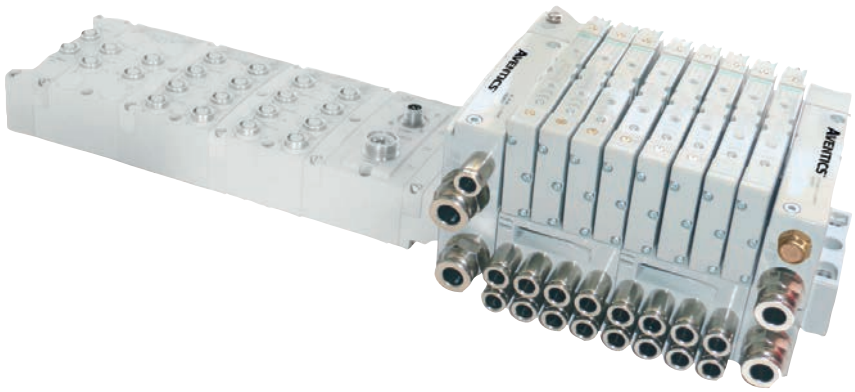
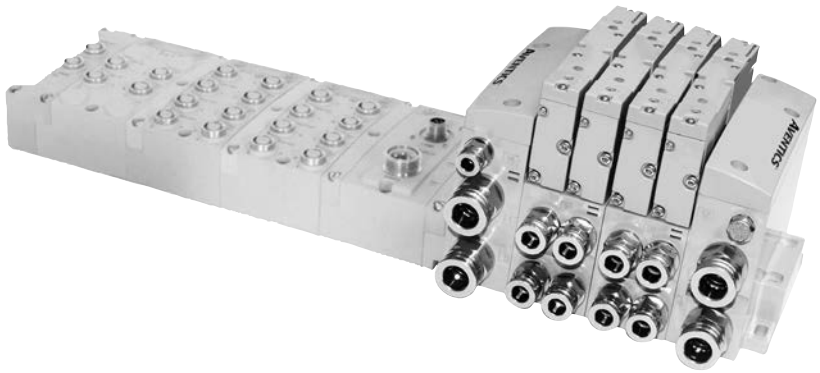
Fieldbus Electronics

G3 | Communication Node and I/O





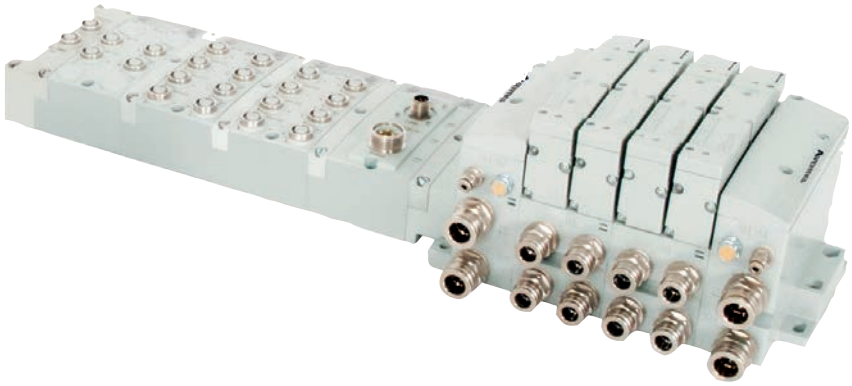


Table of Contents

G3 Electronics and I/O

G3 Fieldbus - Electronics Made Easy!

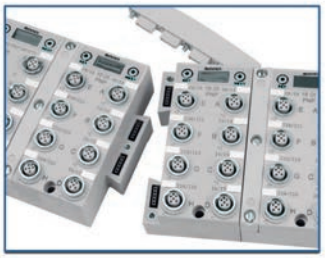
Innovative Graphic Display is used for easy commissioning, visual status & diagnostics.

Commissioning Capabilities

- Set network address (including IP & Subnet mask for Ethernet)
- Set baud rate
- Set auto or manual I/O sizes
- Set fault/idle output states
- Set brightness
- Set factory defaults
- Visual diagnostics
- Shorted and open load detection
- Shorted sensor/cable detection
- Low & missing power detection
- Missing module detection
- Self-test activation
- Log of network errors
- Distribution errors

Graphic Display for Configuration & Diagnostics

Auto Recovery Module


Highly Distributable


Easy, Robust Connections

G3 Fieldbus Communications Electronics

Why use Aventics Fieldbus communication electronics?

Modular Reality...

No internal wiring simplifies assembly

- SPEEDCON® M12 connector technology allows for fast and efficient ½ turn I/O connector attachment
- Power connector allows output power to be removed while inputs and communication are left active
- IP65 protection
- Up to 1.200 Input/1.200 Output capability with one communication node!
- Up to 128 valve solenoids per manifold, up to 17 manifolds per communication node!
- One node supports 16 I/O modules – Analog I/O, Digital I/O (NPN & PNP) and Specialty
- Integrated web server with EtherCAT® , EtherNet/IP™ DLR, Ethernet POWERLINK®, Modbus® TCP/IP, and PROFINET™
- Innovative clip design allows easy module removal/replacement without dismantling manifold
- Auto Recovery Module (ARM) protects configuration information during a critical failure. Allows configuration information to be saved and reloaded to replacement module automatically

Supported Protocols

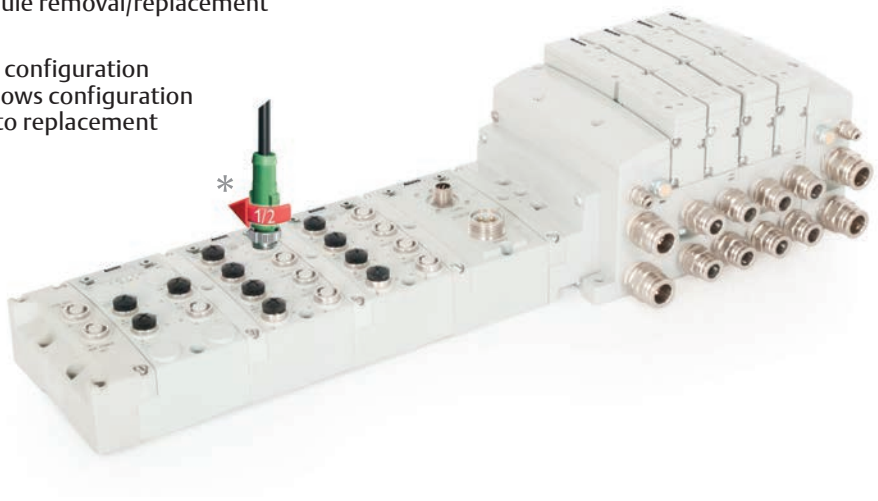
- CANopen®(1)
- CC-Link IE Field™(1)
- DeviceNet™
- DeviceNet™ w/ QuickConnect™
- EtherCAT®(1)
- EtherNet/IP™ DLR(1) w/ QuickConnect™
- Ethernet POWERLINK®(1)
- Modbus® TCP/IP(1)
- PROFIBUS™ DP(1)
- PROFINET™(1)

(1) 32+ capable.

CE cULus LISTED

* Aventics I/O with SPEEDCON® Technology

- 1/2 turn for faster I/O connections
- Backwards compatible with standard M12 cables/connectors
- Meets the same IP/NEMA standards as M12/Micro cables/connectors
- Same cost as standard M12/Micro cables/connectors



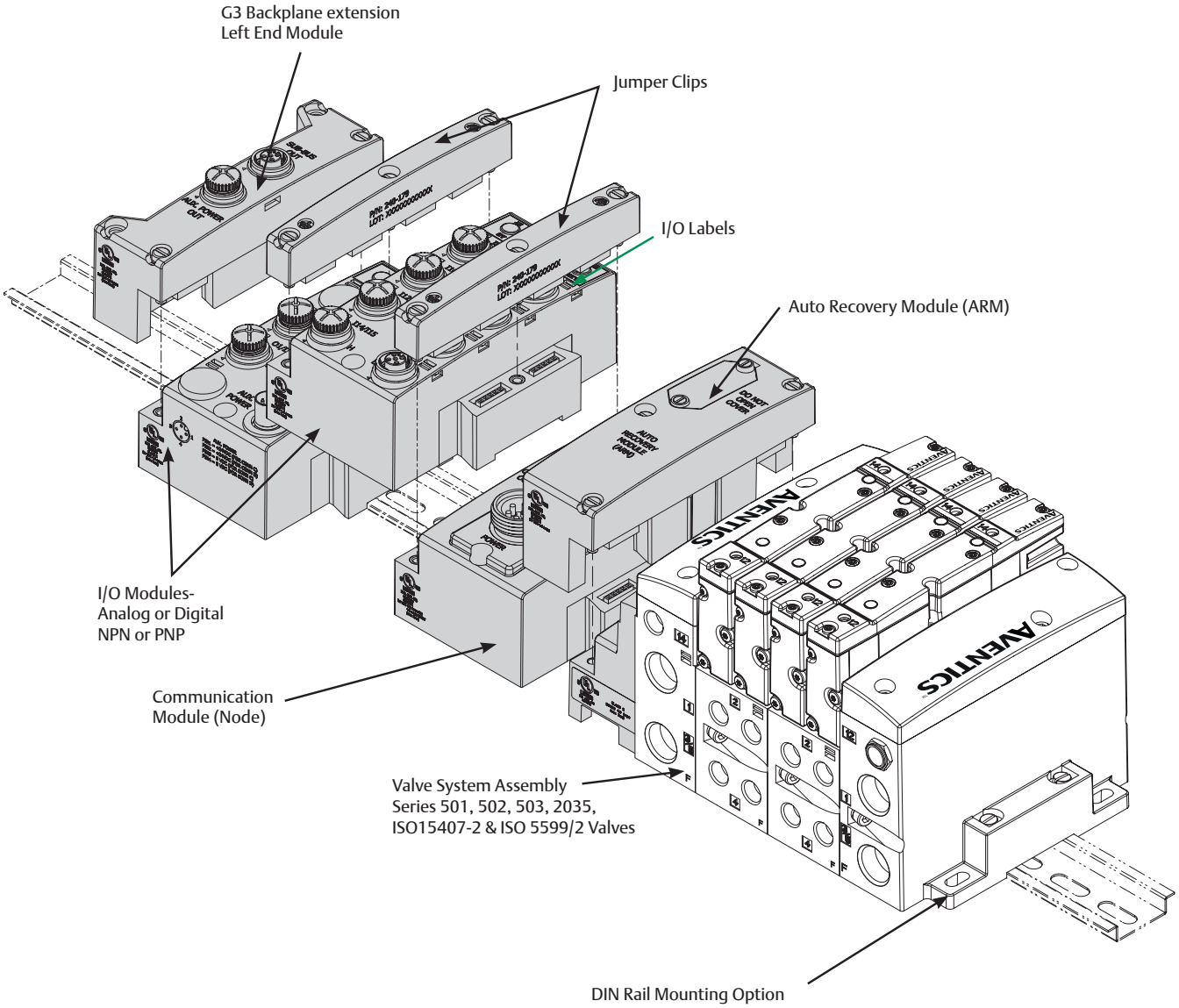
01834GB-2020/R01

G3 Electronics Modularity

Discrete I/O

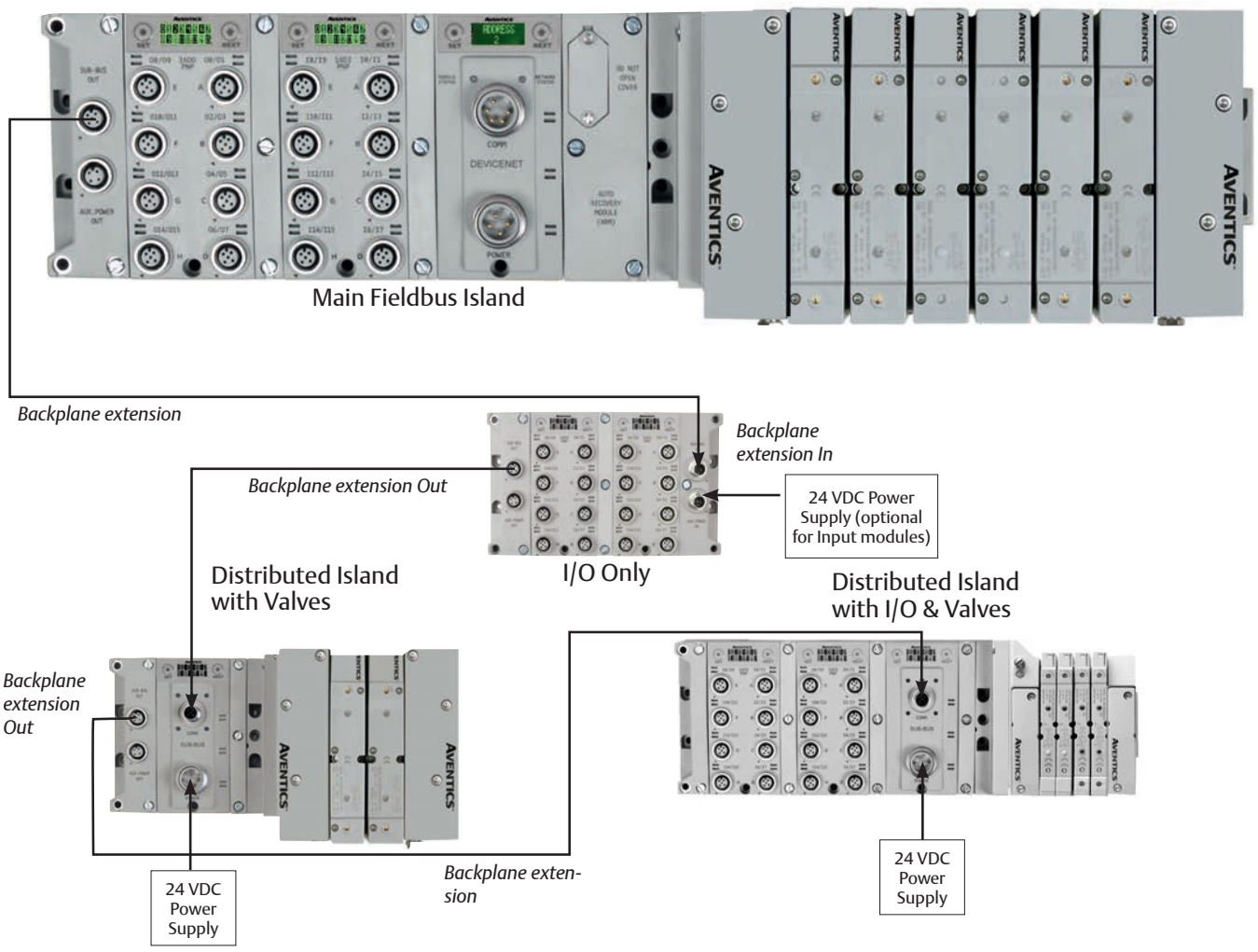
The Series G3 product line is a completely modular system. All of the G3 electronic modules plug together, via mechanical clips, allowing easy assembly and field changes. This makes the system highly distributable. Additional flexibility is incorporated because the same modules can be used in either centralized or distributed applications.

The G3 electronics interfaces with the series 501, 502 and 503 but also with the highly modular Aventics generation Series 2000, Series ISO 5599/2 and ISO 15407-2 valve lines to further enhance the modularity and flexibility of the entire system solution.



G3 Platform Distribution Options

Easy, Cost Effective Solutions for Digital I/O and Valve Automation using G3 Electronics



Distribution Benefits

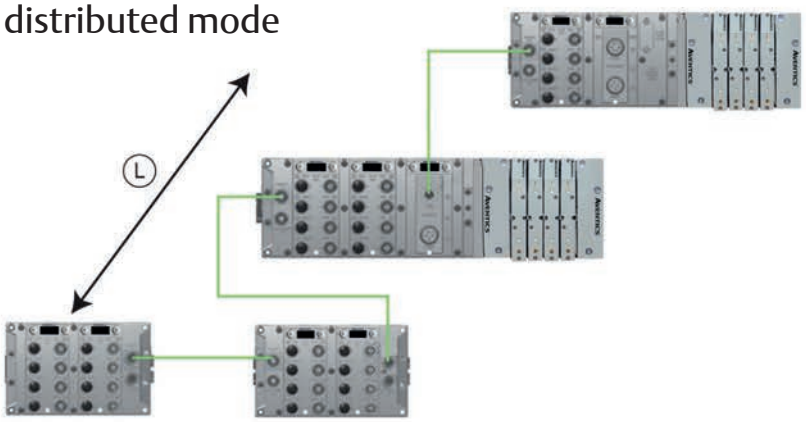
- Up to 1.200 Input / 1.200 Output capability with one communication node!
- 16 manifolds per communication node, in line or in star
- Up to 128 valve solenoids per manifold, up to 17 manifolds per communication node!
- One node supports 16 distributed modules max. (Manifold, Analog I/O, Digital I/O (NPN & PNP)
- Unique distribution system allows system efficiency by allowing the same modules to be used in either centralized or distributed applications

G3 Platform Distribution Options

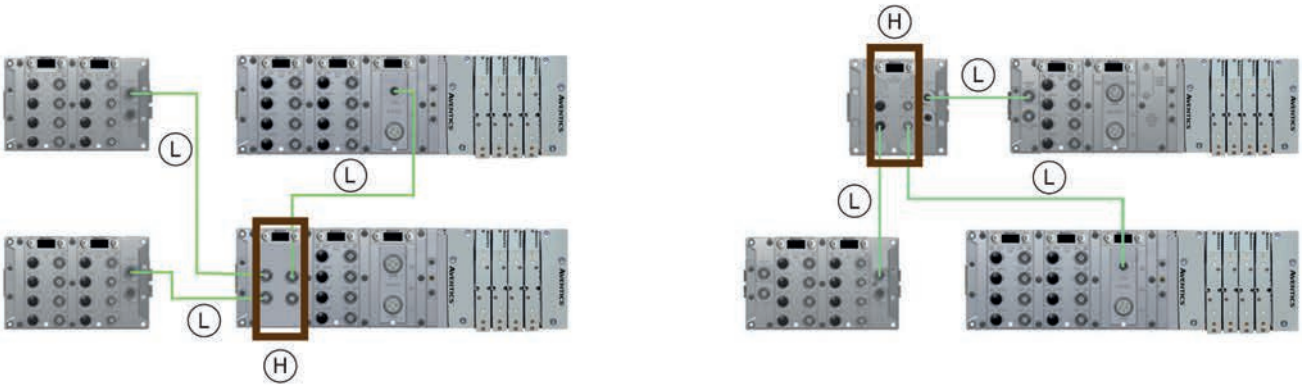
Easy, Cost Effective Solutions for Digital I/O and Valve Automation using G3 Electronics

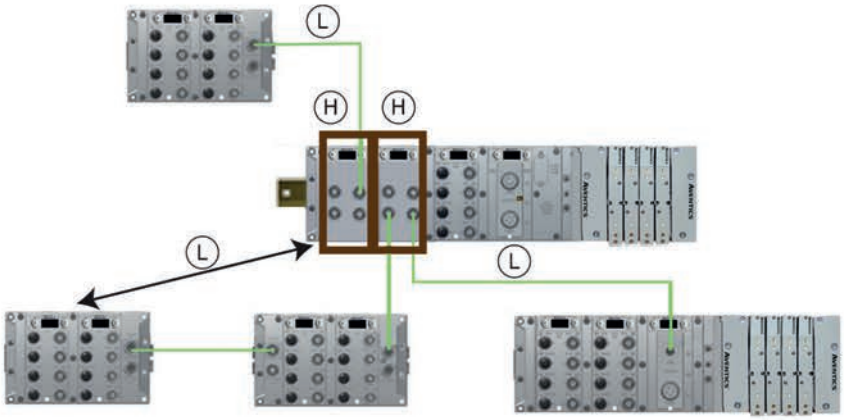
Integrated Valve systems

In line distributed mode



Star distributed mode





(L) Max. 30 m
(H) Hub

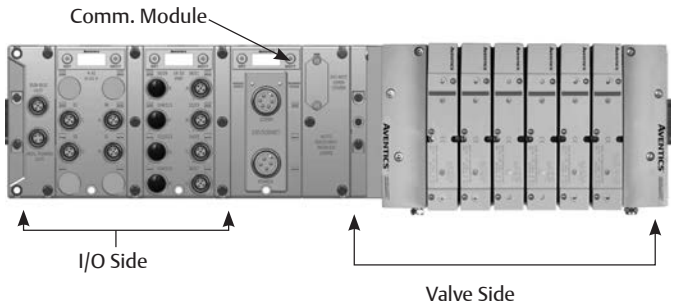
G3 Platform Distribution Options

The G3 platform is flexible to the point that there are a virtually infinite number of I/O distribution options using the few basic G3 modules. The following basic rules should be followed in the configuration of your control architecture.

