



CCS-2 v1.0

COMPUTER CONTROL SWITCHOVER SYSTEM



# CCS-2

# COMPUTER SWITCHOVER

# USER GUIDE

## CCS-2 Overview

The Nemesis CCS-2 is a flexible and versatile collection of switching technologies for computer control and playback systems, housed within a sturdy 1U rackmount box.

The CCS-2 is able to interface to and switch signals such as USB keyboard and mouse, VGA and DVI video signals, physical and USB MIDI streams, as well as a large range of GPI (General Purpose Input) switch and GPO (General Purpose Output) relay options.

Due to the vast range of possible configuration options, the CCS-2 is fully programmable via the Nemesis *Preset Manager* software for Windows and MacOS, enabling every detail of a switchover state to be defined.

Front panel menu options enable system configuration and diagnostic information to be displayed and set.

Dual-redundant power supplies ensure the highest reliability for show critical applications.

## Front Panel Overview



**PROG:** Programming Connector. A mini USB connector for connection to a PC or Mac for updating the current switching configuration as defined by the *Preset Manager* software.

**DISPLAY:** Allows various configuration options to be set and diagnostic information shown.

**MENU, SET, UP, DOWN:** Use to navigate the front panel menu. See *Front Panel Menu Options*.

**MIDI I/P:** Flashes briefly when MIDI Input is present at any of the physical (5-Pin DIN) MIDI input connectors

**MIDI O/P:** Flashes briefly when MIDI Output is being transmitted by the CCS-2 to any of the physical (5-Pin DIN) connectors. This could be MIDI thru data from any of the input sources, or self-generated MIDI by the CCS-2 itself.

**MIDI UA:** Flashes briefly when MIDI data is present on the USB A MIDI connection. Indicates both MIDI in and MIDI out.

**MIDI UB:** Flashes briefly when MIDI data is present on the USB B MIDI connection. Indicates both MIDI in and MIDI out.

**GPI 1-8:** Flashes briefly when a GPI switch contact is closed on the 9-Pin GPI Input D-SUB connector.

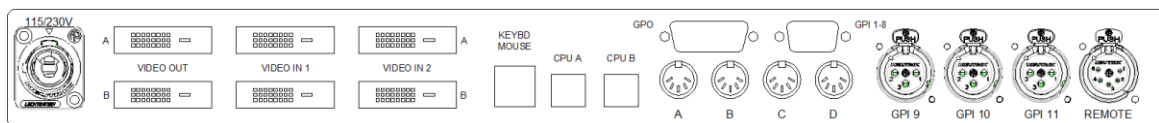
**GPI 9-11:** Flashes briefly when a GPI switch contact is closed on the 3 XLR GPI Input connectors 9-11.

**ER:** Illuminates when an error condition is detected inside the CCS-2. The exact error(s) can be shown on the front panel by selecting *Menu -> Show Current Error(s)*. Common errors would include a faulty power supply or low voltage condition.

**FRONT SWITCH A:** Illuminated large front panel user button. Commonly configured to switch the computer system to the “Main” or “A” system.

**FRONT SWITCH B:** Illuminated large front panel user button. Commonly configured to switch the computer system to the “Backup” or “B” system.

## Rear Panel Connections



**Mains Input:** Powercon style mains input connector. The CCS-2 is fitted with dual-redundant switched mode power supply modules, and can be connected to mains supply voltages from 115V to 240V. Both supplies are internally fused and a fault condition in either module will illuminate the **ER** front panel LED.

**VIDEO OUT 1 & 2:** 2 DVI-I style connectors for accessing the switched output of the video boards. The CCS-2 contains 2 video switching boards for dual screen operation. Both DVI and VGA signals are present on this connector, and suitable connectors/adaptors should be used to access the desired signal. Note that there is no conversion inside the CCS-2 between DVI and VGA – if a signal is connected to the Video Input as VGA, only the VGA output pins will have signal at this connector, and vice-versa. Care should be taken to ensure the correct adaptors are in place.

**VIDEO IN A 1 & 2:** 2 DVI-I style connectors for connecting a computer video source to each of the video boards. The source can be DVI or VGA as described above by using suitable adaptors or cables. Most commonly used for connecting a “Main” computer video source.

**VIDEO IN B 1 & 2:** 2 DVI-I style connectors for connecting a computer video source to each of the video boards. The source can be DVI or VGA as described above by using suitable adaptors or cables. Most commonly used for connecting a “Backup” computer video source.

**KEYB/MOUSE:** A USB-A dual socket for connecting a console keyboard and mouse to the USB switching section of the CCS-2. The signals are switched between computer systems as defined by the current preset configuration.

**CPU A:** A USB-B connector for connecting to one of the host computer systems, most commonly the “Main” machine. This socket is the output of the internal USB hub, and so contains signals from Keyboard and Mouse (when switched) and the internal USB MIDI device.

**CPU B:** A USB-B connector for connecting to one of the host computer systems, most commonly the “Backup” machine. This socket is the output of the internal USB hub, and so contains signals from Keyboard and Mouse (when switched) and the internal USB MIDI device.

**EXP:** Expansion Port. See Nemesis website for currently available expansion cards.

**MIDI A-D:** 4x 5-Pin DIN standard MIDI connections. Allows interfacing between traditional MIDI equipment and the CCS-2. MIDI connectors A & B are configurable as Input or Output connectors to increase flexibility (via the *Preset Manager* software), whilst connectors C & D are always outputs. To further increase connectivity, connectors A & B have additional wiring options to allow them to be used as both input and output connectors simultaneously with suitable adaptor cabling (see *Pinouts* for more information). When used in this way, the connector should be configured as an input, with the output signal being found on the additional pins. Note that this does mean the connector is no longer “standard MIDI compliant”, so there are internal jumpers which can be removed to defeat this operation if compliancy is important.

**GPO:** 15-Pin Female D-Sub. Provides access to the 4 internal GPO changeover relays. The relays can be set as simple switchover contacts or pulse operation to simulate button presses via the *Preset Manager* software. External power can also be sourced from this connector, see *Pinouts*.

**GPI 1-8:** 9-Pin Female D-Sub. Provides access to GPI inputs 1-8, which operate as “close to ground” input switches. Functionality of these inputs is determined by the current configuration as defined by the *Preset Manager* software. See *Pinouts* for individual pin information.

