Power outputs overview

The **Power Outputs** node is used to configure the power outputs for Power Box devices. Refer to the relevant PIS sheet for your Power Box device to find the ratings for each pin.

Centaurus : Centaurus Product Information Sheet

General Tips

Before you configure the power outputs pay attention to the following tips:

Output type – Check if the output is a high-side drive (HSD - switches the positive line) or a low-side (LSD - switches the ground line) output. On the Centaurus, CN1-4, CN1-11, CN1-12, CN1-19, and CN1-20 are low power low-side outputs.

Current rating – Each output has a maximum current rating. Overloading an output can damage the device. Choose outputs rated adequately for the devices they control. Group output pins to increase current rating if required (see Configuring a Grouped Pin Output)

Continuous vs. Peak Current – Some outputs can handle larger inrush current and longer surge times than others. Ensure the continuous and peak current consumption of the powered device is known before you configure outputs.

Heat Dissipation – Install the Power Box in a location with adequate ventilation and consider ambient temperature limits to avoid thermal shutdowns.

Fail-safe Configurations – For critical functions (for example., engine cooling fans or fuel pumps) consider adding redundant circuits or configuring fail-safes to make sure that these devices remain functional even if one output fails.

Output configuration

Add a new output

To configure a new power out, navigate to the **Output Configuration** menu. Click the **+** tool to add a new output (1). You can use the 'import' and 'export' tools to import and export configurations between existing setups (2). Use the 'bin' tool to delete unwanted outputs (3).
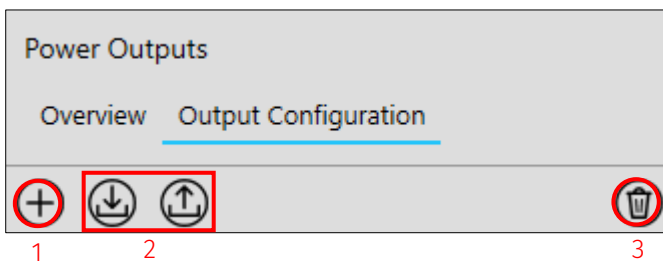
Once an output is created you can name it (1) and add a brief description about the output (2).

Configure an output

To configure an output, select which connector to use (1), and then click the **+** tool to add a new output pin (2). Use the 'bin' tool to delete unwanted pins (3).

Connector 1 CN1 (Low Current) : 1	6x 2.5A outputs 5x LSD outputs
Connector 2 CN2 (Medium Current) :	32x 7.5A outputs
Connector 3 CN3 (High Current) :	5x 12A outputs 2x 25A 'wiper' outputs 7x 25A 'standard' outputs 2x 25A 'high surge'

You can then select a pin from the **Add Pins** menu. A description about each pin is shown. Click a pin in the menu (1), and then click the 'tick' tool to add (2), or alternatively double-click the pin name.

You can also click on pins in the displayed connector to select/deselect them. Selected pins are highlighted in blue.

Grouped pin outputs

You can select multiple pins to form grouped pin outputs. Grouped pins outputs enable increased output current rating by sharing current between pins. In other words, you can group 2x 2.5A pins to make a 1x 5A output and group 4x 7.5A pins to make a 1x 30A output.
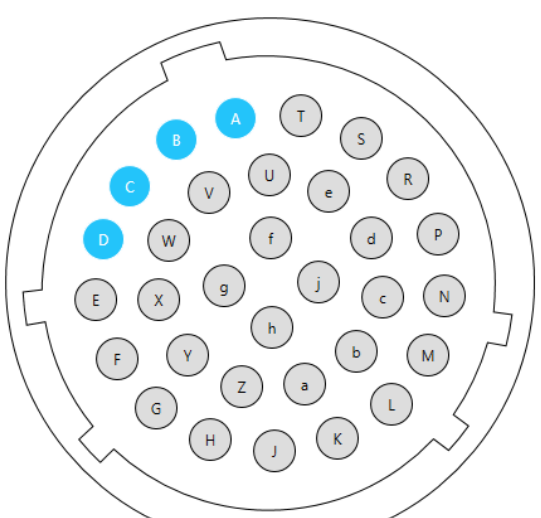

In the **Output Pins** menu, click pins + Shift to select multiple pins.

