

**Manual**

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**Användarhandbok**

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**Blue Smart IP65 Charger**

**Manuale**

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**12/4**

**24/5**

**12/5**

**24/8**

**12/7**

**24/13**

**12/10**

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Appendix



## Safety instructions



- Always provide proper ventilation during charging.
- Avoid covering the charger.
- Never try to charge non-rechargeable or frozen batteries.
- Never place the charger on top of the battery when charging
- Prevent sparks close to the battery. A battery being charged could emit explosive gasses.
- Battery acid is corrosive. Rinse immediately with water if acid comes into contact with skin.
- This appliance is not designed for use by young children or people who cannot read or understand the manual unless they are under the supervision of a responsible person to ensure that they can use the battery charger safely. Store and use the battery charger out of the reach of children, and ensure that children cannot play with the charger.
- Connection to the mains supply must be in accordance with the national regulations for electrical installations. In case of a damaged supply cord please contact the manufacturer or your service agent.
- The battery terminal not connected to the chassis has to be connected first. The other connection is to be made to the chassis, remote from the battery and fuel line. The battery charger is then to be connected to the supply mains.
- After charging, disconnect the battery charger from the supply mains. Then remove the chassis connection and then the battery connection.

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victron energy



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## 1. Quick start guide

- a) Connect DC cables to the charger and then the battery or batteries; ensure that there is a good electrical connection and keep the terminals away from any surrounding objects that could cause a short circuit.



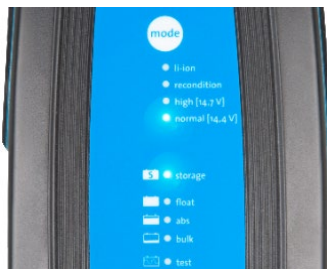
- b) Connect the AC power cable to a mains power outlet; the TEST LED will be illuminated or blink when the **blue smart charger** is powered up.

The TEST LED will continue to blink until a charge pulse is able to increase the battery voltage above 12.5V (25.0V for 24V chargers) or 2 minutes have elapsed.

If a fault is detected during the test phase (such as a short circuit, reverse polarity or incorrect charger voltage) all charge status LEDs will blink; in this case the charger should be immediately disconnected.

- c) Select the charge mode appropriate for the battery type; briefly press the MODE button to cycle through the available options, the LED beside the currently selected charge mode will be illuminated.





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The charger will automatically store the selected charge mode and recall it for future charge cycles (even after being disconnected from power).

When recondition mode is selected, the RECONDITION LED will be illuminated in addition to the selected charge mode LED.

If required, activate low current mode (reduced charge current); depress and hold the MODE button for 6 seconds, when activated the selected charge mode LED (normal / high / li-ion) will blink. Depress and hold the MODE button for 6 seconds again to end low current mode.

- d) When the ABS LED is illuminated the charger has moved into absorption stage (bulk stage is complete); the battery will be approximately 80% charged and may be returned into service if required.
- e) When the FLOAT LED is illuminated the charger has moved into float stage (absorption stage is complete); the battery will be fully (100%) charged and is ready to be returned into service.

- f) When the STORAGE LED is illuminated the charger has moved into storage mode (float stage is concluded); to maintain the battery at full charge, the battery can be left on continuous charge for an extended duration.
  
- g) Disconnect the AC power cable from the mains power outlet at any time to stop charging.



## 2. Features

a) **Bluetooth setup and monitoring (Using VictronConnect)**

Easily setup, monitor or update the charger firmware using the VictronConnect app and a Bluetooth enabled device (such as a mobile phone or tablet).

b) **Multi-stage charge algorithm**

The multi-stage charge algorithm is specifically engineered to optimise each recharge cycle and charge maintenance over extended periods.

c) **Adaptive absorption**

Adaptive absorption monitors the battery's response during initial charging and intelligently determines the appropriate absorption duration for each individual charge cycle.

This ensures that the battery is fully recharged regardless of the discharge level or capacity and avoids excessive time at the elevated absorption voltage (that can accelerate battery aging).

d) **Temperature compensation**

Charge voltage is automatically compensated depending on the ambient temperature; this ensures that the battery is charged at the optimal charge voltage regardless of the climate and avoids the need for manual settings adjustments.

Temperature compensation is not required and automatically disabled when in LI-ION charge mode.

e) **High efficiency**

The **blue smart charger** range is up to ~95% efficient; resulting in lower power usage, less heat generated and cooler operation.

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- f) **Durable and safe**
- i. Engineered to provide years of trouble-free and dependable operation in all usage conditions
  - ii. Protection against overheating: output current will be reduced if the charger temperature increases to 50°C
  - iii. Protection against short circuit: If a short circuit condition is detected all status-LEDs will start blinking
  - iv. Protection against reverse polarity connection: If the charger is incorrectly connected with reverse polarity all status-LEDs will start blinking
  - v. Protection against ingress of dust and water/liquid

g) **Silent operation**

Charger operation is totally silent: there is no cooling fan or moving parts.

h) **Lithium Ion compatible**

Compatible with Li-ion (LiFePO<sub>4</sub>) batteries; when the integrated LI-ION charge mode is selected the charge cycle settings are altered to suit.

