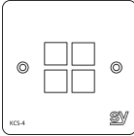
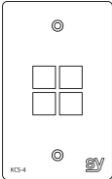
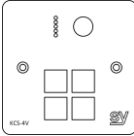
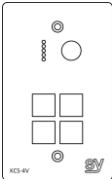
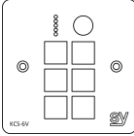
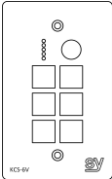
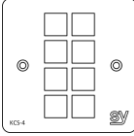
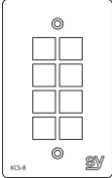


KCS Keypad Controllers

User Manual (v 1.0)

| | UK | US |
|--------|---|---|
| KCS-4 |  |  |
| KCS-4V |  |  |
| KCS-6V |  |  |
| KCS-8 |  |  |

Available in White, Black, and Brushed Aluminium
The UK version facia is 86x86mm (same size as EU)

Thank you for purchasing this product

The KCS keypad controllers have been designed with the professional installers in mind. The many extensive features will assist you in implementing the required system control quickly and help with integration, validation and maintenance.

Installation precautions

This product has special circuitry to protect it against moderate surges and static discharges. However, to ensure reliable operation and long service life, it is important to take the necessary precautions against any spikes, surges and static discharges.

Place the units away from sources of heat and/or moisture.

As much as possible, long cable runs should be routed away from any noisy sources and avoiding long runs in close proximity to AC mains cables.

The KCS range of keypad controllers are easy to configure and are packed with a wide range of interfaces (RS232, RS485, IR, and digital I/O), making them an ideal controller either as a stand-alone device or as part a larger distributed control system.

The integrated IR learner simplifies the inclusion of any new device with IR requirements.

The Codeless methodology (No-code) enables easy configuration of the KCS series by accessing a vast array of device libraries for effortless implementation. Complex functions are easy to implement without the need for any programming skills. For more sophisticated requirements, the units are programmed in Lua, achieving even more amazing functions simply and easily.

The easy to operate **NebulaStudio**[®] application environment facilitates your requirements to achieve all the desired functions (codeless or coded). For a complex multi-controller system, the meshing facility makes the implementation easy, especially for future changes or upgrades.

The large elegant buttons are backlit with an RGB LED and can be set to any colour / intensity required. Each button can be labelled, and protected with a clear cover cap. The versions with the smooth rotary dial (volume control) also have a bar graph to show the set level.

Features

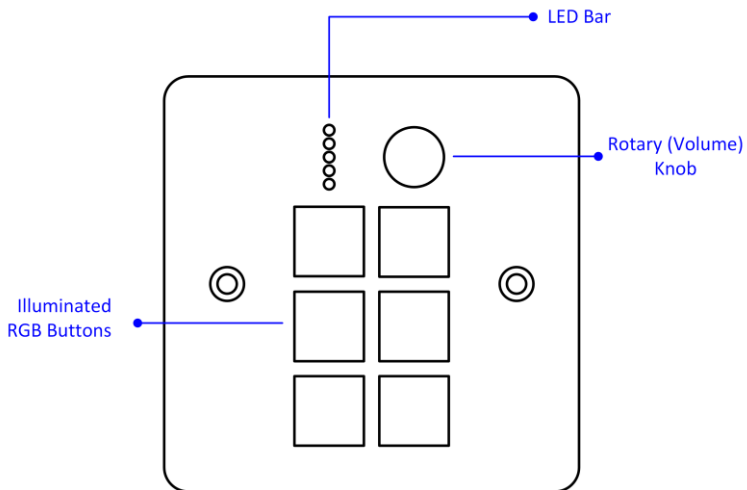
- Choice of 4, 6, or 8 illuminated buttons (RGB)
- Rotary control (with push switch) versions
- Up to 4x RS232, and 4x IR comm ports (using Flexi-ports)
- 4x digital I/O ports (24V, 200mA – Over current & back EMF protected)
- Built-In universal IR Learner (25-60KHz carrier)
- 16 concurrent event timers
- Rugged and resilient – All ports are fully protected
- Codeless – “No Code” methodology
- Can program complex projects using Lua
- Standalone or meshed topology for multi controller installations
- The KCS series keypads are managed & programmed using **NebulaStudio**[®]
- 12V DC operation

Packing List

- KCS-xx keypad
- 12V 1A DC PSU, fitted with 2-way pluggable connector
- Six 3-way pluggable connectors for RS232 and I/O ports
- Legend sheet for labelling the buttons
- Clear caps to protect the button and its legend label
- CRT (Cap Removal Tool)

