Genesis®

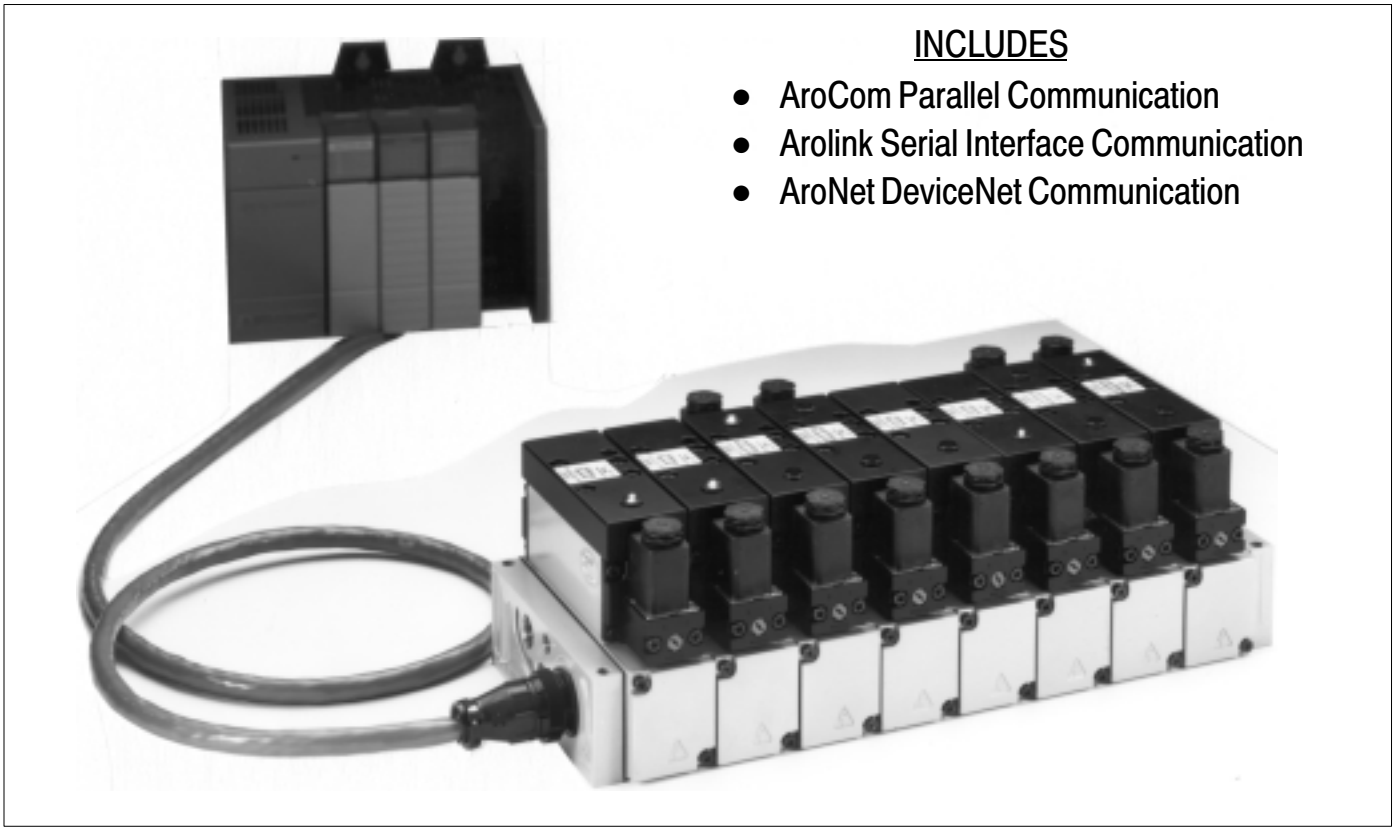
Released: 7-12-95

Revised: 1-25-01

ARO

ARO EasyWire™ System Installation Guide

Flexible Communications for ARO Genesis® Manifold Valves Using Any Discrete Output PLC.



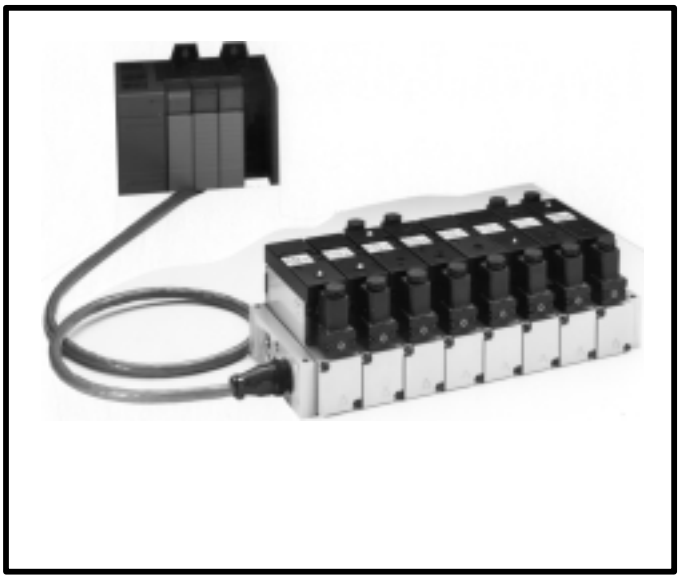
INCLUDES

- AroCom Parallel Communication
- Arolink Serial Interface Communication
- AroNet DeviceNet Communication

INDEX **PAGE**

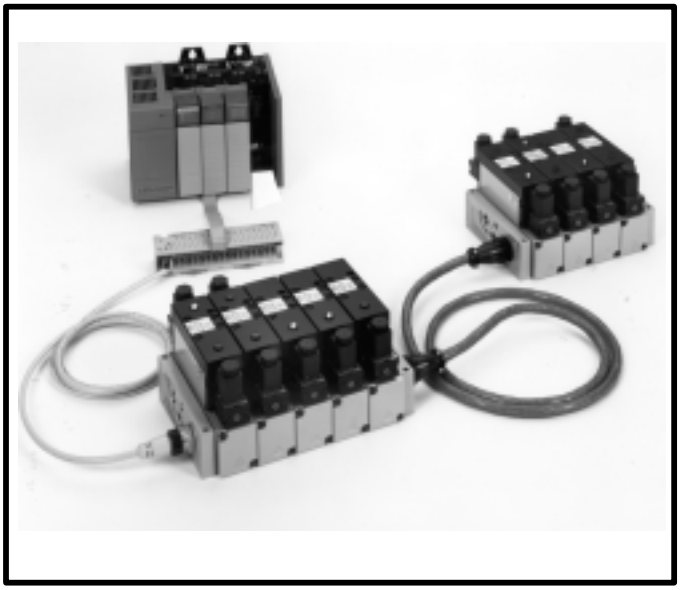
INGERSOLL-RAND COMPANY
P.O. BOX 151 • ONE ARO CENTER • BRYAN, OHIO 43506-0151
✆ (419) 636-4242 • FAX (419) 633-1674

