

Distributed I/O
Advantys STB
The *open* device
integration I/O system

Catalogue
September

03



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Advantys STB Distributed I/O Solution

Open and Modular System



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, an open, modular input/output system, makes it possible to design islands of automation managed by a master controller via a bus or communication network.

These islands, installed as close to the machine as possible, help reduce the time and cable costs for 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 sensors and actuators on the I/O modules 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.

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 55.

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 module features, 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 42 to 45).

Composition

A typical Advantys STB island is composed in great part of I/O modules of various widths: 13.9, 18.4 and 28.1 mm. 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:

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, CANopen, Modbus Plus, Fipio, INTERBUS, Profibus DP, and DeviceNet.
- 1 or more STB PDT Power Distribution Modules "PDM". They provide the \sim 24 V or \sim 115/230 V 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 d model motor-starters (mounted with the Tego Power system) and STB EPI TeSys model U starter-controllers.

Additional modules are available for the various architectures proposed below (see page 5):

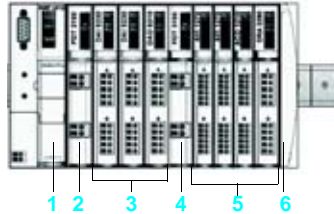
- 2 STB XBE 1●00 "EOS" and "BOS" extension modules for multisegment structures (up to 6 extension segments).
- STB XCA bus extension cables.
- 1 STB XBE 2100 CANopen extension module for integrating standard CANopen devices.

Advantys STB Distributed I/O Solution

Open and Modular System

Description

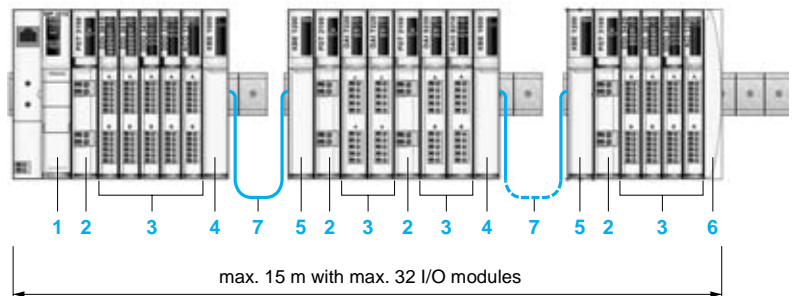
Advantys STB: primary segment



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 $\sim 115/230$ 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 $\sim 115/230$ 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.

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:

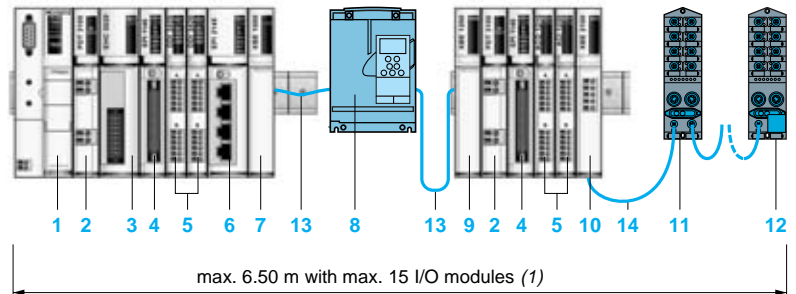
- 1 STB N●●: Network Interface Module “NIM”. It is placed at the beginning of the primary segment. Each island must have one NIM module only.
- 2 STB PDT ●100: PDM power distribution module (≈ 24 V or $\sim 115/230$ V). It is installed immediately to the right of the NIM and provides ≈ 24 V or $\sim 115/230$ 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●: Analog and digital I/O modules, requiring AC or DC power. The I/O groups of various powers are placed to the immediate right of the PDM matching their type.
- 4 STB XBE 1000: EOS bus extension module: It is always installed in the rightmost position 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.
- 7 STB XCA 100●: island bus extension cables.

Advantys STB Distributed I/O Solution

Open and Modular System

Description (continued)

Advantys STB with application-specific modules, preferred module, and standard CANopen devices



The island bus can support:

- Preferred modules of type ATV 38/58 controller (available later). This type of preferred module is installed between two segments.
- Standard CANopen devices. They are installed at the end of the island with up to 12 standard CANopen devices. These devices may reduce the maximum island length to 6.5 m (baud rate dependant).

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 EPI 1145: module for Tego Power motor-starters.
- 5 STB AV● and STB AC●: analog I/O modules
- 6 STB EPI 2145: module for TeSys model U starter-controllers.
- 7 STB XBE 1000: EOS bus extension module: It is always installed in the slot the farthest to the right in the primary or extension segment, and is used to extend the island bus to another segment.
- 8 ATV 58 controller: preferred module with special option card (available at a later date).
- 9 STB XBE 1200: EOS bus extension module. It is installed at the beginning of the extension segment.
- 10 STB XBE 2100: CANopen extension module (max. 12 devices per island).
- 11 FTB 1CN: Advantys FTB IP 67 monobloc I/O splitter boxes.
- 12 FTX DPTL12: CANopen bus line terminator (with 120 Ω resistance).
- 13 STB XCA 100●: island bus extension cables.
- 14 User supplied cable.

(1) Includes the preferred modules and the standard CANopen devices.

Advantys STB Distributed I/O Solution

Open and Modular System



STB XBE 1000



STB XBE 1200



STB XBA 2000



STB XBE 2100

References

| Description | Reference | Weight kg | |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------|-----------|
| Network Interface Modules (Includes the island bus terminator) | See page 10 | - | |
| PDM Power Distribution Modules | See page 15 | - | |
| Digital I/O modules | See page 22 | - | |
| Analog I/O modules | See page 30 | - | |
| Parallel interfaces | Tego Power applications | See page 35 | |
| | TeSys Model U applications | See page 37 | |
| Counter module | See page 41 | - | |
| Description | Use | Reference | Weight kg |
| EOS bus extension module | Installed at the end of the segment (except for the last segment on the island) | STB XBE 1000 | - |
| BOS bus extension module | Installed at the beginning of each extension segment | STB XBE 1200 | - |
| CANopen bus extension module | Optionally installed at the end of the last segment to connect standard CANopen devices | STB XBE 2100 | - |

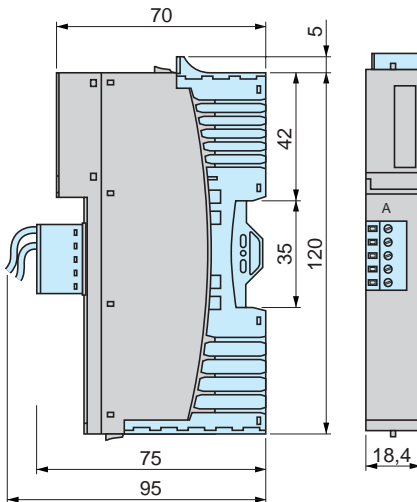
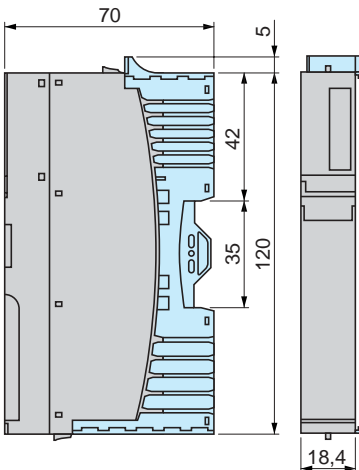
Separate parts

| Description | Use for | Reference | Weight kg | | |
|---------------------------------------------------------|------------------------------------|---------------------|-----------------|---------------------|-----------|
| I/O base (width 18.4 mm) | STB XBE 1000 extension module | STB XBA 2400 | 0,028 | | |
| | STB XBE 1200 extension module | STB XBA 2300 | 0,033 | | |
| | STB XBE 2100 extension module | STB XBA 2000 | 0,028 | | |
| Description | Use for | Type | Sold in lots of | Reference | Weight kg |
| 2-pin removable connectors for \approx 24 V | STB XBE 1200 | Screw-type | 10 | STB XTS 1120 | 0,006 |
| | | Spring-type | 10 | STB XTS 2120 | 0,006 |
| 5-pin removable connectors | STB XBE 2100 | Screw-type | 20 | STB XTS 1110 | 0,006 |
| | | Spring-type | 20 | STB XTS 2110 | 0,006 |
| User-customizable labels sheets | Customization of modules and bases | | 25 | STB XMP 6700 | - |
| Description | Length | Reference | Weight kg | | |
| Island bus extension cables | 0.3 m | STB XCA 1001 | - | | |
| | 1.0 m | STB XCA 1002 | - | | |
| | 4.5 m | STB XCA 1003 | - | | |
| | 10.0 m | STB XCA 1004 | - | | |
| | 14.0 m | STB XCA 1006 | - | | |

Dimensions

STB XBE 1000/1200

STB XBE 2100



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 | 500 m according to 802.3 standard 1,000 m with ConneXium cabling system | From 30 m (1 Mbit/s) to 5,000 m (10 Kbit/s) |
| Network interface module features | Number of I/O modules per Advantys STB island (1) | max. 32 with: - 1 primary segment - max. 6 extension segments | |
| | Power supply voltage | = 24 V not isolated (19.2...30 V) | |
| | Logic power supply | Provides = 5 V logic power to all the I/O modules of an island (1200 mA) | |
| 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) | - PDO mapping |
| Type of module | STB NIP 212 | STB NCO 212 | STB NCO 113 |

| | |
|--------------|----|
| Pages | 11 |
|--------------|----|

(1) One Advantys STB island corresponds to 1 device on the bus or the network.
 (2) Any I/O module inserted after the Economy CANopen NIM is treated as an individual device by the bus master.

| 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.O) | 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 | Master/slave | Master | CSMA-CD |
| 1 Mbit/s | 1 Mbit/s | 500 Kbit/s | 9.6 Kbit/s...12 Mbit/s | 125, 250 ou 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 |
| 450 m per segment 1800 m with 3 repeaters | 1000 m per segment | 400 m per bus segment between stations 12.8 km for the bus between stations 50 m for the installation bus | 1200 m (9.6 Kbit/s), 4800 m with 3 repeaters, 200 m (12 Mbit/s), 800 m with 3 repeaters | 1200 m |
| max. 32 with: - 1 primary segment - max. 6 extension segments | | | | |

| | | | | |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| - Global data - Peer-to-peer - Peer Cop | - Periodic I/O exchanges - Point-to-Point message - Use of standard profiles FRD/FSD/FED | - Implicit Data process exchange - Logical addressing - Diagnostic | - Slave configuration - Configuration control - Read/write Slave I/O data | - DeviceNet Object (Class ID3) - Connection Object (Class ID5) - Island Bus Object (Class ID101) |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|

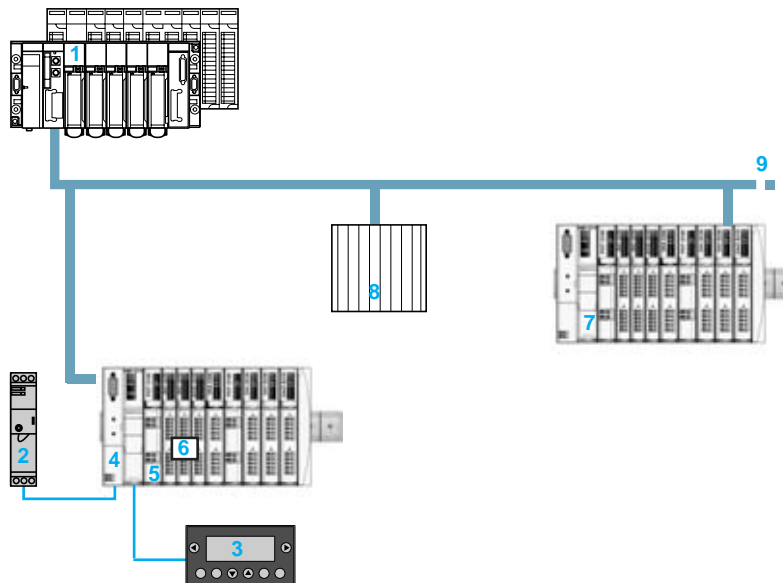
| | | | | |
|---------------------|---------------------|---------------------|---------------------|---------------------|
| STB NMP 2212 | STB NFP 2212 | STB NIB 2212 | STB NDP 2212 | STB NDN 2212 |
|---------------------|---------------------|---------------------|---------------------|---------------------|

Advantys STB Distributed I/O Solution Network Interface Modules

Presentation

The STB N●● 2212 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 (except Economy CANopen NIM module) 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 master
- 2 External \pm 24 V power supply
- 3 HMI terminal
- 4 Network Interface Module "NIM"
- 5 Power Distribution Module "PDM"
- 6 I/O modules
- 7 Other network nodes
- 8 Other slave PLCs
- 9 Bus terminator

The Advantys STB offer comprises 8 network interface modules, each one dedicated to a specific network or bus:

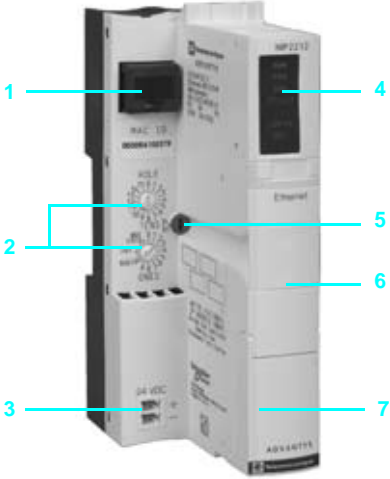
| Network or bus | Network interface module |
|---------------------|----------------------------|
| Ethernet network | STB NIP 2212 |
| CANopen Bus | STB NCO 2212, STB NCO 1113 |
| Modbus Plus Network | STB NMP 2212 |
| Fipio Bus | STB NFP 2212 |
| INTERBUS Bus | STB NIB 2212 |
| Profibus DP Bus | STB NDP 2212 |
| DeviceNet Network | STB NDN 2212 |

Power Supply for Network Interface Module

Network interface modules are powered by an external \pm 24 V power supply. They convert this power to \pm 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 "BOS" STB XBE 1200 module. See page 5.

This built-in 5 V power supply provides up to 1.2 A current.

Advantys STB Distributed I/O Solution Network Interface Modules

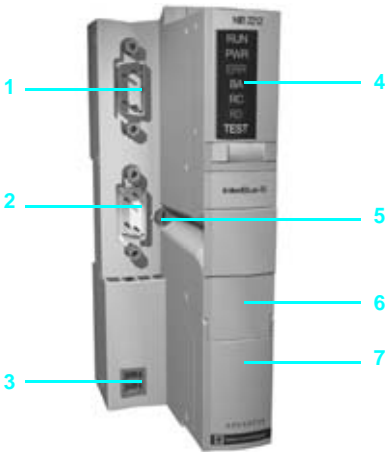


Description

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

They feature the following on the front panel:

- 1 A connector used to connect the island to the fieldbus. See the various connector types on page 9.
- 2 Two rotary node addressing selectors on the bus or the network.
- 3 An external $\bar{\text{—}}$ 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 for the STB N●● 2212 module of DIN rails.
- 6 A drawer (1) for an STB XMP 4440 removable memory card.
- 7 Cover (1) accessing the port used to connect an island setup and configuration PC or an HMI screen (read/write data), and the Reset button.



