

# DMX Output Interface



## Contents

<b>Introduction</b>	<b>3</b>	<b>Input and Output Wiring</b>	<b>5</b>
Dimensions	.3	Relay Outputs	.5
Weight	.3	Analog/Digital Inputs	.5
Specification	.3	Digital Outputs	.5
General	.3	<b>Control Wiring</b>	<b>6</b>
8 Analog / digital inputs	.3	iCAN Network	.6
8 Digital Outputs	.4	RS485 Control	.6
Support for multiple control protocols	.4	RS485 & DMX Terminations	.7
2 Alarm switch inputs	.4	Alarm Inputs	.7
<b>Mounting</b>	<b>4</b>	DMX Output	.7
Location and spacing	.4	DMX Channel Mapping	.7
Ambient atmosphere requirements	.4	RJ12 Connector	.7
Mounting Holes	.4	<b>Operation</b>	<b>8</b>
<b>Supply Wiring</b>	<b>4</b>	Commissioning	.8
Connecting the Supply	.4	Diagnostics	.8
Wire Gauge for Supply Terminals	.5	<b>WARRANTIES AND LIMITATION OF LIABILITY</b>	<b>8</b>



## WARNING



**WARNING HAZARDOUS VOLTAGES, DISCONNECT FROM SUPPLY BEFORE REMOVING COVERS**

NO USER SERVICEABLE PARTS INSIDE SERVICE BY QUALIFIED PERSONNEL ONLY



## SAFETY INSTRUCTIONS



### IMPORTANT SAFEGUARDS

#### READ AND FOLLOW ALL SAFETY INSTRUCTIONS

The DMX Output Interface is built and tested to strict safety regulations. By following the steps listed below and elsewhere within this guide, you can ensure safe installation and operation of these controller units.

- The DMX Output Interface must be installed only by a qualified electrician.
- The installation must comply with the appropriate electrical codes and regulations in force in your area.
- The DMX Output Interface is designed for indoor installation and use only. The unit can, however, be used to control appropriately certified exterior fixtures.
- Ensure that all wiring used conforms fully to local specifications and is sufficiently rated for the installation.
- All new wiring must be fully verified before applying power.
- The high voltage supply should be fed to the DMX Output Interface via an external isolation breaker with sufficient capacity for the planned installation.
- Ensure that the supply is fully isolated at an external breaker before removing the chassis covers. Test that power has been removed before starting to handle conductors.
- Ensure that high voltage and low voltage wiring remains separate.

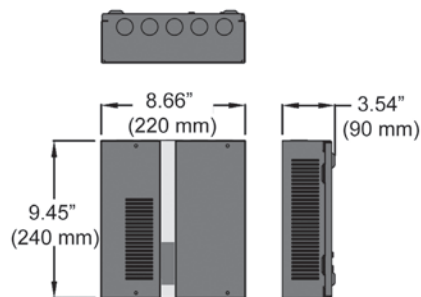
#### SAVE THESE INSTRUCTIONS

## Introduction

This unit provides DMX output that track 96 channels in the iCANnet™ system. Eight of these control volt-free mains rated low power relays and a further eight control digital outputs which can be used to control the power to the DMX sources or control channels in their own right. These allow lighting sources that use DMX as the control signal to be used as part of the iCANnet™ system.

Fitting in the smallest of the iCAN™ system controller boxes this compact unit can be mounted virtually anywhere. As well as the essential connections to the iCANnet network, there are also terminals provided for connection to an RS485 system.

## Dimensions



## Weight

- Packed: 5.7 lbs. (2.6 kg)
- Unpacked: 5.3 lbs. (2.4 kg)

## Specification

### General

- Unit requires 120 VAC, 50/60 Hz, 1A single phase supply
- RJ12 iCANnet port for local connection of iCAN system tools
- Service switches and indicators for diagnostic operations
- Ambient temperature range 36°F to 104°F (2°C to 40°C)
- Humidity 5% to 95%, non-condensing
- EEPROM configuration and sequence memory
- Field upgradable FLASH program memory
- Configurable start up action on power-up condition

