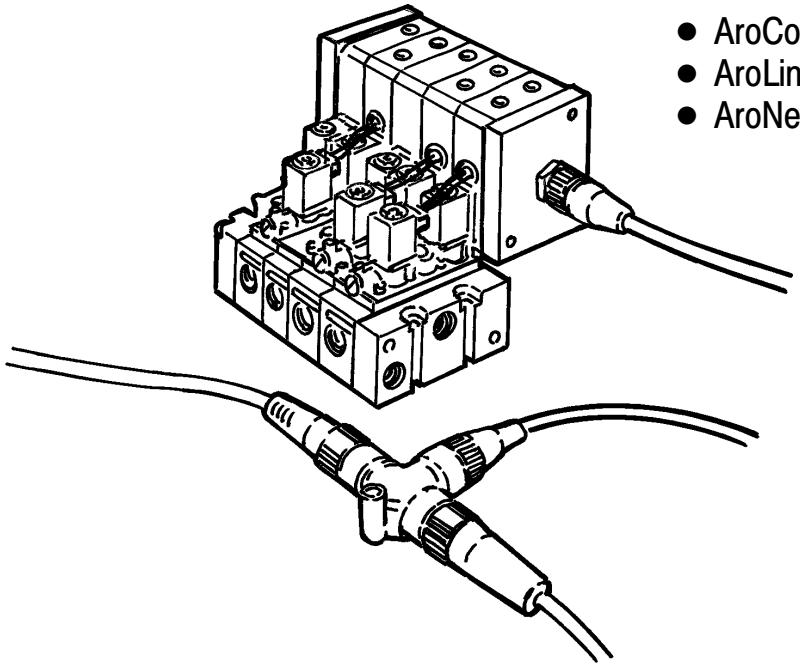
Released: 6–3–96
Revised:

**ALPHA**

# ARO EasyWire™ System Installation Guide

## Flexible Communications for ARO Alpha™ Stacking or Thin Valves Using Any Discrete Output PLC.



INCLUDES:

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

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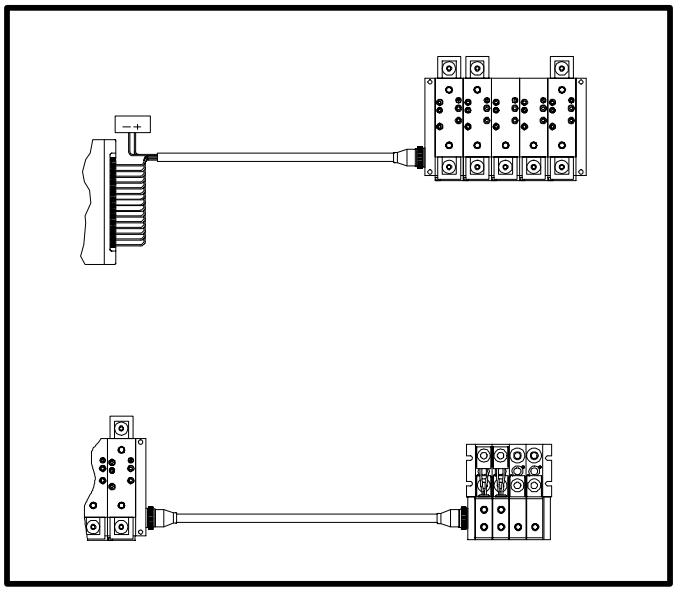
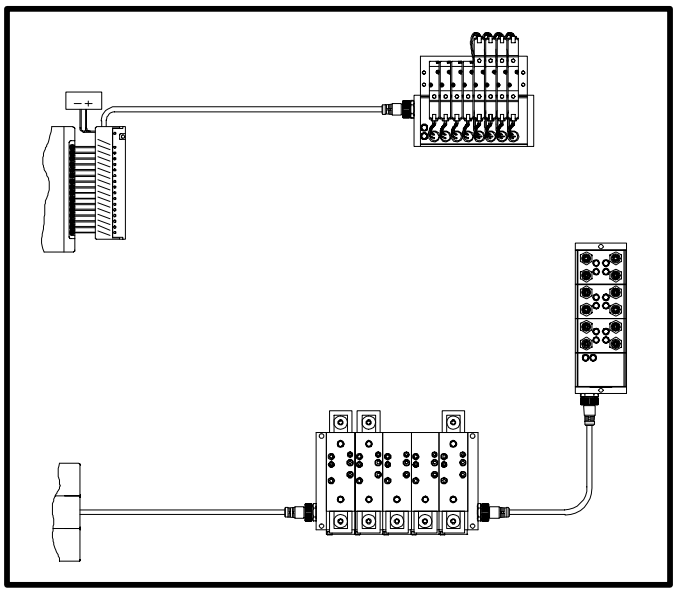
INGERSOLL-RAND
FLUID PRODUCTS



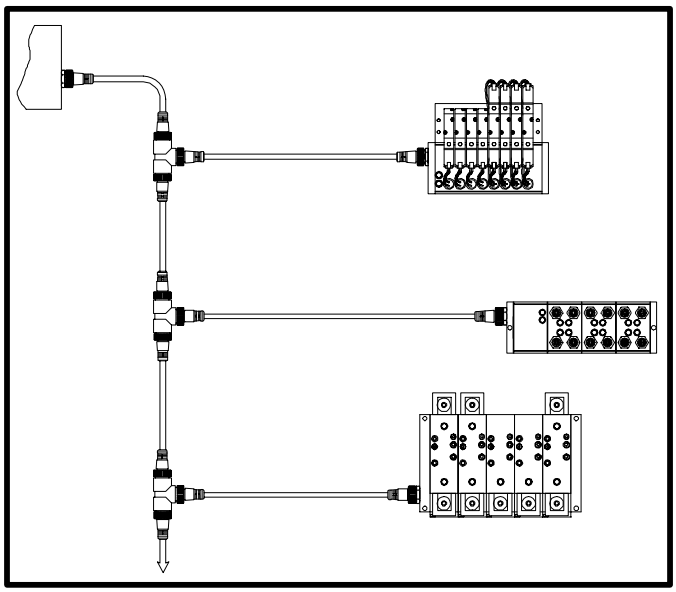
## EasyWire AroCom Parallel Communication

- Controls up to 15 solenoids.
- Direct PLC to valve interface.
- Split–stack mounting capability.
- Add / remove valves in minutes.
- Runs off TTL (3.4 – 24 V) signal, sourcing or sinking.



