Saflec Systems (Pty) Ltd

Introduction

The SDC-550 is a multiple door controller that can control up to 8 doors. It has five relay outputs and eight inputs.

It can be connected to other controllers (SDC-520 or SDC-550) using a protected RS-485 network. It has a reader RS-485 network that can also connect to up to sixteen slave devices including remote I/O boards.

The unit comes with a 12Vdc 5A power supply with a battery backup of 7Ah and is mounted in a lockable case.

Note: Make sure the power is disconnected while performing your wiring connections to prevent possible shorts or power spikes from causing problems.
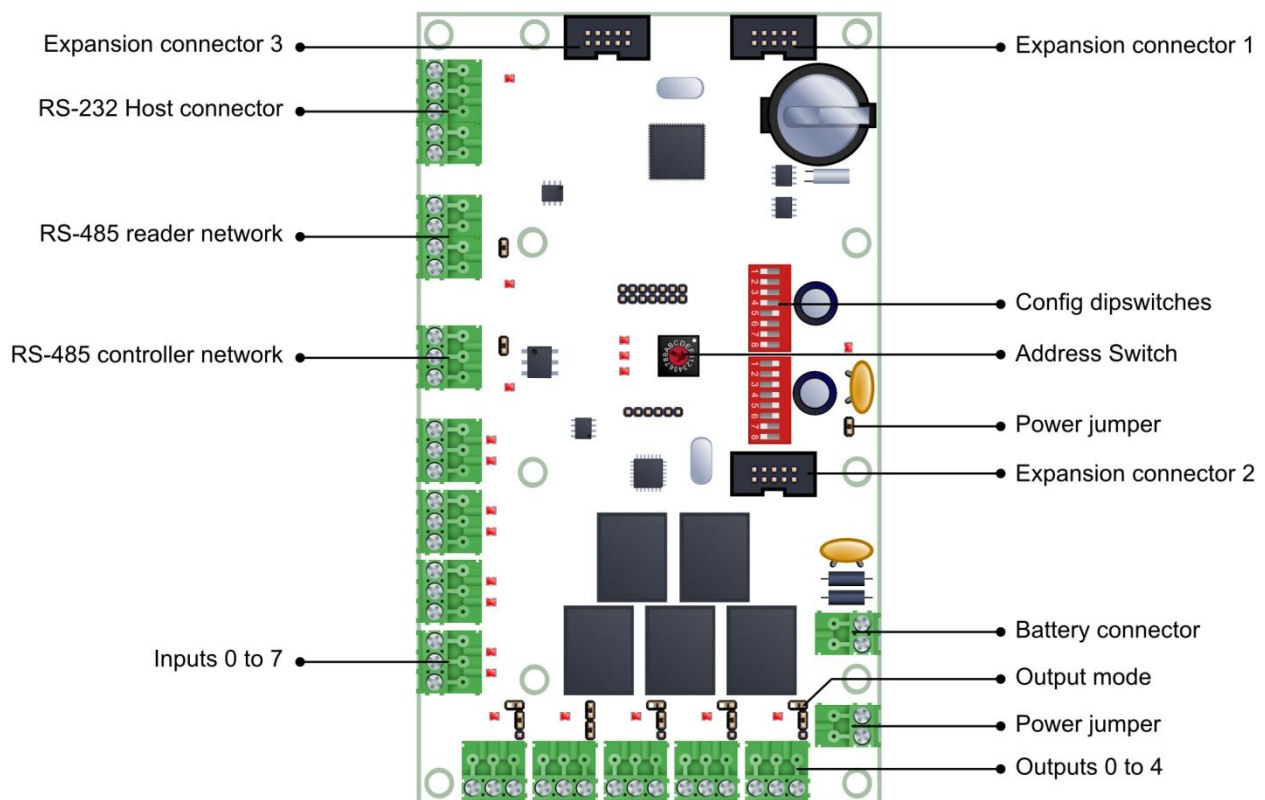

