

Dimensions in mm



General description

Introduction

The CAN-LON Area Controller (AC) is a network component used in the LightMaster Modular (LMM) system. It is used to sub-divide a lighting management system into discreet areas, zones or floors. A LightMaster Modular system is often divided into a number of separate areas, with each being supervised by an Area Controller. The AC is available in two versions; the basic model LFC5089/10 and the TCP/IP enabled LFC5089/20.

The Area Controllers divide the LMM control system into discrete units to manage network traffic, schedule time commands to the lighting controllers (LCMs) under their control and implement commands from the Central Supervisor to re-configure areas (e.g. to alter the relationship between switches and lights).

A Central Supervisor can manage up to 99 Area Controllers on a CAN spine or 1000 via the Ethernet. Each Area Controller can control up to 100 LMM lighting control modules with the use of a Lonworks® repeater when more than 60 LCMs are involved.

This AC can also be used in LightMaster 100 Systems (sold and installed between 1996 and 2005) as a service spare.

Mechanical

The Area Controller is supplied in a galvanized, folded, 1.0mm steel enclosure. It is provided with 9 knock-outs (20mm) on one face to facilitate cable entry for both mains and bus wiring.

Location

The Area Controller should be located in an electrical riser cupboard, on the same floor as the lighting control modules it manages. It should be mounted at eye level to facilitate the use of the internal controls and LCD panel.

Power supply

A 230V 50Hz ac 3A un-switched fused spur is required to supply the Area Controller. A standard 13A 3 pin socket outlet must also be provided within 3m of the AC to allow connection of a laptop PC for commissioning and maintenance purposes.

IMPORTANT

It is mandatory that mains wiring and spine bus wiring to the Area Controller are run through separate containment systems. Use a screened, twisted pair type Belden 9272 (PVC), or 89272 (Teflon); or approved equivalent.

The treatment of the field bus wiring will depend upon the type selected, and must comply with the requirements of the EIA 709 standard; Belden 8471 or equal may be used.

These cables must **NOT** be tested with high voltage insulation testers.

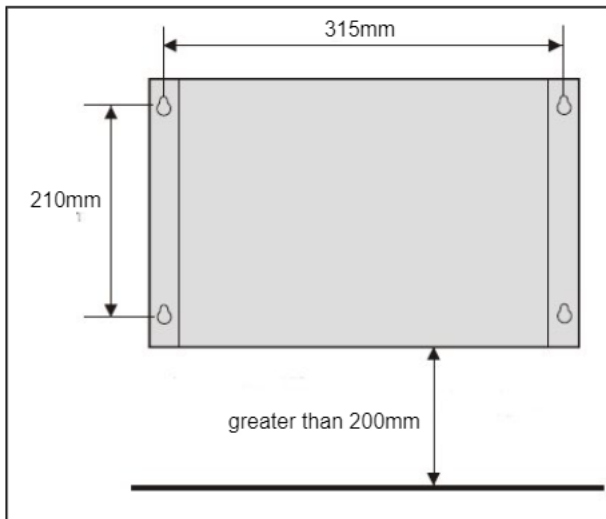
The casing of the Area Controller must not be drilled or modified in any way. Failure to comply with these Instructions will invalidate all warranties given or implied.

Installation

Fixing

The unit is designed for wall mounting and must be located in a clean, dry and accessible position such as an electrical riser cupboard. (Refer to 'Environmental conditions' in the Technical data section for actual temperature and humidity limits.) The unit should be mounted as shown below, 1m - 1.8m above finished floor level with 4x M4 bolts, or equivalent pan head screws.

At least 200mm clearance must be left below the unit for commissioning.



Wiring

All cables connected to the Area Controller must enter via the provided knockout on the bottom face of the unit. The CAN spine cabling must be kept apart from the supply wiring within the unit itself. Figure n below is a copy of the internal label, which shows all wiring connections EXCEPT the LonTalk® field bus.

TCP/IP connectivity

The LFC5089/20 Area Controller is designed to accommodate Ethernet connectivity. A typical application is outlined in Appendix 1 on Page 4 of this datasheet.

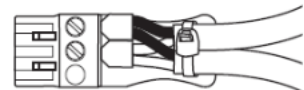
All LightMaster Systems

The 230V ac supply wiring is connected to the terminals marked N L E. If a spine bus is required it is connected to the indicated terminal (6 qty.).

LightMaster Modular Systems

The field bus for these systems uses the LonTalk® protocol and the field bus must be connected to the indicated network terminals on the daughter board (LON Interface.)

