Due to the changes of constant improvement in LED technology, all details are subject to change without notice. Consult factory for up to date information.

**FEATURES**

A small aperture, architectural LED downlight that delivers the ultimate in uncompromised quality and performance, with precise, glare-free illumination, and unmatched flexibility. With the use of a single universal housing, it utilizes a multitude of trims, field changeable optics, and is fully adjustable to any beam angle, up to 45 degrees, with a full 365-degree horizontal rotation. Whether it’s high-end architectural, hospitality, commercial, residential, or retail, the ER3 provides the most innovative solution to any design application that requires a small aperture.

### TRIM OPTIONS

- **ROUND FLANGED**
- **ROUND TRIMLESS**
- **SQUARE FLANGED**
- **SQUARE TRIMLESS**

### REFLECTOR COLORS

- WH (White)
- CL (Chrome)
- SHZ (Satin Haze)
- BK (Black)

### COLOR QUALITY

- 2 Step MacAdam Ellipse

### DISTRIBUTION

- WD (Wide Distribution)
- MD (Medium Distribution)
- ND (Narrow Distribution)

### TRIM OPTIONS

- Downlight, Lensed Downlight, Wall Wash, Adjustable Accent, and Pinhole, Square and Round Trim and Trim-less Options

### LUMENS

<table>
<thead>
<tr>
<th>NOMINAL LUMENS</th>
<th>LEDENGINE</th>
<th>LUMENETIX</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500</td>
<td>20W</td>
<td>20 W</td>
</tr>
<tr>
<td>1200</td>
<td></td>
<td>15 W</td>
</tr>
<tr>
<td>900</td>
<td>10W</td>
<td></td>
</tr>
</tbody>
</table>

Based on 4000K, 90+ CRI. Actual wattage may vary +/- 5%.

### DIMMING

- DMX-512/RDM, ELDODMX.1

### EMERGENCY

- PELI-S-20, PELI-S-100, PELI-S-250, PELI-S-400

### LIFETIME

- L70 at 50,000 Hours

### PHOTOMETRIC TESTS

- In Accordance with IES LM79-08, LM80 and TM-30, TM-21

### CCEA OPTION

- For CCEA approved ER3 Family, please contact Elite Lighting for more information.

Reference IES files for additional distribution curve information.
Due to the changes of constant improvement in LED technology, all details are subject to change without notice. Consult factory for up to date information.

3" Architectural High Lumen Adjustable LED Downlight

**FLANGED OPTION**
Post-painted powder coated Die-Cast trim ring available in white and custom colors. Collar and trim rotate jointly, and a Solite frosted lens is standard on all trims (Please consult factory for additional lens options). Available in Open Downlight, Lensed Downlight, Pinhole Downlight, Slot, Adjustable Downlight Accent or Lensed Adjustable Wall Wash. Trims attach to the housing with piano springs for snug fit and zero light leakage.

**TRIM-LESS OPTION**
Die-Cast perforated mesh cover intended for installation in drywall or plaster ceilings. Mudding may be applied right up to the edge of the luminaire to prevent fractures in the ceiling and/or drywall during and after installation. Trims attach to the housing with piano springs for snug fit and zero light leakage. Available in Open Downlight, Lensed Downlight, Pinhole Downlight, Slot, Adjustable Downlight Accent or Lensed Adjustable Wall Wash.

**HOUSING**
Designed for new construction installations and suitable for use in IC and Non IC applications. Thermally protected, specification grade adjustable recessed housing. For new construction insulated ceilings where housing will be in direct contact with insulation. Die-formed all aluminum construction is painted matte black for maximum heat dissipation, rust protection and glare-free illumination.

**MOUNTING**
Pre-installed bar hangers allow housing to be positioned and locked at any point within a 24" joist span. They can be positioned on either the long or short axis of the housing and can be shortened for 12" joists. Bar hangers can fit onto T-Bar spline with additional slots and holes for special mounting methods, if necessary. Butterfly brackets are also provided and are constructed from 18-gauge steel and can be adjusted vertically. Butterfly brackets may be installed with 3/4" or 1-1/2" lathing channel, 1/2" EMT, or optional C-Channel mounting bars are available.

**WARRANTY**
Five-year warranty for parts and components. (Labor not included.)

**LISTINGS**
c-UL-us - Listed for Wet Location if used with 1328 or 1307 Trims
CP - City of Chicago Environmental Air (CCEA) marking for plenum applications (option).

