

FEATURES

- ❖ Charges 12V house battery bank from up to two separate engine alternators.
- ❖ Isolates all batteries from each other when the alternators are not charging.
- ❖ No 0.7V drop or heat produced as with RV style isolators. Allows batteries to reach full charge preventing sulfating and premature battery failure.
- ❖ Generator option - one alternator charges separate house and generator batteries for motor homes.
- ❖ Automatically switches charge current back from the house batteries to maintain a minimum crank battery voltage during extended storage periods.
- ❖ Easy to install with only four cables to connect.
- ❖ **Meets US Coast Guard Title 33, Section 183.410 electrical requirements for recreational boats.**

APPLICATIONS

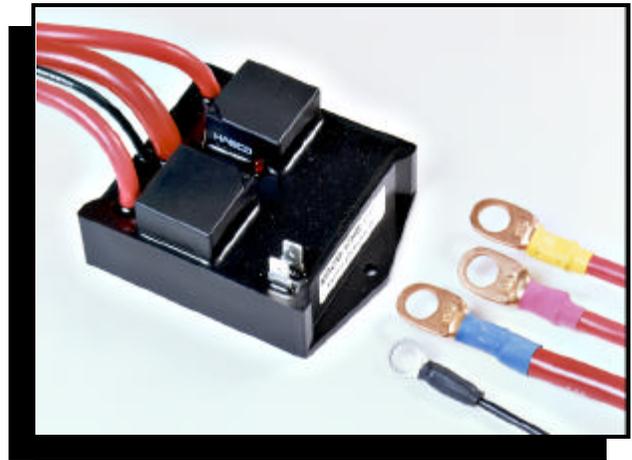
- ❖ Single and dual engine cabin cruisers and house boats with multiple 12V batteries.
- ❖ Motor Homes with separate starter, house and generator 12V batteries.

DESCRIPTION & OPERATION

The MBCM-12 monitors both engine starter batteries and house battery bank. If an alternator is putting out charge current, and the house battery bank needs to be charged, it closes its relay sharing the charge. If both engines are running then both alternators share their charge current with the house battery bank. The starter batteries must reach 13.5V before the charge current is shared with the house battery bank to insure that the starter batteries will be able to restart the engines. The house battery bank will continue to charge from each respective alternator until the alternator stops charging or its engine is shut off. At that point the MBCM-12 relays will open isolating the house batteries from the starter batteries. Both engines can be run individually or in parallel to charge the house batteries. If the house batteries are charging from solar panels etc., the MBCM-12 will disconnect one alternator at a time to prevent over charging the house batteries and loss of water. They will reconnect if the engines are still running when the house batteries will accept additional charge.

The MBCM-12 also monitors the voltage in the starter batteries and switches charge current from the solar or generator charged house battery bank to maintain a minimum starting battery voltage during extended storage periods.

The MBCM-12 is powered by +12V from the Red/Blue house battery wire and the 16AWG black ground wire (drawing less than 7mA continuous current in sleep mode). The MBCM-12 microprocessor looks for a charge voltage of 13.5V to connect and 12.9V to disconnect its relays. If the house batteries are fully discharged when the MBCM-12 connects the charge current, the relays may cycle several times at 5 second intervals until staying continuously on. If the house battery bank continues to draw excessive charge current (due to shorted cell, etc.), the MBCM-12 will go into a lockout mode, which requires both engines to be shut down to reset.