Valve Side

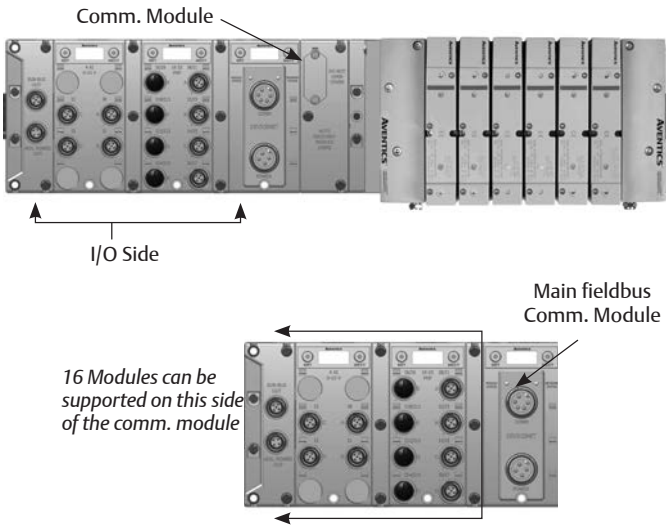
- Up to a total of 128 (Series 501)/80 (Series 502/503) valve solenoids can be driven in a manifold assembly integrated into the Main Fieldbus Island. This can be any number of single or double solenoid valves with a total number of solenoids not to exceed 128 (Series 501)/80 (Series 502/503).

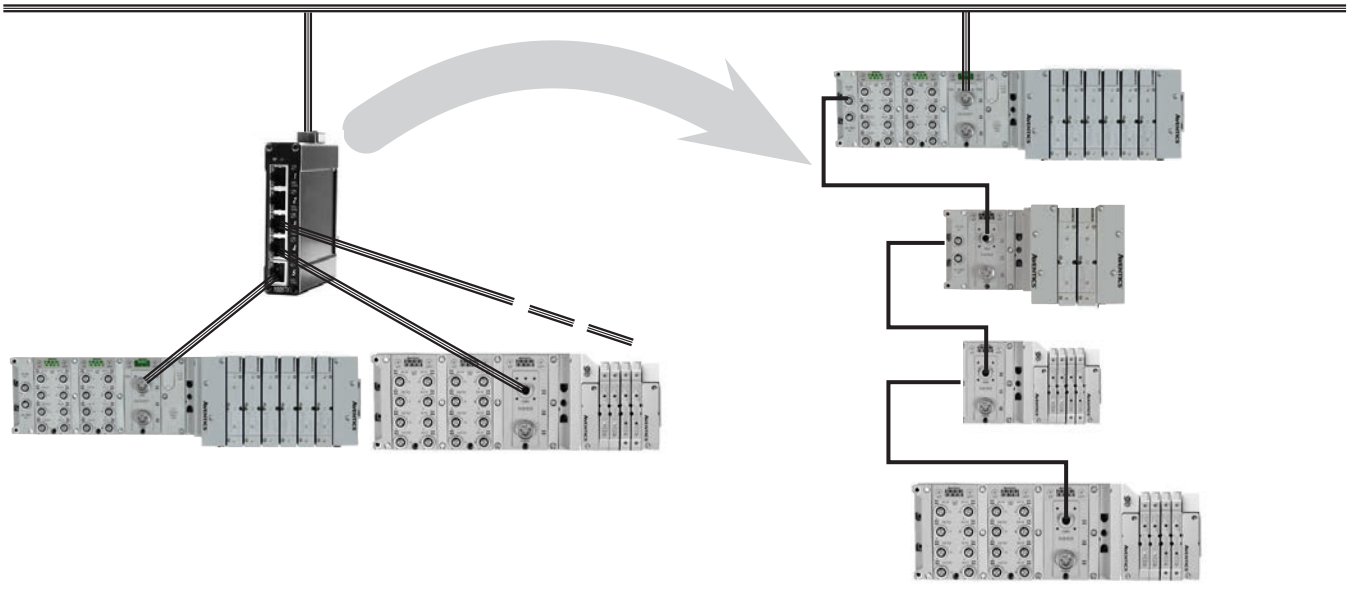
Typical Main Fieldbus Island



I/O Side Distribution

- A total of 16 modules can be integrated into the network and controlled by the main fieldbus communication module (Node)
- Modules include analog and digital I/O modules providing addressing capacity for up to 1200 Inputs/1200 Outputs per node
- Unique distribution system allows system efficiency by allowing the same modules to be used in either centralized or distributed applications
- Distribution options include Inputs only, Outputs only, I/O only, valves with Inputs, valves with Outputs and valves with I/O
- Configuration can include up to 16 of the following modules:
  - Digital I/O modules
  - Sub-bus valve modules
  - Analog I/O modules





AVENTICS™ G3 Electronics and I/O

DeviceNet™

DeviceNet™ is an open bus fieldbus communication system developed by Allen-Bradley based on Controller Area Network (CAN) technology. The governing body for DeviceNet™ is the Open DeviceNet™ Vendors Association (ODVA). The ODVA controls the DeviceNet™ specification and oversees product conformance testing.

Aventics' G3 nodes for DeviceNet™ have an integrated graphic display and are capable of addressing combinations of up to 1200 outputs and 1200 inputs.

They have been tested and approved for conformance by the ODVA.

More information about DeviceNet™ and the ODVA can be obtained from the following website:
www.odva.org

Description	Replacement Part Number
DeviceNet™ communications module (node)	**240-180**

DeviceNet™

COMM MALE

Pin 1 = Shield
Pin 2 = V+ (24 V DC)
Pin 3 = V- (Ground)
Pin 4 = CAN_H
Pin 5 = CAN_L

POWER MALE

Pin 1 = +24 V DC (valves & out)
Pin 2 = +24 V DC (node & in)
Pin 3 = 0 V DC (node & in)
Pin 4 = 0 V DC (valves & out)

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 V DC +/- 10%	0.0404 A
BUS Power	11-25 V DC	0.025 A
Valves & Discrete I/O	24 V DC +/- 10%	8 A Maximum
Power Connector	Single key 4 pin 7/8" MINI type (male)	
Communication Connector	Single key 5 pin 7/8" MINI type (male)	
LEDs	Module Status and Network Status	

Operating Data	
Temperature Range (ambient)	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault/Idle Actions, DeviceNet QuickConnect, Diagnostics and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure.
Maximum Valve-Solenoid Outputs	32 for all series
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	125K Baud, 250K Baud, 500K Baud, with Auto-Baud detection
Supported Connection Type	Polled, Cyclic, Change of State (COS) and combination Message Capability
Communication Connector	Single key 5 pin 7/8" MINI type (male)
Diagnostics	Power, short, open load conditions and module health are monitored
Special Features	Supports Auto-Device Replacement (ADR) and fail-safe device settings

Weight	
DeviceNet™ Communications Module	252 g

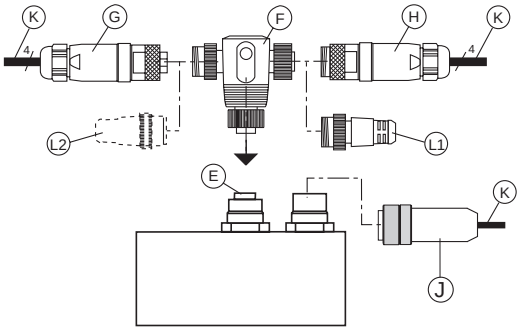
DeviceNet™ bus connection

the front panel of the communication module for DeviceNet™ is equipped with a 5 pin 7/8 - 16 UN male socket (E).

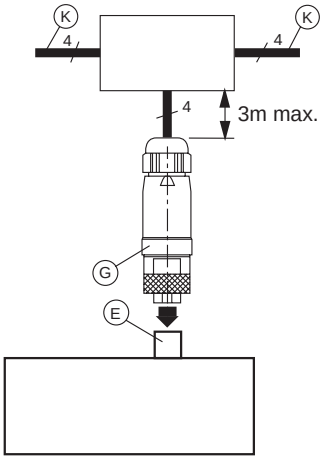
The bus can be connected in the two following ways:
- directly to the module with a T-connector;
- with a straight connector, cable (max. length: 3 m) and a DeviceNet distributor box.

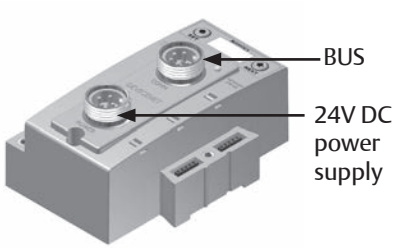
The modules on either side of the system must be provided with terminating resistors (L1 or L2).

■ Wiring with T-connector



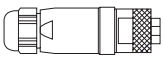
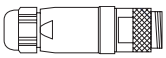
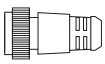
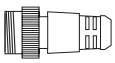
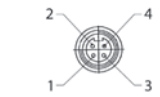
■ Connection with DeviceNet™ distributor box (X)





Accessories for DeviceNet™

The modules on either side of the system must be provided with terminating resistors (H)

	Accessory	Description	Catalog number
G		5 pin straight 7/8-16 UN female connector	**88161930**
H		5 pin straight 7/8-16 UN male connector	**88161931**
F		T-connector 7/8-16 UN, 5 male / female / female pins	**88161932**
L1		Terminating resistor female plug 120 ohms	**88161933**
L2		Terminating resistor male plug 120 ohms	**88161934**
J		4 pin straight female cable connector 7/8”	**230-1003**
		4 pin elbow female cable connector 7/8”	**230-1001**
		4 pin elbow female cable connector 7/8” with 9.15 m cable  1 = brown 2 = white 3 = blue 4 = black	**230-950**

(K) Cable to be ordered separately.

Modbus® TCP/IP

Ethernet used throughout the world to network millions of PC's has now evolved into a viable industrial network. Ethernet is an open architecture high-level communication network that meets the demands of today's industrial applications requiring high-speed (10/100 Mbit/s), high-throughput and flexibility.
Additionally, Ethernet technology can integrate an on-board web server, which can make the node readily accessible for configuration, testing and even retrieval of technical documentation.

Aventics' G3 nodes for Modbus® TCP/IP have an integrated graphic display and are capable of addressing combinations of up to 1200 outputs and 1200 inputs.

Description	Replacement Part Number
Modbus® TCP/IP communications module (node)	**240-292**

Modbus® TCP/IP

COMM  FEMALE

Pin 1 = TX+
Pin 2 = RX+
Pin 3 = TX-
Pin 4 = RX-

POWER  MALE

Pin 1 = +24 V DC (valves & out)
Pin 2 = +24 V DC (node & in)
Pin 3 = 0 V DC (node & in)
Pin 4 = 0 V DC (valves & out)

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 V DC +/- 10%	0.0657 A
Valves & Discrete I/O	24 V DC +/- 10%	8 A maximum
Power Connector	Single key 4 pin 7/8" MINI type (male)	
Communication Connector	D-coded 4 pin M12 type (female)	
LEDs	Module Status, Network Status and Activity/Link	

Operating Data	
Temperature Range (ambient)	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting IP Address, Subnet mask, Fault/Idle Actions, DHCP / BootP and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure
Maximum Valve-Solenoid Outputs	128 for Series 501, 80 for Series 502/503 and 32 for all other series
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Communication Connector	D-coded 4 pin M12 type (female)
Diagnostics	Power, short, open load conditions and module health are monitored
Special Features	Integrated web server and fail-safe device settings, HTTP, FTP, and UNICAST (for EtherNet/IP™)

Weight	
Modbus® TCP/IP Communications Module	255 g

Accessories for Modbus® TCP/IP

Accessory	Description		Catalog number
	M12 Straight 4 Pin Male D-Coded to Male RJ45 network Cable - Shielded supply 24 V DC	5m	QA0405MK0VA04000
		10m	QA0410MK0VA04000
	M12 Straight 4 Pin Male D-Coded Field Wireable network Connector PG 9 Cable Gland – Screw Terminal		QA04F20000000000
	4 pin straight female cable network connector 7/8" supply 24 V DC		230-1003
	4 pin elbow female cable network connector 7/8" supply 24 V DC		230-1001
	4 pin elbow female cable network connector 7/8" with 9.15 m cable supply 24 V DC	 1 = brown 2 = white 3 = blue 4 = black	230-950

PROFIBUS™ DP

PROFIBUS™ DP is a vendor-independent, open fieldbus protocol designed for communication between automation control systems and distributed I/O at the device level.

Aventics' G3 nodes for PROFIBUS™ DP have an integrated graphic display and are capable of addressing combinations of up to 1200 outputs and 1200 inputs.

The G3 PROFIBUS™ DP nodes have been designed and tested to conform to the PROFIBUS™ standard EN50170. Certification has been done by the PROFIBUS™ Interface Center (PIC) according to the guidelines determined by the PROFIBUS™ Trade Organization (PTO). The certification process ensures interoperability for all PROFIBUS™ devices.

More information regarding PROFIBUS™ can be obtained from the following website: www.profibus.com

Description	Replacement Part Number
PROFIBUS™ DP communications module (node)	**240-239**

PROFIBUS™ DP

COMM

MALE FEMALE

Pin 1 = +5 V DC
Pin 2 = Data Line A
Pin 3 = Common 0 VDC
Pin 4 = Data Line B
Pin 5 = Earth Ground ⏚

POWER

MALE

Pin 1 = 0 V DC (valves & outputs)
Pin 2 = 0 V DC (node & inputs)
Pin 3 = Earth Ground ⏚
Pin 4 = +24 V DC (node & inputs)
Pin 5 = +24V DC (valves & outputs)

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 V DC +/- 10%	0.0623 A
Valves & Discrete I/O	24 V DC +/- 10%	8 A maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Single reverse key (B-Coded) 5 pin M12 type (1 male and 1 female)	
LEDs	Module Status and Network Status	

Operating Data	
Temperature Range (ambient)	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault/Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure
Maximum Valve-Solenoid Outputs	128 for Series 501, 80 for Series 502/503 and 32 for all other series
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	125K Baud, 250K Baud, 500K Baud, with Auto-Baud detection
Communication Connector	Single reverse key (B-Coded) 5 pin M12 type (1 male and 1 female)
Diagnostics	Power, short, open load conditions and module health are monitored
Special Features	Supports Auto-Device Replacement (ADR) and fail-safe device settings

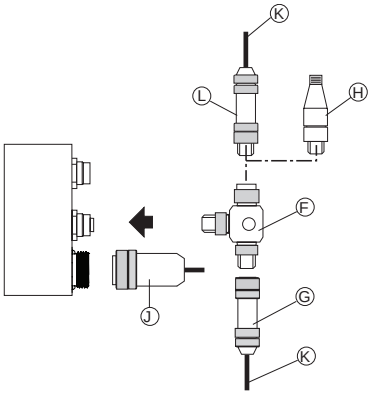
Weight	
PROFIBUS™ DP Communications Module	227 g

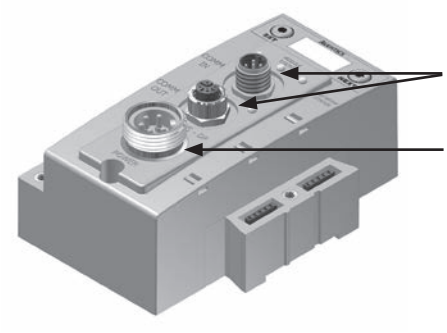
PROFIBUS™ DP bus connection

The front panel of the communication module for Profibus-DP® is equipped with:
- a 5 pin male 7/8" socket for power supply
- a 5 pin male M12-B socket or 5 pin female M12-A socket for the bus cable (with a T-connector on integrated M12 COM-IN/COM-OUT connector)

Fieldbus connection

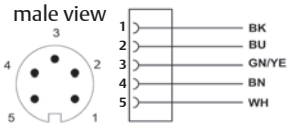
Wiring with T-connector





Accessories for PROFIBUS™ DP

The modules on either side of the system must be provided with terminating resistors (H)

	Accessory	Description	Catalog number
F		T-connector M12-B, 5 female / male / male pins (Profibus 12Mb max)	**88100712**
G		M12-B connector , 5 female pins - for cable dia. 6 - 8 mm (Profibus 12Mb max)	**88100713**
L		M12-B connector , 5 male pins - for cable dia. 6 - 8 mm (Profibus 12Mb max)	**88100714**
H		Terminating resistor M12-B - male plug	**88100716**
J		5 pin straight female cable connector 7/8"	**MC05F90000000000**
		5 pin elbow female cable connector 7/8"	**MD05F20000000000**
		5 pin elbow female cable connector 7/8" with 10 m cable 	**MD0510MAG0000000**
		Dust cover - M12 female	**88157773**

(K) Cable to be ordered separately.

