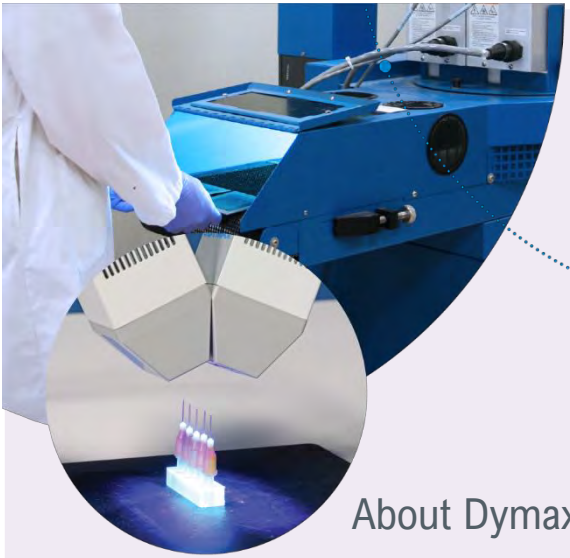
MX-4E

Expansion Module for BlueWave® MX-Series Systems User Guide

DYMAX®



About Dymax

Light-curable adhesives. Systems for light curing, fluid dispensing, and fluid packaging.

Dymax manufactures industrial adhesives, light-curable adhesives, epoxy resins, cyanoacrylates, and activator-cured adhesives. We also manufacture a complete line of manual fluid dispensing systems, automatic dispensing systems, and light-curing systems. Light-curing systems include LED light sources, spot, flood, and conveyor systems designed for compatibility and high performance with Dymax adhesives. Dymax adhesives and light-curing systems optimize the speed of automated assembly, allow for 100% in-line inspection, and increase throughput. System designs enable stand-alone configuration or integration into your existing assembly line.

Please note that most dispensing and curing system applications are unique. Dymax does not warrant the fitness of the product for the intended application. Any warranty applicable to the product, its application, and use is strictly limited to that contained in the Dymax standard Conditions of Sale. Dymax recommends that any intended application be evaluated and tested by the user to ensure that desired performance criteria are satisfied. Dymax is willing to assist users in their performance testing and evaluation. Data sheets are available for valve controllers or pressure pots upon request.

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Introduction

This guide describes how to set up, use, and maintain the MX-4E expansion module safely and efficiently.

Intended Audience

This user guide is meant for experienced process engineers, technicians, and manufacturing personnel. If you are new to high-intensity LED light sources and do not understand the instructions, contact Dymax Application Engineering for answers to your questions before using the equipment.

Where to Get Help

Customer Support and Applications Engineering teams are available by phone and email in Germany, Monday through Friday, from 8:00 a.m. to 5:00 p.m. Central European Time. You can also email Dymax Europe GmbH at info_de@dymax.com. Contact information for additional Dymax locations can be found on the back cover of this user guide. For more information about this product visit dymax.com.

Safety

WARNING! *Under NO circumstances should the interconnect cable from the controller to the LED emitter be connected or disconnected while power to the unit is on. This procedure is usually called "hot swapping" and should not be performed as it could cause damage to the controller or the emitter. Always power down the equipment before disconnecting or connecting any of these devices.*

WARNING! *When used with a UV LED light source injury can result from exposure to high-intensity UV light. To reduce the risk of injury, please read and ensure you understand the information in the UV Light Safety Guide, SAF001, and specific safety related information found in the BlueWave® QX4 LED manual, MAN075 Contact customer support for more information.*

Product Overview

Description of the MX-4E

- The MX-4E is an expansion module that will interface with Dymax MX-Series Multichannel Controllers, as well as with the BlueWave® MX-MIM machine interface module, to utilize existing BlueWave® QX4 LED heads.

- The MX-4E provides benefits over the MX-150 using lightguides for use in robotic applications. The BlueWave QX4 LED heads utilize a robotic grade cable that provides better performance for robotic applications over a lightguide.

- When multiple MX-4Es are used on a single BlueWave MX-Series 4-Channel (4CH) Controller up to 16 LED heads can be used. (Figure 3)

- The MX-4E can be mounted by removing the rubber feet and using the hole patterns on the bottom of the housing body.