## EasyWire AroLink Serial Interface Communication

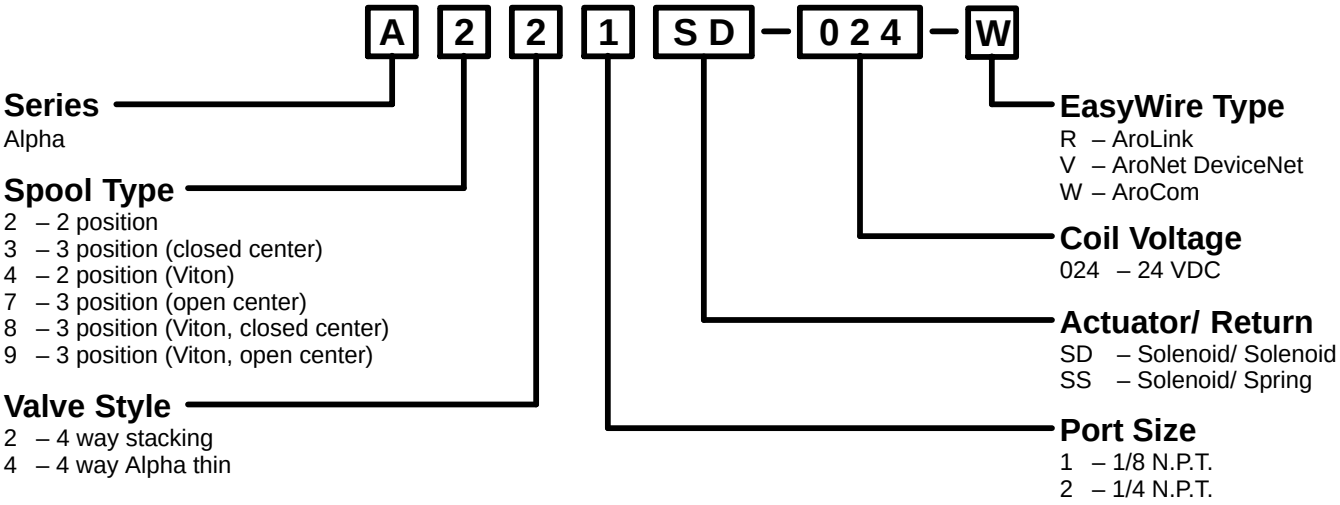
- Controls up to 16 solenoids per wire.
- Works with any make Discrete Output PLC.
- Split–stack mounting capability.
- Add / remove valves in minutes.
- Compatible with Omron Link Terminals.
- External power available.



## EasyWire AroNet DeviceNet Communication

- Fully DeviceNet compatible.
- Controls up to 16 solenoids per node using a Device-Net interface.
- Split–stack mounting capability without consuming additional nodes.
- Diagnostics capability.
- Software programmable addresses.
- Add / remove valves in minutes.
- External power available.

## EasyWire Model Description Chart

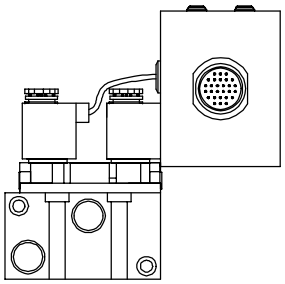



| MODEL | DESCRIPTION |
|---|---|
| **End Plate (for AroCom System)** | |
| 119816–1 | Parallel In (left) Parallel Out (right). |
| –2 | Parallel In (left) Serial/ External Power Out (right). |
| –3 | Parallel In (left) Blank (right). |
| **End Plate (for AroLink and AroNet DeviceNet)** | |
| 119816–4 | Serial In (left) Parallel Out (right). |
| –5 | Serial In (left) Serial/ External Power Out (right). |
| **Transmitter Terminal (for AroLink System)** | |
| 119557 | Transmitter converts 24 PNP–Compatible, 16 inputs to AroLink signal. |
| **Patch Cables** | |
| 119779–1 | Male/Female 5–pin patch cable for AroLink – 6 ft. |
| –2 | Male/Female 5–pin patch cable for AroLink – 12 ft. |
| **Cables (AroCom)** | |
| 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. |
| **Cables (AroLink)** | |
| 119438–1 | 5–Wire serial communication cable with plug on one end and 5 (each) stripped wires on other end – 12 ft. |
| –2 | Same as –1, except 30 ft length. |

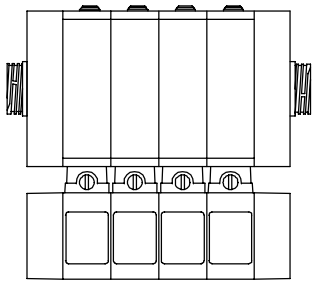
## AroCom Parallel Wiring System Configurations

EasyWire stacks are assembled in the same way as standard Alpha stacks. To interface with external wiring systems, special endplate kits are used. There are three available for use with AroCom, and an assembled AroCom system will contain one valve endplate kit, one electronics kit and as many AroCom valves (AXXXXX–024–W) as necessary. The leftmost valve is the first in the system.