### 8 Analog / digital inputs

- Individually programmable as analog or digital inputs
- Analog input mode:
  1. Suitable for use with rotary and linear variable resistors
  2. Reads input voltages from 0 – 10 VDC
  3. Inputs protected for use up to 12 VDC
- Digital input mode works with:
  1. Switch closure from the IN to Common
    - For use with both momentary and maintained inputs
    - Minimum momentary input pulse duration 20 msec
    - Switch will see up to 60uA when closed
  2. Open collector NPN active low circuit
    - On-state voltage  $\leq$  500mV and capable of sinking 60uA
    - Collector-emitter leakage current  $\leq$  10 uA
    - Collector-emitter voltage  $\geq$  supply voltage
  3. Actively driven circuit
    - Active low voltage  $\leq$  500mV and capable of sinking 60uA
    - Active high voltage  $\geq$  supply – 1 volt
- All analog / digital inputs wire with 2 part connectors with screw terminals. Wire sizes 12 AWG (4mm<sup>2</sup>) to 24 AWG (0.25mm<sup>2</sup>).

## Mounting

### 8 Digital Outputs

- LED indication of switched output status
- Configurable as digital control channels
- Outputs will drive a single LED, or two LEDs in a series with up to 20 mA of current; exact current will depend upon the forward voltage drop of the LED used.
- Outputs are actively driven high and low to TTL voltages with an internal series impedance of 220 ohms.
- All digital outputs wire with 2 part connectors with screw terminals. Wire sizes 12 AWG (4mm<sup>2</sup>) to 24 AWG (0.25mm<sup>2</sup>).

### Support for multiple control protocols

- 2 sets of terminals for the iCANnet network
- RS485 connection to third party devices
- DMX 512A output to third party devices

### 2 Alarm switch inputs

- For integration with emergency control devices and building management systems
- For DC use only
- Maximum open circuit voltage, 5V

## Mounting

### Location and spacing

The DMX Output Interface should be installed in a dry ventilated location, where ambient conditions are maintained within the requirements of the unit.

The unit has ventilation slots on its sides to allow convection cooling and under no circumstances should these be blocked.

Allow 2" (50mm) above and below the unit if trunking with a depth greater than 2" (50mm) is used.

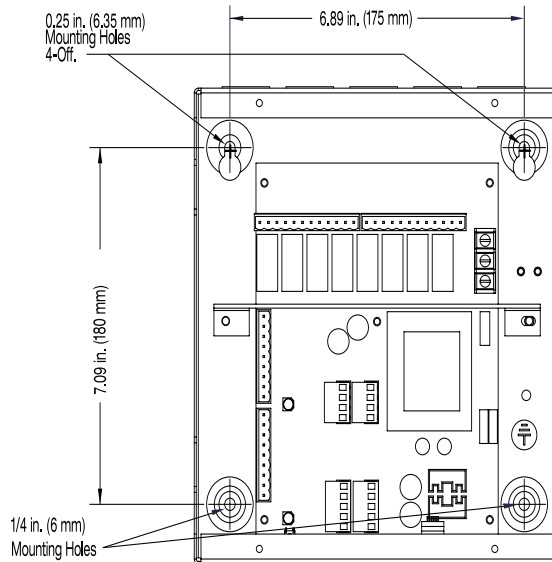
### Ambient atmosphere requirements

- Temperature: 32°F to 104°F (0°C to +40°C)
- Humidity: 0 to 95%, non-condensing

### Mounting Holes

The unit is provided with four 1/4in (6mm) diameter fixing holes for wall mounting.

The mounting holes can be accessed by undoing the four screws on the front cover and removing it.



## Supply Wiring

### Connecting the Supply

This unit requires a nominal 120V single phase supply (Hot, Neutral, and Ground) with 1A capability.

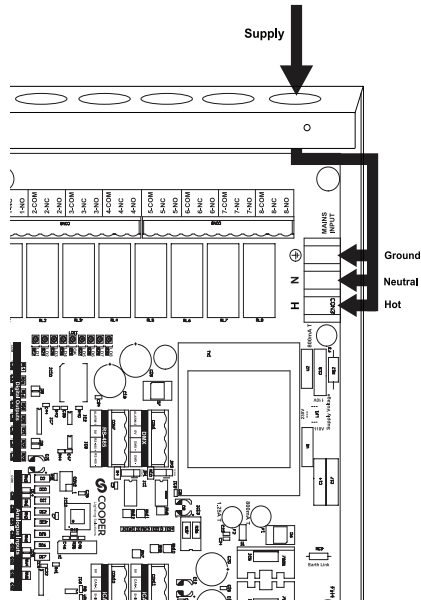
Keep the supply wiring segregated from the relay connector cabling.

