

CEREBRUM

CGP-4848

Cerebrum 1U General Purpose Interface unit

Operation manual



- ALWAYS disconnect your entire system from the AC mains before cleaning any component.
- NEVER use flammable or combustible chemicals for cleaning components.
- NEVER operate this product if any cover is removed.
- NEVER wet the inside of this product with any liquid.
- NEVER pour or spill liquids directly onto this unit.
- NEVER block airflow through ventilation slots.
- NEVER bypass any fuse.
- NEVER replace any fuse with a value or type other than those specified.
- NEVER attempt to repair this product. If a problem occurs, contact your local Axon distributor.
- NEVER expose this product to extremely high or low temperatures.
- NEVER operate this product in an explosive atmosphere.

Warranty: Axon warrants their products according to the warranty policy as described in the general terms. That means that Axon Digital Design BV can only warrant the products as long as the serial numbers are not removed.

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This product complies with the requirements of the product family standards for audio, video, audio-visual entertainment lighting control apparatus for professional use as mentioned below.

	EN60950	Safety
	EN55103-1: 1996	Emission
	EN55103-2: 1996	Immunity

<p>Axon Digital Design CGP-4848</p>  <p>Tested To Comply With FCC Standards</p> <p>FOR HOME OR OFFICE USE</p>	<p>This device complies with part 15 of the FCC Rules Operation is subject to the following two conditions: (1) This device may cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.</p>
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1 Introduction to Cerebrum

An Introduction to Cerebrum

In modern broadcasting, the multi-platform delivery and multi-purpose repackaging of materials demand that you master a diversity of workflows. AXON's Cerebrum software application makes the implementation of multiple video and audio signal paths easier, more efficient and cost-effective than ever. Cerebrum provides comprehensive tools to configure, monitor and maintain not only the complete range of Axon products, but also a wide variety of other devices.

The result is that you, and limitless numbers of users, can take total control over multiple and complex routines. Ultimately, you can make your work flow how you want it to flow.

Please visit the AXON Digital Design Website at www.axon.tv to obtain the latest information on our new products and updates.

Key Cerebrum features

Cerebrum is a Windows-based application whose advanced functionality and broad range of features make life easier. The brains behind your many and varied workflows, Cerebrum allows users to remotely:

- Configure... a complex workflow in a short space of time.
- Manage & Report... events using hierarchical system status.
- Control... devices via an intuitive, user-friendly graphical interface.
- Maintain... a workflow over its lifetime.

Cerebrum employs Ethernet communication to each device in your chosen workflow, providing the ability to both configure and monitor devices at local and remote sites. It uses an SQL database to record, view and archive historical workflow events as well as store the user-definable aspects of each device's configuration. This database can also be redeployed for the user's own requirements via ODBC or similar interface.

The application allows up to 64 user-groups to be defined. For each group the level of access can be restricted, not only to program functionality but also to control access of individual settings on specific devices. Limitless users can be added and assigned to one of these groups, each with their own unique password. This ensures that Cerebrum can be used in operations where conditional access is required, and as an administrative tool.

Configuration

Within its clear, intuitive interface Cerebrum provides you with the tools to configure your workflow with speed and ease. Each device is represented by one, or more, graphical dialogue interfaces, which are shown automatically in the Control view when the device is selected. These provide a clear idea of the function and signal flow within the module, and make clear what effect the setting has on the signal path. Visualisations for some devices, such as Synapse Aspect Ratio Converters, are given for the output display. If you need further clarification of function a view to the manual for the selected card is always available.

You can save the configuration of a device as a template file, or to the clipboard, and quickly copy it to other selected devices in the workflow. Using Cerebrum's Compare function, the settings and status of a device of the same type can be compared, with any differences highlighted. To ease some aspects of configuration, and to make monitoring of the system more applicable to each user's particular application, additional data can be added about the location, channel and/or service the device is providing. There is also a free-form notes field for all other critical information.

Monitoring workflow & events

Cerebrum provides a multitude of ways to let you accurately track events within your workflows. Each device in your workflow is shown in the System view, and displays its current and historical status using an icon. Cerebrum actively monitors each device to check for its current status. The status of each device is passed to a parent node within the System view and a hierarchical status of your complete workflow is shown using a single icon. This is also reflected in the application's optional Status Bar, and in the System Icon Tray, when the application is either obscured or minimised. The System view can be alphanumerically sorted by the network address, user name, card type or one of the user defined data items such as Channel, Service, Room or Bay.