You can also click on pins in the displayed connector to select/deselect them. Selected pins are highlighted blue.
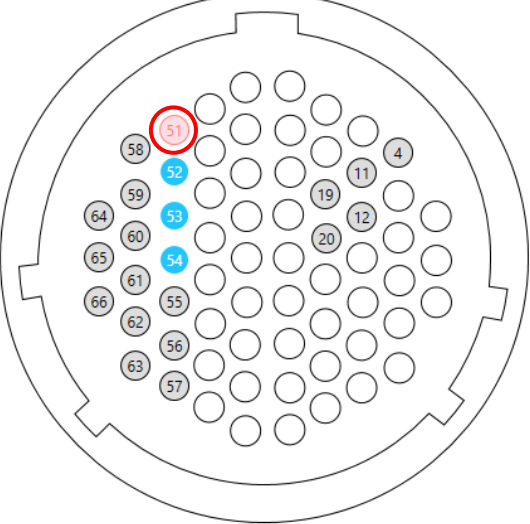
Note 1: Pins can only be grouped within a connector. Pins cannot be grouped between connectors.

Note 2 – A pin can only be used in one configured output. A pin cannot be used in more than one output. If a pin is used in more than one output, an error is raised, and the pin is highlighted in red.

Note 3: Grouped pins must have the same current rating. In other words, a 12A pin and 25A pin cannot be grouped together.
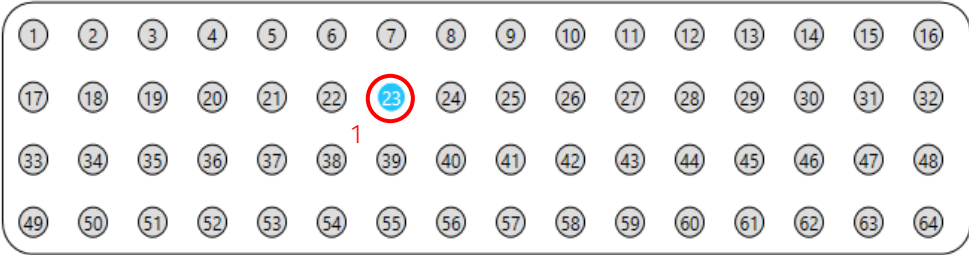
Power output LED

The **Power Output LED** section is used to configure which of the LEDs on the display are used to display the output status. When the LED is illuminated, this signals that the output is on. When the LED is not illuminated this signals that the output is off.

Click on an output LED from the displayed numbered LEDs (1) or type the LED Id number in the **Id** box to select the LED to display the output status. The selected LED is highlighted in blue.

Output overview

An overview of all the configured outputs is displayed on the **Overview** page.

By default, the **Overview** page is show in 'Grid' mode. This mode displays all the configured properties of the output(s).

The Grid Overview Page displays:

- Id   –   Output LED ID number
- Name   –   Output name
- Description –   Output description
- Rating   –   Current rating (will update for grouped pin outputs)
- No   –   Number of output pins assigned to this output
- PWM   –   PWM output enabled (Blue enabled, White disabled) *
- Ltc   –   Low trip current setting **
- Htc   –   High trip current setting **
- Ltt   –   Low trip time setting **
- Htt   –   High trip time setting **
- Tre   –   Trip retry enabled (Blue enabled, White disabled) **
- Trc   –   Trip retry count setting **
- Trd   –   Trip retry delay time setting **
- Doc   –   Default output condition (Blue ON, White OFF) *
- Oic   –   Output is controlled by a control channel (Blue true, White false) *
- MS   –   Manufacturer status (see Setups – Setup Locking)

*   (see Control Menu section)
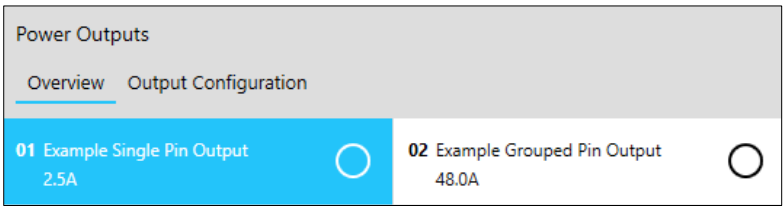**   (see Trips Menu section)

