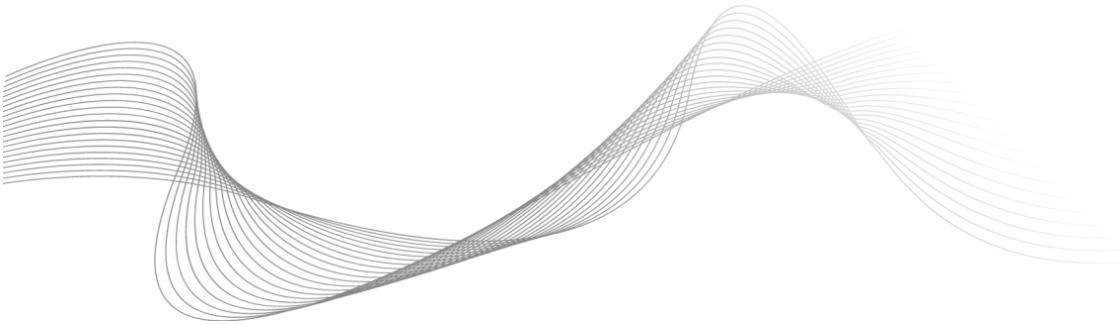
COTEK



Easy Charger Wizard Product Guide

1. Scope

Easy Charger Wizard is a flexible kit to make your COTEK Power converters a three -stage battery charger, which can easily fit all frequently used battery types and different battery voltage (12/24/48).
The package of easy charger wizard is consisted of below items:

1. Charger wizard board
2. Cable 1 (Refer to Section 5 Hardware Specification)

You will need a COTEK AE/AEK series power supply and CT-201 (RS232 communication board) to work with Easy Charger Wizard. For installation instruction, please refer to Section 4-1.
To change default charger setting, there are 2 ways to do it:

1. RS232 protocol
2. COTEK Charger Wizard GUI interface

For more details, please refer to Section 4-2.

Note. Please read carefully the precautions and instructions on the product package & the product Guide before installation and use. Thank you.

2. Packing Configuration

Cable Charger Wizard

3. Functions & features

3-1 Charger Wizard

- Single model (e.g. 60V) can be used to charge different types of batteries including Lithium Ion, Gel, AGM, Lead Acid, etc. Suitable charging voltage from 1V ~ 60V.
  (NOTE: Please refer to Cotek AE/AEK Spec. sheet for the max. charging current. For example, max. charging current of AE-1500-60 is 25A, but AC input voltage must be 100Vac or above. For AEK-3000-60, the max. charging current can support 50A, but AC input voltage must be 180Vac or above. Please

refer to the de-rating curve spec. of Cotek AE/AEK Series for more detail info.)

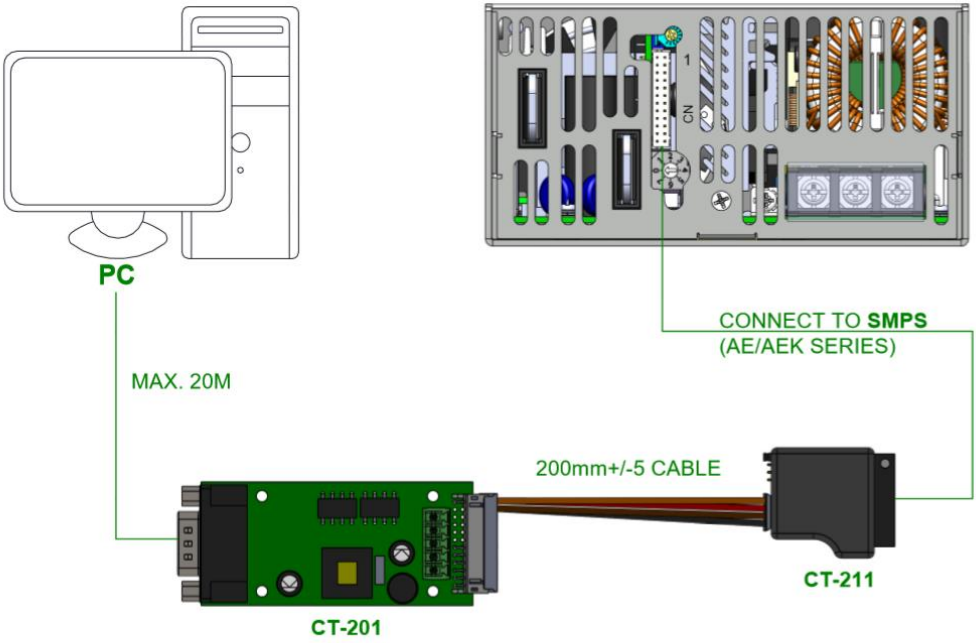
- Memorize charging curve setting
- Programmable charger solution (higher flexibility for different type of batteries)
- High Voltage / Current charging requirement
- LED to show different charging status
- The software can automatically detect the model name connected, and allow user to control the output voltage and current within supported spec. and select the suitable battery type.
- Protection: Overvoltage (This function is to protect the battery)

