

BEP
LEADING ELECTRICAL DESIGN

MASTERVOLT

CZONE™



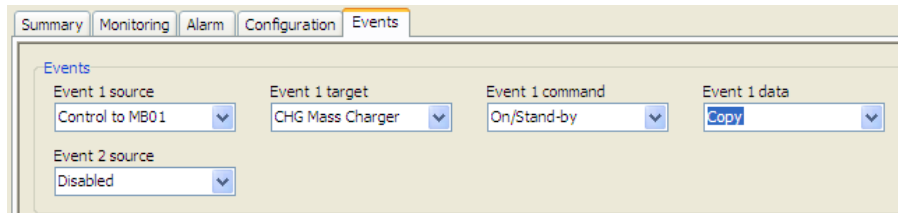
Mass Charger CZone™ Configuration Instructions

Configuration within MasterAdjust

First, ensure both the Mass Charger and the MasterBus Interface are both powered and connected, along with a MasterBus USB interface, to the MasterBus network. If all of this has been done the Mass Charger and the MBI will be listed, with any other MasterBus Compatible devices also connected to the network, in the left column on the MasterAdjust Screen.

Charger On/Off Control

1. Select the MBI (default name: "INT MBI") from the list of MasterBus devices, navigate to the 'Events' tab and create a new event using the following settings to allow a control signal from CZone™ to MasterBus to control the Mass Charger's On/Off state.



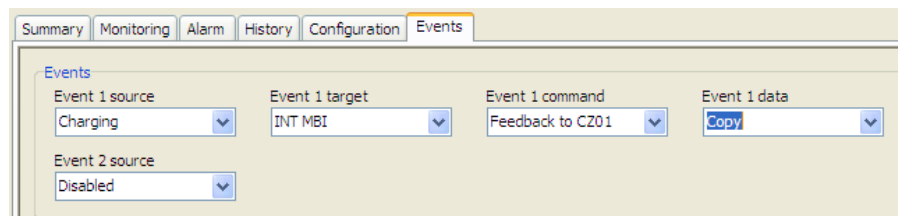
The screenshot shows the 'Events' configuration window in MasterAdjust. The 'Events' tab is selected. The configuration for Event 1 is as follows:

| Event 1 source | Event 1 target | Event 1 command | Event 1 data |
|-----------------|------------------|-----------------|--------------|
| Control to MB01 | CHG Mass Charger | On/Stand-by | Copy |

Event 2 source is set to Disabled.

2. Select the Mass Charger (e.g. CHG Mass Charger) from the list of MasterBus devices and create a new event using the below settings to allow the Mass Charger's On/Off status to be fed back to CZone™ as a feedback/'systems in operation' signal.

Note: For every control event programmed from CZone™ to MasterBus, a corresponding feedback event needs to also be programmed.



The screenshot shows the 'Events' configuration window in MasterAdjust. The 'Events' tab is selected. The configuration for Event 1 is as follows:

| Event 1 source | Event 1 target | Event 1 command | Event 1 data |
|----------------|----------------|------------------|--------------|
| Charging | INT MBI | Feedback to CZ01 | Copy |

Event 2 source is set to Disabled.

DC Monitoring

To allow AC/DC data, as well as the inverter and charger state (e.g. Bulk, Float, etc.) to be shown in CZone™, the individual MasterBus data items (voltage, current, state of charge, etc.) need to be selected in order to populate standard NMEA2000 AC/DC/Charger Status PGN messages which are to be transmitted and monitored within the NMEA2000/CZone™ network. Each of these sets of AC/DC/Charger Status data items are configured within the MBI Configuration tab using data item index values retrieved from the Monitoring tabs of devices presenting the information.

Charger Status

Select the MBI (INT MBI) from the list of MasterBus devices and go to the Configuration tab.

1. In the first available Metering field (in this example Metering 1) click on the 'Type' dropdown and select Inv/Chg Status. (The same data type is used for both Charger and Inverter Status items)
2. Click the 'Device' dropdown and select the Mass Charger (e.g. CHG Mass Charger). This indicates that the data item being configured will come from the Mass Charger.
3. Click the 'Charger status' dropdown and select 'Monitoring'. This indicates that the data item being configured will come from the Monitoring tab of the Mass Charger.
4. To figure out the correct 'Charger status' index to enter, click on the 'Mass Charger' in the device list on the left of the screen. Navigate to the 'Monitoring' tab. Hover the mouse pointer over the Charger State parameter. The Index Number will appear beside the mouse pointer – note this number down.

