Crestron **CGDMX-512BI**
DMX512 controller
Operations & Installation Guide

CRESTRON®

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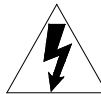
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Important Safety Instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Disconnect power prior to connecting or disconnecting equipment.
- Do not install in direct sunlight.
- The apparatus must be installed in a way that the power cord can be removed either from the wall outlet or from the device itself in order to disconnect the mains power.
- Prevent foreign objects from entering the device.

WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE. THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THE APPARATUS.

WARNING:

TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER. THERE ARE NO USER SERVICEABLE PARTS INSIDE. ONLY QUALIFIED SERVICE PERSONNEL SHOULD PERFORM SERVICE.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

AVIS: RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:

THIS IS AN APPARATUS WITH CLASS I CONSTRUCTION. IT SHALL BE CONNECTED TO AN ELECTRICAL OUTLET WITH AN EARTHING GROUND TERMINAL.

IMPORTANT:

The CGDMX-512BI can be used with Class 2 output wiring.

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DMX512 Controller: CGDMX-512BI

Introduction

The CGDMX-512BI is a serial DMX512 interface which makes easy interfacing possible between a Crestron control system and lighting product using the DMX512 protocol.

Only one serial RS-232/422 port on the Crestron control system is required to communicate with the DMX512 interface.

The DMX512 interface has two separate DMX Ports, one DMX Out to send data to the DMX lighting products and one DMX In to receive and/or control data from a DMX512 Lighting console or other lighting control units.

Features and Functions

- System integration via RS232
- 512 DMX inputs
- 512 DMX outputs
- Optimal and standard-compliant DMX512 timing

Applications

Control of any lighting systems that is compatible with the DMX512 protocol.

Specifications

Specifications for the CGDMX-512BI are listed in the following table.

CGDMX-512BI Specifications

SPECIFICATION	DETAILS
Fuse	Slow, 0,63mA – Type TR5
I/O 1	RS232/422 (selectable)
I/O 2	DMX512-A, terminated, 120 ohm automatic switch after power on

Timing (adjustable)
    Break
    Mark
    B2B
	
	179µ
	14µ
	22,8ms (S2=0)

Power
 	
    Supply voltage
    Power Consumption
	
	85 - 265V~, 47 – 83Hz
	approx. 5W

Default Net ID	N/A
Minimum 2-Series Control System Update File[1, 2]	Version 2 or later

Environmental
 	
    Temperature
 	
    Humidity
	
	41º to 104º F (5º to 40º C)
	
	10% to 90% RH (non-condensing)

Enclosure
 	
    Chassis
 	
    Isolation
	
	UL-94-V-0, heavily inflammable
	
	All I/O (DIN3 56930-2/4.2.3)

Dimensions
 	
    Height
 	
    Width
 	
    Depth
	
	2,24 in (5,7 cm)
	
	4,33 in (11 cm)
	
	7,87 in (20 cm)

Weight	1,06 lbs (0,480 kg)

1. The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.
2. Crestron 2-Series control systems include the AV2 and PRO2. Consult the latest Crestron Product Catalog for a complete list of 2-Series control systems.

NOTE: Crestron software and any files on the website are for authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIP) only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

This section provides information on the connections, controls and indicators available on your CGDMX-512BI.
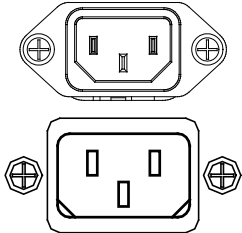
CGDMX-512BI Physical View

CGDMX-512BI Overall Dimensions

Connectors, Controls & Indicators

#	CONNECTORS, CONTROLS & INDICATORS	DESCRIPTION
1	DMX512 Output	[+Data(3), GND_2(1), -Data(2)]
2	DMX512 Input	[+Data(3), GND_1(1), -Data(2)]
3	Status LED's: Power CN COM DMX512	Indicates that the device is powered. Indicates traffic between the Crestron processor and CGDMX-512BI. Indicates a valid DMX512 input signal.
4	RS232/422 Interface-connector to the Crestron processor	Asymmetrical or symmetrical wiring is available by Jumper J5. TX (RS232) = pin 2 RTS (RS232) = pin 7 RX (RS232) = pin 3 CTS (RS232) = pin 8 GND_3 (RS232/422)= pin 5 TX- (RS422) = pin 1 RX- (RS422) = pin 9 TX+ (RS422) = pin 6 RX+ (RS422) = pin 4
S1	Rotary code switch	Set Baud rate, factory 7
S2	Rotary code switch	Set DMX512 speed, factory 1
S3	Rotary code switch	Set interface mode, factory 1
	100 – 240V ~2.4A 50/60 Hz	(1) IEC Socket, mates with removable power cord (included)

Industry Compliance

As of the date of manufacture, the CGDMX-512BI has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.

$$C \in \mathcal{C}$$

Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Setup

Supplied Hardware

The hardware supplied with the CGDMX-512BI is listed in the following table.