Ensure all supply connections are fully tightened.

A knockout, suitable for a 3/4" (19mm) cable gland, is provided for the supply entry point.

## Wire Gauge for Supply Terminals

Terminals suitable for wire sizes from 22AWG (0.34mm<sup>2</sup>) to 12AWG (4mm<sup>2</sup>).



Supply Wiring Connections

## Input and Output Wiring

### Relay Outputs

There are 8 Relay Outputs that can be wired to provide low voltage or line voltage outputs.

- Normally open and Normally closed terminals available for each relay
- Low voltage volt free outputs
- Line voltage rated at 3 Amps AC for general use, resistive, incandescent lamps (tungsten), electric discharge (ballast) loads and ¼ HP AC motor loads for use at 120 and 240 VAC.
- Do not mix low voltage and line voltage on relay output terminals
- Controlled as channels 1-8

Connections are made via two 12-way 2 part connectors with screw terminals.

**Wire Gauge for Relay Outputs:** Terminals suitable for wire sizes from 24AWG (0.25mm<sup>2</sup>) to 12AWG (4mm<sup>2</sup>).

The unit is supplied with knockouts, suitable for 3/4" (19mm) cable glands, for relay output wiring. An appropriate cable gland should be fitted to each knockout hole to protect the cabling from damage.

### Analog/Digital Inputs

The unit has eight inputs which can be configured via software for either digital or analog input signals.

- Individually programmable to be analog or switch inputs
- Analog inputs accept 0 – 10VDC signals

**Note:** Wire distance from the device to the SCD96-NA should not exceed 32 feet (10m).

Connections are made via a 9-way two part connector with screw terminals.

The unit is supplied with knockouts, suitable for 3/4" (19mm) cable glands, for analog/digital input cabling. An appropriate cable gland should be fitted to the knockout hole to protect the cabling from damage.

Wire Gauge for inputs: terminals suitable for wire sizes from 24AWG (0.25mm<sup>2</sup>) to 12AWG (4mm<sup>2</sup>).

### Digital Outputs

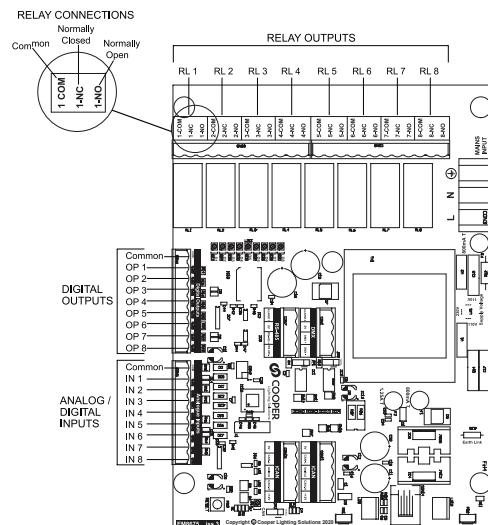
The unit has eight digital outputs. These can be configured as:

- LED drive indicators of switched output status
- Digital control channels
- Controlled as channels 9-16

Connections are made via the 9-way two part connector with screw terminals.

**Wire Gauge for Digital outputs:** terminals suitable for wire sizes from 24 AWG (0.25mm<sup>2</sup>) to 12 AWG (4mm<sup>2</sup>).

The unit is supplied with knockouts, suitable for 3/4" (19mm) cable glands, for digital output wiring. An appropriate cable gland should be fitted to the knockout hole to protect the cabling from damage.

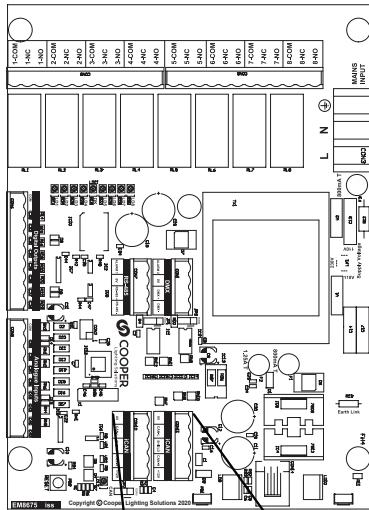


Input/Output Wiring Connections

# Control Wiring

## iCAN Network

Two removable 5 way connector blocks are provided for the connection of iCAN network cables. The iCAN terminals on the board are connected in parallel.