INTERBUS STB NIB 2212 network interface module

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

It features the following on the front panel:

- 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 $\bar{\text{—}}$ 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 for the STB N●● 2212 module of DIN rails.
- 6 A drawer (1) for an STB XMP 4440 removable memory card.
- 7 Cover (1) accessing the port used to connect an island setup and configuration PC or an HMI screen (read/write data), and the Reset button.

Network interface modules are provided with the STB XMP 1100 bus terminator and are mounted directly on DIN rails.

(1) Not available with STB NCO 1113 Economy CANopen module.

Advantys STB Distributed I/O Solution Network Interface Modules

| Characteristics | | | | | | | | | |
|-----------------------------------------------|------------------------------------------|-------------------------------|------------------|-----------------|---------------------|--------------------------------------------------------|-------------------------------------------------------|--------------------------|-------------------------------|
| Type of network interface module | STB | NIP 2212 | NCO 2212 | NCO 1113 | NMP 2212 | NFP 2212 | NIB 2212 | NDP 2212 | NDN 2212 |
| Network or bus | | Ethernet | CANopen | Economy CANopen | Modbus Plus | Fipio | INTERBUS | Profibus DP | DeviceNet |
| 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 | INTERBUS Club | DIN 19245, Parts 1 and 3 | Open DeviceNet Vendors Assoc. |
| Power supply voltage | --- V | 24 not isolated | | | | | | | |
| Input current | mA | 700 | | | | | | | |
| Voltage limits | --- V | 19.2...30 | | | | | | | |
| Output voltage to the island logic bus | --- V | 5.25 ± 0.21 | | | | | | | |
| Output current rating | A | 1.2 at --- V | | | | | | | |
| 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 | 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 dialogue) | HE 13, 8-pin female | | – | HE 13, 8-pin female | | | | |
| Max. number of addressable I/O modules | Per island | 32 | 32 | 20 (2) | 32 | 32 | 32 | 32 | 32 |
| Number of segments supported | Primary | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Extension | max. 6 | max. 6 | – | max. 6 | | | | |

(1) Use a --- V SELV external power supply (Safety Extra Low Voltage).
 (2) Max. 126 STB modules for all islands with the STB NCO 1113 Economy CANopen module

Special features of the STB NCO 1113 Economy CANopen NIM

The Economy CANopen NIM (STB NCO 1113) allows the bus master to view any I/O module following the STB NCO 1113 as an individual device. Its configuration and setup are performed by exporting the EDS file to the island master configuration software.

The I/O modules that depend on the STB NCO 1113 module are integrated in the PL7/Unity network configuration software and directly exchange data over the fieldbus. As a result, the custom configuration of the I/O modules (using the Advantys configuration software) and the use of reflex functions are not available with the Economy CANopen Interface network module.

Advantys STB Distributed I/O Solution Network Interface Modules



STB NIP 2212



STB NCO 2212/1113



STB NDP 2212



STB NDN 2212

Network Interface Modules

| Description | Power supply voltage | Reference | Weight kg |
|---------------------------|----------------------|--------------|-----------|
| Ethernet network | — 24 V | STB NIP 2212 | 0,130 |
| CANopen Bus | — 24 V | STB NCO 2212 | 0,135 |
| CANopen Bus (Economy NIM) | — 24 V | STB NCO 1113 | 0,130 |
| Modbus Plus network | — 24 V | STB NMP 2212 | 0.145 |
| Fipio Bus | — 24 V | STB NFP 2212 | 0.145 |
| INTERBUS Bus | — 24 V | STB NIB 2212 | 0.155 |
| Profibus DP Bus | — 24 V | STB NDP 2212 | 0.140 |
| DeviceNet Network | — 24 V | STB NDN 2212 | 0.140 |

Separate parts

| Description | Use | Sold in lots of | Reference | Weight kg |
|----------------------------------------------------|---------------------------|-----------------|--------------|-----------|
| 32 Kb removable memory card | Application backup memory | 1 | STB XMP 4440 | — |
| External — 24 V power supply (SELV) | — | — | See page 15 | — |
| 2-pin removable connectors for — 24 V power supply | Screw-type | 10 | STB XTS 1120 | 0.003 |
| | Spring-type | 10 | STB XTS 2120 | 0.003 |
| DeviceNet removable connectors (5-pin) | Screw-type | 1 | STB XTS 1111 | — |
| | Spring-type | 1 | STB XTS 2111 | — |

Replacement parts

| Description | Use | Reference | Weight kg |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------|-----------|
| Bus termination | — | STB XMP 1100 | — |
| Shielded twisted pair cable, length 2 m (HE13 module (RS 232 port) with the 8 pins/SUB-D 9 pins) | Connects the network interface module (RS 232 port) with the configuration PC or the HMI terminal | STB XCA 4002 | — |

(1) Except with STB NCO 1113 Economy CANopen NIM module.

Advantys STB Distributed I/O Solution Network Interface Modules



490 NTW 000 ●●

Connection accessories

Ethernet Network

| Description | Fitted at both ends | Length | Reference | Weight kg |
|-----------------------------------------------------------------------|------------------------------------------------------------|--------|-----------------------|-----------|
| Straight shielded twisted pair cable for connecting hubs and switches | 2 RJ45 connectors to connect data terminal equipment (DTE) | 2 m | 490 NTW 000 02 (1) | – |
| | | 5 m | 490 NTW 000 05 (1) | – |
| | | 12 m | 490 NTW 000 12 (1) | – |
| | | 40 m | 490 NTW 000 40 (1) | – |
| | | 80 m | 490 NTW 000 80 (1) | – |

CANopen Bus

| Description | Use | Reference | Weight kg |
|--------------|-----------------------------------------------------------------------------------------------------|---------------|-----------|
| Junction box | For T connection (15-pin SUB-D connector) to 1 or 2 CANopen bus(es) (9-pin SUB-D female connectors) | TSX CPP ACC 1 | – |

Modbus Plus Network

| Description | Use | Reference | Weight kg |
|----------------------------|--------------------------------------------------------------------------------------------------------------------|----------------|-----------|
| 9 pin SUB-D male connector | Connection of the Modbus Plus connector | AS MBKT 085 | – |
| Modbus Plus junction box | IP 20 device for T connections | 990 NAD 230 00 | 0.230 |
| | IP 65 unit for T connections, supports 1 RJ45 connector on front panel | 990 NAD 230 10 | 0.650 |
| | IP 20 T connector with 2 RJ45 connectors for Modbus Plus cable and one 9 pin SUB-D connector for auxiliary devices | 170 XTS 020 00 | 0.260 |

| Description | Use | | Length | Reference | Weight kg |
|-------------------------|---------------------------------------|-----------------------------|--------|----------------|-----------|
| | From | To | | | |
| Modbus Plus drop cables | IP 20 | IP 20 | 0.25 m | 170 MCI 020 10 | – |
| | 170 XTS 020 00 | 170 XTS 020 00 | 1 m | 170 MCI 020 36 | – |
| | T connector | T connector | 3 m | 170 MCI 021 20 | – |
| | | | 10 m | 170 MCI 020 80 | – |
| | STB NMP 2212 network interface module | 990 NAD 230 00 Junction box | 2.4 m | 990 NAD 211 10 | 0.530 |
| | | | 6 m | 990 NAD 211 30 | 0.530 |

Fipio Bus

| Description | Use | Characteristics | Reference | Weight kg |
|---------------------------------|----------------------------------------------------------------|---------------------------|---------------|-----------|
| Female connectors (9 pin SUB-D) | On STB NFP 2212 network interface module | Black polycarbonate IP 20 | TSX FP ACC 12 | 0.040 |
| | | Zamak | TSX FP ACC 2 | 0.080 |
| Bus connection unit | Junction for main cable | Black polycarbonate IP 20 | TSX FP ACC 14 | 0.120 |
| | | Zamak IP 65 | TSX FP ACC 4 | 0.660 |
| Drop cables | 8 mm, 2 shielded twisted pairs 150 Ω For standard environments | 100 m | TSX FP CC 100 | 5.680 |
| | | 200 m | TSX FP CC 200 | 10.920 |
| | | 500 m | TSX FP CC 500 | 30.000 |

(1) Cable compliant with EIA/TIA-568 standard and IEC 1180/EN 50 173 in class D. For UL and CSA 22.1 certified cables, add letter **U** to end of the reference.



TSX FP ACC 12



TSX FP ACC 14



TSX FP ACC 4

Connection accessories (continued)

INTERBUS Bus

| Description | Use | Length | Reference | Weight kg |
|--------------------------|---------------------------------------------------------------|---------|----------------|-----------|
| Installation bus cables | Prefitted cables to connect 2 network interface modules "NIM" | 0.110 m | 170 MCI 007 00 | – |
| | | 1 m | 170 MCI 100 00 | – |
| Junction interface | To connect inter-station bus to installation bus | – | 170 BNO 671 00 | – |
| Inter-station bus cables | – | 100 m | TSX IBS CA 100 | – |
| | | 400 m | TSX IBS CA 400 | – |

Profibus DP Bus

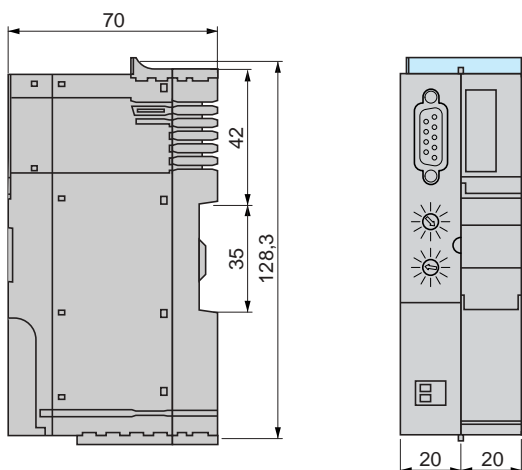
| Description | Use | Length | Reference | Weight kg |
|------------------------------------------------------|--------------------------------------------|--------|----------------|-----------|
| Connectors for STB NDP 2212 network interface module | Bus terminator | – | 490 NAD 911 03 | – |
| | Intermediate connection | – | 490 NAD 911 04 | – |
| | Intermediate connection with terminal port | – | 490 NAD 911 05 | – |
| Profibus DP connection cables | – | 100 m | TSX PBS CA 100 | – |
| | | 400 m | TSX PBS CA 400 | – |

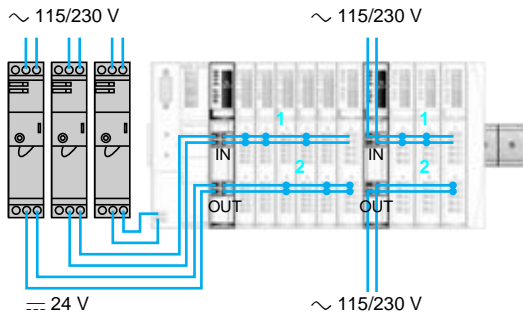
DeviceNet Network

| Description | Use | Type | Reference | Weight kg |
|-------------------------|-------------------------------------------|-------------|--------------|-----------|
| Female 5-pin connectors | For STB NDN 2212 network interface module | Screw-type | STB XTS 1111 | – |
| | | Spring-type | STB XTS 2111 | – |

Dimensions

STB No● 2212/NCO 1113





Presentation

The STB PDT ●100 Power Distribution Modules “PDM” provide power for the I/O module sensors and actuators via the sensor bus **1** and the actuator bus **2**.
Two 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 $\text{---} 24 \text{ V}$ power supply
- The STB PDT 2100 module is dedicated to providing power to the I/O module sensors and actuators requiring a $\text{---} 115/230 \text{ V}$ power supply.

Choice of Power Distribution Module “PDT” determined by I/O modules

| Power distribution module | Voltage (V) | STB I/O modules | | | | | Application-specific |
|---------------------------|-----------------|-----------------|----------|---------------|----------|----------|----------------------|
| | | Digital | | | Analog | | |
| | | Inputs | Outputs | Relay Outputs | Inputs | Outputs | |
| STB PDT 3100 | $\text{---} 24$ | DDI 3230 | DDO 3200 | DRC 3210 | AVI 1270 | AVO 1250 | EPI 1145 |
| | | DDI 3420 | DDO 3230 | | DRA 3290 | ACI 1230 | ACO 1210 |
| | | DDI 3610 | DDO 3410 | DDO 3600 | ART 0200 | | |
| STB PDT 2100 | ~ 115 | DAI 5230 | DAO 8210 | | | | |
| | ~ 230 | DAI 7220 | DAO 8210 | | | | |

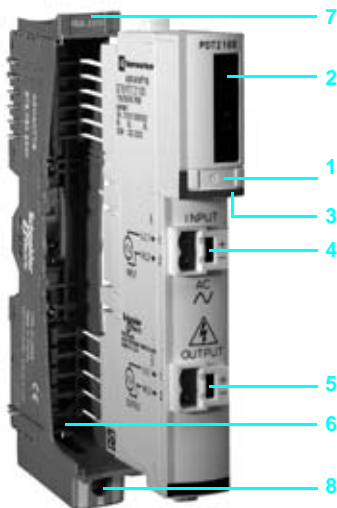
Description

The Advantys STB PDT ●100 power distribution modules comprise:

- 1 A location for a customizable label.
- 2 A status block with 2 display LEDs:
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 $\sim 115/230 \text{ V}$, blue for $\text{---} 24 \text{ V}$).
- 4 A connector for removable screw-type connector (STB XTS 1130) or spring-type connector (STB XTS 2130) used to connect the sensor power supply.
- 5 A connector for removable screw-type connector (STB XTS 1130) or spring-type connector (STB XTS 2130) used to connect the actuator power supply.

To be ordered separately:

- 6 A STB XBA 2200 mounting base, width 18.4 mm.
This base features:
- 7 A location for a customizable label.
- 8 A captive grounding screw.



Characteristics

| Module Type | | STB PDT 3100 | STB PDT 2100 |
|----------------------------------------|----------------------|--------------------------------------------------|---------------------------------------|
| Power supply voltage | | $\text{---} 24$ (1) | $\sim 115/230$ |
| Max. current | For inputs | 4 at 30 °C 2.5 at 60 °C | 5 at 30 °C 2.5 at 60 °C |
| | For outputs | 8 at 30 °C 5 at 60 °C | 10 at 30 °C 5 at 60 °C |
| Sensor/actuator bus voltage range | | $\text{---} 19.2\text{...}30$ (2) | $\sim 85\text{...}265$ (3) |
| Plug in/plug out with power on | | No | |
| Nominal consumption | | 0 on $\text{---} 5 \text{ V}$ logic power supply | |
| Reverse polarity protection | | Yes, on the actuator bus | |
| Built-in overcurrent protection | For inputs | By 5 A time-delayed fuse | |
| | For outputs | By 10 A time-delayed fuse | |
| Max. current on the grounding terminal | | 30 for 2 minutes | |
| Voltage-detect thresholds | IN/OUT LED turns on | $\geq \text{---} 15 \text{ V} \pm 1 \text{ V}$ | $> \sim 70 \text{ V} \pm 5 \text{ V}$ |
| | IN/OUT LED turns off | $< \text{---} 15 \text{ V} \pm 1 \text{ V}$ | $< \sim 50 \text{ V} \pm 5 \text{ V}$ |
| Mounting base | | STB XBA 2200 width 18.4 mm | |

(1) Use a $\text{---} 24 \text{ V}$ external power supply with very low safe allowable voltage.