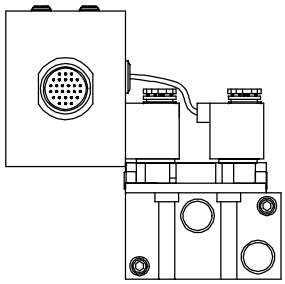
For details on the individual board connections, refer to the Internal Wiring section.



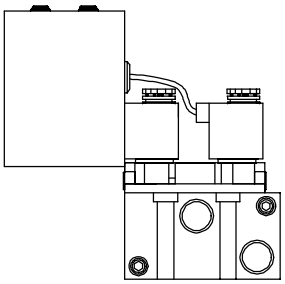
AroCom System with Parallel–In Connector (left side)



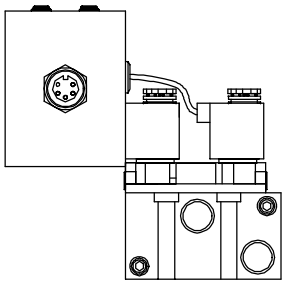
AXXXXX–024–W (4)



Right side Parallel–Out



Right side Ports Only

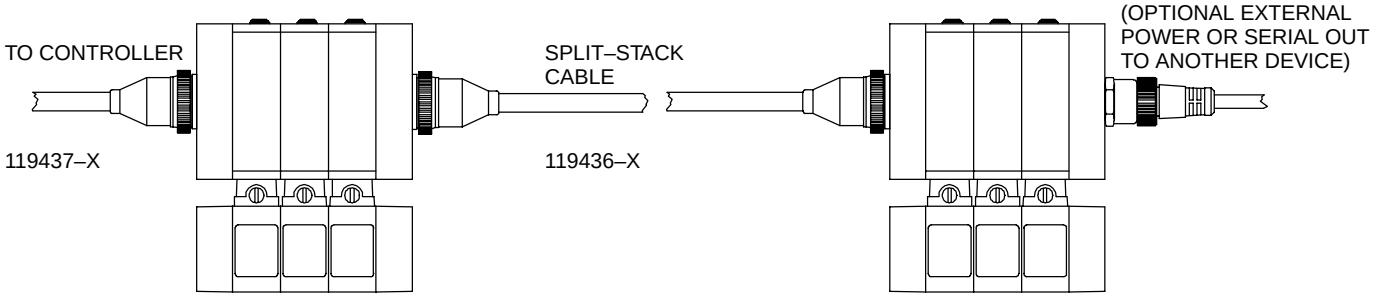


Right side Serial Out/ External Power

## Sample AroCom System with Split–Stack

This system is a six station AroCom system with external power. A split–stack is used between the third and fourth station.

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



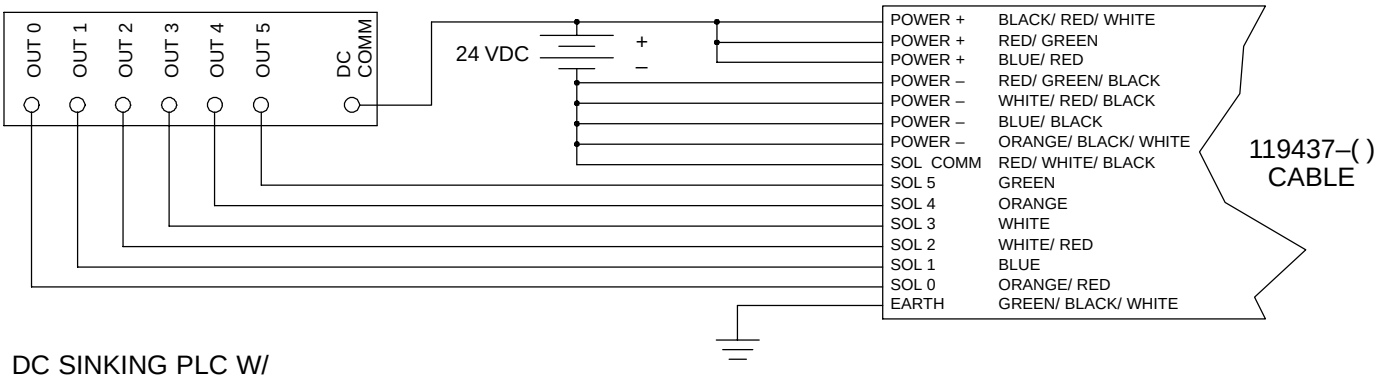
# AroCom Parallel System Wiring Diagrams

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

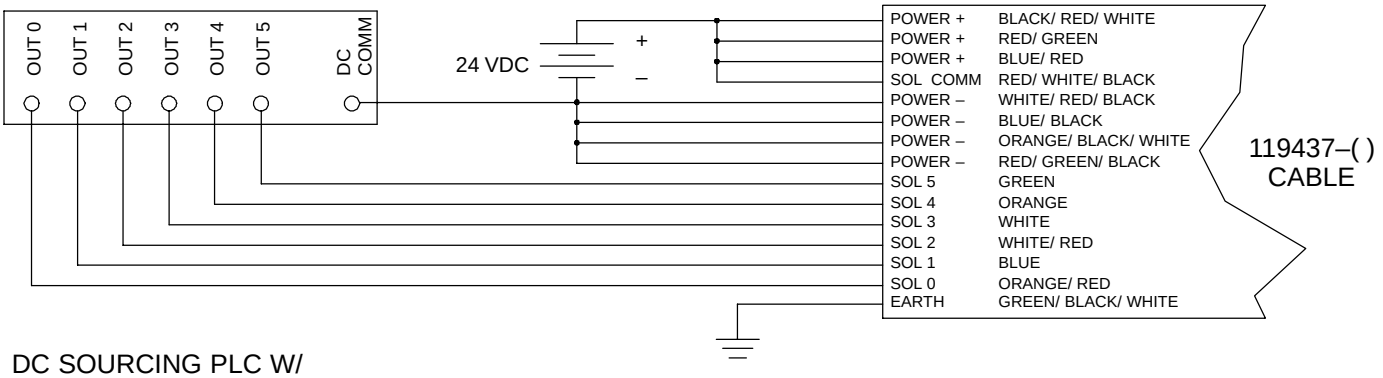
For clarity, only the first 6 outputs are shown. (15 total)