SPECIFICATIONS

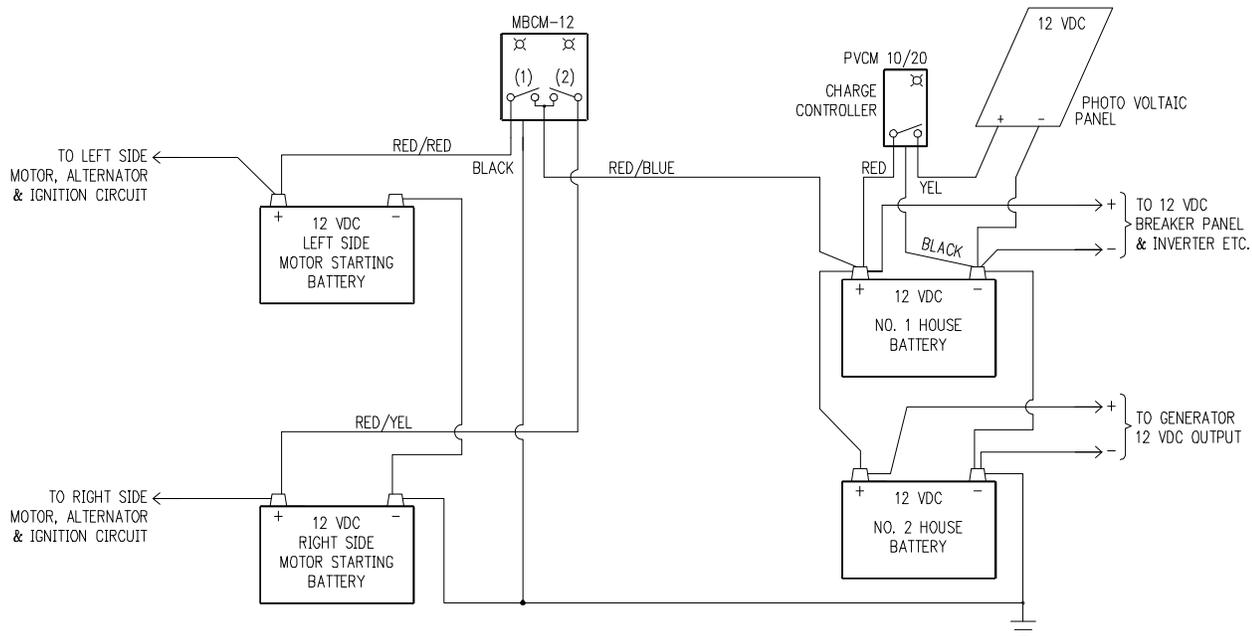
SIZE:	3.0"W x 3.0"L x 1.2"H
WEIGHT:	36 ounces, housing, main and battery cables
ENCLOSURE:	Epoxy potted in PVC plastic to prevent ignition sparks
MOUNTING:	Two #8 x 1" screws
POWER:	10 to 15 V DC from battery
CONNECTIONS:	(2) 6 ft. #8 AWG Main-Bat cables (1) 4 ft. #4 AWG House Bat cables (1) 4 ft. #16 AWG black Gnd wire
CURRENT CONSUMPTION:	Sleep mode ≤ 7 mA Charge mode ≤ 200mA
THRESHOLD:	On @ 13.5V DC ±0.1V DC Off @ 12.9V DC ±0.1V DC
INDICATION:	2 LED indicating relay operation
CAPACITY:	Dual alternators up to 85 Amps Motor home single alternators up to 120 Amps
RELAY CAPACITY:	CAR1AP80 current rating: 80A continuous, 160A. Inrush
TEMPERATURE:	-30 to 75°C ambient
THERMAL PROTECTION:	Disconnects above 85°C relay contact temperature

ORDERING INFORMATION

MBCM-12 - Multiple Dual Battery Charging Module
For house boats 3 battery systems
Handles up to 85 Amp Systems

CAUTION: The battery wire lengths serve to limit instantaneous charge current and should not be shortened or will VOID warranty!

APPLICATION 1 - TYPICAL WIRING CONFIGURATION



The MBCM-12 monitors both the port and starboard engine starting batteries and switches charge current to the house battery bank from either or both engine alternators if the starting battery is above 13.5V and the house batteries can accept additional charge. The MBCM-12 will also switch some charge current from the solar or generator charged house batteries back to the starting batteries if their voltage drops below 12.2V. The house batteries voltage must be above 12.7V and a 7 day period has passed since the MBCM-12 has gone through a charge cycle were one or both engines has run and provided charge to the house batteries. The MBCM-12 then provides a 10 second pulse every 5 minutes to either or both starting batteries to maintain 12.2V on each battery. If the house battery falls below 12.7V this function suspended until the house batteries are charged above 12.7V by either solar panels or generator.