Front Panel

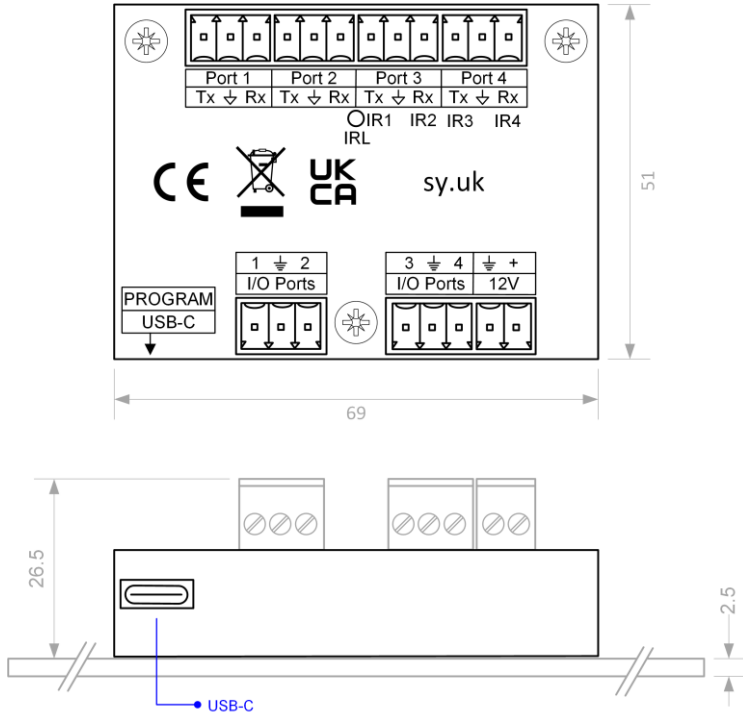
KCS-6V keypad controller in the UK front panel example.



| Name | Description |
|-----------------------------|--|
| Buttons | Legend-able back-lit (RGB) buttons. Any colour or brightness level |
| Rotary knob (Volume) | Rotary encoder with push switch (mute/unmute, on/off) |
| LED bar | LED volume bar indicator (4x Green, 1x Red) |

Back Panel

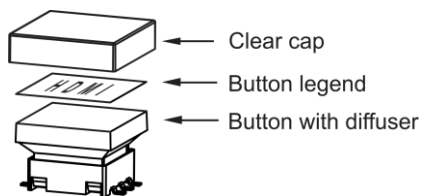
For clarity, only the back-panel connections are shown (for all KCS range).



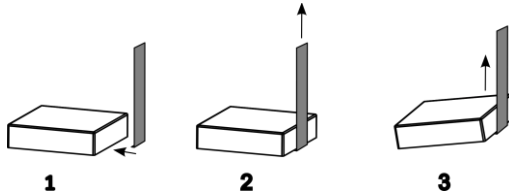
| Name | Description |
|------------------------|---|
| Port 1 ~ Port 4 | Serial communication Ports 1 ~ 4 (ports 3 & 4 are Flexi-ports) |
| IR1 ~ IR4 | IR output ports – IR1, IR2 are on Flexi-Port 3 and IR3, IR4 are on Flexi-Port 4 |
| I/O Ports | Digital I/O Ports 1 ~ 4 |
| 12V | 12V DC PSU Input |
| IRL | IR sensor aperture for the IR Learning feature |
| USB-C | Programming port, on the side of the back panel |

Fitting the Button Legend and Clear Cap

Remove the desired legend from the legend sheet provided in the box and affix it to the top of the button, then carefully fit the clear cap to protect the button legend.



Using the Cap Removal Tool (SY-CRT)



1. Carefully insert the Cap Removal Tool between the button and faceplate opening.
2. Gently pull the Cap Removal Tool (CRT) in an UPWARDS direction away from the faceplate surface. **DO NOT** attempt to lever off the cap, as this action may damage the button. You can gently **try two or three sides** to loosen the cap off the button.
3. Please **avoid excessive force** and be gentle, as otherwise you may damage the button.

