
HI SEC Integrated Systems

Subject:

New S-ART 2xx Range

Ref. No.: 93014501

Service Note 145



Summary: This Service Note describes a new enhanced range of S-ART's which will replace the existing S-ART range.

The Service Note covers all S-ART types from the new range including the existing types which continue as part of the new range.

The version 1 of the note completes the S-209 installation drawings and wire colors.

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1. General Information

A new range of S-ART's will be introduced during the end of 2006 and beginning of 2007. The existing range S-1xx will disappear as the stock is used. You will then receive the new S-2xx range replacing the old series.

Purpose

The new series offers the choice of S-ART's covering from 1 to 3 addresses. Each S-ART address has two inputs, but with one of them pre-selected for tamper monitoring when used in connection with Intruder Alarm Systems. Some of the S-ART's also have one or two 2A relay outputs.

The existing S-106 and S-130 will continue to be available as part of the new range.

Design

The new S-2xx S-ART range has been designed with the installers needs in mind. They are all (except S-209) based upon the same Printed Circuit Board, but with different components mounted, depending upon type.

Each type is designed for specific purposes, giving the installer an option between various in- and output types as well as other functions.

Input types include Double Balanced Loops and Dual Current Loops. With or without the need for end-of-line resistors.

Certain S-ART types are supplied with a 12 V regulator for detector supply, to be used where the S-ART's are supplied with 24 V DC. If more current is needed a new 24V to 12V DC / 0.5 A converter is available.

The entire range (except S-209) is equipped with pluggable screw-terminals to ease the service engineer's work when replacing or measuring the cables.

All the S-ART types (except S-209) are equipped with a tamper switch, ensuring that the Intruder Alarm System or the Access Control Terminal will detect tampering attempt.

The following is a list of the total range mentioning the old replacements.

Name	Product no.	Address	Input / Output	Output	12V	EOL Values	Replacing
S-220	853220	1	1 x Double-balanced Loop	-	1	21k5 / 4k7	S-120
S-221	853221	1	2 x Single-balanced Loop	-	1	21k5 / 21k5	S-121
S-222	853222	1	2 x Digital inputs	1	-	0	S-122
S-223	853223	1	1 x Double-balanced Loop	1	1	21k5 / 4k7	S-123
S-224	853224	2	2 x Double-balanced Loop	-	2	21k5 / 4k7	
S-225	853225	3	3 x Double-balanced Loop	-	2	21k5 / 4k7	
S-226	853226	2	4 x Single-balanced Loop	2	2	21k5 / 21k5	
S-209	853209	1	2 x Digital inputs	1 (O.C.)	1	0	S-107 / S-108
S-212	853212	1	2 x Single-balanced Loop	1	2	21k5 / 21k5	S-112
S-106*	853004	6	6 x Double-balanced Loop	1		10k / 2k2	S-106
S-130*	853007	30	30 x Double-balanced Loop	Opt.		2k2 or 10k	S-130

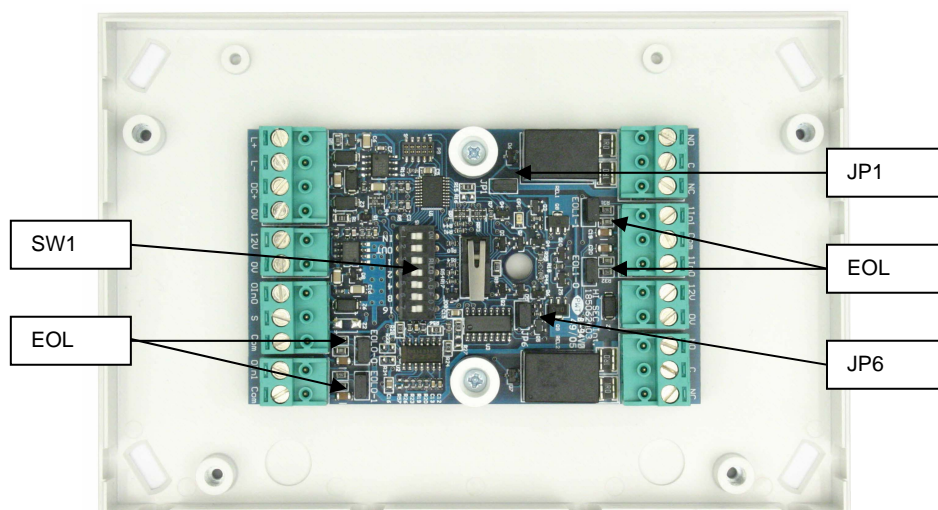
* Existing models will continue.

Compatibility	The S-2xx range of S-ART's can be mixed with all old types of S-ART's.
Intrusion	All S-ART types can be used both with the CU-30 and the ThorGuard CU Central Units.
Access	All S-ART types EXCEPT S-106 and S-130 can be used with all types of HI SEC Readers.

1.1 General Description

On the board there are the following switches and jumpers:

Fig. 1.1 S-ART Jumpers and Switch lay-out.



SW 1

This 7 pole dip-switch in the centre is used to setup the address and options of the S-ART. The different positions have the following meaning.
1 – 16: The address equals the sum of the switches set to OFF.

Text: Description:

IN: All S-ART's, except S-209: Setting this switch ON selects Alarm Contact Normally Open. Setting this switch OFF selects Alarm Contact Normally Closed. Tamper is always Normally Closed Contacts.

OUT: All 2 address S-ART's: Setting this switch ON will make all two address S-ARTs act as a one address S-ART (set address).
On S-206, setting this switch ON also associates both relays with the set address (Access Application). Setting this switch OFF will associate the two relays with two different addresses (Intrusion Application).

JP6

Mount this jumper during installation of the S-ART. The jumper inverts the tamper switch function to enable testing without mounting the cabinet lid. While the jumper is mounted the S-ART reads its address and options setup directly from the dip-switch. When removed, the address and options setup are saved to a non-volatile memory and is subsequently read from there. This feature can also be used to hide the S-ART address after installation.

As long as the jumper is mounted, the red LED will flash. Failing to remove the jumper before mounting the lid, will result in tamper error from the S-ART. After removing the jumper it will take the S-ART 2-4 seconds to complete the programming.

Tamper

Tamper is indicated as "No Communication".

JP1

Mounting this jumper connects the "C" relay terminal of Rel1 (P8) to DC+ (Only on S-222, S-212, S-226 and S-223).

EOLx-x

These jumpers are used when external termination resistors are required. Remove the jumpers to use internal termination resistors (Only on S-221, S-212 and S-226).

1.2 S-ART Address Setup



Please note that the address switch SW1 of the S-ART is only read with power on and stored when the Jumper J6 is removed.

If the S-ART is installed when there is no power on the installation it can be a good idea to initialise the S-ART before installation with the address to avoid going back after power on. The procedure to give an address is very simple and described in the below table. To do so you need a 9 V DC battery connected to a two pole pluggable screw terminal block. DC+ must be connected to terminal 1 and DC- to terminal 2.

Step	What to do...	Display
1	Power on the S-ART terminal L+ and L- from the 9V battery.	No indication. *1
2	Connect Jumper J6	No indication. *1
3	Setup the S-ART address on SW1	No indication. *1
4	Disconnect Jumper J6	S-ART is storing the programmed address.
5	Wait 3 to 4 seconds and disconnect power.	The S-ART can be installed and it will keep the programmed address.

*1: If used with a 4 pole pluggable connector and the battery voltage also supplied to terminal 3 (DC+) and 4 (DC-), the LED will flash while J6 is mounted.



Please note that the power is during this procedure connected to L+ and L- and alternatively also on DC+ and DC-.

2. S-ART Specifications

In the following is shown the specifications and connections for each single S-ART model.

2.1 S-ART S-220

Fig. 2.1 S-ART S-220 in small box.