If the charger is connected to a battery where under voltage protection (UVP) has tripped, the **blue smart charger** range will automatically reset UVP and start charging; many other chargers will not recognise a battery in this state.

**Warning: Never charge a Li-ion battery when its temperature is below 0°C.**

i) **Storage stage**

An additional stage to extend battery life whilst the battery is unused and on continuous charge.



- j) **Recondition stage**  
An optional stage that can partially recover/reverse lead acid battery degradation due to sulfation; typically caused by inadequate charging or if the battery is left in a deeply discharged state.
- k) **Low current mode**  
An optional mode that limits the maximum charge current to a significantly reduced level; recommended when charging lower capacity batteries with a high current charger.
- l) **Recovery function**  
The **blue smart charger** range will attempt to recharge a severely discharged battery (even down to 0V) with low current and then resume normal charging once the battery voltage has risen sufficiently - many other chargers will not recognise a battery in this state.
- m) **Power supply mode**  
A specific mode to use the charger as a DC power supply; to power equipment at a constant voltage with or without a battery connected.

## 3. Operation

### 3.1 Multi-stage charge algorithm

The Victron **blue smart charger** range are intelligent multi-stage battery chargers, specifically engineered to optimise each recharge cycle and charge maintenance over extended periods.

The multi-stage charge algorithm includes the individual charge stages described below:

#### 1. Test/Charge

Before the charge cycle commences the battery is tested to determine if it will accept charge, even if the battery is fully discharged (close to 0V open circuit voltage) it may successfully accept charge.

The TEST LED will continue to blink until a charge pulse is able to increase the battery voltage above 12.5V (25.0V for 24V chargers) or 2 minutes have elapsed.

If there is a clear issue such as reverse polarity connection, a short circuit or if a 12V charger is connected to a 24V battery, the battery will be rejected, and all charge status LEDs will blink; in this case the charger should be immediately disconnected.

If the test phase persists for an extended period and the battery casing becomes unusually hot (after moving into bulk stage), its likely that the battery is damaged and has an developed an internal short circuit; in this case the charger should also be immediately disconnected.

If a load is simultaneously connected while attempting to test and charge a deeply discharged battery a false rejection may occur; in this case all loads should be disconnected, and the test stage repeated.



## 2. Bulk

The battery is charged at maximum charge current until the voltage increases to the configured absorption voltage.

The bulk stage duration is dependent on the battery's level of discharge, the battery capacity and the charge current.

Once the bulk stage is complete, the battery will be approximately 80% charged and may be returned into service if required.

## 3. Absorption

The battery is charged at the configured absorption voltage, with the charge current slowly decreasing as the battery approaches full charge.

The absorption stage duration is adaptive and intelligently varied depending on the battery's level of discharge – this is determined from the duration of the bulk charge stage.

The absorption stage duration can vary between a minimum of 30 minutes, up to a maximum limit of 8 hours (or as configured) for a deeply discharged battery.

## 4. Recondition

The battery is charged at low current until the voltage increases to the configured recondition voltage.

Recondition is an optional charge stage for lead acid batteries and not recommended for regular/cyclic use - use only if required, as unnecessary or overuse will reduce battery life due to excessive gassing.

The higher charge voltage during recondition stage can partially recover/reverse battery degradation due to sulfation, typically caused by inadequate charging or if the battery is left

in a deeply discharged state for an extended period (if performed in time).

The recondition stage may also be applied to flooded batteries occasionally to equalise individual cell voltages and prevent acid stratification.

During recondition stage the charge current is limited to 8% of the nominal charge current, (for example - 1.2A for a 15A charger) and the stage is terminated as soon as the battery voltage increases to the configured recondition voltage or after a maximum duration of 1 hour (or as configured).

#### **5. Float**

The battery voltage is maintained at the configured float voltage to prevent discharge.

Once float stage is commenced the battery is fully charged and ready for use.

The float stage duration is also adaptive and varied between 4 to 8 hours depending on the duration of the absorption charge stage, at which point the charger determines the battery to be in storage stage.

#### **6. Storage**

The battery voltage is maintained at the configured storage voltage, which is slightly reduced compared to the float voltage to minimise gassing and extend battery life whilst the battery is unused and on continuous charge.

#### **7. Refresh**

To refresh the battery and prevent slow self-discharge while in storage stage over an extended period, a 1 hour absorption charge will automatically occur every 7 days (or as configured).



## 3.2 Temperature compensation

The Victron **blue smart charger** range will automatically compensate the configured charge voltage based on ambient temperature (unless disabled or in Li-ion mode).