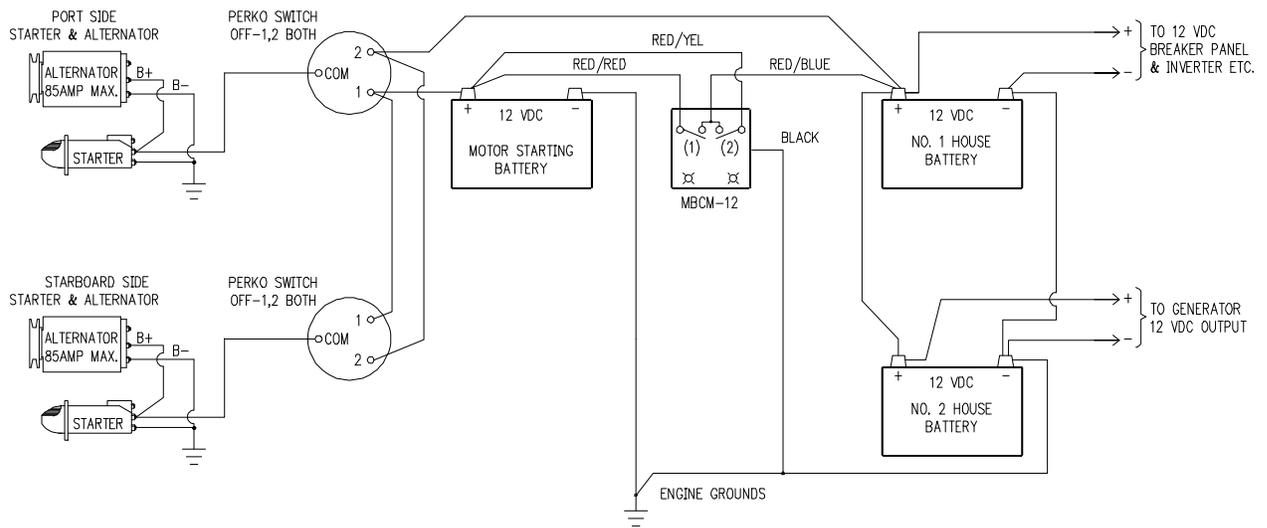
INSTALLATION INSTRUCTIONS - 12V DC BATTERY SYSTEMS ONLY!

THE MBCM-12 IS NOT FOR 24V BATTERY SYSTEMS. CONNECTING IT UP TO A 24V SYSTEM COULD BE DANGEROUS!!!

1. Using your voltmeter and tracing the wires, identify and label the main starting (crank) batteries and the house battery bank. Measure the voltage to make sure that the house battery bank is only 12V DC, not 24V DC or higher.
2. Make sure that at least a #2AWG battery ground wire connects from both of the cranking batteries negative terminals over to the house battery bank negative terminals. This wire should be large enough to allow the cranking current to come from the house battery bank if one of the cranking batteries is fully discharged.
3. Connect the #16AWG black wire from the MBCM-12 to a negative terminal of the house battery bank. Now connect the (4 ft.) #4AWG red/blue wire from the MBCM-12 to a positive terminal of the house battery bank.
4. Connect the red/yellow battery charge wire from the MBCM-12 to the positive terminal of one of the cranking batteries and connect the red/red battery charge wire from the MBCM-12 to the positive terminal of the other cranking battery. Now tighten all of the battery connections just completed.
5. Mount the MBCM-12 securely using the two mounting holes and route and secure all the wires. Use grease or silicone to cover the battery terminal connections to prevent corrosion.
6. Start one of your engines and rev up to at least 1000 RPM. As soon as the alternator is charging the crank battery up to at least 13.5 volts the MBCM-12 relay will pull in, (the respective LED will light) and charging current will be shared with the house battery bank. Now start the other engine as above and observe that its alternator also starts charging the house battery bank.
7. Now shut off both engines and observe that within a few moments the MBCM-12 relays drop out isolating the cranking and house batteries. The MBCM-12 should operate automatically from now on.