3-2 COTEK SMPS Features

- Universal input (90-264Vac)
- Active PFC design with high power density and efficiency (up to 93%)
- Remote setting multiple RS232 communication
- Operation temperature -20C ~ 70C (de-rating)
- Safety Standards: UL, TUV, and CB (Worry-Free design-in)
- EMI conduction & Radiation: Certified EN55032
- Protection: OVP, OLP, OTP, Fan failure

4. Installation Notice (Warning)

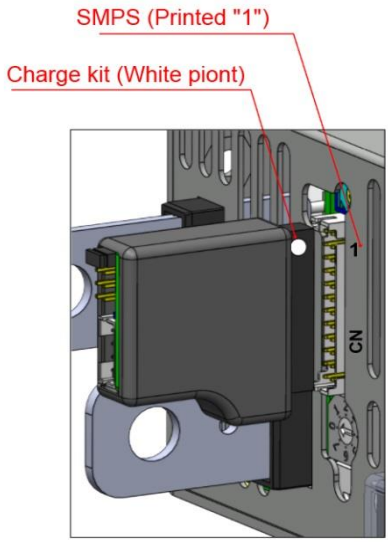
4-1 Hardware Installation



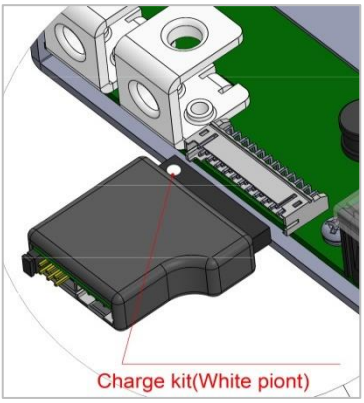
- **Step 1:** Make sure to connect Power supply DC wire before connecting battery
- **Step 2:** Make sure to check battery spec. before setting the charging voltage / current
- **Step 3:** Add suitable ORingFET in between the output side of SMPS & battery to avoid battery current damaging power supply.

Output voltage	Recommend ORingFET
12V/15V/24V/30V	40V MOSFET BSC010N04LS or equivalent
36V/48V/60V	80V MOSFET BSC026N08NS5 or equivalent

- **Step 4:** connect Battery +/- with AE/AEK power supply DC outputs (be aware of reverse polarity)
- **Step 5:** Install Charger Wizard to Cotek SMPS Front Panel (Connection diagram as shown below, please be aware of reverse connection)



