



Blue Smart IP65 Charger

6V/12V — 1.1A | 0.5A 100/240VAC

VECIP65-6-12/1.1

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1. Safety Instructions



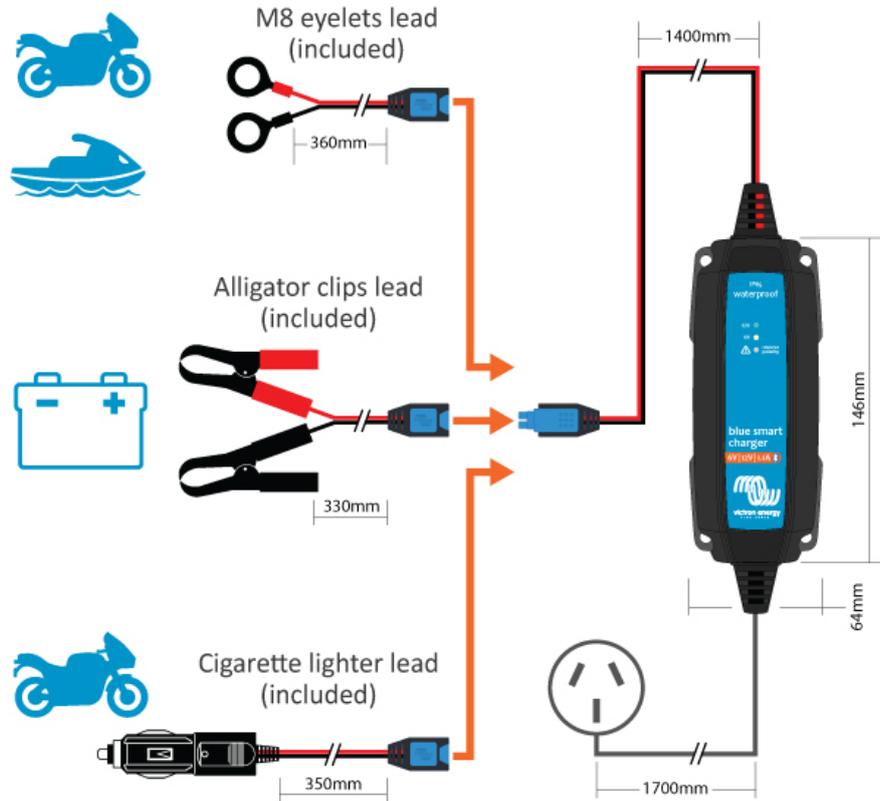
CAUTION: CAREFULLY READ AND FOLLOW ALL SAFETY INSTRUCTIONS

- Ensure the area around the battery and charger is properly ventilated.
- Do not cover or place any objects on top of the charger.
- Do not place the charger on top of the battery.
- Ensure that there are no sparks or ignition sources near the battery; batteries can emit explosive gases while being charged.
- Battery acid is corrosive; if battery acid comes into contact with skin immediately rinse with water.
- Do not attempt to charge non-rechargeable or frozen batteries.
- The charger must not be used by children or people who cannot read and understand the instruction manual, unless they are under strict supervision of a responsible person to ensure the charger is used safely.
- Store and use the charger out of the reach of children.
- The charger must be connected in the following order:
 - i. Connect the DC cable to the battery terminal that is not connected to the chassis
 - ii. Connect the remaining DC cable to the chassis, away from the battery and any fuel lines/sources
 - iii. Connect the AC power cable to a mains power outlet
- After charging, the charger must be disconnected in the following order (reverse of the connection order):
 1. Disconnect the AC power cable from the mains power outlet
 2. Disconnect the DC cable that is connected to the chassis
 3. Disconnect the DC cable connected to the battery terminal
- Connection to the mains supply must be in accordance with local electrical regulations. In case the AC power cable is damaged, contact the manufacturer or a service agent.
- The charger must only be plugged into an earthed AC mains power outlet.
- The default charge mode and adaptive charge logic is well suited for most common battery types; such as flooded lead-acid, AGM and Gel.

NB. Selection of lithium charge mode and advanced configuration with user defined settings is only possible using the VictronConnect app and a Bluetooth enabled device (such as a mobile phone or tablet).

2. Quick Start Guide

1. Download the VictronConnect App from the Google Play or Apple App Stores to your mobile Device. Use the VictronConnect App to configure, monitor, update and diagnose your Blue Smart IP65 1.1/0.5A Blue Smart Charger.
2. 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.



3. Select the charge mode appropriate for the battery type / chemistry; using the VictronConnect app select the required charge preset and the 'maximum charge current' (standard or low) directly from the settings list – see section 5.2 'Using VictronConnect' for more information. The charger will automatically store the previous selected charge mode and recall it for future charge cycles (even after being disconnected from power). The Battery Voltage is reset to Auto select as a default every time the charger is powered up.

Battery voltage	Auto
Charge preset	
<input checked="" type="radio"/> Normal	7.2V
<input type="radio"/> Normal + recondition	7.2V
<input type="radio"/> High	7.3V
<input type="radio"/> High + recondition	7.3V
<input type="radio"/> Li-ion	
Charge current	
<input type="radio"/> 0.5A	< 2Ah
<input checked="" type="radio"/> 1.1A	> 2Ah

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4. When the appropriate STATUS 12V (green) or 6V (orange) LED is illuminated and fast flashing the charger is in bulk stage.
5. When the appropriate STATUS 12V (green) or 6V (orange) LED is illuminated and slow flashing the charger has moved into absorption stage (bulk stage is complete). The battery will be approximately 80% charged (or >95% for Li-ion batteries) and may be returned into service if required.
6. When the appropriate STATUS 12V (green) or 6V (orange) LED is illuminated and is a solid light the charger has moved into Storage mode (float stage is concluded if applicable); To maintain the battery at full charge, the battery can be left on continuous charge for extended durations.
7. When the Reverse Polarity (red) LED is on and the 12V (green) or 6V (orange) LED's are flashing alternately the charger is in fault mode. Turn off the charger and reconnect the leads to the correct terminals.
8. Disconnect the AC power cable from the mains power outlet at any time to stop charging.



