/O Power Return
5	Digital Input Common (17 to 24)		Isolated digital input common pin for isolated digital inputs 17 to 24
6	Digital Input Common (25 to 32)		Isolated digital input common pin for isolated digital inputs 25 to 32
7	Digital Input 17	DInPort.bit(16)	Isolated digital input 17 (NPN or PNP, depending on the connection of the group's common pin)
8	Digital Input 25	DinPort.bit(24)	Isolated digital input 25 (NPN or PNP, depending on the connection of the group's common pin)
9	Digital Input 18	DInPort.bit(17)	Isolated digital input 18 (NPN or PNP, depending on the connection of the group's common pin)
10	Digital Input 26	DInPort.bit(25)	Isolated digital input 26 (NPN or PNP, depending on the connection of the group's common pin)
11	Digital Input 19	DInPort.bit(18)	Isolated digital input 19 (NPN or PNP, depending on the connection of the group's common pin)
12	Digital Input 27	DInPort.bit(26)	Isolated digital input 27 (NPN or PNP, depending on the connection of the group's common pin)
13	Digital Input 20	DInPort.bit(19)	Isolated digital input 20 (NPN or PNP, depending on the connection of the group's common pin)
14	Digital Input 28	DInPort.bit(27)	Isolated digital input 28 (NPN or PNP, depending on the connection of the group's common pin)
15	Digital Input 21	DInPort.bit(20)	Isolated digital input 21 (NPN or PNP, depending on the connection of the group's common pin))
16	Digital Input 29	DInPort.bit(28)	Isolated digital input 29 (NPN or PNP, depending on the connection of the group's common pin)
17	Digital Input 22	DInPort.bit(21)	Isolated digital input 22 (NPN or PNP, depending on the connection of the group's common pin)

Pin #	Name	Software Representation	Description
18	Digital Input 30	DInPort.bit(29)	Isolated digital input 30 (NPN or PNP, depending on the connection of the group's common pin)
19	Digital Input 23	DInPort.bit(22)	Isolated digital input 23 (NPN or PNP, depending on the connection of the group's common pin)
20	Digital Input 31	DInPort.bit(30)	Isolated digital input 31 (NPN or PNP, depending on the connection of the group's common pin)
21	Digital Input 24	DInPort.bit(23)	Isolated digital input 24 (NPN or PNP, depending on the connection of the group's common pin)
22	Digital Input 32	DInPort.bit(31)	Isolated digital input 32 (NPN or PNP, depending on the connection of the group's common pin)
23	I/O Power		Connected internally to X5: I/O PWR pin 1, I/O Power
24	I/O Power		Connected internally to X5: I/O PWR pin 1, I/O Power
25	I/O Power Return		Connected internally to X5: I/O PWR pin 2, I/O Power Return
26	I/O Power Return		Connected internally to X5: I/O PWR pin 2, I/O Power Return
27	Digital Output Common Power (9 to 12)		Isolated digital output common power pin for isolated digital outputs 9 to 12
28	Digital Output Common Power (13 to 16)		Isolated digital output common power pin for isolated digital outputs 13 to 16
29	Digital Output Common Return (9 to 12)		Isolated digital output common return pin for isolated digital outputs 9 to 12
30	Digital Output Common Return (13 to 16)		Isolated digital output common return pin for isolated digital outputs 13 to 16
31	Digital Output 9	DOutPort.bit(8)	Isolated digital output 9 (programmable sink or source)
32	Digital Output 13	DOutPort.bit(12)	Isolated digital output 13 (programmable sink or source)
33	Digital Output 10	DOutPort.bit(9)	Isolated digital output 10 (programmable sink or source)
34	Digital Output 14	DOutPort.bit(13)	Isolated digital output 14 (programmable sink or source)
35	Digital Output 11	DOutPort.bit(10)	Isolated digital output 11 (programmable sink or source)
36	Digital Output 15	DOutPort.bit(14)	Isolated digital output 15 (programmable sink or source)
37	Digital Output 12	DOutPort.bit(11)	Isolated digital output 12 (programmable sink or source)

Pin #	Name	Software Representation	Description
38	Digital Output 16	DOutPort.bit(15)	Isolated digital output 16 (programmable sink or source)
39	PE		Ground earth connection
40	PE		Ground earth connection

Connector (on controller)	Wurth	61204022921
Mating connector	Wurth	61204023021
Cable	3M	3365/40 300
Wiring	28 AWG, insulation rated for 300V	

3.6.6 Interface X1: Analog I/O - 1

Connector X1 is used for connecting up to two analog inputs and one analog outputs to the adapter.

