AS-i Bus

Class 8340

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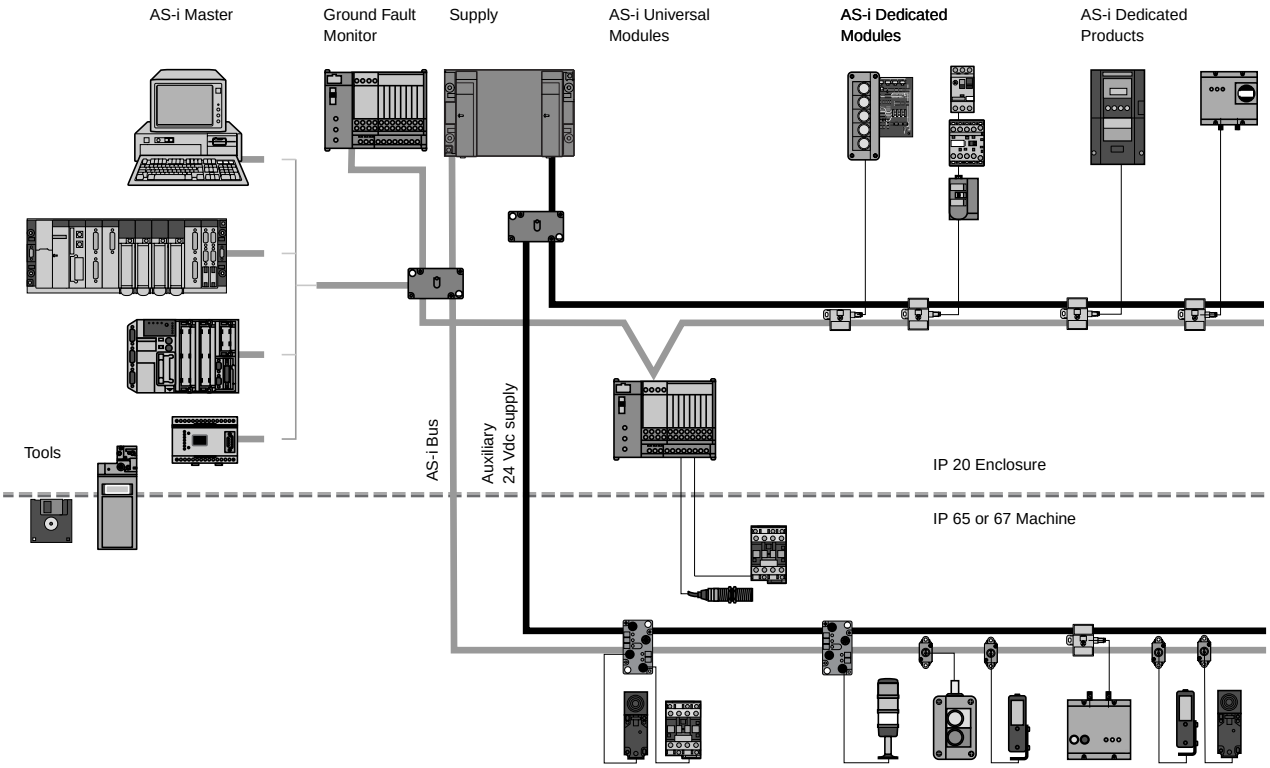
Merlin Gerin
Modicon
Square D
Telemecanique
Schneider Electric Brands

SQUARE D
Schneider Electric

AS-i (Actuator Sensor Interface) is a bus made up of sensors and actuators with a very short response time. AS-i is an open industry standard supported by the AS-i association. The leading manufacturers of sensors, actuators, programmable controllers and connection accessories are members of this association. AS-i has the advantage of not being a sole supplier network.

Connection to a higher level bus can be made through network gateways or by using a communication bus controller (programmable controller, etc.).



ASIC

The AS-i intelligence is based on an ASIC (Application Specific Integrated Circuit), which can either be integrated directly into a sensor or actuator (known as an intelligent component), or in an interface module which can accept up to 8 standard (non-intelligent) sensors and actuators. It is the ASIC which manages all the communication functions of the sensor or actuator in order to supply information to the AS-i master regarding switching state, operational availability of the sensor, etc.

Advantages of the AS-i Bus

Cabling: Data is transmitted by a standard cable consisting of a pair of non-twisted unshielded #16 or #14 AWG (1.5 mm^2 or 2.5 mm^2) wires. The supply to the sensors and actuators is also provided by this cable. The cable is installed directly on the machine, without having to fit any special components (splitter blocks, etc.).

Installation: software tools, incorporated in PL7 products, make it possible to select bus components and to enter the parameters for these components by way of the automation system configuration.

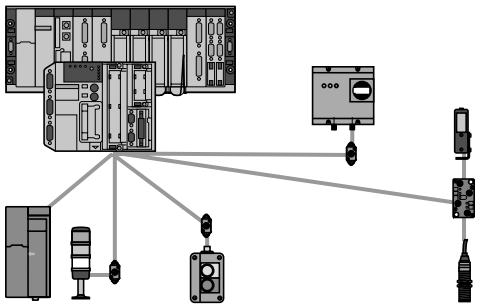
Maintenance: all services offered on the interfaces and “in-rack” I/O programming are included in the PL7 tools, with screens for diagnostics, channel topology syntax, associated mnemonics, overriding of variables, debugging zone, etc.

Summary of Advantages:

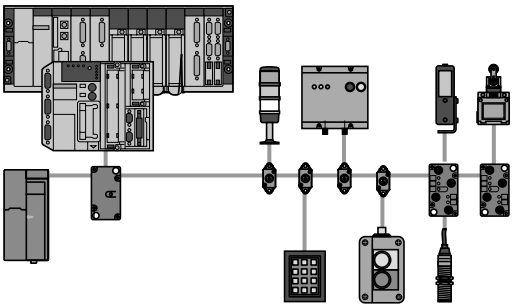
- Reduction in cost and volume of cabling.
- Reduction in size of enclosures.
- Capability for expanding and adapting existing machines is simplified.
- Increased availability and adaptability of sub-assemblies.

Topology of the AS-i Bus

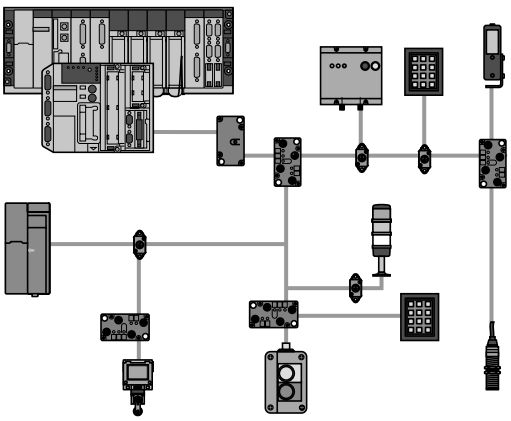
The topology of the AS-i bus is unrestricted. The lack of restrictions enables the most direct connections to be made between the bus and the various sensors and actuators in an installation. The maximum length of the AS-i bus is 328 feet (100 m) (including main runs and tap-off runs). Cable runs of up to 984 feet (300 m) are possible using repeaters (signal regenerators).



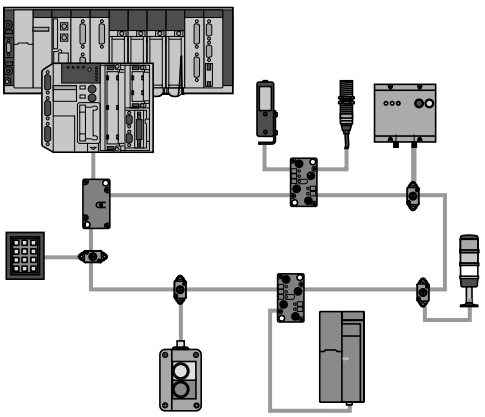
Point-to-point



Line

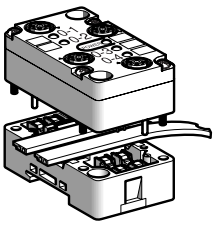


Tree

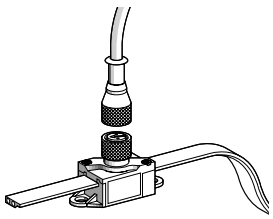


Ring

Connection of the AS-i cable is fast and is easily achieved by means of the IDCs (Insulation Displacement Connectors) on splitter boxes, T-connectors, or tap-offs, which pierce the cable insulation to make contact with the conductors. In the event of the IDCs being removed for circuit modifications, the cable insulation self-seals.



Splitter box: connection base + splitter module



T-Connector

Master/Slave Bus

AS-i is a master/slave bus: all the slaves are managed by a single master. The master polls each of the slaves present on the bus, in turn, and waits for a reply. The cycle time is 5 ms maximum, for 31 digital slaves. Communications are always initiated by the bus master.

AS-i slaves are manufactured and have a configuration at delivery with the address 0. Prior to implementing for the first time, an address must be assigned to each slave using an addressing terminal. The dialog between the master and the slaves is achieved using a modulated carrier current utilizing an alternating pulse modulation (APM) technique. This is also known as Manchester coding. An error detection procedure provides excellent integrity of data transmission.

AS-i Masters

AS-i accepts different types of masters:

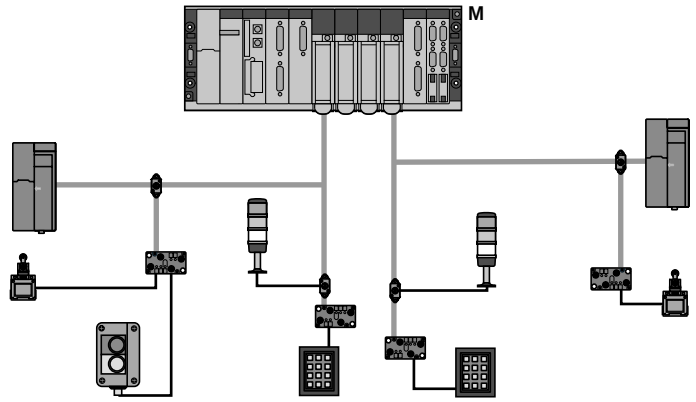
- The **programmable controller master module** incorporating an AS-i communication port, directly transfers the data, transparently, to the PLC application program. The Premium PLC supports 1 to 8 AS-i masters; the Micro PLC supports 1 AS-i master.
- The **gateway master** converts the AS-i bus from a simple communication node to a higher level bus. Gateways to higher level networks such as MODBUS Plus and Profibus DP are available from various third-party vendors.

M AS-i Bus Master

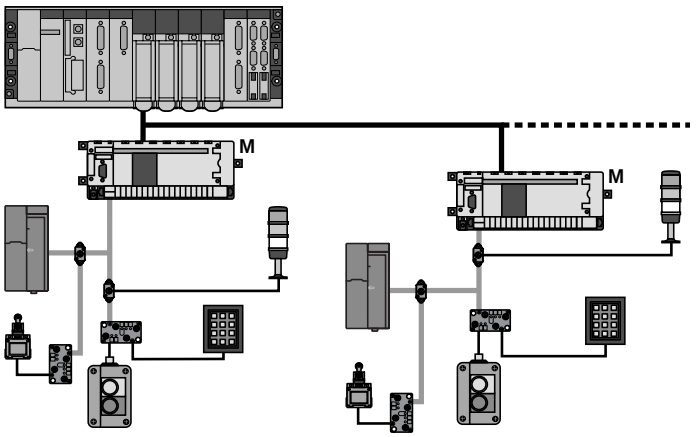
AS-i Bus

Other Bus

AS-i Port
Integrated into the PLC



Fipio/AS-i Gateway Master



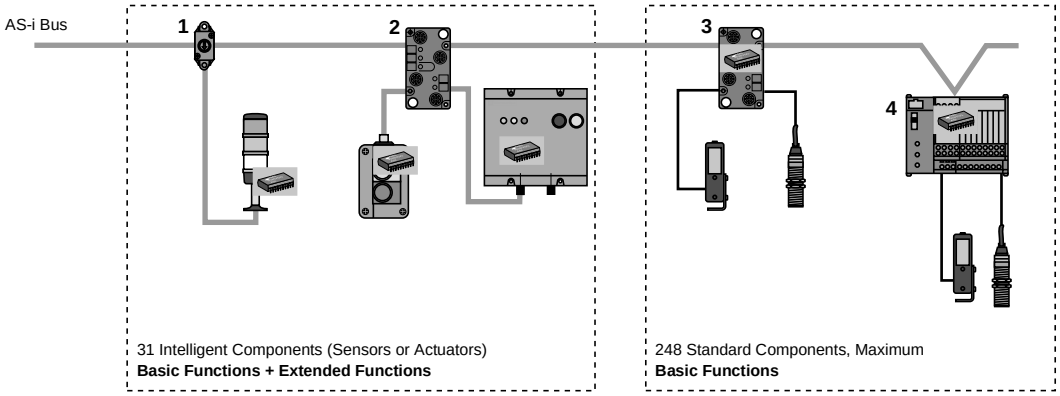
AS-i Slaves

An AS-i bus may be used with up to 31 slaves (each incorporating an ASIC) each consisting of 4 Input bits and 4 Output bits for cyclical exchange of information with the master, plus 4 parameter bits allowing extended functions (configuration, diagnostics, etc.). Each slave has its own address and a profile (defining the exchange of variables). Intelligent sensors and actuators (incorporating an ASIC) can be connected directly to the AS-i bus via passive splitter boxes or T-connectors.

Standard (non-intelligent) digital sensors or actuators are connected to the bus via intelligent splitter boxes or cabling interfaces. The maximum number of standard units that may be connected is 248.

Many applications involve a mixture of both intelligent and standard (non-intelligent) sensors/actuators.

1 Passive T-connector
2 Passive splitter box
3 Intelligent splitter box
4 Cabling interface



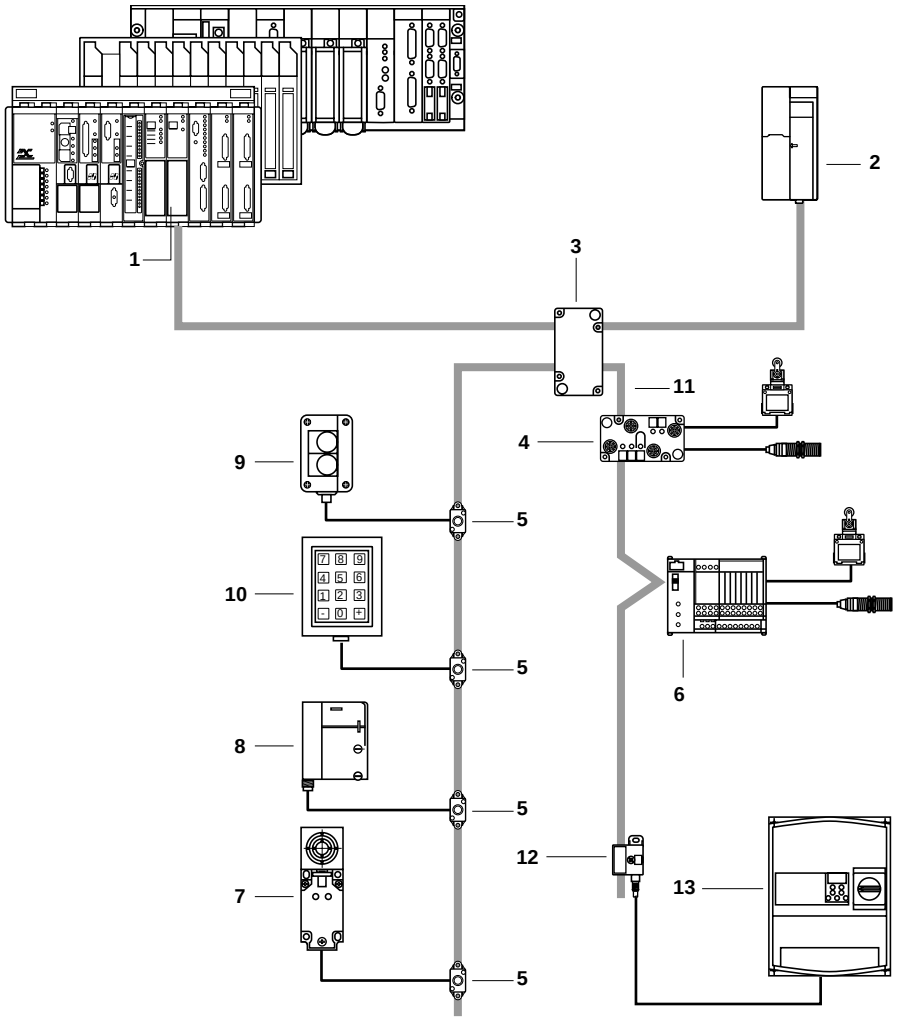
Each device connected on the AS-i bus is supplied via the AS-i cable from a special power supply unit (PSU).

The rating of this PSU must be suitable for the total consumption of the devices on the bus. The PSU may be located at any point of the bus.

Protocol	Centralized master/slave
Dialog Type	Cyclical polling
Refresh Time	5 ms for 31 slaves
Response Time	Max. time defined for each slave
Connection Points	31 slaves
Number of Standard Products	248 maximum
Data	4 status bits, 4 command bits, and 4 parameter bits per slave
Maximum Length of Bus	328 ft (100 m), 984 ft (300 m) with repeater
Network Characteristics	Supply and signal on the same cable
Physical Layer	2-core unscreened cable

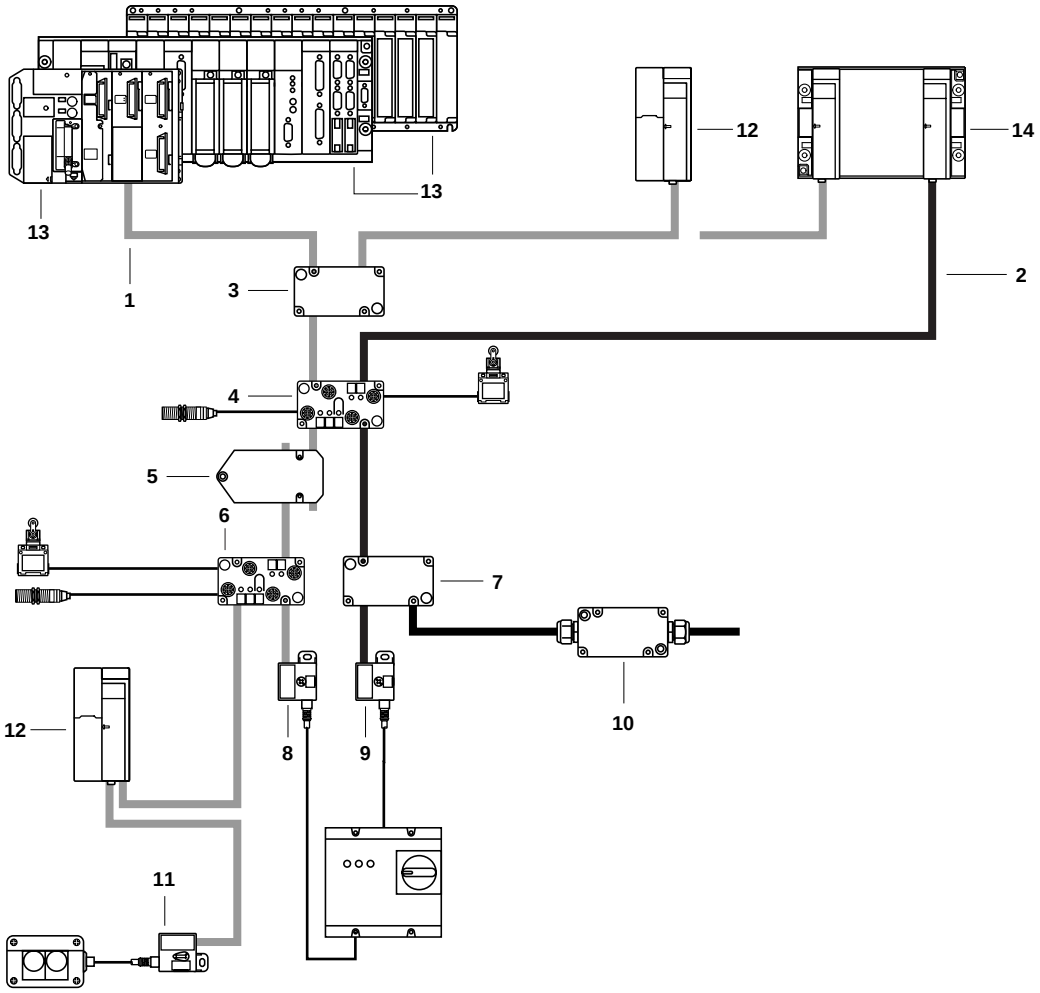
“Actuator-Sensors Interface AS-i Bus” document XDOC5011EN contains basic information on the AS-i bus for electricians, automation engineers, and specifiers. This document explains the AS-i concept, recommendations for initial installation, and set-up.

Example – Bus Supply Only



1	**TSXSAZ10**	AS-i bus master for TSX Micro PLC's or
	TSXSAY100	AS-i bus master for TSX Premium PLC
2	**TSXSUPA0• or ABL6**	Power supply unit for all sensors/actuators on the AS-i bus.
3	**XZSDE1113 + XZSDP**	Passive splitter box allowing connection of two AS-i cables by IDCs.
4	**XZSDE11•3 + XZSDA••D••**	Intelligent splitter box, comprising a connection module + a splitter module, allowing the connection of standard sensors and actuators onto the AS-i bus (versions available: 2 I/2 O, 4 I, 4 O).
5	**XZCG0•20**	T-connectors allowing the connection (by IDC) of intelligent AS-i sensors and actuators to the AS-i bus.
6	**ABE8•••S••0**	TELEFAST SB2 intelligent interface allowing connection (by screw terminals) of standard sensors and actuators to the AS-i bus.
7	**XS7C40AS101 or XS8C40AS101**	Inductive proximity sensor, plug-in body, 5-position turret head
8	**XUJ••••••AS**	Photo-electric detectors, type compact XUJ.
9	**XALS200•**	Control station, with 2 pushbuttons, illuminated or not
10	**XBLC5012•581**	12-way keypads, tactile feedback type.
11	**XZCB1•••1**	Flat, unshielded, 2-core AS-i bus cable (yellow) with asymmetric profile, ensuring connection with the correct polarity.
12	**XZCG0122**	Tap-off for flat cable.
13	**ATV58EU••••**	Altivar 58 variable speed drives for asynchronous motors.

Example – Bus Supply plus Auxiliary Power Supply

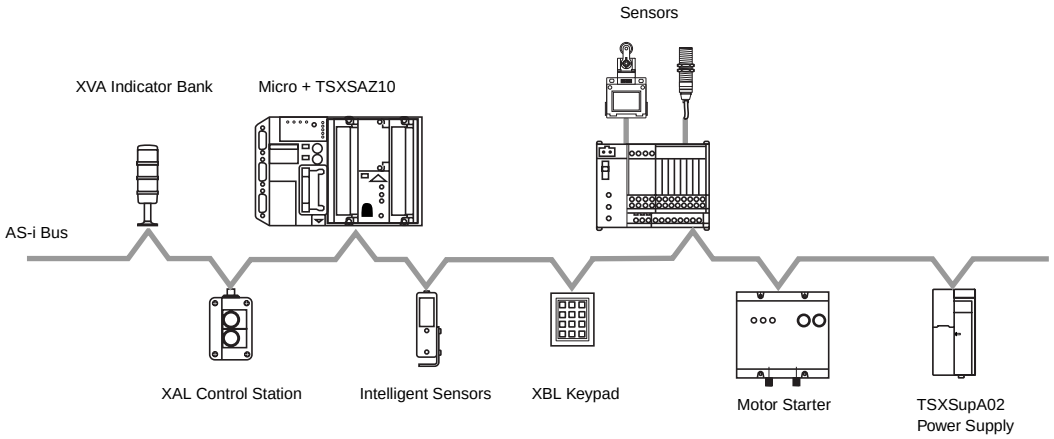


1	**XZCB1•••1**	Flat, unshielded, 2-core AS-i bus cable (yellow) with asymmetric profile, ensuring connection with the correct polarity.
2	**XZCB1•••2**	Flat, unshielded, 2-core cable (black) for separate 24 Vdc power supply, with asymmetric profile ensuring connection with the correct polarity.
3	**XZSDE1113 + XZSDP**	Passive splitter box allowing connection of 2 yellow AS-i cables by means of IDCs.
4	**XZSDE1143 + XZSDA22D12**	Intelligent splitter box comprising a connection module + a splitter module, allowing connection of 2 standard sensors and 2 standard actuators onto the AS-i bus.
5	**XZMA1**	Repeater, for extending the line to increase the length of AS-i links by 328 ft (100 m) with 984 ft (300 m) max.
6	**XZSDE1113 + XZSDA40D3**	Intelligent splitter box comprising a connection module + a splitter module, allowing connection of 4 standard sensors onto the AS-i bus.
7	**XZSDE1133 + XZSDP**	Passive splitter box allowing connection of 2 cables by IDCs.
8	**XZCG012•D**	Tap-off, allowing connection (by IDC) to the AS-i bus; connection to the sensor or actuator by means of cable (2 x 0.34 mm^2) with M12 straight connector.
9	**XZCG0122**	Tap-off, allowing connection (by IDC) to the AS-i bus; connection to the sensor or actuator by cable (2 x 0.34 mm^2), bared at the device end for connection via terminals.
10	**XZSDE2213 + XZSDP**	Passive splitter box allowing connection of a black AS-i cable and a round cable by means of screw terminals.
11	**XZCG0120•C**	Tap-off allowing connection (by IDC) to the AS-i bus; connection to the sensor or actuator by cable (2 x 0.34 mm^2) with M12 elbowed connector.
12	**TSXSUPA0• or ABL6**	Power supply unit, for all the sensors/actuators on the AS-i bus.
13	**Master**	AS-i bus master. TSXSAZ10 for TSX Micro PLC. TSXSAY100 for TSX Premium PLC.
14	**Power supply unit, TSXSUPA05**	Separate 24 Vdc power supply unit, for supply to all sensors and actuators with heavier power requirements.

MICRO AUTOMATION PLATFORM INTERFACE

Introduction

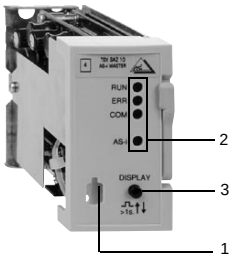
The TSXSAZ10 AS-i bus module enables the Micro PLC to act as the AS-i bus master. In this way up to 31 sensor/actuator type devices may be managed on the one AS-i bus. Up to 4 inputs and/or outputs can be connected to each device, giving a maximum of 248 I/O on one segment.



The AS-i bus consists of a master station (Micro PLC) and slave stations. The TSXSAZ10 module supports the AS-i M2 profile, interrogates the device connected on the AS-i bus in turn and stores the data (state of sensors/actuators, operational status of devices) in the PLC memory. Communication management on the AS-i bus is completely transparent with regard to the PLC application program.