Supplied Hardware for the CGDMX-512BI

DESCRIPTION	PART NUMBER	QUANTITY
Serial Cable	N/A	1
Power Cable	N/A	1

Hardware Hookup

- Connect the serial cable with the used serial port on the Crestron processor.

- Connect the DMX512 output with the DMX512 input of the device you want to control.

- Connect the DMX512 input with the DMX512 output of the device you want to control.

- Connect the power cord with the power connector and turn on the device.

Programming Software

Have a question or comment about Crestron software?

Answers to frequently asked questions (FAQs) can be viewed in the Online Help section of the Crestron website. To post a question or view questions you have submitted to Crestron's True Blue Support, log in at http://support.crestron.com. First-time users will need to establish a user account.

Earliest Version Software Requirements for the PC

NOTE: Crestron recommends that you use the latest software to take advantage of the most recently released features. The latest software is available from the Crestron website.

Crestron has developed an assortment of Windows®-based software tools to develop a controlled system. You can create a program to control the CGDMX-512BI using the Crestron programming tools D3 Pro™ or SIMPL Windows. Customers whose focus is on lighting systems may prefer to use the D3 Pro software since it is designed especially for creating lighting and environmental system control applications. Customers already familiar with SIMPL Windows who are including a lighting system as part of an overall control system project may prefer to continue using SIMPL Windows. For the minimum recommended software versions, visit the Version Tracker page of the Crestron website (www.crestron.com/versiontracker).

Programming with Crestron SystemBuilder

Crestron SystemBuilder is the easiest method of programming but does not offer as much flexibility as SIMPL Windows. For additional details, download SystemBuilder from the Crestron website and examine the extensive help file.

Programming with D3 Pro

Crestron's D3 Pro lighting software provides all the tools necessary to create a complete Crestron lighting system for residential applications. The lighting system includes the control system logic program, touchpanel projects and keypad programming, documentation and real-time lighting adjustment capabilities.

As with all Crestron software, D3 Pro provides extensive right-click and drag-and-drop functionality in addition to convenient keyboard shortcuts for frequently used functions and commands.

Programming is organized into six system **Views** of the lighting system, each providing a moveable toolbox of devices such as interfaces, fixtures and control modules. You can add a device to your system simply by selecting it from one of the toolboxes and dragging it to a room. The available toolboxes differ depending on the View but all Views include a "General" toolbox that allows you to add areas and rooms at any time.

Programming with SIMPL Windows

SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate but equally important "Managers".

Configuration Manager

Configuration Manager is the view where programmers "build" a Crestron control system by selecting hardware from the *Device Library*.

- To incorporate the CGDMX-512BI into the system, drag the CGDMX-512BI from the User module | Product module folder after copying the modules to the User macro folder or the same folder where the project is stored

Program Manager

Program Manager is the view where programmers "program" a Crestron control system by assigning signals to symbols.

The symbol can be viewed by double clicking on the icon or dragging it into *Detail View*. Each signal in the symbol is described in the SIMPL Windows help file (**F1**).

The CGDMX-512BI module should be placed in the user database specified in the SIMPL Windows software.

Example Program

An example program for the CGDMX-512BI is available from the Crestron website (www.Crestron.eu).

Uploading

Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication. Once communication has been established, files (for example, programs) can be transferred to the control system.

Programs

Program files may be distributed from programmers to installers or from Crestron to dealers. One has the option to upload programs via the programming software. For details on uploading, refer to the SIMPL Windows help file.

If a SIMPL Windows program is provided, it can be uploaded to the control system using SIMPL Windows or Crestron Toolbox.

Operation

The CGDMX-512BI uses three rotary switches to set up the device. Rotary switch
S1 is used to set the baud rate, S2 sets the DMX512 speed and S3 the interface mode.

S1 Values

Baud rate COM interface [set by S1]

0	1	2	3	4	5
1200	2400	4800	9600	14400	19200

6	7	8	9
28800	*38400*	76800	115200

The interface type - symmetrical RS422 or asymmetrical RS232 is
selectable by Jumper J5 as printed on pcb. (here RS422 = RS485)
(Factory setting RS232)

S2 Values

The DMX512 data are processed by the CGDMX-512BI interface with an optimal
and standard-compliant DMX512 timing.
If problems should appear like flickering or short black outs, the connected lighting
devices may be not able to receive DMX512 data with optimum timing.
In this case the CGDMX-512BI includes a RETIMER section to adjust the DMX512
timing to slower DMX devices.