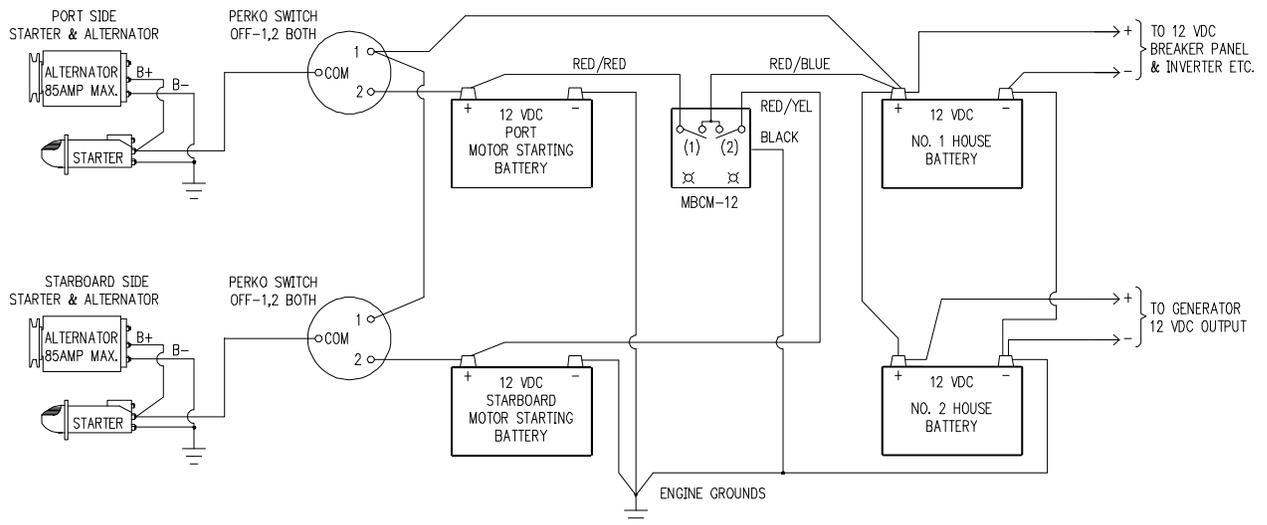
NOTE: The MBCM-12's long term power consumption in "sleep mode" is about 3 amp-hr per month from the house battery bank. If this is a problem, disconnect the #4AWG red/blue charge wire from the house battery bank positive terminal. DO NOT shorten battery charge wires as this will VOID warranty and reduce current limiting capability!

APPLICATION 2 - TWO ENGINES WITH ONE CRANK BATTERY AND HOUSE BATTERY BANK



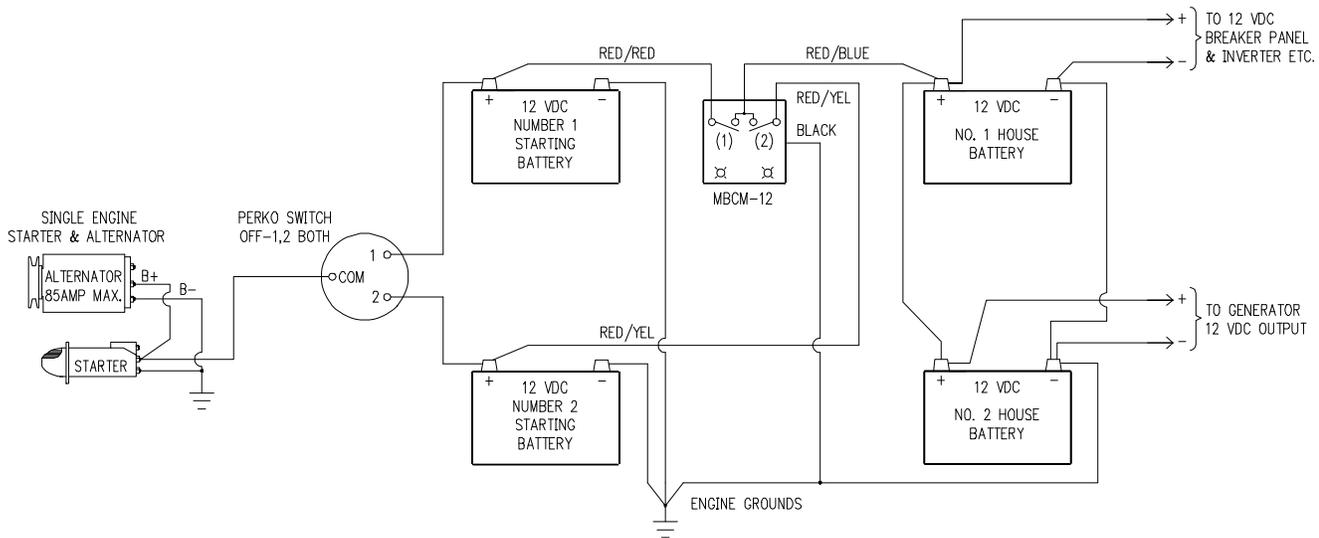
The MBCM-12 function is the same as in Application 1. However, the Perko battery switches allow either engine to be started from the starting battery or house battery bank. Both MBCM-12 starting battery wires are connected in parallel to the single starting battery to handle the simultaneous current supplied by both alternators. The MBCM-12 function charging the house battery bank is independent of whichever Perko switch selection is made.