Figure 1
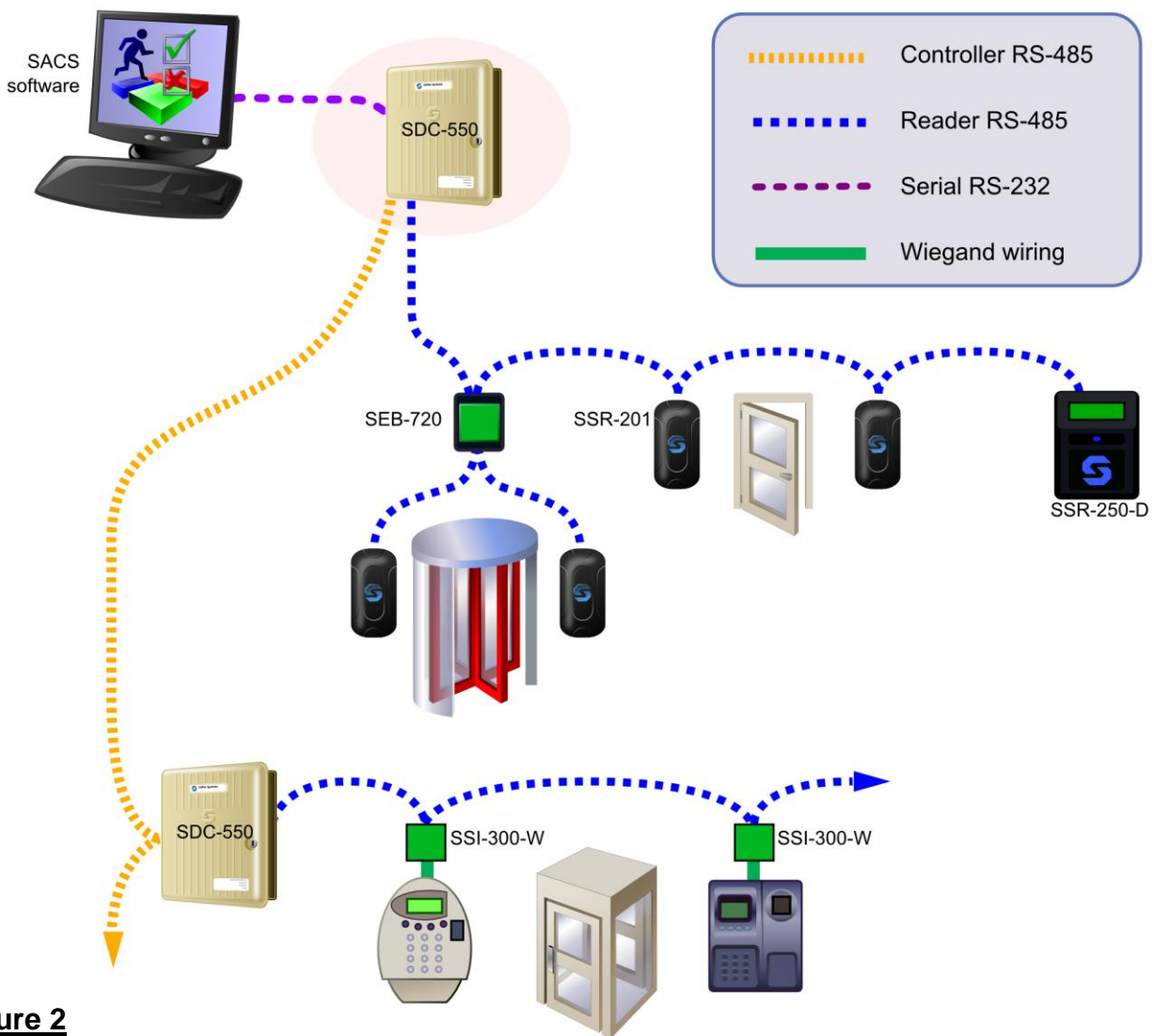*SDC-550 Controller board - labeled*

Figure 2

Wiring layout of a typical SACS access control system.

Step 1: Set the address using address switch SW3

The SDC-550 communicates with other controllers via a multi-drop RS-485 communications network. Each controller on this network requires a unique address for communications and identification. Duplicate addresses will cause communication problems.