Features List

This table gives the features supported by each keypad type:

| Product | Buttons | Volume | RS232 | IR Out | I/O | IRL |
|---------|---------|--------|-------|--------|-----|-----|
| KCS-2 | 2 | — | 2 | 2 | 2 | — |
| KCS-4 | 4 | — | 4 | 4 | 4 | ✓ |
| KCS-4V | 4 | ✓ | 4 | 4 | 4 | ✓ |
| KCS-6V | 6 | ✓ | 4 | 4 | 4 | ✓ |
| KCS-8 | 8 | — | 4 | 4 | 4 | ✓ |

✓ Feature is supported

— Feature is not supported

IRL – Built-in IR
Learner

Using this Product

1. The KCS keypad controllers can be configured or programmed using the **NebulaStudio**[®]. This is quite intuitive and flexible, allowing complex control and set ups in a very short time. The vast array of third-party device libraries simplifies the implementation. Adding new commands to the library is simple and quick. Each button can have multiple functions, with any desired colour. The final program can be downloaded into the KCS keypad controller via the USB-C port.
2. Each button can be individually labelled using the legend sheet, before fitting the clear cap to protect the label.
3. Connect to the RS232 serial, I/O, or IR ports as required.
4. Connect the 12V DC power supply.

Using Built-In IR Learner

This feature is supported on all the KC series keypads. The IR Learner sensor is located beneath the IRL aperture on the rear of the keypad. Use **NebulaStudio**[®] to perform the IR learning and then assign the captured IR Remote commands to a library file.

Flexi-Ports

Port 3 and Port 4, known as Flexi-Ports, are multi-purpose ports:

| Mode | Flexi-Port 3 | Flexi-Port 4 |
|-------|--------------|--------------|
| RS232 | ✓ | ✓ |
| IR | ✓ | ✓ |

IR mode is set during the creation of the control program in **NebulaStudio®**.

Using the Serial Ports

The KCS keypads have 4 RS232 ports that are capable of full-duplex communication with any combination of the following parameters:

| | |
|------------|-------------------|
| Baud rate: | 600 to 115,200 |
| Data bits: | 8 or 9 |
| Parity: | None, Odd or Even |
| Stop bits: | 1 or 2 |

All the ports are protected against short-circuits and ESD.

Comm Ports 1-2

Ports 1 and 2 are dedicated Bi-directional Full-duplex RS232 ports (Tx, Rx).

Flexi-port 3 & 4

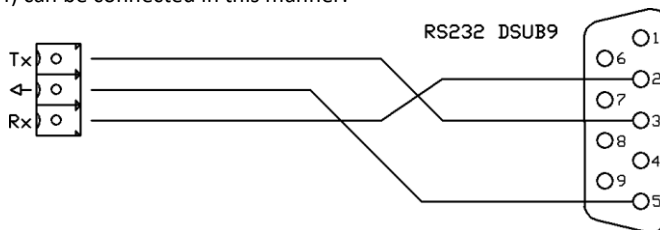
Comm ports 3 & 4 are Flexi-ports and can be configured in one of 3 ways via **NebulaStudio®**:

- Full-duplex RS232 (Tx, Rx)
- RS232 Tx with 1x IR Infra-Red output (IR2)
- 2x Infra-Red outputs (IR1, IR2). (See Flexi-port examples).

Flexi-Port Connection Examples

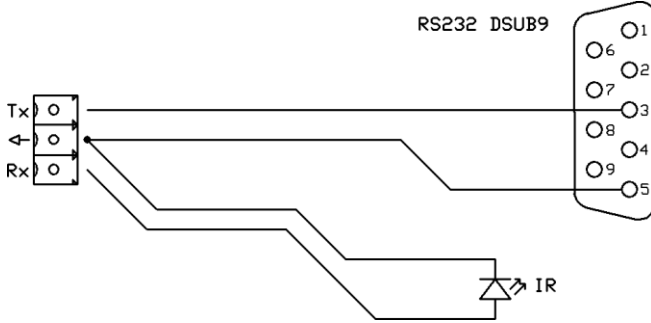
Bi-directional RS232 Only

This diagram shows a full-duplex RS232 connection to the Dsub-9 connector. Always refer to the third-party product manual to determine the actual connector type and wiring. All ports (1 ~ 4) can be connected in this manner.



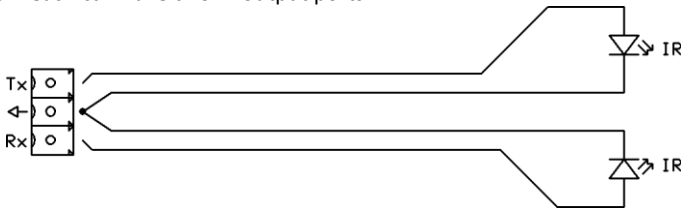
RS232 Tx with IR Out on the same port

This connection is for either port 3 and/or port 4.