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

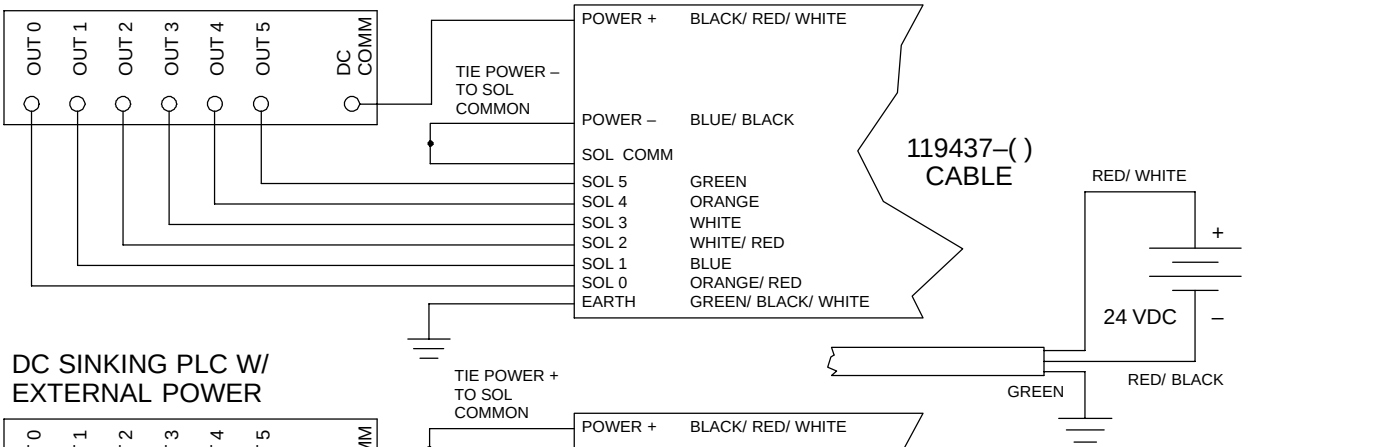
## DC SOURCING PLC W/ POWER AT PLC



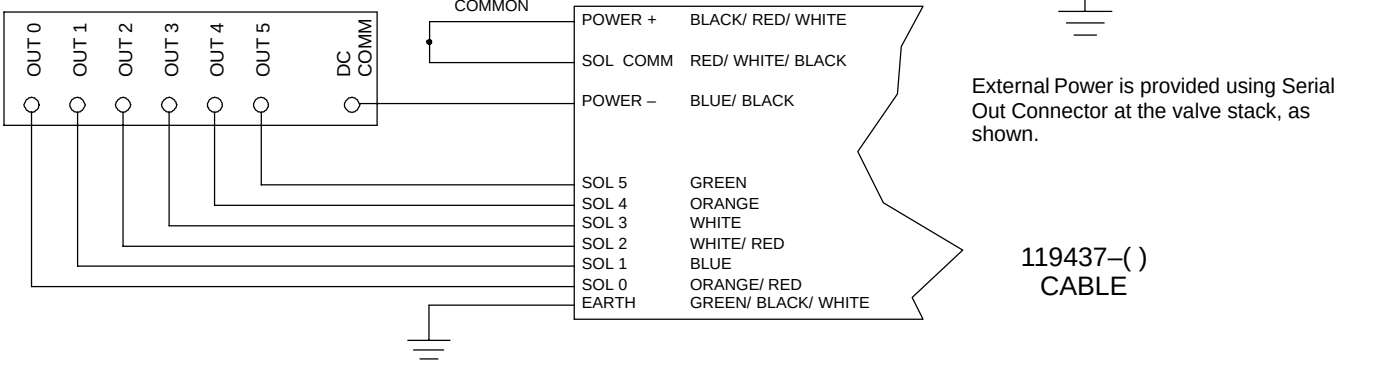

## DC SINKING PLC W/ POWER AT PLC




## DC SOURCING PLC W/ EXTERNAL POWER




## DC SINKING PLC W/ EXTERNAL POWER

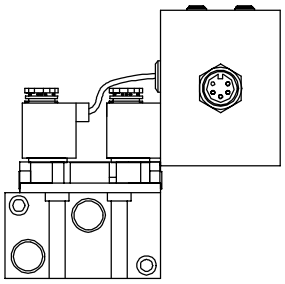



External Power is provided using Serial Out Connector at the valve stack, as shown.