LED Status Indication	
12V Bulk Charge	Fast flashing green
12V Absorption Charge	Slow flashing green
12V Float/Storage	Solid green
6V Bulk Charge	Fast flashing orange
6V Absorption Charge	Slow flashing orange
6V Float/Storage	Solid orange
Reverse Polarity	Solid red with fast flashing green and orange

3. 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.

Blue Smart IP65 6V/12V — 1.1A / 0.5A 100/240 VAC = 85% efficiency
- 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 the charger will immediately shut down
 - iv. Protection against reverse polarity connection: If the charger is incorrectly connected to a battery with reverse polarity the user replaceable fuse will blow (except for the 12/25 model, which has a non-replaceable internal fuse)
 - 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 (LiFePO₄) 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. Six (6) & Twelve (12) Volt Compatible.

The default setting is auto detect on power up. 6 or 12 Volt can be selected manually via the VictronConnect app for power supply mode or deeply discharged batteries.

Blue Smart IP65 6V/12V — 1.1A / 0.5A 100/240 VAC

m. 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.

n. 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.

The power supply mode can be used in either 6- or 12-Volt mode (range: 4Volt to 14.7Volt) and High (1.1A) or Low (0.5A) mode

4. Operation

4.1. 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. 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 (or >95% for Li-ion batteries) and may be returned into service if required.

2. 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.

3. Recondition

The battery voltage is attempted to be increased to the configured recondition voltage, while the charger output current is regulated to 8% of the nominal charge current.

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.

Recondition 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).

Note that in certain conditions it is possible for the recondition state to end before the configured recondition voltage is achieved, such as when the charger is simultaneously powering loads, if the battery was not fully charged before recondition stage commenced, if the recondition duration is too short (set to less than one hour) or if the charger output current is insufficient in proportion to the capacity of the battery/battery bank.

4. 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.

5. 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.

6. 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).

The POWER and STATUS LEDs can be used to determine if the blue smart charger is powered up or not, and the active charge stage; refer to the table below:

LED	State	Power / Charge Stage
Status 12V (green) or 6V (orange)	Fast blinking	Bulk
	Slow blinking	Absorption / Recondition / Refresh
	Illuminated	Float / Storage / Power supply mode

4.2. Temperature compensation

The Victron blue smart charger range will automatically compensate the configured charge voltage based on ambient temperature (except for Li-ion mode or if manually disabled).

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.

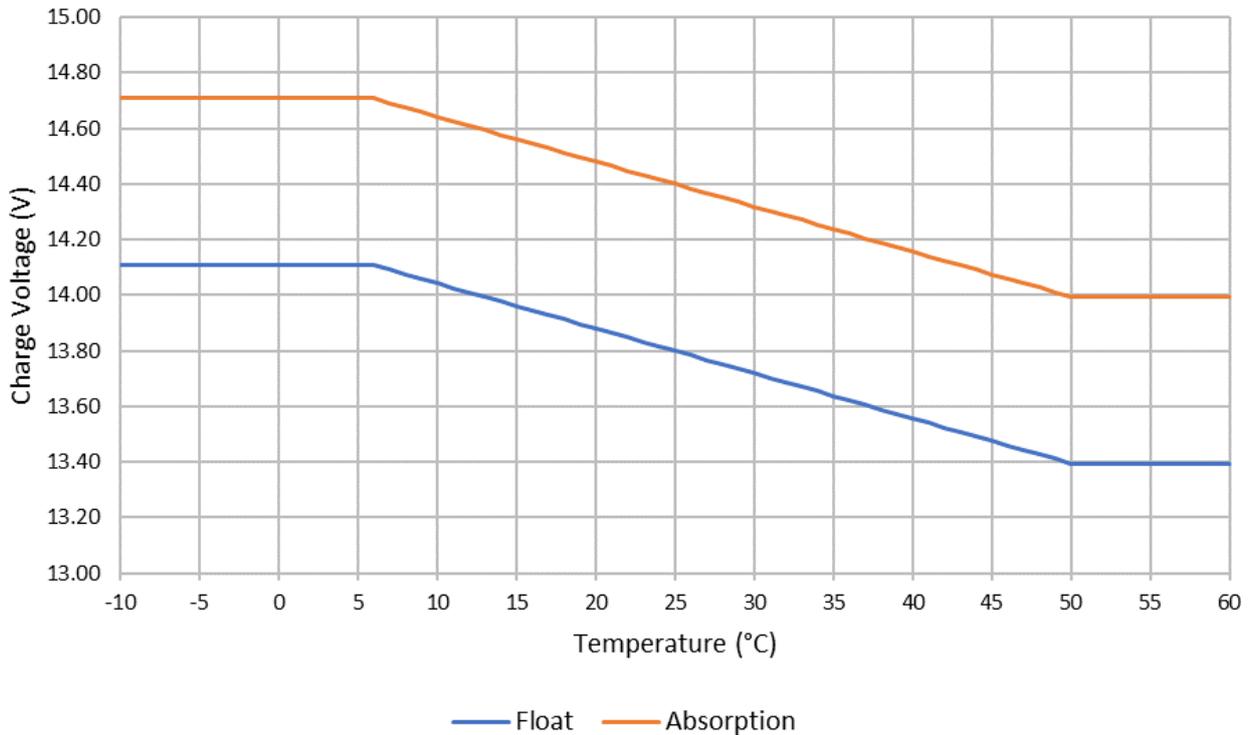
During power up the charger will measure its internal temperature and use that temperature as the reference for temperature compensation, however the initial temperature measurement is limited to 25°C as it's unknown if the charger is still warm from earlier operation.