You can change the 'Display Mode' to 'Compact' to display information in a reduced format from the **Display mode** dropdown menu.
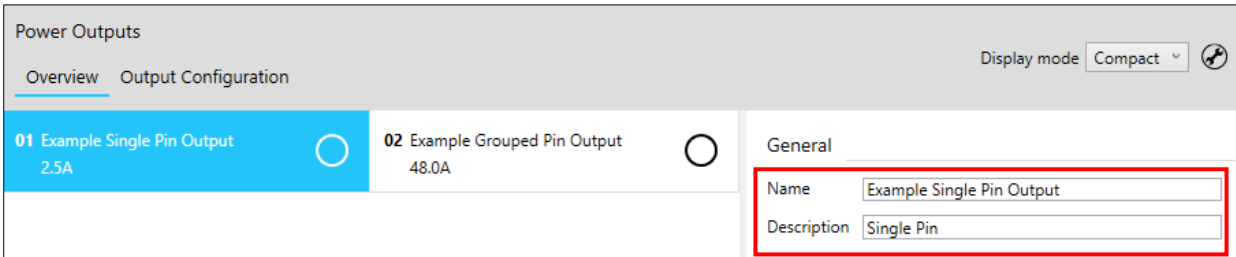
Enabling Greatness for over 65 years

The 'Compact' display mode only shows the output name and its current rating.
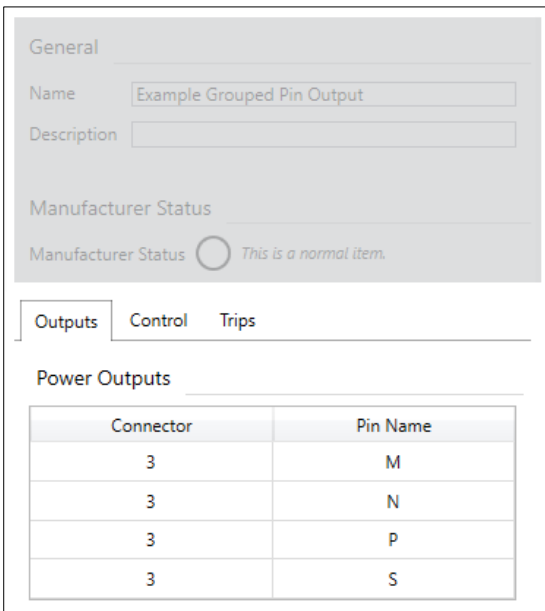

You can change the name and description of the output from the **Overview** page under the **General** section.

Outputs menu

The **Outputs** menu displays the allocated connector number and pin name(s) for the selected output.

Control menu

The **Control** menu is where the PWM configuration and output control channels are configured.
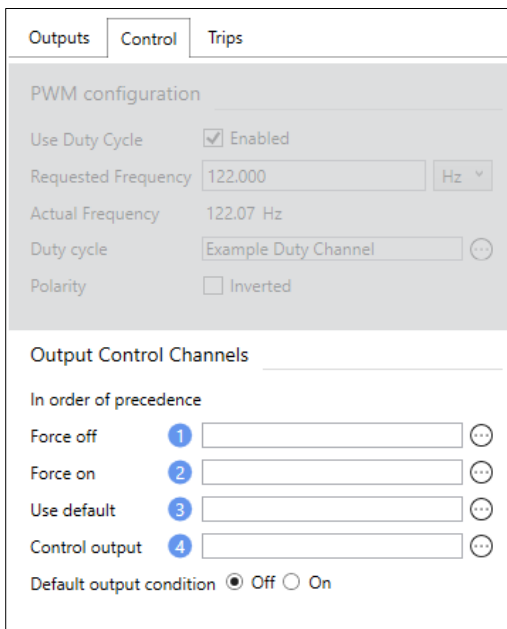
PWM configuration

To enable PWM for an output select the **Use Duty Cycle** check box (1). You can then set the requested PWM frequency (2).

