

PanL Mood Lighting (ML) DALI/DMX 512 Controller (PC0011) Datasheet



1 Introduction

The PanL **Mood Lighting (ML) Controller** brings digital technology into lighting controls through DALI/DMX protocols enabling each individual light to hold a unique address for dimming, RGB hue controls and selective on/off without the need for re-wiring. Along with the PanL Hub, smart lighting controls can be enabled for existing or new lighting installations.

1.1 Features

The PanL ML has the following features:

- 32-bit RISC microcontroller FT903 with 100MHz system clock
- DMX Output supports up to 512 RGB Channels
- DALI Output supports up to 64 DALI drivers
- Rotate ID switch configuration

- RJ45 Ports support RS485 Interface to PanL Hub, PanL Terminator, daisy chain to another PanL ML Controller or other PanL Devices
- Powered by PanL Hub at 24V DC Input through either PI/P2 RJ45 port
- Max 1 watt power consumption
- Operating temperature range : 0°C to +55°C



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2 Ordering Information

Part No.	Description
PC001100A	PanL Mood Light (ML) Controller with DALI and DMX512 Interface

Table 1 - PanL ML Part Number & Description

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3 Specifications

PLATFORM	Microcontroller	FT903Q
FEATURES	Interface1	DALI
	Interface2	DMX512
	Reset Button	Push Switch
	Power Indicator	Red LED
	Status Indicator	4x RGB LEDs
	Single Wire Debug (1W)	Reserved for factory use only
POWER	Input Voltage	+9V to +24V DC (P1/P2 RJ45 in Parallel)
	Micro USB	Reserved for factory use only
PHYSICAL CHARACTERISTICS	Color	White
	Housing	Polycarbonates
	Dimensions	145.70 x 96.70 x 29.00 mm
	Weight	155g
ENVIRONMENTAL LIMITS	Operating Temperature	0 to 55°C
	Storage Temperature	0 to 70°C
	Ambient Relative Humidity	20 to 85% (non-condensing)
STANDARDS & CERTIFICATIONS	EMC (FCC/CE)	EN 55032:2015+AC:2016 Class B CISPR 32:2015+C1: 2016 Class B EN 55035:2017 FCC PART 15, Subpart B
PACKAGE CONTENTS	Device	1x PanL ML Controller
	Documentation	1x Quick Start Guide