---

**OPTICS**
Optical variation and choices allow for a custom solution to any application. Narrow at 25°, Medium at 35° and Wide at 50°.

**AIMING**
Proprietary hot aiming system allows the lamp to be positioned at the perfect setting to ensure the proper position of the beam of light before trim is installed. Lamp holder is designed to ensure that the center beam of the light source emerges out of luminaire at any angled position from 0° to 45°.

**DIMMING & DRIVER INFORMATION**
LUMENETIX (Araya5 Module) RGB platform with tuning range of 8000K to 1650K, Saturation and Hue Gradients of color can be added in increments of 1% to fully saturated colors at 100% enabling gamut access to pastels and saturated colors (RGBW-LENGN-65K-18K).
Control via, DMX512-RDM, LUTECO, BLE, DALI.
LED Engin RGB+W platform produces a full spectrum of brilliant colors with tuning range of 6500K to 1800K (RGBW-LENGN-65K-18K).
Control via ELITE-CONNECT DMX WALL CONTROLLER (SR-2812) IP, DMX512, DMX-RDM, BLE, DALI

**LED DYNAMIC PLATFORM OPTIONS**
RGB + White technology has a white color tuning range from 8000K to 1650K. RGB color range derived from the primary colors red, green and blue is used to create infinite color options in the RGB palette, adding colors together in varying amounts to create new ones. RGB Tunable White technology enables users to adjust the color temperature, adding gradients of saturated colors. No longer restricted to white light LEDs, lighting designers and architects can manipulate a space with desired hues and shades, altering the color temperature of the room, creating the perfect environment. The use of RGB Tunable White technology in healthcare and assisted living stimulates circadian rhythm, accelerating the healing process. Available in 2 platforms, using Lumenetix and LED Engin components, both maintain a constant CRI of 90+

**365° HORIZONTAL LOCKING**
Effortlessly rotates on a 365° horizontal rotational smooth slotted groove track system

**TOOL-LESS ADJUSTABILITY**
Of the luminaire is to ensure whatever position is desired up to 45 degrees the beam and maximum lumen power is exiting the luminaire accordingly

**NUMERICAL DEGREE**
Allows for the luminaires to be easily field adjusted for precision, performance, and versatility. At installation, you have the ability to lock the beam angle to 1 degree increments, which are marked at 5 degree increments.

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Due to the changes of constant improvement in LED technology, all details are subject to change without notice. Consult factory for up to date information. www.iuseelite.com

Round Flanged Trim Options

FLANGED OPTION:
Post-painted powder coated Die-Cast trim ring available in white and custom colors (Please consult factory for custom paint color options). Collar and trim rotate jointly, and a Solite frosted lens is standard on all trims (Please consult factory for additional lens options). Available in Open Downlight, Lensed Downlight, Pinhole Downlight, Slot, Adjustable Downlight Accent or Lensed Adjustable Wall Wash. Trims attach to the housing with piano springs for snug fit and zero light leakage.

Round Trim-less Options

TRIMLESS OPTION:
Die-Cast perforated mesh cover intended for installation in drywall or plaster ceilings. Mudding may be applied right up to the edge of the luminaire opening to provide a seamless appearance. Trimless accessory is secured to the housing to prevent fractures in the ceiling and/or drywall during and after installation. Trims attach to the housing with piano springs for snug fit and zero light leakage. Available in Open Downlight, Lensed Downlight, Pinhole Downlight, Slot, Adjustable Downlight Accent or Lensed Adjustable Wall Wash.

Note:
Additional lens filters must only be used on open non-lensed downlight trim options
Due to the changes of constant improvement in LED technology, all details are subject to change without notice. Consult factory for up to date information.

www.iuseelite.com

RGB+Tunable White

3" Architectural High Lumen Adjustable LED Downlight

3"

ER3-LED

By Elite Lighting

Due to the changes of constant improvement in LED technology, all details are subject to change without notice. Consult factory for up to date information.

