AVENTICS™ 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 1/2 turn I/O connector attachment
- Power connector allows output power to be removed while inputs and communication are left active
- IP65 protection
- Up to 1200 Input/1200 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®
- DeviceNet™
- EtherCAT®
- EtherNet/IP™ DLR w/ QuickConnect™

- Ethernet POWERLINK®
- Modbus® TCP/IP
- PROFIBUS™ DP
- PROFINET™

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
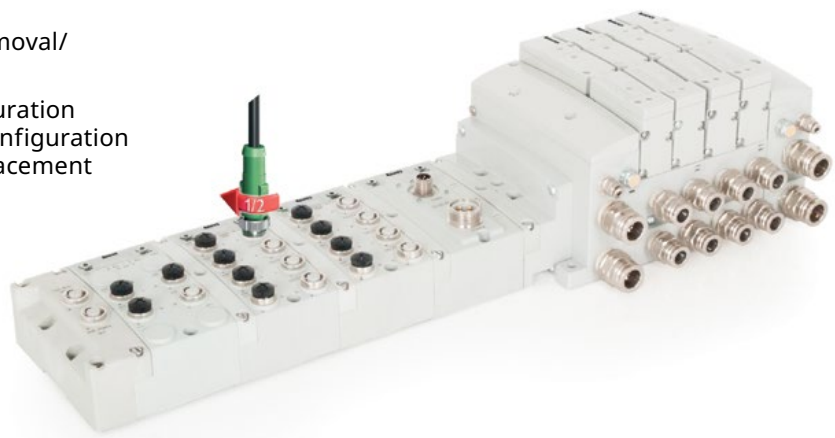
Modbus is a registered trademark of Modbus Organization, Inc.
EtherNet/IP, DeviceNet and QuickConnect are trademarks of ODVA.
EtherCAT is a registered trademark of the EtherCAT Technology Group.
CANopen is a registered Community trademark of CAN in Automation e.V.
PROFIBUS and PROFINET are trademarks of Profibus Nutzerorganisation e.V.
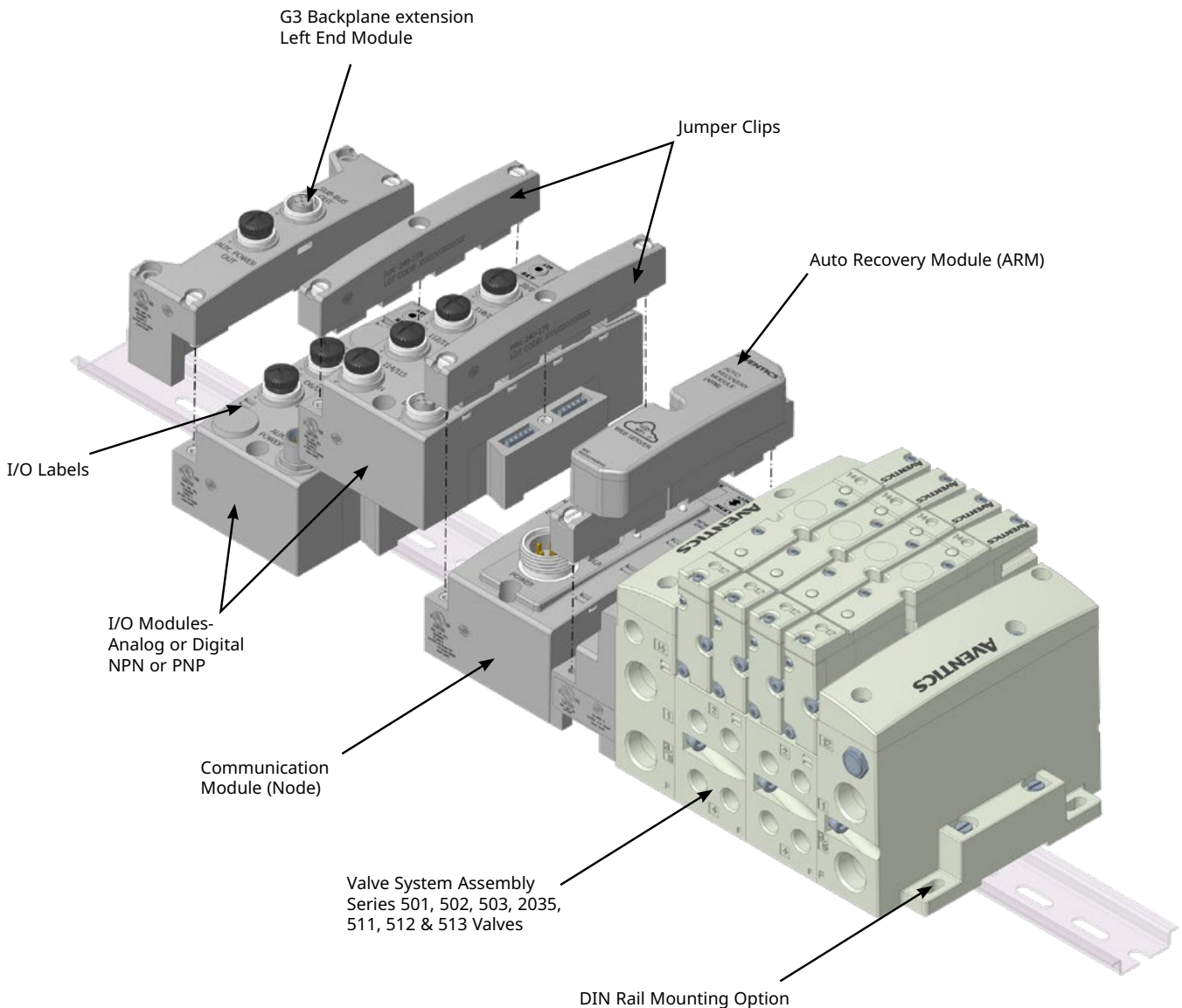Ethernet POWERLINK is a registered trademark of Bernecker + Rainer Industrie – Elektronik Ges.m.b.H.

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 and ISO 5599-2 Series 511, 512 and 513 valve lines to further enhance the modularity and flexibility of the entire system solution.

G3 Backplane extension
Left End Module

Jumper Clips

Auto Recovery Module (ARM)

I/O Labels

I/O Modules-
Analog or Digital
NPN or PNP

Communication
Module (Node)

Valve System Assembly
Series 501, 502, 503, 2035,
511, 512 & 513 Valves

DIN Rail Mounting Option

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.
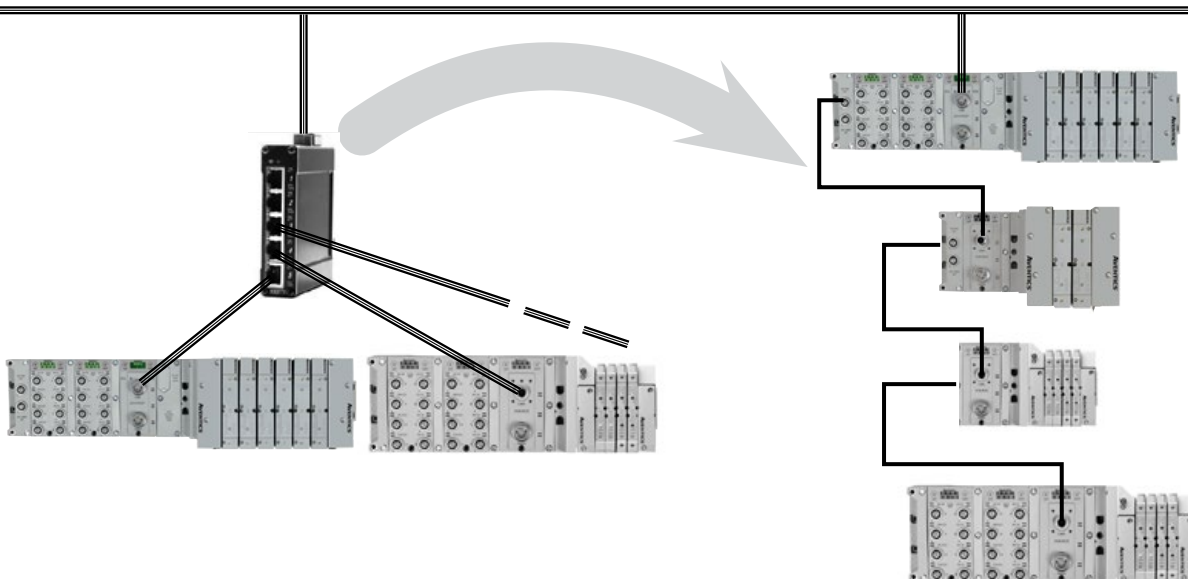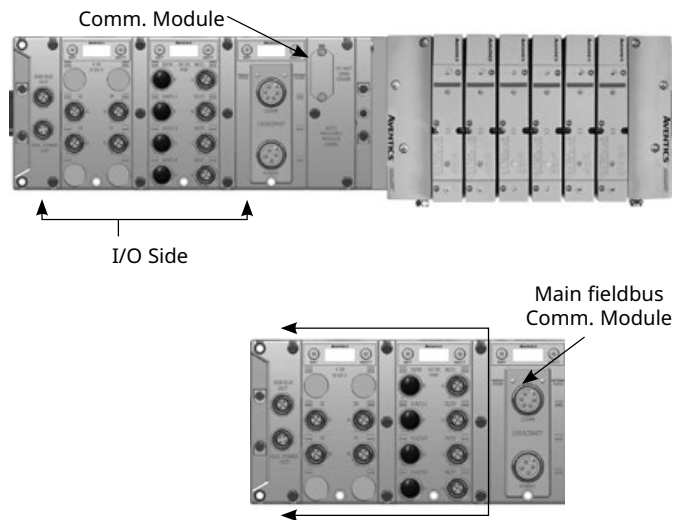
Valve Side