An AS-i power supply must be used for powering the various components on the AS-i bus. Ideally this power supply unit (PSU) should be situated nearest to the stations with the largest current demands.

Description



TSXSAZ10

The TSXSAZ10 AS-i bus master is a half-format module designed to slide into the basic configurations of TSX37-10/21/22 Micro PLCs, in position 4 (one TSXSAZ10 module per configuration) ■.

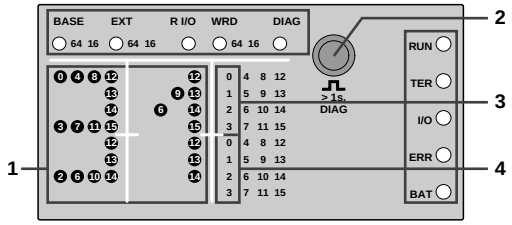
The front panel consists of:

1. An opening with a locating device for routing AS-i bus ribbon or round cable (to be connected to a terminal block inside the module).
2. Four indicator lamps:
   - — RUN: the module is active
   - — ERR: module fault or bus connection fault
   - — COM: AS-i bus communication is active
   - — AS-i: bus configuration error
3. A push button to transfer the AS-i bus display to the PLC front panel.

■ When the TSXSAZ10 module is in position 4, the upper position 3 can only receive a TSXA•Z•••• analog or TSXCTZ••• counter half-format module.

Module Diagnostics

The Micro PLC centralized display block enables the display of the status of all the I/O channels, and the diagnostics for devices on the AS-i bus (present, missing, faulty, not conforming to the configuration):



1. Device number
2. Control push button for accessing the various operating modes of the display block
3. State of the 4 device inputs
4. State of the 4 device outputs

Refer to page 14 for detailed programming information.

Selection

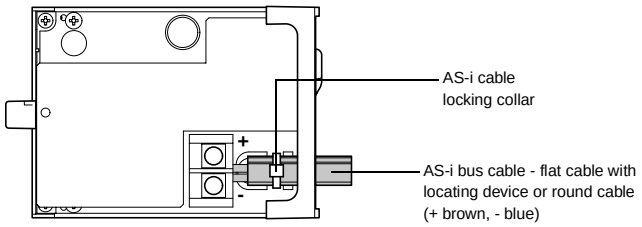
AS-i Bus Module

Description	Protocol	Number of I/O	Catalog Number
AS-i bus master module for TSX37-10/21/22 PLCs	AS-i	31 devices, 248 I/O maximum	TSXSAZ10

TSXSAZ10

Connections

TSXSAZ10 module



Specifications

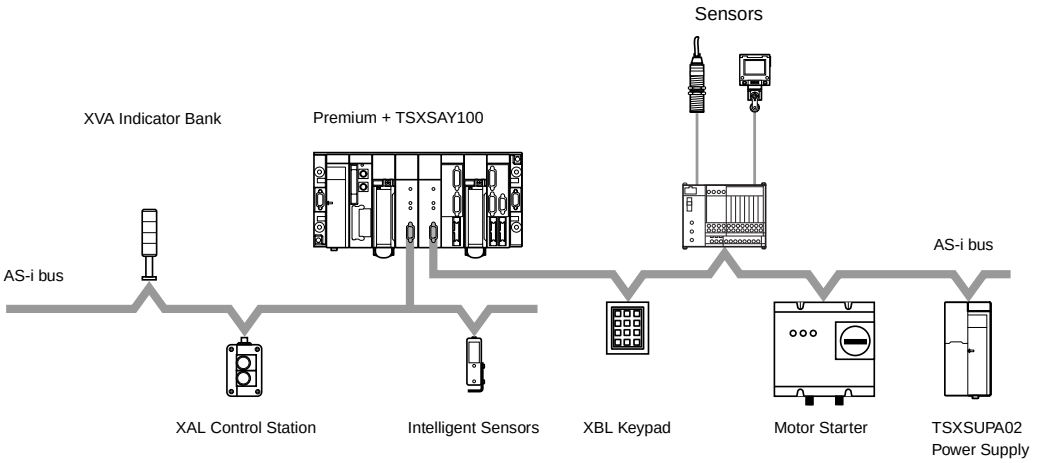
Type of Module	TSXSAZ10		
Product Certifications	AS-i No. 04601, NF C 63-850		
AS-i Profile	M2		
Ambient Air Temperature	Operation: +32 °F to +140 °F (0 °C to +60 °C), Storage: -13 °F to +158 °F (-25 °C to +70 °C)		
Degree of Protection	IP 20		
Vibration Resistance	Conforming to IEC 68-2-6, Fc tests.		
Shock Resistance	Conforming to IEC 68-2-27, EA tests.		
Number of Connectable Slaves	31 AS-i slaves		
Number of Inputs/Outputs	124 inputs and 124 outputs		
Processing Times ■	Depending on the scan time of the PLC “Master Task”		
Execution Time	10 ms	30 ms	60 ms
Average Processing Time	22 ms	50 ms	80 ms
Maximum Processing Time	35 ms	75 ms	135 ms
Bus Connection	By integral terminal within the module (interlock to maintain cable polarity)		
Module Power Supply	Supplied directly from the PLC (100–240 Vac, 24 Vdc)		
Display Diagnostics	By display panel integrated into the Micro PLC or via a suitable PC terminal using PL7 Micro/Junior software.		
Compliance Standards	UL Listed E194434 CCN NRAQ CSA Certified LR58905 Class 2252 01		

■ Defined as the time between an AS-i input being triggered and an AS-i output (on the same slave) being energized, including the processing within the PLC program.

PREMIUM AUTOMATION PLATFORM INTERFACE

Introduction

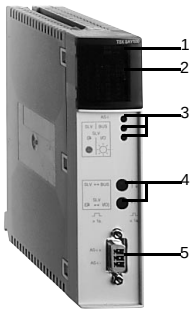
The TSXSAY100 master module for the AS-i bus enables the Premium PLC to act as the AS-i bus master. In this way, up to 31 sensor/actuator type devices may be managed on one AS-i bus. Up to 4 inputs and/or outputs can be connected to each device, giving a maximum of 248 I/O on one segment.



The AS-i bus consists of a master station (Premium PLC) and slave stations. The TSXSAY100 module, which supports the AS-i M2 profile, interrogates the devices connected on the AS-i bus and stores the data (status of sensors/actuators, operational status of devices) in the PLC memory. Communication management on the AS-i bus is completely transparent with regard to the PLC application program.

An AS-i power supply must be used for powering the various components on the bus. Ideally, this power supply unit (PSU) should be situated nearest to the components with the largest power demands.

Description



TSXSAY100

The TSXSAY100 AS-i bus master is a standard format module. It is designed to slide into any position on the Premium rack except those reserved for the processor and power supply.

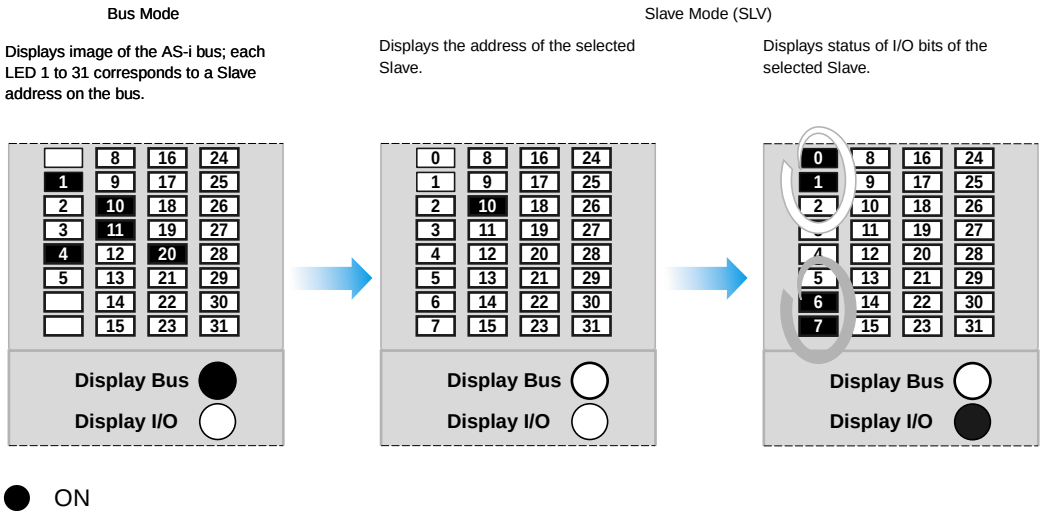
The module features, on the front panel:

1. A display unit comprising 4 indicator lamps showing the module operating modes:
   - RUN: module operating
   - ERR: module fault
   - COM: AS-i bus communication active
   - I/O: AS-i bus I/O fault
2. A display unit comprising 32 indicator lamps for diagnostics of the AS-i bus and of each Slave connected to the bus.
3. Three indicator lamps specific to the module:
   - AS-i: AS-i power supply fault
   - Display Bus: display unit (2) is in Bus display
   - Display I/O: display unit (2) is in Slave display (state of slave I/O)
4. Two push buttons used for local diagnostics of the AS-i bus.
5. One 3-way male SUB-D connector for connection to the AS-i bus (female connector supplied).

The maximum number of TSXSAY100 modules per PLC station depends on the type of processor installed. See “Selection” on page 13.

Module Diagnostics

The TSXSAY100 module display unit displays the status of all the I/O channels (Slave mode) and is used for diagnostics of devices on the AS-i bus (Bus mode):

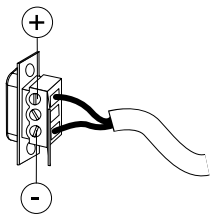


● ON

Selection

Description	Protocol	Number per PLC	Number of I/O	Catalog Number
AS-i bus master module for Premium PLCs	AS-i	2 for 51-10 4 for 57-20 8 for 57-30 8 for 57-40	31 devices or 248 I/O maximum	TSXSAY100

TSXSAY100



AS-i Cable Connections

Specifications

Type of Module	TSXSAY100		
Product Certifications	AS-i No. 18801, NF C 63-850		
AS-i Profile	M2		
Ambient Air Temperature	Operation: +32 °F to +140 °F (0 °C to +60 °C), Storage: -13 °F to +158 °F (-25 °C to +70 °C)		
Degree of Protection	IP 20		
Vibration Resistance	Conforming to IEC 68-2-6, Fc tests.		
Shock Resistance	Conforming to IEC 68-2-27, EA tests.		
Number of Connectable Slaves	31 AS-i slaves		
Number of Inputs/Outputs	124 inputs and 124 outputs		
Processing Times ■	Depending on the scan time of the PLC “Master Task”		
Execution Time	10 ms	30 ms	60 ms
Average Processing Time	27 ms	33 ms	45 ms
Maximum Processing Time	37 ms	55 ms	80 ms
Bus Connection	By 3-way SUB-D connector		
Module Power Supply	Power supply integrated on Premium PLC (100–240 Vac, 24 Vdc)		
Diagnostics	Via centralized display unit on Micro PLC or on TSXSAY100 module and the diagnostics function of PL7 Micro, PL7 Junior, and PL7 Pro software.		
Compliance Standards	UL Listed E194434 CCN NRAQ CSA Certified LR58905 Class 2252 01		

■ Defined as the time between the appearance of an input, its processing by the PLC processor, and the activation of an output on the same slave device.

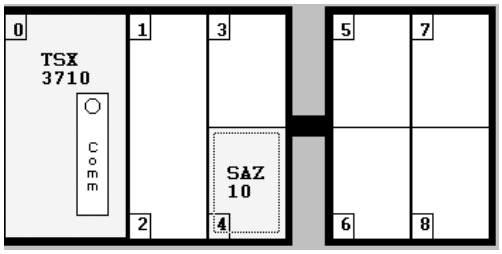
Software Setup

The AS-i bus is configured using PL7 Micro/Junior/Pro software. The utilities available are based on the principle of simplicity:

- Management of profile tables, parameters, and data by the master (this management is transparent to the user).
- Topological I/O addressing: each AS-i slave declared on the bus is assigned a topological address on the bus by the user. This is transparent to the user.
- Each sensor/actuator on the AS-i bus is treated as an in-rack I/O by the Micro/Premium PLC.

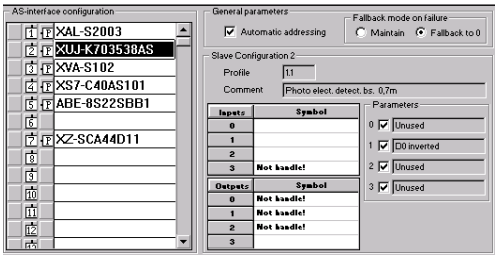
AS-i Bus Configuration

All devices on the AS-i bus are configured implicitly using the following sequence of screens:



Declaration of the AS-i bus master module

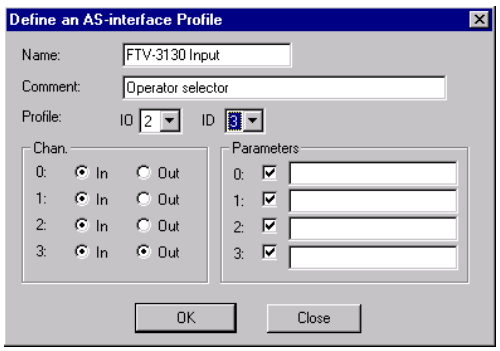
- The TSXSAZ10 module is always inserted and declared in position no. 4 on TSX37-10 or TSX37-21/22 PLCs.
- The TSXSAY100 module is inserted into any position on TSX57, TPMX57, or TPCX57 PLCs (except the position reserved for processors and power supply).



Configuration of the AS-i slave devices

Using the configuration screen, it is possible to configure all the slave devices (1 to 31), i.e. all 248 I/O. Configuration for each device consists of defining, according to case:

- Groupe Schneider AS-i devices. The user selects the AS-i device catalog number from the various product families. This selection determines the AS-i profile and the parameters associated with the device.
- Third party AS-i devices. The user can use PL7 Micro/Junior software to manage a “customized” list of sensors/actuators of different brands. This list, specifying the AS-i profile and parameters, is compiled to meet the needs of the user.



The configuration screen is also used to:

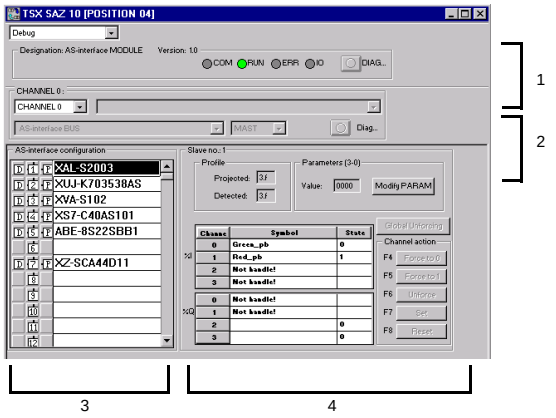
- Associate a symbol with each AS-i input or output (up to 32 characters)
- Define the default position of the actuators for all devices (set to state 0 or maintained) should the Micro/Premium PLC stop.

Programming

After configuration, the I/O connected on the AS-i bus are processed by the application program in the same way as a PLC in-rack I/O, using either the address (e.g. I\4.0\16.2, input 2 of slave 16 of the AS-i bus) or the associated symbol (e.g. Start_conveyor).

Software Diagnostics

Diagnostics performed using the centralized display unit on the Micro PLC or using the centralized display unit on the TSX SAY 100 module of the Premium PLC can be completed using an FTX517 terminal or PC compatible with PL7 Micro/Junior/Pro software.



The terminal connected to the Micro/Premium PLC is used for operational diagnostics of the TSXSAZ10 and TSXSAY100 master modules, the AS-i bus and the slave devices on the AS-i bus.

Diagnostics are performed using a single screen divided into four sections providing information on:

1. Operational status of the TSXSAZ10 or TSXSAY100 module (RUN, ERR, I/O status).
2. Status of the AS-i channel connected to the module.
3. Faulty slave.
4. Data relating to any selected slave (profile, parameters, forcing).

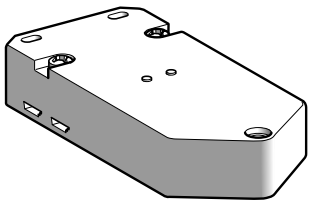
In the event of an AS-i module or channel fault, a second screen can be accessed, which clearly shows the type of fault, which may be at internal or external level.

Network Gateways

This is a partial listing of AS-i network gateway products. For up-to-date information, visit www.as-interface.com.

Network	Example Hosts	Product Name/ Catalog Number	Vendor	Phone	Website
DeviceNet	Allen-Bradley PLCs	GWAS/DN	Lumberg	(804) 379-2012	www.lumbergusa.com
DeviceNet	Allen-Bradley PLCs	VAG-DN-K5	Pepperl+Fuchs	(330) 425-3555	www.pepperl-fuchs.com
Interbus-S	Modicon PLCs Siemens PLCs	VAG-IBS-K1	Pepperl+Fuchs	(330) 425-3555	www.pepperl-fuchs.com
Interbus-S	Modicon PLCs Siemens PLCs	IBS ST ASI DIO	Phoenix Contact	(800) 888-7388	www.phoenixcon.com
MODBUS	Most PLCs	VAG-MOD-KF-R4	Pepperl+Fuchs	(330) 425-3555	www.pepperl-fuchs.com
Profibus DP	Siemens PLCs	GWAS/DP	Lumberg	(804) 379-2010	www.lumbergusa.com
Profibus DP	Siemens PLCs	VAG-PB-KF-R4 VAG-PB-G4F-R4	Pepperl+Fuchs	(330) 425-3555	www.pepperl-fuchs.com
Profibus FMS	Siemens PLCs	GWAS/DP-FMS	Lumberg	(804) 379-2011	www.lumbergusa.com

AS-i Bus
Repeater



XZMA1

The repeater allows an AS-i link to be extended by 328 feet (100 m). The maximum length of the bus becomes 984 feet (300 m). The repeater is connected directly to the flat AS-i cable by insulation displacement connectors (IDCs). There is electrical insulation between the segments.

Selection

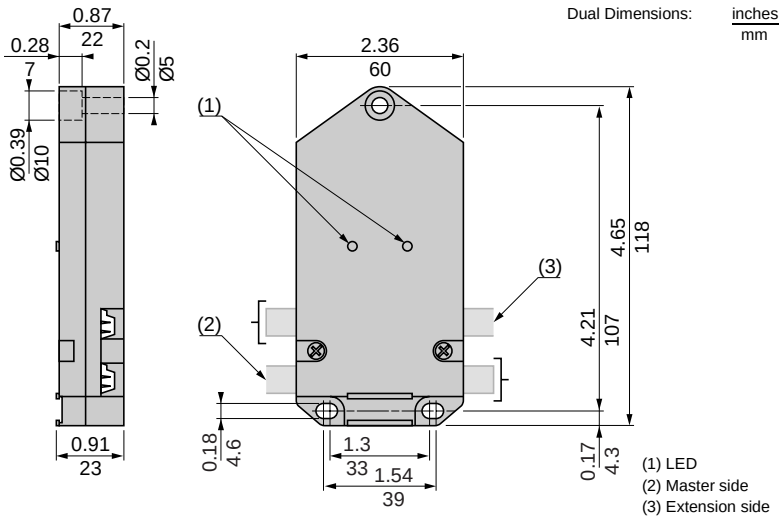
Description	Catalog Number
Repeater	XZMA1

Specifications

Approvals	Pending
Ambient Air Temperature	Operation: +32 °F to +130 °F (0 °C to + 55 °C) Storage: -13 °F to +167 °F (-25 °C to + 75 °C)
Degree of Protection	IP 67
Material	Plastic
Connection	To yellow AS-i cable
Power Supply	By the AS-i cable
Current Consumption	45 mA per AS-i segment (90 mA total)
Operational Voltage	Depending on AS-i specification (18.5 to 31.6 Vdc)
Insulation	Electrical insulation between the segments
Indication	One green LED per segment
Response Time	6 µs per message (12 µs per exchange)

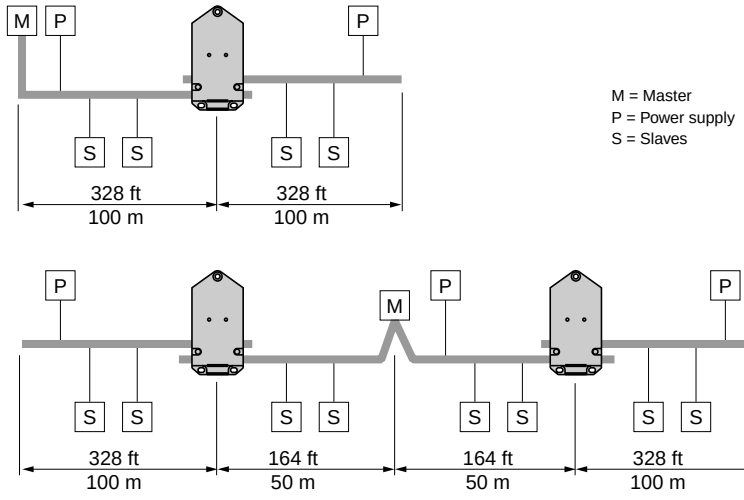
Dimensions

XZMA1

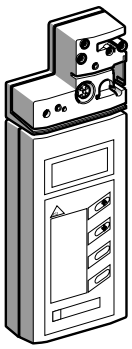


Connections

Examples



The addressing terminal is used to set and change the addresses of AS-i slave devices. It is lightweight, hand-held, and powered by a rechargeable battery. A battery charger is included.



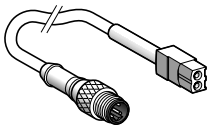
XZMC11

Selection

Description		Catalog Number
Addressing terminal Battery operated. Battery charger included.	For addressing intelligent modules, splitter boxes and AS-i slaves.	XZMC11US
Connection cable adaptors Cable length: 0.5 m (Spare parts)	For connecting addressing terminal XZMC11 to slaves fitted with socket (proximity sensors XS7/XS8, keypads, illuminated indicator banks, variable speed controllers ATV 58, interface modules LA9Z, and TELEFAST SB2, etc.)	XZMG12
	For connecting addressing terminal XZMC11 to splitter boxes XZSCA•••••	XZMG13
Documentation	Reference manual “AS-i sensor/actuator bus” (in English)	XD0C5011EN

Specifications

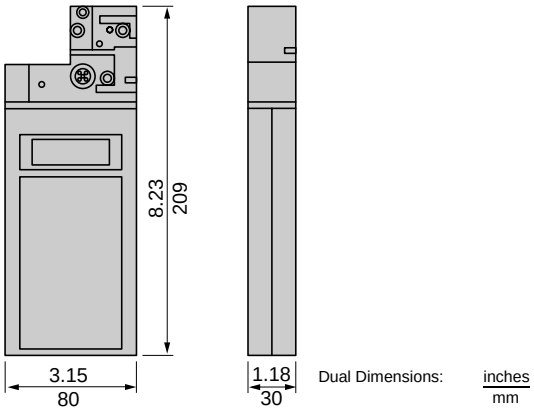
Ambient Air Temperature	Operation: +32 °F to +130 °F (0 °C to + 55 °C) Storage: -4 °F to +131 °F (-20 °C to + 55 °C)
Degree of Protection	IP 20
Power Supply	By rechargeable batteries
Charge Time	14 hours
Operating Time	8 hours (fully charged batteries) or 250 read/writes
Display	13 mm LCD screen
Keypad	4 key membrane
Connection	To AS-i slave: direct using M12 connector or by cable adaptor XZMG11 (see page 54) To splitter module: direct
Overload and Short-circuit Protection	Yes
Functions	+1 address, -1 address, write address, read address
Error codes	F1: overload, F2: connection not made, F3: slave fault, LOW BAT: recharge batteries



XZMG11

Dimensions

XZMC11



XALS2001, XALS2002

XALS2003

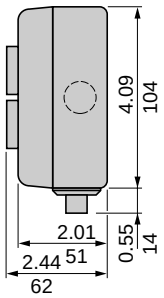
Selection

Description	Operator Colors	Catalog Number
Control stations with 2 spring return flush push buttons, Ø 22 mm	Push button “I” (N/O contact): White Push button “O” (N/C contact): Black	XALS2001
	Push button “I” (N/O contact): Green Push button “O” (N/C contact): Red	XALS2002
Control stations with 2 spring return flush illuminated push buttons, Ø 22 mm ■	Push button 1 (N/O contact): Green Push button 2 (N/C contact): Red	XALS2003

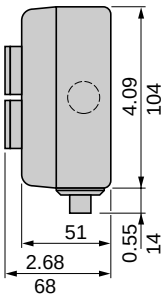
■ Illuminated push buttons with interchangeable LEDs.

Dimensions

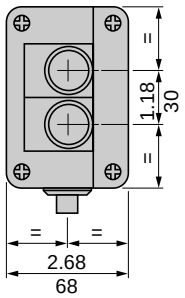
XALS2001, XALS2002



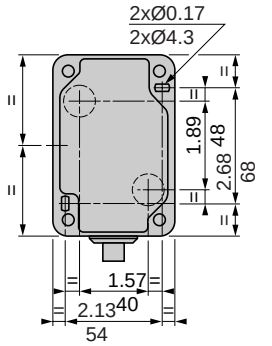
XALS2003



Common face view



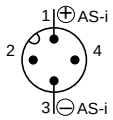
Rear housing



Dual Dimensions: inches / mm

Connections

XALS200



Enclosure with one red and one black blank legend plate. For legend plates in other colors or with markings (must be ordered separately), please refer to the Square D Digest 172.