Each event occurring for a device being monitored (Synapse, SNMP or Router) is logged to the database and shown in the Event Log. A status priority can be assigned to each event to determine whether an alarm or warning action should be triggered. Each state of a device's status can be configured by the system administrator to reflect the severity of the event, plus the method by which the warning or error should be cleared (either manually or automatically on a good event state) allowing the status to really reflect the condition of a users system.

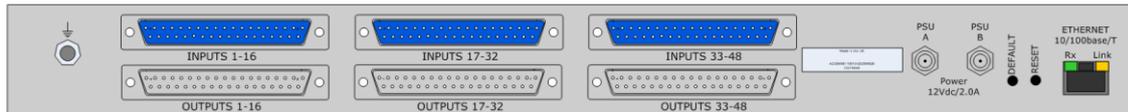
The Event Log window can be filtered using different criteria. Additional user data can be stored with each event, such as the cause/reason for the related warning or error.

Cerebrum allows limits to be set for the size of the Alarm Log table in the SQL database allowing the user to keep historical records for the activity of the system.

4 The CGP-4848 control panel

Introduction

The CGP-4848 Cerebrum general purpose interface unit is a 1U rack mount panel with 48 GPI inputs and 48 GPI outputs.



Features

All GPI's are optically isolated providing a high degree of isolation from the connected equipment. A local protected low voltage source is available on the input connectors for any GPI's fed from a floating relay contact pair.

All GPO's are provided in the form of a floating/isolated relay contact pair using the common and normally open contacts. Fifteen of the relay outputs also make the normally closed contact available.

The unit provides a basic hardware interface to a Cerebrum control system. The general purpose inputs and outputs can be used for a variety of tasks including physical GPI/O's for the Cerebrum Tally and Mnemonic option or just for very simple interface to third party devices for tasks such as alarm/status monitoring or control.

The unit uses its inbuilt 100Base-T Ethernet connector to connect to the Cerebrum server over either a local or wide area network. The unit can be configured to use either DHCP or manually assigned IP addresses. As with other Axon devices when used in manual IP assignment mode the address, sub-net mask and gateway can be assigned using the configuration mode of the panel.

The unit shows the status for the power supplies, GPI and GPO activity as well as Ethernet connectivity on the front panel of the device.

The unit is powered with an external AC-DC brick PSU unit. The rear of the unit has two lockable DC power inlets allowing for an optional redundant PSU in critical applications. The unit has an earth or grounding stud by the side of the DC inlets.

5 Installation

Connecting the D-sub connectors

The connection details of the 37 way D type connectors are shown in the tables on the next page. Please make sure the cables are properly soldered by trained personnel.

General Purpose Inputs

To activate a GPI input on the unit a voltage drop (4.5V-13Vdc) has to be present across the input (A & B) pins. Internally these pins feed a bidirectional optical isolator which provides an electrical isolation between the input signals applied and the unit. Internal resistors on each pin (330 Ohms, total of 660 Ohms) will limit the current flow through the optical isolator.

If the input to the unit cannot generate a voltage then the local supply voltage (+5Vdc) on pin 19 of each of the input connectors can be used to provide this. This output pin is current limited and will provide no more than 400mA. However even if all 16 inputs use this pin then only 120mA will be drawn.

For instance to connect a normally open mechanical switch to trigger input GPI 1 when it is closed, wire pin 19 of the input connector to one side of the switch, then wire the other side of the switch to pin 1 (Input 1A) of the same connector, then wire pin 20 (Input 1B) to pin 17,18,36 or 37(0V).

General Purpose Outputs

The GPI outputs are connected internally to relay contacts. On the first five GPI outputs of each connector the common, normally open and normally closed contacts are available. On the remaining eleven GPI outputs just the common and normally open contact pairs are available.

The contact pairs can pass a current of up to 2A with a resistive load. For more details see the following specification section.