- 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

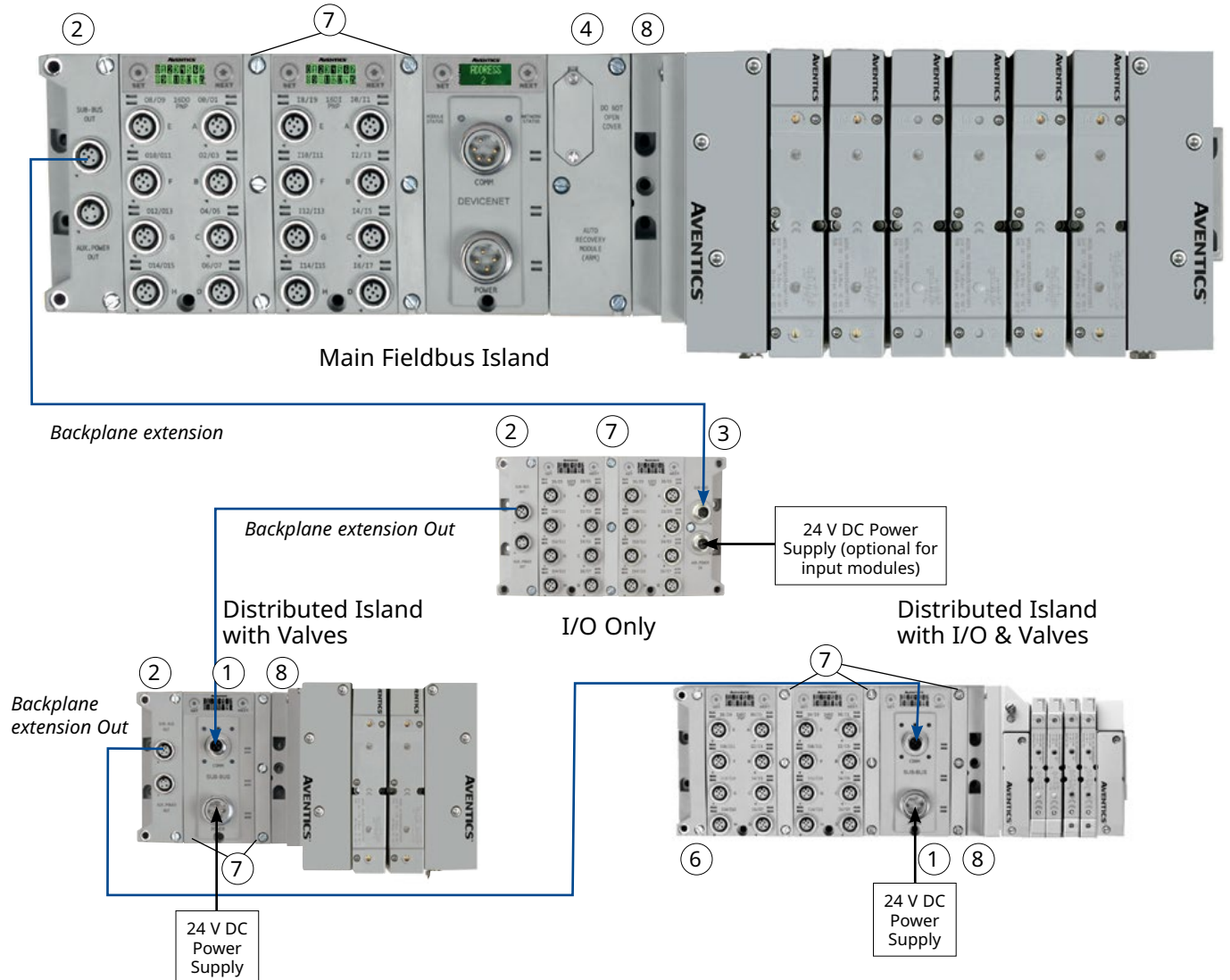Comm. Module

I/O Side

Valve Side
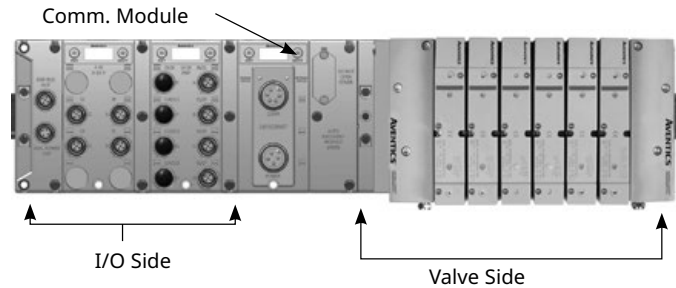
I/O Side Distribution

- 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

Comm. Module

I/O Side

Main fieldbus
Comm. Module

G3 Platform Distribution Options

Main Fieldbus Island

Backplane extension

Backplane extension Out

24 V DC Power Supply (optional for input modules)

Distributed Island with Valves

I/O Only

Distributed Island with I/O & Valves

Backplane extension Out

24 V DC Power Supply

24 V DC Power Supply

Distribution Benefits

- Up to 1200 Input / 1200 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
- Maximum Sub-bus length not to exceed 30 meters. Maximum Sub-bus cable current not to exceed 4 amps or excessive cable voltage drops per segment. Auxiliary power connections available for currents above 4 amps. Consult factory for possible deviations.
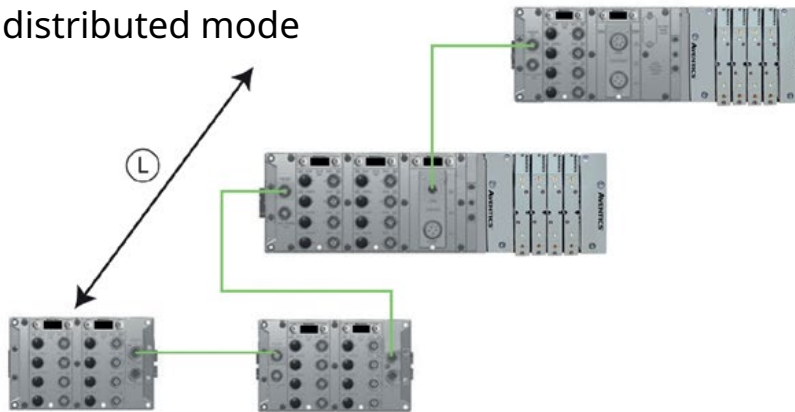
G3 Platform Distribution Options

Integrated Valve systems

In line distributed mode

### Star distributed mode
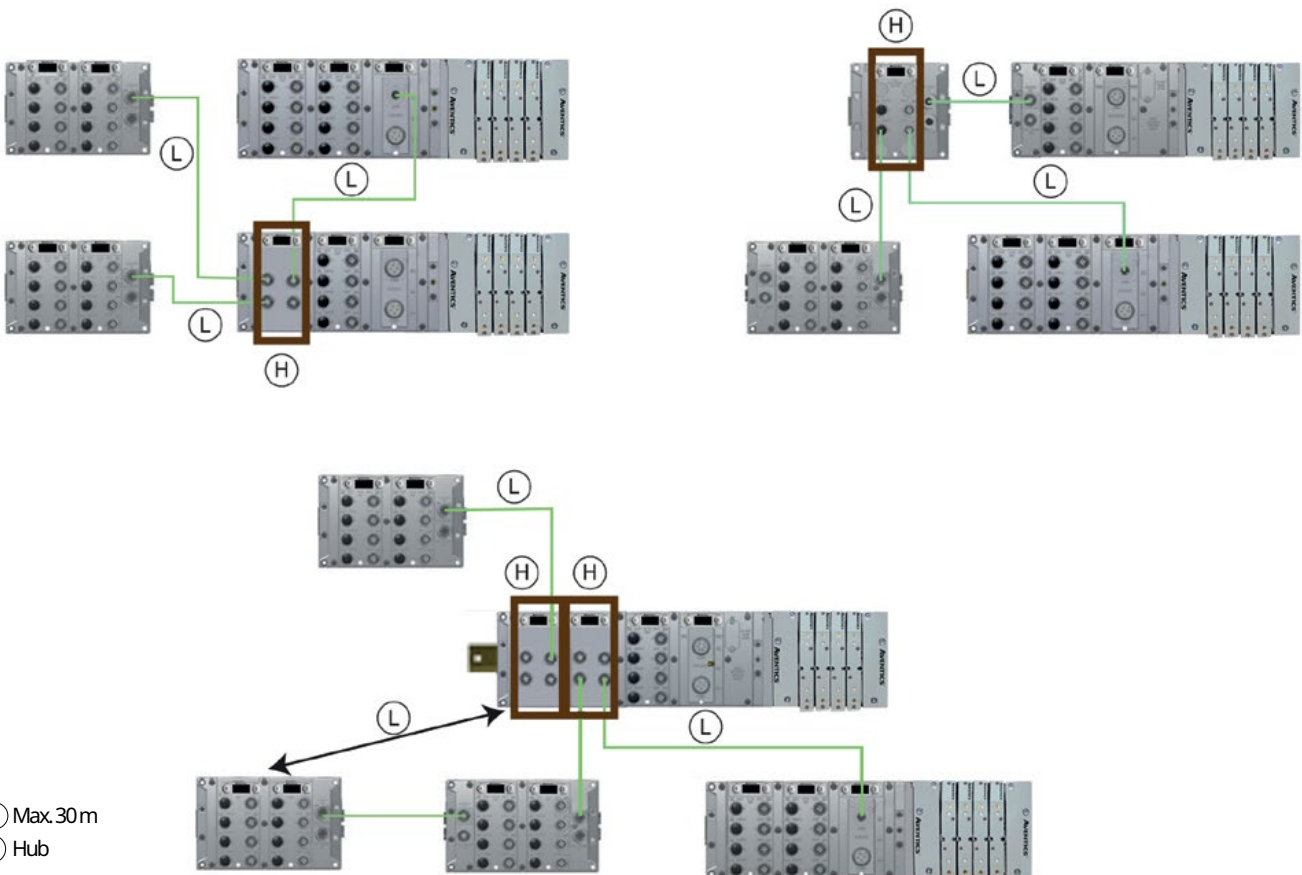
Ⓛ Max. 30 m
Ⓗ Hub

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
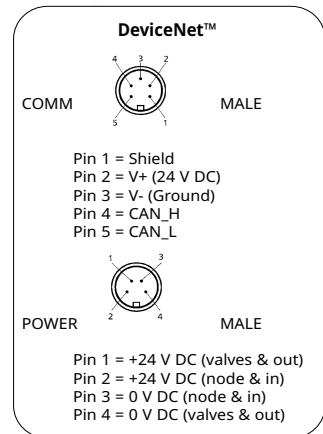
Description	Replacement Part Number
DeviceNet™ Communications Module (node)	240-180

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).

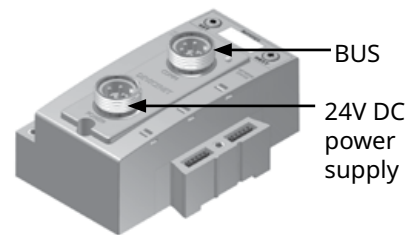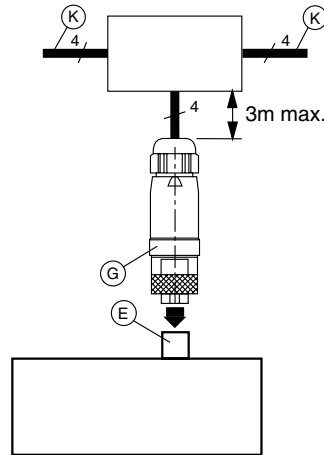The bus can be connected in the two following ways:
• directly to the module with a T-connector;
• with a straight connector, cable (max. length: 3 m) and a DeviceNet distributor box.
The modules on either side of the system must be provided with terminating resistors (L1 or L2).

Wiring with T-connector
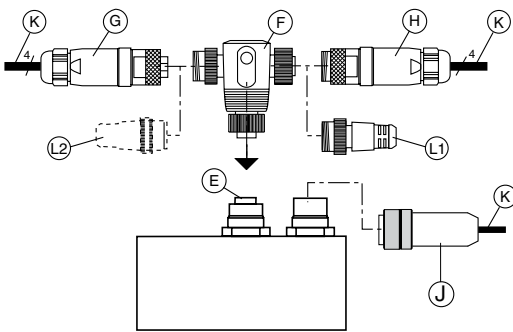
Connection with DeviceNet™ distributor box (X)

BUS

24V DC power supply

3m max.

Accessories for DeviceNet™

The modules on either side of the system must be provided with terminating resistors Ⓛ

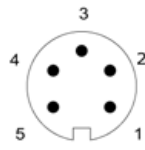| N°	Accessories	Description		Part Number (Europe)	Part Number (Americas)
		M12 Backplane extension cables with SPEEDCON connector technology			
G		5 pin straight 7/8-16 UN female network connector, Field Wireable		**88161930**	**MC05F90000000000**
		5 pin straight 7/8-16 UN female network connector, Single Ended Cable - Shielded	5 m	-	**MC0505MGD0000000**
			10 m	-	**MC0510MGD0000000**
		5 Pin M12 Straight female network connector, Single Ended Cable - Shielded	5 m	-	**TC0505MGD0000000**
			10 m	-	**TC0510MGD0000000**
H		5 pin straight 7/8-16 UN male network connector, Field Wireable		**88161931**	**MA05F90000000000**
F		T-connector 7/8-16 UN, 5 male / female / female pins, MINI 3 Way "T"		**88161932**	**MC0500000MT05000**
L1		Terminating resistor 7/8-16 UN female plug 120 ohms		**88161933**	-
L2		Terminating resistor 7/8-16 UN male plug 120 ohms		**88161934**	**MA05TR0000000000**
		Terminating resistor M12 male plug		-	**TA05TR0000000000**
J		4 pin straight female cable connector 7/8", supply 24		**230-1003**	-
		4 pin elbow female cable connector 7/8", supply 24 V		**230-1001**	-
		4 pin elbow female cable connector 7/8" with 9.15 m supply 24 V DC 1 = brown 2 = white 3 = blue 4 = black		**230-950**	-
		7/8" MINI Straight 5 Pin Female Single Ended Cable, Euro Color Code	5 m	-	**MC0505MAG0000000**
			10 m	-	**MC0510MAG0000000**
		7/8" MINI 90° 5 Pin Female Single Ended Cable, Euro Color Code	5 m	-	**MD0505MAG0000000**
			10 m	-	**MD0510MAG0000000**

(K) Cable to be ordered separately.

**MINI Cable -
Pin Out/Color Code**   (Male View)

**M12 Cable -
Pin Out/Color Code**   (Male View)

1	DRAIN
2	V+ (RED)
3	V- (BLACK)
4	CAN_H (WHITE)
5	CAN_L (BLUE)

| Technical Data	Cable	T & TR	Field Wireable
Molded Body/Insert	PVC	PVC	Body = Glass Filled Polyamide
Coupling Nut	Nickel Plated Brass or Anodized Aluminum	Clear Anodized Aluminum	Black Anodized Aluminum
Cable Jacket Material	PVC	N/A	N/A
Cable O.D.	MINI = 8mm M12 = 8mm	N/A	5 – 13mm - One size fits all
Voltage Rating (Nominal)	150 Volts	T = 300 Volts	600 Volts
Current Rating	MINI = 4.0 Amps MR = 3.0 Amps	T = 8.0 Amps TR = NA	8.0 Amps
Degree of Protection	IP65 (mated)	IP65 (mated)	IP65 (mated)
Operating Temperature	-40 °C to 80 °C (-40 °F to 176 °F)	-40 °C to 105 °C (-40 °F to 221 °F)	-40 °C to 90 °C (-40 °F to 194 °F)
Conductor Gauge	22 AWG Power 24 AWG Signal	N/A	16 – 22 AWG
Bend Radius Minimum	Cable = 72mm	N/A	N/A
Wire Connection	NA	N/A	Screw Terminal

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.