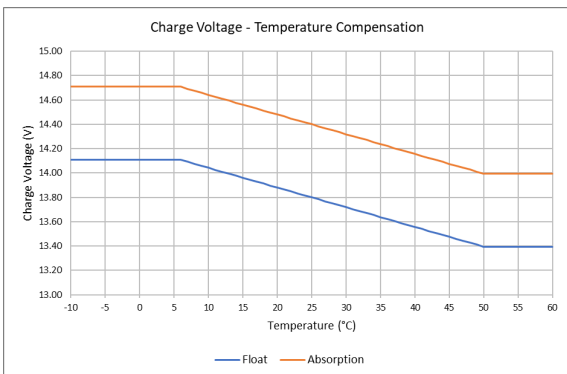
The optimal charge voltage of a lead acid battery varies inversely with battery temperature; automatic temperature-based charge voltage compensation avoids the need for special charge voltage settings in hot or cold environments.

During power up the charger will measure its internal temperature and use that temperature as the reference for temperature compensation, however the initial temperature measurement is limited to 25°C as it's unknown if the charger is still warm from earlier operation.

Since the charger generates some heat during operation, the internal temperature measurement is only used dynamically if the internal temperature measurement is considered reliable; when the charge current has decreased to a low/negligible level and adequate time has elapsed for the charger's temperature to stabilise.

The configured charge voltage is related to a nominal temperature of 25°C and linear temperature compensation occurs between the limits of 6°C and 50°C based on the default temperature compensation coefficient of 16.2mV/°C (for 24v chargers multiply the coefficient by 2) or as configured.

The temperature compensation coefficient is specified in mV/°C and applies to the entire battery/battery bank (not per battery cell).





### 3.3 Commencing a new charge cycle

A new charge cycle will commence when:

- i. Bulk stage is complete and the current output increases to the maximum charge current for four seconds (due to a simultaneously connected load)
- ii. If re-bulk current is configured; the current output exceeds the re-bulk current in float or storage stage for four seconds (due to a simultaneously connected load)
- iii. The MODE button is pressed or a new charge mode is selected
- iv. VictronConnect is used to select a new charge mode or change the function from 'Power Supply' to 'Charger' mode
- v. The AC supply has been disconnected and reconnected

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### 3.4 Estimating charge time

A lead acid battery is at approximately 80% state of charge (SOC) when the bulk charge stage is completed.

The bulk stage duration  $T_{\text{bulk}}$  can be calculated as  $T_{\text{bulk}} = Ah / I$ , where  $I$  is the charge current (excluding any loads) and  $Ah$  is the depleted battery capacity below 80% SOC.

An absorption period  $T_{\text{abs}}$  of up to 8 hours may be required to fully recharge a deeply discharged battery.

For example, the charge time of a fully discharged 100Ah battery when charged with a 10A charger to approximately 80% SOC is  $T_{\text{bulk}} = 100/10 = 10$  hours.

Including an absorption duration of  $T_{\text{abs}} = 8$  hours, the total estimated charge time would be  $T_{\text{total}} = T_{\text{bulk}} + T_{\text{abs}} = 10 + 8 = 18$  hours.

A Li-ion battery is more than 95% charged at the end of the bulk stage and reaches 100% charge after approximately 30 minutes of absorption charge.



## 4. Setup

### 4.1 Using the MODE button

There are 3 easily selectable integrated charge modes that are suitable for most common battery types, as well as an optional recondition stage that can be included (except for Li-ion mode).

Any settings made are stored and will not be lost when the charger is disconnected from mains power or the battery.

#### a) Charge voltage

By simply selecting the appropriate charge mode for the battery type being charged, (refer to the battery manufacturer's recommendations) the voltage settings for each charge stage will be altered according to the table below:

Mode	Absorption	Float	Storage	Recondition
<b>Normal</b>	14.4V	13.8V	13.2V	16.2V
<b>High</b>	14.7V	13.8V	13.2V	16.5V
<b>Li-ion</b>	14.2V	13.5V	13.5V	N/A

Note: For 24V chargers multiply all voltages by 2.

Charge voltage is also automatically compensated depending on ambient temperature (except for Li-ion mode) - see section 3.2 'Temperature compensation' for more information.

The desired charge mode can be selected by briefly pressing the MODE button to cycle through the charge modes – the LED beside the active charge mode (NORMAL / HIGH / LI-ION) will be illuminated.

**b) Recondition mode**

If enabled the recondition stage is included in the charge cycle; use only if required as a corrective/maintenance action - see section 3.1 / 4 'Recondition' for more information.

If recondition mode is enabled the RECONDITION LED will be illuminated and blink during recondition stage.

**c) Low current mode**

If enabled the charge current is continuously limited to a significantly reduced level (varies per model - refer to specifications) compared to the nominal charge current.