**GPI 9-11:** 3-Pin Female XLR connections for providing access to GPI’s 9-11, in a format ready for connection to an analogue multi-core. Most commonly used for long-drive inputs such as implementing a remote Start/Stop button solution for backing tracks or remote control operation. Internally protected up to +/-70V to prevent cross-connection to Comms or Phantom-Powered systems causing damage to the CCS-2. Functionality of the inputs is determined by the current configuration as defined by the *Preset Manager* software.

**REMOTE:** 5 Pin Female XLR connection. A standard Nemesis Remote Connection port for remote button boxes and control. Enables 2 remote button and 2 remote lamps to be connected to the CCS-2. Exact operation is determined by the current preset as defined by the *Preset Manager* software. Most commonly set up to reflect the state of the front panel user buttons for remote operation.

## Front Panel Menu Options

Press **Menu** once to enter the front panel menu system.

Use the **UP** and **DOWN** buttons to scroll through the available options.

Press **Menu** again to exit a current sub menu, **SET** to select an option.

**01 Set MIDI Chan Override:** Override the MIDI channels set for CCS-2 generated messages and lock to a specific channel. Available options are Off (use channels defined in *Preset Manager*), 1-16.

**02 Set Video HPD Mode:** Specify the mode of operation for the HPD (Hot Plug Detect) display link. Available options are NORM (allow the display to directly control the HPD link to the graphics card), HOLD (allow the CCS-2 to hold the HPD line, even when the display is switched to the alternative source). For more information on this, see *Preset Manager – HPD Mode*.

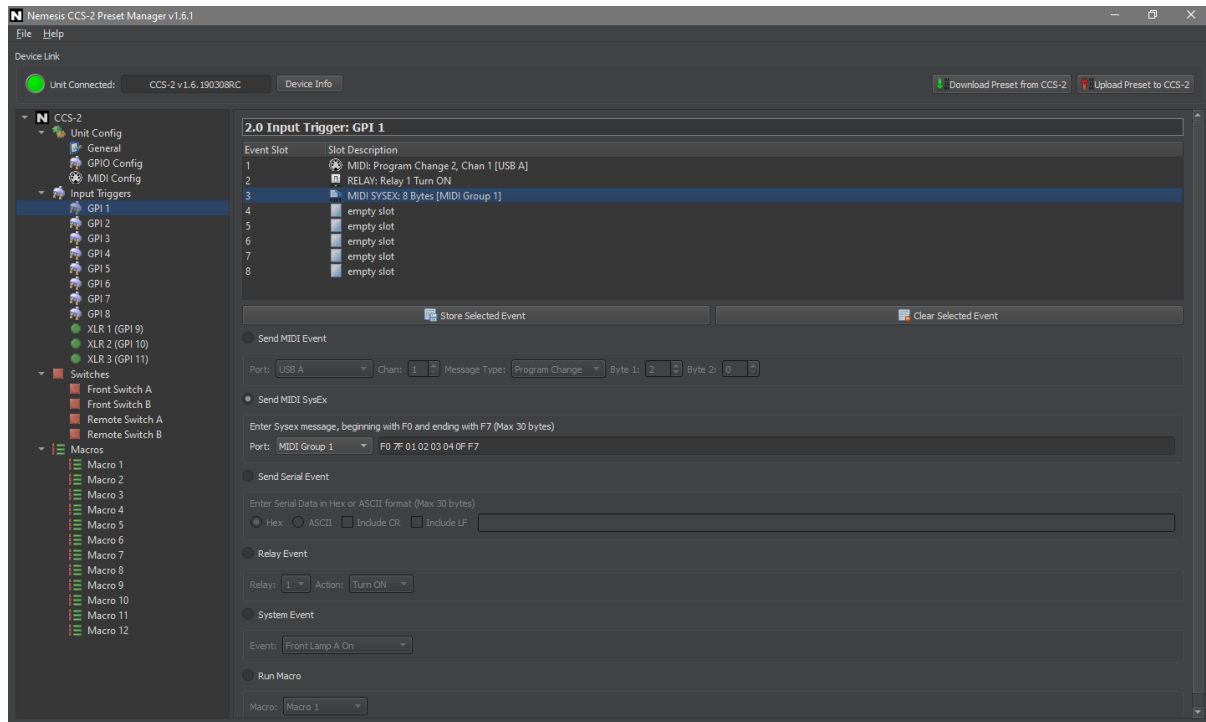
**03 Show Current Error(s):** Display any current errors detected in the CCS-2 when the front panel **ERR** light is illuminated. Most commonly used to display Power Supply faults or Low Voltage conditions.

**04 Show Date and Time:** Display the current date and time held within the CCS-2. Time and Date are automatically updated at each sync with *Preset Manager* using the computers clock.

**05 About CCS-2 Vers. Info:** Display current firmware information for the main and sub processors inside the CCS-2.

**06 Reset Unit Confirm:** Reset all internal processors inside the CCS-2 and reboot the system.

# Preset Manager



Available for Windows and MacOS, *Preset Manager* is the configuration utility for the CCS-2. The software allows most features of the CCS-2 to be user-configured, including the status of lamps, the effect of button pushes, MIDI routing strategies etc.

A complete configuration state for the CCS-2 is known as a “Preset” and these can be loaded from and saved to disk for future use using the *File* menu. A preset can also be downloaded from a connected CCS-2 for further examination or editing before uploading back to the unit.

Connection to a CCS-2 is by means of a standard USB-A to Mini USB cable, and the device utilises the Human Interface Device class, so no driver is necessary on both Windows and MacOS as these are included in the operating system.

A preset is created by specifying the overall configuration of the unit and then adding events to the GPI, Switches and Macro sections of the software to define the overall behaviour of the CCS-2. Events can include MIDI channel messages, MIDI system exclusive messages, relay (GPO) events and system events such as switching USB control, video source selection, illuminating lamps and recalling different MIDI patches.

The following section of the manual describes each section, with further details on each of the available events.

