IP 20 distributed inputs/outputs
Advantys STB

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a brand of Schneider Electric

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Presentation

To meet the needs of machine manufacturers and users, automation architectures have been decentralized while delivering performance comparable to centralized systems. The Advantys STB distributed I/O system is an open, modular input/output system and makes it possible to design automation islands managed by a master controller via a bus or communication network.
These islands can be used to connect:
- Motor-starters, starter-controllers
- Variable speed drives
- Magelis operator interface terminals on Modbus
- Or many other validated third-party product via the CANopen bus (Festo valves, IP 67 FTB distributed I/O, etc.)

Installed as close to the machine as possible, these islands help reduce the time and cost of wiring sensors and actuators, while increasing system availability.

The island components are electronic modules mounted on one or more DIN rails. These clusters of modules, known as segments, carry a bus from beginning to end of each island. The island bus provides power distribution, signal sensing, and power management to all compatible modules, in the form of a wiring management system.

The Advantys STB I/O family can be divided into 2 groups of modules:
- The standard range: a comprehensive offer with configurable parameters
- The basic range: an extension of the standard range, a low-cost option but with fewer functions and non-configurable modules

Standard and basic modules can be combined on the same island, although mixing modules in this way does lead to certain operational restrictions, see page 5.

These 2 ranges comprise:
- Network interface modules
- Digital I/O modules (⎓ 24 V & ∿115/220 V)
- Analog I/O modules
- Counter module
- Module for TeSys U-Line starter-controllers
- Relay modules (⎓ 24 V coil and ⎓ 24 V or ∿ 115/230 V contact)

Sensor and actuator power distribution modules are available for these modules, simplifying the wiring.

The sensors and actuators are connected to the I/O modules via removable screw- or spring-type connectors. Built-in mechanisms make it possible to remove and replace (hot swap) Advantys STB modules when the system is powered on (provided that standard network interface modules are used).

The Advantys STB distributed I/O system features a protection rating of IP 20. For installations in production workshops, the Advantys STB distributed I/O system must be incorporated in protective housings with at least an IP 54 rating (in compliance with IEC 60950 or NEMA 250 standards). See page 62.

Each Advantys STB module has a default configuration making the island operational as soon as it is powered on. However, in order to benefit from the various features of the standard modules, use the Advantys configuration software to configure the system to meet user requirements. This software also allows you to define reflex actions in the output modules, thereby avoiding processing by the island master (see pages 52 to 55).

Presentation (continued)

The table below sets out the main features of the standard and basic Advantys STB ranges:

	I/O modules		Network Interface Modules		Power modules		
Advantys STB	**Basic**	**Standard**	**Basic**	**Standard**	**Basic**	**Standard**	**See page**
Max. no. of I/O modules	–	–	**12**	**32**	–	–	6 to 8
Removable connectors	■	■	■	■	■	■	–
Keying pin	■	■	–	–	■	■	26
Hot swapping supported		***(1)***					27
Separate power supply to sensors and actuators	***(2)***	***(2)***	–	–	–	■	18
Built-in electronic protection	■	■	■	■	■	■	–
Status LEDs	■	■	■	■		■	–
Compatible with all types of network interface module	■	■	–	–	■	■	26
Extension segment	–	–		■	–	–	12
Removable memory	–	–		■	–	–	12
Local HMI on Modbus (Magelis)				■	–	–	13
Default configuration function	■	■	■	■	–	–	52
Configurable with Advantys software		■		■	–	–	52
Configurable I/O parameters		■	–	■	–	–	53
Built-in reflex functions		■		■	–	–	55
Advanced diagnostics		■	■	■	–	–	54
Internal software update (firmware)	–	–	■	■	–	–	13

■ Available function

Non available function

– Non relevant function

Composition

A typical Advantys STB island is composed of standard or basic I/O modules of various widths: 0.54" (13.9mm), 0.72" (18.4mm) and 1.09 ' (27.8mm). The I/O modules, used in conjunction with the DIN rail, network interface modules “NIM” and power distribution modules “PDM”, as well as other accessories, convey a bus which distributes various required power supplies to each module *(3)*.

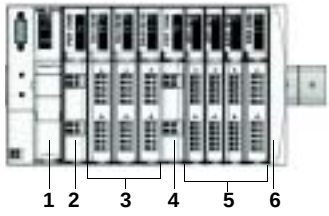
An island including 1 to 7 segments comprises:
■ 1 STB N●● Network Interface Module “NIM”
This module manages communications on the island bus. It acts as a gateway for exchanges with the fieldbus or network master. Seven network protocols are offered: Ethernet TCP/IP (standard only), CANopen, Modbus Plus (standard only), Fipio (standard only), INTERBUS, Profibus DP and DeviceNet.
■ 1 or more STB PDT Power Distribution Modules “PDM”. They provide the 24 VDC or 115/230 VAC field power required for the sensors and actuators, thereby simplifying connections
■ Digital I/O modules with DC power (STB DD) or AC power (STB DA)
■ Analog I/O modules using current or voltage: STB A●●
■ STB EHC counter modules
■ Application-specific modules for controlling TeSys U-Line starter-controllers
Standard and basic modules can be combined on the same island.

Additional modules (with standard range) are available for the various architectures proposed below (see page 6):
■ 2 STB XBE 1●00 “EOS” and “BOS” bus extension modules for multisegment structures (up to 6 extension segments)
■ STB XCA bus extension cables
■ 1 STB XBE 2100 CANopen extension module for integrating validated standard CANopen devices

(1) Requires the standard Network Interface Module “NIM”.
(2) Requires the standard Power Distribution Module “PDM”.
(3) Each module (with the exception of the network interface module “NIM”) requires a base and one or more specific connectors.

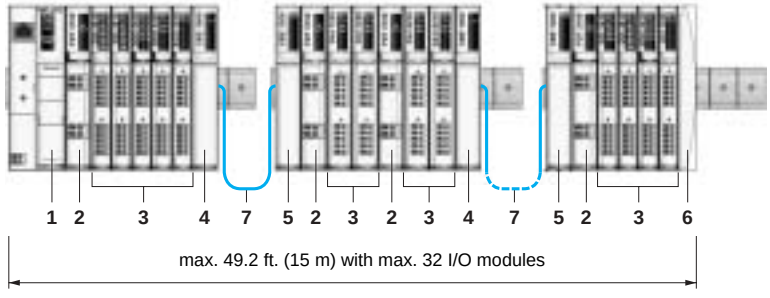
Description of standard Advantys STB

Advantys STB: primary segment



In the example above, the primary segment comprises:
1 STB N●●: Network Interface Module “NIM”. It is placed at the beginning of the primary segment. Each island must have one NIM module only.
2 STB PDT 2100: Power Distribution Module “PDM”. It is installed immediately to the right of the NIM and provides ∿ 115/230 V power to the I/O modules requiring AC power.
3 STB DA●: digital I/O modules with AC power.
4 STB PDT 3100: Power Distribution Module “PDM”. It is installed after all the ∿ 115/230 V I/O modules. It provides ⎓ 24 V to the I/O modules requiring DC power.
5 STB AV● and STB AC●: analog I/O modules requiring DC power. They are installed after the “PDM” module.
6 STB XMP 1100: bus termination *(1)*.
□ STB CPS 2111: auxiliary power supply ⎓ 24 V/⎓ 5 V logic. It is an additional power supply to the built-in 5 V power supply of the Network Interface Module “NIM”.▲

Advantys STB: primary segment with extension segments



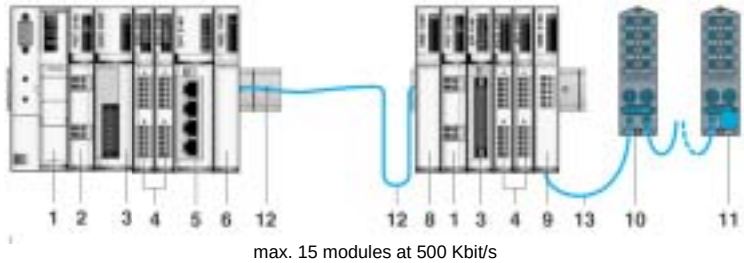
The island bus can support the primary segment with as many as six extension segments.

These segments comprise:
1 STB N●●: Network Interface Module “NIM”. It is placed at the beginning of the primary segment. Each island must have one NIM module only.
2 STB PDT ●100: PDM power distribution module (⎓ 24 V or ∿ 115/230 V). It is installed immediately to the right of the NIM and provides ⎓ 24 V or ∿ 115/230 V power according to the type of I/O modules located on the right.
3 STB AV●, STB AC●, STB DD●, STB DA● and STB DR●: I/O modules requiring DC power or digital modules requiring AC power. They are placed to the immediate right of the PDM.
4 STB XBE 1000: EOS bus extension module: It is always installed in the farthest right slot in the primary or extension segment, and is used to extend the island bus to another segment.
5 STB XBE 1200: BOS bus extension module: It is installed at the beginning of each extension segment.
6 STB XMP 1100: island bus termination *(1)*.
7 STB XCA 100●: island bus extension cables.
□ STB CPS 2111: auxiliary power supply ⎓ 24 V/⎓ 5 V logic. It is an additional power supply to the built-in 5 V power supply of the Network Interface Module “NIM” and the BOS bus extension module. ▲

(1) Supplied with the corresponding NIM network interface module.
▲ *Available Q2, 2005.*

Description of standard Advantys STB (continued)

Advantys STB with application-specific modules, and devices



max. 15 modules at 500 Kbit/s

The island bus can support:
■ Standard Schneider validated CANopen devices. They are installed at the end of the island with up to 12 standard CANopen devices *(1)*. These devices may reduce the maximum island length to 6.5 m (baud rate dependent).

The island bus comprises:
1 STB N●●: Network Interface Module “NIM”
2 STB PDT 3100: ⎓ 24 V Power Distribution Module “PDM”. It is installed immediately to the right of the “NIM” and provides ⎓ 24 V power to the I/O modules requiring DC power
3 STB EHC 3020: 1-channel counter module
4 STB AV● and STB AC●: analog I/O modules
5 STB EPI 2145: module for TeSys U-Line starter-controllers
6 STB XBE 1000: EOS bus extension module. It is always installed in the farthest right slot in the primary or extension segment, and is used to extend the island bus to another segment.
7 STB XBE 1200: BOS bus extension module. It is installed at the beginning of the extension segment.
8 STB XBE 2100: CANopen extension module (max. 12 devices per island)
9 FTB 1CN: Advantys FTB IP 67 monobloc I/O splitter boxes ▲
10 FTX DPTL12: CANopen bus line terminator (with 120 Ω resistance)
11 STB XCA 100●: island bus extension cables
12 User supplied cable
□ STB CPS 2111: auxiliary power supply ⎓ 24 V/⎓ 5 V logic. It is an additional power supply to the built-in 5 V power supply of the Network Interface Module “NIM” and the BOS bus extension module. ▲

CANopen extension module

The CANopen extension module STB XBE 2100 can be used to connect external CANopen devices. Any Schneider validated CANopen device must necessarily be installed at the end of the segment. The CANopen devices can be:
■ Advantys FTB monobloc I/O splitter boxes ▲
■ ATV31 variable speed drives
■ Festo CPV-CO2 electropneumatic valves

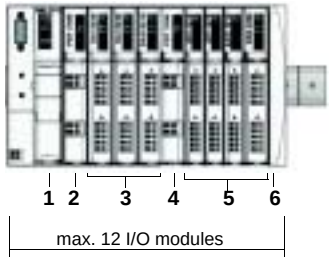
To connect other external CANopen products we recommend that you contact Schneider Electric to check the behavior of these products in an STB island.

Note : *The number of I/O modules and CANopen devices depends on the type of NIM and the device type. Certain complex devices reduce the maximum number of modules and devices from 12 to 7.*

▲ *Available Q2, 2005.*

Description of basic Advantys STB

Basic Advantys STB: single segment



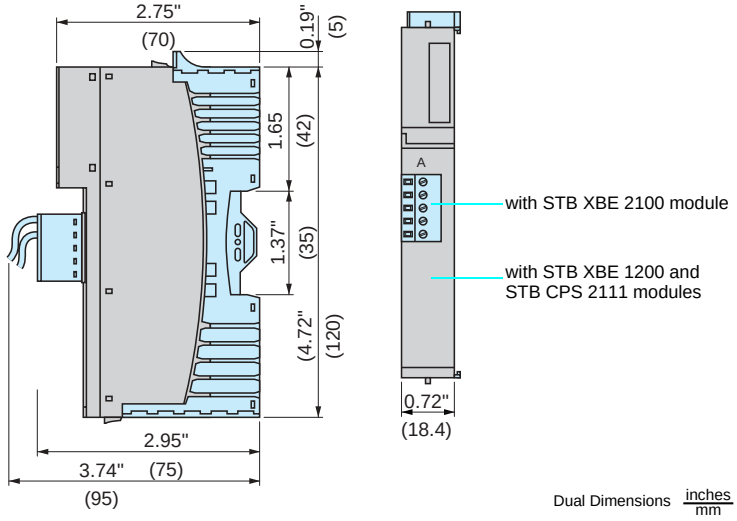
In the example above, the single segment comprises:

1 STB N●●: Network Interface Module “NIM”. It is placed at the beginning of the primary segment. Each island must have one NIM module only.
2 STB PDT 2105: Power Distribution Module “PDM”. It is installed immediately to the right of the NIM and provides ∿ 115/230 V power to the I/O modules requiring AC power.
3 STB DA●: digital I/O modules with AC power.
4 STB PDT 3105: Power Distribution Module “PDM”. It is installed after all the ∿ 115/230 V I/O modules. It provides ⎓ 24 V to the I/O modules requiring DC power.
5 STB AV● and STB AC●: analog I/O modules requiring DC power. They are installed after the “PDM” module.
6 STB XMP 1100: bus termination.

The basic network interface module can be used to create islands with a single segment comprising a maximum of 12 I/O modules (as compared with a maximum of 32 I/O modules for the standard module).

Dimensions

STB XBE 1000/1200/2100, STB CPS 2111



Advantys STB
Distributed I/O Solution
Open and Modular System

STB XBE 1000

STB XBE 1200

STB XBE 2100

STB CPS 2111

STB XBA 2●00

References

Description		Reference	Weight kg
Network Interface Modules "NIM" (Includes the island bus terminator)		See page 14	–
Power Distribution Modules "PDM"		See page 19	–
Digital I/O modules		See page 30	–
Analog I/O modules		See page 38	–
Parallel interfaces	Tego Power applications	See page 45	–
	TeSys U-Line applications	See page 45	–
Counter module		See page 49	–

Description	Use with standard STB	Reference	Weight kg
EOS bus extension module	Installed at the end of the segment (except for the last segment on the island)	**STBXBE1000**	–
BOS bus extension module	Installed at the beginning of each extension segment	**STBXBE1200**	–
CANopen bus extension module	Optionally installed at the end of the last segment to connect standard CANopen devices	**STBXBE2100**	–

Description	Use	Reference	Weight kg
Auxiliary power supply ⎓ 24 V/⎓ 5 V 1.2 A *(1)*	Additional power supply for logic power to the I/O modules	**STBCPS2111**	–

Separate parts

Description	Use for	Reference	Weight kg
I/O base Width 0.72" (18.4 mm)	STB XBE 1000	**STBXBA2400**	0.028
	STB XBE 1200	**STBXBA2300**	0.033
	STB XBE 2100	**STBXBA2000**	0.028
	STB CPS 2111	**STBXBA2100**	0.033

Description	Use for	Type	Sold in lots of	Reference	Weight kg
2-pin removable connectors for ⎓ 24 V	STB XBE 1200	Screw-type	10	**STBXTS1120**	–
		Spring-type	10	**STBXTS2120**	–
5-pin removable connectors	STB XBE 2100	Screw-type	20	**STBXTS1110**	0.006
		Spring-type	20	**STBXTS2110**	0.006
Keying pins	Modules		60	**STBXMP7700**	–
	Removable connectors		96	**STBXMP7800**	–
User-customizable label sheets *(2)*	Customization of modules and boxes		25 sheets	**STBXMP6700**	–
Screwdriver slotted 2.5 mm	Screw-type removable connectors	Fully insulated chrome vanadium steel	–	**STBXTT0220**	–

Description	Length	Reference	Weight kg
Island bus extension cables	0.3 m	**STBXCA1001**	–
	1.0 m	**STBXCA1002**	–
	4.5 m	**STBXCA1003**	–
	10.0 m	**STBXCA1004**	–
	14.0 m	**STBXCA1006**	–

(1) Auxiliary power supply in additional to the built-in 5 V power supply of the Network Interface Module "NIM" and the BOS bus extension module.
(2) A template for the user-customizable label sheets is supplied with the documentation mini-CD-Rom.

Advantys STB
Distributed I/O Solution
Network Interface Modules

Applications		**Data exchange between master PLC and Advantys STB I/O modules**	
Bus or network type		Ethernet TCP/IP Network	CANopen Bus
			
Bus or network nature		Industrial LAN	CAN field bus
Structure	**Physical interface**	10 BASE-T	ISO 1198
	Access method	CSMA-CD	CSMA-MA, multimaster
	Baud rate	10 Mbit/s	10 Kbit/s…1 Mbit/s depending on bus length
Medium		Shielded dual twisted pair via Ethernet ConneXium cabling system	Shielded dual twisted pair
Configuration	**Number of devices** *(1)*	max. 256 per segment, unlimited with switches	127 slaves
	Maximum length	1640 ft. (500 m) according to 802.3 standard 3280 ft. (1000 m) with ConneXium cabling system	From 98.4 ft. (30 m) (1 Mbit/s) to 16404 ft. (5,000 m) (10 Kbit/s)
Network interface module features	**Number of I/O modules per Advantys STB island** *(1)*	Standard NIM: max. 32 modules on 1 primary segment and max. 6 extension segments	Standard NIM: max. 32 modules on 1 primary segment and max. 6 extension segments Basic NIM: max. 12 modules on 1 primary segment
	Power supply voltage	24 VDC not isolated (19.2…30 V)	
	Logic power supply	Provides 5 VDC logic power to all the I/O modules of an island (1200 mA)	
	CANopen devices supported	max. 12 devices *(2)*	
Services used		- Embedded Web (configuration, diagnostics, and access to variables) - TCP/IP Modbus - SNMP agent	- Process Data Object (PDO) - Service Data Object (SDO) - Special function Object - Network management (NMT)
Type of NIM module	**Standard**	**STB NIP 2212**	**STB NCO 2212**
	Basic *(3)*		**STB NCO 1010**
Pages		15	

(1) One Advantys STB island corresponds to 1 device on the bus or the network.
(2) Depending on the nature of the CANopen devices, this maximum number may be limited to 7.
(3) Does not support the CANopen bus extension module (for external CANopen products). Does not allow hot swapping of Advantys STB I/O modules.

