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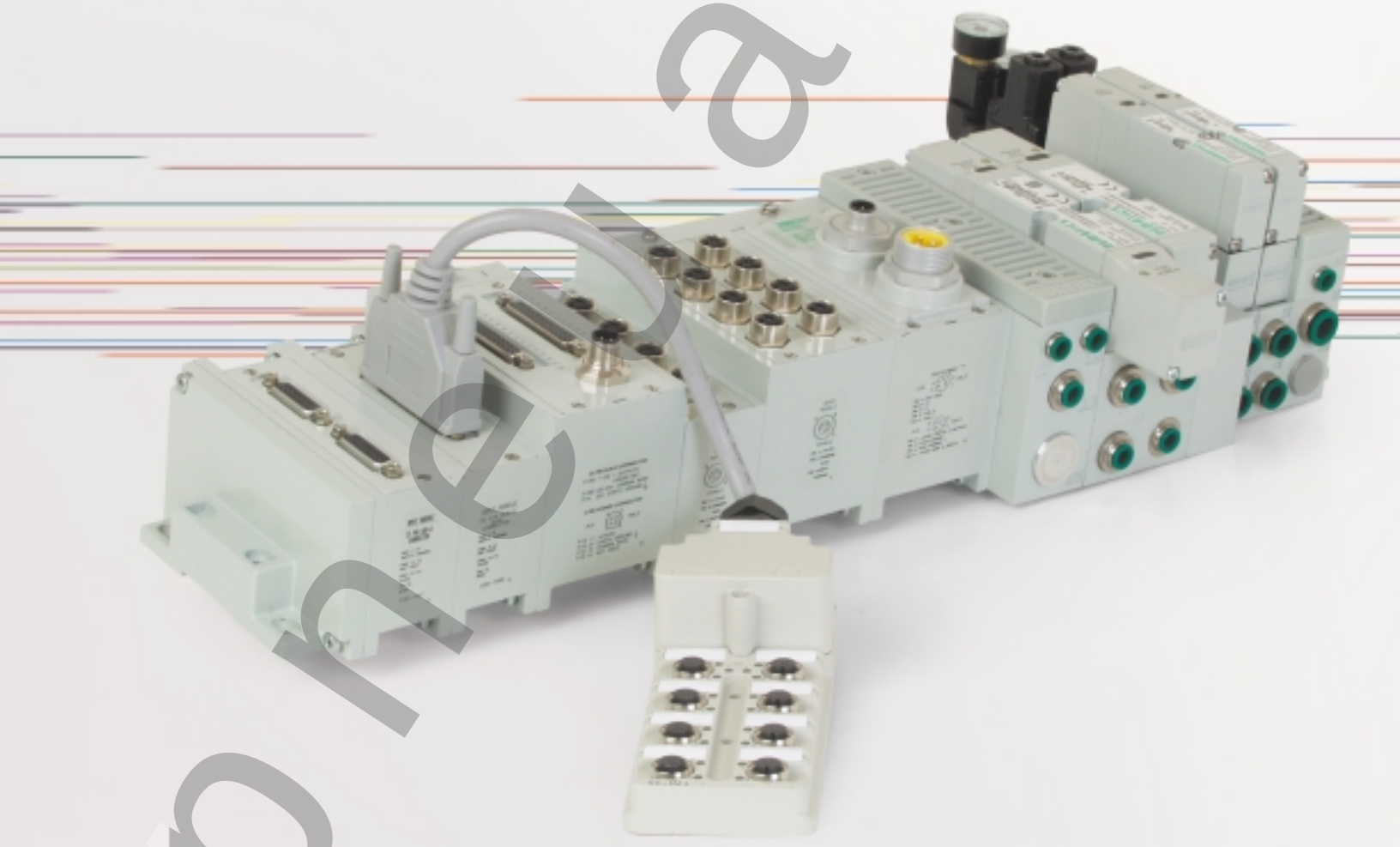
Fieldbus



Fieldbus Electronics and I/O

We're everywhere you need us to be!

