# SVF Flow Controls

# ASi VALVE NETWORKING

## SVF ASi Valve Position Controllers

ASi makes it simple. SVF's VPCs with encapsulated ASi interface cards adapt your on/off automated valves to an advanced 2-wire ASi valve network. Money and time will be saved as installation and maintenance are streamlined with reduced wiring and improved system diagnostics.

The ASi network protocol was developed to provide industry with a simple and cost effective method of networking on/off sensors and devices. An ASi network can interface directly with your plant's PLCs or through other protocols such as DeviceNet, Foundation Fieldbus, Profibus or Modbus with a gateway. SVF supplies total ASi packages including power supplies, gateways, held-hand programmers, cable and quick disconnect connectors.
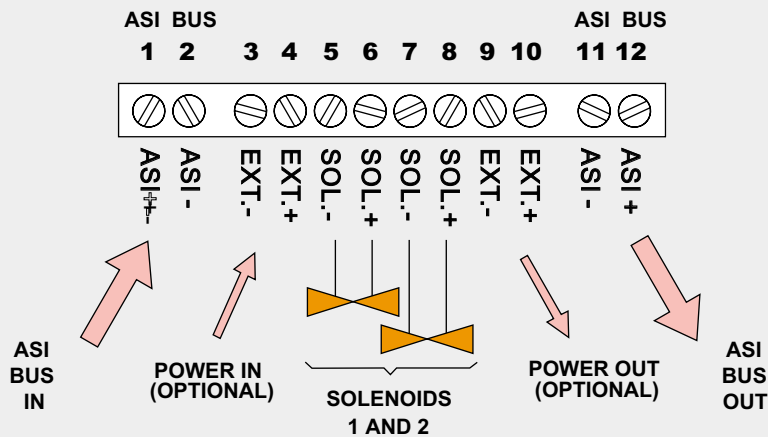
## SVF's ASi Platform Is Simply Better

1) **The Network Card.** A full function encapsulated network card for the ASi protocol optimized for the functions of the VPC is included in the housing. The cards offer the following benefits:

   A) Encapsulation of the electronics insures component reliability in corrosive, humid and dirty environments.
   B) Solid State position sensors are encapsulated on board, protecting them from the environment. These sensors are optimized for the card and are more stable than mechanical or reed switches in areas of high vibration.
   C) Up to two transistor outputs for 24VDC on-board power, or up to two optional relays for control of devices requiring separate DC or AC power supplies, such as specialty high power AC solenoids using hydraulic fluid.
   D) The option to "daisy chain" the network or separate power supply through the VPC, if space constraints require it.
   E) Separate addressing plug located on board, allowing addressing of the units with your ASi hand-held programmer after the VPCs have been fully installed & wired.
   F) High visibility LEDs are located on-board for local indication of on -board sensors, auxiliary inputs, outputs and network state.
   G) Two additional inputs are optional for local pressure or temperature switches.

2) **The Enclosure.** SVF's platform is available in a wide variety of enclosure materials to match your hazardous or corrosive environment and provide long-term reliability.

   A) Housings in Aluminum, SuperTough Zytel Thermoplastic or Cast CF-8M Stainless Steel for General Purpose or Hazardous Areas
   B) SVF's Engineered Loc-Ring Cam and Shaft Retention System assures stable output signals in difficult environments
   C) Optional Junction boxes to facilitate maintenance of the automated valve without shutting the network down are available for general purpose or hazardous areas.
   D) Optional DIN 4-pin Female Micro plug connectors can be fitted to the conduit entries of the enclosures to speed installation in general purpose areas.

3) **The Visual Indicator.** SVF's High Visibility Valve Position Indication preferred by users worldwide, available in a wide variety of colors and flow patterns.

4) **The Solenoid Valve.** Low power solenoid valves optimized for the network card output, available pre-wired with the VPC or with direct NAMUR actuator mounting.

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# SVF Flow Controls  *ASi VALVE NETWORKING*

## ASi Technical Information

- Supports up to 124 inputs and 124 outputs over 31 nodes or addresses
- Baud rate at 167Kbit (No termination required)
- Scan time < 5ms for a fully loaded system
- Deterministic - each slave adds 150 μs to the scan time
- Can be installed in any topology
- Bus power and communications share the same 2 wire cable
- Standard 16AWG or special AS-interface flat cable can be used

- 990 ft. total bus length (with maximum 2 repeaters)
- High level of noise and temperature immunity make ASi an excellent choice for the process plant environment.
- Each AS-interface node requires its own unique address (master/slave)
- No configuration software required
- Nodes can be addressed using buttons on master, hand-held programmer, or through serial communications

## Wiring Diagram



ASI BUS 1 2   3 4 5 6 7 8 9 10   11 12

ASI+ ASI-   EXT.- EXT.+ SOL.- SOL.+ SOL.- SOL.+ EXT.- EXT.+   ASI- ASI+

ASI BUS IN

POWER IN (OPTIONAL)