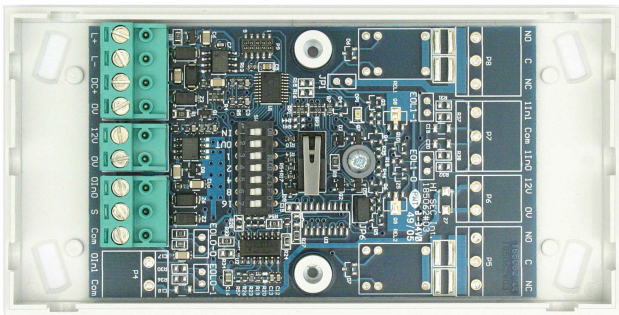
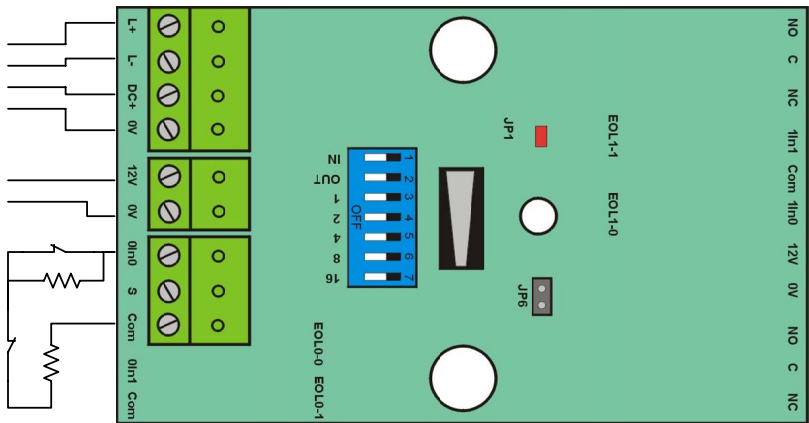


Fig. 2.2 S-ART S-220 connections.



Application:

One set of Alarm and Tamper contacts.
Intrusion
Power consuming detectors.

Technical data

Parameter	Value or description
S-220 Part No.	853220
Number of addresses occupied	Single
Illegal addresses	30 - 31
Number and type of input	One Double Balanced Input
External End-of-line resistors	1 x RA=4k7 / 1 x RT=21k5 ±1%
One regulated DC output (only when used with 24V input)	12V DC/15mA Output.
Length of input cable	max 3000 m
Size of box	Small box 65 x 130mm
Power Consumption, S-ART Line	1-1.5mA
Power Consumption, 12/24Vdc Supply	0 - 15mA
Temperature range	-25 °C to +70 °C

2.2

S-ART S-221

Fig. 2.3 S-ART S-221 in small box.

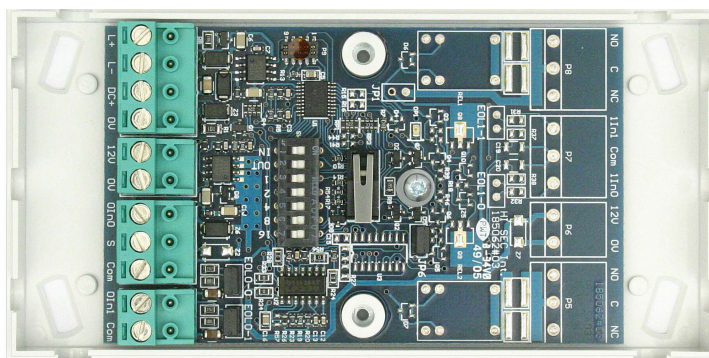
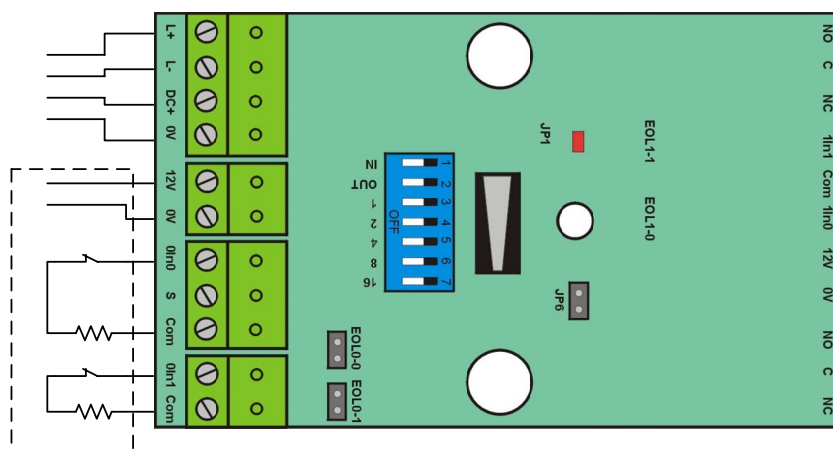


Fig. 2.4 S-ART S-221 connections.



Please note EOL0-0 and EOL0-1 must be set ON.

Application:

One set of Alarm and Tamper contacts.
Power consuming detectors.
Intrusion and Access Control inputs.

Technical data

Parameter	Value or description
S-221 Part No.	853221
Number of addresses occupied	Single
Illegal addresses	30 - 31
Number and type of input	Two Current Loop Inputs
External or internal End-of-line resistors	1 x RA=21k5 ±1% / 1 x RT=21k5 ±1%
One regulated DC output (only when used with 24V input)	12V DC/15mA Output.
Length of input cable	max 30 m
Size of box	Small box 65 x 130mm
Power Consumption, S-ART Line	1-1.5mA
Power Consumption, 12/24Vdc Supply	0 - 15mA
Temperature range	-25 °C to +70 °C

2.3 S-ART S-222

Fig. 2.5 S-ART S-222 in small box.

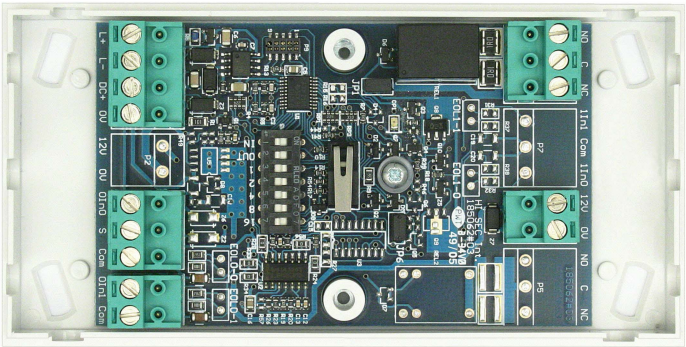
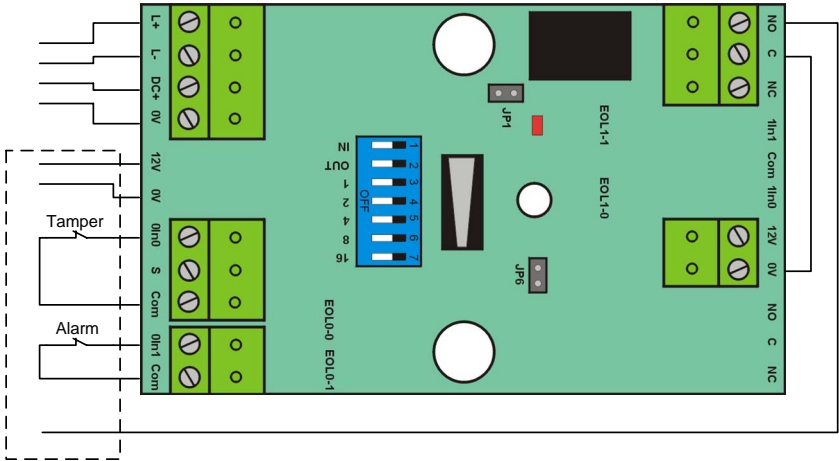
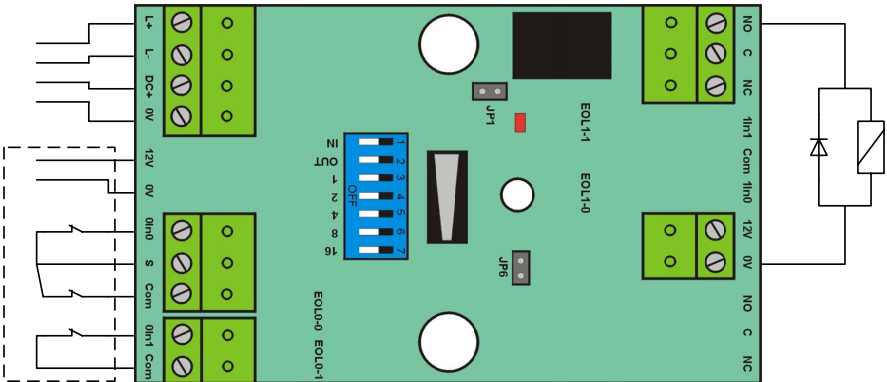


Fig. 2.6 S-ART S-222 connections. Access and Intrusion example.