Environment

Product Certifications	AS-i No. 06301
Ambient Air Temperature	Operation: -13 °F to +158 °F (-25 °C to +70 °C), Storage: -40 °F to +158 °F (-40 °C to +70 °C)
Degree of Protection	IP 65
Vibration Resistance	15 g (f = 40 to 500 Hz) conforming to IEC 68-2-6
Shock Resistance	70 g conforming to IEC 68-2-27 (push buttons)
Materials	Polycarbonate enclosure, colored gray RAL 7035 and grey RAL 7021
Enclosure Flame Resistance	NF C 20-455: 1760 °F (960 °C), UL 94: V0
Connection	M12 connector

Electrical Specifications

Power Supply	From the AS-i bus
Current Consumption from Bus	< 40 mA (XALS2001 and XALS2002), < 80 mA (XALS2003)
Contact Blocks	1 N/C and 1 N/O, 24 V, 5 mA
LEDs of Illuminated Push Buttons	24 Vdc, 20 mA (XALS2003)
Short-circuit Protection	Yes, for the LED indicators
Compliance Standards	UL Listed E164353 CCN NKCR

Data Exchange Specifications

AS-i Profile	S3.F		
Data Bits (Status)	Bit value	0	1
	State D0 (I)	Push button “I” unoperated (N/O contact open)	Push button “I” operated (N/O contact closed)
	State D1 (I)	Push button “O” operated (N/C contact open)	Push button “O” unoperated (N/C contact closed)
Data Bits (Commands) (only applicable to XALS2003)	Bit value	0	1
	Command D2 (O)	Green indicator off	Green indicator illuminated
	Command D3 (O)	Red indicator off	Red indicator illuminated
Parameter Bits	Parameters P0 to P3	Not used	

AS-i Bus
12-Button Keypads

Selection

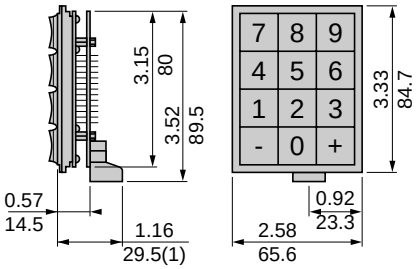
Description	Mounting Method	Catalog Number
12-button keypads Marked 0 to 9, +, - (1)	Flush mounting	XBLC5012F581
	Surface mounting	XBLC5012R581

XBLC5012F581

XBLC5012R581

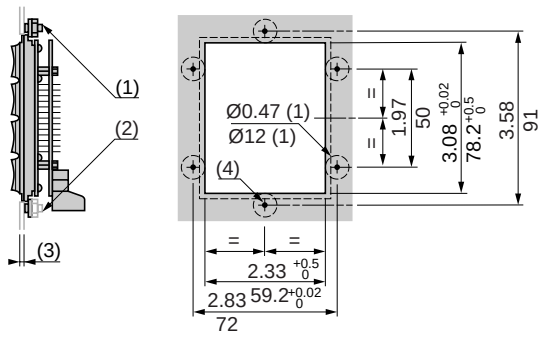
Dimensions

XBLC5012F581



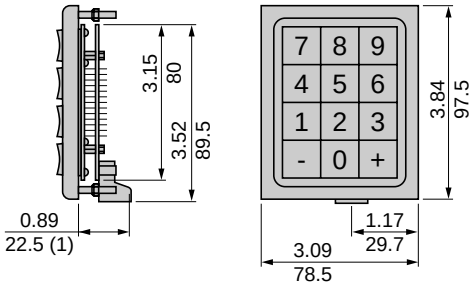
(1) Connection by screw terminal plug-in block

Panel cutout and mounting holes



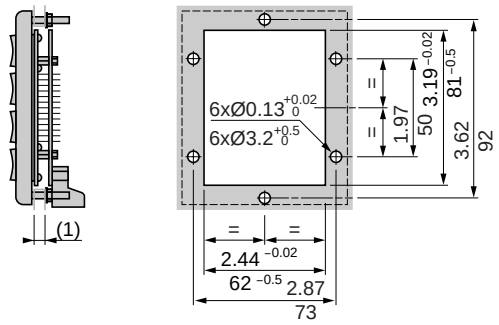
(1) Spacers, solder lugs and nuts included
(2) Alternative mounting using M3 screws, length 0.5 inches (12 mm), not included
(3) 0.06 inches (1.5 mm) nominal
(4) Holes Ø0.13 inches (Ø3.2 mm) (2)

XBLC5012R581



(1) Connection by screw terminal plug-in block

Panel cutout and mounting holes

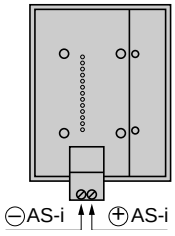


(1) 0.55 inches (14 mm), maximum

Dual Dimensions: inches / mm

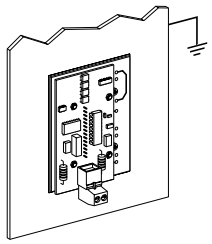
Connections

Rear view



Mounting precaution

When mounting the keypad on a metal support, the support must be grounded.



Specifications

These dust and damp protected compact keypads incorporate tactile feedback and are particularly suited to the majority of industrial applications.

The keypads are constructed using a single piece elastomer membrane, with the keys molded in, and the whole assembly is fixed to a mounting base plate (2 mounting methods: flush mounting or surface mounting).

The degree of protection with respect to the panel is provided by the compression of the elastomer membrane in the event of flush mounting or by a gasket in the event of surface mounting.

Environment

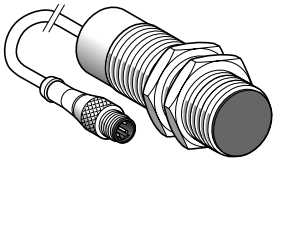
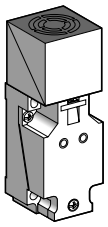
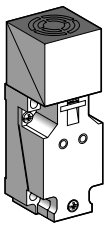
Product Certifications	AS-i No. 08701
Ambient Air Temperature	Operation: +23 °F to +158 °F (-5 °C to +70 °C), Storage: -40 °F to +176 °F (-40 °C to +80 °C)
Degree of Protection	IP 65
Key Colors	Gray RAL 7032 and beige RAL 1019
Mechanical Life	3 million operating cycles
Key Travel	0.08 inch (2 mm)
Operating Force	2 N (7 ounces), with tactile feedback
Mounting	Flush or surface mounting
Connection	Screw terminal plug-in block, 1 x 16 AWG (1 x 1.5 mm^2)

Electrical Specifications

Power Supply	From the AS-i bus
Current Consumption from bus	< 80 mA
Compliance Standards	UL Listed E164353 CCN NKCR

Data Exchange Specifications

AS-i Profile		S0.F												
Data Bits (Status)		Key No. pressed												
		0	1	2	3	4	5	6	7	8	9	-	+	None
		Bit value												
	State D0 (I)	0	1	0	1	0	1	0	1	0	1	0	1	1
	State D1 (I)	0	0	1	1	0	0	1	1	0	0	1	1	1
	State D2 (I)	0	0	0	0	1	1	1	1	0	0	0	0	1
	State D3 (I)	0	0	0	0	0	0	0	0	1	1	1	1	1
	Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	F
Parameter bits		Parameters P0 to P3: not used												

Sensors	Flush Mountable in Metal		Non Flush Mountable
			
Nominal sensing distance (Sn)	0.39 inches (10 mm)	0.59 inches (15 mm)	0.79 inches (20 mm)

Selection

Catalog Number	XS1M30AS101	XS7C40AS101	XS8C40AS101

Specifications

Product Certifications	AS-i No. 16901	AS-i No. 10001	
Ambient Air Temperature	Operation: -13 °F to +158 °F (-25 °C to +70 °C) Storage: -40 °F to +185 °F (-40 °C to + 85 °C)		
Degree of Protection	IP 67		
Shock Resistance	50 g, 11 ms conforming to IEC 68-2-27		
Vibration Resistance	25 g at 55 Hz, amplitude ± 2 mm, f = 10 to 55 Hz, conforming to IEC 68-2-6		
Materials	Nickel plated brass	PEI	PEI
Connection	Pre-cabled with moulded M12 end connector. Cable length: 2.62 ft (0.8 m)	Screw terminals ■	Screw terminals ■
Operating Zone	0.08 to 0.31 in (2 to 8 mm)	0.12 to 0.47 in (3 to 12 mm)	0.16 to 0.63 in (4 to 16 mm)
Repeat Accuracy	3% of Sr (2)		
Differential Travel	1 to 15% of Sr ▲	3 to 20% of Sr ▲	3 to 20% of Sr ▲
Delays	First-up: ≤5 ms; response: ≤ 2 ms; recovery: ≤ 2 ms		
Maximum Switching Frequency	150 Hz		
Indicators	Output: yellow LED Alarm ◆: red LED	Output: yellow LED Alarm ◆: red LED	Output: yellow LED Alarm ◆: red LED
Power Supply	From the AS-i bus		
Current Consumption from Bus	≤35 mA		
Compliance Standards	UL Listed E164353 CCN NKCR		

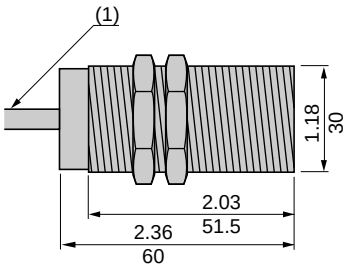
Data Exchange Specifications

AS-i Profile	S1.1		
Data Bits (Status)	Bit value	0	1
	State D0 (I)	Signal “off”	Signal “on”
	State D1 (I)	Alarm “on” (3)	Alarm “off”
	State D2 (I)	Sensor out of service	Sensor in service
Data Bits (Commands)	Command D3 (O)	Not used	
Parameter Bits	Bit value	0	1
	Parameter P0	Not used	
	Parameter P1	Not used	
	Parameter P2	Not used	
	Parameter P3	Flash “on” ●	Flash “off”

■ Terminal capacity: 2 x 16 AWG. Cable gland not included with sensor. Cable gland XSZPE13 to be ordered separately.
▲ Sr = Real sensing distance: sensing distance measured at rated supply voltage and at rated ambient temperature (0.9 Sn - Sr - 1.1 Sn).
◆ Indication of detection of an object outside the correct operating zone of the sensor (see LED function table, page 23).
● Diagnostic function. Quick location of the sensor by its flashing yellow LED.

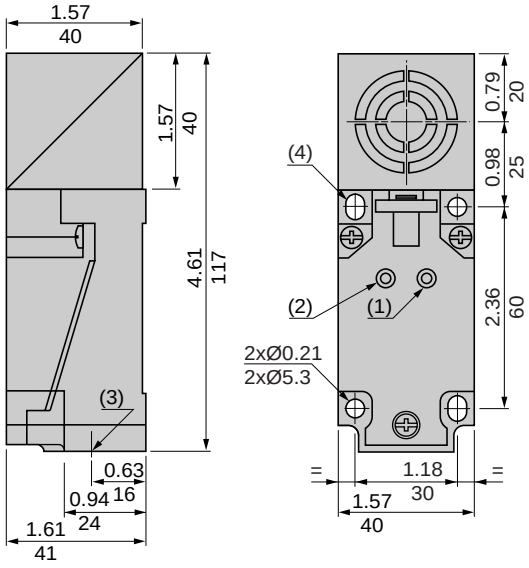
Dimensions

XS1



(1) Cable, length 2.62 ft (0.8 m)

XS7, XS8



Dual Dimensions: inches / mm

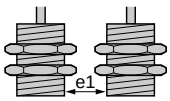
(1) Output or "flash" function LED
(2) Alarm LED
(3) 1 tapped entry for No. 13 plastic cable gland
(4) 2 elongated holes 0.21 x 0.28 in (5.3 x 7 mm)

Setting-Up

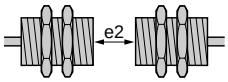
Minimum Mounting Distances, inches (mm)

XS1

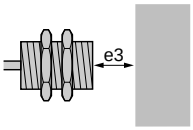
Side by side



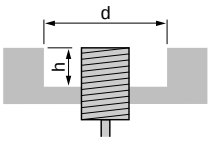
Face to face



Facing a metal object



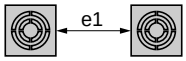
Mounted in a metal support



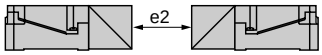
XS1 (1) e1 ≥ 20 e2 ≥120 e3 ≥ 30 d ≥30, h ≥0
Mounting nut tightening torque: < 50 N m

XS7, XS8

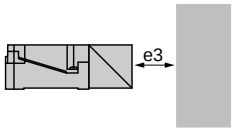
Side by side



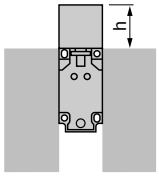
Face to face



Facing a metal object



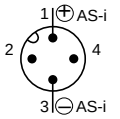
Mounted in a metal object

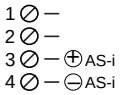


XS7 ■ e1 ≥ 40 e2 ≥ 120 e3 ≥ 45 h ≥ 0
XS8 ▼ e1 ≥ 80 e2 ≥ 160 e3 ≥ 80 h ≥ 40

■ Flush mountable in metal. ▼ Non flush mountable in metal

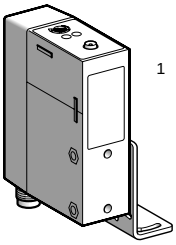
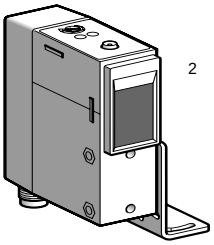
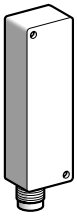
Connections, LED Function Table





Object/sensor distance		0.2 Sn	0.8 Sn	Sn	1.2 Sn	
Output	Bit D0	1	1	1	0	0
	Yellow LED	☼	☼	☼	⊗	⊗
Alarm	Bit D1	0 ●	1 ▲	0 ◆	0 ◆	1
	Red LED	☼	⊗	☼	☼	⊗

● The alarm is immediately triggered when an object is detected within the zone 0 to 0.2 Sn.
▲ Correct detection when 0.2 Sn < S < 0.8 Sn.
◆ Delayed triggering. The alarm will be triggered if an object passes within the zone 0.8 to 1.2 Sn and its time of passing exceeds 160 ms.

Type of Unit	Complete Detectors				Back Cover ■
	 1		 2		
System	**Thru-beam 1**	**Polarized reflex 2**	**Diffuse with background suppression 1**		–
Type of Transmission	Infra-red	Red	Infra-red		–
Nominal Sensing Distance (Sn)	49.2 ft (15 m)	19.7 ft (6 m) ▲	2.3 ft (0.7 m)	3.94 ft (1.2 m)	–

Selection

Catalog Number	XUJK103534AS ●	XUJK063539AS	XUJK703538AS	XUJK123538AS	XUJZAS1

Specifications

Product Certifications	AS-i No. 06201	
Ambient Air Temperature	Operation: -13 °F to +140 °F (-25 °C to +60 °C). Storage: -40 °F to +176 °F (-40 °C to +80 °C)	
Vibration Resistance	7 g (f = 42 to 150 Hz), amplitude ± 1.5 mm (f = 5 to 42 Hz), conforming to IEC 68-2-6	
Shock Resistance	30 g, duration 11 ms, conforming to IEC 68-2-27	
Degree of Protection	IP 65	
Connection	M12 connector	
Materials	Case : PEI; window (polarized model) : PMMA	PEI
Maximum Switching Frequency	200 Hz	–
Delays	First-up: ≤ 15 ms; response: ≤ 2 ms; recovery: ≤ 2 ms	–
Power Supply	From the AS-i bus	
Indicators	Output: yellow LED. Verification of correct operation: green LED. Alarm: red LED (4)	
Current Consumption from Bus	< 70 mA	< 70 mA (with associated detector)
Compliance Standards	UL Listed E164353 CCN NKCR	

Data Exchange Specifications

AS-i Profile	S1.1		
Data Bits (Status)	Bit value	0	1
	State D0 (I)	No object present	Object present
	State D1 (I)	Alarm “on” ◆	Alarm “off” (4)
	State D2 (I)	Not used	
Data Bits (Commands)	Command D3 (O)	Not used	
Parameter Bits	Bit value	0	1
	Parameter P0	Not used	
	Parameter P1	Inversion of D0	Non inversion of D0
	Parameter P2	Not used	
	Parameter P3	Not used	

■ The replacement of the back cover of a standard XUJ solid state output detector by this cover enables the detector to be connected directly to the AS-i bus.
The detectors which may be adapted are: XUJK06353 (reflex system), XUJK063539 (polarized reflex system), XUJK103534 (thru-beam system), XUJK703538 and XUJK123538 (diffuse system with background suppression).

NOTE: The bit D1 is unusable when the XUJZAS1 cover is used on an XUJK703538 or XUJK123538 detector.

▲ With Ø80 mm reflector XUZC80.

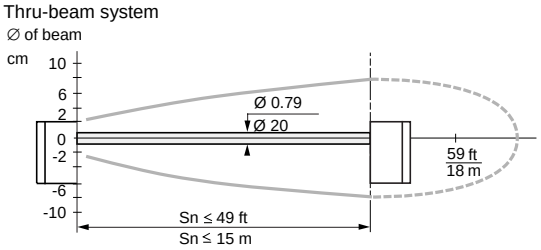
● Reference of thru-beam system receiver. The receiver must be used in conjunction with a standard XUJM1000D2 transmitter (incorporating an M12 connector) with the supply (pins 1 and 3) either being powered from:
- a separate 12 or 24 Vdc supply (current consumption ≤15 mA), or
- the AS-i bus via interface module XZSDA••••• . Supply via an output of an interface module (4 Outputs model XZSDA04D•• or 2 Inputs/2 Outputs model XZSDA22D••, see pages 44 to 47), enables the emitter to be turned on/off for testing purposes.

◆ Indication of weak reception of the transmitted beam, which could be a result of dirty lenses on the detectors, a high degree of pollution in the atmosphere or disturbance of the optical alignment. Not applicable to diffuse system detectors (see LED function table, page 25).

Dimensions

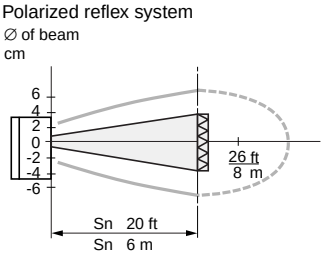
Detection Curves

Thru-beam system

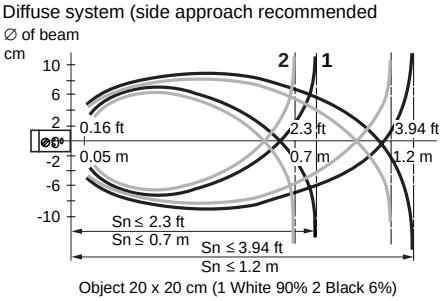


With reflector XUZC80

Polarized reflex system



Diffuse system (side approach recommended

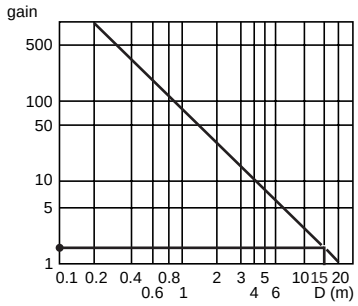


Object 20 x 20 cm (1 White 90% 2 Black 6%)

Excess gain curves

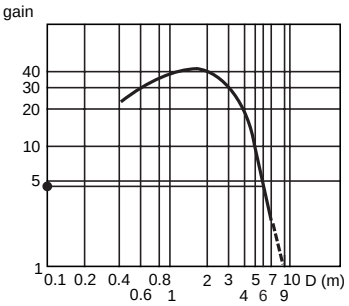
ambient temperature: +77 °F (+25 °C)

Thru-beam system



1 m = 3.28 ft

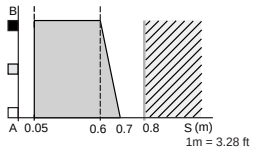
Polarized reflex system with XUZC80 reflector



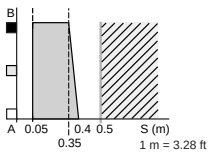
Variation of usable sensing distances

XUJK703538AS (Diffuse system)

Potentiometer at maximum

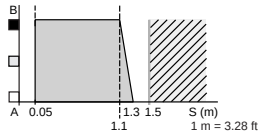


Potentiometer at minimum

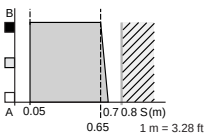


XUJK12358AS

Potentiometer at maximum



Potentiometer at minimum



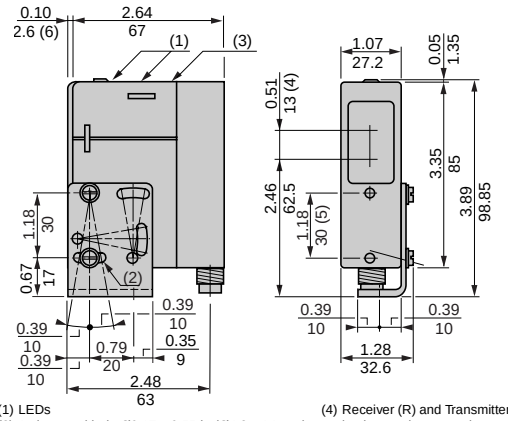
A-B: Object reflection coefficient

Black 6% Gray 18% White 90%

Sensing range Non detection zone

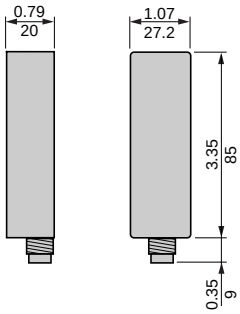
Dimensions

XUJK••••••AS



(1) LEDs
(2) 1 elongated hole Ø0.17 x 0.55 in (Ø4.2 x 14 mm).
(3) Sensitivity potentiometer.
(4) Receiver (R) and Transmitter (T) are reversed on diffuse system detectors with background suppression.
(5) Front mounting Ø0.16 in (Ø4 mm) screws and inserts supplied.
(6) Applicable only to polarized reflex system detectors.

XUJZAS1

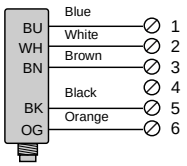


Dual Dimensions: inches / mm

Connections

Connector

XUJZAS1 backcover connections to associated detector



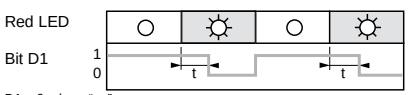
LED function table

Yellow LED illuminated for D0=1, green LED: verification of correct operation

Parameters	Thru-beam and reflex systems						Diffuse system					
	No object present in the beam			Object present in the beam			No object present in the beam			Object present in the beam		
P1 = 1	D0=0	☼	⊗	D0=1	⊗	☼	D0=0	⊗	⊗	D0=1	☼	☼
P1 = 0	D0=1	☼	☼	D0=0	⊗	⊗	D0=1	⊗	☼	D0=0	☼	⊗

Test output

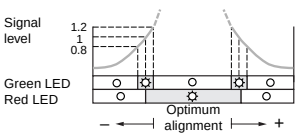
Thru-beam and reflex systems



D1 = 0: alarm "on"
D1 = 1: alarm "off"
t = 160 ms

Verification of correct operation

Thru-beam and reflex systems



XVAS102

XVAC6•••••

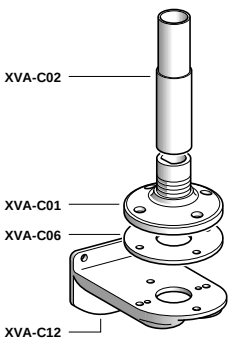
XVA34

XVAC37

XVAC9•

+

XVAC21 XVAC07



Illuminated indicator banks are visual or audible signalling units used mainly to indicate machine operation sequences and to check status from a distance. The illuminated units are visible throughout 360°. Examples: machine stop - start, no material, call technical staff, fault indication, etc.

Supplied as sub-assemblies for user assembly of up to 4 units (illuminated or audible). The column comprises:

- a base, incorporating terminal block, cable clamp, and support tube mountings,
- an AS-i adaptor unit,
- 1 to 4 colored lens units (green, red, orange, blue, clear, yellow) or audible signalling unit,
- a top cover, where necessary,
- optional accessories that include an anodized aluminium support tube, height 3.94 in (100 mm), 15.75 in (400 mm) or 31.5 in (800 mm) and support plate.

The units stack vertically and are each locked by a single screw. Electrical connections between each unit are made automatically during assembly.

Choice of panel mounting:

- either directly by the base using 2 screws, or
- using the support plate (4 mounting screws) and support tube.

Supply connections to the illuminated and audible units are brought out to terminals incorporated in the base unit.

The AS-i adaptor unit is connected to the bus using a plug-in terminal.

AS-i Adaptor Unit

Description	Catalog Number
AS-i adaptor unit (the adaptor must be the lowest unit on the column)	XVAS102

Illuminated Lens Units

Description	Signal	Supply Voltage	Color	Catalog Number
High intensity xenon “flash” lamp (Maximum of 1 unit per indicator bank, mounted at top)	With discharge circuit Integral tube	24 Vdc	Green	XVAC63C0241
			Red	XVAC64C0241
			Orange	XVAC65C0241
			Blue	XVAC66C0241
			Clear	XVAC67C0241
Illuminated lens units	Steady light Bulb not included ■	12 to 48 Vac/dc ▲	Green	XVAC33
			Red	XVAC34
			Orange	XVAC35
			Blue	XVAC36
			Clear	XVAC37
			Yellow	XVAC38
	Flashing light Bulb not included ■	24 to 48 Vac ▲	Green	XVAC43
			Red	XVAC44
			Orange	XVAC45
			Blue	XVAC46
			Clear	XVAC47

■ Bulb type for direct supply units: BA 15d base fitting incandescent, see page 27.

▲ When using with an AS-i adaptor unit, the maximum supply voltage for steady or flashing illuminated units must not exceed 48V.

NOTE: Illuminated indicator banks are supplied as sub-assemblies, for assembly by the user.

Each unit is packed individually and marked with its respective catalog number. Maximum number of units per bank: 4 illuminated units or 3 illuminated units + 1 audible unit (mounted immediately above the AS-i adaptor unit).