GPI input connectors

This is the pin assignment of the 37 pin 'D'-type female (socket) connectors

Inputs 1-16

PIN	SIGNAL
1	Input 1A
2	Input 2A
3	Input 3A
4	Input 4A
5	Input 5A
6	Input 6A
7	Input 7A
8	Input 8A
9	Input 9A
10	Input 10A
11	Input 11A
12	Input 12A
13	Input 13A
14	Input 14A
15	Input 15A
16	Input 16A
17	0V (1-16)
18	0V (1-16)
19	+5V (1-16)
20	Input 1B
21	Input 2B
22	Input 3B
23	Input 4B
24	Input 5B
25	Input 6B
26	Input 7B
27	Input 8B
28	Input 9B
29	Input 10B
30	Input 11B
31	Input 12B
32	Input 13B
33	Input 14B
34	Input 15B
35	Input 16B
36	0V (1-16)
37	0V (1-16)

Inputs 17-32

PIN	SIGNAL
1	Input 17A
2	Input 18A
3	Input 19A
4	Input 20A
5	Input 21A
6	Input 22A
7	Input 23A
8	Input 24A
9	Input 25A
10	Input 26A
11	Input 27A
12	Input 28A
13	Input 29A
14	Input 30A
15	Input 31A
16	Input 32A
17	0V (17-32)
18	0V (17-32)
19	+5V (17-32)
20	Input 17B
21	Input 18B
22	Input 19B
23	Input 20B
24	Input 21B
25	Input 22B
26	Input 23B
27	Input 24B
28	Input 25B
29	Input 26B
30	Input 27B
31	Input 28B
32	Input 29B
33	Input 30B
34	Input 31B
35	Input 32B
36	0V (17-32)
37	0V (17-32)

Inputs 33-48

PIN	SIGNAL
1	Input 33A
2	Input 34A
3	Input 35A
4	Input 36A
5	Input 37A
6	Input 38A
7	Input 39A
8	Input 40A
9	Input 41A
10	Input 42A
11	Input 43A
12	Input 44A
13	Input 45A
14	Input 46A
15	Input 47A
16	Input 48A
17	0V (33-48)
18	0V (33-48)
19	+5V (33-48)
20	Input 33B
21	Input 34B
22	Input 35B
23	Input 36B
24	Input 37B
25	Input 38B
26	Input 39B
27	Input 40B
28	Input 41B
29	Input 42B
30	Input 43B
31	Input 44B
32	Input 45B
33	Input 46B
34	Input 47B
35	Input 48B
36	0V (33-48)
37	0V (33-48)



GPI output connectors

This is the pin assignment of the 37 pin 'D'-type male (plug) connectors

Outputs 1-16

PIN	SIGNAL
1	Output 1 NO
2	Output 1 NC
3	Output 2 COM
4	Output 3 NO
5	Output 3 NC
6	Output 4 COM
7	Output 5 NO
8	Output 5 NC
9	Output 6 COM
10	Output 7 COM
11	Output 8 COM
12	Output 9 COM
13	Output 10 COM
14	Output 11 COM
15	Output 12 COM
16	Output 13 COM
17	Output 14 COM
18	Output 15 COM
19	Output 16 COM
20	Output 1 COM
21	Output 2 NO
22	Output 2 NC
23	Output 3 COM
24	Output 4 NO
25	Output 4 NC
26	Output 5 COM
27	Output 6 NO
28	Output 7 NO
29	Output 8 NO
30	Output 9 NO
31	Output 10 NO
32	Output 11 NO
33	Output 12 NO
34	Output 13 NO
35	Output 14 NO
36	Output 15 NO
37	Output 16 NO

Outputs 17-32

PIN	SIGNAL
1	Output 17 NO
2	Output 17 NC
3	Output 18 COM
4	Output 19 NO
5	Output 19 NC
6	Output 20 COM
7	Output 21 NO
8	Output 21 NC
9	Output 22 COM
10	Output 23 COM
11	Output 24 COM
12	Output 25 COM
13	Output 26 COM
14	Output 27 COM
15	Output 28 COM
16	Output 29 COM
17	Output 30 COM
18	Output 31 COM
19	Output 32 COM
20	Output 17 COM
21	Output 18 NO
22	Output 18 NC
23	Output 19 COM
24	Output 20 NO
25	Output 20 NC
26	Output 21 COM
27	Output 22 NO
28	Output 23 NO
29	Output 24 NO
30	Output 25 NO
31	Output 26 NO
32	Output 27 NO
33	Output 28 NO
34	Output 29 NO
35	Output 30 NO
36	Output 31 NO
37	Output 32 NO