Please note that JP1 must be set ON in above examples.

Application:

One Intrusion Alarm and Tamper contacts without EOL.
Access control door installation
Intrusion Relay Output.

Technical data

<i>Parameter</i>	<i>Value or description</i>
S-222 Part No.	853222
Number of addresses occupied	Single
Illegal addresses	30 - 31
Number and type of input	Two Current Loop Inputs
Internal End-of-line resistors	1 x RA=0 / 1 x RT=0
One Relay Output, max power switch	2A / 30V DC / AC.
Length of input cable	max 30 m
Size of box	Small box 65 x 130mm
Power Consumption, S-ART Line	1-1.5mA
Power Consumption, 12/24Vdc Supply	0 - 18mA for relay active
Temperature range	-25 °C to +70 °C

2.4

S-ART S-223

Fig. 2.7 S-ART S-223 in large box.

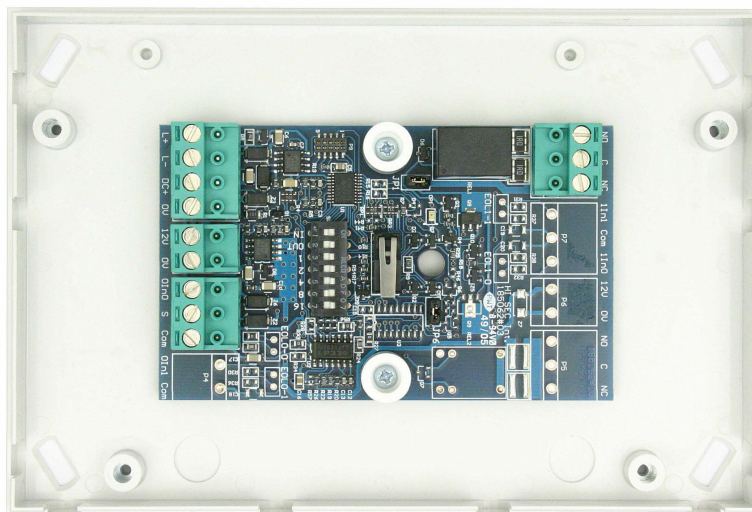
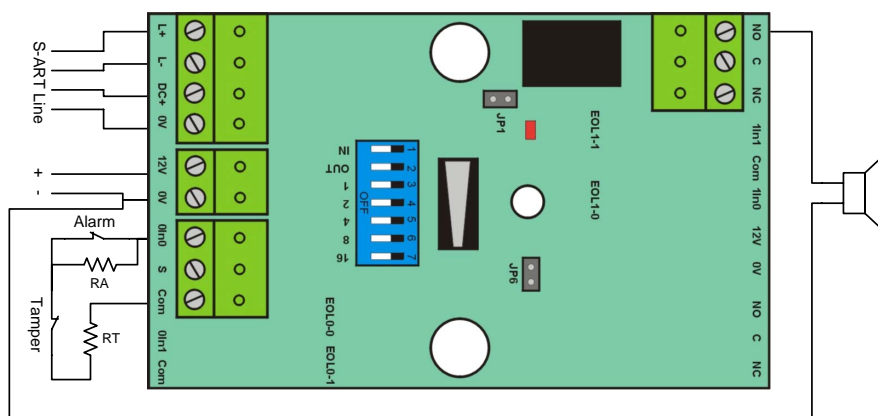


Fig. 2.8 S-ART S-223 connections.



Please note that JP1 must be set ON.

Application:

One Alarm and Tamper contacts.
Intrusion Relay Output.
Power consuming detectors with Test Input.



Please note that for longer cables between detector and S-ART you must use the new S-220.

Technical data

Parameter	Value or description
S-223 Part No.	853223
Number of addresses occupied	Single
Illegal addresses	30 - 31
Number and type of input	One Double Balanced Input
External or internal End-of-line resistors	1 x RA=4k7 \pm 1% / 1 x RT=21k5 \pm 1%
One regulated DC output (only when used with 24V input)	12V DC/15mA Output.
One Relay Output, max power switch	2A / 30 VDC / AC.
Length of input cable	max 3000 m
Size of box	Large box 106 x 158mm
Power Consumption, S-ART Line	1-1.5mA
Power Consumption, 12/24Vdc Supply	0 - 15mA + 18mA for relay active
Temperature range	-25 °C to +70 °C

2.5

S-ART S-224

Fig. 2.9 S-ART S-224 in large box.

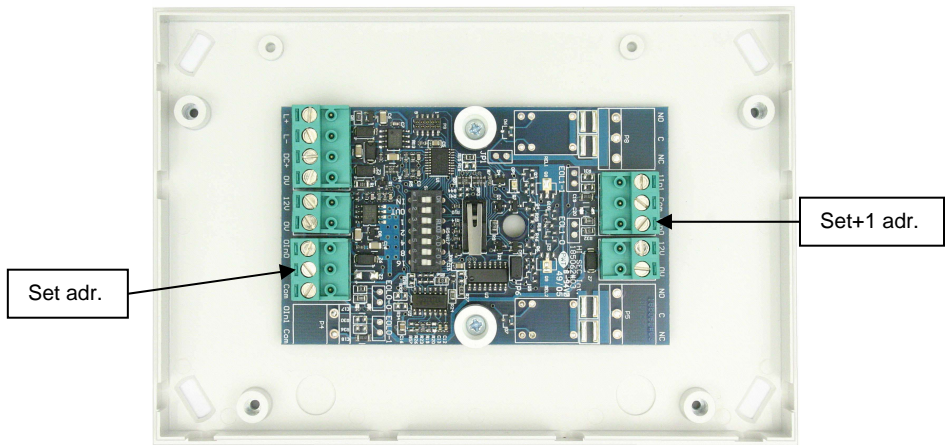
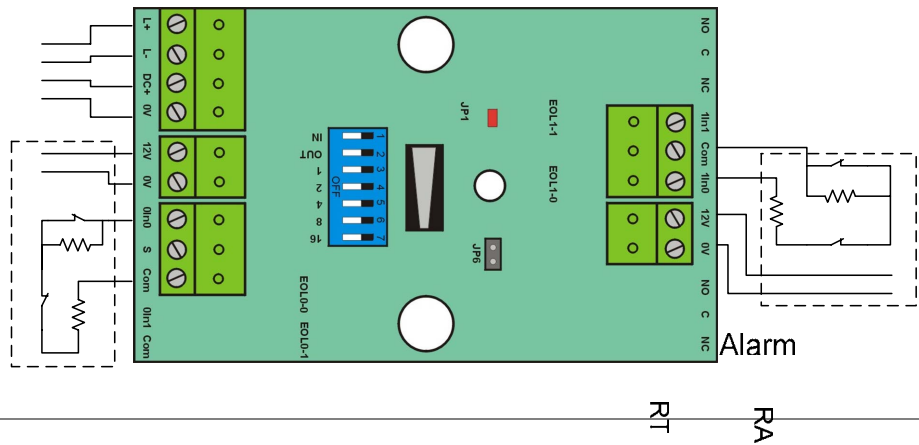


Fig. 2.10 S-ART S-224 connections.



