AS-B

Introduction

At the core of a SmartStruxure solution is a SmartStruxure server device, such as AS-B. AS-B performs key functionality, such as control logic, trend logging, and alarm supervision, provides built-in I/O, and supports communication and connectivity to the field buses. The distributed intelligence of the SmartStruxure solution ensures fault tolerance in the system and provides a fully featured user interface through WorkStation and WebStation.

Feature

AS-B is a powerful device with built-in power supply and I/O. AS-B can act as a standalone server using its built-in I/O and also monitor and manage field bus devices. In a small installation, the embedded AS-B device acts as a standalone server, mounted in a small footprint. In medium and large installations, functionality is distributed over multiple SmartStruxure server devices that communicate over TCP/IP.

Communications hub

Capable of coordinating traffic from above and below its location, AS-B can deliver data directly to you or to other servers throughout the site. AS-B can run multiple control programs, manage built-in I/O, alarms, and users, handle scheduling and logging, and communicate using a variety of protocols. Because of this, most parts of the system function autonomously and continue to run as a whole even if communication fails or individual SmartStruxure servers or devices go offline.

Models

AS-B comes in eight models with different I/O point count and I/O mix.

Model	I/O Points
AS-B-24	24
AS-B-24H	24
AS-B-24L	24
AS-B-24HL	24
AS-B-36	36
AS-B-36H	36
AS-B-36L	36
AS-B-36HL	36

AS-Bs with “H” in the product name are equipped with a display for output override.

AS-Bs with “L” in the product name do not support Modbus, BACnet MS/TP, or hosting of BACnet/IP devices. The RS-485 port is not used.

AS-Bs with 36 I/O points have the same small footprint as AS-Bs with 24 I/O points, but with 50 percent higher I/O point count.

Versatile and flexible mix of I/O points

AS-B offers a mix of I/O point types that match most types of HVAC applications. Most I/O points are highly flexible and can be configured as either inputs or outputs.

AS-Bs with 24 I/O points have the following types:

- 12 Universal inputs/outputs, Ua type
- 4 Universal inputs/outputs, Ub type
- 4 Digital inputs
- 4 Relay outputs

AS-Bs with 36 I/O points have the following types:

- 20 Universal inputs/outputs, Ua type
- 8 Universal inputs/outputs, Ub type
- 4 Triac outputs
- 4 Relay outputs

Universal inputs/outputs

The universal inputs/outputs are ideal for any mix of temperature, pressure, flow, status points, and similar point types in a building control system.

The universal inputs/outputs can be configured to read several different types of inputs:

- Digital
- Counter
- Supervised
- Voltage
- Current (Ub only)
- Temperature
- Resistive
- 2-Wire RTD temperature
- 2-Wire RTD resistive

As counter inputs, the universal inputs/outputs are commonly used in energy metering applications. As RTD inputs, they are ideal for temperature points in a building control system. As supervised inputs, they are used for security applications where it is critical to know whether or not a wire has been cut or shorted. These events provide a separate indication of alarms and trouble conditions to the system.

The universal inputs/outputs are capable of supporting analog outputs of type voltage outputs. Therefore, the universal inputs/outputs support a wide range of devices, such as actuators.

Digital inputs

The digital inputs can be used for cost effective sensing of multiple dry contact digital inputs in applications, such as equipment status monitoring or alarm point monitoring. As counter inputs, digital inputs are commonly used in energy metering applications.

Relay outputs

The relay outputs support digital Form A point types. The Form A relays are designed for direct load applications.

Triac outputs

The triac outputs can be used in many applications to switch 24 VAC on or off for external loads such as actuators, relays, or indicators. Triacs are silent and last longer than relays.

Manual override function

AS-Bs with “H” in the product name are equipped with an LCD display and keys to support manual override control of analog and digital outputs. This function allows you to manually override the outputs for testing, commissioning, and maintenance of equipment.

The override configuration is readable through user interfaces, such as Building Operation WorkStation, enabling more precise monitoring and control.

Built-in power supply

The device has a built-in power supply designed to accommodate 24 VAC or 24 VDC input power. The main AC/DC input (L/+ and N/-) is galvanically isolated from the DC output. This removes the risk of damage due to earth currents and permits the input power to be wired without concern for polarity matching.

Variety of connectivity options

AS-B has numerous ports that enable it to communicate with a wide range of protocols, devices, and servers.

AS-B has the following ports:

- Two 10/100 Ethernet ports
- One RS-485 port
- One USB host port
- One USB device port

The two Ethernet ports are connected to a built-in Ethernet switch. One port should be connected to the site network. The other port can be used to connect a single WorkStation or WebStation, a Modbus TCP unit, or a BACnet/IP device, but not another SmartStruxure server.

The USB device port allows you to upgrade and interact with AS-B using Device Administrator. The USB host port can be used to provide power and communications for Advanced Display.

Authentication and permissions

A SmartStruxure solution provides a powerful permission system that is easy to manage, flexible, and adapts to all kinds of system sizes. The permission system provides a security level to the highest standards. Authentication is done against the built-in user account management system or against Windows Active Directory Domains. The built-in account management system provides password policies that meet the toughest requirements. When Windows Active Directory is used, the administration costs are lower because users do not have to be managed in multiple directories.

WorkStation/WebStation interface

Through any client, the user experience is similar regardless of which SmartStruxure server the user is logged on to. The user can log directly on to AS-B to engineer, commission, supervise, and monitor AS-B and its built-in I/O as well as its attached field bus devices. See the WorkStation and WebStation specification sheets for additional information.

Open building protocol support

One of the cornerstones of SmartStruxure solution is support for open standards. AS-B can natively communicate with two of the most popular standards for buildings: BACnet and Modbus.

Native BACnet support

AS-B communicates directly to BACnet/IP and BACnet MS/TP networks. AS-B provides access to an extensive range of BACnet devices from Schneider Electric and other vendors.

Native Modbus support

AS-B natively integrates Modbus RS-485 master and slave configurations, as well as Modbus TCP client and server. This allows full access to third-party products and the range of Schneider Electric products that communicate on the Modbus protocol, such as power meters, UPS, circuit breakers, and lighting controllers.

Web Services support

AS-B supports the use of Web Services based on open standards, such as SOAP and REST, to consume data into the SmartStruxure solution. Use incoming third-party data (temperature forecast, energy cost) over the Web to determine site modes, scheduling, and programming.

EcoStruxure Web Services support

EcoStruxure Web Services, Schneider Electric's Web Services standard, is natively supported in AS-B. EcoStruxure Web Services offers extra features between compliant systems whether within Schneider Electric or other authorized systems. These features include system directory browsing, read/write of current values, alarm receipt and acknowledgement, and historical trend log data. EcoStruxure Web Services is secure. User name and password are required to log on to the system.

Two programming options

Unique to the industry, AS-B has both Script and Function Block programming options. This flexibility assures that the best programming method can be selected for the application.

4 GB of eMMC memory for data and backup

AS-B has an available capacity of 4 GB of eMMC memory. This represents 2 GB for application and historical data and 2 GB dedicated for backup storage. This ensures that all data is safe from damage, loss, or unintended edits. Users can also manually back up or restore AS-B to a storage location on a PC or network. Through the Enterprise Server, users have the ability to perform scheduled backups of associated AS-B devices to network storage for even greater levels of protection.

IT friendly

AS-B communicates using the networking standards. This makes installations easy, management simple, and transactions secure.

TLS support

Communication between clients and the SmartStruxure servers can be encrypted using Transport Layer Security (TLS 1.0). The servers are delivered with a default self-signed certificate. Commercial Certification Authority (CA) server certificates are supported to lower the risk of malicious information technology attacks. Use of encrypted communication can be enforced for both WorkStation and WebStation access.

Supported protocols

- IP addressing (IPv6 ready)
- TCP communications
- DHCP/DNS for rapid deployment and lookup of addresses
- HTTP/HTTPS for Internet access through firewalls, which enables remote monitoring and control
- NTP (Network Time Protocol) for time synchronization throughout the system
- SMTP with support for SSL/TLS based authentication, enables sending email messages triggered by schedule or alarm
- SNMP enables network supervision and reception of application alarms in designated network management tools

Simple DIN-rail installation

Fasteners easily snap into a locked position for panel installation. The fastener has a quick-release feature for easy DIN-rail removal.

Removable terminal blocks

AS-B uses plugable terminal blocks, which are easy to install and remove from the device. The terminal blocks are ordered separately from Schneider Electric.

Efficient terminal management

The input and output terminals are clearly labeled. The Building Operation WorkStation software can generate custom as-built labels for AS-B.

Protection

Protection components on the universal inputs/outputs, digital inputs, and triac outputs protect against high-voltage short-duration transient events. Universal inputs/outputs configured as current inputs (Ub only) are protected against over current. Universal inputs/outputs configured as voltage outputs have current limits to protect against permanent short-circuit to ground.

Specifications

AC input

Nominal voltage .....24 VAC
Operating voltage range .....+/-20 %
Frequency .....50/60 Hz
Maximum current .....0.5 A rms
Recommended transformer rating ..... ≥15 VA

DC input

Nominal voltage .....24 to 30 VDC
Operating voltage range .....21 to 33 VDC
Maximum power consumption ..... 10 W

Environment

Ambient temperature, operating .....0 to 50 °C (32 to 122 °F)
Ambient temperature, storage .....-20 to +70 °C (-4 to +158 °F)
Maximum humidity.....95 % RH non-condensing

Material

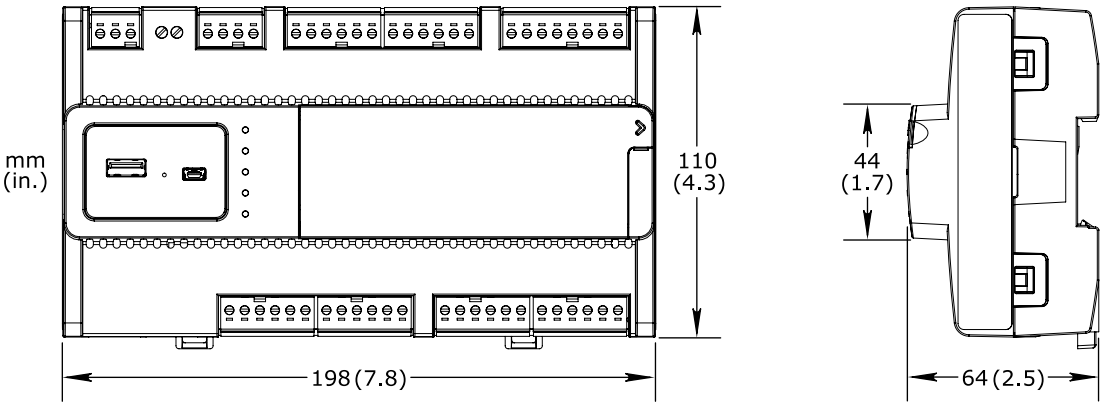
Plastic rating.....UL94-5VB

Enclosure .....PC/ABS

Enclosure rating .....IP 20

Mechanical

Dimensions .....198 W x 110 H x 64 D mm (7.8 W x 4.3 H x 2.5 D in.)



Weight, including terminal blocks ..... 0.504 kg (1.111 lb)[a]
a) The weight includes the display and keys, which are 0.022 kg (0.049 lb).

Weight, excluding terminal blocks ..... 0.420 kg (0.926 lb)[a]
a) The weight includes the display and keys, which are 0.022 kg (0.049 lb).

Agency compliances

Emission .....RCM; EN 61000-6-3; EN 50491-5-2; FCC Part 15, Sub-part B, Class B

Immunity .....EN 61000-6-2; EN 50491-5-2

Safety .....EN 60730-1; EN 60730-2-11; EN 50491-3; UL 916 C-UL US Listed

Product .....EN 50491-1

Real-time clock backup

Inaccuracy, at 25 °C (77 °F) .....+/-52 seconds per month

Backup time .....10 days

Communication ports

Ethernet ..... Dual 10/100BASE-TX RJ45

USB ..... USB 2.0, 1 device port (mini-B) and 1 host port (type-A)

RS-485 ..... 2-wire port, bias 5.0 VDC

Communications

BACnet .....BACnet/IP and MS/TP, port configurable, default 47808

Modbus .....Modbus TCP, client and server
.....Serial, RS-485, master or slave

TCP .....Binary, port fixed, 4444

HTTP .....Non-binary, port configurable, default 80

HTTPS .....Encrypted supporting TLS 1.0, port configurable default 443

SMTP .....Email sending, port configurable, default 25

SNMP .....version 3
..... Network supervision using poll and trap
.....Application alarm distribution using trap

CPU

Frequency ..... 333 MHz
Type .....SPEAr320S, ARM926 core
DDR2 SDRAM ..... 256 MB
eMMC memory .....4 GB
Memory backup ..... Yes, battery-free, no maintenance

Display

Display resolution .....128 x 64 pixels
Display size .....36.5 W x 17.6 H mm (1.4 W x 0.7 H in.)
Display type ..... FSTN monochrome LCD, white color transflective backlight

Part numbers

SmartX Controller – AS-B-24 ..... SXWASB24X10001
SmartX Controller – AS-B-24H
Includes display SXWASB24H10001
SmartX Controller – AS-B-24L
No support for Modbus, BACnet MS/TP, or hosting of BACnet/IP devices SXWASB24X10002
SmartX Controller – AS-B-24HL
Includes display
No support for Modbus, BACnet MS/TP, or hosting of BACnet/IP devices SXWASB24H10002
SmartX Controller – AS-B-36 ..... SXWASB36X10001
SmartX Controller – AS-B-36H
Includes display SXWASB36H10001
SmartX Controller – AS-B-36L
No support for Modbus, BACnet MS/TP, or hosting of BACnet/IP devices SXWASB36X10002
SmartX Controller – AS-B-36HL
Includes display
No support for Modbus, BACnet MS/TP, or hosting of BACnet/IP devices SXWASB36H10002
AS-B connector kit (includes terminal blocks) SXWASBCON10001
AS-B installer kit SXWASBINS10001

Add-on options

SW-EWS-1, EcoStruxure Web Services (run-time) option
Consume only for one SmartStruxure server, no maintenance.....SXWSWEWSX00001
SW-EWS-2, EcoStruxure Web Services (run-time) option
Serve & Consume for one SmartStruxure server, no maintenance SXWSWEWSX00002
SW-EWS-3, EcoStruxure Web Services (run-time) option
Serve & Consume, plus Historical trend log data for one SmartStruxure server, no maintenance.....SXWSWEWSX00003
SW-GWS-1, Web Services (Generic Consume) option
For one SmartStruxure server, no maintenance SXWSWGWSX00001
SW-SNMP-1, Alarm notifications via SNMP option
For one SmartStruxure server, no maintenance.....SXWSWSNMP00001
SW-SMARTDRIVER-1, Communication to external devices via SmartDriver
For one SmartDriver license.....SXWSWSDRV00001

Universal inputs/outputs, Ua and Ub

Channels, AS-B with 24 I/O points .....12 Ua, Ua1–Ua12

.....4 Ub, Ub1–Ub4

Channels, AS-B with 36 I/O points ..... 20 Ua, Ua1–Ua20,
.....8 Ub, Ub1–Ub8

Absolute maximum ratings .....-0.5 to +24 VDC

A/D converter resolution .....16 bits

Digital inputs

Range.....Dry contact switch closure or open collector/open drain, 24 VDC, typical wetting current 2.4 mA

Minimum pulse width .....120 ms

Counter inputs

Range.....Dry contact switch closure or open collector/open drain, 24 VDC, typical wetting current 2.4 mA

Minimum pulse width .....20 ms

Maximum frequency .....25 Hz

Supervised inputs

5 V circuit, 1 or 2 resistors
Monitored switch combinations.....Series only, parallel only, and series and parallel

Resistor range.....1 to 10 kohm
For a 2-resistor configuration, each resistor is assumed to have the same value +/- 5 %

Voltage inputs

Range.....0 to 10 VDC

Accuracy .....+/-(7 mV + 0.2 % of reading)

Resolution .....<0.5 mV

Impedance.....100 kohm

Current inputs

Range.....0 to 20 mA

Accuracy .....+/-(0.01 mA + 0.4 % of reading)

Resolution .....<1 µA

Impedance .....47 ohm

Resistive inputs

10 ohm to 10 kohm accuracy .....+/-(7 + 4 x 10^{-3} x R) ohm
R = Resistance in ohm

10 kohm to 60 kohm accuracy .....+/-(4 x 10^{-3} x R + 7 x 10^{-8} x R^2) ohm
R = Resistance in ohm

Temperature inputs (thermistors)