(2) DC power supplies may be shared or separate, or shared with the $\text{---} 24 \text{ V}$ SELV 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.

Advantys STB Distributed I/O Solution Power Distribution Modules



STB XBA 2200



STB PDT 3100



STB XTS 1130



STB XTS 2130



STB XMP 7810

References

Power distribution modules

| Power Supply Type | Voltage | Reference | Weight kg |
|-------------------|-----------|--------------|-----------|
| ≡ | 24 V | STB PDT 3100 | 0.130 |
| ~ | 115/230 V | STB PDT 2100 | 0.129 |

Separate parts

| Description | Use for | Sold in lot of | Reference | Weight kg |
|---------------------------------|------------------------------------------------------------|----------------|--------------|-----------|
| Mounting base (width 18.4 mm) | Mounting of STB PDT ●100 power supply modules on DIN rails | 1 | STB XBA 2200 | 0.035 |
| Removable connectors | Screw-type | 10 | STB XTS 1130 | 0.006 |
| | Spring-type | 10 | STB XTS 2130 | 0.006 |
| Keying pins | Distribution modules | 60 | STB XMP 7700 | – |
| | Removable connectors | 24 | STB XMP 7810 | – |
| User-customizable labels sheets | Customization of modules and bases | 25 | STB XMP 6700 | – |

Phaseo regulated, single-phase switching power supplies

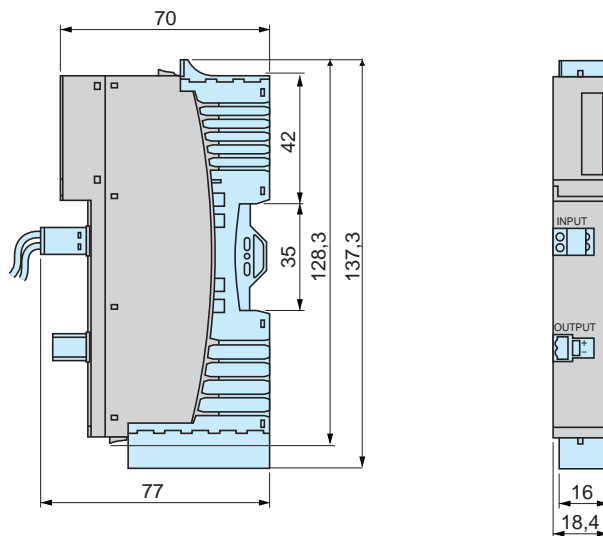
| Output voltage | Input voltage mains 47...63 Hz | Nominal power | Nominal current | Reference | Weight kg |
|----------------|--------------------------------|---------------|-----------------|-------------|-----------|
| ≡ 24 V | 100...240 V | 48...240 W | 2...10 A | See page 51 | 0.520 |

Replacement units



| Description | Description | Reference | Weight kg |
|-------------|------------------------------------|--------------|-----------|
| Fuses | 5 A (lot of 5) and 10 A (lot of 5) | STB XMP 5600 | – |

Dimensions

STB PDT 3100/2100



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

| Configuration | Input modules | | | | |
|-----------------------------------------|-------------------------------------------------------------------------------------|-----------------|-----------------|-------------------------------------------------------------------------------------------------------------------|-------------------------|
| | For direct current | | | For alternating current | |
| |  | | |  | |
| Voltage | 24 VDC | | | 115 VAC | 230 VAC |
| Number of channels | 2 | 4 | 6 | 2 | |
| Input | Logic Type (IEC/EN 61131-2) | | | – | |
| Load current/channel (outputs) | – | | | | |
| Response time | Off-to-on | | | 1.5 line cycles | |
| | On-to-off | | | 1.5 line cycles | |
| Filter time constant | 0.2...16 ms | 0.5...16 ms | 1 ms | – | – |
| Field wiring connectors | 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 | |
| Base | STB XBA 1000 | | | STB XBA 2000 | |
| Power Distribution Modules “PDM” (1) | Voltage Part number | | | 115 VAC STB PDT 2100 | 230 VAC STB PDT 2100 |
| Isolation | Field-to-bus Channel-to-channel | | | 1780 VAC for 1 minute – | |
| Protections against | Reverse polarity Short circuit and overload Sensor/actuator power | | | Yes Yes, 5 A time-lag fuse on the Power Distribution Module “PDM” Electronic short-circuit protection (SCP) | |
| Model number | STB DDI 3230 | STB DDI 3420 | STB DDI 3610 | STB DAI 5230 | STB DAI 7220 |
| Page | 22 | | | | |

(1) Each voltage group requires its own Power Distribution Module “PDM”.

Output modules

For direct current (transistor)

For alternating current (triac)

For direct/alternating current (relay)



| | | | | | | | |
|-------------------------------------------------------------------------------|--------------|----------------------|---------------------|-------------------------------------------------------------------------------|--------------|--------------------------------------------------------------|--|
| 24 VDC | | | | 115/230 VAC | | 24 VDC 115/230 VAC | |
| 2 | | 4 | 6 | 2 | | 2 form C (N.O/N.C) relay outputs 2 form A/B relay outputs | |
| Source | | | | - | | - | |
| - | | | | - | | - | |
| 0.5 A | 2.0 A | 0.5 A | | 2 A @ 30 °C (86°F) 1 A @ 60 °C (140°F) | | 2 A per contact 7 A per contact | |
| 620 µs @ 0.5 A load | 520 µs | 560 µs @ 0.5 A load | 715 µs @ 0.5 A load | 10.0 ms | | 5.25 ms 10 ms | |
| 575 µs @ 0.5 A load | 720 µs | 870 µs @ 0.5 A load | 955 µs @ 0.5 A load | 10.5 ms | | 6.75 ms 10 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 | | STB XBA 3000 | |
| 24 VDC STB PDT 3100 | | | | 115/230 VAC STB PDT 2100 | | 24 VDC (coil) STB PDT 3100 | |
| 1500 VDC for 1 minute | | | | 1780 VAC for 1 minute | | 1780 VAC for 1 minute | |
| - | | 500 VDC for 1 minute | | - | | 500 VAC for 1 minute | |
| Yes | | | | | | | |
| Yes (2) | | (3) | | Yes, 10 A time-lag fuse on the Power Distribution Module "PDM" | | | |
| Electronic overcurrent protection (OCP) | | | | - | | - | |
| STB DDO 3200 | STB DDO 3230 | STB DDO 3410 | STB DDO 3600 | STB DAO 8210 | STB DRC 3210 | STB DRA 3290 | |

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(2) Yes, 10 A time-lag fuse on the Power Distribution Module "PDM".
 (3) Recommend user-supplied 2,5 A time-lag fuses on each channel.

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 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, 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.

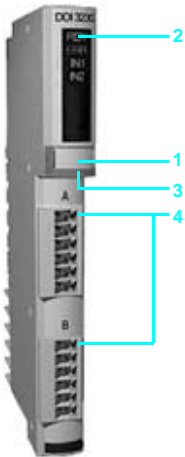
Description

A typical digital input/output module comprises the following:

- 1 A location for user-customizable label.
- 2 A display block showing:
 - the state of the module (RDY, ERR),
 - the state of 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 width 13.9, 18.4 or 28.1 mm, 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 labels sheets: STB XMP 6700.



Advantys STB Distributed I/O Solution

Digital Input/Output Modules

Characteristics of digital input modules

| Type of input module | | STB DDI 3230 | STB DDI 3420 | STB DDI 3610 | STB DAI 5230 | STB DAI 7220 | | | |
|----------------------------------------------------|-------------------------------------------|--------------|---------------------------------------------------|-------------------------------|--------------|----------------------|--------------------|-------------|--------------|
| Number of input channels | | 2 | 4 | 6 | 2 | | | | |
| Input nominal values Voltage | | V | 24 DC | 24 DC | 24 DC | 115 AC (50/60 Hz) | 230 AC (50/60 Hz) | | |
| Input | Logic | | Sink | Sink | Sink | – | – | | |
| | Type (IEC/EN 61131-2) | | Type 2 | Type 1+ | Type 1 | Type 1 | Type 1 | | |
| Input response time | On-to-off | ms | 0.625 @ 0.2 input filter time | 1.35 @ 0.5 input filter time | 1.74 | 1.5 line cycles | | | |
| | Off-to-on | ms | 0.610 @ 0.2 input filter time | 0.925 @ 0.5 input filter time | 1.21 | 1.5 line cycles | | | |
| Input limit values | Frequency | Hz | – | – | – | 47...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 | | | | | | |
| Reverse polarity protection against miswired power | | | Yes | | | – | | | |
| Isolation voltage | Field-to-bus | V | 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 | | – | 60 max. | – | | |
| Input filtering | Default setting | ms | 1.0 | 1.0 | 1.0 max. | – | – | | |
| | User-configurable setting (1) | ms | 0.20 | 0.50 | – | | | | |
| | | | 0.50 | 1.0 | | | | | |
| | | | 1.0 | 2.0 | | | | | |
| 2.0 | | | 4.0 | | | | | | |
| 4.0 | | | 8.0 | | | | | | |
| 8.0 | 16.0 | | | | | | | | |
| Tolerance | ms | ± 0.1 | ± 0.25 | – | | | | | |
| Input polarity | Default setting | | Logic normal on both channels | | | | | | |
| | User-configurable setting (1) | | Logic normal or reversed, configurable by channel | | | | | | |
| I/O base | | | STB XBA 1000 | | | STB XBA 2000 | | | |
| Power Distribution Module "PDM" requirements | Voltage | V | 24 DC | | | 115/230 AC | | | |
| | Model | | STB PDT 3100 | | | STB PDT 2100 | | | |
| | Power protection | | 5 A time-lag fuse on the "PDM" | | | | | | |
| Logic bus current consumption @ 5 VDC | | mA | 50 | 60 | 70 | 50 | | | |

(1) Requires the Advantys configuration software.

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

| Characteristics of digital output modules | | | | | | |
|--------------------------------------------------------|-------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------|--------------------------------------------------------|-----------------------------------------|
| Type of output module | | STB DDO 3200 | STB DDO 3230 | STB DDO 3410 | STB DDO 3600 | STB DAO 8210 |
| Number of output channels | | 2 | 2 | 4 | 6 | 2 |
| Output nominal values | Voltage | V | 24 DC | 24 DC | 24 DC | 115/230 AC |
| | Current/channel | A | 0.5 | 2 | 0.5 | 2 @ 30° C (86° F) 1 @ 60° C (140° F) |
| Output logical | | Source | | | | – |
| 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 | | | 300 AC for 10 s 400 AC for 1 cycle |
| Response time | Off-to-on | | 620 µs @ 0.5 A load | 520 µs | 560 µs @ 0.5 A load | 715 µs @ 0.5 A load |
| | On-to-off | | 575 µs @ 0.5 A load | 720 µs | 870 µs @ 0.5 A load | 955 µs @ 0.5 A load |
| Hot swapping supported | | Yes | | | | |
| Reverse polarity protection against miswired power | | Yes | | | | |
| Isolation voltage | Field-to-bus | V | 1500 DC for 1 minute | | | 1780 AC for 1 minute |
| | Channel-to-channel | V | – | 500 DC for 1 minute | – | |
| Output protection (internal) | | Electronic overcurrent protection (OCP) | | | | Transient voltage via Varistor and RC |
| On-state leakage/channel | | mA | 0.4 @ 30 VDC max. | 1.0 @ 30 VDC max. | 0.4 @ 30 VDC max. | 2.5 @ 230 VAC 2.0 @ 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) | 30 (1 cycle) 20 (2 cycles) |
| Maximum load | Capacitance | µF | 50 | | | – |
| | Inductance | | 0.5 H @ 4 Hz switch frequency $L = 0.5/I^2 \times F$ (1) | | | – |
| Minimum load current | | mA | 0.5 | 2 | 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 | | | | No fault detection |
| | User-configurable setting (2) | Auto-recovery or latched off | | | | |
| Fallback modes | Default | Predefined fallback values on both channels | | | | |
| | User-configurable setting (2) | Hold last value, predefined fallback values on one or more channels | | | | |
| Fallback states (when predefined is the fallback mode) | Default | Both channels to 0 | | | | |
| | User-configurable setting (2) | Each channel configurable to 1 or 0 | | | | |
| Output polarity | Default | Logic normal on both channels | | | | |
| | User-configurable setting (2) | Logic normal or reverse configurable by channel | | | | |
| I/O base | | STB XBA 1000 | | | | STB XBA 2000 |
| Power Distribution Module "PDM" requirements | Voltage | V | 24 DC | | | Either 115 AC or 230 AC |
| | Model | | STB PDT 3100 | | | STB PDT 2100 |
| | Power protection | | 10 A time-lag fuse on the "PDM" | (3) | 10 A time-lag fuse on the "PDM" | |
| Logic bus current consumption @ 5 VDC | | mA | 60 | | 80 | 90 |

(1) L = load inductance (H), I = load current (A), F = switching freq. (Hz).

(2) Requires the Advantys configuration software.

(3) Recommended user-supplied 2,5 A time-lag fuses on each channel.

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

| Characteristics of relay | | | STB DRC 3210 | STB DRA 3290 | |
|------------------------------------------------------------------|-------------------------------|-----------|---------------------------------------------------------------|-------------------------------------------------|---|
| Type of relay module | | | 2 relay outputs (form C, NO/NC contact pairs) | 2 relay outputs (form A/B, NO/NC contact pairs) | |
| Number of relay output channels | | | | | |
| Output nominal values | Voltage | V | 24 DC, 115/230 AC | | |
| | Current per contact | 24 VDC | A | 2 | 7 |
| | | 230 VAC | A | 2 | 7 |
| Output voltage values | Permanent voltage | V | 5...30 DC | | |
| | | V | 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 | | 10,000,000 operations | | |
| | Electrical | | 10,000 operations (resistive load @ max. voltage and current) | | |
| Hot swapping supported | | | Yes | | |
| Isolation voltage | 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) | | | None | | |
| Maximum surge current/relay | | A | 20 capacitive load @ t = 10 ms | | |
| Minimum load current | | mA | 50 | | |
| Fault recovery response | Default setting | | Shorted relay latched off - requires user reset | | |
| | User-configurable setting (1) | | Auto recovery | | |
| Fallback modes | Default | | Predefined | | |
| | User-configurable setting (1) | | Hold last value | | |
| Fallback states (when predefined is the fallback mode) | Default | | 2 relays de-energized | | |
| | User-configurable setting (1) | | Each relay energized or de-energized | | |
| Output polarity | Default | | Logic normal on both channels | | |
| | User-configurable setting (1) | | Logic normal or reverse by channel | | |
| I/O base | | | STB XBA 2000 | STB XBA 3000 | |
| Power Distribution Module "PDM" requirements | Coil voltage | V | 24 DC | | |
| | Model | | STB PDT 3100 | | |
| | Coil protection | A | 10 time-lag fuse on the "PDM" | | |
| Logic bus current consumption @ 5 VDC | | mA | 60 | | |

(1) Requires the Advantys configuration software.