Application:

2 Sets of Intrusion Alarm and Tamper contacts.
Power consuming detectors.

Tamper

+
-

Technical data

Parameter	Value or description
S-224 Part No.	853224
Number of addresses occupied	Two
Illegal addresses	29 - 31
Number and type of input	Two Double Balanced Inputs
External or internal End-of-line resistors	2 x RA=4k7 \pm 1% / 2 x RT=21k5 \pm 1%
Two regulated DC outputs (only when used with 24V input)	12V DC/2 x 15mA Output
Length of input cable	max 30 m
Size of box	Large box 106 x 158mm
Power Consumption, S-ART Line	1-1.5mA
Power Consumption, 12/24Vdc Supply	0 - 30mA
Temperature range	-25 °C to +70 °C

2.6 S-ART S-225

Fig. 2.11 S-ART S-225 in a large box.

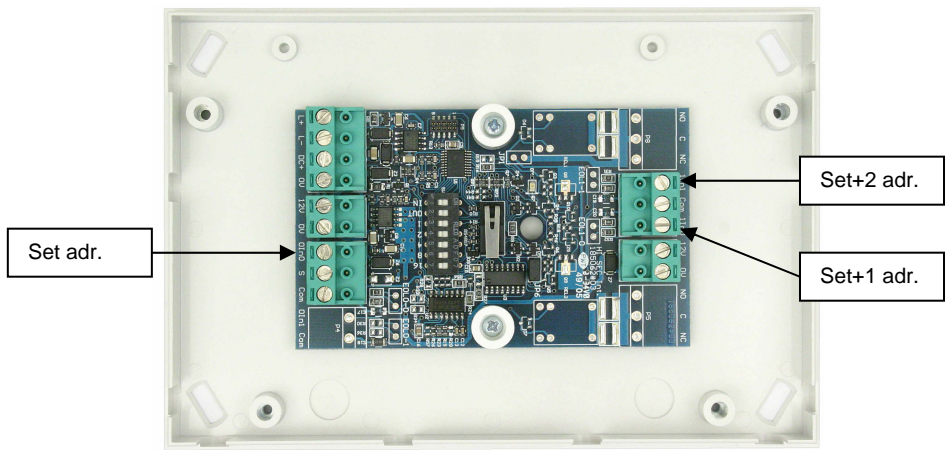
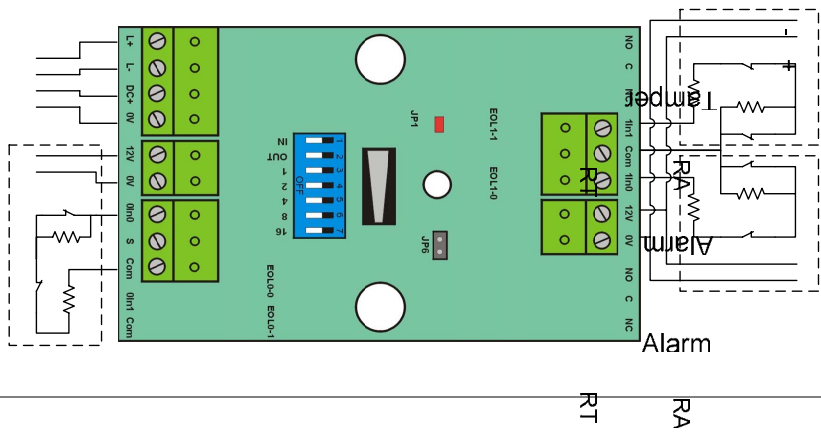


Fig. 2.12 S-ART S-225 connections.



Application:

3 Sets of Intrusion Alarm and Tamper contacts.
Power consuming detectors.

Tamper

+

Technical data

Parameter	Value or description
S-225 Part No.	853225
Number of addresses occupied	Three
Illegal addresses	28 - 31
Number and type of input	Three Double Balanced Inputs
External or internal End-of-line resistors	3 x RA=4k7 \pm 1% / 3 x RT=21k5 \pm 1%
Two regulated DC outputs (only when used with 24V input)	12V DC/2 x 15mA Output
Length of input cable	max 30 m
Size of box	Large box 106 x 158mm
Power Consumption, S-ART Line	1-1.5mA
Power Consumption, 12/24Vdc Supply	0 – 30mA
Temperature range	-25 °C to +70 °C

2.7

S-ART S-226

Fig. 2.13 S-ART S-226 in large box.

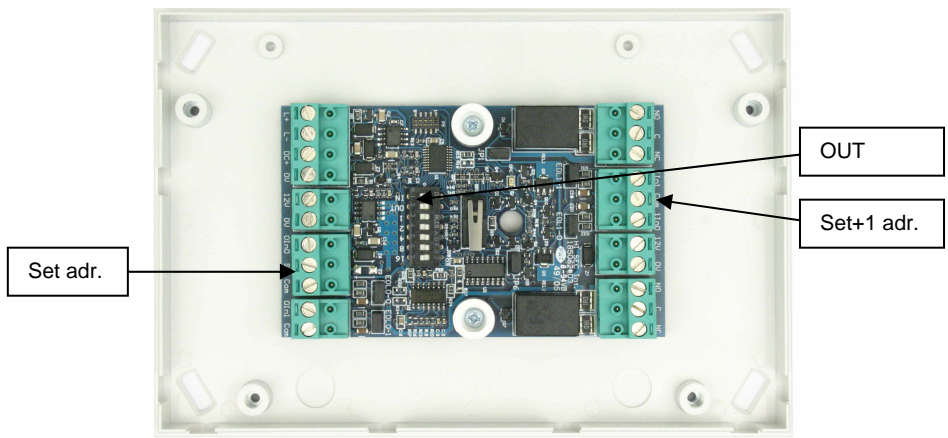
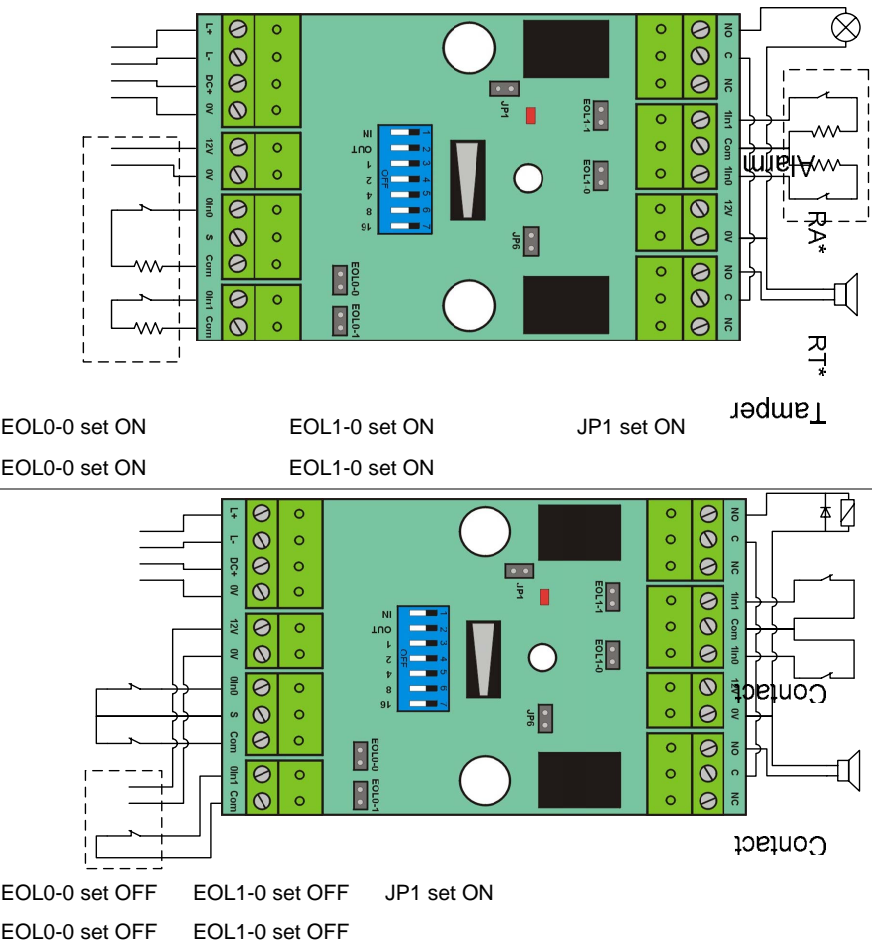


Fig. 2.14 S-ART S-226 connections. Intrusion and Access examples.