# Unit Config

## General

The screenshot shows a configuration window titled "1.0 Config: General". It is divided into several sections:

- Preset Information:** Contains two text input fields. "Preset Name:" has the value "<EMPTY PRESET>". "Preset Description:" has the value "default".
- Boot Options:** Contains two dropdown menus. "Setup Macro:" is set to "<No Action>". "Initial State:" is set to "<No Action>".
- Configuration Options:** Contains three dropdown menus. "Video HPD Function:" is set to "Normal (Display Controlled)". "MIDI Channel Override:" is set to "Off". "Switch Double Press Limit:" is set to "100ms".
- Serial Configuration (Expansion Board):** Contains two dropdown menus. "Baud Rate:" is set to "9600". "Parity:" is set to "None".

At the bottom of the Serial Configuration section, there is a note: "Note these settings are applied to the expansion board on preset load only".

**Preset Name:** Enter a name for the preset to be shown on the top line of the CCS-2 display.

**Preset Description:** Enter a description for the current preset to be displayed on the bottom line of the CCS-2 display.

**Boot Options:** Define a set of Macros for the CCS-2 to run at startup. *Setup Macro* is usually defined as a one-time set of commands to be run at boot-up for configuring external devices, e.g. A serial device may need config options defined or other config settings applied. *Initial State* would usually specify which of the switching macros used throughout the general operation of the unit to start up in. Without this defined, or recalling an empty macro at startup, the unit may be in an undefined state until there is user interaction. See *Macros* for more information about defining a Macro

**Video HPD Function:** Defines the Hot Plug Detect (HPD) functionality of the video switchover boards. HPD is a feature of a display-computer connection to allow the computer graphics card to detect when a monitor has been connected or disconnected, allowing the OS to resize screens, reorder window displays etc.

When in "Normal (Display Controlled)" mode, the CCS-2 will act as simple pass through from the display's HPD connection back to the computer, allowing the 2 devices to communicate as if the monitor was connected directly to the computer graphics card.

When in "Hold (CCS-2 Controlled)", the CCS-2 will override the HPD signal from the monitor preventing the computer graphics card from seeing the removal signal when the video board switches to the alternate input. In most cases this speeds up the switchover process as the graphics card no longer needs to communicate with the monitor about screen sizes etc, at each reconnect, and helps to ensure window placements are not altered when switched. Note that some newer operating systems attempt to communicate with the display on a more regular basis, and as such will still detect the display has been removed as no valid EDID data will be returned from the display in this condition.

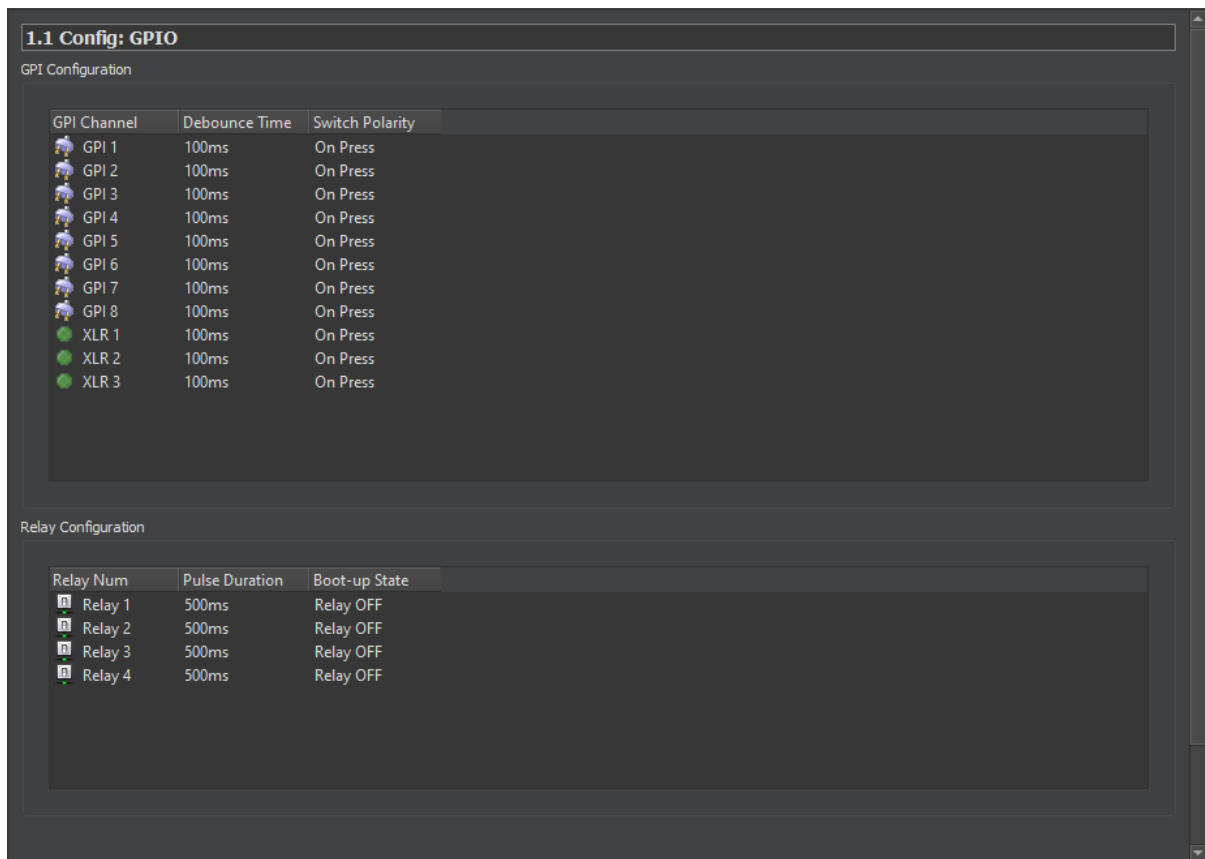
In either mode, the HPD signal will always reflect the state of the display when it is physically disconnected from the CCS-2.

**MIDI Channel Override:** MIDI events within a preset may be defined on several different MIDI channels. This may be undesirable in some conditions where conflicts may occur with other MIDI devices, and whilst the optimum solution is to update the preset, a simple solution is to set an override channel, ensuring all CCS-2 generated MIDI events will be locked to this channel. Note this feature is also available on the front panel, irrespective of this setting in the preset.