Table 2 - PanL ML Controller Specifications

4 Hardware Features

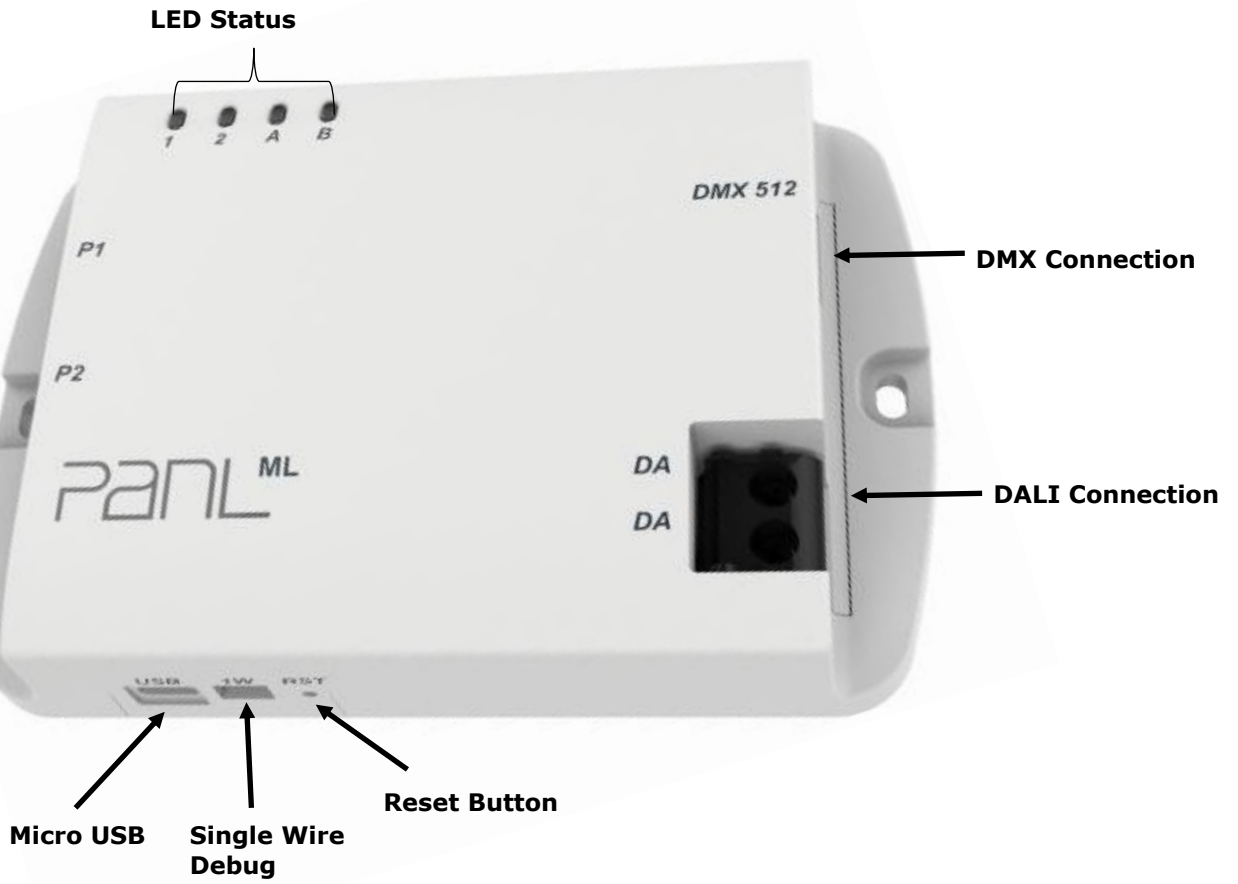


Figure 1 - PanL ML Controller Front View

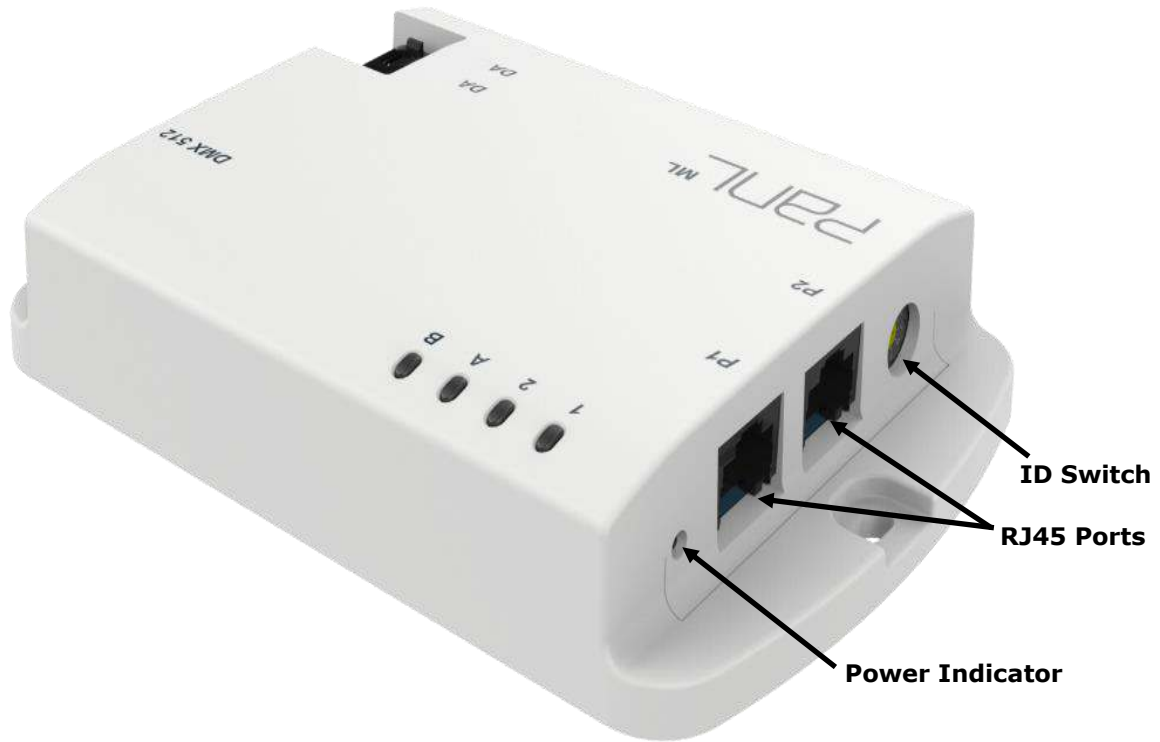


Figure 2 - PanL ML Controller Side View

4.1 Power Supply

The PanL ML Controller receives power externally from PanL Hub through the P1/P2 RJ45 ports. Input supply voltage is 9VDC to 24V DC (nominally 24V, 500mA from Hub).

