



Product Compliance



Low Voltage Directive (LVD) 2014/35/EU

Electromagnetic Compatibility Directive (EMC) 2014/30/EU

EN 55022 (CISPR 22) Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement 2010/AC: 2011

EN 55024 (CISPR 24) Information technology equipment - Immunity characteristics - Limits and methods of measurement 2010

EN 60950-1 Information technology equipment - Safety - Part 1: General requirements 2001

Copyright © NewMar 2022 All rights reserved.

Release Date: 27 SEP 2022

Disclaimer: NewMar reserves the right to make changes to the information within this document without notice

Installation Manual CM Series DC-DC Converter

Table of Contents

1	Safety	6
2	Receiving Instructions	6
2.1	Package Inspection.....	6
2.2	Equipment Inspection.....	6
2.3	Handling	6
2.4	Identification Labels.....	7
3	Scope.....	7
4	Principles of Operation	7
4.1	Introduction	7
4.2	Front Panel Indicators.....	7
5	Features (User Adjustable).....	8
5.1	Output Voltage	8
5.2	Default Output Voltage.....	8
5.3	Current Limit (Output).....	8
5.4	Power Limit.....	8
5.5	Over-Voltage Shut Down (Output).....	8
5.6	Current Share	8
5.7	Shutdown Latch Enable.....	9
5.8	Default Output Settings	9
6	Features (Factory Set).....	9
6.1	Input Over/Under-Voltage Shut Down.....	9
6.2	Input/Output Inrush Current Limiter.....	9
6.3	Over-Temperature Shutdown.....	9
6.4	Reverse Polarity Protection.....	9
6.5	Parallel Converter Operation	9
6.6	Converter Fail Relay.....	10
6.7	Rear Connector.....	10
6.7.1	Pin descriptions.....	10
6.7.2	Positronix Connector.....	11
7	Installation	11
7.1	Positioning of Converter	11
7.2	Mounting the Converter into the Rack	11
7.3	Cabling.....	12
7.4	Multiple Converters	12
7.5	Commissioning the Converter	12
8	Servicing	12
8.1	Warnings	12
8.2	Troubleshooting.....	13

1 SAFETY



All installation and maintenance must be carried out by suitably qualified personnel.



For your protection, the product manual should be read and thoroughly understood before unpacking, installing, and using the equipment.

2 RECEIVING INSTRUCTIONS

Newmar provides all equipment to the delivering carrier securely packed and in perfect condition. Upon acceptance of the package from Newmar, the delivering carrier assumes responsibility for its safe arrival. Once the equipment is received, it is the recipient's responsibility to document any damage the carrier may have inflicted, and to file the claim promptly and accurately.

2.1 Package Inspection

Examine the shipping crate or carton for any visible damage: punctures, dents, and any other signs of possible internal damage.

Describe any damage or shortage on the receiving documents and have the carrier sign their full name.

2.2 Equipment Inspection

Open the crate or carton and inspect the contents for damage. While unpacking, be careful not to discard any equipment, parts, or manuals. If any damage is detected, call the delivering carrier to determine the appropriate action. They may require an inspection.

IMPORTANT: Save all the shipping materials for the inspector to see.

After the inspection has been made, if damage has been found, contact Newmar. We will determine if the equipment should be returned to our plant for repair or if some other method would be more expeditious. If it is determined that the equipment should be returned to us, ask the delivering carrier to send the packages back at the delivering carrier's expense.

If repair is necessary, we will invoice you for the repair so that you may submit the bill to the delivering carrier with your claim forms.

It is your responsibility to file a claim with the delivering carrier. Failure to properly file a claim for shipping damages may void warranty service for any physical damages later reported for repair.

2.3 Handling

Handle the equipment with care. Do not drop or lean on front panel or connector. Keep away from moisture.

2.4 Identification Labels

Model number and serial number are clearly marked on all equipment. Please refer to these numbers in all correspondence with Newmar. Ideally provide a photograph of the product label for reference.

3 SCOPE

This document details the Newmar CM series of DC-to-DC converters: features, functions, specifications, and installation.

4 PRINCIPLES OF OPERATION

4.1 Introduction

The CM series of fan cooled flat-mount DC-DC converters consist of the following models:

Table 1: CM series converter specifications


Model	Nominal Input Voltage	Input Voltage range	Nominal Output Voltage	Output Voltage Range	Maximum Output Current	Power Rating
CM-12-40	48V	40-60V	12V	10.5-15V	40.0A	600W
CM-24-40	48V	40-60V	24V	21-30V	40.0A	600W


The features of the converters are:

- Fan cooled
- Thermal protection
- Input/output voltage and current protected
- Active load sharing when operated in parallel with another converter
- External alarm and control interface
- 1U rack height

4.2 Front Panel Indicators

There are 3 LED indicators on the front panel indicate the operational state of the converter.