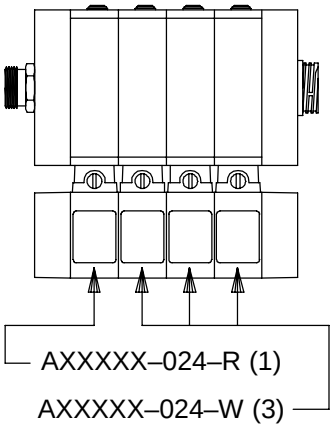
## AroLink Serial Wiring System Configurations

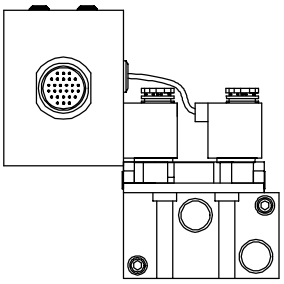
EasyWire stacks are assembled in the same way as standard Alpha stacks. To interface with external wiring systems, special endplate kits are used. There are four available for use with AroLink, and an assembled AroLink system will contain one valve endplate kit, one electronics kit, one AroLink valve (AXXXXX–024–R) and as many AroCom valves (AXXXXX–024–W) as necessary. The leftmost valve is the first in the system.

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

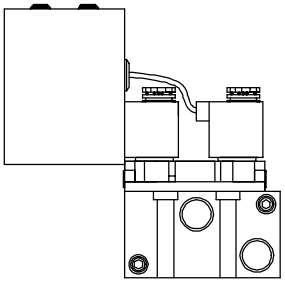


AroLink System with Serial–In Connector (left side)

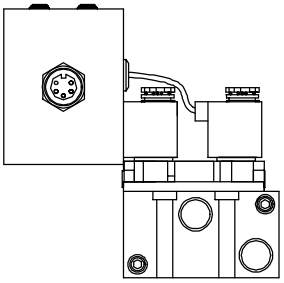


Right side Parallel–Out



Right side Ports Only

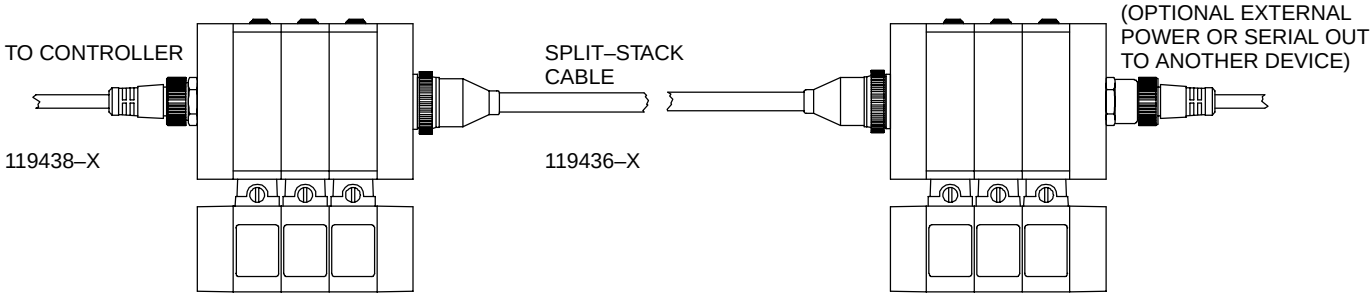


Right side Serial Out/ External Power

## Sample AroLink System with Split–Stack

This system is a six station AroLink system with external power. A split–stack is used between the third and fourth station.

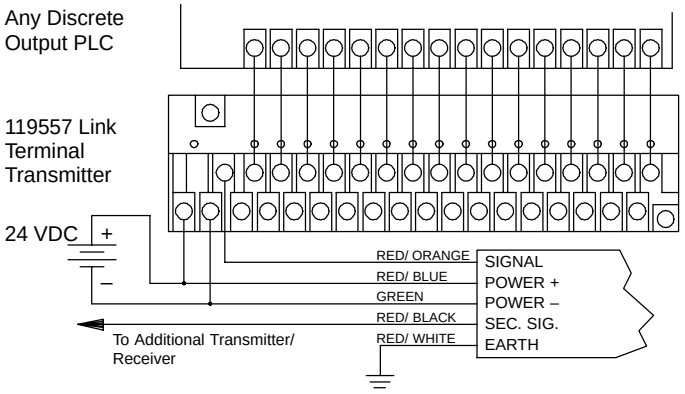
NOTE: This system would be ordered as (1) three station AroLink system with parallel out and (1) three station AroCom system with external power (if needed). Cables are ordered separately.



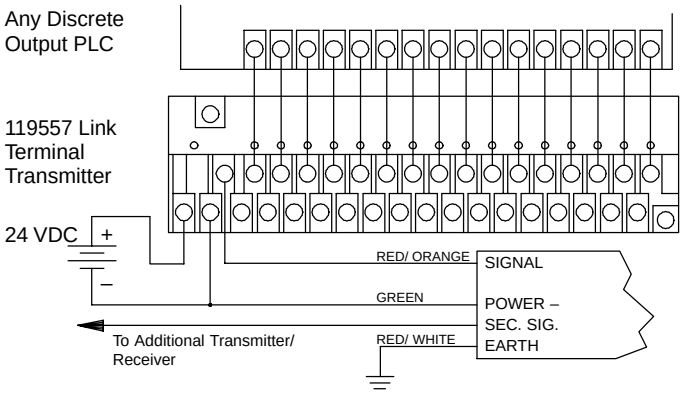
# AroLink Serial System Wiring Diagrams

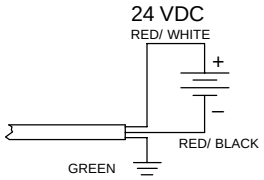
Wire colors given as: WIRE/ STRIPE/. (i.e. RED/ WHITE is a red wire with a white stripe).

