Kinetrol AS Interface Circuit

AS Interface BUS Communication

The Kinetrol AS interface circuit board is fitted inside a standard actuator-mounted Kinetrol Universal Limit Switch Box (2 or 4 entry), so that the actuator (and up to 30 others like it) can be controlled, monitored and powered directly via a single two-conductor digital communication cable (or bus), using the open AS interface 2.1 standard. All the advantages of the limit switch box (all-metal construction, corrosion resistant, up to IP67 sealing, easy connection, easy setting of limit switch strikers etc - see KF487 literature) combined with the highly specified AS interface circuit to give unique levels of practicality, genuine industrial quality, and use-anywhere adaptability.

FEATURES

☐ **AS interface 2.1 compatibility - control and monitor using the simplest and most economical serial communication standard (see opposite page).**

☐ **Up to 31 units with solenoid valve on-off control and limit switch monitoring can receive power and communication via a single two-conductor cable - all you need is the AS interface and compressed air.**

☐ **Up to 62 units (using extended addressing) with limit switch monitoring only, can get power and communication via a single two-conductor cable.**

☐ **Up to 62 units (using extended addressing) can be solenoid-controlled and monitored via a single two-conductor cable, using one of three options to bypass the capacitance limits of the AS interface standard, (see overleaf).**

☐ **All-metal robust industrial-quality limit switch box, allowing use just about anywhere an actuator can go, with a wide range of box options available (see box literature KF487).**

☐ **2 on/off outputs per unit - can drive two solenoid valve coils one at a time - hardwired logic prevents accidental switching on of two coils, by energising only one pre-selected coil when an instruction to switch on both is received.**

☐ **Explosion proof option available (see literature KF619).**

☐ **4 on/off inputs per unit - reads up to 4 limit switches (ie maximum 240 inputs per bus using extended addressing).**

☐ **Reads either mechanical switches or inductive sensors.**

☐ **Retrofittable to standard Kinetrol Universal Limit Switch box ie. conventional control and monitoring can be upgraded later to serial communication with minimal extra investment.**

☐ **LED external indicator option gives bright, clear red and green signalling of position, powered by the AS interface cable only. Options can be selected to read from one switch only, or to use two for indication at travel ends only. Clear cone monitor option only.**

☐ **Standard 24V 2.5W solenoid valves can be connected to the bus-powered circuit without a need for separately wired power supplies, and up to 31 such valves can be switched on simultaneously.**

☐ **M12 connector option available for instant connection of bus cable without need for lid removal.**

☐ **Unit supplied set to address 0 (zero) for easy live addition of extra units to an existing operational bus - working address (non-zero) is then set remotely via the AS interface in the usual way.**

☐ **Open-source AS interface specification gives huge choice of complementary control and monitoring devices which can happily share a bus with Kinetrol's device.**

☐ **Output short circuit protection built in.**

AS INTERFACE 2.1 SPECIFICATION

☐ **Master - Slave protocol**

☐ **All slaves are scanned at a maximum interval of 5 milliseconds**

☐ **Baud Rate - 167Kbits/second**

☐ **26.5 to 31.5 Vdc, 8 A max power supply**

☐ **100 m (325ft) maximum cable length (repeaters may extend network distance)**
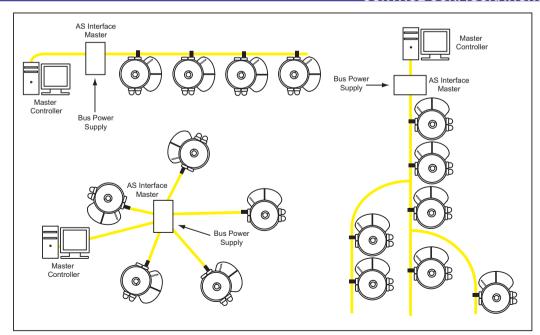
Serial communication for on / off actuators

Devices conforming to the AS interface (Actuator Sensor interface) set of open specifications are used to make up control systems based on a two-wire communication cable known as a bus. Up to 31 actuators and sensors ("slaves") can be connected to the AS interface bus, and can be controlled or monitored by means of a digital signal sent via the bus to and from a "master" device (which can be a computer or a PLC).

The slave devices will always function in response to commands sent by the master device, either to actuate, or to return a message reporting the value of a sensed variable, or both. The AS interface 2.1 specification allows 31 slave devices to be powered by a DC voltage fed into the same two-cable wire used as the communication bus, with allowed power consumption adequate to drive the slave plus a standard pneumatic solenoid valve. Under extended addressing, a maximum of 62 slave devices can be connected via one bus, but specified limits on device capacitance make this applicable only to systems with limited numbers of solenoid valves, or with a special scheme to get round the limit (see overleaf).