**Switch Double Press Limit:** Limit the maximum speed at which the front and rear buttons can be toggled to prevent the CCS-2 getting out of sync with external equipment that takes a while to respond when switching between states quickly.

**Serial Configuration (Expansion Board):** If the serial expansion card is fitted, these options specify the baud rate and parity to be applied to the USB-Serial adapter.

## GPIO Configuration



Use these configuration options to set the debounce times and polarity settings for the GPI inputs and pulse times for the GPO relays.

**Debounce Time:** Set the minimum response time between successive switch contact presses. Click over the current setting to reveal the dropdown selection options. Available time options are 50ms, 100ms, 200ms, 500ms, 1.0sec, 1.5sec, 2.0sec. This can be used to smooth out noisy switch contact operation as well as reducing human error.



**Switch Polarity:** Set whether the GPI event will fire when the contact is initially closed or when the contact closure is opened again. Click over the current setting to reveal the dropdown selection options. Available options are On Press, On Release.

**Pulse Duration:** Set the time a relay should invert its current state when using the “Pulse” options under Relay Events. For a “Pulse ON” command, this sets the time the relay will temporarily close its contacts, before returning to an opened state. For a “Pulse OFF” command, this sets the time the relay will temporarily open its contacts, before returning to a closed state. Click over the current setting to reveal the dropdown selection options. Available options are 50ms, 100ms, 200ms, 500ms, 1.0sec, 1.5sec, 2.0sec.

**Boot-up State:** Set whether the relay boots with contacts closed (“Relay ON”) or opened (“Relay OFF”), before any further interaction or events have occurred.

## MIDI

**1.2 Config: MIDI**

**MIDI Port Setup**

Port A:  MIDI IN 1  MIDI OUT A

Port B:  MIDI IN 2  MIDI OUT B

Port C:  MIDI OUT C

Port D:  MIDI OUT D

**MIDI Remote Control**

MIDI Control Port:

MIDI Control Channel:

**MIDI Routing Groups**

Group 1:	Group 2:	Group 3:	Group 4:
<input checked="" type="checkbox"/> MIDI OUT A	<input type="checkbox"/> MIDI OUT A	<input type="checkbox"/> MIDI OUT A	<input type="checkbox"/> MIDI OUT A
<input type="checkbox"/> MIDI OUT B	<input checked="" type="checkbox"/> MIDI OUT B	<input type="checkbox"/> MIDI OUT B	<input type="checkbox"/> MIDI OUT B
<input type="checkbox"/> MIDI OUT C	<input type="checkbox"/> MIDI OUT C	<input checked="" type="checkbox"/> MIDI OUT C	<input type="checkbox"/> MIDI OUT C
<input type="checkbox"/> MIDI OUT D	<input type="checkbox"/> MIDI OUT D	<input type="checkbox"/> MIDI OUT D	<input checked="" type="checkbox"/> MIDI OUT D

**MIDI Routing Patch A**

	MIDI OUT A	MIDI OUT B	MIDI OUT C	MIDI OUT D	USB A	USB B	MERGE IN 1	MERGE IN 2
MIDI IN 1								
MIDI IN 2								
USB A					<input checked="" type="checkbox"/>			
USB B						<input checked="" type="checkbox"/>		
MERGE OUT							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
EXPANSION								

**MIDI Routing Patch B**

	MIDI OUT A	MIDI OUT B	MIDI OUT C	MIDI OUT D	USB A	USB B	MERGE IN 1	MERGE IN 2
MIDI IN 1								
MIDI IN 2								
USB A					<input checked="" type="checkbox"/>			
USB B						<input checked="" type="checkbox"/>		
MERGE OUT							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
EXPANSION								

Set up MIDI Port and MIDI routing strategies.

**MIDI Port Setup:** MIDI Ports A and B can be set as either MIDI inputs or MIDI outputs. When configured as MIDI In, they are accessed as MIDI IN 1 and MIDI IN 2. When configured as outputs they become MIDI OUT A and MIDI OUT B. Use these options to set the desired mode for these connectors. Note that these connectors can be used as MIDI inputs and outputs simultaneously by utilising the additional pins as described earlier in this manual. In this case, these ports should be configured as inputs, as the output is always present on the additional pins. See *Pinouts*.

**MIDI Remote Control:** Many of the functions of the CCS-2 can be controlled via MIDI. Use these options to select which port, if any, to respond to and which channel should be monitored. See *MIDI Control*.

**MIDI Routing Groups:** Any CCS-2 generated MIDI events can be routed to any of the available MIDI ports on the unit, from individual MIDI ports to the USB MIDI connections. It may be desirable to send a set of messages to a group of ports rather than just a single port, so MIDI “Groups” can be set up here to combine output destinations. Check the boxes of each port required within the group.