## LINK TERMINAL W/ POWER AT PLC

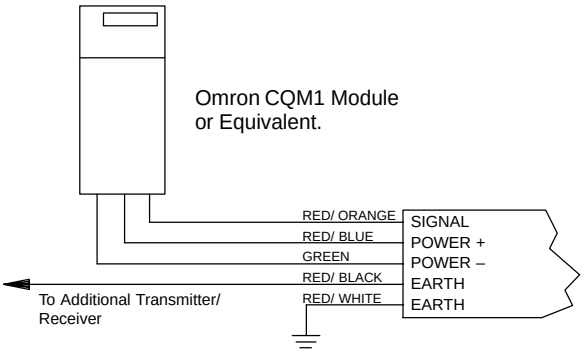


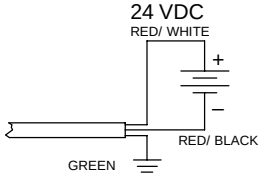

## LINK TERMINAL W/ DUAL POWER




## PLC MODULE W/ EXTERNAL POWER



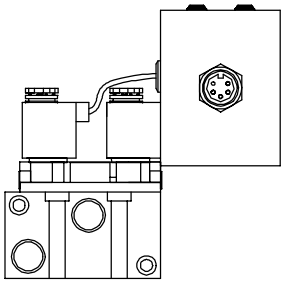




External power is provided.

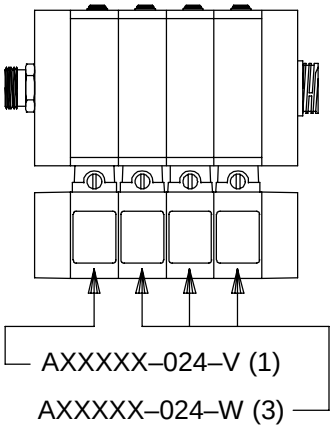
## AroNet (DeviceNet) Network Serial Wiring System Configurations

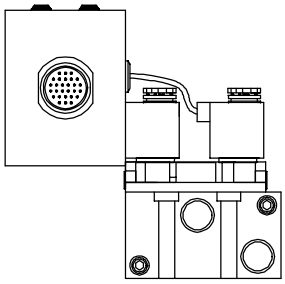
EasyWire stacks are assembled in the same way as standard Alpha stacks. To interface with external wiring systems, special endplate kits are used. There are four available for use with AroNet, and an assembled AroNet system will contain one valve endplate kit, one electronics kit, one AroNet valve (AXXXXX–024–V) and as many AroCom valves (AXXXXX–024–W) as necessary. The leftmost valve is the first in the system.

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

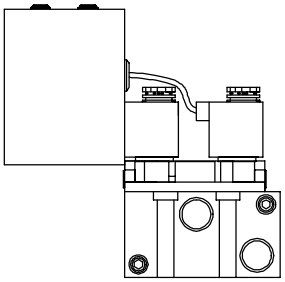


AroNet System with Serial–In Connector (left side)

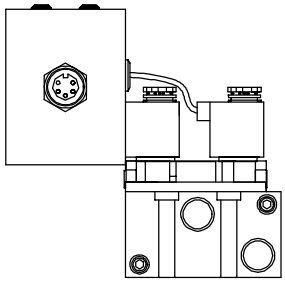


Right side Parallel–Out



Right side Ports Only

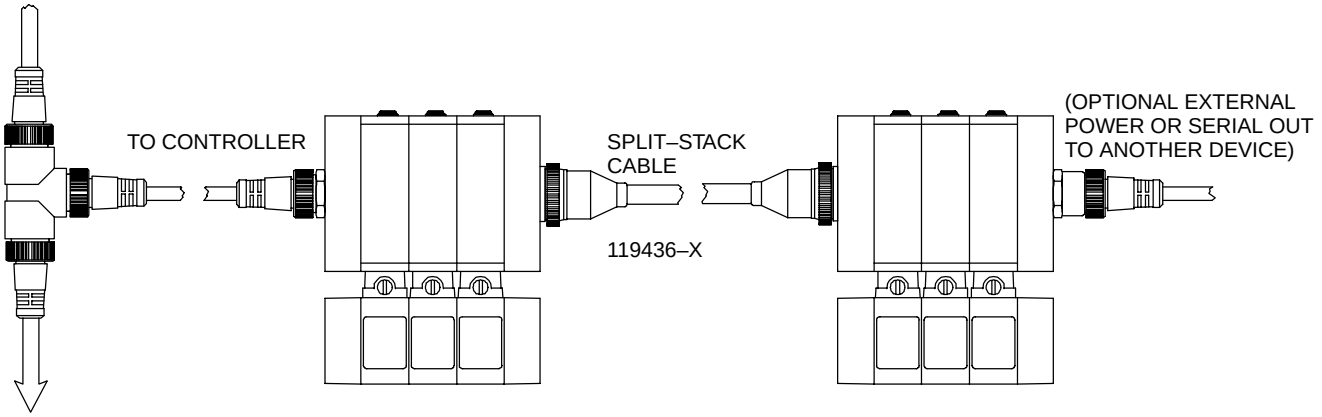


Right side Serial Out/ External Power

## Sample AroNet System with Split–Stack

This system is a six station AroNet system with external power. A split–stack is used between the third and fourth station.

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

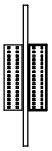


# Alpha EasyWire Internal Wiring Instructions

## For All Systems

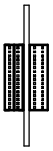
### AroCom boards

Shown from the top to illustrate jumper placement.



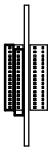
Jumper placed on right hand header on all boards.

Board shown set for double solenoid valve.



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

Board shown set for single solenoid valve.