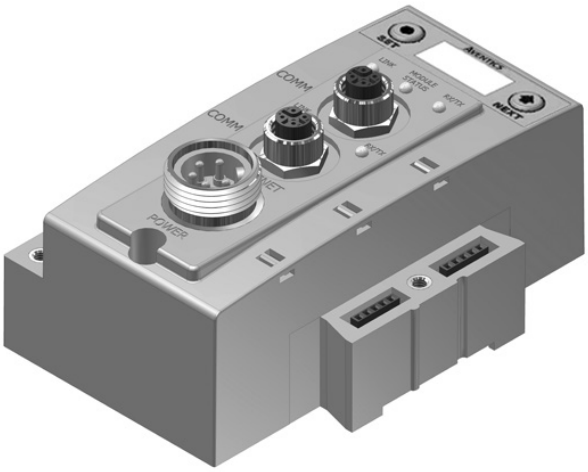
PROFINET™

PROFINET™ is the innovative open standard for Industrial Ethernet, development by Siemens and the PROFIBUS® User Organization (PNO). PROFINET™ complies to IEC 61158 and IEC 61784 standards. PROFINET™ products are certified by the PNO user organization, guaranteeing worldwide compatibility.

Aventics' G3 nodes for PROFINET™ IO (PROFINET™ RT) have an integrated graphic display and are capable of addressing combinations of up to 1200 outputs and 1200 inputs.

PROFINET™ is based on Ethernet and uses TCP/IP and IT standards and complements them with specific protocols and mechanisms to achieve a good Real Time performance.

More information regarding PROFINET™ can be obtained from the following website: www.profinet.com



Description	Replacement Part Number
PROFINET® communications module (node)	**240-240**

PROFINET COMM

FEMALE

Pin 1 = TD+
Pin 2 = RD+
Pin 3 = TD-
Pin 4 = RD-

POWER

MALE

Pin 1 = 0 V DC (valves & outputs)
Pin 2 = 0 V DC (node & inputs)
Pin 3 = Earth Ground ⏚
Pin 4 = +24 V DC (node & inputs)
Pin 5 = +24V DC (valves & outputs)

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 V DC +/- 10%	0.0903 A
Valves & Discrete I/O	24 V DC +/- 10%	8 A maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LEDs	Module Status, Network Status and Activity/Link	

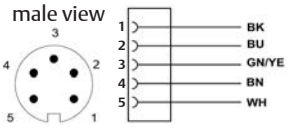
Operating Data	
Temperature Range (ambient)	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting IP Address, Subnet Mask, Fault/Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure.
Maximum Valve-Solenoid Outputs	128 for Series 501, 80 for Series 502/503 and 32 for all other series
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

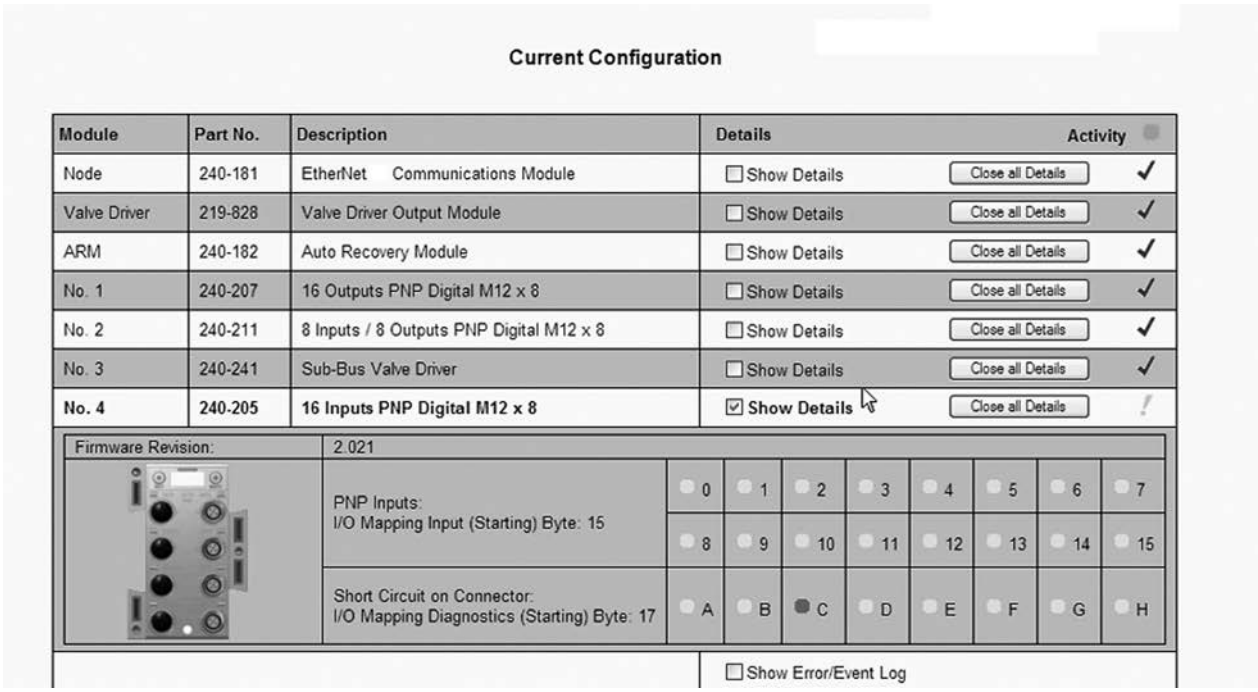
Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Communication Connector	Two D-coded 4 pin M12 type (2-Female)
Diagnostics	Power, short, open load conditions and module health and configuration are monitored
Special Features	Integrated web server, Integrated 2 port switch and fail-safe device settings, and FSU

Weight	
PROFINET™ Communications Module	227 g

Accessories for PROFINET™

Accessory	Description		Catalog number
	M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable - Shielded supply 24 V DC	5m	QA0405MK0VA04000
		10m	QA0410MK0VA04000
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland – Screw Terminal		QA04F20000000000
	5 pin straight female cable connector 7/8", supply 24 V DC		MC05F90000000000
	5 pin elbow female cable connector 7/8", supply 24 V DC		MD05F20000000000
	5 pin elbow female cable connector 7/8" with 10 m cable Euro colour code supply 24 V DC	male view 	MD0510MAG0000000

Server web page



Current Configuration

Module	Part No.	Description	Details	Activity
Node	240-181	EtherNet Communications Module	☐ Show Details — Close all Details	✓
Valve Driver	219-828	Valve Driver Output Module	☐ Show Details — Close all Details	✓
ARM	240-182	Auto Recovery Module	☐ Show Details — Close all Details	✓
No. 1	240-207	16 Outputs PNP Digital M12 x 8	☐ Show Details — Close all Details	✓
No. 2	240-211	8 Inputs / 8 Outputs PNP Digital M12 x 8	☐ Show Details — Close all Details	✓
No. 3	240-241	Sub-Bus Valve Driver	☐ Show Details — Close all Details	✓
No. 4	**240-205**	**16 Inputs PNP Digital M12 x 8**	☑ **Show Details** — Close all Details	!

Firmware Revision:	2.021							
	PNP Inputs: I/O Mapping Input (Starting) Byte: 15	○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7
		○ 8	○ 9	○ 10	○ 11	○ 12	○ 13	○ 14	○ 15
	Short Circuit on Connector: I/O Mapping Diagnostics (Starting) Byte: 17	○ A	○ B	● C	○ D	○ E	○ F	○ G	○ H

☐ Show Error/Event Log

Ethernet POWERLINK®

Ethernet POWERLINK® is a open fieldbus protocol designed by B&R for communication between automation control systems and distributed I/O at the device level.

Aventics' G3 Ethernet POWERLINK® nodes have an integrated graphic display and are capable of addressing combinations of up to 1200 outputs and 1200 inputs.

The G3 Ethernet POWERLINK® nodes have been designed and tested to conform to the Ethernet POWERLINK® specifications available at EPSG group (Ethernet Powerlink® Standardization Group). The certification process ensures interoperability for all Ethernet POWERLINK® devices and compatibility with B&R systems.

More information regarding Ethernet POWERLINK® can be obtained from the following website:
www.ethernet-powerlink.org

Description	Replacement Part Number
Ethernet POWERLINK® communications module (node)	**240-309**

Ethernet POWERLINK®
COMM

FEMALE

Pin 1 = TD+
Pin 2 = RD+
Pin 3 = TD-
Pin 4 = RD-

POWER

MALE

Pin 1 = 0 V DC (valves & outputs)
Pin 2 = 0 V DC (node & inputs)
Pin 3 = Earth Ground ⏚
Pin 4 = +24 V DC (node & inputs)
Pin 5 = +24V DC (valves & outputs)

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 V DC +/- 10%	0.0955 A
Valves & Discrete I/O	24 V DC +/- 10%	8 A maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LEDs	Module Status, Network Status and Activity/Link	

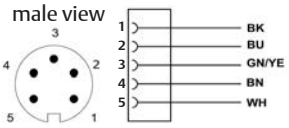
Operating Data	
Temperature Range (ambient)	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault/Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure
Maximum Valve-Solenoid Outputs	128 for Series 501, 80 for Series 502/503 and 32 for all other series
Maximum Addressable I/O Points	Various combinations of 1200 outputs and 1200 inputs

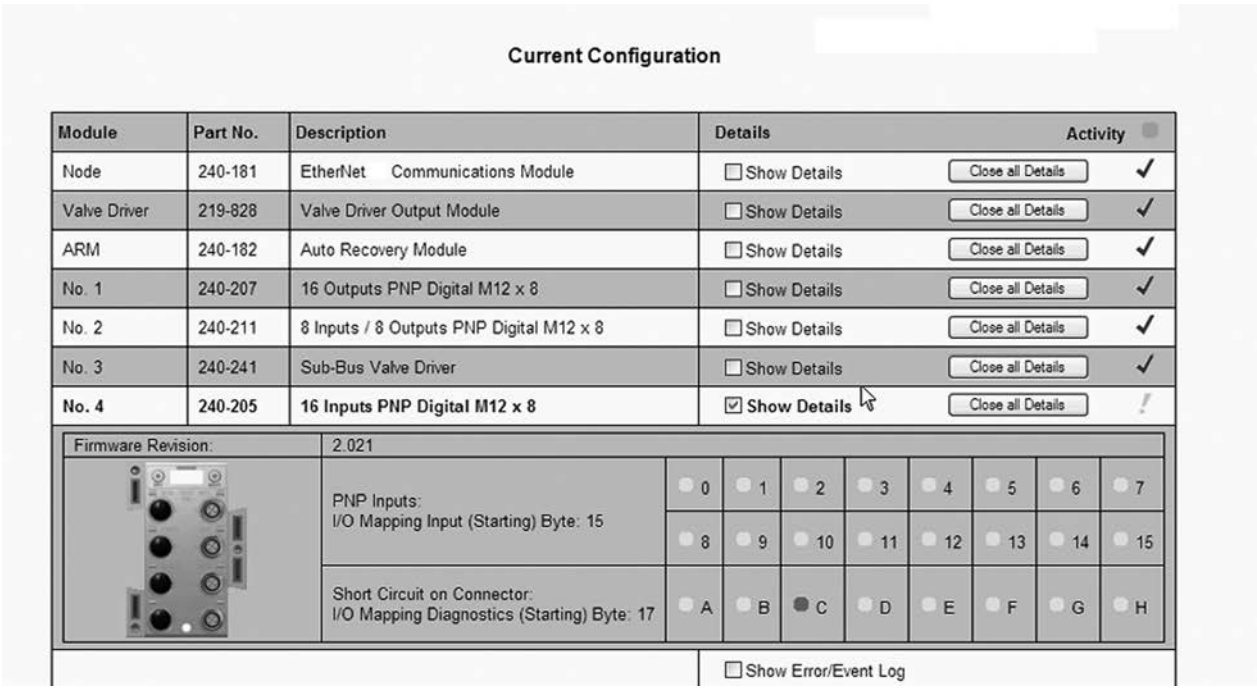
Network Data	
Supported Baud Rates	10 Mbit/100 Mbit
Communication Connector	Two D-coded 4 pin M12 type (female)
Diagnostics	Power, short, open load conditions and module health are monitored
Special Features	Integrated web server, Integrated 2 port switch and fail-safe device settings

Weight	
Ethernet POWERLINK® Communications Module	227 g

Accessories for Ethernet POWERLINK®

Accessory	Description		Catalog number
	M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable - Shielded	5m	QA0405MK0VA04000
		10m	QA0410MK0VA04000
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland – Screw Terminal		QA04F20000000000
	5 pin straight female cable connector 7/8”		MC05F90000000000
	5 pin elbow female cable connector 7/8”		MD05F20000000000
	5 pin elbow female cable connector 7/8” with 10 m cable Euro colour code		MD0510MAG0000000

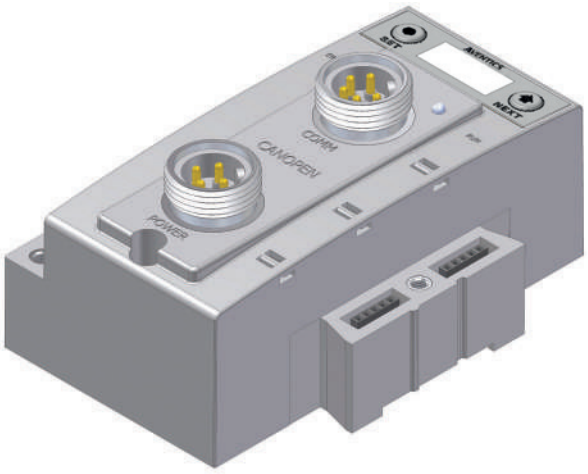
Server web page



CANopen®

CANopen® is an open protocol based on Controller Area Network (CAN). It was designed for motion oriented machine control networks but has migrated to various industrial applications. CAN in Automation (CIA) is the international users' and manufacturers' organization that develops and supports CAN-based protocols. Aventics' G3 CANopen® nodes have an integrated graphic display and are capable of addressing combinations of up to 256 outputs and 256 inputs.

More information regarding this organization can be found at: www.can-cia.org



Description	Replacement Part Number
CANopen® communications module (node)	**240-291**

CANopen®

COMM — MALE

Pin 1 = Shield
Pin 2 = V+ (24 V DC)
Pin 3 = V- (Ground)
Pin 4 = CAN_H
Pin 5 = CAN_L

POWER — MALE

Pin 1 = +24 V DC (valves & out)
Pin 2 = +24 V DC (node & in)
Pin 3 = 0 V DC (node & in)
Pin 4 = 0 V DC (valves & out)

Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 V DC +/- 10%	0.0404 A
BUS Power	11-25 V DC	0.025 A
Valves & Discrete I/O	24 V DC +/- 10%	8 A maximum
Power Connector	Single key 4 pin 7/8" MINI type (male)	
Communication Connector	Single key 5 pin 7/8" MINI type (male)	
LEDs	Module Status and Network Status	

Operating Data	
Temperature Range (ambient)	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture Protection	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault/Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure.
Maximum Valve-Solenoid Outputs	32 for all series
Maximum Addressable I/O Points	Various combinations of 256 outputs and 256 inputs

Network Data	
Supported Baud Rates	125K Baud, 250K Baud, 500K Baud, 1M Baud
Communication Connector	Single key 5 pin 7/8" MINI type (male)
Diagnostics	Power, short, open load conditions and module health are monitored and fail-safe device settings

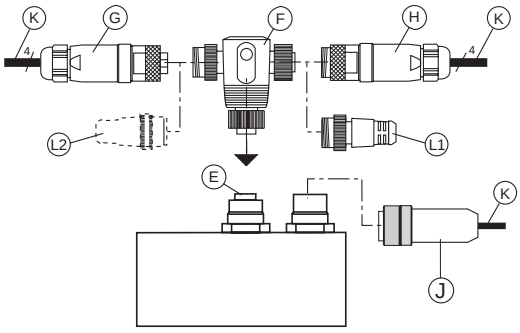
Weight	
CANopen® Communications Module	252 g

CANopen® bus connection

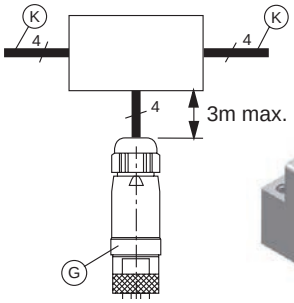
The front panel of the communication module for CANopen® is equipped with:
- a 4 pin male 7/8" socket for power supply
- a 5 pin male 7/8" socket for the bus cable (E)

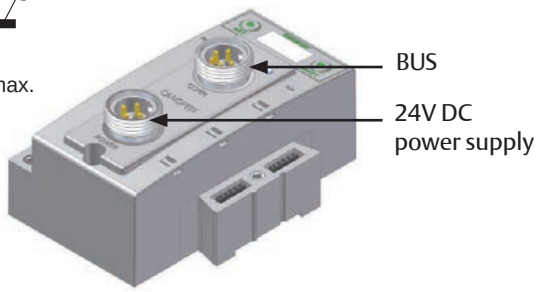
The bus can be connected in the two following ways:
• directly to the module with a T-connector,
• with a straight connector, cable (max. length: 3 m) and a DeviceNet distributor box.
The modules on either side of the system must be provided with terminating resistors (L1 or L2).