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Rev. 2/04

G2-1 Fieldbus Communications Electronics

Why use Numatics Fieldbus communication electronics? ***Modular Reality...***

- No internal wiring
- Up to 40 valve solenoids
- Discrete I/O status with short circuit protection
- Software or manual configuration
- Plug-together flexibility
- Conformance tested
- Shorted and open load diagnostics
- Universal input technology allows NPN or PNP sensor types with same input module.
- NEMA4/IP65
- Up to 16 discrete output points and 16 input points per communication node
- Low cost distribution options
- Used with 2002 Series

Supported Protocols:

- DeviceNet
- Allen Bradley 1771 Remote I/O
- Profibus DP 1.5 MBps & 12MBps
- DeviceLogix
- CANopen - Consult Factory

DeviceNet

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

Numatics G2-1 DeviceNet modes have been tested and approved for conformance by the ODVA.

More information about DeviceNet and the ODVA can be obtained from the following WEB site:

Open DeviceNet Vendors Association (ODVA)
www.odva.org

Technical Data

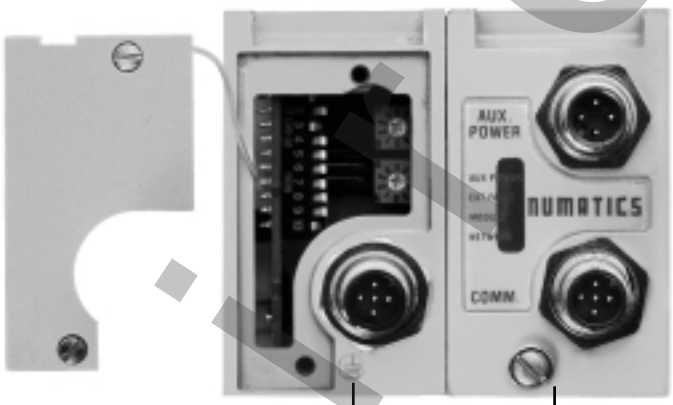
ELECTRICAL DATA	VOLTAGE	CURRENT
BUS Power	11-25 VDC	0.025 amps.
Valve & Discrete I/O	24 VDC +/- 10%	4 amps. maximum
Aux Power Connector	Single key way 4 pole 12mm (Micro) connector	
Communication Connector	Single key way 5 pole 12 mm (Micro) connector	
LED's	Module status, Network status, Ext fault & Aux power	
OPERATING DATA		
Temperature Range	+32˚ to +115˚ F (0˚ to +46˚ C)	
Humidity	95% relative humidity, non-condensing	
Moisture	Designed to meet NEMA 4 / IP65 requirements	

CONFIGURATION DATA	
Communication Module	Contains all communication electronics as well as short circuit protected driver circuitry for up to 24 valve solenoids. Supports auto-baud detection and auto-device replacement (ADR) feature.
Manual Configuration Module (MCM)	Optional module for use when a manual configuration method is preferred.
Maximum Valve Solenoid Outputs	24
Maximum Discrete I/O Points	16
Numatics' DeviceNet modules features polled, change of state (COS), cyclic and combinations message capability.	
Electronic Data Sheet (EDS) file and technical manuals are available in the download section of the Numatics, Inc. web site at: www.numatics.com/fieldbus	

ORDER ONLINE

Allen Bradley 1771 Remote I/O

Allen-Bradley 1771 Remote I/O is a proprietary protocol based on a patented chipset.
This chipset is obtained from Allen-Bradley and incorporated into the Numatics RIO module.



Communication Module

Manual Configuration Module (MCM) (Required)

This product incorporates technology which is licensed by Allen- Bradley Company, Inc. Allen-Bradley has not technically approved, nor does it warrant or support this product. All warranty and support for this product and its application is provided solely by Numatics, Incorporated.

Technical Data

ELECTRICAL DATA	VOLTAGE	CURRENT
Valve & Discrete I/O	24 VDC +/- 10%	4 amps. maximum
Aux Power Connector	Single key way 4 & 5 pole 12mm (Micro) connector	
Communication Connector	Single key way 5 pole 12 mm (Micro) connector, Bus in and out	
LED's	Communications status, ext. fault and auxiliary power	
OPERATING DATA		
Temperature Range	+32˚ to +115˚ F (0˚ to +46˚ C)	
Humidity	95% relative humidity, non-condensing	
Moisture	Designed to meet NEMA 4 / IP65 requirements	

CONFIGURATION DATA	
Communication Module	Contains all communication electronics as well as short circuit protected driver circuitry for up to 24 valve solenoids.
Manual Configuration Module (MCM)	Module contains DIP and rotary switches for setting device configuration data
Maximum Valve Solenoid Outputs	24
Maximum Discrete I/O Points	16
Rack Size	Rack size set automatically to 1/4 rack

Profibus DP (1.5 MBps & 12 MBps)

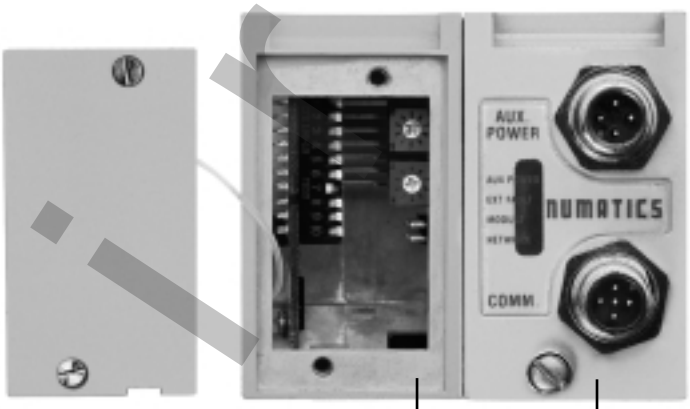
Profibus-DP is a vendor-independent, open fieldbus designed for communication between automation control systems and distributed I/O at the device level.

The 2002 Series - Profibus product is designed to conform to the Profibus standard EN50170. Certification is 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 about Profibus can be obtained at the following web sites:

Profibus Interface Center
www.aut.sea.siemens.com/pic/index.htm

Profibus Trade Organization
www.profibus.com



Manual Configuration Module (MCM) (Not required with Class II Master)

Communication Module

Technical Data

ELECTRICAL DATA		VOLTAGE	CURRENT
Valve & Discrete I/O		24 VDC +/- 10%	4 amps. maximum
Aux. Power Connectors	1.5 MBps 12 MBps	Single key way 4 pole 12 mm (Micro) connector Single key way 4 pole 12 mm (Micro) connector	
Communication Connector	1.5 MBps 12 MBps	5 pole 12 mm (Micro) connector 5 pole reverse key female (Micro) connector	
LED's		Module status, Network status, Ext fault and Auxiliary power	
OPERATING DATA			
Temperature Range		+32˚ to +115˚ F (0˚ to +46˚ C)	
Humidity		95% relative humidity, non-condensing	
Moisture		Designed to meet NEMA 4 / IP65 requirements	

CONFIGURATION DATA	
Communication Module	Contains all communication electronics as well as short circuit protected driver circuitry for up to 24 valve solenoids.
Manual Configuration Module (MCM)	Module containing DIP and rotary switches for setting device configuration data.
Maximum Valve Solenoid Outputs	24
Maximum Discrete I/O Points	16, available with 12mm (micro) connectors or 25 pin sub-D styles

(GSD) File and technical manuals are available in the download section of the Numatics, Inc. website at: www.numatics.com/fieldbus.

Discrete I/O Modules

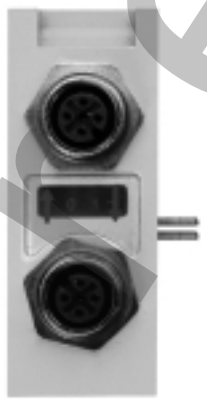
Discrete I/O modules are used to connect additional I/O devices to the valve manifold node. This provides for more efficient use of system resources when configuring a communication system.

Universal input modules feature technology that allows the same module to automatically recognize PNP or NPN type sensors without the need to add external pull-up resistors or manually select sensor type.

Input and output modules have two 12mm (micro) connectors. Each can be used individually (i.e. 1 I/O point per connector) or can be used for double point (i.e. connector 1 has two points of I/O). This standard feature further simplifies external I/O wiring.

Sub-D output module can be used to drive 16 additional coils on a separate manifold or 16 discrete output points.

Sub-D I/O module can be used for inputs and or up to a total of 16 I/O points.