Two IR Outputs

Port 3 and 4 each can have two IR output ports:



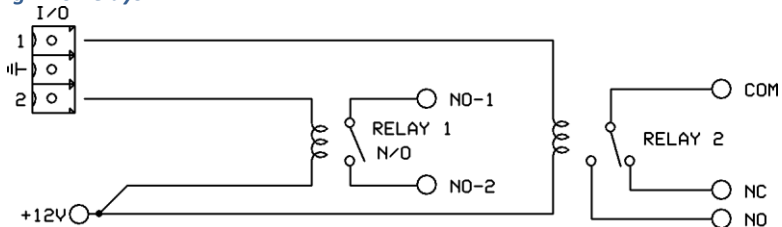
Using the Digital I/O Ports

Each of the 4 digital I/O ports may be configured as either input or output:

- An input port can accept any voltage up to 24V DC.
- An output port can tolerate up to 24V and switches to 0V (max of 200mA sink current).
- Each output is overcurrent & back EMF protected.
- Each output can directly drive a 12V relay coil (back EMF protected).
- The 12V input supply is used to also power the relays.

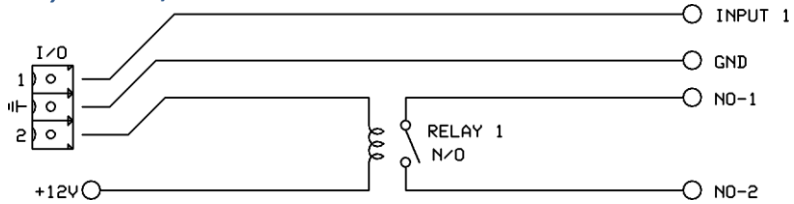
NOTE: In each of the following example diagrams, the referenced connections to I/O1 and I/O2 can also be applied to I/O3 and I/O4. The below are just some sample possibilities.

Driving Two Relays



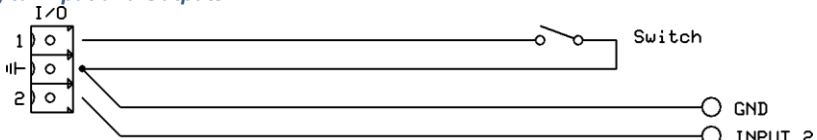
No additional diode protection is required, as all KCS I/O ports are fully protected against any back EMF. The +12V connection is on the PSU connector.

One Relay and One I/O Connection



Input 1 can alternatively be configured as an output signal. The +12V is on the PSU connector.

Digital Input and Outputs

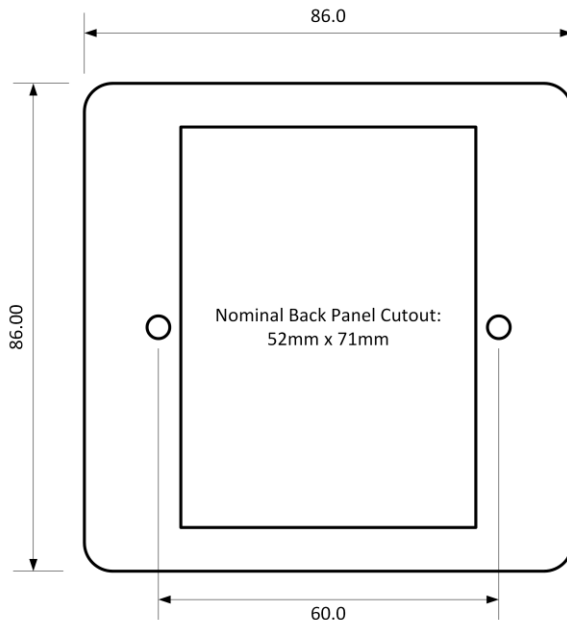


A switch can be attached to any I/O without the need for pull-up resistor.

KCS Panel Dimensions

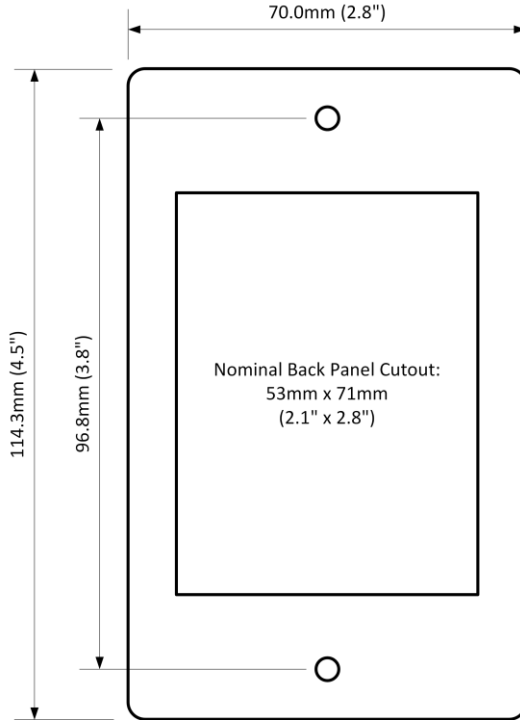
For each of the following diagrams (shown from back), the **Nominal Cutout** dimensions gives the clearance required for the KCS back-panel. The images are not to actual size.