For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

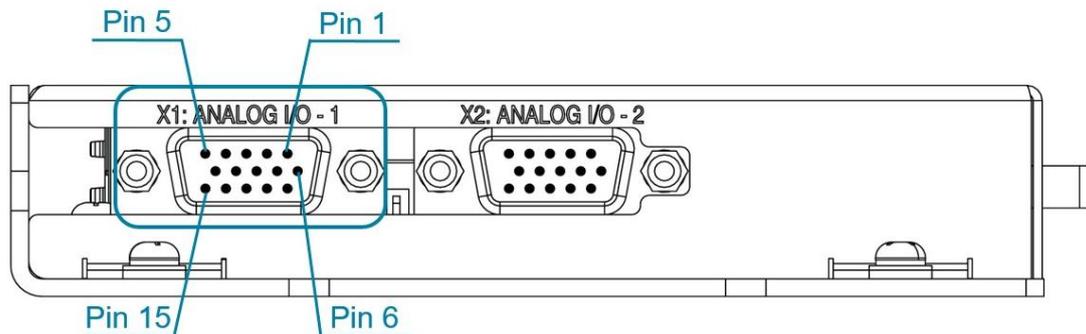


Figure 31. Analog I/O – 1 Connector

Connector X1: Analog I/O - 1

Pin #	Name	Software Representation	Description
1	Analog Input Return 1		Analog input 1, return
2	-15V		Low current supply for external analog circuits
3	Analog Input Return 3		Analog input 3, return
4	-15V		Low current supply for external analog circuits
5	Analog Output 1 -		Differential analog output 1-, ±12V, 16 bits
6	Analog Input 1	AInPort[1]	Analog input 1, ±12V, 12 bits
7	+15V		Low current supply for external analog circuits
8	Analog Input 3	AInPort[3]	Analog input 3, ±12V, 12 bits
9	+15V		Low current supply for external analog circuits

Pin #	Name	Software Representation	Description
10	Analog Output 1 +	AOutPort[1]	Differential analog output 1+, ±12V, 16 bits
11	AGND		Ground for analog signals
12	AGND		Ground for analog signals
13	AGND		Ground for analog signals
14	AGND		Ground for analog signals
15	AGND		Ground for analog signals

Connector (on controller)	D-Sub 15 High Density (Female)
Mating connector options	MH Connectors MHHDS15-M-T-B-S Any D-Sub 15 High Density (Male)
Backshell options	MH Connectors MHCCOV-9SC-MP Any D-Sub 9 Backshell
Wiring	26 AWG, insulation rated for 100V



Note – 15V Supply Limitations

The ±15V supply is used internally for the analog inputs. It is also made available for external analog circuits. Limit the current usage to 40mA and below.

3.6.7 Interface X2: Analog I/O - 2

Connector X2 is used for connecting up to two analog inputs and one analog outputs to the adapter.

For schematics and more information about this interface, refer to the section *I/O Connection Diagram Example*.

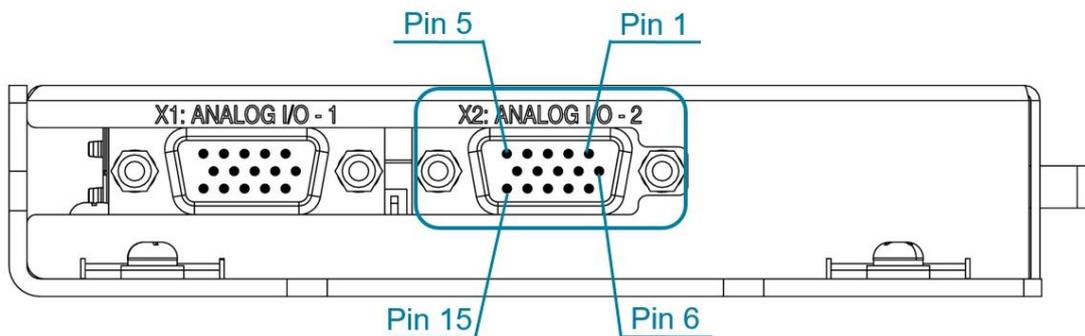


Figure 32. Analog I/O – 2 Connector

Connector X2: Analog I/O - 2

Pin #	Name	Software Representation	Description
1	Analog Input Return 2		Analog input 2 return
2	-15V		Low current supply for external analog circuits

