

General Description

The MCOR 12 system is a 16-channel precision magnet driver, capable of providing bi-polar output currents in the range from $-12A$ to $+12A$. The output current can be adjusted smoothly through zero. A single, unregulated bulk power supply provides the main DC power for the entire crate. The MCOR system employs a modular architecture, so that any individual channel is serviceable without disturbing the operation of adjacent channels in the same crate.

Features

- Proven member of a modular Power Module family, more than 800 units are in service
- Precision-regulated Bi-Polar output provides up to $+12$ to -12 Amps for Magnet loads.
- Smooth operation through zero amps output current, no “Crossover” problems.
- All 2510 MCOR12 Power Modules are identical and interchangeable, and can be used in any application within its ratings. When a module is replaced, the Programming Card is plugged into the replacement module.
- Has two high-precision measurements of output current; one is used to close the regulation control loop, the other provides an independent monitoring signal to the Crate Interface Card.
- Fault sensing circuitry in the module sets a Fault Latch which inhibits the output.
- A (momentary) Sync input signal inhibits MOSFET switching when it is active (high); this eliminates switching noise “feed-through “ from the Bulk Power Supply to the AC power lines. This feature reduces power line noise during sensitive analog signal measurements.



Applications

- Particle accelerator beams
- Industrial Robotics
- Motor control
- Medical equipment

Specifications

Parameter	Min	Typ	Max	Unit
DC Mains Input Range	20		50	V
Output polarity		Bipolar		
Nominal Output Current Range	0		12	A
Maximum Fault Current			15	A
Load Capacitance Range (For Stable Operation)	0		50	uF
Operating Temperature	15		65	°C

Programming Card

Each magnet design has a unique inductance and frequency characteristic, and in addition each corrector installation has a unique cable plant resistance and maximum current rating.

In order to provide “custom-tailored” service to each corrector magnet, yet retain a high degree of modularity and consistency in the driver design, each MCOR 12 power module accommodates a small programming (PGM) card. This card contains a set of passive components that match several important characteristics of power module to its corrector magnet, including:

- IVA (output current vs. SAM voltage) determined by R101
R=300,000/ full-scale output current
- DVI (DAC voltage vs. output current) determined by R102
R=300,000/ full-scale output current
- Tuning compensation values – C101 (pole), R103 (zero)
- IMMO (maximum output current limit) determined by R104
R=3,000 ohm for 7.5 max output
R=20,000 ohm for 12A max output
R=OPEN CKT for 15A max output
- Internal or external sync selection

It is important to note that all MCOR 12 power modules are identical and interchangeable. Every power module is capable of any full-scale current rating, as dictated by the plug-in PGM card that “piggybacks” on the power module. The PGM card is the only item that changes from slot to slot, giving the power module a tailored response to its corrector magnet. Each PGM card is labeled with the building, rack level and slot to which it belongs. When a power module is replaced, the programming card is removed from the old power module and installed on the new one, preserving the tailored response for that corrector magnet.