RGB+Tunable White

3" Architectural High Lumen Adjustable LED Downlight

ES3-F-1302 Open Downlight

ES3-F-1363 Adjustable Accent

ES3-F-1314 Pinhole Downlight

Square Flanged Trim Options

ES3-TL-1302 Open Downlight

ES3-TL-1363 Adjustable Accent

ES3-TL-1314 Pinhole Downlight

Square Trim-less Options

ES3-TL-1302 Open Downlight

ES3-TL-1363 Adjustable Accent

ES3-TL-1314 Pinhole Downlight

ES3-TL Mud Ring

FLANGED OPTION:
Post-painted powder coated Die-Cast trim ring available in white and custom colors (Please consult factory for custom paint color options). Collar and trim rotate jointly, and a Solite frosted lens is standard on all trims (Please consult factory for additional lens options). Available in Open Downlight, Lensed Downlight, Pinhole Downlight, Slot, Adjustable Downlight Accent or Lensed Adjustable Wall Wash. Trims attach to the housing with piano springs for snug fit and zero light leakage.

FINISH

WH - White
CL - Chrome
SHZ - Satin Haze
BK - Black

TRIMLESS OPTION:
Die-Cast perforated mesh cover intended for installation in drywall or plaster ceilings. Mudding may be applied right up to the edge of the luminaire opening to provide a seamless appearance. Trimless accessory is secured to the housing to prevent fractures in the ceiling and/or drywall during and after installation. Trims attach to the housing with piano springs for snug fit and zero light leakage. Available in Open Downlight, Lensed Downlight, Pinhole Downlight, Slot, Adjustable Downlight Accent or Lensed Adjustable Wall Wash.

Note:
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ORDERING GUIDE

<table>
<thead>
<tr>
<th>ORDERING GUIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRIM &amp; TRIM-LESS OPTIONS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROUND TRIM OPTIONS</th>
<th>FLANGE-LESS TRIM OPTIONS</th>
<th>FINISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ ER3-TL-1328**: Lensed Downlight (wet Location)</td>
<td>☑ ER3-TL-1302**: Open Downlight</td>
<td>W: White</td>
</tr>
<tr>
<td>☑ ER3-TL-1307**: Lensed Wall Wash (wet Location)</td>
<td>☑ ER3-TL-1363**: Open Adjustable Accent</td>
<td>CL: Chrome</td>
</tr>
<tr>
<td>☑ ER3-TL-1314**: Pinhole Downlight</td>
<td>☑ ER3-TL-1303**: Slot</td>
<td>SHZ: Satin Haze</td>
</tr>
<tr>
<td>☑ ER3-TL-1303**: Slot</td>
<td>☑ ER3-TL-1302**: Open Downlight</td>
<td>BK: Black</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FLANGED TRIM OPTIONS</th>
<th>BRANCHED TRIM OPTIONS</th>
<th>LENS FILTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ ER3-F-1328**: Lensed Downlight (wet Location)</td>
<td>☑ ER3-F-1302**: Open Downlight</td>
<td>☑ BP8MR16-FR - FROSTED</td>
</tr>
<tr>
<td>☑ ER3-F-1307**: Lensed Wall Wash (wet Location)</td>
<td>☑ ER3-F-1363**: Open Adjustable Accent</td>
<td>☑ BP8MR16-SF - SOFT FOCUS</td>
</tr>
<tr>
<td>☑ ER3-F-1314**: Pinhole Downlight</td>
<td>☑ ER3-F-1303**: Slot</td>
<td>☑ BP8MR16-CL - CLEAR</td>
</tr>
<tr>
<td>☑ ER3-F-1303**: Slot</td>
<td>☑ ER3-F-1302**: Open Downlight</td>
<td>☑ BP8MR16-UV - ULTRAVIOLET</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SQUARE TRIM OPTIONS</th>
<th>FLANGE-LESS TRIM OPTIONS</th>
<th>FINISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ ES3-TL-1328**: Lensed Downlight (wet Location)</td>
<td>☑ ES3-TL-1302**: Open Downlight</td>
<td>W: White</td>
</tr>
<tr>
<td>☑ ES3-TL-1307**: Lensed Wall Wash (wet Location)</td>
<td>☑ ES3-TL-1363**: Open Adjustable Accent</td>
<td>CL: Chrome</td>
</tr>
<tr>
<td>☑ ES3-F-1314**: Pinhole Downlight</td>
<td>☑ ES3-F-1303**: Slot</td>
<td>SHZ: Satin Haze</td>
</tr>
</tbody>
</table>

<table>
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<td>☑ BP8MR16-FR - FROSTED</td>
</tr>
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<td>☑ ES3-F-1363**: Open Adjustable Accent</td>
<td>☑ BP8MR16-SF - SOFT FOCUS</td>
</tr>
<tr>
<td>☑ ES3-F-1314**: Pinhole Downlight</td>
<td>☑ ES3-F-1303**: Slot</td>
<td>☑ BP8MR16-CL - CLEAR</td>
</tr>
</tbody>
</table>

Note: Additional lens filters must only be used on open non-lensed downlight trim options.