■ Wiring with T-connector



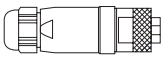
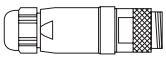
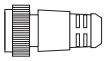
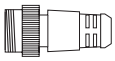
■ Connection with distributor box





Accessories for CANopen®

The modules on either side of the system must be provided with terminating resistors (H)

	Accessory	Description	Catalog number
G		5 pin straight 7/8-16 UN female network connector	**88161930**
H		5 pin straight 7/8-16 UN male network connector	**88161931**
F		T-connector 7/8-16 UN, 5 male / female / female pins	**88161932**
L1		Terminating resistor female plug 120 ohms	**88161933**
L2		Terminating resistor male plug 120 ohms	**88161934**
J		4 pin straight female cable connector 7/8", supply 24 V DC	**230-1003**
		4 pin elbow female cable connector 7/8", supply 24 V DC	**230-1001**
		4 pin elbow female cable connector 7/8" with 9.15 m cable, supply 24 V DC  1 = brown 2 = white 3 = blue 4 = black	**230-950**

(K) Cable to be ordered separately.

EtherNet/IP™ DLR

EtherNet/IP™ used throughout the world to network millions of PCs has now evolved into a viable industry network. EtherNet/IP™ is an open architecture high-level communication network that meets the demands of today's industrial applications requiring high-speed (10/100 Mbit/s), high-throughput and flexibility. Additionally, EtherNet/IP™ technology can integrate an on-board web server, which can make the node readily accessible for configuration, testing and even retrieval of technical documentation.

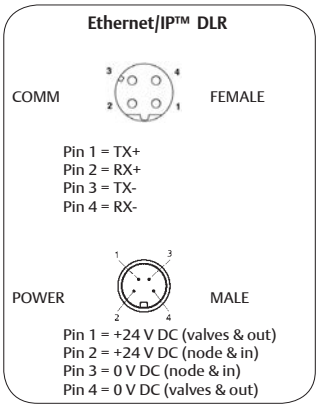
Aventics' G3 EtherNet/IP™ DLR (Device Level Ring) node with integrated display has an embedded switch which allows the unit to be used in simplified networks with linear topology configurations (daisy chain). This technology alleviates the need for an external Ethernet switch device in a single subnet configuration. Additionally, the DLR compatibility allows the node to be used in a fault tolerant "ring" network, when using appropriate EtherNet/IP™ DLR scanners. DLR configuration allows communication recovery from a single point failure on the network ring (e.g. failed network connection or cable).

Aventics' G3 EtherNet/IP™ nodes are capable of addressing combinations of up to 1200 outputs and 1200 inputs.

The G3 EtherNet/IP™ nodes have been tested and approved for conformance by the ODVA.

More information about Ethernet/IP™ and the ODVA can be obtained from the following website: www.odva.org.

Description	Replacement Part Number
EtherNet/IP™ DLR communications module (node)	**240-325**



Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 V DC +/- 10%	0.0953 A
Valves and Discrete I/O	24 V DC +/- 10%	8 A Maximum
Power Connector	Single key 4 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LEDs	Module Status, Network Status and Activity / Link	

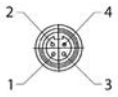
Operating Data	
Temperature Range	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting IP address, Subnet Mask, Fault/Idle Actions, and all other system settings
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system settings in the event of total or partial system failure
Maximum Valve Solenoid Outputs	128 for Series 501, 80 for Series 502/503 and 32 for all other series
Maximum Sub-Bus I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Communication Connector	Two D-coded 4 pin M12 type (female)
Diagnostics	Power, short, open load conditions and module health and configuration are monitored
Special Features	Embedded two port switch, Device Level Ring (DLR) compatibility, Linear network topology, QuickConnect™ capability, fail-safe device settings, integrated web server, HTTP, TFTP, UNICAST

Weight	
EtherNet/IP™ DLR Communications module	227 g

Accessories for EtherNet/IT™ DLR

Accessory	Description		Catalog number
	M12 Straight 4 Pin Male D-Coded to Male RJ45 network Cable - Shielded	5m	QA0405MK0VA04000
		10m	QA0410MK0VA04000
	M12 Straight 4 Pin Male D-Coded Field Wireable network Connector PG 9 Cable Gland – Screw Terminal		QA04F20000000000
	4 pin straight female cable connector 7/8”, suply 24 V DC		230-1003
	4 pin elbow female cable connector 7/8”, suply 24 V DC		230-1001
	4 pin elbow female cable connector 7/8” with 9.15 m cable, suply 24 V DC	 1 = brown 2 = white 3 = blue 4 = black	230-950

EtherCAT®

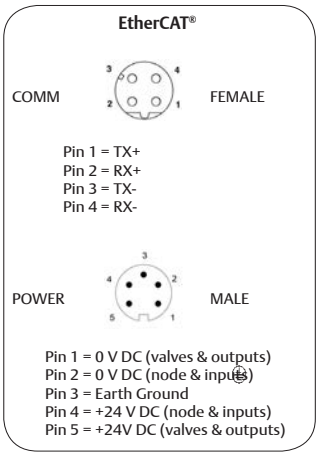
EtherCAT® is an open ethernet based fieldbus protocol developec by Beckhoff. EtherCAT® sets new standards for real-time performance and topology flexibility with short data update/cyc times and low communication jitter.

Aventics' G3 EtherCAT® node has an integrated graphic display for simplified commissioning and diagnostics. It is capable of addressing combinations of up to 1200 outputs and 1200 inputs.

The G3 nodes for EtherCAT® have been designed and tested to conform with EtherCAT® specifications set forth by the ETG.

More information regarding EtherCAT® can be obtained from the following website: www.ethercat.org.

Description	Replacement Part Number
EtherCAT® communications module	240-310



Technical Data

Electrical Data	Voltage	Current
Node Power at Max. Brightness	24 V DC +/- 10%	0.073 A
Valves and Discrete I/O	24 V DC +/- 10%	8 A Maximum
Power Connector	Single key 5 pin 7/8" MINI type (male)	
Communication Connector	Two D-coded 4 pin M12 type (female)	
LEDs	Module Status, Network Status and Activity /Link	

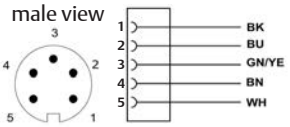
Operating Data	
Temperature Range	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity, non-condensing
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6
Moisture	IP65, IP67 (with appropriate assembly and termination)

Configuration Data	
Graphic Display	Display used for setting IP address, Subnet Mask, Fault/Idle Actions, and all other system settings
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system settings in the event of total or partial system failure
Maximum Valve Solenoid Outputs	128 for Series 501, 80 for Series 502/503 and 32 for all other series
Maximum Sub-Bus I/O Points	Various combinations of 1200 outputs and 1200 inputs

Network Data	
Supported Baud Rates	10 Mbit / 100 Mbit
Communication Connector	Two D-coded 4 pin M12 type (female)
Diagnostics	Power, short, open load conditions and module health and configuration are monitored.
Special Features	Integrated web server, fail-safe device settings

Weight	
EtherCAT® Communications module	227 g

Accessories for EtherCAT®

Accessory	Description		Catalog number
	M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable - Shielded supply 24 V DC	5m	QA0405MK0VA04000
		10m	QA0410MK0VA04000
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland – Screw Terminal		QA04F20000000000
	5 pin straight female cable connector 7/8", supply 24 V DC		MC05F90000000000
	5 pin elbow female cable connector 7/8", supply 24 V DC		MD05F20000000000
	5 pin elbow female cable connector 7/8" with 10 m cable Euro colour code supply 24 V DC		MD0510MAG0000000

I/O Modules M12

with short circuit protection integrated

Digital I/O 5-pin M12 Modules

	Description	Part Number		
	Signal Type	PNP	NPN	NAMUR
Inputs	8 Inputs	**240-206**	**240-210**	-
	16 Inputs	**240-205**	**240-209**	-
	8 Inputs (**Ex ia**)	-	-	**240-320**
Outputs	8 Outputs PNP	**240-208**	-	-
	16 Outputs PNP	**240-207**	-	-
	8 Outputs PNP high current (1A)	**240-300**	-	-
Inputs & Outputs	8 Inputs & 8 Outputs	**240-211**	-	-

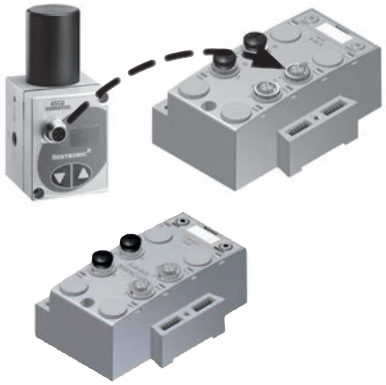
ia (Namur) input module

Analog I/O (16 bit resolution)

5-pin M12 Modules

	Description	Part Number	
	Signal Type	0-10 V DC	4-20 mA
Analog I/O	4 Inputs	**240-212**	**240-214**
	2 Inputs & 2 Outputs	**240-213**	**240-215**
Analog I/O for proportional valves (Sentronic^{PLUS})	2 Inputs & 2 Outputs	**240-307**	-
	4 Inputs & 4 Outputs	-	**240-363**

SUB-BUS HUB Module	Description	Part Number
HUB (M12)	4 Branches	**240-326**

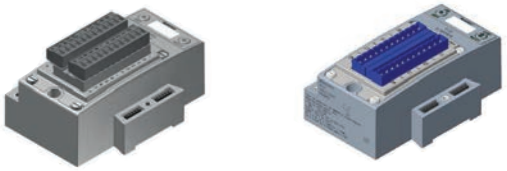


Digital Inputs -Terminal Strip Modules

with short circuit protection integrated

Digital Inputs -Terminal Strip Modules

	Description	Part Number		
	Signal Type	PNP	NPN	NAMUR
Inputs	16 Inputs	**240-203**	**240-204**	-
	8 Inputs	**204-316**	-	-
	8 Inputs (**Ex ia**)	-	-	**240-322**
Outputs	16 Outputs	**240-330**	-	-



Technical Data

Operating Data	**5-pin M12 Modules**	**Terminal Strip Modules**
Temperature Range (ambient)	-20°C to +50°C (Electronics only)	
Humidity	95% relative humidity, non-condensing	
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6	
Wire Range	-	12 to 24 AWG
Strip Length	-	7 mm
Tightening Torque	-	0.5 Nm
Ingress Protection	IP65, IP67 (with appropriate assembly and termination)	IP20

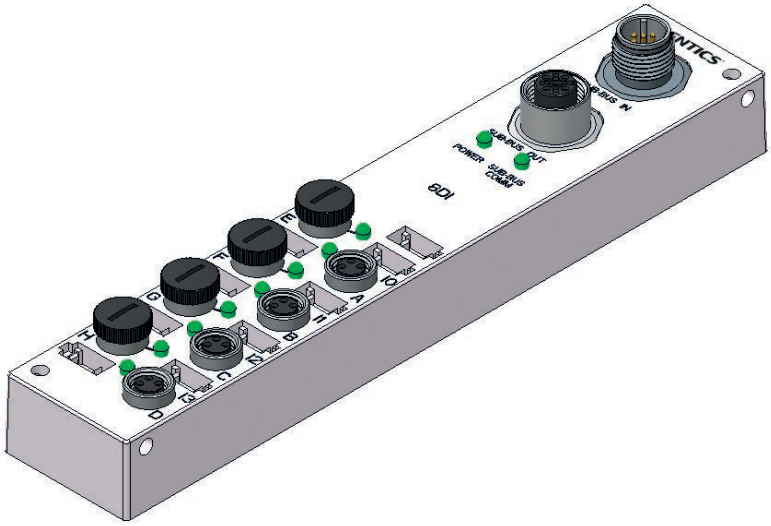
Weight	
Module Inputs - Analog	244 g
Module Inputs - Digital	274 g

Electrical data	**Namur Ex ia Module**
Voltage	24 VDC Module Supply Sensor Supply = 8.2 VDC Nominal
Input Type NC (Normally Closed)	NAMUR Signal Current (0) ≥ 2.1 mA Signal Current (1) ≤ 1.2 mA Short Circuit Monitoring < 100 Ω Open/Broken Wire Detection < 0.05 mA
Safety Parameter Output Maximums	Uo ≤ 9.6 V Io ≤ 13 mA Po ≤ 31 mW
Diagnostics	Open (broken wire) and Short Circuit
Certification	
Module Marking (ATEX)	Ⓔx II(1)GD [EX ia Ga] IIC [EX ia Da] IIC
I/O Connector	M12 4 Pin Female (Compatible with 5 Pin)
Weight	284 g
Operating Data	
Temperature Range	-20°C to +50°C (Electronics only)
Humidity	95% relative humidity; non-condensing
Ingress Protection	IP65 (with appropriate assembly and terminations)

I/O Modules

Digital I/O 3 Pin M8 Sub-bus Module

Description	Part Number
Inputs	
8 PNP Inputs	240-379



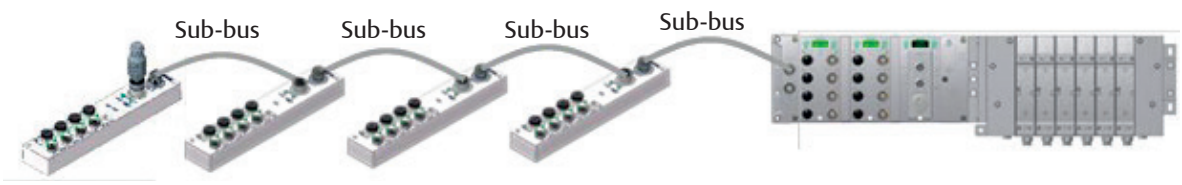
Technical Data

Operating Data	
Temperature Range (ambient)	-23°C to 50°C
Humidity	95% relative humidity, non-condensing
Vibration/Shock	IEC 60068-2-27, IEC60068-2-6
Ingress Protection	IP67 (with appropriate assembly and termination)
Connector	M8 3 Pin Female
Special Features	Linear topology and internally powered through Sub-bus connection
M12 Terminating Resistor (required on last M8 Module)	TA05TR0000000000

Weight	
Sub-bus Module	204 g

Dust Cover -
M8 Male 140-1152

M8 Input Module Distribution **G3 Fieldbus**



I/O Modules M12

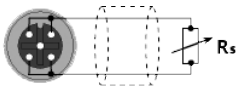
RTD temperature sensor input module
Analog I/O (16 bit resolution)
5-pin M12 Modules

	Description	Part Number
Analog I/O	4 Inputs	**240-311**

Operating Data	RTD temperature sensor input module	
Temperature range (ambient)	-20° to +50° C	
Humidity	95% relative humidity, non-condensing	
Vibration / Shock	IEC 60068-2-27, IEC 60068-2-6	
Sensor type of input	Pt100 - Pt200 - Pt500 - Pt1000	Ni100 - Ni120 - Ni500 - Ni1000
Sensor connection technology	2-3-4 wires (3 wires with compensation of connection cable)	
Temperature range of input signal	-200°C to +850°C	
Minimum temperature scale	25°C	
Moisture protection	IP65, IP67 with appropriate assembly and termination	
Absolute accuracy at +25°C	0.03% (linearity / repeatability / hysteresis / stability)	
Temperature error relatives to input range	+/- 0.05%	
ATEX certification	compatible to zone 2-22 and sensor installed in zone 2-22	
Standard	DIN/IEC 60751, IEC 751, DIN 43710	
Module weight	247 g	

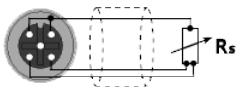
Wiring diagrams

2 Wire Sensor Type Low Accuracy



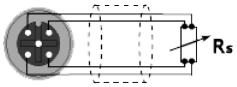
2 Wire Sensor Type
2 Wire Cable (Fig.1)

3 Wire Sensor Type Medium Accuracy

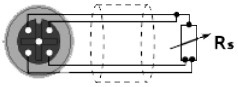


3 Wire Sensor Type
3 Wire Cable (Fig.2)

4 Wire Sensor Type High Accuracy



4 Wire Sensor Type
4 Wire Cable (Fig.4)



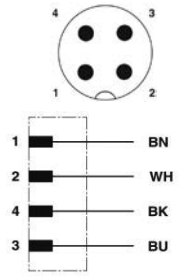
3 Wire Sensor Type
4 Wire Cable (Fig.3)

⚠. For maximum accuracy on a 3 wire sensor type make identified jumper connections at the sensor end (see Fig.3). Cable resistance, resulting from cable length, affects mesuring error; therefore use cables that are as short as possible.

. For long cable runs and high accuracy use 4 wire sensor types.