Audible Signalling Units

Description	Signal	Supply Voltage	Catalog Number
Audible signalling units, 90 db at 3.28 ft (1 m)	Continuous	12 to 48 Vdc	XVAC911
	Intermittent	12 to 48 Vdc	XVAC921

Mounting Units

Description			Catalog Number
Base unit + cover	For bank without high intensity “flash” lamp		XVAC21
Base unit only	For bank with high intensity “flash” lamp		XVAC07
Complementary mounting accessories for tube mounting	Tube only	3.94 in (100 mm)	XVAC02
		15.75 in (400 mm)	XVAC03
		31.5 in (800 mm)	XVAC04
	Tube/support mounting plate	Plastic	XVAC01
		Metal	XVAC11
	Side mounting bracket for tube/support mounting plate or base unit	Metal	XVAC12
Sealing gaskets	Dust and damp protecting	For base unit	XVAC05
		For tube support	XVAC06

Accessories and Spare Parts

Description			Catalog Number
Set of sealing gaskets	For IP 54 degree of protection of the indicator bank		XVAC082
Bulbs, incandescent BA 15d base fitting (Sold in lots of 10)	For illuminated units	12 V - 5 W	DL1BA012
		24 V - 6.5 W	DL1BL024
		48 V - 6 W	DL1BA048

Environment

Product Certifications	AS-i No. 06401
Ambient Air Temperature	Operation: +14 °F to +122 °F (-10 °C to +50 °C), Storage: -4 °F to +158 °F (-20 °C to +70 °C)
Degree of Protection	IP 42 (mounted vertically, direct base mounting)
Vibration Resistance	5 g (f = 10 to 500 Hz) conforming to IEC 68-2-6
Shock Resistance	25 g, 11 ms conforming to IEC 68-2-27
Materials	Unit housing: polycarbonate. Base and top cover: glass reinforced polyamide

Illuminated and Audible Signalling Unit Specifications

Rated Insulation Voltage	Ui: 250 V conforming to IEC 947-1
Supply Voltage (for use with AS-i adaptor unit)	12 to 48 Vac or Vdc
Consumption	Standard flashing light unit: 24 Vac: 250 mA
	High intensity xenon flashing light unit: 24 Vdc: 350 mA maximum (720 mA at switch-on)
	Audible unit: 12 to 48 Vdc: 10 to 50 mA
Rated Impulse Withstand Voltage	U imp = 4 kV conforming to IEC 947-1
Bulb/Lamp type	Illuminated units with steady or flashing circuit: BA 15d base fitting bulbs, minimum power: 5 W, maximum power: 7 W
	Illuminated units with high intensity “flash” lamp (internal xenon tube): 13.6 cds (integrated luminosity) with clear lens
Audible Signalling Unit	90 db at 1 m, signal continuous or intermittent. Fundamental frequency : 3 kHz
Connection	Screw and captive cable clamp terminals, capacity: 2 x 14 AWG (2 x 2.5 mm^2)

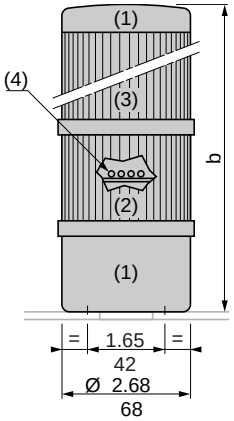
AS-i Adaptor Unit Specifications

Power Supply	From the AS-i bus		
Current Consumption from Bus	< 80 mA		
Output Relay Type	Relay contact 12 to 48 Vac or Vdc		
Maximum current	1 A		
No. of operating cycles	1 million		
AS-i Profile	S8.F		
Data Bits	Bit value	0	1
(Commands)	Command D0 (O)	Unit 1 “off”	Unit 1 “on”
	Command D1 (O)	Unit 2 “off”	Unit 2 “on”
	Command D2 (O)	Unit 3 “off”	Unit 3 “on”
	Command D3 (O)	Unit 4 “off”	Unit 4 “on”
Parameter Bits	Parameters P0 to P3	Not used	
Indicators	Units 1 to 4: yellow LEDs. Supply: green LED		
Compliance Standards	UL Listed E164353 CCN NKCR		

DIMENSIONS

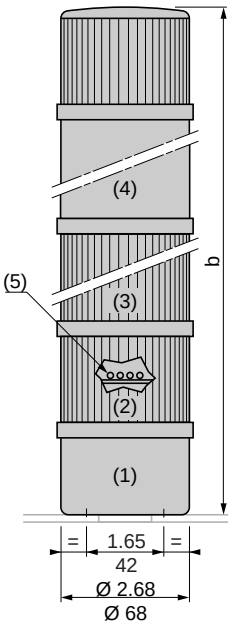
Illuminated indicator banks

without high intensity “flash” lamps



Number of illuminated or audible signalling units (3)	b
1	6.26 in (159 mm)
2	8.31 in (211 mm)
3	10.35 in (263 mm)
4	12.4 in (315 mm)
(1) XVAC21	
(2) XVAS102	
(3) XVAC3 •, C4 • or C9 •	
(4) LEDs	

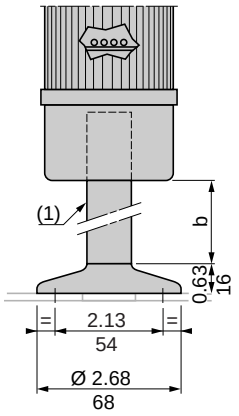
with high intensity “flash” lamp (4)



Dual Dimensions: inches / mm

Number of illuminated or audible signalling units (3)	b
0	9.17 in (233 mm)
1	11.22 in (285 mm)
2	13.27 in (337 mm)
3	15.31 in (389 mm)
(1) XVAC07	
(2) XVAS102	
(3) XVAC3 •, C4 • or C9 •	
(4) XVAC6•••••	
(5) LEDs	

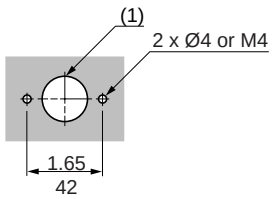
Tube XVAC0• and support plate XVAC



XVA	C02	C03	C04
b	2.48 in (63 mm)	14.29 in (363 mm)	30.04 in (763 mm)
(1) Tube, Ø0.98 in (Ø25 mm)			

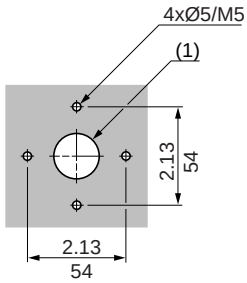
Panel cut-out

For direct mounting



(1) Ø0.98 in (Ø25 mm)

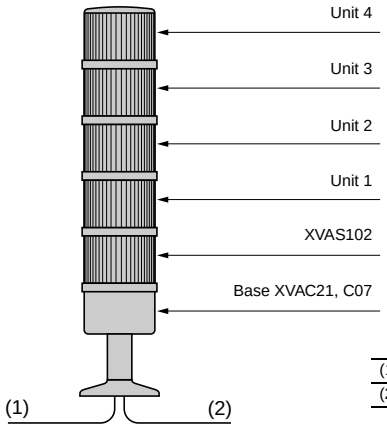
For tube mounting on support plate



Dual Dimensions: inches / mm

Mounting, Connections

Mounting the units

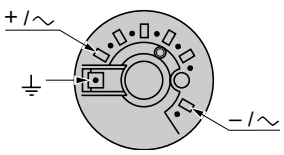


(1) Supply to audible and illuminated units

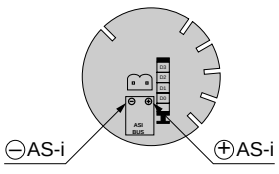
(2) Supply to AS-i unit

Connections base (viewed from above)

Supply connections to illuminated and audible signalling units



AS-i adapter unit



ATV58HU••••

ALTIVAR® 58 DRIVE CONTROLLER INTERFACE

Description

The TELEMECANIQUE® ALTIVAR 58 drive controller range is used to control asynchronous electrical motors with a power of 0.37 to 15 kW for 200/240 Vac single-phase and 200/240 Vac – 380/500 Vac 3-phase power supply voltages.

Based on the concept of sensorless flux vector control, it can offer a range of high performance levels: wide range of speed, low duty torque, powerful acceleration and braking, adaptive tuning to motors and an energy saving function. The range is available in three versions, offering greater flexibility in installation and setup:

- Standard drive controller with heatsink (ATV58HU)
- Drive controller on a base plate (ATV58PU)
- Drive controller fitted in IP55 enclosure (ATV58EU)

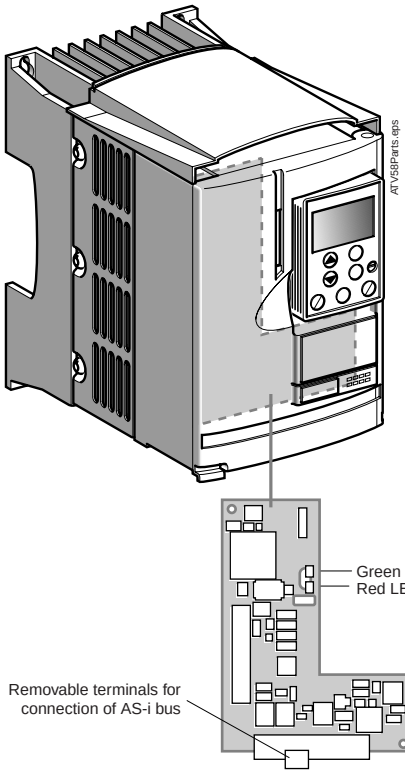
Conforming to standards IEC, UL, and CSA, the ALTIVAR 58 drive controller range can be used for applications in the industrial and commercial sectors using simple or complex machines: mechanical handling machines, conveyors, lifts, packing and packaging machines, textile machines, timber machines, pumps, compressors, fans, air-conditioners, kneaders, etc.

Modularity of Communication Functions

ALTIVAR 58 drive controllers include a RS485 multidrop serial link (MODBUS RTU protocol) as standard and communication cards equipped with various protocols (Interbus-S, AS-i, MODBUS PLUS, Fipio, Uni-Telway, MODBUS) as options to meet the need for integration in remote architectures.

ATV58PU••••

Description



ATV58EU••••

ALTIVAR 58 Drive Controller Functions

Start-Stop Commands via the AS-i Bus

The AS-i bus communication card is used to perform the following commands:

- Forward operation
- Reverse operation
- Normal stop on deceleration ramp
- Fast stop
- DC injection stop
- Freewheel stop
- Reset faults (for drive controller reset)

Speed Commands via the AS-i Bus

One of the following operating modes can be selected:

- 2 directions with 4 preset speeds
- 1 direction with 7 preset speeds
- + fast/– fast

Selection is via the AS-i bus, using parameters P1 and P2.

Speed Commands via Analog Input

Inputs AI1 and AI2 can be used to receive a frequency setpoint.

The Start/Stop commands are sent via the AS-i bus.

Control via the AS-i Bus

Input bits (state) D2 and D3 can be assigned as and when required.

<table>
<tr><th colspan="2">Function</th><th>Local Configuration on ATV58 Drive Controller (Terminal or PC)</th><th>Parameter Entry via AS-i Bus</th></tr>
<tr><td>D0</td><td>Fault/Ready</td><td>–</td><td>–</td></tr>
<tr><td>D1</td><td>Off/On</td><td>–</td><td>–</td></tr>
<tr><td rowspan="2">D2</td><td>Sensor signal</td><td rowspan="2">Assignment of LI3</td><td>–</td></tr>
<tr><td>Local forcing</td><td>–</td></tr>
<tr><td rowspan="8">D3</td><td>Sensor signal</td><td rowspan="2">Assignment of LI4</td><td rowspan="8">Parameter P3</td></tr>
<tr><td>Local forcing</td></tr>
<tr><td>Frequency threshold reached</td><td rowspan="6">Assignment of R2</td></tr>
<tr><td>High speed reached</td></tr>
<tr><td>Frequency reference reached</td></tr>
<tr><td>Current threshold reached</td></tr>
<tr><td>Thermal threshold reached</td></tr>
</table>

Communication Card

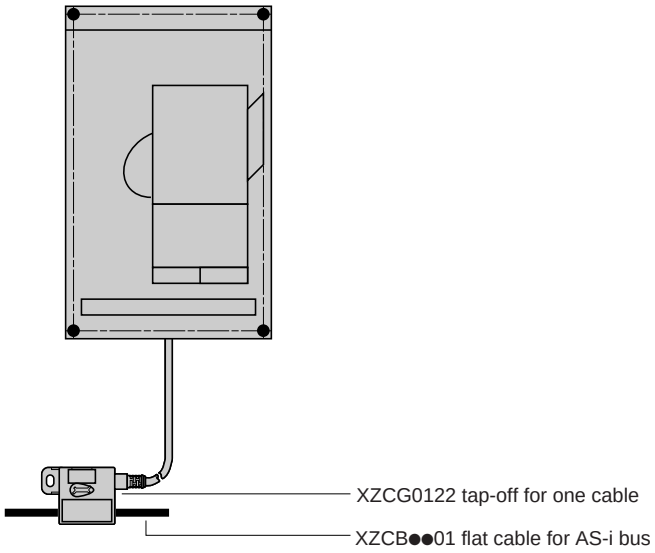
Description	Connector	For Drive Controllers	Catalog Number
AS-i card	Removable terminals	ATV 58 all ratings	VW3A58305

Cord

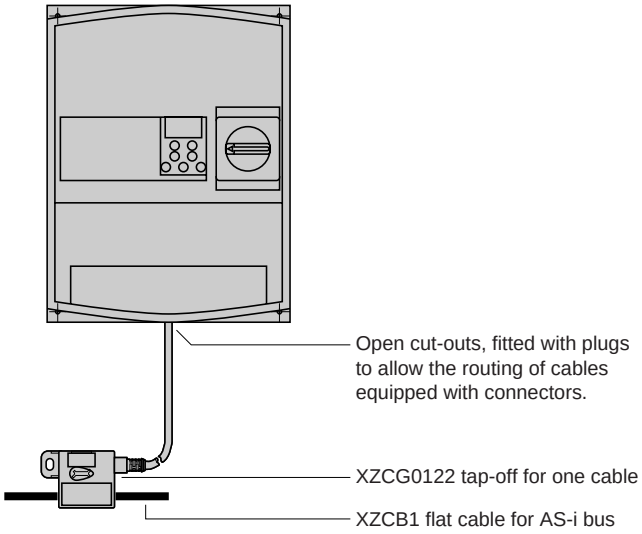
Description	Length	Catalog Number
Tap-off for one cable	6.56 ft (2 m)	XZCG0122

Connections

Standard drive controller with heatsink, drive controller on a base plate



Drive controller fitted in IP55 enclosure



Specifications

Product Certification	AS-i	Pending
Ambient Air Temperature	Operation	+14 °F to +104 °F (-10 °C to +40 °C)
	Storage	-13 °F to +149 °F (-25 °C to +65 °C)
Compliance Standards	UL Listed E164874 CCN NMMS CSA Certified LR96921 Class 3211 06	

Electrical Specifications

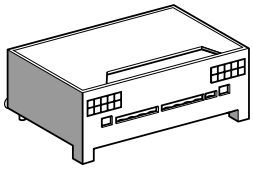
Current Consumed	On the AS-i bus	30 mA

Communication Specifications (parameter entry by default, factory setup)

Profile		7.D							
Data Bits (Commands)		Stop				Forward operation		Reverse operation	Fault reset
	D0 (Out)	= 0				= 1		= 0	= 1
	D1 (Out)	= 0				= 0		= 1	= 1
		Stop modes				Frequency Specification			
		Normal	Fast	DC injection braking	Freewheel	LSP + AI	SP2	SP3	HSP
	D2 (Out)	= 0	= 1	= 0	= 1	= 0	= 1	= 0	= 1	= 1
	D3 (Out)	= 0	= 0	= 1	= 1	= 0	= 0	= 1	= 1	= 1
Data Bits (Status)		Value of bit = 0					Value of bit = 1		
	D0 (In)	Fault					Ready		
	D1 (In)	Off					On		
	D2 (In)	Logic input LI3 off					Logic input LI3 on		
	D3 (In)	Logic output R2 off					Logic output R2 on		

Adaptors for Control and Signalling Units

Description	Signalling Mode of Illuminated Indicator	Mounting Position	Catalog Number
Interface-2 inputs/2 outputs Inputs for digital contacts Outputs for 24 Vdc LEDs DL1CJ024• ■	Steady	-	XALSZ1
Interface-4 inputs/4 outputs for printed circuits Inputs for digital contacts Outputs for indicators	Steady	Vertical	ZB2BZS2V
		Horizontal	ZB2BZS2H
	Steady or flashing depending on parametering	Vertical	ZB2BZS1V
		Horizontal	ZB2BZS1H

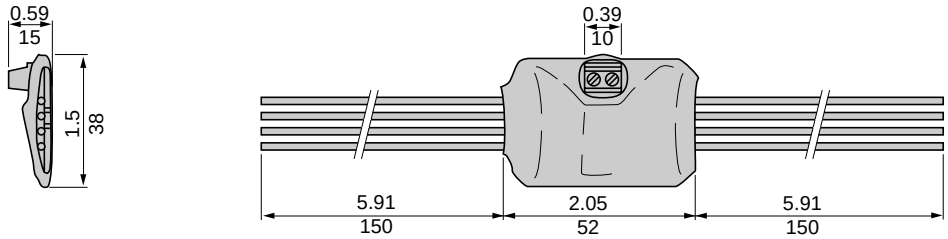


XA2BZ

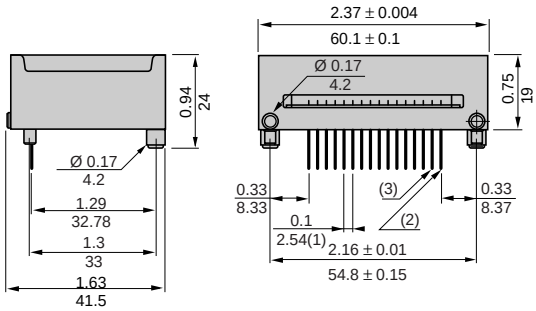
■ Green LED: DL1CJ0243, red LED: DL1CJ0244, yellow LED: DL1CJ0245

Dimensions

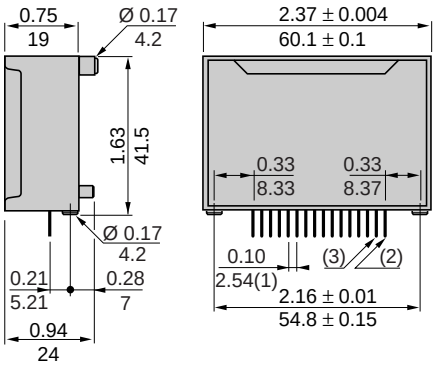
XALSZ1



ZB2BZS•H



ZB2BZS•V

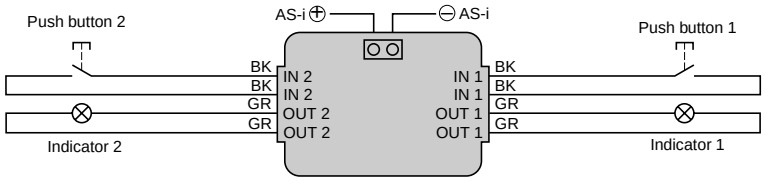


(1) 16 x Ø 1 mm pins on 2.54 mm pitch
(2) AS-i θ pin
(3) AS-i ⊕ pin

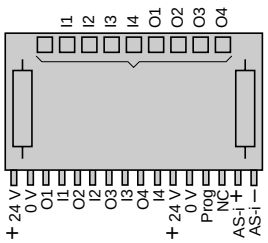
Dual Dimensions: inches / mm

Connections

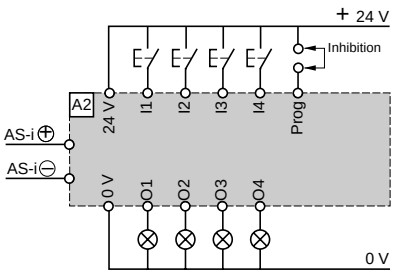
XALSZ1



ZB2BZS••



Connection example



Specifications for AS-i Adaptor, XALSZ1

Ambient Air Temperature	Operation: -13 °F to +158 °F (-25 °C to + 70 °C) Storage: -40 °F to +158 °F (-40 °C to + 70 °C)		
Degree of Protection	IP 20		
Connection	By 2 wires, each 4 x 22 AWG (4 x 0.5 mm^2)		
Supply	From the AS-i bus		
Current Consumption from Bus	< 80 mA		
Inputs	For 2 digital N/C or N/O contacts: 24 Vac, 5 mA		
Outputs	For 2 LED indicators: 24 Vdc, 20 mA With short-circuit protection		
Compliance Standards	UL Recognized E164353 CCN NKCR2		
AS-i Profile	S3.F		
Data Bits (Status)	Bit value	0	1
	State D0 (I)	Push button 1, contact open	Push button 1, contact closed
	State D1 (I)	Push button 2, contact open	Push button 2, contact closed
Data Bits (Commands)	Bit value	0	1
	Command D2 (O)	Indicator 1 off	Indicator 1 on
	Command D3 (O)	Indicator 2 off	Indicator 2 on
Parameter Bits	Parameters P0 to P3	Not used	

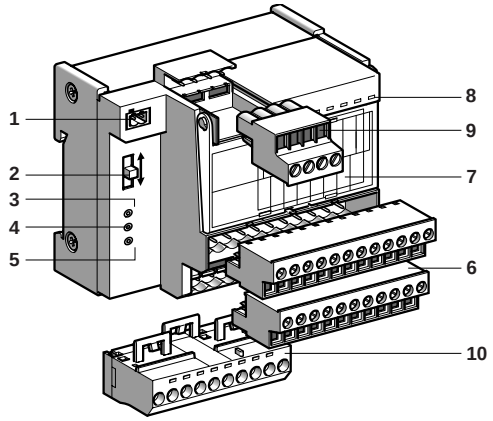
Specifications for AS-i Adaptors, ZB2BZS••

Product Certifications	AS-i No. 16801		
Ambient Air Temperature	Operation: +14 °F to +131 °F (-10 °C to + 55 °C) Storage: -40 °F to +158 °F (-40 °C to + 70 °C)		
Degree of Protection	IP 20		
Connection	To printed circuit: 16-pin on 2.54 mm pitch		
Power Supply	From the AS-i bus		
Current Consumption from Bus	< 280 mA		
Inputs	For 4 digital N/C or N/O contacts: 24 Vac, 5 mA		
Outputs	For 4 LED indicators: 24 Vdc, 1.2 W, 50 mA max. per output With overload and short-circuit protection Watchdog: output = 0 after 30 ms of non polling of the slave by the master		
Indication	LED indicators for inputs, outputs, and supply		
Compliance Standards	UL Recognized E164353 CCN NKCR2		
AS-i Profile	ZB2BZS1•: S7.F; ZB2BZS2•: S7.0		
Data Bits (Status)	Bit value	0	1
	State D0 (I)	Push button 1, contact open	Push button 1, contact closed
	State D1 (I)	Push button 2, contact open	Push button 2, contact closed
	State D2 (I)	Push button 3, contact open	Push button 3, contact closed
	State D3 (I)	Push button 4, contact open	Push button 4, contact closed
Data Bits (Commands)	Bit value	0	1
	Command D0 (O)	Indicator 1 off	Indicator 1 on
	Command D1 (O)	Indicator 2 off	Indicator 2 on
	Command D2 (O)	Indicator 3 off	Indicator 3 on
	Command D3 (O)	Indicator 4 off	Indicator 4 on
Parameter Bits for ZB2BZS1•	Bit value	0	1
	Parameter P0	Indicator 1 on (flashing)	Indicator 1 on (steady)
	Parameter P1	Indicator 2 on (flashing)	Indicator 2 on (steady)
	Parameter P2	Indicator 3 on (flashing)	Indicator 3 on (steady)
	Parameter P3	Indicator 4 on (flashing)	Indicator 4 on (steady)
Parameter Bits for ZB2BZS2•	Parameters P0 to P3	Not used	

Description

The TELEFAST® SB2 AS-i intelligent interfaces are based upon the TELEFAST 2 concept. They allow standard discrete sensor and actuator devices to be connected to the AS-i bus. They are available in 4 or 8 I/O versions. Their inputs, depending upon the model, may be isolated from the AS-i bus. Their outputs (either solid state or electromechanical relay) may be used to control actuators of 1 to 5 A.

Composition of the TELEFAST SB2 intelligent interfaces



All the TELEFAST SB2 interfaces share certain common functions and features, as shown below:

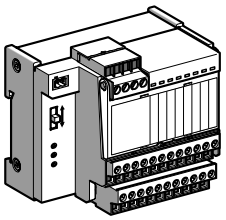
1. Module address connector
2. "Normal"/"Addressing" mode selector switch
3. LED (green) indicating correct connection to AS-i bus
4. LED (red) indicating an I/O fault
5. LED (green) indicating presence of external power supply (only on ABE8S22SBB• and ABE8S44SBB•)
6. Removable screw terminals for I/O connection and external power supply, if required
7. Channel marking label
8. LED showing I/O status
9. Removable screw terminal block for connection to the AS-i bus
10. Add-on terminal blocks (ABE7BV10 and ABE7BV20) for additional common

Configurations

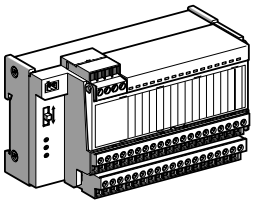
Eight versions of TELEFAST SB2 intelligent interfaces are available as follows:

- 8-channel interfaces
  Four versions available, incorporating 4 inputs and 4 outputs.
  ABE8S44SBB0
  — The inputs, isolated from the AS-i bus, are powered by an external 24 Vdc supply. They are protected by a current limiter.
  — The solid state outputs, isolated from the AS-i bus, are powered by an external 24 Vdc supply.
  ABE8S44SBB1
  — The inputs are powered from the AS-i bus and protected by a current limiter.
  — The solid state outputs, isolated from the AS-i bus, are powered by an external 24 Vdc supply.
  ABE8R44SB11
  — The inputs are powered from the AS-i bus and protected by a current limiter.
  — The electromechanical relay outputs with 1 N/O contact, isolated from the AS-i bus, are powered by an external 5 to 125 Vdc or 5 to 250 Vac supply.
  ABE8R44SF10
  — The inputs, isolated from the AS-i bus, are powered by an external 110 Vac supply.
  — The electromechanical relay outputs with 1 N/O contact, isolated from the AS-i bus, are powered by an external 5 to 125 Vdc or 5 to 250 Vac supply.
- 4-channel interfaces
  Four versions are available, incorporating 4 inputs, 4 outputs or 2 inputs/2 outputs.
  ABE8S40SB00
  — Interface with 4 inputs powered by the AS-i bus and protected by a current limiter.
  ABE8R04S010
  — Interface with 4 electromechanical relay outputs with 1 N/O contact, isolated from the AS-i bus, and powered by an external 5 to 125 Vdc or 5 to 250 Vac supply.
  ABE8S22SBB1
  Interface with 2 inputs and 2 outputs.
  — The inputs are powered from the AS-i bus and protected by a current limiter.
  — The solid state outputs, isolated from the AS-i bus, are powered by an external 24 Vdc supply.
  ABE8S22SBB2
  Interface with 2 inputs and 2 outputs.
  — The inputs are powered from the AS-i bus and protected by a current limiter.
  — The solid state outputs, isolated from the AS-i bus, are powered by an external 24 Vdc supply.

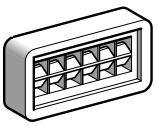
  NOTE: The outputs have an inverse operation:
  - state 0 when they are controlled
  - state 1 when deactivated
  In the case of a bus failure, the default position is state 1.



