2. Synchronisation

In order to keep your battery monitor delivering accurate status information about your battery, it is important to regularly synchronise your battery monitor with your battery. As explained in the quick start guide, a synchronisation step is also needed before you can actually use your battery monitor. During operation, the battery monitor automatically indicates when a synchronisation is required, by displaying “SYNCHRONISE”. A synchronisation step means nothing more than performing a complete charge cycle on your battery. A charge cycle will be considered complete when the battery voltage reaches the battery monitor alarm condition (F2.0). If F1.0 and F1.2 are set correctly, the battery monitor will automatically detect the full charge state of your battery and the message “FULL” will disappear when a key is pressed, or automatically, when the battery starts discharging again. Performing synchronisations regularly is also important to keep your battery healthy and to increase its lifetime. You will notice that your battery performs better and longer after a synchronisation.

Besides automatic synchronisations based on meeting the Auto-Sync Functions, you can also manually synchronise the battery monitor with your battery when you are sure your battery is fully charged. This can be accomplished by pressing F6.0 = “Auto-synch” and selecting “FULL” (this message appears on the display just like when it is automatically synchronised).

3. Status menu

The Status menu is a read only menu that shows the battery monitor’s current status of several items. This menu can be accessed by the following sequence:

When the Status menu is entered, you can use the + and - keys to browse through the different status items. By pressing the MENU key, the selected status item can be viewed. Pressing the MENU key again, will then step back to the Status menu. From any menu position, the Normal Operating Mode can be accessed again by pressing the MENU key for 3 seconds.

3.1 Alarm Status. When multiple alarms are activated, use the + or - keys to browse through the currently active alarms. If no alarms are activated, this item displays “-----”.

3.2 Days running. The number of days the battery monitor is operating to monitor your battery. This item resets when a battery reset is executed (see Reset menu).

3.3 Days since last synchronised. The number of days the battery monitor has not been synchronised. This item resets when the battery monitor is synchronised or when a battery reset is executed (see Reset menu).

3.4 Charge Efficiency Factor (CEF). The charge efficiency factor used by the battery monitor. Depending on the value set in Function F5.6, this item displays the automatically calculated CEF or the manually set CEF.

4. History menu

The History menu is a read only menu that shows the battery monitor’s History data. History data are special events that are stored in internal memory. This menu can be accessed by the following sequence:

When the History menu is entered, you can use the + and - keys to browse through the different History items. By pressing the MENU key, the selected History item can be viewed. Pressing the MENU key again, will then step back to the History menu. From any menu position, the Normal Operating Mode can be accessed again by pressing the MENU key for 3 seconds. The following History menu items are available:

4.1 Battery History

H1.0 Average discharge in Ah. This number will be recalculated after each synchronisation.

H1.1 Average discharge in %. This number will be recalculated after each synchronisation.

H1.2 Deep discharge in Ah. 

H1.3 Deep discharge in %. 

H1.4 Total Amp hours removed. The total number of Amp hours removed from the battery when synchronising 10000Ah, the units are kAh and the value displayed must be multiplied by 1000.

H1.5 Total Amp hours charged. The total number of Amp hours charged to the battery. These Amp hours are not compensated by the Charge Efficiency Factor (CEF). When synchronising every 10000Ah, the units are kAh and the value displayed must be multiplied by 1000.

F1.1 Number of cycles. 

F1.8 Number of full discharges. 

F2.1 Battery temperature. In this Function the average battery temperature can be adjusted. The value enables the automatic temperature measurement, provided that an external temperature sensor is connected to the battery monitor. Also the temperature readout in the Normal Operating Mode is enabled.

F2.4 Enable Battery low battery alarm / Use contact. Select “OFF” to disable the battery low battery alarm. Select “[1]” to use the battery monitor’s internal alarm relay. Select “[1]” to “[8]” to use an external alarm contact (only for use with optional Alarm output expander).

F3.1 Main battery low battery alarm On (% SOC). When the percentage falls below this value, the message “Lo” will appear on the display and the selected alarm relay will be activated (depending on F3.3).

F3.2 Main battery low battery alarm Delay. This is the time the Main battery low battery alarm On condition, F3.1, must be met in order to consider the battery as fully discharged. 

F3.3 Auxiliary battery low battery alarm On. When the Auxiliary battery voltage falls below this value, the message “Lo” will appear on the display and the selected alarm relay will be activated (depending on F3.5).