UK Faceplate



The UK style faceplates are very similar looking to the EU style; however, they are only compatible with the UK electrical back-box.

US Faceplate



Specifications

General

| | |
|-----------------------------------|---|
| Buttons | Full colour RGB |
| RS232 baud rates | All standard baud rates from 600 to 115,200 600 1,200 2,400 4,800 9,600 19,200 38,400 57,600 115,200 |
| RS232 settings | Data bits – 8 or 9 Parity bit – none, even, or odd Stop bits – 1 or 2 |
| I/O Ports | 24V DC, 200mA sink (to 0V) |
| I/O input impedance | 100K pull up to 12V |
| IR Learner Frequency Range | 25 ~ 60 kHz carrier frequency |
| IR Out Frequency Range | 20 ~ 150 kHz carrier frequency |
| Power Consumption | 0.3 ~ 1W (depending on the button LEDs brightness setting) |
| PSU | 12V 1A |

The actual power consumption is dependent on the brightness setting of the button LEDs.

Environmental

| | |
|------------------------------|------------------------------|
| Operating Temperature | 0 ~ 40°C (32~104°F) |
| Operating Humidity | 10 ~ 90% RH (non-condensing) |

Physical

| | |
|-----------------------------------|--|
| Dimensions (WxHxD) | UK: 86 x 86 x 18.3 mm US: 70 x 114.3 x 18.3 mm (2.75" x 4.5" x 0.72") Allow minimum depth of 32mm, to allow for connectors and wiring. |
| Weight (Net) | 0.13 kg |
| Package Dimensions (WxHxD) | 233 x 60 x 129 mm (9.2 x 2.4 x 5.1 inches) |
| Package Weight | 0.38 kg |

KCS Keypad Controller Models

KCS keypad part numbering scheme:

SY-KCS□□-□□

Faceplate Country

UK = United Kingdom

US = United States

Faceplate Style

W = White

A = Brushed Aluminium

B = Black

Product

2 = 2 button keypad

4 = 4 button keypad

4V = 4 button keypad + volume control

6V = 6 button keypad + volume control

8 = 8 button keypad

Examples:

SY-KCS2-W-UK 2 Button, White panel, UK style

SY-KCS4-A-UK 4 button, Aluminium panel, UK style

SY-KCS6V-B-UK 6 button, with Rotary volume, Black panel, UK style

SY-KCS8-W-US 8 button, White panel, US style

Safety Instructions

To ensure reliable operation of this product as well as protecting the safety of any person using or handling these devices while powered, please observe the following instructions.

1. **ONLY USE** the power supply provided. If an alternate supply is required, check the voltage, polarity and that it has sufficient power to supply the device it is connected to.
2. **DO NOT** operate this product outside the specified temperature and humidity range given in the above specifications.
3. Ensure there is adequate ventilation as this product generates heat while operating.
4. Repair of this product should only be carried out by qualified professionals as this product contains sensitive devices that may be damaged by any mistreatment.
5. Only use this product indoors and in a dry environment. **DO NOT** allow any liquids or harmful chemicals to come into contact with this product.

After Sales Service

1. Should you experience any problems while using this product, firstly refer to the Troubleshooting section in this manual and/or your local dealer before contacting SY Technical Support.
2. When calling SY Technical Support, please provide the following information:
 - Full Product Name and Model Number
 - Product Serial Number
 - Details of the fault and any conditions under which the fault occurs.
3. This product has a two year standard warranty beginning from the date of purchase as stated on the sales invoice. For full details please refer to our Terms and Conditions.
4. The SY Product warranty is automatically void under any of the following conditions:
 - The product is already outside of its warranty period
 - Damage to the product due to incorrect usage or storage
 - Damage caused by unauthorised repairs
 - Damage caused by mistreatment of the product
5. Please direct any questions or problems you may have to your local dealer before contacting SY Electronics.