Figure 1.
MX-4E Expansion Module for BlueWave® MX-Series Systems

Unpacking

Upon arrival, inspect all boxes for damage and notify the shipper of box damage immediately. Check for equipment damage. If parts are damaged, notify the shipper and submit a claim for the damaged parts. Contact Dymax so that new parts can be shipped to you immediately.

WARNING! *Until the MX-4E is attached to a controller via the interconnect cable it is susceptible to ESD damage. Handle it according to ESD standards using a ground strap and do not touch exposed connector pins.*

The parts below are included in every package/order. If parts are missing from your order, contact your local Dymax representative or Dymax Customer Support to resolve the problem.

Parts Included

- MX-4E Expansion Module
- User Guide

Installation

Mounting/Connections

The MX-4E is part of a BlueWave MX-series curing system and requires connection to a controller via an interconnect cable for proper operation.

Important Information

WARNING! *Under no circumstance should the interconnect cable from the BlueWave MX-series controller to the LED emitter be connected or disconnected while power to the unit is on. This procedure is usually called "hot-swapping" and should not be performed as it could cause damage to the controller or the LED emitter. Always power down the equipment before disconnecting any of these devices.*

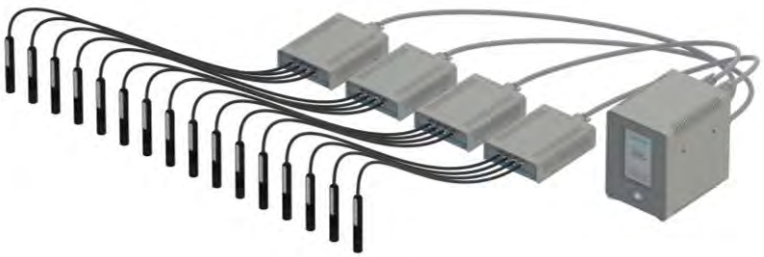
- Mount the MX-4E to a rigid support or place securely on a tabletop prior to connecting the interconnect cable to prevent handling damage.

- To hard mount the unit, remove the rubber feet using a 2-mm hex. The hole thread is an M3 and the depth is 4.8 mm (Figure 2).

Figure 2.
MX-4E Rubber Feet Installation

- Using the interconnect cable, connect the MX-4E to either a BlueWave MX-Series Multichannel Controller or a BlueWave MX-MIM.
- When connecting the controller to the MX-4E, ensure there is a minimum bend radius of four inches for strain relief to prevent pinching or kinking of the interconnect cable.
- For cooling needs, all vents should have at least 5 mm (0.2 in) clearance all around.

Figure 3.
Example of Installation, BlueWave MX-Series 4-Channel Controller with 16 Heads



LED Heads & Lenses

- The BlueWave QX4 LED heads use and technical information is found in the BlueWave QX4 LED Spot Lamp User Guide (MAN075). There are four LED head jacks labeled CH 1 – 4 (Figure 4). The connectors are keyed so they may require slight rotation to align with the keying elements of the connector pair. Press the LED head connector into any available jack until it clicks and locks in place. **DO NOT** rotate the connectors once installed, they are not threaded, and damage may occur (Figure 5).

- To remove the LED head, slide the outer retaining ring body of the connector away from the module to unlock it from the jack.

Figure 4.
CH 1-4 Jacks

Figure 5.
LED Head Connection to MX-4E

Operation

- The MX-4E, when attached to the appropriate controller functions as an independent channel on that controller. All LED heads will illuminate together based on the commanded settings in the controller.
- When attached to a BlueWave MX-Series Multichannel Controller or BlueWave MX-MIM, the MX-4E expansion module is controlled and managed as a single emitter. Up to four expansion modules can be managed by a 4-channel controller.
- Each expansion module can have between 1 and 4 BlueWave QX4 LED heads attached.

- All BlueWave QX4 LED heads attached to a MX-4E expansion module will operate simultaneously.
- Each MX-4E expansion module may be controlled independently by channel.
- Always verify proper light shielding is in place prior to starting the light curing process.