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)

Description	Replacement Part Number
Modbus® TCP/IP Communications Module (node)	**240-292**
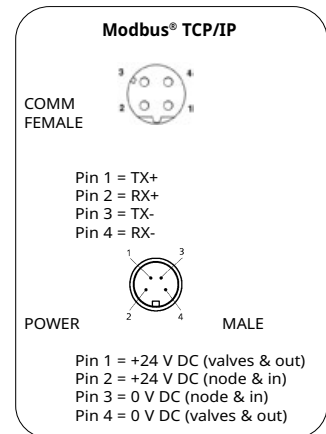
Technical Data

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		Part Number (Europe)	Part Number (Americas)
	M12 Straight 4 Pin Male D-Coded to Male RJ45 network Cable - Shielded	5m	QA0405MK0VA04000	
		10m	QA0410MK0VA04000	
	M12 Straight 4 Pin Male D-Coded Single Ended Cable	5m	-	QA0405MK00000000
		10m	-	QA0410MK00000000
	M12 Straight 4 Pin Male D-Coded Double Ended Cable	5m	-	QA0405MK0QA04000
		10m	-	QA0410MK0QA04000
	M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Convertor	0.2m	-	QA04D2MK0VC04000
	M12 Straight 4 Pin Male D-Coded Field Wireable network Connector PG 9 Cable Gland – Screw Terminal		QA04F20000000000	
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland - IDC		-	QA04F2000000071N
	RJ45 Field Wireable Connector PG 9 Cable Gland - IDC		-	VA08F2000000071N
	4 pin straight female cable connector 7/8", suply 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 connector 7/8" with 9.15 m cable, suply 24 V DC	1 = brown 2 = white 3 = blue 4 = black	230-950	-

**M12 D-Coded Cable -
Pin Out/Color Code**   (Male View)

Technical Data	Cable	RJ45 Field Wireable	M12 Field Attachable
Molded Body/Insert	TPU, PA, PA66	Housing = PA Carrier = PC	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc or Brass	NA	Nickel Plated Brass
Cable Jacket Material	PUR or PVC	NA	NA
Cable O.D.	0.67 to 8.0mm	4.5 to 8.0mm	6.0 to 8.0mm
Voltage Rating (Nominal)	42 Volts	NA	60 Volts
Current Rating	1.5 Amps	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated)	IP20	IP 65 (mated)
Operating Temperature	-20 °C to 60 °C (-4 °F to 140 °F)	-20 °C to 70 °C (-4 °F to 158 °F)	-40 °C to 85 °C (-40 °F to 185 °F)
Conductor Gauge	26 & 24 AWG	26 – 22 AWG Solid/Stranded	Screw 24 – 18 AWG IDC 26 – 22 AWG
Bend Radius	40mm	NA	NA
Wire Connection	NA	IDC	IDC, Screw Terminal

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

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)
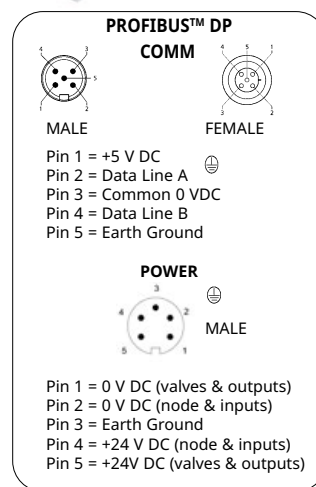
Description	Replacement Part Number
PROFIBUSTM DP Communications Module (node)	**240-239**

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)

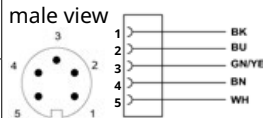**Fieldbus connection**

Wiring with T-connector

BUS

24V DC
power supply
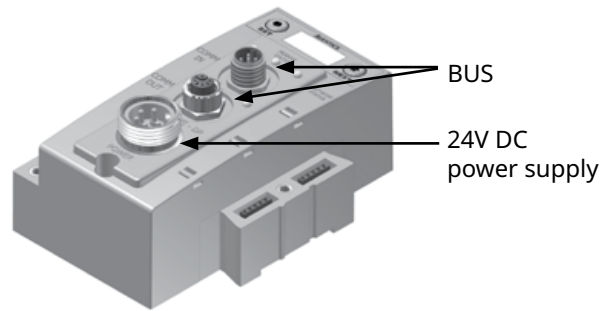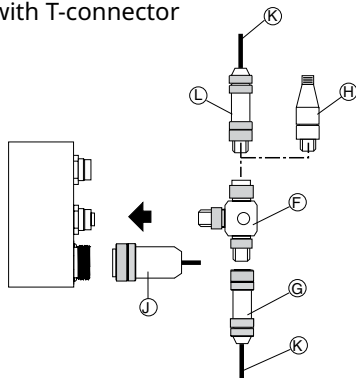
Accessories for PROFIBUS™ DP

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

N°	Accessory	Description		Part Number (Europe)	Part Number (Americas)
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**	**RC05F200P0000000**
		M12 Straight 5 Pin Female Reverse Key Single Ended Cable - Shielded	5m	**-**	**RC0505MHP0000000**
			10m	**-**	**RC0510MHP0000000**
L		M12-B connector , 5 male pins - for cable dia. 6 - 8 mm (Profibus 12Mb max)		**88100714**	**RA05F200P0000000**
		M12 Straight 5 Pin Female Reverse Key Single Ended Cable - Shielded	5m	**-**	**RA0505MHP0000000**
			10m	**-**	**RA0510MHP0000000**
		M12 Straight 5 Pin MALE TO FEMALE Reverse Key EXTENSION CABLE	5m	**-**	**RC0505MHPRC05000**
			10m	**-**	**RC0510MHPRC05000**
H		Terminating resistor M12-B - male plug		**88100716**	**RA05TR0000000000**
		5 pin straight female cable connector 7/8"		**MC05F90000000000**	**-**
		5 pin elbow female cable connector 7/8"		**MD05F20000000000**	**-**
J		7/8" MINI Straight 5 Pin Female Single Ended Cable, Euro Color Code	5m	**-**	**MC0505MAG0000000**
			10m	**-**	**MC0510MAG0000000**
		7/8" MINI 90° 5 Pin Female Single Ended Cable, Euro Color Code	5m	**-**	**MD0505MAG0000000**
			10m	**MD0510MAG0000000**	
		Dust cover - M12 female		**88157773**	**-**

male view

```
      3
   4     2        1 ── BK
   5     1        2 ── BU
                  3 ── GN/YE
                  4 ── BN
                  5 ── WH
```

(K) Cable to be ordered separately.

**M12 Reverse Key B-Coded Cable -
Pin Out/Color Code**

(Male View)
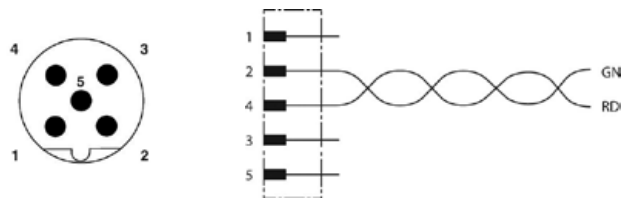
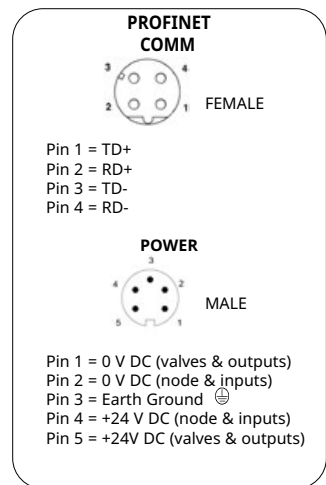| Technical Data	Cable	RJ45 Field Attachable	M12 Field Attachable
Molded Body/Insert	TPU	TR = TPU	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc	Nickel Plated Zinc or Brass	Nickel Plated Brass
Cable Jacket Material	PUR	N/A	N/A
Cable O.D.	7.4 mm	N/A	8.5 mm Max.
Voltage Rating (Nominal)	250 Volts	60 Volts	60 Volts
Current Rating	4.0 Amps	4.0 Amps	4.0 Amps
Degree of Protection	IP65 (mated)	IP65 (mated)	IP 65 (mated)
Operating Temperature	-20 °C to 80 °C (-4 °F to 176 °F)	-10 °C to 60 °C (14 °F to 140 °F)	-40 °C to 85 °C (-40 °F to 185 °F)
Conductor Gauge	24 AWG	N/A	18 AWG Maximum
Bend Radius	Cable = 78mm	N/A	N/A
Wire Connection	N/A	N/A	Screw Terminal

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

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)

Description	Replacement Part Number
PROFINET® Communications Module (node)	**240-240**

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		Part Number (Europe)	Part Number (Americas)
	M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable - Shielded	5m	**QA0405MK0VA04000**	**QA0405MR0VA04000**
		10m	**QA0410MK0VA04000**	**QA0410MR0VA04000**
	M12 Straight 4 Pin Male D-Coded Single Ended Cable	5m	-	**QA0405MR00000000**
		10m	-	**QA0410MR00000000**
	M12 Straight 4 Pin Male D-Coded Double Ended Cable	5m	-	**QA0405MR0QA04000**
		10m	-	**QA0410MR0QA04000**
	M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Convertor	0.2m	-	**QA04D2MK0VC04000**
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland – Screw Terminal		**QA04F20000000000**	
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland - IDC		-	**QA04F200R000071N**
	5 pin straight female Field Wireable cable connector 7/8"		**MC05F90000000000**	-
	5 pin elbow female Field Wireable cable connector 7/8"		**MD05F20000000000**	-
	RJ45 Field Wireable Connector PG 9 Cable Gland		-	**VA08F200R000071N**
	7/8" MINI Straight 5 Pin Female Single Ended Cable, Euro Color Code	5m	-	**MC0505MAG0000000**
		10m	-	**MC0510MAG0000000**
	7/8" MINI 90° 5 Pin Female Single Ended Cable, Euro Color Code	5m	-	**MD0505MAG0000000**
		10m	**MD0510MAG0000000**	

male view

1		BK
2		BU
3		GN/YE
4		BN
5		WH

Server web page

M12 D-Coded Cable - Pin Out/Color Code	(Male View)		1 — YE 2 — WH 3 — OG 4 — BU

Technical Data	Cable	RJ45 Field Attachable	M12 Field Attachable
Molded Body/Insert	TPU	Housing = PA Carrier = PC	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc	N/A	Nickel Plated Brass
Cable Jacket Material	PVC	N/A	N/A
Cable O.D.	6.5 to 7.4mm	Accepts 4.5 to 8.0mm	Accepts 6.0 to 8mm
Voltage Rating (Nominal)	250 Volts	N/A	60 Volts
Current Rating	4.0 Amps	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated), RJ45 – IP20	IP20	IP 65 (mated)
Operating Temperature	-25 °C to 60 °C (-13 °F to 140 °F)	-10 °C to 60 °C (14 °F to 140 °F)	-40 °C to 85 °C (-40 °F to 185 °F)
Conductor Gauge	22 & 24 AWG	22 AWG Solid/Stranded	Screw 24-18 AWG IDC 26-22 AWG
Bend Radius Minimum	19.5mm (fixed) 45.5mm (Flexible)	N/A	N/A
Wire Connection	N/A	IDC	Screw Terminal, IDC

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

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)

Description	Replacement Part Number
Ethernet POWERLINK® Communications Module (node)	**240-309**

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)

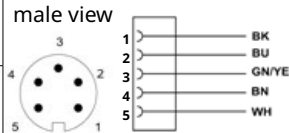| Configuration Data	
Graphic Display	Display used for setting Node Address, Baud Rate, Fault/Idle Actions, and all other system settings.
ARM	(Auto Recovery Module) Optional module that contains automatic recovery of system setting in the event of total or partial system failure
Maximum Valve-Solenoid 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		Part Number (Europe)	Part Number (Americas)
	M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable - Shielded	5m	QA0405MK0VA04000	QA0405MS0VA04000
		10m	QA0410MK0VA04000	QA0410MS0VA04000
	M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable - Shielded	5m	-	QA0405MS0QA04000
		10m	-	QA0410MS0QA04000
	M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Convertor	0.2m	-	QA04D2MK0VC04000
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland – Screw Terminal		QA04F20000000000	
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland - IDC		-	QA04F200R000071N
	5 pin straight female Field Wireable cable connector 7/8"		MC05F90000000000	-
	5 pin elbow female Field Wireable cable connector 7/8"		MD05F20000000000	-
	RJ45 Field Wireable Connector		-	VA08F200R000071N
	7/8" MINI Straight 5 Pin Female Single Ended Cable, Euro Color Code	5m	-	MC0505MAG0000000
		10m	-	MC0510MAG0000000
	7/8" MINI 90° 5 Pin Female Single Ended Cable, Euro Color Code	5m	-	MD0505MAG0000000
		10m	MD0510MAG0000000	

male view

```
3        1 —— BK
  4      2 —— BU
   2     3 —— GN/YE
  5  1   4 —— BN
         5 —— WH
```

