

DXRL-RT DMX RDM MONITOR TIMER RELAY USER GUIDE

DXRL-RT V3.1x

DESCRIPTION

The **DXRL-RT V3.1** is a commercial-grade, single-channel DMX to Relay Controller featuring full **ANSI E1.20 Remote Device Management (RDM)** compliance. The DXRL-RT is a DMX to relay controller, and with RDM access additional functionality is programmable: DMX monitor/timer enable, DMX monitor range start and end channels, set timer value (seconds), and view timer count down value (seconds). By integrating the programmable DMX range monitor and a precision timeout timer, the DXRL-RT allows users to trigger AC loads automatically when control data falls below a set threshold, providing a robust solution for energy conservation, system failsafes, and automated equipment shutdown.

OPERATION

The DXRL-RT V3.1 is a DMX/RDM-compliant relay controller that automatically manages AC power loads based on incoming DMX signals. If the RDM programmed DMX monitor timer is enabled, and DMX levels meet or exceed the preset threshold of 5% (decimal thresholds: ≥ 7 is off / ≤ 18 is on), the unit energizes its internal relay to power connected equipment. If control data drops below 5%, an RDM-programmable countdown timer (up to 6 hours) triggers before automatically opening the relay to cut load power. During a loss of DMX data, customizable failsafe modes force the relay ON, hold its current state, or execute the countdown sequence. If the timer is not enabled (or more than 1 relay equipped) the start address of the relay(s) are set on the front panel dip switches 1-9. See the dip switch settings for additional functions. Front-panel LEDs provide real-time status for power, DMX signal, relay state, and timer activity.

LED INDICATORS

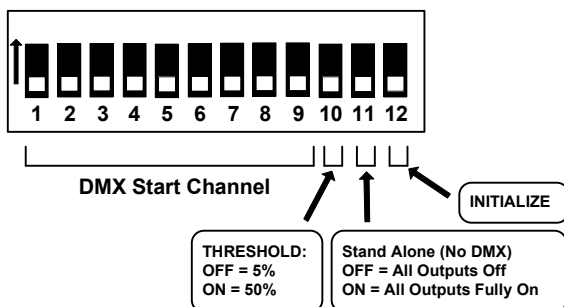
PWR (Red): +12VDC power is supplied to the internal logic board

DMX (Yellow): Active & valid DMX data packet stream is being received

RLY (Green): Indicates the current closed state of the power relay(s)

TMR (Yellow): Flashes to indicate that the internal programmable countdown timer is running

DIP SWITCH SETTINGS



DIP SWITCH LEGEND

1-9 DMX Start Channel	DIP/RDM*
10 THRESHOLD	DIP Only
OFF=5%	
ON=50%	
11 Stand Alone Mode	DIP/RDM*
OFF=All outputs off	
ON=All Outputs Fully On	
RDM Only-Hold Last	
12 Initialize/Factory Defaults	DIP Only
Powered+ON=Initialize	
ON then powered=Fact.Def.	

*Latest changed is active/recalled

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DIPS 1–9 Start Address

Set DMX start address channel for non timer relay(s) activation. If monitor timer relay is active and only a single relay is equipped these addresses are ignored. Use industry standard binary addressing to assign a start channel from 1- 511.

NOTE: Switches 1-9 parameters are managed by dip switches or RDM programming. The latest powered setting overrides and sets the parameter and recalled on startup.

DIP 10: Threshold Configuration

Determines the percentage trigger threshold used to manage relay states, and 0-10 volt outputs.

DIP OFF: 5% threshold for non timer relay(s) (≥ 7 is off / ≤ 18 is on decimal)

DIP ON: 50% threshold for non timer relay(s) (≥ 7 is off / ≤ 18 is on decimal)

[!] *NOTE: Switch 10 parameters are managed ONLY via the physical board-level hardware switch and cannot be modified or overridden through RDM parameters.*

DIP 11: Stand-Alone Action (Loss of DMX Signal)

Dictates device behavior if the incoming DMX control connection drops or fails.