*Driver only accessible from the top of the luminaire when using Trim-less application

**Pinhole and Slot are only available in black (Reflector) and white (Trim)
Emergency only accessible from the top of the luminaire

COLOR FILTERS & DISTRIBUTION FILTERS

MR16 LENS FILTER

<table>
<thead>
<tr>
<th>CAT. #</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP8MR16-BL</td>
<td>BLUE</td>
</tr>
<tr>
<td>BP8MR16-GR</td>
<td>GREEN</td>
</tr>
<tr>
<td>BP8MR16-PI</td>
<td>PINK</td>
</tr>
<tr>
<td>BP8MR16-PU</td>
<td>PURPLE</td>
</tr>
<tr>
<td>BP8MR16-DL</td>
<td>DAY LIGHT</td>
</tr>
<tr>
<td>BP8MR16-YE</td>
<td>YELLOW</td>
</tr>
<tr>
<td>BP8MR16-AM</td>
<td>AMBER</td>
</tr>
<tr>
<td>BP8MR16-OR</td>
<td>ORANGE</td>
</tr>
<tr>
<td>BP8MR16-RE</td>
<td>RED</td>
</tr>
</tbody>
</table>

MR16 SPECIALTY LENS FILTER

<table>
<thead>
<tr>
<th>CAT. #</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BP8MR16-FR</td>
<td>FROSTED</td>
</tr>
<tr>
<td>2. BP8MR16-SF</td>
<td>SOFT FOCUS</td>
</tr>
<tr>
<td>3. BP8MR16-CL</td>
<td>CLEAR</td>
</tr>
<tr>
<td>4. BP8MR16-UV</td>
<td>ULTRAVIOLET</td>
</tr>
<tr>
<td>5. 6BP8MR16-SP</td>
<td>SPREAD</td>
</tr>
<tr>
<td>6. BP8MR16-HC</td>
<td>HONEY COMB</td>
</tr>
<tr>
<td>7. BP8MR16-LI</td>
<td>LINEAR</td>
</tr>
<tr>
<td>8. BP8MR16-SOL</td>
<td>SOLITE</td>
</tr>
</tbody>
</table>

Note: Additional lens filters must only be used on open non-lensed downlight trim options.

*Please consult factory
1.1 DMX512-A Protocol Specifications

DMX512-A is an acronym for Digital Multiplex, a communication protocol used to remotely control lighting dimmers and intelligent fixtures. It is designed to provide a common communications standard between these lighting devices regardless of the manufacturer. The 512-A after the DMX refers to the number of control channels used on one network segment (often called a ‘universe’) of devices. In a simple dimming system, one channel controls the intensity of the fixture. A single intelligent fixture such as the araya5 requires several channels to control its various parameters (one channel each for DIM, CCT, SAT, HUE).

DMX512A Specifications:
• DMX 512-A (Controller).
• A universe is 512 Channels.
• DMX value is between 0 and 255, where 0 is off and 255 is full on.
• The maximum number of devices in a daisy-chain wire run is 32, which include the controller and opto-splitter.
• The maximum network wire run is a distance of up to 1600 feet for non-RDM systems and up to 1000 feet for RDM systems.
• One device functions as the master (DMX controller) on a network, while the rest function as slaves (mergers, splitters, intelligent fixtures, etc.).
• Only the controller (master) transmits over the network, and all fixtures receive the same data.
• The final device in the daisy-chain must be terminated with a 120 ohm resistor between DMX+ and DMX- pins.
• It is recommended that the terminator for the final device be located in the control panel, if it falls within the recommended wiring distance.
• All wiring must be in a continuous run and daisy-chained.
• Star wiring is only allowed in conjunction with an opto-splitter.
• Do not run DMX control cable in close proximity to AC power lines. EM spikes from switching of high-current devices such as HVAC equipment or generators will induce noise into the DMX cable.
• The shield must be carried through between modules and properly grounded at one point only.
• Connections to DMX512-A-RDM accessory board: wire size to be 24AWG, and solid or stranded cables may be used. Stranded wire used must be tinned or installed with ferule connector.