Pin #	Name	Software Representation	Description
3	Analog Input Return 4		Analog input 4 return
4	-15V		Low current supply for external analog circuits
5	Analog Output 2 -		Differential analog output 2-, $\pm 12V$, 16 bits
6	Analog Input 2	AInPort[2]	Analog input 2, $\pm 12V$, 12 bits
7	+15V		Low current supply for external analog circuits
8	Analog Input 4	AInPort[4]	Analog input 4, $\pm 12V$, 12 bits
9	+15V		Low current supply for external analog circuits
10	Analog Output 2 +	AOutPort[2]	Differential analog output 2+, $\pm 12V$, 16 bits
11	AGND		Ground for analog signals
12	AGND		Ground for analog signals
13	AGND		Ground for analog signals
14	AGND		Ground for analog signals
15	AGND		Ground for analog signals

Connector (on controller)	D-Sub 15 High Density (Female)
Mating connector options	MH Connectors MHHDS15-M-T-B-S Any D-Sub 15 High Density (Male)
Backshell options	MH Connectors MHCCOV-9SC-MP Any D-Sub 9 Backshell
Wiring	26 AWG, insulation rated for 100V



Note – 15V Supply Limitations

The $\pm 15V$ supply is used internally for the analog inputs. It is also made available for external analog circuits. Limit the current usage to 40mA and below.

I/O Connection Diagram Example

Isolated Digital Inputs 1 to 8, 9 to 16, 17 to 24 and 25 to 32

- Isolated digital inputs are organized as groups with a dedicated common pin. This enables connection to different voltage supplies. Each group is fully isolated and independent of the other groups.
- Digital Input Common are grouped by digital inputs 1 to 8, digital inputs 9 to 16, digital inputs 17 to 24 and digital inputs 25 to 32.
- Each group can be connected as NPN or PNP interfaces, depending on the wiring of the group's common pin. If the common pin is connected to power (5V to 28V), then the inputs of this group can be used with external NPN devices (external current sinking devices). If the common is connected to the GND of some external power, then the inputs can be used with external PNP devices (external current sourcing devices).
- The input circuit of the opto-couplers includes two diodes. This enables use as NPN or PNP.

- One group can be wired to interface external NPN devices and another group can be wired to interface PNP devices. However, within a group, all interfaces (NPN or PNP) must be the same, as they are based on the connection of the group’s common pin.



Attention

The input voltage range for isolated digital inputs and outputs is 5V to 28V maximum.