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



STB XBA 1000



STB DDI 3230



STB XBA 1000



STB DDO 3200



STB XBA 2000



STB DRC 3210

References

Digital input modules

| Input voltage | Modularity (No. of channels) | Compliance IEC/EN 61131-2 | Reference | Weight kg |
|---------------|------------------------------|---------------------------|--------------|-----------|
| 24 VDC | 2 (sink) | Type 2 | STB DDI 3230 | 0.110 |
| | 4 (sink) | Type 1+ | STB DDI 342 | 0.111 |
| | 6 (sink) | Type 1 | STB DDI 3610 | 0.112 |
| 115 VAC | 2 | Type 1 | STB DAI 5230 | 0.120 |
| 230 VAC | 2 | Type 1 | STB DAI 7220 | 0.122 |

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 | STB DDO 3200 | 0.112 |
| | | 2 (source) | Yes | STB DDO 3230 | 0.116 |
| | 0.5 A | 4 (source) | Yes | STB DDO 3410 | 0.110 |
| | | 6 (source) | Yes | STB DDO 3600 | 0.114 |
| 115/230 VAC | 2 A | 2 | Yes | STB DAO 8210 | 0.125 |

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 | STB DRC 3210 | 0.130 |
| | 7 A | 2 | Yes | STB DRA 3290 | 0.130 |

Separate parts

| Description | Base width | For I/O modules | Reference | Weight kg |
|-------------|------------|-------------------------------|--------------|-----------|
| I/O bases | 13.9 mm | STB DDI STB DDO | STB XBA 1000 | 0.024 |
| | 18.4 mm | STB DAI STB DAO STB DRC | STB XBA 2000 | 0.028 |
| | 28.1 mm | STB DRA | STB XBA 3000 | 0.048 |

| Description | No. of channels | Type | For I/O modules | Reference | Weight kg |
|---------------------------------------------|-----------------|-------------|------------------------------------------|--------------|-----------|
| Field wiring connector (sold in lots of 20) | 6 | Screw-type | STB DDI STB DDO | STB XTS 1100 | 0.006 |
| | | Spring-type | STB DDI STB DDO | STB XTS 2100 | 0.006 |
| | 5 | Screw-type | STB DAI STB DAO STB DRC STB DRA | STB XTS 1110 | 0.006 |
| | | Spring-type | STB DAI STB DAO STB DRC STB DRA | STB XTS 2110 | 0.006 |

| Description | Use for | Sold in lots of | Reference | Weight kg |
|---------------------------------|-----------------------|-----------------|--------------|-----------|
| Keying pins | Modules | 60 | STB XMP 7700 | - |
| | I/O connectors | 96 | STB XMP 7800 | - |
| User-customizable labels sheets | I/O bases and modules | 25 | STB XMP 6700 | - |

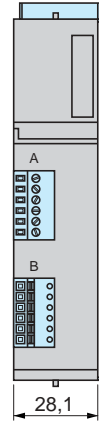
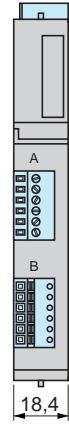
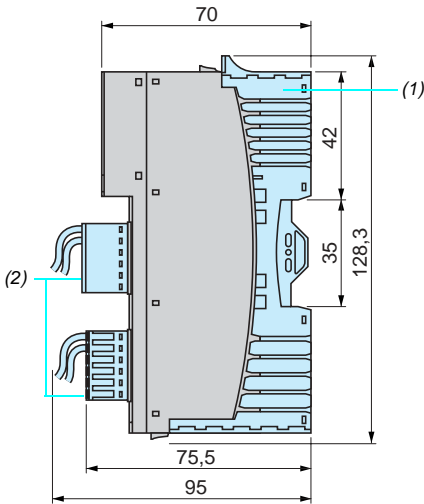
Dimensions

Side view

STB DDI/DDO 3●●●

STB DAI ●●●●0/DAO 8210
STB DRC 3210/DRA 3290

STB DRA 3290



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

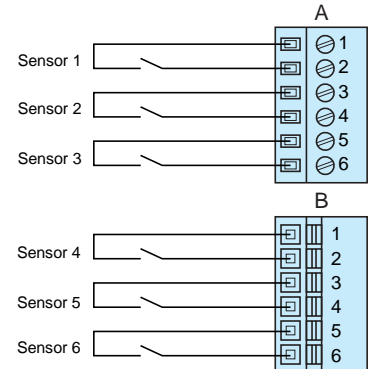
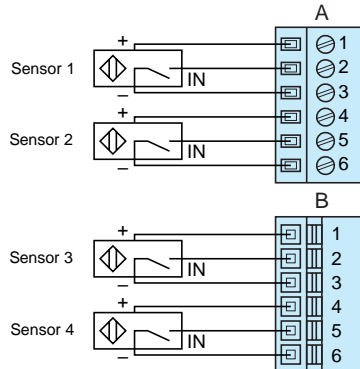
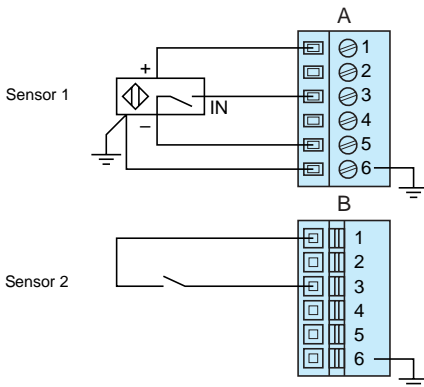
Wiring

Digital input modules

STB DDI 3230

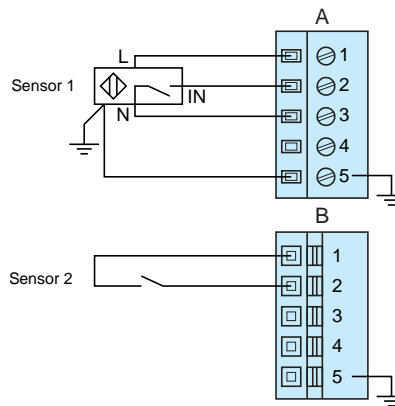
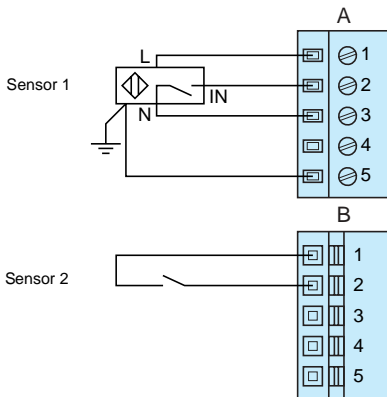
STB DDI 3420

STB DDI 3610



STB DAI 5230

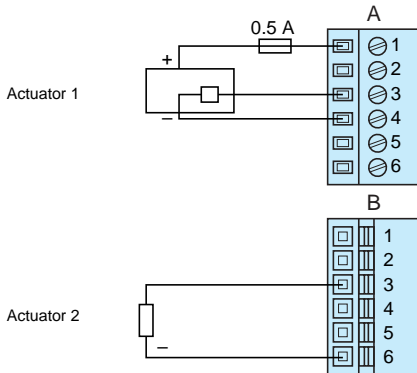
STB DAI 7220



Wiring (continued)

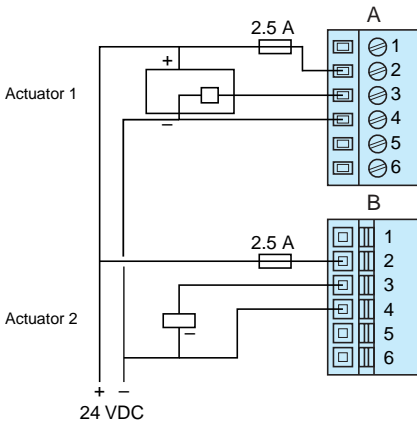
Digital output modules for direct current

STB DDO 3200



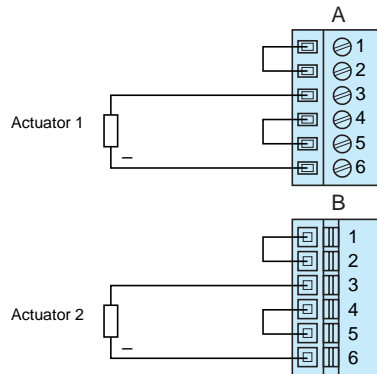
STB DDO 3230

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

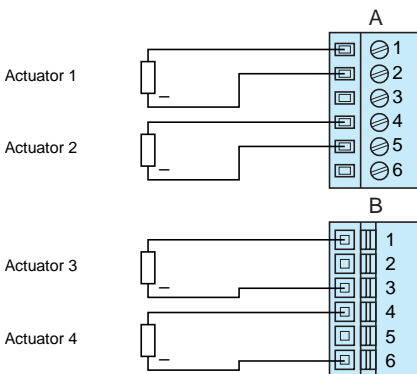


STB DDO 3230

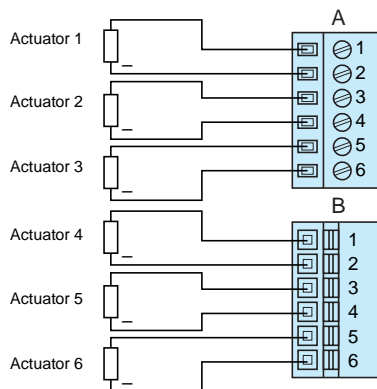
Two two-wire actuators wired to use field power from the actuator bus



STB DDO 3410



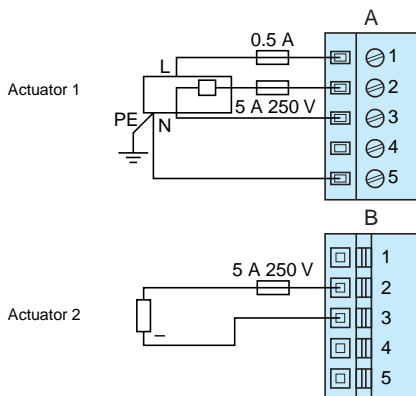
STB DDO 3600



Wiring (continued)

Digital output modules for alternative current

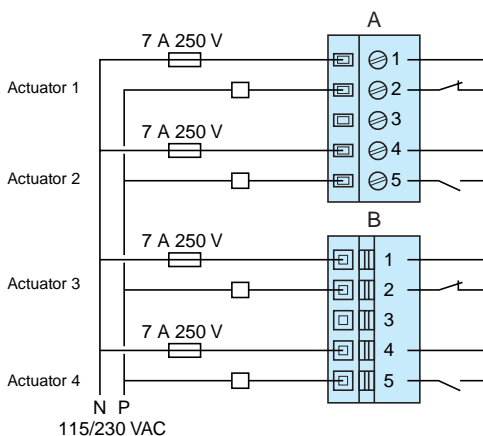
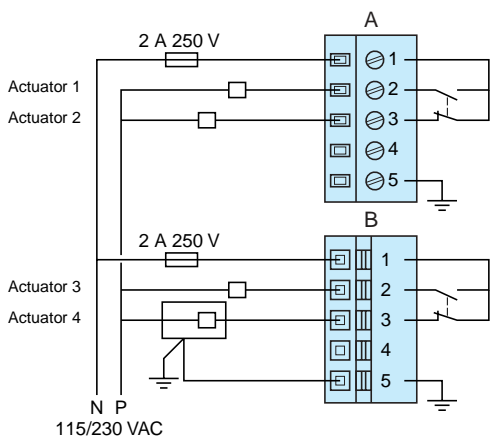
STB DAO 8210



Digital output modules for direct/alternative current (relay)

STB DRC 3210

STB DRA 3290



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

| Configuration | Analog input modules | |
|-----------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| | For voltage | For current |
| | | |
| Number of channels | 2 inputs | |
| Range | - 10...+ 10 V | 0...20 mA |
| Resolution | 11 bits + sign | 12 bits |
| Load current/channel (outputs) | - | |
| Response time | 5.0 ms for both channels | |
| Acquisition period | - | |
| Update time | 10 ms for both channel | |
| Field wiring connector | Two STB XTS 1100 (6-channel) screw-type connectors or two STB XTS 2100 (6-channel) spring-type | |
| Base | STB XBA 1000 | |
| Power Distribution Modules "PDM" (1) | Voltage | 24 VDC |
| | Part number | STB PDT 3100 |
| Isolation | Field-to-bus | 1500 VDC for 1 minute |
| | Channel-to-channel | 30 VDC rms (when sensor bus is not used for field power) |
| Fallback states | - | |
| Protection against | Reverse polarity | Yes |
| | Short circuit and overload | Yes, 5 A time-lag fuse on the Power Distribution Module "PDM" |
| | Sensor power | Electronic short-circuit protection (SCP) |
| Model number | STB AVI 1270 | STB ACI 1230 |
| Page | 31 | |

(1) One Power Distribution Module "PDM" is required per voltage group.

Analog output modules

For multirange analog For voltage For current



2 outputs

Thermocouple B, E, J, K, R, S et T
"RTD" Pt 100, Pt 1000, Ni 100, Ni 1000, Cu 10
± 80 mV

Voltage (- 0...+ 10 V, - 10...+ 10 V)

Current (0...20 mA)

15 bits + sign

11 bits + sign or 12 bits

12 bits

5 mA

3.0 ms plus settling time 2 channels

20 mA

–

–

150...360 ms (depending on the range)

25 ms for 2 channels

connectors

1500 VAC for 1 minute

1500 VDC for 1 minute

–

30 VDC

Hold last value
Reset to 0 V on 2 channels
Go to a predefined value (between 0 V and full scale) on each channel

Hold last value
Reset to 0 mA on 2 channels
Go to predefined value (between 0 mA and full scale) on each channel

Hold last value
Reset to 0 mA on 2 channels
Go to predefined value (between 0 mA and full scale) on each channel

Yes, 5 A time-lag fuse on the Power Distribution Module "PDM"

Recommended user-supplied 2,5 A time-lag fuses on each channel

Yes, 10 A time-lag fuse on the Power Distribution Module "PDM"

–

STB ART 0200

STB AVO 1250

STB ACO 1210

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 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 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.

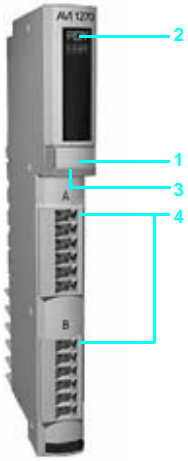
Description

A typical analog input/output module comprises of the following:

- 1 A location for user-customizable label.
- 2 A display block showing:
 - the state of the module (RDY, ERR),
- 3 A color-coded module identification stripe.
- 4 Two receptacles for field-wiring connectors.

To be ordered separately:

- I/O bases width 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.
- 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 labels sheets: STB XMP 6700.