Return to the 'Configuration' tab of the MBI and enter the index number just noted down into the 'Charger status' number box.

The screenshot shows the configuration interface for 'Metering 1'. It contains several fields:

- Type:** A dropdown menu with 'Inv/Chg Status' selected. A red arrow labeled '1' points to this dropdown.
- Device:** A dropdown menu with 'CHG Mass Charger' selected. A red arrow labeled '2' points to this dropdown.
- Inverter status:** A dropdown menu with 'Not selected' selected.
- Inverter status:** A numeric input field with '0' entered.
- Charger status:** A dropdown menu with 'Monitoring' selected. A red arrow labeled '3' points to this dropdown.
- Charger status:** A numeric input field with '13' entered. A red arrow labeled '4' points to this field.

DC Metering

Select the MBI (INT MBI) from the list of MasterBus devices on the left of the screen and go to the Configuration tab.

1. In the next available Metering field (in this example 'Metering 2') click the 'Type' dropdown and select 'DC'.
2. Click the 'Device' dropdown and select the Mass Charger (e.g. CHG Mass Charger).
3. Click 'Voltage' dropdown and select 'Monitoring' to indicate that the voltage data will be retrieved from the Monitoring tab of the Mass Charger.
4. To figure out the correct 'Voltage' index value to enter, click on the 'Mass Charger' in the device list on the left of the screen. Navigate to the 'Monitoring' tab and hover the mouse pointer over the 'DC' battery voltage parameter. The Index Number will appear beside the mouse pointer – note this number down.

Return to the 'Configuration' tab of the MBI and enter the index number just noted into the 'Voltage' number box of the Metering item being configured.

5. Click 'Current' dropdown and select 'Monitoring' to indicate that the current data will be retrieved from the Monitoring tab of the Mass Charger.
6. To figure out the correct 'Current' index value to enter into the number box, click on the 'Mass Charger' in the device list on the left of the screen. Navigate to the 'Monitoring' tab and hover the mouse pointer over the 'DC' battery current parameter. The Index Number will appear beside the mouse pointer – note this number down.

Return to the 'Configuration' tab of the MBI and enter the index number just noted into the 'Current' number box of the Metering item being configured.

7. Click 'Battery temp' dropdown and select 'Monitoring' to indicate that the temperature data will be retrieved from the Monitoring tab of the Mass Charger.
8. To figure out the correct 'battery temp' index value to enter into the number box, click on the 'Mass Charger' in the device list on the left of the screen. Navigate to the 'Monitoring' tab and hover the mouse pointer over the 'DC' battery temperature parameter. The Index Number will appear beside the mouse pointer – note this number down.

Return to the 'Configuration' tab of the MBI and enter the index number just noted into the 'Battery temp' number box of the Metering item being configured.

Leave the remaining items as 'Not Selected' and/or '0'.

The screenshot shows the 'Metering 2' configuration window. It contains several sections, each with a dropdown menu and a corresponding number box. Red arrows point to the following fields:

- 1. Type dropdown (set to DC)
- 2. Device dropdown (set to CHG Mass Charger)
- 3. Voltage dropdown (set to Monitoring)
- 4. Voltage number box (set to 14)
- 5. Current dropdown (set to Monitoring)
- 6. Current number box (set to 15)
- 7. Battery temp dropdown (set to Monitoring)
- 8. Battery temp number box (set to 16)

Other fields include State of charge (dropdown: Not selected, number box: 0), Ripple volts (dropdown: Not selected, number box: 0), and State of health (dropdown: Not selected, number box: 0).

Configuration within CZone™

Open the CZone™ Configuration Tool.

Controlling the Charger

The control mechanism between CZone™ and MasterBus functions by configuring virtual loads (MasterBus Event Sources) within CZone™ which subsequently function as virtual switches (Control to MB) within MasterBus. To control one of these virtual switches, a load must first be configured within CZone™ and programmed to turn on/off within a CZone™ circuit. The corresponding switch within MasterBus will then follow the state (on=closed, off=open) of this virtual load (MasterBus Event Source).