WARNING! Looking directly at the high-intensity light emitted by the BlueWave QX4 LED head can result in eye injury. To prevent eye injury, never look directly at the energy-emitting end of the LED head and always wear protective goggles. To avoid accidental exposure, always point the emitter at the curing substrate.

- The **green** status LED on the back of the unit indicates the emitter is commanded to be on. The **blue** status LED on the back of the unit indicates there is power applied to the MX-4E. (Figure 6)

Figure 6.
Green and Blue Status LEDs

BlueWave MX-Series Multichannel Controller

The BlueWave MX-Series Multichannel Controller's main screen will identify the MX-4E expansion module using a purple banner and the words "MX Expansion Module" (Figure 7).

The system information display will indicate the configuration of the expansion module and the BlueWave QX4 LED heads will be identified by type (Redi, Prime, Visi, or none). (Figure 8)

Figure 7.
Controller Main Screen Identifying MX-4E

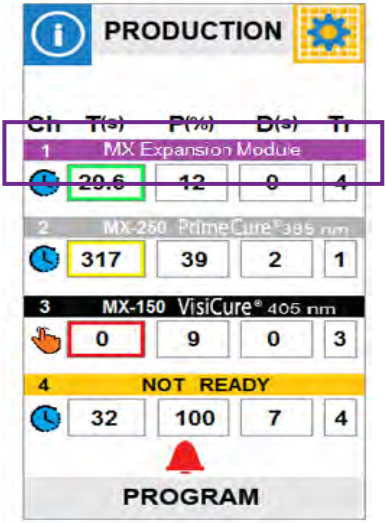
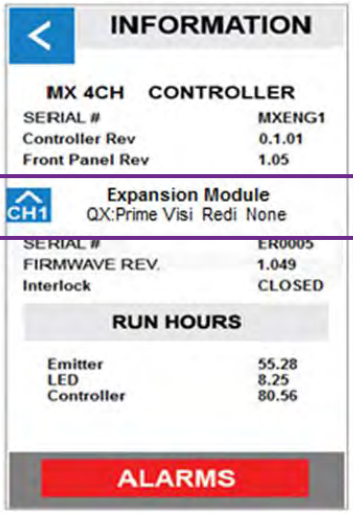


Figure 8.
System Information Screen Identifying MX-4E



All controls available to any BlueWave MX-Series emitter may be used, refer to the BlueWave MX-Series Multichannel Controller User Guide (MAN090) for details on operation.

The display will read the channel order as CH1, CH2, CH3, CH4.

Expansion module hours are accumulated but will not reset when a BlueWave QX4 head is replaced. It is suggested to monitor BlueWave QX4 head hours separately for process control. The MX-4E is identified as "Emitter" under run hours.

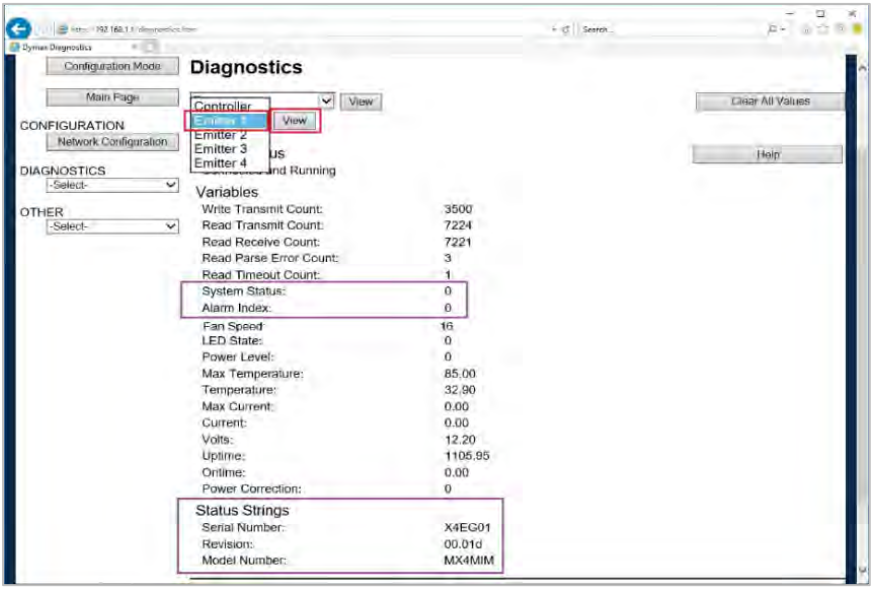
BlueWave MX-MIM Machine Interface Module