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

Characteristics of analog input modules

| Type of input module | | STB AVI 1270 | STB ACI 1230 | STB ART 0200 |
|---------------------------------------|--------------------|--------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Number of input channels | | 2 single-ended analog input channels | 2 single-ended analog input channels | 2 analog input channel individually configurable for "RTD", TC or mV operation |
| Range | | ± 10 V | 0...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, T thermocouples ± 80 mV |
| Resolution | | bits 11 + sign | 12 | 15 + sign |
| Maximum input (without damage) | | 50 VDC | 25 mA, 50 VDC | ± 7.5 VDC |
| Response time | | ms 5 both channels | | See page 30 |
| Hot swapping supported | | Yes | | |
| Return data format | | IEC | | |
| Update time | | ms 10 for 2 channels | | See page 30 |
| Input filter | | Single low-pass filter at a nominal 25 Hz | | |
| Integral linearity | | ± 0.2% of full scale, typical | ± 0.1% of full scale | See page 30 |
| 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 | | ± 0.5% of full scale @ 25° C | | |
| Temperature drift | | ± 0.01% of full scale/ °C | | |
| Isolation | Field-to-bus | V 1500 DC for 1 minute | | 1500 AC for 1 minute |
| | Channel-to-channel | V 30 DC (when sensor bus is not used for field power) | | – |
| Addressing requirement | | 4 words (2/channel) | | 5 words (2/channel + cold-junction compensation) |
| I/O base | | STB XBA 1000 | | |
| PDM requirement | Voltage | VDC 24 | | |
| | Model | STB PDT 3100 | | |
| Logic bus current consumption @ 5 VDC | | mA 60 | | 100 |

Characteristics of analog output modules

| Type of input module | | STB AVO 1250 | STB ACO 1210 |
|-----------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Number of output channels | | 2 single-ended analog output channels | 2 single-ended current analog output channels |
| Range | | 0...10 V | ± 10 V |
| Resolution | | bits 12 | 11 + sign |
| Maximum output current/channel | | mA 5 | – |
| Response time | | ms 3 plus settling time both channels | |
| External loop supply | | V – | 19.2...30 DC (from the 24 DC PDM) |
| Return data format | | IEC | |
| Update time | | ms 25 for 2 channels | |
| Short circuit protection on the outputs | | Yes | |
| Settling | | μs – | 900 to ± 0.1% of final value |
| 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 | VDC 1500 for 1 minute | |
| | Channel-to-channel | VDC 30 (when sensor bus is not used for field power) | |
| Fallback states | Default setting | V 0 V on 2 channels | Drop to minimum output (0 mA) |
| | User-configurable setting (1) | Hold last value; force to a user-specified state - 32 000...+ 32 000 (with ± 10 V range) | 0...32 000 |
| Fallback mode | Default | User configurable | |
| | User-configurable setting (1) | Hold last value | |
| Addressing requirement | | 2 words for output data and 2 noncontiguous bytes of configurable data (for voltage range and fallback state) | 2 words for output data plus 1 for the power-down state configurable parameter |
| I/O base | | STB XBA 1000 | |
| PDM requirement | Voltage | VDC 24 | |
| | Model | STB PDT 3100 | |
| Logic bus current consumption @ 5 VDC | | mA 80 | |

(1) Requires the Advantys configuration software.

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

| Characteristics of STB ART 0200 analog input module | | | B | E | J | K | R | S | T | |
|-----------------------------------------------------|------------------------------------------|-----------|----------------------------------------------|----------------------------|--------------------|--------------------|-------------------|-------------------|-------------------|--|
| Thermocouple range | | | ° C or ° F (° C by default) | | | | | | | |
| Temperature unit | | | | | | | | | | |
| 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) | ° C | | ± 10.5 | ± 7 | | | ± 10.5 | | ± 7 | |
| | ° C | | ± 7 @ 25 ° C | ± 5 @ 25 ° C | | | ± 7 @ 25 ° C | | ± 5 @ 25 ° C | |
| | ° F | | ± 51 | ± 44.6 | | | ± 51 | | ± 44.6 | |
| | ° F | | ± 44.6 @ 77 ° F | ± 41 @ 77 ° F | | | ± 44.6 @ 77 ° F | | ± 41 @ 77 ° F | |
| 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...+ 850 (by default) | | | | - 60...+ 180 | | - 100...+ 260 | |
| | | ° F | - 328...+ 1562 (by default) | | | | - 76...+ 356 | | - 148...+ 500 | |
| | US/JIS | ° C | - 100...+ 450 | | | | N/A | | | |
| | | ° F | - 148...+ 842 | | | | N/A | | | |
| 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 | 500 | 50 | |
| | 2 or 3-wire | Ω | 20 (IEC/US/JIS) | 200 (IEC/US/JIS) | 20 | 200 | 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 | | ° C | | ± 1 | | ± 1 | | ± 4 | |
| | @ 60 ° C | | ° C | | ± 2 | | ± 1 | | ± 4 | |
| | @ 77 ° F | | ° F | | ± 1.6 | | ± 1.6 | | ± 6 | |
| | @ 140 ° F | | ° 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 | | ± 0.1 % of full scale @ ambient temperature | | | | | | | |
| | @ 60 ° C/140 ° F | | ± 0.15 % of full scale @ ambient temperature | | | | | | | |

Advantys STB Distributed I/O Solution

Analog Input/Output Modules



STB AVI 1270



STB XBA 1000



STB AVO 1250

References

Analog input modules

| Input current | Modularity (No. of channel) | Compliance IEC/EN 61131-2 | Reference | Weight kg |
|------------------------------|-----------------------------|---------------------------|--------------|-----------|
| ± 10 V | 2 | Yes | STB AVI 1270 | 0.115 |
| 0...20 mA | 2 | Yes | STB ACI 1230 | 0.116 |
| Thermocouple, "RTD", ± 80 mV | 2 | Yes | STB ART 0200 | – |

Analog output modules

| Output current | Modularity (No. of channel) | Compliance IEC/EN-61131-2 | Reference | Weight kg |
|--------------------|-----------------------------|---------------------------|--------------|-----------|
| 0...10 V or ± 10 V | 2 | Yes | STB AVO 1250 | 0.116 |
| 0...20 mA | 2 | Yes | STB ACO 1210 | 0.117 |

Separate parts

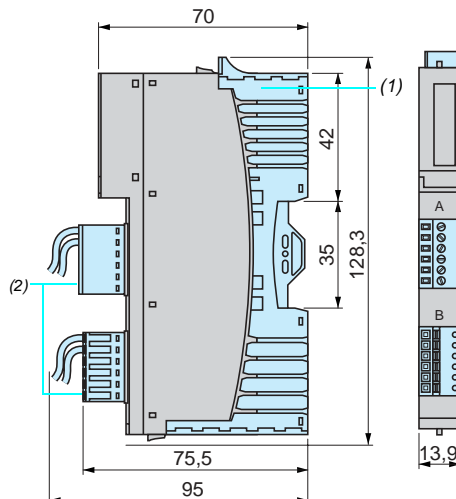
| Description | Base width | For I/O modules | Reference | Weight kg |
|-------------|------------|------------------------------------------------------------------------------|--------------|-----------|
| I/O base | 13.9 mm | STB AVI 1270 STB ACI 1230 STB ART 0200 STB AVO 1250 STB ACO 1210 | STB XBA 1000 | 0.024 |

| Description | Type | For I/O modules | Sold in lots of | Reference | Weight kg |
|------------------------------------|-------------|------------------------------------------------------------------------------|-----------------|--------------|-----------|
| Field wiring connector 6 points | Screw-type | STB AVI 1270 STB ACI 1230 STB ART 0200 STB AVO 1250 STB ACO 1210 | 20 | STB XTS 1100 | 0.006 |
| | Spring-type | STB AVI 1270 STB ACI 1230 STB ART 0200 STB AVO 1250 STB ACO 1210 | 20 | STB XTS 2100 | 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 | STB XSP 3000 | – |
| Terminals for grounding kit | Cables (width 1.5...6 mm ²) | 10 | STB XSP 3010 | – |
| | Cables (width 5...11 mm ²) | 10 | STB XSP 3020 | – |
| Keying pins | Modules | 60 | STB XMP 7700 | – |
| | I/O connectors | 96 | STB XMP 7800 | – |
| User-customizable labels sheets | I/O bases and modules | 25 | STB XMP 6700 | – |

Dimensions

STB AVI/ACI/ART/AVO/ACO



(1) STB XBA 1000 I/O base.

(2) STB XTS 1100/2100 connectors.

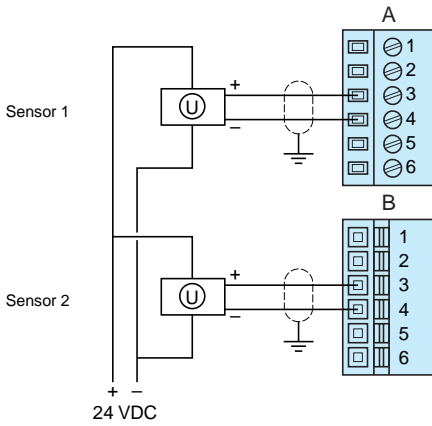
Advantys STB Distributed I/O Solution Analog Input/Output Modules

Wiring

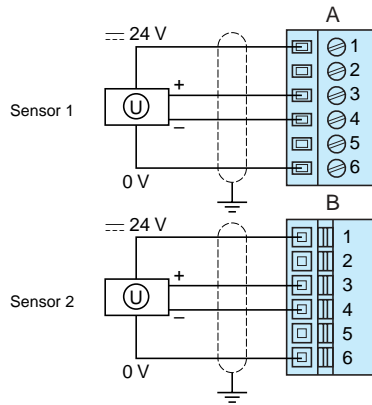
Analog input/output modules

STB AVI 1270

Two isolated analog sensors

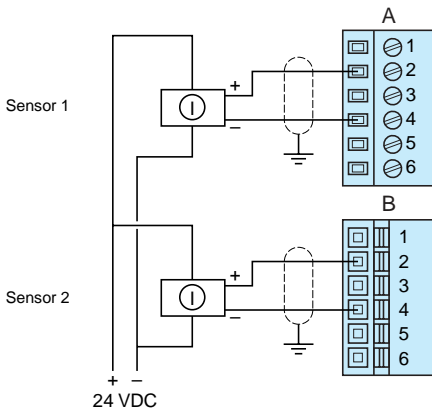


24 VDC from island sensor bus to power analog field devices

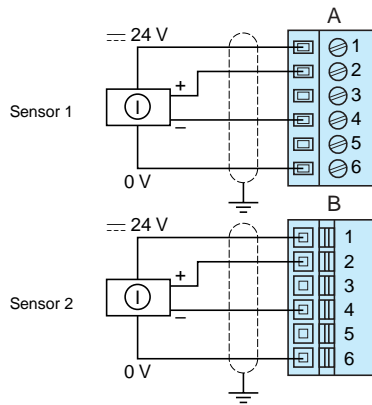


STB ACI 1230

Two isolated analog sensors

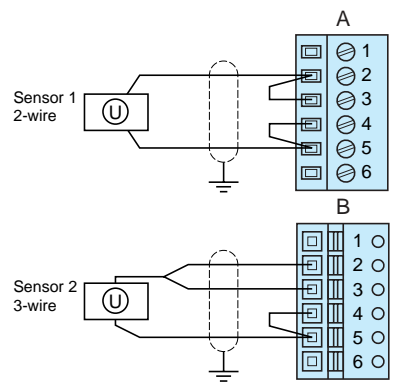


24 VDC from island sensor bus to power analog field devices



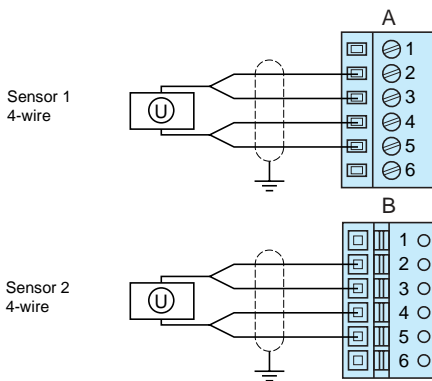
STB ART 0200

Wiring of 2-wire and 3-wire "RTD"

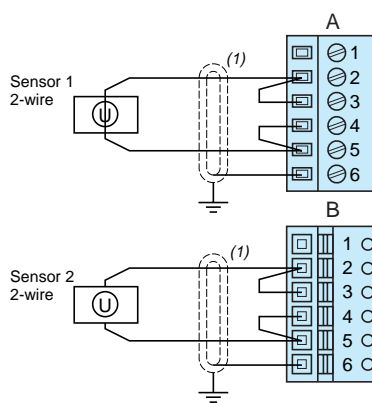


STB ART 0200 (continued)

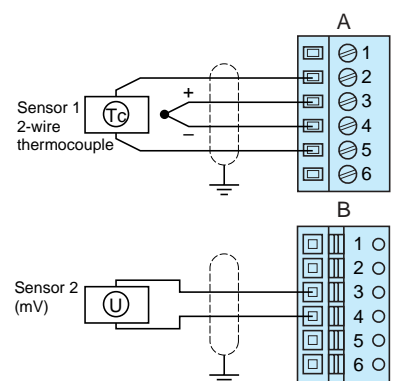
Wiring of 4-wire "RTD"



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



Wiring of 2-wire thermocouple and mV sensor



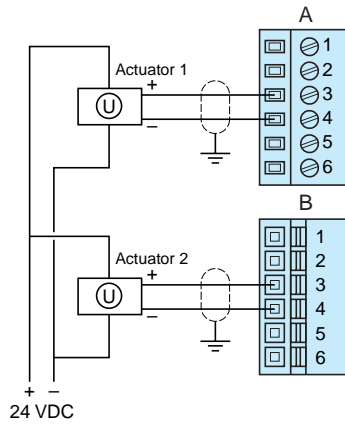
(1) Double-shielded cable

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

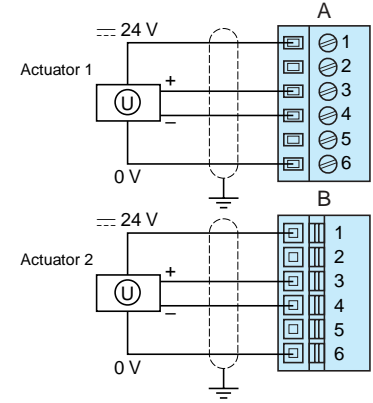
Wiring (continued)

STB AVO 1250

Two isolated analog actuators

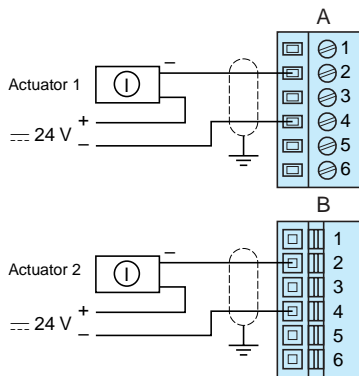


24 VDC from island actuator bus-to-power analog field devices

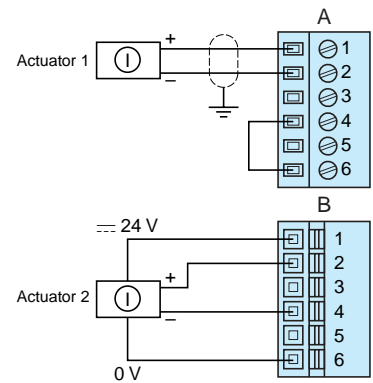


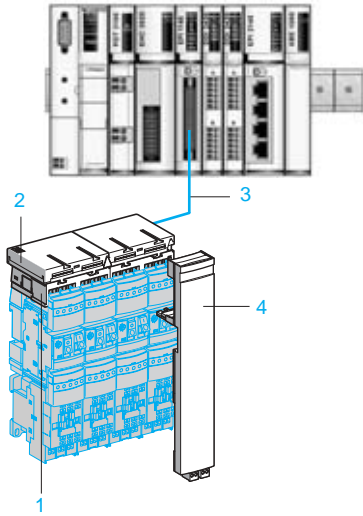
STB ACO 1210

Two isolated analog actuators

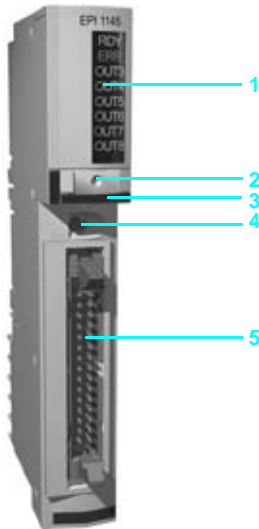


24 VDC from island actuator bus-to-power analog field devices





- 1 63 A power splitter box
- 2 Control splitter box
- 3 Connection cable
- 4 Connection control module



Presentation

The STB EPI 1145 parallel interface is a component of the Advantys STB island designed for the remote connection of 8 motor-starters (or 4 motor-starters in both directions). These TeSys model d motor-starters use the Tego Power installation assistance system.