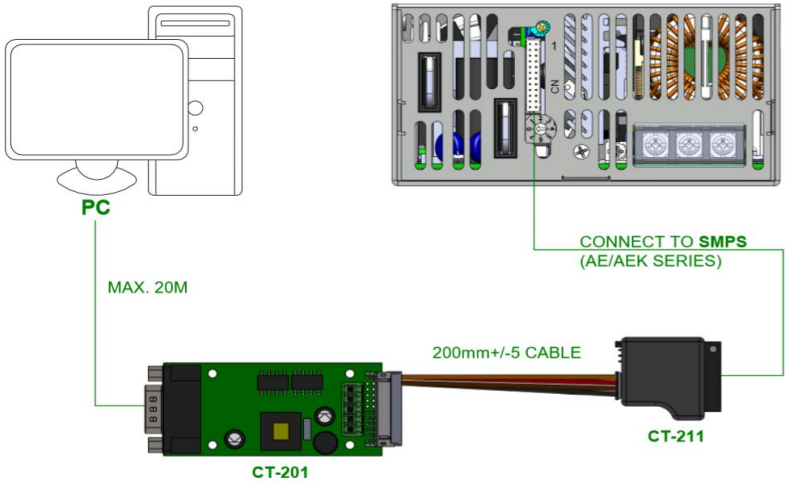
AE/AEK Series



AE-800

- **Step 5:** connect cable 1 to 4 Pin connector of Charger Wizard.

- **Step 6:** connect the white 24 pin connector of cable 1 to Cotek communication board, CT-201



- **Step 7:** AC Power On
- **Step 8:** Install Charger Wizard GUI to perform charging curve setting

4-2 Charger Wizard charging curve setting

It's also easy to change default settings of COTEK Charger Wizard, via below 2 ways:

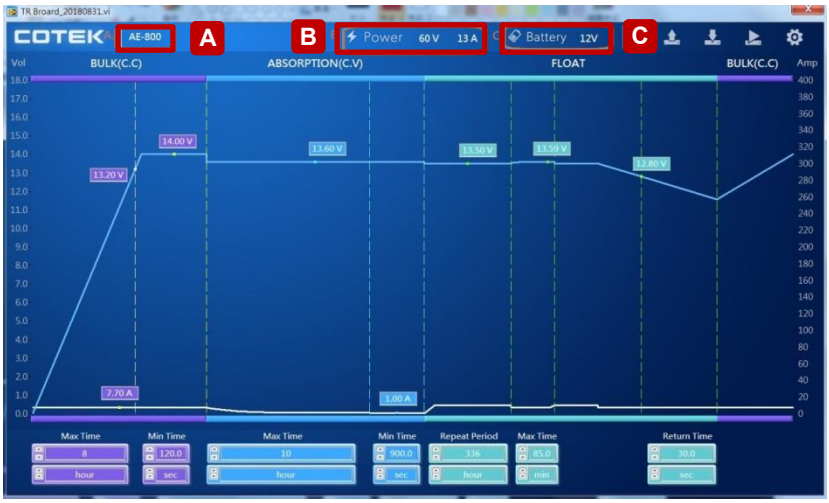
4-2-1 RS232

- Connectivity and necessary equipment (Please refer to section 4-1)
- Install "TR Broard" GUI software to set charging voltage and current

4-2-2 COTEK Charger Wizard GUI interface

- Connectivity and necessary equipment (Please refer to section 4-1 Hardware Installation info.)
- Software download: available from Cotek Website, Partner Section (或是申請 ftp 以利客戶 download)
- A brief explanation of GUI section