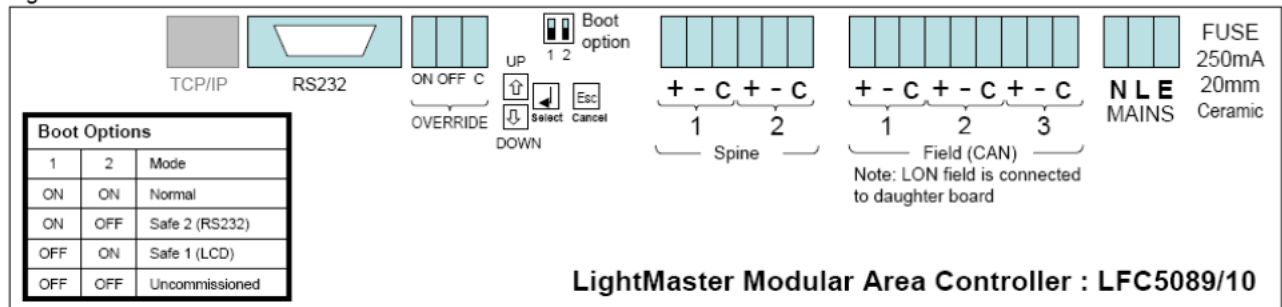
The input connector for the Field bus is wired as shown By this diagram:-



LightMaster 100 Systems (LM100)

When the Area Controller is retrofitted into an existing LM100 System the CAN field bus is connected to one (or more) of the three field bus outputs on the main mother board.

Figure 1: Internal label – Basic version



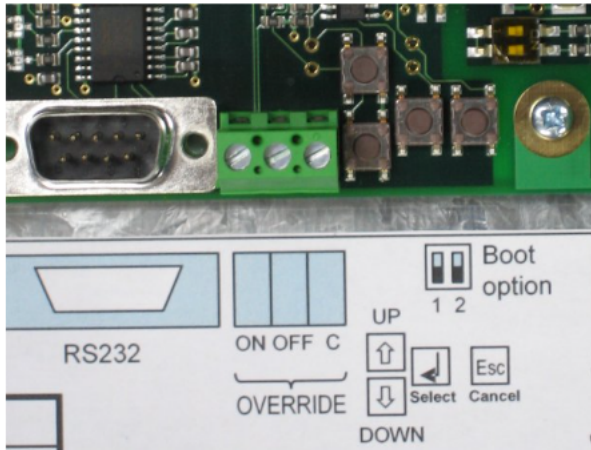
Commissioning software

The commissioning and configuration of a network with LMM controllers is done using LightManager®. The unit's neuron ID is registered in the software by pressing the service pin on the housing (mains connection side) or by using the barcode stickers on the units. The unit has two barcodes: one to stay on the unit and one which can be taken off and put on the floor plan showing its location. This offers the ID registration using a barcode scanner or via the keyboard.

WARNING

The setting information defined on this page is for commissioning purposes only. Any attempt by unqualified personnel to make adjustments to the switches can erase valuable AC data and will invalidate any warranty given or implied.

Area Controller user set-up switches



The LFC5089/10 is supplied, internally, with a LCD menu display and four set-up switches – indicated above as 'UP', 'DOWN', 'Select' and 'Cancel'. These switches allow the user to configure the Area controller (e.g. area number etc) via a menu displayed on the LCD. Configuration can also be achieved by using a serial connection from a laptop computer running a terminal program to the RS-232 connector on the Area Controller. The serial connection can also be used to upload new Area Controller software.

The Area Controller serial communication settings are:

Baud rate: 115200 - Data bits: 8 - Parity: none – Stop bits: 1 - Flow Control: Hardware

Boot option DIL switch

A 2-way DIL switch is provided to offer 4 different modes of operation after the Area Controller boots up, these are:

1. Un-commissioned mode

This mode acts as a pre-commissioning network tester and allows the lights on site to be globally controlled before the system is ready for commissioning. The Area Controller shall leave the factory in this mode to allow initial control and testing of the installation.

This mode has the following features:

- Loads system data & area number. Does not load system database.
- LCD and user configuration switches are enabled.
- RS-232 serial communications are enabled.
- Spine CAN communications are enabled.
- Field CAN communications are enabled.
- Override Switch will globally control all outputs. On/off and dimming control will be available in this mode.

2. Safe mode 1 (LCD mode)

This mode can be used to upload software and configure settings if there is a problem with the Area Controller booting correctly or loading the system database. Area Controller software can be uploaded via the spine CAN bus. This mode has the following features:

- Will not load system data, area number and system database (always area 1).
- LCD and user configuration switches are enabled.
- RS-232 serial communications are disabled.
- Spine CAN communications are enabled.
- Field LON communications are disabled.
- Override Switch will have no effect on LCM's.