 : This green LED indicates that input power is connected to the unit and that the primary stages of the converter are operating.

 : This yellow LED indicates a non-urgent alarm state within the converter.

This could be caused by the following:

- Converter in output power/current limit
- Converter over temperature
- Fan failed
- Converter soft starting

 : This red LED indicates an urgent alarm state within the converter.

This could be caused by the following:

- Converter failed
- The DC input voltage is outside the operating range.
- Converter shut down due to output over-voltage or over-temperature

5 FEATURES (USER ADJUSTABLE)

The following converter features are adjustable by the user. Features must be adjusted using the serial communications interface using the EM4x energy manager.

5.1 Output Voltage

The output voltage is set through the serial interface by an external controller (e.g., System monitor). This setting is volatile and is not saved when the converter powers down. If this setting is not set, then the converter will use the Default Output Voltage. The adjustment range is indicated in table1.

5.2 Default Output Voltage

The default output voltage will be the output voltage if no serial connection is made to the converter while in operation.

5.3 Current Limit (Output)

The converter automatically limits the converter output current. The maximum output current is preset in the factory but may be adjusted down.

5.4 Power Limit

The output power is factory set and model-specific it may be set at a lower limit if desired.

5.5 Over-Voltage Shut Down (Output)

The converter will automatically shut down if the output voltage exceeds the preset value. The Over- Voltage Shutdown voltage is preset in the factory at the value indicated in Table 2.

The over-voltage set point will reduce with increased output current by to 2% at full load. This is to ensure that the converter producing the over-voltage is shutdown first and any other converters operating in parallel remain operating.

5.6 Current Share

Current share is normally always enabled, but it is possible to temporarily disable current share to investigate system operation issues.

5.7 Shutdown Latch Enable

When the converter is shut down due to either over-voltage or over-temperature, it will automatically restart when the voltage or temperature returns to normal levels. However, this setting, when enabled, ensures the converter is latched off when either or both conditions occur.

5.8 Default Output Settings

In the factory the converters output settings are set as follows:

Table 2: CM series converter factory settings

Model	Default Voltage	Over Voltage Shutdown	Current Limit	Power Limit
CM-12-40	13V	16.0V	40.0A	600W
CM-24-40	26V	32.0V	40.0A	600W

6 FEATURES (FACTORY SET)

6.1 Input Over/Under-Voltage Shut Down

If the input voltage moves outside the specified range, the converter may shut down until the input voltage returns to within this specified range.

6.2 Input/Output Inrush Current Limiter

On start-up, the peak input and output inrush currents are limited. They are both limited so as not to exceed their normal operating level.

6.3 Over-Temperature Shutdown

When the converter reaches its maximum operating temperature, the converter will progressively reduce the output current to attempt to reduce the heat within the unit. In extreme circumstances, the converter will totally shutdown.

The operating ambient temperature range is: -20 to 70°C. Maximum output power is de-rated at temperatures above 50°C.

6.4 Reverse Polarity Protection

The converter has an internal reverse polarity protection fuse and crowbar diode fitted to the input and output of the converter. These parts are not user serviceable, and the converter will require to be returned to an authorized service center for repair.

6.5 Parallel Converter Operation

The converters may be connected in parallel to source more current, or to provide a degree of redundancy.

The converters connected in parallel must all be of the same model, voltage, and power rating. If multiple converters are used, they may be housed in one or more converter shelves with dedicated backplane circuit boards. The converters should have the load share signal connected between the converters. This is achieved by connecting the load share signal line on the back plane on each converter (Note: with a common backplane this can be done on the backplane itself).

When load share is connected, the converters with the higher voltage output will automatically adjust their output voltage down so that all converters take a uniform share of the load. If using more than one shelf of converters the link between the shelves should be connected.

6.6 Converter Fail Relay

The converter fail relay output appears on pins 12 and 15 of the rear connector. The relay is normally energized while the converter is operating. If the converter fails, the relay will be de-energized, and the contacts change state. The contacts can be set to be either Normally Open (NO) or Normally Closed (NC) using the header next to the main rear connector. If the header link bridges the two pins closest to the main connector the relay contacts will be NC. If the header links the two pins furthest from the main connector, the relay contacts will be NO.

