

Advant[®] OCS
with Master software

S100 I/O

Product Guide

3BSE 015 967R201 Rev B



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Chapter 1 Overview

S100 I/O is a board-based I/O system where the boards are placed in subracks. It is used together with the Advant Controller 400 Series process controllers. The range of process I/O modules is complete, consisting of general purpose digital and analog inputs and outputs and special interfaces for special tasks.

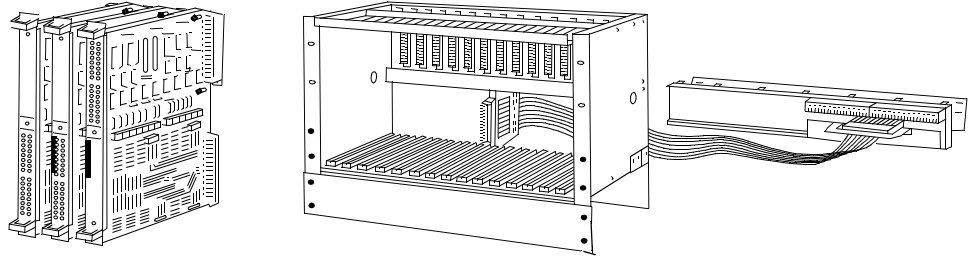


Figure 1-1. S100 I/O Subrack configuration

1.1 Product Benefits

The S100 I/O gives the following benefits:

- a complete set of process interface
- hot replacement of all I/O modules
- high disturbance immunity, meeting the requirements of the EC directives 89/336/EEC and 73/23/EEC when placed in cabinets.
- comprehensive self-diagnostics
- on-board processing capabilities such as time-tagging, event handling, filtering and gain control.
- supports transparent dual redundancy
- modularity, permitting step-by-step expansion
- reliability and auto-diagnostics
- easy to configure.

By using the Object Oriented Connection Units you will reduce the complexity and cost of process control cabling. Object Oriented Connection Units means, besides that they are user friendly, less need for cable marshalling, which leads to easier and faster:

- engineering
- pre-delivery testing
- cable termination
- functional checking
- fault tracing
- system expansion.

1.2 Features

The S100 I/O gives you the following features:

- quick faultfinding with help of LEDs of each module and channel
- an extensive scope of Digital input/output modules and Analog input/output modules
- support of dual redundancy in power supply
- all outputs can be individually set to freeze or to take on predefined values
- pulse counting
- frequency measuring
- positioning
- speed control of motors

Chapter 2 Functional Description

2.1 General

All S100 process I/O modules provide simple interfacing, accurate control and easy integration of individual loops into a comprehensive plant-wide control and supervision system. The process cables are connected to connection units, which are connected via standard cables to the I/O boards. The S100 I/O system is the rack mounted process interface for Advant Controller 400 Series process controllers.

I/O boards can be exchanged while the system is running. New boards can also be inserted live. A newly inserted board is taken into operation within 10 seconds. For some of the digital input boards local time tagging on the input board are available for process events, thus providing a very good time resolution.

For loop control, the board DSAX 110/110A (and DSAI 133/133A for additional inputs) can be used. Dual boards and a special connection unit make a redundancy configuration, achieving a high degree of availability. The outputs are supervised by reading back the output signals through dedicated analog inputs on the board.

Support for both the HART protocol and Intrinsic Safety Isolators are available.

2.2 S100 I/O Functionality

Application programs have access to process signals via DB elements. They also contain all I/O system configuration information. Configuring the I/O system involves filling in DB elements with parameters for each module and channel. Typical parameters are tag name, signal range, filter time, etc. Analog values are automatically converted to process-related units (engineering units), relieving the application programmer from all considerations about scaling.

2.2.1 Scanning

Analog and digital input modules in S100 I/O are scanned cyclically, the cycle times can be selected from the same group of cycle times as the cycle times for the execution modules in PC programs. The I/O scanning is performed immediately before the PC program scanning in each scan cycle.

For digital inputs the same scanning cycle applies to all channels on the same module. For some digital input modules interrupt-controlled updating of the DB element can be selected instead of the scanning. For analog inputs the scan time is specified for each channel individually. For Pt100 and thermocouple inputs longer cycle times, than the cycle times for PC programs, are available. Both digital and analog outputs are updated immediately after the PC execution unit where the value has changed.

For regulatory control this mean that within one scan cycle, analog input is read, the control algorithm executed and the resulting output is presented on the terminals.

2.2.2 Redundancy

It is possible to duplicate some of the I/O modules to create a hardware redundancy, for a higher availability.

2.2.3 Diagnostics

Diagnostic functions are executed for all I/O modules at system start-up and during normal operation. A faulty unit is indicated by a red LED on the I/O module and a system error message is sent to the operator station to catch the operators attention.

2.2.4 Events and Alarms

For digital inputs events or alarms can be generated in case of status change. The event is time tagged by the Process Interface software. For Interrupt-controlled digital inputs the event is time tagged on the input module. For analog inputs limits are available. When the value pass the limits events or alarms can be generated, in which case the event is time tagged by the Process Interface software.

The relative time error between events (DI signals) handled within one controller utilizing S100 I/O is <2 ms (interrupt driven). The relative time error between events handled within separate controllers are max 4 ms, typically 3 ms. If external time synchronization is used between the controllers (“minute pulse” is connected to the actual controllers) the time error is <4 ms.

2.2.5 Analog Inputs

The analog input signals are protected against over-voltage and hf-filtering. A low-pass filtering amplifier with programmable gain and A/D conversion is handled on the AI-board. The amplifier can be programmed to handle a wide range of voltage and current inputs, 4-20mA, 2-10mA, 0-±10mA, 0-10V, 0-±10V, 0-5V, 0-±5V etc. depending of type of I/O-board and connection unit.

- Analog inputs of different types are available. Both single ended and differential inputs with or without live zero are possible to connect to Advant Controller 400 Series
- All values are used in the system as engineering units
- Each module has reference channels for automatic testing
- The database is updated by scanning, with cycle times normally selected from the range 100 ms to 600 s
- Optional software filtering, square-root linearization and deadband limits for updating can be selected
- Group wise isolation valid for DSAI 130A, DSAI 133A.

2.2.6 RTD Inputs (Pt 100 etc.)

- All values are used in the system as engineering units, selectable between degrees Fahrenheit and Celsius
- Temperature range is selectable per channel. Different temperature ranges are available within the temperature span:
 - S100 I/O: -200 to +640 °C
- Each module has built-in reference channels for automatic calibration and testing
- The database is updated by scanning, with cycle times normally selected from the range 100 ms to 600 s
- The suppression frequency is selectable between 20, 30, 50 and 60 Hz
- Optional software filtering and deadband limits for updating can be selected
- Group wise isolation valid for DSAI 146.

2.2.7 Thermocouple Inputs

- All values are used in the system as engineering units, selectable between degrees Fahrenheit and Celsius
- Thermocouple inputs are available for the sensor types B, C, E, J, K, R, S, and T. The sensor type is selectable per I/O board
- Each module has built-in reference channels for automatic calibration and testing
- The database is updated by scanning, with cycle times normally selected from the range 100 ms to 600 s
- Optional software filtering and deadband limits for updating can be selected
- Group wise isolation valid for DSAI 155A.

2.2.8 Analog Outputs

- Analog outputs of different types are available, with or without live zero
- All values are used in the system as engineering units
- The update of the analog output module is done immediately after an update request has been received either from PC program or from operator
- Group wise isolation valid for DSAO 130A
- Channel wise isolation valid for DSAO 120A.

2.2.9 Digital Inputs

- Mode of database updating can be selected, either by interrupts or by scanning. The scan cycle times are normally selected from the range 10 ms to 60 s
- Some modules offer pulse extension, which can be used to avoid rapid scanning of digital inputs used for push-buttons
- The digital input can be inverted so the value is 1 when the electrical signal is off, and 0 when it is on. Suitable when the logical sensor function is the inverse of the electrical
- For interrupt-controlled digital inputs the process event is time tagged on the input module.

2.2.10 Digital Outputs

- The update of the physical output is done immediately after an update request has been received either from PC program or from operator
- The digital output can be inverted so value 1 means the electrical signal is off and value 0 that it is on. Suitable when the logical actuator function is the inverse of the electrical

2.2.11 Pulse Counters

Pulse counter units are available for pulse counting and frequency measurement for frequencies up to 2.5 MHz.

2.2.12 Positioning

Positioning is available as a programmable function in Advant Controller 400 Series. It is a general system for position measurement and for control and positioning of d.c. motors, a.c. motors, and hydraulic or pneumatic servos via a special interface module to the controller. Position measurement is incremental. A pulse encoder provides a number of pulses which corresponds to the positional displacement. Each axis uses two pulse input channels to detect direction of the movement and a third channel for synchronization. Configuration is done with dedicated PC elements which interact with dedicated hardware as an interface to the process. The hardware accumulates the pulse train from the encoders and handles the outputs and synchronizing signals. Depending on the function selected, there are three different PC elements:

- Position measurement or analog speed control with time optimal position control
- ON/OFF control with or without stepping function
- Length measurement with order output.

Each positioning axis requires a positioning board DSDP 140A.

All input and output signals are handled in process-related units, such as mm, inches or degrees. Additional functional features are available:

- Movements can be stated relative to a previous position (line movement), or relative to a zero point (absolute positioning)
- A zero point introduced into the system can be moved easily, all the other position values following
- The number of axes in a controller is virtually unlimited, and is restricted only by memory space considerations
- The number of positions per axis is also “unlimited”
- Movements can be made according to a pre-programmed curve
- Positions can be given as numerical values, or by the system learning actual positions

2.2.13 Digital Speed Control

Digital speed control is available as a programmable function in Advant Controller 400 Series. A thyristor converter for d.c. motor drives with analog speed control can be provided with a digital speed control by connecting the converter to a dedicated interface module in the Advant Controller 400 Series. Configuration is done with two dedicated PC elements which interact with the dedicated hardware as an interface to the process.

2.3 Bus Extension

The S100 I/O subracks are connected to the controller subrack with an electrical bus extension cable. The cable is limited to 12 meters (39 ft.) and can connect up to 5 I/O subracks. The **bus** is designed not to be used outside the cabinets which must be considered when different cabinet configurations are connected together with the electrical bus extension cable.

By using an optical bus extension the S100 I/O subracks can be distributed up to 500 m (1640 ft.) from the controller subrack. The bus is designed for point-to-point communication and consists of one modem in each end and an optical cable with two separate fibres. The modem in the controller end is connected to the electrical bus extension via a connection box, TK560 or TX560, which makes it possible to disconnect the modem (by removing the box) without breaking the electrical bus. Both the electrical and the optical bus extension can be used in a redundant configuration.

Three combinations can be used:

- Single PM511V and single S100 I/O bus extension.
- Redundant PM511V and single S100 I/O bus extension by using Interconnection Unit TK566.
- Redundant PM511V and redundant S100 I/O bus extension

The redundant S100 I/O bus extension contains two single bus extensions connected in parallel.
 See Figure 2-1 for a S100 I/O Redundant Bus Extension example.

