Saflec Systems (Pty) Ltd

Introduction

The SDC-520 is a multipurpose controller with USB and Ethernet connectivity.
It has two relay outputs and four inputs.
It can be connected to other controllers (eg. SDC-550) using a protected RS-485 network. It can also connect to up to sixteen slave devices including remote I/O boards and can also have two Wiegand compatible devices connected directly on the board.

The unit comes with a 15Vdc 2.6A power supply with a battery backup of 7Ah and is mounted in a metal case with a lockable door.
This metal case can be mounted where required using the mounting key holes on the outer edges of the case.

Note: Make sure the power is disconnected while performing your wiring connections to prevent possible shorts or power spikes from causing problems.
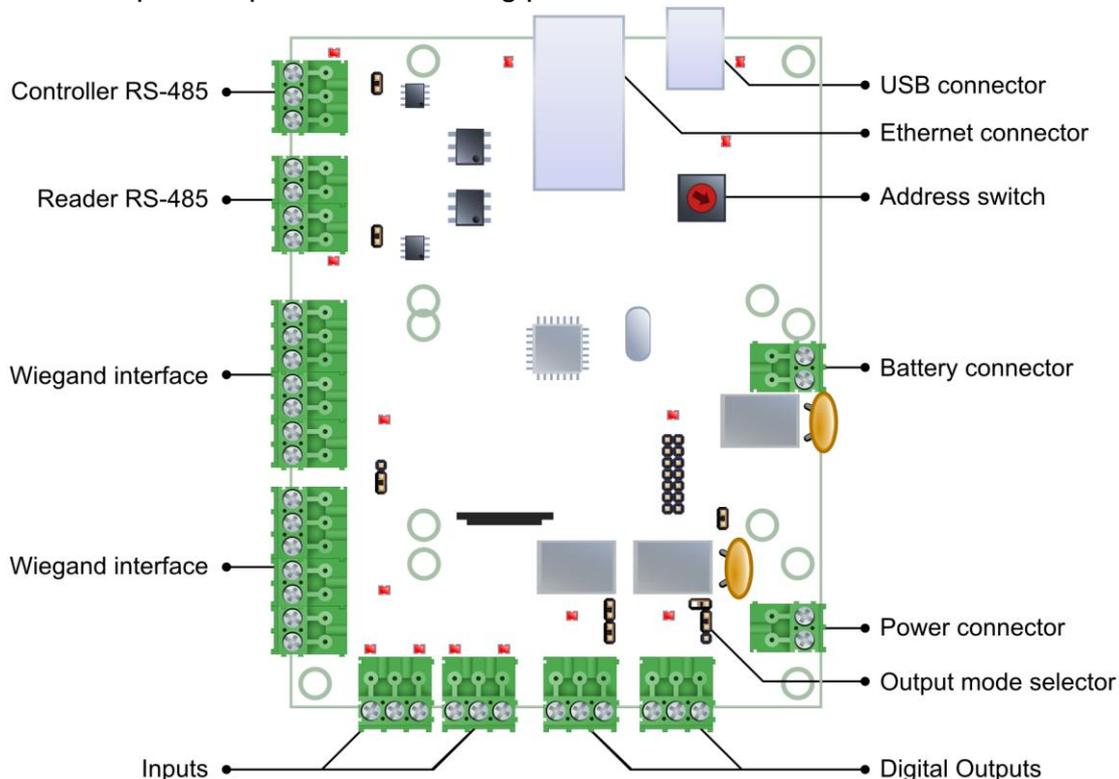
Figure 1
SDC-520 Controller board - labeled
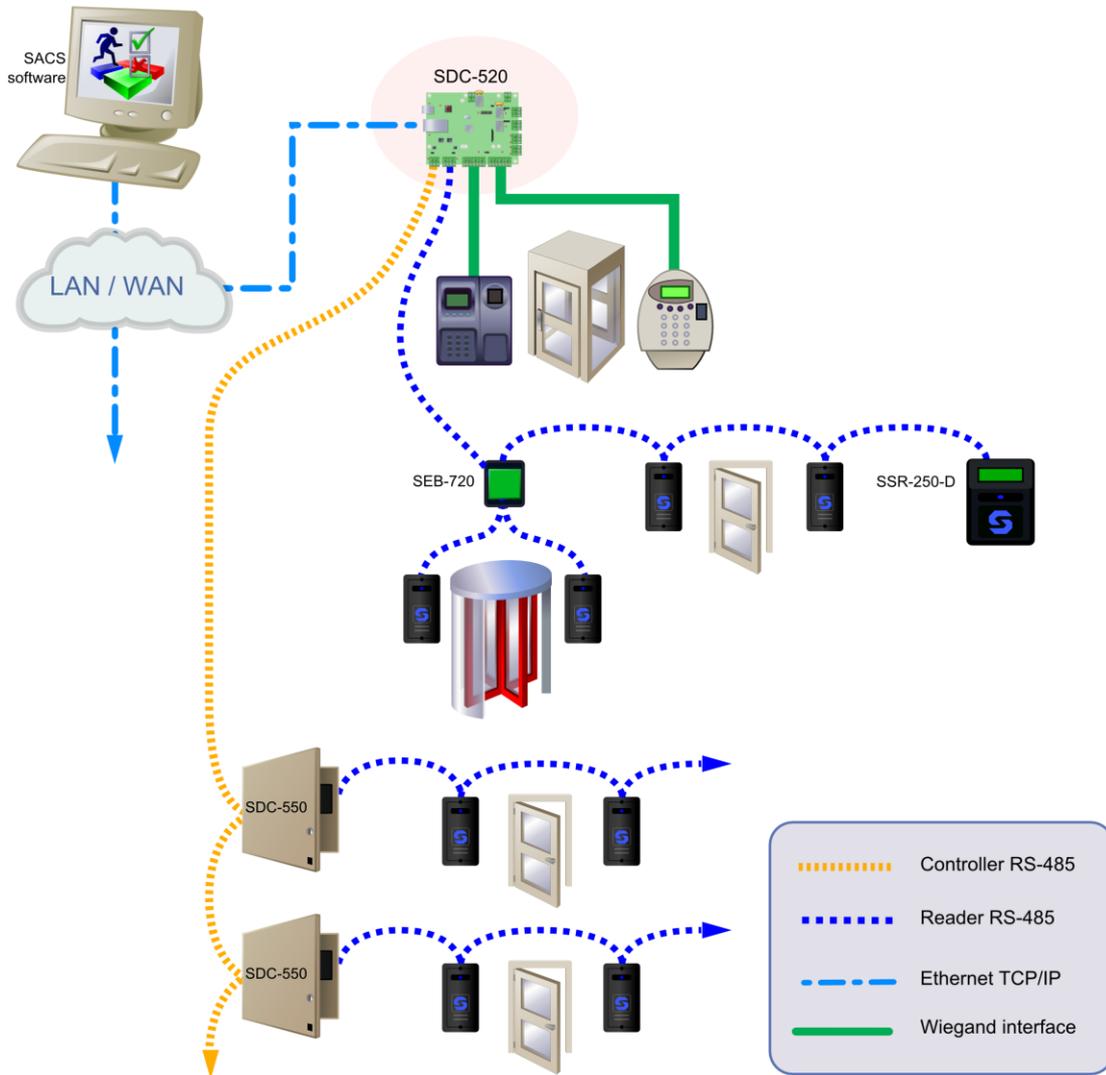
Figure 2