ABE8S40SB00



ABE8R44S••



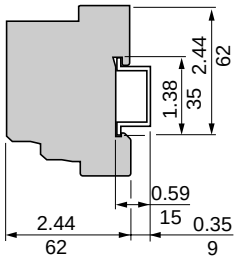
AR1SB3

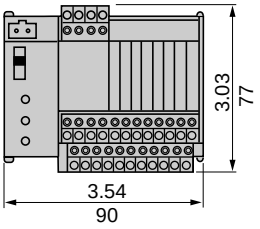
No. of Channels	Function		Voltage		Polarity Distribution/ Operative Part	Output/ Channel Current	Output Default Position	Catalog Number
	Input	Output	Input	Output				
4	4	–	Bus	–	–	–	–	ABE8S40SB00
	–	4 relays 1 N.O.	–	125 Vdc/ 250 Vac	Common for 4 channels or volt-free	5 A	State 0	ABE8R04S010
	2	2 solid state	Bus	24 Vdc	Common for 2 channels	2 A	State 0	ABE8S22SBB1
							State 1	ABE8S22SBB2 ▲
8	4	4 solid state	24 Vdc ext.	24 Vdc	Common for 4 channels	1 A ■	State 0	ABE8S44SBB0
			Bus	24 Vdc	Common for 4 channels	1 A ■	State 0	ABE8S44SBB1
	4	4 relays 1 N.O.	Bus	125 Vdc/ 250 Vac	Common for 4 channels or volt-free	5 A	State 0	ABE8R44SB11
			110 Vac ext.	125 Vdc/ 250 Vac	Common for 4 channels or volt-free	5 A	State 0	ABE8R44SF10

Description	Specifications	Sold in Lots of	Catalog Number
Kit for mounting on solid plate	–	10	ABE7ACC01
Additional snap-on terminal blocks	10 shunted terminals	5	ABE7BV10
	20 shunted terminals	5	ABE7BV20
Adhesive label holder	For 6 characters	50	AR1SB3
Quick-blow fuses (HRC) 5 x 20, 250 V, UL ●	4 A	10	ABE7FU400
	6.3 A	10	ABE7FU630

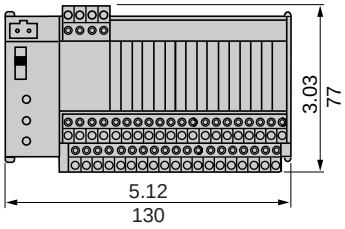
Dimensions

ABE8S4•••••
ABE8S2•••••
ABE8R04••••





ABE8R44S•••



Dual Dimensions: inches / mm

■ Derate outputs to 0.75 A for 4 simultaneous outputs
● HRC: High Rupturing Capacity
▲ The outputs have an inverse operation: state 0 when they are controlled and state 1 when deactivated

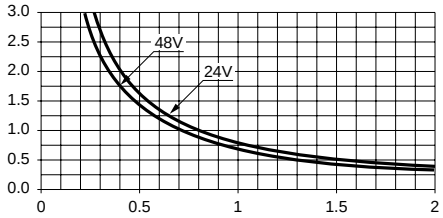
General System Environment

Product Certifications	AS-i		
Enclosure Rating	Conforming to IEC 529	IP 2X	
Shock Resistance	Conforming to IEC 68-2-27	11 ms (semi-sinusoidal) 15 g (acceleration)	
Vibration Resistance		5 to 13.2 Hz ± 1 mm 13.2 to 100 Hz- 0.7 gn	
Resistance to Electrostatic Discharges	Conforming to IEC 1000-4-2	Level 3	
Resistance to Radiated Fields	Conforming to IEC 1000-4-3	Level 3	
Resistance to Transients	Conforming to IEC 1000-4-4	Level 3	
Surge Withstand	Conforming to IEC 1000-4-5	1 kV at 2 Ohms (differential mode), 2 kV at 12 Ohms (common mode)	
Ambient Air Temperature	Operation, conforming to IEC 1131-2	-23 °F to +140 °F (-5 °C to +60 °C)	
	Storage, conforming to IEC 1131-2	-40 °F to +176 °F (-40 °C to +80 °C)	
Insulation Voltage (for 1 minute)	Terminals/fixing rails	2 kV	
Installation Category	Conforming to IEC 664	II	
Degree of Pollution	Conforming to IEC 664	2	
Mounting	Standard profiles	On backplate: 15 mm DIN rail or using ABEACC01 On chassis: 15 mm and 7.5 mm DIN rails	
Suitable Cable Sections		1 conductor	2 conductors
	Flexible cable without cable end	0.14 to 2.5 mm^2 26 to 14 AWG	– –
	Flexible cable with cable end	0.14 to 1.5 mm^2 26 to 16 AWG	0.14 to 0.75 mm^2 26 to 18 AWG
	Solid cable	0.14 to 2.5 mm^2 26 to 14 AWG	0.14 to 1.5 mm^2 26 to 16 AWG
Tightening Torque	With 3.5 mm screwdriver	5.3 lb-in (0.6 N•m)	5.3 lb-in (0.6 N•m)

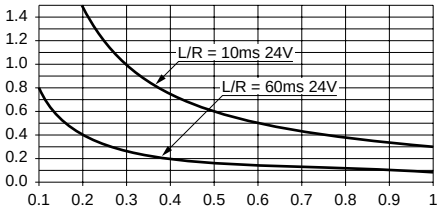
Electrical Durability (in millions of operating cycles, according to IEC 947-5-1)

Electrical durability of electromechanical relays on the ABE8R44SB1, ABE8R44SF10, and ABE8R04S010 interfaces

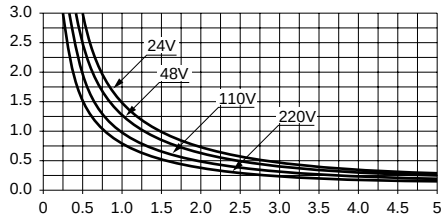
DC12 curves (1)



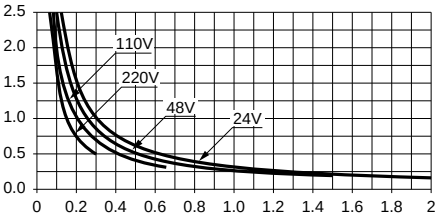
DC13 curves (2)



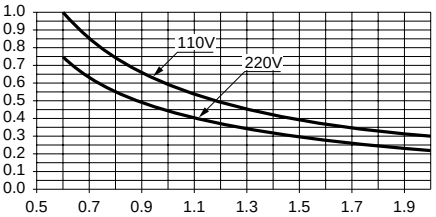
AC12 curves (3)



AC14 curves (4)



AC15 curves (5)



(1) DC12: control of resistive loads and solid state loads optically isolated, I/R ≤ 1 ms.
(2) DC13: control of electromagnets, L/R ≤ 2 x (Ue x Ie) in ms, Ue: rated operating voltage, Ie: rated operating current (with protective diode across load, DC12 curves must be used with a coefficient of 0.9 applied to the number in millions of operating cycles).
(3) AC12: control of resistive loads and solid state loads optically isolated, power factor (pf) ≥ 0.9.
(4) AC14: control of small electromagnetic loads from electromagnets ≤72 VA, make: pf = 0.3, break: pf = 0.3.
(5) AC15: control of electromagnetic loads from electromagnets > 72 VA, make: pf = 0.7, break: pf = 0.4.

4-Channel Modules

Type of Interface			ABE8S40SB00	ABE8R04S010	ABE8S22SBB1	ABE8S22SBB2
Function			4 inputs	4 outputs	2 inputs/2 solid state outputs	
AS-i Certification			No. 113	No. 112	No. 23601	
Specifications at 140 °F (60 °C)						
Inputs (sensor side)	Supply voltage		From the bus	–	From the bus	
	Supply current limit		200 mA	–	200 mA	
	Current consumption per channel, at Un		10 mA	–	10 mA	
	Guaranteed state 1 U > / I >		11 V/6 mA	–	11 V/6 mA	
	Guaranteed state 0 U < / I <		5 V/2 mA	–	5 V/2 mA	
	Conforming to IEC 1131-2		Type 2	–	Type 2	
Outputs (actuator side)	Supply voltage conforming to IEC 947-5-1		–	Ext.: 5 to 125 Vdc Ext.: 5 to 250 Vac	Ext.: 19.2 to 30 Vdc	
	Maximum volt drop at In		–	–	0.5 V	
	Thermal rating per channel		–	5 A	1.4 A	
	Thermal rating for the common return		–	6 A	3 A	
	Rated operating current ▲ conforming to IEC 947-5-1		–	AC12: 5 A AC15: 1.5 A	DC12: 1.4 A DC13: 1 A	
	Mechanical life (in millions of operating cycles)		–	20	–	
	Minimum operating current		–	10 mA (at 5 V)	2 mA	
	Maximum leakage current		–	–	0.3 mA	
	Overload protection		–	–	Electronic	
	Overcurrent trip level		–	–	2 Types	
	Low level contact switching reliability (17 V/5 mA). Faults per 100 million operations		–	1	–	
Other Specifications						
Current Consumption from the Bus	"No-load"		< 35 mA	< 25 mA	< 35 mA	
	With all the channels "On"		< 250 mA	< 100 mA	< 250 mA	
Internal Fuse Protection			–	6.3 A "quick-blow" THPC	4 A "quick-blow" FPC	
Maximum Switching Frequency			100 Hz	10 Hz "no-load" 0.5 Hz at Ie	100 Hz at input < 0.5 Hz/li^2 at output	
Maximum Insulation Voltage	Conforming to IEC 947-1	Inputs/bus	–	–	–	
		Outputs/bus	–	300 V	300 V	
Maximum Impulse Resistance	1.2/50		–	2.5 kV	2.5 kV at output	
Compliance Standards			UL Listed E164866 CCN NRAQ CSA Certified LR89150 (164581-2500005985) Class 3211 07			
Indicators ●	Bus operational		Green LED			
	Fault		Red LED			
	External supply healthy		–	–	Green LED	
AS-i Profile			S0.0	S8.0	S3.0	S3.F
Data Bits ◆		Bit value	= 0 / = 1	= 0 / = 1	= 0 / = 1	= 0 / = 1
		D0	Input 1	Output 1	Input 1	Input 1
			0 / 1	0 / 1	0 / 1	0 / 1
		D1	Input 2	Output 2	Input 2	Input 2
			0 / 1	0 / 1	0 / 1	0 / 1
		D2	Input 3	Output 3	Output 1	Output 1
			0 / 1	0 / 1	0 / 1	1 / 0
		D3	Input 4	Output 4	Output 2	Output 2
			0 / 1	0 / 1	0 / 1	1 / 0
Parameter Bits	P0 to P3		Not used			
Output Default States	Watchdog checks status of bus		–	State 0	8S22SBB1: state 0 8S22SBB2: state 1	

▲ See curves on page 37.

● Detailed operating descriptions are given in each installation guide.

◆ State of Di bit: state of corresponding input or output. Except for ABE8S22SBB2 where the state of the outputs is the inverse of bits D2 and D3.

8-Channel Modules

Type of Interface			ABE8S44SBB0	ABE8S44SBB1	ABE8R44SB11	ABE8R44SF10
Function			4 inputs/4 solid state outputs	4 inputs/4 solid state outputs	4 inputs/4 EM relay outputs	4 inputs/4 EM relay outputs
AS-i Certification			No. 114	No. 179	No. 23501	No. 23401

Specifications at 140 °F (60 °C)

Inputs (sensor side)	Supply voltage		Ext.: 19.2 to 30 Vdc	From the bus	From the bus	Ext.: 110 Vac
	Supply current limit		250 mA	200 mA	150 mA	–
	Current consumption per channel, at Un		13 mA	10 mA	10 mA	17 mA
	Guaranteed state 1 U > / I >		11 V/6 mA			74 V/10 mA
	Guaranteed state 0 U < / I <		5 V/2 mA			20 V/4 mA
	Conformity to IEC 1131-2		Type 2			
Outputs (actuator side)	Supply voltage conforming to IEC 947-5-1		Ext.: 19.2 to 30 Vdc	Ext.: 19.2 to 30 Vdc	Ext.: 5 to 125 Vdc Ext.: 5 to 250 Vac	
	Maximum volt drop at In		0.5 V		–	
	Thermal rating per channel		0.7 A		5 A	
	Thermal rating for the common return		2.8 A	2 A	6 A	
	Rated operating current conforming to IEC 947-5-1		DC12: 0.7 A DC13: 0.5 A		AC12: 5 A AC15: 1.5 A	
	Mechanical life (in millions of operating cycles)		–		20	
	Minimum current		1 mA		10 mA (at 5 V)	
	Maximum leakage current		0.2 mA		–	
	Overload protection		Electronic		–	
	Overcurrent trip level		1 Type		–	
	Low level contact switching reliability (17 V/5 mA). Faults per 100 million operations		–		1	

Other Specifications

Current Consumption from the Bus	"No-load"		< 25 mA	< 35 mA	< 35 mA	< 25 mA
	With all the channels "On"		< 35 mA	< 250 mA	< 300 mA	< 100 mA
Internal Fuse Protection			4 A "quick-blow" FPC		6.3 A "quick-blow" THPC	–
Maximum Switching Frequency			100 Hz at input, < 0.5 Hz/Ii^2 at output		10 Hz "no-load", 0.5 Hz at Ie	
Maximum Insulation Voltage	Conforming to IEC 947-1	Inputs/bus	300 V	–	–	300 V
		Outputs/bus	300 V	300 V	300 V	300 V
Maximum Impulse Resistance	1.2/50		2.5 kV			
Compliance Standards			UL Listed E164866 CCN NRAQ CSA Certified LR89150 (164581-2500005985) Class 3211 07			
Indicators ▲	Bus operational		Green LED			
	Fault		Red LED			
	External supply healthy		Green LED		–	
AS-i Profile			S7.0			

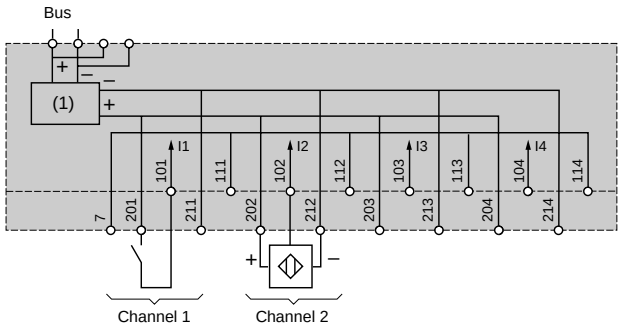
Data Bits ●	Bit value	= 0	= 1	= 0	= 1	= 0	= 1	= 0	= 1
	D0	Input 1		Input 1		Input 1		Input 1	
		0	1	0	1	0	1	0	1
		Output 1		Output 1		Output 1		Output 1	
		0	1	0	1	0	1	0	1
	D1	Input 2		Input 2		Input 2		Input 2	
		0	1	0	1	0	1	0	1
		Output 2		Output 2		Output 2		Output 2	
		0	1	0	1	0	1	0	1
	D2	Input 3		Input 3		Input 3		Input 3	
		0	1	0	1	0	1	0	1
		Output 3		Output 3		Output 3		Output 3	
		0	1	0	1	0	1	0	1
	D3	Input 4		Input 4		Input 4		Input 4	
		0	1	0	1	0	1	0	1
		Output 4		Output 4		Output 4		Output 4	
		0	1	0	1	0	1	0	1

Parameter Bit	P0 to P3	Not used
Output Default States	Watchdog checks status of bus	State 0

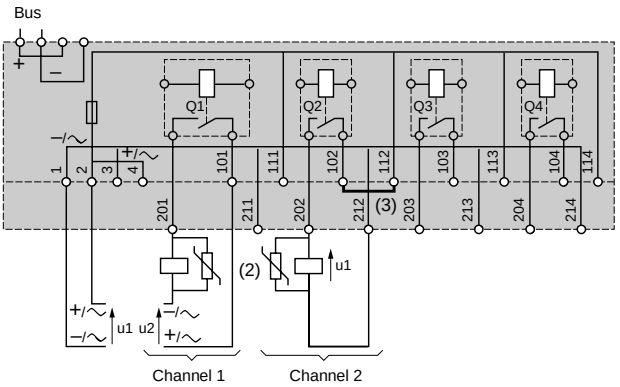
▲ Detailed operating descriptions are given in each installation guide.

● State of Di bit: state of corresponding input or output. Except for ABE8S22SBB2, where the state of the outputs is the inverse of bits D2 and D3.

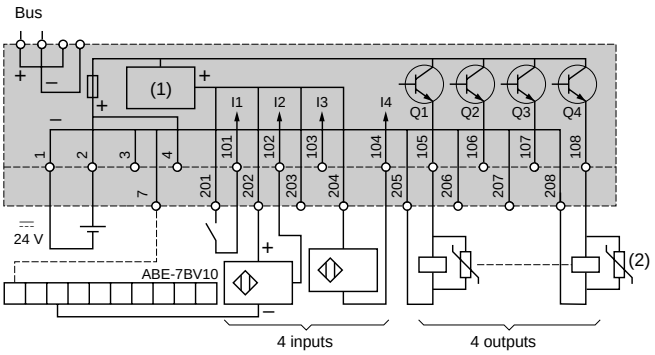
ABE8S40SB00



ABE8R04S010



ABE8S44SBB0



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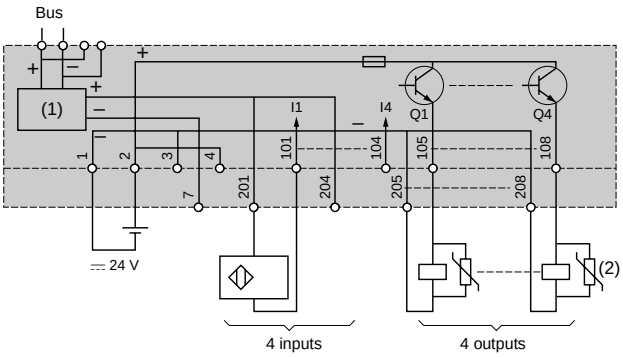

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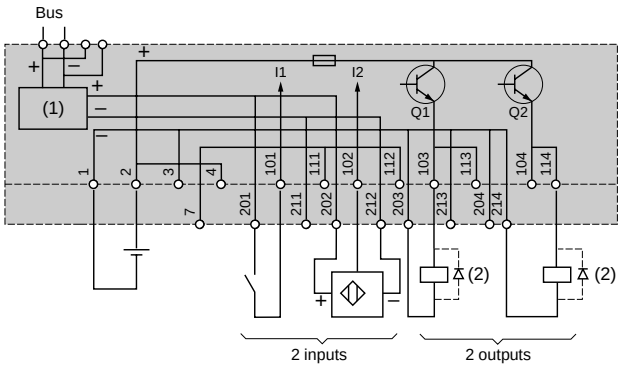
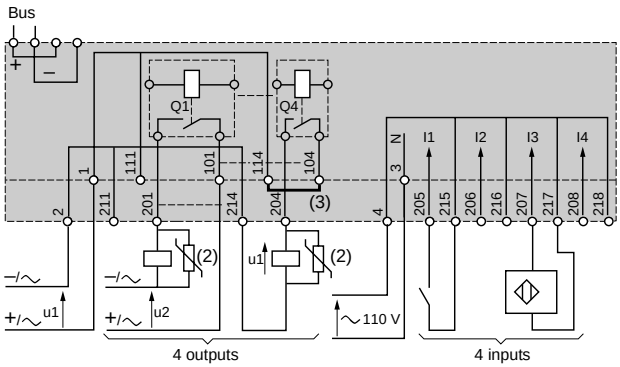
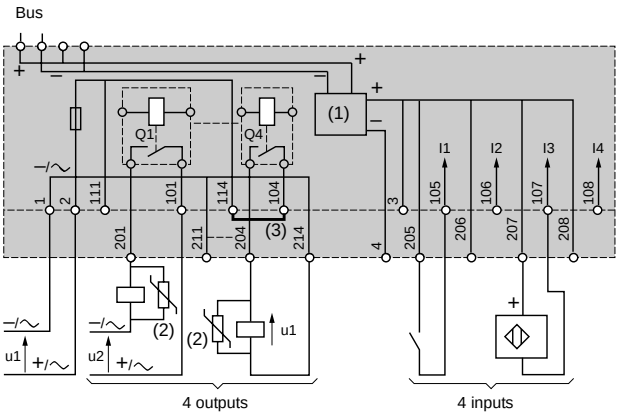


ABE8R44SF10



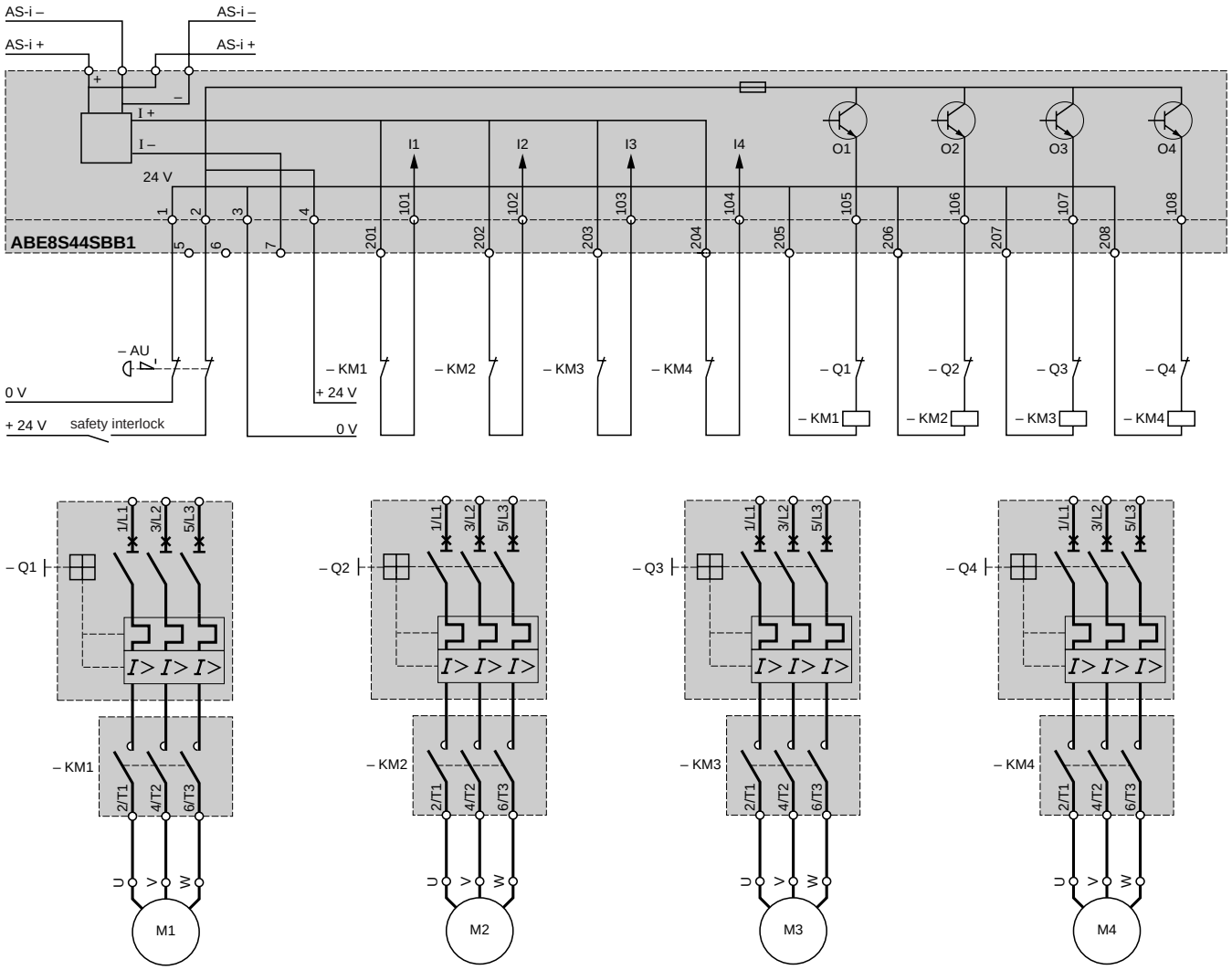
ABE8R44SB11



(1) Current limiter (see specifications on pages 38 and 39).
(2) On inductive load where the energy is greater than the specified value
(3) Jumpers supplied with the product

Using TELEFAST® SB2 Intelligent Interfaces with Motor Starters

Recommended Wiring Diagrams

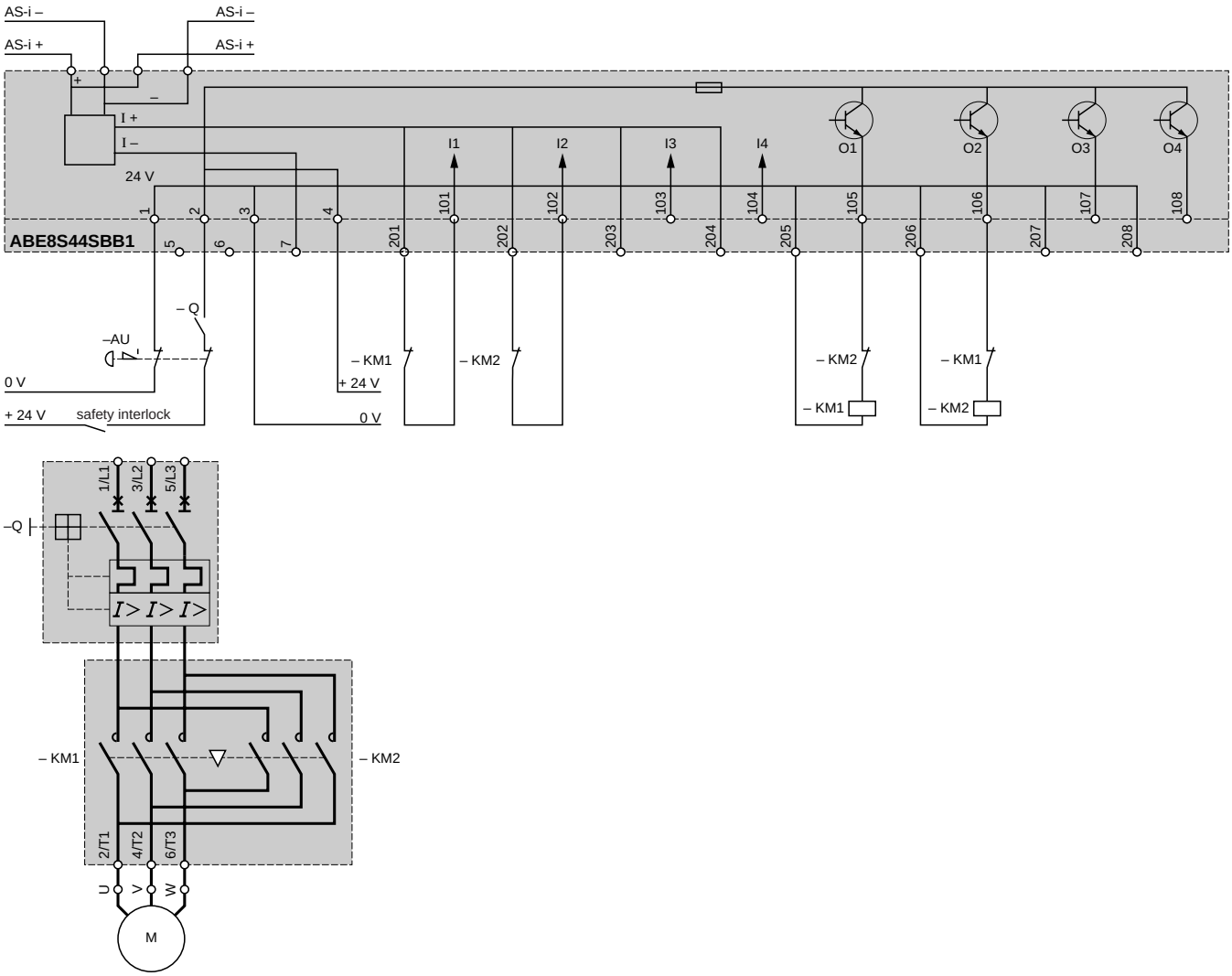


Data Exchange Specifications

AS-i Profile	7.0		
Data Bits (Commands)	Bit value	= 0	= 1
	Command D0 (O)	De-energize contactor 1	energize contactor 1
	Command D1 (O)	De-energize contactor 2	energize contactor 2
	Command D2 (O)	De-energize contactor 3	energize contactor 3
	Command D3 (O)	De-energize contactor 4	energize contactor 4
Data Bits (Status)	Bit value	= 0	= 1
	State D0 (I)	Contactor 1 energized	Contactor 1 de-energized
	State D1 (I)	Contactor 2 energized	Contactor 2 de-energized
	State D2 (I)	Contactor 3 energized	Contactor 3 de-energized
	State D3 (I)	Contactor 4 energized	Contactor 4 de-energized