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 6V chargers divide 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).

Charge Voltage - Temperature Compensation



4.3. Commencing a new charge cycle

A new charge cycle will commence when:

- Bulk stage is complete and the current output increases to the maximum charge current for four seconds (due to a simultaneously connected load)
- 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)
- VictronConnect is used to select a new charge mode or change the function from 'Power Supply' to 'Charger' mode
- The AC supply has been disconnected and reconnected

4.4. 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_{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_{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:

$$T_{\text{total}} = T_{\text{bulk}} + T_{\text{abs}} = 10 + 8 = 18 \text{ hours.}$$

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.

5. Setup

5.1. Overview

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.

5.1.1. 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
Normal	14.4V	13.8V	13.2V	16.2V
High	14.7V	13.8V	13.2V	16.5V
Li-ion	14.2V	13.5V	13.5V	N/A



NOTES:

1. For 6V chargers divide all voltages by 2
2. Charge voltage is automatically compensated depending on ambient temperature (except for Li ion mode or if manually disabled) see section 4.2 'Temperature compensation' for more information.

The desired charge mode can be selected using the VictronConnect app - see section 5.2 'Using VictronConnect' for more information.

5.1.2. Recondition mode

If enabled the recondition stage is included in the charge cycle; use only if required as a corrective/maintenance action - see section 4.1 'Recondition' for more information.

Recondition mode can be enabled and disabled using the VictronConnect app - see section 5.2 'Using VictronConnect' for more information.

5.1.3. 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).

Low current mode can only be enabled and disabled using the VictronConnect app - see section 5.2 'Using VictronConnect' for more information.

5.2. Using VictronConnect

Blue Smart IP65 6V/12V 1.1A/0.5A: The selection of an integrated charge mode and other general settings must 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 Victron Website:

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

To setup the charger using VictronConnect:

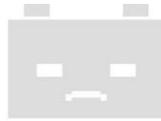
- a. Download and install the VictronConnect app.

The VictronConnect app can be downloaded from the following locations:

- i. Android – Google Play Store
- ii. iOS/Mac – Apple App Store

- b. Enable Bluetooth on the mobile phone or tablet (if not already enabled).

- c. 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.

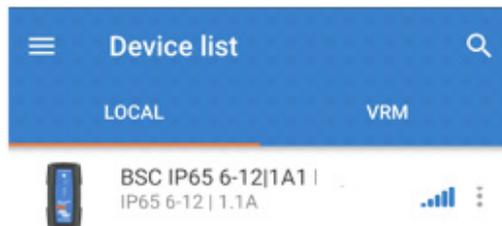


No devices found

Don't see the product you were looking for?

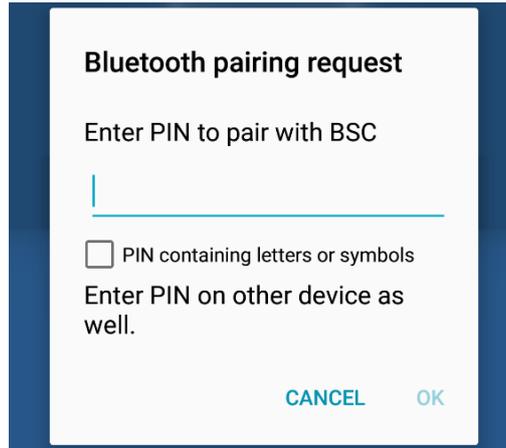


- d. Select the **blue smart charger** from the local device list.



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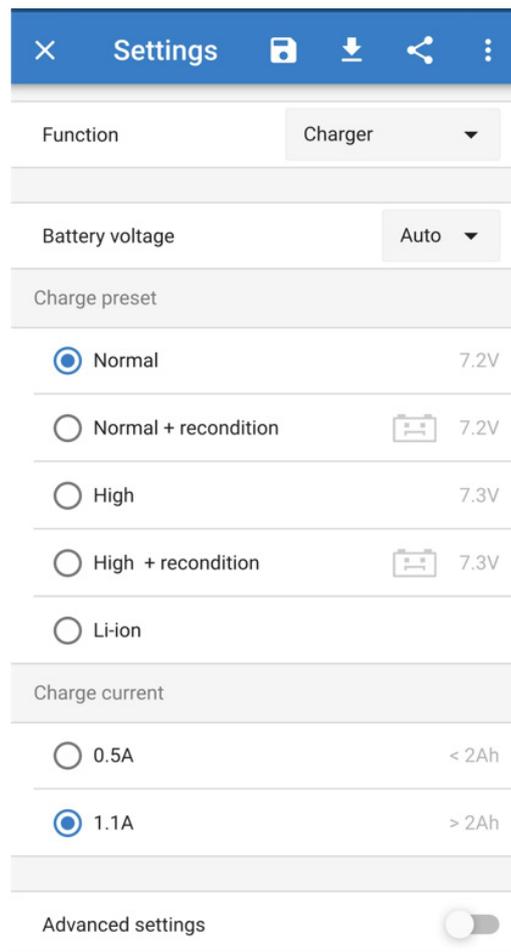
- e. During initial connection a 'Bluetooth pairing request' prompt will appear requesting the Bluetooth PIN code; enter the default PIN code 000000.