Possible location for the SDC-520 in an access control system.

Step 1: Set the address using address switch SW1

The SDC-520 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.

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.

Figure 3
Address switch (SW1) with address 1 selected

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.
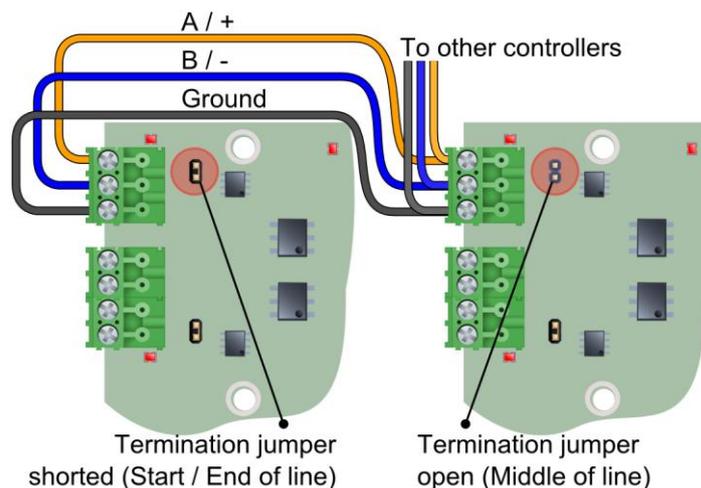
Figure 4