ARO



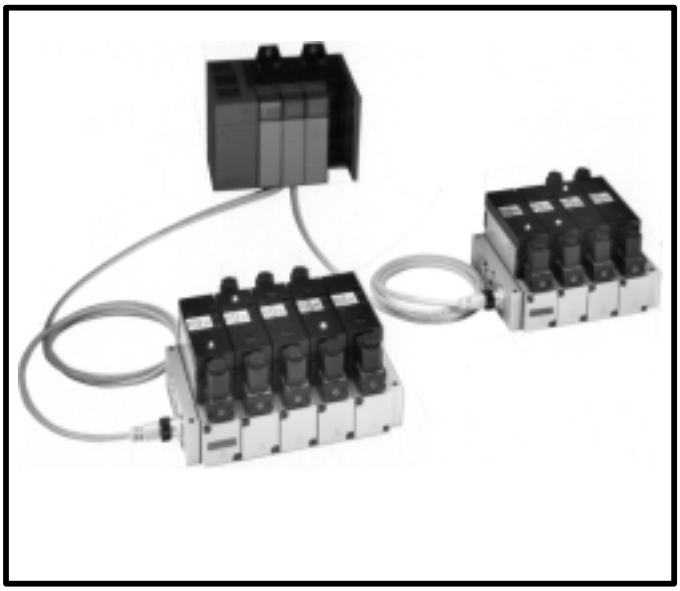
EasyWire AroCom Parallel Communication

- Controls up to 15 Solenoids / 14 Valves.
  (first station must be Double Solenoid)
- Direct PLC to Valve interface.
- Split-Stack Mounting Capability.
- Very Low Power Draw with Aro Low-Watt Solenoid.
- Easy, Single-to-Double Solenoid Conversion.
- Add / Remove Valves in Minutes.
- Runs off TTL (3.4 - 24 V) Signal, Sourcing or Sinking.



EasyWire AroLink Serial Interface Communication

- Controls up to 16 Solenoids per Wire.
- Works with any make Discrete Output PLC.
- Split-Stack Mounting Capability.
- Quick, Single-to-Double Solenoid Conversion.
- Add / Remove Valves in Minutes.
- Compatible with Omron Link Terminals.
- External Power Available.
- Up to 15 Valves per Wire.
  (first station must be Double Solenoid)



EasyWire AroNet DeviceNet Communication

- Fully DeviceNet Compatible.
- Controls up to 16 Solenoids Per Node using a DevicNet Interface.
- Split-Stack Mounting Capability Without Consuming Additional Nodes.
- Diagnostics Capability.
- Software Programmable Addresses.
- Quick, Single-to-Double Solenoid Conversion.
- Add / Remove Valves in Minutes.
- External Power Available.
- Up to 15 Valves per Node.
  (first station must be Double Solenoid)

EasyWire Model Description Chart

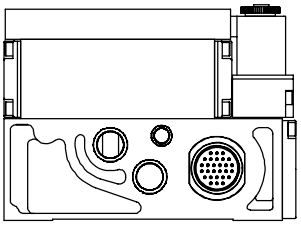
MODEL		DESCRIPTION
Manifolds (for complete Manifold information refer to Form 9323-M)		
GMP1X7 ("X" = Port Size) 2 = 1/4" NPT 3 = 3/8" NPT		Genesis Manifold assembled with "Driver" cards for AroCom, AroLink, and AroNet Systems. For AroLink and AroNet systems, a "communications" card manifold must be ordered and installed at front (left) end of valve stack.
GMP1X6 ("X" = Port Size) 2= 1/4" NPT 3 = 3/8" NPT		Genesis Manifold assembled with AroLink communications card. One card (manifold) needed per 16 solenoids. Driver card manifolds (GMP1X7)required for subsequent valves in stack.
GMP1X5 ("X" = Port Size) 2= 1/4" NPT 3 = 3/8" NPT		Genesis Manifold assembled with AroNet Communications card. One card (manifold) needed per 16 solenoids. Driver card manifolds (GMP1X7) required for subsequent valves in stack.
Transmitter Terminal (for AroLink System)		
119557		24V PNP-Compatible, 16 Inputs
End Plates (for AroCom System)		
119435	**-1**	Parallel In (Left), Parallel Out (Right)
	-2	Parallel In (Left), External Power In (Right)
	-3	Parallel In (Left), Nothing Out with Air (Port) connections (Right)
	-4	Parallel In (Left), Nothing Out (Right)

MODEL		DESCRIPTION
End Plates (for AroLink and AroNet)		
119435	**-5**	Serial In (Left), Parallel Out (Right)
	-6	Serial In (Left), Serial Out (Right)
	-7	Serial In (Left), Nothing Out with Air (Port) Connections (Right)
	-8	Serial In (Left), Nothing Out (Right)
	-11	Serial In (Left), External Power In (Right)
Cables (for AroCom System)		
119436	**-1**	28-Wire Cable, Plugs on Both Ends, 6-ft.
	-2	28-Wire Cable, Plugs on Both Ends, 12-ft.
	-3	28-Wire Cable, Plugs on Both Ends, 24-ft.
119437	**-1**	28-Wire Cable, Plug on One End, 6-ft.
	-2	28-Wire Cable, Plug on One End, 12-ft.
	-3	28-Wire Cable, Plug on One End, 24-ft.
		3-Wire Power Supply Cable, 12-ft. Length
119439	**-1**	3-Wire Power Supply Cable, 12-ft. Length
Cables (for AroLink and AroNet Systems)		
119438	**-1**	5-Wire Serial Communication Cable with Plug on One End and 5 (ea.) stripped wires on other. 12-ft. Length
119438	**-2**	Same as -1, except 30-ft. Length.
119439	**-1**	3-Wire Power Supply Cable, 12-ft. Length
Valves (for complete Valve information refer to Form 9323-M)		
GP1XXX-024-D		DC Standard Coil, No Lights
GP1XXX-024-L		DC Low-Watt Coil, No Lights
GP1XXX-024-J		DC Standard Coil, With Lights
GP1XXX-024-P		DC Low-Watt Coil, With Lights

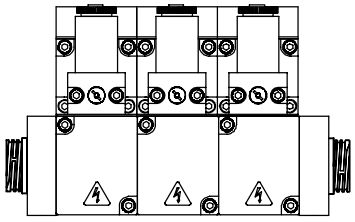
AroCom Parallel Wiring System Configurations

EasyWire Manifolds are assembled in the same way as standard Genesis manifolds. To interface with external wiring systems, special endplate kits are used. There are four available for use with AroCom, and an assembled AroCom system will contain one endplate kit and as many AroCom manifolds (GMP1X7) as necessary. The leftmost valve is the first in the system.