F3.4 Primary battery low battery alarm Delay. This is the time the Primary battery low battery alarm On condition, F3.3, must be met before the alarm is activated. 

F3.5 Secondary battery low battery alarm Delay. This is the time the Secondary battery low battery alarm On condition, F3.3, must be met before the alarm is activated.

F4.1 Enable Main battery low battery alarm / Use contact. Select “OFF” to disable the Main battery low battery alarm. Select “[1]” to “[8]” to use an external alarm contact (only for use with optional Alarm output expander).

F4.2 Enable Secondary battery low battery alarm / Use contact. Select “OFF” to disable the Secondary battery low battery alarm. Select “[1]” to “[8]” to use an external alarm contact (only for use with optional Alarm output expander).
### 6.5 Voltage precision

This function is only important when an optional voltage prescaler is installed on the battery monitor. All products use a 1000:1 prescaler. 

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Voltage precision is enabled.</td>
</tr>
<tr>
<td>0</td>
<td>Voltage precision is disabled.</td>
</tr>
</tbody>
</table>

Default: 1-Range: 1-1 / 1-5 / 1-10

### 6.6 Temperature unit selection

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Celsius (°C)</td>
</tr>
<tr>
<td>0</td>
<td>Fahrenheit (°F)</td>
</tr>
</tbody>
</table>

Default: 1

### 6.7 Communication mode

This function is used to configure the data output mode. There are four data output modes:

- **Mode 1**: WP-Pro (broadcast mode)
- **Mode 2**: WP-Pro (request mode)
- **Mode 3**: Expert 501 compatibility mode (broadcasting)
- **Mode 4**: Expert 501 compatibility mode (request only)

Default: 0

### 6.9 Setup lock

When set to "ON", all functions (except this one) are locked and cannot be altered. The reset menu is also locked.

Default: OFF

### 6.10 Reset menu

In the reset menu, you can reset a number of items of your battery monitor. This menu can be accessed by the following sequence:

```
[3 sec]
```

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>rSt.F</td>
<td>Reset Functions: resets all Function values to factory default values.</td>
</tr>
<tr>
<td>rSt.b</td>
<td>Reset Battery status: resets your current battery status (CEF, State-of-charge and battery history).</td>
</tr>
<tr>
<td>rSt.F</td>
<td>Resets all Function values to factory default values.</td>
</tr>
</tbody>
</table>

### 6.11 Charge Efficiency Factor (CEF)

This factor represents the difference between the energy removed from a battery during discharge and the energy used during charging to restore the original capacity. It is recomended to keep the value at 1.25. A value of 1.000 is the WP-Pro's compensation factor.

Default: 1.25

### 6.12 Shunt self-discharge rate

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>Continuous operation without battery connection.</td>
</tr>
<tr>
<td>-2</td>
<td>Continuous operation with battery connection.</td>
</tr>
<tr>
<td>-1</td>
<td>Continuous operation with battery connection.</td>
</tr>
<tr>
<td>0</td>
<td>Continuously charging or discharging.</td>
</tr>
<tr>
<td>1</td>
<td>Continuously charging or discharging.</td>
</tr>
<tr>
<td>2</td>
<td>Continuously charging or discharging.</td>
</tr>
</tbody>
</table>

Default: 0

### 6.13 Charge current

This parameter represents your battery monitor's ability to charge a battery's capacity. It is recomended to use 0.1A for full charge.

Default: 0

### 6.14 Communication mode

This function is used to select the communication mode for the WBM-Pro. There are four communication modes:

- **Mode 1**: WP-Pro (broadcast mode)
- **Mode 2**: WP-Pro (request mode)
- **Mode 3**: Expert 501 compatibility mode (broadcasting)
- **Mode 4**: Expert 501 compatibility mode (request only)

Default: 0

### 6.15 Setup lock

This function is used to set the setup lock function to OFF (Function F1.0, F1.1, F1.2 for possible wrong settings). When the menu is entered, you can use the < and > keys to browse through the different reset items. By pressing the menu key again, the menu will refresh and the current setup will be displayed.

Default: OFF

### 7. Troubleshooting guideline

<table>
<thead>
<tr>
<th>Problem</th>
<th>Remedy or suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>The monitor doesn't operate (no display)</td>
<td>Check monitor and battery side connections. Make sure the fuse is installed and not blown. Check battery voltage. Battery might be flat.</td>
</tr>
</tbody>
</table>