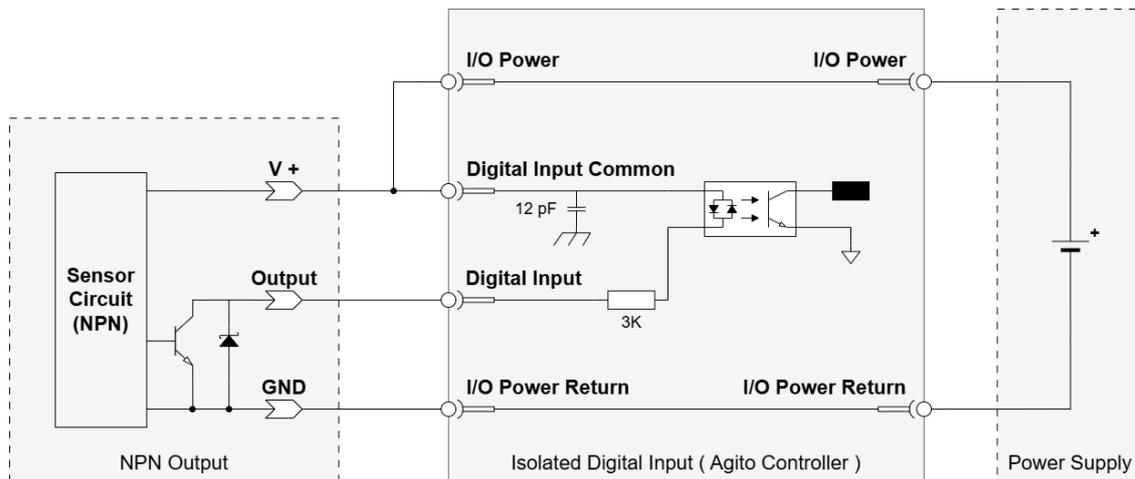


Figure 33. Digital Input with NPN Sensor

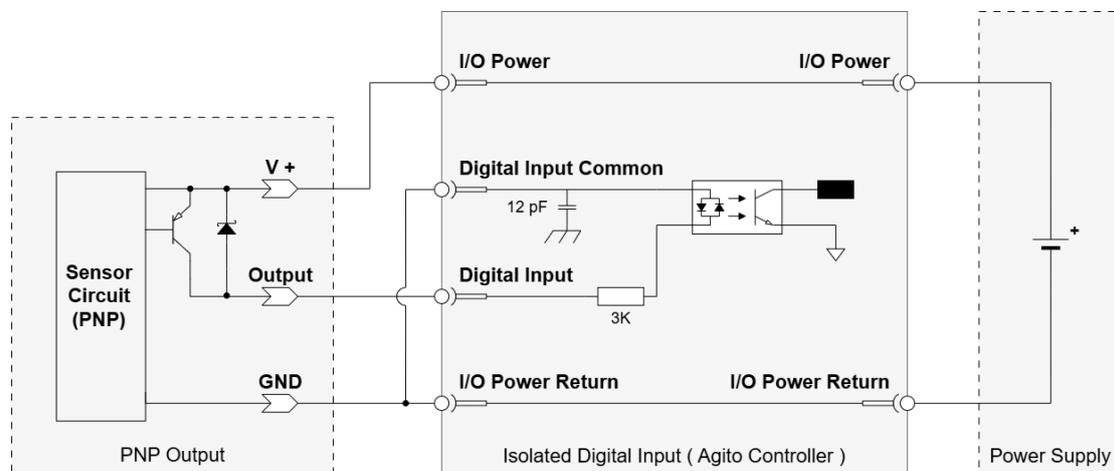


Figure 34. Digital Input with PNP Sensor

Isolated Digital Outputs 1 to 4, 5 to 8, 9 to 12 and 13 to 16

- The digital output interface circuit is identical for all outputs.
- Each output can be programmed (by software parameter) to act as a current sourcing output (up to 300mA), or as a current sinking output (up to 500mA).
- Digital Output Common Power is divided into four groups – digital outputs 1 to 4, digital outputs 5 to 8, digital outputs 9 to 12 and digital outputs 13 to 16.
- The outputs are designed for resistive loads. For inductive loads, an external flyback diode is required.

▪ Digital outputs specifications:

- Digital Output Common Power voltage range is between 5V and 28V.
- Maximal load current, per each output:

Sink mode, any Digital Output Common Power voltage: 500 mA
 Source mode, at 24V Digital Output Common Power: 300 mA
 Source mode, at 5V Digital Output Common Power: 60 mA (see Note below)



Note – Digital Output Common Power in source mode limitation

When using Digital Output Common Power in source mode with the 5V supply, high current (but less than the absolute maximum value of 250 mA) can be driven. However, the output voltage will drop significantly. To maintain output high voltage at > 4.5V, limit the current to 60 mA.

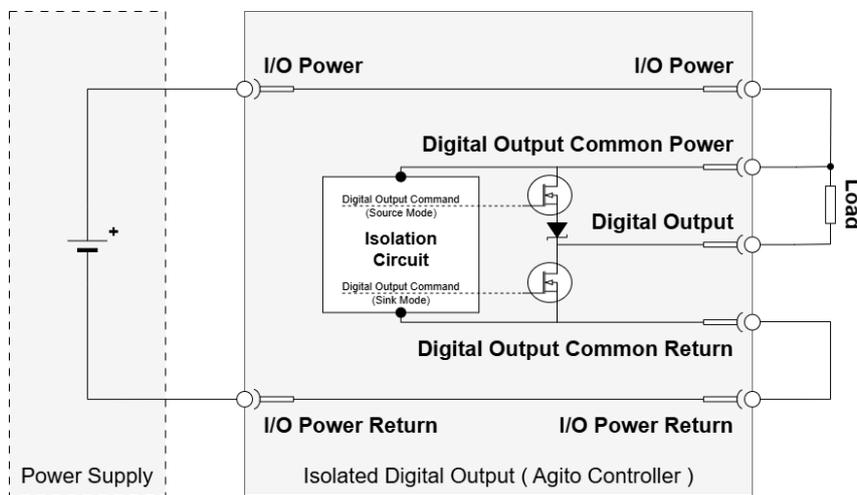


Figure 35. Digital Output (Sink Mode)

