

# Marlec Charge Controller Universal Reprogram Application

Marlec battery charge controllers are pre-programmed with regulation settings to match Lead-Acid batteries unless otherwise requested during manufacture.

This application allows the user to adjust the voltage regulation levels & some other parameters to suit alternative battery chemistries.

This software app requires a PC running Windows XP® or later & the Marlec Controller Interface cable (Part No CA-07/04) which allows connection of the controller to a computer USB port.

The controller needs to be powered by a battery or DC power supply of the correct system voltage connected to the main battery terminals on the controller.

After correct connection, the app will automatically detect the type of controller & configure the adjustable options accordingly.

This application is compatible with the following controllers:

- **HRDi from Serial number H02101001 Firmware rev 1.0 or later.**
- **1200 Hybrid Controller from serial number N01905001.**
- **1200 Hybrid Controllers from N01802024 up to N01905001 rev 1.5 to 1.7 allow some Parameter adjustment. <sup>2</sup>**
- **1200 hybrid controllers may provide partial or full adjustment if they have been returned to Marlec for a Firmware upgrade.**
- **1200 Terrain Controller from serial number P#2012011.**  
*Note: '# is the voltage code, either 0 (12/24v) or 4 (48v).*
- **1803 MPC-2 Controller from serial number D\$2011001.**  
*Note: '\$ is the voltage code, either 1 (12v), 2 (24v) or 4 (48v).*

## The following settings may be available for adjustment:

### **Bulk Charge Phase Voltage levels: (HRDi & 1200 Controllers)**

Bulk phase is when the battery receives most of its charge. The 'Max level' is the limit that the battery should not be charged beyond.

Bulk phase 'Min level' is when the controller will begin to regulate the charge current to the batteries until the voltage reaches the Bulk phase 'Max level' when charge current will be zero. At this point the batteries are considered to be fully charged, so to prevent overcharging & to maximise the life of the batteries the controller changes to Float Phase.

### **Float Charge Phase Voltage levels: (HRDi & 1200 Controllers)**

Float phase maintains the battery at full charge after a bulk phase. The 'Max level' is the limit the battery should not be continuously charged beyond to maximise its life.

Float phase 'Min level' is when the controller will begin to regulate the charge current to the batteries until the voltage reaches the Float phase 'Max level' when charge current will be zero.

### **Return to Bulk Voltage level: (HRDi & 1200 Controllers)**

The Battery voltage level, below which it is considered to be sufficiently discharged to trigger another Bulk phase. The controller will change the regulation voltage levels back to the Bulk levels & the cycle begins again.

### **Low Battery Voltage Warning Level: (All Controllers)**

The Battery voltage level, below which the controller will warn that the battery is seriously discharged & loads should be switched off to prevent further discharge until the battery recovers.

### **System Voltage Detection: (HRDi & 1200 Controllers 12/24v only, dependant on Firmware revision)**

If set to the factory default 'Auto 12/24v', the controller will automatically detect the voltage of the system battery & configure itself when Battery 1 is first connected. In unusual cases when a 24v system is used & the battery is discharged to an extremely low level where there is insufficient voltage to power the electronics, (This would occur at an extremely low voltage which should be avoided since it can cause battery failure), if the voltage is then allowed to slowly rise, the voltage will first pass through 12v after the controller powers up & therefore will incorrectly configure itself for a 12v system. To prevent this, the controller can be configured for fixed 24v. *48v Controllers are fixed at 48v.*

### **Temperature Compensation: (All Controllers, dependant on Firmware revision)**

For lead acid battery systems, the battery voltage regulation levels should be adjusted for the battery temperature to ensure complete charging & to maximise battery life. If this is enabled, temperature compensation will be automatically applied to all the regulation levels based on the temperature detected by the remote temperature sensor. If the sensor is not connected or this feature is disabled, temperature compensation is not applied & default 25°C levels will be used.

### **Low temperature Shutdown: (All Controllers, dependant on Firmware revision) <sup>1</sup>**

Some battery chemistries require that charging is prevented below a certain low temperature. This feature can be enabled & a temperature level set which will cause the controller to shut down the charge sources when the temperature sensed by the remote sensor falls below this level. The charge sources will be automatically re-started when the temperature rises 1°C above this level. The remote temperature sensor MUST be connected for this to operate & it must be enabled in the parameter settings together with a minimum temperature setting.