DIP OFF (All Off): Turns off all non timer relay(s) and 0-10 volt outputs if equipped. If the **RLY1 timer is enabled**, the timeout countdown sequence will immediately trigger and begin running.

DIP ON (All On): Turns ON all non timer relay(s) and 0-10 volt outputs to 10 volts if equipped. If the **RLY1 timer is enabled**, the timeout countdown timer is disengaged and will not start, RLY1 is turned on and maintains a continuous power state.

RDM ONLY (HOLD LAST): If enabled by RDM (overrides dip switch setting) the last state of non timer relay(s) and 0-10 volt if equipped are held until DMX is restored or powered off. If the RLY1 timer is enabled, the timeout countdown timer is disengaged and will not start, RLY1 holds its latest state.

DIP 12: Hardware Initialize & Factory Defaults

Provides system management utilities depending on when the switch state is toggled.

Live Hardware Detection & Learning: If DIP 12 is toggled **ON while the module is already powered up**, the system forces a live scan of the board structure to detect attached add-on hardware (such as an 8-channel 0-10V expansion sub-board). When complete the data LED will **Rapid Flash** and system holds operations until DIP 12 is toggled back **OFF** to resume normal operation.

Power-On Default Reset: If DIP 12 is set **ON prior to powering the unit**, the system clears its flash memory and reloads all factory defaults. Custom RDM profiles must be manually reprogrammed after this cycle finishes. When complete the data LED will **Slow Blink** and system holds operations until DIP 12 is toggled back **OFF**.

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RDM PROGRAMMING

The DXRL-RT fully supports Remote Device Management (RDM) compliant with the ANSI E1.20 standard, allowing network-wide device discovery, diagnostics, parameter queries, and remote configuration adjustments.

Supported RDM Parameters (PIDs)

- DISC_UNIQUE_BRANCH/ DISC_MUTE/ DISC_UN_MUTE(Standard Device Discovery)
- DEVICE_INFO(Tracks category, software version, and footprint data)
- DMX_START_ADDRESS(Remotely reassigns base operating address)
- SOFTWARE_VERSION_LABEL(Returns manufacturer runtime code version)
- *Custom Config PIDs*: Used for assigning timer constraints, DMX monitoring windows, and extended standby properties.

Time Out Timer Duration Value - RDM:Set/Get

The timeout clock duration can be set via RDM configuration parameters within a window of **0 to 21,600 seconds**.

CRITICAL RUNTIME NOTE: If a revised timer value is transmitted via RDM while the countdown sequence is actively running, the active sequence WILL CONTINUE to count down based on the original time value. The new value will only load once the timer mechanism is dropped and re-triggered. Use code with caution.

Timer Countdown Value - RDM:Set/Get

The timer countdown clock value can be read to determine how many seconds remain until the relay turns off. This value can also be set while the countdown clock is running to lengthen or shorten the timer. Note that this value will automatically load the **timer time value** if DMX is restored/lost before the timer counts down to zero. **0 to 21,600 seconds**.

DMX Monitor Timer Range Start/End - RDM:Set/Get

Users can define a customized window of DMX channels to monitor, this applies only if monitor timer is enabled. Note: Set values must be in the range of 1-512, and the **Start** address must be equal to or less than the **End** address and **End** greater than or equal to **Start**.

DMX Global Start Address - RDM:Set/Get

Users can define the DMX start channel of non timer relay(s) and 0-10 volt 8 ch output if equipped. NOTE: The start and end address settings for DMX monitor timer Relay 1 (**RLY1**) operate completely independently and are **NOT affected by this Global start address** parameter.

RDM Stand-Alone "HOLD" Mode - RDM:Set/Get

- In addition to the physical choices on DIP 11, RDM unlocks an extended **"HOLD"** mode. If the unit enters a loss-of-data state while set to "HOLD", the countdown **timer automatically turns off**. If RLY1 was already active, it will lock **ON**; if RLY1 was inactive, it will lock **OFF** (the timer remains deactivated in both conditions).

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Variable/Switch Mode (0-10 Volt Outputs Only) - RDM:Set/Get ONLY

- **Variable:** The 0-10 volt outputs are analog voltage levels in respect to assigned DMX channel levels.