Using TELEFAST® SB2 Intelligent Interfaces with Reversing Motor Starters

Recommended Wiring Diagrams



Data Exchange Specifications

AS-i Profile	7.0		
Data Bits (Commands)	Bit value	= 0	= 1
	Command D0 (O)	Stop forward running	Start forward running
	Command D1 (O)	Stop reverse running	Start reverse running
	Command D2 (O)		
	Command D3 (O)		
Data Bits (Status)	Bit value	= 0	= 1
	State D0 (I)	Forward running	Stopped forward running
	State D1 (I)	Reverse running	Stopped reverse running
	State D2 (I)		
	State D3 (I)		

Using TELEFAST® SB2 Intelligent Interfaces with Motor Starters

Associated Components

Standard Motor Starters

Rated Operational Power for Utilization Category AC-3		DOL Non-reversing Starters			Reversing Starters				Contactor Consumption at 24 Vdc
400/415 Vac	220/230 Vac	Disconnect/ Protector	Add-on Auxiliary Block	Contactors KM1 to KM4	Disconnect/ Protector	Add-on Auxiliary Block	Reversing Contactors KM1 & KM2	Add-on Auxiliary Block	
kW	kW	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.	mA
0.06	–	GV2M02	GV2AE20	LP1K0601BD	GV2M02	GV2AE20	LP2K0601BD	LA1KN11	125
0.09	0.06	GV2M03	GV2AE20	LP1K0601BD	GV2M03	GV2AE20	LP2K0601BD	LA1KN11	125
0.12/0.18	–	GV2M04	GV2AE20	LP1K0601BD	GV2M04	GV2AE20	LP2K0601BD	LA1KN11	125
0.25	0.09/0.12	GV2M05	GV2AE20	LP1K0601BD	GV2M05	GV2AE20	LP2K0601BD	LA1KN11	125
0.37/0.55	018/0.25	GV2M06	GV2AE20	LP1K0601BD	GV2M06	GV2AE20	LP2K0601BD	LA1KN11	125
0.75	0.37	GV2M07	GV2AE20	LP1K0601BD	GV2M07	GV2AE20	LP2K0601BD	LA1KN11	125
1.1/1.5	0.55/0.75	GV2M08	GV2AE20	LP1K0601BD	GV2M08	GV2AE20	LP2K0601BD	LA1KN11	125
2.2	1.1	GV2M10	GV2AE20	LP1K0601BD	GV2M10	GV2AE20	LP2K0601BD	LA1KN11	125
3/4	1.5	GV2M14	GV2AE20	LP1K0901BD	GV2M14	GV2AE20	LP2K0901BD	LA1KN11	125
5.5	2.2/3	GV2M16	GV2AE20	LP1D1201BD	GV2M16	GV2AE20	LP2D1201BD	LA1DN11	375
7.5	4	GV2M20	GV2AE20	LP1D1801BD	GV2M20	GV2AE20	LP2D1801BD	LA1DN11	375
9	–	GV2M21	GV2AE20	LP1D2501BD	GV2M21	GV2AE20	LP2D2501BD	LA1DN11	460
11	5.5	GV2M22	GV2AE20	LP1D2501BD	GV2M22	GV2AE20	LP2D2501BD	LA1DN11	460
15	7.5/9	GV3M40	GV2AE20	LP1D3201BD	GV3M40	GV2AE20	LP2D3201BD	LA1DN11	460
18.5	–	GV3M40	GV2AE20	LP1D3201BD	GV3M40	GV2AE20	LP2D3201BD	LA1DN11	460
22	11	GV3M63	GV2AE20	LP1D5001BD	–	–	–	–	920 ◆
30	15	GV3M63	GV2AE20	LP1D6501BD	–	–	–	–	920 ◆
37	18.5/22	GV7RE80	GV7AE11	LP1D8001BD	–	–	–	–	920 ◆

◆ Only for ABS8••: 3 contactors can be interfaced with the ASBE8S44SBB1 module (maximum accumulative current for all output channels: 3.15 A)

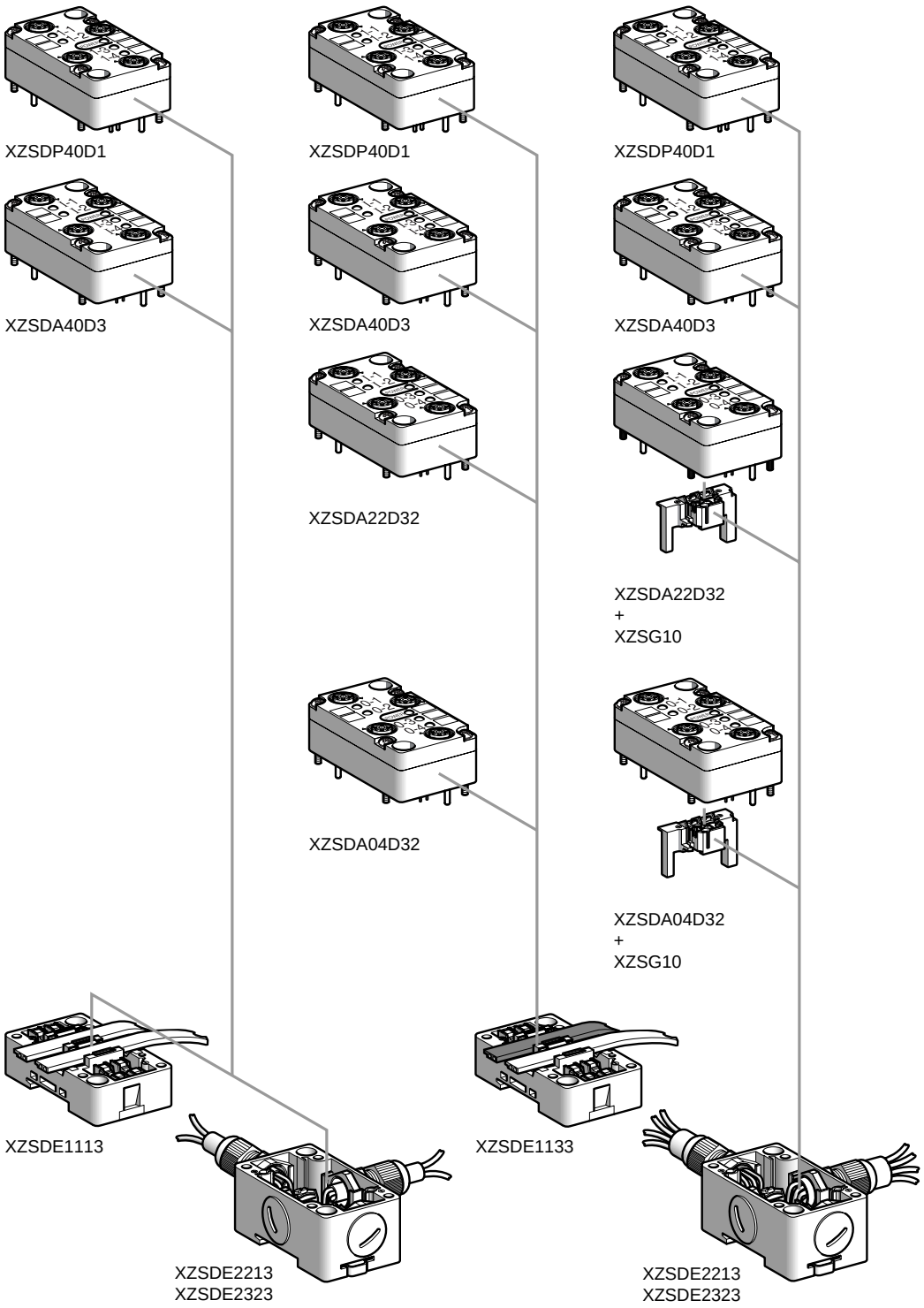
High-Performance Motor Starters

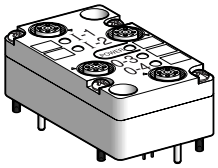
Rated Operational Power for Utilization Category AC-3		DOL Non-reversing Starters			Reversing Starters				Contactor Consumption at 24 Vdc
400/415 Vac	220/230 Vac	Disconnect/ Protector	Add-on Auxiliary Block	Contactors KM1 to KM4	Disconnect/ Protector	Add-on Auxiliary Block	Reversing Contactors KM1 & KM2	Add-on Auxiliary Block	
kW	kW	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.	mA
0.06	–	GV2P02	GV2AE20	LP1D0901BD	GV2P02	GV2AE20	LP2D0901BD	LA1DN11	375
0.09	0.06	GV2P03	GV2AE20	LP1D0901BD	GV2P03	GV2AE20	LP2D0901BD	LA1DN11	375
0.12/0.18	–	GV2P04	GV2AE20	LP1D0901BD	GV2P04	GV2AE20	LP2D0901BD	LA1DN11	375
0.25	0.09/0.12	GV2P05	GV2AE20	LP1D0901BD	GV2P05	GV2AE20	LP2D0901BD	LA1DN11	375
0.37/0.55	018/0.25	GV2P06	GV2AE20	LP1D0901BD	GV2P06	GV2AE20	LP2D0901BD	LA1DN11	375
0.75	0.37	GV2P07	GV2AE20	LP1D0901BD	GV2P07	GV2AE20	LP2D0901BD	LA1DN11	375
1.1/1.5	0.55/0.75	GV2P08	GV2AE20	LP1D1801BD	GV2P08	GV2AE20	LP2D1801BD	LA1DN11	375
2.2	1.1	GV2P10	GV2AE20	LP1D1801BD	GV2P10	GV2AE20	LP2D1801BD	LA1DN11	375
3/4	1.5	GV2P14	GV2AE20	LP1D1801BD	GV2P14	GV2AE20	LP2D1801BD	LA1DN11	375
5.5	2.2/3	GV2P16	GV2AE20	LP1D2501BD	GV2P16	GV2AE20	LP2D2501BD	LA1DN11	460
7.5	4	GV2P20	GV2AE20	LP1D2501BD	GV2P20	GV2AE20	LP2D2501BD	LA1DN11	460
9	–	GV2P21	GV2AE20	LP1D2501BD	GV2P21	GV2AE20	LP2D2501BD	LA1DN11	460
11	5.5	GV2P22	GV2AE20	LP1D2501BD	GV2P22	GV2AE20	LP2D2501BD	LA1DN11	460
15	7.5/9	GV3M40	GV2AE20	LP1D8001BD	GV3M40	GV2AE20	LP2D8001BD	LA1DN11	920 ◆
18.5	–	GV3M40	GV2AE20	LP1D8001BD	GV3M40	GV2AE20	LP2D8001BD	LA1DN11	920 ◆
22	11	GV3M63	GV2AE20	LP1D8001BD	–	–	–	–	920 ◆
30	15	GV3M63	GV2AE20	LP1D8001BD	–	–	–	–	920 ◆
37	18.5/22	GV7RE80	GV7AE11	LP1D8001BD	–	–	–	–	920 ◆

◆ Only for ABS8••: 3 contactors can be interfaced with the ASBE8S44SBB1 module (maximum accumulative current for all output channels: 3.15 A)

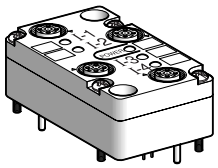
For convenience, the tables above provide references for IEC devices. The same connectivity can be done with NEMA starters and contactors. Consult the factory for additional information.

Passive	**4-way**	XZSDP40D1
Intelligent	**4 Inputs**	XZSDA40D3
	2 Inputs/ 2 Outputs	XZSDA22D32
	4 Outputs	XZSDA04D32
Connection Bases		XZSDE1113, XZSDE2213, XZSDE2323

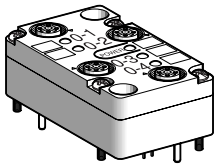




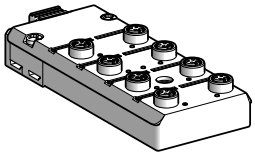
XZSDA22D32



XZSDA40D3



XZSDA04D32



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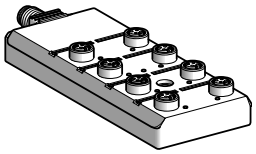

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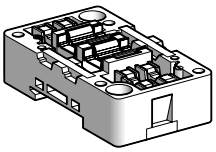

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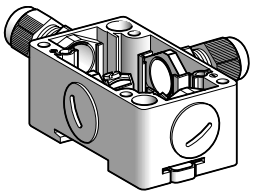
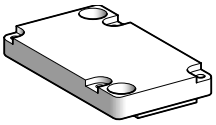
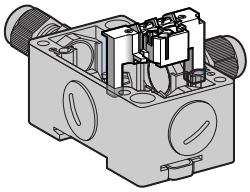


XZSDE2213



XZSDP



XZSG10

XZLG102

4-Port Intelligent Splitter Modules for Connections to Actuators ■ or Sensors ▲

Description	Sensor Supply	Separate Supply to the Actuators	Catalog Number
Splitter module 2 inputs/ 2 solid-state outputs	Via XZSDE•••• connection base, from the AS-i bus	Via XZSDE•••• connection base	XZSDA22D32
Splitter module 4 inputs (200 mA max.)	Via XZSDE•••• connection base, from the AS-i bus	–	XZSDA40D3
Splitter module 4 solid-state outputs	–	Via XZSDE•••• connection base	XZSDA04D32

8-Port Splitter Modules

Description	Connection	Catalog Number
Splitter boxes 4 inputs/ 4 solid-state outputs	To the AS-i bus and to the separate supply by IDC (Insulation Displacement Connectors) to yellow and black flat cables	XZSCA44D21
	To the AS-i bus and to the separate supply by 5-pin male M12 connector	XZSCA44D22

■ Connection to outputs of low power relays, LEDs, valves, etc.

▲ Connection to inputs of digital contacts (push buttons, limit switches) and to solid-state outputs of 2 or 3-wire type PNP sensors.

Connection Bases

Description	Cable Connection	Type and Number of Cables	Catalog Number
Connection bases for flat cable	By IDC	2 flat cables for AS-i bus (yellow) or 2 flat cables for separate supply (black) Ie ≤ 2 A	XZSDE1113
	By IDC	2 flat cables: - 1 for AS-i bus (yellow) - 1 for separate supply (black) Ie ≤ 2 A	XZSDE1133
Connection base for round cable ●	To screw terminals Maximum clamping capacity: 2 x 16 AWG (2 x 1.5 mm^2)	Unshielded	XZSDE2213
		Shielded	XZSDE2323

Accessories for Connection Bases

Description	Cable Type Suitable for Connection to Equipped Base	Catalog Number
Adaptor for provision of separate supply from the XZSDE2••• connection base	4-core cable (2 for the AS-i bus, 2 for the separate supply)	XZSG10
Cover for connection base		XZSDP

Accessory for Splitter Modules

Description	Catalog Number
Blanking plug for M12 connector Degree of protection IP 67	XZLG102

● Two PG 11 cable glands (clamping capacity Ø6 to 10 mm) and 3 blanking plugs included with connection base. For twin-conductor cable for AS-i bus Ie ≤ 4 A.

AS-i Bus
Intelligent Splitter Modules

Specifications

Type	2 inputs/2 outputs	4 inputs/4 outputs	4 inputs/4 outputs
	XZSDA22D32	XZSCA44D21	XZSCA44D22

Environment

Product certifications		AS-i No. 10201	AS-i No. 26201	AS-i No. 26201
Ambient Air Temperature		Operation: -13 °F to +158 °F (-25 °C to +70 °C) Storage: -40 °F to +185 °F (-40 °C to +85 °C)		
Degree of Protection		IP 67		
Materials		PA6-GF-FR		
Connection	From the bus	By connection base XZSDE••••	By insulation displacement connector	By male, 5-pin, M12 connector
	To the actuators or PNP sensors	By female, 4-pin, M12 connector		

Electrical Specifications

Power Supply	Module	From the AS-i bus	From the AS-i bus (protected against reverse polarity)	
	Sensors	18 to 30 Vdc ■		
	Actuators	From separate 24 Vdc supply, -10% to +15%	From separate 24 Vdc supply, -10% to +15% (with protection against reverse polarity)	
		Via connection base	Via AS-i black flat cable	Via connector
Current Consumption from the Bus		≤ 200 mA	≤ 250 mA (output "On")	
PNP Inputs	Maximum current for the 2 or 4 sensors	90 mA	200 mA	
	Input current - high	≥ 5 mA		
	Input current - low	≤ 1.5 mA		
	Input voltage - high	> 10 Vdc		
	Input voltage - low	< 5 Vdc		
Outputs	Type	Solid state 24 Vdc		
	Watchdog	Default to state O (off) in the event of a communications failure		
	Maximum current	2 A ▲	DC12: 1.4 A; DC13: 2 A	
	Short-circuit protection	Yes	Yes plus protection against inductive over voltages	
Indicators	Green LED	Supply	Supply plus verification of bus operation	
	Yellow LEDs	Inputs/outputs		

Data Exchange Specifications

AS-i Profile		S3.0		S7.0			
Data Bits Status (I) and Commands (O)	Bit value	= 0	= 1	= 0	= 1	= 0	= 1
	D0	(I): Sensor 1 signal		(I): Sensor 1 signal		(I): Sensor 1 signal	
		Absent	Present	Absent	Present	Absent	Present
				(O): Output 1		(O): Output 1	
				Off	On	Off	On
	D1	(I): Sensor 2 signal		(I): Sensor 2 signal		(I): Sensor 2 signal	
		Absent	Present	Absent	Present	Absent	Present
				(O): Output 2		(O): Output 2	
				Off	On	Off	On
	D2	(O): Output 3		(I): Sensor 3 signal		(I): Sensor 3 signal	
		Off	On	Absent	Present	Absent	Present
				(O): Output 3		(O): Output 3	
				Off	On	Off	On
	D3	(O): Output 4		(I): Sensor 4 signal		(I): Sensor 4 signal	
		Off	On	Absent	Present	Absent	Present
				(O): Output 4		(O): Output 4	
				Off	On	Off	On
Parameter Bits	P0 to P3	Not used					

■ The power supplied to the module from the AS-i bus is short-circuit protected (maximum current: 100 mA).
▲ Total permissible current for the module: 2 A max.

Type	**4 inputs**	**4 outputs**
	XZSDA40D3	XZSDA04D32

Environment

Product Certifications		AS-i No. 03602	AS-i No. 10301
Ambient Air Temperature		Operation: -13 °F to +158 °F (-25 °C to +70 °C) Storage: -40 °F to +185 °F (-40 °C to +85 °C)	
Degree of Protection		IP 67	
Materials		PA6-GF-FR	
Connection	From the bus	By connection base XZSDE••••	
	To the actuators or PNP sensors	By female, 4-pin, M12 connector	

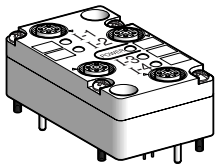
Electrical Specifications

Power Supply	Module	From the AS-i bus	
	Sensors	18 to 30 Vdc ■	-
	Actuators	-	From separate 24 Vdc supply, -10% to +15%
		-	Via connection base
Current Consumption from the Bus		≤ 300 mA	≤ 50 mA
PNP Inputs	Maximum current for the 2 or 4 sensors	200 mA	-
	Input current - high	≥ 5 mA	-
	Input current - low	≤ 1.5 mA	-
	Input voltage - high	> 10 Vdc	-
	Input voltage - low	< 5 Vdc	-
Outputs	Type	-	Solid state 24 Vdc
	Watchdog	-	Default to state O (off) in the event of a communications failure
	Maximum current	-	2 A ▲
	Short-circuit protection	-	Yes
Indicators	Green LED	Supply	
	Yellow LEDs	Inputs/outputs	

Data Exchange Specifications

AS-i Profile		S0.0			
Data Bits Status (I) and Commands (O)	Bit value	= 0	= 1	= 0	= 1
	D0	(I): Sensor 1 signal		(O): Output 1	
		Absent	Present	Off	On
	D1	(I): Sensor 2signal		(O): Output 2	
		Absent	Present	Off	On
	D2	(I): Sensor 3 signal		(O): Output 3	
		Absent	Present	Off	On
	D3	(I): Sensor 4 signal		(O): Output 4	
		Absent	Present	Off	On
Parameter Bits	P0 to P3	Not used			

■ The power supplied to the module from the AS-i bus is short-circuit protected (maximum current: 100 mA).
▲ Total permissible current for the module: 2 A max.



XZSDP40D1

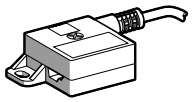
Passive Splitter Modules for Connections to AS-i Sensors or Actuators

Description	Catalog Number
Splitter module, 4-way (2 A max. per way)	XZSDP40D1

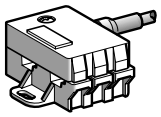
Accessories for Connection of AS-i Flat Cable

Tap-Offs

Connection to flat cables by IDC (Insulation Displacement Connector).
Ue - 40 V, Ie - 2 A.
Degree of protection IP 40.
Ambient air temperature: Operation: -13 °F to +158 °F (-25 °C to +70 °C), Storage: -40 °F to +185 °F (-40 °C to +85 °C)



XZCG012

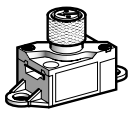


XZCG014

Description	Connection to AS-i Sensor or Actuator	Cable Length	Mounting	Catalog Number
Tap-offs for connection to a flat cable for AS-i bus (yellow)	By 5-pin female straight M12 remote connector Cable: 2 x 24 AWG (2 x 0.34 mm^2)	1.97 ft (0.6 m)	Screw	XZCG01205D
		3.28 ft (1 m)	Screw	XZCG0121D
	By 5-pin female elbowed M12 remote connector Cable: 2 x 24 AWG (2 x 0.34 mm^2)	1.97 ft (0.6 m)	Screw	XZCG01205C
		3.28 ft (1 m)	Screw	XZCG0121C
	By cable with bared ends for terminal block Cable: 2 x 24 AWG (2 x 0.34 mm^2) Brown wire: AS-i Blue wire: AS-i	6.56 ft (2 m)	Screw	XZCG0122
Tap-offs for connection to two flat cables: - 1 for AS-i bus (yellow) - 1 for the separate supply (black)	By 5-pin female straight M12 remote connector Cable: 4 x 24 AWG (4 x 0.34 mm^2)	0.98 ft (0.3 m)	Screw	XZCG01403D
		6.56 ft (2 m)	Screw	XZCG0142D
	For 5-pin female elbowed M12 remote connector Cable: 4 x 24 AWG (4 x 0.34 mm^2)	0.98 ft (0.3 m)	Screw	XZCG01403C
		6.56 ft (2 m)	Screw	XZCG0142C
	By cable with bared ends for terminal block Cable 4 x 24 AWG (4 x 0.34 mm^2) Brown wire: AS-i Blue wire: AS-i White wire: 0 V Black wire: + 24 V	6.56 ft (2 m)	Screw	XZCG0142

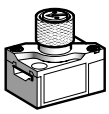
T connectors

Connection to flat cable by IDC
Ue ≤ 40 V, Ie ≤ 2 A.
Degree of protection IP 67.
Ambient air temperature: Operation: -13 °F to +158 °F (-25 °C to +70 °C), Storage: -40 °F to +185 °F (-40 °C to +85 °C)



XZCG0120

Description	Connection to AS-i Sensor or Actuator	Mounting Lugs	Catalog Number
T connectors for connection to a flat cable for AS-i bus (yellow)	By 5-pin female M12 connector	With	XZCG0120
		Without	XZCG0220



XZCG0220

Flat Cables and Accessories

The special profile of these 2-core flat cables eliminates the risk of polarity reversal when connecting.
Connection to the cables are made by IDCs (see connection accessories).
The sheath material self-seals the holes made by the IDC in the event of the connector being removed.
Degree of protection IP 67.
Ambient air temperature:
- standard cable: Operation: -13 °F to +185 °F (-25 °C to +85 °C), Storage: -40 °F to +185 °F (-40 °C to +85 °C).
- TPE (oil and vapor resistant cable): Operation with cable flexing: -22 °F to +221 °F (-30 °C to +105 °C)
Non-flexing operation or storage: -40 °F to +221 °F (-40 °C to +105 °C)

XZCB1••0•

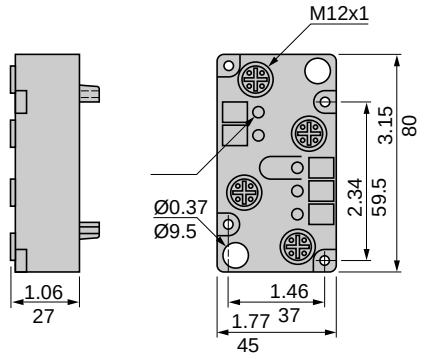
Description	Sheath Color	Length	Type of Cable	Catalog Number
Flat cable 2 x 16AWG (2 x 1.5 mm^2) Ue ≤ 48 V	Yellow (for bus)	65.6 ft (20 m)	Standard	XZCB10201
			TPE	XZCB10201H
		164.0 ft (50 m)	Standard	XZCB10501
			TPE	XZCB10501H
		328.1 ft (100 m)	Standard	XZCB11001
			TPE	XZCB11001H
	Black (for separate 24 Vdc supply)	65.6 ft (20 m)	Standard	XZCB10202
			TPE	XZCB10202H
		164.0 ft (50 m)	Standard	XZCB10502
			TPE	XZCB10502H
		328.1 ft (100 m)	Standard	XZCB11002
			TPE	XZCB11002H

XZCE40

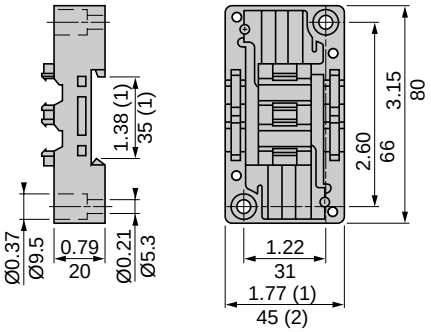
Description	Catalog Number
Cable gland protective seal for use with flat cable and No. 11 cable gland (DIN PG11)	XZCE40

Dimensions

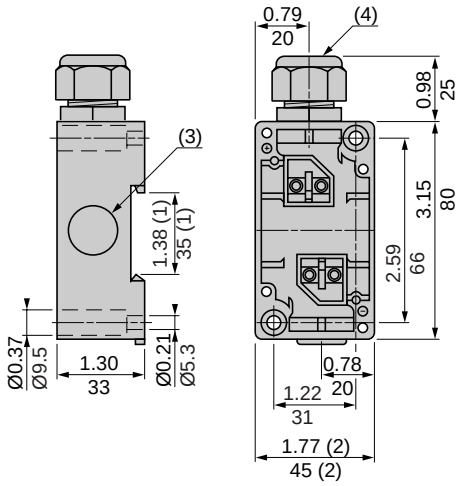
Splitter modules XZSDA•••, XZSDP40D1



Connection bases XZSDE11•3

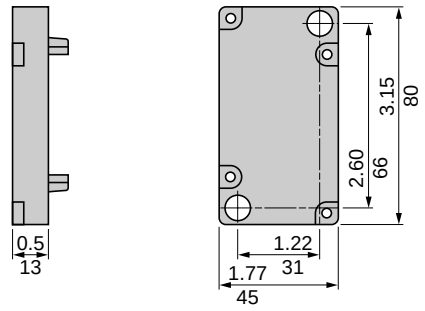


Connection bases XZSDE2•••

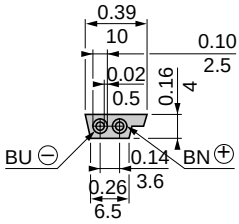


(1) Mounting on DIN rail.
(2) When mounting side-by-side, allow 0.04 in (1 mm) minimum between the modules.
(3) 4 holes for mounting PG11 cable gland or blanking plug.
(4) PG11 cable gland.