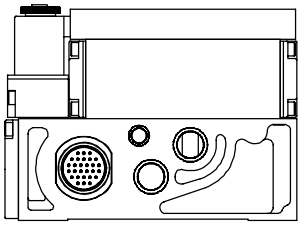
For details on the individual board connections, refer to the Internal Wiring section.



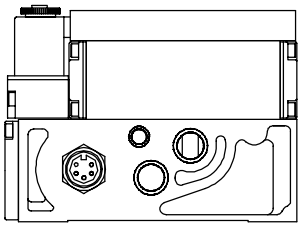
AroCom System with Parallel-In Connector (left side)



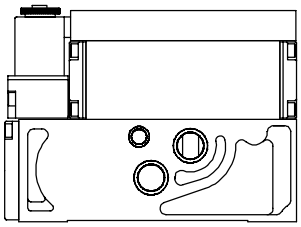
GMP1X7 GMP1X7 GMP1X7



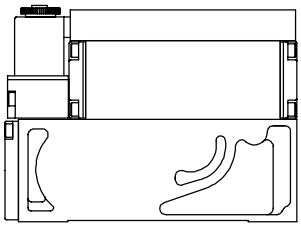
Right Side Parallel-Out (119435-1)



Right Side External Power In (119435-2)



Right Side Ports Only (119435-3)

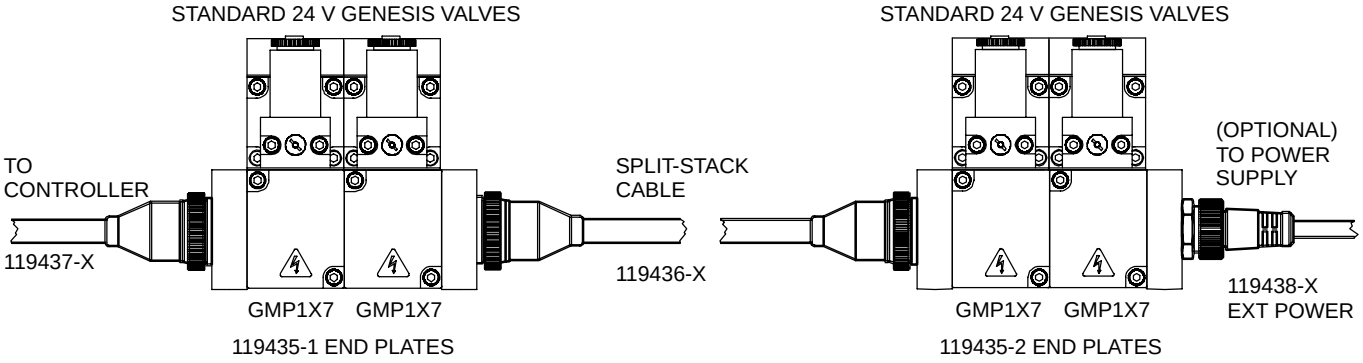


Right Side Blank (119435-4)

Sample AroCom System with Split-Stack:

This system is a four station AroCom system with external power. A Split-Stack is used between the second and third station.

Note: This system would be ordered as (1) two station AroCom system with parallel out and (1) two station AroCom system with external power (if needed). Cables are ordered separately.



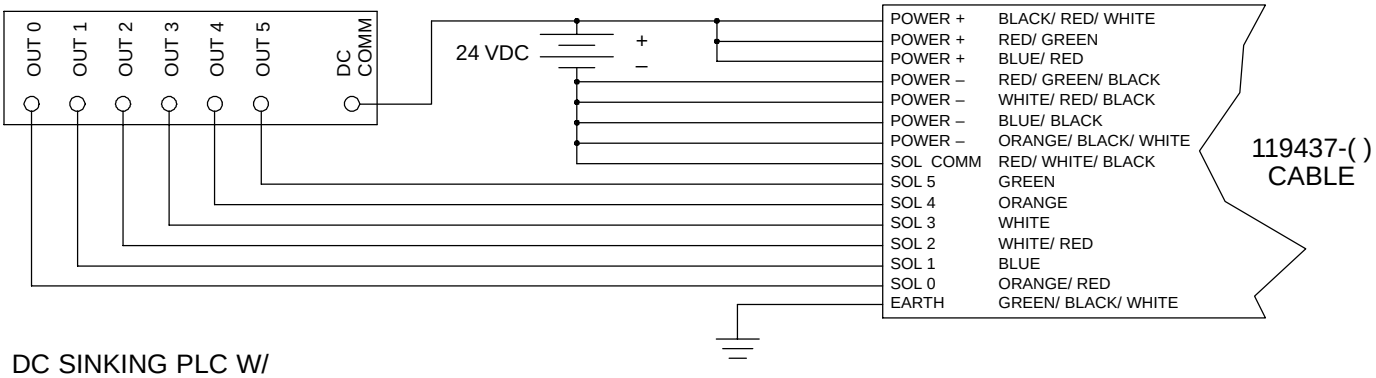
AroCom Parallel System Wiring Diagrams

DC COMM at the PLC is wired to +24 V for sourcing and 0 V for sinking.

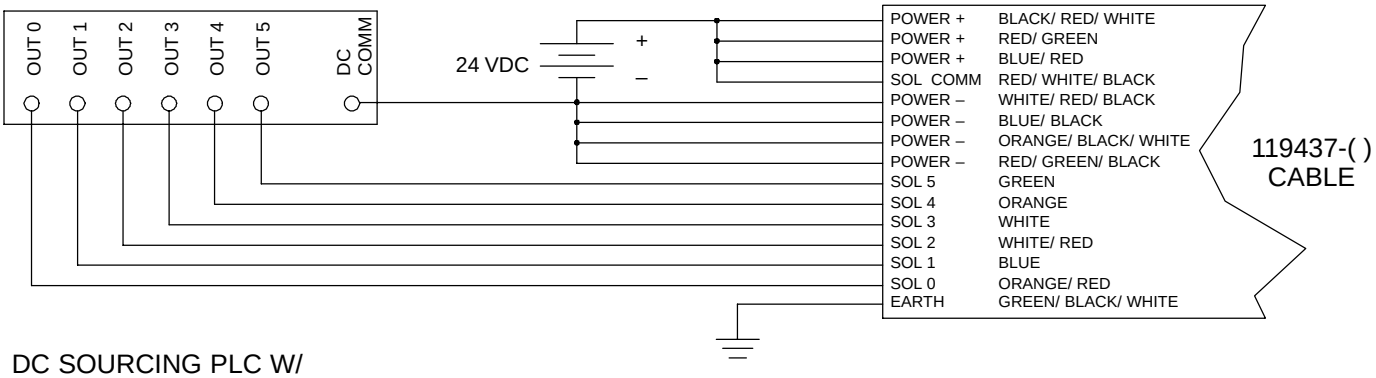
For clarity, only the first 6 outputs are shown. (15 total)

Wire colors given as: WIRE/ STRIPE/ SECOND STRIPE. (i.e. BLACK/ WHITE is a BLACK wire with a WHITE stripe).