3. Safe mode 2 (RS-232 mode)

This mode is similar to 'Safe mode 1' but with different peripherals disabled. Area controller software can be uploaded via the serial RS-232 connection. This mode has the following features:

- Will not load system data, area number and system database (always area 1).
- LCD and user configuration switches are disabled.
- RS-232 serial communications are enabled.
- Spine CAN communications are disabled.
- Field LON communications are disabled.
- Override Switch will have no effect on LCM's.

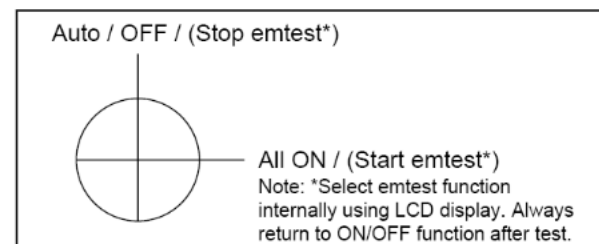
4. Normal run mode

This is the correct mode for a commissioned Area controller. In this mode the software will load the configuration data and the entire system database. The area controller will need to be in this mode when commissioning commences and should be left in this mode once commissioning is complete. This mode has the following features:

- Software will load system data, area number and system database.
- LCD and user configuration switches are enabled.
- RS-232 serial communications are enabled.
- Spine CAN communications are enabled.
- Field LON communications are enabled.
- Override Switch will globally control all outputs. On/off functionality only (no dimming).

Operating the front panel keyswitch

Prior to commissioning the keyswitch on the front panel is able to send an All ON / All OFF command, which helps to prove the connected field network functions. The same keyswitch is also able to do a function and duration emergency lighting test – this option is selected internally.



NOTE: It is recommended that the keyswitch is always returned to its ON/OFF function after a test.

APPENDIX ONE

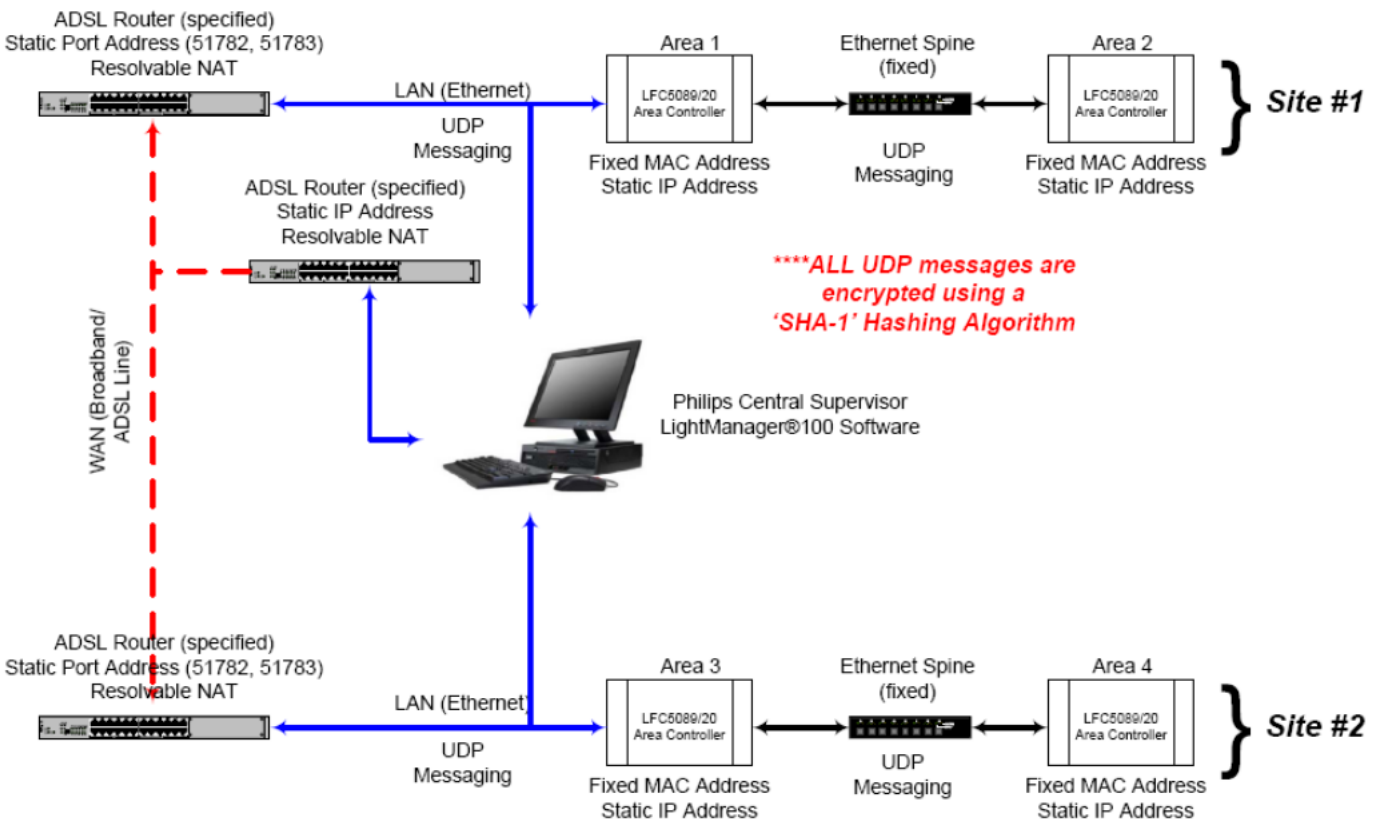
Using the LFC5089/20 in TCP/IP Ethernet applications:

The LFC5089/20 area controllers (AC) all come equipped with an on board Ethernet 10/100baseT controller. The AC is provided with a standard RJ45 Ethernet socket.

The hardware allows us the facility to have an AC >AC Ethernet spine as well as an Ethernet connection as your network interface (rather than CAN). It is important to note that the Ethernet spine uses UDP as its communications protocol. This feature effectively provides a solution for multi-site applications and access to a LightMaster Modular System via either a LAN or WAN using a web based approach.

The application and use of a TCP/IP network is likely to be different from project to project. For this reason this element of a LightMaster Modular system is worked out on individual projects and specific details advised accordingly.

Schematic diagram of a typical TCP/IP network



Ethernet Port

Each Area Controller has its own unique MAC (Media Access Control) address allocated to its EIA-852 Ethernet port.

Technical data

Environmental conditions		Override switch interface	
Operating Conditions		- Number	1 qty. independent
- Temperature	+5 to +55 °C If the AC is mounted in a cabinet, or other enclosure, this temperature must be measured inside this enclosure.	- Number of switches	2 qty. closures
- Relative humidity	20% to 80% non-condensing	- Type	Keyswitch fitted
Storage conditions		- Connector	Screw terminal 3 pole [on-off-common]
- Temperature	0 to 55°	Indicators	
- Relative humidity	20% to 80% non-condensing	- Mains power	Red neon - OFF = no mains power - ON = power present
Mains input		- Network status	Green LED - Off = unit configured - On – no application software or failure - Flash = unit is unconfigured
- Voltage	230 Vac +/- 10% 50/60Hz	Approvals and standards	
- current	0.06A	Standard	EN/IEC 60669-2-1
- connector	Camden CTB 7300 /3F/C	Classification	Class 1
- fuses	1 fuse, 250mA HBC	Pollution degree	2
- mains distribution	TN-S	Over-voltage category	III
CAN interface		Approbation	Product complies with the relevant EU Directive (CE)
- Protocol	CAN A	SELV circuits	CAN, LON and switch are ELV
- Transceiver type	82C250	Protection Class	IP20
- Network polarity	Sensitive	Insulation	For LON and CON: double insulation 4kV to mains
- protection PCB	Galvanic isolation 1kV	EMC compliance	IEC EN615447
Spine bus wiring		Immunity	IEC EN61000-3-2, and -3-3 55022 class B
- cable length	Belden 8762 – max. = 1000m Belden 89272 (LSF) - ditto -		
- connector	Screw terminal 3 pole		
- maximum wire gauge	Solid 4.0mm ² Stranded 2.5mm ²		
LON interface			
- Protocol	ANSI/EIA 709.1-A-1999 (LonTalk® protocol)		
- Transceiver	FT3150 Smart Transceiver; Combined with a FT-X1 Communication Transformer		
- Network Polarity	Insensitive		
- protection PCB	Varistor		
- bus voltage	Max. 42.4V dc, external supplied		
- network cable length	Belden 8471: total max. 500m without repeaters		
- Connector	Wieland Wiecon 8213 B/3 pole [Not used- LON – LON] Wieland Ref. 99.200.8391.9		
- Maximum wire gauge	2.5 mm ²		
LFC5089/20 only			
TCP/IP interface			
- Protocol	Ethernet 10/100baseT		
- Connection	RJ45 connector		
Packing data			
Box Dimensions	Qty	Weight (kg) net	gross
360mm x 280mm x 90mm	1	2.66	2.76