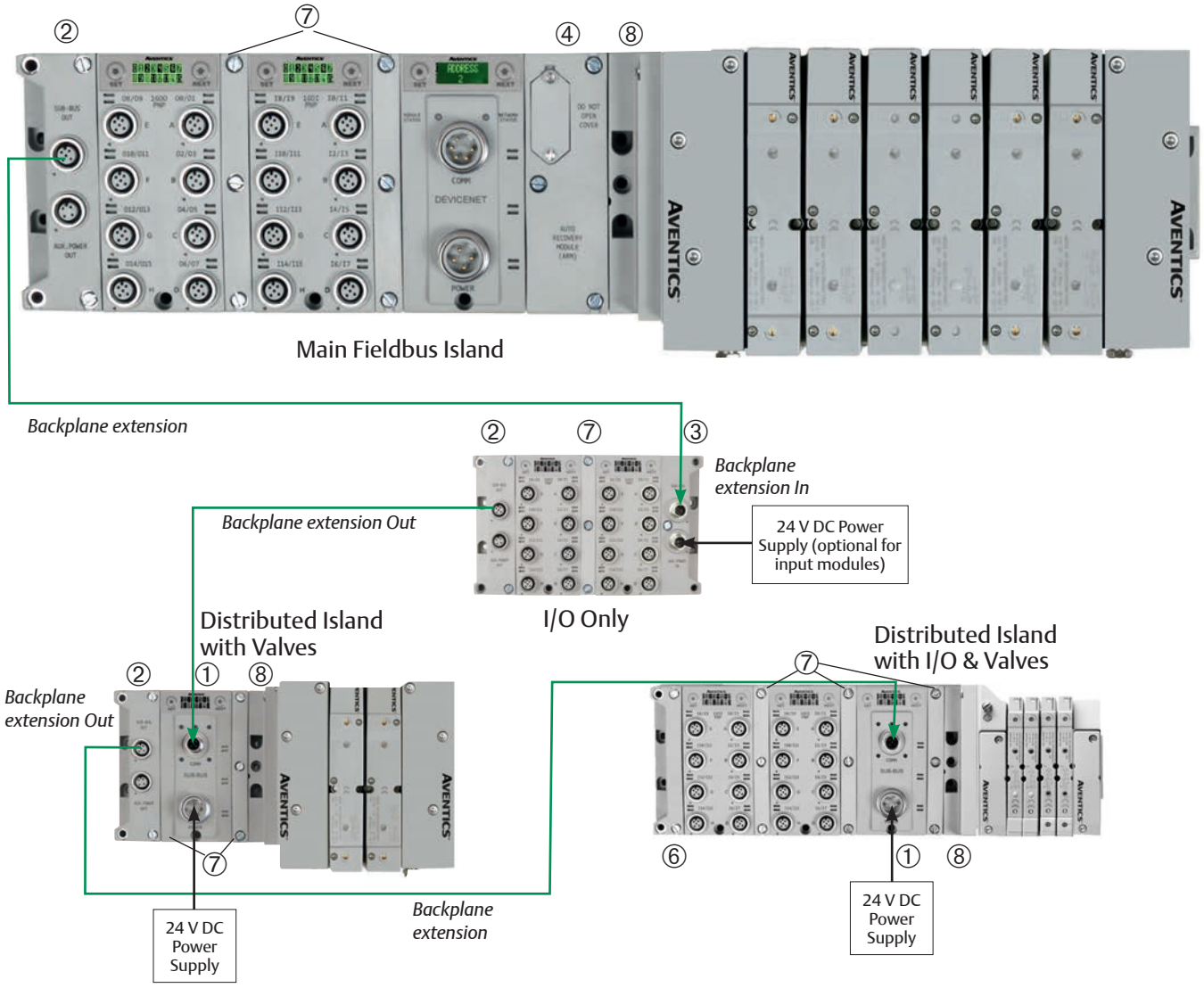
I/O Modules / cables & connectors

Accessory	Description		Catalog number
	5 pin straight male M12 connector		**88100330**
	5 pin elbow male M12 connector		**88161927**
	Dust Cover - M12 Male		**230-647**
	5 pin male DUO M12 connector for 2 inputs (2 cables, Ø3-5 mm)		**88100253**
	M12 SPEEDCON connector Straight 4 Pin Male Single Ended Cable, Euro Color Code	1.5 m	**TA04E5MIE000071P**
		3 m	**TA0403MIE000071P**
		5 m	**TA0405MIE000071P**
	M12 SPEEDCON connector 90° 4 Pin Male Single Ended Cable, Euro Color Code	1.5 m	**TB04E5MIE000071P**
		3 m	**TB0403MIE000071P**
		5 m	**TB0405MIE000071P**
	Replacement Terminal strip	I/O 0-7	**140-1073**
		I/O 8-15	**140-1074**
-	Keying Element for terminal strip		**140-1076**



G3 Platform Distribution Options

Easy, Cost Effective Solutions for Digital I/O and Valve Automation using G3 Electronics



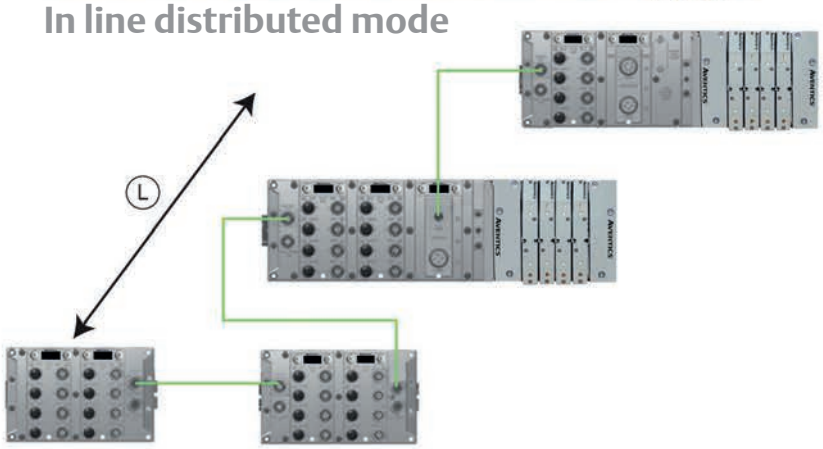
- Unique distribution system allows system efficiency by allowing the same modules to be used in either centralized or distributed applications
- Distribution options include:
  Inputs OR Outputs
  Inputs AND Outputs
  Valves with Inputs AND Outputs
  Valves with Inputs OR Outputs
  Valves Only
- Maximum Backplane extension length not to exceed 30 m.
  Maximum Backplane extension cable current not to exceed 4 A or excessive cable voltage drops per segment. Auxiliary power connections available for currents above 4 A. Consult factory for possible deviations.

G3 Platform Distribution Options

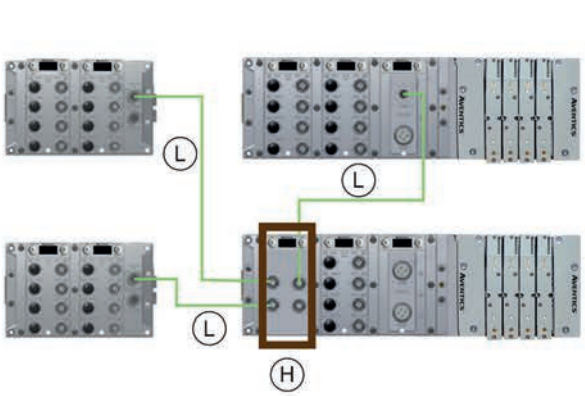
Easy, Cost Effective Solutions for Digital I/O and Valve Automation using G3 Electronics

Integrated Valve systems

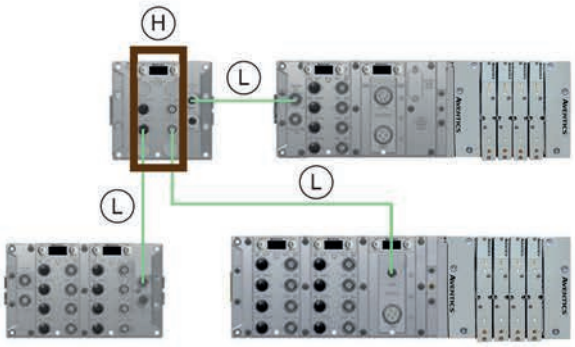
In line distributed mode



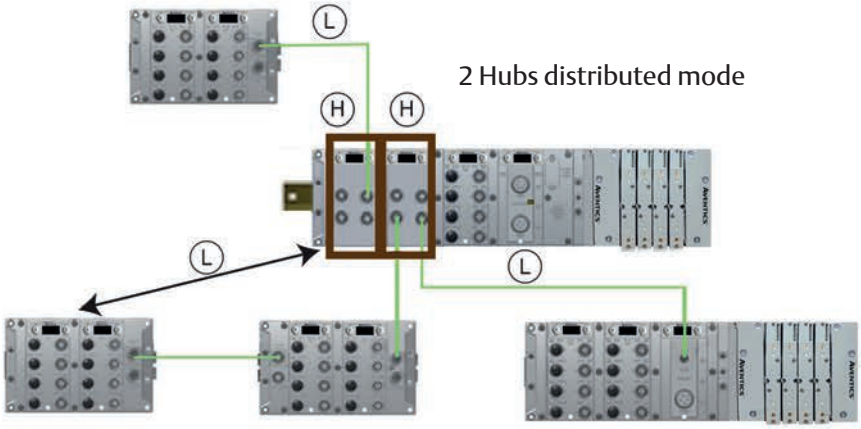
Star distributed mode



Hub on the island

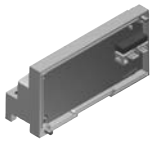
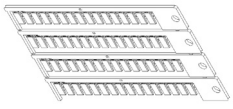


distributed Hub

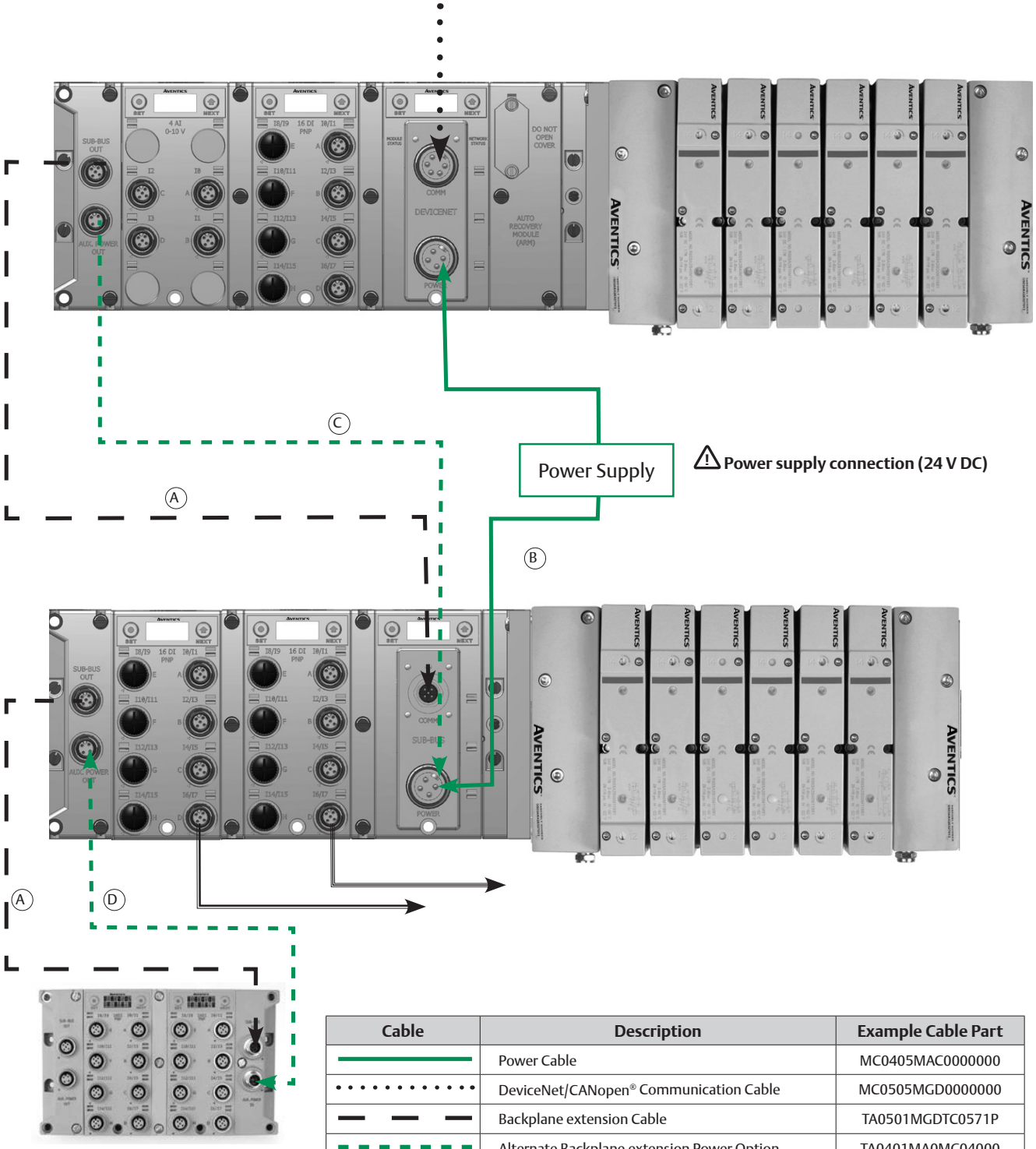


2 Hubs distributed mode

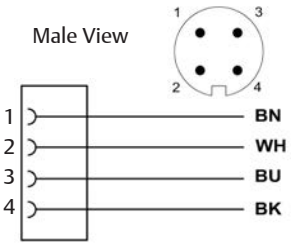
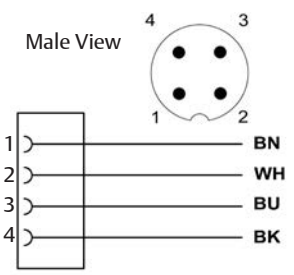
(L) Max. 30m
(H) Hub

N°	Accessories	Description			Weight	Part Number
Backplane Extension Modules						
①		Distributed Valve Module	Distributed module for valves with display	-	235 g	**240-241**
②		G3 Backplane extension Left End Module	G3 Left End Module for back-plane distribution and 24VDC to I/O modules	with DIN Rail Clips	141 g	**240-244**
				W/o clips	130 g	**240-183**
			for Ex ia Namur	W/o clips	-	**240-318**
③		G3 Backplane extension Right Module	G3 Right Module allowing the connection of distributed I/O modules	with DIN Rail Clips	141 g	**240-246**
				W/o clips	130 g	**240-185**
			for Ex ia Namur	W/o clips	-	**240-319**
Miscellaneous Modules						
④		Auto Recovery Module (ARM)	Protects configuration information during a critical failure. Allows configuration information to be saved and reloaded to replacement module automatically.	-	127 g	**240-182**
⑥		G3 Left Terminator Module	Must be installed after the last I/O module or after the communication module if there are no I/O modules installed.	with DIN Rail Clips	102 g	**240-245**
				W/o clips	91 g	**240-184**
⑦		Jumper Clip	Provides electrical connections between modules	-	45 g	**240-179**
			jumper clip for Namur input	-	-	**240-317**
⑧		Valve Driver Module	G3 electrical interface to pneumatics ends and valves			série 500
				with DIN Rail Clips	227 g	**P599AE508827002**
				W/o clips	216 g	**P599AE508827001**
						série 2000
				with DIN Rail Clips	147 g	**219-858**
				W/o clips	136 g	**219-828**
⑨		Right Hand Mounting Cover	Used when a communication module is used without local valves installed	with DIN Rail Clips	-	**240-289**
				W/o clips	-	**240-255**
⑩		Hub	4 Branches	-	-	**340-326**
Accessories						
		Labels	For use with Murrplastik© Type 20 Software		-	**122-1251**
		M12 Dust Cover	Protects the connector against dust	Male	-	**230-647**
				Female	-	**88157773**

Example Backplane extension Layout and Cabling
(DeviceNet™ / CANopen® Network)

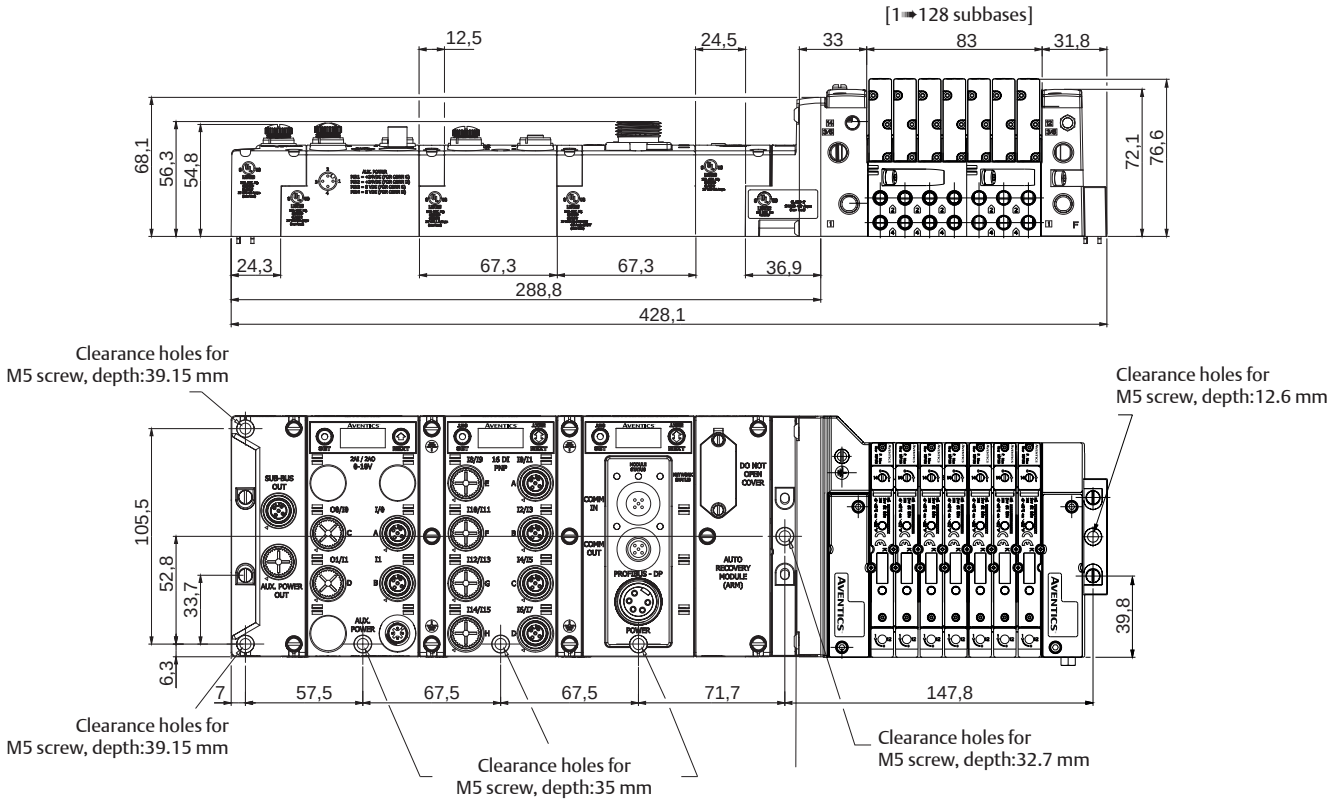


Cable	Description	Example Cable Part
	Power Cable	MC0405MAC0000000
	DeviceNet/CANopen® Communication Cable	MC0505MGD0000000
	Backplane extension Cable	TA0501MGDTC0571P
	Alternate Backplane extension Power Option	TA0401MA0MC04000
	I/O Field Wireable Connector	TA04F2000000081E
	I/O Connector with Molded Cable	TA0405MIE000071P