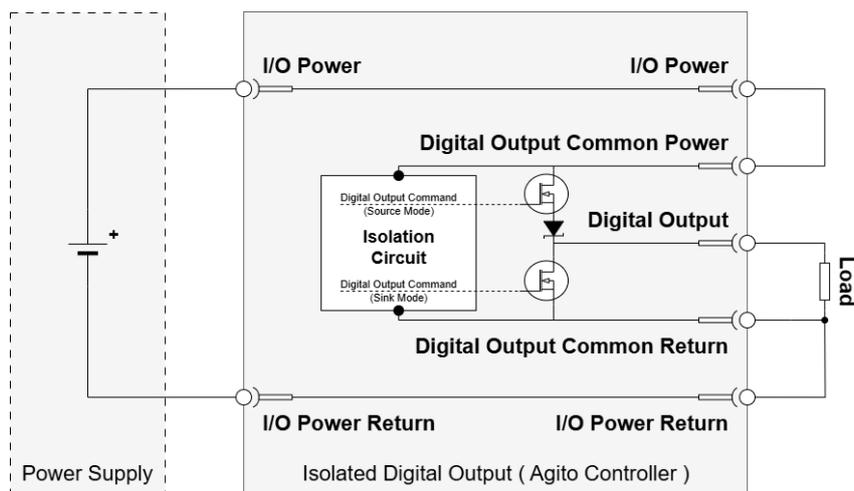


Figure 36. Digital Output (Source Mode)

Analog Inputs 1 to 4

- The electrical interfaces of all analog inputs are identical.

- The analog input range is -12V to +12V, and resolution is 12 bits.
- The analog input is designed for standard differential analog input, with a simple input circuit, having an input resistance of ~60 k Ω .
- For single-ended analog inputs, be sure to connect the return line to GND. Do not leave it unconnected.
- Input circuit bandwidth is 1 kHz, -40 dB/decade.
- The controller software provides the following parameters to control the analog input reading:
 - Filter
 - Offset
 - Deadband
 - Gain

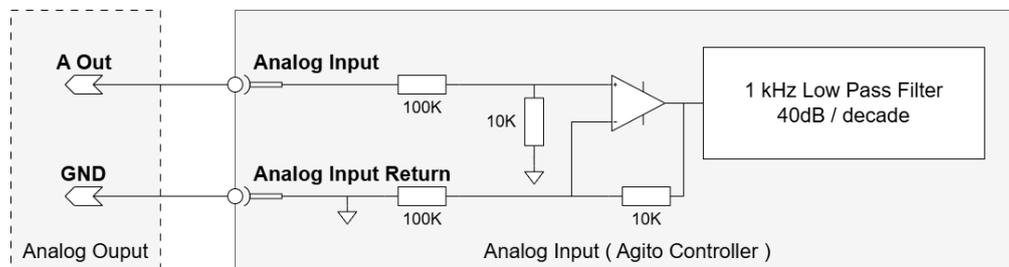


Figure 37. Analog Input

Differential Analog Outputs 1 to 2

- The electrical interfaces of all analog outputs are identical.
- The analog output range is from -12V to +12V, with resolution of 16 bits.
- Output resistance is 10 Ω .
- Output current is up to ± 2 mA, without internal current limitation.
- Analog outputs are controlled by the controller software in a few operational modes:
 - Analog output controlled by the user program for a general purpose.
 - Analog output used to provide analog torque or velocity command to external amplifier.

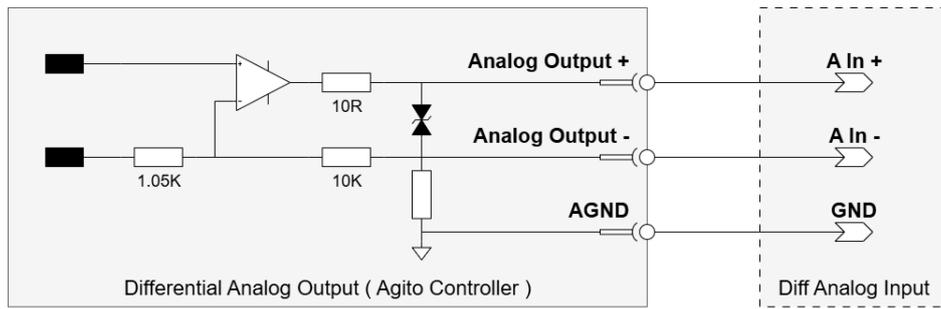


Figure 38. Differential Analog Output