Note: The contact states normally open (NO) or normally closed (NC) refer to the status of the relay contacts when it is de-energized. Hence, this is the state that the contacts will be when the converter has failed.

6.7 Rear Connector

The power input/output and monitor connection are made through the Positronix goldfish GFSH109 series on the rear of the converter. Pin identification table is below:

6.7.1 Pin descriptions

Table 3: CM series converter rear connector output pin descriptions

Pin #	Description
Pin 1,2,4	Positive Input - Always connect in parallel.
Pin 3,5,6	Negative Input - Always connect in parallel.
Pin 7	Serial Communication Bus (SBI)
Pin 8	Rack Position - horizontal
Pin 9	Rack Position - vertical
Pin 10	Post-mate - connected to 0V
Pin 11	Load Share
Pin 12	Fail Alarm isolated relay. 100V, 100mA max (jumper determines contact state)
Pin 13	SBI - Power (+)
Pin 14	SBI - Power (-)
Pin 15	Fail Alarm isolated relay. 100V, 100mA max (jumper determines contact state)
Pin 16,17	Negative Output - Always connect in parallel.
Pin 18,19	Positive Output - Always connect in parallel.

6.7.2 Positronix Connector

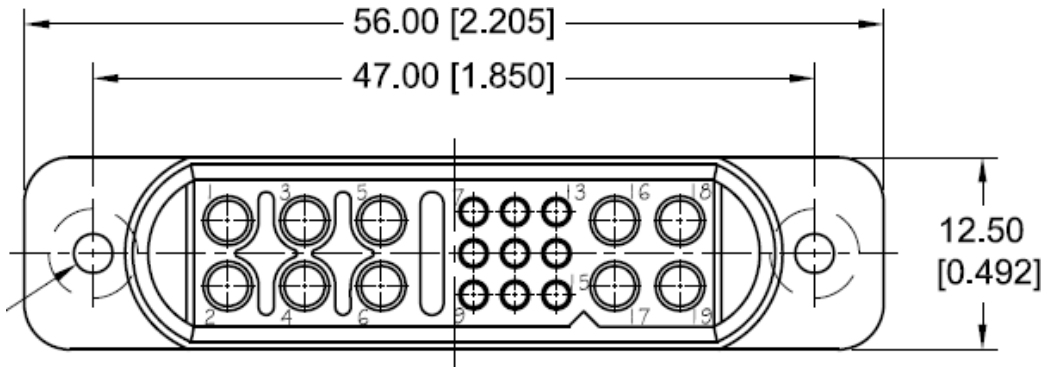


Figure 1: CM series converter rear connector output pin locations

7 INSTALLATION

7.1 Positioning of Converter

The converter should be positioned close to the load supply, to keep the length of the low voltage cables to a minimum. These cables are carrying high currents, and voltage drop in the cables must be kept to a minimum.

CM series converters can be mounted 4 across a 1U 19" shelf. The shelves may also be stacked on top of each other.



Care should be taken to ensure that air entering the front of the converter is cool air and has not been heated by other equipment.

7.2 Multiple Converters

The converters may be operated in parallel to provide greater current capability and to provide redundancy.

When converters are connected in parallel (and load sharing), alarm outputs on the converters give the status of all the units.

Any fuses or circuit breakers on the output of the converter must be placed after the converter outputs have been connected.

7.3 Commissioning the Converter

1. Ensure the polarity of the load and battery cables to the backplane is correct
2. Plug the converter into the converter shelf using the following steps:
 - Locate the metal tag (at the bottom/rear of the converter) into the chosen slot in the backplane
 - Push the converter into the converter shelf until the connector is fully engaged.
 - There will be an audible click as the converter locks itself in position using the plastic spring retainer on the right side of the front panel.
 - Converter removal is achieved by pressing and holding the unlock button then gently pulling on the front panel.
3. Once the converter is installed into the converter shelf, the AC power can be turned on. After the initial startup period the converter will be set to the desired system parameters by

the monitor module via serial connection. If there is more than one converter connected in parallel, then follow the above procedure for each converter in turn (with the other converters all disconnected). Ensure all converters are adjusted to the same output voltage. Finally check that all converters are indicating near equal current (should be better than 10% of full load).

8 SERVICING

If the converter develops an operational fault or is damaged in any way an authorized service center should service, it immediately.



DANGER Do not operate the converter if the covers are removed or damaged in any way.



WARNING The converter contains voltages that may be lethal even after the input supply has been removed.



WARNING The converter contains components at high temperature that may burn if touched.