The system information display from the diagnostics screen in the BlueWave MX-MIM will indicate the configuration of the expansion module and the BlueWave QX4 LED heads will be identified by type (RediCure®, PrimeCure®, VisiCure®, or none). (Figure 9)

The model number field, located under the status strings heading at the bottom, will reflect a code: **QX-aa-bb-cc-dd.**

- aa through dd reflect the wavelength of the attached heads
- RC=RediCure, PC=PrimeCure, VC=VisiCure, and NA= No head Found

Figure 9.
Diagnostics Screen



All controls available to any BlueWave MX-Series emitter may be used, refer to the BlueWave MX-MIM User Guide (MAN101) for details on operation.

Expansion module hours are accumulated but will not reset when a BlueWave QX4 head is replaced. It is suggested to monitor BlueWave QX4 LED head hours separately for process control. The MX-4E is tracked as “Emitter” under Run Hours.

Troubleshooting

Table 1.
Troubleshooting for MX-4E

Problem	Possible Cause	Corrective Action
BlueWave QX4 LED head does not produce light	LED intensity adjustment set to 0% or too low	Increase LED intensity setting.
	No trigger supplied	Activate trigger
	Interlock is open	Verify interlock jumpers are in place. Verify PLC command structure for PLC mode.
	Interface cable connections loose or damaged	Check connections and condition of interface cable.
	Trigger setting not matched to input	Trigger setting on admin screen should match the desired input trigger channel.
	LED head is not connected to the correct port/channel	Verify that the head is connected to the desired port/channel.
BlueWave QX4 LED head suddenly stops producing light	Over-temperature shutdown was triggered (MX-4E alarms at 80°C and the LED's alarm at 90°C	Verify alarms.
	Footswitch defective	Activate unit using the front control panel. Replace the footswitch if the unit operates from the front control panel.
	Interlock is open	Verify interlock jumpers are in place. Verify PLC command structure for PLC mode.
BlueWave QX4 LED head provides only low-intensity light	LED intensity adjustment set to minimum	Increase LED intensity setting on admin settings or I/O input for PLC mode.
	Contaminated/dirty lens optics	Clean the surface of the lens.

Alarm Codes

2	No MX-4E Found at Power Up
6	MX-4E Wrong Firmware
7	Controller Lost Comms with MX-4E
8	Emitter Interlock is Open
103	LED Current Draw is Wrong for Set Intensity
110	MX-4E Wand1 Over Temperature
111	MX-4E Wand2 Over Temperature
112	MX-4E Wand3 Over Temperature
113	MX-4E Wand4 Over Temperature
114	MX-4E Wand1 Fault
115	MX-4E Wand2 Fault
116	MX-4E Wand3 Fault
117	MX-4E Wand4 Fault
118	MX-4E Wand1 Lost Comms
119	MX-4E Wand2 Lost Comms
120	MX-4E Wand3 Lost Comms
121	MX-4E Wand4 Lost Comms

Maintenance

Product Cleaning and Care

Product cleaning is limited to wiping the product with a damp cloth. Do not soak. Isopropyl Alcohol or household cleaners may be used for cleaning the product.