Low current mode is recommended when charging lower capacity batteries with a high current charger, for example some lead acid batteries can overheat if charged with a current that exceeds 0.3C (more than 30% of the battery capacity in Ah).

To enable low current mode, depress and hold the MODE button for 6 seconds; the selected mode LED (normal / high / li-ion) will blink once activated.

To disable low current mode, also depress and hold the MODE button for 6 seconds.



## 4.2 Using VictronConnect

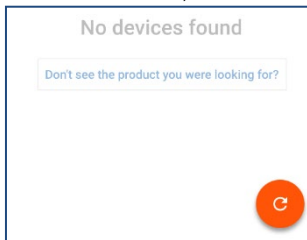
With the **blue smart charger** range, selection of an integrated charge mode and other general settings can also be made with a Bluetooth enabled device (such as a mobile phone or tablet); using the VictronConnect app.

For further details about the VictronConnect app refer to the online user manual:

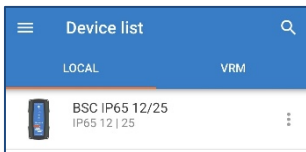
<https://www.victronenergy.com/live/victronconnect:start>

To setup the charger using VictronConnect:

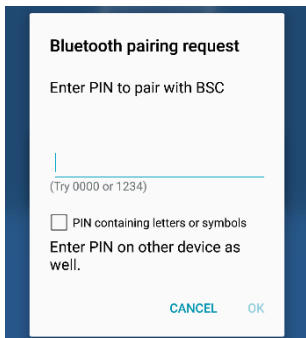
- i. Download and install the VictronConnect app.  
The VictronConnect app can be downloaded from the following locations:  
Android – Google Play Store  
iOS/Mac – Apple App Store
- ii. Enable Bluetooth on the mobile phone or tablet (if not already enabled).
- iii. Open the VictronConnect app and look for the **blue smart charger** in the LOCAL page, if it doesn't automatically appear perform a scan for devices in range by selecting the 'scan' button (round orange button with circular arrow) in the bottom right corner.



- iv. Select the **blue smart charger** from the local device list.



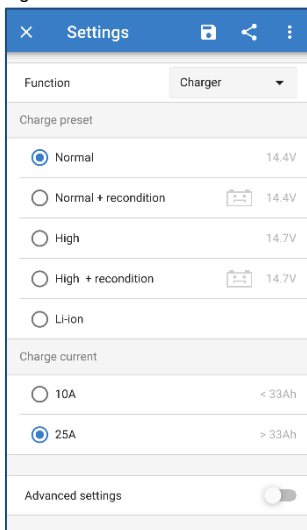
- v. During initial connection a 'Bluetooth pairing request' prompt will appear requesting the Bluetooth PIN code; enter the default PIN code 000000.



- vi. Access the settings menu by selecting the 'setting' icon (gear) in the top right corner.



- vii. Select the required 'charge preset' and the 'maximum charge current' (standard or low) directly from the settings list.



- viii. The indicator LEDs on the **blue smart charger** will be illuminated to confirm the active charge mode and settings implemented.

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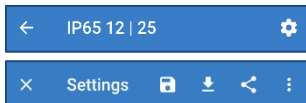
## 4.3 Bluetooth

### a) Changing the PIN code

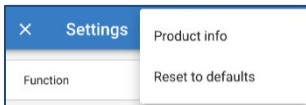
To prevent an unauthorised Bluetooth connection, it is highly recommended to change the default PIN code.

To change the Bluetooth PIN code:

- i. Complete initial Bluetooth pairing and connection using the default PIN code (000000)
- ii. Access the 'device options' by selecting the 'settings' icon (gear) in the top right corner, then the 'device options' icon (three vertical dots).

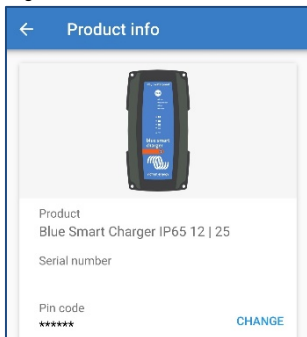


- iii. Open the 'Product info' page by selecting 'Product info'.

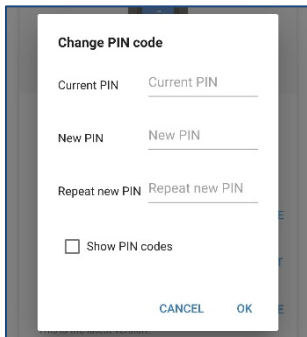




- iv. Beside 'Pin code' select 'CHANGE' to open the 'Change PIN code' window.



- v. Enter the current and new PIN code (twice), then select OK; avoid using an obvious PIN code that is easy for someone else to guess, such as 11111 or 123456.



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## b) **Resetting the PIN code**

If the PIN code is forgotten or lost, it can be easily reset to the default 000000 using the MODE button on the charger.