SOLENOIDS 1 AND 2

POWER OUT (OPTIONAL)

ASI BUS OUT

## Standard ASi Network Card Specifications

### Power

| | |
|---|---|
| voltage | 30Vdc (ASi standard) |
| current | <30mA |
| local indication | green LEDs |

### Communication

| | |
|---|---|
| type | slave |
| addressing | 1 to 31 (0 from factory) |
| cycle time | less than 5ms |

### ASI configuration

| | |
|---|---|
| Bit D0 | proximity switch #2 |
| Bit D1 | proximity switch #1 |
| Bit D2 | ready signal |
| Bit D3 | output relay |
| Bits P0, P1 | |
|     P2, P3 | not used |
| IO code | IO = 1H |
| ID code | ID = FH |

### On Board Sensor Inputs

| | |
|---|---|
| type | (2) Hall effect solid-state sensors, (1) for each valve position |
| local indication | green LEDs |

### Auxiliary Inputs

| | |
|---|---|
| type | Namur (DIN 19234) or mechanical switch |
| voltage | 8Vdc ± 5% - ripple 5% |
| current | active <1mA, inactive >3mA |
| local indication | green led (each input) |
| protection | reverse polarized |

### Output

| | |
|---|---|
| type | (2) transistor or relay |
| transistor rating | 2w @ 24 VDC |
| relay contact | programmable NO or NC |
| relay voltage | 120VAC, 220 VAC, 24 VDC |
| current | 1A |

## Introduction To Valve Networking

Traditional plant installation requires each device to be connected and wired directly to a central control location and power supply. With a valve network, all of the valve accessories (limit switches, solenoid valve, etc.) sharing communication and power on 2 wires. This method greatly simplifies the installation and maintenance of these devices.

This technology is no longer future speak - it is being implemented now in plants worldwide. End users are realizing the benefits of this new technology that have been documented time and time again. At SVF we believe it is time to become comfortable with the technology now by using it on your next job.
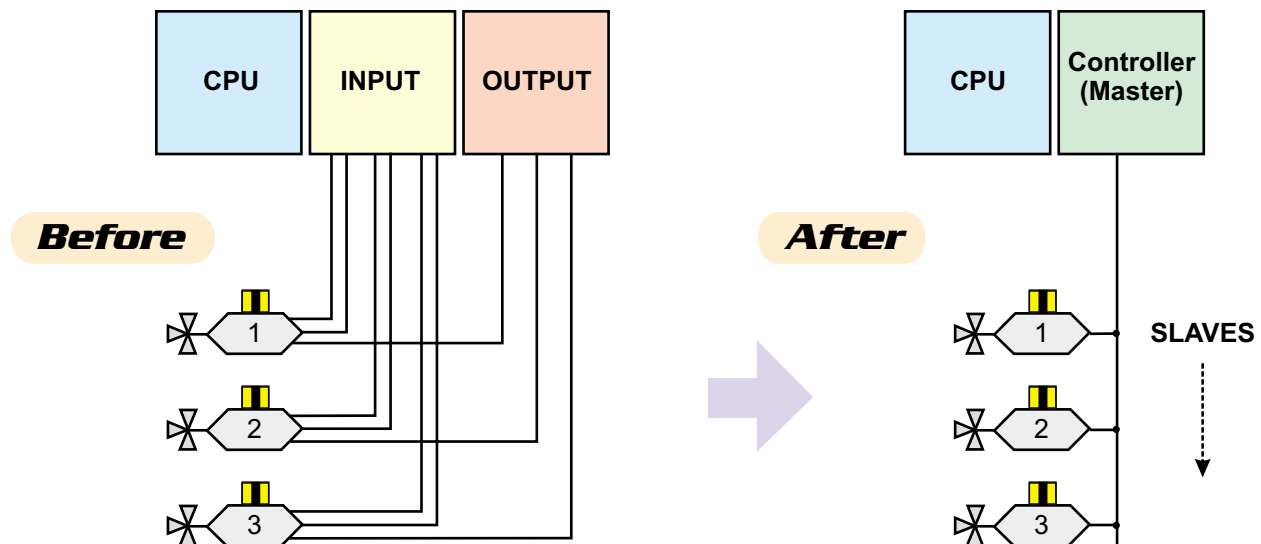
## Main Advantages of Valve Networking

1) **Simplified Plant Wiring** - Automated valves can be wired in any configuration to suit physical needs Utilizing only 2 or 4 wires for all the valves in the network eliminates the wiring "spaghetti" of traditional methods.

2) **Reduced Installation Costs** - Wiring and installation time can be reduced even further utilizing quick-disconnect pin-style connectors. Set-up is simpler and diagnostic functions speed troubleshooting.