Compatible Devices

Item	Part Number
Controllers	
BlueWave MX-Series 2-Channel Controller/Power Supply - US	43185
BlueWave MX-Series 4-Channel Controller/Power Supply - US	43182
BlueWave MX-Series 2-Channel Controller/No cord	43184
BlueWave MX-Series 4-Channel Controller/No cord	43181
BlueWave MX-Series 2-Channel Controller/Power Supply - Asia	43186
BlueWave MX-Series 4-Channel Controller/Power Supply - Asia	43183
BlueWave MX-MIM	43299
Interconnect Cables	
Interconnect Cable Assembly - 2 Meter	42287
Interconnect Cable Assembly - 5 Meter	42889
Extended Interconnect Cable - 10 Meter	43010
Extended Interconnect Cable - 20 Meter	43011
LED Heads	
RediCure (365 nm)	43163
PrimeCure (385 nm)	43162
VisiCure (405 nm)	43161
Radiometer	
ACCU-CAL™ 50-LED Radiometer	40505
BlueWave QX4 Accessories	
ø3 mm Lens, Spot	43164
ø5 mm Lens, Spot	43165
ø8 mm Lens, Spot	43166

Item	Part Number
BlueWave QX4 Accessories	
Connection Cable, 0.5 M Extension	41563
Connection Cable, 1.0 M Extension	41564
Connection Cable, 1.5 M Extension	41565
Connection Cable, 2.0 M Extension	41566
Personal Protection Equipment	
Protective Goggles — Green	35286
Protective Goggles — Gray (standard model included with unit)	35285
Face Shield	35186

Intended for machine installation only.

Specifications

Property	Specification
LED Activation	Footswitch, front panel, or PLC
Cooling	Natural convection
Module Dimensions (W x D x H)	4.625" x 6.125" x 2" [117.37 mm x 155.58 mm x 49.82 mm]
Weight	Module: 2.3 lbs. [1.03 kg] LED Head: 0.2 lbs. [0.08 kg]
Unit Warranty	1 year from purchase date
Operating Environment	5 - 40°C [41-104°F], 0-80% relative humidity, non-condensing

Figure 10.
MX-4E Dimensions

Declaration of Conformity

Figure 11.

Declaration of Conformity - CE

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EU Declaration of Conformity

Manufacturer:
Dymax Corporation
318 Industrial Lane
Torrington CT 06790, USA

Product description:	BlueWave® MX-4E Expansion Module
Model name(s):	**BlueWave® MX-4E**

This product complies with the following relevant Union Harmonization Legislation:

Applicable EU Directives:	**Applicable Harmonized Standards:**
Electromagnetic Compatibility Directive(2014/30/EU)	EN55011:2016 EN 61000-3-2:2014 Class A EN 61000-3-3:2013 EN 61326-1:2013
Low Voltage Directive(2014/95/EU)	EN 61010-1:2010/AMD1:2019
RoHS Directive 2011/65 EU (2015/863)	EN IEC 63000:2018

Declaration:
This declaration of conformity is issued under the sole responsibility of the manufacturer.
Signed for and on behalf of:

CE

Name	Date	Location
[signature]	6/5/2023	Torrington, CT

Authorized Signatory:
Toby Trudeau
Engineering Manager, Equipment
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Figure 12.
Declaration of Conformity - UKCA

DYMAX

UK Declaration of Conformity

Manufacturer:
Dymax Corporation
318 Industrial Lane
Torrington CT 06790, USA

Product description: BlueWave® MX-4E Expansion Module
Model name(s): **BlueWave® MX-4E**

This product complies with the following relevant UK Legislation:

Applicable UK Legislation:	Applicable Harmonized Standards:
Electromagnetic Compatibility Regulations 2016	EN55011:2016 EN 61000-3-2:2014 Class A EN 61000-3-3:2013 EN 61326-1:2013
Electrical Equipment Safety Regulations 2016	EN 61010-1:2010/AMD1:2019
The Restriction of the Use of Certain Hazardous Substances in Electrical And Electronic Equipment Regulations 2012	EN IEC 63000:2018

Declaration:
This declaration of conformity is issued under the sole responsibility of the manufacturer.
Signed for and on behalf of:

UK CA

T. T. — 6/5/2023 — Torrington, CT
Name — Date — Location

Authorized Signatory:
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Warranty

From date of purchase, Dymax Corporation offers a one-year warranty against defects in material and workmanship on all system components with proof of purchase and purchase date. Unauthorized repair, modification, or improper use of equipment may void your warranty benefits. The use of aftermarket replacement parts not supplied or approved by Dymax Corporation, will void any effective warranties and may result in damage to the equipment.

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