Application: 2 Sets of Intrusion Alarm and Tamper contacts.
2 General Intrusion or Access Outputs
Power consuming detectors.
Access control door installation.

Switch Setting: OUT: (Only on S-226) Setting this switch ON, associates both relays with the set address and makes the S-ART acting as a one address S-ART with two relays/outputs (Access Application). In this position only the Set Address inputs can be used.

Setting this switch OFF will associate the two relays with two different addresses (Intrusion Application).

Technical data

Parameter	Value or description
S-226 Part No.	853226
Number of addresses occupied	Two
Illegal addresses	29 - 31
Number and type of input	2 x 2 Current Loop Inputs
External or internal End-of-line resistors	2 x RA=21k5 ±1% / 2 x RT=21k5 ±1%
Two Relay Outputs, max power switch	2A / 30 VDC / AC.
Two regulated DC outputs (only when used with 24V input)	12V DC/2 x 15mA Output
Length of input cable	max 30 m
Size of box	Large box 106 x 158mm
Power Consumption, S-ART Line	1-1.5mA
Power Consumption, 12/24Vdc Supply	0 – 30mA + 18mA per active relay
Temperature range	-25 °C to +70 °C

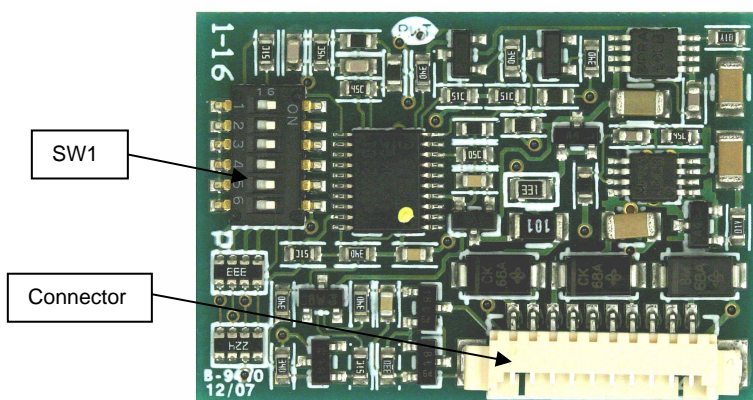
2.8

S-ART S-209

Description

S-209 is a mini - S-ART unit which is made for being installed inside a detector. It is delivered with wires and can in this way be directly connected to the terminals in a detector. It can be fixed with doublesided scotch.

Fig. 2.15. S-ART S-209 Lay-out.



Inputs:

The S-209 has 2 current loop inputs for alarm and tamper contacts (NC).

Output:

To control a test input in a sensor the S-ART has an open collector output.

12V DC:

The S-209 can supply the detector with 12 VDC in case it is a 24 V system.

Address coding

The address of the S-209 is programmed with the Switch SW1. The first 5 positions numbered from 1 to 5 are used for the address. The number 6 is used to store the selected address and must be in ON position. The address can be selected from 00 to 29. 30 and 31 are illegal and will be ignored.

Switch number						Switch number						Switch number					
Address	1	2	3	4	5	Address	1	2	3	4	5	Address	1	2	3	4	5
00	ON	ON	ON	ON	ON	10	ON	OFF	ON	OFF	ON	20	ON	ON	OFF	ON	OFF
01	OFF	ON	ON	ON	ON	11	OFF	OFF	ON	OFF	ON	21	OFF	ON	OFF	ON	OFF
02	ON	OFF	ON	ON	ON	12	ON	ON	OFF	OFF	ON	22	ON	OFF	OFF	ON	OFF
03	OFF	OFF	ON	ON	ON	13	OFF	ON	OFF	OFF	ON	23	OFF	OFF	OFF	ON	OFF
04	ON	ON	OFF	ON	ON	14	ON	OFF	OFF	OFF	ON	24	ON	ON	ON	OFF	OFF
05	OFF	ON	OFF	ON	ON	15	OFF	OFF	OFF	OFF	ON	25	OFF	ON	ON	OFF	OFF
06	ON	OFF	OFF	ON	ON	16	ON	ON	ON	ON	OFF	26	ON	OFF	ON	OFF	OFF
07	OFF	OFF	OFF	ON	ON	17	OFF	ON	ON	ON	OFF	27	OFF	OFF	ON	OFF	OFF
08	ON	ON	ON	OFF	ON	18	ON	OFF	ON	ON	OFF	28	ON	ON	OFF	OFF	OFF
09	OFF	ON	ON	OFF	ON	19	OFF	OFF	ON	ON	OFF	29	OFF	ON	OFF	OFF	OFF

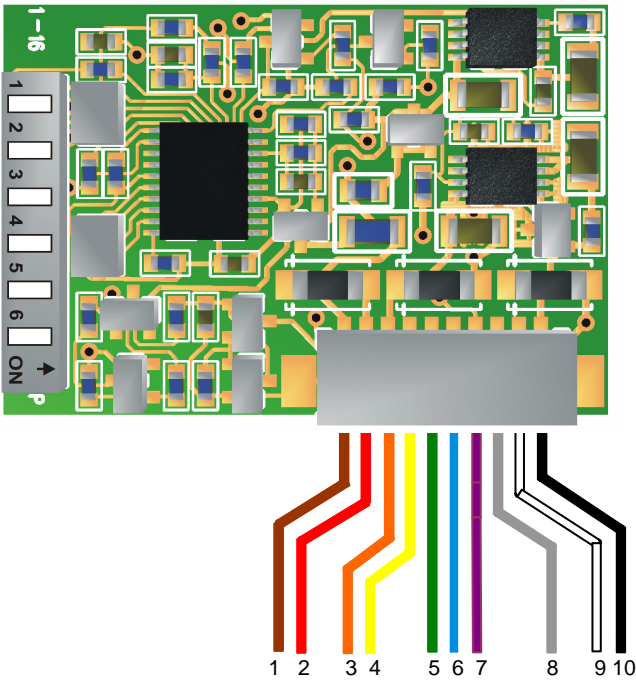
Programming of the address


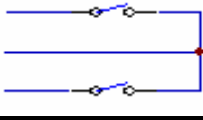

The selected address will be programmed in the S-ART by changing Switch number 6 back to OFF position. After 2-3 seconds the S-ART is programmed with the address. If the Switch number 6 is left in OFF position all address switches can be put in any position to hide the address.

Connections

The S-ART is delivered with a connector with 10 wires:

Fig. 2. S-ART S-209 Connections.



Group	Connec. pos.	Color	Function	Illustration
S-ART line	1	Braun	L+	
	2	Red	L-	
DC Supply	3	Orange	DC+	
	4	Yellow	0V	
Inputs	5	Green	Alarm	
	6	Blue	GND (same as L-)	
	7	Violet	Tamper	
Output	8	Grey	NPN open collector	
12V	9	White	0V	
	10	Black	12Vdc	

Technical data

Parameter	Value or description
S-209 Part No.	853209
Number of addresses occupied	Single
Illegal addresses	30 - 31
Number and type of input	1 x 2 digital Inputs
End-of-line resistors	0
One NPN Open Collector Output, max power switch	10 mA
One regulated DC outputs (only when used with 24V input)	12V DC / 10mA Output
Length of input cable	30 cm
Dimensions (without wires)	25mm x 38mm x 6mm
Power Consumption, S-ART Line	1-1.5 mA
Power Consumption, 12/24Vdc Supply	0 – 10 mA
Temperature range	-25 °C to +70 °C

2.9 S-ART S-212

Fig. 2.15 S-ART S-212 in large box.