The Tego Power System

Tego Power is a modular system to help install TeSys model d motor-starters by offering prewired control and power circuits. This Quickfit technology enables cable-free connections to spring-loaded contactor terminals, model d (9 to 32 A) and GV2 M2 motor circuit-breakers.

Tego Power with Quickfit technology enables you to create motor-starter assemblies up to 15 kW/400 V.

Structure of the Tego Power System

The Tego Power system differentiates the power section from the control section:

■ The power kit comprises:

- a specific plate used to assemble 2 to 8 motor-starters,
- two connection modules,
- a power splitter box with a power terminal block,

The contactor for each motor-starter is activated by one of the 8 outputs of the STB EPI 1145 parallel interface.

■ The control kit comprises:

- a control splitter box for the 2 to 8 motor-starters,
- a connection module.

The 2 return outputs of each motor-starter (contactor status, circuit-breaker status) are connected to 2 of the 16 inputs to the STB EPI 1145 parallel interface.

Description

The STB EPI 1145 parallel interface comprises:

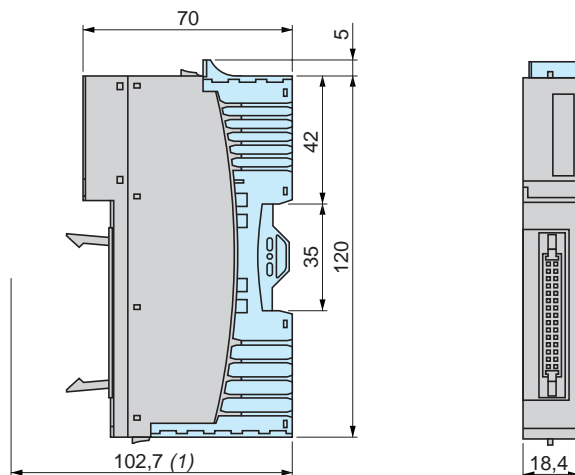
- 1 A display block with 8 LEDs indicating the state of the various motor-starters or output devices.
- 2 A location for a user-customizable label.
- 3 A color-coded module identification stripe (black).
- 4 Selection switch used to view each motor-starter state.
- 5 An HE 10 connector (30-pin) to connect to a Tego Power system via STB XCA 3002/3003 cables.

To be ordered separately:

An STB XBA 2000 base, width 18.4 mm. The base features a location for the user-customizable label.

Dimensions

STB EPI 1145



(1) With HE 10 connector (30-pin).

Characteristics

Electrical characteristics

| | | | |
|--------------------------------|-------------------------------------------------|-----------|-------------------------------------------------------------------------------------|
| Module Type | STB EPI 1145 | | |
| Plug in/plug out with power on | Yes | | |
| Connection | Via 1 HE 10 connector (30 contacts). | | |
| P/S | Via STB PDT 3100 24 V power distribution module | | |
| Protection | Via STB PDT 3100 power distribution module fuse | | |
| Consumption | On 5 V logic bus | mA | 130 |
| | On 24 V sensor bus | mA | max. 100 |
| | On 24 V actuator bus | mA | max. 50 (with all 8 outputs at 0 state), max. 1,000 (with all 8 outputs at 1 state) |

Characteristics of inputs

| | | | |
|----------------|-----------------------------------------------------------------------------------|----------|--------------------|
| Number | 16 (8 for the status of each contactor/ 8 for the status of each circuit-breaker) | | |
| Nominal values | Voltage | V | 24 |
| Type | IEC/EN 61131-2 Type 1 | | |
| 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 | 8 (8 to control each contactor) | | |
| Nominal values | Voltage | V | 24 |
| | Current | mA | 100 per channel, 850 per module |
| Limit values | Permanent voltage | V | 19.2...30 |
| | Absolute voltage | V | 36 |
| | Peak voltage | A | 1 for 100 µs per channel |
| Max. loads | Capacity | µF | 50 |
| | Inductance | 0.5 Henry at 4 Hz | |
| Short circuit and overload protection | Yes, per channel | | |

References

Parallel interface for TeSys model d motor-starters with Tego Power system

| Power Supply type | Voltage | Reference | Weight kg |
|-------------------|---------|--------------|-----------|
| 24 V | 24 V | STB EPI 1145 | 0,120 |

Separate parts

| Description | Use | Sold in lots of | Reference | Weight kg |
|---------------------------------|-------------------------------------------------|-----------------|--------------|-----------|
| Base 18.4 mm | Application-specific module mounted on DIN rail | 1 | STB XBA 2000 | 0.024 |
| Keying pin | For application-specific module | 60 | STB XMP 7700 | — |
| User-customizable labels sheets | Customization of modules and bases | 25 | STB XMP 6700 | — |

| Description | Use | Length | Reference | Weight kg |
|----------------------------------------|-----------------------------------------------------------------------------|--------|--------------|-----------|
| Connection cables (30-pin at each end) | From the power splitter box and APP 2R●E control to the STB EPI 1145 module | 1 m | STB XCA 3002 | — |
| | | 2 m | STB XCA 3003 | — |

Tego Power separate elements (1)

| Description | Use | Reference | Weight kg |
|----------------------------------|---------------|-----------|-----------|
| Power and control splitter boxes | 2 outputs | APP 2R2E | — |
| | 4 outputs (2) | APP 2R4E | — |

(1) For other Tego Power components, refer to our catalog: "Motor-starter solutions, control and power protection components".

(2) For a set of 8 motor-starters, use 2 APP 2R4E splitter boxes.



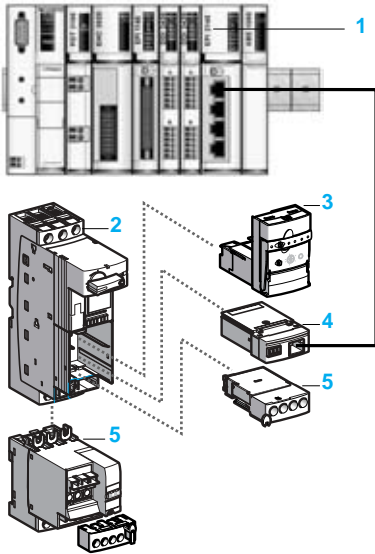
STB XBA 2000



STB EPI 1145

Advantys STB Distributed I/O Solution

Parallel Interface for TeSys Model U 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 model U starter-controllers (12 inputs and 8 outputs).

Presentation of model U starter-controllers

The TeSys model U starter-controllers 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.).
 - history.

Components of a model U starter combined with an STB EPI 2145 (1) module

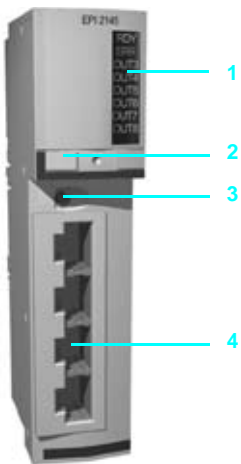
The starter-controller functions are performed by a click-lock adjustment that removes the need for cables,

- On a power base **2**.
- a 24 V **3** control unit (LUC B/D/C/M ●●BL) for 0.09 to 15 kW 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 model U components: consult our catalog "Starters and basic TeSys model U equipment".



Description

The STB EPI 2145 parallel interface module comprises:

- 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 4 RJ45 connectors for connecting 4 model U starter-controllers.

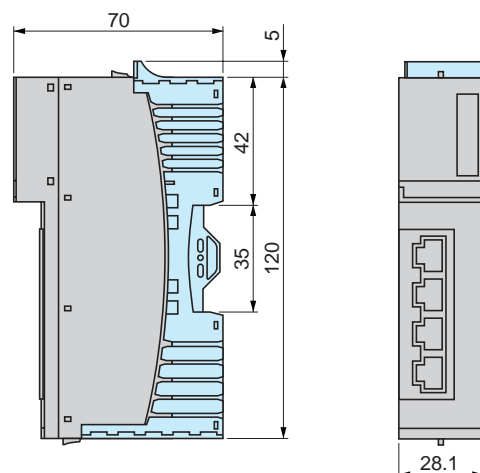
To be ordered separately:

An STB XBA 3000 base, width 28.1 mm.

The base features a location for the user-customizable label.

Dimensions

STB EPI 2145



Advantys STB Distributed I/O Solution

Parallel Interface for TeSys Model U
Applications

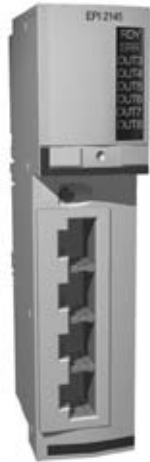
Characteristics

| | | | |
|----------------------------------------------|-------------------------------------------------|-------------------|-------------------------------------------------------------------------------------|
| Module Type | STB EPI 2145 | | |
| Hot swapping | Yes | | |
| Connection | Via 4 RJ45 connectors | | |
| Power Supply | Via STB PDT 3100 24 V power distribution module | | |
| Protection | Via STB PDT 3100 power distribution module fuse | | |
| Consumption | On 5 V logic bus | mA | 130 |
| | On 24 V sensor bus | mA | max. 100 |
| | On 24 V actuator bus | mA | max. 50 (with all 8 outputs at 0 state), max. 1,000 (with all 8 outputs at 1 state) |
| Characteristics of Inputs | | | |
| Number of inputs | 12 | | |
| Nominal values | Voltage | V | 24 |
| Type | Type IEC/EN61131-2 | Type 1 | |
| 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 | | |
| Nominal values | Voltage | V | 24 |
| | Current | mA | 100 per channel, 850 per module |
| Limit values | Permanent voltage | V | 19.2...30 |
| | Absolute voltage | V | 36 |
| | Peak voltage | A | 1 for 100 µs per channel |
| Max. loads | Capacity | µF | 50 |
| | Inductance | 0.5 Henry at 4 Hz | |
| Short circuit and overload protection | Yes, per channel | | |

References



STB XBA 3000



STB EPI 2145

Parallel Interface for TeSys model U starter-controllers

| Type of Power Supply | Voltage | Reference | Weight kg |
|----------------------|---------|--------------|-----------|
| 24 V | 24 V | STB EPI 2145 | 0.165 |

Separate parts

| Description | Use | Sold in lot of | Reference | Weight kg |
|---------------------------------|-------------------------------------------------|----------------|--------------|-----------|
| Base 28.1 mm | Application-specific module mounted on DIN rail | 1 | STB XBA 3000 | 0.048 |
| Keying Pin | For application-specific module | 60 | STB XMP 7700 | - |
| User-customizable labels sheets | Customization of modules and bases | 25 | STB XMP 6700 | - |

| Description | Use | Length | Reference | Weight kg |
|----------------------------------------------------|-------------------------------------------------------------------|--------|----------------|-----------|
| Connection cables An RJ45 connector at each end | Linking the STB EPI 2145 module to the model U starter-controller | 0.3 m | LU9 R03 | 0.045 |
| | | 1 m | LU9 R10 | 0.065 |
| | | 2 m | 490 NTW 000 02 | - |
| | | 3 m | LU9 R30 | 0.125 |
| | | 5 m | 490 NTW 000 05 | - |
| | | 12 m | 490 NTW 000 12 | - |

Advantys STB Distributed I/O Solution Counter Module

Presentation

Counting parts or events, grouping objects, controlling incoming and outgoing data streams, and measuring lengths or positions all require counting functions.

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 max. 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.

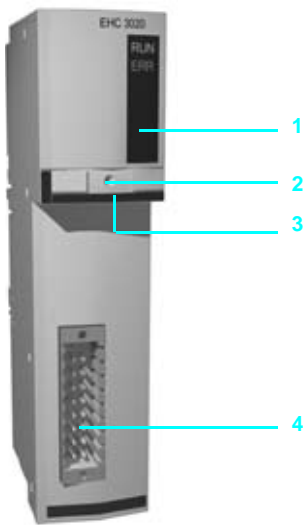
2 Location for user-customizable labels.

3 Color-coded module identification stripe (black).

4 A connector for an STB XTS 2150 removable spring-type connector (must be ordered separately).

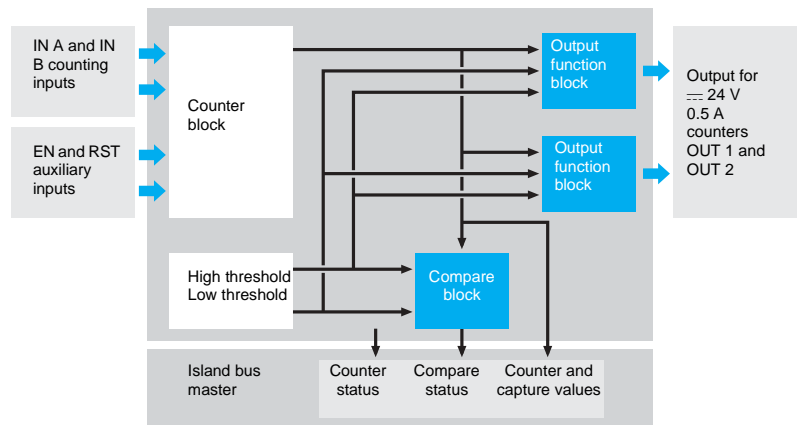
To be ordered separately:

- STB XBA 3000 base width 28.1 mm. Includes a location for user-customizable labels.
- STB XTS 2150 removable connector with 18-pin.



Operation

Counter channel block diagram



Depending on the counting function used (see operating characteristics page 39), 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 continually 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 master controller of bus.