### **Current Limit (1200 Controllers, dependant on Firmware revision)**

If this current is reached, the controller will shut down the turbine for a timed period.

**1803 MPC-2 controllers regulate charge levels using a cyclic method. The following settings are exclusive to 1803 controllers:**

#### **Stall Level: (1803 MPC-2 Controllers)**

This is the maximum charge level voltage, when the battery reaches this point continuously for a pre-set period, the controller will stall the turbine & charging will cease.

#### **Reset level (1803 MPC-2 Controllers)**

The Battery voltage level, below which the controller will switch back to charge mode.

#### **Max Voltage (1803 MPC-2 Controllers)**

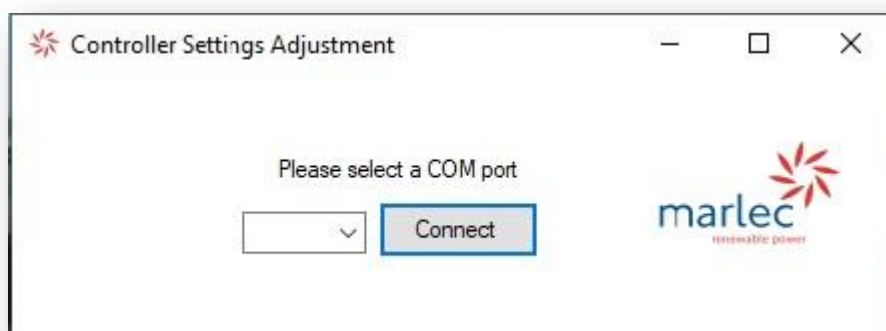
This is an absolute maximum voltage level which is set above the stall level, if this level is reached even momentarily, the turbine will stall & charging will cease. This prevents over voltage Alarms & trips in other equipment being triggered due to transient voltage excursions during very gusty wind conditions.

**Note: All the voltage levels above are nominal at 25°C.**

**It is the user's responsibility to ensure that any adjustments to settings are suitable for the batteries used. Incorrect settings can damage batteries & other system components or reduce battery life.**

## Setup & Using the Application

- Only use the Marlec Controller Interface cable (Marlec Part No CA-07/04) for connection of the controller to a PC USB port.
- Plug the USB connector into a free USB port on a PC running MS Windows XP® or later & allow Windows® to install the necessary drivers & configure the adapter.
- Select 'Devices and printers' from the Windows® menu & look for 'Marlec Controller Interface' in the list of devices. Double click this Icon & select the 'Hardware' tab. In the list of Device functions, make a note of the COM port No (in brackets beside 'USB Serial Port').
- Extract the application on the USB memory stick. The app can be run from the memory stick.
- Connect a DC power supply of the intended system voltage to the Battery terminals of the controller (Battery 1 on dual battery controllers). This can be the system battery (i.e. adjustments can be made while installed in the system), or it can be a DC power supply or battery on the bench.
- Ensure charge sources are shut down.
- Plug the RJ11 connector on the Interface cable into the data port on the controller.
- Start the PC application.



- At any time, clicking the Marlec Logo will connect to the Marlec Website if an internet connection is available.
- Select the COM port, previously noted, from the dropdown list. Click the 'Connect' button.
- If the application detects that the firmware version of your controller is not compatible or provides partial customization of parameters, a message to this effect may be displayed. <sup>2</sup>
- The controller type will be automatically detected and interrogated by the PC app; the settings currently stored in the controller memory available for adjustment will be displayed.
- If a 1200 Controller is detected & charge sources are in run mode, they will automatically be shut down.
- The regulation voltage levels will be in accordance with the nominal system voltage detected.
- If Low Temperature Shutdown is Enabled, an adjustable temperature setting will be displayed.<sup>1</sup>

- The settings can be adjusted to suit the battery system intended by selecting the arrows to the right of each box. **It is the user's responsibility to ensure that any settings are suitable for the intended battery system.**
- The 'Restore' button will return all settings to factory defaults & save them to the controller's memory.
- When the settings have been adjusted as desired, click the 'Save' button & the new settings will be sent to the controller to save in its memory. These new settings will be retained when the power is disconnected & reloaded when the controller is powered up.