Data exchange between master PLC and Advantys STB I/O modules				
Modbus Plus Network	Fipio Bus	INTERBUS Bus	Profibus DP Bus	DeviceNet Network
				
Industrial LAN compliant with the Modbus Plus standard	Open industrial field bus compliant with the FIP standard	INTERBUS industrial field bus (Generation 4)	Industrial field bus (Profibus DP V.0)	Network compliant with v.2.0 of the Open DeviceNet Vendor Assoc. (ODVA)
Modbus Plus standard	FIP standard	isolated RS 485	RS 485	–
Token passing	Bus managed by bus arbitrator	Generation 4 master/slave	Master/slave	CSMA-CD
1 Mbit/s	1 Mbit/s	500 Kbit/s	9.6 Kbit/s…12 Mbit/s	125, 250 or 500 Kbit/s
Twisted pair	Shielded twisted pair	Shielded twisted pair	Shielded twisted pair	Twisted pair
32 per segment 64 for all segments	32 per segment max. 128 for all segments	max. 512 slaves with max. 254 bus terminal blocks	125 slaves	64 slaves
1476 ft. (450 m) per segment 5905 ft. (1800 m) with 3 repeaters	3280 ft. (1000 m) per segment	1312 ft. (400 m) per bus segment between stations 41994 ft. (12.8 km) for the bus between stations 164 ft. (50 m) for the installation bus	3936 ft. (1200 m) (9.6 Kbit/s), 15747 ft. (4800 m) with 3 repeaters, 656 ft. (200 m) (12 Mbit/s), 2624 ft. (800 m) with 3 repeaters	3936 ft. (1200 m)
Standard NIM: max. 32 modules on 1 primary segment and max. 6 extension segments		Standard NIM: max. 32 modules on 1 primary segment and max. 6 extension segments Basic NIM: max. 12 modules on 1 primary segment		
max. 12 devices *(2)*				
- Global data - Peer-to-peer - Peer Cop	- Periodic I/O exchanges - Peer-to-peer messages - Use of standard profiles FRD/FSD/FED	- Data process implicit exchange - Logical addressing - Diagnostics	- Slave configuration - Configuration control - Read/write Slave I/O data	- DeviceNet Object (Class ID3) - Connection Object (Class ID5) - Island Bus Object (Class ID101)
STB NMP 2212	**STB NFP 2212**	**STB NIB 2212**	**STB NDP 2212**	**STB NDN 2212**
		STB NIB 1010	**STB NDP 1010**	**STB NDN 1010**

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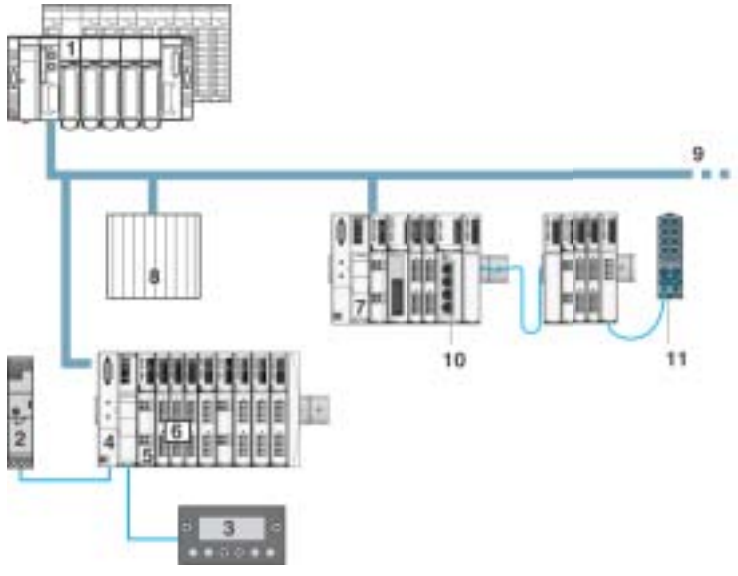
Advantys STB
Distributed I/O Solution
Network Interface Modules

Presentation

The STB N●● 2212 and STB N●● 1010 network interface modules, located at the beginning of each island, are gateways for exchanging data between the network or bus master PLC and the Advantys STB automation island.
They also enable the configuration of parameters and addressing of installation devices. These settings are stored in the module's internal RAM or Flash memory. Optionally, they can be saved to the STB XMP 4440 removable memory card (32 Kb).



1 Fieldbus or network master
2 External ⎓ 24 V power supply
3 HMI terminal on Modbus (Magelis XBT range, see page 15)
4 Network Interface Module "NIM"
5 Power Distribution Module "PDM"
6 I/O modules
7 Second STB island
8 Slave PLC
9 Bus terminator
10 Parallel interface module for TeSys U-Line starter-controller
11 Advantys FTB splitter box (or CANopen device) ▲

The Advantys STB offer comprises 7 standard and 5 basic network interface modules, each one dedicated to a specific network or bus:

Network or bus	Standard network interface module "NIM"	Basic network interface module "NIM"
Ethernet network	STB NIP 2212	–
CANopen bus	STB NCO 2212	STB NCO 1010
Modbus Plus network	STB NMP 2212	–
Fipio bus	STB NFP 2212	–
INTERBUS bus	STB NIB 2212	STB NIB 1010
Profibus DP bus	STB NDP 2212	STB NDP 1010
DeviceNet network	STB NDN 2212	STB NDN 1010

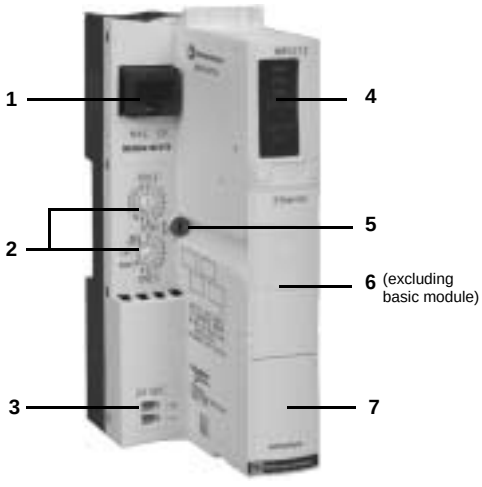
Power supply for network interface modules

Network interface modules are powered by an external ⎓ 24 V power supply. They convert this power to ⎓ 5 V to provide logic power to the Advantys STB I/O modules. Logic power for the I/O modules in each extension segment is provided by that segment's STB XBE 1200 "BOS" module. See page 14.

This built-in 5 V power supply provides up to 1.2 A current. This current can be increased by the addition in the segment (primary, extension) of the auxiliary power supply "CPS" providing up to 1.2 A current (see page 9).

▲ *Available Q2, 2005.*

Advantys STB
Distributed I/O Solution
Network Interface Modules

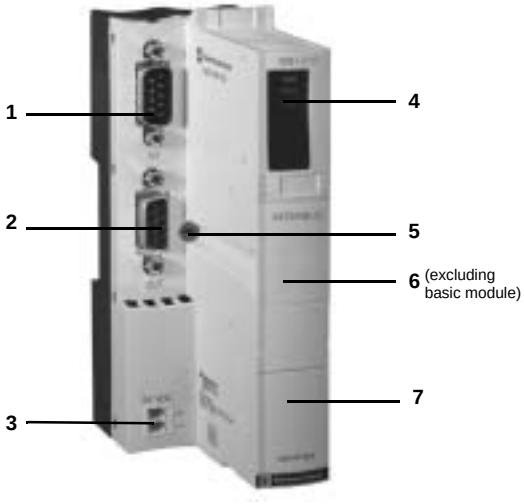


Description

Network interface modules (except for the INTERBUS STB NIB 2212/1010 module)

The front panel features the following:

1 A connector used to connect the island to the fieldbus.
2 Two rotary node addressing selectors on the bus or the network.
3 An external ⎓ 24 V power connector for the removable screw-type (STB XTS 1120) or spring-type (STB XTS 2120) connector.
4 A display block with LEDs for the various island states on the bus: power, communication, send/receive data, errors, etc.
5 Locking screw securing the STB N●● 2212 module to the DIN rail.
6 A slot for an STB XMP 4440 removable memory card (excluding basic module).
7 Standard module: cover accessing the port used to connect an island setup and configuration PC or an HMI terminal (read/write data), and the Reset button *(1)*. Can also be used to update the firmware for the network interface module. Basic module: cover accessing the port used to connect a PC (for updating the firmware for the network interface module only) and the Reset button *(1)*.



INTERBUS STB NIB 2212/1010 network interface module

It is identical to the network interface modules described above except for the INTERBUS connector.

The front panel features the following:

1 A 9-pin SUB-D male connector used to connect the input bus cable.
2 A 9-pin SUB-D female connector used to connect the output bus cable.
3 An external ⎓ 24 V power connector for the removable screw-type (STB XTS 1120) or spring-type (STB XTS 2120) connector.
4 A display block with LEDs for the various island states on the bus: power, communication, send/receive data, errors, etc.
5 Locking screw securing the STB N●● 2212 module to the DIN rail.
6 A slot for an STB XMP 4440 removable memory card (excluding basic module).
7 - Standard module cover accessing the port used to connect an island setup and configuration PC or an HMI terminal (read/write data), and the Reset button *(1)*. Can also be used to update the firmware for the network interface module.
- Basic module: cover accessing the port used to connect a PC (for updating the firmware for the network interface module only) and the Reset button *(1)*.

Network interface modules are supplied with a documentation mini-CD-Rom and the STB XMP 1100 bus terminator and are mounted directly on DIN rails.

(1) Pressing the Reset button requires the power to be switched off and then on again.

Characteristics

Type of network interface module		STB	NIP 2212	NCO 2212	NCO 1010	NMP 2212	NFP 2212
Range			**Standard**	**Standard**	**Basic**	**Standard**	**Standard**
Network or bus			Ethernet	CANopen		Modbus Plus	Fipio
Compliance with bus or network standards			IEEE 802.3	CIA DS-301		modbus.org	EN 50170, Vol 3, Parts 1-3, 2-3, 3-3, 5-3, 6-3 and 7-3
Power supply voltage		**⎓ V**	24 not isolated				
Input current		**mA**	700	700	400	700	
Voltage limits		**⎓ V**	19.2…30				
Output voltage to the island logic bus		**⎓**	5.25 V ± 0.21 %				
Output current rating		**A**	1.2 at ⎓ 5V				
Output impedance		**mΩ**	< 50 to 100 kHz				
Isolation			None *(1)*				
Immunity to electromagnetic disturbance (EMC)			Yes, according to IEC 61131-2				
Connector type	To bus or network		RJ45 female	9-pin SUB-D male		9-pin SUB-D female	9-pin SUB-D male
	RS 232 port (configuration and dialog)		HE 13, 8-pin female	HE 13, 8-pin female	*(1)*	HE 13, 8-pin female	
Max. number of addressable I/O modules	Per island		32	32	12	32	
Number of segments supported	Primary		1				
	Extension		max. 6	max. 6	–	max. 6	

Type of STB network interface module		NIB 2212	NIB 1010	NDP 2212	NDP 1010	NDN 2212	NDN 1010
Range		**Standard**	**Basic**	**Standard**	**Basic**	**Standard**	**Basic**
Network or bus		INTERBus		Profibus DP		DeviceNet	
Compliance with bus or network standards		INTERBus Club		DIN 19245, Parts 1 and 3		Open DeviceNet Vendors Assoc.	
Power supply voltage	**⎓ V**	24 not isolated					
Input current	**mA**	700	400	700	400	700	400
Voltage limits	**⎓ V**	19.2…30					
Output voltage to the island logic bus	**⎓**	5.25 V ± 0.21 %					
Output current rating	**A**	1.2 at ⎓ 5V					
Output impedance	**mΩ**	< 50 to 100 kHz	⩽ 50	< 50 to 100 kHz	⩽ 50	< 50 to 100 kHz	⩽ 50
Isolation		None					
Immunity to electromagnetic disturbance (EMC)		Yes, according to IEC 61131-2					
Connector type	To bus or network	Input: 9-pin SUB-D male Output: 9-pin SUB-D female		9-pin SUB-D female		5-pin male connector	
	RS 232 port (configuration and dialog)	HE 13, 8-pin female	*(1)*	HE 13, 8-pin female	*(1)*	HE 13, 8-pin female	*(1)*
Max. number of addressable I/O modules	Per island	32	12	32	12	32	12
Number of segments supported	Primary	1					
	Extension	max. 6	–	max. 6	–	max. 6	–

(1) Connection for updating firmware only.
(2) Use a ⎓ 24 V SELV (Safety Extra Low Voltage) external power supply.

Advantys STB
Distributed I/O Solution
Network Interface Modules

STB NIP 2212

STB NCO 2212/1010

STB NMP2212

STB NFP 2212

STB NIB 2212/1010

STB NDN 2212/1010

Network interface modules *(1)*

Description	Range	Power supply voltage	Reference	Weight kg
Ethernet network	**Standard**	⎓ 24 V	**STBNIP2212**	0.130
CANopen bus	**Standard**	⎓ 24 V	**STBNCO2212**	0.135
	Basic	⎓ 24 V	**STBNCO1010**	0.135
Modbus Plus network	**Standard**	⎓ 24 V	**STBNMP2212**	0.145
Fipio bus	**Standard**	⎓ 24 V	**STBNFP2212**	0.145
INTERBUS Bus	**Standard**	⎓ 24 V	**STBNIB2212**	0.155
	Basic	⎓ 24 V	**STBNIB1010**	0.155
Profibus DP bus	**Standard**	⎓ 24 V	**STBNDP2212**	0.140
	Basic	⎓ 24 V	**STBNDP1010**	0.140
DeviceNet network	**Standard**	⎓ 24 V	**STBNDN2212**	0.140
	Basic	⎓ 24 V	**STBNDN1010**	0.140

Separate parts

Description	Use	Sold in lots of	Reference	Weight kg
32 Kb removable memory card *(2)*	Application backup memory for standard network interface module	1	**STBXMP4440**	–
External ⎓ 24 V power supply (SELV)	–	–	See page 19	–
Removable connectors for ⎓ 24 V power supply (2-pin)	Screw-type	10	**STBXTS1120**	0.003
	Spring-type	10	**STBXTS2120**	0.003
DeviceNet removable connectors (5-pin)	Screw-type	1	**STBXTS1111**	–
	Spring-type	1	**STBXTS2111**	–
Configuration software *(2)*	Dedicated Advantys configuration software		See page 55	–
Magelis XBT terminal connection cable *(2)* (length 2.5 m)	XBT N401/NU400 display units XBT H/HM display units XBT P/E/PM terminals XBT F graphic terminals		**XBTZ988**	0.210
RS 232C connection cable HE 13 8-pin/SUB-D 9-pin *(2)* (length 2 m)	XBT G2●30 graphic terminals Configuration PC		**STBXCA4002**	–

Replacement parts

Description	Use	Reference	Weight kg
Bus terminator	–	**STBXMP1100**	–

(1) All network interface modules are supplied with a English documentation on mini-CD-Rom and bus terminators (STB XMP 1100).
(2) With standard network interface modules only.

490 NTW 000 ●●

Connection accessories

Ethernet network

Description	Fitted at both ends	Length ft. (m)	Reference	Weight kg
Straight shielded twisted pair cable for connecting hubs and switches	2 RJ45 connectors to connect data terminal equipment (DTE)	6.56 (2)	**490NTW00002U**	–
		16.4 (5)	**490NTW00005U**	–
		39.3 (12)	**490NTW00012U**	–
		131.2 (40)	**490NTW00040U**	–
		2624 (80)	**490NTW00080U**	–

Modbus Plus network

Description	Use	Reference	Weight kg
9-pin SUB-D male connector	Connection of the Modbus Plus connector	**ASMBKT085**	–
Modbus Plus junction box	IP 20 device for T connections	**990NAD23000**	0.230
	IP 65 unit for T connections, supports 1 RJ45 connector on front panel	**990NAD23010**	0.650
	IP 20 T connector with 2 RJ45 connectors for Modbus Plus cable and one 9 pin SUB-D connector for auxiliary devices	**170XTS02000**	0.260

AS MBKT 085

Description	Use		Length	Reference	Weight kg
	From	To			
Modbus Plus drop cables	IP 20 170 XTS 020 00 T connector	IP 20 170 XTS 020 00 T connector	0.82 (0.25)	**170MCI02010**	–
			3.28 (1)	**170MCI02036**	–
			9.84 (3)	**170MCI02120**	–
			32.8 (10)	**170MCI02080**	–
	STB NMP 2212 network interface module	990 NAD 230 00 junction box	7.87 (2.4)	**990NAD21110**	0.530
			19.6 (6)	**990NAD21130**	0.530

Fipio bus

Description	Use	Characteristics	Reference	Weight kg
Female connectors (9-pin SUB-D)	On STB NFP 2212 network interface module	Black poly carbonate IP 20	**TSXFPACC12**	0.040
		Zamak	**TSXFPACC2**	0.080
Bus connection unit	Junction for main cable	Black poly carbonate IP 20	**TSXFPACC14**	0.120
		Zamak IP 65	**TSXFPACC4**	0.660
Drop cables	8 mm, 2 shielded twisted pairs 150 Ω For standard environments	328 (100)	**TSXFPCC100**	5.680
		1640 (500)	**TSXFPCC500**	30.000

TSX FP ACC 12

TSX FP ACC 14

TSX FP ACC 4

Connection accessories (continued)

INTERBUS bus

Description	Use	Length ft. (m)	Reference	Weight kg
Installation bus cables	Prefitted cables to connect 2 network interface modules "NIM"	0.36 ft. (0.110)	**170MCI00700**	–
Junction interface	To connect inter-station bus to installation bus	–	**170BNO67100**	–
Inter-station bus cables	–	328 ft. (100)	**TSXIBSCA100**	–
		1312 ft. (400)	**TSXIBSCA400**	–

Profibus DP bus

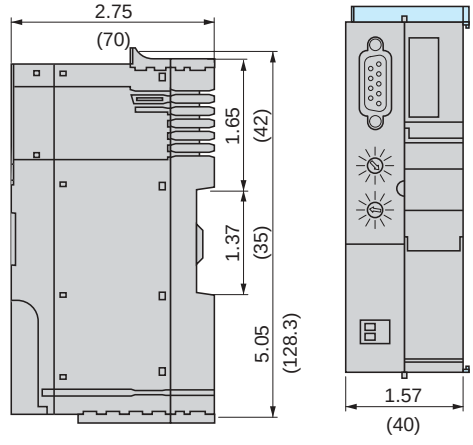
Description	Use	Length	Reference	Weight kg
Connectors for STB NDP 2212 network interface module	Bus terminator	–	**490NAD91103**	–
	Intermediate connection	–	**490NAD91104**	–
	Intermediate connection with terminal port	–	**490NAD91105**	–
Profibus DP connection cables	–	328 ft. (100)	**TSXPBSCA100**	–
		1312 ft. (400)	**TSXPBSCA400**	–

DeviceNet network

Description	Use	Type	Reference	Weight kg
Female 5-pin connectors	For STB NDN 2212 network interface module	Screw-type	**STBXTS1111**	–
		Spring-type	**STBXTS2111**	–

Dimensions

STB N●● 2212/1010

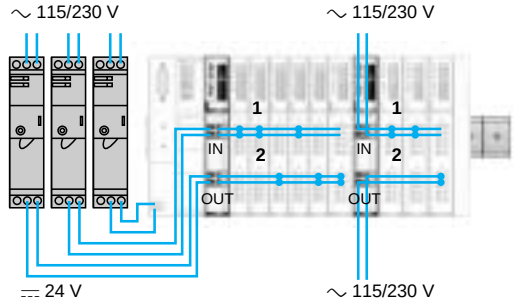


Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Advantys STB Distributed I/O Solution
Power Distribution Modules

Presentation

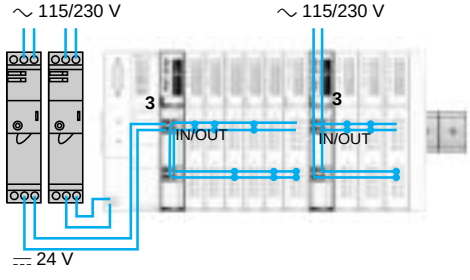
The **STB PDT ●100 standard** Power Distribution Modules “PDM” provide power for the I/O module sensors and actuators *(1)* via the sensor bus **1** and the actuator bus **2**.



Two standard power distribution modules are available for the Advantys STB distributed I/O:

- The STB PDT 3100 module is dedicated to providing power to the I/O module sensors and actuators requiring a ⎓ 24 V power supply.
- The STB PDT 2100 module is dedicated to providing power to the I/O module sensors and actuators requiring a ∿ 115/230 V power supply.

The **STB PDT ●105 basic** Power Distribution Modules “PDM” provide power for the I/O module sensors and actuators *(1)* via the same bus **3**.



Two basic power distribution modules are available for the Advantys STB distributed I/O:

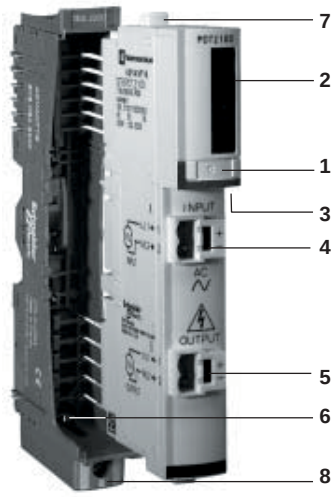
- The STB PDT 3105 module is dedicated to providing power to the I/O module sensors and actuators requiring a ⎓ 24 V power supply.
- The STB PDT 2105 module is dedicated to providing power to the I/O module sensors and actuators requiring a ∿ 115/230 V power supply.