APPLICATION 3 - TWO ENGINES WITH TWO CRANK BATTERIES AND HOUSE BATTERY BANK



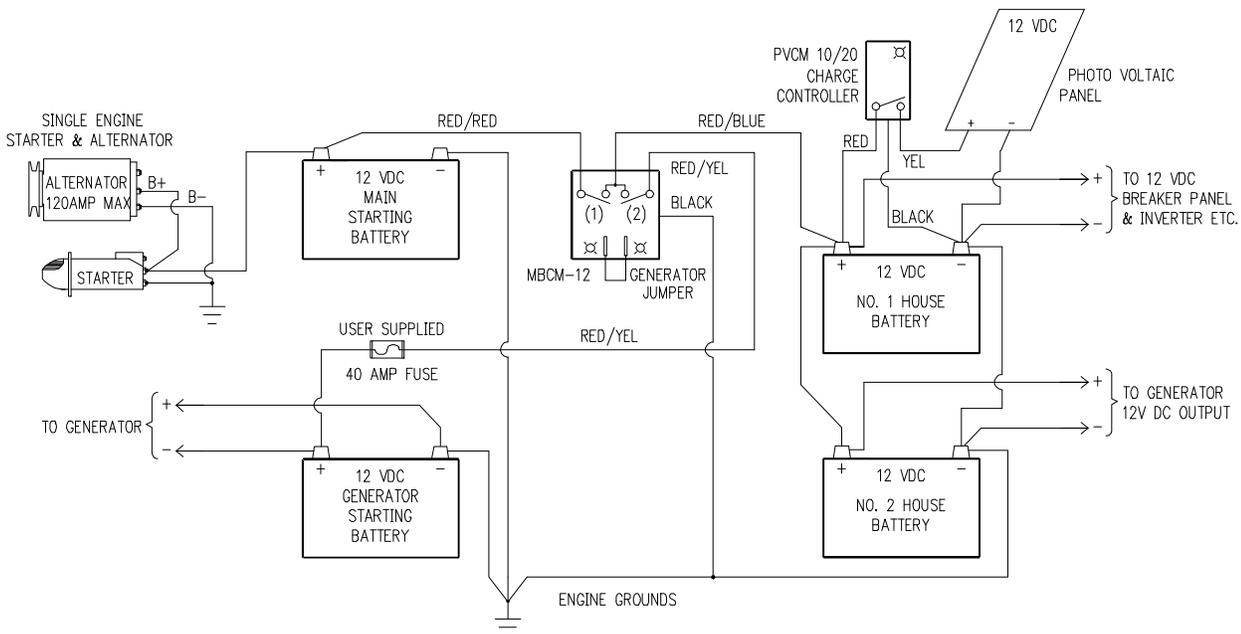
The MBCM-12 function is the same as Application 1. The Perko battery switches allow either engine to be started by its own starting battery or from the house battery bank. The MBCM-12 function charging the house battery bank is independent of whichever Perko switch selection is made.

APPLICATION 4 - ONE ENGINE WITH TWO CRANK BATTERIES AND HOUSE BATTERY BANK



The MBCM-12 function is the same as Application 1. This application is where an inverter and house battery bank are added to an existing two battery single engine system. The Perko switch allows the single engine to be started by either starting battery. The MBCM-12 charges the house battery bank from either starting battery when the engine is operating. Both starting batteries will charge from the alternator even if the Perko switch is selected to the other battery when the house battery bank is nearing full charge.

APPLICATION 5 - MOTOR HOME TYPICAL WIRING CONFIGURATION



When the "Generator Jumper" is installed the MBCM-12 doesn't look for an alternator charge voltage on the red/yellow battery wire. The MBCM-12 operates normally as in Application 1 with regard to the starting battery connected to the red/red battery wire. The MBCM-12 monitors the generator starting battery connected to the red/yellow wire. If the generator starting battery voltage is too low in the 12V range then the MBCM-12 will deliver a short 10 second pulse of charge from the house battery bank and monitor the generator battery voltage rise to make sure that it doesn't overcharge as it may be a considerably smaller battery than the capacity of the house battery bank. The MBCM-12 can also maintain a 6V generator starting battery, but an appropriate in-line resistor and fuse must be installed in the red/yellow battery leg to prevent damaging the 6V generator battery. Contact the factory for the 6V generator battery application sheet.