

CH1010EMA/E/U/X



Dual Bay Enhanced Desktop Smart Charger+Calibrator Instructions for use

The CH1010EM is an enhanced standalone dual bay desktop smart, standard battery charger with the added ability to cycle through modes of: normal charge to full, 30% SOC charge or discharge, and recalibration of the fuel gauge via pushbuttons on two smart battery packs using a power sharing configuration. It works with all Inspired Energy® brand “N” Series smart standard packs and hybrids irrespective of size, shape, voltage, cell chemistry or capacity.

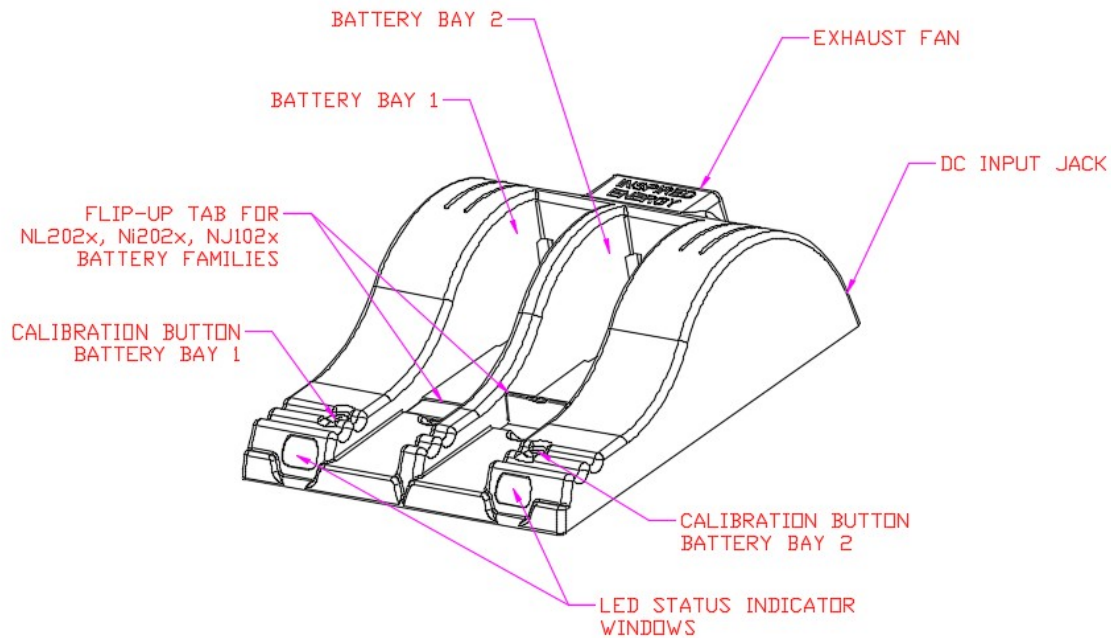
What’s in the box?

1. One CH1010EM enhanced desktop charger/calibrator
2. Two sets of three plastic spacers to modify the battery bay to suit your battery size
3. One 26V 60W DC power supply with universal mains input
 - N. American chargers (CH1010EMA) are packed with a US 3-pin mains cord
 - European chargers (CH1010EME) have a European 2-pin + ground recess mains cord
 - UK chargers (CH1010EMU) are packed with a UK 3-pin mains cord
 - CH1010EMX is not packed with a mains cord

Safety:

1. Do not expose the charger or power supply to water or liquids.
2. Do not open the charger or power supply case, no user serviceable parts are inside.
3. Do not cover the fan exhaust or obstruct the airflow, this will cause overheating.
4. Use only the manufacturer’s power supply and observe terminal polarity.
5. Place the charger in a cool spot, away from external heat sources.
6. Caution - during recalibration the charger may become warm.

Using your Charger:



Place the charger on a flat, level surface away from sources of heat and moisture. Plug the DC connector from the power supply into the back of the charger and connect the power supply to the mains AC supply using the cable supplied. The fan turns on, and all LEDs illuminate for two seconds on power up.

Using the Plastic Spacers:

Plastic spacers are supplied to assist in the correct insertion of all of the different sizes of smart standard packs. To insert a spacer, place the bottom of the spacer in the rear corner of the battery bay. Place a thumb on the top of the spacer and push it firmly towards the back of the charger. Correct insertion should be accompanied by a click as the guides lock into place. The cross reference of spacers to batteries is given below:

Thick “L” shaped spacer:	NC2560, NI1030, ND2017, Ni2020 Style
Thin “L” shaped spacer:	NL2020 & NL2024 Style
Flat spacer:	203x, 204x, and 2050x
No spacer is required for the 40xx ranges of batteries.	