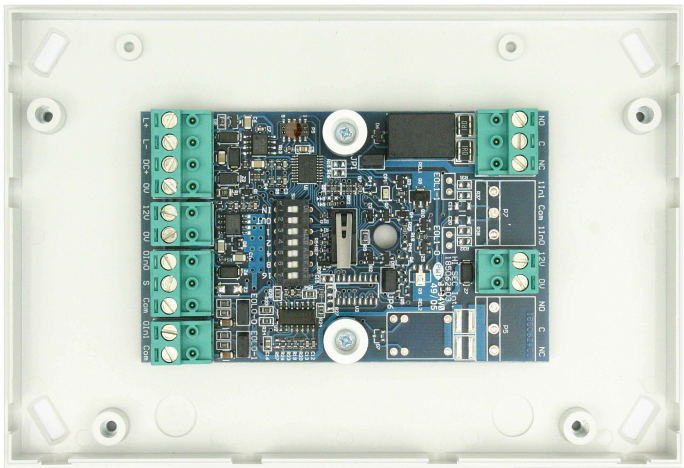
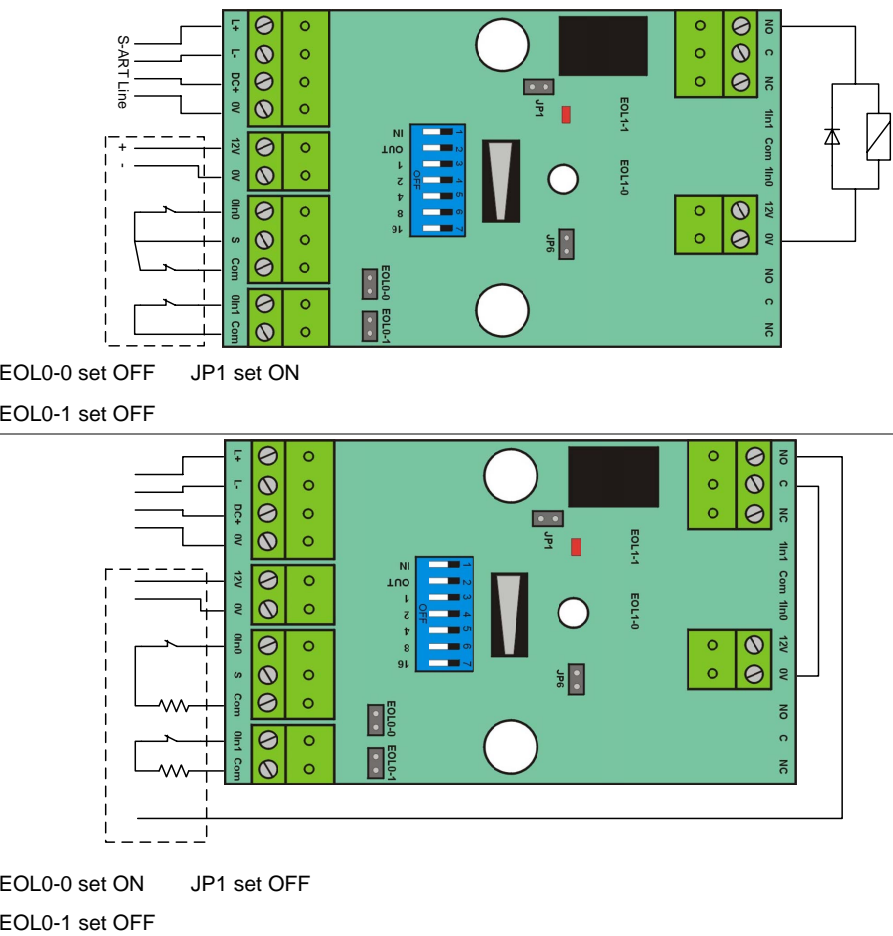


Fig. 2.16 S-ART S-212 connections. Access and Intrusion examples.



Application: Power consuming detectors.
1 Set of Intrusion Alarm and Tamper contacts.
General Intrusion or Access Output
Access control door installation.

Technical data

<i>Parameter</i>	<i>Value or description</i>
S-212 Part No.	853212
Number of addresses occupied	Single
Illegal addresses	30 - 31
Number and type of input	1 x 2 Current Loop Inputs
External or internal End-of-line resistors	1 x RA=21k5 ±1% / 1 x RT=21k5 ±1%
One Relay Outputs, max power switch	2A / 30 VDC / AC.
Two regulated DC outputs (only when used with 24V input)	12V DC/2 x 15mA Output
Length of input cable	max 30 m
Size of box	Large box 106 x 158mm
Power Consumption, S-ART Line	1-1.5mA
Power Consumption, 12/24Vdc Supply	0 – 30mA + 18mA for active relay
Temperature range	-25 °C to +70 °C

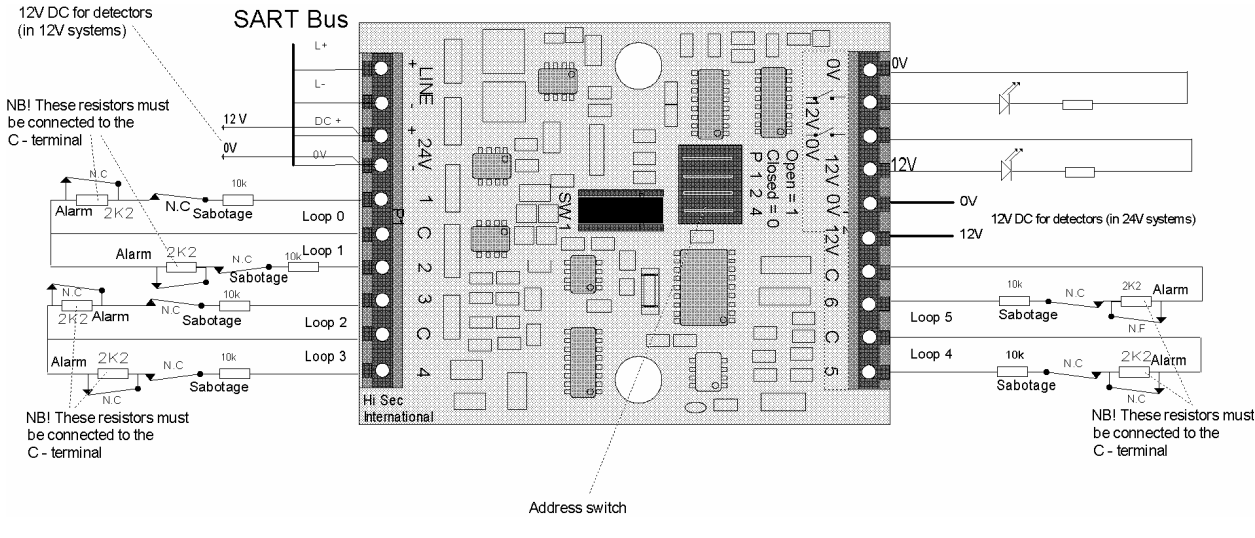
2.10 S-ART S-106

Description

The S-ART S-106 is designed for installations where several detectors are close to each other. The S-106 contains six input loops and one NPN or PNP transistor output.

The S-106 is delivered in large housing to provide additional space for cables. The dimensions are: 106.5 x 158 x 20.3 mm.

Fig. 2.17 Connections to the S-106 S-ART.



Note

The best noise immunity is achieved by connecting the alarm resistor (2.2 kΩ) to the C -terminal (COM) as shown in the connection diagram.

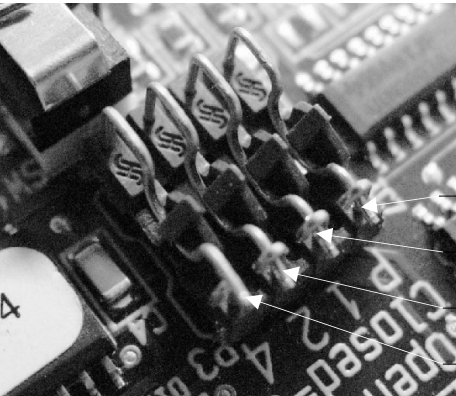
The six input loops are numbered from 0 to 5. The addresses used on the S-ART bus depend on the programmed address on the address switch (see the table below).

The address of the output is automatically set to the address of loop 0.

The tamper contact is in series with the tamper input on loop 0. An open loop on the Alarm/tamper loop or "cover open" will give a message 3 in Menu 35, Test Input.