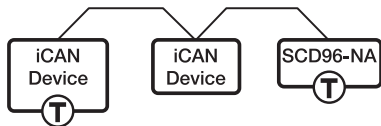


iCAN Connectors

- Cable type: Cooper Lighting Solutions LCCP or LCCNP or Belden 1502R or 1502P
- Maximum cable length: 1000 ft. (305 m)\*
- Devices per segment: 100 (without bridge or repeater)

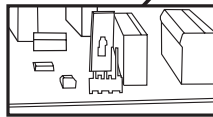
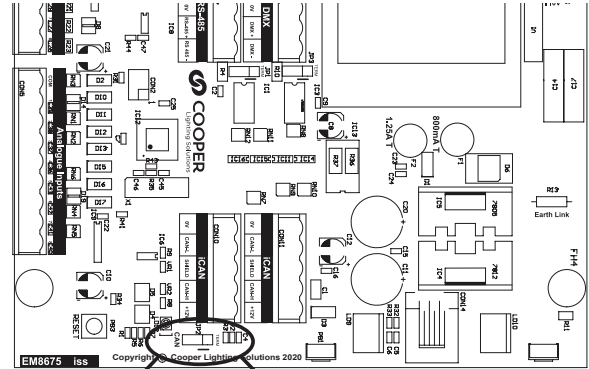
\* A maximum segment distance of 3200 ft. (1000 m) is possible if an additional 12V power supply is used.

iCAN devices are 'daisy-chained' on the network. Spurs from the Network are not permitted and will result in communications problems. Devices on an iCAN network can be wired in any order. Termination is required at both ends of the network.

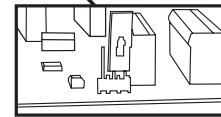


(T) - Indicates where a termination is required.

The SCD96-NA has built-in network termination. If the SCD96-NA is at the end of the network, ensure the CAN TERM jumper is fitted in the Termination On position.



Termination OFF



Termination ON

CAN Terminator

## RS485 Control

An RS485 port is provided for connection to third party devices or PC integration.

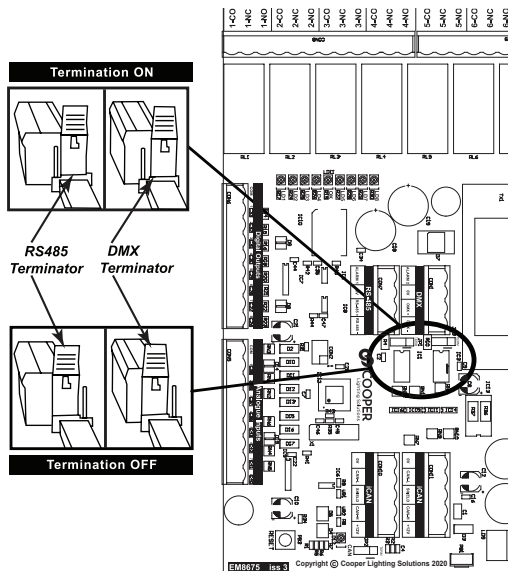
The settings are:

- Baud Rate: 9600 Baud
- Data Structure: No parity, 8 data bits, 1 start bit, 1 stop bit.

A removable 4 way connector block is provided for the connection of RS485.

## RS485 & DMX Terminations

RS485 and DMX networks are daisy-chained. Devices at either end of the network must be terminated. If the SCD96-NA is at the end of the network, ensure the appropriate jumper is fitted in the termination ON position, as in the following diagram:

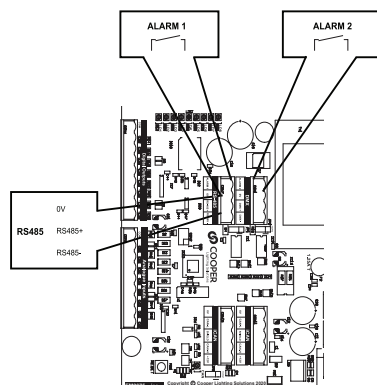


RS485 & DMX Terminations

## Alarm Inputs

The default action for the alarm inputs is for all outputs to switch on. These inputs are designed for integration with emergency control devices and building management systems, using volt-free switch inputs.