### **Using the MODE button**

To reset the Bluetooth PIN code:

- i. Depress and hold the MODE button (on the **blue smart charger**) for 10 seconds.
- ii. After 10 seconds have elapsed all blue LEDs will blink twice to indicate that the PIN code has been reset.

During this procedure:

- i. The PIN code is reset to default (000000)
- ii. Any active Bluetooth connections are disconnected
- iii. All Bluetooth pairing information is cleared

Subsequently, before attempting to re-connect it's also necessary to remove/clear the **blue smart charger** Bluetooth pairing information from any devices (mobile phones or tablets) that were previously paired.

## c) **Disabling Bluetooth**

It is possible to totally disable Bluetooth communication if desired.

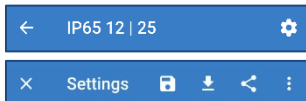
Typically, there is no need to disable Bluetooth since unauthorised access is protected with a PIN code, but certain situations may warrant it for an even higher level of security.

To disable Bluetooth:

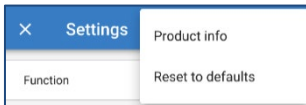
- i. Complete initial Bluetooth pairing and connection using the default PIN code (000000) or the current PIN code set.



- ii. Access the 'device options' by selecting the 'settings' icon (gear) in the top right corner, then the 'device options' icon (three vertical dots).



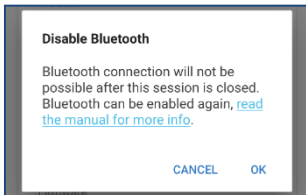
- iii. Open the 'Product info' page by selecting 'Product info'.



- iv. Beside 'Bluetooth Enabled' select 'DISABLE' to open the 'Disable Bluetooth' window.



- v. Select 'OK' as confirmation.



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**d) Re-enabling Bluetooth**

It is possible to re-enable Bluetooth using the MODE button.

To re-enable Bluetooth:

- i. Depress and hold the MODE button (on the **blue smart charger**) for 10 seconds.
- ii. After 10 seconds have elapsed all blue LEDs will blink twice to indicate that Bluetooth has been re-enabled, and all Bluetooth settings reset.

During this procedure:

- i. Bluetooth is re-enabled
- ii. The PIN code is reset to default (000000)
- iii. Any active Bluetooth connections are disconnected
- iv. All Bluetooth pairing information is cleared

Subsequently, before attempting to re-connect it's also necessary to remove/clear the **blue smart charger** Bluetooth pairing information from any devices (mobile phones or tablets) that were previously paired.



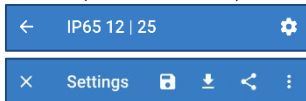
## 4.4 System reset

It is possible to perform a full system reset to restore all charger/battery related settings to their default value; using the VictronConnect app.

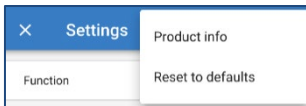
Note that this does **not** reset any Bluetooth related settings, such as the PIN code or pairing information.

To perform a system reset:

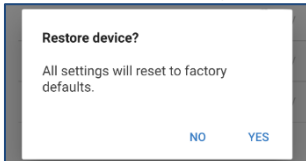
- i. Access the 'device options' by selecting the 'settings' icon (gear) in the top right corner, then the 'device options' icon (three vertical dots).



- ii. Open the 'restore device' page by selecting 'Reset to defaults'.



- iii. Select 'YES' to reset all settings to factory defaults.



## 5. Monitoring (Using VictronConnect)

The charger operation and recharge statistics can be closely monitored live or post charging with a Bluetooth enabled device (such as a mobile phone or tablet) using the VictronConnect app.

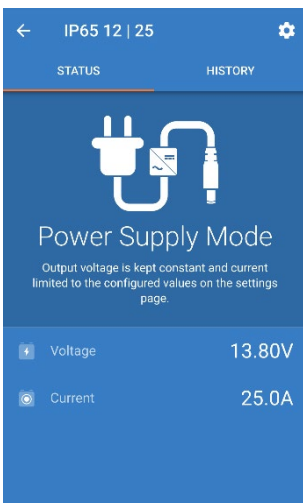
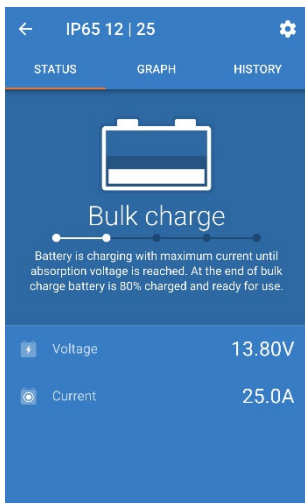
There are 3 different overview screens available (STATUS, GRAPH and HISTORY), each displaying different monitoring or historical data; spanning back over the last 40 charge cycles.

The desired screen can be selected by either selecting the window title or by swiping across between screens.