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	

**M12 D-Coded Cable & RJ45
Pin Out/Color Code**

(Male View)

RJ45 to M12

M12 to M12
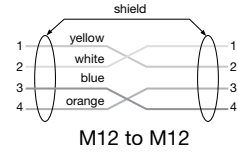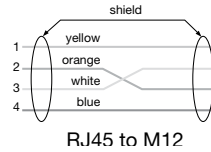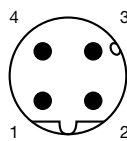
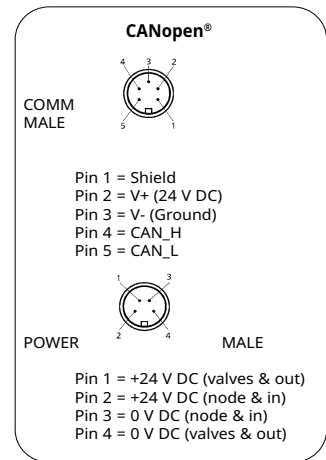| Technical Data	Cable	RJ45 Field Attachable	M12 Field Attachable
Molded Body/Insert	N/A	Housing = PA Carrier = PC	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc or Brass	N/A	Nickel Plated Brass
Cable Jacket Material	PUR	N/A	N/A
Cable O.D.	6.5mm	Accepts 4.5 to 8.0mm	Accepts 6.0 to 8mm
Voltage Rating (Nominal)	N/A	N/A	60 Volts
Current Rating	N/A	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated), RJ45 – IP20	IP20	IP 65 (mated)
Operating Temperature	-25 °C to 60 °C (-13 °F to 140 °F)	-10 °C to 60 °C (14 °F to 140 °F)	-40 °C to 85 °C (-40 °F to 185 °F)
Conductor Gauge	22 AWG	22 AWG Solid/Stranded	Screw 24 – 18 AWG IDC 26-22 AWG
Bend Radius Minimum	45.5mm	N/A	N/A
Wire Connection	N/A	IDC	Screw Terminal, IDC

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

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)

Description	Replacement Part Number
CANopen® Communications Module (node)	**240-291**

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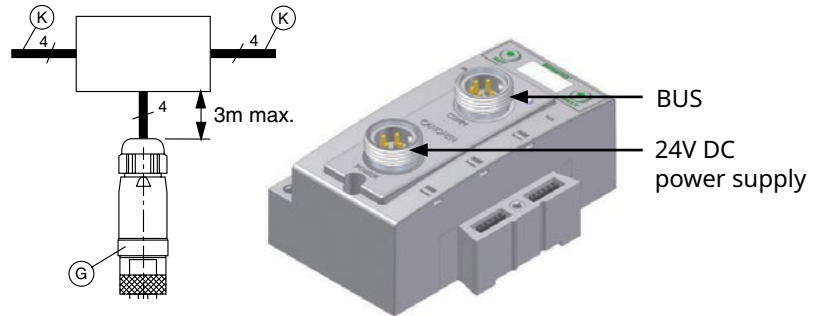
The bus can be connected in the two following ways:
• directly to the module with a T-connector,
• with a straight connector, cable (max. length: 3 m) and a DeviceNet distributor box.
The modules on either side of the system must be provided with terminating resistors (L1 or L2).

Wiring with T-connector
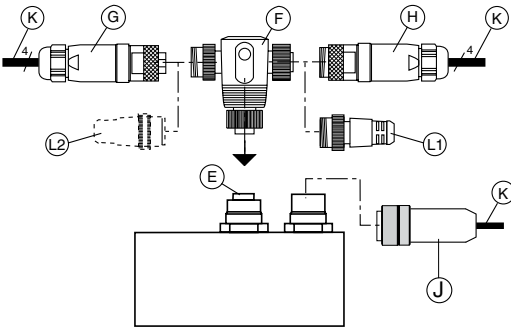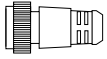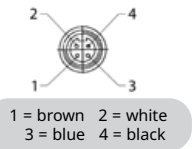
Connection with distributor box

BUS

24V DC
power supply

Accessories for CANopen®

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

Accessory		Description		Part Number (Europe)	Part Number (Americas)
G		5 pin straight 7/8-16 UN female network connector, Field Wireable		**88161930**	**MC05F90000000000**
		5 pin straight 7/8-16 UN female network connector, Single Ended Cable - Shielded	5m	-	**MC0505MGD0000000**
			10m	-	**MC0510MGD0000000**
		5 Pin M12 Straight female network connector, Single Ended Cable - Shielded	5m	-	**TC0505MGD0000000**
			10m	-	**TC0510MGD0000000**
H		5 pin straight 7/8-16 UN male network connector, Field Wireable		**88161931**	**MA05F90000000000**
F		T-connector 7/8-16 UN, 5 male / female / female pins, MINI 3 Way "T"		**88161932**	**MC0500000MT05000**
L1		Terminating resistor 7/8-16 UN female plug 120 ohms		**88161933**	-
L2		Terminating resistor 7/8-16 UN male plug 120 ohms		**88161934**	**MA05TR0000000000**
		Terminating resistor M12 male plug		-	**TA05TR0000000000**
J		4 pin straight female cable connector 7/8", supply 24		**230-1003**	-
		4 pin elbow female cable connector 7/8", supply 24 V		**230-1001**	-
		4 pin elbow female cable connector 7/8" with 9.15 m supply 24 V DC 1 = brown 2 = white 3 = blue 4 = black		**230-950**	-

(K) Cable to be ordered separately.

MINI Cable -
Pin Out/Color Code   (Male View)

M12 Cable -
Pin Out/Color Code   (Male View)

1 DRAIN
2 V+ (RED)
3 V- (BLACK)
4 CAN_H (WHITE)
5 CAN_L (BLUE)

Technical Data	Cable	T & TR	Field Wireable
Molded Body/Insert	PVC	PVC	Body = Glass Filled Polyamide
Coupling Nut	Nickel Plated Brass or Anodized Aluminum	Clear Anodized Aluminum	Black Anodized Aluminum
Cable Jacket Material	PVC	N/A	N/A
Cable O.D.	MINI = 8mm M12 = 8mm	N/A	5 – 13mm - One size fits all
Voltage Rating (Nominal)	150 Volts	T = 300 Volts	600 Volts
Current Rating	MINI = 4.0 Amps MR = 3.0 Amps	T = 8.0 Amps TR = NA	8.0 Amps
Degree of Protection	IP65 (mated)	IP65 (mated)	IP65 (mated)
Operating Temperature	-40 °C to 80 °C (-40 °F to 176 °F)	-40 °C to 105 °C (-40 °F to 221 °F)	-40 °C to 90 °C (-40 °F to 194 °F)
Conductor Gauge	22 AWG Power 24 AWG Signal	N/A	16 – 22 AWG
Bend Radius Minimum	Cable = 72mm	N/A	N/A
Wire Connection	NA	N/A	Screw Terminal

AVENTICS™ G3 Electronics and I/O

EtherNet/IP™ DLR

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.

Capable of addressing up to 1200 outputs and 1200 inputs, 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).

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.
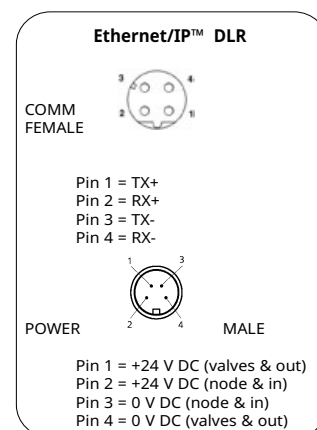
Ethernet/IP™ DLR

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)

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/IP™ DLR

Accessory	Description		Part Number (Europe)	Part Number (Americas)
	M12 Straight 4 Pin Male D-Coded to Male RJ45 network Cable - Shielded	5m	QA0405MK0VA04000	
		10m	QA0410MK0VA04000	
	M12 Straight 4 Pin Male D-Coded Single Ended Cable	5m	-	QA0405MK00000000
		10m	-	QA0410MK00000000
	M12 Straight 4 Pin Male D-Coded Double Ended Cable	5m	-	QA0405MK0QA04000
		10m	-	QA0410MK0QA04000
	M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Convertor	0.2m	-	QA04D2MK0VC04000
	M12 Straight 4 Pin Male D-Coded Field Wireable network Connector		QA04F20000000000	
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland - IDC		-	QA04F2000000071N
	RJ45 Field Wireable Connector PG 9 Cable Gland - IDC		-	VA08F2000000071N
	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	2 — 4 / 1 — 3 1 = brown 2 = white 3 = blue 4 = black	230-950	-

M12 D-Coded Cable -
Pin Out/Color Code   (Male View)

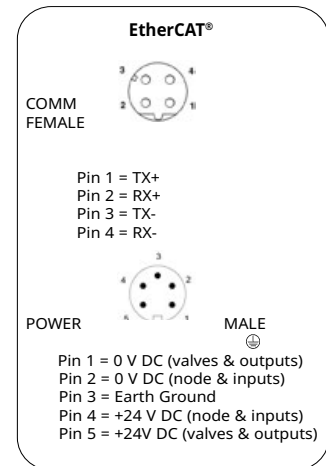| Technical Data	Cable	RJ45 Field Wireable	M12 Field Attachable
Molded Body/Insert	TPU, PA, PA66	Housing = PA Carrier = PC	Body = Nickel Plated Zinc Insert = PA 66
Coupling Nut	Nickel Plated Zinc or Brass	NA	Nickel Plated Brass
Cable Jacket Material	PUR or PVC	NA	NA
Cable O.D.	0.67 to 8.0mm	4.5 to 8.0mm	6.0 to 8.0mm
Voltage Rating (Nominal)	42 Volts	NA	60 Volts
Current Rating	1.5 Amps	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated)	IP20	IP 65 (mated)
Operating Temperature	-20 °C to 60 °C (-4 °F to 140 °F)	-20 °C to 70 °C (-4 °F to 158 °F)	-40 °C to 85 °C (-40 °F to 185 °F)
Conductor Gauge	26 & 24 AWG	26 – 22 AWG Solid/Stranded	Screw 24 – 18 AWG IDC 26 – 22 AWG
Bend Radius	40mm	NA	NA
Wire Connection	NA	IDC	IDC, Screw Terminal

EtherCAT®

EtherCAT® is an open ethernet based fieldbus protocol developed by Beckhoff. EtherCAT® sets new standards for real-time performance and topology flexibility with short data update/cycle 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.