Outputs 33-48

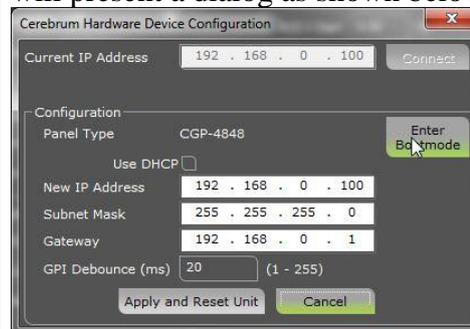
PIN	SIGNAL
1	Output 33 NO
2	Output 33 NC
3	Output 34 COM
4	Output 35 NO
5	Output 35 NC
6	Output 36 COM
7	Output 37 NO
8	Output 37 NC
9	Output 38 COM
10	Output 39 COM
11	Output 40 COM
12	Output 41 COM
13	Output 42 COM
14	Output 43 COM
15	Output 44 COM
16	Output 45 COM
17	Output 46 COM
18	Output 47 COM
19	Output 48 COM
20	Output 33 COM
21	Output 34 NO
22	Output 34 NC
23	Output 35 COM
24	Output 36 NO
25	Output 36 NC
26	Output 37 COM
27	Output 38 NO
28	Output 39 NO
29	Output 40 NO
30	Output 41 NO
31	Output 42 NO
32	Output 43 NO
33	Output 44 NO
34	Output 45 NO
35	Output 46 NO
36	Output 47 NO
37	Output 48 NO

6 Configuration

Ip settings

When powering on the CGP-4848 unit for the first time the unit will default its IP address to 192.168.0.100. In order to change IP settings of the CGP-4848 unit you will need to use Cerebrum V1.07 (or higher). The Cerebrum application will need to be able to communicate with the unit at the default (192.168.0.100) or currently assigned IP address. This may require you to directly connect to the unit using a CAT5 crossover cable and manually assigning an IP address for the PC, or assigning another IP address within the same sub-net (192.168.0.X) to your local IP adapter.

In order to change the IP address of the unit select the Engineering->Configure Cerebrum Hardware option under the View menu. This will present a dialog as shown below.



NOTE

Please do not press the 'Enter Bootmode' button in the above displayed screenshot, unless explicitly instructed by Axon Support.

When the Current IP Address field is correct, press the 'Connect' button to read back the current settings from the unit. If the application communicated with the unit then the fields for the New IP Address, Use DHCP, Subnet mask, Gateway IP address and GPI de-bounce time will reflect the settings of the unit and will be enabled for editing.

When the desired settings have been given, press the Apply and Reset Unit button to write these settings to the unit. The unit will then re-boot and will appear on the network at the desired IP address.

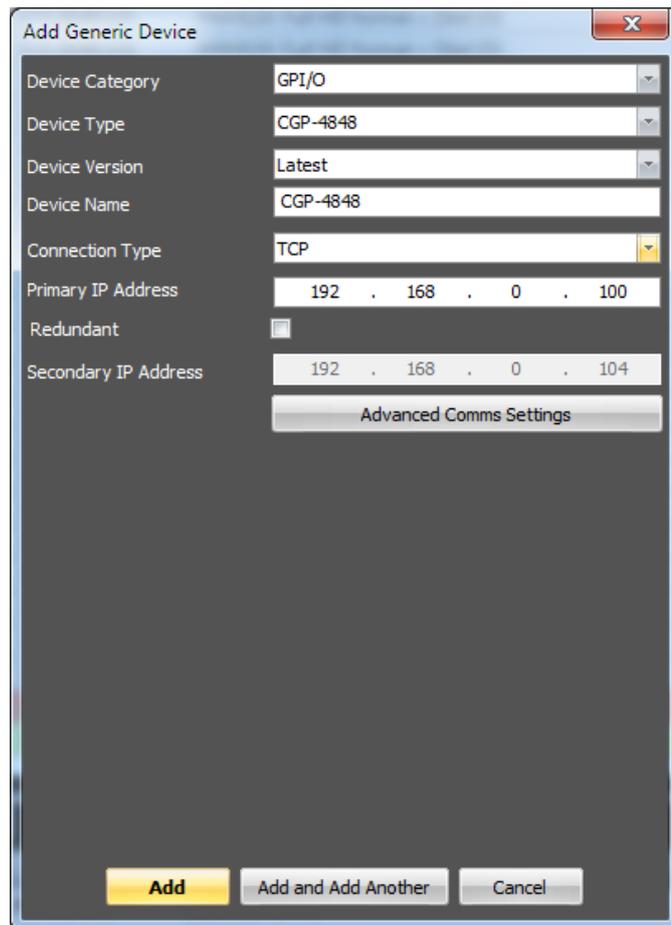
In order to default the unit back to its initial settings there is a recessed default switch on the rear of the unit. If this is pressed for 5 seconds whilst either the unit is powered on, or the recessed reset button is pressed then the unit will clear down the statically stored settings to the following values:

DHCP Mode:	off (manually assigned IP)
IP Address:	192.168.0.100
Sub-net mask:	255.255.255.0
Gateway IP Address:	192.168.0.1
GPI de-bounce time:	5mS

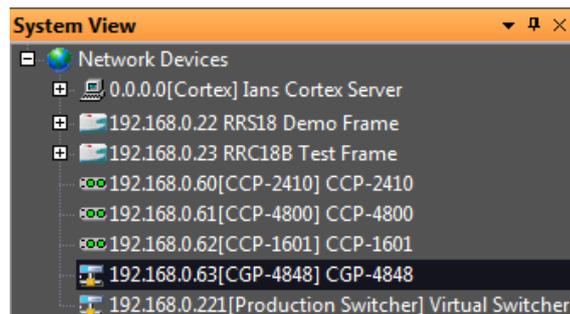
Adding the CGP-4848 to the Cerebrum system

On the correct IP address has been given, the device will need to be added to the Cerebrum system in order for it to be used within the application.

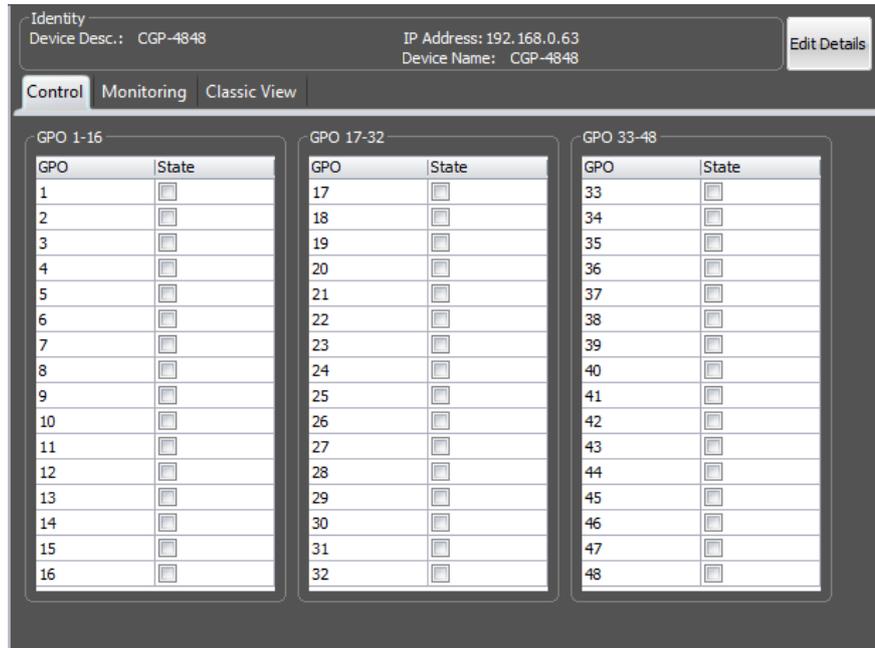
In order to use a CGP-4848 on your Cerebrum system you will need to be running Cerebrum V1.07 or later. To add the unit go to the Network menu and choose the Add Generic Device option, from the Device Category selection choose the 'GPI/O' setting and 'CGP-4848' from the Device type selection. Then select the configured IP address and suitable Device name for the unit and finally press the Add button. The following screenshot displays this window.