RDM

DMX512-A control protocol that enables Remote Device Management for two-way communications for configuration, monitoring and system setup. Allows two way communication between lighting controller and the fixtures. Allows for remote setting of DMX start addressing. RDM signals are sent back the other way, but not constantly. Controller can ask one or more devices for query feedback. RDM packets are inserted in-between the existing DMX data packets being used to control the lighting. The DMX Control Console will broadcast up to 512 channels over one DMX cable (max. run of 1000 feet for RDM). Some of these channels may not be used, but will still be transmitted, as required by the protocol. It must be set to a desired channel (001, 002. 003. 004, etc.) to control the connected light fixture. This is usually accomplished using RDM. This desired ‘channel’ is commonly known as the DMX address. When addressing fixtures, it is not recommended to skip addresses.

When RDM is not available with the control system, it is permissible to use the Lumenetix commissioning tool (the araya5 Tunable Color 2.0 iOS App) to set the address of the slots. The instructions to configure the DMX channels can be found in the separate araya5 Tunable Color Instruction Manual.

The DMX512-A interface follows the ANSI E1.11-2008 (R21013) standard. Four address slots are allocated to each interface board and control the Dim level, CCT, Saturation and Hue of the araya5 modules connected to the board.

Lumenetix DMX512 Protocol and Wiring Description

Default Lumenetix DMX512-A Slot Allocation:

<table>
<thead>
<tr>
<th>Slot</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dim Level</td>
</tr>
<tr>
<td>2</td>
<td>CCT</td>
</tr>
<tr>
<td>3</td>
<td>Saturation Level</td>
</tr>
<tr>
<td>4</td>
<td>Hue</td>
</tr>
</tbody>
</table>
### 1.2 DMX512-A Electrical Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESD Protection</td>
<td>±15KV (air), ±8KV (conducted)</td>
<td>Per IEC 61000-4-2</td>
</tr>
<tr>
<td>Termination</td>
<td>Recommended</td>
<td>The DMX512 bus termination rules apply</td>
</tr>
<tr>
<td>Directionality</td>
<td>Receive only</td>
<td></td>
</tr>
<tr>
<td>Frequency stability</td>
<td>±20ppm</td>
<td></td>
</tr>
<tr>
<td>Load per port</td>
<td>1/256</td>
<td>1/8 of Nominal RS-485</td>
</tr>
<tr>
<td>Isolation</td>
<td>3KVrms</td>
<td></td>
</tr>
</tbody>
</table>

### DMX512-A Control Systems (recommended list)

- Choreo
- Cognito
- Crestron Greenlight System
- Entec
- ETC Mosaic
- ETC Paradigm
- Fresno
- Interactive Technologies
- Lutron HomeWorks QS
- Lutron Quantum
- Nicolaudie
- Pathway Connectivity
- Pharos
- Traxon Ecue
- Vantage Controls

*Recommendations are subject to change. Consult your Lumenetix representative for the most updated list.*

### DMX512-A Recommended Internal / Field Wiring

**TMB Cable ProPlex DMX**

- **PC224T**: 2-pair DMX512 cable, overall foil and braid shielding with drain wire. UV and fungus resistant. Fully rated for installations, yet easy handling for light duty portable applications. **PC224TW**: Same as above, with white jacket.

**For use as DMX in/out under one jacket:**

- **PC244T**: Two individually shielded pairs and drain wires. UV resistant. Color coded foil shielding for easy reference.
DMX512-A PROTOCOL

1.3 DMX512-A Recommended Field Wiring

Liberty 24-2P-485 (Non-Plenum), 24 AWG, 2 pair dual 120 ohm, 11.2 pf/ft low capacitance (Wago, XLR and PHX connectors)
Liberty 24-2P-P485 (Plenum), 24 AWG, 2 pair dual 120 ohm, 11.2 pf/ft low capacitance (XLR and PHX connectors)
Belden #9842 (Non-Plenum), 24 AWG, 2 pair dual shielded 120 ohm, 12.8 pf/ft low capacitance (XLR and PHX connectors)
Belden #89842 (Plenum), 24 AWG, 2 pair dual shielded 120 ohm, 12.8 pf/ft low capacitance (XLR and PHX connectors)

Please refer to wire manufacturer’s lighting catalog for and equals as required by code.

