Introduction

The Kinetrol ASi card is a standard ASi slave for mounting inside a standard Kinetrol universal limit switch box, which in turn can be mounted on a Kinetrol quarter turn pneumatic actuator, or on any supplier's actuator. The card can read up to four standard limit switches, or proximity switches, and drive up to two 24v 2.5 Watt solenoid coils. It appears as an ASi V2.1 standard four input / two output slave in the ASi network.

The ASi card layout and the terminals for the ASi bus, and for each input and output on the ASi Card, are shown on the Connection Diagram below.

ASi Card Connection Diagram

Green LED

Red LED

Limit Switch DI 3-
Limit Switch DI 3+
Limit Switch DI 2-
Limit Switch DI 2+
Solenoid Coil DO 2-
Solenoid Coils Common +
Solenoid Coil DO 3-

Limit Switch DI 0+
Limit Switch DI 0-
Limit Switch DI 1+
Limit Switch DI 1-
ASi +
ASI -
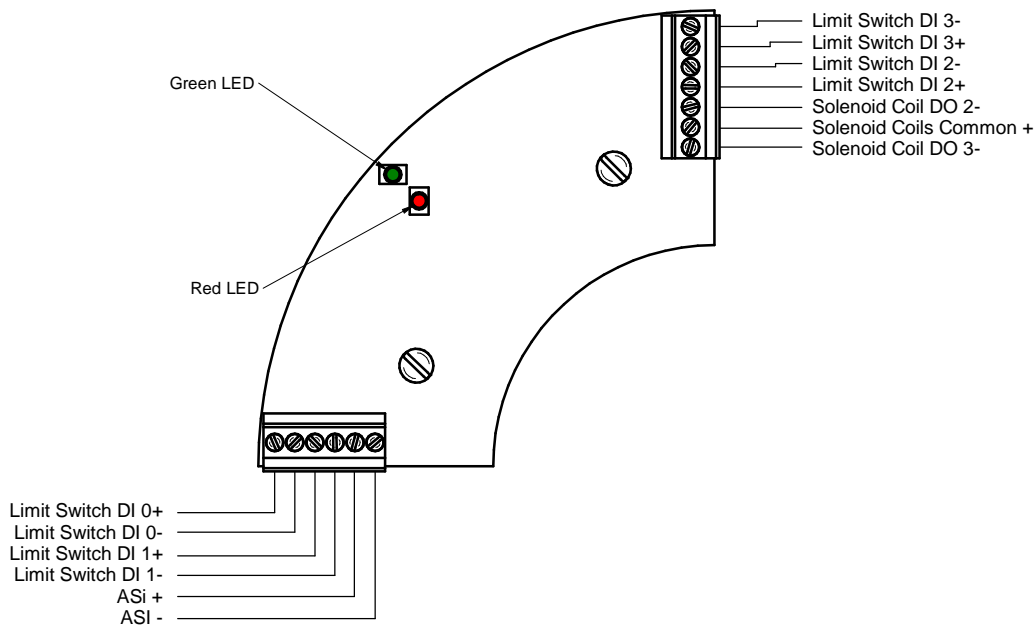
Installation

Installation is extremely simple and is completed in the following sequence:

1. Connect the two wires of the ASi bus, ASi(+) and ASi(-), to their terminals in the limit switch box, or to the external ASi clamp connector.

2. Configure the slave unit in the ASi network. The ASi master will automatically detect the new unit on the bus, and will show the unit as a standard four input / two output slave at address zero. The unit is supplied with the address set to zero for this purpose. The unit is configured by setting the address to any value between 1 and 31, B addresses are not allowed, unless an Option with Extended Addressing enabled has been supplied. With the address set the unit can be accessed by the system.

Input Data Bits

The four inputs are designed to read both mechanical limit switches and 2-wire 8v DC proximity swithces - up to four in total of either type.