Address and protocol switch

The addresses used and the protocol to use on the S-ART bus are set by opening or closing the jumpers on the address switch. See the example below.



The example shows that inverted protocol has been selected and the addresses have been set to the range 24 to 29.

- "P" - Closed
- "1" - Closed
- "2" - Closed
- "4" - Open

Protocol setting

The jumper "P" sets the protocol applied:

Open: Normal S-ART protocol

Closed: Inverted S-ART protocol (Please remember the Invert attribute in Menu 47)

Address setting

The jumpers 1, 2 and 4 set the addresses to use. They are set in sets of six addresses as follows:

S-ART address	Switch "1"	Switch "2"	Switch "4"
00 - 05 (for example 100 - 105)	Closed	Closed	Closed
06 - 11 (for example 106 - 111)	Open	Closed	Closed
12 - 17 (for example 112 - 117)	Closed	Open	Closed
18 - 23 (for example 118 - 123)	Open	Open	Closed
24 - 29 (for example 124 - 129)	Closed	Closed	Open

Technical data

Parameter	Value or description
Alarm/tamper loop	Any voltage free contact normally closed.
Terminating resistor R_{eol}	10 k Ω , 1%
Max. length of cable	1000 m
Sensitivity alarm	$\pm 20 \%$
Sensitivity tamper	$\pm 40 \%$
S-ART Line current consumption	Typically 8 mA
Current consumption	10 mA at 12 V DC (excluding the output current)
Max. output current	50 mA.
Temperature range	-25 °C to +70 °C

2.11

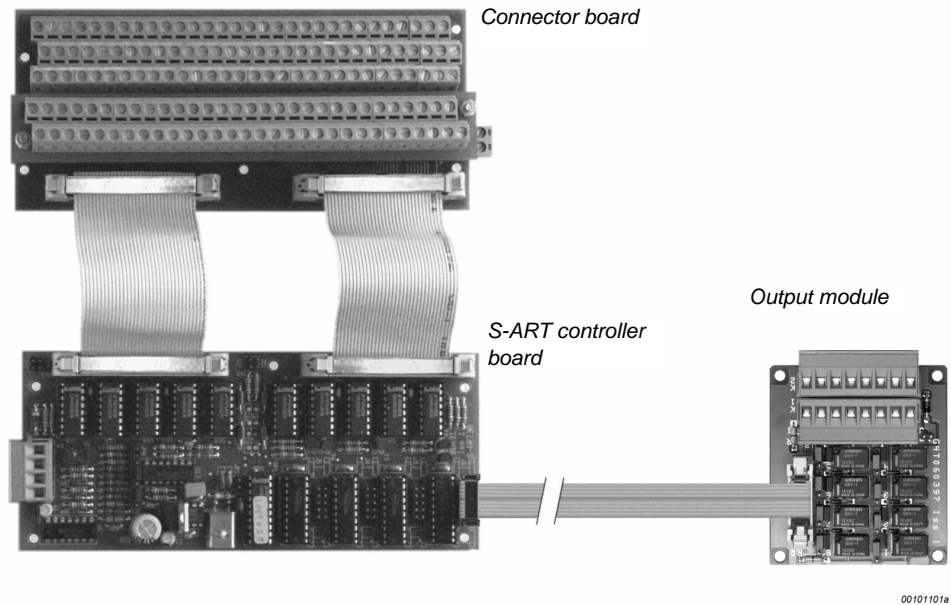
S-ART S-130

Description

The S-ART S-130 is designed for installations where several detectors are close to each others. It has thirty alarm inputs with an end-of line resistor that can be set to 2.2 k Ω , 5.6 k Ω or 10 k Ω . The end-of-line resistance is the same for all alarm loops. In addition to this, it contains thirty selectable polarity anti-mask inputs for use with detectors with an anti-mask facility. Via output modules (One included) 30 open collector outputs with indicator LEDs are available.

The S-130 comprises an S-ART controller board connected to the S-ART bus, a Connector board for connection of the inputs and an Output module for the outputs. Interconnections between the three types of units are performed by means of flat-cables. See the figure below.

Fig. 2.18 S-130 S-ART including connector board and one output module.

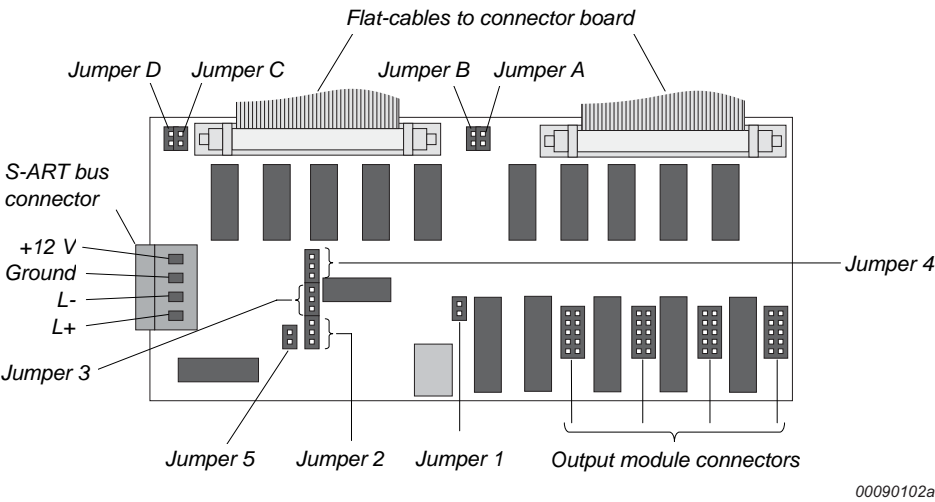


Technical data

Parameter	Value or description
Number of alarm loops	30
Alarm/tamper loop	Any voltage free contact normally closed.
Terminating resistor R_{eol}	2.2 k Ω \pm 1 %, 5.6 k Ω \pm 1 %, or 10 k Ω \pm 1 %
Max. length of alarm loop cable	1000 m (Max. resistance 200 Ω , max. capacity 200 nF).
S-ART Line current consumption	Typically 8 mA
Supply voltage	11 to 16 V DC
Current consumption	Typically 25 mA at 13.6 V DC (excluding output current)
Number of outputs	8 open collector outputs (can be expanded to 30)
Maximum supply voltage for loads	45 V DC
Max. output current	250 mA. with all outputs on.
Temperature range	0 $^{\circ}$ C to +70 $^{\circ}$ C
Dimensions:	90T S-130 controller: 166.5 x 72 x 26 mm Connector board: 175 x 72 x 49.5 mm Output module: 53 x 72 x 30.5 mm

Jumpers and connectors of controller board

Fig. 2.19 Position of jumpers and connectors of S-ART S-130 controller board.



S-ART bus connections

The S-ART bus is connected to the S-ART bus connector together with the 12 V supply voltage (11 to 16 V DC). See Fig. 2.19

Output module connectors

Four connectors for connection of one to four output modules by means of flat-cables.

Setting the address (jumpers 1 and D)

The jumpers 1 and D are used for setting the address range of the S-130. An S-ART bus can accommodate 30 addresses. This means that only one S-130 can be connected to the S-ART bus. However, you can set the S-130 only to use either the address range 00 to 15 or 16 to 29 by the setting of jumper 1. By means of jumper D, you can select which part of the addresses to use. With no jumper on D, the address range is set to 00 to 15; with a jumper installed, the address range is set 16 to 29. See 2.19 for position of jumpers 1 and D.

Jumper setting for the various address settings (See Fig. 2.19 for real position of jumpers)		
Full address range	Addresses 00 to 15	Addresses 16 to 29

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Enabling/disabling anti-mask inputs (jumpers A, B, and C)

Jumpers A and B allows you to enable or disable the anti mask inputs, while jumper C sets the polarity of the anti-mask. When delivered, jumpers A and B (and C) are not fitted, meaning that the anti-mask inputs should not be used. See 2.19 for position of jumpers A, B, and C.