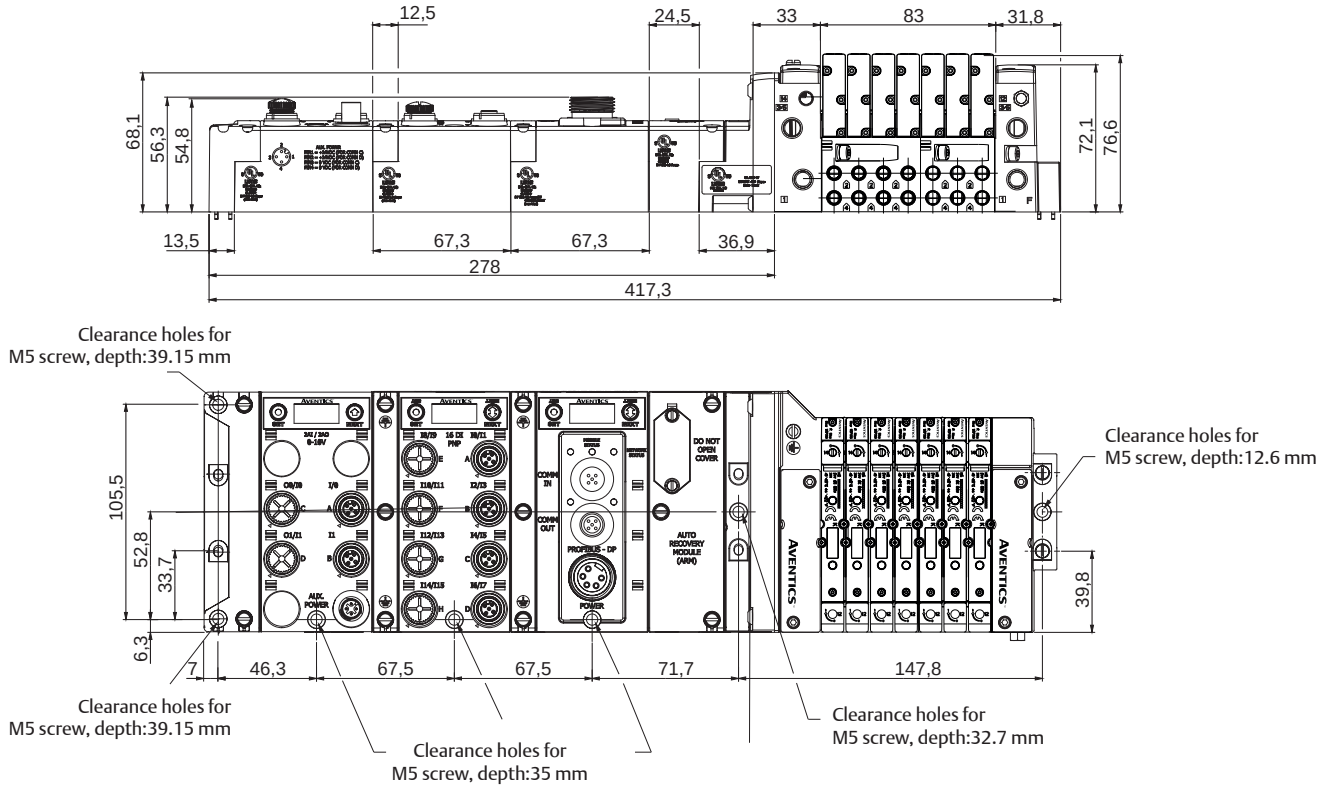
N°	Accessories	Description			Part Number
M12 Backplane extension cables with SPEEDCON connector technology					
Ⓐ		M12 Straight 5 Pin Male to Female Backplane extension Cable - Shielded (backplane extension)		1 m	**TA0501MGDTC0571P**
				5 m	**TA0505MGDTC0571P**
				10 m	**TA0510MGDTC0571P**
7/8" MINI 4 Pin cables & connectors for backplane extension valve module power					
Ⓑ		7/8" MINI Straight 4 Pin Female Single Ended Cable, Euro Color Code		5 m	**MC0405MAC0000000**
				10 m	**MC0410MAC0000000**
		7/8" MINI 90° 4 Pin Female Single Ended Cable, Euro Color Code		5 m	**MD0405MAC0000000**
				10 m	**MD0410MAC0000000**
		7/8" MINI Straight 4 Pin Female Field Wireable Connector –Cable Gland – One size fits all			**230-1003**
		7/8" MINI 90° 4 Pin Female Field Wireable Connector – PG 9 Cable Gland			**230-1001**
M12 4 Pin cables for backplane extension In/Out module power					
Ⓒ		M12 to 7/8" MINI Cable for Backplane extension Power M12 Straight 4 Pin Male to 7/8" MINI 4 Pin Female Extension (distribution of the power 24V to valve systems)		1 m	**TA0401MA0MC0471T**
				5 m	**TA0405MA0MC0471T**
				10 m	**TA0410MA0MC0471T**
Ⓓ		M12 Straight 4 Pin Male to Female Cable Extension		1 m	**TC0401MAETA04000**
				5 m	**TC0405MAETA04000**
				10 m	**TC0410MAETA04000**
		M12 Cables for Backplane extension Power M12 Straight 4 Pin Female Single Ended Cable, Euro Color Code		5 m	**TC0405MAE0000000**
				10 m	**TC0410MAE0000000**
		M12 Cables for Backplane extension Power M12 90° 4 Pin Female Single Ended Cable, Euro Color Code		5 m	**TD0405MAE0000000**
				10 m	**TD0410MAE0000000**

Dimensions (mm) - G3 Fieldbus Manifold Assembly

Series 501 valve system assembly with G3 Electronics w/ Backplane extension Output

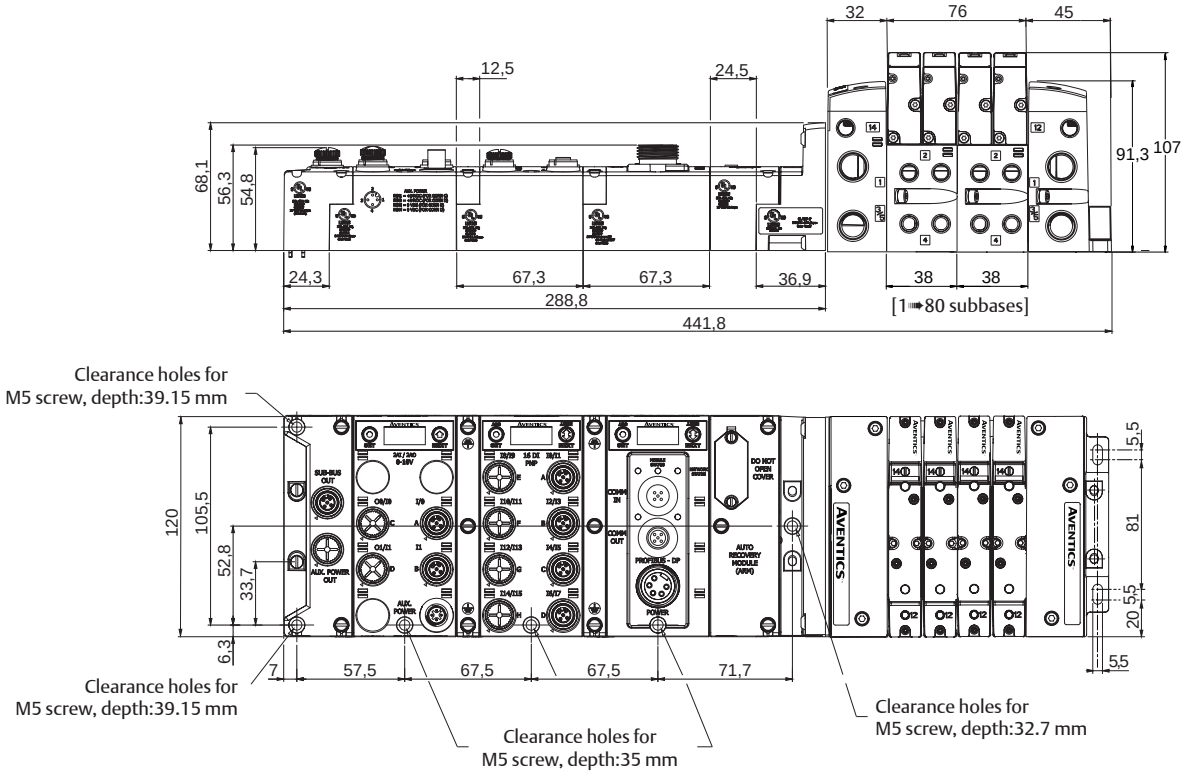


Series 501 valve system assembly with G3 Electronics w/o backplane extension output (with left terminator module)

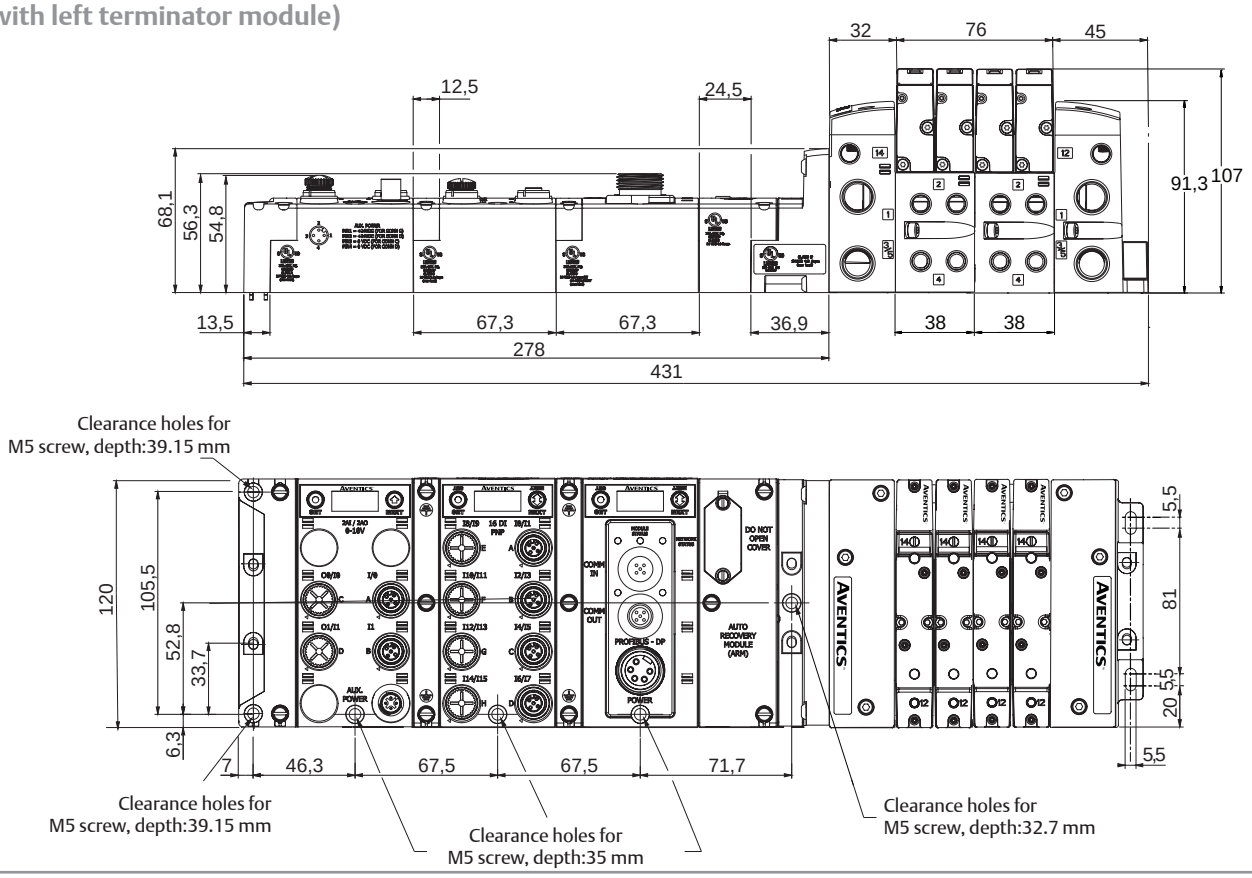


Dimensions (mm) - G3 Fieldbus Manifold Assembly

Series 502 valve system assembly with G3 Electronics w/ Backplane extension Output

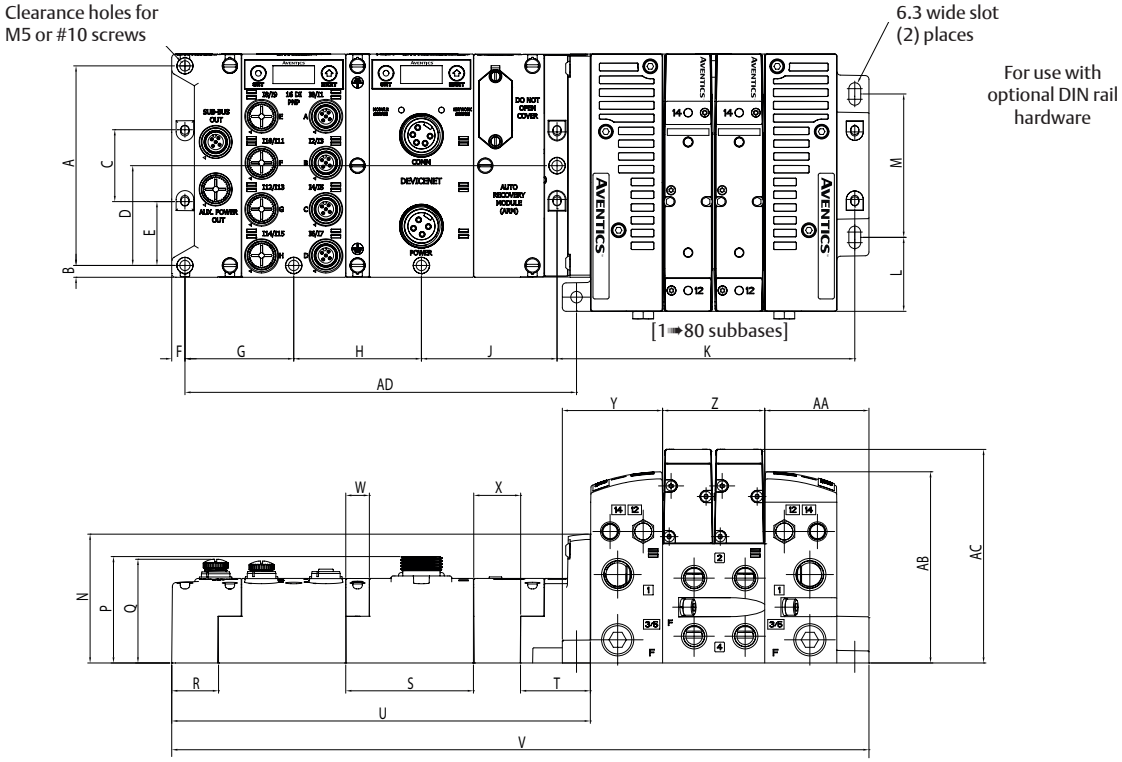


Series 502 valve system assembly with G3 Electronics w/o backplane extension output (with left terminator module)



Dimensions (mm) - G3 Fieldbus Manifold Assembly

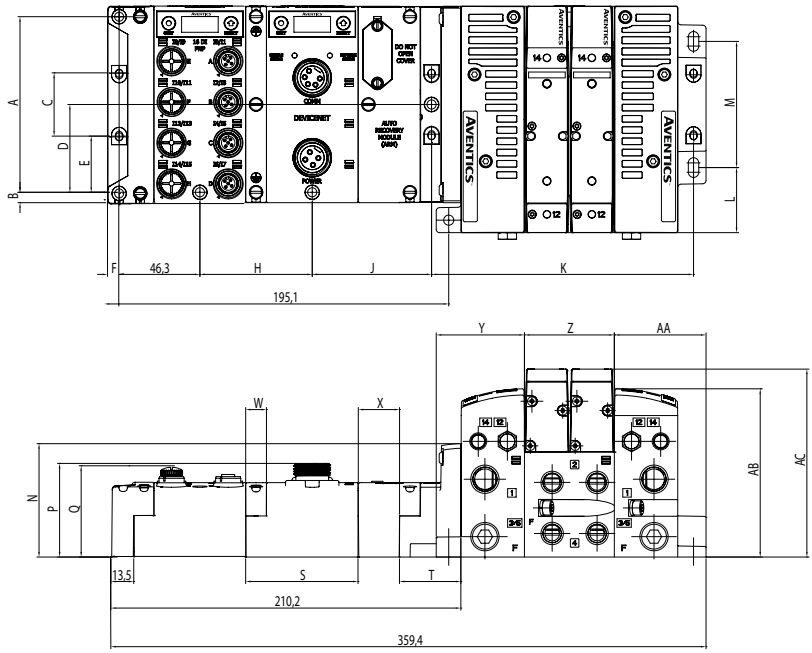
Series 503 valve system assembly with G3 Electronics w/ Backplane extension Output



A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
105.5	6.3	38	52.8	33.8	7	57.5	67.5	71.7	157.4	39.1	75.8	68.1	56.3	54	24.8	67.5	36.9	221.3

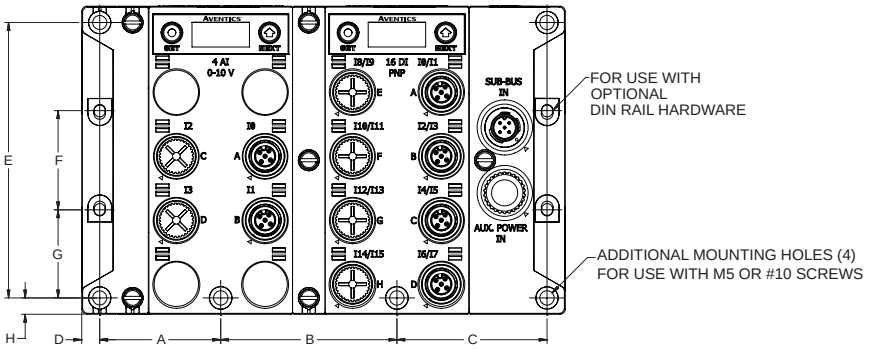
V	W	X	Y	Z	AA	AB	AC	AD
368.6	12.5	24.8	53	54	55.1	101.1	112.9	207