## 5.1 Status screen

The STATUS screen is the main overview screen; it displays the battery voltage, the charge current and the active charge stage.

This data will update continuously and in real time as the charge cycle progresses.



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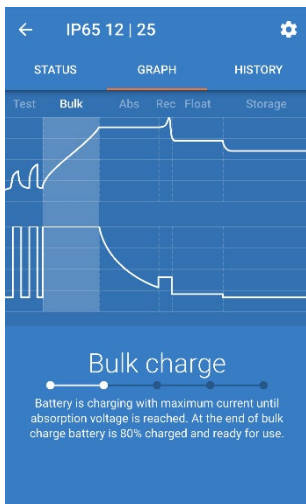
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## 5.2 Graph screen

The GRAPH screen provides an easy to understand graphical representation of each charge stage with respect to battery voltage and charge current.

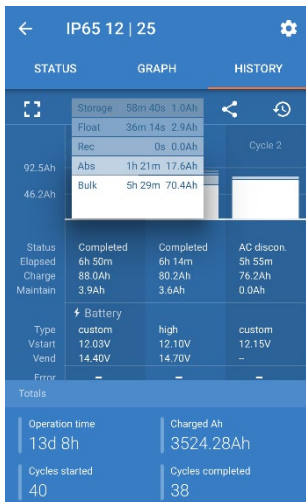
The active charge stage is also highlighted and stated below, along with a brief explanation.





## 5.3 History screen

The HISTORY screen is a very powerful reference as it contains historical usage data over the charger's lifetime and detailed statistics for the last 40 charge cycles (even if the charge cycle is only partially completed).

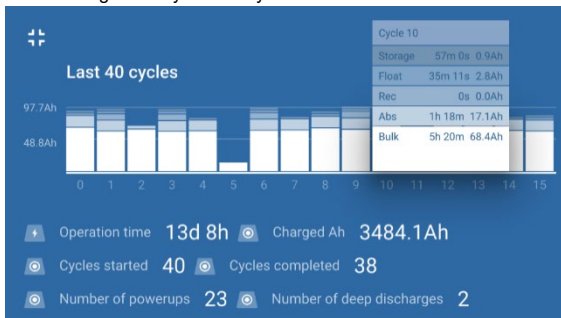


### a) Independent charge cycle statistics

- Cycle overview:** Expandable bar chart showing the time spent in each charge stage and the charge capacity provided (in Ah) during each charge stage
- Status:** Confirms if the charge cycle was successfully completed or if it was ended early/interrupted for some reason, including the reason/cause

- iii. **Elapsed:** The elapsed/total charge cycle time
- iv. **Charge:** Total capacity provided during the recharge stages (Bulk and Absorption)
- v. **Maintain:** Total capacity provided during the charge maintenance stages (Float, Storage and Refresh)
- vi. **Type:** The charge cycle mode used; either a 'Built-in preset' or a custom 'User defined' configuration
- vii. **Vstart:** Battery voltage when charging commences
- viii. **Vend:** Battery voltage when charging is complete (end of absorption stage)
- ix. **Error:** Displays if any errors occurred during the charge cycle, including the error number and description

By selecting the full screen view the data is displayed in landscape view with significantly more days visible at the same time.



**b) Charger lifetime statistics**

- i. **Operation Time:** The total operation time over the lifetime of the charger
- ii. **Charged Ah:** The total charge capacity provided over the lifetime of the charger
- iii. **Cycles started:** The total charge cycles started over the lifetime of the charger
- iv. **Cycles completed:** The total charge cycles completed over the lifetime of the charger
- v. **Cycles completed %:** The percentage of charge cycles completed over the lifetime of the charger
- vi. **Number of power-ups:** The number of times the charger has been powered up over the lifetime of the charger
- vii. **Number of deep discharges:** The number of times the charger has recharged a deeply discharged battery over the lifetime of the charger

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## 6. Advanced Configuration (Using VictronConnect)

In specific use cases where the integrated charge modes are not suitable/ideal for the battery type being charged or the battery manufacturer recommends specific charge parameters and fine tuning is desired, advanced configuration is possible with a Bluetooth enabled device (such as a mobile phone or tablet) using the VictronConnect app.

For most common battery types, advanced configuration is not required or recommended; the integrated charge modes and adaptive charge logic are typically suitable and perform very well.



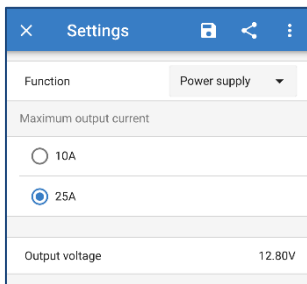
## 6.1 Power supply function

The Victron **blue smart charger** range are also suitable for use as a DC power supply, to power equipment without a battery connected (or while also connected to a battery).

While it's still possible to use the charger as a power supply without changing any settings, a dedicated 'Power supply' mode exists for this purpose/usage.