Limit switch option: The four input data bits DI 0 to DI 3 show the state of the limit switches connected to the ASi card input terminals. An open contact shows as 0, and a closed contact shows as 1.

Proximity switch option: The four input data bits DI 0 to DI 3 show the state of the proximity switches connected to the ASi card input terminals. A low current through the proximity switch shows as 0, and a high current as 1. The sensors supplied by Kinetrol pass a high current normally, and a low current when a metal striker is adjacent to the switch.

Output Data Bits

The two output data bits DO 2 and DO 3 energise their solenoid coil when the output is set to 1, and de-energise the solenoid coil when the output is reset to zero. The ASi card powers up with the solenoids de-energised. The ASi card is hardwired to energise only one solenoid at once. Priority is given to DO 2, if 1 is sent to both DO 2 and DO 3 at the same time, only the DO 2 output is energised. The DO 3 output is energised only if the DO 2 output is de-energised (0 sent to DO 2 and 1 sent to DO 3).

The parameter bits are not used.

Output Drive

The outputs, when energised, each provide 24v dc at up to 105mA. The outputs are designed to drive the inductive loads of solenoid coils. The outputs are short circuit protected and can withstand a continuous short circuit between the solenoid coil common(+) and drive(-) lines. The output recovers automatically within 150ms of removal of the short.
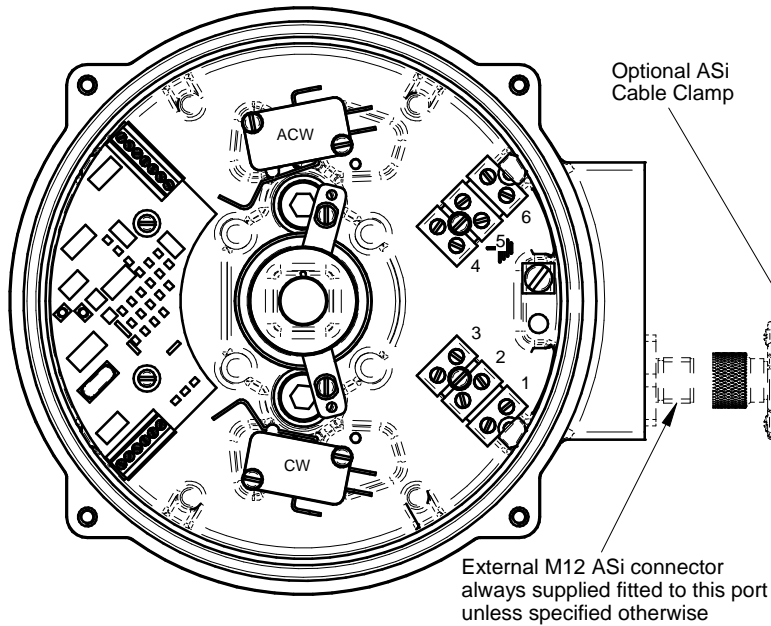
External Connections

The diagrams on the following pages show the identity of the terminals used for the connection options. Either the box is supplied with internal connector blocks for use with conduited cables, or it is supplied with an M12-type threaded conduit-entry-mounted plug, usually used with a connecting cable-mounted socket which is clamped onto a yellow ribbon-type Asi bus cable. If this cable-mounted socket is supplied by Kinetrol, then it should be connected to the cable as shown on the following page.

LED Status Indication

SYMPTOM	STANDARD STATUS INDICATION	NOTES
Power off	◯ ◯	No power supply available
Normal operation	🟢green ◯	Data communication is extablished
No data exchange	🟢green 🔴red	The *Data_Exchange_Disable* flag is still set, prohibiting Data Port communication. IC is waiting for *Write_Parameter* request.
		The Communication Monitor has detected no Data Exchange status or the IC was rest by the Watchdog IC Reset.
No data exchange (Address = 0)		Slave is waiting for address assignment. Data Port communication is not possible.
Peripheral fault	🟢green ✴🔴red	Periphery Fault signal generated at FID input.
Serious periphery fault when reset		Data strobe driven LOW for more than 44µs.

Optional ASi Cable Clamp

External M12 ASi connector always supplied fitted to this port unless specified otherwise

Option B:
AS interface allows 31 slaves to be connected to the bus and energised.

Solenoid 24V 2.5W MAX
Bus supply 26.5 to 31.5 Vdc 8A max

Connections:
1 - ASi +
2 - ASi -
3 - Solenoid 3 (+)

4 - Solenoid 3 (-)
5 - Solenoid 2 (+)
6 - Solenoid 2 (-)

Option C:
AS interface with extended addressing enabled and outputs disabled. For use without limit for the purpose of reading limit-switch sensors only. If a solenoid is connected it will not function.

Bus supply 26.5 to 31.5 Vdc 8A max

Connections:
1 - ASi +
2 - ASi -
3 - Not Connected

4 - Not Connected
5 - Not Connected
6 - Not Connected

Option D:
AS interface with extended addressing enabled and outputs enabled. An isolated relay is fitted to the outputs which allows up to 31 solenoids to be energised simultaneously on the bus. Up to 62 slave units may be connected to the bus. Each unit can only have one solenoid output for this option.

Warning: The user's control system must include a pre-programmed limit on the maximum number of solenoids to be energised at once. If the system instructs too many units to switch on solenoids, the bus capacitance will be exceeded.

Solenoid 24V 2.5W MAX
Bus supply 26.5 to 31.5 Vdc 8A max

Connections:
1 - ASi +
2 - ASi -
3 - Not Connected

4 - Not Connected
5 - Solenoid 2 (+)
6 - Solenoid 2 (-)

	SWITCH TYPE	SWITCH POSITION	INPUT DATA BIT	STATUS WHEN STRIKING/SENSING
2 SWITCHES/ SENSORS IN BOX	MECH	ACW	DI 3	1
	MECH	CW	DI 0	1
	PROX	ACW	DI 3	0
	PROX	CW	DI 0	0
4 SWITCHES/ SENSORS IN BOX	MECH	ACW BOTTOM	DI 3	1
	MECH	ACW TOP	DI 2	1
	MECH	CW BOTTOM	DI 0	1
	MECH	CW TOP	DI 1	1
	PROX	ACW BOTTOM	DI 3	0
	PROX	ACW TOP	DI 2	0
	PROX	CW BOTTOM	DI 0	0
	PROX	CW TOP	DI 1	0

EXTERNAL M12 ASi CONNECTOR OPTION:

Pin Connections:
1 - ASi +
2 - Not Connected
3 - ASi -
4 - Not Connected

Option E:
AS interface with extended addressing and outputs enabled. An isolated relay is fitted to the outputs to allow solenoid valves to be powered by a power supply separate from the ASi bus.
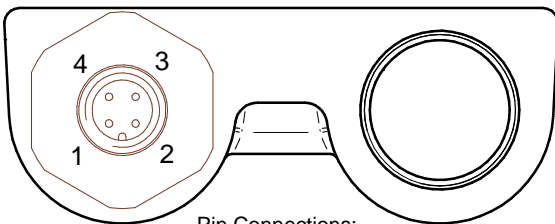
Solenoid 24V 2.5W MAX
Bus supply 26.5 to 31.5 Vdc 8A max

Connections:
1 - ASi +
2 - ASi -
3 - Not Connected

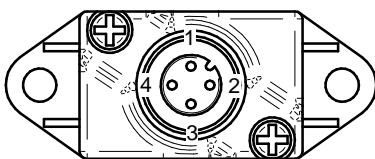4 - Solenoid 2 (-), 24Vdc (-)
5 - Solenoid 2 (+)
6 - 24Vdc (+)

ASi CABLE CLAMP OPTION:

Pin Connections:
1 - ASi +
2 - Not Connected
3 - ASi -
4 - Not Connected