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



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

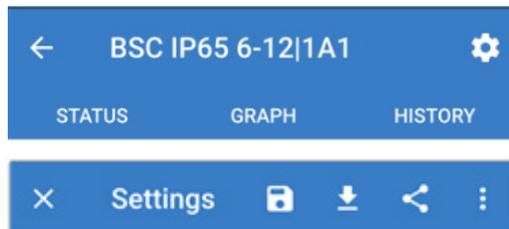


5.3. Bluetooth

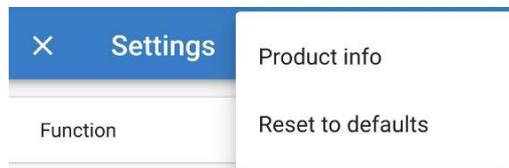
5.3.1. Changing the PIN code

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

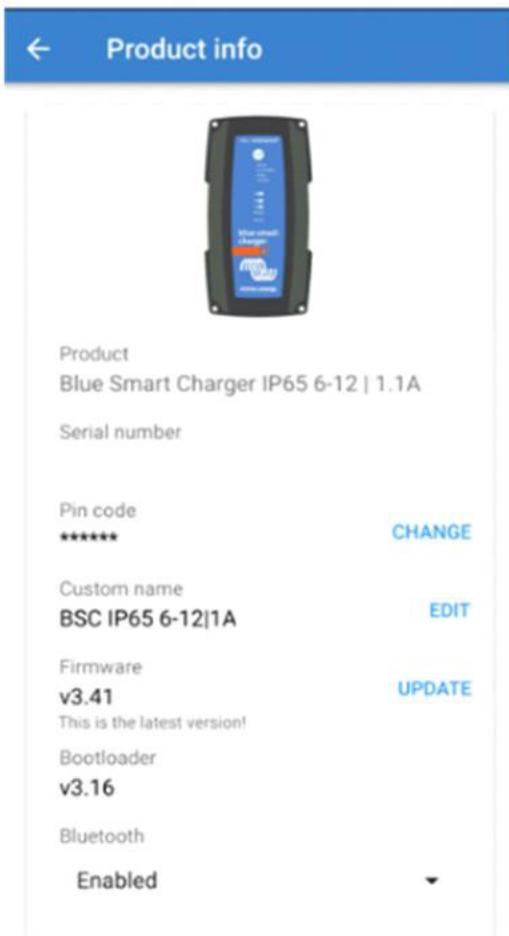
- Complete initial Bluetooth pairing and connection using the default PIN code (000000)
- Access the 'device options' by selecting the 'settings' icon (gear) in the top right corner, then the 'device options' icon (three vertical dots).



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



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



Blue Smart IP65 6V/12V — 1.1A / 0.5A 100/240 VAC

- e. 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 111111 or 123456.

Change PIN code

Current PIN

New PIN

Repeat new PIN

Show PIN codes

CANCEL OK

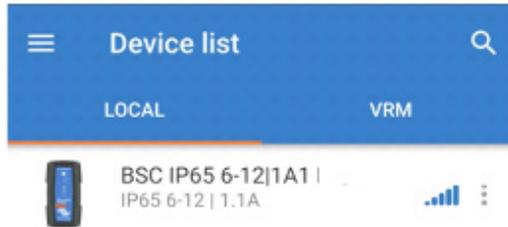
5.3.2. Resetting the PIN code

If the PIN code is forgotten or lost, it can be easily reset to the default 000000 using the VictronConnect app.

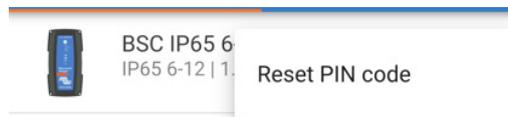
Using VictronConnect

To reset the Bluetooth PIN code:

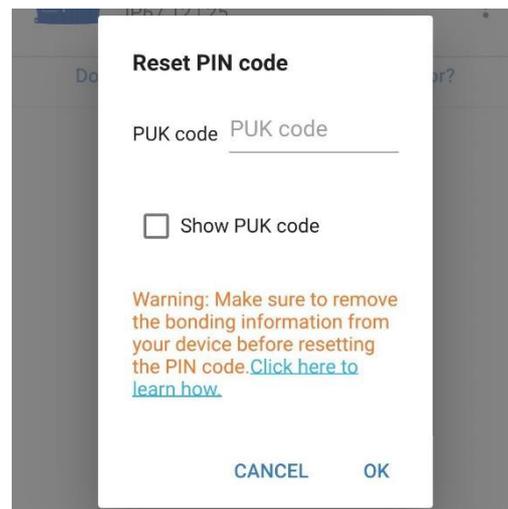
- a. Locate the **blue smart charger** in the LOCAL page and select the 'device options' icon (three vertical dots) on the right side of the description.



- b. Select 'Reset PIN code' from the pop-up prompt.



- c. Enter the PUK code and select 'OK'. The PUK code is located on a label stuck to the back of the **blue smart charger**.



DURING THIS PROCEDURE:

- a. The PIN code is reset to default (000000)
- b. Any active Bluetooth connections are disconnected
- c. All Bluetooth pairing information is cleared

Subsequently, before attempting to reconnect 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.

5.3.3. 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.