If the charger will be used as a power supply, it is recommended to activate 'Power supply' mode, as it will disable the internal charge logic and provide a constant DC supply voltage.

To activate power supply mode, open the settings menu and in the 'Function' drop down menu select 'Power supply' mode; once activated the BULK, ABS, FLOAT and STORAGE LEDs will be illuminated.

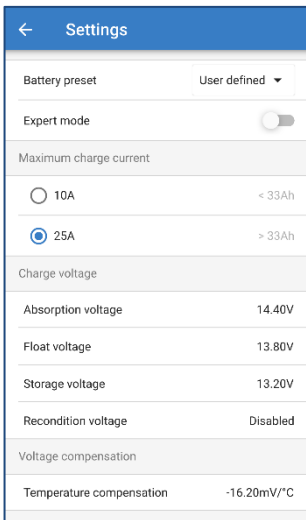


It is also possible to enable low current mode while in power supply mode and to specify the desired output voltage.

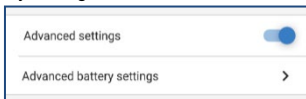
To return the charger back to normal use as a battery charger, access the settings menu and in the 'Function' drop down menu select 'Charger' mode again.

## 6.2 Advanced settings

The advanced settings menu enables specific configuration of charge parameters and user defined settings to be saved and easily loaded.



To access the advanced settings menu, open the general settings menu and enable the 'Advanced settings' switch, then select 'Advanced battery settings'.



The settings in the advanced menu (with expert mode disabled) include:

**a) Battery preset**

The 'Battery preset' dropdown allows selection from the following options:

- i. Built-in preset**  
Selection of a standard integrated pre-set (same as the general settings menu)
- ii. User defined**  
Reselection of the last 'user defined' charge settings
- iii. Select preset**  
Selection from an extended range of integrated battery charging pre-sets, including new user defined charging pre-sets
- iv. Create preset**  
A new charging preset to be created and saved from user defined settings
- v. Edit presets**  
An existing preset to be edited and saved

**b) Maximum charge current**

The maximum charge current setting allows selection between the standard (full current) or a significantly reduced charge current limit (varies per model - refer to specifications), same as through the general settings menu.

**c) Charge voltage**

- i. Absorption, Float, Storage and Recondition voltage**  
The absorption, float, storage and recondition voltage settings enables the voltage setpoint for each charge stage to be independently configured and some charge stages (recondition and float) to be disabled or enabled.

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**d) Voltage compensation**

**i. Temperature Compensation**

The temperature compensation setting enables the charge voltage temperature compensation coefficient to be configured, or temperature compensation to be totally disabled (such as for Li-ion batteries).

The temperature compensation coefficient is specified in  $\text{mV}/^{\circ}\text{C}$  and applies to the entire battery/battery bank (not per battery cell).





## 6.3 Expert mode settings

Expert mode expands the advanced settings menu even further to include more specialised configuration settings.

The screenshot shows the 'Settings' screen in the Victron Energy app. The 'Expert mode' toggle is turned on. The 'Maximum charge current' is set to 25A. The 'Charge voltage' section includes Absorption voltage (14.40V), Float voltage (13.80V), Storage voltage (13.20V), and Recondition voltage (Disabled). The 'BatterySafe' feature is also turned on. The 'Voltage compensation' section shows a temperature compensation of -16.20mV/°C. The 'Bulk' section includes a bulk time limit of 10h 0m and a disabled re-bulk current. The 'Absorption' section includes adaptive absorption time (turned on), a maximum absorption time of 8h 0m, and repeated absorption every 7 days. The 'Recondition' section includes a recondition stop mode set to 'Automatic, on voltage' and a maximum recondition duration of 1h 0m.

Setting	Value
Battery preset	User defined
Expert mode	On
Maximum charge current	25A (> 33Ah)
Charge voltage	
Absorption voltage	14.40V
Float voltage	13.80V
Storage voltage	13.20V
Recondition voltage	Disabled
BatterySafe	On
Voltage compensation	
Temperature compensation	-16.20mV/°C
Bulk	
Bulk time limit	10h 0m
Re-bulk current	Disabled
Absorption	
Adaptive absorption time	On
Maximum absorption time	8h 0m
Repeated absorption	Every 7 days
Recondition	
Recondition stop mode	Automatic, on voltage
Maximum recondition duration	1h 0m

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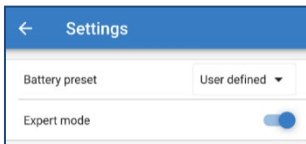
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To access expert mode and expand the advanced settings menu, enter the advanced setting menu and enable the 'Expert mode' switch.



The **additional** settings in the advanced menu with expert mode enabled include:

a) **Charge Voltage**

i. **BatterySafe**

The BatterySafe setting allows the BatterySafe voltage control to be enabled or disabled. When BatterySafe is enabled, the rate of battery voltage increase during bulk stage is automatically restricted to a safe level.