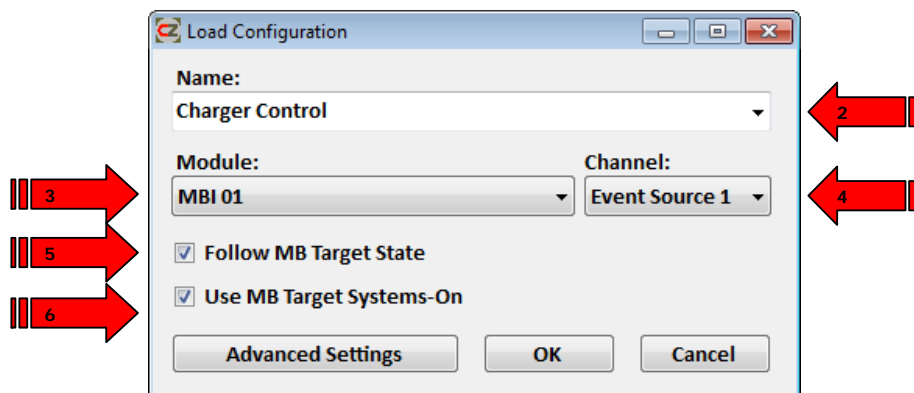
The virtual load (MasterBus Event Source) can be configured within CZone™ as follows.

Ensure that the MBI has been added to the configuration within the 'Modules' tab.

Charger Load Configuration

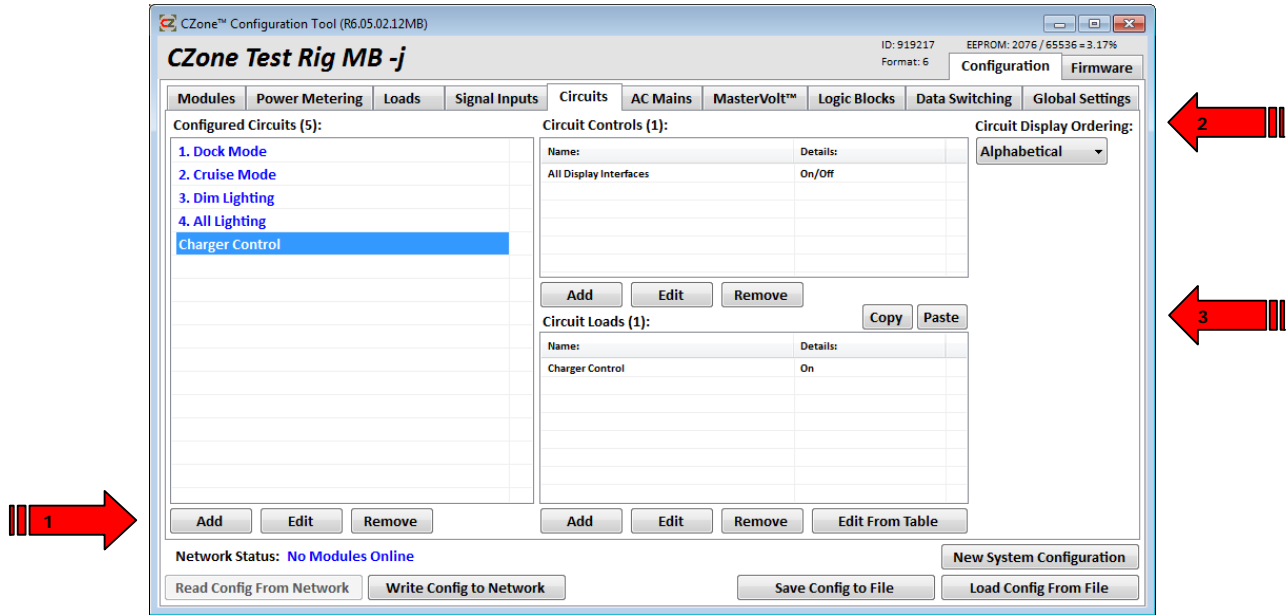
1. Go to the 'Loads' tab and then click 'Add'.
2. Enter a name for the virtual load/MasterBus Event Source (e.g. "Charger Control").
3. Click the 'Module' dropdown and select the 'MBI' previously added in the Modules tab for this example we are using 'MBI 01'.
4. Click the 'Channel' dropdown and select the Event Source number configured above in MasterAdjust to control the charger On/Off state (for this example we are using 'Event Source 1').
5. Tick the box 'Follow MB Target State' checkbox. This ensures that the virtual load (Event Source) on/off state follows the on/off state of the Mass Charger. This is important when the Mass Charger is also controlled from outside of CZone™ – if the virtual load remains off when the Mass Charger is turned on externally, turning the virtual load off in order to turn the charger off will have no effect. The virtual load (Event Source) state must therefore follow the target device state in order for on/off commands from the user to always function correctly.
6. Tick the 'Use MB Target Systems-On' checkbox. This ensures that the systems in operation indicators for any circuits in which this virtual load are used will follow the on/off state of the target MasterBus device (which needs configured in MasterAdjust to be fed back to the MBI, as above). If this checkbox is not ticked, the systems in operation for the virtual load will follow the state of the virtual load, which may not correctly indicate the state of the target device (this would be like indicating the state of a switch rather than indicating the state of what the switch controls).