An AS interface bus can be used as the final field link in a more complex hierarchy of devices making up a large plant-wide control system. Actuators and sensors must often be installed in unprotected environments where conditions can be demanding; the AS interface bus is ideal for using as the link between these field devices and the "indoor" equipment making up the upper part of the control system.

AS interface is well suited to on/off control and monitoring, and is a good choice when a simple economical, reliable and robust solution is required to control and monitor a series of actuators and sensors in a process control or machine application. Kinetrol's AS interface Universal Limit Switch Box is designed to meet all of these requirements.

CONTROL CONFIGURATIONS

EXTENDED ADDRESSING

Kinetrol's AS interface circuit is a slave device to allow 32 devices (usually 31 slaves plus an AS interface master device) to be powered and controlled via a 2-wire bus cable, with full capability to energise one solenoid on every unit all at the same time.
This is the standard (Option code B).

The AS interface 2.1 specification also allows for an extended address option, whereby 62 addresses can be connected and powered via one bus cable. The specified limits on device capacitance however, mean that if the full extended-address compliment of slaves all had standard solenoid valves connected, the bus limit would be exceeded.

Kinetrol offer these options to allow use of extended addressing:

1. (Option Code C)
AS interface circuit with extended addressing enabled and outputs disabled, for use without limit to read limit-switch sensors only. If a solenoid is connected it will not function.
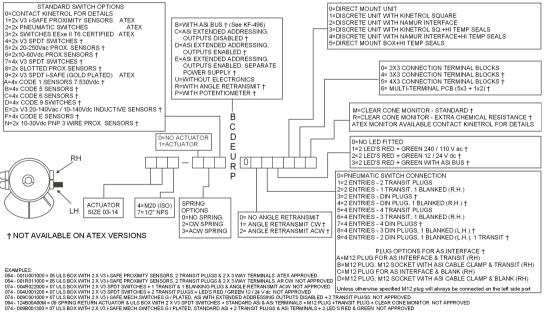
2. (Option Code D)
AS interface circuit with extended addressing and outputs enabled, one solenoid per interface card, plus added isolating relay option fitted to outputs, to allow up to 31 solenoids to be energised simultaneously even from the bus, though up to 62 slave units may be connected to the bus. This requires the user's control system to include a pre-programmed limit on the maximum number of solenoids to be energised. If the system instructs too many units to switch on solenoids, they will obey, and the bus capacitance limit will be exceeded – thus this option must be at the user's risk with regard to this issue.

3. (Option Code E)
AS interface circuit with extended addressing and outputs enabled, one solenoid per interface card, plus added relay options fitted to outputs to allow solenoid valves to be powered by a supply separate from the AS interface bus. This option requires a separate 24V DC power supply to each actuator, and allows up to 62 slave units to energise their solenoids simultaneously.

ORDERING CODES

STANDARD SWITCH OPTIONS
0=CONTACT KINETROL FOR DETAILS
1=2x V3 i-SAFE PROXIMITY SENSORS   ATEX
2=2x PNEUMATIC SWITCHES   ATEX
3=2x SWITCHES EExe II T6 CERTIFIED   ATEX
4=2x V3 SPDT SWITCHES †
5=2x 20-250Vac PROX. SENSORS †
6=2x10-60Vdc PROX.SENSORS †
7=4x V3 SPDT SWITCHES †
8=2x SLOTTED PROX SENSORS †
9=2x V3 SPDT i-SAFE (GOLD PLATED)   ATEX
A=4x CODE 1 SENSORS 7.530Vdc †
B=4x CODE 5 SENSORS †
C=4x CODE 6 SENSORS †
D=4x CODE 9 SWITCHES †
E=2x V3 20-140Vac / 10-140Vdc INDUCTIVE SENSORS †
F=4x CODE E SENSORS †
N=2x 10-30Vdc PNP 3 WIRE PROX. SENSORS †

B=WITH ASi BUS † (See KF-496)
C=ASi EXTENDED ADDRESSING,
   OUTPUTS DISABLED †
D=ASi EXTENDED ADDRESSING,
   OUTPUTS ENABLED †
E=ASi EXTENDED ADDRESSING,
   OUTPUTS ENABLED, SEPARATE
   POWER SUPPLY †
U=WITHOUT ELECTRONICS
R=WITH ANGLE RETRANSMIT †
P=WITH POTENTIOMETER †

0=DIRECT MOUNT UNIT
1=DISCRETE UNIT WITH KINETROL SQUARE
2=DISCRETE UNIT WITH NAMUR INTERFACE
3=DISCRETE UNIT WITH KINETROL SQ.+HI TEMP SEALS
4=DISCRETE UNIT WITH NAMUR INTERFACE+HI TEMP SEALS
5=DIRECT MOUNT BOX+HI TEMP SEALS