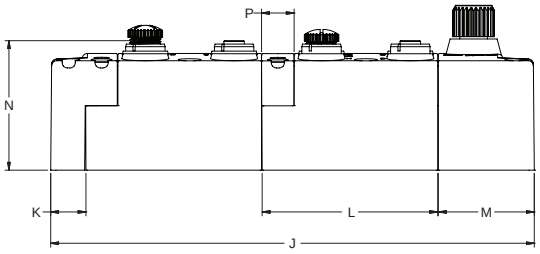
Series 503 valve system assembly with G3 Electronics w/o backplane extension output (with left terminator module)

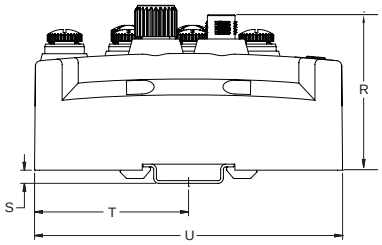


Dimensions (mm) - G3 Fieldbus I/O Assembly

I/O Assembly with G3 Electronics w/o Backplane extension output

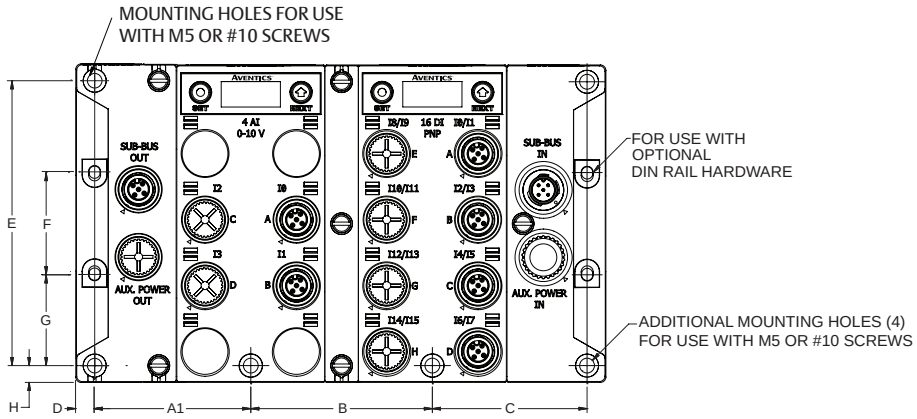


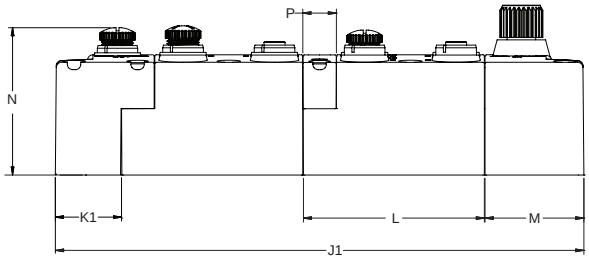


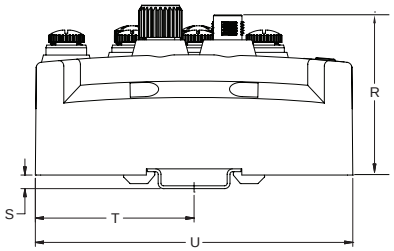


VIEW SHOWN WITH OPTIONAL DIN RAIL HARDWARE AND 35mm DIN RAIL

I/O Assembly with G3 Electronics w/ Backplane extension output





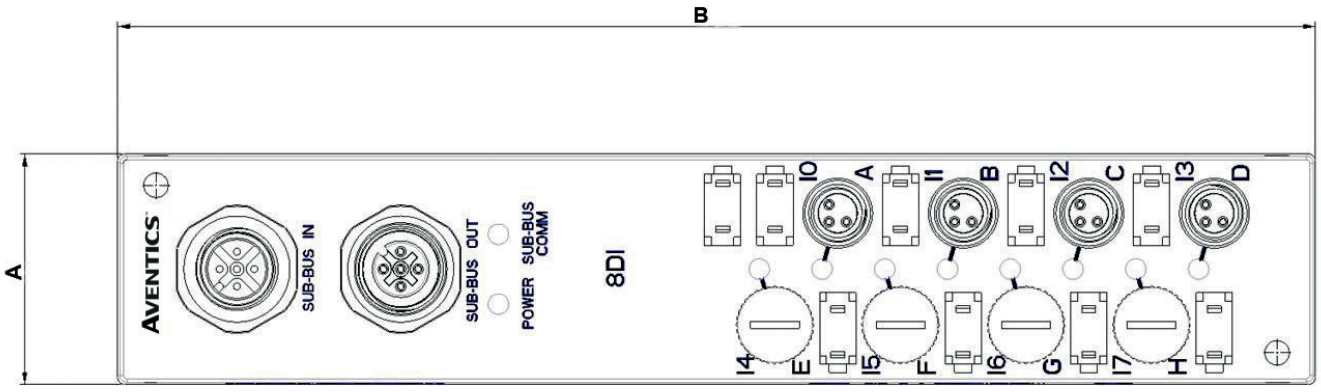


VIEW SHOWN WITH OPTIONAL DIN RAIL HARDWARE AND 35mm DIN RAIL

A	A1	B	C	D	E	F	G	H	J	J1	K	K1	L	M	N	P	R	S	T	U
46.4	57.6	67.5	57.6	7.0	105.5	38.0	33.7	6.25	185.3	196.5	13.5	24.5	67.5	37	54.0	12.5	62.5	5.1	59.0	118.0

Dimensions (mm) - G3 Sub-bus I/O Assembly

3 Pin M8 Sub-bus Module

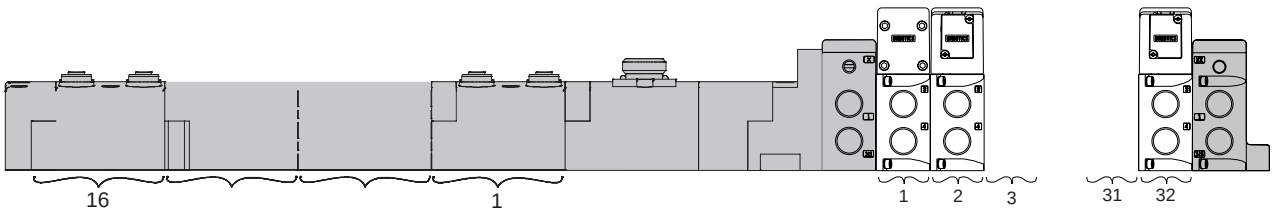


A	B
33	171.75

G3 Electronics - Series 2035

How to Order - G3 Assembly Kit

Configurator - CAD Files



How to Order

Manifold assemblies kit (Electronic + End plate)

A	K	3	B	D	0	0	0	0	3	L	STD

Electrical/Electronic, Type & location

3	=	G3 Electronics

Series*

0	=	N/A
B	=	Series 2035

Q	=	ISO 1 (ISO 5599/2 size 1)
R	=	ISO 2 (ISO 5599/2 size 2)
S	=	ISO 3 (ISO 5599/2 size 3)

Special Options

STD	=	Standard
DRM	=	DIN Rail mounting - Not available w/ 2035, ISO 1, ISO 2, ISO 3
MUF	=	Muffler - Not available w/ ISO 1, ISO 2, ISO 3
DWM	=	DIN Rail w/ Muffler - Not available w/ 2035, ISO 1, ISO 2, ISO 3

End plate Port Type

L	=	Push-in Fitting
G	=	ISO 228/1-G Tap Pressure Ports (ISO228/1 Conduit Ports if applicable)

Number of valve Stations

A	= 1	I	= 9	Q	= 17	Y	= 25
B	= 2	J	= 10	R	= 18	Z	= 26
C	= 3	K	= 11	S	= 19	2	= 27
D	= 4	L	= 12	T	= 20	3	= 28
E	= 5	M	= 13	U	= 21	4	= 29
F	= 6	N	= 14	V	= 22	5	= 30
G	= 7	O	= 15	W	= 23	6	= 31
H	= 8	P	= 16	X	= 24	7	= 32

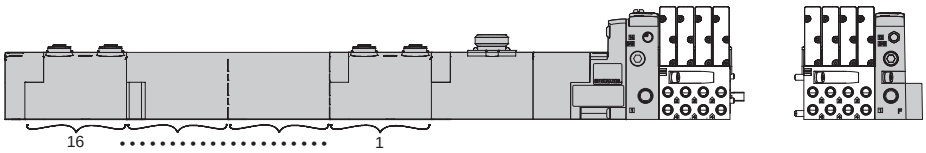
End Plate Port Size

		Series	Port 1	Ports 3/5
3	=	ISO 1	G3/8	G3/8
4	=	2035 ISO 2	G1/2 G1/2	G1/2 G1/2
6	=	ISO 3	G1	G1
X	=	Two or more valve groups resulting in different standard end plate port sizes.		

*For manifold assembly with multiple valve series - Consult Factory

AVENTICS™ G3 Electronics and I/O

G3 Electronics - Series 501



Configurator - CAD Files

How to Order

Manifold assemblies kit (Electronic + End plate)

G	501	A	V	3	H	1	0	0	V	A00

Thread connection
G = ISO 228/1
8 = NPT (contact us)
K = Push-in connectors

Product series
501 (11 mm valve)

Revision letter
A = Initial release

Product type
V = Valve Manifold Assembly

Electronics
8 = **580 Fieldbus Electronics**
D = CHARMs Electronics
3 = **G3 Fieldbus Electronics**
J = 25 Pin Sub-D Connector
M = 37 Pin Sub-D Connector
Q = 19 Pin Round Connector
R = 26 Pin Round Connector
T = Terminal Strip 1-32
Z = Fanuc Robot End Effector

Number of Valve Stations

501

A = NA/33/65/97	**I** = 9/41/73/105	**Q** = 17/49/81/113	**Y** = 25/57/89/121
B = NA/34/66/98	**J** = 10/42/74/106	**R** = 18/50/82/114	**Z** = 26/58/90/122
C = 3/35/67/99	**K** = 11/43/75/107	**S** = 19/51/83/115	**2** = 27/59/91/123
D = 4/36/68/100	**L** = 12/44/76/108	**T** = 20/52/84/116	**3** = 28/60/92/124
E = NA/37/69/101	**M** = 13/45/77/109	**U** = 21/53/85/117	**4** = 29/61/93/125
F = 6/38/70/102	**N** = 14/46/78/110	**V** = 22/54/86/118	**5** = 30/62/94/126
G = 7/39/71/103	**O** = 15/47/79/111	**W** = 23/55/87/119	**6** = 31/63/95/127
H = 8/40/72/104	**P** = 16/48/80/112	**X** = 24/56/88/120	**7** = 32/64/96/128

End Plate Port Size (1-3-5)
Used with the first digit «G» or «8»:
1 = 1/8 (female thread only)
Used with the first digit «K»:
H = 6 x 8 mm (push-in connector)

Valve Station Adder
0 = No Adder
1 = 32+
2 = 64+
3 = 96+

Second Valve Series
0 = No Second Valve Series

End Plate Style
V = Vertical

Options
A00 = Standard (no options)
MUF = Muffler in End Plates

DRM = DIN Rail Mount
DWM = DIN Rail Mount with Muffler in End Plates

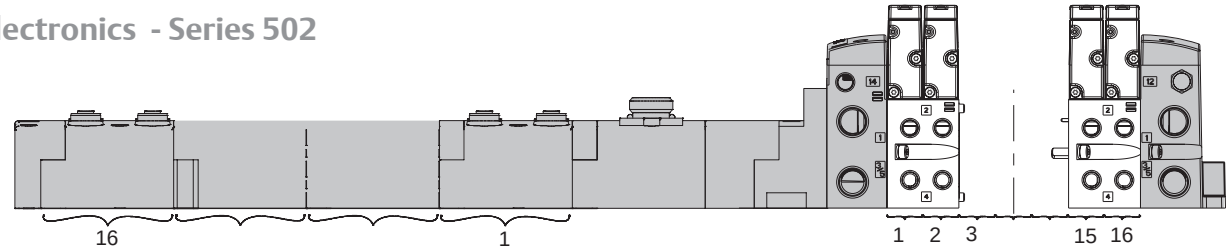
14X = External pilot supply from port 14
D12 = External pilot supply from port 14 and Muffler in End Plates

D14 = External pilot supply from port 14 and DIN Rail Mount
F06 = External pilot supply from port 14 Muffler in End Plates and DIN Rail Mount

How to Order
Subbase
Valves
Regulators

See pages 7-8

G3 Electronics - Series 502



Configurator - CAD Files

How to Order

Manifold assemblies kit (Electronic + End plate)

G 502 A V 3 2 2 0 0 V A00

Thread connection
G = ISO 228/1
8 = NPT (contact us)
K = Push-in connectors

Product series
502 (18 mm valve)

Revision letter
A = Initial release

Product type
V = Valve Manifold Assembly

Electronics
8 = **580 Fieldbus Electronics**
D = CHARMs Electronics
3 = **G3 Fieldbus Electronics**
J = 25 Pin Sub-D Connector
M = 37 Pin Sub-D Connector
Q = 19 Pin Round Connector
R = 26 Pin Round Connector
T = Terminal Strip 1-32
Z = Fanuc Robot End Effector
0 = No Electronics

Number of Valve Stations

B = 2/34/66	**L** = 12/44/76	**V** = 22/54	**7** = 32/64
D = 4/36/68	**N** = 14/46/78	**X** = 24/56	
F = 6/38/70	**P** = 16/48/80	**Z** = 26/58	
H = 8/40/72	**R** = 18/50	**3** = 28/60	
J = 10/42/74	**T** = 20/52	**5** = 30/62	

Options
A00 = Standard (no options)
MUF = Muffler in End Plates
DRM = DIN Rail Mount
DWM = DIN Rail Mount with Muffler
14X = External pilot supply from port 14
D12 = External pilot supply from port 14 and Muffler in End Plates
D14 = External pilot supply from port 14 and DIN Rail Mount
F06 = External pilot supply from port 14 Muffler in End Plates and DIN Rail Mount
D50 = 14X + E42

End Plate Style
V = Vertical

Second Valve Series
0 = No Second Valve Series
1 = 11 mm Valve

Valve Station Adder
0 = No Adder
1 = 32+
2 = 64+

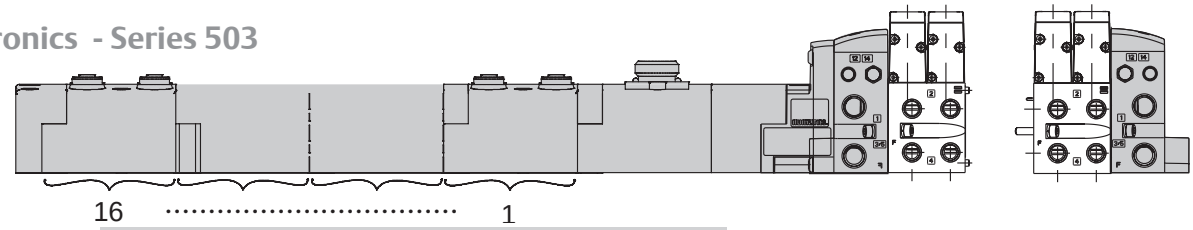
End Plate Port Size (1-3-5)
Used with the first digit «G» or «8»:
3 = 3/8 (manifold base)
Used with the first digit «K»:
K = 8 x 10 mm (push-in connector)
M = 10 x 12 mm (push-in connector)

How to Order

Subbase
Valves
Regulators

See pages 16..18

G3 Electronics - Series 503



Configurator - CAD Files

How to Order

Manifold assemblies kit (Electronic + End plate)

G 503 A V 3 2 3 0 0 V A00

Thread connection
G = ISO 228/1
8 = NPT (contact us)
K = Push-in connectors

Product series
503

Revision letter
A = Initial release

Product type
V = Valve Manifold Assembly

Electronics
8 = **580 Fieldbus Electronics**
D = CHARMs Electronics
3 = **G3 Fieldbus Electronics**
J = 25 Pin Sub-D Connector
M = 37 Pin Sub-D Connector
Q = 19 Pin Round Connector
R = 26 Pin Round Connector
T = Terminal Strip 1-32
Z = Fanuc Robot End Effector
0 = No Electronics

Number of Valve Stations

B = 2/34/66	**L** = 12/44/76	**V** = 22/54	**7** = 32/64
D = 4/36/68	**N** = 14/46/78	**X** = 24/56	
F = 6/38/70	**P** = 16/48/80	**Z** = 26/58	
H = 8/40/72	**R** = 18/50	**3** = 28/60	
J = 10/42/74	**T** = 20/52	**5** = 30/62	

Options
A00 = Standard (no options)
MUF = Muffler in End Plates
DRM = DIN Rail Mount
DWM = DIN Rail Mount with Muffler
14X = External pilot supply from port 14
D12 = External pilot supply from port 14 and Muffler in End Plates
D14 = External pilot supply from port 14 and DIN Rail Mount
F06 = External pilot supply from port 14 Muffler in End Plates and DIN Rail Mount
A27 = Fanuc Robot EE Connection Interface
D28 = Fanuc Robot EE Connection + Muffler in End Plate

End Plate Style
V = Vertical
C = Combination

Second Valve Series
0 = No Second Valve Series
2 = 18 mm Valve

Valve Station Adder
0 = No Adder
1 = 32+
2 = 64+

End Plate Port Size
Used with the first digit «G» or «8»:
3 = 3/8 (manifold base)
Used with the first digit «K»:
K = 8 x 10 mm (push-in connector)
M = 10 x 12 mm (push-in connector)

How to Order

Subbase
Valves
Regulators

See pages 27-28

Series 2035 - 41 mm

How to Order - Series 2035 - Valves

35 4 BB 4 Z6 M L 000 61

Series	
35 =	Series 2035

Port Size of Base	2035
3 = G 3/8 or valve w/o manifold	X
4 = G 1/2 or valve w/o manifold	X

Actuator	
BA =	Single actuated and spring return, flush non-locking manual override
BB =	Double actuated, flush non-locking manual override
00 =	Island w/o valve (blank station)

Function	2035
4 = 5-port., 2-pos. valve	X
5 = 5-port., 3-pos. valve, open center, dual pressure	X
6 = 5-port., 3-pos. valve, closed center	X
P = Indicates blank station plate	X