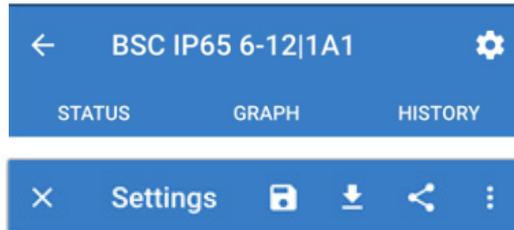
There are two options available:

Option #1: Enabled for 30 seconds

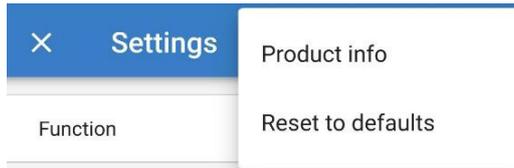
This option allows a Bluetooth connection to be made within the first 30 seconds after a power-up; enabling a firmware update to be completed or Bluetooth to be re-enabled. If no Bluetooth connection is made within the first 30 seconds, then Bluetooth is disabled thereafter.

To disable Bluetooth:

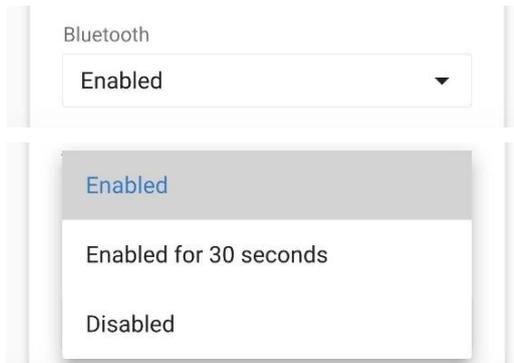
- Complete initial Bluetooth pairing and connection using the default PIN code (000000) or the current PIN code set.
- Access the 'device options' by selecting the 'settings' icon (gear) in the top right corner, then the 'device options' icon (three vertical dots).



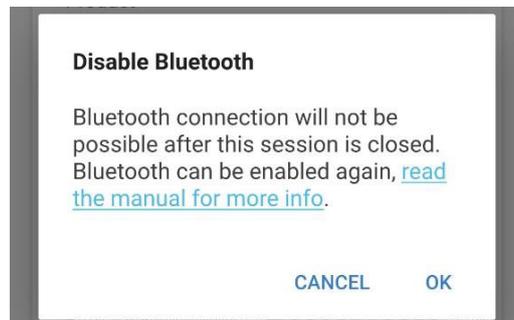
- Open the 'Product info' page by selecting 'Product info'.



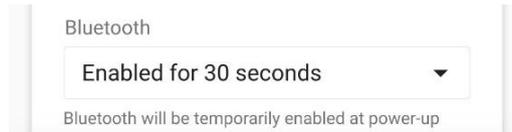
- In the 'Bluetooth' section, select the dropdown arrow to expand the menu, then select 'Enabled for 30 seconds'.



- Select 'OK' as confirmation.



- f. Bluetooth will now be disabled, except for 30 second after every power-up.



Option #2: Disabled (Permanent and Irreversible)

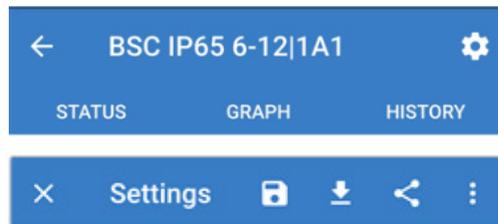


CAUTION:

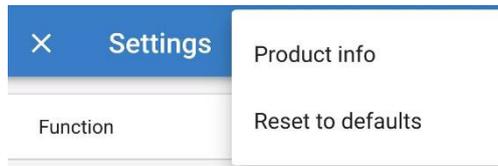
This option will **permanently** disable Bluetooth; use with extreme caution, as this procedure is **irreversible**.

To disable Bluetooth permanently:

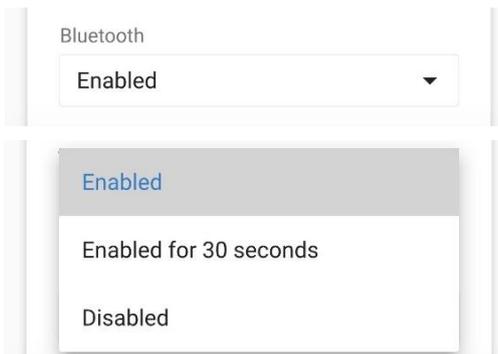
- a. Complete initial Bluetooth pairing and connection using the default PIN code (000000) or the current PIN code set.
- b. Access the 'device options' by selecting the 'settings' icon (gear) in the top right corner, then the 'device options' icon (three vertical dots).



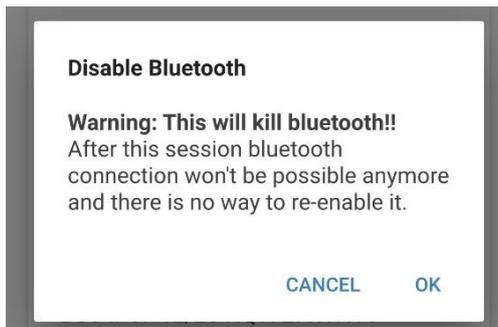
- c. Open the 'Product info' page by selecting 'Product info'.



- d. In the 'Bluetooth' section, select the dropdown arrow to expand the menu, then select 'Disabled'.



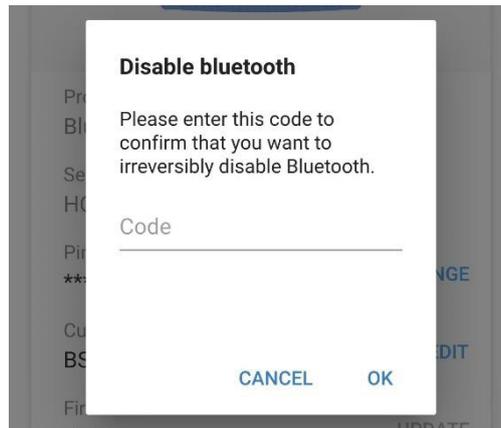
- e. If you are sure that you want to **permanently disable** Bluetooth, select 'OK'.



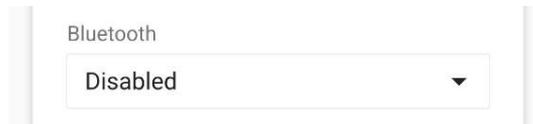
Blue Smart IP65 6V/12V — 1.1A / 0.5A 100/240 VAC

- f. A four digit code is provided to avoid Bluetooth being permanently disabled accidentally, if you are sure that you want to permanently disable Bluetooth enter the code, then select 'OK'.

This is the last chance to abort; after Bluetooth has been permanently disabled it is irreversible and cannot be re-enabled later.



- g. Bluetooth will now be **permanently disabled**.



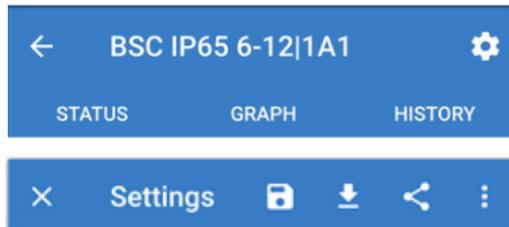
5.3.4. Re-enabling Bluetooth

If Bluetooth was disabled using option #2 'Disabled', this is **irreversible**, and Bluetooth cannot be re-enabled.

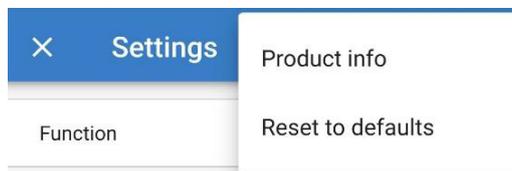
If Bluetooth was disabled using option #1 'Enabled for 30 seconds', it is possible to re-enable Bluetooth.

To re-enable Bluetooth:

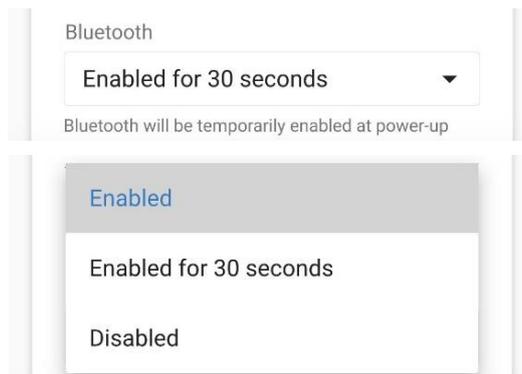
- Disconnect AC power and perform a new power-up.
- Within the first 30 seconds after power-up (before Bluetooth is disabled), complete initial Bluetooth pairing and connection using the default PIN code (000000) or the current PIN code set.
- Access the 'device options' by selecting the 'settings' icon (gear) in the top right corner, then the 'device options' icon (three vertical dots).



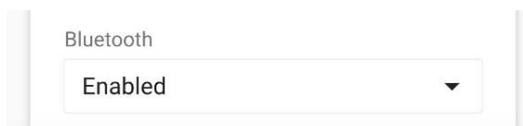
- Open the 'Product info' page by selecting 'Product info'.



- In the 'Bluetooth' section, select the dropdown arrow to expand the menu, then select 'Enabled'.



- Bluetooth will now be re-enabled.



DURING THIS PROCEDURE:

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

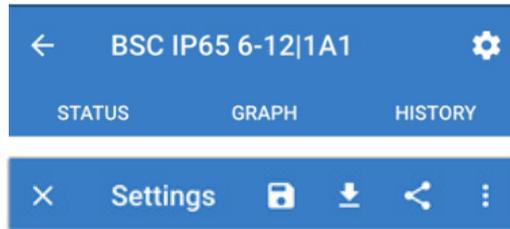
Subsequently, before attempting to re connect it's also necessary to remove/clear the **blue smart charger** Bluetooth pairing information from any devices (mobile phones or tablets) that were previously paired.

5.4. System reset

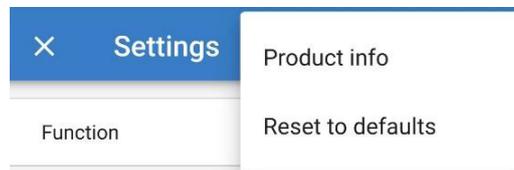
It is possible to perform a full system reset to restore all charger/battery related settings to their default value; using the VictronConnect app.

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

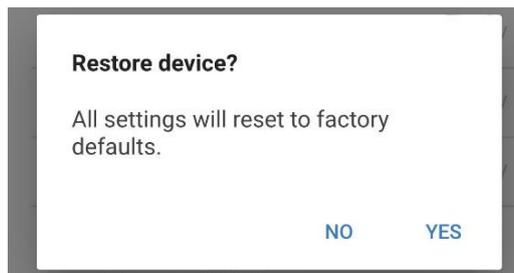
- a. Complete initial Bluetooth pairing and connection using the default PIN code (000000)
- b. Access the 'device options' by selecting the 'settings' icon (gear) in the top right corner, then the 'device options' icon (three vertical dots).



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



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



6. Monitoring

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.