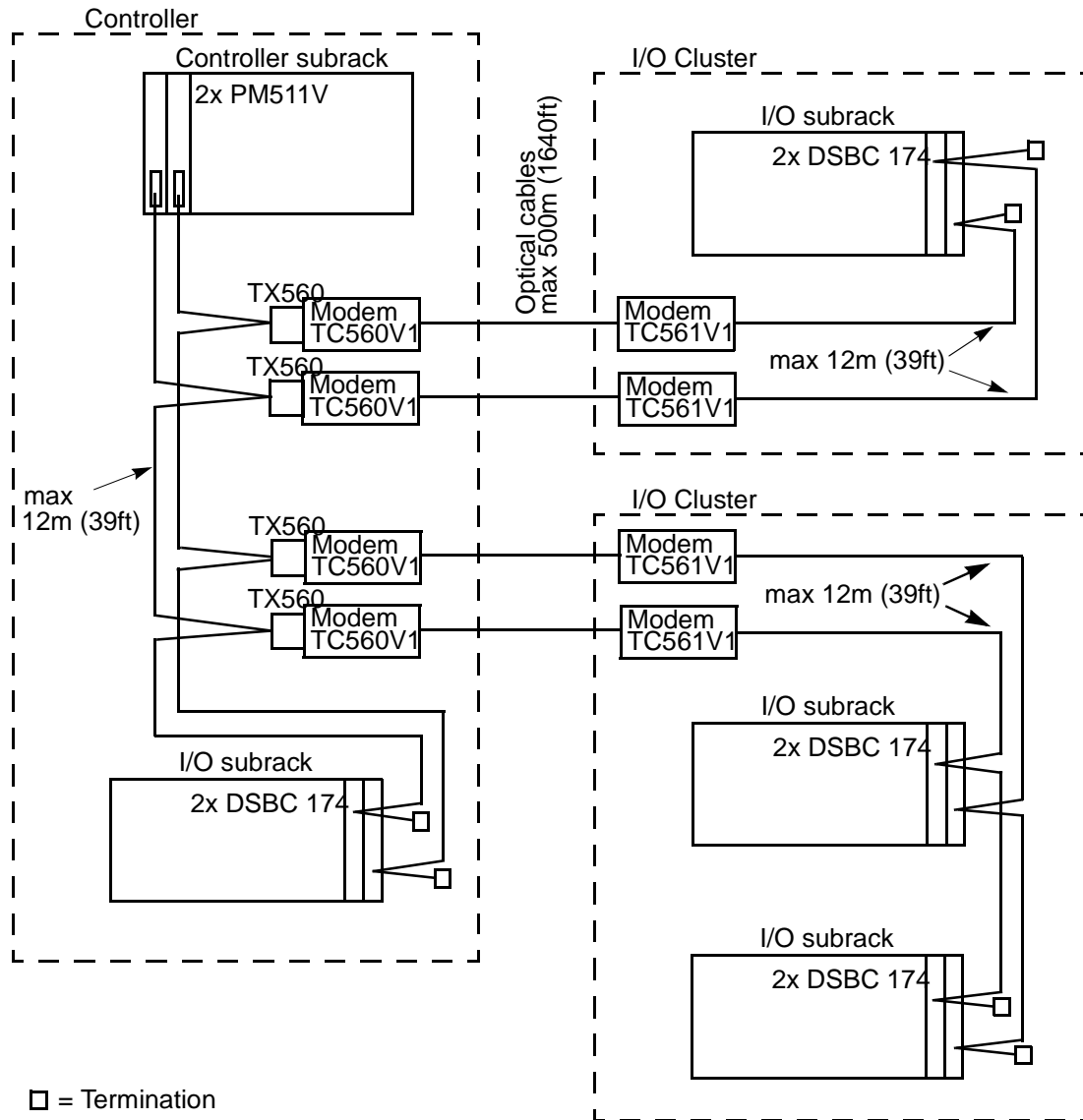


Figure 2-1. S100 I/O Redundant Bus Extension example

The I/O cluster contains an electrical bus extension cable with a maximum length of 12 m (39 ft.) connected to the optical modem and up to 5 I/O subracks.

Optical cable data:

- Type: 62.5/12 μ m (dual)
- Connector: Bayonet ST Connector
- Length: Max 500 m (1640 ft.)

Table 2-1. Max. no. of S100 I/O subracks and optical bus extensions

Configuration	Max. No.
S100 I/O subracks on the electrical bus extension cable connected to controller subrack (PM511V)	5
S100 I/O subracks + TC560V1 (optical bus extension modem) on bus extension cable 12 m (39 ft.) connected to controller subrack	5
Optical bus extensions (if no S100 I/O subracks directly connected to controller subrack)	5
S100 I/O subracks on bus extension cable 12 m (39 ft.) in one I/O cluster	5

Up to 25 S100 I/O subracks can be connected to one controller subrack when optical bus extensions are used (5 I/O clusters with 5 S100 I/O subracks each).

Digital I/O boards have LED indicators showing the status of each channel. Analog input units have a LED indicating completion of each A/D conversion.

Diagnostic functions are executed for all I/O boards at system start-up and during normal operation. Any fault detected is indicated by a LED on the I/O boards face plate, and by a system error message reported to the operator interface software AdvaCommand or to the engineering software AMPL Control Configuration (AdvaBuild for Windows).

Chapter 3 Software Components

3.1 General

S100 I/O has no software components.

For software functions, please refer to:

- *Product Guide for Advant Controller 410*
- *Product Guide for Advant Controller 450.*

Chapter 4 Hardware Components

4.1 General

The S100 I/O system consists of I/O boards with 4 to 32 channels, depending on type. The boards are placed in I/O subracks.

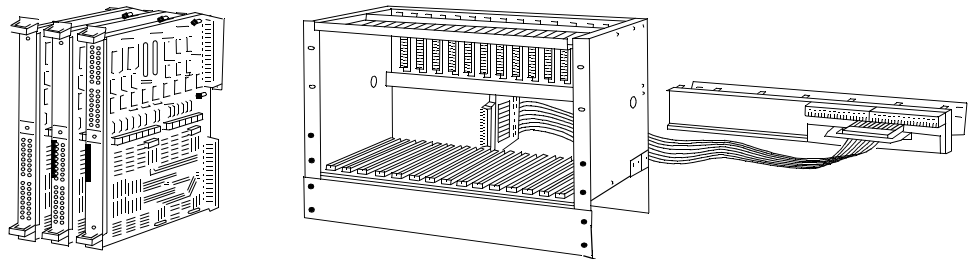


Figure 4-1. Subrack configuration

The dimensions of the I/O subracks are given in Table 4-1.

Table 4-1. I/O subrack dimensions

Width	482,6 mm (19")
Height	347 mm (13.7") (including cable duct)
Depth	335 mm (13.2") (including voltage regulator DSSR 122) 345 mm (13.6") (including voltage regulator DSSR 170)

4.2 I/O Boards

The complete range of I/O boards is listed in Chapter 6, Technical Data and Performance.

4.3 Connection Units

The connection units have additional terminals for power distribution to sensors and actuators. For analog inputs the connection units also include current shunts. This feature makes it possible to exchange analog input boards without breaking any current loops.

Two functional different types of connection units are used for S100 I/O:

- **Board Oriented Connection Units (BOCU)**

The connection unit is connected to one type of S100 I/O board. Such a connection unit normally occupies 120-240 mm (4.7-9.4") of the mounting bar. The size of each connection unit are given in Chapter 6, Technical Data and Performance.

Normally the field cables are connected via marshalling cabinets to adapt the field-wiring to the Board Oriented Connection Units.

4.4 Support for HART Multiplexer

One group of analog input/output sets is provided with special cables for connection of multiplexers for the HART protocol. These multiplexers make it possible to communicate with field equipment (smart transmitters such as flow-meters, ph-meters etc.) by superimposing digital signals on the same cable that carries the analog current signal. Via a personal computer connected to the multiplexer an engineer can change parameters in the field equipment.

The multiplexer and the basic software for the HART protocol must be bought from vendors outside ABB, see the manual *HART Protocol Interface, User's Guide* for further information.

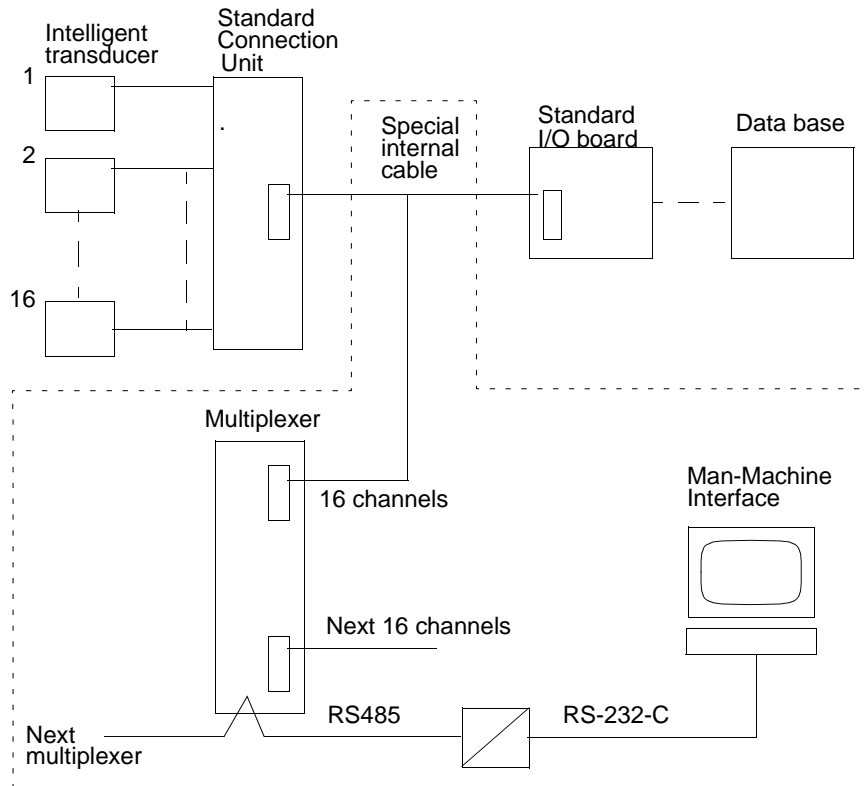


Figure 4-2. Principle of HART Implementation

4.5 Support for Intrinsic Safety System

Intrinsic Safety System from ELCON Instruments (manufacturer outside ABB) is supported via a special series of S100 I/O sets. These sets contain S100 I/O boards and a long connection cable. No connection units are included. The Intrinsic Safety Isolator modules are mounted in cabinets by ELCON Instruments.

Supported Intrinsic Safety systems from ELCON Instruments are the HiD Series 2000.

In the Reference Guide information is given for each I/O set, which system the set supports.

ELCON Instruments can provide a HART protocol connection to I/O modules integrated with the Intrinsic Safety system.

For further information, see the manual “Intrinsic Safety Support S100 I/O with Series 2000 - User’s Guide”.