Voltage	
00 =	Blank station plate
61 =	24 V DC

Options	
000 =	Without option
11B =	Locking override
11M =	Without manual override

Further options on request

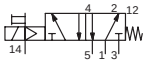
Port Type of Bases	
O =	Without base
G =	G thread
L =	Plug-in fittings (except for series 2035)

Electrical interface	
M =	Plug-in, DC with LED
O =	Blank station plate

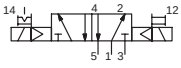
Mounting	
00 =	Valve unit only
01 =	With sandwich speed control
Z1 =	Manifold block with side and bottom ports, single solenoid, “Z-Board“™
Z2 =	Manifold block with side and bottom ports, double solenoid, “Z-Board“™
Z5 =	Z1 with speed control
Z6 =	Z2 with speed control
R1 =	Z1 with ribbon cable connector
R2 =	Z2 with ribbon cable connector
R5 =	Z5 with ribbon cable connector
R6 =	Z6 with ribbon cable connector

Ribbon cable option must be used for manifold assemblies that exceed 16 solenoids.
(7th and 8th digit of valve order code)

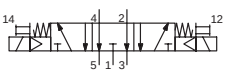
Symbols



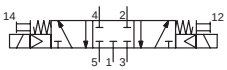
I5/I6... 05/12/35... **BA4** 5-ported, 2-pos. valve, spring return



I5/I6... 05/12/35... **BB4** 5-ported, 2-pos. valve, detented



I5/I6... 05/12/35... **BB5** 5-port., 3-pos. valve, open center, dual pressure



R5/R6... 05/12/35... **BB6** 5-port., 3-pos. valve, closed center

2035 Series - 41 mm

How to Order - Series 2035 - Regulators

35 4 RS 1 Z1 J Q 000 00

Series

35 =	Series 2035

Port Size of Base

		2035
3 =	G 3/8 or valve w/o manifold	X
4 =	G 1/2 or valve w/o manifold	X

Regulator Type

RS =	Single pressure to port 1
RD =	Dual pressure to ports 3 and 5
RC =	Dual pressure with non-relieving checks (2035 series)
RQ =	Dual pressure with relieving checks (2035 series)
RE =	Dual pressure to ports 4 and 2
RT =	Two-pressure selector

Pressure Range

1 =	0.7 to 9 bar
3 =	0.2 to 2 bar
4 =	0.5 to 4 bar

Options

000 =	Standard
12H =	Without gauge
16N =	Jumper on 14 end
16P =	Jumper on 12 end

Further options on request

Port Type of Bases

O =	Without base
Q =	G thread
K =	Plug-in fittings

Wiring Option

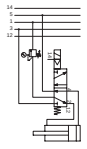
J =	Plug-in receptacle

Mounting

		2035
00 =	Without base	X
01 =	With sandwich speed control	X
Z1 =	Manifold block with side and bottom ports, “Z-Board“ single actuated	X
Z2 =	Manifold block with side and bottom ports, “Z-Board“ double actuated	X
Z5 =	Z1 with speed control	X
Z6 =	Z2 with speed control	X
R1 =	Z1 with ribbon cable connector	X
R2 =	Z2 with ribbon cable connector	X
R5 =	Z5 with ribbon cable connector	X
R6 =	Z6 with ribbon cable connector	X

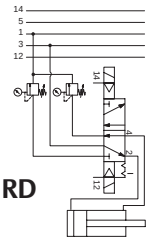
Ribbon cable option must be used for manifold assemblies that exceed 16 solenoids.
(7th and 8th digit of valve order code)

Symbols



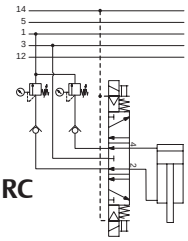
RS

Single pressure from a single supply



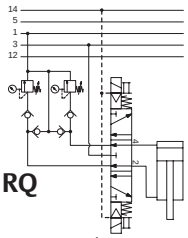
RD

Dual pressure from a single supply



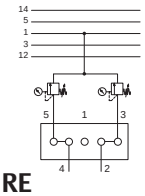
RC

Non-relieving: taps downstream pressure if upstream is exhausted



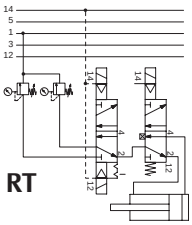
RQ

Non-relieving: exhausts pressure in cylinder if upstream pressure is exhausted



RE

External outlet regulator used with jumper plate for single or dual pressure



RT

Two-pressure selector used for multi-pressure applications

ISO 5599/2 Size 1 2 3

How to Order - ISO 5599/2 Size 1 2 3 - Valves

I24 BA 4 00 M Q 000 61

Series and Port Size

I12* =	ISO 5599/2 Size 1 = 1/4
I13 =	ISO 5599/2 Size 1 = 3/8
I23* =	ISO 5599/2 Size 2 = 3/8
I24 =	ISO 5599/2 Size 2 = 1/2
I34* =	ISO 5599/2 Size 3 = 1/2
I35 =	ISO 5599/2 Size 3 = 3/4

* Use for valve unit only

First letter = "14" Actuator
Second letter = "12" Actuator

BA =	Single solenoid pilot actuated valve with spring control
BB =	Double solenoid pilot actuated valve locking
BW =	Single solenoid pilot actuated valve with differential air return (ISO 2 + ISO 3 series only)
SA =	Single direct solenoid actuated valve with spring return
SS =	Double direct solenoid actuated valve locking
00 =	Valve without manifold block

Function

4 =	5-port., 2-pos. valve
5 =	5-ported, 3-pos. valve, 1 blocked, 2 & 4 exhausted
6 =	5-ported, 3-pos. valve, all ports blocked
7 =	5-ported, 3-pos. valve, 1 connected with 4 & 2
P =	Blank station plate

Mounting

00 =	Valve unit only
01 =	00 with speed control
MS =	Midstation supply and exhaust block with "Z-Board"™
Z1 =	Manifold block with side and bottom ports, single "Z-Board"™
Z2* =	Manifold block with side and bottom ports, double "Z-Board"™
Z5 =	Z1 with speed control
Z6 =	Z2 with speed control
R1 =	Z1 with ribbon cable connector
R2 =	Z2 with ribbon cable connector
R5 =	Z5 with ribbon cable connector
R6 =	Z6 with ribbon cable connector

*also used with function P = blank station

Voltage

00 =	Blank station plate
61 =	24 V_{DC}*

* cannot be used with direct solenoid actuated Valves of ISO 3 Series

Options

000 =	Standard
11B =	Flush manual override
11Z =	Extended locking manual override
14B =	Internal pilot supply from port 1 if not standard
14C* =	Internal pilot supply from port 3
14D* =	Internal pilot supply from port 5
15G =	5 pin mini connector (valve conduit cover)
14X* =	External pilot supply through base or manifold end plates

* must use one of these options when used with RC, RQ or RD regulators and solenoid pilot valves.

Port Type

G =	G-thread (direct solenoid valves)
Q =	G-thread (solenoid pilot valves)

Wiring Option

M =	Plug-in VDC with LED indicator
O =	Blank station plate

Note:
Internal pilot supply from port 1 is standard for all ISO 5599/2 valve series.

ISO 5599/2 Size 1 2 3

How to Order - ISO 5599/2 Size 1 2 3 - Regulators

I24	RS	1	00	J	Q	000	00

Series and Port Size

I12* =	ISO 5599/2 Size 1 = 1/4
I13 =	ISO 5599/2 Size 1 = 3/8
I23* =	ISO 5599/2 Size 2 = 3/8
I24 =	ISO 5599/2 Size 2 = 1/2
I34* =	ISO 5599/2 Size 3 = 1/2
I35 =	ISO 5599/2 Size 3 = 3/4

* Use for valve unit only

Regulator Type

RS =	Single pressure to port 1
RD* =	Dual pressure to ports 3 and 5
RC* =	Dual pressure with non-relieving checks air return (ISO 2 and ISO 3 series only)
RQ* =	Dual pressure with relieving check valves
RE =	Dual pressure, external outlet

* Solenoid pilot valves used with RC, RD or RQ regulators must have the pilot supply from other than internally from port 1.

Pressure Range

1 =	0.7 to 9 bar
3 =	0.2 to 2 bar
4 =	0.3 to 4 bar
6 =	14 to 17 bar

Options

000 =	Standard
12H =	Without gauge
16N =	Jumper on 14 end
16P =	Jumper on 12 end

Further options on request

Port Type

Q =	G-thread (ISO 1, ISO 2 and ISO 3 Series)

Wiring Option

J =	Plug-in receptacle
0 =	No electrical connection

Mounting

00 =	Regulator unit only
01 =	00 with speed control
Z1 =	Manifold block with side and bottom ports, single „Z-Board“™
Z2 =	Manifold block with side and bottom ports, double „Z-Board“™
Z5 =	Z1 with sandwich speed control
Z6 =	Z2 with sandwich speed control
R1 =	Z1 with ribbon cable connector
R2 =	Z2 with ribbon cable connector
R5 =	Z5 with ribbon cable connector
R6 =	Z6 with ribbon cable connector

How to Order - G3 Electronics

G3 ED1 00 D 0 STD

Electronics Protocols

CC1	=	CC Link IE Field [1]
CO1	=	CANopen®
DN1	=	DeviceNet™
EC1	=	EtherCAT® [1]
ED1	=	EtherNET/IP™ DLR [1]
EM1	=	ModBus® TCP/IP [1]
PL1	=	Ethernet POWERLINK® [1]
PT1	=	PROFIBUS™ DP [1]
PN1	=	PROFINET® [1]
DS2	=	Backplane extension Valve Manifold [1]
DS3	=	Backplane extension I/O Assembly

Number of I/O Modules

00	=	0
01	=	1
02	=	2
03	=	3
04	=	4
05	=	5
06	=	6
07	=	7
08	=	8
09	=	9
10	=	10
11	=	11
12	=	12
13	=	13
14	=	14
15	=	15
16	=	16

Left Mounting

D	=	w/ Backplane extension Out
H	=	w/ Terminating Resistor

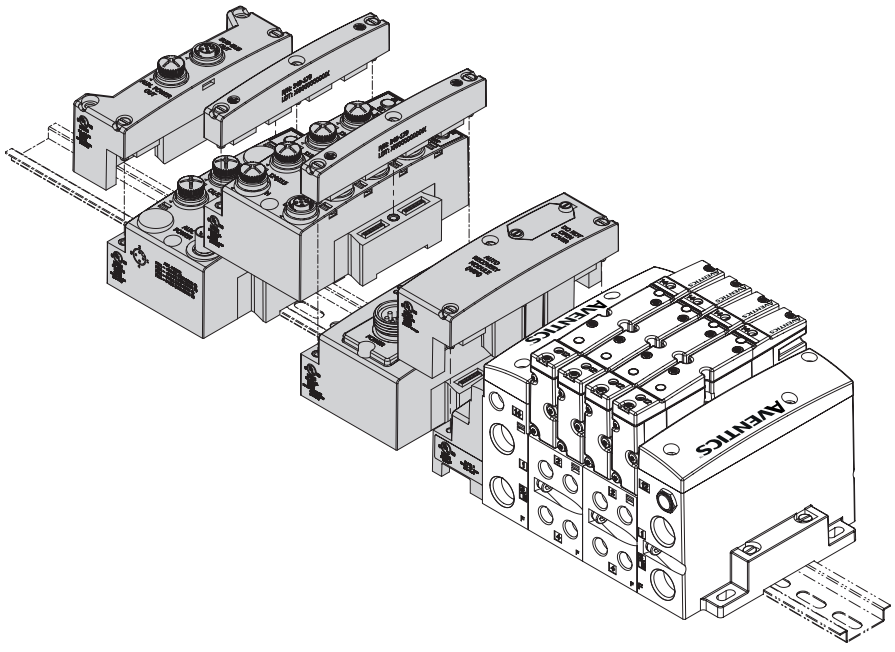
Special Options

STD	=	Standard
DRM	=	DIN Rail Mounting
E23	=	Fieldbus assembly without valves
E28	=	Valve Side 25 pin Sub D NPN output module
E43	=	Wireless Auto Recovery Module (ARM + Wireless)
E44	=	Auto recovery Module (ARM)
G32	=	DRM-Din Rail Mounting E44-Auto Recovery Module (ARM)
G33	=	DRM-Din Rail Mounting E28-Valve Side 25 pin Sub D NPN output module
G34	=	E28-Valve Side 25 pin Sub D NPN output module E44-Auto Recovery Module (ARM)
G36	=	E23-Fieldbus assembly without valves DRM-Din Rail Mounting
J32	=	DRM-Din Rail Mounting E28-Valve Side 25 pin Sub D NPN output module E44-Auto Recovery Module (ARM)

Modification

0	=	Initial release

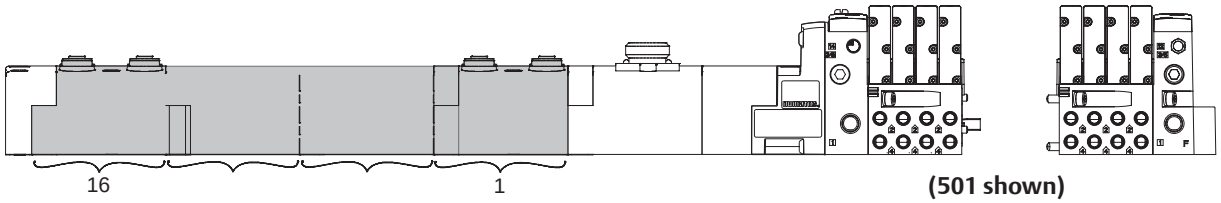
[1] 32+ capable.



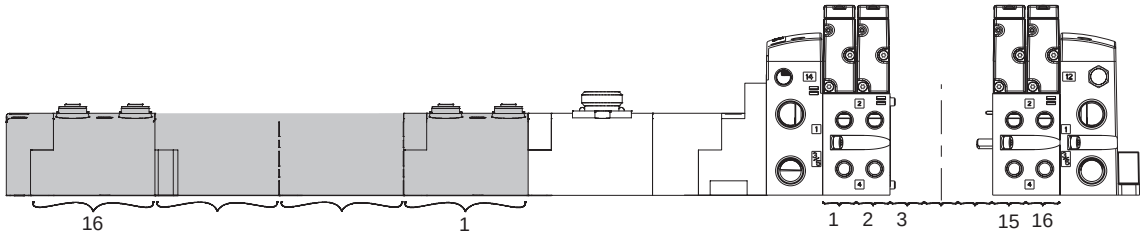
G3 Electronics

Ordering Valve System Assemblies with G3 Electronics & Discrete I/O

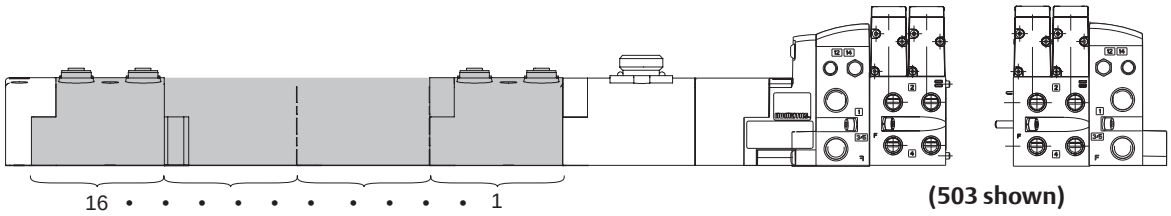
For valve series 501, 502, 503, 2035, ISO15407-2 & ISO 5599/2



(501 shown)



(502 shown)



(503 shown)

Shaded components are described by the assembly kit (AK) model number. The communication module and number of I/O modules are described by the Electronic Interface (G3) model number designation.

Each valve station is listed in sequential order from left to right when facing the port side of the manifold as shown.

Each discrete I/O module is listed in sequential order from RIGHT to LEFT starting from the communication module as shown.

NOTE:

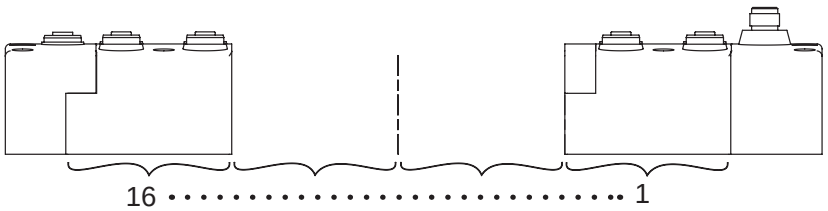
A total of 128 (501) / 80 (502/503) solenoid outputs are available.
Either single solenoid valves or double solenoid valves or any combination of singles.

Example Order - 502 Shown

Assembly Kit	G502AV3H100VA00
Valve Station #1	R502A1B40MA00F1
Valve Station #2	R502A1B40MA00F1
Valve Station #3	R502A1B40MA00F1
Valve Station #4	R502A1B40MA00F1
Mounting # 1	G502AMM22MA0010
Valve Station #1	R502A1B40MA00F1
Valve Station #2	R502A1B40MA00F1
Valve Station #3	R502A1B40MA00F1
Valve Station #4	R502A1B40MA00F1
Mounting # 2	G502AMM22MA0010
Valve Station #1	R502A1B40MA00F1
Valve Station #2	R502A1B40MA00F1
Valve Station #3	R502A1B40MA00F1
Valve Station #4	R502A1B40MA00F1
Mounting # 3	8G502AMM22MA0010
Valve Station #1	R502A1B40MA00F1
Valve Station #2	R502A1B40MA00F1
Valve Station #3	R502A1B40MA00F1
Valve Station #4	R502A1B40MA00F1
Mounting # 4	G502AMM22MA0010
Electronics	G3DN116R0E40
Station 1	240-205
Station 2	240-205
Station 15	240-205
Station 16	240-205

G3 Electronics

Ordering G3 Electronics Assemblies with I/O Only



1. Refer to the selection table to specify the control electronics and I/O configuration.
2. Each discrete I/O module is listed in sequential order from RIGHT to LEFT as shown.
3. A maximum of 16 I/O modules are supported by a single communication node. Analog I/O & digital I/O (NPN & PNP)

Example Order - I/O assembly with Backplane extensions in and backplane extension out modules

Electronics	G3DS316D0STD
Station 1	240-205
Station 2	240-205
⋮	⋮
Station 15	240-205
Station 16	240-205