Advantys STB Distributed I/O Solution Counter Module

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 hertz. 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 maximal 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 maximal number of pulses counted during a time unit is up to 65535. The minimal pulses 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 max. event duration is 0.655, 6.55, or 65.5 seconds, respectively. The max. 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 setpoint 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 setpoint maximal value is 65535. The maximal 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 setpoint 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 modulo defined by the high threshold value. The modulo maximal value is 65535. The maximal 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, the 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: <ul style="list-style-type: none"> <input type="checkbox"/> the IN B input can define the counting direction of the pulses received on IN A. <input type="checkbox"/> 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 : < 0,5 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: <ul style="list-style-type: none"> <input type="checkbox"/> No direct action: the counter status and status words are processed by the island master <input type="checkbox"/> The output is activated when the counter value is less than the low threshold <input type="checkbox"/> The output is activated when the counter value is between the low threshold and the high threshold <input type="checkbox"/> The output is activated when the counter value is greater than the high threshold <input type="checkbox"/> A pulse is generated on the output when the low threshold is exceeded (when counting down) <input type="checkbox"/> A pulse is generated on the output when the low threshold is exceeded (when counting up) <input type="checkbox"/> A pulse is generated on the output when the high threshold is exceeded (when counting down) <input type="checkbox"/> A pulse is generated on the output when the high threshold is exceeded (when counting up) <input type="checkbox"/> The output is activated as long as the counter is RUN (only available on downcounting function) <input type="checkbox"/> The output is activated when the counter is STOP <input type="checkbox"/> The output is activated when the capture value is less than the low threshold (only available on modulo function) <input type="checkbox"/> The output is activated (according to the modulo) when the counter value is between the low threshold and the high threshold |

Characteristics

Electrical characteristics

| Module Type | | 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 |
| Consumption on the logic bus | ≡ 5 V | mA | 60 typical, 140 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, min. 2 mA current (at ≡ 11 V) | | |
| | At state 0 | | ≡ -3...5 V, max. 1.5 mA current | | |
| Logic | | | Positive | | |
| Filter time | Analog | μs | 2.5 | 25 | |
| | Digital | ms | None (max. count 40 kHz) 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 39 | | |
| 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 value, set to state 0 or 1 for each channel | |

Advantys STB Distributed I/O Solution Counter Module



STB XBA 3000



STB EHC 3020

References

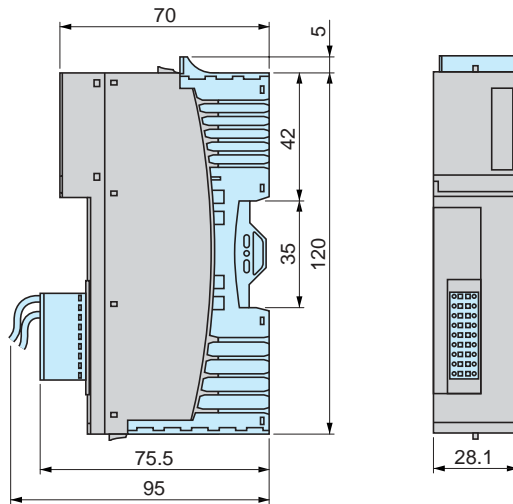
| Description | Input type | Reference | Weight kg |
|------------------------------------|----------------------------------------------------------------------------------------|--------------|-----------|
| Counter module 1 channel 40 kHz | 2/3 wire \pm 24 V detectors Incremental encoder \pm 24 V Mechanical contacts | STB EHC 3020 | – |

Separate Parts

| Description | Use for | Sold in lots of | Reference | Weight kg |
|---------------------------------|------------------------------------|-----------------|--------------|-----------|
| Base 28.1 mm | Module mounted on DIN rails | 1 | STB XBA 3000 | 0,048 |
| Removable connector | 18-pin spring-type | 1 | STB XTS 2150 | 0,006 |
| Keying pin | Counter module | 60 | STB XMP 7700 | – |
| | Removable connector | 96 | STB XMP 7800 | – |
| User-customizable labels sheets | Customization of modules and bases | 25 | STB XMP 6700 | – |

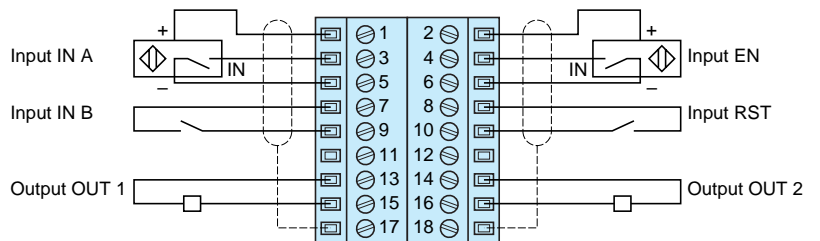
Dimensions

STB EHC 3020



Wiring

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



The \pm 24 V power supplies for the sensors and actuators are provided by the STB PDT 3100 power distribution module via the island's sensor and actuator buses of the Advantys STB island.

Advantys STB Distributed I/O Solution Configuration Software

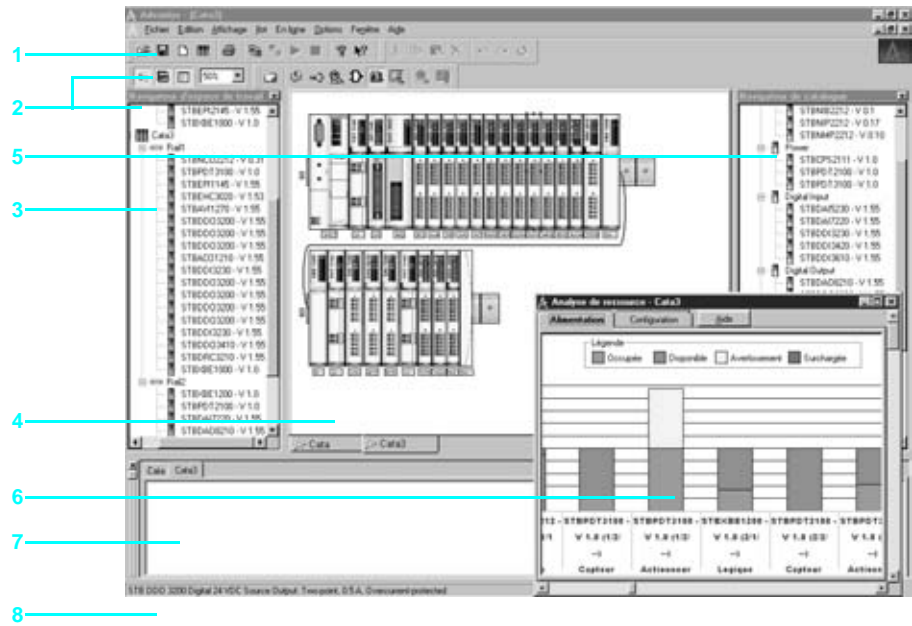
Presentation

The configuration process of the Advantys STB system includes the following steps:

- If necessary, configure all the I/O modules for Advantys STB (digital, analog, and application-specific), and the modules with a default configuration.
 - Configure the reflex functions handled at the island level.
- These settings are defined using the STB SPU 1000 dedicated Advantys configuration software. This program also allows 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 standard CANopen devices or preferred devices (such as the ATV 38/58 controller available later).
 - Check the configuration for compliance and power consumption.
 - Modify the module's default features.

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 contains 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.

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 number of tabs provided by the editor is determined by the mode in which you execute the Advantys Configuration Software (Local or Online). The editor displays some or all of the following tabs: General, etc.

“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,
 - the analog output modules, with for each channel, the refresh rate and the default fallback position (maintain the value or assume a predefined value),
 - parallel interfaces for Tego Power and TeSys Model U applications, 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 38,
 - 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.

Advantys STB Distributed I/O Solution Configuration Software



Functions (continued)

“I/O Image” Tab

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

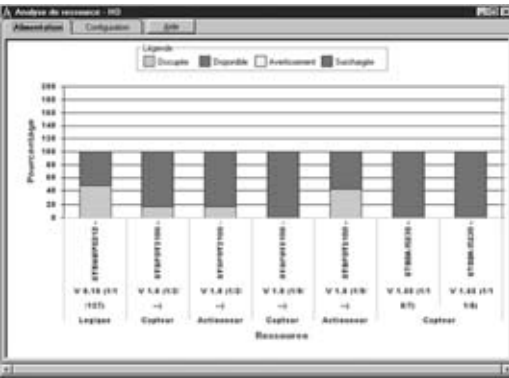
- Input/Output modules comprising the Advantys STB island (values and state of each module).
- Operator Terminal connected to the network interface module. The length of this field (defined in the “Properties” tab of the network interface module) equals the maximum total size of the image table, less 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,
 - = 24 V provided by the STB PDT 3100 power distribution module(s),
 - = 115/230 V provided by the STB PDT 2100 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:

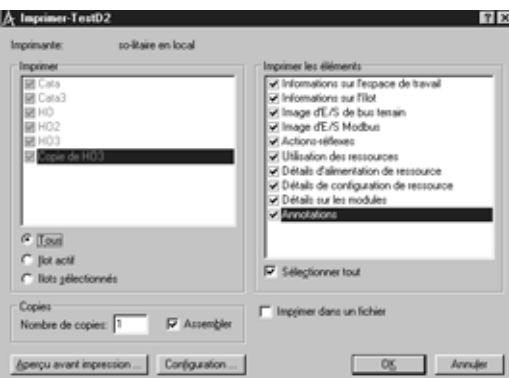
- From the PC to the RAM and Flash memory of the island interface module in order to make the island operational. If the network interface module includes the STB XMP 4440 32 KB removable memory card, data is written to the card, providing a backup.
- From the NIM interface module to the PC.

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. Inversely, those descriptions may be exported to the master in case of a CANopen, 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 Editor

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

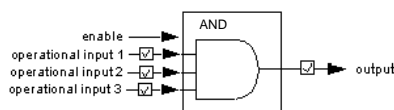
An Advantys STB island can call up to 10 reflex functions. These functions are created from blocks whose inputs are activated by the digital or analog input channels and whose results activate an analog or digital output channel. You can nest two reflex functions.

Reflex types and function blocks

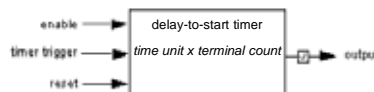
Various types of function blocks are available:

Boolean logic function blocks:

XOR block, AND block with 2 inputs and 3 outputs

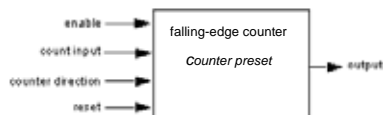


Timer/monostable blocks: when working, when idle, upon activation, and upon deactivation



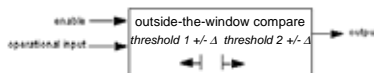
Rising/Falling Edge counting function blocks:

on rising or falling edge, from 0 to 65,535



Compare function blocks

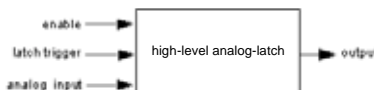
on signed integers (- 32,768 to 32,767): i <, i >, < i >, i < and i >



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)



STB SPU 1000

References

The multilingual Advantys 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 and is provided with a STB XCA 4002 cable to connect the NIM to the PC (length: 2 m).

| Description | Use | Reference | Weight kg |
|---------------------------------|------------------------|--------------|-----------|
| Advantys Configuration Software | Single workstation | STB SPU 1000 | — |
| User Documentation | Multilingual on CD-ROM | STB SUS 8800 | — |

Advantys STB Distributed I/O Solution Phaseo Regulated Power Supplies

ABL 7 power supplies

The ABL-7 range of power supplies is designed to provide the d.c. voltage necessary for the control circuits of automation system equipment. Split into three families, 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, and thus a comprehensive solution is provided 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,
- 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 3%, whatever the load and whatever the type of mains supply, within a range of 85 to 264 V for single-phase, or 360 to 550 V for 3-phase. Conforming to IEC standards, 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.

ABL-7 RE and ABL-7 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 in order to be able 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 \bar{r} rails.

The 24 AC single-phase power supplies referenced in this catalogue are quite adapted to tie-up with the Advantys STB modules (Network Interfaces Modules "NIM", Power Distribution Module "PDT" and inputs/outputs modules).

■ Universal single-phase supplies **ABL 7RE**:

- 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 the Micro and Premium platforms or in any automation system configuration requiring a \bar{r} 24 V supply.

■ Universal single-phase supplies **ABL 7RP**:

- power between 60 W (2.5 A) and 240 W (10 A),
- output voltage available : \bar{r} 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 mains power.

(1) 3-phase power supplies, consult our catalogue "Phaseo Power Supplies and Transformers"



ABL 7RE240●
ABL 7RP240●



ABL 7RE2405
ABL 7RP2405



ABL 7RE2410
ABL 7RP2410

Advantys STB

Distributed I/O Solution

Phaseo Regulated Power Supplies

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 d.c. 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 switchgear 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 an earthed 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 d.c. circuit is not connected to an equipotential protection conductor, an earth leakage detector will indicate any accidental insulation faults (please consult your Regional Sales Office).

Operating voltage

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

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

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 surpassed and to deal with the consequences of this (please consult your Regional Sales Office).

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 mains 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.

The quality of the mains power supply

The Phaseo range is the solution because it guarantees 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 mains supplies within the nominal range, without any adjustment.

The Phaseo RP family can also be connected to --- 110 and 220 V emergency supplies.

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 mains supply. 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 public mains 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 ABL-7RP power supplies conform to standard EN 61000-3-2 and can therefore be connected directly to public mains 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.

Behaviour 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 ABL-7RE/RP), which avoids having to take any action or change a fuse. In addition, the Phaseo ABL-7RP 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 mains power off and back on.

This feature allows Phaseo ABL-7RP/U/REQ power supplies to be used in installations where the risks associated with untimely restarting are significant.

Selection of reset mode

It is made by microswitch on the front panel of the product.

Advantys STB Distributed I/O Solution Phaseo Regulated Power Supplies

Technical characteristics

| Type of power supply | | ABL 7RE | ABL 7RP |
|--------------------------------|---------------------------------|----------------------------------------|--------------|
| Approvals | | UL, CSA, TÜV, CTick | |
| Conforming to standards | Safety | UL 508, CSA 22.2 n° 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 | 0.6 (48 W)/0.83 (72 W) 1.2 (120 W)/2.5 (240 W) | 0.4 (72 W)/0.6 (120 W) 1.3 (240W) |
| | Ue = 100 V | A | 1.2 (48 W)/1.46 (72 W) 1.9 (120 W)/3.6 (240 W) | 0.8 (72 W)/1 (120 W)/2.8 (240 W) |
| Current at switch-on | | A | < 30 | |
| Power factory | | | 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 | 2.5/5/10 |
| Precision | 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 51 | |
| Protections | 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 | mm² | 2 x 2.5 + earth | |
| | Output | mm² | 2 x 2.5 + earth, multiple output, depending on model | |
| Ambient conditions | Storage temperature | °C | - 25... + 70 | |
| | Operating temperature | °C | 0... + 60 (derating as from 50° C, mounted vertically) | |
| | Max. relative humidity | | 95 % without condensation | |
| | Degree of protection | | IP 20 conforming IEC 529 | |
| | Vibrations | | Conforming EN 61131-2 | |
| Operating position | | | Vertical | |
| MTBF at 40 °C | | | > 100 000 h | |
| Connections | Series | | Possible | |
| | Parallel | | Possible (max. temperature 50 °C) | |
| Dielectric strength | Input/output | | 3000 V/50 and 60 Hz 1 minute | |
| | Input/earth | | 3000 V/50 and 60 Hz 1 minute | |
| | Output/earth (and output/output) | | 500 V/50 and 60 Hz 1 minute | |
| Input fuse incorporated | | | Yes, not interchangeable | |
| 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 niv.3 (10 V/m) | |
| | Conduced interference | | EN 61000-4-4 niv.3 (2 kV) , EN 61000-4-5, EN 61000-4-6 niv.3, EN 61000-4-8 niv. 4. | |
| | Mains interference | | EN 1000-4-11 (voltage drops and cuts) | |

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

Advantys STB Distributed I/O Solution Phaseo Regulated Power Supplies

Derating

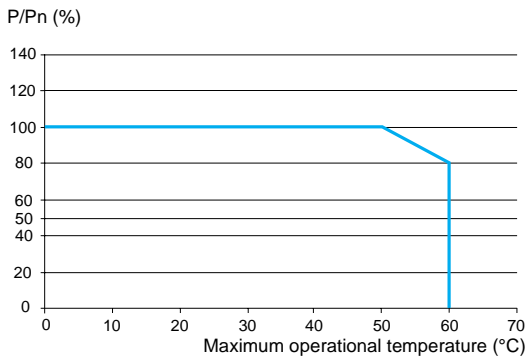
The ambient temperature is a determining factor which limits the power that an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced. Conversely, a power supply can deliver more than its nominal power 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 graph below shows the power P (in relation to the nominal power Pn) which the power supply can deliver continuously, according to the ambient temperature.