Cover XZSDP

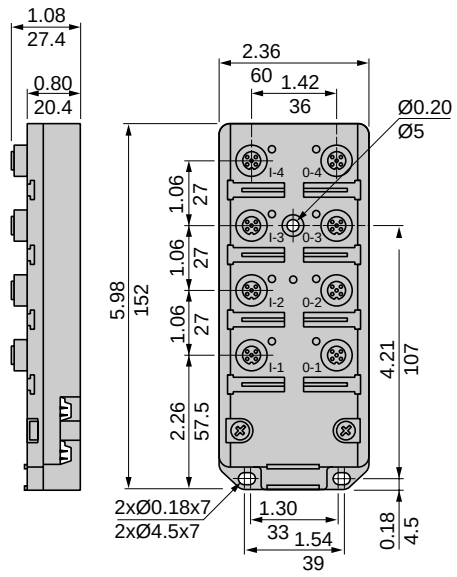


Cables XZCB•••••

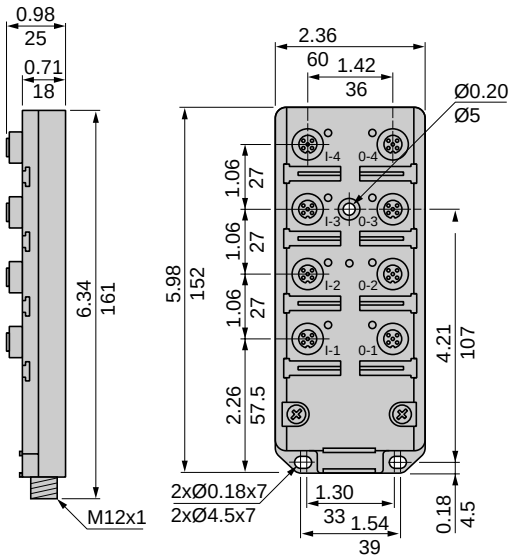


Dual Dimensions: inches / mm

Splitter boxes XZSCA44D21



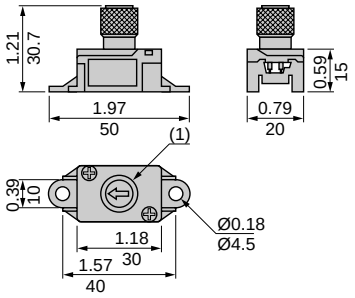
XZSCA44D22



Dimensions

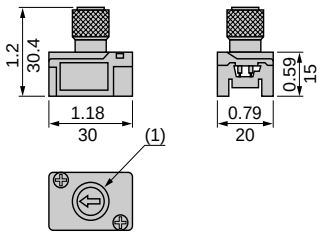
T-connectors

XZCG0120



(1) Connector adjustable to 2 positions through 90°

XZCG0220

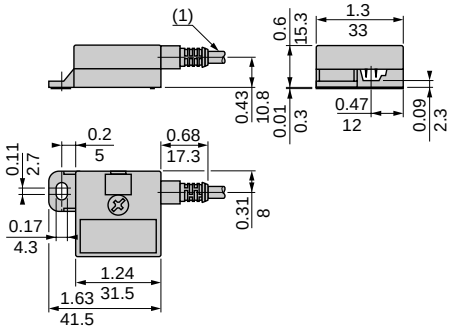


Dual Dimensions: inches / mm

(1) Connector adjustable to 2 positions through 90°

Tap-Offs

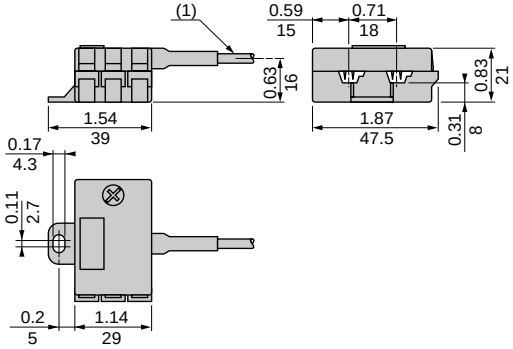
XZCG012••



Dual Dimensions: inches / mm

(1) Cable length 1.97 ft (0.6 m), 3.28 ft (1 m), or 6.56 ft (2 m). Either with stripped ends for terminals (brown: AS-i (+), blue: AS-i (-)) or fitted with M12 connector.

XZCG014••

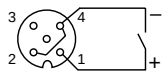


(1) Cable length 0.98 ft (0.3 m) or 6.56 ft (2 m). Either with stripped ends for terminals (brown: AS-i (+), blue: AS-i (-), white: 0 V, black: + 24 V) or fitted with M12 connector

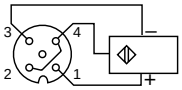
Connections

M12 connectors on intelligent splitter modules
Inputs XZSDA40D•, XZSDA22D••

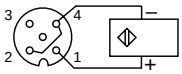
Digital contact



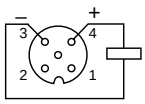
3-wire sensor



2-wire sensor

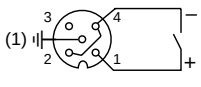


Outputs XZSDA04D••

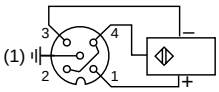


M12 connectors on splitter boxes XZSCA44D2
Inputs

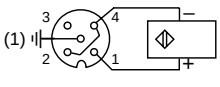
Digital contact



3-wire sensor



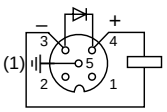
2-wire sensor



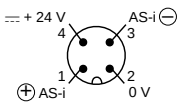
(1) Ground connected to splitter box assembly screws.

Outputs

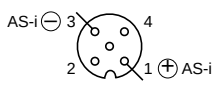
XZSCA44D22



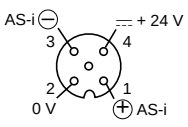
Connection to bus and separate supply



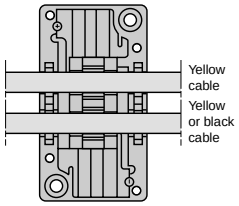
M12 connectors on T connectors XZCG0•20 passive splitter modules XZSDP40D1 and tap-offs XZCG012••



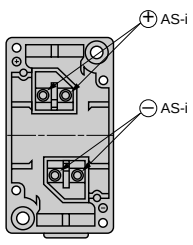
M12 connectors on tap-offs XZCG014••



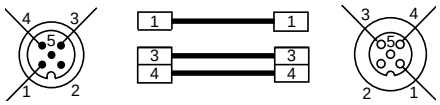
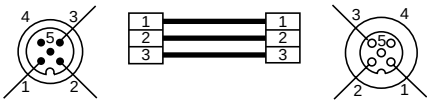
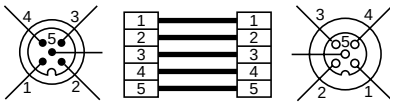
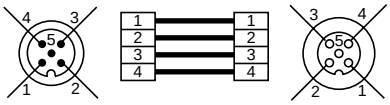
Connection bases XZSDE11•3



XZSDE2•••



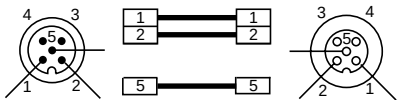
AS-i Bus
Extension Cables

Extension Cables	Connections	AS-i Sensors or Actuators
XZCR••••A•		• Proximity sensors **XS1** • Photo-electric detectors **XUJ** • Control stations **XAL**
XZCR••••E•		• Proximity sensors **XS1** • Photo-electric detectors **XUJ** • Control stations **XAL**
XZCR••••D•		• Proximity sensors **XS1** • Photo-electric detectors **XUJ** • Control stations **XAL**
XZCR••••C•		• Proximity sensors **XS1** • Photo-electric detectors **XUJ** • Control stations **XAL** • Enclosed starters **LF1, LF2**

Extension Cables

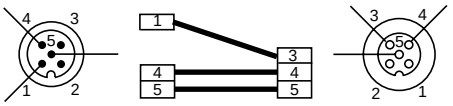
Standard Sensors

XZCR••••B•



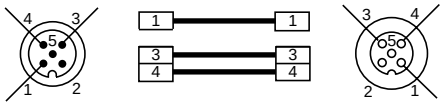
- Limit switches **XCKJ•••D** and **XCM** (4 or 5-pin)
  N.C. contact only.

XZCR••••F•



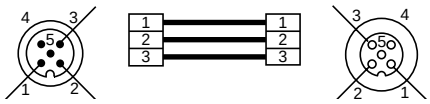
- Limit switches **XCKJ•••D** and **XCM** (4 or 5-pin)
  N.O. contact only.

XZCR••••A•



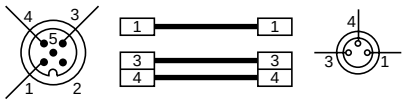
- Photo-electric detectors, 3-wire PNP, Osiris design 18, and Osiris design compact **XUL**.
  Operation: “light on” only.
- Photo-electric detectors, 3-wire PNP, **XUB**.
  - thru beam and reflex: operation: “light on” only
  - diffuse: operation: “dark on” only.
- Limit switches **XS••••••D**, type PNP 3-wire.
  N.O. output only.

XZCR••••E•



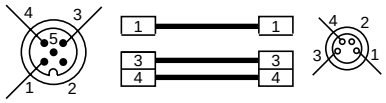
- Photo-electric detectors, 3-wire PNP, **XUB**.
  - thru beam and reflex: operation: “light on” only
  - diffuse: operation: “dark on” only.
- Photo-electric detectors, 3-wire PNP, Osiris design compact **XUJK**.
  Operation: “light on” or “dark on”.
- Limit switches **XS••••••D**, 3-wire PNP.
  N.C. output only.

XZCR••••G•



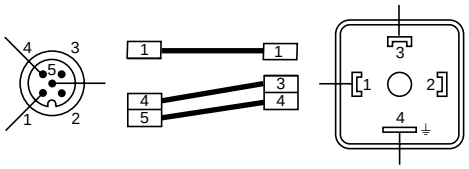
- Photo-electric detectors, PNP, Osiris design 8 **XUA**.
  Operation: “light on” or “dark on”.
- Limit switches **XS••••••D**, 3-wire PNP.
  N.O. or N.C. output.

XZCR••••H•



- Photo-electric detectors, 3-wire PNP, Osiris design fiber **XUD**, Osiris design miniature **XUML**, and Osiris design forked **XUVK**.
  Operation: “light on” only.

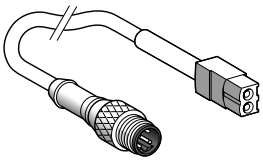
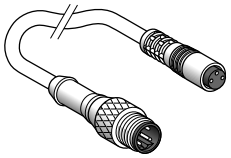
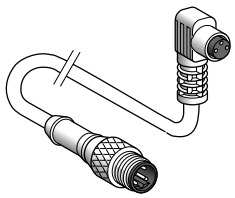
XZCR••••K•



- Electromechanical pressure or vacuum switches **XML**.
  N.O. contact only.

AS-i Bus
Extension Cables

Extension Cables with M12 Male/Female for Terminal Connections, 8 mm Diameter Female Connectors

				
Male Connector Type		M12, 2-pin, straight	M12, 3-pin, straight	
Female Connector Type		For terminal connections	Ø 8 mm, 3-pin, straight	Ø 8 mm, 3-pin, elbowed
Application		See extension cable selection guide according to type of device to be connected to the AS-i bus, pages 52 and 53.		

Selection

PvR Cable, Color Black	L = 1.64 ft (0.5 m)	XZMG11	–	–
	L = 3.28 ft (1 m)	–	XZCR1501040G1	XZCR1502040G1
	L = 6.56 ft (2 m)	–	XZCR1501040G2	XZCR1502040G2

Specifications

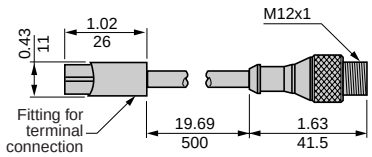
Type of Connector	Male: screw threaded. Female: clip ■, ▲	
Degree of Protection ▲	IP 67 (male connector)	IP 65
Ambient Air Temperature	+14 °F to +122 °F (-10 °C to +50 °C)	-31 °F to +176 °F (-35 °C to +80 °C)
Conductor Size	2 x 22 AWG (2 x 0.5 mm^2)	3 x 24 AWG (3 x 0.34 mm^2)
Cable Diameter	0.2 in (5 mm)	0.2 in (5 mm)
Nominal Voltage	12 to 48 Vdc	60 Vac, 75 Vdc
Nominal Current	3 A	4 A
Contact Resistance	≤ 5 mΩ	≤ 5 mΩ

■ Clip together, without locking.

▲ Degree of protection when correctly clipped together and with clamping ring correctly tightened, on screw versions.

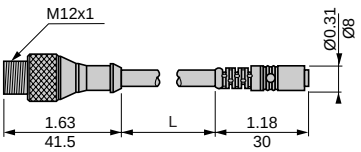
Dimensions

XZMG11



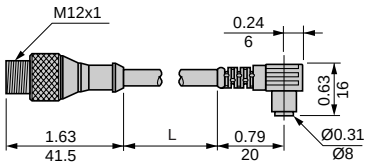
Dual Dimensions: inches / mm

XZCR1501040G•



L = 3.28 ft (1 m) or 6.56 ft (2 m)

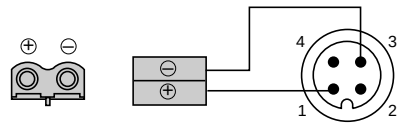
XZCR1502040G•



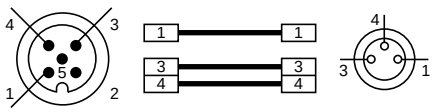
L = 3.28 ft (1 m) or 6.56 ft (2 m)

Connections

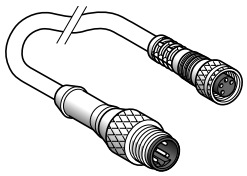
XZMG11

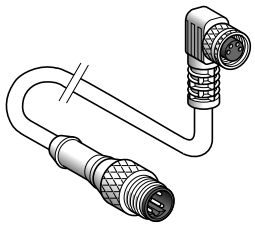


XZCR1501040G•, XZCR1502040G•



Extension Cables with M12 Male Connector and M8 Female Connector





Male Connector Type		M12, 3-pin, straight		M12, 4-pin, straight	
Female Connector Type		M8, 3-pin, straight	M8, 3-pin, elbowed	M8, 4-pin, straight	M8, 4-pin, elbowed
Application		See extension cable selection guide according to type of device to be connected to the AS-i bus, pages 52 and 53.			

Selection

PvR Cable, Color Black	L = 3.28 ft (1 m)	XZCR1509040H1	XZCR1510040H1	XZCR1509041J1	XZCR1510041J1
	L = 6.56 ft (2 m)	XZCR1509040H2	XZCR1510040H2	XZCR1509041J2	XZCR1510041J2

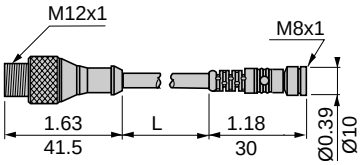
Specifications

Type of Connector	Male and female: screw threaded	
Degree of Protection ■	IP 67	
Ambient Air Temperature	-31 °F to +176 °F (-35 °C to +80 °C)	
Conductor Size	3 x 24 AWG (3 x 0.34 mm^2)	4 x 24 AWG (4 x 0.34 mm^2)
Cable Diameter	0.2 in (5 mm)	0.2 in (5 mm)
Nominal Voltage	60 Vac, 75 Vdc	
Nominal Current	4 A	
Contact Resistance	≤ 5 mΩ	

■ Degree of protection when clamping ring correctly tightened.

Dimensions

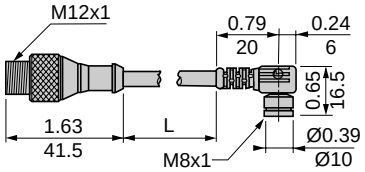
XZCR1509040H•, XZCR1509041J•



L = 3.28 ft (1 m) or 6.56 ft (2 m)

Dual Dimensions: inches / mm

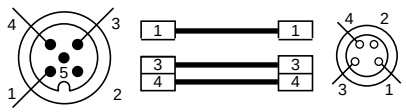
XZCR1510040H•, XZCR1510041J•



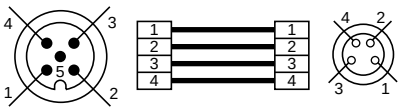
L = 3.28 ft (1 m) or 6.56 ft (2 m)

Connections

XZCR1509040H•, XZCR1510040H•

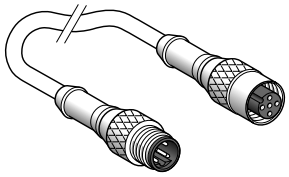


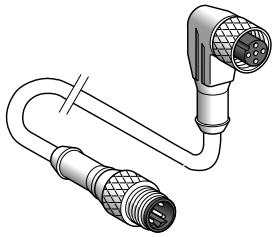
XZCR1509041J•, XZCR1510041J•



AS-i Bus
Extension Cables

Extension Cables with M12 Male Connector and M12 Female Connector





Male Connector Type		M12, 3-pin, straight			
Female Connector Type		M12, 3-pin, straight	M12, 3-pin, elbowed	M12, 3-pin, straight	M12, 3-pin, elbowed
Application		See extension cable selection guide according to type of device to be connected to the AS-i bus, pages 52 and 53.			

Selection

PvR Cable, Color Black	L = 3.28 ft (1 m)	XZCR1511040A1	XZCR1512040A1	XZCR1511040E1	XZCR1512040E1
	L = 6.56 ft (2 m)	XZCR1511040A2	XZCR1512040A2	XZCR1511040E2	XZCR1512040E2

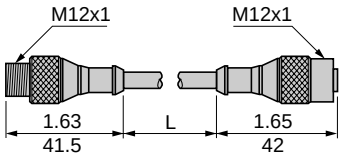
Specifications

Type of Connector	Male and female: screw threaded
Degree of Protection ■	IP 67
Ambient Air Temperature	-31 °F to +176 °F (-35 °C to +80 °C)
Conductor Size	3 x 24 AWG (3 x 0.34 mm^2)
Cable Diameter	0.2 in (5 mm)
Nominal Voltage	250 Vac, 300 Vdc
Nominal Current	4 A
Contact Resistance	≤ 5 mΩ

■ Degree of protection when clamping ring correctly tightened.

Dimensions

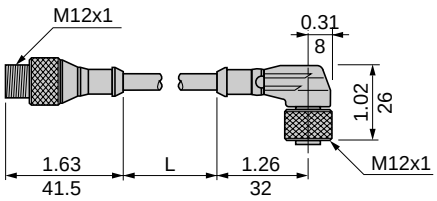
XZCR1511040A•, XZCR1511040E•



L = 3.28 ft (1 m) or 6.56 ft (2 m)

Dual Dimensions: inches / mm

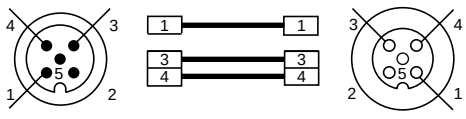
XZCR1512040A•, XZCR1512040E•



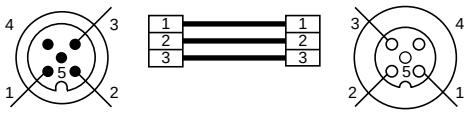
L = 3.28 ft (1 m) or 6.56 ft (2 m)

Connections

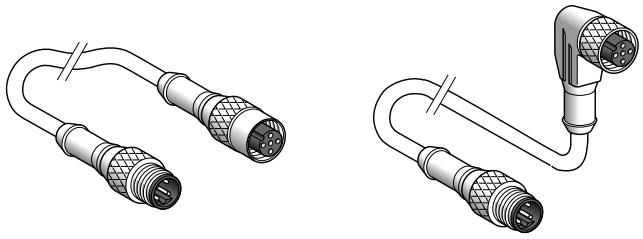
XZCR1511040A•, XZCR1512040A•



XZCR1511040E•. XZCR1512040E•



Extension Cables with M12 Male Connector and M12 Female Connector



Male Connector Type		M12, 5-pin, straight		M12, 4-pin, straight		M12, 3-pin, straight	
Female Connector Type		M12, 5-pin, straight	M12, 5-pin, elbowed	M12, 4-pin, straight	M12, 4-pin, elbowed	M12, 3-pin, straight	M12, 3-pin, elbowed
Application		See extension cable selection guide according to type of device to be connected to the AS-i bus, pages 52 and 53.					

Selection

PvR Cable, Color Black	L = 3.28 ft (1 m)	XZCR1511064D1	XZCR1512064D1	XZCR1511041C1	XZCR1512041C1	XZCR1511062B1	XZCR1512062B1
	L = 6.56 ft (2 m)	XZCR1511064D2	XZCR1512064D2	XZCR1511041C2	XZCR1512041C2	XZCR1511062B2	XZCR1512062B2

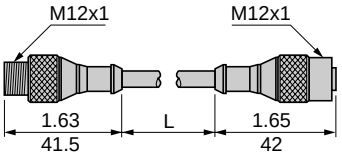
Specifications

Type of Connector	Male and female: screw threaded		
Degree of Protection ■	IP 67		
Ambient Air Temperature	-31 °F to +176 °F (-35 °C to +80 °C)		
Conductor Size	4 x 24 AWG (4 x 0.34 mm^2) + 1 x 22 AWG (1 x 0.5 mm^2)	4 x 24 AWG (4 x 0.34 mm^2)	3 x 22 AWG (3 x 0.5 mm^2)
Cable Diameter	0.23 in (5.8 mm)	0.2 in (5 mm)	0.2 in (5 mm)
Nominal Voltage	30 Vac, 36 Vdc	250 Vac, 300 Vdc	30 Vac, 36 Vdc
Nominal Current	4 A		
Contact Resistance	≤ 5 mΩ		

■ Degree of protection when clamping ring correctly tightened.

Dimensions

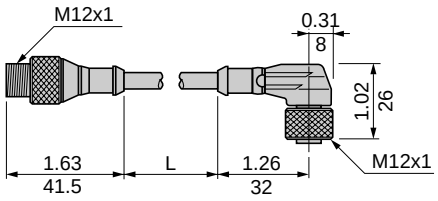
XZCR1511064D , XZCR1511041C•, XZCR1511062B•



L = 3.28 ft (1 m) or 6.56 ft (2 m)

Dual Dimensions: inches / mm

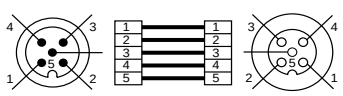
XZCR1512064D•, XZCR1512041C•, XZCR1512062B•



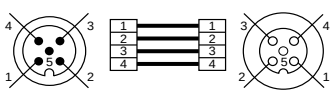
L = 3.28 ft (1 m) or 6.56 ft (2 m)

Connections

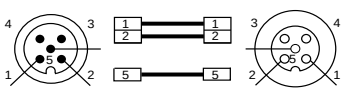
XZCR1511064D•, XZCR1512064D•



XZCR1511041C•, XZCR1512041C•

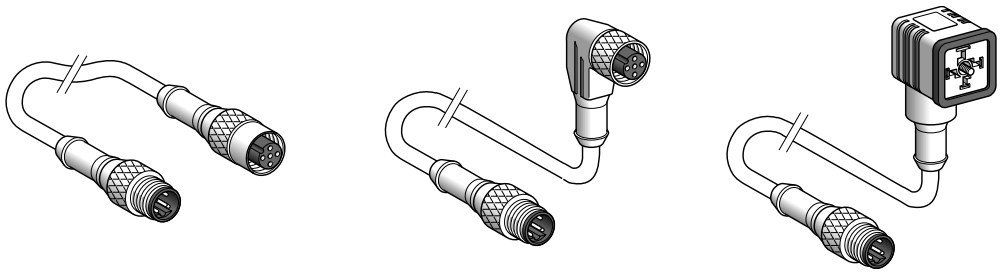


XZCR1511062B•, XZCR1512062B•



AS-i Bus
Extension Cables

Extension Cables with M12 Male Connector and M12 Female or DIN 43650 A Connectors



Male Connector Type		M12, 3-pin, straight		
Female Connector Type		M12, 3-pin, straight	M12, 3-pin, elbowed	DIN 43650 A, elbowed
Application		See extension cable selection guide according to type of device to be connected to the AS-i bus, pages 52 and 53.		

Selection

PvR Cable, Color Black	L = 3.28 ft (1 m)	XZCR1511062F1	XZCR1512062F1	XZCR1523062K1
	L = 6.56 ft (2 m)	XZCR1511062F2	XZCR1512062F2	XZCR1523062K2

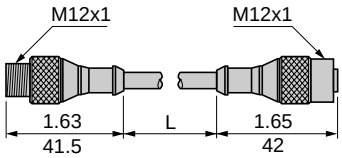
Specifications

Type of Connector	Male and female: screw threaded
Degree of Protection ■	IP 67
Ambient Air Temperature	-31 °F to +176 °F (-35 °C to +80 °C)
Conductor Size	3 x 22 AWG (3 x 0.5 mm^2)
Cable Diameter	0.2 in (5 mm)
Nominal Voltage	30 Vac, 36 Vdc
Nominal Current	4 A
Contact Resistance	< 5 mΩ

■ Degree of protection when clamping ring correctly tightened.