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 J12. 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-201) are connected to each other via an RS-485 multi-drop network which is connected to the controller as detailed in the figure below.
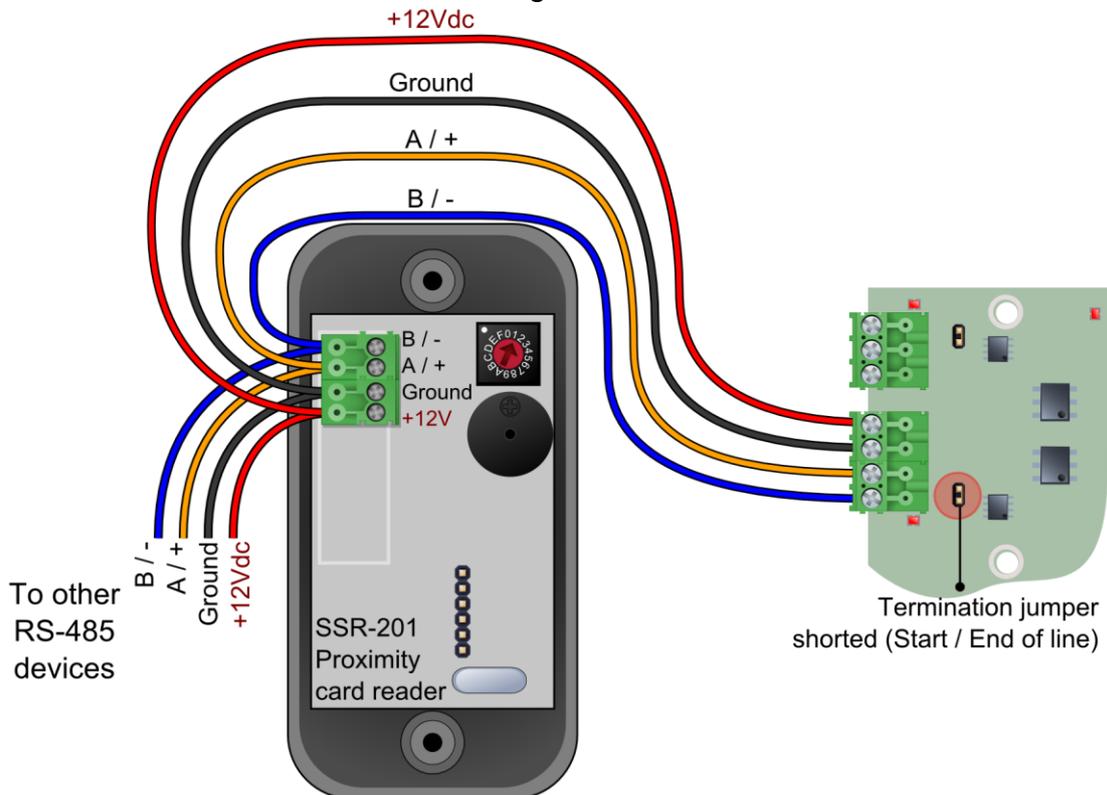
Figure 5
Wiring configuration for the RS-485 reader network

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.

NOTE: Even though the SDC-520 supports up to 16 slave devices, remote address 0 is shared between the Wiegand connections and the RS-485 network. This means that if you have a slave device on address 0 and a Wiegand reader attached on board they will both use the same address and will essentially look like the same device to the controller.

Step 4: Connect the Wiegand devices

The Wiegand devices communicate with the SDC-520 via five signalling lines.
These lines can be broken into two groups:

- The data lines (Data 0, Data 1)
- The control lines (Red LED, Green LED and Buzzer)

Set the power selection jumper (J5) to the correct voltage for the device you are connecting (Default +12Vdc). Both Wiegand interfaces will use the same voltage level.

Note: Make sure that the power is switched off before connecting these cables.

Connect the data and control lines ensuring that the correct cables are used.
Connect the power to the Wiegand device.
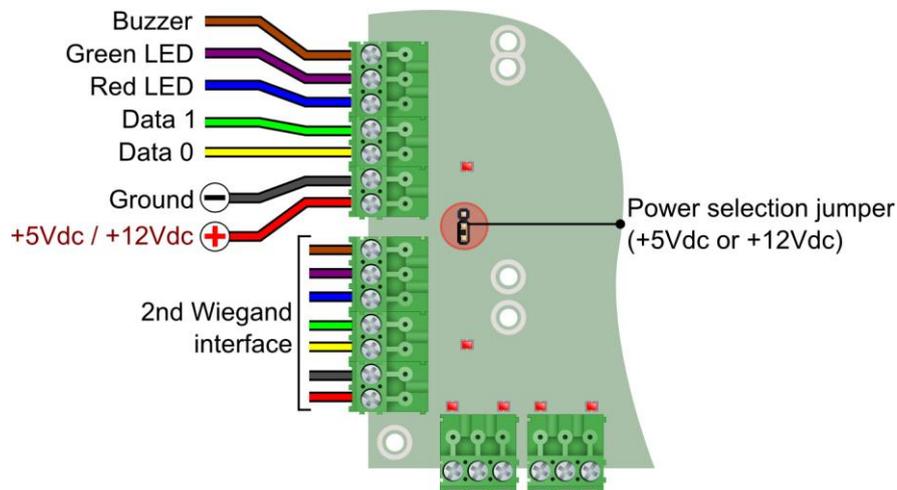
Figure 6
Wiring configuration for the Wiegand interfaces

The second Wiegand interface can also be wired up in the same way.