In cases where the battery voltage would otherwise increase at a faster rate, the charge current is consequently reduced to prevent excessive gassing.

b) **Bulk**

i. **Bulk time limit**

The bulk time limit setting restricts the maximum time the charger can spend in bulk stage as a protection measure, since the absorption voltage should have been achieved by this time. If the bulk time limit is satisfied the charger will move directly to float stage.

ii. **Re-bulk current**

The re-bulk current setting is the charge current limit that will trigger a new charge cycle if exceeded during float or storage stage, causing the charger to move back into bulk charge stage.

Note that even when the re-bulk setting is disabled, re-bulk will still occur if the charge current is maintained at the maximum charge current for 4 seconds.

c) **Absorption**

i. **Adaptive absorption time**

The adaptive absorption time setting allows selection between adaptive absorption time (if enabled) or a fixed absorption time (if disabled).

ii. **Absorption time**

The adaptive absorption time setting enables the maximum adaptive absorption time or the fixed absorption time to be configured (depending if adaptive absorption time is enabled or disabled).

iii. **Repeated absorption**

The repeated absorption time setting enables the elapsed time between each automatic refresh charge cycle (1h in absorption stage) to be configured.

d) **Recondition**

i. **Recondition stop mode**

The recondition stop mode setting allows selection between the recondition stage being ended upon the battery voltage reaching the recondition stage voltage setpoint or a fixed time period.

ii. **Recondition duration**

The recondition time setting enables the maximum recondition time or the fixed recondition time to be configured (depending on the recondition stop mode selected).

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## 7. Specifications

Blue Smart IP65 Charger	12V 4/5/7/10/15/25A	24V 5/8/13A
Input voltage	230VAC	
Efficiency	94%	95%
Standby power consumption	0.5W	
Minimum battery voltage	Starts charging from 0V (dead battery)	
Charge voltage 'absorption'	Normal: 14.4V High: 14.7V Li-ion: 14.2V	Normal: 28.8V High: 29.4V Li-ion: 28.4V
Charge voltage 'float'	Normal: 13.8V High: 13.8V Li-ion: 13.5V	Normal: 27.6V High: 27.6V Li-ion: 27.0V
Charge voltage 'storage'	Normal: 13.2V High: 13.2V Li-ion: 13.5V	Normal: 26.4V High: 26.4V Li-ion: 27.0V
Output current, normal mode	4 / 5 / 7 / 10 / 15 / 25A	5 / 8 / 13A
Output current, low current mode	2 / 2 / 2 / 3 / 4 / 10A	2 / 3 / 4A
Temperature compensation (lead-acid batteries)	16 mV/°C	32 mV/°C
Charge algorithm	7-stage adaptive	
Can be used as power supply	Yes	
Back current drain	0.7Ah/month (1mA)	
Protection	Reverse polarity, Output short circuit, Over temperature	
Operating temperature	-30 to +50°C (full rated output up to 30°C)	
Humidity (non condensing)	Max 95%	
<b>ENCLOSURE</b>		
Battery-connection	Black and red cable of 1.5 meter	
230 V AC-connection	Cable of 1.5 meter with CEE 7/7, BS 1363 plug (UK) or AS/NZS 3112 plug	
Protection category	IP65 (splash and dust proof)	
Weight	IP65 12V 25A 24V 13A: 1.9kg Other: 0.9kg	
Dimensions (h x w x d)	IP65s 12V 4/5A: 45x81x182mm IP65 12V 7A, 24V 5A: 47x95x190mm IP65 12V 10/15A, 24V 8A: 60x105x190mm IP65 12V 25A, 24V 13A: 75x140x240mm	
<b>STANDARDS</b>		
Safety	EN 60335-1, EN 60335-2-29	
Emission	EN 55014-1, EN 61000-6-3, EN 61000-3-2	
Immunity	EN 55014-2, EN 61000-6-1, EN 61000-6-2, EN 61000-3-3	



## Five year limited warranty

This limited warranty covers defects in materials and workmanship in this product, and lasts for five years from the date of original purchase of this product.

The customer must return the product together with the receipt of purchase to the point of purchase.

This limited warranty does not cover damage, deterioration or malfunction resulting from alteration, modification, improper or unreasonable use or misuse, neglect, exposure to excess moisture, fire, improper packing, lightning, power surges, or other acts of nature.

This limited warranty does not cover damage, deterioration or malfunction resulting from repairs attempted by anyone unauthorized by Victron Energy to make such repairs.

Victron Energy is not liable for any consequential damages arising from the use of this product.

The maximum liability of Victron Energy under this limited warranty shall not exceed the actual purchase price of the product.

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# Victron Energy Blue Power

Distributor:

Serial number:

Version : 5

Date : July 7th, 2020