Choice of Power Distribution Module determined by I/O modules

Power distribution module	Voltage	STB I/O modules						STB bus extension modules
		Digital			Analog		Application specific	
		Inputs	Outputs	Relay outputs	Inputs	Outputs		
STB PDT 3100	⎓ 24 V	DDI 3230 DDI 3420 DDI 3610 DDI 3425 DDI 3615	DDO 3200 DDO 3230 DDO 3410 DDO 3600 DDO 3415 DDO 3605	DRC 3210 DRA 3290	AVI 1270 ACI 1230 ART 0200 AVI 1255 AVI 1275 ACI 1225	AVO 1250 ACO 1210 AVO 1255 AVO 1265 ACO 1225	EPI 1145 EPI 2145 EHC 3020	XBE 1000 XBE 2100
STB PDT 2100	∿ 115 V	DAI 5230	DAO 8210	–	–	–	–	
	∿ 230 V	DAI 7220	DAO 8210	–	–	–	–	
STB PDT 3105	⎓ 24 V	DDI 3230 DDI 3420 DDI 3610 DDI 3425 DDI 3615	DDO 3200 DDO 3230 DDO 3410 DDO 3600 DDO 3415 DDO 3605	DRC 3210 DRA 3290	AVI 1270 ACI 1230 ART 0200 AVI 1255 AVI 1275 ACI 1225	AVO 1250 ACO 1210 AVO 1255 AVO 1265 ACO 1225	EPI 1145 EPI 2145 EHC 3020	–
STB PDT 2105	∿ 115 V	DAI 5230	DAO 8210	–	–	–	–	–
	∿ 230 V	DAI 7220	DAO 8210	–	–	–	–	

(1) One power distribution module can supply power to both digital and analog I/O modules simultaneously.

Advantys STB Distributed I/O Solution
Power Distribution Modules



Description

The front panel of the Advantys STB PDT ●100 power distribution modules features:

1 A location for a customizable label
2 A display block with 2 display LEDs (STB PDT 2100/3100 standard module only)::
- IN LED on: the sensor bus power supply is present
- OUT LED on: the actuator bus power supply is present

3 A color-coded module identification stripe (red for ∿ 115/230 V, blue for ⎓ 24 V)
4 A connector for removable screw-type connectors (STB XTS 1130) or spring-type connectors (STB XTS 2130) used to connect:
- the sensor power supply for STB PDT 2100/3100 standard modules
- the sensor/actuator power supply for STB PDT 2105/3105 basic modules

5 A connector for removable screw-type connectors (STB XTS 1130) or spring-type connectors (STB XTS 2130) used to connect the actuator power supply (STB PDT 2100/3100 standard module only)

To be ordered separately:

6 An STB XBA 2200 mounting base, width 0.72" (18.4 mm)
This base features:
7 A location for a customizable label
8 A captive grounding screw

Characteristics

Type of module			STB PDT 3100	STB PDT 2100	STB PDT 3105	STB PDT 2105
Range			**Standard**		**Basic**	
Power supply voltage		**V**	⎓ 24 *(1)*	∿ 115/230	⎓ 24	∿ 115/230
Maximum current	For inputs	**A**	4 at 30°C 2.5 at 60°C	5 at 30°C 2.5 at 60°C	–	–
	For outputs	**A**	8 at 30°C 5 at 60°C	10 at 30°C 5 at 60°C	–	–
	For inputs/outputs	**A**	–	–	4 at 30°C 2.5 at 60°C	
Sensor/actuator bus voltage range		**V**	⎓ 19.2...30 *(2)*	∿ 85...265 *(3)*	⎓ 19.2...30	∿ 85...265
Hot swapping supported			No			
Nominal consumption		**mA**	0 on ⎓ 5 V logic power supply			
Reverse polarity protection			Yes, on the actuator bus	–	Yes, on the actuator bus	–
Built-in overcurrent protection	For inputs		By 5 A time-delayed fuse *(4)*			
	For outputs		By 10 A time-delayed fuse *(4)*		By 5 A time-delayed fuse *(4)*	
Max. current on the grounding terminal		**A**	30 for 2 minutes			
Voltage-detect thresholds	IN/OUT LED turns on		⩾ ⎓ 15 V ± 1 V	> ∿ 70 V ± 5 V	–	
	IN/OUT LED turns off		< ⎓ 15 V ± 1 V	< ∿ 50 V ± 5 V	–	
Mounting base			STB XBA 2200 width 0.72" (18.4 mm)			

(1) Use a ⎓ 24 V safety extra low voltage (SELV) external power supply.
(2) DC power supplies may be shared or separate, or shared with the ⎓ 24 V power supply of the network interface module.
(3) AC power supplies for a given distribution module from a three-phase transformer must be connected at the same phase.
(4) Fuse supplied with the PDT power distribution module. Can be replaced with the STB XMP 5600 fuse kit.

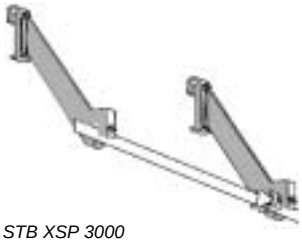
Advantys STB
Distributed I/O Solution
Power Distribution Modules

STB XBA 2200

STB PDT 3100

STB XTS 1130

STB XTS 2130



STB XSP 3000

STB XSP 3010/3020

References

Power distribution modules

Type of power supply	Voltage	Type	Reference	Weight kg
⎓	24 V	Standard	**STBPDT3100**	0.130
		Basic	**STBPDT3105**	0.130
~	115/230 V	Standard	**STBPDT2100**	0.129
		Basic	**STBPDT2105**	0.129

Separate parts

Description	Use for	Sold in lots of	Reference	Weight kg
Mounting base (width 18.4 mm)	Mounting of STB PDT ●100 power supply modules on DIN rails	1	**STBXBA2200**	0.035
Field wiring connectors (2 points)	Screw-type	10	**STBXTS1130**	0.006
	Spring-type	10	**STBXTS2130**	0.006
Keying pins	Distribution modules	60	**STBXMP7700**	–
User-customizable label sheets *(1)*	Customization of modules and bases	25	**STBXMP6700**	–
Grounding kit	Grounding for shielded cables, with 2 parts 1 bar (1 m) and 2 lateral supports	1	**STBXSP3000**	–
Terminals for grounding kit	Cables (width 1.5…6 mm^2)	10	**STBXSP3010**	–
	Cables (width 5…11 mm^2)	10	**STBXSP3020**	–
Screwdriver slotted 2.5 mm	Screw-type removable connectors	–	**STBXTT0220**	–

Phaseo regulated, single-phase switching power supplies

Output voltage	Input voltage mains 47...63 Hz	Nominal power	Nominal current	Reference	Weight kg
⎓ **24 V**	100...240 V	48...240 W	2...10 A	See page 61	–

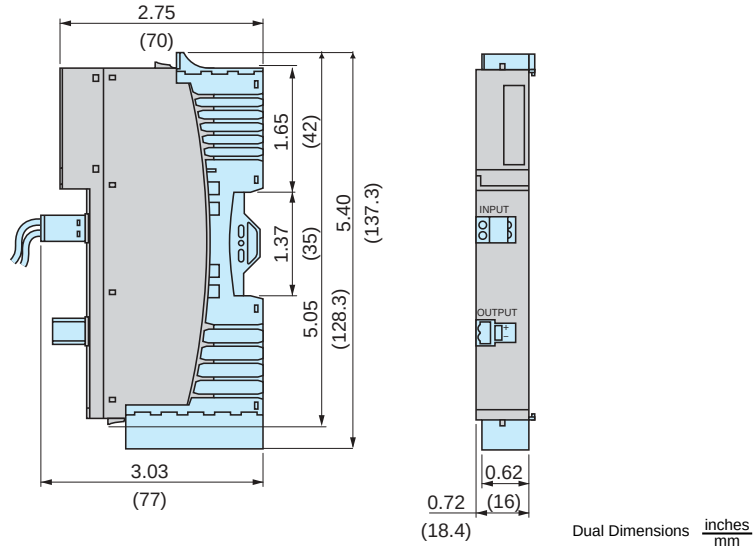
Replacement parts

Description		Reference	Weight kg
Fuses	5 A (lot of 5) and 10 A (lot of 5)	**STBXMP5600**	–
Keying pins *(2)*	Field wiring connectors (sold in lots of 24)	**STBXMP7810**	–

(1) A template for the user-customizable label sheets is supplied with the documentation mini-CD-Rom.
(2) Supplied with STB XTS 1130 screw-type connectors and STB XTS 2130 spring-type connectors.

Dimensions

STB PDT 3100/2100 and 3105/2105



Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Advantys STB Distributed I/O Solution
Digital Input/Output Modules

Applications		**Digital input modules**		
		For direct current		
				
Voltage		24 VDC		
Number of channels		2	4	
Inputs	Default logic	Sink		
	Configurable logic	Yes *(1)*		No
	Type (IEC/EN 61131-2)	Type 2	Type 1+	
Sensor type		3-wire + ground	3-wire	
Response time	Off-to-on	610 ms @ 0.2 ms input filter time	925 µs @ 0.5 ms input filter time	3.5 ms
	On-to-off	625 µs @ 0.2 ms input filter time	1.35 ms @ 0.5 ms input filter time	3.8 ms
Filter time constant		0.2...16 ms	0.5...16 ms	3 ms
Field wiring connectors		Two connectors (6-point): screw-type STB XTS 1100 or spring-type STB XTS 2100		
Base		STB XBA 1000		
Power Distribution Modules "PDM" *(2)*	Voltage	24 VDC		
	Part number	STB PDT 3100/3105		
Isolation	Field-to-bus	1500 VDC for 1 minute		
	Channel-to-channel	–		
Protection against	Reverse polarity	Yes		
	Short-circuit and overload	Yes, time-lag fuse on the Power Distribution Module "PDM"		
	Sensor/actuator power	Electronic short-circuit protection (SCP)		
Module range		Standard		Basic
Module number		**STB DDI 3230**	**STB DDI 3420**	**STB DDI 3425**
Page		30		

(1) Adjustable with STB SPU 1000 configuration software.
(2) Each voltage group requires its own Power Distribution Module "PDM".

Digital input modules			
For direct current		**For alternating current**	
			
24 VDC		115 VAC	230 VAC
6		2	
Sink		–	
Yes *(1)*	No	Yes *(1)*	
Type 1			
2-wire		3-wire	3-wire + ground
1.21 ms	5.25 ms	1.5 line cycles	
1.74 ms	5.75 ms	1.5 line cycles	
1 ms	5 ms	–	
Two connectors (6-point): screw-type STB XTS 1100 or spring-type STB XTS 2100		Two connectors (5-point): screw-type STB XTS 1110 or spring-type STB XTS 2110	
STB XBA 1000		STB XBA 2000	
24 VDC		115 VAC	230 VAC
STB PDT 3100/3105		STB PDT 2100/2105	
1500 VDC for 1 minute		1780 VAC for 1 minute	
–		–	
Yes			
Yes, 5 A time-lag fuse on the Power Distribution Module “PDM”			
Electronic short-circuit protection (SCP)			
Standard	Basic	Standard	
STB DDI 3610	**STB DDI 3615**	**STB DAI 5230**	**STB DAI 7220**
30			

Advantys STB Distributed I/O Solution
Digital Input/Output Modules

Applications		**Digital output modules**			
		For direct current (transistor)			
					
Voltage		24 VDC			
Number of channels		2		4	
Inputs	Default logic	Source			
	Configurable logic	Yes			No
Load current (per channel)		0.5 A	2 A	0.5 A	0.25 A
Response time	Off-to-on	620 µs @ 0.5 A load	520 µs	560 µs @ 0.5 A load	560 µs @ 0.25 A load
	On-to-off	575 µs @ 0.5 A load	720 µs	870 µs @ 0.5 A load	870 µs @ 0.25 A load
Default setting		User-configurable setting *(1)*			Manual resetting
Fallback modes		User-configurable setting *(1)*			Both channels to 0
Field wiring connectors		Two connectors (6-point): screw-type STB XTS 1100 or spring-type STB XTS 2100			
Base		STB XBA 1000			
Power Distribution Modules "PDM" *(2)*	Voltage	24 VDC			
	Reference	STB PDT 3100/3105			
Isolation	Field-to-bus	1500 VDC for 1 minute			
	Channel-to-channel	–	500 VDC for 1 minute	–	
Protection against	Reverse polarity	Yes			
	Short-circuit and overload	Yes *(3)*	*(4)*	Yes *(3)*	
	Power supply	Electronic overcurrent protection (OCP)			
Module range		Standard			Basic
Module type		**STB DDO 3200**	**STB DDO 3230**	**STB DDO 3410**	**STB DDO 3415**
Page		30			

(1) With STB SPU 1000 configuration software.
(2) Each voltage group requires its own Power Distribution Module "PDM".
(3) Built-in time-lag fuses on the Power Distribution Module "PDM".
(4) Recommended user-supplied 2.5 A time-lag fuses on each channel.

Digital output modules					
For direct current (transistor)		**For alternating current (triac)**	**For direct/alternating current (relay)**		
					
24 VDC		115/230 VAC	24 VDC (relay contact) 115/230 VDC (relay contact)		
6		2	2 form C (N O/N C) relays	2 form A/B relays	
Source		–	–		
Yes	No	–	–		
0.5 A	0.25 A	2 A at 30°C 1 A at 60°C	2 A per contact	7 A per contact	
715 µs @ 0.5 A load	550 µs at a resistive load of 250 mA	10 ms	5.25 ms	10 ms	
955 µs @ 0.5 A load	900 µs at a resistive load of 250 mA	10.5 ms	6.75 ms	10 ms	
User-configurable setting *(1)*	Manual resetting	User-configurable setting *(1)*	Manual resetting		
User-configurable setting *(1)*	Both channels to 0	User-configurable setting *(1)*			
Two connectors (6-point): screw-type STB XTS 1100 or spring-type STB XTS 2100		Two connectors (5-point): screw-type STB XTS 1110 or spring-type STB XTS 2110			
STB XBA 1000		STB XBA 2000		STB XBA 3000	
24 VDC		115/230 VAC	24 VDC (relay coil)		
STB PDT 3100/3105		STB PDT 2100/2105	STB PDT 3100/3105		
1500 VDC for 1 minute		1780 VAC for 1 minute	1780 VAC for 1 minute		
–		–	500 VAC for 1 minute		
Yes			–		
Yes *(3)*					
Electronic overcurrent protection (OCP)		–			
Standard	Basic	Standard			
STB DDO 3600	**STB DDO 3605**	**STB DAO 8210**	**STB DRC 3210**	**STB DRA 3290**	
30					

Advantys STB Distributed I/O Solution

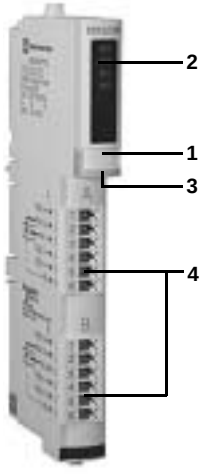
Digital Input/Output Modules

Presentation

The STB digital input/output modules consist of input modules, output modules and relay output modules.

The standard digital I/O offering is defined as follows:
■ 5 digital input modules:
□ one 2-channel module, one 4-channel module, and one 6-channel module with 24 VDC voltage
□ one 2-channel module with 115 VAC voltage
□ one 2-channel module with 230 VAC voltage
■ 5 digital output modules:
□ two 2-channel modules with 24 VDC voltage
□ one 4-channel module, and one 6-channel module with 24 VDC voltage
□ one 2-channel module with 115/230 VAC voltage
■ 2 relay output modules:
□ one 2 - form C relay outputs
□ one 2 - form A/B relay outputs

The basic digital I/O offering is defined as follows:
■ 2 digital input modules:
□ one 4-channel module, and one 6-channel module with 24 VDC voltage
■ 2 digital output modules:
□ one 4-channel module, and one 6-channel module with 24 VDC voltage



Description

The front panel of a typical digital input/output module features:
1 A location for a user-customizable label
2 A display block (standard module only) showing:
□ the state of the module (RDY, ERR with standard module, RDY with basic module)
□ the state of each channel (IN● or OUT●)
3 A color-coded module identification stripe
4 Two receptacles for field-wiring connectors

To be ordered separately:
■ I/O bases 13.9, 18.4 or 28.1 mm wide, depending on the model of I/O module (STB XBA 1000/2000/3000). These bases feature a location for the user-customizable label.
■ Removable screw terminal (5 or 6-channel) STB XTS 1110/1100 or removable spring terminal (5 or 6-channel) STB XTS 2110/2100.
■ Mechanical keying pin to insert between:
□ the I/O module and this I/O base: STB XMP 7700
□ the field wiring connector and this I/O module: STB XMP 7800
to ensure that the I/O module, I/O base and field wiring connector are properly matched
■ User-customizable label sheets: STB XMP 6700

Characteristics of digital input modules

Type of input module				STB DDI 3230	STB DDI 3420	STB DDI 3425	STB DDI 3610	STB DDI 3615	STB DAI 5230	STB DAI 7220
Range				Standard		Basic	Standard	Basic	Standard	
Number of input channels				2	4		6		2	
Input nominal values	Voltage		**V**	24 DC					115 AC (50/60 Hz)	230 AC (50/60 Hz)
Type (IEC/EN 61131-2)				Type 2	Type 1+		Type 1		Type 1	Type 1
Typical input current @ 24 VDC			**mA**	7.5	8.0		4.5		–	
Input logic	Default			Positive on each channel					–	
	User-configurable setting *(1)*			Positive or negative, selection by channel		–	Positive or negative, selection by channel	–	–	
Input response time	Off-to-on		**ms**	0.610 @ 0.2 input filter time	0.925 @ 0.5 input filter time	3.5	1.21	5.25	1.5 line cycles	
	On-to-off		**ms**	0.625 @ 0.2 input filter time	1.35 @ 0.5 input filter time	3.8	1.74	5.75	1.5 line cycles	
Input limit values	Frequency		**Hz**	–					47 to 63	
	At state 1	Voltage	**V**	11...30 DC			15...30 DC		74...132 AC	159...256 AC
		Current	**mA**	6 min.	2.5 min.		2 min.		4 min.	
	At state 0	Voltage	**V**	-3…+5 DC					0...20 AC	0...40 AC
		Current	**mA**	2 max.	1.2 max.		0.5 max.		2 max.	
Input voltage values	Permanent voltage		**V**	30 DC					132 AC	265 AC
	Absolute maximum voltage		**V**	56 DC for 1.3 ms, decaying pulse					200 AC for 1 cycle	400 AC for 1 cycle
Hot swapping supported				Yes		No	Yes	No	Yes	
Reverse polarity protection				Yes					–	
Isolation	Field-to-bus		**V**	2000 DC for 1 minute	1500 DC for 1 minute				1780 AC for 1 minute	
	Channel-to-channel		**V**	–						
Input protection				Resistor-limited						
Current supplied to field device Electronic short-circuit protection (SCP)			**mA**	100 per channel		50 per channel	–		60 max.	–
Input filtering	Default		**ms**	1		3	1 max.	5	–	
	User-configurable setting *(1)*		**ms**	0.20 0.50 1 2 4 8 16	0.50 1 2 4 8 16	–	–			
	Tolerance		**ms**	± 0.1	± 0.25	–				
I/O base				STB XBA 1000					STB XBA 2000	
Power Distribution Module "PDM" requirement	Voltage		**V**	24 DC					115/230 AC	
	Model			STB PDT 3100/3105					STB PDT 2100/2105	
	Power protection			Time-lag fuse on the "PDM" *(2)*						
Logic bus current consumption @ 5 VDC			**mA**	70	60		70		50	

(1) Requires the Advantys configuration software.
(2) Standard module: 10 A fuse. Basic module: 5 A fuse.