**1200 Controller & HRDi appear very similar.**

The screenshot displays the 'Controller Settings Adjustment' window. At the top, it shows 'COM5 Connected' and a 'Disconnect' button. The Marlec logo is visible in the top right. The main section displays controller information: '1200 Terrain Controller P02012005', 'Firmware Rev1.0', and 'System Voltage: 12v'. Below this is the '1200 Settings' section with the following parameters:

Setting	Value	Unit
Bulk	13.80	V @ 25°C
Float	13.20	V @ 25°C
Return to Bulk	12.50	V @ 25°C
Low Voltage Warning	11.00	V @ 25°C
Temperature Compensation	Enabled	
Low Temperature Shutdown	Disabled	
Voltage detection	Auto	

A yellow warning box at the bottom states: 'The voltage levels above are at 25°C. Temperature Compensation will be applied to these levels if the remote Temperature Sensor is connected. Temperature Compensation will not be applied if the Temperature Sensor is not connected or it is Disabled in the settings options above.' At the bottom of the window are 'Save', 'Restore', and 'Exit' buttons.

Annotations on the image include:

- COM Port status:** Points to the 'COM5 Connected' text.
- Selected COM Port:** Points to the 'COM5' dropdown menu.
- Connected Controller Info:** Points to the controller name and system voltage.
- Click logo to Connect to Website:** Points to the Marlec logo.
- Connect/Disconnect COM Port Button:** Points to the 'Disconnect' button.
- Adjustable regulation voltage levels:** Points to the voltage input fields.
- Enabled or Disabled:** Points to the 'Temperature Compensation' dropdown.
- Enabled or Disabled<sup>1</sup>:** Points to the 'Low Temperature Shutdown' dropdown.
- Select Auto 12/24v or Fixed 24v. (Not on 48v Version):** Points to the 'Voltage detection' dropdown.
- Information:** Points to the yellow warning box.
- Restore Factory Defaults:** Points to the 'Restore' button.
- Save new settings to controller:** Points to the 'Save' button.

## Typical 1803 MPC-2 Display

The screenshot shows a software window titled "Controller Settings Adjustment" with standard window controls (minimize, maximize, close). At the top, it indicates "COM5 Connected" with a dropdown menu showing "COM5" and a "Disconnect" button. The Marlec logo is in the top right. The main display area shows the controller model "1803 MPC-2 Controller D22009002", "Firmware Rev 1.0", and "System Voltage: 24v". Below this is a section titled "MPC-2 Settings" containing several adjustable parameters:

Parameter	Value	Unit
Stall Level	28.80	V @ 25°C
Reset level	24.96	V @ 25°C
Low Voltage Warning	22.00	V @ 25°C
Max Voltage	30.00	V @ 25°C
Temperature Compensation	Enabled	
Low Temperature Shutdown	Disabled	

A yellow warning box contains the following text: "The voltage levels above are at 25°C. Temperature Compensation will be applied to these levels if the remote Temperature Sensor is connected. Temperature Compensation will not be applied if the Temperature Sensor is not connected or it is Disabled in the settings options above." At the bottom of the window are three buttons: "Save", "Restore", and "Exit".

**Notes:**

<sup>1</sup> *If Low temperature shut down is enabled, the temperature sensor must be connected which would normally automatically activate temperature compensation. If low temperature shutdown is required together with no temperature compensation, the temperature compensation must be disabled in the settings option.*

<sup>2</sup> *1200 Hybrid Controller Firmware can be upgraded by returning the controller to Marlec. The extent of available parameter adjustments is dependent on the age of the controller. Contact Marlec quoting your Serial Number to confirm.*

*The following are the available parameter adjustments following a Firmware upgrade to the latest available for the controller model:*

***Serial Numbers pre N01706001***

- *Bulk Charge Phase Voltage levels*
- *Float Charge Phase Voltage levels*
- *Return to Bulk Voltage level*
- *Low Voltage Warning level*

***Serial Numbers N01706001 and later***

- *Bulk Charge Phase Voltage levels*
- *Float Charge Phase Voltage levels*
- *Return to Bulk Voltage level*
- *Low Voltage Warning level*
- *Temperature Compensation; Enable/Disable*
- *Low Temperature Shutdown; Enable/Disable*
- *Low Temperature Shutdown; Temperature level*
- *Voltage detection; Auto or Fixed 24v (Not 48v versions)*
- *Max Current Limit*