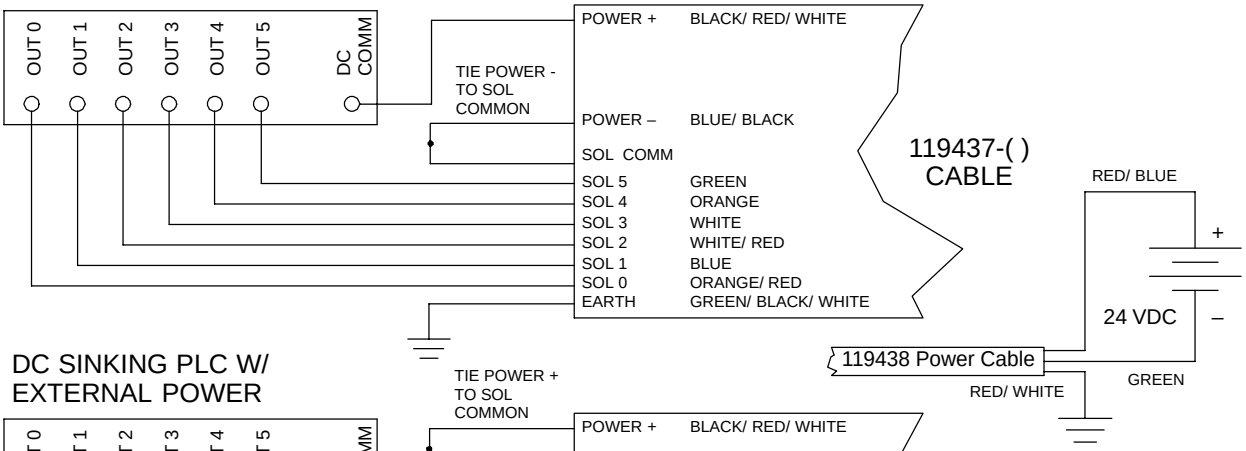
DC SOURCING PLC W/
POWER AT PLC



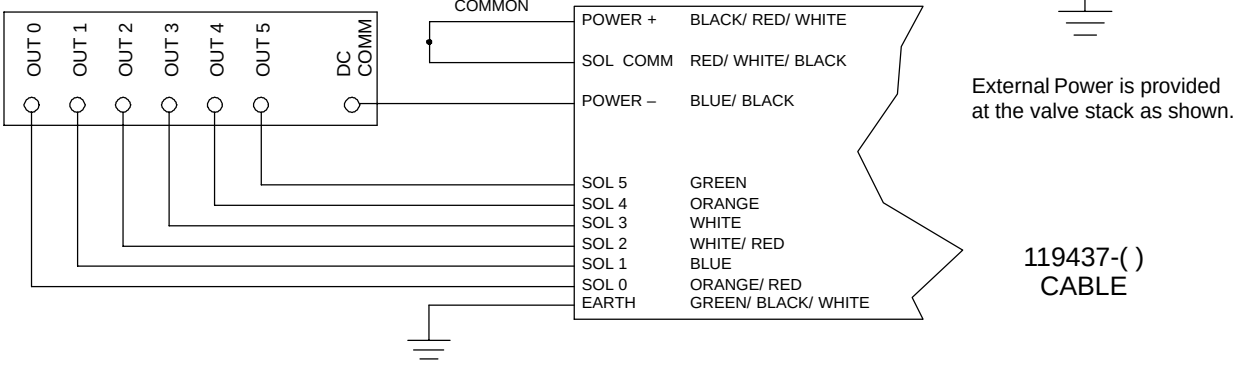
DC SINKING PLC W/
POWER AT PLC



DC SOURCING PLC W/
EXTERNAL POWER



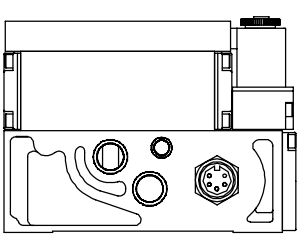
DC SINKING PLC W/
EXTERNAL POWER



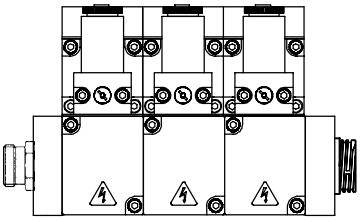
AroLink Serial Wiring System Configurations

EasyWire Manifolds are assembled in the same way as standard Genesis manifolds. To interface with external wiring systems, special endplate kits are used. There are four available for use with AroLink, and an assembled AroLink system will contain one endplate kit, one AroLink manifold (GMP1X6) and as many AroCom manifolds (GMP1X7) as necessary. The leftmost valve is the first in the system.

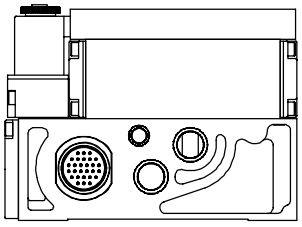
For details on the individual board connections, refer to the Internal Wiring section.



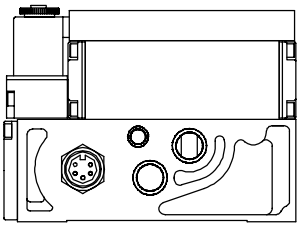
AroLink System with Serial-In Connector (left side)



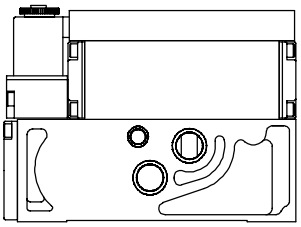
GMP1X6 GMP1X7 GMP1X7



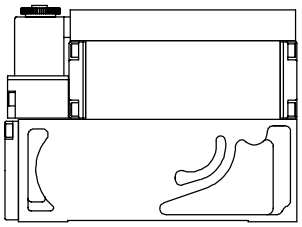
Right Side Parallel-Out (119435-5)



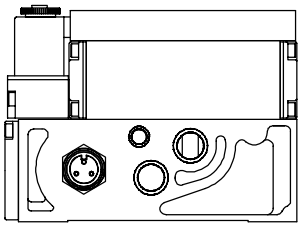
Right Side Serial Out (119435-6)



Right Side Ports Only (119435-7)



Right Side Blank (119435-8)

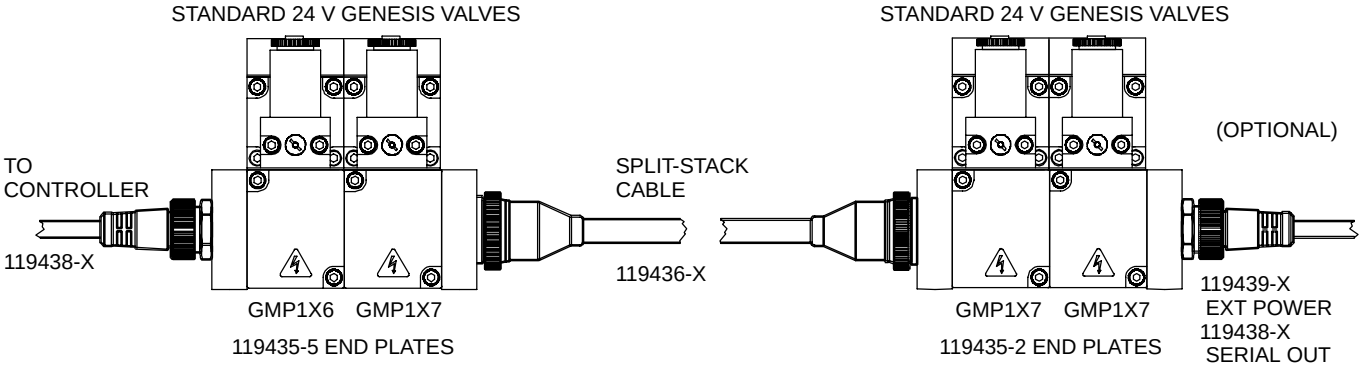


Right Side External Power In (119435-11)

Sample AroLink System with Split-Stack

This system is a four station AroLink system with external power. A Split-Stack is used between the second and third station.

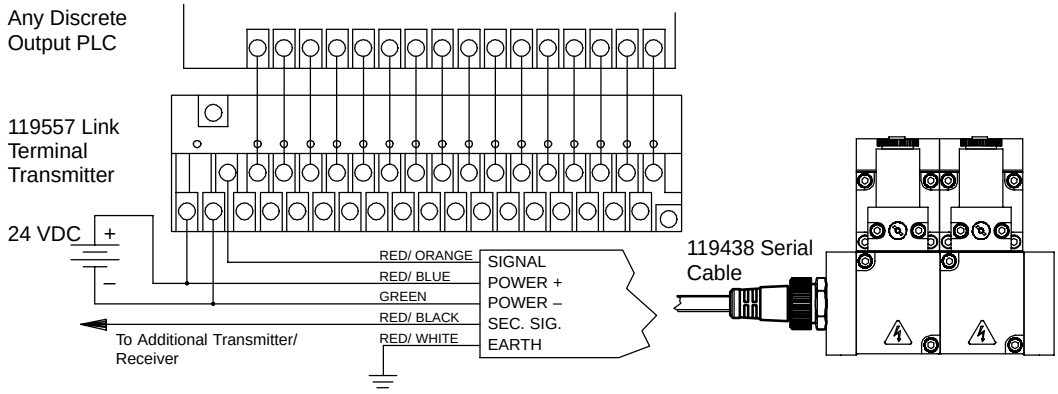
Note: This system would be ordered as (1) two station AroLink system with parallel out and (1) two station AroCom system with external power (if needed). Cables are ordered separately.



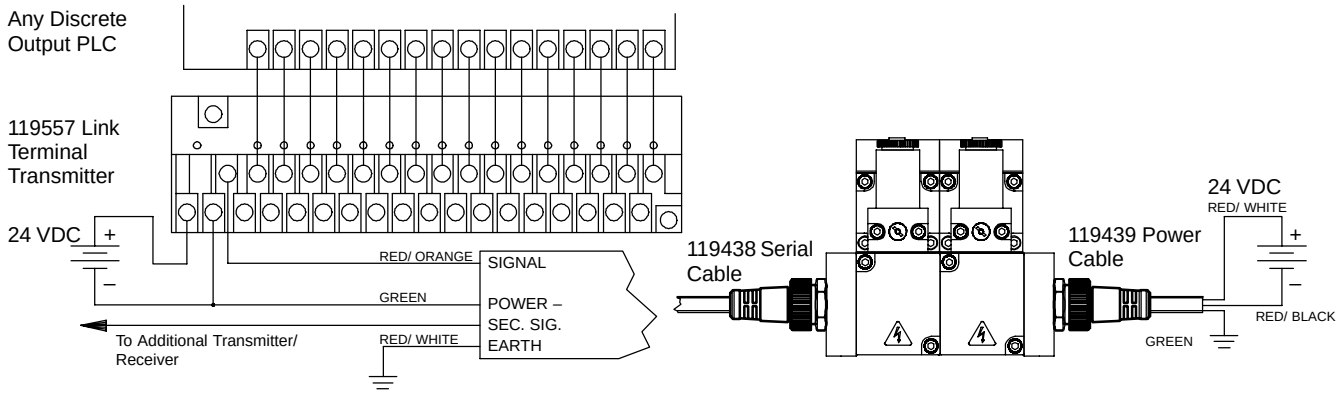
AroLink Serial System Wiring Diagrams

Wire colors given as: WIRE/ STRIPE/. (i.e. RED/ WHITE is a red wire with a white stripe).
Link Terminal is a trademark of Omron Electronics Inc.

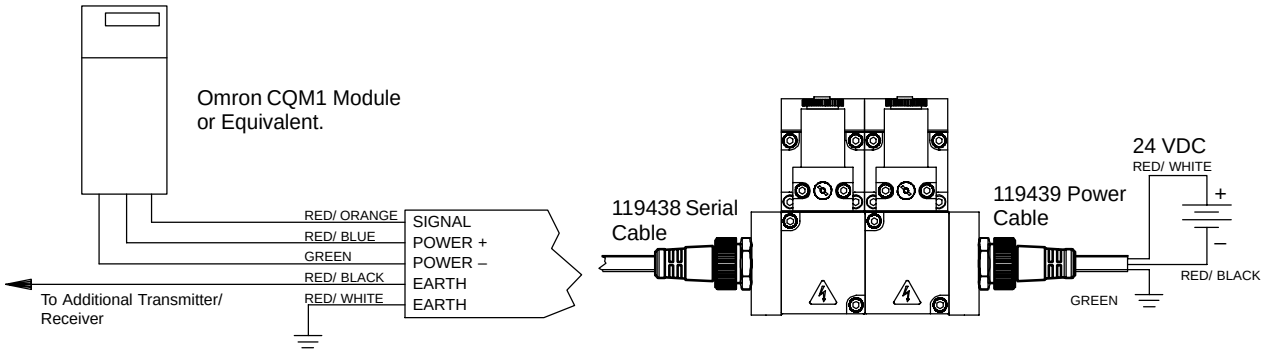
LINK TERMINAL W/ POWER AT PLC



LINK TERMINAL W/ DUAL POWER



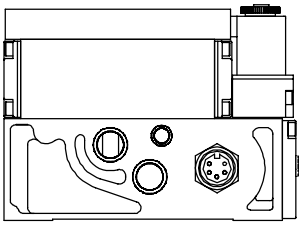
PLC MODULE W/ EXTERNAL POWER



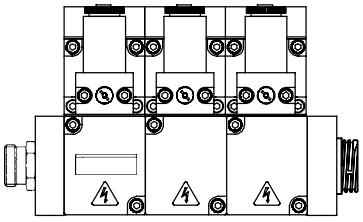
AroNet Network Serial Wiring System Configurations

EasyWire Manifolds are assembled in the same way as standard Genesis manifolds. To interface with external wiring systems, special endplate kits are used. There are four available for use with AroNet, and an assembled AroNet system will contain one endplate kit, one AroNet manifold (GMP1X5), and as many AroCom manifolds (GMP1X7) as necessary. The leftmost valve is the first in the system.

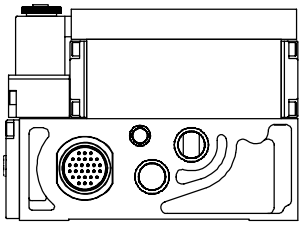
For details on the individual board connections, refer to the Internal Wiring section.



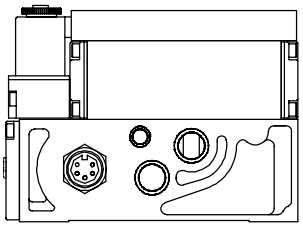
AroNet System with Serial-In Connector (left side)



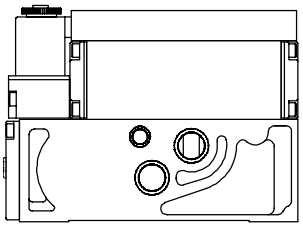
GMP1X5 GMP1X7 GMP1X7



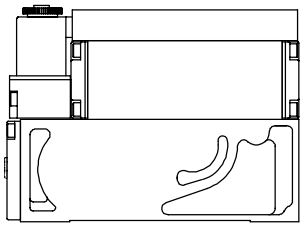
Right Side Parallel-Out (119435-5)



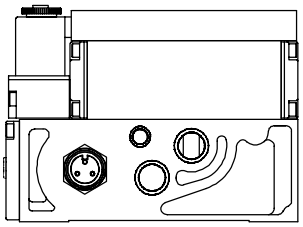
Right Side Serial Out (119435-6)



Right Side Ports Only (119435-7)



Right Side Blank (119435-8)

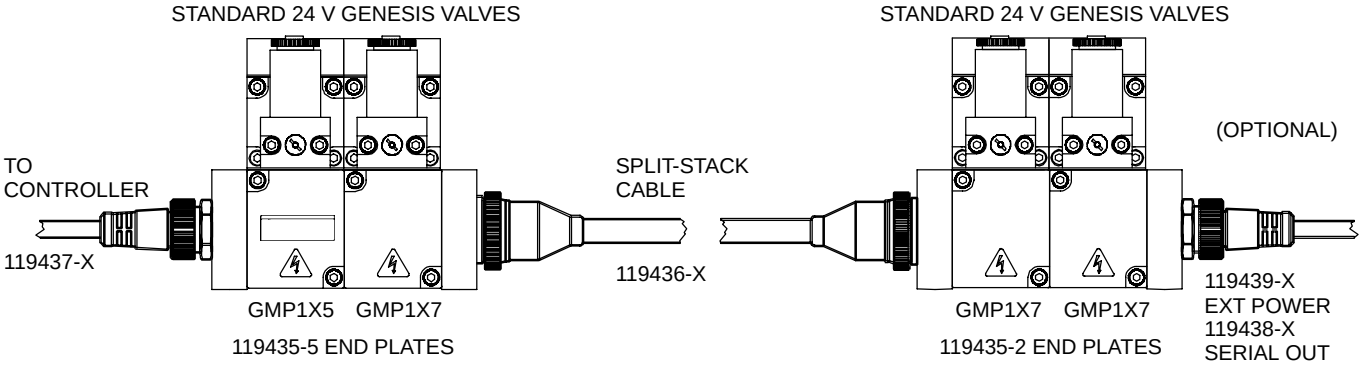


Right Side External Power In (119435-11)

Sample AroNet System with Split-Stack

This system is a four station AroNet system with external power. A Split-Stack is used between the second and third station.

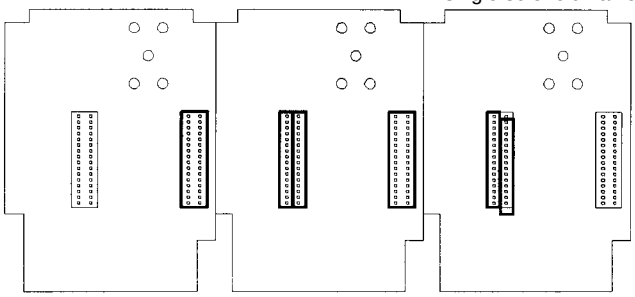
Note: This system would be ordered as (1) two station AroNet system with parallel out and (1) two station AroCom system with external power (if needed). Cables are ordered separately.



EasyWire Internal Wiring Instructions

For All Systems

AroCom boards
Shown from the top to illustrate jumper placement.



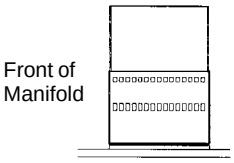
Jumper placed on right hand header on all boards.

Jumpers placed directly on left hand headers for a DOUBLE solenoid driver.

Inside jumper placed directly on header and outide jumper shifted as shown for a SINGLE

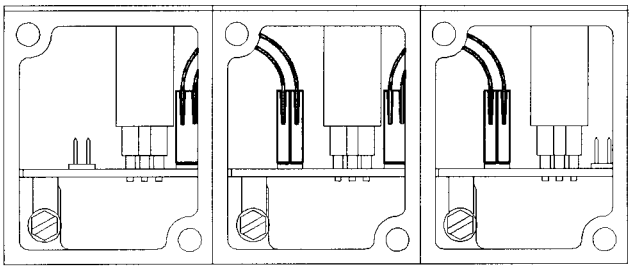
NOTE: The first station in any manifold (leftmost) is automatically set for a DOUBLE solenoid valve. Sol 0 is the “12” end and Sol 1 is the “14” end. This is explained further in the “Numbering” section.

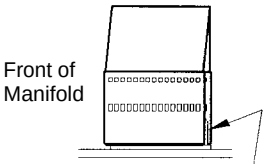
Jumpers shown from the right hand side.



DOUBLE DRIVER

AroCom Manifolds
Shown from the front.

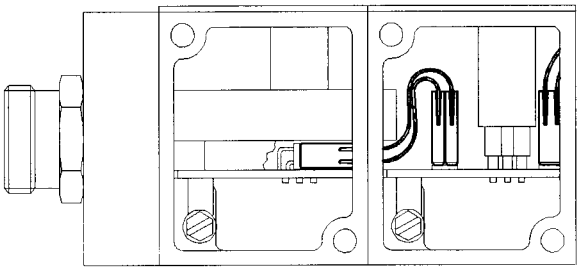




SINGLE DRIVER

Note pin is showing

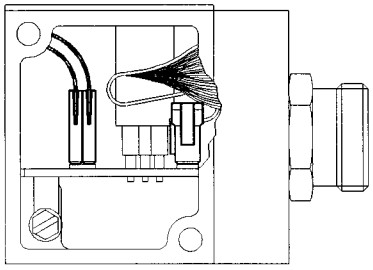
AroLink Manifold
With cutaway to show position of header.



Jumpers placed directly on right hand header located under the Receiver Chip.

NOTE: Header is horizontal.

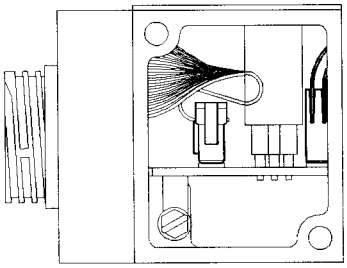
Manifold With External Power Connector.



Connector receptacle placed onto right header.

NOTE: Ribs on receptacle face LEFT and ribbon cable extends to the RIGHT. If installed any other way, the system will not function.

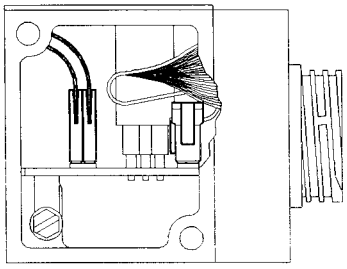
AroCom Manifold
With Parallel Input Connector.



Connector receptacle placed onto left header.

NOTE: Ribs on receptacle face LEFT and ribbon cable extends to the LEFT. If installed any other way, the system will not function.

Manifold With Parallel Output Connector.



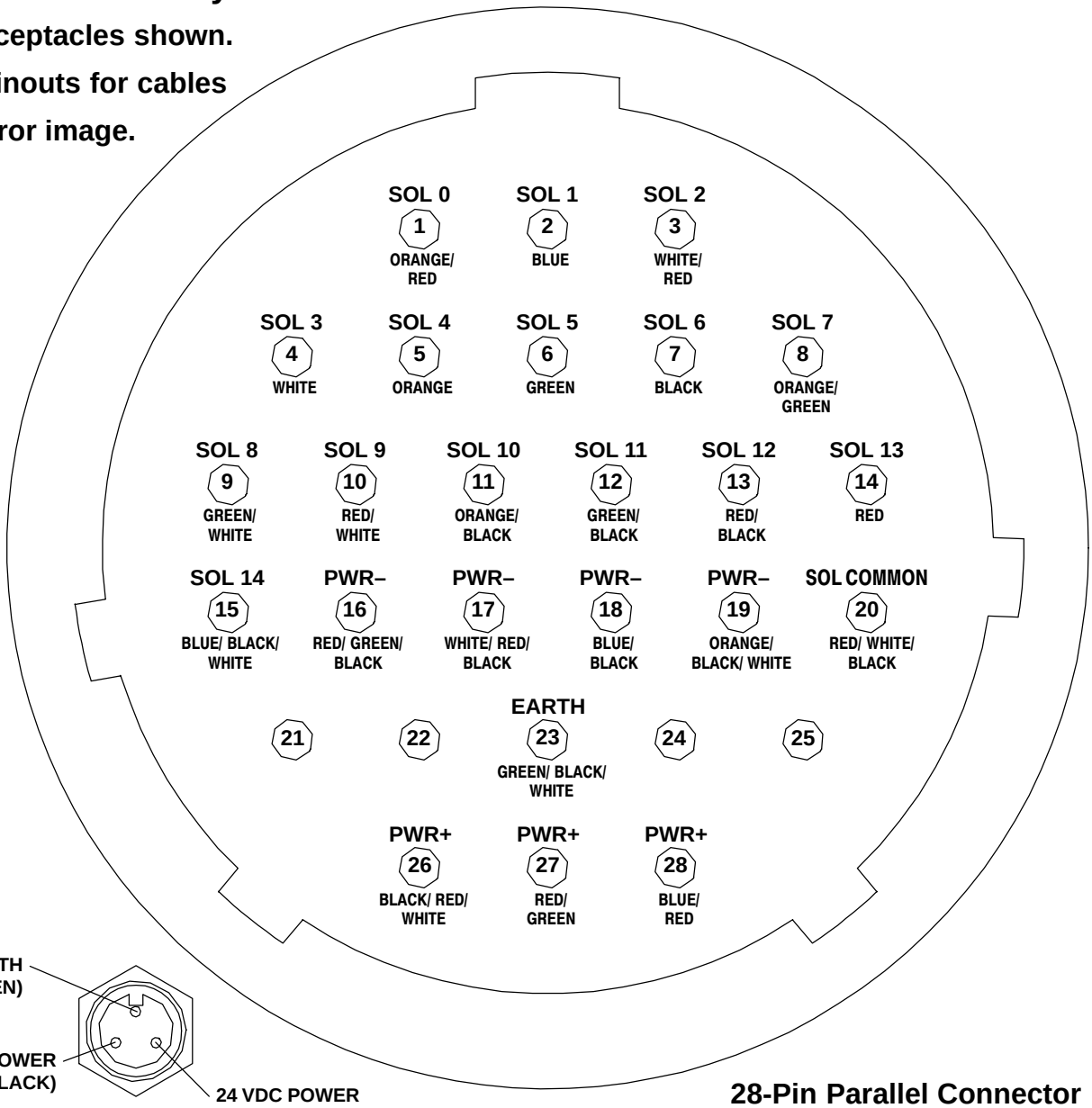
Connector receptacle placed onto right header.

NOTE: Ribs on receptacle face LEFT and ribbon cable extends to the RIGHT. If installed any other way, the system will not function.

Parallel and Serial System Pinouts for Stack Connections

Male receptacles shown.

Note: Pinouts for cables are mirror image.

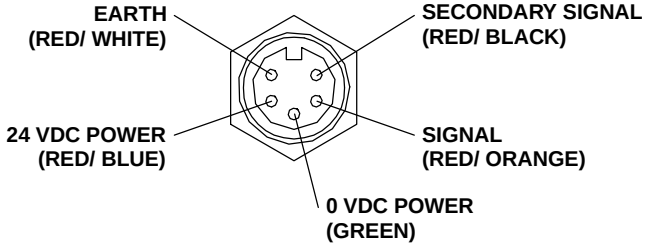


28-Pin Parallel Connector

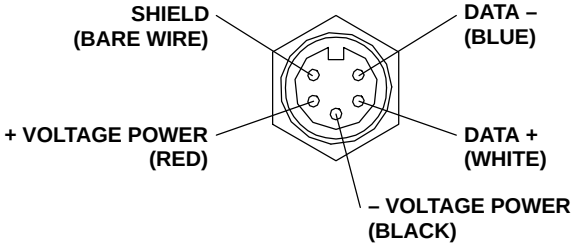
3-Pin Power Connector

These pinouts are given for reference, actual wiring diagrams are included for each system.

Wire colors given as: WIRE/ STRIPE/ SECOND STRIPE. (i.e. BLACK/ WHITE is a black wire with a white stripe, while BLACK/ RED/ WHITE is a black wire with a red stripe and a white stripe).



5-Pin AroLink Connector



5-Pin AroNet Connector (DeviceNet Standard)

ARO EasyWire System Technical Data

EasyWire General

	Low Watt Coil	Standard Watt Coil
Power (VDC)	24	24
Current per Coil (mA)	75	240
Max. Solenoids ON at any time (per system of 16 coils)	16	12
Max. Temperature (deg. F)	240 (115 C)	240 (115 C)
Max. Pressure (p.s.i.g.)	115 (7.9 bar)	150 (10.3 bar)

EasyWire Systems

	AroCom System	AroLink System	AroNet System
Power (VDC)	24	24	24
Signal Voltage / Current	3.4 V @ 3.4 mA to 24 V @ 33 mA	20 V to 24 V @ 6 mA	–
Max. Distance: Power at PLC	60 ft (18 m)	50 ft (15 m)	Refer to
External Power	100 ft (30 m)	330 ft (100 m)	DeviceNet
Dual Power	130 ft (40 m)	1640 ft (500 m)	Specifications
Max. Scan Time (mS)	–	19 (high speed 3 mS available)	–
PLC to be used	any discrete output DC (3.4 V to 24 V)	sourcing discrete output PLC (24 V)	–

AroNet Configuration

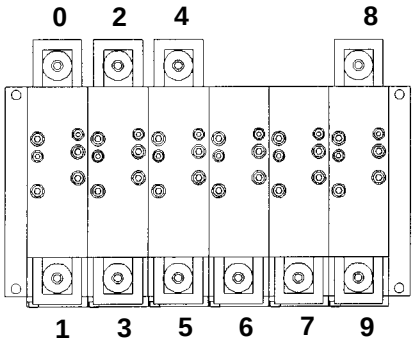
DIP Switch Configurations:	SW1	SW2	Baud Rate
	OPEN	OPEN	125k
	CLOSED	OPEN	250k
	OPEN	CLOSED	500k
Reset MAC ID to 63 @ Power On	CLOSED	CLOSED	Default Setting

LED Designations	LED 1 (Module Status)	LED 2 (Network Status)
Solid Green	AroNet Receiving Power	AroNet Properly Allocated
Flashing Green	AroNet Running thru startup procedures	AroNet senses network, but is unable to communicate. Possible Node Allocation Collision.
Red (any form)	Not Applicable	Fault Mode. AroNet is unable to sense network. Possible failure to allocate a node on network.

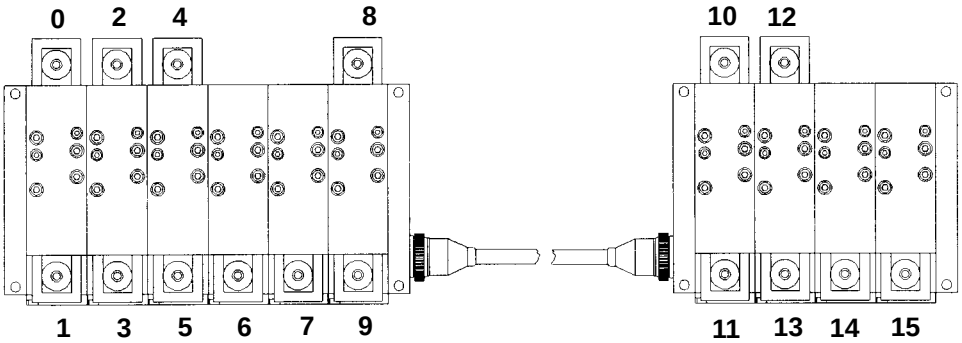
Communication Type:	Polled Device (Group 2 only slave)
Bit Mapping Reservations:	16 Bit output word, additional enable bit dependent upon DeviceNet scanner / PLC interfacing.

EasyWire Solenoid Numbering

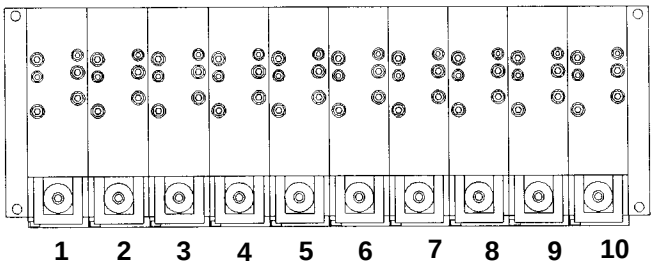
AroLink and AroNet may control up to 16 solenoids per control point (node) and AroCom, up to 15 solenoids. The first manifold (leftmost looking at the conduit covers) in each stack is always configured for a double solenoid valve and each remaining manifold may be configured as either a single or double at any time.



Numbering will begin with the leftmost manifold using Outputs #0 and #1 and increase as valves are added to the right of this. The “12” end solenoid on double solenoid valves will be the lower number and the “14” end on single solenoid valves will be the ONLY number.
EXAMPLE: Engaging Output 8 at the PLC activates the “12” end on the sixth valve in the above stack.



If all of the points available in any of the three systems are not used in the first valve stack, a “parallel-out“ endplate may be used on the right side. Using a 119436 cable, an AroCom system may be added to consume the remaining outputs. The numbering on the added stack begins where that of the original stack left off.



If the leftmost manifold does not use a double solenoid valve, as seen above, the first output, Output 0, will have no effect. Because of this, the maximum number of single solenoid valves available with AroLink and AroNet is 15 and 14 for Aro-Com.