Characteristics of digital output modules

Type of output module			STB DDO 3200	STB DDO 3230	STB DDO 3410	STB DDO 3415	STB DDO 3600	STB DDO 3605	STB DAO 8210
Range			Standard			Basic	Standard	Basic	Standard
Number of output channels			2		4		6		2
Output nominal values	Voltage	**V**	24 DC						115/230 AC
	Current/channel	**A**	0.5	2	0.5	0.25	0.5	0.25	2 @ 30°C 1 @ 60°C
Output logic	Default		Source for each channel						
	User-configurable setting *(1)*		*(2)*			–	*(2)*	–	*(2)*
Output voltage values	Permanent voltage	**V**	19.2...30 DC						20...265 AC
	Absolute maximum voltage	**V**	56 DC for 1.3 ms, decaying voltage pulse						*(3)*
Response time	Off-to-on		620 µs @ 0.5 A load	520 µs	560 µs @ 0.5 A load	560 µs @ 0.25 A load	715 µs @ 0.5 A load	550 µs @ 0.25 A load	10 ms
	On-to-off		575 µs @ 0.5 A load	720 µs	870 µs @ 0.5 A load	870 µs @ 0.25 A load	955 µs @ 0.5 A load	900 µs @ 0.25 A load	10.5 ms
Hot swapping supported			Yes			No	Yes	No	Yes
Reverse polarity protection			Yes						–
Isolation	Field-to-bus	**V**	1500 DC for 1 minute						1780 VAC for 1 minute
	Channel-to-channel	**V**	–	1500 DC for 1 minute	–				
Output protection (internal)			Electronic overcurrent protection (OCP)						*(4)*
Output resets			Reset mode configurable with standard output modules and tripping data transmitted to network interface module “NIM”. Automatic fault recovery on basic output modules						–
On-state leakage current		**mA**	0.4 @ 30 VDC max.	1 @ 30 VDC max.	0.4 @ 30 VDC max.				2.5 @ 230 VAC 2 @ 115 VAC
Maximum surge current		**A**	5 @ 500 µs (no more than six/minute)	10 @ 500 µs (no more than six/minute)	5 @ 500 µs (no more than six/minute)	2.5 @ 500 µs (no more than six/minute)	5 @ 500 µs (no more than six/minute)	2.5 @ 500 µs (no more than six/minute)	30 (1 cycle) 20 (2 cycles)
Maximum load	Capacitance	**µF**	50						–
	Inductance		0.5 H @ 4 Hz switch frequency $L = 0.5/I^2 \times F$ *(5)*						–
Minimum load current		**mA**	0.5	2	0.5	–	0.5	–	5
Short-circuit	Electronic protection		Per group (2 channels per group)						–
	Feedback		Per channel		2 per channel, 4 or 6 per group (2 channels per group)				–
Fault recovery response	Default setting		Channel latched off – requires user reset						–
	User-configurable setting *(1)*		*(6)*			–	*(6)*	–	*(6)*
Fallback modes	User-configurable setting *(1)*		*(7)*			No	*(7)*	No	*(7)*
Fallback states	Default		Both channels to 0					All 6 channels to 0	Both channels to 0
I/O base			STB XBA 1000						STB XBA 2000
Power Distribution Module “PDM” requirement	Voltage	**V**	24 DC						115 or 230 AC
	Model		STB PDT 3100/3105						STB PDT 2100/2105
	Power protection		Time-lag fuse on the “PDM” *(8)*	*(9)*	Time-lag fuse on the “PDM” *(8)*				
Logic bus current consumption @ 5 VDC		**mA**	60		80		90		70

(1) Requires the Advantys configuration software.
(2) Source or sink, selection by channel,
(3) 300 AC for 10 s, 400 AC for 1 cycle.
(4) Transient voltage by Varistance and RC.
(5) L = load inductance (H), I = load current (A), F = switch frequency (Hz).
(6) Manual or automatic resetting.
(7) Hold last value, go to a predefined value (0 or 1) on one or more channels.
(8) Standard modules: 10 A fuse, basic modules: 5 A fuse.
(9) Recommended user-supplied 2.5 A time-lag fuses on each channel.

Characteristics of relay output modules

Type of output module				STB DRC 3210	STB DRA 3290
Range				Standard	
Number of channels				2 relay outputs (form C, NO/NC contact pairs)	2 relay outputs (form A/B, NO/NC contact pairs)
Output nominal values	Voltage		**V**	24 DC, 115/230 AC	
	Current per contact	24 VDC	**A**	2	7
		230 VAC	**A**	2	7
Limit voltage values	Permanent voltage		**V**	5…30 DC, 20…250 AC	
Response time	Off-to-on		**ms**	5.25	10
	On-to-off		**ms**	6.75	10
Switching capability			**VA**	600 (resistive load)	2100 (resistive load)
Relay contact life	Mechanical			10^6 operations	
	Electrical			10^5 operations (resistive load @ max. voltage and current)	
Hot swapping supported				Yes	
Isolation	Field-to-bus		**V**	1780 AC for 1 minute	
	Channel-to-channel		**V**	500 AC for 1 minute	
	Bus-to-actuator bus		**V**	1500 DC for 1 minute	
Output surge protection (internal)				Yes, by GMOV (300 V rms, 385 VDC, 400 Joules max. @ 20 µs, 0.1 W max.) *(1)*	
Maximum surge current/relay			**A**	20 capacitive load @ t = 10 ms	
Minimum load current			**mA**	50	
Fault recovery response				Shorted relay latched off, requires user reset	
Fallback modes	User-configurable setting *(2)*			Hold last predefined value on each channel	
Fallback states (when the fallback mode is predefined)	Default			2 coils de-energized	
Output logic	Default			Positive on both channels	
	User-configurable setting *(2)*			Positive or negative by channel	
I/O base				STB XBA 2000	STB XBA 3000
Power Distribution Module "PDM" requirement	Coil voltage		**V**	24 DC	
	Model			STB PDT 3100/3105	
	Coil protection			10 A time-lag fuse on "PDM"	
Logic bus current consumption @ 5 VDC			**mA**	60	70

(1) For a higher protection, an RC circuit, a free-wheel diode or a GMOV peak limiter circuit, appropriate to the voltage, must be mounted in parallel across the terminals of each actuator.
(2) Requires the Advantys configuration software.

Advantys STB Distributed I/O Solution

Digital Input/Output Modules

STB XBA 1000

STB DDI 3230

STB DDO 3200

STB XBA 2000

STB DRC 3210

STB XBA 3000

STB DRA 3290

References

Standard digital input modules

Input voltage	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
24 VDC	2 (sink)	Type 2	**STBDDI3230**	0.110
	4 (sink)	Type 1+	**STBDDI3420**	0.111
	6 (sink)	Type 1	**STBDDI3610**	0.112
115 VAC	2	Type 1	**STBDAI5230**	0.120
230 VAC	2	Type 1	**STBDAI7220**	0.122

Basic digital input modules

Input voltage	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
24 VDC	4 (sink)	Type 1+	**STBDDI3425**	0.111
	6 (sink)	Type 1	**STBDDI3615**	0.112

Standard digital output modules

Output voltage	Output current	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
24 VDC	0.5 A	2 (source)	Yes	**STBDDO3200**	0.112
	2 A	2 (source)	Yes	**STBDDO3230**	0.116
	0.5 A	4 (source)	Yes	**STBDDO3410**	0.110
		6 (source)	Yes	**STBDDO3600**	0.114
115/230 VAC	2 A	2	Yes	**STBDAO8210**	0.125

Basic digital output modules

Output voltage	Output current	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
24 VDC	0.25 A	4 (source)	Yes	**STBDDO3415**	0.110
		6 (source)	Yes	**STBDDO3605**	0.114

Standard relay output modules

Output voltage	Output current	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
24 VDC or 115/230 VAC	2 A	2	Yes	**STBDRC3210**	0.130
	7 A	2	Yes	**STBDRA3290**	0.130

Separate parts

Description	Base width inches (mm)	For I/O modules	Reference	Weight kg
I/O bases	0.54 (13.9)	STB DDI STB DDO	**STBXBA1000**	0.024
	0.72 (18.4)	STB DAI STB DAO STB DRC	**STBXBA2000**	0.028
	1.10 (28.1)	STB DRA	**STBXBA3000**	0.048

Description	Characteristics	Type	For I/O modules	Reference	Weight kg
Field wiring connectors (sold in lots of 20)	6 contacts	Screw-type	STB DDI STB DDO	**STBXTS1100**	0.006
		Spring-type	STB DDI STB DDO	**STBXTS2100**	0.006
	5 contacts	Screw-type	STB DAI STB DAO STB DRC STB DRA	**STBXTS1110**	0.006
		Spring-type	STB DAI STB DAO STB DRC STB DRA	**STBXTS2110**	0.006

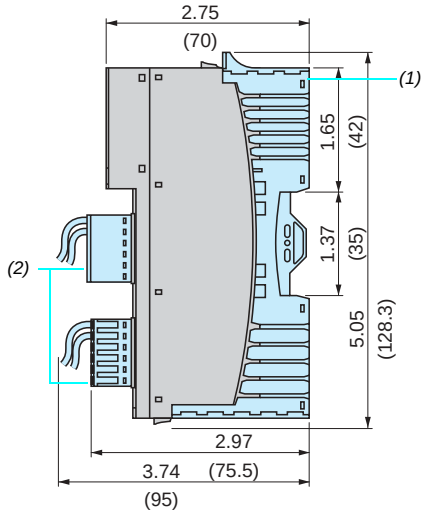
Description	Use for	Sold in lots of	Reference	Weight kg
Keying pins	Modules	60	**STBXMP7700**	–
	I/O connectors	96	**STBXMP7800**	–
User-customizable label sheets *(1)*	I/O bases and modules	25	**STBXMP6700**	–

(1) A template for the user-customizable label sheets is supplied with the documentation mini-CD-Rom.

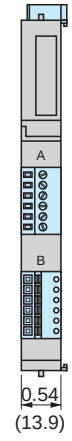
Dimensions

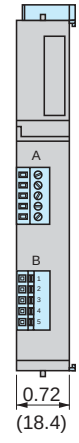
Side view

STB DDI/DDO 3●●0
STB DDI/DDO 3●●5

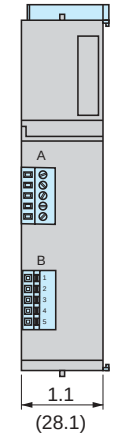


STB DAI ●●●0/DAO 8210
STB DRC 3210





STB DRA 3290



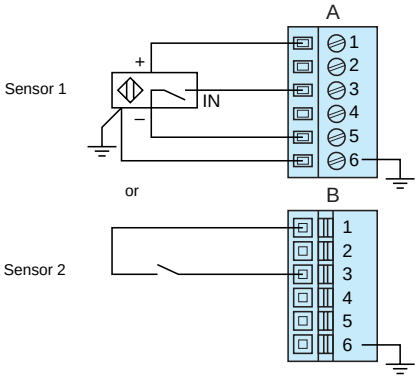
Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

(1) STB XBA 1000/2000/3000 I/O bases
(2) STB XTS 11●0/21●0 connectors

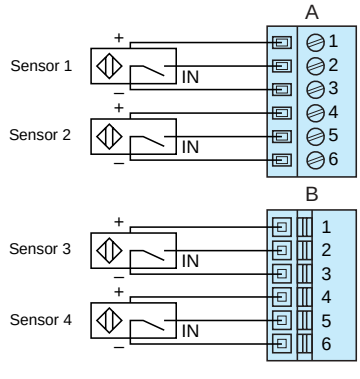
Wiring

Digital input modules

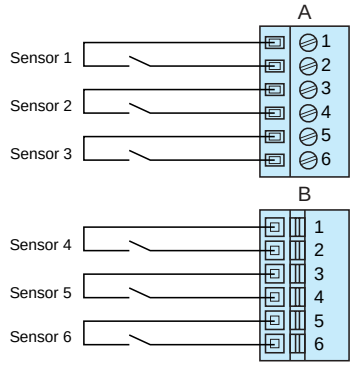
STB DDI 3230



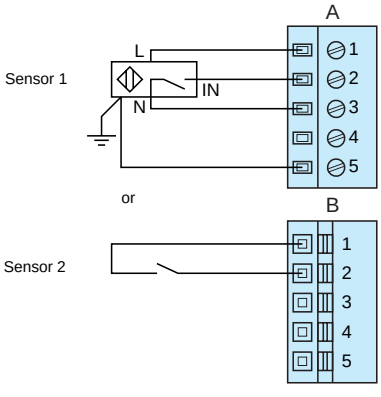
STB DDI 3420/3425



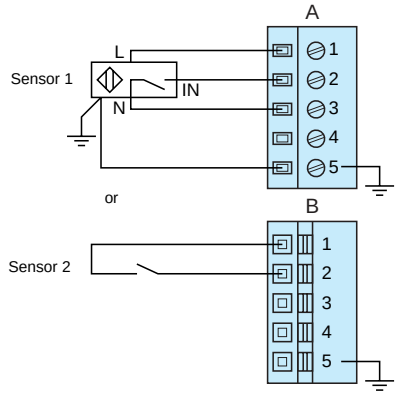
STB DDI 3610/3615



STB DAI 5230



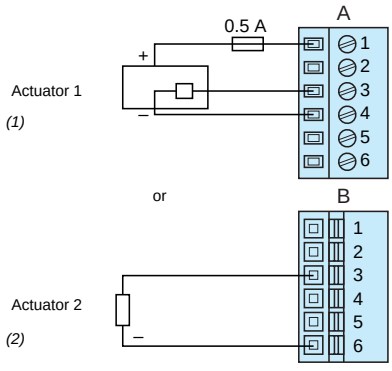
STB DAI 7220



Wiring (continued)

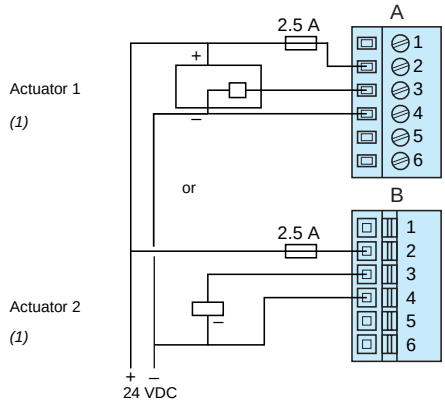
Digital output modules for direct current

STB DDO 3200

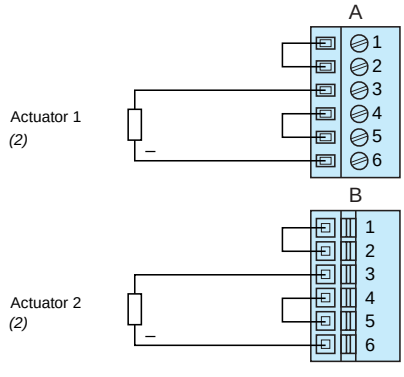


STB DDO 3230

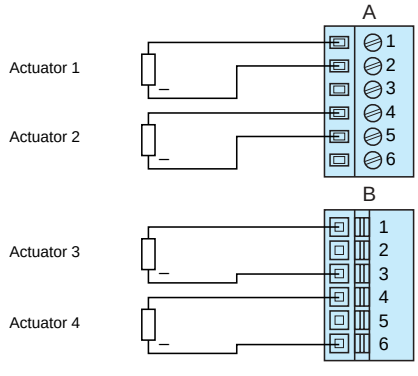
Two field actuators receiving field power from external 24 VDC power supply instead of the PDM



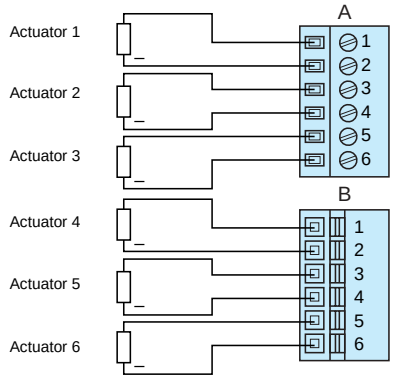
Two two-wire actuators wired to use field power from the power distribution module



STB DDO 3410/3415



STB DDO 3600/3605

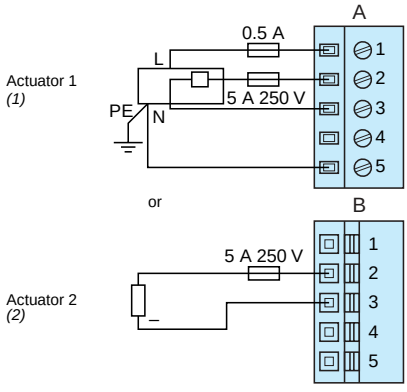


(1) Actuator protected by external fuse (depending on use).
(2) Actuator protected by fuse on power distribution module (10 A fuse with STB PDT 3100/2100 or 5 A fuse with STB PDT 3105/2105).

Wiring (continued)

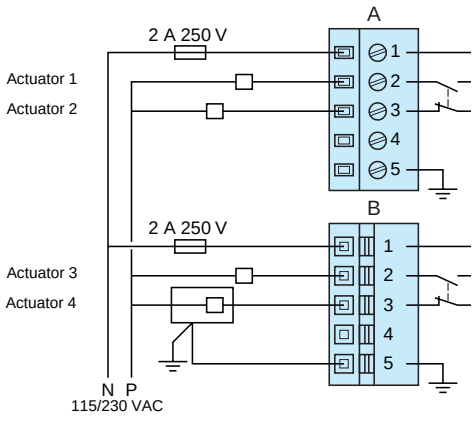
Digital output modules for alternating current

STB DAO 8210

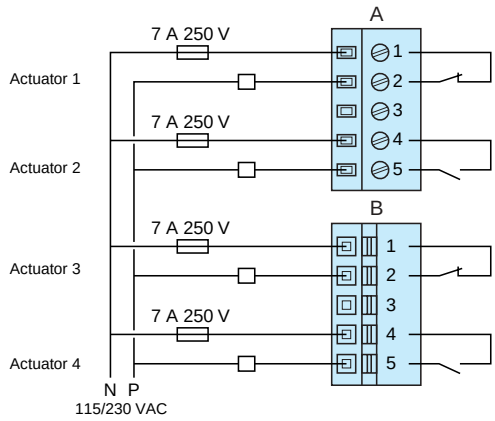


Digital output modules for direct/alternating current (relay)

STB DRC 3210



STB DRA 3290



(1) Actuator protected by external fuse (depending on use).
(2) Actuator protected by fuse on power distribution module (10 A fuse with STB PDT 3100/2100 or 5 A fuse with STB PDT 3105/2105).

Advantys STB Distributed I/O Solution
Analog Input/Output Modules

Applications		**Analog input modules**				
		For voltage			**For current**	
						
Number of channels		2 inputs				
Range		- 10…+ 10 V		0…10 V	0…20 mA	4…20 mA
Resolution		11 bits + sign	9 bits + sign	10 bits	12 bits	10 bits
Load current/channel (outputs)		–				
Response time		5.0 ms for both channels				
Acquisition period		–				
Update time		10 ms for both channels				
Field wiring connector		Two STB XTS 1100 (6-channel) screw-type connectors or two STB XTS 2100 (6-channel) spring-type connectors				
Base		STB XBA 1000				
Power Distribution Modules "PDM" *(1)*	Voltage	24 VDC				
	Part numbers	STB PDT 3100/3105				
Isolation	Field-to-bus	1500 VDC for 1 minute				
	Channel-to-channel	30 VDC (when sensor voltage is separate from logic bus voltage)				
Fallback states		–				
Protection against	Reverse polarity	Yes				
	Short circuit and overload	Yes, time-lag fuse on the Power Distribution Module "PDM"				
	Sensor power	Electronic short-circuit protection (SCP)				
Range		Standard	Basic		Standard	Basic
Module number		**STB AVI 1270**	**STB AVI 1275**	**STB AVI 1255**	**STB ACI 1230**	**STB ACI 1225**
Page		39				

(1) One Power Distribution Module "PDM" is required per voltage group.
(2) Hold last value: reset to 0 V on both channels; go to a predefined value (between 0 V and full scale) on each channel.

	Analog output modules				
For multirange	For voltage			For current	
					
2 inputs	2 outputs				
Thermocouple B, E, J, K, R, S and T "RTD" Pt 100, Pt 1000, Ni 100, Ni 1000, Cu 10 ± 80 mV	-10…+10 V	0…+ 10 V, - 10…+ 10 V	0…10 V	0…20 mA	4…20 mA
15 bits + sign	9 bits + sign	12 bits or 11 bits + sign	10 bits	12 bits	10 bits
–	5 mA			20 mA	
–	3.0 ms plus settling time both channels				
150... 360 ms (depending on the range)	–				
10 ms for both channels	25 ms for both channels				
Two STB XTS 1100 (6-channel) screw-type connectors or two STB XTS 2100 (6-channel) spring-type connectors					
STB XBA 1000					
24 VDC					
STB PDT 3100/3105					
1500 VAC for 1 minute	1500 VDC for 1 minute				
–	30 VDC (when actuator voltage is separate from logic bus voltage)				
–	0 V on 2 channels	*(2)*	0 V on 2 channels	*(2)*	4 mA on 2 channels
Yes					
Yes, time-lag fuse on the Power Distribution Module "PDM"	Recommended user-supplied 2.5 A time-lag fuses on each channel			Yes, time-lag fuse on the Power Distribution Module "PDM"	
–					
Standard	Basic	Standard	Basic	Standard	Basic
STB ART 0200	**STB AVO 1265**	**STB AVO 1250**	**STB AVO 1255**	**STB ACO 1210**	**STB ACO 1225**

Advantys STB Distributed I/O Solution

Analog Input/Output Modules

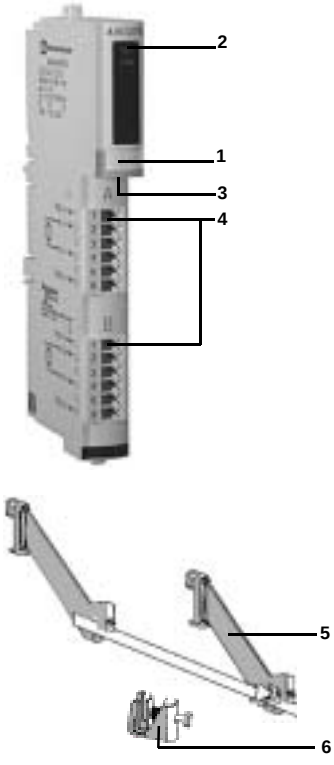
Presentation

The STB analog inputs allow the acquisition of various analog values encountered in industrial applications. The STB analog outputs are used to control analog field devices such as variable speed drives, proportional control valves, etc.