EtherCAT®

COMM
FEMALE

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

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)

Description	Replacement Part Number
EtherCAT® Communications Module (node)	**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		Part Number (Europe)	Part Number (Americas)
	M12 Straight 4 Pin Male D-Coded to Male RJ45 Cable - Shielded supply 24 V DC	5m	QA0405MK0VA04000	QA0405MT0VA04000
		10m	QA0410MK0VA04000	QA0410MT0VA04000
	M12 Straight 4 Pin Male D-Coded Single Ended Cable	5m	-	QA0405MT00000000
		10m	-	QA0410MT00000000
	M12 Straight 4 Pin Male D-Coded Double Ended Cable	5m	-	QA0405MT0QA04000
		10m	-	QA0410MT0QA04000
	M12 Straight 4 Pin Male D-Coded to RJ45 Female Socket Convertor	0.2m	-	QA04D2MK0VC04000
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland – Screw Terminal		QA04F20000000000	
	M12 Straight 4 Pin Male D-Coded Field Wireable Connector PG 9 Cable Gland - IDC		-	QA04F200R000071N
	RJ45 Field Wireable Connector PG 9 Cable Gland - IDC		-	VA08F200R000071N
	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	-
	7/8" MINI Straight 5 Pin Female Single Ended Cable, Euro Color Code	5m	-	MC0505MAG0000000
		10m	-	MC0510MAG0000000
	7/8" MINI 90° 5 Pin Female Single Ended Cable, Euro Color Code	5m	-	MD0505MAG0000000
		10m	MD0510MAG0000000	

male view
1 — BK
2 — BU
3 — GN/YE
4 — BN
5 — WH

**M12 D-Coded Cable -
Pin Out/Color Code**

(Male View)

Pin	Color
1	YE
2	WH
3	OG
4	BU

Technical Data	Cable	RJ45 Field Wireable	M12 Field Attachable
Molded Body/Insert	TPU/PE	Housing = PA Carrier = PC	Nickel Plated Zinc/PA 66
Coupling Nut	Nickel Plated Zinc	NA	Nickel Plated Brass
Cable Jacket Material	PVC	NA	NA
Cable O.D.	6.5mm	Accepts 4.5 to 8.0mm	Accepts 4.0 to 8mm
Voltage Rating (Nominal)	250 Volts	NA	60 Volts
Current Rating	4.0 Amps	1.75 Amps	Screw 4.0 Amps IDC 1.75 Amps
Degree of Protection	IP65 (mated), RJ45 – IP20	IP20	IP 65 (mated)
Operating Temperature	-40 °C to 70 °C (-40 °F to 158 °F)	-10 °C to 60 °C (14 °F to 140 °F)	-40 °C to 85 °C (-40 °F to 185 °F)
Conductor Gauge	22 & 24 AWG	22 AWG Solid/Stranded	Screw 24 – 18 AWG IDC 26 – 22 AWG
Bend Radius Minimum	19.5mm (fixed) 45.5mm (Flexible)	NA	NA
Wire Connection	NA	IDC	Screw Terminal, IDC

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	16 Inputs	**240-205**	**240-209**	-
	16 Inputs 19 Pin M23 (**Fig. B Only**)	**240-323**	-	-
	8 Inputs (**Ex ia**)	-	-	**240-320**
Outputs	16 Outputs PNP	**240-207**	-	-
	8 Outputs PNP high current (1A) (**Fig. A Only**)	**240-300**	-	-
Inputs & Outputs	8 Inputs & 8 Outputs	**240-211**	-	-

Figure A

Figure B
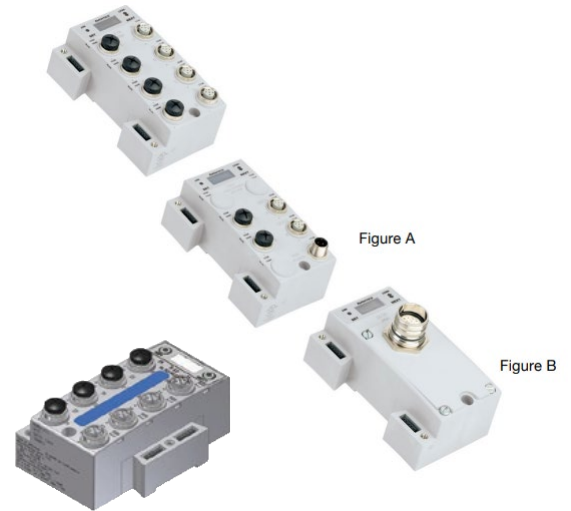
ia (Namur) input module

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 4 Inputs & 4 Outputs	**240-307** -	- **240-363**

Digital Inputs -Terminal Strip Modules
with short circuit protection integrated
Digital Inputs -Terminal Strip Modules

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

ia (Namur) input module

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	
M12 Module - Analog	244 g
M12 Module - Digital	274 g
M12 Module - High Current Outputs	264 g
M23 Module	343 g
Terminal Strip Module	292 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) $\geq$ 2.1 mA Signal Current (1) $\leq$ 1.2 mA Short Circuit Monitoring < 100 Ω Open/Broken Wire Detection < 0.05 mA
Safety Parameter Output Maximums	$U_o \leq 9.6$ V $I_o \leq 13$ mA $P_o \leq 31$ mW
Diagnostics	Open (broken wire) and Short Circuit
Certification	
Module Marking (ATEX)	⟨Ex⟩ II(1)GD [EX ia Ga] IIC [EX ia Da] IIC
I/O Connector	M12 4 Pin Female (Compatible with 5 Pin)
	Terminal Strip
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
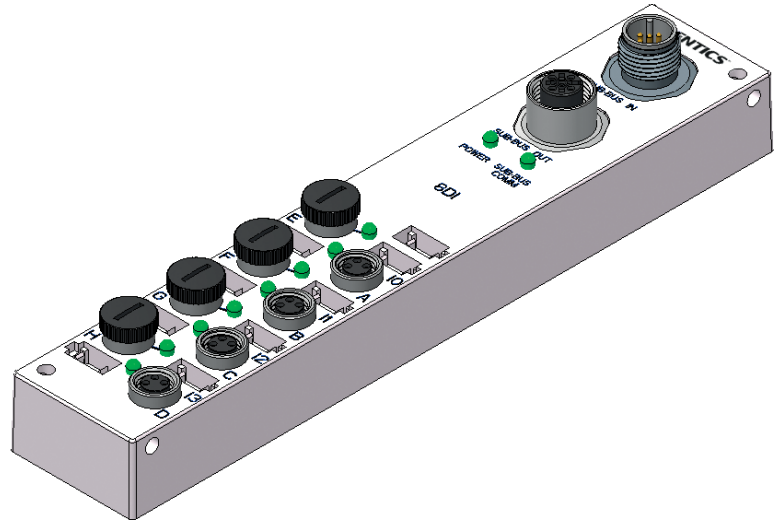
Technical Data

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**

Sub-bus   Sub-bus   Sub-bus   Sub-bus

AVENTICS™ G3 Electronics and I/O
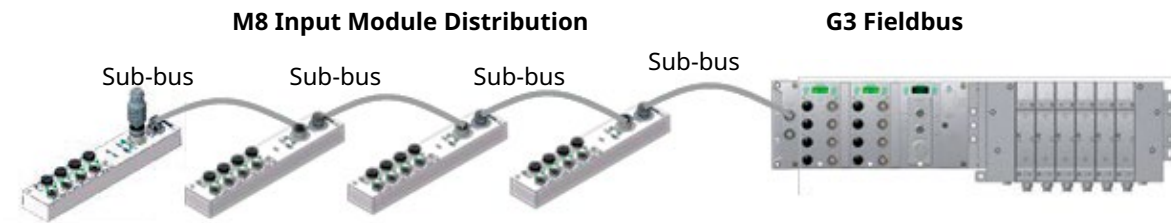
I/O Modules M12
RTD temperature sensor input module
Analog I/O (16 bit resolution)
5-pin M12 Modules

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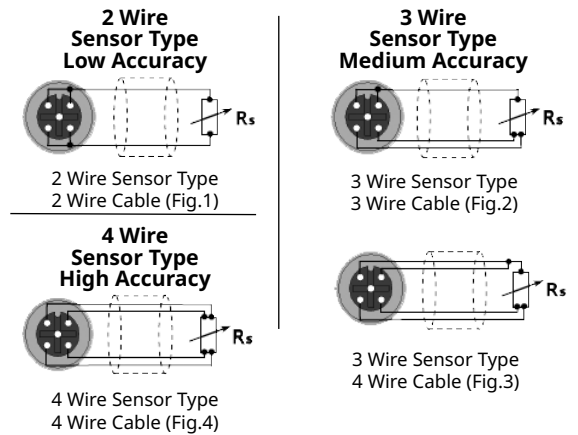
⚠ . For maximum accuracy on a 3 wire sensor type make identified jumper connections at the sensor end (see Fig.3). Cable resistance, resulting from cable length, affects mesuring error; therefore use cables that are as short as possible.

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

IO-Link Master

Multiple masters can be incorporated into one valve system, can be distributed via Sub-bus up to 30 meters, and can support standard IO-Link smart sensors.

Description	Replacement Part Number
8 Port Class A IO-Link Master	**240-381**
Supports 580 IO-Link for Series 500 valve systems, Series AV and ES05 valve systems with IO-Link, Sentronic proportional valves with IO-Link, AF2 Flow Sensors with IO-Link, and other IO-Link smart sensors	

Wiring Diagram

Pin 1= +24VDC (UNSW)
Pin 2= Digital Input /
       Digital Output
Pin 3= 0VDC (UNSW)
Pin 4= IO-Link / Digital Input /
       Digital Output
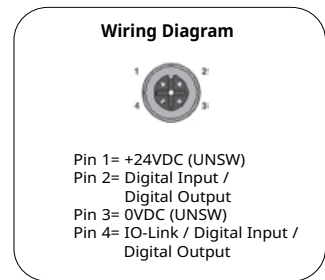
Technical Data

| Operating Data	
Supported Protocols	Ethernet/IP DLR and PROFINET
Input Type	Class A
Supported Sensor Type	IO-Link and Digital
Temperature Range (ambient)	-23 °C to 50 °C (-10 °F to 122 °F)
Humidity	95% relative humidity, non-condensing
Vibration/Shock	IEC 60068-2-27, IEC60068-2-6
Ingress Protection	IP65 (with appropriate assembly and termination)
Connector	M12 5 Pin Female, SPEEDCON®
Data Format	Mapped & Event Diagnostics
Special Features	Up to 16 IO-Link Class A master modules per communication module
	Supports IO-Link Class B solutions with optional T-adapter R412028657

Weight	
Class A IO-Link Master	278g / 9.8 oz

NOTE: For IO-Link communication cables see the 580 Series IO-Link Communication Class A & B Cables and Connectors section and for power cables see the 580 Series Power Cables and Connectors section.

I/O Module Accessories

Accessory	Description	Part Number (Europe)	Part Number (Americas)
	M12 Straight 4 Pin Male Field Wireable Connector, IDC Connection - PG 9 Cable Gland w/ SPEEDCON® connector technology	-	TA04F2000000081E
	5 pin straight male M12 connector	88100330	-
	M12 Straight 4 Pin Male Field Wireable Connector, Screw Terminal - PG 7 Cable Gland	-	TA04F10000000000
	M12 Straight 4 Pin Male Field Wireable Connector, Screw Terminal - PG 9 Cable Gland	-	TA04F20000000000
	5 pin elbow male M12 connector	88161927	-
	M12 Straight 4 Pin Male Field Wireable Connector, Screw Terminal - PG 7 Cable Gland	-	TB04F10000000000
	M12 Straight 4 Pin Male Field Wireable Connector, Screw Terminal - PG 9 Cable Gland	-	TB04F20000000000
	Dust Cover - M12 Male	230-647	
	5 pin male DUO M12 connector for 2 inputs (2 cables, Ø3-5 mm)	88100253	-
	M12 to M12 "Y" Splitter, 21mm Spacing	-	TA0500000JC05000
	M12 to M8 "Y" Splitter	-	TA0400000KC03000
	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
	M12 Straight 4 Pin Male to Female Cable Extension	1.5 m	TC04E5MIETA0471P
		3 m	TC0403MIETA0471P
	M12 Straight 3 Pin Male to M8 3 Pin Straight Female Extension	1.5 m	TC03E5MIEPA0371P
		3 m	TC0303MIEPA0371P
	M8 3 Pin Straight Male to M8 3 Pin Straight Female Extension	1.5 m	PC03E5MIEPA0371P
		3 m	PC0303MIEPA0371P
	Replacement Terminal strip	I/O 0-7	140-1073
		I/O 8-15	140-1074
-	Keying Element for terminal strip	140-1076	
-	Keying Element for Module	140-1077	
	IO-Link Class A to Class B T-connector	R412028657	
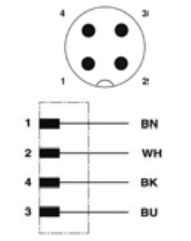
Pin diagram for SPEEDCON connectors:

1	BN
2	WH
4	BK
3	BU

Backplane extension modules and Accessories

N° *	Accessories	Description			Weight	Part Number
Backplane Extension Modules						
1	Distributed Valve Module	Distributed module for valves with display		with I/O	235 g	**240-241**
				w/o I/O, w/o clips (500 Series only)	320 g	**P580AEDS4010A00**
				w/o I/O, with DIN Rail Clips (500 Series only)	332 g	**P580AEDS4010DRM**
2	G3 Backplane extension Left End Module	G3 Left End Module for backplane 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.		ARM Module	131 g/ 4.6 oz	**240-383**
				Wireless ARM Module		**240-382**
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 nelectrical 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		serie 500		
			with DIN Rail Clips		227 g	**P599AE508827002**
			W/o clips		216 g	**P599AE508827001**
				serie 2000		
			with DIN Rail Clips		147 g	**219-858**
			W/o clips		136 g	**219-828**
-	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**
-	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**

* See page 4 for reference numbers

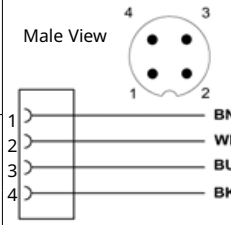## Example Backplane extension Layout and Cabling
(DeviceNet™ / CANopen® Network)