Discrete I/O

Sub-D I/O

Technical Data

ELECTRICAL DATA	
Inputs:	
Supply Voltage	24 VDC ± 10%
Type	Sourcing (PNP), Sinking (NPN) or contact closure (universal input technology)
LED Indicator	Input status
Outputs:	
Voltage	24 VDC +/- 10%
Current	0.5 amperes per output (4A max. per manifold)
Type	Sinking (NPN)
LED Indicator	Output status

OPERATING DATA	
Temperature Range	+32˚ to +115˚ F (0˚ to +46˚ C)
Humidity	95% relative humidity, non-condensing
Moisture	Designed to meet NEMA 4 / IP65 requirements
Connectors	Single keyway 5 pole female 12mm (micro) connector or 25 pin sub-D female

CONFIGURATION DATA
The maximum number of modules connected to the discrete I/O side is 8. A fully configured manifold assembly would require 2 master modules with 6 slaves.

How to Order

1) Assembly Kit Selection A K C 6 _ 0 0 0 0 _ _ _

Electrical / Electronic Type & Location
C = Communication Module

Valve Series
6 = 2002 Series

Number of Valve Stations*

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

End Plate Port Size
2 = 1/4
H = 8mm (5/16)

Port Type
L = Push In
D = Barbed Fitting

Options
STD = Standard
DRM = DIN Rail Mounting (Std. 35mm)
MUF = Muffler in End Plates
DWM= DIN Rail with MUF
A01 = 25 Pin Sub-D 16 Discrete Outputs Sinking (NPN)
D01 = A01 + DRM
D03 = A01 + MUF
F01 = A01 + DRM + MUF
A17 = 25 Pin Sub-D 16 I/O Points Inputs Sourcing (PNP) Outputs Sinking (NPN)
D18 = A17 + DRM
D19 = A17 + MUF
F07 = A17 + DRM + MUF

* Maximum number of valve stations is determined by the combination of single and double Z-Boards types installed in the manifold sub-bases. All G2-1 communication modules support 24 output drivers for valve solenoid coils.

2) Valve Model Number Selection

Valve model number with plug-in manifold base and “G” wiring option.

3) Electronic Interface N X 6 _ _ _ D F E02

Fieldbus Protocols
DN = DeviceNet™
AB = Allen Bradley RIO
PB = Profibus DP 1.5 MBps
PT = Profibus DP 12 MBps
DL = DeviceLogix

Number of Discrete Inputs**

Number of Discrete Outputs**

Options
E02 = Separate Power (Valve and I/O)
G08 = With MCM if Not Standard
STD = Standard

Voltage
F = 24 VDC

I/O Type
D = Digital

**4) I/O Per I/O Station – Electronic Interface Option Only (See I/O table below)

When ordering up to eight (8) I/O you must order one (1) Master I/O (which contains two (2) points I/O itself). The balance required is made up of Slaves, two (2) points per I/O station (total 3 Slave modules). A maximum of sixteen (16) I/O points can be configured by using two (2) Master modules and six (6) Slave modules. Total number of discrete inputs plus total number of discrete outputs must be less than or equal to 16. (See I/O table below).

Input master modules can be used with Output Slave Modules.

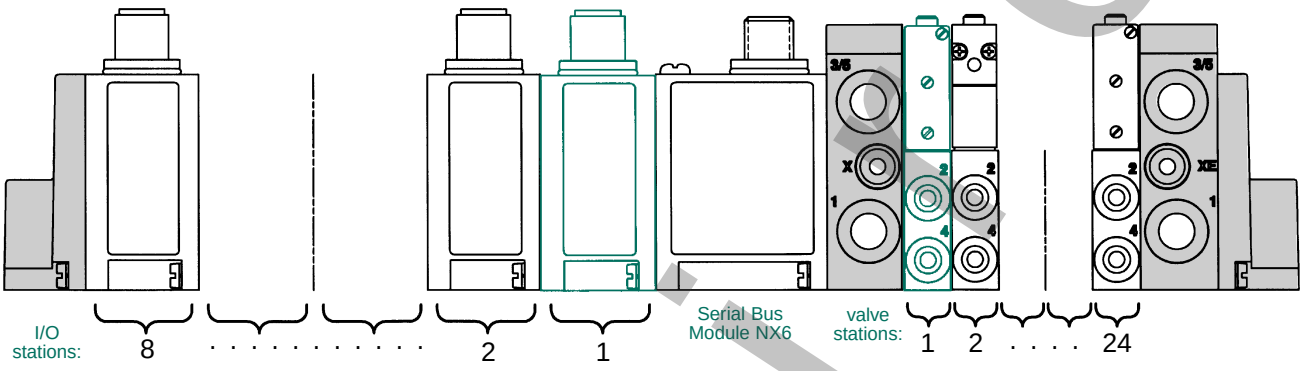
Output master Modules can be used with Input Slave Modules.