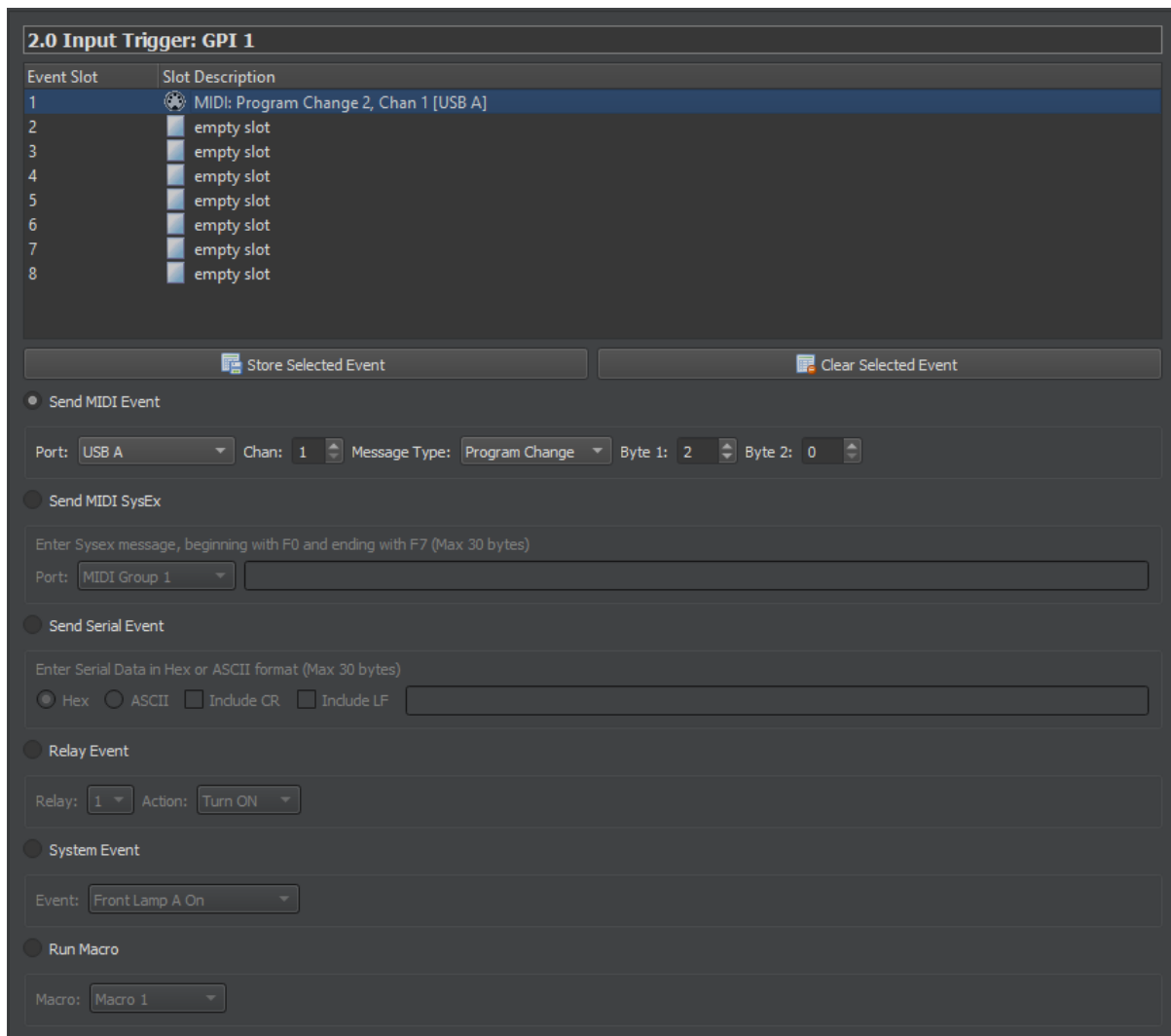
**MIDI Routing Patch:** The CCS-2 can hold 2 different MIDI routing patches in its preset memory, patch “A” and patch “B”. These are commonly recalled when switching between computer systems. Use the 2 grids to define routing strategies for each of the 2 patches by clicking in the grid. A blue blob indicates a routing connection. Sources are shown down the left of the grid and destinations along the top.

Certain routing combinations aren’t possible, so these are greyed out in the grid.

The CCS-2 contains a microprocessor based 2-input merge chip to allow MIDI signals to be combined gracefully inside the unit. To utilise this, create connections between the MIDI In sources and “MERGE IN 1” and “MERGE IN 2”. The resultant merged signal will appear at “MERGE OUT” and can be patched to any other available destination.

MIDI Patches can be recalled using the System Events options described later.

## Input Triggers



The CCS-2 has 11 configurable GPI input triggers, 8 are available on the 9-Pin D-Sub and a further 3 available as XLR connectors. These triggers are commonly used to perform cue operations such as Go, Stop, Previous, Next – sending MIDI data to playback software.

Each GPI trigger can be configured in this section of *Preset Manager* to perform up to 8 events. These events can include:

- Send a standard MIDI channel message
- Send a system exclusive MIDI message
- Control the GPO relays
- Alter a system parameter (such as illuminating a lamp, switching a video board or changing MIDI patch)
- Run a pre-defined Macro

For a detailed explanation of each event, see *Event Descriptions*.

## Unit Control (Switches)

Event Slot	Slot Description
1	MACRO: Toggle Macro Pair 1-2
2	empty slot
3	empty slot
4	empty slot
5	empty slot
6	empty slot
7	empty slot
8	empty slot

Buttons: Store Selected Event, Clear Selected Event

Send MIDI Event

Port: USB A Chan: 1 Message Type: Program Change Byte 1: 2 Byte 2: 0

Send MIDI SysEx

Enter Sysex message, beginning with F0 and ending with F7 (Max 30 bytes)

Port: MIDI Group 1

Send Serial Event

Enter Serial Data in Hex or ASCII format (Max 30 bytes)