The address of the controller can be a number from 0 to 15. This setting can be adjusted using the rotary dipswitch on the controller board. Turn the dial until the arrow points to the address that you wish to assign to the controller.

Figure 3
Address switch (SW3) with address 1 selected

Note: This address will be the same address as used in the SACS software, addresses 10 to 15 are labelled 'A' to 'F' where 'A' = 10 and 'F' = 15.

Step 2: Connect the RS-485 controller network

All controllers in a specific network will be connected together via an isolated multi-drop RS-485 network. This network will be connected as detailed in figure 4 below.
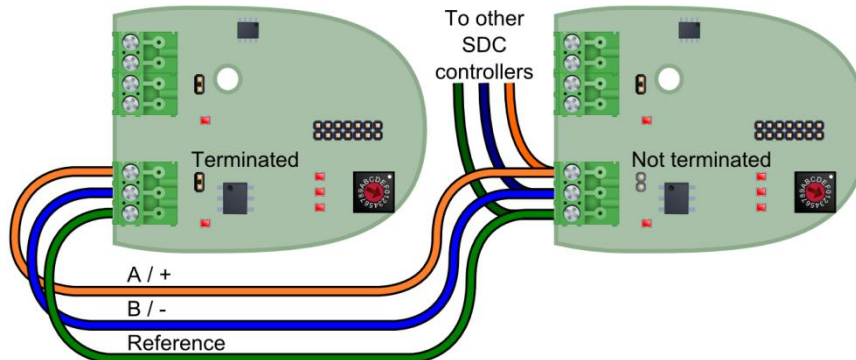

<u>Figure 4</u>

Wiring configuration for multiple controllers on the RS-485 controller network

Note that the RS-485 network requires termination on the first and last controller on the line by shorting J6. Controllers in the middle of the line must not have the termination jumper inserted as this can cause network problems.

In the diagram above you will see that the controller on the left is terminated while the controller on the right isn't. This is because the cables go off to another controller; hence the controller is in the middle of the line and must not be terminated.

Step 3: Connecting the RS-485 reader network

All readers (SSR-001) are connected to each other via an RS-485 multi-drop network which is connected to the controller as detailed in figure 5 below.
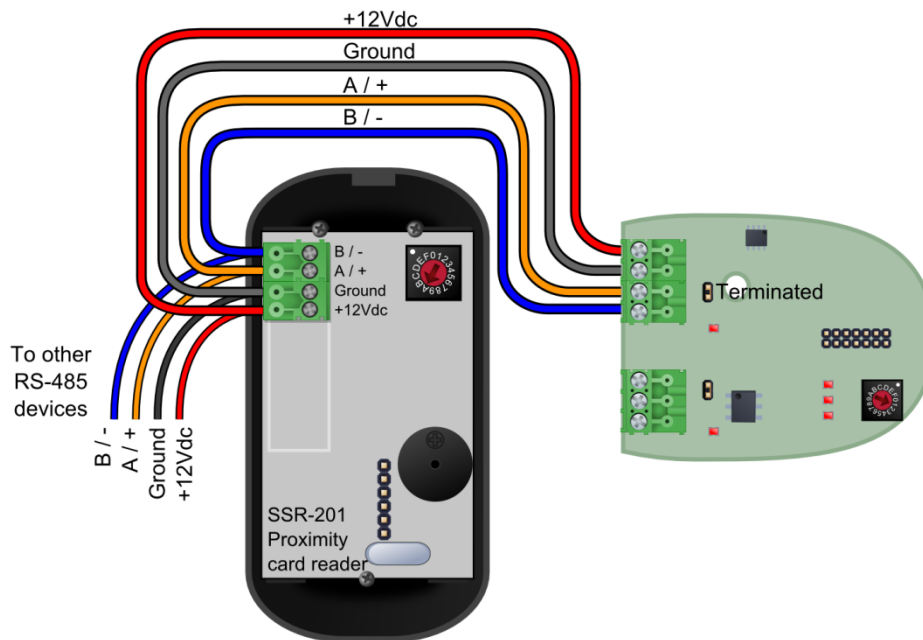

Figure 5
Wiring configuration for the RS-485 reader network

Note that the power supplied by the controller is dependant on the length of the cable and the number of readers being supplied with power. Should the cable length be too long, or should there be too many readers the voltage drop might cause the power to be insufficient.