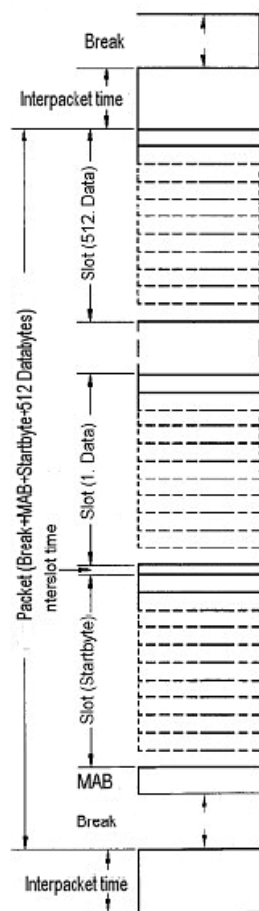| S2	BREAK (μs)	MAB (μs)	DATA (μs)	MBB (μs)	description
0	176	12	44	0	B2B 22,8ms !
1	*176*	*12*	*48*	*0*	*48 μs per byte*
2	176	12	48	176	48 μs & MBB 176 μs
3	176	12	52	0	52 μs
4	176	18	52	176	52 μs & MBB 176 μs
5	176	18	56	0	56 μs
6	176	18	56	352	56 μs & MBB 352 μs
7	176	18	64	352	64 μs & MBB 352 μs (30 frames / second)
8	176	18	77	528	77 μs & MBB 528 μs (25 frames / second)
9	176	18	96	528	96 μs & MBB 528 μs (20 frames / second)

MAB = Mark after Break
MBB = Mark before Break
B2B = Break to Break

DMX timing diagram

DMX512 timing

Packet (22,7ms):
includes Break, MAB, startbyte and up to 512 data bytes.

Interpacket time:
time between two frames

Slot (44µs):
1 start-bit, data-byte (8Bit), 2 stop-bits

Interslot time:
time between two data bytes

S3 Values

MODE   SHORTFORM / DESCRIPTION

0   TX DMX512 only
XSIG values received from CMP - transmitted as DMX512 values. No DMX512 Input.

1   *RX/TX DMX512 + message on change*
XSIG values received from CMP - transmitted as DMX512 values.
! every Data change on a single DMX512 channel will be transmitted to CMP as an 4 byte XSIG value.

2   RX/TX DMX512, HTP Merge
HTP merge between DMX512-IN and CMP-values to DMX Output.
! HTP configuration is changeable by CMP (HTP, LTP, Excl., each channel separately).
! after Power-On or xFC (Interface-Reset) the CGDMX-Interface returns to HTP all channels.

3   RX/TX DMX512, HTP Merge + message on change
HTP merge between DMX512-IN and CMP-values to DMX Output.
! every data change on a single DMX512 channel will be transmitted to CMP as an 4 byte XSIG value.
! HTP configuration is changeable by CMP (HTP, LTP, Excl. , each channel separately).
! after Power-On or xFC (Interface Reset) the CGDMX-Interface returns to HTP on all channels.

MODE	SHORTFORM / DESCRIPTION
4	RX/TX DMX512, LTP Merge

LTP merge between DMX512-IN and CMP-values to DMX Output.
! LTP configuration is changeable by CMP (HTP, LTP, Excl. , each channel separately).
! after Power-On and xFC (Interface Reset) the CGDMX-Interface returns to LTP all channels.

5	RX/TX DMX512, LTP Merge + message on change

LTP merge between DMX512-IN and CMP-values to DMX Output.
! every data change on a single DMX512 channel will be transmitted to CMP as an 4 byte XSIG value.
! LTP configuration is changeable by CMP (HTP, LTP, Excl. , each channel separately).
! after Power-On and xFC (Interface Reset) the CGDMX-Interface returns to LTP all channels.

6	processing with configuration 0, Merge

reads complete 512 byte configuration from non volatile memory how to process values from DMX IN with CMP values to DMX Output. (MERGE -HTP, -LTP, -Excl., may set for each channel, see channel processing flags).
! after Power-On and xFC (Interface Reset) the CGDMX-Interface returns to process config stored in "config0".

7	processing with configuration 1, Merge

reads complete 512 byte configuration from non volatile memory how to process values from DMX IN with CMP values to DMX Output. (MERGE -HTP, -LTP, -Excl., may set for each channel, see channel processing flags).
! after Power-On and xFC (Interface Reset) the CGDMX-Interface returns to process config stored in "config1".

MODE	SHORTFORM / DESCRIPTION
8	Auto fade all channel

Test - all DMX channels are fade between 0-100%.
! the values are also send to CMP as 4 Byte XSIG analog values.

9	all channel 75%

Test - all DMX channels will set to 75%.
! the values are also send to CMP as 4 Byte XSIG analog values.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

CGDMX-512BI Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Device does not function.	Device is not communicating with the processor.	Check the serial connection
	Device is not receiving power	Check the power source and the power cord
Loss of functionality due to electrostatic discharge.	Improper grounding.	Check that all ground connections have been made properly.

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron website (www.crestron.com/manuals). This link will provide a list of product manuals arranged in alphabetical order by model number.

List of Related Reference Documents

DOCUMENT TITLE
2-Series Control Systems Reference Guide

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at +32-15-509920.

You can also log onto the online help section of the Crestron website (www.crestron.com/onlinehelp) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the CGDMX-512BI, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an "Addendum" in the Download column.

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2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.

3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

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