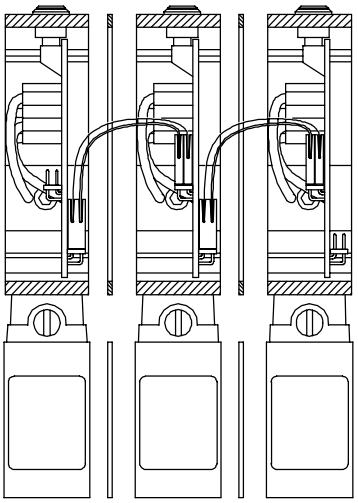


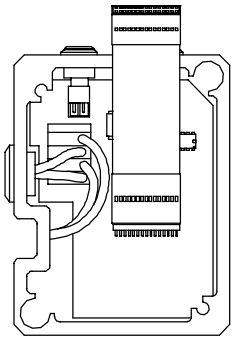
Outside jumper placed directly on header and inside jumper shifted as shown for a SINGLE solenoid driver.

NOTE: The first station (leftmost) in any valve stack 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.

### AroCom Valves

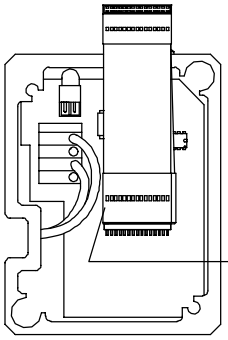
Shown from the front.





DOUBLE DRIVER

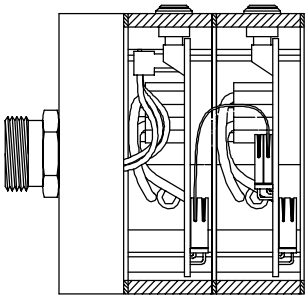
Jumpers shown from the left hand side.



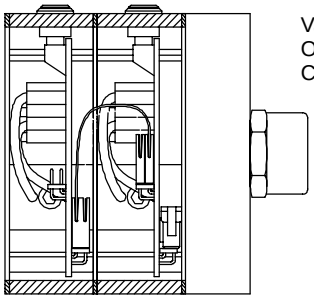
SINGLE DRIVER

NOTE: Inside header shifted one pin. Bare pin not seen in this view.

### AroLink and AroNet Valve Stack



Connector attached to the 5–pin receptacle at the top of the board.



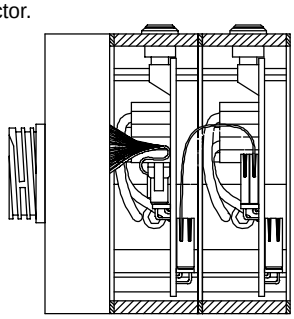
Valve Stack with Serial Output/ External Power Connector.

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.

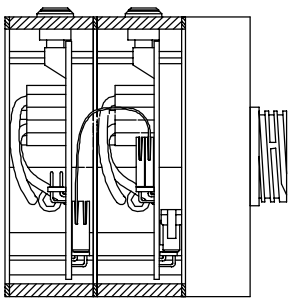
### AroCom Valve Stack

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.



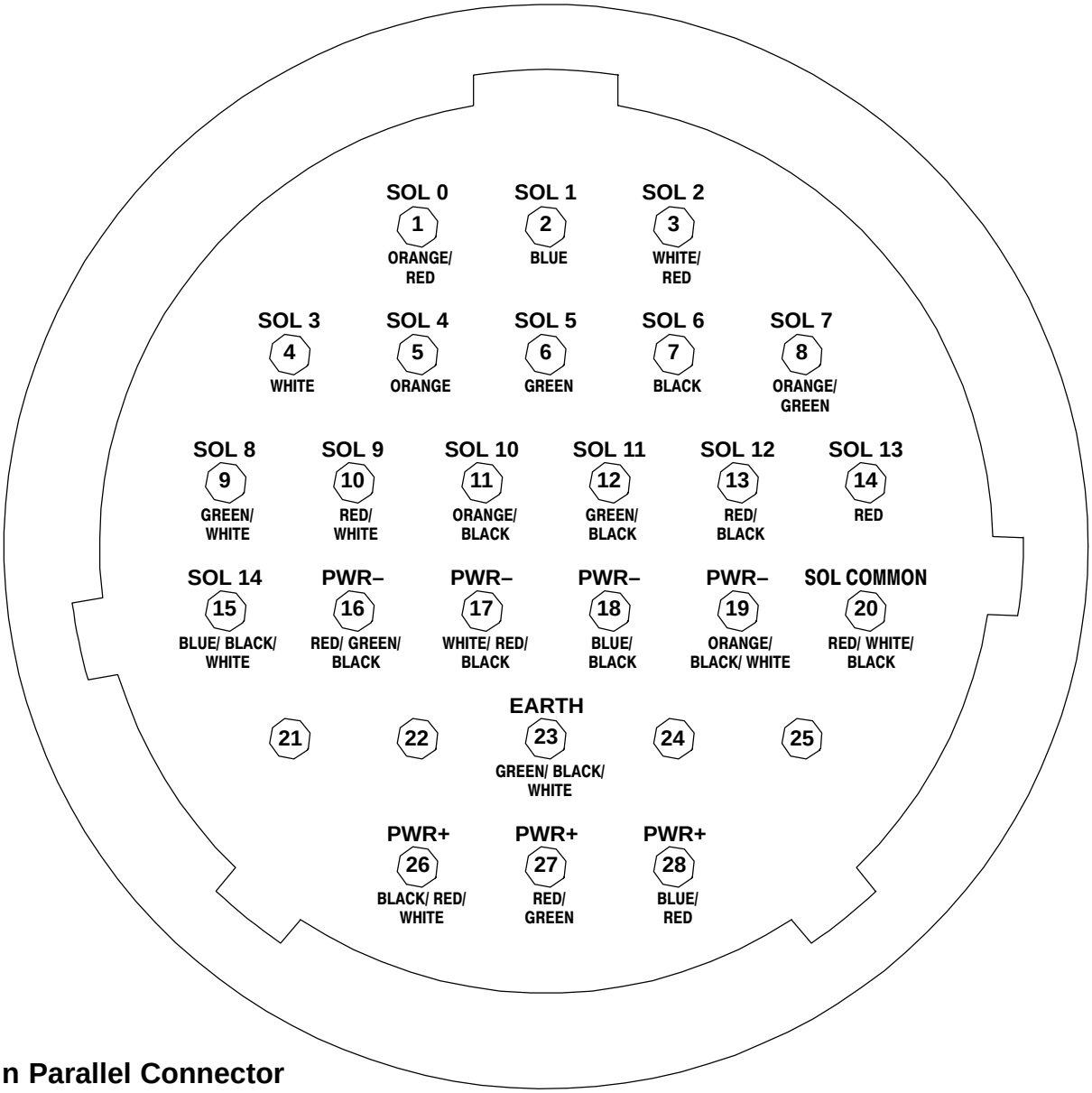
Valve Stack with Parallel Output Connector.