4.2 Micro-Controller

The FT903Q 100-pin QFN microcontroller which is provided on the board belongs to the [32-bit FT90X Super Bridging Microcontroller family](#) from [Bridgetek](#).

4.3 Power Indicator

A red colour LED indicator to indicate the power status (ON/OFF) of the PanL ML Controller.

4.4 LED Status Indicator

Four RGB LEDs indicates the functioning status of the PanL ML Controller. Refer to the table below –

Normal Function Status	System Status (1)		Communications (2)		DALI Status (A)		DMX Status (B)	
Power On Status	Red		Red		Red		Red	
Boot Success	Green		Red		Off		Off	
No Communication	Green		Red		Off		Off	
Communication	Green		Green*		Off		Off	
DALI Data Transfer	Green		Green*		Green*		Off	
DMX Data Transfer	Green		Green*		Off		Green*	
Discover in Progress	Green		Green*		Green		Off	

Failsafe Status	System Status (1)		Communications (2)		DALI Status (A)		DMX Status (B)	
Power On Status	Red**		Off		Off		Off	
Boot Success	Red**		Off		Off		Off	
No Communication	Red**		Red		Off		Off	
Communication	Off		Green*		Off		Off	
Waiting for Recovery	Red<->Green**		Green*		Off		Off	
Discover in Progress	Red<->Yellow**		Green*		Off		Off	
Recovery Done	Green**		Green**		Off		Off	

* - LED blinks during data transfer

** - LED blinks twice a second (2Hz rate)

Table 3 – LED Status Indicator

4.5 P1/P2 (RJ45) Port

P1/P2 (RJ45) ports are used either as an input or output terminal that is connected to the Hub, other PanL Devices or another PanL ML Controller device as illustrated below. When a single PanL ML Controller is connected to a PanL Hub port, the maximum length of the RJ45 8P8C cable shall not exceed 100 meters. For multiple PanL ML Controllers connected to a single PanL Hub port, the first connection to PanL Hub and the subsequent connections in between the PanL ML Controller devices must not exceed 50 meters in cable length each. A single PanL Hub port can support up to three PanL ML Controllers. The total combined cable lengths must not exceed 100 meters. Connect the PanL terminator provided in PanL Hub box to the last unconnected PanL ML Controller P1 or P2 port.

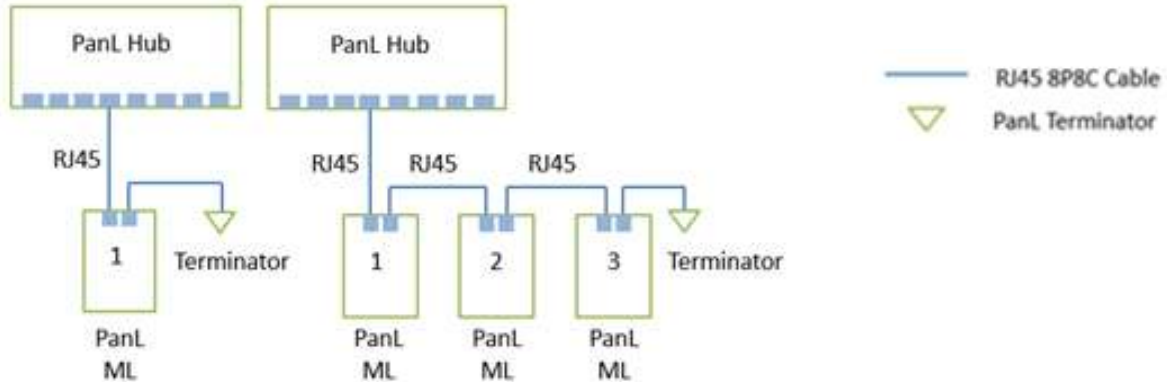


Figure 3 – Daisy Chain Network

4.6 ID Switch

For multiple PanL ML Controllers or mixed PanL Device daisy chain connection to a single PanL Hub port, the ID switch must be configured to be unique. Using a Philip head screw driver, set a unique number for each device between 0-7 (8-9 are reserved). For example, if connecting 3 PanL ML Controller to a PanL Hub port, you may set it as 0, 1, and 2. PanL ML Controllers connected to different PanL Hub ports can share the same unique number. A maximum of two PanL devices are allowed for daisy chain if there are more than 1 PD70, PD70PLUS or PD50 device or any combination of these present. Any other combinations will have a maximum limit of 3 devices.