Range .....-50 to +150 °C (-58 to +302 °F)

Supported thermistors

Honeywell .....20 kohm

Type I (Continuum) .....10 kohm

Type II (I/NET).....10 kohm

Type III (Satchwell).....10 kohm

Type IV (FD)..... 10 kohm

Type V (FD w/ 11k shunt).....Linearized 10 kohm

Satchwell D?T .....Linearized 10 kohm
Johnson Controls.....2.2 kohm
Xenta .....1.8 kohm
Balco .....1 kohm

Thermistor accuracy

20 kohm.....-50 to -30 °C: +/-1.5 °C (-58 to -22 °F: +/-2.7 °F)
.....-30 to 0 °C: +/-0.5 °C (-22 to +32 °F: +/-0.9 °F)
..... 0 to 100 °C: +/-0.2 °C (32 to 212 °F: +/-0.4 °F)
.....100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)

10 kohm, 2.2 kohm, and 1.8 kohm .....-50 to -30 °C: +/-0.75 °C (-58 to -22 °F: +/-1.35 °F)
.....-30 to +100 °C: +/-0.2 °C (-22 to +212 °F: +/-0.4 °F)
.....100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)

Linearized 10 kohm .....-50 to -30 °C: +/-2.0 °C (-58 to -22 °F: +/-3.6 °F)
.....-30 to 0 °C: +/-0.75 °C (-22 to +32 °F: +/-1.35 °F)
..... 0 to 100 °C: +/-0.2 °C (32 to 212 °F: +/-0.4 °F)
.....100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)

1 kohm .....-50 to +150 °C: +/-1.0 °C (-58 to +302° F: +/-1.8 °F)

RTD temperature

Supported RTDs .....Pt1000, Ni1000, and LG-Ni1000

Pt1000

Range .....-50 to +150 °C (-58 to +302 °F)

Accuracy .....-50 to +70 °C: +/-0.5 °C (-58 to +158 °F: +/-0.9 °F)
.....70 to 150 °C: +/-0.7 °C (158 to 302 °F: +/-1.3 °F)

Ni1000

Range .....-50 to +150 °C (-58 to +302 °F)

Accuracy .....+/-0.5 °C (+/-0.9 °F)

LG-Ni1000

Range .....-50 to +150 °C (-58 to +302 °F)

Accuracy .....+/-0.5 °C (+/-0.9 °F)

RTD temperature wiring

Maximum wire resistance .....20 ohm/wire (40 ohm total)

Maximum wire capacitance.....60 nF
The wire resistance and capacitance typically corresponds to a 200 m wire.

RTD resistive

1,000 ohm

Range.....500 to 2,200 ohm
.....Including wiring resistance

Accuracy.....+/-(0.2 + 1.5 x 10^{-3} x R) ohm
R = resistance in ohm

Resolution.....0.1 ohm

RTD resistive wiring

Maximum wire capacitance.....60 nF

Voltage outputs

Range.....0 to 10 VDC
Accuracy .....+/-60 mV
Resolution .....10 mV
Minimum load resistance.....5 kohm
Load range.....-1 to +2 mA

Digital inputs, DI

Channels, AS-B with 24 I/O points 4, DI1–DI4
Channels, AS-B with 36 I/O points 0
Absolute maximum ratings .....-0.5 to +24 VDC

Digital inputs

Range.....Dry contact switch closure or open collector/open drain, 24 VDC, typical wetting current 2.4 mA
Minimum pulse width .....120 ms

Counter inputs

Range.....Dry contact switch closure or open collector/open drain, 24 VDC, typical wetting current 2.4 mA
Minimum pulse width .....20 ms
Maximum frequency .....25 Hz

Relay outputs, DO

Channels, AS-B with 24 I/O points 4, DO1–DO4
Channels, AS-B with 36 I/O points 4, DO1–DO4
Contact rating.....250 VAC/30 VDC, 2 A, Pilot Duty (C300)
Switch type .....Form A Relay
.....Single Pole Single Throw
.....Normally Open
Isolation contact to system ground.....3000 VAC
Cycle life (Resistive load) .....At least 100,000 cycles
Minimum pulse width .....100 ms

