Optional Discharge Kit:

The unit can be operated to provide backup power or remote battery power for off-grid applications.

A battery array kit is available to provide battery output power from any battery packs in the charge bays.

Each battery pack contains short circuit protection and each board is diode-protected to prevent one battery from charging an adjacent battery.

The battery packs will discharge in parallel, and the output will be battery voltage. Depending on the batteries used, each CR12 unit can provide a battery array of up to 1.17kWh.

WARNING: the combined battery output from this unit can deliver 1600W / 96A continuously, with peak power significantly higher.

DO NOT SHORT CIRCUIT. The battery packs are protected from damage but any source of short circuit will suffer damage &/or may become extremely hot, causing injury.

Remove the battery packs and any personal jewelry (rings, bracelets etc) before working on the discharge circuit.

To install the discharge kit (available separately):

- Remove all battery packs from the unit & remove the CR12 unit from its rack housing.
- Mount the discharge connector to the side of the rack unit using the screws & nuts provided.
- Plug a discharge connector to each board

Fully Assembled Systems:

Rack-mount cases such as those shown below may be used to create a self-contained portable system. Inspired Energy recommends Gator or SKB cases. Please contact us if you wish to purchase a fully assembled system.

These units must be operated with the front & rear covers both removed to allow sufficient airflow.

Batteries MUST be removed for shipping or moving a rack-mounted system, and also before connecting AC or DC power to the unit.

CR12 rack mount smart charger systems are designed & built to order in the USA by Inspired Energy. For pricing or additional information, please contact us at:

Inspired Energy, LLC 25440 NW 8th Place, Newberry FL 32669
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www.inspiredenergy.com

CR12

12-Bay, 19” Rack-Mount Charging System

Operating Instructions.

INSPIRED ENERGY®
SOLUTIONS FOR PORTABLE POWER

Features:

- 24V DC operation
- Standard 19” rack mounting (3U)
- Fits Inspired Energy N-Series battery packs
- 12 independent, simultaneous charge bays
- Adjustable charge power on each charge bay
- LED charging / fully charged indication on each charge bay
- Can be mounted in multiples to provide any quantity of simultaneous charge bays
- Optional +1kWh battery-array kit enables all 12 batteries to discharge simultaneously

Description:

The CR12 rack-mount unit contains 12 independent SMBus quick chargers, and can be ordered to fit the following Inspired Energy brand batteries:

Battery Model	CR12 Rack Part Number
NL2050 / NL2054 / NH2054 / NH2057	CR12H205
ND2053 / ND2054 / ND2057	CR12D205
NL2044 / Ni2040 / NF2040 / NF2047	CR12i204
NC2040	CR12C204
NF2030 / ND2034 / ND2037	CR12D203
NB2037	CR12B203
Ni2020 / NJ1020	CR12i202
NC2560 / ND2017 / NL2020 / NL2024 / Ni1030 / P-series	Not supported

The CR12 fits standard 19" racks with 3 or more standard spaces (3U). It will simultaneously charge all the batteries at their maximum rate, reducing the cycle time for multi-battery applications. The CR12 is designed only for use with Smart SMBus battery packs manufactured by Inspired Energy.

CAUTION: THERE IS A RISK OF EXPLOSION OR FIRE IF AN INCORRECT BATTERY IS INSERTED.

Specification Summary	
Weight:	8lb / 3.6kg
Height:	5.25" / 133.4mm (3U)
Length:	10.5" / 266.7mm
Width:	19" / 482.6mm (Std. 19" rack/DIN41494)
LED Displays (12 total)	Green flash: Charging Green solid: Charged Red solid: Error
Power Consumption	24VDC, <720W

Connecting to the CR12:

Each circuit board requires 24V DC via a 2.1mm x 5.5mm, positive-center, coaxial socket on the back of each board.

A mating connector molded onto a 2-conductor cable is provided for each board. The cables are 6'/2m long & supplied un-terminated to allow your 24V DC power supply to be located to suit your needs.

Ring terminals are supplied so that the DC power cables can be summed together for attaching to your 24V DC power supply. The positive wire is identified by a white stripe running the length of the cable.