4.7 Reset Button

It is a device reset pin which is used to reset the PanL ML Controller.

4.8 USB Interface

This is reserved for factory use only.

4.9 Single Wire Debug

This is reserved for factory use only.

4.10 DALI Interface

Connect the DALI bus wires to the two DA terminals on PanL ML Controller and tighten the screws for a secured connection. The DALI bus is polarity free and so the two wires may be connected to either port. The recommended maximum length of the bus is 300 meters when 16AWG wire is used. PanL ML Controller supports up to 64 DALI drivers with the use of an external DALI bus power supply, see Figure 4:

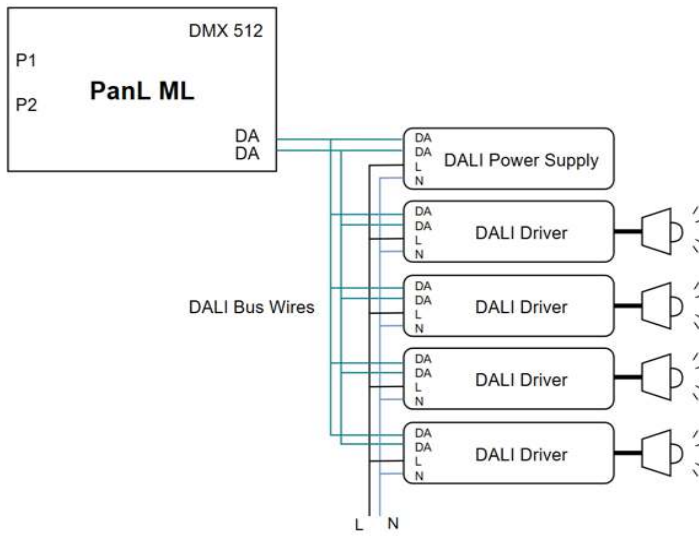


Figure 4 – Wiring Structure

Wiring Structure:

It is recommended that the 2 DALI wires are closely placed to each other in a cable conduit to prevent unintended coupling to other signals. To balance the voltage drops across all the DALI driver wires, the DALI Bus PSU should be central to all the connections.

4.11 DMX Interface

Connect a RJ45 cable from the PanL ML Controller port labelled DMX 512 to the first DMX decoder and connect a DMX terminator to the last unused decoder port as illustrated in the example below. The PanL ML Controller supports up to 512 DMX channels. Depending on the number of channel(s) per decoder used, the cumulative channels must not exceed 512 for all connected decoders. Please refer to the decoder’s datasheet for any cable length specifications.

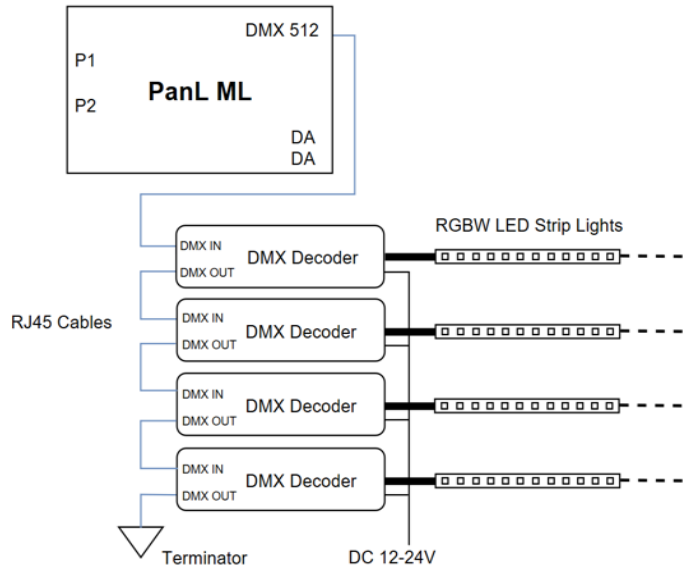


Figure 5 – DMX Setup

6 Contact Information

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Appendix A – References

Document References

NA

Acronyms and Abbreviations

Terms	Description
DALI	Digital Addressable Lighting Interface
DMX	Digital Multiplex
LED	Light Emitting Diode
ML	Mood Lighting
MCU	Microcontroller Unit
RGB	Red Blue Green
RISC	Reduced Instruction Set Computer

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Appendix C – Revision History

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Version 1.0	Initial Release	2019-12-31