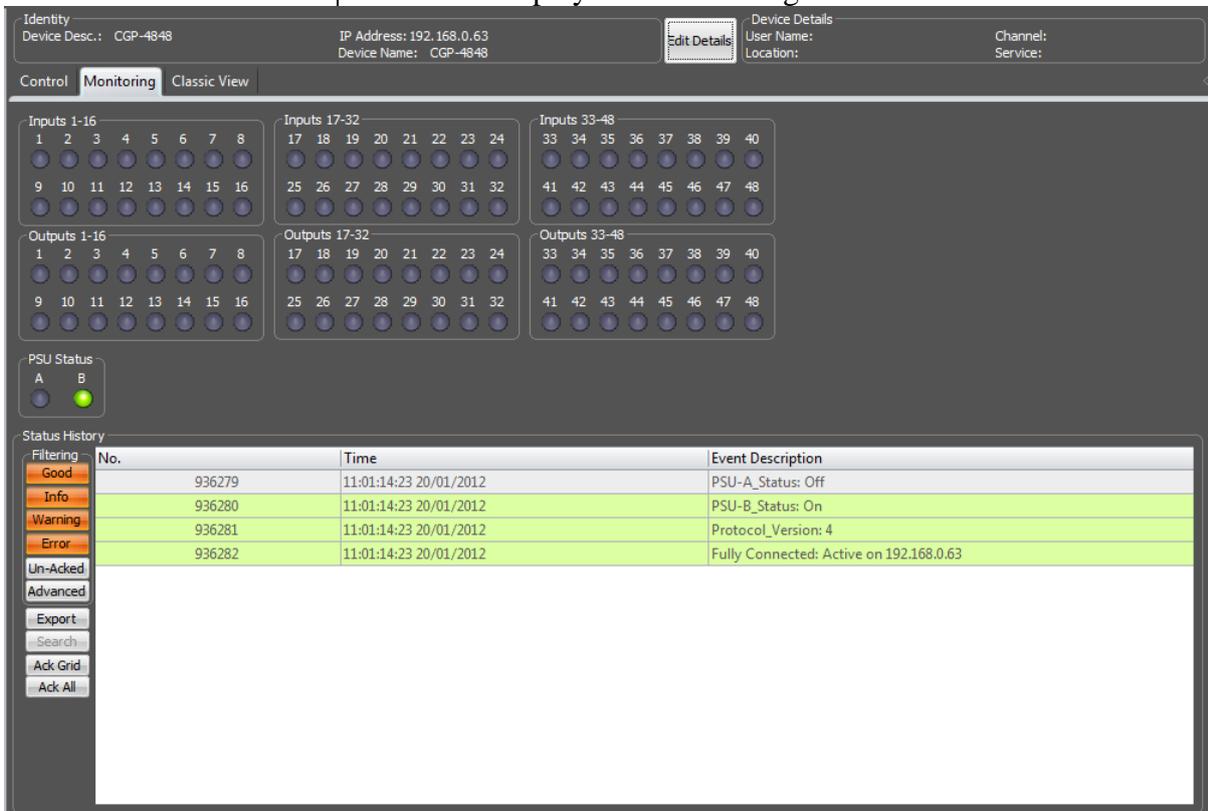
The unit should now appear at the correct IP address in the System View of Cerebrum.



When the unit is on-line and selected in the System View the Device View will allow control of the GP outputs of the unit as shown below.



The Monitoring tab, in the same way as all other devices within Cerebrum, shows a historical log of the status events for this unit along with the status of the GP inputs and PSU's. the following screenshot displays the monitoring tab.





Configuring functionality

The CGP-4848 is a 'generic' device in the system and can be used by the Cerebrum cost options (Panel Viewer, Tally Manager) to trigger GP outputs and any event within the Cerebrum system.

The CGP-4848 device can be used as a basic status detection for third party devices, for this to be used the Status severities of the unit will need to be configured using the Generic Device Status Severities dialog which can be found in the Configuration->Status Severities menu within Cerebrum.

For more information on either of these topics please consult the Cerebrum on-line help file.

7 Reprogramming the CGP-4848

Enter Bootmode

The firmware on the unit can be reprogrammed via an Ethernet connection by using a web page available when the unit is in its bootloader mode.

To put the unit into its bootloader mode make sure the unit has been removed from the system, the quickest and easiest way to do this is to change the IP address of the device in the system view to another IP address temporarily. Then select the Engineering → Configure Cerebrum Hardware option under the View menu. This will present a dialog as shown below.