The advantage to having this box not ticked is that the systems in operation feeds back instantly, which can be preferable when there is a significant delay in the feedback event from the target device within MasterBus. For the Mass Charger there is a delay of 2-3 seconds in the systems in operation feedback from the charger, so it may in fact be preferable to leave the 'Use MB Target Systems-On' checkbox not ticked.

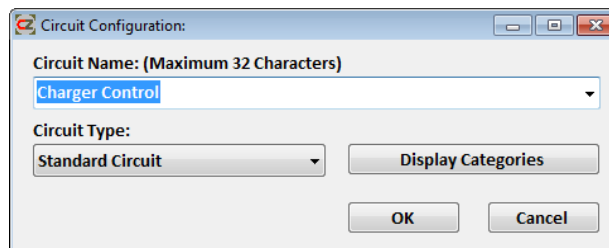


Charger Circuit Configuration

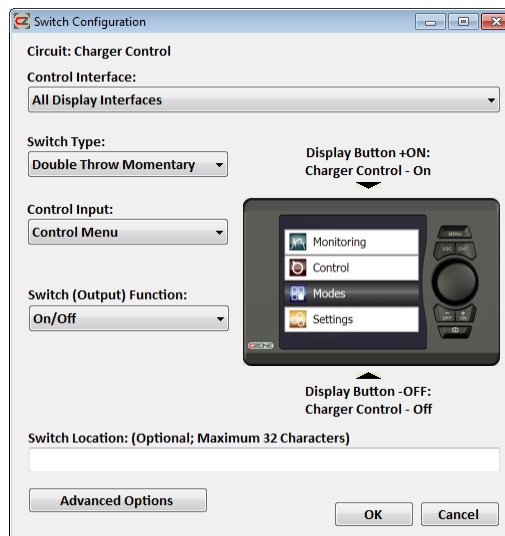
Here is where we set up the circuit to control the virtual load we just created for the Charger Control.



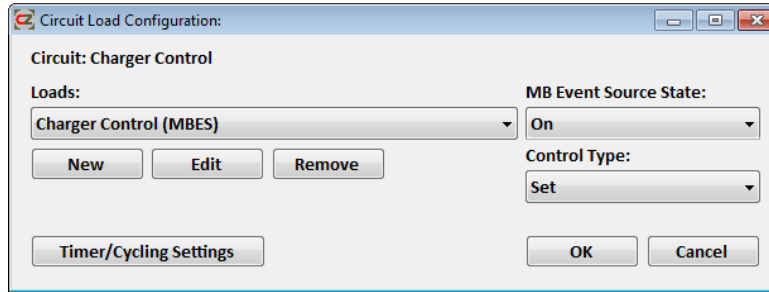
1. Go to the 'Circuits' tab. Under 'Configured Circuits' select 'Add'. Create a standard circuit, in this example called 'Charger Control'.



2. Under 'Circuit Controls' set up an 'All Display Interfaces' switch as a Double Throw Momentary On/Off. Note: If control is only required within the CZone™ 'Inverter/Charger Control' page and not within the standard 'Circuits' menu, there is no need to add this 'All Display Interfaces' circuit controller.



- Under Circuit Loads select the MasterBus Event Source virtual load we created above in the Loads section (e.g. "Charger Control").