The standard analog I/O offering is defined as follows:
- ■ 3 analog input modules:
  - □ one with 2 ± 10 V, single-ended analog input channels
  - □ one with 2 x 0…20 mA, single-ended analog input channels
  - □ one with 2 thermocouple, “RTD” or mV channels
- ■ 2 analog output modules:
  - □ one with 2 single-ended analog output channels configurable for 0…10 V or ± 10 V
  - □ one with 2 single-ended analog current output channels at 0…20 mA

The basic analog I/O offering is defined as follows:
- ■ 3 analog input modules:
  - □ one with 2 x 0…10 V, single-ended analog input channels
  - □ one with 2 ± 10 V, single-ended analog input channels
  - □ one with 2 x 4…20 mA, single-ended analog input channels
- ■ 3 analog output modules:
  - □ one with 2 x 0…10 V, single-ended analog current output channels
  - □ one with 2 ± 10 V, single-ended analog current output channels
  - □ one with 2 single-ended analog output channels at 4…20 mA

Description



The front panel of a typical analog input/output module features:
1 A location for a user-customizable label
2 A display block showing the state of the module (RDY, ERR with standard module, RDY with basic module)
3 A color-coded module identification stripe
4 Two receptacles for field-wiring connectors

To be ordered separately:
- ■ I/O base width 0.54" (13.9 mm) STB XBA 1000. The base features a location for the user-customizable label.
- ■ Removable screw terminal (6-point) STB XTS 1100 or removable spring terminal (6-point) STB XTS 2100.
- ■ Use of the grounding kit for connecting the cable shielding is compulsory. The grounding kit can also be used to secure cables in installations subject to severe vibration:

5 STB XSP 3000 grounding kit,
6 STB XSP 3010 connectors for cable widths 1.5 to 6 mm^2 or STB XSP 3020 connectors for cable widths 5 to 11 mm^2.

- ■ Mechanical keying pin to insert between:
  - □ the I/O module and this I/O base: STB XMP 7700
  - □ the field wiring connector and this I/O module: STB XMP 7800

to ensure that the I/O module, I/O base and field wiring connector are properly matched
- ■ User-customizable label sheets: STB XMP 7600

Characteristics of analog input modules

Type of input module		STB	AVI 1275	AVI 1270	AVI 1255	ACI 1230	ACI 1225	ART 0200
Type			Basic	Standard	Basic	Standard	Basic	Standard
Number of input channels			2 single-ended analog input channels					2 analog input channels individually configurable for RTD, TC or mV operation
Range			± 10 V		0…10 V	0…20 mA *(1)*	4…20 mA	Pt 100, Pt 1000, Ni 100, Ni 1000 and Cu 10 2, 3 or 4-wire "RTD"
								B, E, J, K, R, S and T thermocouples
								± 80 mV
Resolution		**bits**	9 + sign	11 + sign	10	12	10	15 + sign
Maximum input (without damage)			50 VDC			25 mA, 50 VDC		± 7.5 VDC
Response time		**ms**	5 for both channels					See page 38 for details
Hot swapping supported			Depends on "NIM" *(1)*	Yes	Depends on "NIM" *(1)*	Yes	Depends on "NIM" *(1)*	Yes
Return data format			IEC					
Update time		**ms**	10 for both channels					See page 38 for details
Input filter			Single low-pass filter at a nominal 25 Hz					
Integral linearity			± 0.2% of full scale, typical			± 0.1% of full scale	± 0.2% of full scale	See page 38 for details
Differential linearity			Monotonic					–
Input impedance		Ω	400 K			⩽ 300		–
Current supplied to field device			100 mA per channel (electronic short-circuit protection SCP)					
Source impedance		**kΩ**	1 max.			–		–
Absolute accuracy			± 0.75% of full scale @ 25°C	± 0.5% of full scale @ 25°C				See page 38 for details
Temperature drift			± 0.01% of full scale/°C					See page 38 for details
Isolation	Field-to-bus	**V**	1500 DC for 1 minute					1500 AC for 1 minute
	Field-to-sensor bus	**V**	30 DC rms (when sensor bus is not used for field power)					–
Addressing requirement			2 words (1 data word per channel)	4 words (2 words per channel)	2 words (1 data word per channel)	4 words (2 words per channel)	2 words (1 data word per channel)	2 words (2 per channel + 1 for cold-junction compensation)
I/O base			STB XBA 1000					
PDM requirement	Voltage	**V**	24 DC					
	Model		STB PDT 3100/3105					
Logic bus current consumption @ 5 VDC		**mA**	60					55

(1) If the STB ACI 1230 module is configured with the STB SPU 1000 software, a zero offset can be set, e.g. 4…20 mA.
(2) Basic NIM modules do not support hot swapping of input/output modules.

Detailed characteristics of STB ART 0200 analog input module

Thermocouple range				**B**	**E**	**J**	**K**	**R**	**S**	**T**
Temperature unit				°C or °F (°C by default)						
Nominal values			**°C**	130 ... 1820	-270 ... +1000	-200 ... +760	-270 ... +1370	-50 ... +1665	-50 ... +1665	- 270 ... +400
			°F	266 ... 3200	-328 ... +1832	-328 ... +1400	-454 ... +2498	-58 ... +3029	-58 ... +3029	-328 ... +752
Data resolution				Increments of 0.1 °C or °F						
Broken wire detection				Monitored independently on each channel						
Typical conversion times	With internal cold-junction compensation		**ms**	230 @ 50 Hz 210 @ 60 Hz						
	With external cold-junction compensation		**ms**	400 @ 50 Hz 360 @ 60 Hz						
Accuracy (thermocouple errors not included)	With internal cold-junction compensation	@ 25°C	**°C**	± 4.6	± 4.6	± 5.1	± 4	± 3.6	± 4.1	± 4.4
		@ 60°C	**°C**	± 6.8	± 6.8	± 7.0	± 5.5	± 4.2	± 5.0	± 6.4
	With external cold-junction compensation	@ 25°C	**°C**	± 1.75						
		@ 60°C	**°C**	± 2.85						
	With internal cold-junction compensation	@ 77°F	**°F**	± 8.28	± 8.28	± 9.18	± 7.2	± 6.48	± 7.38	± 7.92
		@ 140°F	**°F**	± 12.24	± 12.24	± 12.6	± 9.9	± 7.56	± 9	± 11.52
	With external cold-junction compensation	@ 77°F	**°F**	± 3.15						
		@ 140°F	**°F**	± 5.18						

Temperature probe range			**Pt 100**	**Pt 1000**	**Ni 100**	**Ni 1000**	**Cu 10**
Type			2, 3 or 4-wire (3-wire by default)				
Temperature unit			°C or °F (°C by default)				
Nominal values	IEC	**°C**	-200 to +850 (by default)		-60 to +180		-100 ... +260
		°F	-328 to +1562 (by default)		-76 to +356		-148 ... +500
	US/JIS	**°C**	-100 ... +450		–		
		°F	-148 ... +842		–		
Data resolution			Increments of 0.1 °C or °F				
Broken wire detection			Monitored independently on each channel				
Max. wiring resistance	4-wire	Ω	50 (IEC/US/JIS)	500 (IEC/US/JIS)	50	500	50
	2 or 3-wire	Ω	20 (IEC/US/JIS)	200 (IEC/US/JIS)	20	200	20
Typical conversion times	3-wire	**ms**	340 @ 50 Hz 300 @ 60 Hz				
	2 or 4-wire	**ms**	200 @ 50 Hz 180 @ 60 Hz				
Accuracy ("RTD" errors not included)	@ 25°C internal	**°C**	± 1		± 1		± 4
	@ 25°C external	**°C**	± 2		± 1		± 4
	@ 77°F internal	**°F**	± 1.6		± 1.6		± 6
	@ 77°F external	**°F**	± 3.6		± 1.6		± 6

mV range			
Range of the scale	**mV**	± 80 (- 81.92 ... + 81.92)
Data resolution		Increments of 0.01 mV
Typical conversion times	**ms**	170 @ 50 Hz 150 @ 60 Hz
Input impedance	**MΩ**	10 typical
Accuracy	@ 25°C/77°F internal	± 0.1% of full scale @ ambient temperature
	@ 25°C/77°F external	± 0.15% of full scale @ ambient temperature

Characteristics of analog output modules

Type of output module		STB	AVO 1265	AVO 1255	AVO 1250		ACO 1225	ACO 1210
Type			Basic		Standard		Basic	Standard
Number of output channels			2 single-ended analog output channels					
Range			± 10 V	0... 10 V	0... 10 V	± 10 V	4... 20 mA	0... 20 mA *(1)*
Resolution		**bits**	9 + sign	10	12	11 + sign	10	12
Maximum output current/channel		**mA**	5		max. 5		20	–
Response time		**ms**	3 plus settling time both channels					
Return data format			IEC					
Update time		**ms**	25 for 2 channels					
Typical conversion times		**µs**	–				900 to ± 0.1% of final value	
Short-circuit protection on the outputs			Yes					
Integral linearity			± 0.1% of full scale typical					
Differential linearity			Monotonic					
Absolute accuracy			± 0.5% of full scale @ 25°C					
Temperature drift			± 0.01% of full scale/°C					
Isolation	Field-to-bus	**V**	1500 DC for 1 minute					
	Field-to-actuator bus	**V rms**	30 DC (when actuator bus is not used for field power)					
Fallback states	Default setting	**V**	0 V on 2 channels				4 mA on 2 channels	Drop to minimum output (0 mA)
	User-configurable setting *(2)*		–		Hold last value; force to a user-specified state		–	Hold last value; force to a user- specified state
Fallback mode			Predefined		User configurable		Predefined	User configurable
Addressing requirement			2 output data words		2 output data words and 2 non-contiguous input data bytes (for status diagnostic modules and channels)		2 output data words	2 output data words plus 1 for the power-down state configurable parameter
I/O base			STB XBA 1000					
PDM requirement	Voltage	**V**	24 DC					
	Model		STB PDT 3100/3105					
Logic bus current consumption @ 5 VDC		**mA**	80					

(1) If the STB ACI 1230 module is configured with the STB SPU 1000 software, a zero offset can be set, e.g. 4…20 mA.
(2) Requires the Advantys configuration software.

Advantys STB
Distributed I/O Solution
Analog Input/Output Modules

STB AVI 1270

STB AVO 1250

STB XBA 1000

STB XSP 3000

STB XSP 3010/3020

References

Standard analog input modules

Input current	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
± 10 V	2	Yes	**STBAVI1270**	0.115
0…20 mA	2	Yes	**STBACI1230**	0.116
Thermocouple, "RTD", ± 80 mV	2	Yes	**STBART0200**	–

Basic analog input modules

Input current	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
- 10…+ 10 V	2	Yes	**STBAVI1275**	0.115
0…10 V	2	Yes	**STBAVI1255**	0.116
4…20mA	2	Yes	**STBACI1225**	–

Standard analog output modules

Output current	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
0... 10 V or ± 10 V	2	Yes	**STBAVO1250**	0.116
0... 20 mA	2	Yes	**STBACO1210**	0.117

Basic analog output modules

Output current	Modularity (no. of channels)	Compliance IEC/EN 61131-2	Reference	Weight kg
-10…+10 V	2	Yes	**STBAVO1265**	0.115
0…10 V	2	Yes	**STBAVO1255**	0.116
4…20mA	2	Yes	**STBACO1225**	–

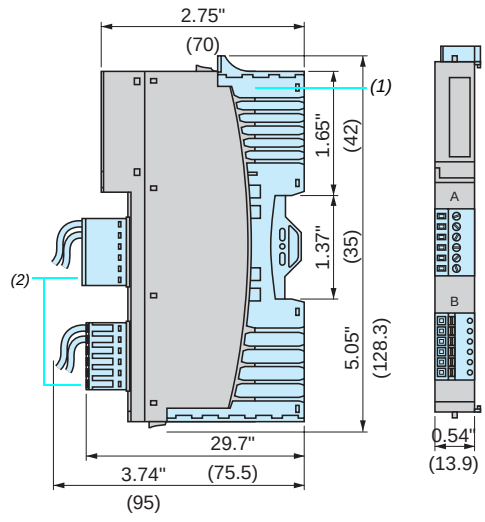
Separate parts

Description	Base width *STB AVO 1250*	For I/O modules		Reference	Weight kg
I/O base	0.54" (13.9 mm)	STB AVI STB ACI STB ART STB AVO STB ACO		**STBXBA1000**	0.024
Description	**Type**	**For I/O modules**	**Sold in lots of**	**Reference**	**Weight kg**
Field wiring connectors (6 points)	Screw-type	STB AVI STB ACI STB ART STB AVO STB ACO	20	**STBXTS1100**	0.006
	Spring-type	STB AVI STB ACI STB ART STB AVO STB ACO	20	**STBXTS2100**	0.006
Description	**Use for**		**Sold in lots of**	**Reference**	**Weight kg**
Grounding kit	Grounding for shielded cables, with 2 parts: 1 bar (1 m) and 2 lateral supports		1	**STBXSP3000**	–
Terminals for grounding kit	Cables (width 1.5...6 mm^2)		10	**STBXSP3010**	–
	Cables (width 5...11 mm^2)		10	**STBXSP3020**	–
Keying pins	Modules		60	**STBXMP7700**	–
	I/O connectors		96	**STBXMP7800**	–
User-customizable label sheets *(1)*	I/O bases and modules		25	**STBXMP6700**	–

(1) A template for the user-customizable label sheets is supplied with the documentation mini-CD-Rom.

Dimensions

STB AVI/ACI/ART/AVO/ACO



Dual Dimensions inches / mm

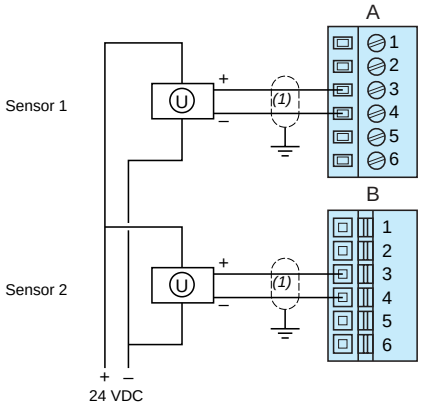
(1) STB XBA 1000 I/O base.
(2) STB XTS 1100/2100 connectors.

Wiring

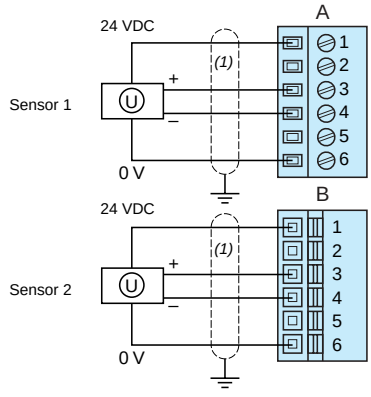
Analog input/output modules

STB AVI 1270

Two isolated analog sensors

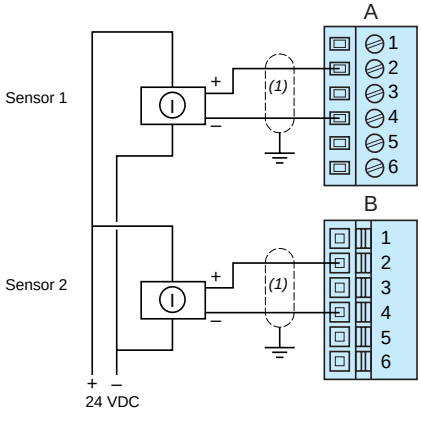


24 VDC from island sensor bus-to-power analog field devices

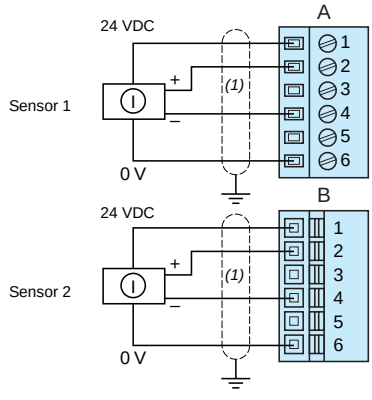


STB ACI 1230

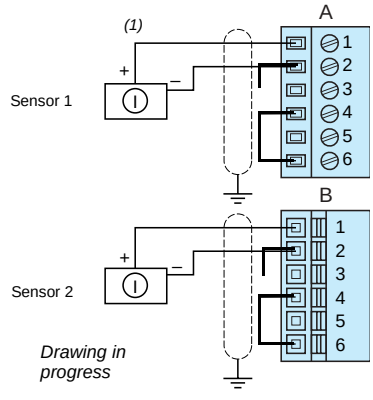
Two isolated analog sensors



24 VDC from island sensor bus-to-power analog field devices



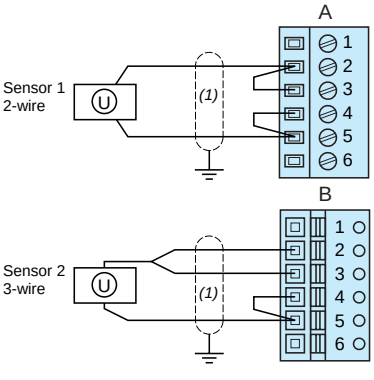
Two analog sensors required a supply loop



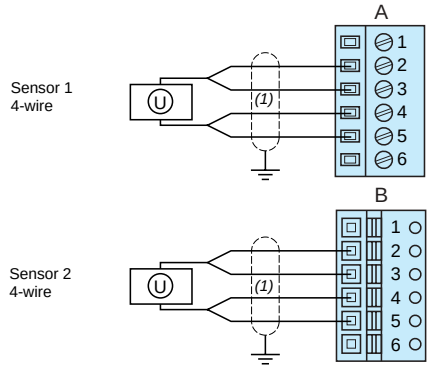
Drawing in progress

STB ART 0200

Wiring of 2-wire and 3-wire “RTD”



Wiring of 4-wire “RTD”

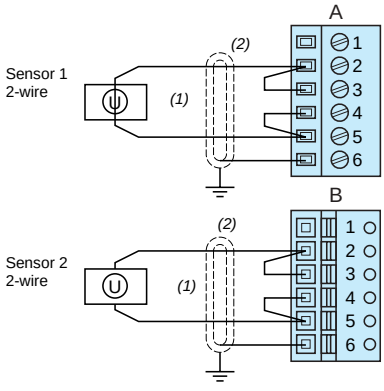


(1) Use of STB XSP 3000 grounding kit with STB XSP 3010/3020 terminals is compulsory.

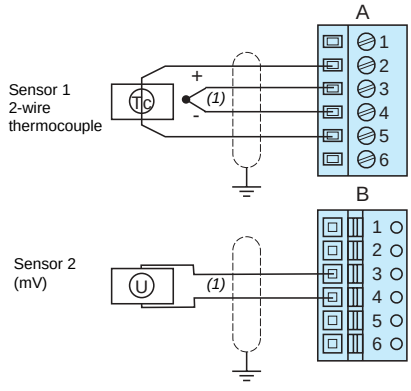
Wiring (continued)

STB ART 2000 (continued)

Wiring of 2-wire "RTD" in high noise operating environments

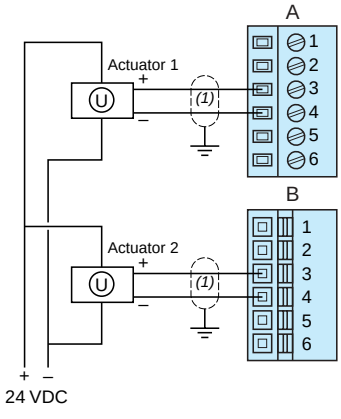


Wiring of 2-wire thermocouple and mV sensor

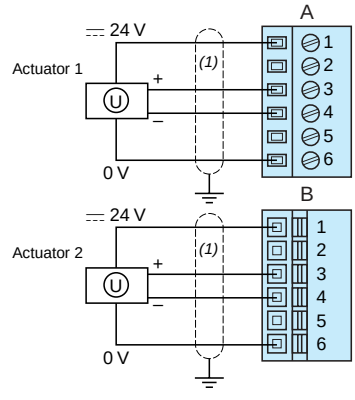


STB AVO 1250

Two isolated analog actuators

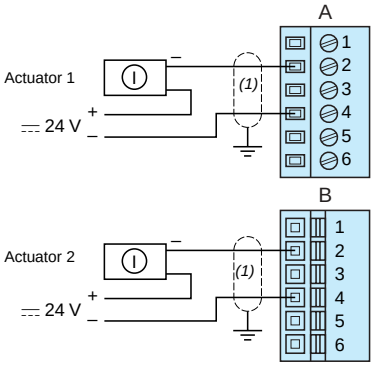


24 VDC from island actuator bus-to-power analog field devices

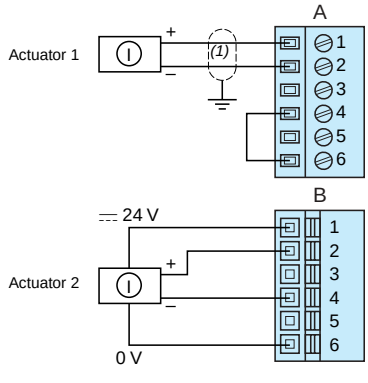


STB ACO 1210

Two isolated analog actuators



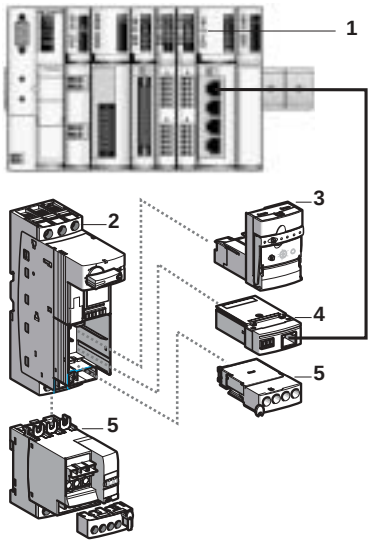
24 VDC from island actuator bus-to-power analog field devices



(1) Use of STB XSP 3000 grounding kit with STB XSP 3010/3020 terminals is compulsory.
(2) Double-shielded cable.

Advantys STB Distributed I/O Solution

Parallel Interface for TeSys U-Line Applications



Presentation

The STB EPI 2145 **1** parallel interface is a component of the Advantys STB distributed I/O system designed for the remote connection of 4 TeSys U-Line starter-controllers (12 inputs and 8 outputs).

Presentation of U-Line starter-controllers

The TeSys U-Line starter-controller is a direct motor-starter which performs the following functions:

- ■ Protects and controls single phase or 3-phase motors:
  - □ disconnecting power
  - □ short circuit and overcurrent protection
  - □ thermal overload protection
  - □ power switching
- ■ Application control:
  - □ protection alarms, application monitoring (amount of time in use, number of faults, motor current values, etc.)
  - □ log

Components of a U-Line starter combined with an STB EPI 2145 module *(1)*

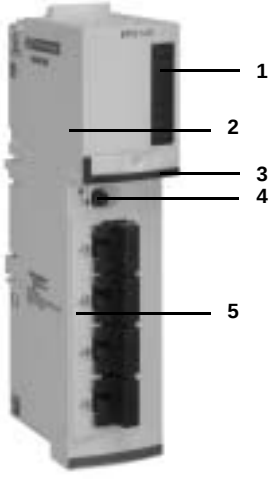
The starter-controller functions are performed by a click-lock adjustment that removes the need for cables;

- ■ on a power base **2**
- ■ a ⎓ 24 V **3** control unit (LUC B/D/C/M ●●BL) for 0.1 to 32 A motors
- ■ a parallel link communication module (LUF C00) **4**
- ■ options (additional contacts, inverter blocks) **5**

Each of the 4 channels of the STB EPI 2145 application-specific module features:

- ■ 2 outputs (starter control and reverse direction control)
- ■ 3 inputs (circuit-breaker status, contactor status, and direction feedback)

(1) TeSys U-Line components: consult our catalog "Starters and basic TeSys® U-Line equipment".



Description

The STB EPI 2145 parallel interface features:

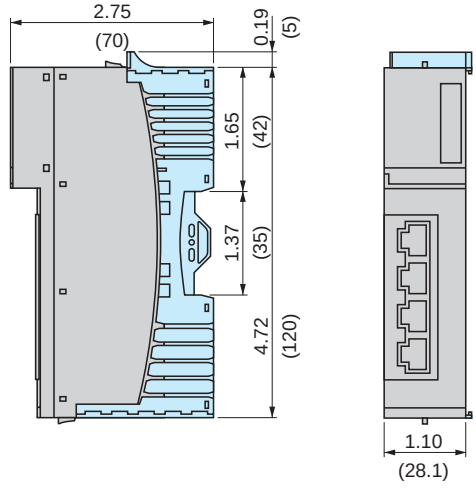
1 A display block with LEDs for the various states of the starter-controllers
2 A location for a user-customizable label
3 A color-coded module identification stripe (black)
4 A selection switch used to view each motor-starter state
5 4 RJ45 connectors for connecting 4 U-Line starter-controllers

To be ordered separately:

STB XBA 3000 base width 1.10" (28.1 mm). Includes a location for user-customizable labels.

Dimensions

STB EPI 2145



Dual Dimensions inches / mm

Advantys STB Distributed I/O Solution

Parallel Interface for TeSys U-Line Applications

Characteristics

Type of module				STB EPI 2145
Hot swapping supported				Yes
Connection				Via 4 RJ45 connectors
Power supply				Via STB PDT 3100/3105 ⎓ 24 V power distribution module
Protection				Via STB PDT 3100/3105 power distribution module fuse
Consumption	On ⎓ 5 V logic bus		**mA**	max. 110
	On ⎓ 24 V sensor bus		**mA**	max. 100
	On ⎓ 24 V actuator bus		**mA**	min. 50 (with all 8 outputs at state 0), 80 mA per output at state 1 (max. 220 mA for 150 ms)
Characteristics of inputs				
Number of inputs				12
Nominal values	Voltage		**⎓ V**	24
Limit values	At state 1	Voltage	**V**	15...30
		Current	**mA**	min. 2
	At state 0	Voltage	**V**	- 3...+ 5
		Current	**mA**	max. 0.5
Protection				Resistor-limited
Characteristics of outputs				
Number of outputs				8
Rated power voltage			**⎓ V**	24
Starter-controller compatibility				TeSys U-Line 12 A (LUB 12 base) and 32 A (LUB 32 base). TeSys bases can be fitted with one of the following ⎓ 24 V control units: - standard LUCA●●BL - advanced LUCB●●BL, LUCC●●BL and LUCD●●BL - multifunction LUCA●●BL
Short circuit and overload protection				Yes, per channel

References

STB XBA 3000

STB EPI 2145

Parallel interface for TeSys U-Line starter-controllers

Power supply type	Voltage	Reference	Weight kg
⎓	24 V	**STBEPI2145**	0.165

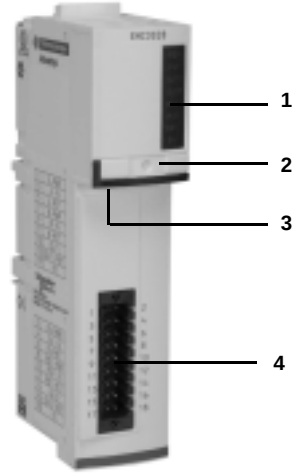
Separate parts

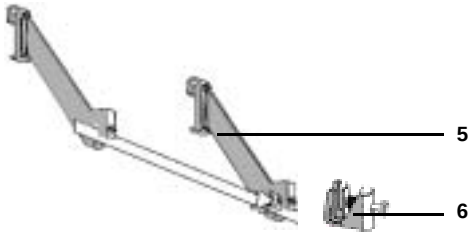
Description	Use	Sold in lots of	Reference	Weight kg
Base 1.10" (28.1 mm)	Application-specific module mounted on DIN rail	–	**STBXBA3000**	0.048
Keying pins	For application-specific module	60	**STBXMP7700**	–
User-customizable label sheets *(1)*	Customization of modules and bases	25	**STBXMP6700**	–

Description	Use	Length	Reference	Weight kg
Connection cables An RJ45 connector at each end	Linking the STB EPI 2145 module to the U-Line starter-controller	0.3 m	**LU9R03**	0.045
		1 m	**LU9R10**	0.065
		2 m	**490NTW00002**	–
		3 m	**LU9R30**	0.125
		5 m	**490NTW00005**	–
		12 m	**490NTW00012**	–

(1) A template for the user-customizable label sheets is supplied with the documentation mini-CD-Rom

Advantys STB Distributed I/O Solution
Counter Module





Presentation

Following operations all require counting parts or events, grouping objects, controlling incoming and outgoing data streams, as well as measuring lengths or positions.

The STB EHC 3020 counter module performs these functions for an Advantys STB automation island (controlled by a master connected to the island) with a maximum counting frequency of 40 kHz.
The STB EHC 3020 module, with 1 counting channel, accepts as input typical ⎓ 24 V sensors: proximity sensors, photo-electric detectors, incremental encoders or mechanical contacts *(1)*.
As output, the module features 2 digital ⎓ 24 V 0.5 A outputs.
The Advantys configuration software is used to select one of the six functions the module can perform.

(1) The counting frequency is limited to 400 Hz with mechanical contacts.

Description

The front panel of the STB EHC 3020 counter module features:
1 A display block with 8 display LEDs:
- RDY LED: module is operational
- FLT LED: steady: module fault; blinking: ⎓ 24 V power distribution fault or output short-circuit (depending on pattern)
- OUT 1 or OUT 2 LEDs: output 1 or 2 active (steady) or short-circuit (blinking)
- IN A, IN B, RST and EN LEDs: status of 4 input channels

2 Location for user-customizable labels
3 Color-coded module identification stripe (black)
4 A connector for an STB XTS 2150 removable spring-type 18-pin connector (must be ordered separately)

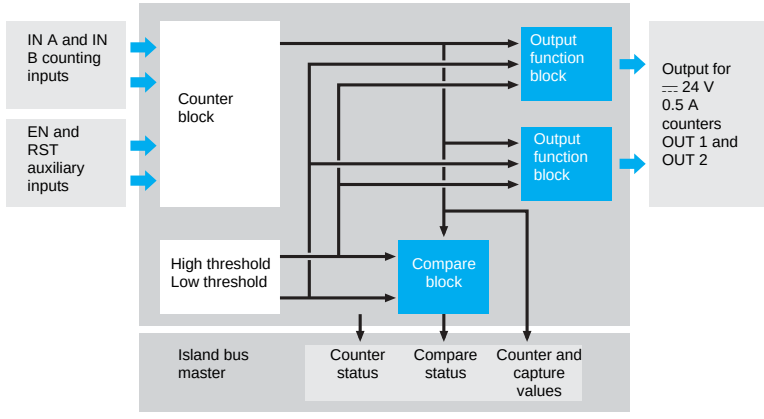
To be ordered separately:
- STB XBA 3000 base width 1.10" (28.1 mm). Includes a location for user-customizable labels.
- STB XTS 2150 removable connector with 18-pin

Use of the grounding kit for connecting the cable shielding is recommended (compulsory for 40 kHz counting):
5 STB XSP 3000 grounding kit
6 STB XSP 3010 connectors for cable widths 1.5 to 6 mm^2 or STB XSP 3020 connectors for cable widths 5 to 11 mm^2

Advantys STB Distributed I/O Solution
Counter Module

Operation

Counter channel block diagram



Depending on the counting function used (see functional characteristics page 47), the I/O for the STB EHC 3020 module are allocated to:
- Input IN A, connected to a sensor.
- Inputs IN B, EN and RST, connected to a sensor or activated by the Advantys STB master via the field bus.

The 16-bit counter value is compared to the two threshold values (configured with the configuration software) and is used to activate the two OUT 1 and OUT 2 outputs, without requiring processing by the bus master controller.
Reports such as the counting value or the two status bits (counter status, compare status) are sent to the bus master controller.

Functional characteristics

Configurable functions	Number	1 of the 6 configurable functions (using the Advantys configuration software)
	Frequency meter	This function measures the frequency received on the IN A input. This frequency is always expressed in Hz (number of pulses per second), with a precision of 1 Hz. Also measures the speed in Units per second. The number of points to be received on the IN A input, corresponding to one unit, must be defined from one up to 255. The maximum frequency on the IN A input is 40 kHz in both cases (without filtering). Response time: < 0.2 s (frequency 2/40 kHz), < 1 s (frequency 0.2 kHz).
	Count events	This function provides the value of the number of pulses received on the IN A input during a selectable time unit. The time unit is configurable: 0.1s, 1s, 10 s or 1 minute. The IN B input can be used to reset the internal time basis which provides the time unit. The maximum number of pulses counted during a time unit is up to 65535. The minimum pulse duration on the IN A input is 10 µs (without filtering). Response time: < 0.5 ms.
	Measure time periods	Measures the elapsed time during an event or between two events (on IN A input) according to the selectable time base of 10 µs, 100 µs or 1 ms. The maximum event duration is 0.655, 6.55, or 65.5 seconds, respectively. The maximum frequency on the IN A input is 200 Hz. Response time: < 0.5 ms.
	Down counting	The IN B input starts or restarts the counter by resetting the set point value defined by the high threshold value. When the counter is running, any pulse received on the IN A input decreases the counter. The counter stops when it reaches 0. The maximum set point value is 65535. The maximum frequency on the IN A input is 40 kHz (without filtering). Response time: < 0.5 ms.
	Loop (modulo) counting	The IN B input starts or restarts the counter by resetting the set point value to 0. The IN B input also triggers the capture of the previous counting value before the counter is reset to 0. When the counter is running, any pulse received on the IN A input increases the counter. The counter turns back to zero automatically when the pulse number received equals the module defined by the high threshold value. The maximum modulo value is 65535. The maximum frequency on the IN A input is 40 kHz (without filtering). Response time: < 0.5 ms.
	Up/down counting	The RST input starts or restarts the counter by resetting the preset value. When the counter is running, counting increases or decreases according to the pulses received on the IN A and IN B inputs (default settings: IN A increases the counter and IN B decreases the counter). By configuration: □ the IN B input can define the counting direction of the pulses received on IN A □ the IN A and IN B inputs can receive the signals of an incremental encoder. The counter value is limited to 0 as low limit and to 65535 as high limit. Response time: < 5 ms
	OUT 1 and OUT 2 output functions	According to requirements, each of the counting module's two outputs can be configured for one of the following operating modes: □ No direct action: the counter status and status words are processed by the island master. □ The output is activated when the counter value is less than the low threshold □ The output is activated when the counter value is between the low threshold and the high threshold □ The output is activated when the counter value is greater than the high threshold □ A pulse is generated on the output when the low threshold is exceeded (when counting down) □ A pulse is generated on the output when the low threshold is exceeded (when counting up) □ A pulse is generated on the output when the high threshold is exceeded (when counting down) □ A pulse is generated on the output when the high threshold is exceeded (when counting up) □ The output is activated when the counter is in RUN mode (only available when counting down) □ The output is activated when the counter is in STOP mode □ The output is activated when the capture value is less than the low threshold (only available for the modulo function) □ The output is activated when the capture value is between the low threshold and the high threshold (only available for the modulo function)

Characteristics

Electrical characteristics

Type of module			STB EHC 3020
Frequency on counting inputs		**kHz**	1 channel max. 40
Hot swapping supported			Yes
Mounting base			STB XBA 3000
PDM (power distribution module) required	Voltage provided	**V**	24
	Reference		STB PDT 3100/3105
Consumption on the logic bus	⎓ 5 V	**mA**	60 typical, 100 max.
Isolation	Between island bus and I/O	⎓ **V**	500

Characteristics of inputs

Input type			Counting inputs (IN A and IN B)	Auxiliary inputs (EN and RST)
Nominal values	Voltage	⎓ **V**	24 (limits 19.2…30 V)	
	Current	**mA**	6	
Limit values	At state 1		⎓ 11…30 V, minimum 2 mA current (at ⎓ 11 V)	
	At state 0		⎓ - 3…5 V, maximum 1.5 mA current	
Logic			Sink	
Filter time	Analog	µs	2.5	25
	Digital	**ms**	None (max. count 40 kHz) *(1)* 0.40 (max. count 1 kHz) 1.20 (max. count 400 kHz)	–

Characteristics of outputs

Output type			OUT 1 and OUT 2 outputs
Rated power voltage		⎓ **V**	24 (limits 19.2…30 V)
Nominal current		**A**	0.5 (1 A per module)
Logic			Positive (by default), positive on 1 or 2 channels, negative on 1 or 2 channels (configurable)
Response time			See functional characteristics, page 47
Leakage current	At state 0	**mA**	max. 0.1
Voltage drop	At state 1	**V**	max. 3
Max. load inductance		**Henry**	0.5 at 4 Hz, or $L = 0.5/I^2 \times F$ where L: load inductance, I: load-in current, and F: switching frequency
Short-circuit and overload protection	Type per channel		By current limiter (1.1 A typical/1.5 A max.) and electronic tripping (manual or automatic reset)
Default fallback positions	Default		Set to 0 state for both channels
	Configured		Maintain at the hold last value, set to state 0 or 1 for each channel

(1) Use of STB XSP 3000 grounding kit with STB XSP 3010/3020 terminals is compulsory.

Advantys STB Distributed I/O Solution
Counter Module

STB XBA 3000

STB EHC 3020

STB XSP 3000

STB XSP 3010/3020

References

Description	Input type	Reference	Weight kg
Counter module 1 channel 40 kHz	2/3 wire ⎓ 24 V detectors Incremental encoder ⎓ 24 V Mechanical contacts	**STBEHC3020**	–

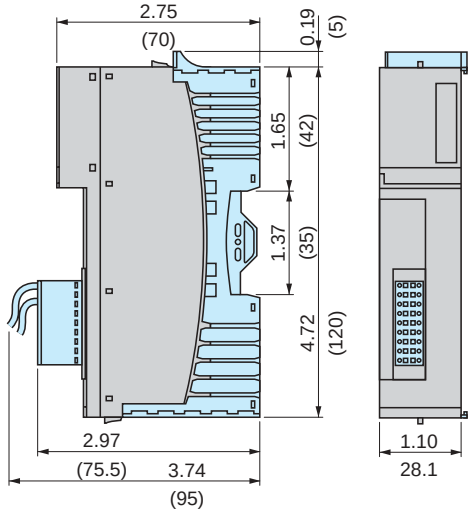
Separate parts

Description	Use for	Sold in lots of	Reference	Weight kg
Base 1.10" (28.1 mm)	Module mounted on DIN rail	–	**STBXBA3000**	–
Removable connector	18-pin spring-type	–	**STBXTS2150**	–
Grounding kit *(1)*	Grounding for shielded cables, with 2 parts 1 bar (1 m) and 2 lateral supports	–	**STBXSP3000**	
Terminals for grounding kit	Cable widths 1.5 to 6 mm²	10	**STBXSP3010**	–
	Cable widths 5 to 11 mm²	10	**STBXSP3020**	–
Keying pins	Counter module	60	**STBXMP7700**	–
User-customizable label sheets *(2)*	Customization of modules and bases	25	**STBXMP6700**	–

(1) Use of STB XSP 3000 grounding kit with STB XSP 3010/3020 terminals is recommended (compulsory for 40 kHz counting).
(2) A template for the user-customizable label sheets is supplied with the documentation mini-CD-Rom.

Dimensions

STB EHC 3020



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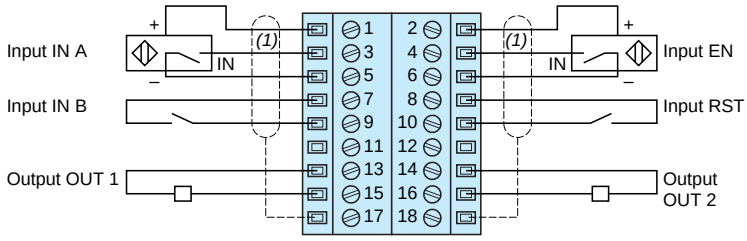
Wiring

Connection to STB XTS 2150 removable terminal block for 18 spring-loaded terminals



Nota : *The ⎓ 24 V power supplies for the sensors and actuators are provided by the STB PDT 3100 power distribution module via the sensor and actuator buses of the Advantys STB island.*

(1) Use of STB XSP 3000 grounding kit is recommended (compulsory for 40 kHz counting).