3) **Increased System Reliability** - Components are designed to require less maintenance and  work "one-way" only while built-in diagnostic functions continuously monitor the equipment during operation

4) **Standardized, Proven Technology** - Bus Technology has evolved to simple, standardized protocols that are supported by almost all leading manufacturers of process equipment.
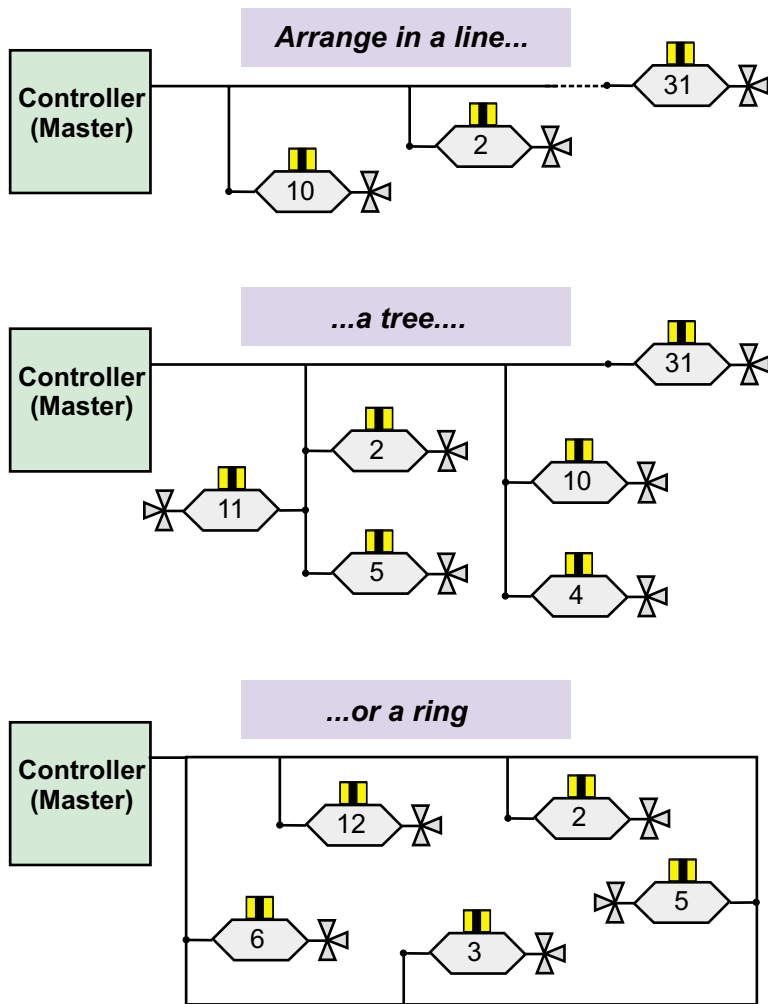
## The ASi (Actuator - Sensor Interface)

The ASi protocol was specifically developed for applications which require on-off or "binary" feedback. It was designed to be a low cost complement to more sophisticated protocols (such as DeviceNet, Profibus, Modbus and Foundation Fieldbus) for lower levels of plant automation. It is the digital replacement for traditional parallel wiring. This technology was developed by a consortium of 11 European companies with the intention of creating a standard. Today, over 100 companies worldwide offer products that are ASi compatible.

## ASi Can Work In Your Plant!

SVF offers a full range of gateways, power supplies, cabling and connector solutions for your application. Contact SVF for your project and our team of specialists will help you configure your next valve network.

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Form VN3-0400

# SVF Flow Controls   *ASi VALVE NETWORKING*

### Arrange in a line...

Controller (Master)

31
2
10

### ...a tree....

Controller (Master)

31
2
11
5
10
4

### ...or a ring

Controller (Master)

12
2
5
6
3

## Flexible Network Configuration

An ASi network allows the wiring structure to match the physical needs of your system layout. A network can be branched in a line, tree or ring (see figures at left), allowing new slaves or valve monitors to be placed in any position.

## Cable

This network does not require special cabling, although dedicated ASi cabling is available to simplify installation. Total cable length must be less than 300 ft. (100m) *including* all branches. When a longer wiring length is necessary, the cable can be extended for another 300 ft. (100m) using a repeater. Up to two repeaters are allowed for a total cable length of 900 ft. (300m).

## Automated Valves - The Slaves

Each valve monitor includes two position sensors or switches, an ASi module and a solenoid valve. Both limit switches and the solenoid valve connect to the ASi module inside the unit. The ASI module controls the solenoid valve and the feedback of the position sensors through the network.

## Addressing the Valves

An ASi network can operate with a maximum of 31 valve monitors or "slaves". The node or address is stored in memory on the board once it has been programmed by the master or handheld programmer. The master calls the slaves in series and receives their responses. When all the slaves have been called, the master repeats the cycle again. Total cycle time for the system to address all 31 slaves is 5 ms.

SVF Devices can assist you in implementing an ASi valve network. Contact your local SVF representative for details and find out how easy ASi is.