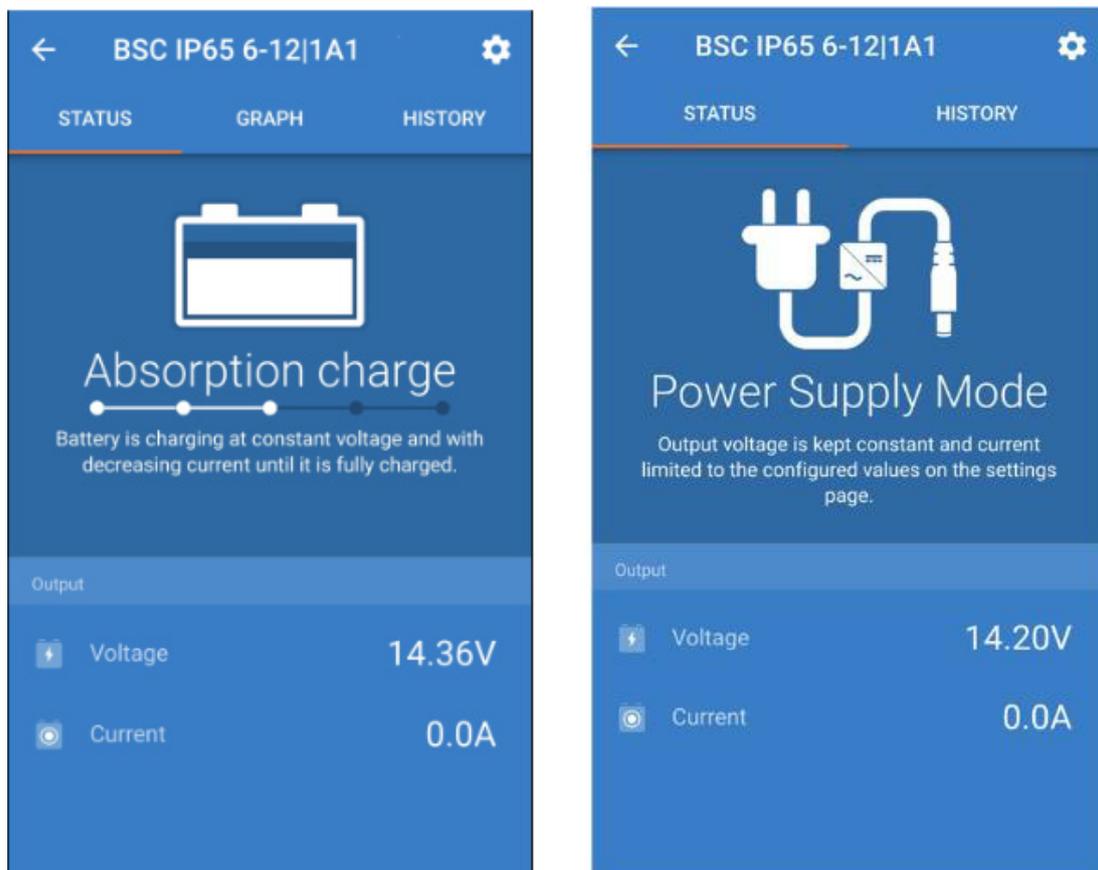
There are 3 different overview screens available (STATUS, GRAPH and HISTORY), each displaying different monitoring or historical data; spanning back over the last 40 charge cycles.

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

6.1. Status screen

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

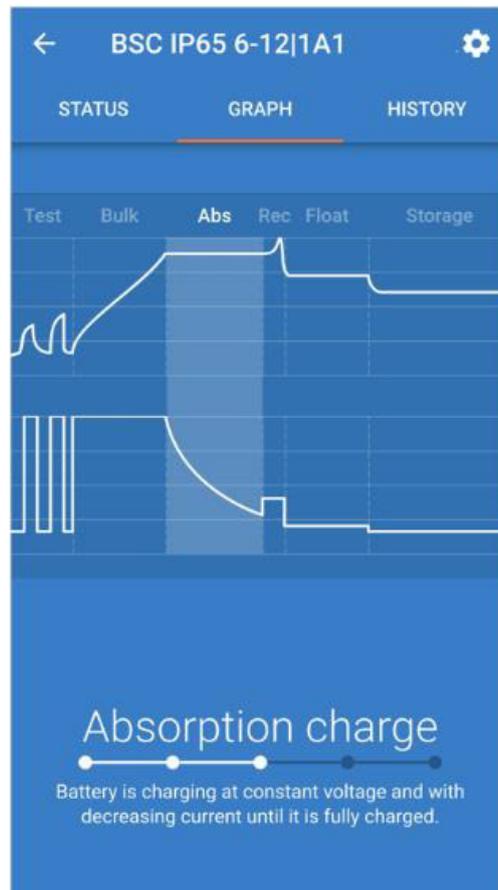
This data will update continuously and in real time as the charge cycle progresses.



6.2. Graph screen

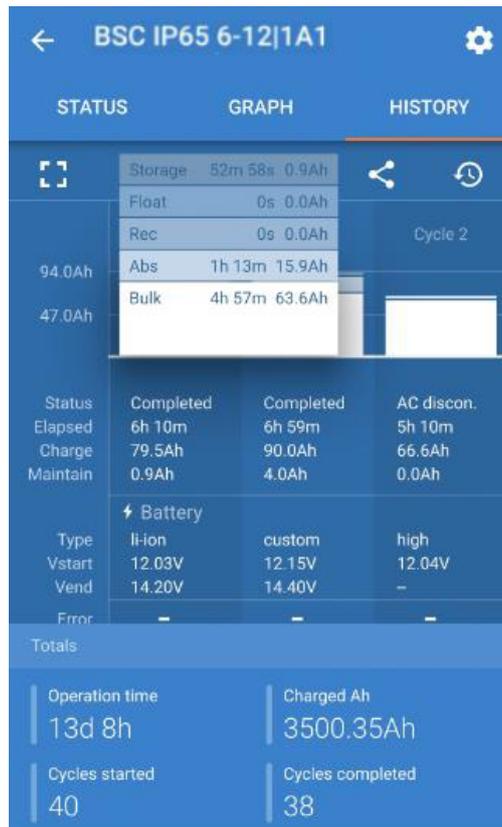
The GRAPH screen provides an easy to understand graphical representation of each charge stage with respect to battery voltage and charge current.

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



6.3. 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).



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



- a. Charge cycle statistics**
 - i. Cycle overview**

Expandable bar chart showing the time spent in each charge stage and the charge capacity provided (in Ah) during each charge stage
 - ii. 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
- 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

7. Advanced Configuration

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.

7.1. Advanced settings

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

The screenshot shows the 'Settings' menu in the VictronConnect app. The menu is titled 'Settings' and includes the following options:

- Battery voltage:** 12V (dropdown menu)
- Battery preset:** User defined (dropdown menu)
- Expert mode:** Disabled (toggle switch)
- Maximum charge current:**
 - 0.5A (< 2Ah) (radio button)
 - 1.1A (> 2Ah) (radio button, selected)
- Charge voltage:**
 - Absorption voltage: 14.20V
 - Float voltage: 13.50V
 - Storage voltage: 13.50V
- Recondition voltage:** Disabled (text: Increases the battery voltage while the current is below 0.1A)
- Voltage compensation:**
 - Temperature compensation: -16.20mV/°C

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

The screenshot shows the general settings menu with the following options:

- Advanced settings:** Enabled (toggle switch)
- Advanced battery settings:** > (arrow icon)

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

The charge voltage settings enable the voltage setpoint for each charge stage to be independently configured and some charge stages (recondition and float) to be disabled or enabled.

The charge voltage setpoint for the following charge stages can be configured:

i. Absorption

ii. Float

iii. Storage

iv. Recondition

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 mV/°C and applies to the entire battery/battery bank (not per battery cell).

7.2. Expert mode settings

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

The screenshot shows the 'Settings' menu with the following configuration:

- Battery preset:** User defined
- Expert mode:** Enabled (toggle switch)
- Maximum charge current:**
 - 0.5A (< 2Ah)
 - 1.1A (> 2Ah)** (selected)
- Charge voltage:**
 - Absorption voltage: 14.40V
 - Float voltage: 13.80V
 - Storage voltage: 13.20V
 - Recondition voltage: Disabled
- BatterySafe:** Enabled (toggle switch). Description: Prevent excessive gassing by automatically limiting the rate of voltage increase.
- Voltage compensation:**
 - Temperature compensation: -16.20mV/°C
- Bulk:**
 - Bulk time limit: 10h 0m
 - Re-bulk current: Disabled. Description: When the charge current exceeds this value while in float/storage, the charge cycle restarts.
- Absorption:**
 - Adaptive absorption time: Enabled (toggle switch). Description: Automatically calculates the absorption time.
 - Maximum absorption time: 8h 0m
 - Repeated absorption: Every 7 days
- Recondition:**
 - Recondition stop mode: Automatic, on voltage
 - Maximum recondition duration: 1h 0m

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

This close-up screenshot shows the top portion of the 'Settings' menu:

- Battery preset:** User defined
- Expert mode:** Enabled (toggle 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).

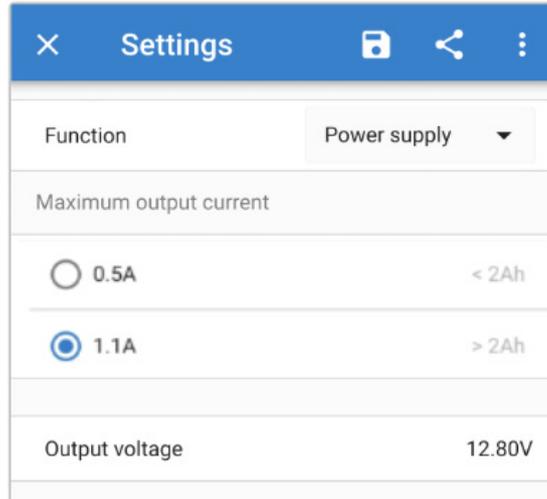
7.3. Power supply function

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 STATUS LED 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.

8. Technical specifications

Blue Smart IP65 6V/12V	1.1A
Input voltage and frequency range	100 - 240VAC 50 – 60Hz
Efficiency	82%
Standby power consumption	0.5W
12V Charge voltage – Absorption (Divide by 2 for 6V)	Normal: 14.4V High: 14.7V Li-ion: 14.2V
12V Charge voltage - Float (Divide by 2 for 6V)	Normal: 13.8V High: 13.8V Li-ion: 13.5V
12V Charge voltage - Storage (Divide by 2 for 6V)	Normal: 13.2V High: 13.2V Li-ion: 13.5V
Max output current - Normal mode	1.1A
Max output current - Low current mode	0.5A
Temperature compensation (lead-acid only)	16mV/°C
Charge algorithm	7-stage adaptive
Power supply mode	Yes
Back current drain	0.7Ah/month (1mA)
Protection	Reverse polarity (fuse), output short circuit, over temperature
DC fuse - Internal (not replaceable)	N/A
DC fuse - ATO blade in DC cable	20A
Operating temperature	-20 to +60°C (full rated output up to 40°C)
Humidity	Up to 100%
Material & Colour	Aluminium (blue RAL 5012)
Battery connection	1.4 meter red and black cable with: M8 ring terminals Alligator clips Adaptive cigarette lighter plug
AC connection	1.7m cable with AS/NZS 3112 plug
Protection category	IP65
Weight	460g
Dimensions (h x w x d)	64 x 146 x 35mm

9. Warranty

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 unauthorised 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.