The default action for the alarm inputs is for all mapped DMX channels output 255, digital outputs drive high, and relay outputs close. They will then remain in this state, regardless of any other command received, until both alarm inputs are open again.



Connections for RS485 and Alarm Inputs

## DMX Output

A DMX port is provided for connection to third party DMX devices, such as lighting fixtures, etc.

The output conforms to the DMX-512A standard and is therefore isolated from the main electronics and electrical supply of the SCD96. (NOTE: The DMX output port and the RS485 port use a common isolated supply and are therefore NOT isolated from each other)

A removable 4 way connector block is provided for the connection of DMX.

## DMX Channel Mapping

The mapping of the iCANnet™ channels of the SCD96 to the DMX output channels is configurable from iCANsoft.

The first eight channels control the relays as well as being able to be mapped to any available DMX channel. The next eight channels control the digital outputs as well as being able to be mapped to any available DMX channel. The next 80 channels are DMX output only and can be mapped to any available DMX channel.

Both the relay and digital output switching points are configurable (via the Min & Max values) from iCANsoft.

**Note:** Only one iCANnet™ channel should be mapped to a single DMX channel. One to Many & Many to One topologies are NOT supported.

## RJ12 Connector

An RJ12 connector is also fitted, for factory & commissioning use.

**Note:** It is not recommended to connect to this port for normal operation.



# Operation

## Commissioning

The DMX Output Interface can be energized without network cables being connected.

A flashing green LED indicates that the unit is powered and operating normally.

When first energized after installation, the unit will switch all relay outputs on. This allows verification of the output load connections.

Intermittent flashing of the red LED indicates iCANnet messages are being transmitted & received.

An iCANnet fault (including non-connection to the network) will be indicated by a permanently lit red LED.

If iCANnet cables are connected after the unit has been energized, it should be noted that cables will be carrying low voltage signals and misconnection of these cables could result in damage to devices on the network.

## Diagnostics

The DMX Output Interface has two service switches with green & red LEDs located at the base of the unit.

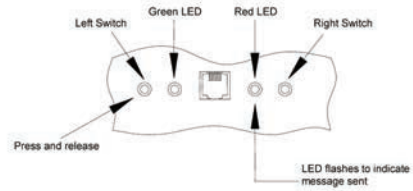
The service switches are used for:

- Sending a message to identify the device on the network
- Entering Diagnostic Mode

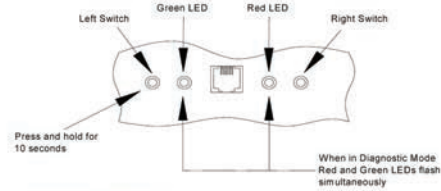
In diagnostic mode, the outputs can be tested by switching them all on and off (override mode) or by switching them sequentially (sequential test mode).

It is possible to enter Diagnostic Mode even if the unit indicates an iCAN fault.

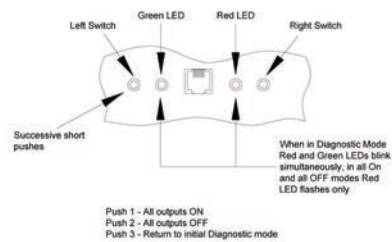
### DEVICE IDENTIFICATION



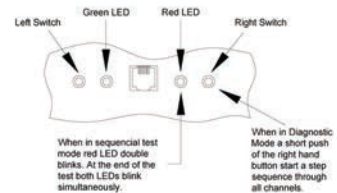
### ENTERING DIAGNOSTIC MODE



### OVERRIDE MODES



### SEQUENTIAL TEST MODE



# WARRANTIES AND LIMITATION OF LIABILITY

Please refer to [www.cooperlighting.com](http://www.cooperlighting.com) under the Legal section for our terms and conditions.



Cooper Lighting Solutions  
1121 Highway 74 South  
Peachtree City, GA 30269  
P:770-486-4800  
[www.cooperlighting.com](http://www.cooperlighting.com)

© 2020 Cooper Lighting Solutions  
All Rights Reserved  
Printed in USA  
P/N: 9850-000464-00

Cooper Lighting Solutions is a registered trademark.

All trademarks are property of their respective owners.