Triac outputs, DO

Channels, AS-B with 24 I/O points 0
Channels, AS-B with 36 I/O points 4, DO5–DO8
Output rating.....Max. 0.8 A
Voltage .....24 to 30 VAC
Commons .....COM1 for DO5 and DO6
.....COM2 for DO7 and DO8
The common terminals COM1 and COM2 can be connected to 24 VAC or to ground.
Common voltage, high side output.....0 V
Common voltage, low side output .....24 to 30 VAC
Minimum pulse width .....100 ms

Terminals

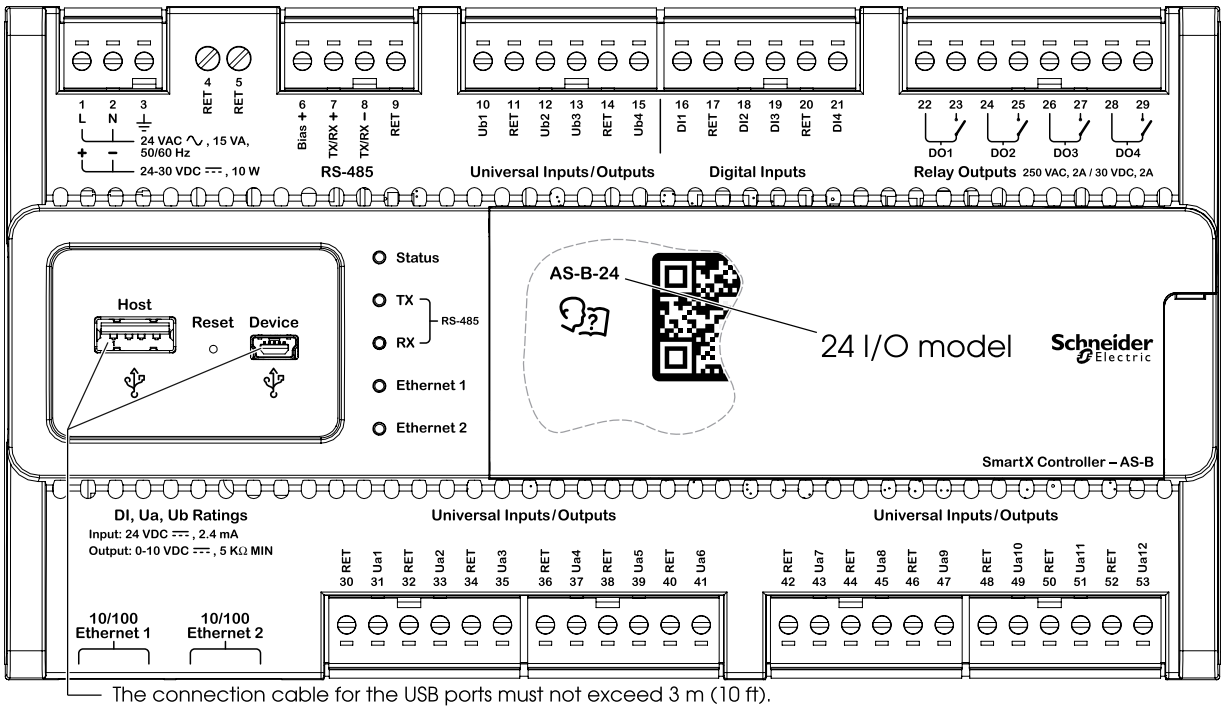


Figure: AS-B model with 24 I/O points

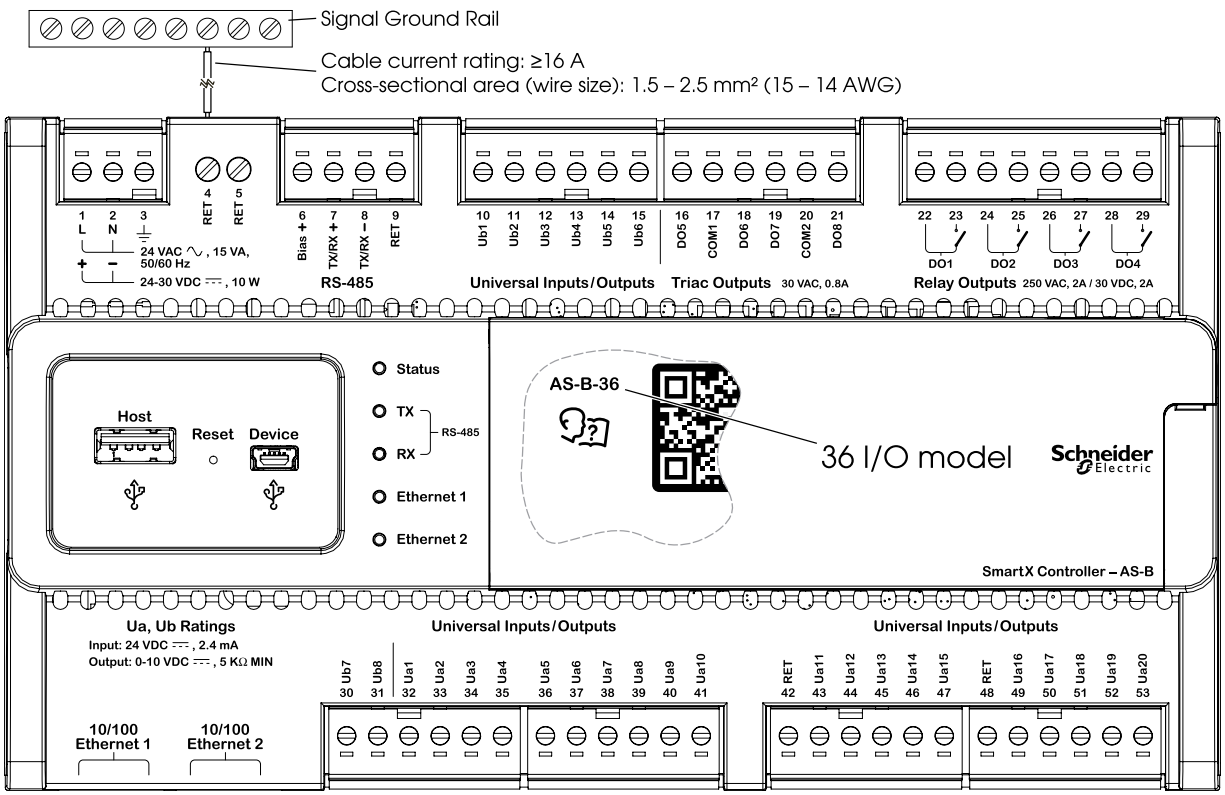


Figure: AS-B model with 36 I/O points

For protection from excess current that could be produced by field wiring, follow these instructions:

- Connect RET terminal number 4 or 5 to a common chassis/signal ground rail in the control panel using a using a size 14 AWG (1.5 to 2.5 mm²) or larger wire. The wire must have a current rating greater than or equal to 16 A.
- AS-Bs with 24 I/O points have more RET terminals for connection of I/O returns, so the common chassis/signal ground rail is optional and may not be needed.
- Individual 24 VDC power sources to the field must be current limited to maximum 4 A for UL compliant installations, and maximum 6 A in other areas.

For more information on wiring, see Hardware Reference Guide.

Regulatory Notices

Federal Communications Commission
FCC Rules and Regulations CFR 47, Part 15, Class B
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation.

Industry Canada
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Regulatory Compliance Mark (RCM) - Australian Communications and Media Authority (ACMA)
This equipment complies with the requirements of the relevant ACMA standards made under the Radiocommunications Act 1992 and the Telecommunications Act 1997. These standards are referenced in notices made under section 182 of the Radiocommunications Act and 407 of the Telecommunications Act.

CE - Compliance to European Union (EU)
2014/30/EU Electromagnetic Compatibility Directive
2014/35/EU Low Voltage Directive
2011/65/EU Restriction of Hazardous Substances (RoHS) Directive
This equipment complies with the rules, of the Official Journal of the European Union, for governing the Self Declaration of the CE Marking for the European Union as specified in the above directive(s) per the provisions of the following standards: EN 50491-1 Product Standard; EN 60730-1, EN 60730-2-11, and EN 50491-3 Safety Standards.

WEEE - Directive of the European Union (EU)
This equipment and its packaging carry the waste of electrical and electronic equipment (WEEE) label, in compliance with European Union (EU) Directive 2012/19/EU, governing the disposal and recycling of electrical and electronic equipment in the European community.

UL 916 Listed products for the United States and Canada, Open Class Energy Management Equipment. UL file E80146.