Hex  ASCII  Include CR  Include LF

Relay Event

Relay: 1 Action: Turn ON

System Event

Event: Front Lamp A On

Run Macro

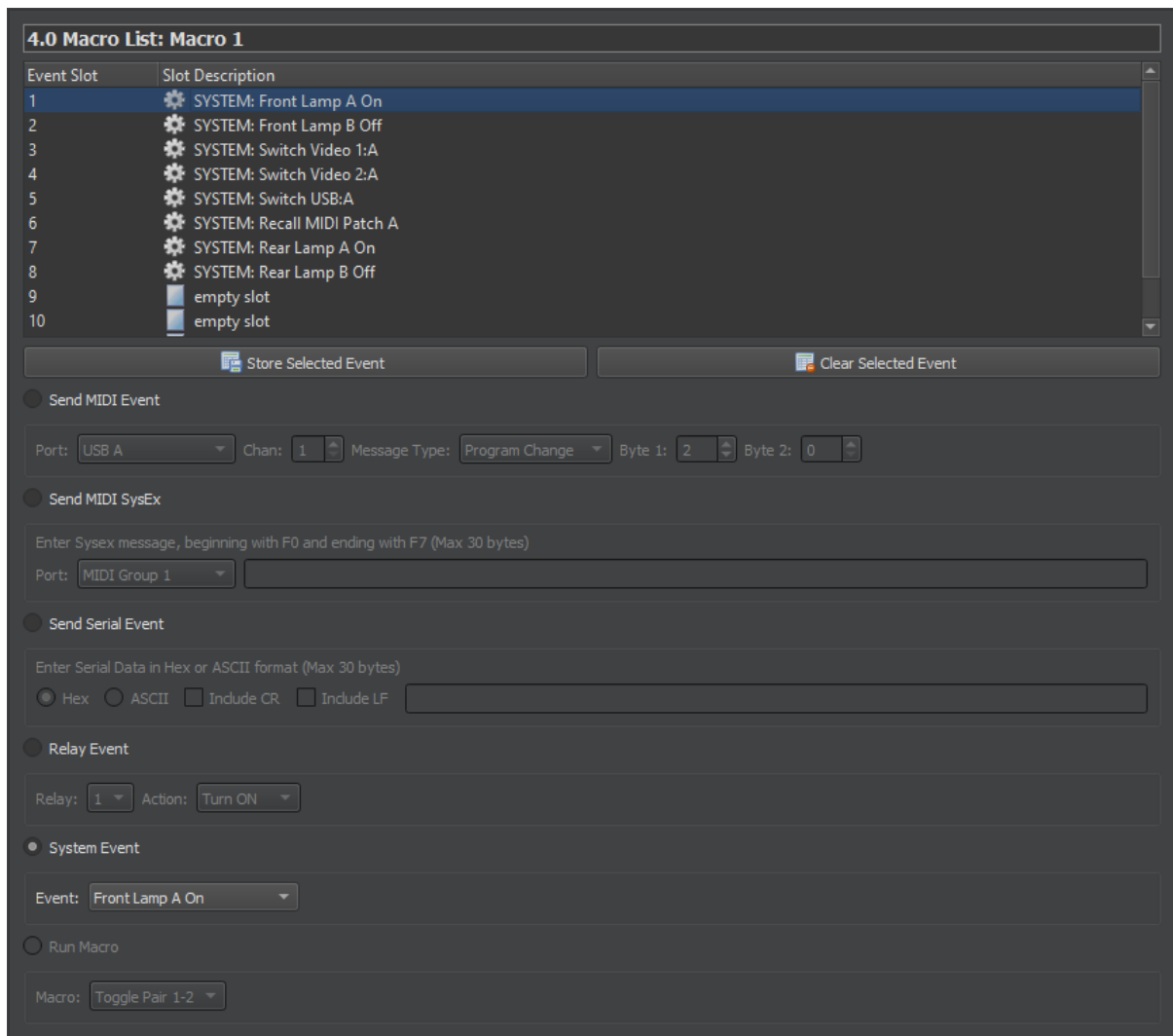
Macro: Toggle Pair 1-2

The 2 front panel switches and the 2 remote port switches can have up to 8 events or macros assigned to them, similar to the Input Triggers described above.

These are commonly used to perform a switchover operation, and as the same functionality is usually required on the front buttons as the remote buttons, a macro can be defined to include all the system command operations required, and this macro added to both front and rear buttons rather than duplicating all the events to both buttons.

A macro recall can also be toggled to enable one button to flip between 2 states, allowing the possibility of a single button changeover, freeing the second front panel switch for other duties, such as temporarily switching the keyboard video and mouse to display the second computer for diagnostic purposes without causing all MIDI and audio switchers to also switch over.

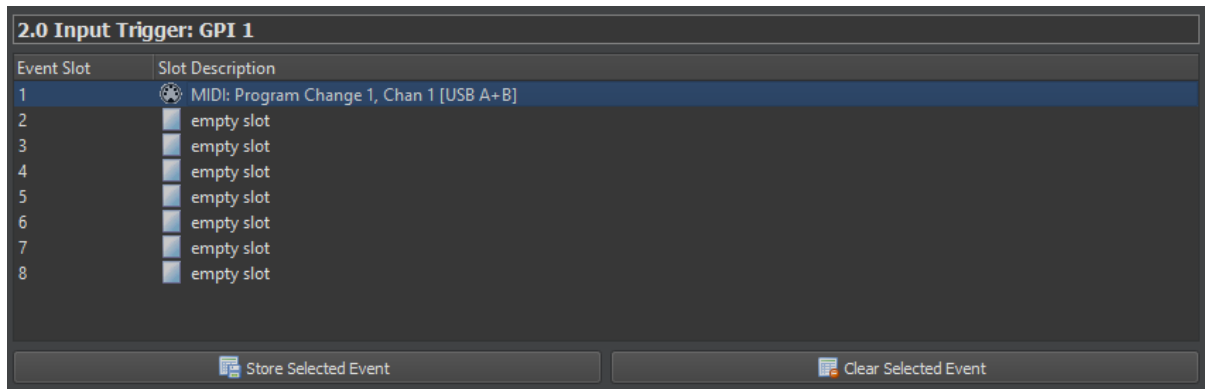
## Macros



A Macro is a collection of up to 12 events that can be called from any of the input triggers, switches or set to run up startup. The same events are available within a macro as are available in the other categories, apart from being able to call another macro from within a macro to prevent a possible loop occurring.

The Macro in the image above is showing one half of a macro pair designed to perform a single-button switchover system. In this case, this is the 'default' state ("Main" computer).

## Adding and Removing Events



An event can be added to a trigger, switch or macro by defining the event using the dropdown boxes, selecting an empty “slot” in the events list and clicking “Store Selected Event”.

Events will be processed by the CCS-2 in the order they are stored in the events list.

To edit an event, select it in the list, make the required changes and press “Store Selected Event” again, to overwrite the previous settings.

To completely remove an event, select it in the events list and press “Clear Selected Event”.

Note that any empty slots in the events list will be removed by the CCS-2 during upload/download, as well as when re-loading from a preset file.

## Event Descriptions

### Send MIDI Event

**Port:** Choose a destination for the generated MIDI event to be sent. Available options include MIDI Group 1, MIDI Group 2, MIDI Group 3, MIDI Group 4 (as defined in the configuration options), USB A, USB B, USB A+B, Active USB (the currently selected USB connection based on the last USB select command).

**Chan:** Select a MIDI channel 1-16 for the MIDI Message.

**Message Type:** Choose the standard MIDI message to be sent. Available options include Note Off, Note On, Key Pressure, Control Change, Program Change, Channel Pressure, Pitch Bend.

**Byte 1:** First data byte for the MIDI message.

**Byte 2:** Second data byte for the MIDI message. Ignored for messages that only have one data byte, e.g Program Change.