1. Software GUI Main Page

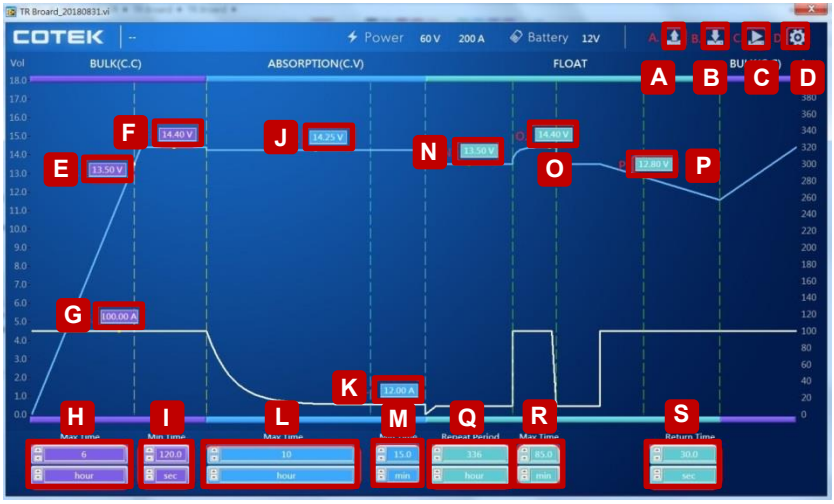


A. Model Name

B. Power Supply Rated Output Voltage and Rated Output Current

C. Rated Battery Voltage

2. Parameter Setting Description



A: Read Charger Wizard Setting

B: Save the Easy Charger Wizard setting to EEPROM

C: Transfer the setting values of the software on the PC to the Charger Wizard

D: Set the communication interface, battery type, reset, archive, archive before loading and other function settings

E~S: The charging current and charging voltage parameters can be entered manually or drag the parameter. The maximum setting will depend on the rated voltage and current of SMPS (Cotek AE/AEK). It will also reference to the rated battery voltage selected by the operator. Parameters as follow:

E~I: BULK(C.C) Parameter:

- Fixed charging current is 'G' in BULK mode
- Conditions to enter the ABSORPTION mode (either one):
  1. Start timing 'H' when the battery voltage reaches the 'E' voltage
  2. When the battery voltage reaches the 'F' voltage and the time is maintained 'I'
- J~M: ABSORPTION (C.V) Parameter
- Fixed charging voltage is 'J' in ABSORPTION mode
- Conditions to enter the FLOAT Mode (either one):

  1. When the time in this mode exceeds 'L'.

  2. When the charging current is less than 'K', and the time is maintained above 'M'.
- N、O、Q、R. FLOAT Parameter:
- Repeat steps 1 and 2 after entering FLOAT mode

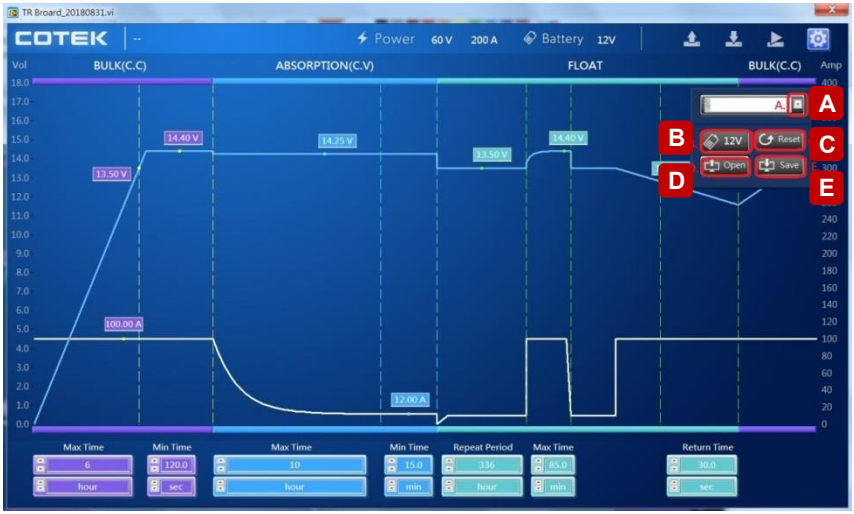
Step 1: Change the charging voltage to N, when the time reaches 'Q'

Step 2: Generate a charging pulse (charge voltage is 'O', time remain at 'R')

- P、S Parameter:

  Under ABSORPTION or FLOAT, when the battery voltage is lower than 'P' and the hold time will change to BULK mode if it exceeds 'S'