8.1 Warnings

This converter contains no user serviceable components. Do not disassemble the converter. To isolate the converter from the power supply, simply unplug it from the shelf.

8.2 Troubleshooting

Basic operation checks:

- Check power to the converter
- Check that the DC input LED is on
- Check and resolve any fault conditions indicated by the converter
- Disconnect load leads. Check the voltage across the load is as expected
- Connect a current meter in series with the load. Adjust the load and check the current delivered by the converter is as expected (if not recheck each converters output voltage)

Load Checks:

- Connect a load to the converter output. Turn the input volts on and check that the current drawn by the load is as expected, and within the capabilities of the converter.

8.3 EM4x Shelf Configuration

The EM4x Web UI is used to configure DC-DC converter shelves under IO Configuration>IO Boards> Shelf Configuration.

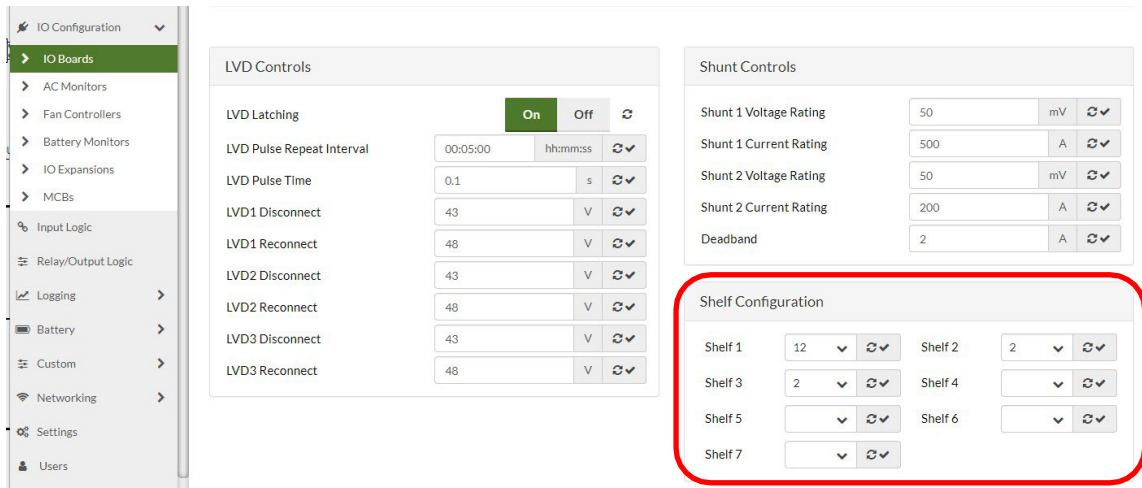


Figure 9: EM4x Shelf Configuration

Enter the number of DC-DC converter modules in a shelf into the appropriate shelf field, starting at Shelf 7 and decrementing for each DC-DC converter shelf in the system. That is, the number of DC-DC converter modules in a second shelf is entered into the Shelf 6 field, then Shelf 5 field, and so on.

Note: that the Shelf Configuration section of the IO Boards page shows all the shelves of the system. Where 'Shelf' in this instance is each dedicated module backplane (a 12-way 3U rectifier backplane = 'one shelf') and the shelf number is determined by the module type:

- Rectifier shelves (including Renewable shelves) start their numbering at Shelf 1 and increment.
- DC-DC converter shelves start numbering at Shelf 7 and decrement.

Note: the maximum number of shelves per IO board is 7. For shelf numbers greater than 7 an IO expansion board is included in the system.

Warranty

NewMar warrants that this product is free from defects in material and workmanship and agrees to remedy any defect (or at its option replace the product) for a period of two years from the date of purchase. This warranty covers both parts and labor. Parts may be replaced under this warranty with new or remanufactured parts.

This warranty will not apply to any product that has been improperly installed (as described in the installation manual), misused, abused, used in ways the product was not designed, altered, or repaired in any way which may affect the performance or reliability of operation, sustained damage by power surges or electrical storms, or sustained shipping damage, or repaired by any unauthorized repair center.

Please contact NewMar Customer Service to obtain a Returned Materials Authorization (RMA) prior to shipping any products for repair. All shipments must be shipped prepaid and include proof of the date of your original purchase. Please include your name, address, phone number, email address and a brief description of the problem.

NewMar makes no other warranties, express or implied, including any warranty of fitness for a particular purpose. In no event shall NewMar be responsible for indirect or consequential damages or lost profits even if NewMar has been advised of the possibility of such damages. NewMar sole obligation to you shall be the repair or replacement of a non-conforming product.