0= 2X3 CONNECTION TERMINAL BLOCKS
4= 3X3 CONNECTION TERMINAL BLOCKS †
5= 4X3 CONNECTION TERMINAL BLOCKS †
6= MULTI-TERMINAL PCB (5x3 + 1x2) †

M=CLEAR CONE MONITOR - STANDARD †
R=CLEAR CONE MONITOR - EXTRA CHEMICAL RESISTANCE †
ATEX MONITOR AVAILABLE CONTACT KINETROL FOR DETAILS

0=NO LED FITTED
1=2 LED'S RED + GREEN 240 / 110 V ac †
2=2 LED'S RED + GREEN 12 / 24 V dc †
3=2 LED'S RED + GREEN WITH ASi BUS †

0=PNEUMATIC SWITCH CONNECTION
1=2 ENTRIES - 2 TRANSIT PLUGS
2=2 ENTRIES - 1 TRANSIT, 1 BLANKED (R.H.)
3=2 ENTRIES - DIN PLUGS †
4=2 ENTRIES - DIN PLUG, 1 BLANKED (R.H.) †
5=4 ENTRIES - 4 TRANSIT PLUGS
6=4 ENTRIES - 3 TRANSIT, 1 BLANKED (R.H.)
7=4 ENTRIES - 4 DIN PLUGS †
8=4 ENTRIES - 3 DIN PLUGS, 1 BLANKED (L.H.) †
9=4 ENTRIES - 2 DIN PLUGS, 1 BLANKED (L.H.), 1 TRANSIT †

PLUG OPTIONS FOR AS INTERFACE †
A=M12 PLUG FOR AS INTERFACE & TRANSIT (RH)
B=M12 PLUG, M12 SOCKET WITH ASI CABLE CLAMP & TRANSIT (RH)
C=M12 PLUG FOR AS INTERFACE & BLANK (RH)
D=M12 PLUG, M12 SOCKET WITH ASI CABLE CLAMP & BLANK (RH)

Unless otherwise specified M12 plug will always be connected on the left side port

B
C
D
E
U
R
P

0=NO ACTUATOR
1=ACTUATOR

RH

LH

ACTUATOR
SIZE 03-14

4=M20 (ISO)
7=1/2" NPS

SPRING
OPTIONS
0=NO SPRING
2=CW SPRING
3=ACW SPRING

0= NO ANGLE RETRANSMIT
1= ANGLE RETRANSMIT CW †
2= ANGLE RETRANSMIT ACW †

† NOT AVAILABLE ON ATEX VERSIONS

EXAMPLES:
054 - 001U001000 = 05 ULS BOX WITH 2 X V3 i-SAFE PROXIMTY SENSORS, 2 TRANSIT PLUGS & 2 X 3 WAY TERMINALS ATEX APPROVED
054 - 001R011000 = 05 ULS BOX WITH 2 X V3 i-SAFE PROXIMTY SENSORS, 2 TRANSIT PLUGS & 2 X 3 WAY TERMINALS, AR CW NOT APPROVED
074 - 004R022000 = 07 ULS BOX WITH 2 X V3 SPDT SWITCHES + 1 TRANSIT & 1 BLANKING PLUG & ANGLE RETRANSMIT ACW NOT APPROVED
074 - 004U001200 = 07 ULS BOX WITH 2 X V3 SPDT SWITCHES + 2 TRANSIT PLUGS + LED'S RED / GREEN 12 / 24 V dc NOT APPROVED
074 - 009C001000 = 07 ULS BOX WITH 2 X V3 i-SAFE MECH.SWITCHES G / PLATED, ASi WITH EXTENDED ADDRESSING OUTPUTS DISABLED + 2 TRANSIT PLUGS NOT APPROVED
094 - 124B00A00M = 09 SPRING RETURN ACTUATOR & ULS BOX WITH 2 X V3 SPDT SWITCHES + STANDARD ASi & ASi TERMINALS + M12 PLUG +TRANSIT PLUG + CLEAR CONE MONITOR NOT APPROVED
074 - 009B001300 = 07 ULS BOX WITH 2 X V3 i-SAFE MECH.SWITCHES G / PLATED, STANDARD ASi + 2 TRANSIT PLUGS & ASi TERMINALS + 2 LED'S RED & GREEN NOT APPROVED

Further switch options are available upon request - contact Kinetrol for details

Please Note: If Angle Retransmit is required, a multi-terminal PCB must also be selected in the coding.

KINETROL

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AS Interface Serial Communication