- **Switch:** The 0-10 volt output outputs are either fully on (10V) or off (0V) in respect to assigned DMX channel levels and threshold setting.

Footprint Visibility Note: The 0-10V sub-board does not register its own independent footprint profile within standard RDM discovery.

Level Cap - RDM:Set/Get

- 0-10 volt setting if equipped, limits the 0-10 volt outputs to this decimal level (0-255). Once set any DMX level set greater than the cap value will be ignored.

DMX Loss Count - RDM:Get

- Get the amount of times DMX has been lost since powered. Max count up to 255.

OPERATION

Normal DMX Operation

During standard operation with a stable, active DMX network connected:

1. The console transmits data to the assigned address channel.
2. The **DMX (Yellow) LED** illuminates solid.
3. The unit evaluates incoming data against the assigned threshold level (5% or 50% via DIP 10).
4. When values match or exceed the threshold, the internal driver switches the high-current relay **ON**, illuminating the **RLY (Green) LED**.

Timer Operation – RDM Configured Only

The countdown sequence automates load shutdowns when system control levels fall.

1. When control data drops **below 5%**, the countdown sequence triggers immediately (if the timer is enabled via RDM).
2. The **TMR (Yellow) LED** illuminates to show an active countdown state.
3. The relay remains closed (ON), maintaining line voltage throughput to the RLY PWR OUT port.
4. When the clock reaches 0 seconds the relay turns off (disconnects attached load). The **RLY** and **TMR** LEDs both turn off.

Typical Application Scenario/Automated Structural Power Management

Setup: Connect the main power input of a network of LED lighting fixtures to the RLY PWR OUT port of the DXRL-RT. **Note: Do not exceed load specifications.**

Execution: During normal operation, the console keeps the monitor channel(s) at 100%. At the end of production, the console drops the channel(s) to 0%. The DXRL-RT detects the drop below 5%, triggers its internal preset timer (0-6 hours set in seconds), counts down to zero and automatically cuts all AC line power to the fixtures. This eliminates any power draw without manual intervention.

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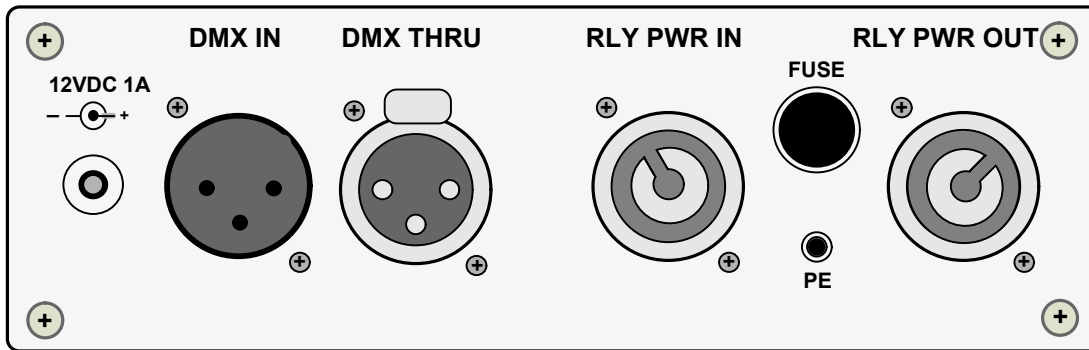


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Back Panel Connections

The back panel houses all physical data and high-voltage power routing interfaces.



Data Connections

DMX IN: Dedicated 3 or 5-pin female XLR chassis connector. Connect the incoming DMX data line from the control console or data distributor here.

DMX THRU: Passthrough 3 or 5-pin male XLR chassis connector used to daisy-chain the DMX signal to downstream terminal devices. *Note: **TERMINATION REQUIRED:** This is a direct through connection from the DMX input and is not internally terminated. If daisy chained follow DMX wiring standards: loop from device to device, never 'T' or 'Y' a cable, don't exceed 32 devices Max, and terminate at the end device. If this connector is unused install a terminator (not supplied) providing a 120 ohm resistance across pins 2 and 3.*

Power & Load Connections

12VDC 1A Input: Main power supply barrel jack (5.5mm x 2.1mm), regulated, center-positive external supply for internal circuit board.