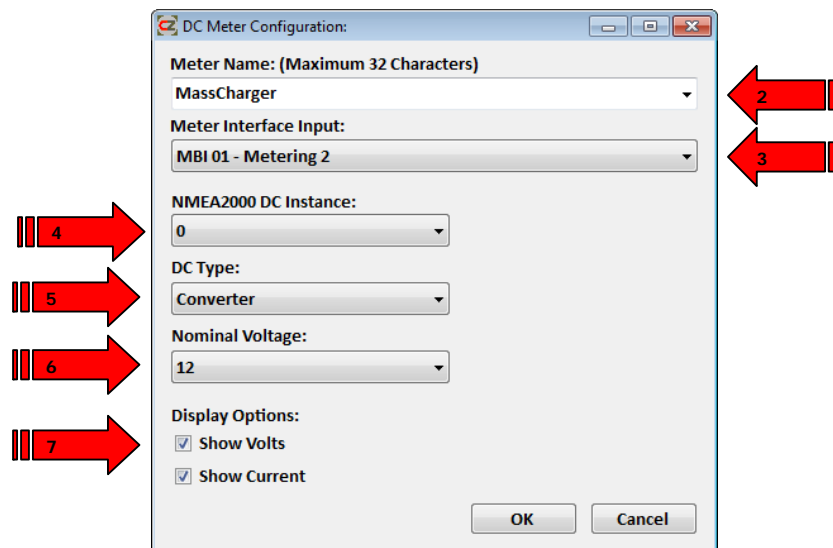


DC Monitoring

Here is where we specify the parameters to enable the Mass Charger DC data sets configured above in the MasterAdjust section to be transmitted as a NMEA2000 data and subsequently displayed within the CZone™ Monitoring menus.

DC Configuration

- Go to the 'Power Metering' tab and then click 'Add DC Meter'.
- Enter a name for the meter to be shown on the CZone™ monitoring menu (i.e. MassCharger).
- Click the 'Metering Interface Input' dropdown and select metering item number used for the DC data configured in the MasterAdjust section above (i.e. Metering 2).
- Click the 'NMEA2000 DC Instance' dropdown and select a unique NMEA 2000 DC Instance.
- Click the 'DC Type' dropdown and select 'Converter'.
- Click the 'Nominal Voltage' dropdown and select the nominal voltage of the Mass Charger Charger output.
- Tick both the 'Show Volts' and the 'Show Current' checkboxes.



Mastervolt™ Device Configuration

Here is where we set up the parameters to enable all of the data configured for the Mass Charger to be displayed on a single diagram within the CZone™ Inverters/Chargers Control menu.

1. Go to the 'Mastervolt' tab and then under the 'Configured Mastervolt Inverter/Chargers' section click 'Add'.
2. Enter a name for the device (e.g. 'Mass Charger').
3. Click the 'Inverter/Charge Status Metering Item' dropdown and select the metering item number used for the Inverter/Charger status configured in the MasterAdjust section above (i.e. Metering 1).
4. Click the 'Device Type' dropdown and select 'Mass Charger'.
5. Click the 'Charger Instance' dropdown and select a unique NMEA 2000 Charger Instance (these instance numbers must be different for each charger added to the system).
6. Click the 'Inverter Instance' dropdown and select 'None / Charger Only'.
7. Click the 'Inverter Output AC Instance' dropdown and select the preconfigured AC Meter item (i.e. MassCombi AC Out)
8. Click the 'Battery/DC Instance 1' dropdown and select the preconfigured DC Meter item to be associated with this device on the CZone™ Inverters/Chargers Control page. In this example we will use the 'MassCharger' DC Metering item we configured earlier. For charger with multiple DC outputs up to three DC Metering items can be associated – in this example we will only use one.
9. Click the 'Charger Control Circuit' dropdown and select the 'Charger Control' circuit configured above (i.e. Charger Control)

The screenshot shows the 'MasterVolt™ Inverter/Charger Setup' dialog box. The fields are configured as follows:

- Device Name: (Maximum 32 Characters): Mass Charger
- Inverter/Charger Status Metering Item: MBI 01 - Metering 1
- Device Type: Mass Charger
- Charger Instance: 0
- Inverter Instance: None / Charger Only
- Charger Input AC Instance: None
- Inverter Output AC Instance: 1
- Battery/DC Instance 1: MassCharger
- Line: 1 2 3
- Battery/DC Instance 2: None
- Battery/DC Instance 3: None
- Inverter Control Circuit: None
- Charger Control Circuit: Charger Control

Red arrows with numbers 2 through 9 point to the following fields:

- 2: Device Name
- 3: Inverter/Charger Status Metering Item
- 4: Device Type
- 6: Inverter Instance
- 5: Charger Instance
- 7: Charger Input AC Instance
- 8: Battery/DC Instance 1
- 9: Charger Control Circuit

At this stage we are ready to save and write the CZone™ configuration to the network and see it all in action.

Below is an example of what will be shown in the 'CZone™ Inverters/Chargers Control' page for the example configured above:

