

APPLICATION NOTE

Application note #	AN16-EN-143		
Date	25-05-2016	Revision	A
Subject	Using Trigger-Action to only activate charger when the battery voltage drops below certain value.		
Related product(s)	All Powersine Combi inverter/charger models		
No. of pages	10		

Description :

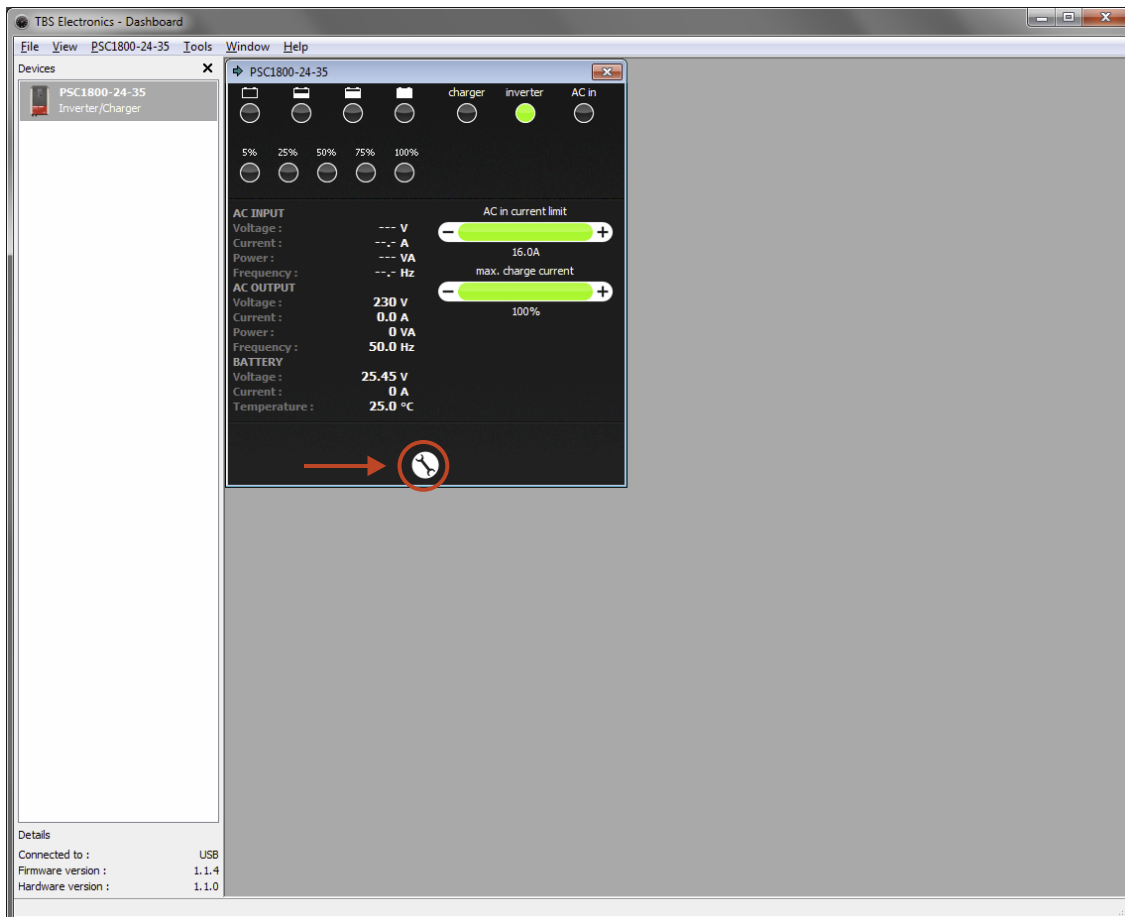
In a typical domestic self-consumption solar application, the inverter/charger is powered from a battery bank that is being charged through an external solar charge controller. In order to avoid the inverter/charger to also charge this battery bank from the metered grid connection, the internal charger section should be disabled. However, when due to bad weather or winter season the PV generated power is too small to keep the batteries sufficiently charged, the inverter/charger must be allowed to charge the batteries as well. This way the batteries remain healthy which results in a longer lifespan.

To set this up in the Powersine Combi, the battery voltage must be monitored all the time. Only when the battery voltage has dropped below a certain voltage, indicating that the SOC is low, the charger section must be enabled and complete a full charge cycle. After the charge cycle has been completed, the charger section will be disabled automatically again. Of course grid power must be available to perform this charge cycle.

This scheme can be realized by setting up a so-called Trigger-Action event. For this, the Powersine Combi should be connected to a PC running TBS Dashboard through a TBSLink to USB interface box. These items are available in the "TBSLink to USB Interface Kit (art.# 5092120)". Given below is the step by step procedure to implement this Trigger-Action.

Step 1

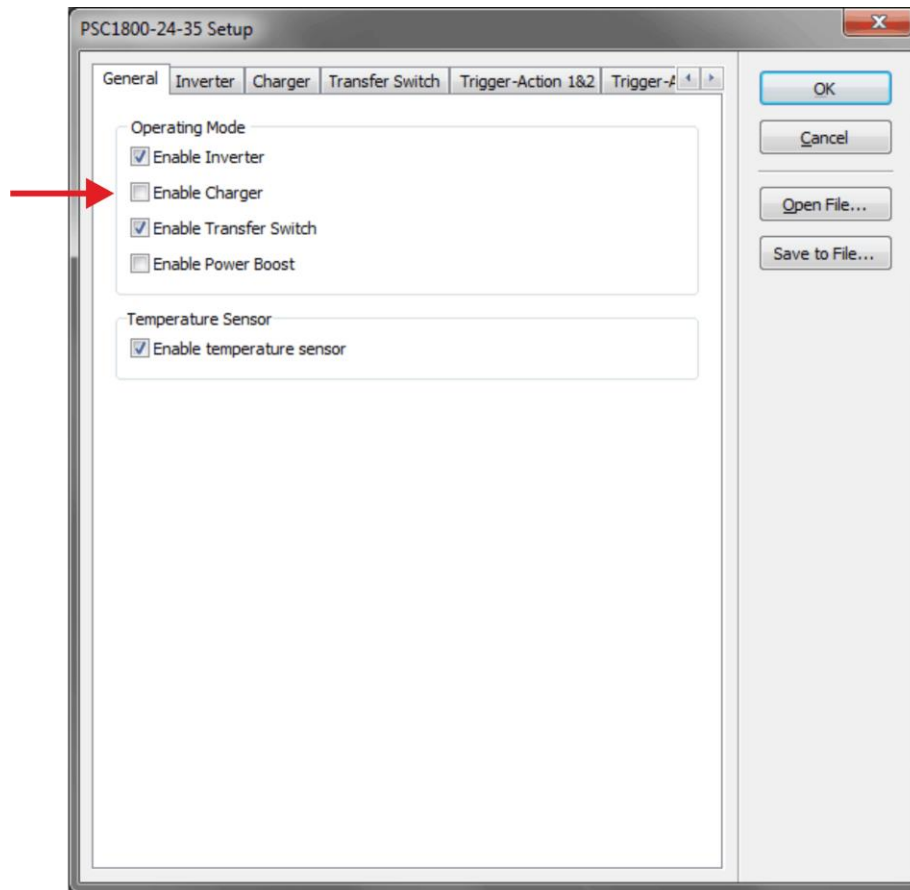
For this example we have connected a Powersine Combi PSC1800-24-35 to a PC running TBS Dashboard. The image below shows the connected PSC1800-24-35 on the left, as well as the display/control panel on the right:



We need to press on the wrench tool button as indicated by the red arrow to activate the setup window. Please note that DIP switch no. 1, inside the Powersine Combi, needs to be set to ON (External programming). Otherwise setting up the Combi by the Dashboard software is blocked.

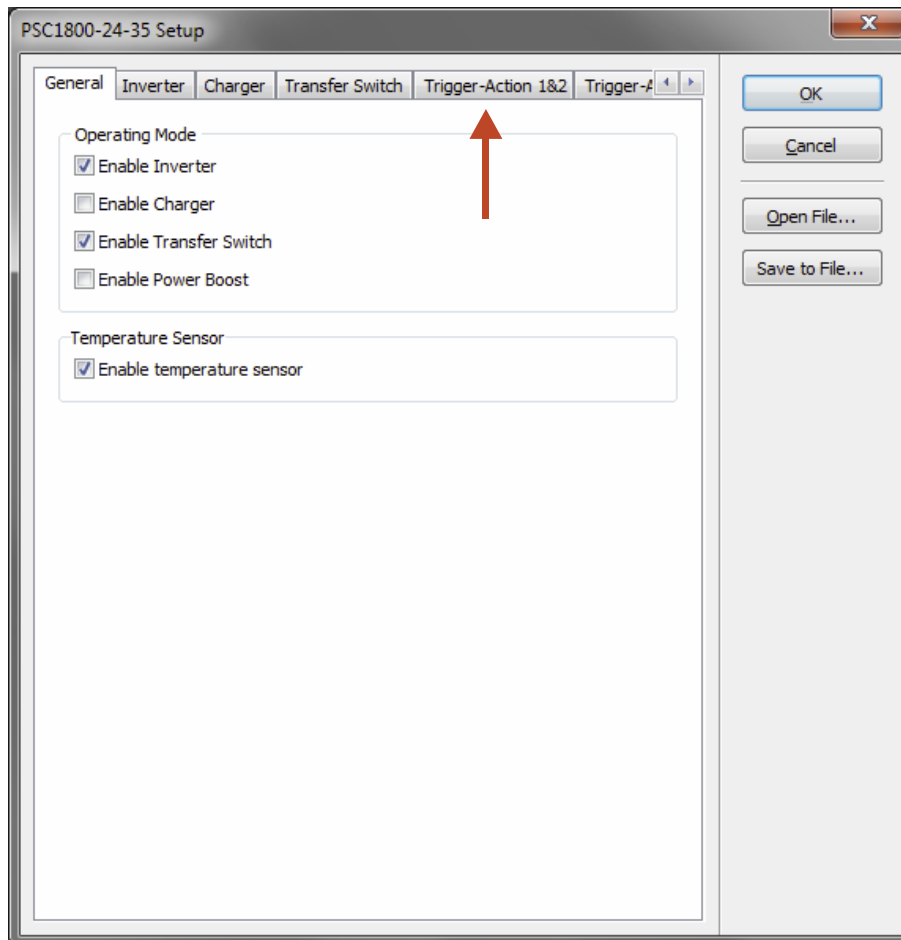
Step 2

Now that the setup window is opened, we first need to disable the Charger by unchecking the 'Enable Charger' box, indicated below by the red arrow:



Step 3

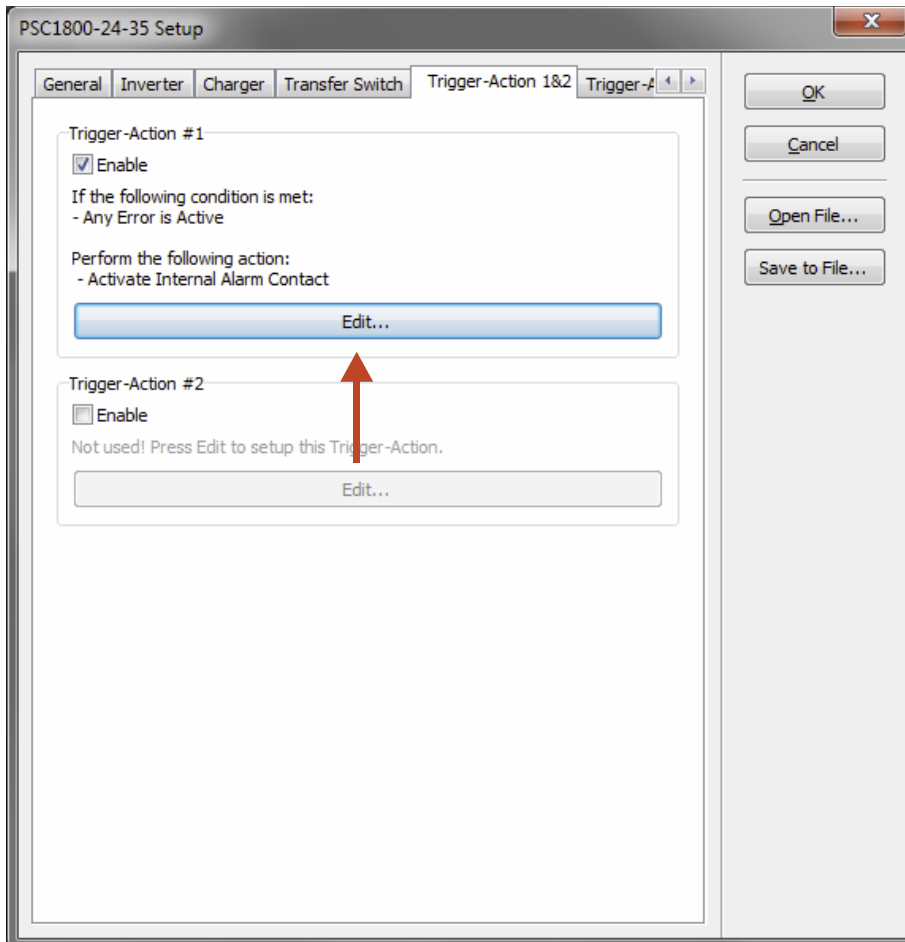
Now we need to select the tab “Trigger-Action 1&2” as indicated below by the red arrow:



Step 4

With the “Trigger-Action 1&2” tab opened, you can see below that “Trigger-Action #1” is already set by the factory in order to trigger the internal alarm relay once any error is active.

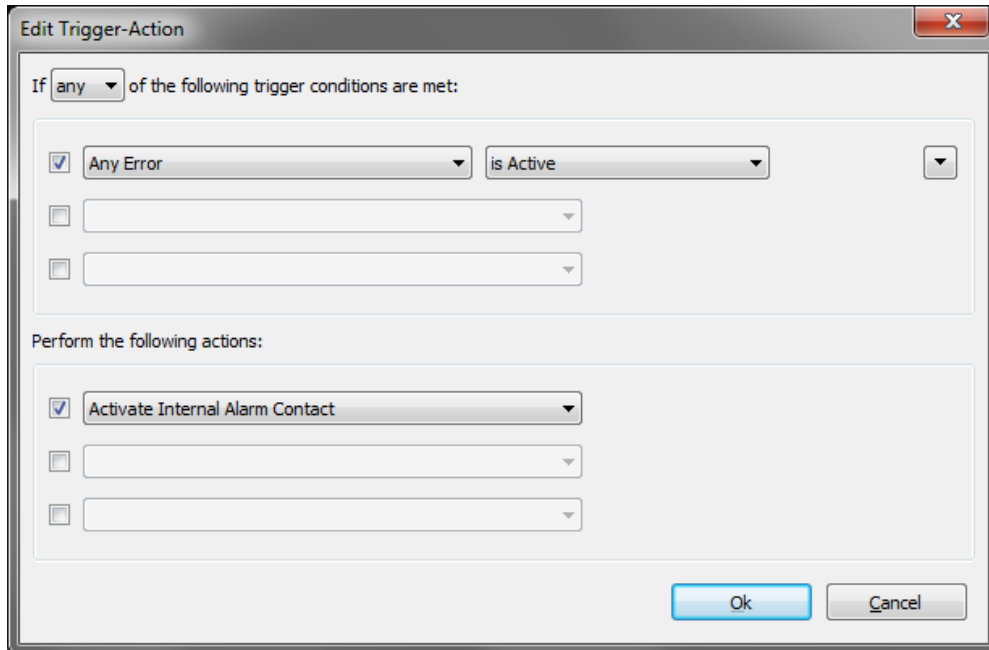
We are going to overwrite this Trigger-Action with the one explained in this application note. So we need to press the long ‘Edit’ button as indicated by the arrow below:



When you wish to keep the factory default Trigger-Action in place, you can also Enable Trigger-Action #2 and perform the steps below in the #2 Trigger-Action slot, by pressing the Edit button in this box.

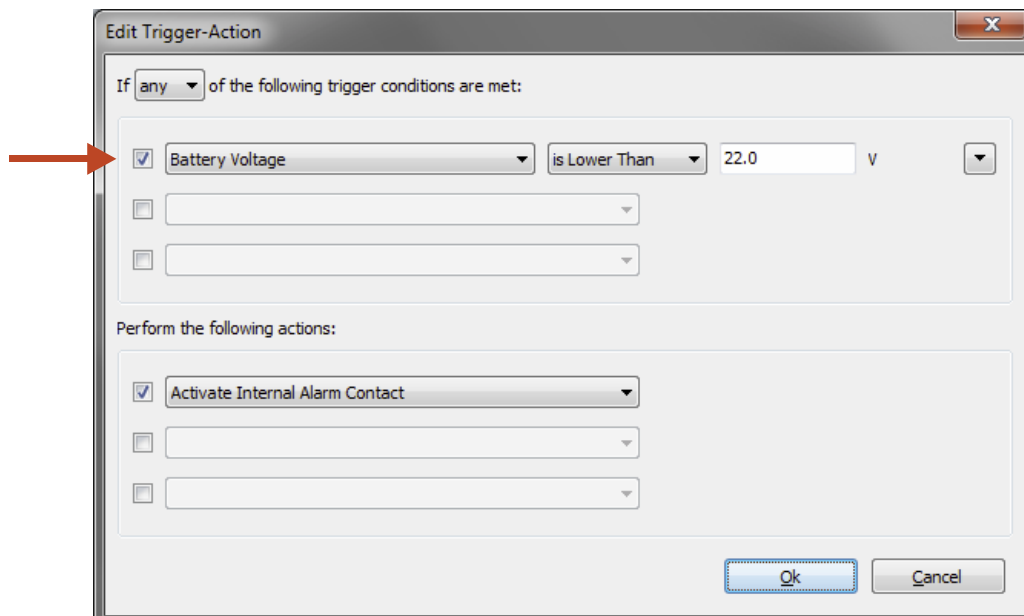
Step 5

The following edit window will appear, containing the default Trigger-Action values:



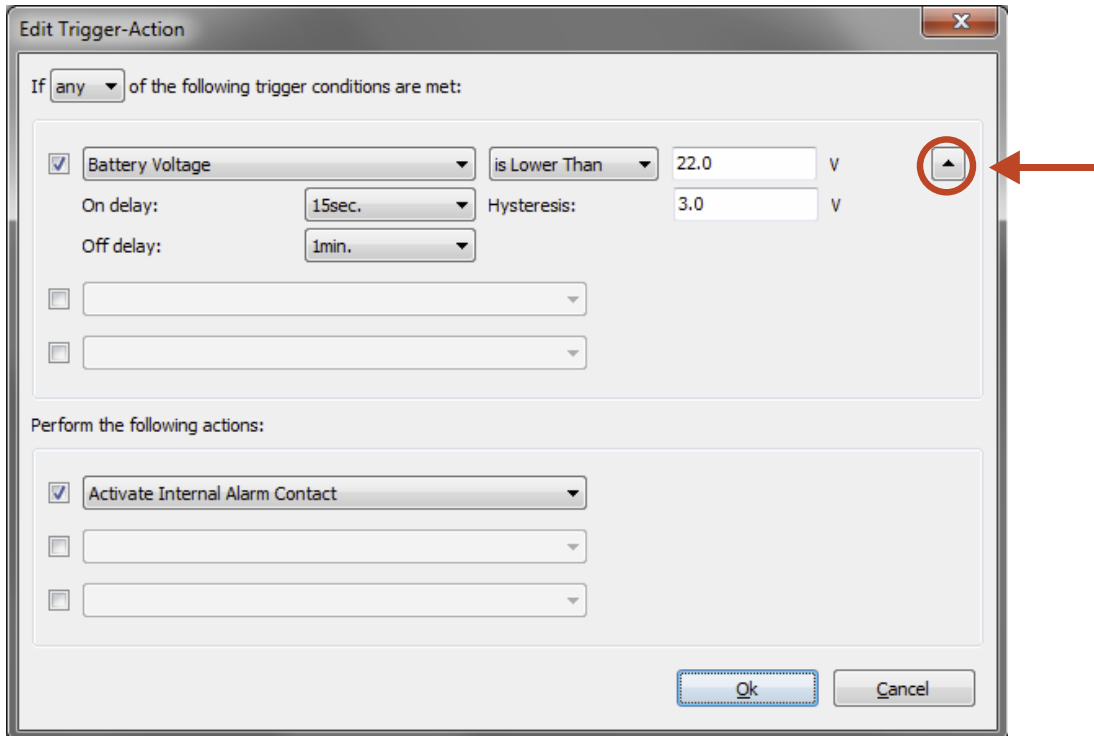
We will start by changing the Trigger conditions first. The trigger conditions in this example are:
Enable the charger when the battery voltage has dropped below 22.0V and complete a full charge cycle. After the charge cycle has been completed, disable the charger again.

First the "Battery Voltage" Trigger condition must be entered:



Step 6

Next, by pressing the rectangular up/down arrow button as indicated by the red circle below, we can enter the additional Trigger conditions:



7

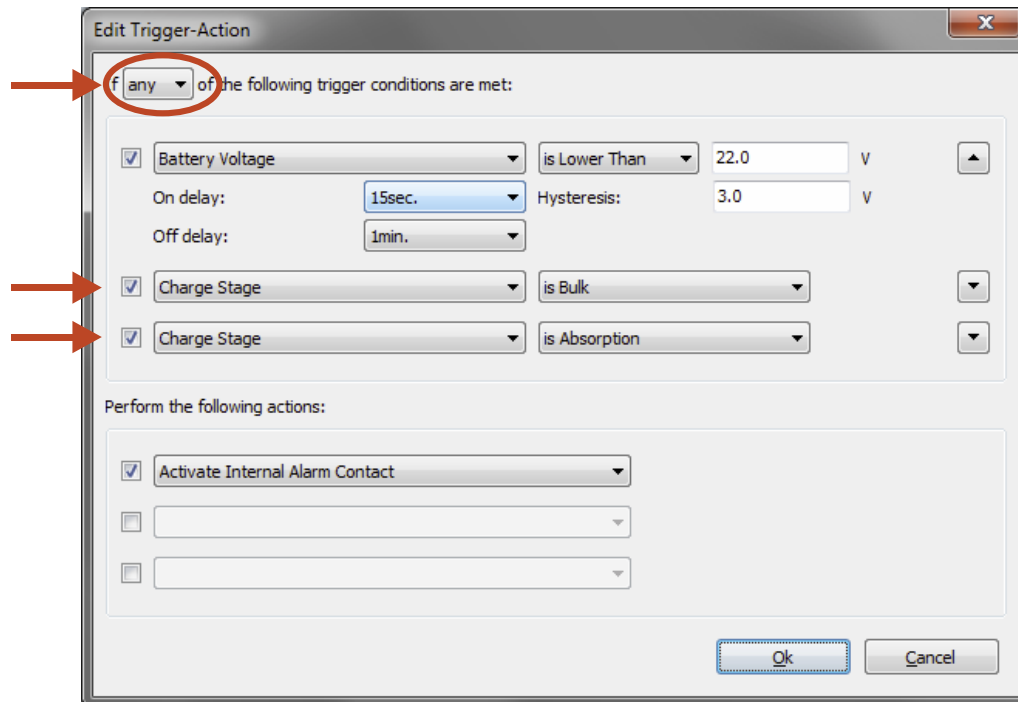
As you can see, we have set the 'On delay' to '15sec.', which means that the Trigger will be considered active once the battery voltage is lower than 22.0V for 15 seconds.

The 'Hysteresis' is set to '3.0V', which means that for the Trigger to de-activate again, the battery voltage must be increased to at least $22.0V + 3.0V = 25.0V$.

And finally, we have set 'Off delay' to '1min.', which means that the Trigger will at least be active for 1minute, even if the battery voltage is already higher than 25.0V.

Step 7

To make sure that a full charge cycle will be completed, we are adding two additional triggers, as can be seen below:



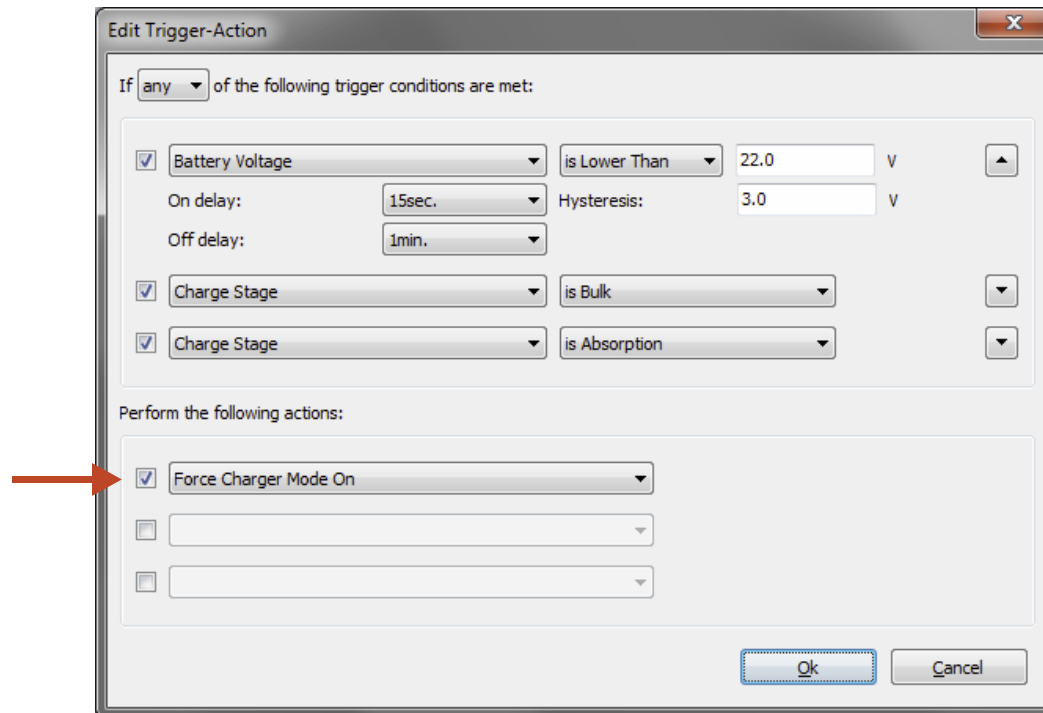
These settings make sure that as long as the charger is operating in the Bulk or Absorption stage, the charge process is still running, so the Trigger must remain active.

When the charge process has ended (charger jumps to a Float or Stop stage), no Triggers are active anymore and the charger will be disabled again.

Please make also sure that 'any' is selected in the Trigger statement.