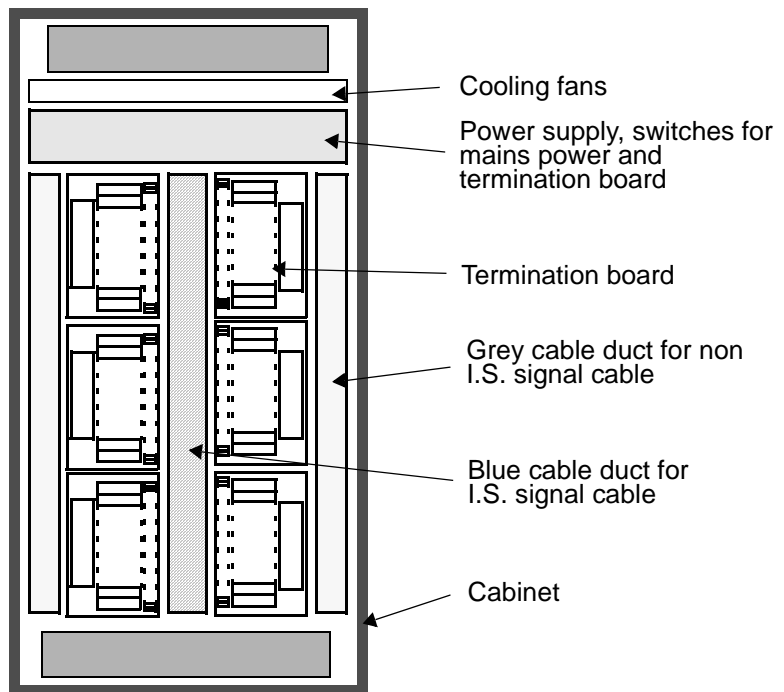


Figure 4-3. Intrinsic Safety System Mounted in Cabinet from Other Manufacturer

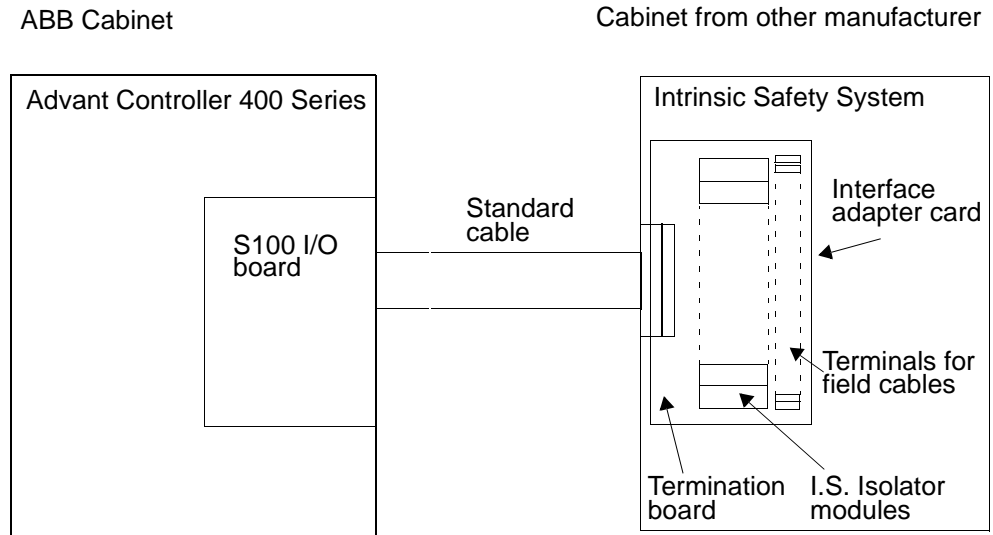


Figure 4-4. Principles of the Intrinsic Safety Support

4.6 Power Supply System

All essential functions in the power supply system are supervised and status is indicated in the cabinet on LEDs. On an Advant Operator Workplace the status indication will also appear on System Status Displays and faults will be reported in the System List.

4.6.1 Mains Network Types

The power supply system can be connected to the following types of mains supply:

- 120/230 V a.c., 50 or 60 Hz.
- 24/48 V d.c. via a d.c./d.c. converter, providing galvanic isolation between the power line and Advant Controller 410.
- 24 V d.c. (without d.c./d.c. converter) the mains supply must be grounded in the cabinet.

4.6.2 Redundancy, Mains Power Supply

The availability of the power supply system for S100 I/O can be increased by duplicating the unstabilized power supplies and by using redundant voltage regulators.

The redundancy is achieved by using two mains supplies and three DSSR 170 voltage regulators in parallel. Regulators and mains supplies can be replaced while the S100 I/O boards are in full operation.

4.6.3 Configuration Alternatives

There are two configurations of the main power supply: with or without redundancy, as depicted in Figure 4-5 and Figure 4-6. When also taking the type of mains supply into consideration there will be a total of six alternative configurations of the power supply. Please see Table 4-2 for an overview

Table 4-2. Power supply arrangements for S100 I/O

Power supply	Redundancy		Configuration	Remark
	No	Yes		
120/230 V a.c.	x		Figure 4-5	
24/48 V d.c.	x		Figure 4-5	
24 V d.c.	x		Figure 4-5	No galvanic isolation
120/230 V a.c.		x	Figure 4-6	
24/48 V d.c.		x	Figure 4-6	
120/230 V a.c.		x	Figure 4-6	Two different supply networks

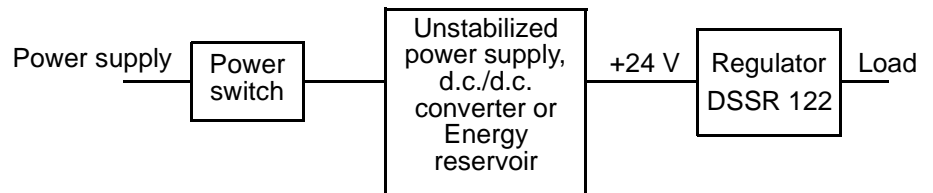


Figure 4-5. Block diagram of power supply without redundancy

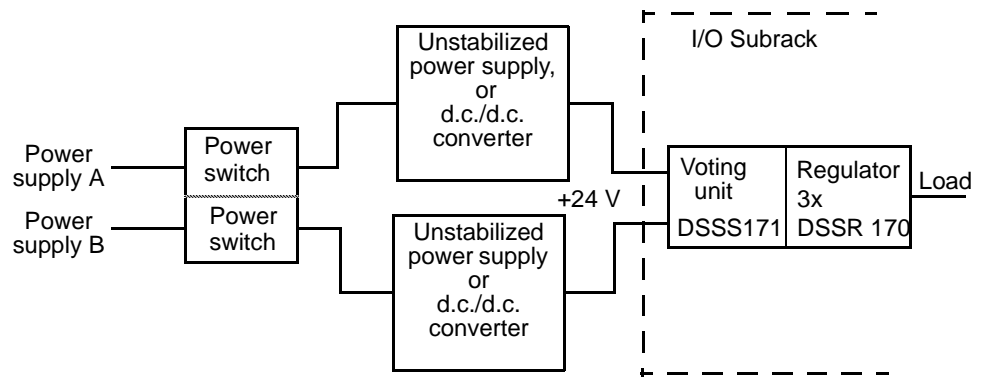


Figure 4-6. Block diagram of power supply with redundancy

The following Table 4-3 only specify the main components in the power supply system. For configuration information, please refer to the Product section of this guide.

Table 4-3. Power Supply

Consists of	Description
SA161	Unstabilized power supply. Input: 120 V a.c. Output: 24V d.c., 10 A
SA167	Unstabilized power supply. Input: 120 V a.c. Output: 24V d.c., 25 A
SA162	Unstabilized power supply. Input: 230 V a.c. Output: 24V d.c., 10 A
SA168	Unstabilized power supply. Input: 230 V a.c. Output: 24V d.c., 25 A
SD150	d.c./d.c. converter with galvanic isolation between output and input Input: 24/48 V d.c. Output: 24V d.c., 20 A
DSSB 170	Energy reservoir with no galvanic isolation between output and input. The power line must be grounded in the cabinet. Input: 24 V d.c. Output: 24V d.c., 25 A

Chapter 5 Mechanical Design

5.1 Cabinet Design

S100 I/O is mounted in a cabinet in a standardized way. Depending on the mixture of I/O boards, connection units, modems, power supplies, etc. to be used, some variations can occur.

Figure 5-1 shows an example of the arrangement of S100 I/O in a cabinet

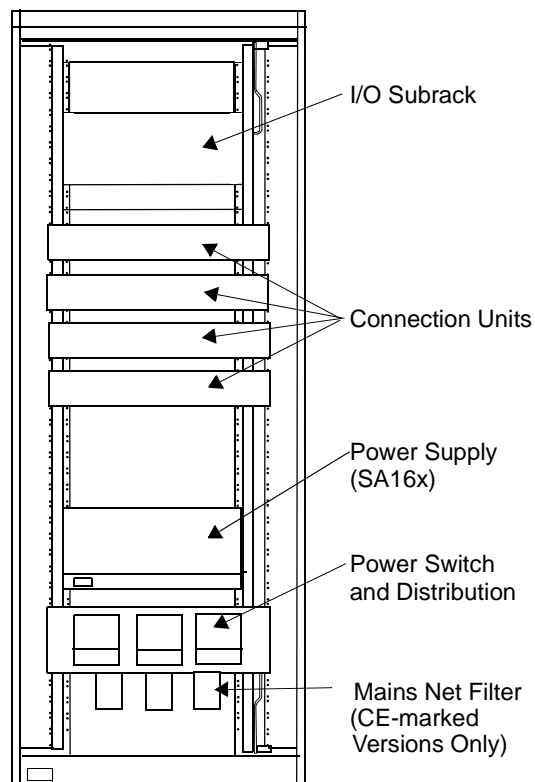


Figure 5-1. Typical Arrangement of S100 I/O in Cabinet

NOTE

Two different cabinet versions are used, RM500V1 and RM500V2.

5.2 Product Design

The subracks are mounted in cabinets and are fitted with guide bars for I/O boards and other plug-in units. Each board is connected to the back plane of the rack. One or several connection units with screw terminal blocks for connection of the process cables are provided for each I/O board. The connection units are connected with the I/O board via standard cables and are normally mounted in the rear part of the cabinet.

Rules for Standard Assembling in Cabinets

The standard way of assembling in RM500 cabinets is shown below as a set of assembling rules and a series of cabinet configurations. A standardized placing order will be used for the physical location of items (such as power supplies, modems, subrack etc.) in the cabinets. Besides this standard way of assembling, there is a possibility to have the equipment assembled in an order specific way. Below are some general assembling rules:

- Place the cabinets side by side (close to each other with no plates between the cabinets).
- The delivery will be in a combination of single and double cabinets.
- An I/O subrack is not filled with more than 18 boards (17 boards if redundant S100 I/O bus extension is used). 2 empty slots will be spare for the future expansion.
- The number of boards in an I/O subrack is limited either by the 18 (17) boards in the subrack or by the available space for connection units.
- In each double (single) cabinet space for 1 mounting bar (for connection units) is left for future expansion.

S100 I/O with BOCU in RM500V1 Cabinets

The S100 I/O is physically separated from control subracks via an optical bus extension.

- The delivery is assembled in up to 6 cabinets, for the 5 possible I/O subracks that can be connected to the same electrical S100 I/O bus extension.
- An extra cabinet, in the configuration figures below showed as the cabinet no 7, can be added to the right of a given configuration, if necessary, to house connection units. For connections units in the extra cabinet, cables with extended length have to be used from the I/O subracks.
- With subrack no. 1 in the cabinet to the left, the expansion direction is to the right.
- All cabinets (single or double) that share the same S100 I/O bus extension (max 12 meters) are connected to the same power switch placed in the cabinet housing the subrack no. 1.
- Each double (single) cabinet (no. 1, 3 and 5) has its own power supplies (power switch in cabinet no 1).
- One set of power supplies for field equipment, if ordered, is placed in cabinet no 2.
- Connection units are placed only within the same double (single) cabinet that houses the corresponding I/O subrack.
- The boards are placed in the I/O subracks in the order AI, AO, DO, DI starting in subrack no 1.

NOTE

DI boards are the last group. Connection units for higher voltage than 24 V occupies more space than the corresponding units for 24 V. Expansion with the extra cabinet no 7 may be necessary.

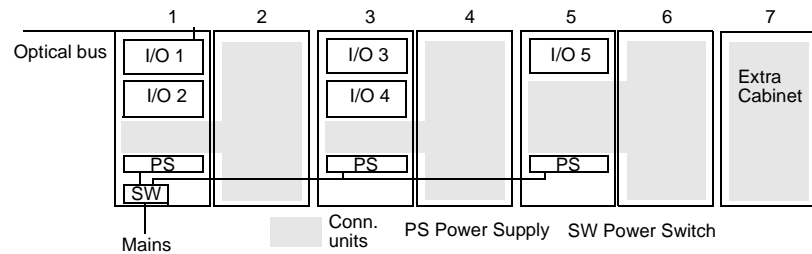


Figure 5-2. Maximum cabinet configuration for S100 I/O assembled in RM500V1 cabinets.

Table 5-1. RM500V1 configurations for S100 I/O

Configuration	Cabinet No	No. of I/O Subracks	Remark
C1	1	1	Only I/O 1 subrack in cabinet 1
C2	1 - 2	1	Only I/O 1 subrack in cabinet 1
C3	1 - 2 (+7)	2	
C4	1 - 3	3	Only I/O 3 subrack in cabinet 3
C5	1 - 4	3	
C6	1 - 4 (+7)	4	
C7	1 - 5	5	
C8	1 - 6 (+7)	5	

S100 I/O with BOCU in RM500V2 Cabinets

The S100 I/O is physically separated from control subracks via an optical bus extension.

- The delivery is assembled in up to 6 cabinets, for the controller subrack and the 5 possible I/O subracks that can be connected to the same bus extension.
- With cabinet housing the controller subrack to the left, the building direction is to the right.
- Cabinet no 2, 4 and 6 contain no hinged frame.
- All cabinets (single or double) that share the same bus extension (max 12 m) are connected to the same power switch placed in the cabinet no 1.
- Each double (single) cabinet has its own power supply (power switch in cabinet no 1).
- One set of power supplies for field equipment, if ordered, is placed in cabinet no 2.
- Connection units are placed only within the same double (single) cabinet that houses the corresponding I/O subrack.

- The boards are placed in the I/O subracks in order AI, AO, DO, DI starting in subrack 1.

NOTE

DI boards are the last group. Connection units for higher voltage than 24 V occupies more space than the corresponding units for 24 V.

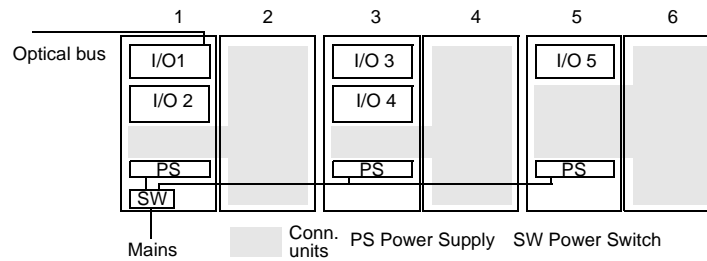


Figure 5-3. Maximum cabinet configuration for S100 I/O assembled in RM500V2 cabinets.

Table 5-2. RM500V2 configurations for S100 I/O

Configuration	Cabinet No	No. of I/O Subracks	Remark
D1	1	1	Only I/O 1 subrack in cabinet 1
D2	1 - 2	1	Only I/O 1 subrack in cabinet 1
D3	1 - 2	2	
D4	1 - 3	3	Only I/O 3 subrack in cabinet 3
D5	1 - 4	3	Only I/O 3 subrack in cabinet 3
D6	1 - 4	4	
D7	1 - 5	5	
D8	1 - 6	5	

Chapter 6 Technical Data and Performance

6.1 General

In the following tables you will find the Technical Data and Performance of the S100 I/O.

An I/O set consists of one or two I/O boards, a cable and one or several connection units. The reason for presenting S100 I/O in sets is that the function is defined by an I/O board and the corresponding connection units.

Table 6-1. Analog Input Sets for S100 I/O with BOCU

I/O Set	Description
DSAI 130 DSTA 131 DSTK 221L3 or DSAI 130A DSTA 131 DSTK 221L3	16 channels, resolution 12 bit, differential, 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 100 V, CMRR > 100 dB (50 Hz) 16 channels, resolution 12 bit, differential, 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 50 V, CMRR > 100 dB (50 Hz)
DSAI 130 DSTA 133 DSTK 221L3 or DSAI 130A DSTA 135 DSTK 221L3	8 channels differential+8 channels single ended, each channel separately fuse-protected, resolution 12 bit, 0 to ± 10 V or 0 to ± 20 mA shunt 250Ω 0.05%, for 2-wire transmitters CMV 100 V, CMRR > 100 dB (50 Hz). 16 channels differential, each channel separately protected, resolution 12 bit, 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.05%, for 2-wire transmitters CMV 50 V, CMRR > 100 dB (50 Hz).
DSAI 133 2 x DSTA 002A DSTK 222L3 or DSAI 133A 2 x DSTA 002B DSTK 222L3	32 channels, resolution 12 bit, single-ended 0 to +10 V or 0 to +20 mA, shunt 250Ω 0.05% 32 channels, resolution 12 bit, single-ended 0 to +10 V, 0 to +20 mA, shunt 250Ω 0.05%
2 x DSAI 133 2 x DSTA 002A 2 x DSTK 222L3 or 2 x DSAI 133A 2 x DSTA 002B 2 x DSTK 222L3	With redundancy: 32 channels, resolution 12 bits, single-ended 0 to + 10V or 0 to +20mA, shunt 250Ω 0.05% With redundancy: 32 channels, resolution 12 bit, single-ended 0 to +10 V, 0 to +20 mA, shunt 250Ω 0.05%

Table 6-1. Analog Input Sets for S100 I/O with BOCU (Continued)

I/O Set	Description
DSAI 146 DSTA 145 DSTK 229SL3	31 (+ 1 ref.) channels for Pt100, 3-wire, resolution 12 bits, -100/ +320 or -200/ + 640 °C
DSAI 155A DSTA 156 DSTK 225SL3 or DSAI 155A DSTA 156B DSTK 225SL3	14 (+ 2 ref. + 1 compens.) channels for thermocouples, resolution 12 bits, measurement ranges B, C, E, J, K, R, S, T for thermocouples with floating output signal, CMV 16 V, CMRR > 100 dB (50 Hz)
DSTA 155 or DSTA 155P	Connection unit for compensation of the cold junction. Used between the thermocouples and DSTA 156 Connection unit for compensation of the cold junction. Used between the thermocouples and DSTA 156B Disconnectible screw terminal blocks.

Table 6-2. Analog Output Sets for S100 I/O with BOCU

I/O Set	Description
DSAO 110 ⁽¹⁾ DSTA 160 DSTK 223L3	4 channels, resolution 12 bits, 0 to ±10 V (min load 600 Ω) or 0 to ±20 mA (max load 500 Ω galvanic isolation. DSTA 160 length 80 mm (3.2"))
DSAO 120A DSTA 171 DSTK 221L3	8 channels, resolution 12 bits, 0 to ±10 V (min load 1000 Ω) or 0 to ±20 mA (max load 600 Ω galvanic isolation. DSTA 171 length 120 mm (4.7"))
DSAO 120 ⁽²⁾ DSTA 170 DSTK 223L3	8 channels, resolution 12 bits, 0 to ±10 V (min load 2000 Ω) or 0 to ±20 mA (max load 500 Ω). DSTA 170 length 160 mm (6.3")
DSAO 130A DSTA 181 DSTK 221L3	16 channels, resolution 12 bits, 0 to +20 mA (max load 850 Ω). DSTA 181 length 120 mm (4.7")
DSAO 130 ⁽²⁾ DSTA 180 DSTK 221L3	16 channels, resolution 8 bits, 0 to +10 V (min load 500 Ω) or 0 to +20 mA (max load 950 Ω at 24 V). DSTA 180 length 240 mm (9.4")

(1) When released, the DSAO 120A will functionally replace the DSAO 110.

(2) When released, the DSAO 130A will functionally replace the DSAO 120 and DSAO 130.

Table 6-3. Analog Input/Output sets for S100 I/O with BOCU

I/O Set	Description
DSAX 110 DSTA 001A DSTK 223L3 or DSAX 110A DSTA 001B DSTK 223L3	8 input channels, resolution 12 bits, single-ended, 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%. 8 output channels, resolution 12 bits, 0 to +20 mA or 0 to +10 V (over shunt 500 Ω 0.1% on DSTA 001A or DSTA 001B)
2 x DSAX 110 DSTA 001A 2 x DSTK 223L3 or 2 x DSAX 110A DSTA 001B 2 x DSTK 223L3	For redundancy, 8 input channels, resolution 12 bits, single-ended, 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%. 8 output channels, resolution 12 bit, 0 to +20 mA or 0 to + 10 V (over shunt 500 Ω 0.1% on DSTA 001A or DSTA 001B)

Table 6-4. Analog Input/Output sets for S100 I/O with BOCU and support for HART multiplexer

I/O Set	Description
DSAI 133 2 x DSTA 002A DSTK 231L5 or DSAI 133A 2 x DSTA 002B DSTK 231L5	16 + 16 channels, resolution 12 bit, single-ended 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%. 16 + 16 channels, resolution 12 bit, single-ended 0 to +10 V, 0 to +20 mA, shunt 250 Ω 0.05%.
2 x DSAO 120 ⁽¹⁾ 2 x DSTA 170 DSTK 232L5	16 channels, resolution 12 bits, 0 to \pm 10 V (min load 2000 Ω) or 0 to \pm 20 mA (max load 500 Ω). DSTA 170 length 160 mm (6.3")
DSAO 130A DSTA181 DSTK 240L5	16 channels, resolution 12 bits, 0 to +20 mA (max load 850 Ω). DSTA 181 length 120 mm (4.7")
DSAO 120 ⁽¹⁾ DSTA 170 DSTK 232L5	8 channels, resolution 12 bits, 0 to \pm 10 V (min load 2000 Ω) or 0 to \pm 20 mA (max load 500 Ω). (occupies 16 channels in the multiplexer)

Table 6-4. Analog Input/Output sets for S100 I/O with BOCU and support for HART multiplexer
 (Continued)

I/O Set	Description
DSAX 110 DSTA 001A DSTK 230L5 or DSAX 110A DSTA 001B DSTK 230L5	8 input channels, resolution 12 bits, single-ended, 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%. 8 output channels, resolution 12 bits, 0 to +20 mA or 0 to +10 V (over shunt 500 Ω 0.1% on DSTA 001A or DSTA 001B)

(1) When released, DSAO 130A will functionally replace DSAO 120.

Table 6-5. Digital Input Sets for S100 I/O with BOCU

I/O Set	Description
DSDI 110A DSTD 190 DSTK 221L3 or DSDI 110AV1 DSTD 190V1 DSTK 221L3	32 channels, 24 V d.c., controlled by scanning or interrupt, pulse extension Local time tagging of process events
DSDI 110A DSTD 150A DSTK 221L3 or DSDI 110AV1 DSTD 150A DSTK 221L3	32 channels, 24 V d.c., controlled by scanning or interrupt, pulse extension Local time tagging of process events Disconnectible screw terminal blocks

Table 6-5. Digital Input Sets for S100 I/O with BOCU (Continued)

I/O Set	Description
DSDI 110A or DSDI 110AV1 and DSTK 226L3	4 x 8 channels, input voltage according to connection unit, controlled by scanning or interrupt, pulse extension Local time tagging of process events
DSTD 195 ⁽¹⁾	- Connection unit for 8 channels, 24 V d.c. all channels galvanically isolated
DSTD 196 or DSTD 196P ⁽²⁾	- Connection unit for 8 channels, 24 V d.c. (48 V d.c over open input)
DSTD 197 ⁽¹⁾	- Connection unit for 8 channels, 110 V d.c. or 120 V a.c.
DSTD 198 ⁽¹⁾	- Connection unit for 8 channels, 230 V a.c.
DSDI 120A DSTD 190 DSTK 221L3 or DSDI 120AV1 DSTD 190V1 DSTK 221L3	32 channels, 48 V d.c., controlled by scanning or interrupt, pulse extension Local time tagging of process events.
DSDI 120A DSTD 150A DSTK 221L3 or DSDI 120AV1 DSTD 150A DSTK 221L3	32 channels, 48 V d.c., controlled by scanning or interrupt, pulse extension. Local time tagging of process events Disconnectible screw terminal blocks.

- (1) The connection unit delays the signal with 8 ms before time tagging on DSDI 110A/110AV1.
(2) Disconnectible screw terminal blocks.

Table 6-6. Digital Output Sets for S100 I/O with BOCU

I/O Set	Description
DSDO 115 DSTK 226L3	32 channels, 24- 250 V a.c./d.c. For connection units, see DSTD 108/108L below.
DSDO 115A DSTK 226L3	32 channels, 24- 250 V a.c./d.c. For connection units, see DSTD 108P/108LP/109P below.
DSDO 115 DSTD 190 DSTK 221L3 or DSDO 115A DSTD 190V1 DSTK 234L3	32 channels, 24 V d.c., short-circuit proof transistor outputs, max. 150 mA. 32 channels, 24 V d.c., short-circuit proof transistor outputs, max. 500 mA.
DSDO 115 DSTD 110A ⁽¹⁾ DSTK 221L3 or DSDO 115A DSTD 110A ⁽¹⁾ DSTK 221L3	32 channels, 24 V d.c. short-circuit proof transistor outputs, max. 150 mA. 32 channels, 24 V d.c. short-circuit proof transistor outputs, max. 500 mA.
DSDO 120 ⁽²⁾ DSTD 120A DSTK 220L3,2	16 channels, 24/48 V d.c., transistor outputs, max. 1 A.
DSTD 108 or DSTD 108P ⁽¹⁾	Connection unit with 8 relay channels Input: 24 V d.c. Output: 24-250 V a.c./d.c. ⁽³⁾
DSTD 108L or DSTD 108LP ⁽¹⁾	Connection unit with 8 relay channels Input: 24 V d.c. Output: 24-2 50 V a.c./d.c. ⁽⁴⁾
DSTD 109P ⁽¹⁾	Connection unit with eight (8) static outputs, 24 V d.c., 2 A, with common power supply.

- (1) Disconnectible screw terminal blocks.
- (2) When released, the DSDO 115A and DSTD 109P will functionally replace DSDO120 and DSTD 120A. One DSDO 115A replaces two DSDO 120.
- (3) Relay data: Load current: max. 3 A, min. 0.1 A at 24 V or 2.5 VA.
Breaking capacity: a.c. max 720 VA at cos F > 0.4, d.c. max. 44 W at L/R <40 ms
- (4) Relay data for L version: Load current: max. 100 mA, min. 0.5 mA or 2.5 VA.
Breaking capacity: a.c. max 100 mA or 5 VA at cos F > 0.4, d.c. max. 100 mA or 5 VA at L/R <40 ms

Table 6-7. Positioning and Pulse Counting Sets for S100 I/O with BOCU

I/O Set	Description
DSDP 140A DSTD 190 DSTK 225SL3	Positioning Set for one Positioning Loop Pulse encoder input: 3 ch., ± 15 mA, max. 80 kHz DI/DO: 24 V d.c. AO: resolution 11 bits, 0 to ± 10 V or 0 to ± 20 mA
DSDP 140A DSTD 150A DSTK 225SL3	Positioning Set for one Positioning Loop Pulse encoder input: 3 ch., ± 15 mA, max. 80 kHz DI/DO: 24 V d.c. AO: resolution 11 bits, 0 to ± 10 V or 0 to ± 20 mA Disconnectible screw terminal blocks
DSDP 150 DSTD 190 DSTK 225SL3	Pulse Counting Set 12 ch., 5/12/24 V d.c. max. 10 kHz
DSDP 150 DSTD 150A DSTK 225SL3	Pulse Counting Set 12 ch., 5/12/24 V d.c. max. 10 kHz Disconnectible screw terminal blocks
DSDP 170 DSTX 170 DSTK 228L3	Pulse Counting Set 4 measuring systems each containing: Pulse encoder input: 2 ch. + strobe 5/12/24 V or ± 15 mA max. 2.5 MHz DI: 24 V d.c and DO: 24 V, 250 mA d.c

Table 6-8. S100 I/O Sets supporting Intrinsic Safety System

I/O Set		Description
Cable 10 m (25 ft.)	Cable 15m (37.5 ft.)	
DSAI 130 DSTK 225SL10 or DSAI 130A DSTK 225SL10	DSAI 130 DSTK 225SL15 or DSAI 130A DSTK 225SL15	16 channels, resolution 12 bit, differential, 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 100 V, CMRR > 100 dB (50 Hz)
		16 channels, resolution 12 bit, differential, 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 50 V, CMRR > 100 dB (50 Hz)

Table 6-8. S100 I/O Sets supporting Intrinsic Safety System (Continued)

I/O Set		Description
Cable 10 m (25 ft.)	Cable 15m (37.5 ft.)	
DSAI 133 DSTK 222SL10 or DSAI 133A DSTK 222SL10	DSAI 133 DSTK 222SL15 or DSAI 133A DSTK 222SL15	32 channels, resolution 12 bit, single-ended 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05% 32 channels, resolution 12 bit, single-ended 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%
DSAO 120 DSTK 223SL10	DSAO120 DSTK 223SL15	8 channels, resolution 12 bits, 0 to \pm 10 V (min load 2000 Ω) or 0 to \pm 20 mA (max load 500 Ω).
DSAX 110 DSTK 223SL10 or DSAX 110A DSTK 223SL10	DSAX 110 DSTK 223SL15 or DSAX 110A DSTK 223SL15	8 input channels, resolution 12 bits, single-ended, 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%. 8 output channels, resolution 12 bits, 0 to +20 mA
DSDI 110A DSTK 225SL10 or DSDI 110AV1 DSTK225SL10	DSDI 110A DSTK 225SL15 or DSDI 110AV1 DSTK225SL15	32 channels, 24 V d.c. input voltage, controlled by scanning or interrupt, pulse extension. Local time tagging of process events.
DSDO 115 DSTK 225SL10 or DSDO 115 DSTK 225SL10	DSDO 115 DSTK 225SL15 or DSDO 115A DSTK 225SL15	32 channels, output 24 V d.c.
DSDP 150 DSTK 225SL10	DSDP 150 DSTK 225SL15	Pulse Counting Set 12 ch., 5/12/24 V d.c. max. 10 kHz

Table 6-9. Sets for connection of Thyristor Converters for S100 I/O with BOCU

I/O Set	Description
DSDC 111 DSTX 110 DSTK 224L3	Set for connection of 1 analog controlled thyristor converter to Advant Controller 400 Series

Table 6-10. Special Units

Consists of	Description
DSTY 101 ⁽¹⁾	Analog isolation amplifier to be mounted on the mounting bar DSRA 110. Input/Output: 0 to $\pm 10V$ or 0 to ± 20 mA, single-ended. Inaccuracy: max error in linearity 0.3% max error in symmetry 0.5%. Isolation voltage: 3 kV Supply Voltage: 24 V d.c.

(1) **NOT** verified for CE-marking.
Only available in price list "Spare Parts for Advant Controller 400 Series".

6.1.1 Connection Unit Dimensions

The width of the connection units are given in Table 6-11 below.

Table 6-11. The Width of the Connection Units

Connection Unit	Width in	
	mm	inch
DSTA 001A	240	9.4
DSTA 001B	240	9.4
DSTA 002A	240	9.4
DSTA 002B	240	9.4
DSTA 131	240	9.4
DSTA 133	240	9.4
DSTA 135	240	9.4
DSTA 137	470	18.5
DSTA 138	470	18.5
DSTA 145	240	9.4
DSTA 155	240	9.4
DSTA 155P	160	6.3
DSTA 156	240	9.4
DSTA 156B	120	4.7
DSTA 160	80	3.2
DSTA 170	160	6.3
DSTA 171	120	4.7

Table 6-11. The Width of the Connection Units (Continued)

Connection Unit	Width in	
	mm	inch
DSTA 180	240	9.4
DSTA 181	120	4.7
DSTD 108	120	4.7
DSTD 108L	120	4.7
DSTD 108LP	120	4.7
DSTD 108P	120	4.7
DSTD 109P	120	4.7
DSTD 110A	240	9.4
DSTD 120A	240	9.4
DSTD 145	470	18.5
DSTD 147	470	18.5
DSTD 148	470	18.5
DSTD 150A	240	9.4
DSTD 190	120	4.7
DSTD 190V1	120	4.7
DSTD 195	120	4.7
DSTD 196	120	4.7
DSTD 196P	120	4.7
DSTD 197	120	4.7
DSTD 198	120	4.7
DSTX 110	120	4.7
DSTX 170	240	9.4
DSTY 101	53	2.1

6.2 Cabinet RM500

S100 I/O is installed in RM500 cabinets. There are two different cabinet versions, RM500V1 and RM500V2, with different foot prints. Dimensions, see Table 6-12.

Table 6-12. RM500 Cabinets Dimensions

Cabinet Version	Width ⁽¹⁾		Depth ⁽²⁾		Height ⁽³⁾	
	mm	inches	mm	inches	mm	inches
RM500V1	800	31.5	512	20.1	2125	83.7
RM500V2	700	27.6	637	25.1	2225	87.6

- (1) Side plates (20 mm or 0.8" each) are **not** included
- (2) Door and back plate are included
- (3) Roof is included

RM500V1 cabinets are provided with double doors (double door consists of two equal sized doors). RM500V2 cabinets are provided with single doors. RM500 cabinets are available for different environmental protection classes, see Table 6-13.

Table 6-13. RM500 Cabinet Protection Classes

Type	Protection class RM500
Ventilated, EMC-proof ⁽¹⁾	IP 21
Ventilated ⁽²⁾	IP 41
Sealed	IP 54
Sealed with heat exchanger ⁽³⁾	IP 54

- (1) Standard cabinet without filter on ventilation openings. Filter is available as an option.
- (2) Ventilation openings are covered with metallic net to prevent insects to enter the cabinet. A heater is included to heat the cabinet when the controller is not in use.
- (3) Available as a standard sealed cabinet with heat exchanger as an option.

6.2.1 Mounting Bars for Connection Units

Connection units are fit to mounting bars in the rear of the cabinet. Mounting bars are available in the length of 19" or 24".

6.2.1.1 For S100 I/O with BOCU

Each mounting bar normally carries two or more connection units for S100 I/O boards. Information about how many mounting bars can be used in different cabinets of RM500 type are given in Table 6-14 and Table 6-15.

Table 6-14. Numbers of mounting bars in RM500V1 cabinets

	RM500V1 cabinet with					
	Hinged frame				No hinged frame	
	1 S100 I/O subrack	2 S100 I/O subracks	2 S100 I/O subracks	1 S100 I/O subrack	No subrack	No subrack
Cabinet number, Figure 5-2	No. 1	No. 1	No. 3	No. 3, 5	No. 2	No. 4, 6, 7
Cabinet with redundant mains supply	4	2	5	7	10	14
Additional mounting bars with single mains supply	+1	+1	+1	+1	+1 ⁽¹⁾	–
Additional mounting bars with no mains supply	–	–	–	–	+3 ⁽¹⁾	–

(1) Mains supply for field equipment (in cabinet no. 2 only)

Table 6-15. Numbers of mounting bars in RM500V2 cabinets

	RM500V2 cabinet with			
	Hinged frame		No hinged frame	
Cabinet number, Figure 5-3	No. 1	No. 3, 5	No. 2	No. 4, 6
Cabinet with redundant mains supply	9	14	11	14
Additional mounting bars with single mains supply	+1	–	+1 ⁽¹⁾	–
Additional mounting bars with no mains supply	–	–	+2 ⁽¹⁾	–

(1) Mains supply for field equipment (in cabinet no. 2 only)

Chapter 7 Environmental Immunities

For information on the environmental immunity, please refer to the Environmental Immunities chapter in *Product Guide for Advant OCS with Master software, Overview*.

Chapter 8 Ordering

Price List Structure

Depending on the desired I/O configuration one or several price lists must be used when ordering S100 I/O.

S100 I/O

See this Product Guide. This price list must be used for each physically distributed cluster of S100 I/O subracks via the optical bus extension. 1 - 5 copies of the price list can be used for the same controller.

NOTE

The width for the Connection Units are given in Table 6-11.

8.1 Reference Guide for S100 I/O with BOCU

Physically Separated from Controller Subrack via Optical Bus Extension

8.1.1 General Requirement

Table 8-1. General and Normative Requirements

Description	Consists of	Article No.
CE-marking , Cabinet Mounted Delivery	- EC Declaration of Conformity - CE mark - Mains Filter	3BSE019968R1
CE-marking , Loose Part Delivery	- Conditional EC Declaration of Conformity	3BSE019969R1
Assembly and test of subrack in RM500		3BSE016033R1

8.1.2 Bus Extension and Subracks

Table 8-2. S100 I/O Optical Bus Extension

Description	Consists of	Article No.
Modem Set for connection to single optical bus extension, incl. mounting plate	TC561V1 RA543	3BSE008631R1
Modem Set for connection to redundant optical bus extension, incl. mounting plate	2xTC561V1 RA543	3BSE014094R1

Table 8-3. S100 I/O Subracks for RM500 Cabinets

Description	Consists of	Article No.
Subrack with single 5V regulator	DSRF 197 DSSR 122	3BSE019999R1
Subrack with redundant 5V regulator	DSRF 200 ⁽¹⁾ 3xDSSR 170	3BSE020178R1
Voting unit for voting of 24V A or B when redundancy	DSSS 171	3BSE005003R1

(1)Voting unit DSSS 171 has to be used if redundant 24V (24VA and 24VB) will be connected to the subrack.

Table 8-4. Cables for S100 I/O bus extension

Description	Consists of	Article No.
Connection kit for single S100 I/O bus extension to I/O subrack For subrack no. 1 TK575: 2.5 m (8.3 ft.)	DSBC 176 DSTC 176 DSTK 227L0,1 TK575	3BSE019956R1
Connection kit for single S100 I/O bus extension to I/O subrack For subrack no. 3 and 5 TK517V040: 4 m (11.7 ft.)	DSBC 176 DSTK 227L0,1 TK517V040	3BSE019957R1
Connection kit for single S100 I/O bus extension to I/O subrack For subrack no. 2 and 4 TK195: 0.6 m (2 ft.)	DSBC 176 DSTK 227L0,1 DSTK195	3BSE019958R1
Connection kit for redundant S100 I/O bus extension to I/O subrack For subrack no. 1 TK575: 2.5 m (8.3 ft.)	2 x DSBC 174 2x DSTC 176 DSTK 233L0,3 2 x TK575	3BSE019959R1
Connection kit for redundant S100 I/O bus extension to I/O subrack For subrack no. 3 and 5 TK517V040: 4 m (11.7 ft.)	2 x DSBC 174 DSTK 233L0,3 2 x TK517V040	3BSE019960R1
Connection kit for redundant S100 I/O bus extension to I/O subrack For subrack no. 2 and 4 TK195: 0.6 m (2 ft.)	2 x DSBC 174 DSTK 233L0,3 2 x DSTK195	3BSE019961R1

8.1.3 I/O Sets

Table 8-5. Analog Input Sets for S100 I/O

Description	Consists of	Article No.
16 channels, resolution 12 bit , differential 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 100 V, CMRR > 100 dB (50 Hz)	DSAI 130 DSTA 131 DSTK 221L3 or	3BSE019910R1
16 channels, resolution 12 bit , differential 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 50 V, CMRR > 100 dB (50 Hz)	DSAI 130A DSTA 131 DSTK 221L3	

Table 8-5. Analog Input Sets for S100 I/O (Continued)

Description	Consists of	Article No.
<p>8 channels differential + 8 channels single ended, each channel separately fuse-protected, resolution 12 bit, 0 to ± 10 V or 0 to ± 20 mA shunt 250Ω 0,05%, for 2-wire transmitters CMV 100 V, CMRR > 100 dB (50 Hz).</p> <p>16 channels differential, each channel separately f protected, resolution 12 bit, 0 to ± 10 V or 0 to ± 20 mA shunt 250Ω 0,05%, for 2-wire transmitters CMV 50 V, CMRR > 100 dB (50 Hz).</p>	<p>DSAI 130 DSTA 133 DSTK 221L3 or</p> <p>DSAI 130A DSTA 135 DSTK 221L3</p>	3BSE019911R1
<p>32 channels, resolution 12 bit, single-ended 0 to +10 V or 0 to +20 mA, shunt 250Ω 0.05%</p> <p>32 channels, resolution 12 bit, single-ended 0 to +10 V, 0 to +20 mA, shunt 250Ω 0.05%</p>	<p>DSAI 133 2 x DSTA 002A DSTK 222L3 or</p> <p>DSAI 133A 2 x DSTA 002B DSTK 222L3</p>	3BSE019912R1
<p>31 (+ 1 ref.) channels for Pt100. 3-wire, resolution 12 bits, -100/+320 or -200/+640°C</p>	<p>DSAI 146 DSTA 145 DSTK 229SL3</p>	3BSE019913R1
<p>14 (+ 2 ref. + 1 compens.) channels for thermocouples, resolution 12 bits, measurement ranges for floating thermocouples of type B, C, E, J, K, R, S, T</p>	<p>DSAI 155A DSTA 156 DSTK 225SL3 or</p> <p>DSAI 155A DSTA 156B DSTK 225SL3</p>	3BSE019914R1
<p>Connection unit for compensation of the cold junction. Used between the thermo-couples and DSTA 156/156B</p>	<p>DSTA 155 or DSTA 155P</p>	<p>57120001-KD 3BSE018323R1</p>

Table 8-6. Redundant Analog Input Sets for S100 I/O

Description	Consists of	Article No.
With redundancy: 32 channels, resolution 12 bits , single-ended 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%	2 x DSAI 133 2 x DSTA 002A 2 x DSTK 222L3 or	3BSE019915R1
With redundancy: 32 channels, resolution 12 bit , single-ended 0 to +10 V, 0 to +20 mA, shunt 250 Ω 0.05%	2 x DSAI 133A 2 x DSTA 002B 2 x DSTK 222L3	

Table 8-7. Analog Output Sets for S100 I/O

Description	Consists of	Article No.
4 channels, resolution 12 bits , 0 to \pm 10 V or 0 to \pm 20 mA, galvanic isolation	DSAO 110 DSTA 160 DSTK 223L3	3BSE019916R1
8 channels, resolution 12 bits , 0 to \pm 10 V or 0 to \pm 20 mA	DSAO 120 DSTA 170 DSTK 223L3	3BSE019917R1
16 channels, resolution 8 bits , 0 to +10 V or 0 to +20 mA	DSAO 130 DSTA 180 DSTK 221L3	3BSE019918R1
8 channels, resolution 12 bits , 0 to \pm 10 V or 0 to \pm 20 mA, galvanic isolation	DSAO 120A DSTA 171 DSTK 221L3	3BSE020419R1
16 channels, resolution 12 bits , 0 to +20 mA	DSAO 130A DSTA 181 DSTK 221L3	3BSE020420R1

Table 8-8. Analog Input/Output Sets for S100 I/O

Description	Consists of	Article No.
8 input channels, resolution 12 bits , single-ended, 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05% 8 output channels, resolution 12 bits , 0 to +20 mA or 0 to +10 V (over shunt 500 Ω 0.1% on DSTA 001A or DSTA 001B)	DSAX 110 DSTA 001A DSTK 223L3 or DSAX 110A DSTA 001B DSTK 223L3	3BSE019919R1

Table 8-9. Redundant Analog Input/Output Sets for S100 I/O

Description	Consists of	Article No.
<p>With redundancy: 8 input channels, resolution 12 bits, single-ended, 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%</p> <p>With redundancy: 8 output channels, resolution 12 bits, 0 to +20 mA or 0 to +10 V (over shunt 500 Ω 0.1% on DSTA 001A or DSTA 001B)</p>	<p>2 x DSAX 110 DSTA 001A 2 x DSTK 223L3 or 2 x DSAX 110A DSTA 001B 2 x DSTK 223L3</p>	3BSE019920R1

Table 8-10. Pulse Input and Positioning Sets for S100 I/O

Description	Consists of	Article No.
<p>Positioning Set for one Positioning Loop Pulse encoder input: 3 ch., ± 15 mA, max. 80 kHz DI/DO: 24 V d.c. AO: resolution 11 bits, 0 to ± 10 V or 0 to ± 20 mA</p>	<p>DSDP 140A DSTD 190 DSTK 225SL3</p>	3BSE019921R1
<p>Positioning Set for one Positioning Loop Pulse encoder input: 3 ch., ± 15 mA, max. 80 kHz DI/DO: 24 V d.c. AO: resolution 11 bits, 0 to ± 10 V or 0 to ± 20 mA Disconnectible screw terminal blocks</p>	<p>DSDP 140A DSTD 150A DSTK 225SL3</p>	3BSE019922R1
<p>Pulse Counting Set 12 ch., 5/12/24 V d.c. max. 10 kHz</p>	<p>DSDP 150 DSTD 190 DSTK 225SL3</p>	3BSE019923R1
<p>Pulse Counting Set 12 ch., 5/12/24 V d.c. max. 10 kHz Disconnectible screw terminal blocks</p>	<p>DSDP 150 DSTD 150A DSTK 225SL3</p>	3BSE019924R1
<p>Pulse Counting Set 4 measuring systems each containing: Pulse encoder input: 2 ch. + strobe 5/12/24 V or ± 15 mA, max. 2.5 MHz DI: 24 V d.c. DO: 24 V, 250 mA d.c.</p>	<p>DSDP 170 DSTX 170 DSTK 228L3</p>	3BSE019925R1

Table 8-11. Digital Input Sets for S100 I/O

Description	Consists of	Article No.
32 channels, 24 V d.c. , controlled by scanning or interrupt, pulse extension, time-tagging with 1 ms resolution	DSDI 110A DSTD 190 DSTK 221L3 or DSDI 110AV1 DSTD 190V1 DSTK 221L3	3BSE019926R1
32 channels, 24 V d.c. , controlled by scanning or interrupt, pulse extension, time-tagging with 1 ms resolution, disconnectible screw terminal blocks	DSDI 110A DSTD 150A DSTK 221L3 or DSDI 110AV1 DSTD 150A DSTK 221L3	3BSE019927R1
<p>4 x 8 channels, input voltage according to connection unit, controlled by scanning or interrupt, pulse extension, time-tagging with 1 ms resolution</p> <ul style="list-style-type: none"> - Connection unit for 8 channels, 24 V d.c. all channels galvanically isolated - Connection unit for 8 channels, 24 V d.c. (48 V d.c. over open input) - Connection unit for 8 channels, 110 V d.c. or 120 V a.c. - Connection unit for 8 channels, 230 V a.c. 	<p>DSDI 110A DSTK 226L3 alt. DSDI 110AV1 DSTK 226L3</p> <p>DSTD 195</p> <p>DSTD 196 alt. DSTD 196P</p> <p>DSTD 197</p> <p>DSTD 198</p>	<p>3BSE019928R1</p> <p>3BSE004724R1</p> <p>3BSE004725R1</p> <p>3BSE018332R1</p> <p>3BSE004726R1</p> <p>3BSE004727R1</p>
32 channels, 48 V d.c. , controlled by scanning or interrupt, pulse extension, time-tagging with 1 ms resolution	DSDI 120A DSTD 190 DSTK 221L3 or DSDI 120AV1 DSTD 190V1 DSTK 221L3	3BSE019929R1

Table 8-11. Digital Input Sets for S100 I/O (Continued)

Description	Consists of	Article No.
32 channels, 48 V d.c. , cont. by scanning or interrupt, pulse extension, time-tagging with 1 ms resol., discon. screw term. blocks	DSDI 120A DSTD 150A DSTK 221L3 or DSDI 120AV1 DSTD 150A DSTK 221L3	3BSE019930R1
Terminal unit for distribution of 24V d.c. to DSTD W110/120/130, DSTD 108/108L/108LP/108P, or DSTD 195/197/198	DSSX 166	5347 049-CR
Voting Unit to DSTD 108, DSTD 195/196/198 if redundant 24V	SS110	3BSE007698R1

Table 8-12. Digital Output Sets for S100 I/O

Description	Consists of	Article No.
32 channels, 24-250 V a.c./d.c.	DSDO 115 DSTK 226L3 or DSDO 115A DSTK 226L3	3BSE019931R1
Connection unit with 8 relay channels Input: 24 V d.c. Output: 24-250 V a.c./d.c. ⁽¹⁾	DSTD 108 or DSTD 108P	5716 0001-ABD 3BSE018333R1
Connection unit with 8 relay channels Input: 24 V d.c. Output: 24-250 V a.c./d.c. ⁽²⁾	DSTD 108L or DSTD 108LP	5716 0001-ABW 3BSE018335R1
Connection Unit with 8 static Outputs, 24 V d.c. 2 A.	DSTD 109P	3BSE018327R1
32 channels, 24 V d.c. , short-circuit proof transistor outputs, max 150 mA	DSDO 115 DSTD 190 DSTK 221L3 or DSDO 115A DSTD 190V1 DSTK 234L3	3BSE019932R1

Table 8-12. Digital Output Sets for S100 I/O (Continued)

Description	Consists of	Article No.
32 channels, 24 V d.c. , short-circuit proof transistor outputs with disconnectible screw terminal blocks, max 150 mA	DSDO 115 DSTD 110A DSTK 221L3 or DSDO 115A DSTD 110A DSTK 221L3	3BSE019933R1
16 channels, 24/48 V d.c. , transistors outputs, max. 1 A	DSDO 120 DSTD 120A DSTK 220L3,2	3BSE019934R1

- (1) Relay data: Load current: max. 3 A, min. 0.1 A at 24 V or 2.5 VA.
Breaking capacity a.c. max 720 VA at cos F > 0.4 d.c. max. 44 W at L/R <40 ms
- (2) Relay data: Load current: max. 200 mA, min. 1 mA or 0.05 VA.
Breaking capacity a.c. 5 VA at cos F > 0.4, d.c. 5 W at L/R <40 ms

Table 8-13. Connection of Thyristor Converters

Description	Consists of	Article No.
Set for connection of one controlled thyristor converter to AC 400 Series	DSDC 111 DSTX 110 DSTK 224L3	3BSE019935R1

Table 8-14. S100 I/O boards for HART Protocol Interface

Description	Consists of	Article No.
32 channels, resolution 12 bit , single-ended 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%	DSAI 133 2xDSTA 002A DSTK 231L5 or DSAI 133A 2xDSTA 002B DSTK 231L5	3BSE019936R1
With redundancy: 32 channels, resolution 12 bits , single-ended 0 to +10 V or 0 to +20 mA, shunt 250 Ω 0.05%	2xDSAI 133 2xDSTA 002A DSTK 222L3 DSTK 231L5 or 2xDSAI 133A 2xDSTA 002B DSTK 222L3 DSTK 231L5	3BSE019937R1

Table 8-14. S100 I/O boards for HART Protocol Interface (Continued)

Description	Consists of	Article No.
16 channels, resolution 12 bits, 0 to ± 10 V or 0 to ± 20 mA	2xDSAO 120 2xDSTA 170 DSTK 232L5	3BSE019938R1
16 channels, resolution 12 bits, 0 to +20 mA	DSAO 130A DSTA 181 DSTK 240L5	3BSE020425R1
8 channels, resolution 12 bits, 0 to ± 10 V or 0 to ± 20 mA	DSAO 120 DSTA 170 DSTK 232L5	3BSE019939R1
8 input channels, resolution 12 bits, single- end., 0 to +10V or 0 to +20mA, shunt 250Ω 0.05% 8 outp. chann., resol. 12 bits, 0 to +20 mA or 0 to +10 V (over shunt 500Ω 0.1% on DSTA 001A or DSTA 001B)	DSAX 110 DSTA 001A DSTK 230L5 or DSAX 110A DSTA 001B DSTK 230L5	3BSE019940R1
With redundancy: 8 input channels, resolution 12 bits, single-ended, 0 to +10 V or 0 to +20 mA, shunt 250Ω 0.05% 8 outp. channels, resol. 12 bits, 0 to +20mA or 0 to +10V (over shunt 500Ω 0.1% on DSTA 001A or DSTA 001B)	2xDSAX 110 DSTA 001A DSTK 230L5 DSTK 223L3 or 2xDSAX 110A DSTA 001B DSTK 230L5 DSTK 223L3	3BSE019941R1

Table 8-15. S100 I/O for Intrinsic Safety Isolator support (without connection units)

Description	Consists of	Article No.
16 channels, resolution 12 bit, differential 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 100 V, CMRR > 100 dB (50 Hz) Cable length: 10m (32.8 ft.)	DSAI 130 DSTK 225SL10 or	3BSE019942R1
16 channels, resolution 12 bit, differential 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 50 V, CMRR > 100 dB (50 Hz) Cable length: 10m (32.8 ft.)	DSAI 130A DSTK 225SL10	

Table 8-15. S100 I/O for Intrinsic Safety Isolator support (without connection units) (Continued)

Description	Consists of	Article No.
<p>16 channels, resolution 12 bit, differential 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 100 V, CMRR > 100 dB (50 Hz) Cable length: 15m (49.2 ft.)</p>	<p>DSAI 130 DSTK 225SL15 or</p>	3BSE019944R1
<p>16 channels, resolution 12 bit, differential 0 to ± 10 V or 0 to ± 20 mA, shunt 250Ω 0.1% CMV 50 V, CMRR > 100 dB (50 Hz) Cable length: 15m (49.2 ft.)</p>	<p>DSAI 130A DSTK 225SL15</p>	
<p>32 channels, resolution 12 bit, single-ended 0 to +10 V or 0 to +20 mA, shunt 250Ω 0.05% Cable length: 10m (32.8 ft.)</p>	<p>DSAI 133 DSTK 222SL10 or</p> <p>DSAI 133A DSTK 222SL10</p>	3BSE019943R1
<p>32 channels, resolution 12 bit, single-ended 0 to +10 V or 0 to +20 mA, shunt 250Ω 0.05% Cable length: 15m (49.2 ft.)</p>	<p>DSAI 133 DSTK 222SL15 or</p> <p>DSAI 133A DSTK 222SL15</p>	3BSE019945R1
<p>8 channels, resolution 12 bits, 0 to ± 10 V or 0 to ± 20 mA Cable length: 10m (32.8 ft.)</p>	<p>DSAO 120 DSTK 223SL10</p>	3BSE019946R1
<p>8 channels, resolution 12 bits, 0 to ± 10 V or 0 to ± 20 mA Cable length: 15m (49.2 ft.)</p>	<p>DSAO 120 DSTK 223SL15</p>	3BSE019947R1
<p>8 input channels, resolution 12 bits, single-ended, 0 to +10 V or 0 to +20 mA, shunt 250Ω 0.05%</p> <p>8 output channels, resolution 12 bits 0 to +20 mA. Cable length: 10m (32.8 ft.)</p>	<p>DSAX 110 DSTK 223SL10 or</p> <p>DSAX 110A DSTK 223SL10</p>	3BSE019948R1
<p>8 input channels, resolution 12 bits, single-ended, 0 to +10 V or 0 to +20 mA, shunt 250Ω 0.05%</p> <p>8 output channels, resolution 12 bits, 0 to +20 mA. Cable length: 15m (49.2 ft.)</p>	<p>DSAX 110 DSTK 223SL15 or</p> <p>DSAX 110A DSTK 223SL15</p>	3BSE019949R1
<p>Pulse Counting Set 12 ch., 5/12/24 V d.c. max. 10 kHz Cable length: 10m (32.8 ft.)</p>	<p>DSDP 150 DSTK 225SL10</p>	3BSE019950R1

Table 8-15. S100 I/O for Intrinsic Safety Isolator support (without connection units) (Continued)

Description	Consists of	Article No.
Pulse Counting Set 12 ch., 5/12/24 V d.c. max. 10 kHz Cable length: 15m (49.2 ft.)	DSDP 150 DSTK 225SL15	3BSE019951R1
32 input channels, 24 V d.c. , controlled by scanning or interrupt, pulse extension, time-tagging with 1 ms resolution Cable length: 10m (32.8 ft.)	DSDI 110A DSTK 225SL10 or DSDI 110AV1 DSTK 225SL10	3BSE019952R1
32 input channels, 24 V d.c. , controlled by scanning or interrupt, pulse extension, time-tagging with 1 ms resolution Cable length: 15m (49.2 ft.)	DSDI 110A DSTK 225SL15 or DSDI 110AV1 DSTK 225SL15	3BSE019953R1
32 output channels, 24-250 V a.c./d.c. Cable length: 10m (32.8 ft.)	DSDO 115 DSTK 225SL10 or DSDO 115A DSTK 225SL10	3BSE019954R1
32 output channels, 24-250 V a.c./d.c. Cable length: 15m (49.2 ft.)	DSDO 115 DSTK 225SL15 or DSDO 115A DSTK 225SL15	3BSE019955R1

Table 8-16. Mounting Bars for Connection Units, RM500V1 cabinet

Description	Consists of	Article No.
Mounting bars for connection units - length = 24", (3 modules height) - length = 19", (3 modules height)	RA121 RA120	3BSE005465R1 3BSE005464R1

8.1.4 Power Supply Systems

Table 8-17. Power Supply in RM500V1 Cabinet, 120V a.c. Main Supply

Description	Consists of	Article No.
Single a.c. Mains Supply for I/O subrack 1 and 2. Input: 120 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA167 SX540 SX554 TK402V035	3BSE016027R1
Red. a.c. Mains Supply for I/O subrack 1 and 2. Input: 120 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	2xSA167 2xSX540 2xSX554 2xTK402V035 TK451	3BSE016028R1
a.c. Mains Supply for I/O subrack 3 and 4. Input: 120 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA167 SX554 TK402V051	3BSE008785R1
a.c. Mains Supply for I/O subrack 5 Input: 120 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA167 SX554 TK402V060	3BSE008786R1

Table 8-18. Power Supply in RM500V1 Cabinet, 230V a.c. Main Supply

Description	Consists of	Article No.
Single a.c. Mains Supply for I/O subrack 1 and 2 Input: 230 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA168 SX554 SX540 TK402V035	3BSE016029R1
Red. a.c. Mains Supply for I/O subrack 1 and 2 Input: 230 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	2xSA168 2xSX554 2xSX540 2xTK402V035 TK451	3BSE016030R1
a.c. Mains Supply for I/O subrack 3 and 4 Input: 230 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA168 SX554 TK402V051	3BSE008787R1
Single a.c. Mains Supply for I/O subrack 5 Input: 230 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA168 SX554 TK402V060	3BSE008788R1

Table 8-19. Power Supply in RM500V1 Cabinet, 24/48V d.c. Main Supply

Description	Consists of	Article
Single d.c. Mains Supply for I/O subrack 1 and 2 Input: 18.5-30 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554 SX555	3BSE004446R1
Red. d.c. Mains Supply for I/O subrack 1 and 2 Input: 18.5-30 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	2xSD150 2xSX554 2xSX555 TK451	3BSE004448R1
Single d.c. Mains Supply for I/O subrack 1 and 2 Input: 30-60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554 SX550 TK582V043	3BSE016031R1
Red. d.c. Mains Supply for I/O subrack 1 and 2 Input: 30-60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	2xSD150 2xSX554 2xSX550 2xTK582V043 TK451	3BSE016032R1
d.c. Mains Supply f I/O subrack 3+4 or 5 Input: 18.5-30V d.c. Output: 24V, 20A, d.c., regul. (<1%)	SD150 SX554	3BSE004447R1
d.c. Mains Supply for I/O subrack 3 and 4. Input: 30-60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554 TK582V051	3BSE008789R1
d.c. Mains Supply for I/O subrack 5 Input: 30-60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554 TK582V060	3BSE008839R1