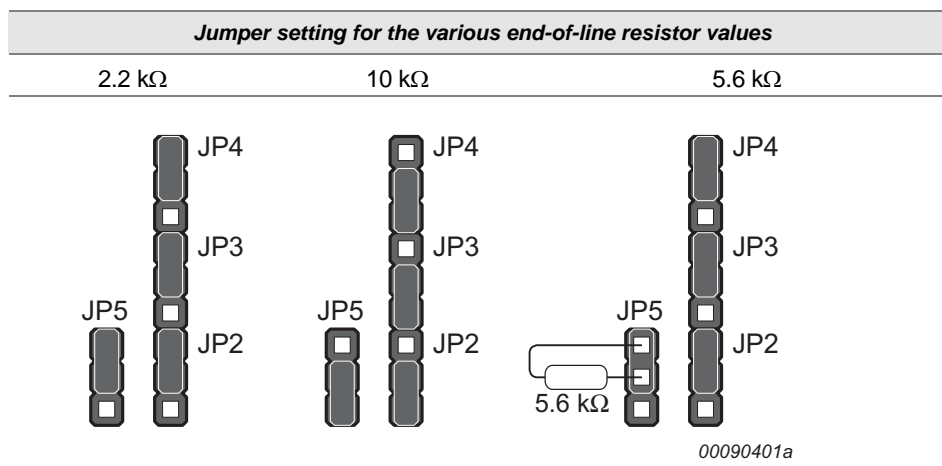
With only jumper A installed, the triggering of an anti-mask input generates a sabotage message.

With only jumper B installed, the triggering of an anti-mask input generates an alarm message.

The jumper \bar{C} sets the polarity of the anti-mask inputs to use either a normally closed contact (NC) when mounted or a normally open contact (NO) when removed.

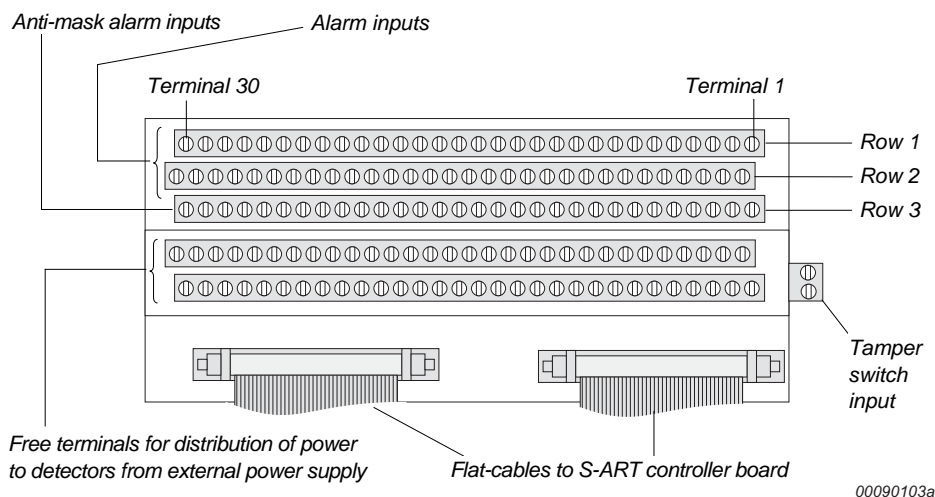
End-of-line resistor (jumpers 2, 3, and 4)

By means of the jumpers 2, 3, and 4, you can set the end-of-line resistor to 2.2 k Ω , 5.6 k Ω , or 10 k Ω . Please note that the value of 5.6 k Ω requires a 5.6 k Ω resistor mounted on JP5 as shown below. See Fig. 2.19 for position of jumpers 2, 3, and D.



Terminals and connectors of Connector board

Fig. 2.20 Position of screw terminals and connectors of S-ART S-130 connector board.



Alarm inputs

The alarm inputs from the detectors are connected to the alarm input terminals Row 2 and the common ground Row 1 (See Fig. 2.2020 and the following table).

Anti-mask inputs

The anti-mask inputs from the detectors are connected to the anti-mask inputs (Row 3 and the common ground Row 1 (See Fig. 2.2020 and the following table)).

	Address	Terminal	Address	Terminal	Address	Terminal	Address	Terminal	Address	Terminal
Row 2	00	1	06	7	12	13	18	19	24	25
Row 3		1		7		13		19		25
Row 2	01	2	07	8	13	14	19	20	25	26
Row 3		2		8		14		20		26
Row 2	02	3	08	9	14	15	20	21	26	27
Row 3		3		9		15		21		27
Row 2	03	4	09	10	15	16	21	22	27	28
Row 3		4		10		16		22		28
Row 2	04	5	10	11	16	17	22	23	28	29
Row 3		5		11		17		23		29
Row 2	05	6	11	12	17	18	23	24	29	30
Row 3		6		12		18		24		30

Free terminals

The two rows, each consisting of thirty terminals, can be used for distribution of power to detectors. The screw terminals of each row are interconnected so that you can use one row for positive supply voltage and one row for the negative supply voltage.

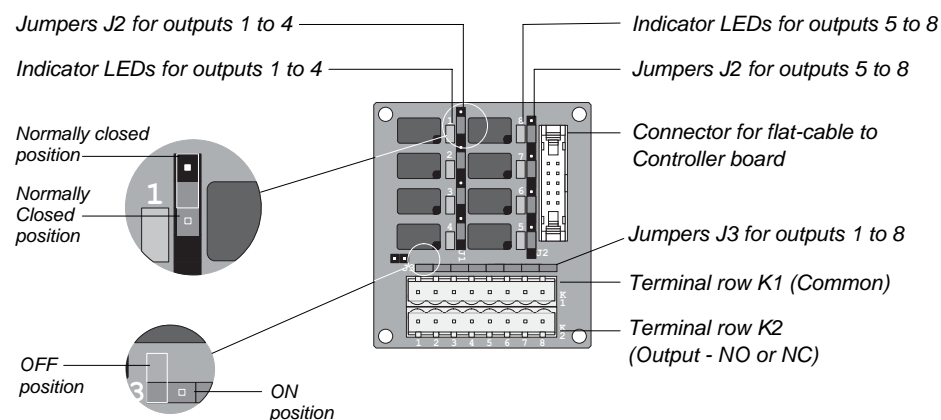
Tamper switch input

These terminals (See Fig. 2.20) are used for connection of a tamper switch to be placed in the box in which the S-130 is mounted. If no tamper switch is used, the terminals should be interconnected by a jumper.

Output module

Up to four output modules (Fig. 2.21) can be connected to the controller board by means of flat-cables. See Fig. 2.20 for position of the connectors. The output module is delivered with a 50 cm long flat-cable for connection to the controller board.

Fig. 2.21 Position of jumpers and connectors of S-ART unit S-130 output module. Please note that the connectors for terminal rows K1 and K2 have been removed to show jumpers J3 and the labelling (1 to 8) of the connectors.



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Jumpers J1 and J2

These jumpers are used for setting the output relays to be either normally open (NO) or normally closed (NC). When delivered, the jumpers are set to normally open (NO). See also Fig. 2.21.

Indicator LEDs 1 to 8	Each relay is associated with a numbered indicator LED (1 to 8) situated next to relay. The LED (red) is switched on when the relay is activated.
Terminal rows K1 and K2	<p>The terminal rows K1 (1 to 8) and K2 (1 to 8) are used for connection of devices to be switched by means of the relays.</p> <p>The K1 terminals are connected to the common contact of the relays. As standard, the common contact of all relays are connected to ground by means of the jumpers J3. See also the paragraph below.</p> <p>The K2 terminals are connected to either the NC or NO contacts of the relays depending on the setting of the jumpers J1 and J2.</p>
Jumpers J3	<p>The J3 row of jumpers (See Fig. 2.21) connects - as standard - the common contact of the individual relays to ground, meaning that these jumpers are set in their ON position when delivered. If this setting is not required for some of the relays or all, the required jumpers can be set to their OFF position (See Fig. 2.21).</p> <p>The jumpers are accessible when you remove (pull off) the connector for the terminal row K1.</p>

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