Category Wire or Equal

The Entertainment Services and Technology Association (ESTA) does not define a maximum run length for DMX over Cat5 since many factors will affect the maximum run length, such as number of devices, number of splices in the cable, the strength of the DMX transmitter(s), if Remote Device Management (RDM) is being used, and sources of interference. ESTA does state (again, in ANSI E1.21-2):

“A properly selected and installed DMX512 cable should provide acceptable signal strength for runs of 300m (1000ft). Please note that the technical requirements, such as run-length and topology for other networking technologies, such as Ethernet, should be considered if using the installed cable for another networking technology in the future is anticipated.”

Cat5 or equivalent is not preferred as a portable cable since it is not as rugged as other DMX cables. Male RJ45 connectors are especially prone to breakage over repeated re-connections.

LUMENETIX RECOMMENDATION:
CAT 5E -150 FEET
CRESTRON
DM-CBL-8G-NP
DM-CBL-8G-P

CAT 7- 330 FEET
CRESTRON
DM-CBL-ULTRA-NP
DM-CBL-ULTRA-P

DMX512-A Recommended Field Connectors (or Equal)
WAGO 221
PHOENIX CONTACT
XLR NEUTRIK
CRESTRON
RJ45 DM-8G-CONN
RJ45 IDC DM-CONN

DMX512-A Wiring Connections

<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
<th>Pin Colors (4-Pair Cable)</th>
<th>Pin Colors (2-Pair Cable)</th>
<th>3-pin XLR connector</th>
<th>5-Pin XLR connector</th>
<th>5-Pin PHX connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Common</td>
<td></td>
<td>White/Brown and Brown</td>
<td>White/Blue and Blue</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Data (-)</td>
<td>Primary Data Link</td>
<td>Orange</td>
<td>Orange</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Data (+)</td>
<td>Primary Data Link</td>
<td>White/Orange</td>
<td>White/Orange</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Data2 (-), or not used</td>
<td>Optional Secondary Data Link</td>
<td>White/Orange</td>
<td></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Data2 (+), or not used</td>
<td>Optional Secondary Data Link</td>
<td>White/Orange</td>
<td></td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

XLR Connectors (5-Pin)

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3” Architectural High Lumen Adjustable LED Downlight
ER3-LED
**DMX512-A PROTOCOL**

### 1.4 DMX512-A Controller Example

**DMX512A Example**

*Fixture refers to a luminaire with one Lumineq module, and with one address (DDM) or four addresses (CTM).*

---

**DMX512-A Drain Wire Connections**

Drain wire connections are required as follows.

**Shielding**

To add another level of protection from electromagnetic noise, a grounded shield is added over the twisted pair wires. When this is enclosed in a protective jacket, to avoid ground loops and electromagnetic contamination of the ground system, all control ground wiring, including cable shields and drain wires, should be treated like sensitive current-carrying conductors. All control ground wires should be insulated (not bare) and the same wiring practices should be observed with ground wires as with other sensitive signals. Care must also be taken when designing control wiring to ensure that each shield is connected to only a single ground point. You should establish this point at a central location, like a control panel or cabinet, and avoid all connection to grounds in the field. A control ground is sometimes referred to as an isolated ground (an oxymoron) for this reason, but the term single-point ground is more accurate.

**Method-1**

A typical two-pair shielded cable can be prepared for termination to the terminals with the drain wire cut off. This is usually done at the field end of the cable where no shield grounding is desired. You will then use insulating tape or heat-shrink tubing to protect the cable from contamination and to prevent accidental grounding of the shield or drain wire. An accidental ground at this point would almost certainly create an undesirable ground loop.

**Method-2**

A typical two-pair shielded cable can be prepared for termination to the terminals with the drain wire cut off. The drain wire, which is an uninsulated conductor, is sleeved with an insulating tubing to prevent accidental grounding. The crimp-on lug is valuable in this instance to retain the tubing. Insulating tape or heat-shrink tubing is again used to protect the cable from contamination and to prevent accidental grounding, since any accidental connection between the drain wire and a chassis, frame, or enclosure would almost certainly create a ground loop.
2.1b DMX512-A-RDM Accessory Card Wiring Diagram
araya® Logic Module (ALM) with Round Arrays

Notes:
1. 24V power (red/black) is Class-2 rated.
2. Adapter is configured at factory for DMX inputs.
3. If more than one line of DMX is needed, then a DMX Splitter must be used to create multiple independent branches of a DMX signal and/or to extend the usable distance of each branch. Each of the splitter’s 4, 6, 8, or 16 output ports generates an independently protected DMX signal.