### Send MIDI Sysex

**Port:** Choose a destination for the generated MIDI event to be sent, as per standard MIDI events.

**Data:** Enter a system exclusive string, starting with F0 ending with F7, up to 30 bytes long, to be sent when this event fires. Examples include MMC, MSC and custom control strings.

## Relay Event

**Relay:** Select the relay number to control.

**Action:** Desired action for the relay. Available options include Turn ON (close the relay contacts), Turn OFF (open the relay contacts), Pulse ON (temporarily close the contacts for the duration defined in the GPI Configuration, then return to an open state), Pulse OFF (temporarily open the contacts for the duration defined in the GPIO Configuration, then return to a closed state).

## System Event

**Front Lamp A On:** Illuminate the lamp inside the Front Switch "A".

**Front Lamp A Off:** Turn off the lamp inside the Front Switch "A".

**Front Lamp B On:** Illuminate the lamp inside the Front Switch "B".

**Front Lamp B Off:** Turn off the lamp inside the Front Switch "B".

**Rear Lamp A On:** Close the remote port relay contacts to illuminate a lamp connected to the 5-Pin remote lamp "A" port.

**Rear Lamp A Off:** Open the remote port relay contacts to turn off a lamp connected to the 5-Pin remote lamp "A" port.

**Rear Lamp B On:** Close the remote port relay contacts to illuminate a lamp connected to the 5-Pin remote lamp "B" port.

**Rear Lamp B Off:** Open the remote port relay contacts to turn off a lamp connected to the 5-Pin remote lamp "B" port.

**Toggle Front Lamp A:** Invert the state of the lamp inside the Front Switch "A".

**Toggle Front Lamp B:** Invert the state of the lamp inside the Front Switch "B".

**Toggle Rear Lamp A:** Invert the state of the remote port relay contacts connected to the remote lamp "A" port.

**Toggle Rear Lamp B:** Invert the state of the remote port relay contacts connected to the remote lamp "B" port.

**Toggle Front Lamp A Flash:** Begin flashing of the lamp inside the Front Switch "A".

**Toggle Front Lamp B Flash:** Begin flashing of the lamp inside the Front Switch "B".

**Toggle Rear Lamp A Flash:** Begin pulsing of the remote port relay contacts connected to the remote lamp "A" port.

**Toggle Rear Lamp B Flash:** Begin pulsing of the remote port relay contacts connected to the remote lamp "B" port.

**Switch Video 1:A:** Set the output of Video Board 1 to Input A.

**Switch Video 1:B:** Set the output of Video Board 1 to Input B.

**Switch Video 2:A:** Set the output of Video Board 2 to Input A.

**Switch Video 2:B:** Set the output of Video Board 2 to Input B.

**Switch USB:A:** Route keyboard and mouse connections to the CPU A connection.

**Switch USB:B:** Route keyboard and mouse connections to the CPU B connection.

**Toggle Video 1:** Set the output of Video Board 1 to the opposite input to that currently selected.

**Toggle Video 2:** Set the output of Video Board 2 to the opposite input to that currently selected.

**Toggle USB:** Route keyboard and mouse connections to the opposite CPU connection to that currently selected.

**Toggle KVM:** Switch all video, keyboard and mouse connections to the opposites of those currently selected.

**Toggle KVM Preview:** Similar to Toggle KVM, but takes a snapshot of the current state of video, keyboard and mouse connections before switching to enable returning back to this state when KVM preview is exited.

**Recall MIDI Patch A:** Change all MIDI routing connections to the “Patch A” state as defined in the MIDI config.

**Recall MIDI Patch B:** Change all MIDI routing connections to the “Patch B” state as defined in the MIDI config.

**Toggle MIDI Patch:** Change all MIDI routing connections to the opposite state to that currently in operation.

**Set MIDI Group 1 Active:** Set MIDI Group 1 as the destination for any MIDI events using the port “Active MIDI Group”.

**Set MIDI Group 2 Active:** Set MIDI Group 2 as the destination for any MIDI events using the port “Active MIDI Group”.

**Set MIDI Group 3 Active:** Set MIDI Group 3 as the destination for any MIDI events using the port “Active MIDI Group”.

**Set MIDI Group 4 Active:** Set MIDI Group 4 as the destination for any MIDI events using the port “Active MIDI Group”.

**Suspend 50ms:** Freeze operation of the CCS-2 for 50ms. Can be used to insert a pause between consecutive events in triggers or macro events list to allow connected equipment time to respond.

**Suspend 100ms:** Freeze operation of the CCS-2 for 100ms. Can be used to insert a pause between consecutive events in triggers or macro events list to allow connected equipment time to respond.

**Suspend 200ms:** Freeze operation of the CCS-2 for 200ms. Can be used to insert a pause between consecutive events in triggers or macro events list to allow connected equipment time to respond.



**Suspend 500ms:** Freeze operation of the CCS-2 for 500ms. Can be used to insert a pause between consecutive events in triggers or macro events list to allow connected equipment time to respond.

**Run Macro (not available in Macro definitions)**

**Macro:** Select a Macro to run when the event is fired.

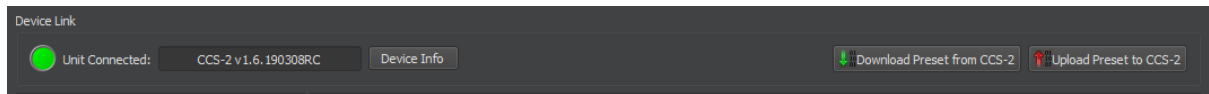
## Example Preset

This simple set of events will enable the CCS-2 to generate 4 MIDI events to the connected computers via USB when using GPI 1-4, and act as a KVM switch to share a single set of keyboard, mouse and display. Front Switch A will select computer A, and Front Switch B will select computer B. A remote button box will also follow the same switching as the front switches.