The readers do not have to be powered from the controller. They can also be powered individually from a separate power supply, should this be preferable.

Step 4: Optional: Connect the RS-232 Host interface

One of the controllers on the RS-485 controller network will be connected to the PC via the RS-232 connection (See Figure 2).
Only one connection is required as all controllers on the line can be communicated with through this connection.
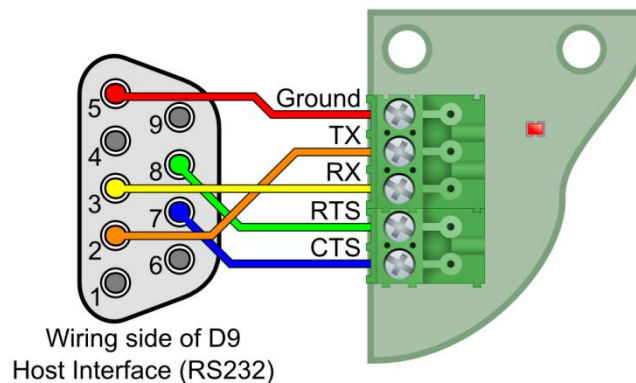

Figure 6
RS-232 wiring configuration for the PC host interface

Step 5: Connecting the power supply

The controller comes with a 12Vdc power supply which gets connected to the top of the board. The controller also has a battery voltage monitor should you wish to monitor the status of the battery.
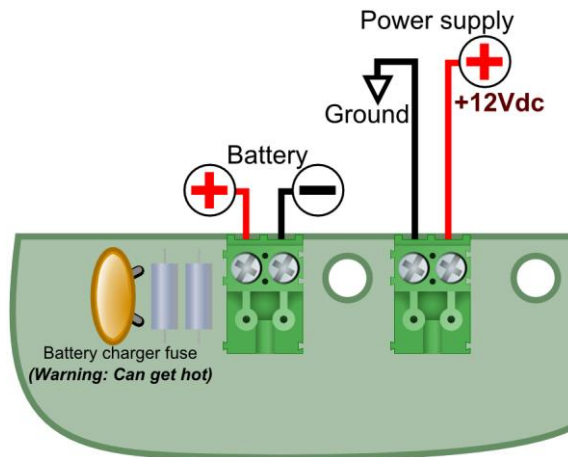

Figure 7
Connections to power supply and battery

When the power is connected the LED to the left of the power connector in the diagram above will turn on.
When you are satisfied that the controller is correctly linked to the power, switch it off again until you have finished wiring your digital inputs and outputs to prevent accidental shorts or power spikes from causing problems.

Step 6: Connecting the digital inputs

Before wiring the digital inputs make sure that the power is switched off on the controller board. When looking at the controller board with the power connector on the top right of the board, the inputs are arranged in ascending order from left to right with a shared common between each input pair. See the diagram below on how to correctly wire them.
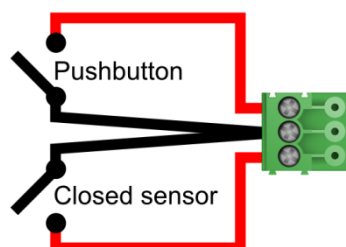

Figure 8
Example wiring of inputs 0 and 1 to a pushbutton and closed sensor

Step 7: Connecting the digital outputs

Before wiring the digital inputs make sure that the power is switched off on the controller board. When looking at the controller board with the power connector to the right, the outputs are arranged in ascending order from left to right.

The outputs can provide 12Vdc power, or simply act as a potential free contact, allowing external DC or AC power to be switched through the relay.

The configuration of this output mode can be accomplished using the jumpers J7 to J11. Possible output modes are listed below.

Output mode 1: Externally powered outputs (Default)

To set the output to externally powered mode, place a single jumper in the center of the jumper pin strip as displayed in the diagram below.