Sub-D outputs and I/O types do not require additional master modules when used alone

I/O Table: Note 2 I/O per station

HOUSING TYPE	SINKING (NPN) OUTPUT	SINKING (NPN) or SOURCING (PNP) INPUT
Master Kit No.	239-1800	239-1802
Slave Kit No.	239-1801	239-1803

AKC Communication Module



- Shaded components described by Assembly Kit (AK) model number designation *(see #1, pg. 8)*, with the exception of the Communication module and number of I/O stations that are described by Electronic Interface (NX6) model number designation. *(see #3, pg. 8)*
- Each valve manifold station is listed in sequential order from left to right when facing the port side of the manifold as indicated.
- Each discrete I/O station is listed in sequential order from RIGHT to LEFT starting from the Communication module as indicated.

  NOTE: I/O stations #1 and #5 (if required) must always be a MASTER KIT. *(see #4, pg. 8)*

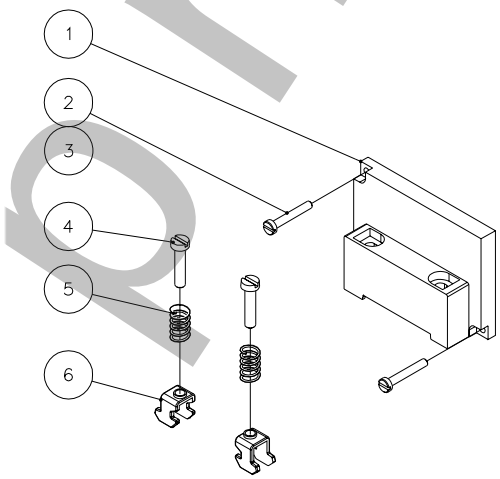
  Stations 2,3,4,6,7 and 8 must be either input or output Slave kits.

NOTE: Total of 24 solenoid outputs available. Either 24 single solenoid valves or 12 double solenoid valves or any combination of singles or doubles, not to exceed 24 solenoid outputs for AKC Serial/Bus are allowed.

Example order: AKC6D00002LSTD
021BW4Z3GL00061
021BW4Z3GL00061
021BB4Z4GL00061
021BB4Z4GL00061
NX6DN0808DFE02

I/O station 1	239-1802	Input Master Sinking (NPN) Kit
I/O station 2	239-1803	Input Slave Sinking (NPN) Kit
I/O station 3	239-1803	Input Slave Sourcing (PNP) Kit
I/O station 4	239-1803	Input Slave Sourcing (PNP) Kit
I/O station 5	239-1800	Output Master Sinking (NPN) Kit
I/O station 6	239-1801	Output Slave Sinking (NPN) Kit
I/O station 7	239-1801	Output Slave Sinking (NPN) Kit
I/O station 8	239-1801	Output Slave Sinking (NPN) Kit
	ASSEMBLED	