3. Function setting page



A. Communication Port setting

B. Battery Voltage setting

C. Reset
D. Load the previously stored settings parameter file
E. Save parameters to the file

NOTE:

- Max. charging voltage: 15.6V (For 12V battery), 31.2V (For 24V battery) and 60V (for 48V battery)
- Max. charging current: same as the rated output current of the power supply installed

- Three step Plus charge system

  The first step of the three step Plus charge system is the BULK phase, in which the output current of the charger is 100%, and the greater part of the capacity of the battery is rapidly charged. The current charges the batteries and gradually the voltage rises to the absorption voltage of 14.4V (12V models) or 28.8V (24V models). The duration of this phase depends on the ration of battery to charger capacity, and naturally also on the degree to which the batteries were discharged to begin with.

  The bulk phase is followed by the absorption phase. Absorption charging starts when the voltage on the batteries has reached 14.4V (12V models) / 28.8V (24V models) , and ends when the battery is completely full. Battery voltage remains constant at 14.25V (12V models) / 28.5V (24V models) @ 25°C / 77°F throughout this stage, and the charge current depends on the

degree to which the battery was initially discharged, the battery type. Once the battery is 100% full, the charger automatically switches over to the float phase.

During the float phase the unit switches to 13.5V (12V models) or 27 (24V models). Once consumption decreases, the charger goes back to normal operation of the three-step charge system.

- User can store the charging curve set in the Charger Wizard
- User can use Charger Wizard tool to adjust the charging curve settings at any time.

Warning

Warning 1. User must check the wiring length and gauge to avoid data loss

1. AC input interface:

AE800 Series

SMPS AC Terminal		Wire color	Wire length/gauge
AC Terminal	L	Black	Within 6 feet /AWG#16
	N	White	
FG (Earth Ground)		Green/ Yellow	26~32 feet/ AWG#16

AE1500 Series

SMPS AC Terminal		Wire color	Wire length/gauge
AC Terminal	L	Black	Within 6 feet /AWG#14
	N	White	
FG (Earth Ground)		Green/ Yellow	26~32 feet/ AWG#14

AE-3000 / AEK-3000 Series

SMPS AC Terminal		Wire color	Wire length/gauge
AC Terminal	L	Black	Within 6 feet /AWG#8
	N	White	
FG (Earth Ground)		Green/ Yellow	26~32 feet/ AWG#10 ~8

2. DC output interface:

2.1 Before installation:

The DC cables should be as short as possible (less than 6 feet / 1.8 meters ideally)

The size of the cable should be thick enough to limit the voltage drop to less than 2% when carrying the maximum output current.

The following sizes of cables are recommended distance (<6 ft.) between the batteries and the power supply.

Wire AWG	SMPS output current (MAX.)
#0	≧200A~250A
#1	≧150A~200A

#4	≧100A~150A
#6	≧50A~100A
#8	≧0A~50A

Warning 2. User must check charging voltage / current setting and suitable charging voltage / current according to battery type and spec to avoid damage to the battery.

Warning 3. When using the Easy Charger Wizard, if the Charger Wizard is pulled out by external force, the COTEK AE/AEK series will restore the original power supply status (Please make sure to power off the power supply before installing or removing the Easy Charger Wizard)

Warning 4. Please make sure the Easy Charger Wizard is installed in the correct direction before power on to avoid possible damage.

Warning 5. Suitable SMPS for Charger Wizard：

- AE-800/1500/3000- LV Series (12V~60VDC)
- AEK3000-LV Series (12V~60VDC)

Warning 6. Please make sure to add suitable ORingFET in between the output side of SMPS & battery to avoid battery current damaging power supply.

Output voltage	Recommend ORingFET

12V/15V/24V/30V	40V MOSFET BSC010N04LS or equivalent
36V/48V/60V	80V MOSFET BSC026N08NS5 or equivalent

Warning 7. The following precautions should be taken when working on the Inverter Charger:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.