RLY PWR IN (Blue powerCON): Main AC line power input rated for **120VAC - 15A MAX.**

RLY PWR OUT (Grey powerCON): Switched AC load output interface rated for **15A MAX.** Connect target fixtures or devices here.

FUSE HOLDER: Houses a standard **5x20mm, 15A, 250V time-delay fuse.**

PE (Chassis Ground): Dedicated earth ground stud terminal block.

WARNING!: Damage may result if **REVERSE VOLTAGE** or **OVER VOLTAGE** is applied to the input voltage terminals. Take great care that the +12V and ground connections are connected as marked.

NOTE: This unit must be installed in accordance with all local and national electrical codes (NEC/NFPA 70). Installation and wiring must be performed by qualified personnel. See the specifications page of the for the proper voltage and current rating of the relays and connections. The user is responsible for all uses and connections.

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SPECIFICATIONS

DMX CONTROL WARNING: NEVER use DMX data devices where human safety must be maintained.
NEVER use DMX data devices for pyrotechnics or similar controls.

MANUFACTURER: ELM Video Technology

PRODUCT NAME: DMX Relay RDM Monitor Timer w/ optional 0-10 Volt

MODEL/MPN: DXRL-RT

INTERNAL RELAY MAX: 120VAC / 15 AMPS

MAIN RELAY FUSE: 15 Amp Slow Blow

+12VDC PCB INPUT FUSE: SMT 1A Slow Blow

POWER INPUT CURRENT: Single Relay Apx 400mA

If equipped: each additional relay closed add 100mA, optional [8] 0~10 volt outputs at 20mA)

PCB RELAY OUTPUT CURRENT (SINK/GROUND DRIVE): 100mA Max each at +12VDC

0~10V SOURCE OUTPUT CURRENT: 20mA Max each (500 ohm minimum load)

0~10V SINK OUTPUT CURRENT: 10mA Max each

DATA TYPE: DMX512 (250Khz) [Pin 1 Shield (not connected on input), Pin 2 Data -, Pin 3 Data +]

DIMENSIONS: 2.1" H x 6.7" W x 4.1" D

WEIGHT: 1.5 pounds

AMBIENT TEMPERATURE MAX: 32°F to 85°F

PCB AND RELAY OPERATING TEMPERATURE MAX: 32°F to 100°F (Air cool if necessary)

HUMIDITY: Non-condensing

0-10V (option) REFRESH RATE: 571 per second w 8 channels (amount of times per second the outputs are updated)

POWER SUPPLY: +12VDC wall mount (UL listed)

Voltage Input: 100 ~ 132 (or 240) VAC

Current Output (Min): 1 or 2 Amp single relay, 2 Amps 3+

Power (Min): 12 or 24 Watts

Polarization: Positive Center

Output Connector: Locking Barrel Plug, 2.5mm I.D. x 5.5mm O.D. x 9.5mm

RELAY SPECIFICATIONS IF EQUIPPED WITH FACTORY INSTALLED RELAYS:

RELAY VOLTAGE MAX: 120VAC

RELAY CURRENT MAX: 15 Amps each

UL LISTINGS: +12VDC power supply and pre populated PCB, PowerCon connectors, 120VAC Fuse holder are UL listed, (populated PCB: NO, Enclosed unit: NO)

RELAY APPROVALS: UL E58304; CSA LR48471

RELAY CONTACT DATA: Contact arrangement: 1 form A (NO) 16A, 1 form B (NC) 10A, 1 form C (CO)

RELAY CONTACT MATERIAL: AgSnOInO, AgCdO

RELAY MIN RECOMMENDED CONTACT LOAD: 1A, 5VDC or 12VAC

RELAY FREQUENCY OF OPERATION: with/without load 360/3600hr

RELAY OPERATE/RELEASE TIME MAX, including bounce: 15/15ms

RELAY MECHANICAL ENDURANCE: 10×10⁶ operations