NOTE: Is the SACS software the two Wiegand readers should be configured to be remote address 0, reader 1 and 2. This means that remote address 0 is shared between the RS-485 slave devices and the Wiegand port.

Step 5: Connecting the power supply

The controller comes with a 15Vdc power supply which gets connected to the top of the board. It will also charge the backup battery from the power supply when power is available.
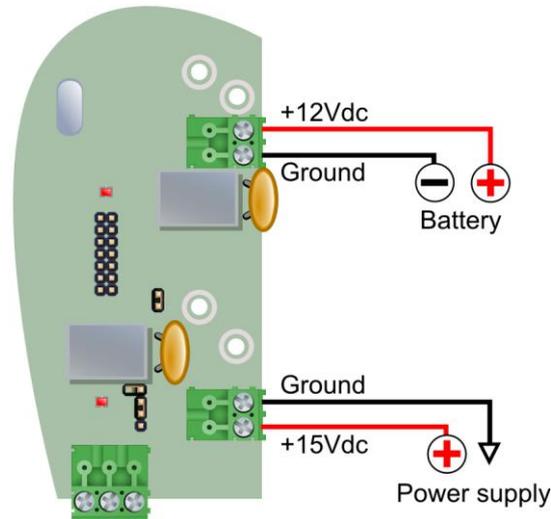
Figure 7
Connections to power supply and battery

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 at 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 descending order from top to bottom on the right hand side of the board (under the outputs) with a shared common between each input pair. See the diagram below on how to correctly wire them.
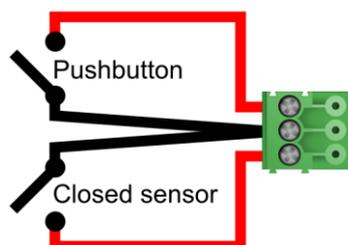
Figure 8
Example wiring of inputs 0 and 1 to a pushbutton and closed sensor

Step 7: Connecting the digital outputs

Before wiring the digital outputs make sure that the power is switched off at the controller board. When looking at the controller board with the power connector on the top right of the board, the outputs are arranged in descending order from top to bottom on the right hand side of the board (above the inputs).

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 J9 and J10. 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 J9 and J10 – 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'.
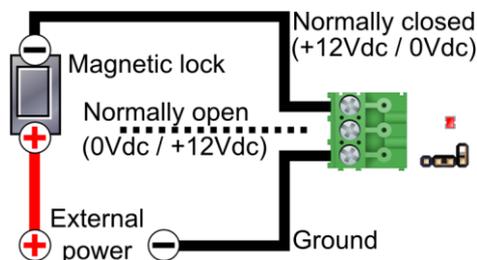
Figure 10
Example wiring for an externally powered magnetic lock – Normally closed

Output mode 2: Internally powered outputs

To set the output to internally powered mode, place two jumpers on both sides of the jumper pin strip as displayed in the diagram below.

Figure 11
Jumper setting for J9 and J10 – 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.
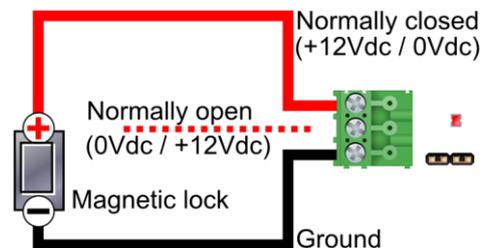
Figure 12
Example wiring for an internally powered magnetic lock – normally closed.

Step 8: Configuring the TCP/IP

For the device to communicate to the SACS Communication Manager as a new device network, its IP address must be configured to the desired IP address that allows communication to the SACS Server PC where the Communications Manager is located.

The default IP Address is **192.168.8.52**.