<b>Run At Startup:</b>	Macro 1
<b>GPI1:</b>	MIDI: Program Change 1, Chan 1 [USB A+B]
<b>GPI2:</b>	MIDI: Program Change 2, Chan 1 [USB A+B]
<b>GPI3:</b>	MIDI: Program Change 3, Chan 1 [USB A+B]
<b>GPI4:</b>	MIDI: Program Change 4, Chan 1 [USB A+B]
<b>Front Switch A:</b>	MACRO: Macro 1
<b>Front Switch B:</b>	MACRO: Macro 2
<b>Rear Switch A:</b>	MACRO: Macro 1
<b>Rear Switch B:</b>	MACRO: Macro 2
<b>Macro 1:</b>	SYSTEM: Front Lamp A On SYSTEM: Front Lamp B Off SYSTEM: Rear Lamp A On SYSTEM: Rear Lamp B Off SYSTEM: Switch Video 1:A SYSTEM: Switch Video 2:A SYSTEM: Switch USB:A
<b>Macro 2:</b>	SYSTEM: Front Lamp A Off SYSTEM: Front Lamp B On SYSTEM: Rear Lamp A Off SYSTEM: Rear Lamp B On SYSTEM: Switch Video 1:B SYSTEM: Switch Video 2:B SYSTEM: Switch USB:B

See the Nemesis website for a set of default presets for further examination/use.

## Uploading to the CCS-2



Once a preset is complete and ready to be transferred to the CCS-2, connect the front panel “PROG” port to the computer running *Preset Manager* using a Mini USB – USB A cable.

If successfully detected, the Device Link indicator should turn green and information about the currently connected CCS-2 should be displayed. If this does not happen, ensure the CCS-2 is turned on, the cable is connected to a working USB port on the computer, or try a different cable.

Click “Upload Preset to CCS-2” to copy the current preset into the units internal memory. The CCS-2 will reboot and load this configuration as soon as the upload is completed.

Click “Download from CCS-2” to overwrite all current settings in the software and replace with the contents of the units internal memory.

## MIDI Control

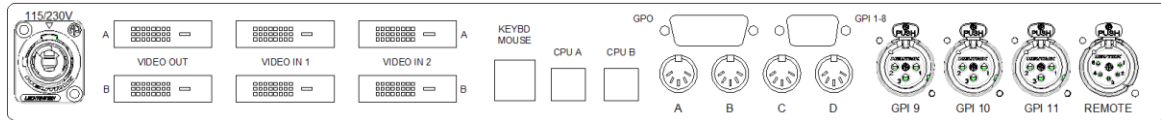
Many of the CCS-2 functions and triggers can be controlled via MIDI.

The port and channel to respond to can be set in Preset Manager in the *MIDI Config* page.

Program Change	Function
0	GPI 1
1	GPI 2
2	GPI 3
3	GPI 4
4	GPI 5
5	GPI 6
6	GPI 7
7	GPI 8
8	GPI 9
9	GPI 10
10	GPI 11
11	Front Switch A
12	Front Switch B
13	Rear Switch A
14	Rear Switch B
15	Macro 1
16	Macro 2
17	Macro 3
18	Macro 4
19	Macro 5
20	Macro 6
21	Macro 7
22	Macro 8
23	Macro 9
24	Macro 10
25	Macro 11
26	Macro 12
27	Toggle Macro 1-2
28	Toggle Macro 3-4
29	Toggle Macro 5-6
30	Toggle Macro 7-8

*\*MIDI Control requires at least firmware v1.6 or higher and FPGA version 190117 or later.*

## Rear Panel Connection Pinout Information



**MIDI 5-PIN Connectors A-D:** A+B Programmable via software for in or out (additional pins 1+ 3 used for permanent out). C+D MIDI Output Connectors.

	A+B (“In”)	A+B (“Out”)	C+D
1	5V	5V	N/C
2	GND	GND	GND
3	MIDI OUT	MIDI OUT	N/C
4	MIDI IN	5V	5V
5	MIDI IN	MIDI OUT	MIDI OUT

**GPO:** 15 Pin Female D-Sub. Relays 1-4, Normally Open, Normally Closed and Common connections available. Switching rated to 1A. Also provides external 5V and 12V power, rated to 0.5A.

1	RLY1 NC
2	RLY1 COM
3	RLY1 NO
4	RLY2 NC
5	RLY2 COM
6	RLY2 NO
7	12V 500mA
8	5V 500mA
9	RLY3 NC
10	RLY3 COM
11	RLY3 NO
12	RLY4 NC
13	RLY4 COM
14	RLY4 NO
15	GND

**GPI Inputs:** Closed Contact to GND, weak pull-up to 5V

1	Switch 1
2	Switch 2
3	Switch 3
4	Switch 4
5	Switch 5
6	Switch 6
7	Switch 7

8	Switch 8
9	GND

**GPI 9-11:** Closed Contact to GND, weak pull-up to 5V, Multicore Ready. Protected to +/-70V.

1	N/C
2	SWITCH
3	GND

**Remote 5-Pin XLR**

1	12V Common (500mA)
2	Switch B
3	Switch A
4	Lamp B (Relay contact to GND)
5	Lamp A (Relay contact to GND)

Suitable button boxes include the Nemesis 2-Button range:  
<http://www.nemesis-audio.com/sales-nemesis-buttons.asp>

**Video In/Video Out:** Standard DVI-I connector, Single-Link DVI and VGA connections available.

## Technical Specifications

Mains Input Voltage: ..... Powercon, 100-240VAC 50/60Hz, Internally Protected  
Rated Power..... 50.4W  
GPI XLR Input Protection:..... Closed Contact to Ground, Protected to +/- 70V  
GPI XLR Maximum Cable Length..... 100m  
5-Pin Remote Relay Contact Rating ..... Closed Contact to Ground, 1A  
GPO Output Power Rating: ..... 12V @ 500mA, 5V @ 500mA, Over-Current Protected  
GPO Relay Contact Rating: ..... 1A, 125VAC, 60VDC  
Video Connection..... DVI-I Connector, Single-Link DVI + VGA  
CPU USB Link..... USB B, Class-Compliant USB MIDI, 12Mbps Internal Hub  
Programming USB Link..... Mini USB, HID Class-Compliant  
Equipment Dimensions (HxWxD)..... 44x482x272mm  
Weight..... 3.7Kg

### Internal Jumpers

Label	On
JP2, JP3	Enable/disable additional out (pins 1+3) on MIDI A
JP4, JP5	Enable/disable additional out (pins 1+3) on MIDI B
JP1	Enable battery backup for on board clock

### Notes:

\*This manual is based on CCS-2 Firmware v1.6.1

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