Figure 9
Jumper setting for J7 to J11 – externally powered outputs – relay switched

When in this mode, only the relay is switched when the output is activated. This allows for devices like AC switched locks to be supplied or external power to be provided for an output. Care must be taken not to exceed the contact ratings listed in the section entitled 'Contact ratings for the output relays'.
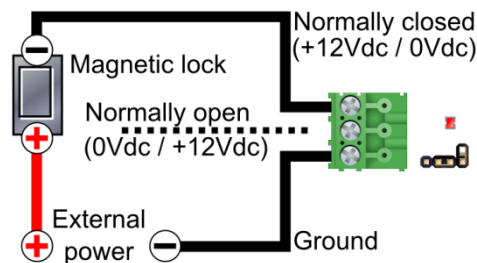

Figure 10
Example wiring for an externally powered magnetic lock – Normally closed

Output mode 2: Internally powered outputs

To set the output to internally powered mode, place two jumpers on the left and right side of the jumper pin strip as displayed in the diagram below.

Figure 11
Jumper setting for J7 to J11 – internally powered outputs

When in this mode, 12Vdc power will be switched through the board from the power supply connected to the board. It will have battery backup (If the standard power supply is used) so that minor power interruptions will not disrupt the output power.
Make sure that sufficient power is available from the power supply for all internally switched outputs, for the controller and for any readers powered from the power supply.
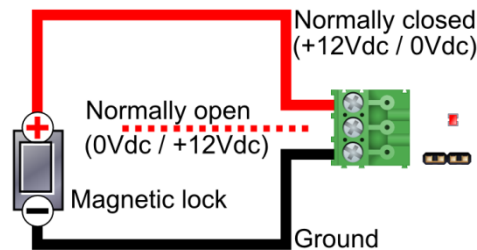

Figure 12
Example wiring for an internally powered magnetic lock – normally closed.

Important: When driving inductive loads such as strike locks, care should be taken to prevent a back-EMF voltage spike. In order to do this a freewheeling diode (also known as flyback diode) should be connected across the load as seen in figure 13 below.
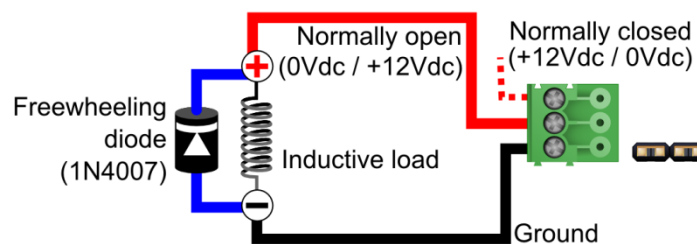

Figure 13
Diagram showing freewheeling diode over an internally powered inductive load (eg. strike lock) – normally open.

PRODUCT SPECIFICATIONS	
Power requirements	
Operating Voltage (DC)	10 to 14 Vdc
Maximum Current	300 mA
Maximum Current (Including two SSR-001 proximity card readers)	500 mA
Environmental characteristics	
Operating Temperature	0°C to +70°C
Storage Temperature	-10°C to +80°C
Enclosure Rating	IP54
Inputs	
Input Type	Digital
Typical Input Voltage (Internal Mode)	0 to +12 Vdc
Maximum Input Voltage	-12 to 36Vdc
Maximum Input Current	7.3 mA
Outputs	
Output type	Relay
Maximum voltage (AC)	250Vac
Maximum voltage (DC)	220Vdc
Maximum current	3A
Recommended maximums (Single Relay)	1A at 30Vdc
Maximum switching current (inductive)	500mA
Note: Care must be taken not to exceed the contact ratings listed or damage to the controller board will occur.	
RS-485 controller network	
Transient Protection	Yes
Protection type	Galvanic isolation
Maximum protection voltage	2kV
Maximum Network Length	1000 metres
RS-485 reader network	
Transient Protection	Yes
Maximum Network Length	500 metres (Data only)
RS-232 Host Interface	
Transient Protection	No
Maximum Cable Length	15 metres