⚠ **Power supply connection (24 V DC)**

Power Supply

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

NOTE: See page 41 for reference numbers

N° *	Accessory	Description		Part Number (Europe)	Part Number (Americas)
		M12 Backplane extension cables with SPEEDCON connector technology			
A		M12 Straight 5 Pin Male to Female Backplane extension Cable - Shielded (backplane extension)	1 m	**TA0501MGDTC0571P**	
			5 m	**TA0505MGDTC0571P**	
			10 m	**TA0510MGDTC0571P**	
		M12 Backplane field wireable connectors and cable			
A		M12 Straight 5 Pin Female Field Wireable Connector, Spring Cage PG9 Cable Gland		-	**TC05F2000000071V**
		M12 Straight 5 Pin Male Field Wireable Connector, Spring Cage PG9 Cable Gland		-	**TA05F2000000071V**
		M12 90º 5 Pin Female Field Wireable Connector, Spring Cage PG9 Cable Gland		-	**TD05F2000000071V**
		M12 90º 5 Pin Male Field Wireable Connector, Spring Cage PG9 Cable Gland		-	**TB05F2000000071V**
		Bulk Sub-bus Cable*	50 m	-	**000550MGD0005000**
			100 m	-	**0005A0MGD0005000**
		7/8" MINI 4 Pin cables & connectors for backplane extension valve module power			
B		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**	**MC04F90000000000**
		7/8" MINI 90° 4 Pin Female Field Wireable Connector – PG 9 Cable Gland		**230-1001**	**MD04F20000000000**

* See page 40 for reference numbers

N° *	Accessory	Description		Part Number (Europe)	Part Number (Americas)
		M12 4 Pin cables for backplane extension In/Out module power			
C		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**	
D		M12 Straight 4 Pin Male to Female Cable Extension	1 m	**TC0401MAETA04000**	
			5 m	**TC0405MAETA04000**	
			10 m	**TC0410MAETA04000**	
		M12 Straight 4 Pin Male to Female Cable Extension	1 m	**TC0405MAE0000000**	
			5 m	**TC0410MAE0000000**	
		M12 Straight 4 Pin Male to Female Cable Extension	1 m	**TD0405MAE0000000**	
			5 m	**TD0410MAE0000000**	
		M12 Straight 4 Pin Female Field Wireable Connector - PG 7 Cable Gland		**TC04F10000000000**	
		M12 Straight 4 Pin Female Field Wireable Connector - PG 9 Cable Gland		**TC04F20000000000**	
		M12 90° 4 Pin Female Field Wireable Connector - PG 7 Cable Gland		**TD04F10000000000**	
		M12 90° 4 Pin Female Field Wireable Connector - PG 9 Cable Gland		**TD04F20000000000**	

Male View: pins 4, 3, 1, 2. 1 BN, 2 WH, 3 BU, 4 BK

*NOTE: Length of field wired cables should not exceed the maximum length of 30 meters for total Sub-bus communications link. See appropriate technical manual for Sub-bus length requirements. The cable assemblies and Bulk cable are the only approved cables for the G3 Sub-bus link. See technical document TDG3SBWD1-0EN for proper installation and wiring of field wireable connectors.
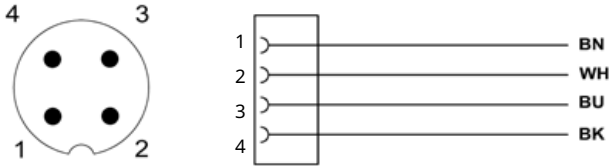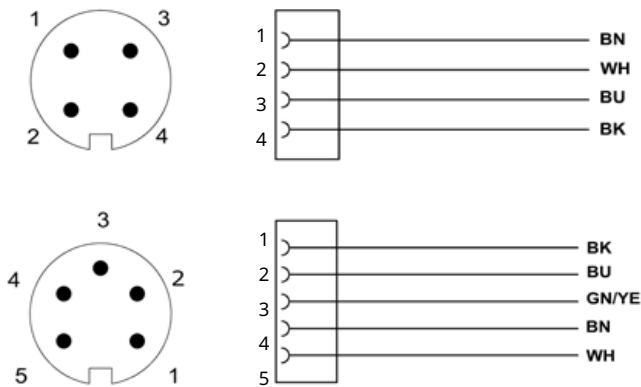
Pin Out and Technical Data

M12 Cable - Pin Out/Euro Color Code

(Male View)

7/8" MINI Cable - Pin Out/Euro Color Code

(Male View)

Technical Data	M12	7/8" MINI
Molded Body/Insert	Cable = PVC Field Wireable = Polyamide	Cable = PVC Field Wireable = Polyamide or PBT
Coupling Nut	Nickel Copper Alloy	Black Anodized Aluminum/Die Cast Zinc
Cable Jacket Material	PVC	PVC
Cable O.D.	7.4mm	7.4mm (4 Pin & 5 Pin)
Voltage Rating (Nominal)	250 V Max. @ 105 °C (221 °F)	250 V Max. @ 105 °C (221 °F)
Current Rating	Cables = 4.0 Amps Field Wireable = 4.0 Amps	Cables = 5.5 Amps Field Wireable = 8.0 Amps
Degree of Protection	IP67 (mated)	IP67 (mated)
Operating Temperature	-25 °C to 85 °C (-13 °F to 185 °F)	-40 °C to 85 °C (-40 °F to 185 °F)
Conductor Gauge	Cable = 18 AWG	Cable = 18 AWG
Bend Radius	Cable = 74mm	Cable = 74mm (4 Pin & 5 Pin)
Maximum Wire AWG	Field Wireable = 18 AWG	Field Wireable = 16 AWG
Wire Connection	Field Wireable = Screw Terminal	Field Wireable = Screw Terminal
PG 7 Range	4 – 6mm	N/A
PG 9 Range	6 – 8mm	5 – 13mm -One size fits all
PG 13.5 Range	N/A	5 – 13mm - One size fits all

M12 Cable Splitter, 2 Straight M12 Female Connectors
TA04D3MIEJC04000 – 0.3 Meter
TA04E5MIEJC04000 – 1.5 Meter
TA0403MIEJC04000 – 3.0 Meter

M12 Cable Splitter, 2 Straight M8 Female Connectors
TA04D3MIEKC03000 – 0.3 Meter
TA04E5MIEKC03000 – 1.5 Meter
TA0403MIEKC03000 – 3.0 Meter

Wire Stripper Tool
140-1097

I/O Cable Connector Pin Out Diagrams

M12 Cable - Pin Out/Color Code

TA04XXMIE0000000,
TB04XXMIE0000000

(Male View)

M12 Cable - Pin Out/Color Code

TC03XXMIEPA0371P
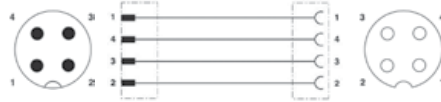
(Male to Female View)

M12 Cable - Pin Out/Color Code

TC03XXMIEPA0371P

(Male to Female View)

M12 to M12 "Y" Splitter - Pin Out

TA0500000JC05000

(Male to Female View)
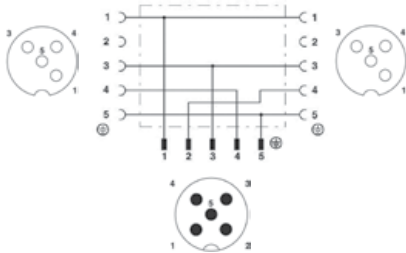
M12 to M8 "Y" Splitter - Pin Out

TA0400000KC03000

(Male to Female View)
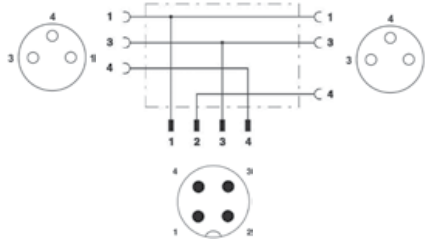
M12 Field Wireable (IDC) - Pin Out

TA04F2000000081E (SPEEDCON®)

(Male View)

M12 to M12 Cable Splitter - Pin Out

TA04XXMIEJC04000

(Male to Female View)
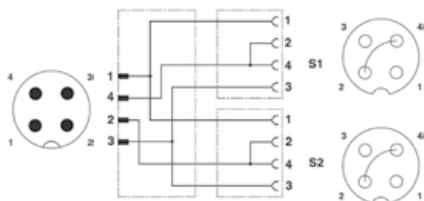
M12 to M8 Cable Splitter - Pin Out

TA04XXMIEKC03000

(Male to Female View)
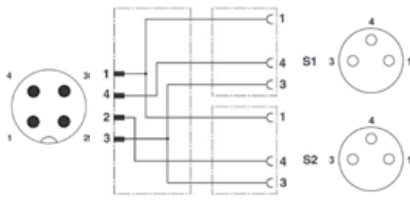
M8 Cable - Pin Out/Color Code

PC03XXMIEPA0371P

(Male to Female View)

NOTE:
XX denotes allowable length.
See pages 101 & 102.

Cable and Connector Technical Data

Technical Data	M12 Cables	M12/M8 Cables	M12 Connectors
Molded Body/Insert	TPU	TPU	Polyamide (or) PA 66
Coupling Nut	Nickel Plated Zinc	Nickel Plated Zinc	Nickel Plated Zinc
Cable Jacket Material	PUR	PUR	NA
Cable O.D.	4.70mm	4.70mm	PG7 4.0 to 6.0mm PG9 4.0 to 8.0mm
Voltage Rating	250 Volts	60 Volts	50 Volts
Current Rating (Cond.)	4.0 Amps	3.0 Amps	4.0 Amps
Degree of Protection	IP65 (mated)	IP65 (mated)	IP67 (mated)
Operating Temperature	-25 °C to 80 °C (-13 °F to 176 °F) (fixed instl.)	-25 °C to 80 °C (-13 °F to 176 °F) (fixed instl.)	-25 °C to 80 °C (-13 °F to 176 °F)
Conductor Gauge	22 AWG	22 AWG	22 AWG Min. 18 AWG Max.
Bend Radius	47mm	47mm	NA

Technical Data	I/O "Y" Splitter	I/O Cable Splitter	M8 Cables
Molded Body/Insert	TPU	TPU	TPU
Coupling Nut	Nickel Plated Zinc	Nickel Plated Zinc	Nickel Plated Zinc
Cable Jacket Material	NA	PUR	PUR
Cable O.D.	NA	4.40mm	1.17mm
Voltage Rating	60 Volts	60 Volts	60 Volts
Current Rating (Cond.)	3.0 Amps	3.0 Amps	4.0 Amps
Degree of Protection	IP67 (mated)	IP67 (mated)	IP67 (mated)
Operating Temperature	-25 °C to 90 °C (-13 °F to 194 °F)	-25 °C to 80 °C (-13 °F to 176 °F)	-25°C to 90°C (-13 °F to 194°F)
Conductor Gauge	NA	22 AWG or 24 AWG	24 AWG
Bend Radius	NA	44mm	44mm

Technical Data	Wire Stripper
Use with	PVC Insulation
Stripping Range	28 AWG to 10 AWG
Cutting Range (Flexible)	10 AWG
Cutting Range (Rigid)	12 AWG

Dimensions (mm) - G3 Fieldbus Manifold Assembly

Series 501 valve system assembly with G3 Electronics w/ Backplane extension Output
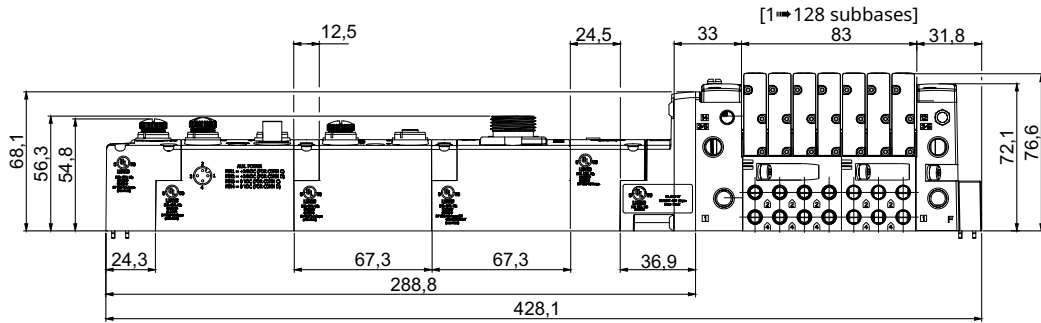
Series 501 valve system assembly with G3 Electronics w/o backplane extension output (with left terminator module)
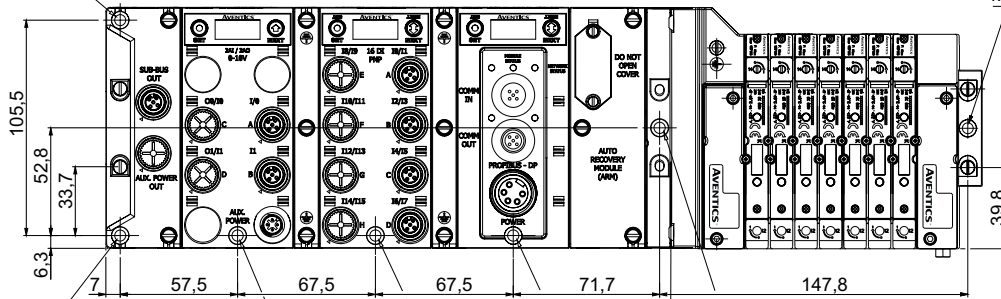
Dimensions (mm) - G3 Fieldbus Manifold Assembly