5. LED Indicator

5-1 Failure Indicator:

Failure Description	LED Status
EEPROM checksum fail	Solid Red
EEPROM Null	Red Slow every 3 secs
Over current or Over voltage	Red light twice flash every 3 secs.
Charging Voltage or current setting over power supply's rated voltage or current	Red light flash three times every 3 secs

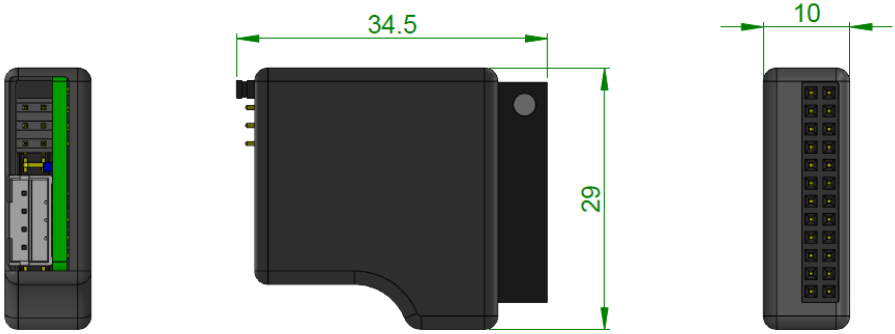
Battery voltage detected is not within the set range Single battery: 8.5v~16.75v 2 batteries: 16.75v~33.5v 4 batteries: 33.5v~67v	Red light flash four times every 3 secs
power supply communication or status error	Red light flash five times every 3 secs

5-2 Charging Status LED Indicator

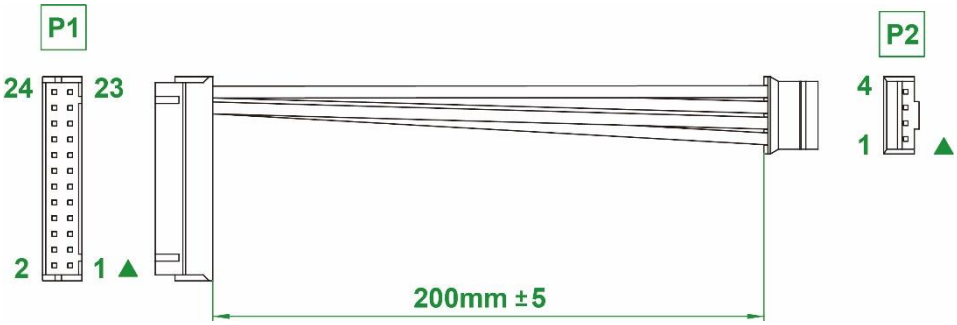
Charging status	LED Status	
Bulk-1	Orange fast	- - - - - - - - - - - - - - -
Bulk-2	Orange slow	— — — — — —
Absorption-1	Orange solid	————————
Absorption-2	Green solid	————————
Float	Green flash	- - - - - - - - - - - - - -

6. Hardware specifications

Dimensions: 34.5 x 29 x 10 mm



Cable 1 :



P1		P2		
Pin. No	Function	Pin. No	Function	Description
1~20	N.C	X	X	X
21	AUX	4	AUX	+5V / 0.5A or +9V / 0.3A Auxiliary power
22	GND	3	GND	Ground
23	RX	2	RX	For RS232 Receiver function

24	TX	1	TX	For RS232 Transmission function

7. Warranty

We guarantee this product against defects in materials and workmanship for a period of 24 months from production month/yr (refer to product serial number). Please contact with your local COTEK authorized distributor for RMA (Return material Authorization) service. Please note that COTEK will ensure our products are operational before delivery and the warranty service is offered to the unit which has defect caused under normal use, in the judgment of COTEK's technician. The warranty is null and void under the following circumstances：

(a) If the unit has been damaged through abuse, misuse, negligence (such as bumping, wetting), fault voltage supply, air/water pollution accidents and natural calamities.

(b) If the serial number has been altered, effaced or removed.