Note: The actual frequency is capped at the maximum frequency of the pin(s). Use the 'browse' tool to select a channel with units of proportion to control the PWM duty cycle (3), and then select an available channel from the channels list (4). Click **OK** to confirm your selection (5). If required, select the **Polarity** check box to invert the polarity (6).
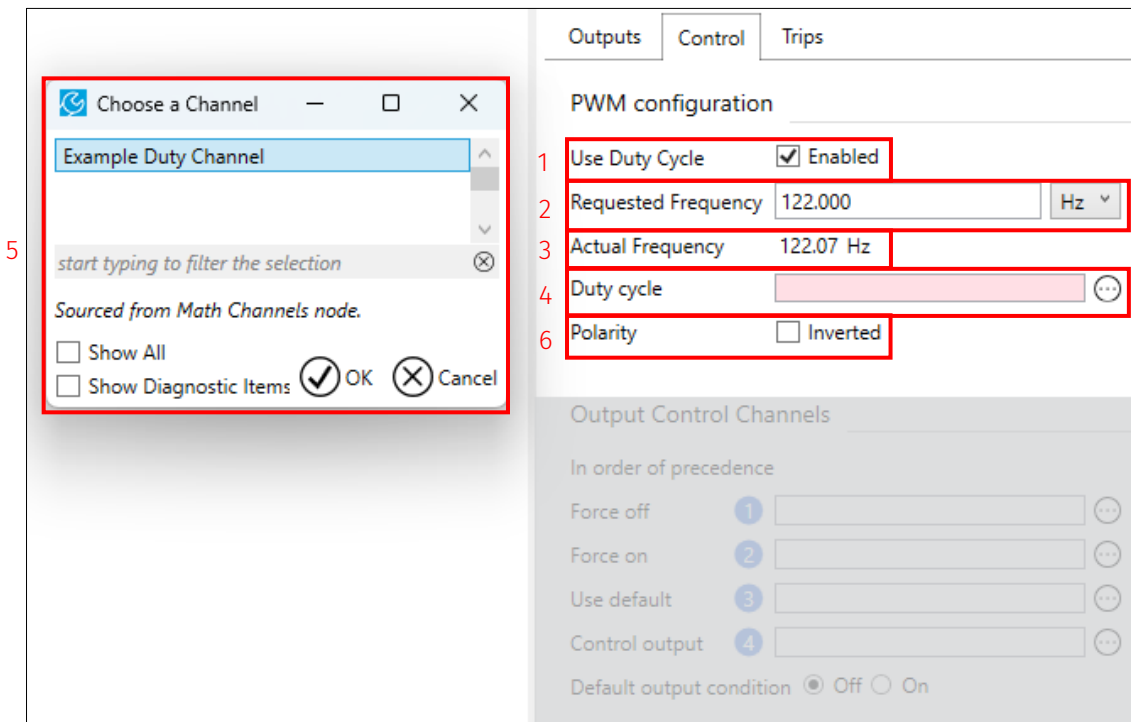
You can set the output to Off or On by default. Select the required **Default Output Condition** check box.

Trips menu

In the **Trips** menu, you can configure 'High' and 'Low' trip definitions. To set the high and low trip definitions, type the current trip rating in the **Current** box (1) and the t ime duration during which the current must be greater or equal than for the trip to occur (2). Select the **Time units** (seconds or milliseconds) from the check boxes (3).

You can also configure a voltage drop to cause the output to trip.

The hard trip time is fixed by Cosworth but can be changed to suit specific applications. Contact the Electronics Support team (electronics.support@cosworth.com) for more information.

If the output trips, you can enable an optional 'Retry' to restart the output. You can configure up to nine attempted retries, with up to 30 seconds between each. Select a channel to trigger the trip reset from the 'browse' menu

Note: The trip reset channel must be a U8 data type.

Generated channels

Seven channels are automatically generated on the **Power Outputs** node and you can edit their names.
- Min Vbat Monitor:
- Max Vbat Monitor:
- Brownout:
- High Current Temperature 1:
- High Current Temperature 2:
- Low Current Temperature 1:
- Low Current Temperature 1:

These channels are not automatically logged but you can set a logging rate for these channels on the Channel Rates node.

Soft starts

It is possible to create a maths channel or logic channel with conditions that enable a device to slowly ramp up to the required output. This can reduce wear on components like lights and motors and avoid sudden inrush currents.

Create a maths channel that has the units of 'proportion' (1), and then create a counter as shown below (2).

This counter is enabled only once the **[Output_Condition]** is true (that is, the switch to activate the output is enabled). This channel needs to be named according to your switch/button that controls the output. Once the condition is met, the counter increments until it reaches 100 (100% duty).

The counter can be set to sped up/slowed down by modifying the evaluating rate of the 'Duty Counter' (for example, 1hz = 100 seconds, 100hz = 1 second, or 200hz = 0.5 seconds).

Select the configured output requiring 'soft start' and enable PWM (1). Set the **Requested Frequency** to the required frequency at 100% duty cycle (2). You can then select the new soft start '100% Duty Cycle' channel (3).