The screenshot shows a dialog box titled "Cerebrum Hardware Device Configuration". At the top, there is a "Current IP Address" field with the value "192 . 168 . 0 . 247" and a "Connect" button. Below this is a "Configuration" section with a "Panel Type" dropdown set to "CGP-4848" and an "Enter Bootmode" button. There is an unchecked "Use DHCP" checkbox. Below that are fields for "New IP Address" (192 . 168 . 0 . 247), "Subnet Mask" (255 . 255 . 255 . 0), and "Gateway" (192 . 168 . 0 . 1). At the bottom, there is a "GPI Debounce (ms)" field with the value "20" and a range "(1 - 255)". Two buttons at the bottom are "Apply and Reset Unit" and "Cancel".

Enter the IP address of the device and then press Connect. When connected press the Enter Bootmode and then Cancel to quit this dialog.

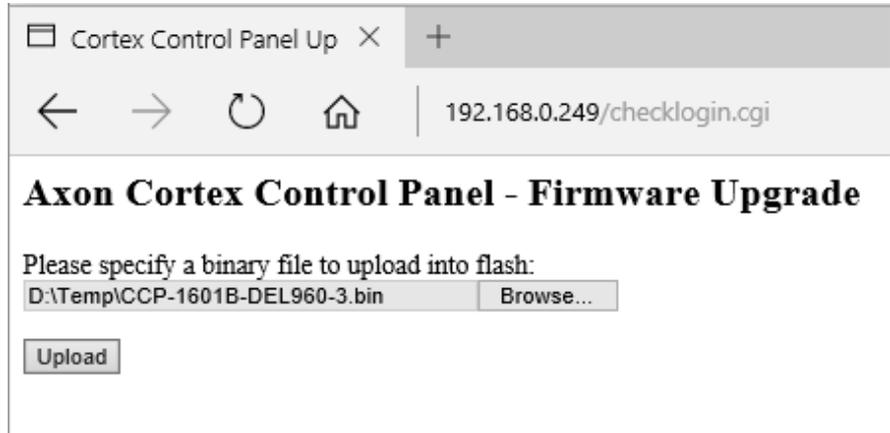
Upgrading the panel's firmware

When the unit is in this mode, it will host a webserver at its IP address. If you use a web browser and type in the IP address in the address bar it will display the following page:

The screenshot shows a web browser window with the title "Cortex Control Panel Up". The address bar contains "192.168.0.249". The main content area displays "Axon Cortex Control Panel - Firmware Upgrade". Below the title, there is a prompt "Enter user ID and password:" followed by "User ID" and "Password" input fields. A "Login" button is located at the bottom left of the form.

To upgrade the firmware supply the user name ('axon') and the password ('Cerebrum') and press the Login button.

The browser page will then prompt for a firmware file with the Browse button.



If you locate the required file and then press the Upload button the panel will then reprogram itself.

After successfully programming the unit it will then prompt the user to reset the MCU.



After doing this the browser will complete and the unit will reset itself after which the unit can be added back into the system by changing the IP address of the device in the system to the IP address of the unit.



8 Specifications

Dimensions

Height	45mm (1.73") (1RU)
Width (including front panel)	484 mm (19")
Depth (including front panel and DC connector)	195mm (7.67")
Width (excluding front panel)	450 mm (17.71")
Depth (excluding front panel, including DC connector)	175mm (6.88")

Weight

Weight (excluding power adapter)	~2.5 kg
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Power

AC PSU	100–240V AC - 1.2A, Frequency: 50/60 Hz
Panel input	12V DC - 2.0A

General Purpose Inputs

Input Voltage range	5-12Vdc +/- 10% (4.5V – 13.2V)
Typical input current	5mA (5Vdc input)

General Purpose Outputs

Maximum Voltage	220Vdc, 250Vac
Maximum Current	2 A
Max. Switching capacity	60W
Contact resistance	< 70mOhms
Expected life	> 5 x 10 ⁵ operations

Local Output Voltage (Input connectors pin 19)

Voltage	5Vdc +/- 10%
Maximum Current	400mA

Miscellaneous

Operating temperature	0° to 40° C environmental temperature (32° to 104° F)
Storage temperature	-20° to 70 ° environmental temperature (-4° to 158° F)