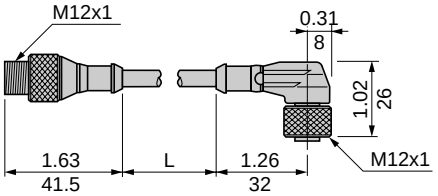
Dimensions

XZCR1511062F•



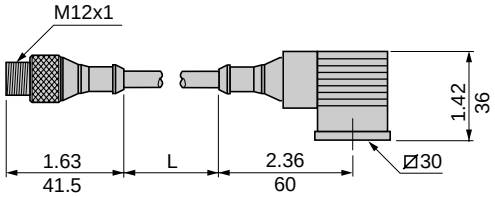
L = 3.28 ft (1 m) or 6.56 ft (2 m)

XZCR1512062F•



L = 3.28 ft (1 m) or 6.56 ft (2 m)

XZCR1523062K•

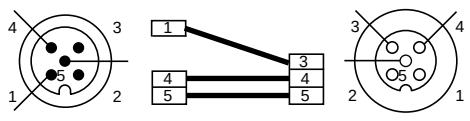


L = 3.28 ft (1 m) or 6.56 ft (2 m)

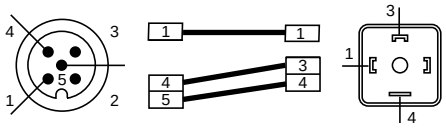
Dual Dimensions: inches / mm

Connections

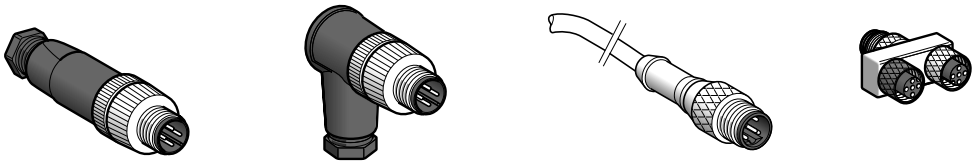
XZCR1511062F•, XZCR1512062F•



XZCR1523062K•



M12 Male Connectors and Extension Cables, M12 Two-Way Splitter Boxes



Male Connector Type		M12, 4-pin, straight	M12, 5-pin, straight	
Application		See extension cable selection guide according to type of device to be connected to the AS-i bus, pages 52 and 53.		

Selection

Connection to Cable by Screw Terminal Connections		XZCC12MDM40B	XZCC12MCM40B	–	–
PvR Cable, Color Black	L = 1.64 ft (0.5 m)	–	–	XZCP1564L05	–
	L = 3.28 ft (1 m)	–	–	XZCP1564L1	–
	L = 6.56 ft (2 m)	–	–	XZCP1564L2	–
2-Way Splitter (M12 Female Connectors, 5 Contacts)		–	–	–	XZLC1220C1

Specifications

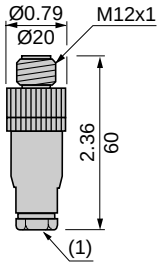
Type of Connector	Male: screw threaded, metal clamping ring ■	Male: screw threaded	Male and female: screw threaded
Degree of Protection ▲	IP 67	IP 67	IP 67
Ambient Air Temperature	-40 °F to +185 °F (-40 °C to +85 °C)	-31 °F to +176 °F (-35 °C to +80 °C)	+5 °F to +194 °F (-15 °C to +90 °C)
Conductor Size	For terminal connections: 4 x 20 AWG (4 x 0.75 mm^2), maximum	4 x 24 AWG (4 x 0.34 mm^2) + 1 x 22 AWG (1 x 0.5 mm^2) Cable diameter 0.23 in (5.8 mm)	–
Nominal Voltage	125 Vac, 150 Vdc	30 Vac, 36 Vdc	10 to 30 Vdc
Nominal Current	3 A	4 A	4 A per way: 4 A max
Contact Resistance	≤ 8 mΩ	≤ 5 mΩ	≤ 5 mΩ

■ To order a connector with a plastic clamping ring (entirely plastic encased connector) replace the second letter M in the selected reference with the letter P. For example: XZCC12MDM40B becomes XZCC12MDP40B.

▲ Degree of protection when clamping ring correctly tightened and cable gland correctly seated.

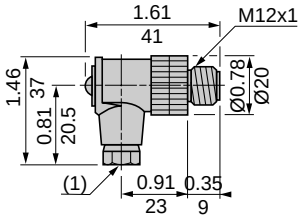
Dimensions

XZCC12MDM40B



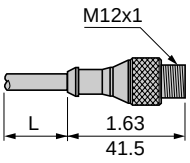
(1) 7 mm plastic cable gland

XZCC12MCM40B



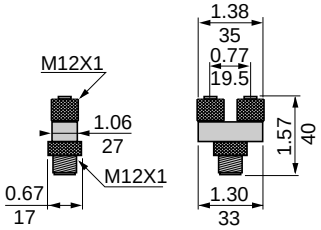
(1) 7 mm plastic cable gland

XZCP1564L•



L = 3.28 ft (1 m) or 6.56 ft (2 m)

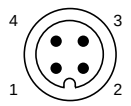
XZLC1220C1



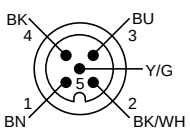
Dual Dimensions: inches / mm

Connections

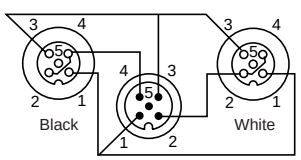
XZCC12M, •M40B



XZCP1564L•



XZLC1220C1



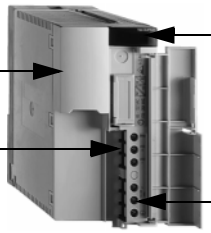
AS-i Bus
Power Supply Module and Unit

Description

The TSXSUPA02 power supply module and the TSXSUPA05 power supply unit integrate the special filters required to supply an AS-i bus. These parts ensure the polarization of the AS-i bus as well as the power supply for sensors connected to it (within the limits of the available power).

The TSXSUPA05 unit also has a 24 Vdc output designed to supply other items (PLCs, sensors, pre-actuators, etc.) whether or not they are connected to the AS-i bus.

TSXSUPA02 Power Supply Module

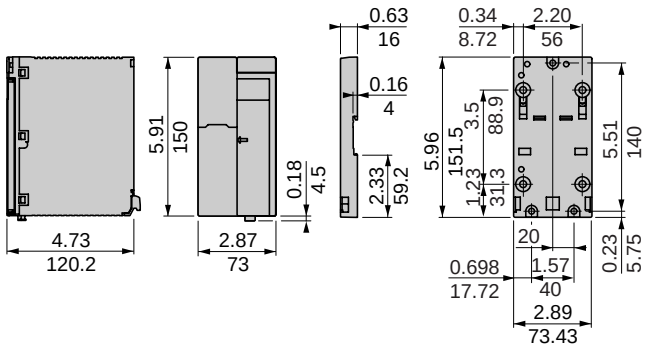


TSXSUPA05 Power Supply Module

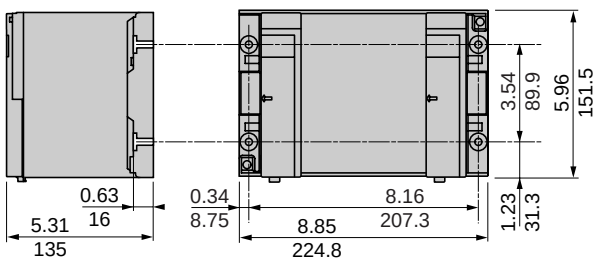
These two power supplies comply with Micro PLC (TSXSUPA02/SUPA05) and Premium PLC (TSXSUPA05) mounting requirements which enables them to be mounted independently on rails next to Micro/Premium PLCs or in a Premium PLC rack (TSXSUPA02 module).

Dimensions

TSXSUPA02 Power Supply Module

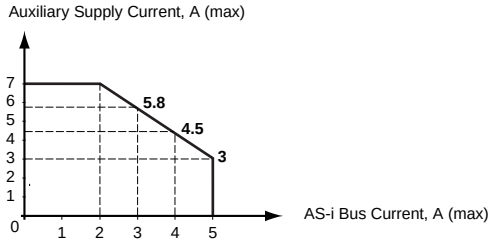


TSXSUPA05 Power Supply Unit



Dual Dimensions: inches / mm

Specifications

Type of Power Supply Module	TSXSUPA02		TSXSUPA05	
Nominal Primary Voltage	100 to 120 Vac	200 to 240 Vac	100 to 120 Vac	200 to 240 Vac
Primary Voltage Range	85 to 132 Vac	170 to 264 Vac	85 to 132 Vac	170 to 264 Vac
Network Limit Frequency	47 to 63	47 to 63	47 to 63	47 to 63
Max. Immunity Time to Microbreaks	10 ms	10 ms	10 ms	10 ms
Secondary Nominal Voltages	30 V (AS-i bus)		30 V (AS-i bus)	24 V (process)
Voltage Limits	29.5 to 31.6 V		29.5 to 31.6	24 V ± 3%
Output Current	2.4 A at 140 °F (60 °C) (2.8 A peak)		See output current curve at 140 °F (60 °C)	
Output Power at Secondary	72 W at 140 °F (60 °C)		See output current curve at 140 °F (60 °C)	
TSXSUPA05 Output Currents ■				
Rms Insulation Voltage Between Primary and Secondary	3500 Vrms			
Withstand to Electric Fields	10 V/m			
Safety Extra Low Voltage (SELV)	Yes			
Interference Withstand Class	FCC class A			
Conformity to Standards – PLC	IEC 1131-2			
Conformity to Standards – Vibrations	IEC 68-2-6-Fc (2 g)		IEC 68-2-6-Fc (1 g)	
Conformity to Standards – Shocks	IEC 68-2-27 (15 g, 11 ms)			
Temperature – Storage	-13 °F to +158 °F (-25 °C to +70 °C)			
Temperature – Operation	+14 °F to +140 °F (-10 °C to +60 °C)			
Compliance Standards	UL Listed E194434 CCN NRAQ CSA Certified LR58905 Class 2252 01			

■ The TSXSUPA05 is a constant output maximum power. The power which is not used on one output is available on the other output. Output currents must respect the above curve.

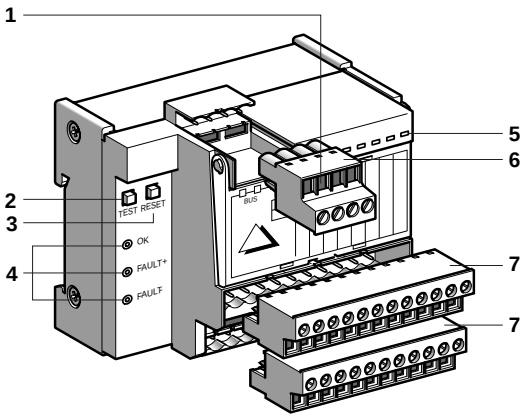
TSXSUPA02

TSXSUPA05

Selection

Description	Current at Secondary Voltages		Catalog Number
	30 Vac (AS-i bus)	24 Vdc	
Module 100 to 120 Vac and 200 to 240 Vac, 50/60 Hz	2.4 A	–	TSXSUPA02
Unit 100 to 120 Vac and 200 to 240 Vac, 50/60 Hz	5 A ▲	7 A ▲	TSXSUPA05
Ground fault detector for AS-i bus	–	–	RM0PAS101
Connection accessories	–	–	See pages 48 and 49.

▲ Constant output maximum power supply unit, see above curve.



Insulation control relay for AS-i bus:

1. Connections to the AS-i bus
2. TEST button
3. RESET button
4. Relay state LED indicator
5. I/O state indicators
6. Removable power supply terminal
7. Removable terminals

General

The RM0PAS101 insulation control relay detects and signals any ground fault on either of the 2 polarities of an AS-i bus cable. It takes into account any input/output ground faults of PNP intelligent splitter boxes (not isolated from the bus).

Used in conjunction with the impedance adaptor LA9RM401 on the supply, the RM0PAS101 insulation relay also detects faulty ground connections to the relay itself and/or to the AS-i supply.

Operating Principle

The RM0PAS101 insulation control relay is supplied directly from the AS-i bus. In the event of a fault, 1 of 2 output contacts allows breaking of the supply to the actuators while the other can be used to signal the fault to a PLC. In addition, the RM0PAS101 insulation control relay inhibits bus communication in the event of a fault, in order to activate the watchdog functions of the connected slaves.

Resetting, after rectification of fault and testing, can be performed by either using the buttons on the front left-hand side of the relay, or by applying a + 24 V signal to the inputs on the terminal block (control by PLC output).

- Operation with no fault present

  On power-up of the AS-i bus, the insulation control relay measures the insulation resistance between each of the AS-i bus polarities (AS-i (+) and AS-i (–)) and the ground terminal, and compares it to a value on the order of 40 kΩ. If each resistance is higher than this value, the output relay energizes and the “OK” LED illuminates.

- Appearance of a fault

  Should one or both of the resistances measured ($R_{\text{AS-i (+)/Ground}}$ and/or $R_{\text{AS-i (–)/Ground}}$) fall below approximately 40 kΩ, or in the event of a fault in the ground connection to the RM0PAS101 insulation control relay:

  — The data exchanges on the AS-i bus are inhibited which, in turn, triggers an alarm at the AS-i bus master within 5 ms.

  — The output relay contacts open.

  — The polarity on which the fault is detected is signalled by the illumination of one or two LEDs (FAULT + or/and FAULT –), located on the front left-hand side of the relay.

- Fault memory

  The contacts remain open and the “Fault” LED stays on, even if the fault disappears, unless the supply to the AS-i (+) and AS-i (–) terminals is broken. If this occurs, the relay resets itself when the supply is restored, providing the fault has disappeared, and the output relay contacts re-close.

- Resetting

  As soon as the fault is eliminated, the relay must be reset which, in turn, closes the output relay contacts and extinguishes the associated “Fault” LED. Two methods of resetting are possible:

  — Locally, by pressing the RESET button.

  — Remotely, by a change of state of the signal between terminals S1 and S2 (see function diagram on the next page) lasting more than 30 ms. This input must be permanently maintained at the high state when not being used for resetting.

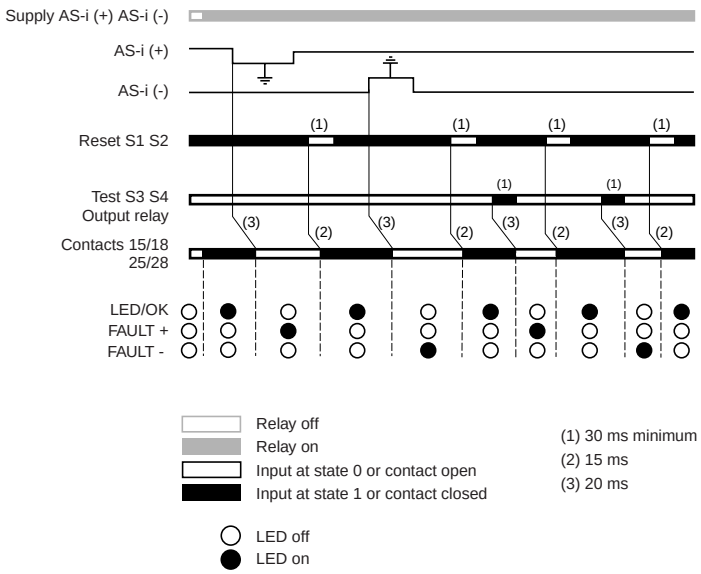
- **Test**

The relay has a test feature to simulate faults. Each test sequence alternatively simulates an insulation fault on one of the two AS-i bus polarities. The relay must respond as if the fault was authentic and following each test, the relay must be reset as detailed above. Each subsequent test sequence checks the other polarity of the AS-i bus (see function diagram on next page).

Two methods of testing are possible:

- Locally, by pressing the TEST button.
- Remotely, by a change of state of the signal between terminals S3 and S4 lasting more than 30 ms.

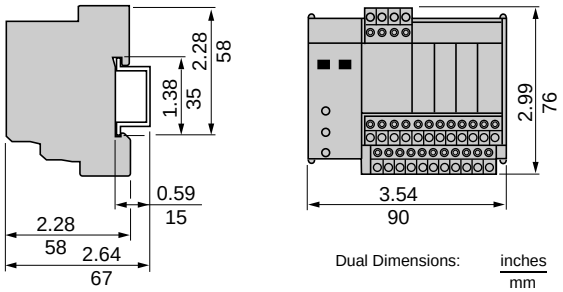
Function Diagram



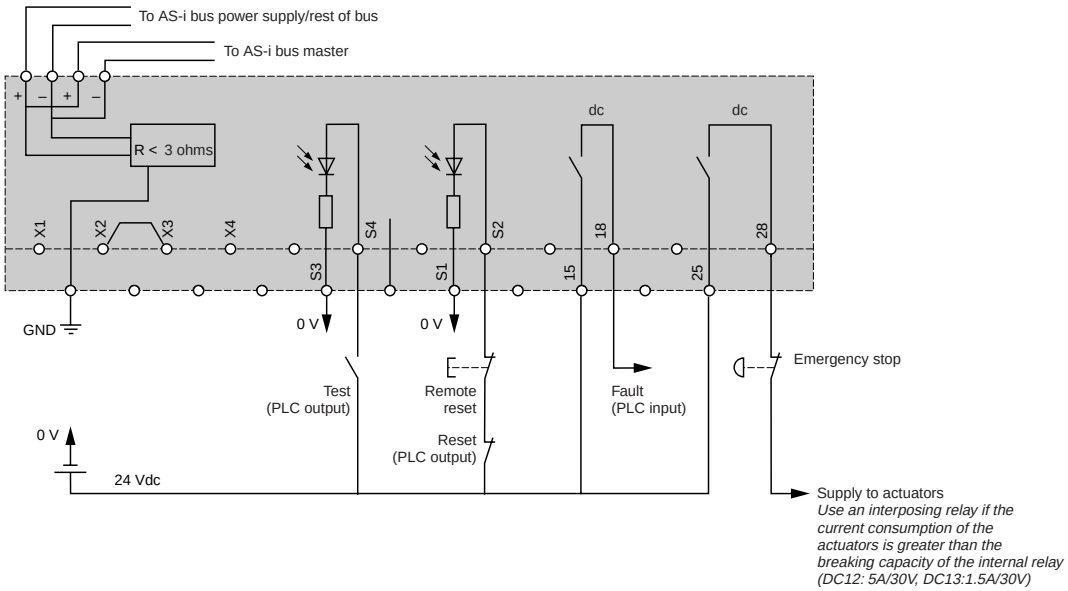
Selection

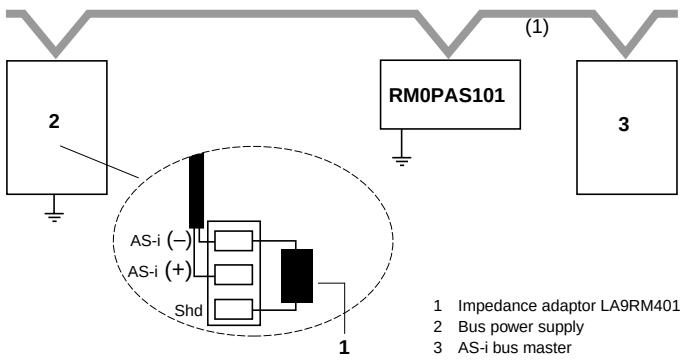
Description	Catalog Number
Insulation control relay for AS-i bus (supplied with an impedance adaptor)	RM0PAS101
Impedance adaptor (replacement part)	LA9RM401

Dimensions



Recommended Wiring Schematic





1 Impedance adaptor LA9RM401
2 Bus power supply
3 AS-i bus master

The insulation control relay impedance is the same as that of the network slave.

For correct operation, fit the impedance adaptor 1 directly on the AS-i bus supply 2, between terminals AS-i and Shd.

Connections to ground: both the bus power supply and the RM0PAS101 insulation relay must be reliably connected to ground (resistance < 3 Ω).

(1) Maximum distance between the insulation control relay and the AS-i bus master: 6.56 ft (2 m). Voltage at the RM0PAS101 insulation control relay must be between 29.5 and 31.6 Vdc.

Specifications

Environment			
Product Certification		AS-i No. 16701	
Conforming to Standards		IEC 204, 1 and 2, EN 60204, 1 and 2	
Degree of Protection	Conforming to IEC 529 (against direct contact)	IP2X	
Resistance to Burning (Hot Wire Test)	Conforming to IEC 695-2-1	1382 °F (750 °C): extinction < 30 s	
Shock Resistance	Conforming to IEC 68-2-27	11 ms (semi-sinusoidal), 15 gn ■	
Vibration Resistance	Conforming to IEC 68-2-6	10 to 150 Hz, 2 gn ■	
Resistance to Electrostatic Discharges	Conforming to IEC 1000-4-2	Level 3	
Resistance to Radiated Fields	Conforming to IEC 1000-4-3	Level 3	
Resistance to Transients	Conforming to IEC 1000-4-4	Level 3	
Surge Withstand	Conforming to IEC 1000-4-5	1.2/50–8/20 µs; Level 3	
Ambient Air Temperature	Operation	23 °F to 140 °F (-5 °C to +60 °C) ■	
Insulation Voltage (for one minute)	Terminals/fixing rail	2 kV	
Installation Category	Conforming to IEC 664	II	
Degree of Pollution	Conforming to IEC 654	2	
Mounting	Standard profiles	On backplate: 15 mm mounting rail or using ABE-ACC01	
		On chassis: 15 mm or 7.5 mm mounting rail	
Suitable Cable Sections	Flexible cable without cable end	1 conductor	2 conductors
		0.14 to 2.5 mm^2	—
		26 to 14 AWG	—
	Flexible cable with cable end	0.09 to 1.5 mm^2	0.09to 0.75 mm^2
		28 to 16 AWG	28 to 20 AWG
	Solid cable	0.14 to 4 mm^2	0.2 to 2.5 mm^2
		26 to 12 AWG	24 to 14 AWG
Tightening Torque	With 3.5 mm screwdriver	5.3 lb-in (0.6 N•m)	
Measuring Input Specifications			
Operating Range		29.5 to 31.6 Vdc	
Average Consumption at 30 V	From bus	50 mA	
Response Time	Opening of relay contacts	< 20 ms	
	BUS communication interrupt	< 5 ms	
Detection Threshold	R AS-i (+) Ground	< 10 kΩ	
	R AS-i (–) Ground	< 10 kΩ	
Output Relay Specifications and Operation			
Number of Outputs		2 relays, each with 1 N/O contact	
Output Relay State		Energized on absence of fault when AS-i + AS-i – supplied	
Rated Operating Voltage		50 Vdc	
Conventional Thermal Current	For U contact = 24 V DC	5 A	
Rated Operating Current	DC12	5 A	
	DC13 (U/R =10ms)	2 A	
Operating Status Indication	FAULT +, upper red LED on	Insulation fault, polarity AS-i +	
	FAULT –, lower red LED on	Insulation fault, polarity AS-i –	
	OK, green LED on	Supply to relay on and no fault present	
	Test, yellow LED on	Test input at state 1	
	Reset, green LED on	Reset input at state 1	
	R1 and R2, green LED on	Output relays energized	
Test Input and Reset Input Characteristics (supplied from external source, not bus)			
Consumption per Channel at Un	Un = 24 Vdc	13 mA	
State 1 Guaranteed	U > or I >	11 V/5 mA	
State 0 Guaranteed	U < and I <	5 V/2 mA	
Conformity	Conforming to IEC 1131-2	Type II	

■ Pending validation.

Description	Catalog Number	Page No.
12 Button Keypad	XBLC5012••••	20
2 I+ 2 O Module for Operator Station	XALSZ1	33
2 Push Buttons Operator Station	XALS20••	18
8-Port Splitter Box	XZSCA•••••	45
Addressing Terminal	XZMC11US	17
Addressing Terminal Cable	XZMG11	17, 55
Addressing Terminal Cable to Non-Splitter Devices	XZMG12	17
Addressing Terminal Cable to Splitter Boxes	XZMG13	17
Adhesive Label Holder	AR1SB3	36
Altivar 58 AS-i Card	VW3A58305	31
AS-i User Guide	XD0C5011EN	17
Base for Round Shielded Cable	XZSDE••••	45
Base for Splitter Box	XZSDE••••	45
Blanking Plug	XSZLD102	45
Cable	XZCB•••••	52
Connector Adapter RJ 45/SUB-D 9 Pin Male	XGVSZ0920	
Cover for Base	XZSDP	45
Covers	XSZLD102	45
Drives Interface Card	VW3A58305	31
Ground Leakage Relay	RMOPAS101	64
Flat Cable	XZCB•••••	49
I/O Card (4I + 4O)	ZB2BZS••	33
I/O Card for Operator Station	XALSZ1	33
Impedance Adapter	LA9RM401	64
Incandescent Bulb for XVA	DL1B••••	27
Inductive Proximity Sensor	XS1M30AS101	22
Inductive Proximity Sensor	XS7C40AS101	22
Inductive Proximity Sensor	XS8C40AS101	22
Insulation Displacement Connectors (IDCs)	XZCG•••••	48
Insulation Relay	RMOPAS101	64
Intelligent Splitter Box	XZSCA•••••	45
Interface Boards	ZB2BZS••	33
IP 20 Connectors	XZCG•••••	48

Description	Catalog Number	Page No.
Jumper Cable	XZCR15•••••••	52-58
Keypads	XBLC5012••••	20
M12, 5 pin, Straight, Extension Cable	XZCP•••••••	59
Male Connector Plug	XZCC12M•••••	59
Master for TSX Micro PLC	TSXSAZ10	9
Master for TSX Premium PLC	TSXSAY100	12
Mini-Style Connector Cable	XZCR15•••••••	52-58
Passive Splitter Box	XZLC1220C1	59
Passive Splitter, 4-Way	XZSDP40D1	48
PG11 Seal for Flat Cable	XZCE40	49
Photoelectric Sensors	XUJK•••••AS	24
Power Supply for AS-i Bus	TSXSUPA••	61
Premium PLC Master	TSXSAY100	12
Push Button Control Station	XALS20••	18
Quick Connector Cable	XZCR15•••••••	52-58
Repeater	XZMA1	16
RJ45/SUB-D 9 Pin Male Connector	XGVSZ0920	
Seal for Flat Cable	XZCE40	49
Sensor Concentrator	XZSCA•••••	45
Spider	XALSZ1	33
Splitter Box	XZSCA•••••	45
Splitter Box	XZSDA•••••	45
Splitter Box	XZLC1220C1	59
Splitter Box Base	XZSDE••••	45
Stack Lights	XVA•••••	26
SUB-D 9 Pin Male Connector	XGVSZ0920	
Supply Adaptor for Round Cable Base	XZSG10	45
Tap-Offs	XZCG•••••	48
Telefast 2 Accessories	ABE7•••••	36
Telefast 2 for AS-i	ABE8•••••	36
TSX 37 Micro PLC User Manual	TSXDM3713E	
User Guide (AS-i Systems)	XD0C5011EN	17
User Manual for TSX37 Micro	TSXDM3713E	
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ABE8•••••	TELEFAST 2 for AS-i	36
AR1SB3	Adhesive Label Holder	36
DL1B••••	Incandescent Bulb for XVA	27
LA9RM401	Impedance Adapter	64
RMOPAS101	Ground Leakage Relay	64
TSXDM3713E	TSX 37 Micro PLC User Manual	
TSXSAY100	Master for TSX Premium PLC	12
TSXSAZ10	Master for TSX Micro PLC	9
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