Charging:

Place the battery into the battery bay ensuring that the 5-way connector is fully seated. The LEDs in the status window will provide status information and the charger will automatically begin charging normally to 100%. Press the mode select button on the associated bay to cycle through the modes as follows: Normal charge to 100% → Charge/Discharge to 30% SOC → Calibration → Repeat. The LEDs will flash briefly upon a button press to indicate which mode the charger is currently in.

LED Indication:

The status of the battery is indicated by the LEDs visible in the status window:

✱	Green flashing:	Battery charging to 100% SOC
●	Green solid:	Battery fully charged
✱	Blue & Green flashing:	Battery charging/discharging to 30% SOC
●	Blue & Green solid:	Battery has achieved 30% SOC
✱	Blue flashing:	Battery in calibration mode
●	Blue solid:	Battery fuel gauge calibrated
✱	Red flashing:	Battery fuel gauge needs recalibration*
●	Red solid:	Error

Note:

* It is possible for the Red LED to flash in either of the normal charge, SOC charge/discharge, or calibration modes. This indicates that the charger is operating in its selected mode, but the battery is requesting calibration.

* If the Red LED continues to flash after the charger has completed a calibration cycle (indicated by a solid Blue LED), the battery itself is still requesting calibration. When this occurs, cycle through the modes to calibrate again.

Recharge Time:

Different battery packs will require differing recharge times. Battery Bay #1 takes priority in the power sharing configuration, and will receive the majority share of charge current. The times given below are for a full charge from 0% to 100% state of charge using just one bay. They are valid for all variants and custom hybrids of each battery model.

Battery Chemistry	Battery Model	Recharge Time (hours)	Recalibration Time (hours)
NiMH	NI1030, NJ1020	1.5 - 2	4 - 5
Li-ion	NC2040, NC2560, ND2054, ND2034	2.5 - 3	16 - 17
	ND2053	4 - 5	58 - 59
	NB2037, ND2017	3 - 3.5	18 - 21
	ND2037, ND2057	3	21 - 22
	NF2040, NF2030	2.5 - 3	17 - 19
	NF2047	3 - 4	24 - 25
	NH2057	5 - 5.5	30 - 31
	NH2054, NH2034	2 - 3	16 - 18
	NI2040, NL2050, NL2054, RH2054, RI2050	2 - 4	19 - 21
	NL2024, NL2044, RH2024, RH2044	2 - 3	17 - 18
	NL2020, RI2020	3 - 4	9 - 10
	NB4037, NC4040, ND4054, NE4068	2 - 4	16 - 19

Recalibration Time:

Recalibration consists of a calibration charge, followed by a calibration discharge. Finally the battery is given a regular charge. A calibration cycle will be faster if the battery is fully charged to begin with. Recalibration time is governed by the battery voltage and capacity. Larger batteries, and lower voltage batteries will take longer to recalibrate. The mode of the CH1010EM is changed each time the button is pressed, so it is not recommended to press the button part way through the recalibration cycle (blue LED flashing). The built-in fan will turn on only during a discharge of either battery.

What are the SMBus and the SBS?

The Smart Battery System defines the parameters that are stored by an SBS-compliant battery. These parameters include full battery status and fuel gauging information. The System Management Bus is the language by which these parameters are communicated between the battery, the charger and the host device. For full details of the SBS information available from your battery please refer to the battery specification sheet available at www.inspired-energy.com.

How does the charger know what charge to deliver?

The CH1010EM charger is capable of sensing and delivering an appropriate charge to all Inspired Energy NiMH and Li-ion “N” Series standard battery packs. Upon inserting the battery into the charger, the battery communicates to the charger over the SMBus telling the charger what type of cell chemistry it is and what type of charge regime it needs. The CH1010EM then configures its output to provide the charge regime requested by the battery. If no SMBus communications are issued from the battery, the charger interrogates the thermistor/resistor I.D. pin on the battery terminal and delivers an appropriate charge. Battery Bay #1 takes priority in the power sharing configuration, and will receive the majority share of charge current

Compatibility:

The CH1010EM is fully compatible with all Inspired Energy® brand “N” Series standard battery packs and their custom hybrids. For optimum results we recommend using only Inspired Energy® brand batteries. For a full list of all compatible Inspired Energy batteries, please visit:

www.inspired-energy.com

CH1010EMA/E/U/X Specification Summary

Weight:	439g / 15.5oz
Height:	58mm / 2¼"
Length:	180mm / 7"
Width:	140mm / 5½"
Mating Connector:	5-blade standard battery connector
Communications Compliances:	System Management Bus Rev 1.1, Smart Battery Data Specification Rev 1.1 and Smart Battery Charger Specification Rev 1.1 compliant
Power Supply:	90-260VAC, 26V, 2.5A DC, 119x38x60mm, 500g / 18oz UL listed, CE Compliant
Mains Cord:	CH1010EMA - 110V N. American 3-pin connector CH1010EME - 220V European 2-pin connector with ground recess CH1010EMU - 240V UK 3-pin connector CH1010EMX - No mains cord supplied