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

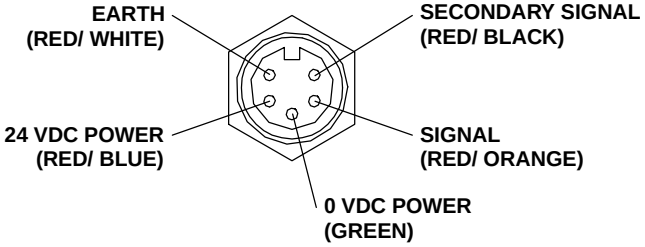
**Male receptacles shown.**



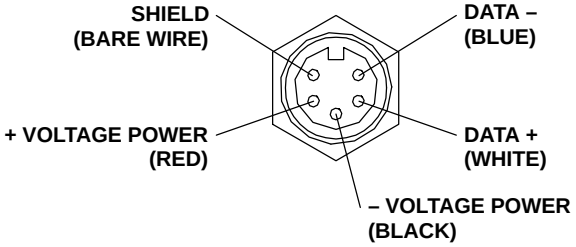

### 28–Pin Parallel Connector

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 (7.8 bar) | 150 (10.2 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 DeviceNet |
| External Power | 100 ft (30 m) | 330 ft (101 m) | Specifications |
| Dual Power | 130 ft (40 m) | 1640 ft (500 m) | |
| 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

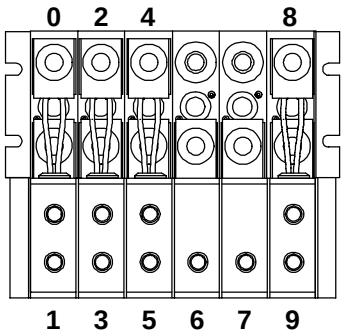
| DIP Switch Configurations: | SW1 | SW2 | Baud Rate |
|---|---|---|---|
| | OPEN | OPEN | 125k |
| | CLOSED | OPEN | 250k |
| | OPEN | CLOSED | 500k |
| Reset MAC ID to 63 @ Power On | CLOSED | CLOSED | Default Setting |

| 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. |

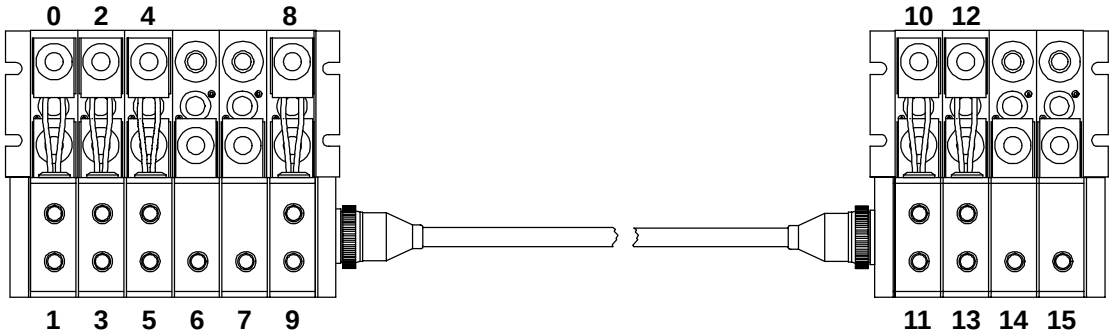
| | |
|---|---|
| Communication Type: | Polled Device (Group 2 only slave) |
| Bit Mapping Reservations: | 16 Bit output word, additional enable bit dependent upon DeviceNet scanner/PLC interfacing. |

## EasyWire Solenoid Numbering

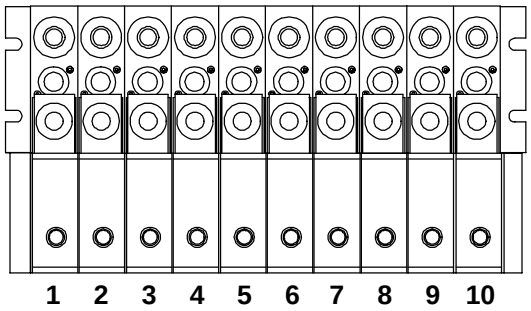
AroLink and AroNet may control up to 16 solenoids per control point (node) and AroCom, up to 15 solenoids. The first manifold (leftmost looking at the product label) in each stack is always configured for a double solenoid valve and each remaining manifold may be configured as either a single or double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