NOTE: BLUETOOTH OPERATION IS FOR COMMISSIONING THE MODULES ONLY, NOT FOR CONTROLLING THEM.
How to wire DMX/RDM lighting systems

DMX/RDM is a robust and reliable system for lighting control. However, if not implemented correctly, problems can arise such as random flashing of lights, erratic operation and delays in responding to commands. This document explains the best practices in DMX wiring.

Below, a typical DMX universe is shown. The DMX controller sends signals over the DMX cable to the drivers. At the last driver, the cable has to be terminated with a 120Ω resistor to prevent reflections of the signal.

**Important things to consider are:**

- DMX is a three-wire system. Use all three!
- DMX is based on the EIA-485/RS-485 standard.
- Always use cable specifically designed for DMX / RS-485. These cables have an impedance of 120Ω and a low capacitance. For instance: Belden 9841 or 3105a.
- DMX must be terminated with a 120Ω resistor to prevent reflections.
- A daisy chain topology should be used.
- After 32 unit loads a repeater/booster should be used.
- Keep cabling below 300 metres between the controller and the last driver.
- It is generally considered good practice to provide separate DMX in and DMX out/DMX thru connections to your fixture to aid in installation. This can be in the form of pigtailed, RJ-45 connectors or 5-pin XLR-connectors.
Connecting the cable on eldoLED drivers with ‘DMX in’ terminals only

Drivers with only one set of DMX terminals (DMX in +, DMX in -, and DMX in shield) use a standard DMX bus topology (daisy chain). At the last driver, a 120Ω resistor must be connected between the DMX in + and DMX in - pins of the driver as termination. This method is compatible with RDM.

Connecting the cable on eldoLED drivers with ‘DMX in’ and ‘DMX thru’ terminals

Some eldoLED drivers have an extra set of DMX terminals (DMX thru +, DMX thru - and DMX thru shield) in addition to the ‘DMX in’ terminals to make installation easier. Internally, these ‘thru’ terminals are electrically connected to the ‘DMX in’ terminals. These drivers also use standard DMX bus topology (daisy chain). The ‘DMX thru’ connections are compatible with RDM.

Connecting the cable on eldoLED drivers with ‘DMX in’ and ‘DMX out’ terminals

Drivers with ‘DMX out’ terminals (DMX out +, DMX out - and DMX out shield) in addition to the ‘DMX in’ terminals provide a buffered DMX out signal. These drivers offer additional functionality on top of standard DMX. On some products ‘DMX out’ is called LEDsync.
DMX out acts as a built-in booster or repeater, so no additional repeaters or boosters are necessary after 32 drivers.

DMX out provides automatic driver addressing possibilities.

With DMX out, it is possible to have mixed topologies instead of daisy chain only.

Only the first driver on the ‘DMX out’-chain (master) is visible on RDM – slaves behind are not visible. If RDM is required, use the ‘DMX in’ terminals instead of ‘DMX out’.

Each DMX out adds a delay of approximately 300µs. After 75 drivers, this delay will be visible.

The maximum available DMX address is 480; DMX addresses 481 – 512 are reserved for ‘DMX out’-features.

If one driver in the chain fails, devices behind the failing driver will stop receiving DMX signals.

Drivers without ‘DMX out’-terminals or third party drivers should be first in the DMX chain, they cannot be connected behind drivers with ‘DMX out’.

Termination with DMX out

With drivers that have DMX out terminals extra care should be taken with termination, depending of the configuration. In short: termination is necessary after each cable run, but not at any T/Y-connections. Some examples:

Figure 5 – Termination on each cable run
• Only the first driver on the 'DMX out'-chain (master) is visible on RDM – slaves behind are not visible. If RDM is required, use the 'DMX in' terminals instead of 'DMX out'.

• Each DMX out adds a delay of approximately 300µs. After 75 drivers, this delay will be visible.

Figure 6 Mixed topology with daisy chain and DMX out

Figure 7 – It is not possible to have third party drivers in the DMX out-chain