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 24V (to compensate for line voltage drops, for example).
- Parallel connection to increase the total power.

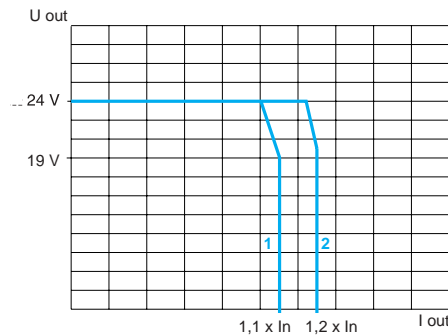


General rules to be complied with

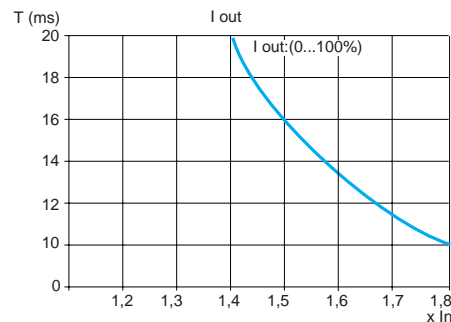
| | |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Intensive operation | See derating on above graph. Example for ABL-7RE: <input type="checkbox"/> without derating, from 0 °C to 50 °C, <input type="checkbox"/> 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



ABL 7RE and ABL 7RP power supply: protection of the power supply line

| Type of mains supply | ~ 115 V single-phase | | | ~ 230 V single-phase | | |
|----------------------|----------------------------------|-------------|---------|----------------------------------|-------------|---------|
| | Thermal-magnetic circuit-breaker | | gG fuse | Thermal-magnetic circuit-breaker | | gG fuse |
| | GB2 | C60N | | GB2 | C60N | |
| ABL 7RE2402 | GB2 ●B07 | MG24517 (1) | 2 A | GB2-DB06 | MG24517 (1) | 2 A |
| ABL 7RE2403 | GB2 ●B07 | MG24517 (1) | 2 A | GB2-DB06 | MG24518 (1) | 2 A |
| ABL 7RE2405 | GB2 ●B08 | MG24518 (1) | 4 A | GB2-DB07 | MG24518 (1) | 2 A |
| ABL 7RE2410 | GB2 ●B12 | MG17454 (1) | 6 A | GB2-DB08 | MG24516 (1) | 4 A |
| ABL 7RP2403 | GB2 ●B07 | MG24517 (1) | 2 A | GB2-DB07 | MG17453 (1) | 2 A |
| ABL 7RP2405 | GB2 ●B07 | MG24517 (1) | 2 A | GB2-DB07 | MG24516 (1) | 2 A |
| ABL 7RP2410 | GB2 ●B09 | MG24519 (1) | 4 A | GB2-DB07 | MG24516 (1) | 2 A |

(1) Disjoncteur certifié UL.

Association Phaseo Power supplies with STB modules

| Installation for Advantys STB with | | Network interface module "NIM" STB N●● | Power distribution module "PDM" STB PDT 3100 | |
|------------------------------------|--|----------------------------------------|----------------------------------------------|--------------------------------|
| | | | Sensors | Actuators |
| 1 power supply | | ABL 7RE2410/ABL 7RP2410 (10 A) | | |
| 2 power supplies | | ABL 7RE2402 (2 A) | ABL 7RE2410/ABL 7RP2410 (10 A) | |
| 3 power supplies | | ABL 7RE2402 (2 A) | ABL 7RP2405/ABL 7RE 2405 (5 A) | ABL 7RP2410/ABL 7R 2410 (10 A) |

Note:

- Network Interface module "NIM" STB N●●: ~ 24 V power supply, the input current is 0.4 A.
- Power distribution module "PDM" STB PDT 3100: the max. current is:
 - for sensors: 4 A @ 30°C, 2.5 A @ 60°C,
 - for actuators: 8 A @ 30°C, 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 manu-reset. EN 61000-3-2 conforming.

References (1)



ABL 7RE2405
ABL 7RP2405

ABL 7RE single-phase regulated switch mode power supplies

| Mains input voltage 47...63 Hz | Output voltage | Nominal power | Nominal current | Auto-protect reset | Conforming to standard EN 61000-3-2 | Reference | Weight |
|----------------------------------------|----------------|---------------|-----------------|--------------------|----------------------------------------|-------------|--------|
| V | ~ V | W | A | | | | kg |
| ~ 100...240 single-phase wide range | 24 | 48 | 2 | auto | no | ABL 7RE2402 | 0.520 |
| | | 72 | 3 | auto | no | ABL 7RE2403 | 0.520 |
| | | 120 | 5 | auto | no | ABL 7RE2405 | 1.000 |
| | | 240 | 10 | auto | no | ABL 7RE2410 | 2.200 |

ABL 7RP single-phase regulated switch mode power supplies

| Mains input voltage 47...63 Hz | Output voltage | Nominal power | Nominal current | Auto-protect reset | Conforming to standard EN 61000-3-2 | Reference | Weight |
|-----------------------------------------------------------|----------------|---------------|-----------------|--------------------|----------------------------------------|-------------|--------|
| V | ~ V | W | A | | | | kg |
| ~ 100...240 single-phase wide range ~ 110...220 (2) | 24 | 72 | 3 | auto/man | yes | ABL 7RP2403 | 0.520 |
| | | 120 | 5 | auto/man | yes | ABL 7RP2405 | 1.000 |
| | | 240 | 10 | auto/man | yes | ABL 7RP2410 | 2.200 |

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

(2) Other Phaseo power supplies, consult our catalogue "Phaseo Power supply and Transformer".

Dimensions

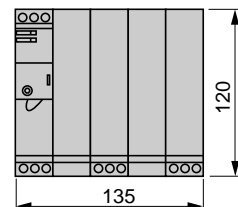
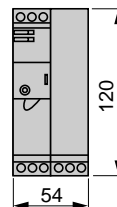
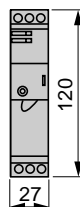
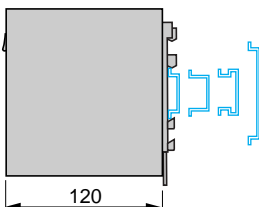
ABL 7RE24●●/ABL 7RP24●●

ABL 7RE2402/2403
ABL 7RP2403

ABL 7RE2405

ABL 7RE2410
ABL 7RP2410

Common side view
Mounting on 35 and 75 mm rails



Advantys STB Distributed I/O Solution Automation Product Certifications








Product certifications and marine classification authorities

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. |
| LR | Lloyd's Register | United-Kingdom |
| RINA | Registro Italiano Navale | Italy |
| RRS | Register of Shipping | C.I.S. |

The table below shows the situation as of the 01.09.2003 for certifications obtained or pending from organizations for base PLCs. Further information regarding certified modules can be obtained from your Regional Sales Office.

| | Certifications | | | | Others | | |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| |  CSA Class 1 Div 2 Canada |  ACA Australia |  SIMPARS Australia |  UL USA |  Class 1 Div 2 Hazardous locations Etats-Unis |  BG Germany |  AS-i Europe |
| ABE-7 | | | | E164866 | | | |
| Advantys STB | LR 32678 | | | E54088 | FM3017828 | | |
| Lexium MHD/BPH | | | | | | | |
| Magelis IPC | | | | E95257 | | | |
| Magelis TXBT-F | LR 44087-77 | N998 | | | | | |
| Magelis XBT-F/FC | LR 44087-77 | N998 | | | | | |
| Magelis XBT-H/P/E/HM/PM | LR 44087-77 | | | E95257 | | | |
| Micro | LR 58905-30 | N998 | NI97/0039 Ex2314X | E95257 | LR 58905-30 | (1) | (2) |
| Momentum | | N998 | | | | | |
| Premium | LR 58905-32S | N998 | NI97/0039 Ex2314X | E95257 | LR 58905-32S | (3) | (4) |
| Quantum | | | | | | | (5) |
| TBX | LR 58905-21 LR 58905-21 (S) | N998 | | E95257 | | | |

(1) TSX DPZ 10D2A safety module.

(2) TSX SAZ 10 AS-i bus master module and TSX SUP A02/A05 AS-i bus power supplies.

(3) TSX PAY 262/282 safety modules.









(4) TSX SAY 100 AS-i bus master modules.

(5) 140 EIA 921 00 AS-i bus master module.

Advantys STB Distributed I/O Solution

Automation Product Certifications

Product certifications and marine classification authorities (continued)

| Normal execution | Sociétés de classification des navires | | | | | | | |
|--------------------------------|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| |  ABS USA |  BV France |  DNV Norway |  GL Germany |  GOST CEI |  LR United-Kingdom |  RINA Italy |  RRS CIS |
| | | | | 99155-96HH | | | | |
| ABE-7 | | | | 99155-96HH | | | | |
| Advantys STB | | | | | | | | |
| Lexium MHD/BPH | | | | | | | | |
| Magelis IPC | | | | | | | | |
| Magelis TXBT-F | | | | | | | | |
| Magelis XBT-F/FC | | | | | | | | |
| Magelis XBT-H/P/E/HM/PM | | | | | | | | |
| Micro | | 45016846A001 | A7961 | 99086-96HH | | 97/00114 | ELE/48896/1 | |
| Momentum | | | | | | | | |
| Premium | 00MS14569-X 00-LD186857- PDA | 4501H07135/B 0 | A7957 | 99405-97HH | | 98/00088 | ELE/35897/1 | |
| Quantum | | | | | | | | |
| TBX | | 45037058A001 | A7952 | 99405-97HH | | | ELE/43795/2 | |

Conformity to European Directives: CE marking

All products are conformed to CE marking.
See Community regulations page 55.

The 5 V required for the logic power supply of the I/O modules is provided by the modules:

- Network Interface NIM positioned at the beginning of the primary segment.
- BOS bus extension module positioned at the beginning of the extension segment.

This built-in 5 V power supply provides up to 1200 mA current.

Depending on the total number of modules (on the primary segment and the extension segments), the island installer ought to calculate the island's total power requirements to assure that the current required by the I/O modules is not greater than the current provided by the network interface module.

Using the worksheet

For each segment:

- In the "Number" column, indicate the desired quantity for each of the I/O modules used.
- In the "Total" column, calculate the total current based on that quantity.
- In cell 1, add up all these values (mA).
- The total in cell 1 must be lesser than or equal to 1,200 mA, cell 2.

| Segment | I/O module reference | Appropriate Module Base | Removable connectors (1) | Power Distribution Modules | Number per segment | Power consumption in mA at 5 V | |
|------------------------------|----------------------|-------------------------|--------------------------|----------------------------|--------------------|--------------------------------|-------|
| | | | | | | By module | Total |
| Digital Inputs | STB DDI 3230 | XBA 1000 | XTS ●100 | PDT 3100 | | 50 | |
| | STB DDI 3420 | XBA 1000 | XTS ●100 | PDT 3100 | | 60 | |
| | STB DDI 3610 | XBA 1000 | XTS ●100 | PDT 3100 | | 70 | |
| | STB DAI 5230 | XBA 2000 | XTS ●100 | PDT 2100 | | 50 | |
| | STB DAI 7220 | XBA 2000 | XTS ●100 | PDT 2100 | | 50 | |
| Digital Outputs | STB DDO 3200 | XBA 1000 | XTS ●100 | PDT 3100 | | 60 | |
| | STB DDO 3230 | XBA 1000 | XTS ●100 | PDT 3100 | | 60 | |
| | STB DDO 3410 | XBA 1000 | XTS ●100 | PDT 3100 | | 80 | |
| | STB DDO 3600 | XBA 1000 | XTS ●100 | PDT 3100 | | 90 | |
| | STB DAO 8210 | XBA 2000 | XTS ●110 | PDT 2100 | | 70 | |
| | STB DRC 3210 | XBA 2000 | XTS ●110 | PDT 3100 | | 50 | |
| | STB DRA 3290 | XBA 2000 | XTS ●110 | PDT 3100 | | 60 | |
| Analog Inputs | STB AVI 1270 | XBA 1000 | XTS ●100 | PDT 3100 | | 60 | |
| | STB ACI 1230 | XBA 1000 | XTS ●100 | PDT 3100 | | 60 | |
| | STB ART 0200 | XBA 1000 | XTS ●100 | PDT 3100 | | 100 | |
| Analog Outputs | STB AVO 1250 | XBA 1000 | XTS ●100 | PDT 3100 | | 80 | |
| | STB ACO 1210 | XBA 1000 | XTS ●100 | PDT 3100 | | 80 | |
| Application-specific modules | STB EPI 1145 | XBA 2000 | - | PDT 3100 | | 130 | |
| | STB EPI 2145 | XBA 3000 | - | PDT 3100 | | 130 | |
| | STB EHC 3020 | XBA 3000 | XTS 2150 | PDT 3100 | | 140 | |

Consumption per segment

Total current consumed by the network interface module

1



| | | | | |
|---------------------------------|--------------|-----------------|--------------------------------|---------|
| Network Interface Modules "NIM" | STB NIP 2212 | Ethernet TCP/IP | Current available on 5 V logic | 1200 mA |
| | STB NCO 2212 | CANopen | | |
| | STB NCO 1113 | Economy CANopen | | |
| | STB NMP 2212 | Modbus Plus | | |
| | STB NFP 2212 | Fipio | | |
| | STB NIP 2212 | INTERBUS | | |
| | STB NDP 2212 | Profibus DP | | |
| STB NIN 2212 | DeviceNet | | | |
| Extension bus module "BOS" | STB XBE 1200 | - | | |

2

(1) For screw-type connector: replace ● by 1, for spring-type connector: by 2

Advantys STB Distributed I/O Solution

Community Regulations and Protective Treatment

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 could not be applied before 1 January 1995 and 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.

Protective treatment of equipment

Advantys, STB distributed I/O meet the requirements of "TC" treatment (1).

For installations in industrial production workshops or in an environment which corresponds to "TH" treatment (2), STB distributed I/O should be enclosed in casings with a minimum of IP 54 protection as prescribed by standards IEC.

Advantys, STB distributed I/O are supplied with an IP 20 protection index. They can therefore be installed without enclosure in locations with restricted access which do not exceed pollution degree 2 (control room which does not contain a machine or dust-producing activity).

(1) "TC" treatment : all climate treatment.

(2) "TH" treatment : treatment for hot and humid environments.

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