Power Supply:

Full power operation requires a 24V DC, 800W power supply. Your choice of power supply depends on:

- Your desired charge time
  - *Charge rate can be adjusted by a jumper on each circuit board.*
- The power available from your AC mains circuit
  - *Multiple rack systems may require special AC circuits to support the power demand*
- The number of batteries you require to be charged simultaneously
  - *More batteries recharging simultaneously will require larger power supplies*
- The battery capacity.
  - *Higher capacity batteries require higher power to recharge at the maximum rate.*
- Budget.
  - *Larger power supplies cost more.*

Inspired Energy recommends the following Meanwell 19" rack-mount power supplies :

- **RCP-1UI** rack chassis + up to three **RCP-1000-24** supplies (1kW, 24VDC each) for up to three CR12 units
- **RKP-1UI** rack chassis + up to three **RKP-2000-24** supplies (2KW, 24VDC each) for up to six CR12 units

Adjusting the power consumption:

Each charge board features a user-adjustable power feature to limit the charge-power to the battery & reduce the power consumption of the CR12 unit. This enables the user to alter the power consumption to suit a specific power supply or to reduce the battery charge rate.

Adjustment is made by a jumper located at the top of each board towards the rear of the unit.

The CR12 unit should be removed from the 19" rack frame, but there is no need to remove the circuit board from the CR12 unit.

Each board in the rack must have the jumper position changed in order to limit its power consumption / charge rate.

In this way the overall rack power consumption can be reduced to suit a lower cost power supply.

If desired, one or two bays may be left at full-power to provide quick charge bays.

Jumper Location	Charge Power / Board	Rack Power Consumption
Top (default)	60W	720W
Center	30W	360W
Bottom	15W	180W

Sizing your 24V DC Power Supply:

The list below shows the power consumed by differing battery packs. Smaller, lower capacity batteries consume less power. The power consumption of each board may be adjusted using the above method.

Battery Model	Rack Model	Charge Voltage	Charge Current	Board Power Consumption	Rack Power Consumption	Power supply required/rack
NB2037	CR12B203	8.4V	1.5A	18W	211W	300W
NC2040	CR12C204	12.6V	1.5A	24W	287W	300W
ND2053	CR12D205	4.2V	4A	22W	262W	300W
ND2054	CR12D205	16.8V	1.5A	30W	362W	400W
ND2057	CR12D205	8.4V	3A	30W	362W	400W
NF2047	CR12i204	8.4V	3A	30W	362W	400W
ND2034	CR12D203	16.8V	1.5A	30W	362W	400W
ND2037	CR12D203	8.4V	3A	30W	362W	400W
NH2057	CR12H205	8.4V	4A	39W	463W	500W
Ni2040	CR12i204	12.6V	4A	55W	665W	700W
NF2040	CR12i204	12.6V	3A	43W	514W	600W
NF2030	CR12F203	12.6V	3A	43W	514W	600W
Ni2020	CR12i202	12.6V	4A	55W	665W	700W
NH2054	CR12H205	16.8V	3A	55W	665W	700W
NL2050	CR12H205	12.6V	4A	55W	665W	700W
NL2054	CR12H205	16.8V	3.5A	60W	720W	800W
NL2044	CR12i204	16.8V	3.5A	60W	720W	800W

Using this table, and factoring-in any reduction in power consumption for each board; a 24VDC power supply can be sourced to suit the quantity of CR12 charger units required.

Sizing your AC Supply:

The modular design allows multiple 12-bay rack units to be stacked to provide charging for any quantity of battery packs. However, doing so may overload the available AC mains circuits. Therefore it is necessary to assess the AC power requirements prior to specifying a power supply.

A system such as this, using 3 CR12H205 units charging NL2054 battery packs requires 24VDC 2.7kW. This requires a 30A AC supply in 110V countries & a 15V AC supply in 220V countries.

If the charge power is throttled back on each board as described above, then the recharge time will increase, but the power consumption can be reduced to 15W per board / 540W for the system & the AC supply can more easily handle the load.

Operation:

- Plug a battery into an open battery slot. The LEDs will flash once upon correct insertion
- The battery will automatically begin charging & the LEDs will indicate the charge status

Certifications:

The CR12 is CE & FCC compliant for emissions & immunity and is safety tested to EN60950