Table 8-20. Power Supply in RM500V1 Cabinet, 24V d.c. Main Supply
without d.c./d.c. converter

Description	Consists of	Article No.
Single d.c. Mains Supply without d.c./d.c. conversion (DSSB170K04) f. I/O subrack 1 and 2 Energy reserv. Cap.: 3 ms at 25A d.c.	DSSB 170 SX555 SX557	3BSE003589R1
Single d.c. Mains Supply without d.c./d.c. conversion (DSSB170K05) f I/O subr. 3 and 4 or 5. Energy reserv. Cap.: 3ms at 25A d.c.	DSSB 170 SX557	3BSE003590R1

Table 8-21. Power Supply in RM500V2 Cabinet, 120V a.c. Main Supply

Description	Consists of	Article No.
Single a.c. Mains Supply for I/O subrack 1 and 2 Input: 120 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA167 SX554 SX540 TK402V035	3BSE004407R1
Red. a.c. Mains Supply for I/O subrack 1 and 2 Input: 120 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	2xSA167 2xSX554 2xSX540 2xTK402V035 TK451	3BSE004413R1
a.c. Mains Supply for I/O subrack 3 and 4 Input: 120 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA167 SX554 TK402V051	3BSE008785R1
a.c. Mains Supply for I/O subrack 5 Input: 120 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA167 SX554 TK402V060	3BSE008786R1

Table 8-22. Power Supply in RM500V2 Cabinet, 230V a.c. Main Supply

Description	Consists of	Article No.
Single a.c. Mains Supply for I/O subrack 1 and 2 Input: 230 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA168 SX554 SX540 TK402V035	3BSE004408R1
Red. a.c. Mains Supply for I/O subrack 1 and 2 Input: 230 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	2xSA168 2xSX554 2xSX540 2xTK402V035 TK451	3BSE004414R1
a.c. Mains Supply for I/O subrack 3 and 4 Input: 230 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA168 SX554 TK402V051	3BSE008787R1
a.c. Mains Supply for I/O subrack 5 Input: 230 V a.c., 50/60 Hz Output: 24 V, 25 A, dc., unregulated	SA168 SX554 TK402V060	3BSE008788R1

Table 8-23. Power Supply in RM500V2 Cabinet, 24/48V d.c. Main Supply

Description	Consists of	Article No.
Single d.c. Mains Supply for I/O subrack 1 and 2 Input: 18.5-30 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554 SX555	3BSE004440R1
Red. d.c. Mains Supply for I/O subrack 1 and 2 Input: 18.5-30 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	2xSD150 2xSX554 2xSX555 TK451	3BSE004424R1
Single d.c. Mains Supply for I/O subrack 1 and 2 Input: 30-60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554 SX550 TK582V043	3BSE004419R1
Red. d.c. Mains Supply for I/O subrack 1 and 2 Input: 30-60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	2xSD150 2xSX554 2xSX550 2xTK582V043 TK451	3BSE004421R1
d.c. Mains Supply for I/O subrack 3 and 4 or 5. Input: 18.5-30 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554	3BSE004447R1
d.c. Mains Supply for I/O subrack 3 and 4 Input: 30-60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554 TK582V051	3BSE008789R1
d.c. Mains Supply for I/O subrack 5 Input: 30-60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	SD150 SX554 TK582V060	3BSE008839R1

Table 8-24. Power Supply in RM500V2 Cabinet, 24V d.c. Main Supply
without d.c./d.c. converter

Description	Consists of	Article No.
Single d.c. Mains Supply without d.c./d.c. conversion (DSSB170K06) f. I/O subr. 1+2. Energy reservoir Capacity: 3ms at 25A d.c.	DSSB 170 SX555 SX557	3BSE004423R1
Single d.c. Mains Supply without d.c./d.c. conversion (DSSB170K05) for I/O subrack 3 and 4 or 5. Energy reservoir Capacity: 3 ms at 25 A d.c.	DSSB 170 SX557	3BSE003590R1

Table 8-25. Extra Power Supply in RM500 for Field Equipment

Description	Consists of	Article No.
Single a.c Power Supply Input: 120 V a.c., 50/60 Hz Output: 24 V, 10 A, d.c., unregulated	SA161 SX554 TK402V027	3BSE003591R1
Single a.c Power Supply Input: 120 V a.c., 50/60 Hz Output: 48 V, 5 A, d.c., unregulated	SA171 SX554 TK402V027	3BSE003593R1
Single a.c Power Supply Input: 230 V a.c., 50/60 Hz Output: 24 V, 10 A, d.c., unregulated	SA162 SX554 TK402V027	3BSE003592R1
Single a.c Power Supply Input: 230 V a.c., 50/60 Hz Output: 48 V, 5 A, d.c., unregulated	SA172 SX554 TK402V027	3BSE003594R1
Red. a.c Power Supply Input: 120 V a.c., 50/60 Hz Output: 24 V, 10 A, d.c., unregulated	2xSA161 2xSX554 DSSS170 2xTK457V027 2xTK402V030	3BSE003596R1
Red. a.c Power Supply Input: 230 V a.c., 50/60 Hz Output: 24 V, 10 A, d.c., unregulated	2xSA162 2xSX554 DSSS170 2xTK402V027 2xTK457V030	3BSE003597R1
Single d.c. Power Supply Input: 18.5-30V d.c. Output: 24 V, 20 A, d.c., regul. (<1%)	SD150	3BSC610028R1
Single d.c. Power Supply Input: 30 - 60 V d.c. Output: 24 V, 20 A, d.c., regul. (<1%)	SD150 TK582V027	3BSE003595R1
Red. d.c. Power Supply Inp.: 18.5-30V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	2xSD150 DSSS 170	3BSE004443R1
Red. d.c. Power Supply Input: 30 - 60 V d.c. Output: 24 V, 20 A, d.c., regulated (<1%)	2xSD150 DSSS 170 2xTK582V027	3BSE003600R1

Table 8-26. Power Distribution Units in RM500 Cabinet

Description	Consists of	Article No.
Power Distribution Unit for expansion of SX540	SX541	3BSE004254R1
Power Distribution Unit for expansion of SX550	SX551	3BSE004259R1

Table 8-27. Mains Supply Filter

Description	Consists of	Article No.
Mains Supply Filter 250 V a.c./d.c., 20 A		3BSC740007R1
Mains Supply Filter 250 V a.c./d.c., 55A		3BSC740008R1
Mains Supply Filter 24/48 V d.c., 80 A		3BSC740009R1
Mounting Plate for three filter 20 A		3BSE016510R1
Mounting Plate for two filter 55 A and one 20 A		3BSE016511R1
Mounting Plate for two filter 80 A and one 20 A		3BSE016512R1

8.1.5 Cabinets

Table 8-28. RM500V1 Cabinets IP21

Description	Consists of	Article No.
Cabinet with hinged frame IP21 vent. WxDxH = 800x512x2125 mm	RM511	3BSE016054R1
Cabinet IP21 vent. WxDxH = 800x512x2125 mm	RM501	3BSE016045R1

Table 8-29. RM500V1 Cabinets IP41

Description	Consists of	Article No.
Cabinet with hinged frame IP41 vent. WxDxH = 800x512x2125 mm	RM512	3BSE016055R1
Cabinet IP41 vent. WxDxH = 800x512x2125 mm	RM502	3BSE016046R1

Table 8-30. RM500V1 Cabinets IP54

Description	Consists of	Article No.
Cabinet with hinged frame IP54 sealed WxDxH = 800x512x2125 mm	RM513	3BSE016056R1
Cabinet IP54 Sealed WxDxH = 800x512x2125 mm	RM503	3BSE016047R1

Table 8-31. RM500V2 Cabinet IP21

Description	Consists of	Article No.
Cabinet with hinged frame IP21 vent. WxDxH = 700x637x2225 mm	RM517	3BSE016060R1
Cabinet IP21 vent. WxDxH = 700x637x2225 mm	RM507	3BSE016051R1

Table 8-32. RM500V2 Cabinet IP41

Description	Consists of	Article No.
Cabinet with hinged frame IP41 vent. WxDxH = 700x637x2225 mm	RM518	3BSE016061R1
Cabinet IP41 vent. WxDxH = 700x637x2225 mm	RM508	3BSE016052R1

Table 8-33. RM500V2 Cabinet IP54

Description	Consists of	Article No.
Cabinet with hinged frame IP54 sealed WxDxH = 700x637x2225 mm	RM519	3BSE016062R1
Cabinet IP54 Sealed WxDxH = 700x637x2225 mm	RM509	3BSE016053R1

Table 8-34. RM500 Accessories

Description	Consists of	Article No.
End panel for RM500V1 cabinet H=2125 mm; add 20mm for each panel on the cabinet width.		3BSE016253R1
End panel for RM500V2 cabinet H=2225 mm; add 20mm for each panel on the cabinet width.		3BSE016254R1
Shield plate H=2125 mm for RM500V1 cabinet For shielding between cabinets.		3BSE016256R1
Shield plate H=2225 mm for RM500V2 cabinet For shielding between cabinets.		3BSE016257R1
Locking Device Cyl. RM500 For one door.		3BSE016258R1
Heat Exchanger air-air for RM500V1 cabinet H=2125mm, 230 V.		3BSE016263R1
Heat Exchanger air-air for RM500V1 cabinet H=2125mm, 120 V.		3BSE016266R1
Heat Exchanger air-air for RM500V2 cabinet H=2225mm, 230 V.		3BSE016264R1
Heat Exchanger air-air for RM500V2 cabinet H=2225mm, 120 V.		3BSE016267R1

8.1.6 Documentation

Table 8-35. Documentation

Title	Description	Article No.
Advant OCS User Documentation on CD-ROM	CD-ROM containing all manuals listed below in this table.	3BSE008143R1101
World Wide Web Access to Advant OCS Documentation One year, single user subscription	Internet access to a WWW containing all manuals listed below in this table.	3BUR001228R0001
World Wide Web Access to Advant OCS Documentation One year, five user's license subscription	Internet access to a WWW containing all manuals listed below in this table.	3BUR001503R0001
Installation Rules	User's Guide describing the installation rules for Advant OCS, to ensure correct function in environments where disturbances are present	3BSE009178R0001
S100 I/O Hardware	Reference manual describing the S100 I/O hardware	3BSE002413R301
HART Protocol Interface	User's Guide describing how to include and use the HART protocol with S100 I/O	3BSE008619R0001
Intrinsic Safety Support S100 I/O with series 2000	User's Guide describing how to include and use the Intrinsic Safety System with S100 I/O	3BSE018949R101
AC 450 Terminal Diagram Form package	Including Terminal Diagram Forms on paper A4 and in IGES format on 3.5" diskettes.	3BSE020423R101
Orderspecific Preliminary Documentation	Assembly drawing & Circuit diagram in IGES format. List of Apparatus & Internal wiring table in Excel format. Will be sent by Lotus Notes earliest 4 weeks before delivery time.	3BSE018003R1

Table 8-35. Documentation (Continued)

Title	Description	Article No.
Orderspecific Released Documentation	Assembly drawing & Circuit diagram in IGES format. List of Apparatus & Internal wiring table in Excel format. Will be sent by Lotus Notes earliest 1 week after Acknowledged delivery time.	3BSE018006R1
Updating of Released Documentation	Only adding of standard items from SEAPR price list. Information needed with layouts.	3BSE018007R1



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