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

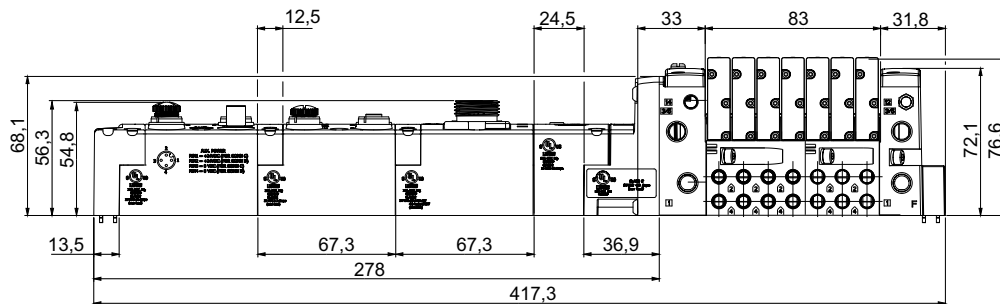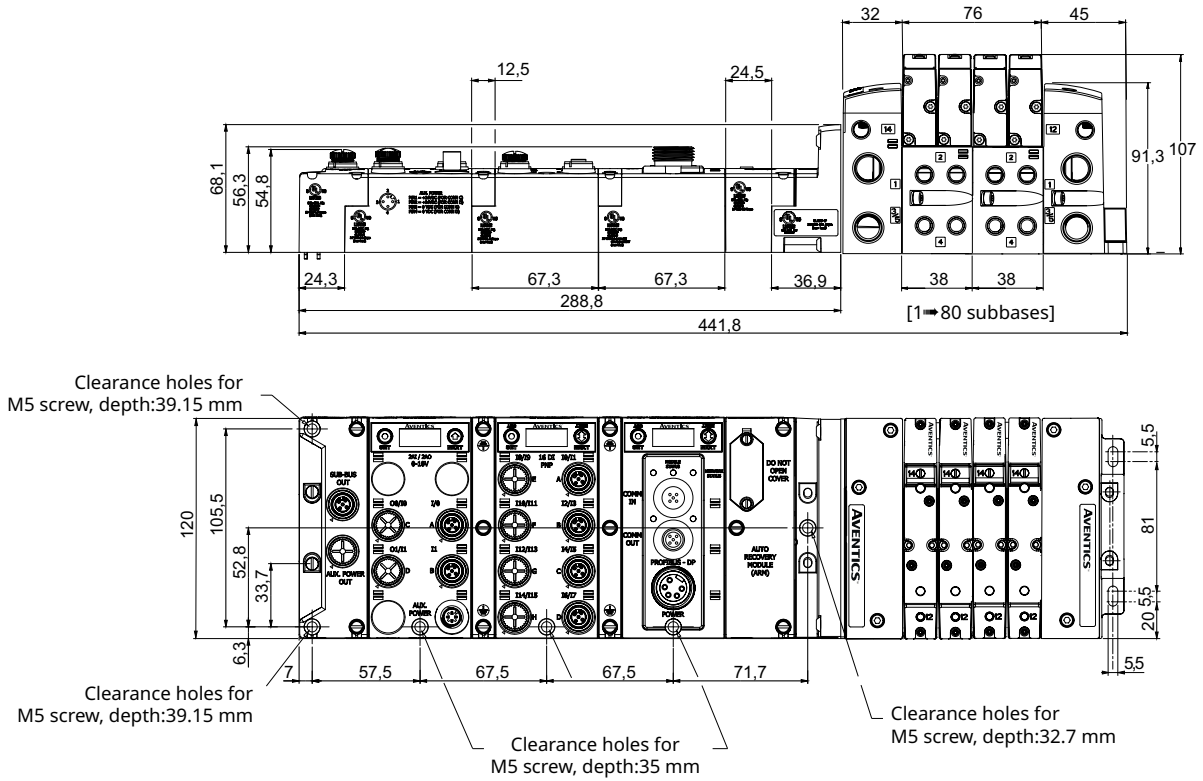Clearance holes for M5 screw, depth:39.15 mm

Clearance holes for M5 screw, depth:39.15 mm

Clearance holes for M5 screw, depth:35 mm

Clearance holes for M5 screw, depth:32.7 mm

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

Clearance holes for M5 screw, depth:39.15 mm

Clearance holes for M5 screw, depth:39.15 mm

Clearance holes for M5 screw, depth:35 mm

Clearance holes for M5 screw, depth:32.7 mm
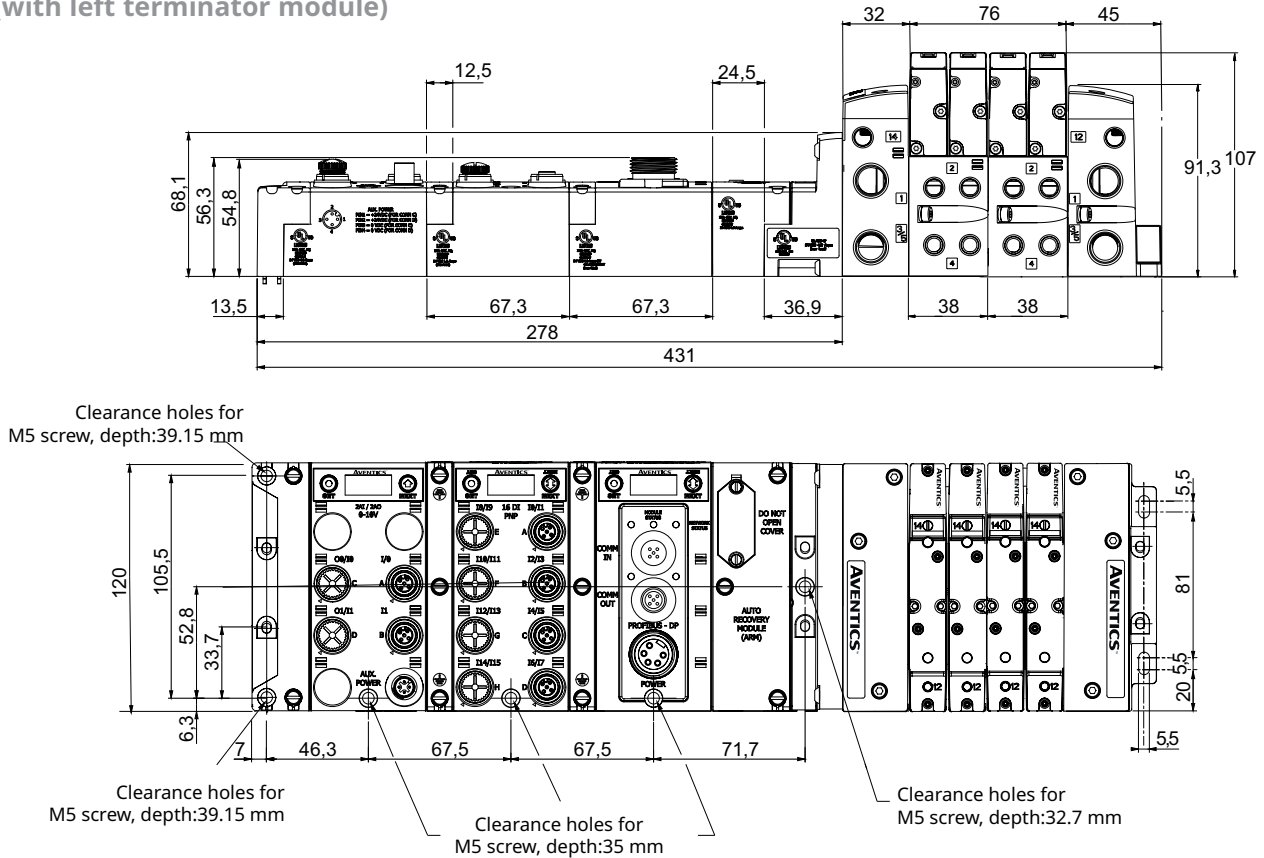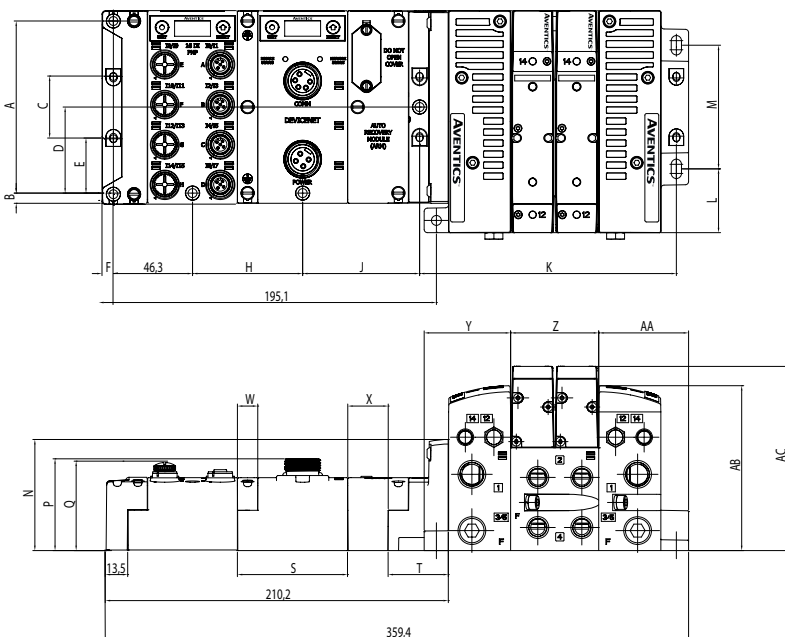
Dimensions (mm) - G3 Fieldbus Manifold Assembly

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

Clearance holes for
M5 or #10 screws

6.3 wide slot
(2) places

For use with
optional DIN rail
hardware

[1➞80 subbases]
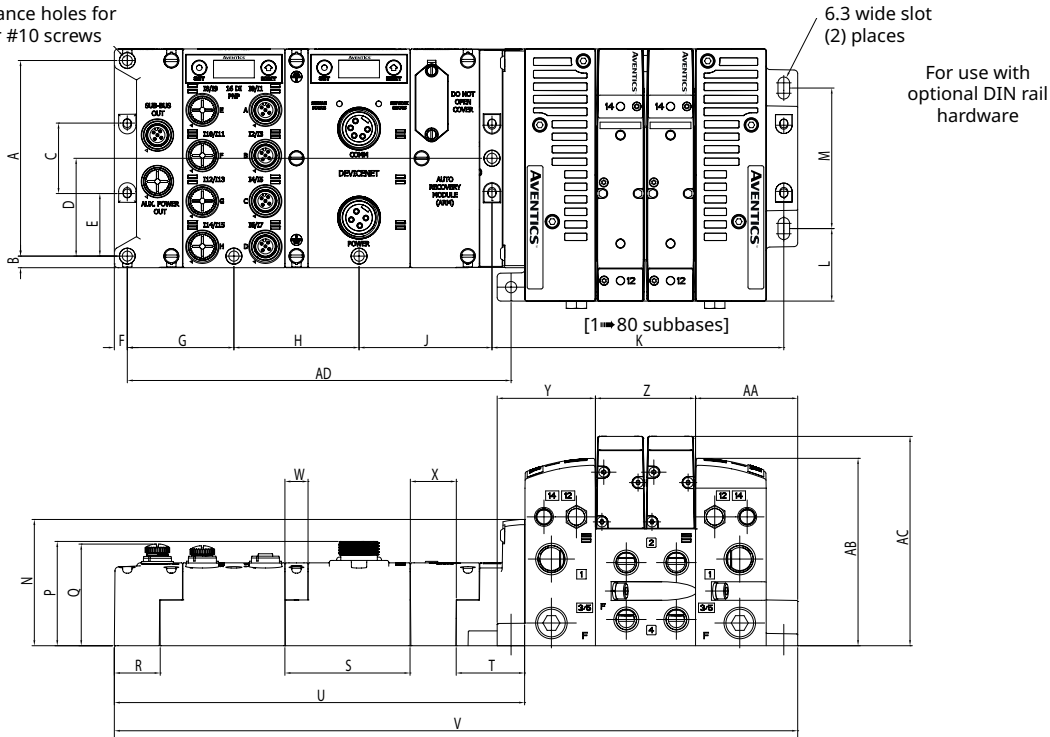
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
105.5	6.3	38	52.8	33.8	7	57.5	67.5	71.7	157.4	39.1	75.8	68.1	56.3	54	24.8	67.5	36.9	221.3