Advantys STB
Distributed I/O Solution
Configuration Software

Presentation

The configuration process of the standard Advantys STB system *(1)* includes the following steps:

■ If necessary, configure all the standard I/O modules for Advantys STB (digital, analog, and application-specific). Each Advantys STB modules has a default configuration.

■ Configure the reflex functions handled at the island level (with the standard digital and analog I/O modules).

These settings are defined using the STB SPU 1000 dedicated Advantys configuration software.

This program also allows you to:

■ Optimize island performance by giving a priority assignment to processing for certain modules.

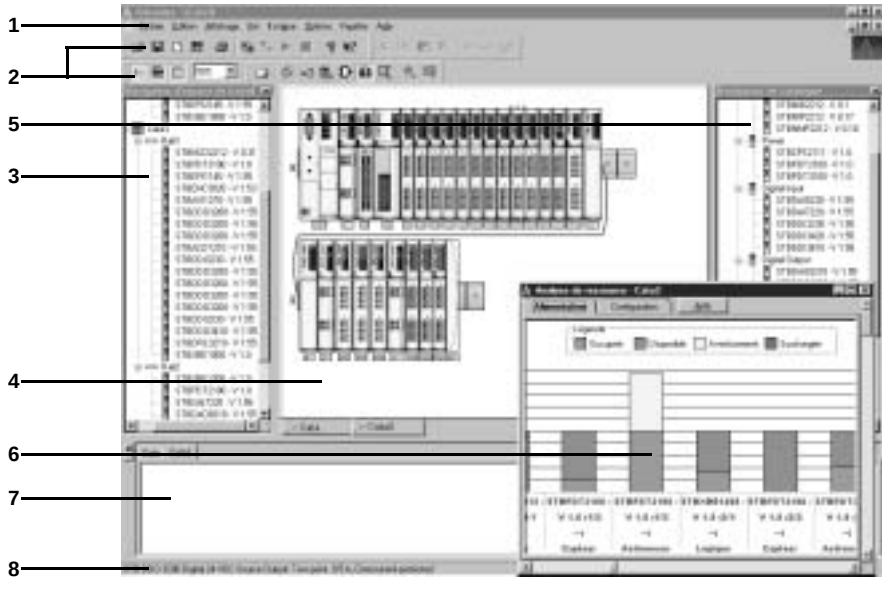
■ Assign mandatory modules (modules whose presence and correct operation are required for the island to operate correctly).

■ Declare in the island, the external CANopen devices (such as Advantys FTB IP67 monobloc I/O splitter boxes, Festo CPV-CO2 electropneumatic valves, other CANopen V4.0 devices validated by Schneider Electric.

■ Check the configuration for compliance and power consumption.

User interface

The main screen of the Advantys STB configuration software gives access to all the available tools in an ergonomic, easy-to-use fashion.



This main screen provides a general view comprising several windows and toolbars that can be moved about the screen:

1 Menu bar, giving access to all functions

2 Toolbar containing icons used for direct access to editors and the most frequently used functions

3 Application browser, for browsing the various islands and segments of each island

4 Main window for viewing islands and segments. By selecting a module, you can access the following editors:

- Module Editor
- Reflex Action Editor
- Power supply and memory resource analysis
- Overview of the I/O image
- Diagnostics

The last two items are available only if the island is online.

5 Catalog browser for all the Advantys STB components, sorted by category (networks, power supply, digital I/O, etc.)

6 Power supply and memory resource analysis window

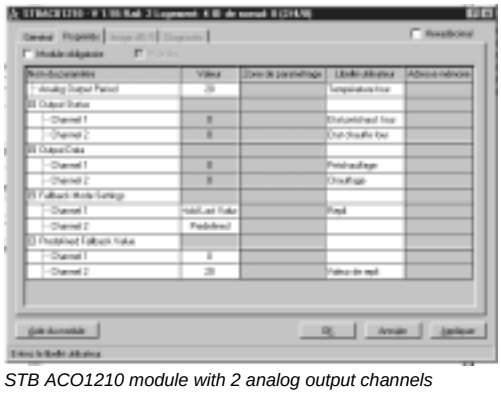
7 Log window displaying the results of operations performed by the configuration software during a work session on an island

8 Status bar

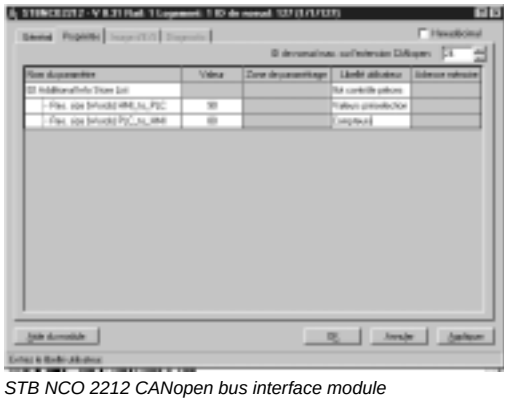
(1) Basic modules cannot be configured (default parameters are used).

Advantys STB
Distributed I/O Solution
Configuration Software

CANopen bus interface NIM module



STB ACO1210 module with 2 analog output channels



STB NCO 2212 CANopen bus interface module

Functions

Module Editor

The editor gives access to 4 tabs, depending on the way in which the island is connected to the network or fieldbus: General, Properties, I/O Image and Diagnostics.

“General” tab

This read-only tab (island online or offline), provides general information and displays the key technical characteristics of the selected module.

“Properties” tab

This tab, accessible when the island is offline, contains the operating settings for the selected module, some of which can be changed by the user. Among other things, you can:

■ Select the display format for parameters: decimal or hexadecimal.
Identify a module as “mandatory”. That module is then designated as critical for island operations. If the module fails or is not present, the island will no longer be operational (it will stop).

■ Declare the scanning priority for the digital input modules. This allows you to assign more frequent scanning to up to 10 modules per island, so that they will be considered as “fast” modules.

■ Configure the module. The configurable items (cells with white backgrounds) depend on the type of I/O module. Depending on the type of module, the main parameters are:

□ user label assignment: free text field, max. 50 characters

□ digital input modules: filter time and choice of positive or negative logic for each channel

□ digital output modules, the behavior upon short-circuit or overload (manual or automatic reset), the choice of positive or negative logic for each channel, the default fallback position for each channel (0 or 1 state)

□ analog input modules, with the offset and scaling for each channel

□ analog output modules, with the refresh rate and the default fallback position (hold the value or assume a predefined value) for each channel

□ application-specific modules for TeSys U-Line motor-starters, the choice of positive or negative logic for each channel, the behavior upon short-circuit or overload (manual or automatic reset), and the default fallback position for each channel (0 or 1 state)

□ counter module, the definition of the counting function and its operation, see page 46

□ network interface modules, the amount of memory reserved for data exchanges with the Operator Terminal (directly connected to the network interface module). This data is also accessible by the island's master device. If an Advantys STB island has a CANopen extension, a parameter allows you to define the address of the last standard CANopen device connected to the island.

Online help for the selected module can be displayed to show the limits and operating values of these parameters.

Functions (continued)

"I/O Image" tab

This tab, accessible when the island is online, provides a table with data concerning the:

- Input/output modules comprising the Advantys STB island (values and state of each module).
- Operator Terminal connected to the network interface module. The length of this field (defined in the "Properties" tab of the network interface module) equals the maximum total size of the image table, less the words occupied by the image of the I/O modules.

The total size of the I/O image table depends on the type of the network interface module. These I/O images can be displayed in two views:

- Field bus or network view: each protocol transfers its data in a specific format.
- Internal island bus view: the Modbus protocol is used.

"Diagnostics" tab

This tab allows the user to perform diagnostics for the island connected to the PC terminal where the Advantys Configuration Software resides.

Analysis of the island's memory and power resources

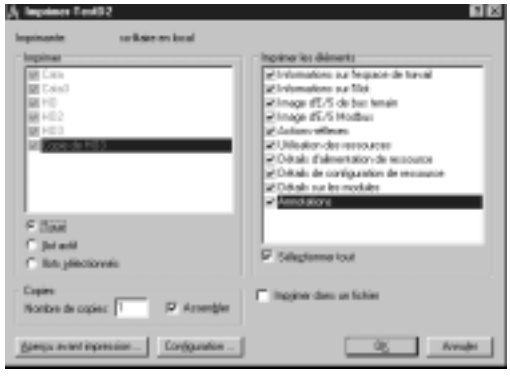
At any time during the configuration process, you can consult the following information as a percentage:

- The power consumption at various voltages:
  - ⎓ 5 V logic provided by the STB N● network interface module,
  - ⎓ 5 V logic provided by the STB XBE 1200 BOS extension module,
  - ⎓ 5 V logic provided by the STB CPS 2111 auxiliary power supply,
  - ⎓ 24 V provided by the STB PDT 3100/3105 power distribution module(s),
  - ∿ 115/230 V provided by the STB PDT 2100/2105 power distribution module(s),
- The usage of the memory integrated in the network interface module:
  - image field for inputs and outputs,
  - settings field for the island configuration data and reflex functions,
  - field dedicated to operator dialog.

Downloading configuration data

The software enables bi-directional transfer of configuration data:

- From the PC to the RAM and Flash memory of the island network interface module in order to make the island operational. If the network interface module includes the STB XMP 4440 32 KB removable memory card, data is written to the card, providing a backup.
- From the NIM interface module to the PC.



Importing/exporting EDS files

When the island includes standard CANopen devices, you must use the software to import the description of those devices contained in the EDS files into the catalog database.
Conversely, those descriptions may be exported to the master in the case of a CANopen, Profibus DP, INTERBUS or DeviceNet bus.

Printing

The Printing mode allows you to select the islands and topics to be printed. You can also print to a file in PDF or RTF format.

Functions (continued)

Reflex Functions Editor

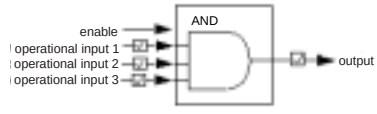
For applications requiring short response times (< 3 ms), the Advantys STB Configuration Software allows you to create reflex functions that work directly on the island output modules, thereby freeing the island master from parsing and processing them. These reflex functions can be associated with “priority” I/O modules to ensure the reliability of the response time.

An Advantys STB island can call up to 10 reflex functions. These functions are created from blocks whose inputs are activated by digital or analog input channels and whose results activate a digital or analog output channel. You can nest two reflex functions.

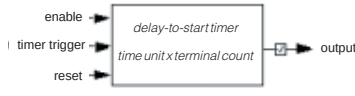
Reflex types and function blocks

Various types of function blocks are available:

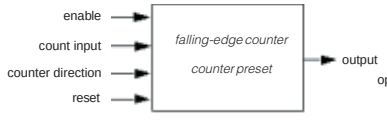
Boolean logic function blocks: XOR block, AND blocks with 3 inputs and 1 output



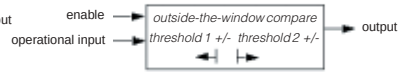
Timer/monostable blocks: when working, when idle, upon activation, and upon deactivation



Rising/falling edge counting function blocks: on rising or falling edge, from 0 to 65,535

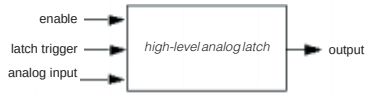


Compare function blocks on signed integers (-32,768 to 32,767): i <, i >, < i >, i < and i >



Digital Latch function blocks: on state 0 or 1 or on rising or falling edge, memorize state 0 or 1

Analog Latch function blocks: on state 0 or 1 or on rising or falling edge, memorize the signed integer (0 to 65,535) or unsigned integer (-32,768 to 32,767)



References

The multilingual Advantys STB Configuration Software is compatible with the following operating systems: Windows 98 (second edition SE), Windows NT 4.0 (service pack ≥ 6), Windows 2000 (service pack ≥ 1) and Windows XP. It includes online help *(1)* and is provided with an **STB XCA 4002** cable to connect the NIM to the PC (length 2 m).

Description	Use	Reference	Weight kg
Advantys Configuration Software	Single workstation	**STBSPU1000**	–

Replacement parts

Cable to connect the PC to the network interface module “NIM”	Length 2m	**STBXCA4002**	–

(1) Multilingual: English, French, German, Spanish and Italian.

STB SPU 1000

Advantys STB
Distributed I/O Solution
Phaseo Regulated Power Supplies

2/3 A power supply

5 A power supply

10 A power supply

ABL7 power supplies

The ABL7 range of power supplies is designed to provide the DC voltage required by the control circuits of automation system equipment. Split into three sizes, this range meets all the needs encountered in industrial, commercial and residential applications.
Single-phase or 3-phase *(1)*, of the electronic switch mode type, they provide a quality of output which is suitable for the loads supplied and compatible with the mains supply available in the equipment. Clear guidelines are given on selecting protection devices which are often used with them, thus providing a comprehensive solution which can be used in total safety.

Phaseo switch mode power supplies

These switch mode power supplies are totally electronic and regulated. The use of electronics makes it possible to significantly improve the performance of these power supplies which offer:
- compact size
- integrated overload, short-circuit, overvoltage and undervoltage protection
- a very wide range of permissible input voltages, without any adjustment required
- a high degree of output voltage stability
- good performance
- LED indicators on the front panel

Phaseo power supplies are available in single-phase and 3-phase versions *(1)*. They deliver a voltage which is precise to 4%, whatever the load and whatever the type of supply, within a range of 85 to 264 V for single-phase, or 360 to 550 V for 3-phase. Conforming to IEC standards and UL and CSA certified, they are suitable for universal use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required.
ABL7 RE and ABL7 RP supplies are also equipped with an output undervoltage control which causes the product to trip if the output voltage drops below 19 V, in order to ensure that the voltage delivered is always usable by the actuators being supplied. All the products are fitted with an output voltage adjustment potentiometer to compensate for any line voltage drops in installations with long cable runs. Most of our power supplies are designed for direct mounting on 35 and 75 mm ⊔ rails.

The single-phase power supplies referenced in this catalog are specially adapted to tie-up with the Advantys STB modules (Network Interface Modules and Power Distribution Modules):
- Universal single-phase supplies **ABL7RE**:
  - power between 48 W (2 A) and 240 W (10 A)
  - compact size
  - for all machine equipment
- suitable for use in automation system environments based on any Modicon platforms requiring a ⎓ 24 V supply.
- Universal single-phase supplies **ABL7RP**:
  - power between 60 W (3 A) and 240 W (10 A)
  - output voltage available: ⎓ 12, 24 and 48 V
  - input filter (PFC) for commercial and residential environments (conforming to standard EN 61000-3-2)
  - two operating modes possible for handling of overload and short-circuit faults:
    - "AUTO" mode which provides automatic restarting of the power supply on elimination of the fault
    - "MANU" mode which requires manual resetting of the power supply to restart. Resetting is achieved by switching off the power supply.

(1) For 3-phase power supplies, consult our catalog "Automation and control - Interfaces, I/O splitter boxes and power supplies".

For other Phaseo power supplies, refer to the Square D Digest, page 21-35, or to catalog 8440CT0001R4/04.

Using ⎓ 24 V

■ Using ⎓ 24 V enables so-called protection installations (PELV) to be built. Using PELV is a measure designed to protect people from direct and indirect contact. Measures relating to these installations are defined in publication NF C 12-201 and in standard IEC 364-4-41.

■ The application of these measures to the electrical equipment in machines is defined in standard NF EN 60204-1 and requires:
□ that the voltage used is below 60 V DC in dry environments and below 30 V in damp environments,
□ the connection of one side of the PELV circuit, or one point of the source, to the equipotential protection circuit associated with higher voltages,
□ the use of switch gear and control gear on which measures have been taken to ensure “safety separation” between power circuits and control circuits.

■ A safety separation is necessary between power circuits and control circuits in PELV circuits. Its aim is to warn of the appearance of dangerous voltages in ⎓ 24 V safety circuits.

■ The reference standards involved are:
□ IEC 61558-2-6 and EN 61558-2-6 (safety transformers),
□ IEC 664 (coordination of isolation).
Telemecanique power supplies meet these requirements.

■ Moreover, to ensure that these products will operate correctly in relation to the demands of their reinforced isolation, it is recommended that they be mounted and wired as indicated below:
□ they should be placed on a grounded mounting plate or rail,
□ they should be connected using flexible cables, with a maximum of two wires per connection, and tightened to the nominal torque,
□ conductors of the correct insulation class must be used.

■ If the DC circuit is not connected to an equipotential protection conductor, an earth leakage detector will indicate any accidental insulation faults.

Operating voltage

■ The permissible tolerances for the operating voltage are listed in publications IEC 1131-2 and DIN 19240.

■ For nominal voltage Un = ⎓ 24 V, the extreme operating values are from -15% to +20% of Un, whatever the supply fluctuations in the range -10% to +6% (defined by standard IEC 38) and load variations in the range 0-100% of In.

All Telemecanique ⎓ 24 V power supplies are designed to provide a voltage within this range.

■ It may be necessary to use a voltage measurement relay to detect when the normal voltage limits are being exceeded and to deal with the consequences of this.

Advantys STB
Distributed I/O Solution
Phaseo Regulated Power Supplies

Selection of power supplies

The characteristics to be taken into account when selecting a power supply are:
- The required output voltage and current.
- The supply voltage available in the installation.

This may however result in several products being selected as suitable.
Other selection criteria must therefore be taken into account.

There are 3 possible power supply options for Advantys STB modules:
- Option 1: a single power supply for the network interface module, sensors and actuators. Advantages: simple and low-cost.
- Option 2: 2 power supplies, 1 for the network interface module and 1 for the sensors/actuators. Advantage: separation of the bus and fieldbus.
- Option 3: 3 power supplies, 1 for the network interface module, 1 for the sensors and 1 for the actuators. Advantage: suitable for applications demanding minimum interference at the inputs

See power supply combination table on page 61).

The quality of the power supply

The Phaseo range is the ideal solution because it ensures precision to 3% of the output voltage, whatever the load current and the input voltage. In addition, the wide input voltage range of Phaseo power supplies allows them to be connected to all supplies within the nominal range, without any adjustment required.
The Phaseo RP family can also be connected to ⎓ 110 and 220 V supply.

Harmonic pollution (power factor)

The current drawn by a power supply is not sinusoidal. This leads to the existence of harmonic currents which pollute the supply voltage. European standard EN 61000-3-2 limits the harmonic currents produced by power supplies. This standard covers all devices between 75 W and 1000 W, drawing up to 16 A per phase, and connected directly to the power supply. Devices connected downstream of a private, low voltage, general transformer are therefore excluded.

Regulated switch mode supplies always produce harmonic currents; a filter circuit (Power Factor Correction or PFC) must therefore be added to comply with standard EN 61000-3-2.
Phaseo ABL7RP power supplies conform to standard EN 61000-3-2 and can therefore be connected directly to public power supplies.

Electromagnetic compatibility

Levels of conducted and radiated emissions are defined in standards EN 55011 and EN 55022.
All products in the Phaseo range have class B certification and can be used without any restrictions due to their low emissions.

Behavior in the event of short-circuits

Phaseo power supplies are equipped with an electronic protection device. This protection device resets itself automatically on elimination of the fault (around 1 second for ABL7RE/RP), which avoids having to take any action or change a fuse.
In addition, the Phaseo ABL7RP ranges allow the user to select the reset mode in the event of a fault:
- in the “AUTO” position, resetting is automatic,
- in the “MANU” position, resetting occurs after elimination of the fault and after switching the power off and back on.

This feature allows Phaseo ABL7RP power supplies to be used in installations where the risks associated with untimely restarting are significant.

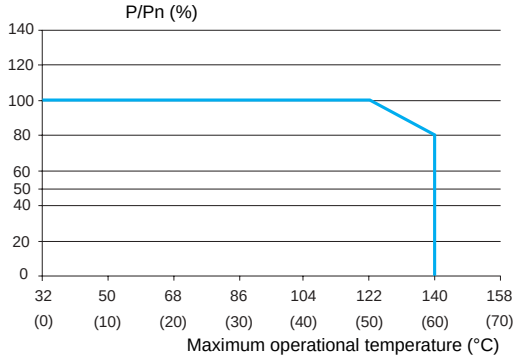
Selection of reset mode

Reset mode is selected by the microswitch on the front panel of the product.