LH Mounting Cover Kit

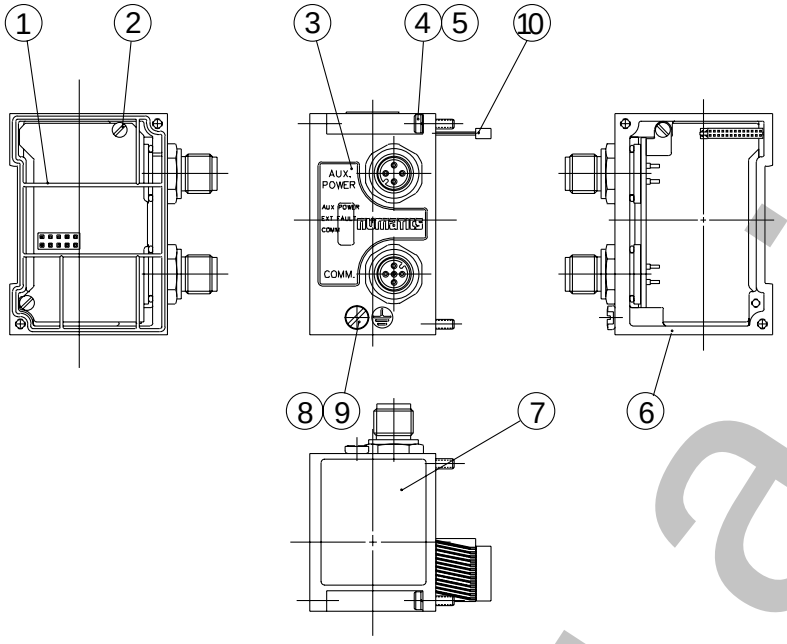


DET. NO.	NO. REQ'D	PART NAME	PART NO.
1	1	LH DIN Rail Mtg Cover	105-381
2	2	Screw	127-844
3	2	Lockwasher	128-192
4	2	Screw	127-472
5	2	Spring	115-355
6	2	Clamp	125-720

LH MOUNTING COVER KIT	PART NO.
With DIN Rail	239-1819
Without DIN Rail	239-1820

Fieldbus Communication Module and Manual Configuration Module Assemblies

Communication Module

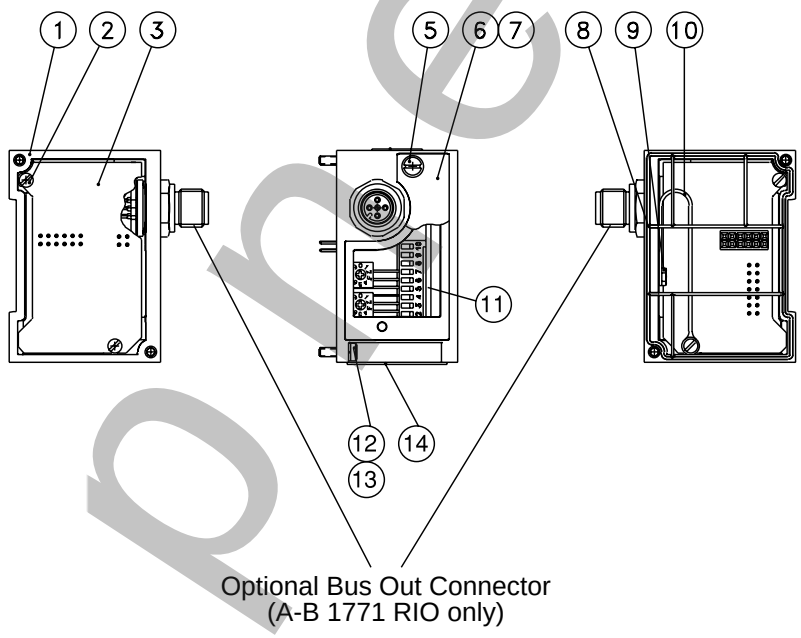


DET. NO.	NO. REQ'D	PART NAME	PART NO.
1	1	Gasket	113-503
2	3	Screw	127-794
3	1	Nameplate (DeviceNet)	122-1122
3	1	Nameplate (Profibus)	122-1123
3	1	Nameplate (Allen Bradley RIO)	122-1124
4	2	Screw	127-795
5	2	Lockwasher	128-192
6	1	Housing	125-1017
7	1	Nameplate	122-1058
8	1	Screw	127-176
9	1	Cup Washer	128-162
10	1	Transfer Board	256-589

Communication Module Kits (w/o End Plates)

DESCRIPTION	PART NO.
DeviceNet	239-1794
Remote I/O	239-1804
Profibus 1.5 Mbps	239-1805
Profibus 12 Mbps	239-1806
DeviceLogix	239-2108
CANopen	Consult Factory

Manual Configuration Module (MCM)