Note: The following IP ports are used by the expansion board: TCP/IP Ports **10000/10001** and UPD Port **12345.** Ensure that these ports can be accessed on the network and is not restricted in any way. (e.g. firewalls restricting or blocking these ports)

1.   Start the Configuration Tool (SSEConfig.exe) installed in the Tools folder under the SACS installation folder on the SACS Corporate/Standard Server PC. Normally this is located at 'C:\Program Files\SaflecSystems\SACS\Tools\SSEConfig.exe'.

2.   The SDC-520 will appear in the list. If there are existing SEB-700 expansion boards or SDC-520 controllers on the network, they would also appear in the list.
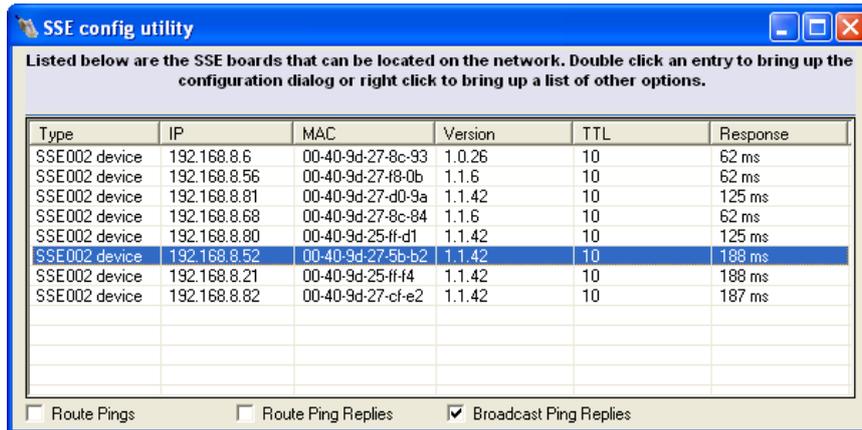
Figure 13
The config utility.

> **Note:** If the device does not appear in the list, check with your IT personnel for the correct port and firewall settings. If the communication path to the SACS Server PC is via ROUTERS and different SUBNETS are used, then the SSE Config Utility will most likely NOT detect the board. In this case use a cross-over cable with a PC/Laptop configured to use the same IP Address range (192.168.8.???) and subnet (255.255.255.0) as that of the expansion board to configure the expansion with the new desired IP Address, Subnet Mask and Gateway.

3. To change the IP Address, double-click on the device with the default IP address.

Figure 14
IP settings dialog.

> **Note:** If there is more than one device with the default IP address (192.168.8.54), then you can use the MAC Address to determine which device is the one you want to configure. The MAC is located on the label attached to the Ethernet connector on the SDC-520 board. (See Figure.1)

4. Type in the new IP Address, Subnet Mask (if required) and Gateway (if required).

Note: You can also choose to enable DHCP. This will allow the device to use a dynamically assigned IP Address determined by the network domain server.

Warning: Using DHCP can cause the device not to function until it has acquired an IP Address from the domain server. This may cause the controller attached to the device to stop functioning causing access control functions to stop!

5. Once configured, click on the Accept button and close the SSE Config Utility.

6. Reboot the controller.

7. The expansion board is now configured and ready for use.

Product specifications

Power requirements

Operating Voltage (DC)	10 to 14 Vdc
Maximum Current	300 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)	125Vac
Maximum voltage (DC)	220Vdc
Maximum current	2A
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
Protection type	Galvanic isolation
Maximum protection voltage	2kV
Maximum Network Length	1000 metres (Data only)

Dimensions
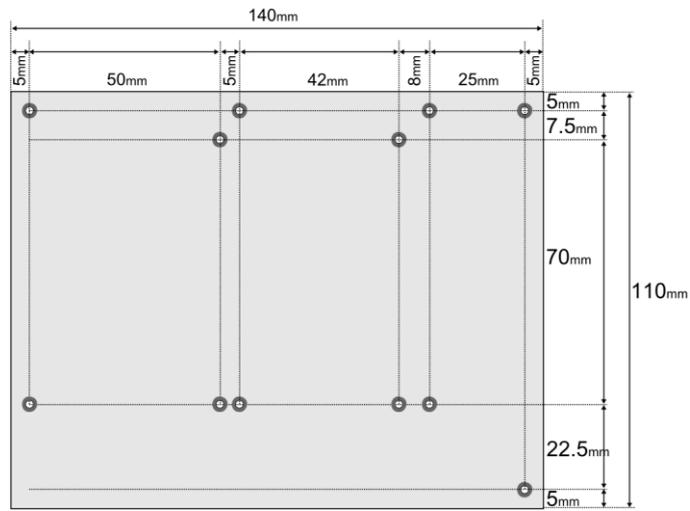
Figure 13
Board dimensions and mounting hole layout.