Technical characteristics

Type of power supply				ABL7RE	ABL7RP
Approvals				UL, CSA, TÜV, CTick, CE	
Conforming to standards	Safety			UL 508, CSA 22.2 no. 950	
	EMC			EN 50081-1, IEC 61000-6-2 (EN 50082-2)	
	Low frequency harmonic currents			–	EN 61000-3-2
Input circuit					
LED indication				Orange LED	Orange LED
Input voltages	Rated values		**V**	∿ 100…240	∿ 100…240, ⎓ 110…220 compatible *(1)*
	Permissible values		**V**	∿ 85…264 single-phase	∿ 85…264, ⎓ 100…250 compatible *(1)*
	Permissible frequencies		**Hz**	47…63	
	Efficiency at nominal load			> 85%	
	Current consumption	Ue = 240 V	**A**	0.7 A (48 W)/0.9 A (72 W) 1.4 A (120 W)/2.5 A (240 W)	0.5 A (60 W)/0.5 A (72 W)/0.7 A (120 W) 0.7 A (144 W)/1.4 A (240 W)
		Ue = 120 V	**A**	1.13 A (48 W)/1.57 A (72 W) 2.44 A (120 W)/4.35 A (240 W)	0.78 A (60 W)/0.87 A (72 W) / 1.39 A (120 W) 1.39 A (1144 W)/2.78 A (240 W)
	Current at switch-on		**A**	< 30	
	Power factor			0.65 approx.	0.98 approx.
Output circuit					
LED indication				Green LED	Green LED
Nominal output voltage (U out)			**V**	⎓ 24	12, 24 and 48
Nominal output current			**A**	2/3/5/10	3/5/10
Accuracy	Output voltage			Adjustable from 100 to 120 %	
	Line and load regulation			± 3 %	
	Residual ripple - interference		**mV**	< 200 (peak-peak)	
Micro-breaks	Holding time at I max and Ve min		**ms**	> 10	> 20
Temporary overloads	Permissible inrush current (U out >19V)			See page 60	
Protection against	Short-circuits			Permanent/automatic restart	Permanent/automatic restart or restart after switching off mains power
	Overload			1.1 In	
	Overvoltage			Tripping if U > 1.5 Un	
	Undervoltage			Tripping if U < 0.8 Un	
Operational and environmental characteristics					
Connections	Input		**AWG (mm)²**	2 - # 14 (2 x 2.5 + ground)	
	Output		**AWG (mm²)**	2 - # 14 (2 x 2.5 + ground), multiple output, depending on model	
Tightening torque			**lb-in (N•m)**	5.4 (0.6)	
Ambient conditions	Storage temperature		**°F (°C)**	-13 to +158 (- 25… + 70)	
	Operating temperature		**°F (°C)**	-32 to +140 (0… + 60) derating as from 122°F (50°C), mounted vertically	
	Max. relative humidity			95% without condensation	
	Degree of protection			IP 20 conforming to IEC 60529	
	Vibrations			Conforming to EN 61131-2	
Operating position				Vertical	
MTBF at 40°C				> 100,000 h	
Connections	Series			Possible	
	Parallel			Possible, max. temperature 122 °F (50°C)	
Dielectric strength	Input/output			3000 V/50 and 60 Hz 1 minute	
	Input/ground			3000 V/50 and 60 Hz 1 minute	
	Output/ground (and output/output)			500 V/50 and 60 Hz 1 minute	
Input fuse incorporated				Yes, internal, not replaceable	
Disturbance				EN 50081-1	
	Conducted			EN 55011/EN 55022 cl.B	
	Radiated			EN 55011/EN 55022 cl.B	
Immunity				IEC 61000-6-2 (generic)	
	Electrostatic discharge			EN 61000-4-2 (4 kV contact/8 kV air)	
	Electromagnetic			EN 61000-4-3 lev.3 (10 V/m)	
	Conducted interference			EN 61000-4-4 lev.3 (2 kV), EN 61000-4-5, EN 61000-4-6 lev.3, EN 61000-4-8 lev.4	
	Mains interference			EN 1000-4-11 (voltage drops and cuts)	

(1) Compatible input voltage, not indicated on the product.



Derating

The ambient temperature is a determining factor which limits the power that an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced. Conversely, a power supply can deliver more than its nominal power if the ambient temperature remains largely below the rated operating temperature.
The rated ambient temperature for Phaseo power supplies is 50°C. Above this, derating is necessary up to a maximum temperature of 60°C.
The adjacent graph shows the power P (in relation to the nominal power Pn) which the power supply can deliver continuously, according to the ambient temperature (in a vertical position).
Derating should be considered in extreme operating conditions:

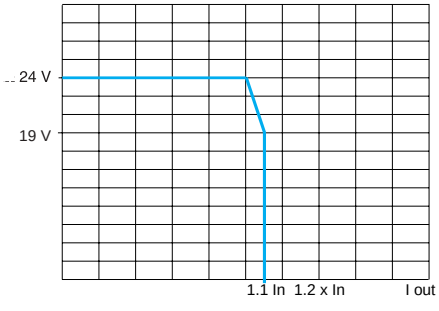
- Intensive operation (output current permanently close to the nominal current, combined with a high ambient temperature).
- Output voltage set above 24 V (to compensate for line voltage drops, for example).
- Parallel connection to increase the total power.

General rules to be complied with

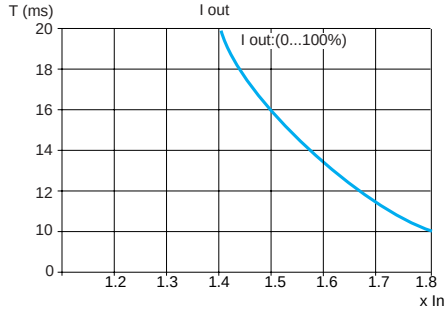
Intensive operation	See derating on above graph. Example for ABL7RE: □ without derating, from 0°C to 50°C, □ derating of nominal current by 2%, per additional °C, up to 60°C.
Rise in output	The nominal power is fixed. Increasing the output voltage means that the current delivered must be reduced.
Parallel connection to increase the power	The total power is equal to the sum of the power of the power supplies used, but the maximum ambient temperature for operation is 50°C. To improve heat dissipation, the power supplies must not be in contact with each other.

In all cases, there must be adequate convection round the products to ensure easier cooling. There must be a clear space of 50 mm above and below Phaseo power supplies and of 15 mm at the sides.

Load limit



Temporary overloads



ABL7RE and ABL7RP power supplies: protection of the power supply line

Type of mains supply	∿ 115 V single-phase			∿ 230 V single-phase		
Type of protection	Thermal-magnetic circuit-protectors		gG fuse	Thermal-magnetic circuit-protectors		gG fuse
	GB2	C60N		GB2	C60N	
ABL7RE2402	GB2 ●B07	MG24517 *(1)*	2 A	GB2 DB06	MG24517 *(1)*	2 A
ABL7RE2403	GB2 ●B07	MG24517 *(1)*	2 A	GB2 DB06	MG24518 *(1)*	2 A
ABL7RE2405	GB2 ●B08	MG24518 *(1)*	4 A	GB2 DB07	MG24518 *(1)*	2 A
ABL7RE2410	GB2 ●B12	MG17454 *(1)*	6 A	GB2 DB08	MG24516 *(1)*	4 A
ABL7RP2403	GB2 ●B07	MG24517 *(1)*	2 A	GB2 DB07	MG17453 *(1)*	2 A
ABL7RP2405	GB2 ●B07	MG24517 *(1)*	2 A	GB2 DB07	MG24516 *(1)*	2 A
ABL7RP2410	GB2 ●B09	MG24519 *(1)*	4 A	GB2 DB07	MG24516 *(1)*	2 A

(1) UL listed circuit protector.

Combinations of Phaseo single-phase power supplies with STB modules

Type of Advantys STB modules		Network interface module "NIM" STB N●● 2212/1010 BOS bus extension module STB XBE 1200 Auxiliary power supply STB CPS 2111	Power distribution module "PDM" STB PDT 3100/3105 *(1)*	
			Sensors	Actuators
Installation for Advantys STB with	**1 power supply**	ABL7RP2410 (10 A)		
	2 power supplies	ABL7RE/RP2402 (2 A)	ABL7RP2410 (10 A)	
	3 power supplies	ABL7RE/RP2402 (2 A)	ABL7RE/RP2405 (5 A)	ABL7RP2410 (10 A)

(1) STB PDT 3105 basic "PDM", installation only with 1 or 2 power supplies.

If the nominal current values for Phaseo power supplies are exceeded, multiple power supplies can be used to power "NIM", "BOS", "CPS" and "PDT" modules in accordance with the above rules (1, 2 or 3 power supplies).

Note:
- ⎓ 24 V power supply. The input current is:
  - Network Interface Module "NIM" STB N●●: 0.4 A
  - BOS bus extension module STB XBE 1200: 0.3 A
  - Auxiliary power supply STB CPS 2111: 0.3 A
- Power Distribution Modules. The maximum current is:
  - STB PDT 3100 for sensors: 4 A @ 30°C, 2.5 A @ 60°C
  - STB PDT 3100 for actuators: 8 A @ 30°C, 5 A @ 60°C
  - STB PDT 3105 for sensors/actuators: 4 A @ 30°C, 2.5 A @ 60°C
- ABL 7RE power supply: built-in auto-protect with auto-reset
- ABL 7RP power supply: built-in auto-protect with auto-reset or manual reset. EN 61000-3-2 compliant.

References *(1)*

ABL7RE2405
ABL7RP2405

ABL7RE single-phase regulated switch mode power supplies

Input voltage 47...63 Hz V	Output voltage ⎓ V	Nominal power W	Nominal current A	Auto-protect reset	Conforming to standard EN 61000-3-2	Reference	Weight kg
∿ 100…240 single-phase wide range	24	48	2	auto	no	**ABL7RE2402**	0.520
		72	3	auto	no	**ABL7RE2403**	0.520
		120	5	auto	no	**ABL7RE2405**	1.000
		240	10	auto	no	**ABL7RE2410**	2.200

ABL 7RP single-phase regulated switch mode power supplies

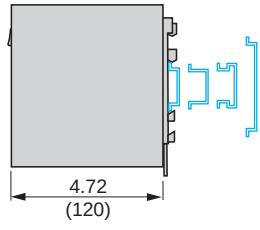
Input voltage 47...63 Hz V	Output voltage ⎓ V	Nominal power W	Nominal current A	Auto-protect reset	Conforming to standard EN 61000-3-2	Reference	Weight kg
∿ 100...240 single-phase wide range ⎓ 110...220 *(2)*	24	72	3	auto/man	yes	**ABL7RP2403**	0.520
		120	5	auto/man	yes	**ABL7RP2405**	1.000
		240	10	auto/man	yes	**ABL7RP2410**	2.200

(1) For other Phaseo power supplies, refer to Square D Digest, page 21-35, or catalog 8440CT0001R4/04.
(2) Compatible input voltage, not indicated on the product.

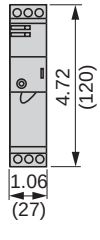
Dimensions

ABL7RE24●●/ABL 7RP24●●

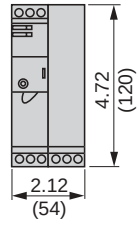
Common side view
Mounting on 35 and 75 mm rails



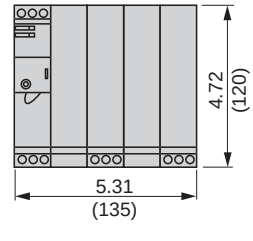
ABL7RE2402/2403
ABL7RP2403



ABL7RE2405
ABL7RP2405



ABL7RE2410
ABL7RP2410



In some countries, certification of certain electrical components is enforced by law. A standard conformity certificate is then issued by the official organization. Each certified product must carry approval symbols when enforced.
Use on board merchant navy vessels generally requires prior approval (= certification) of an electrical device by certain marine classification authorities.

Key	Certification body	Country
CSA	Canadian Standards Association	Canada
C-Tick	Australian Communication Authority	Australia
UL	Underwriters Laboratories	USA
Key	**Classification authority**	**Country**
ABS	American Bureau of Shipping	USA
BV	Bureau Veritas	France
DNV	Det Norske Veritas	Norway
GL	Germanischer Lloyd	Germany
GOST	Institut de recherche Scientifique Gost Standardt	C.I.S., Russia
LR	Lloyd's Register	United-Kingdom
RINA	Registro Italiano Navale	Italy
RMRS	Register of Shipping	C.I.S.

The table below shows the situation as of the 01.07.2004 for certifications obtained or pending from organizations for base PLCs. An overview of certificates for Telemecanique products is available on our Internet web site:
www.telemecanique.com

Product certifications

Certified
Pending certification

		Certifications					
		UL	**CSA**	C-Tick **ACA**	**SIMTARS**	**GOST**	**Hazardous locations** Class 1 Div 2 *(1)*
		USA	Canada	Australia	Australia	CEI, Russia	US
Advantys STB							FM
ConneXium							*(2)*
Lexium MHD/BPH							
Magelis iPC							
Magelis XBT-F/FC							
Magelis XBT-G/H/P/E/HM/PM							
Momentum							
Premium	**PL7**						CSA
	Unity						CSA
Quantum	**Concept**						FM
	Unity						FM
TBX							
Telefast 2							
TSX Micro							
TSX/PMX 47 à 107							
Twido		*(3)*					
Twin Line							

(1) ***Hazardous locations****: CSA 22.2 no. 213, certified products are suitable for use in Class I, division 2, groups A, B, C and D or non-hazardous locations only.*
(2) Depending on the product, consult our Regional Sales Office.
(3) cULus north-american certification (Canada and US).

Local certifications		
BG	Germany	TSX DPZ 10D2A safety module (TSX Micro) TSX PAY 262/282 safety modules (Premium)
AS-Interface	Europe	TSX SAZ 10 master module (TSX Micro) TSX SAY 100/1000 master modules (Premium) TBX SAP 10 Fipio bus/AS-Interface bus gateway

Marine classification

Marine classification des authorities

	ABS	BV	DNV	GL	LR	RINA	RMRS
	USA	France	Norway	Germany	Unit.-Kingdom	Italiy	C.I.S.
Advantys STB	■						
ConneXium				*(1)*			
Lexium MHD/BPH							
Magelis iPC							
Magelis XBT-F/FC		■	■				
Magelis XBT-H/P/E/HM/PM		■	■				
Momentum							
Premium **PL7**	■	■	■	■	■	■	■
Unity	*(2)*						
Quantum **Concept**	■	■	■	■	■		■
Unity	*(2)*						
TBX	■	■	■	■		■	■
Telefast 2		■		■	■		
TSX Micro	■	■	■	■	■	■	■
TSX/PMX 47 à 107		■	■	■		■	■
Twido							
Twin Line							

■ *Certified*
■ *Pending certification*

(1) Depending on the product, consult our Regional Sales Office..
(2) Request for Marine certifications forecast 4th quarter 2004.

Community regulations

European directives

The opening of European markets implies a harmonization of regulations in the various European Union member states.
European Directives are documents used to remove obstacles to the free movement of goods and their application is compulsory in all states of the European Union.
Member states are obliged to transcribe each Directive into their national legislation and, at the same time, to withdraw any conflicting regulations.
The Directives, particularly those of a technical nature with which we are concerned, only set objectives, called “general requirements”.
The manufacturer must take all necessary measures to ensure that his products conform to the requirements of each Directive relating to his equipment.
As a general rule, the manufacturer affirms that his product conforms to the necessary requirements of the Directive(s) by applying the CE label to his product.
CE marking is applied to Telemecanique products where relevant.

The significance of CE marking

■ CE marking on a product means that the manufacturer certifies that his product conforms to the relevant European Directives ; it is necessary in order that a product which is subject to a Directive(s) can be marketed and freely moved within the European Union.
■ CE marking is intended solely for the national authorities responsible for market regulation.

For electrical equipment, only conformity of the product to standards indicates that it is suitable for use, and only a guarantee by a recognised manufacturer can ensure a high level of quality.
One or more Directives, as appropriate, may apply to our products, in particular :
■ The Low Voltage Directive 72/23/EEC amended by Directive 93/68/EEC : CE marking under the terms of this Directive is compulsory as of 1 January 1997.
■ The Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC : CE marking on the products covered by this Directive has been compulsory since 1 January 1996.

The system designer must use devices external to the SCADA to protect against active faults, which are not indicated and are judged to be dangerous to the application.
This may require solutions from various different technologies such as mechanical, electromechanical, pneumatic or hydraulic devices (for example, directly wiring a limit switch and emergency stop switches to the coil of a movement control contactor).

Advantys STB Distributed I/O Solution
Power Consumption

The ⎓ 5 V power supply for the I/O modules is provided by the following modules:
- "NIM" network interface module placed at the beginning of the primary segment
- "BOS" extension bus module placed at the beginning of each extension segment
- "CPS" auxiliary power supply module, to be placed in the primary or extension segment

The "NIM", "BOS" and "CPS" modules use their ⎓ 24 V power supply to deliver a maximum current of 1200 mA at a voltage of ⎓ 5 V.
On the basis of the total number of modules in each segment (primary and extension), the power consumption per segment must be calculated to ensure that the current demanded by the I/O modules does not exceed the current supplied by the "NIM" network interface module or the "BOS" bus extension module.If yes, add "CPS" auxiliary power supply module in this segment.

Procedure : For each segment
- In the "Number" column indicate the required number of I/O modules for each reference.
- In the "Total" column calculate the total current based on that number.
- In box **1** enter the grand total of all these values (mA).
- The grand total in box **1** must be less than or equal to 1200 mA, box **2**. If no, add "CPS" auxiliary power supply module, box **3**

Segment	I/O module reference	Base to be used	Field wiring connectors *(1)*	Power distribution module "PDM"	Number of I/O modules per segment	Consumption in mA at ⎓ 5 V Per I/O module	Total
Digital inputs	**STB DDI 3230**	XBA 1000	XTS ●100	PDT 3100/3105		50	
	STB DDI 3420	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB DDI 3425	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB DDI 3610	XBA 1000	XTS ●100	PDT 3100/3105		70	
	STB DDI 3615	XBA 1000	XTS ●100	PDT 3100/3105		70	
	STB DAI 5230	XBA 2000	XTS ●100	PDT 2100/2105		50	
	STB DAI 7220	XBA 2000	XTS ●100	PDT 2100/2105		50	
Digital outputs	**STB DDO 3200**	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB DDO 3230	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB DDO 3410	XBA 1000	XTS ●100	PDT 3100/3105		80	
	STB DDO 3415	XBA 1000	XTS ●100	PDT 3100/3105		80	
	STB DDO 3600	XBA 1000	XTS ●100	PDT 3100/3105		90	
	STB DDO 3605	XBA 1000	XTS ●100	PDT 3100/3105		90	
	STB DAO 8210	XBA 2000	XTS ●110	PDT 2100/2105		70	
	STB DRC 3210	XBA 2000	XTS ●110	PDT 3100/3105		50	
	STB DRA 3290	XBA 2000	XTS ●110	PDT 3100/3105		60	
Analog inputs	**STB AVI 1270**	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB AVI 1275	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB AVI 1255	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB ACI 1230	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB ACI 1225	XBA 1000	XTS ●100	PDT 3100/3105		60	
	STB ART 0200	XBA 1000	XTS ●100	PDT 3100/3105		100	
Analog outputs	**STB AVO 1250**	XBA 1000	XTS ●100	PDT 3100/3105		80	
	STB AVO 1265	XBA 1000	XTS ●100	PDT 3100/3105		80	
	STB AVO 1255	XBA 1000	XTS ●100	PDT 3100/3105		80	
	STB ACO 1210	XBA 1000	XTS ●100	PDT 3100/3105		80	
	STB ACO 1225	XBA 1000	XTS ●100	PDT 3100/3105		80	
Application-specific modules	**STB EPI 1145**	XBA 2000	–	PDT 3100/3105		130	
	STB EPI 2145	XBA 3000	–	PDT 3100/3105		130	
	STB EHC 3020	XBA 3000	XTS 2150	PDT 3100/3105		140	
Consumption per segment				Total consumption per segment		**1**	
						≤	
"NIM" Network Interface Modules	TCP/IP Ethernet		**STB NIP 2212**	Primary segment		**2**	1200 mA
	CANopen		**STB NCO 2212**				
			STB NCO 1010				
	Modbus Plus		**STB NMP 2212**				
	Fipio		**STB NFP 2212**				
	INTERBUS		**STB NIB 2212**				
			STB NIB 1010				
	Profibus DP		**STB NDP 2212**				
			STB NDP 1010				
	DeviceNet		**STB NDN 2212**				
			STB NDN 1010				
"BOS" bus extention module	–		**STB XBE 1200**	Extension segment		**2**	1200 mA
"CPS" auxiliary power supply	–		**STB CPS 2111**	Primary or extension segment		**3**	1200 mA

(1) For screw-type connector replace ● with **1**, *for spring-type connector replace with* **2**.

Product reference index

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