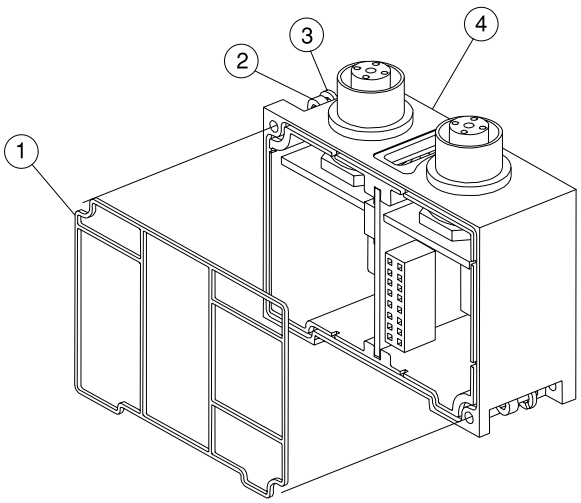
DET. NO.	NO. REQ'D	PART NAME	PART NO.
1	1	Switch Housing w/ conn.	125-800
1	1	Switch Housing w/o conn.	125-1038
2	4	Screw	127-794
5	2	Screw	127-852
6	1	Cover w/ conn.	105-399
6	1	Cover w/o conn.	105-384
7	1	Gasket w/conn.	113-529
7	1	Gasket w/o conn.	113-508
8	1	Gasket	113-503
9	1	Screw	127-172
10	1	Cover Strap	125-772
12	2	Screw	127-795
13	2	Lockwasher	126-192
14	1	Nameplate (Conn Ver. Only)	122-1058

Manual Configuration Module Kits (w/o End Plates)

DESCRIPTION	PART NO.
With Connector (A-B 1771 RIO only)	239-1812
Without Connector	239-1813

I/O Modules Assemblies

I/O Module Kit with Input LED Indicator (2 I/O per module)



DET. NO.	NO. REQ'D	PART NAME	PART NO.
1	1	Gasket	113-503
2	2	Screw	127-795
3	2	Lockwasher	128-192
4	1	Housing	125-807

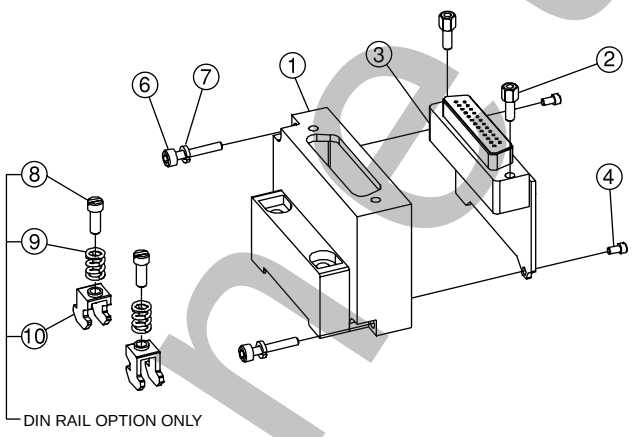
HOUSING TYPE	OUTPUT
Master Kit No.	
Output - Sinking (NPN)	239-1800
Input - Sinking (NPN) or Sourcing (PNP)	239-1802
Slave Kit No.	
Output - Sinking (NPN)	239-1801
Input - Sinking (NPN) or Sourcing (PNP)	239-1803