Step 8

Next we need to decide what kind of Action needs to be linked to the activated Trigger. The Action type can be selected from the drop down list as indicated below by the red arrow :

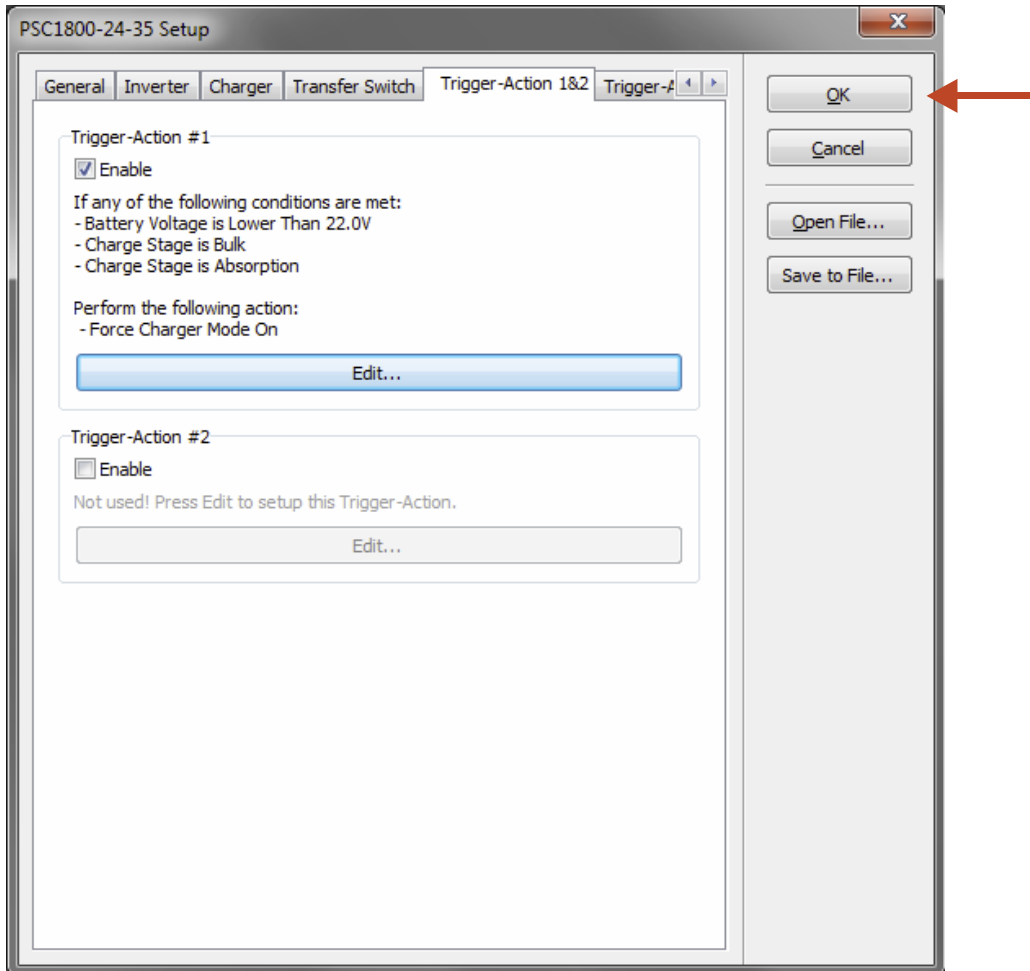


As you can see, we have selected 'Force Charger Mode On' to enable the charger while the any of the three Trigger conditions are met.

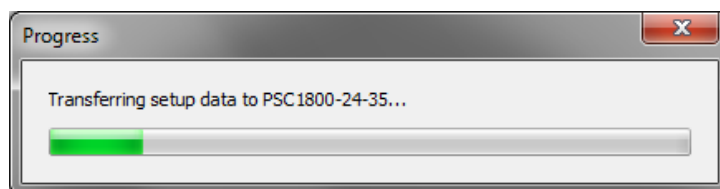
After setting the Action type, please press Ok to confirm all settings.

Step 9

After the Trigger-Action settings have been made and confirmed, you will jump back to the Setup window which indicates an updated summary of 'Trigger-Action #1' :



Once the 'Ok' button (see red arrow) is pressed, Dashboard will transfer all updated data to the Combi and everything should work as desired.



You will notice that the 'Charger On' LED on the Combi front panel has turned red. This is just to indicate that the charger section has been disabled. Until of course one of the Trigger conditions are met.

- End of document -