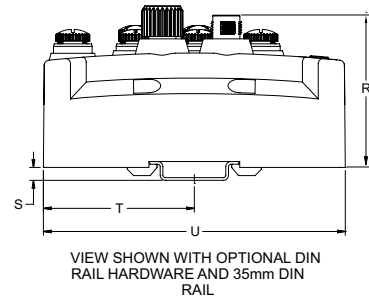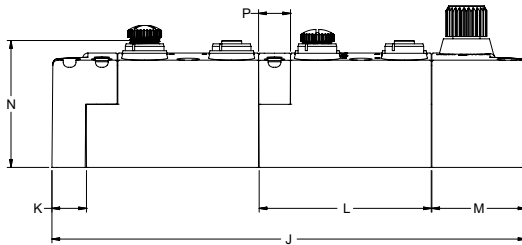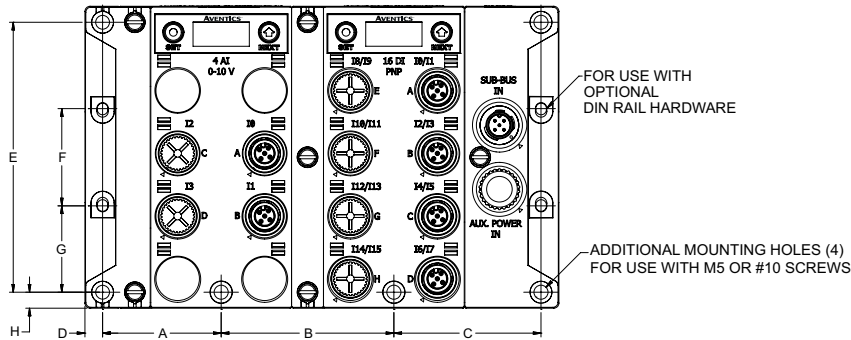| V	W	X	Y	Z	AA	AB	AC	AD
368.6	12.5	24.8	53	54	55.1	101.1	112.9	207

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

Dimensions (mm) - G3 Fieldbus I/O Assembly
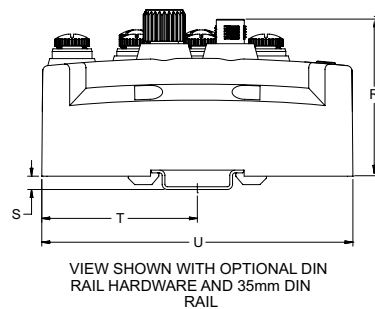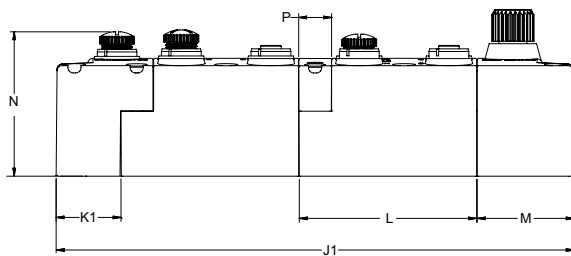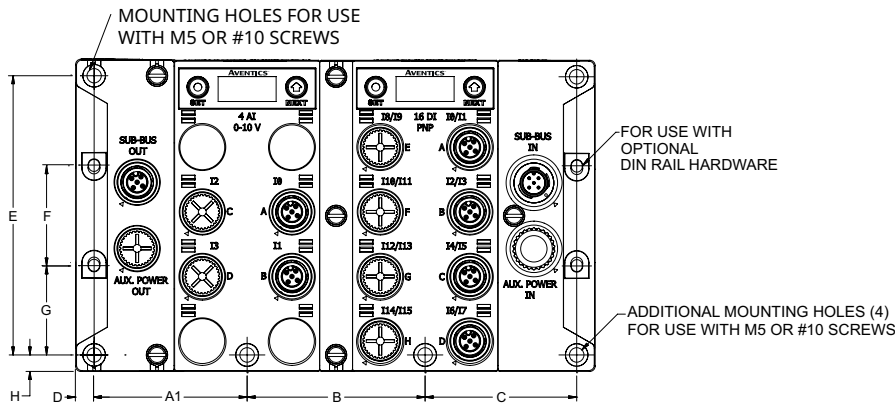
I/O Assembly with G3 Electronics w/o Backplane extension output

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

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
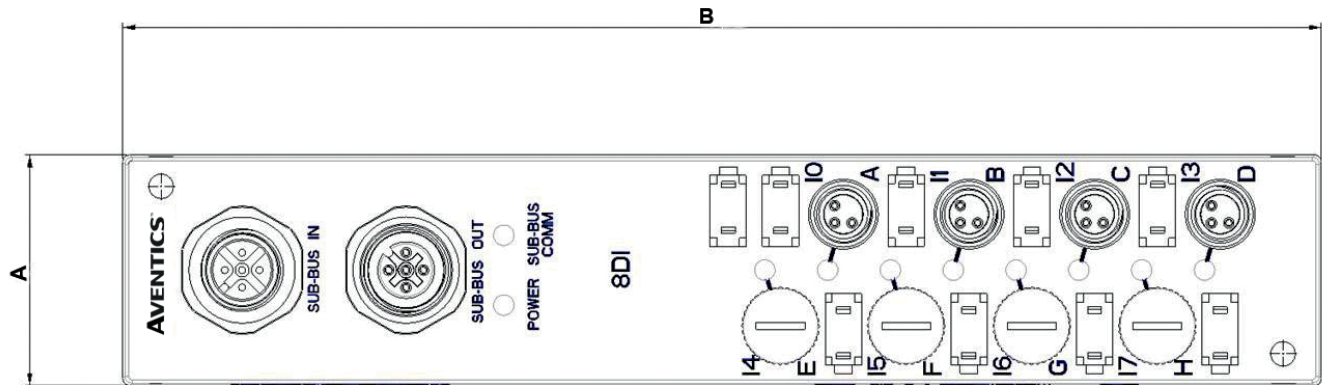
A	B
33	171.75

How to Order - G3 Electronics

G3	ED1	00	D	0	STD

Electronics Protocols

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
**R** = w/ Terminating Resistor

[1] 32+ capable.

Options

STD = Standard
DRM = DIN Rail Mounting
E23 = Fieldbus Assembly without Valves
E43 = Wireless Auto Recovery Module (ARM + Wireless)
E44 = Auto Recovery Module (ARM)
G36 = E23-Fieldbus Assembly without Valves + DRM-DIN Rail Mounting
M05 = E43-Wireless Auto Recovery Module (ARM + Wireless) + DRM-DIN Rail Mounting
M06 = E43-Wireless Auto Recovery Module (ARM + Wireless) + E23-Fieldbus Assembly without Valves
M07 = E43-Wireless Auto Recovery Module (ARM + Wireless) + E23-Fieldbus Assembly without Valves + DRM-DIN Rail Mounting
M08 = E44-Auto Recovery Module (ARM) + DRM-DIN Rail Mounting
M09 = E44-Auto Recovery Module (ARM) + E23-Fieldbus Assembly without Valves
M10 = E44-Auto Recovery Module (ARM) + E23-Fieldbus Assembly without Valves + DRM-DIN Rail Mounting
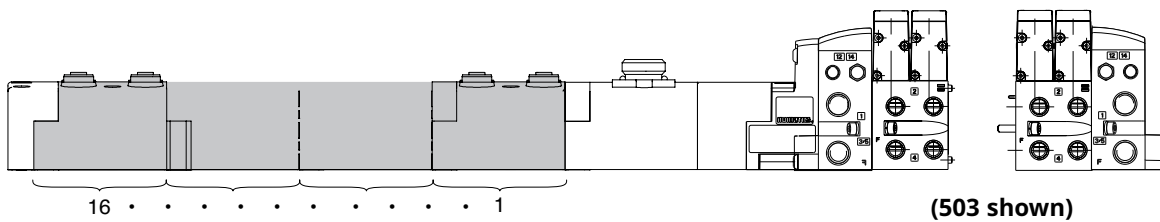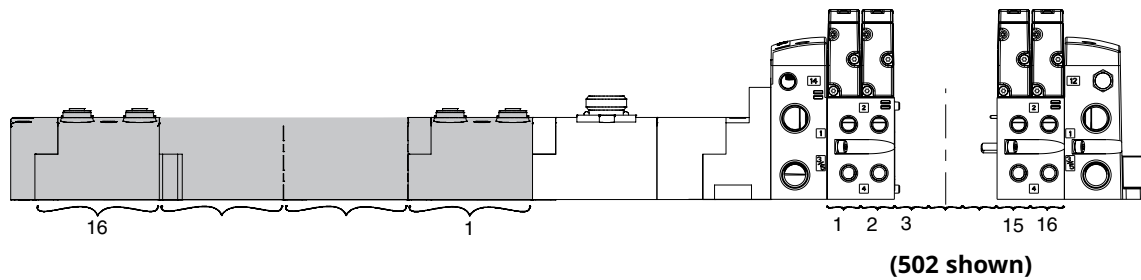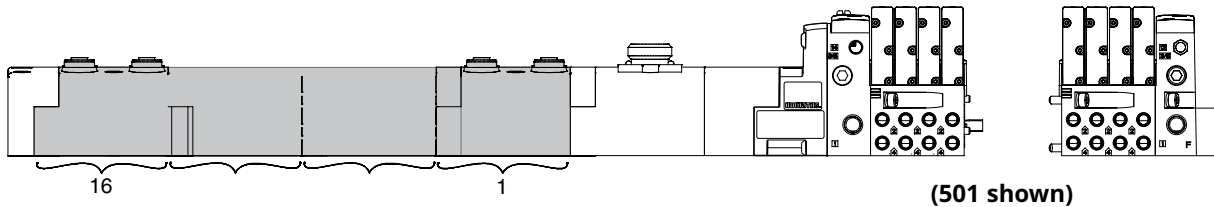
Modification

0 = Initial release
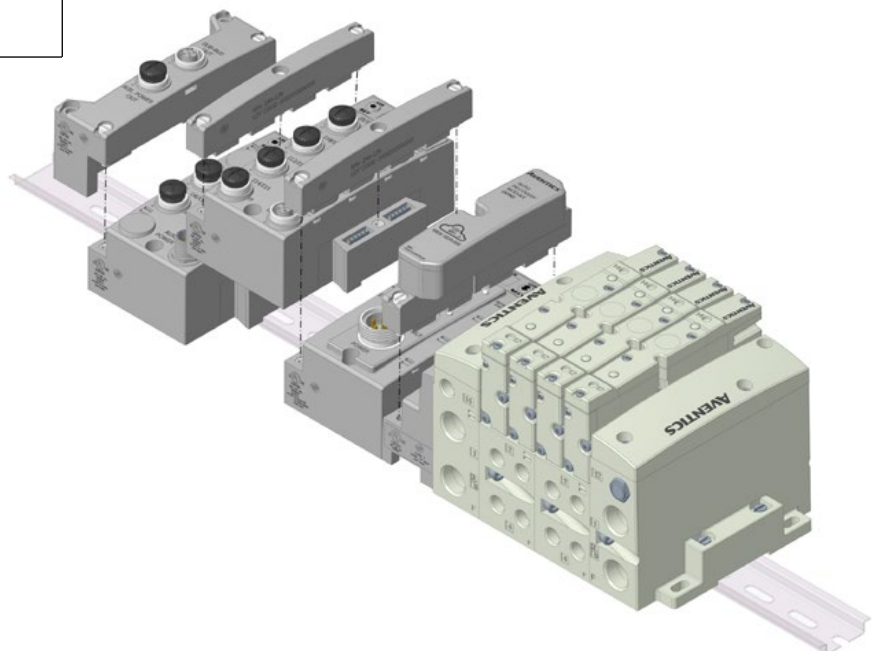
G3 Electronics

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.
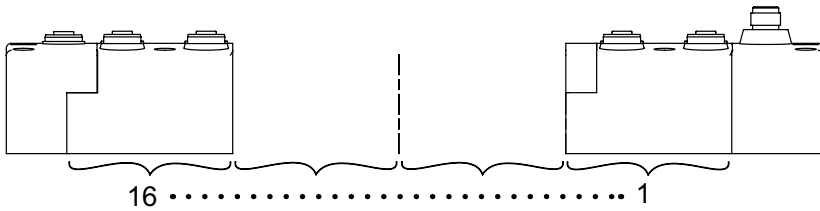
Example Order - 502 Shown

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

16 •••••••••••••••••••••••• 1

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