Connector Type

I/O 12 mm (Micro) 5 Pin Female

Dust cover available for connectors: PART NO. 230-647

25 Pin Female Sub-D Discrete Output and I/O Module



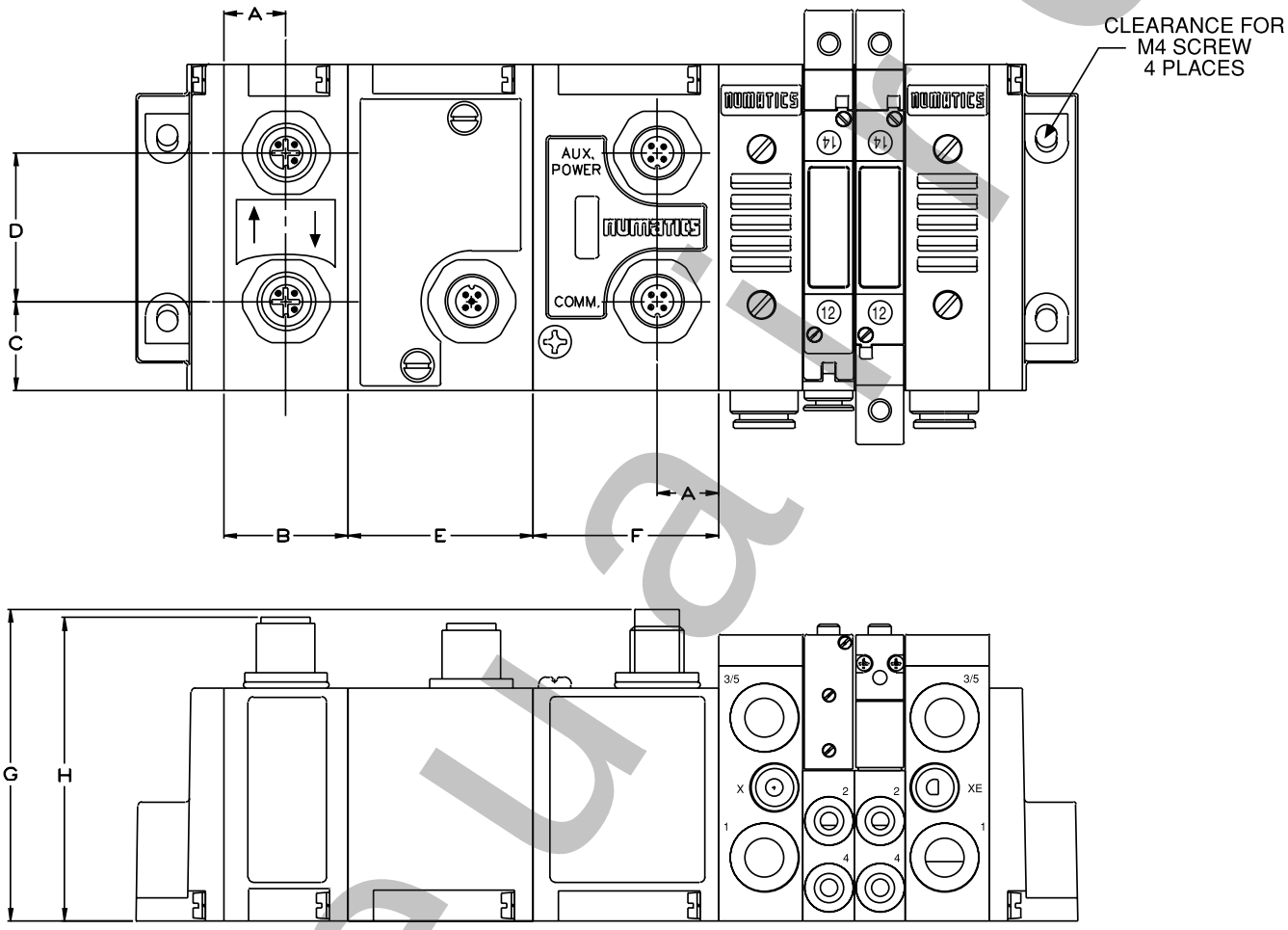
DET. NO.	NO. REQ'D	PART NAME	PART NO.
1	1	Housing	105-379
2	2	Hex Screw	127-825
3	1	Gasket	113-507
4	2	Screw	127-794
6	1	Nameplate	122-1057
7	2	Screw	127-499
8	2	Lockwasher	128-192
9	2	Screw (w/DIN)	127-472
10	2	Spring (w/DIN)	115-355
11	2	Clamp (w/DIN)	125-720

Discrete output and I/O Module Kit

DESCRIPTION	PART NO.
16 pt. Output Sinking (NPN) with DIN Rail	239-1225
16 pt. Output Sinking (NPN) w/o DIN Rail	239-1221
16 pt. Input Sourcing (PNP) and/or Output Sinking (NPN) with DIN Rail	239-1866
16 pt. Input Sourcing (PNP) and/or Output Sinking (NPN) w/o DIN Rail	239-1865

Note: When ordering this module in an assembled manifold "AK" use the corresponding option code in the "AK" model number. Do not list the module part number under the Electronic Interface model number "NX".

FlexiBlok® Manifold with Fieldbus Electronics Dimensional Drawing



Dimensions

top dimensions = inches
bottom dimensions (in parenthesis) = millimeters

A	B	C	D	E	F	G	H
0.50 (12.7)	1.00 (25.4)	0.72 (18.3)	1.20 (30.5)	1.50 (38.1)	1.50 (38.1)	2.38 (60.5)	2.32 (59.0)