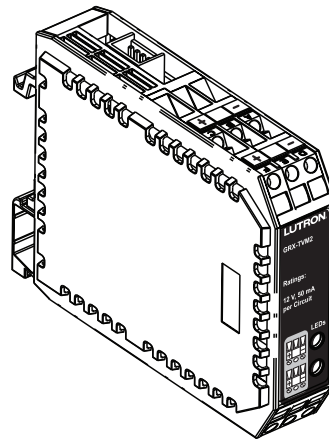# Ten Volt Module and Kit

A Ten Volt Module (TVM) can control various LED and fluorescent load types when the lighting fixtures use a low-voltage signal ballast or LED driver.

The GRX-TVM2 can be considered as an output module in a HomeWorks QS system; it is used to control load types such as: 0–10 V=== sink, 0–10 V=== source, Pulse Width Modulation (PWM), DALI® (broadcast only)†, and Tridonic DSI with the addition of a Module Interface (MI). Each TVM has two outputs which can be individually programmed to control any of these load types. TVMs can work in conjunction with the outputs of RPM-4U modules to switch the ballast or driver.
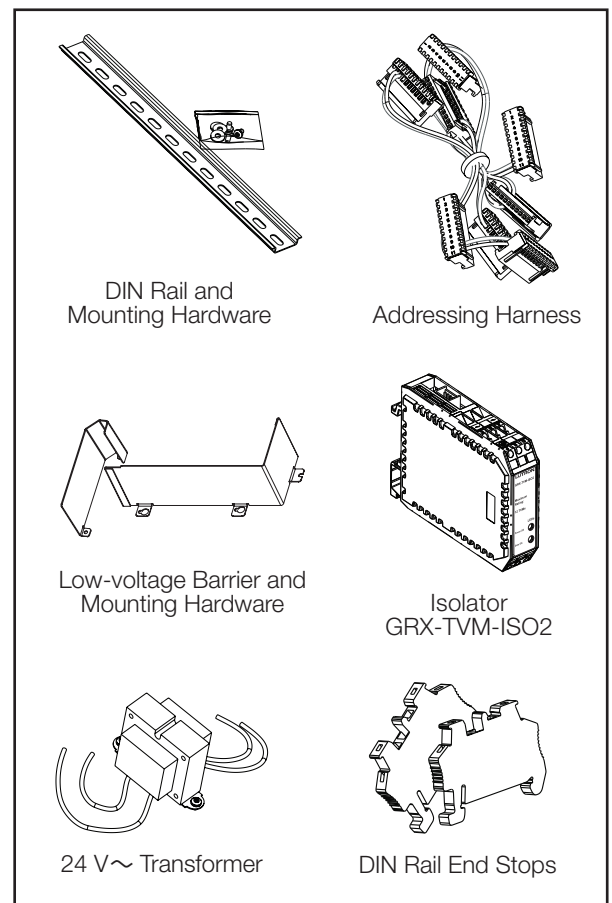
The Ten Volt Module Kit (HW-TVMKIT-120, HW-TVMKIT-230) contains the parts required to install TVMs (TVMs and TVM Kits are sold separately). Each TVM Kit can accommodate up to 12 TVMs, for a total of 24 circuits per panel.

Customers can mount the TVM Kit in their own enclosure or add it to an existing Lutron enclosure* (HWI-PNL-8, HWAP-8, HWBP-8, PBK-8).

The ISO2 (included in the TVM Kit) provides isolated power to the TVMs. Each ISO2 can provide no more than 750 mA of current — equal to 6 fully loaded TVMs or up to 12 partially loaded TVMs.

GRX-TVM2

DIN Rail and Mounting Hardware

Addressing Harness

Low-voltage Barrier and Mounting Hardware

Isolator GRX-TVM-ISO2

24 V∼ Transformer

DIN Rail End Stops

HW-TVMKIT-120; HW-TVMKIT-230

Model Numbers

GRX-TVM2	Ten Volt Module
HW-TVMKIT-120	Ten Volt Module Kit (120 V∼)
HW-TVMKIT-230	Ten Volt Module Kit (230 V∼)
163198	Low-Voltage Transformer for 120 V∼ Kit (replacement)
163227	Low-Voltage Transformer for 230 V∼ Kit (replacement)
GRX-TVM-ISO2	ISO2 (replacement)

* The HW-TVMKIT is mounted in place of Remote Power Module (RPM) #8.
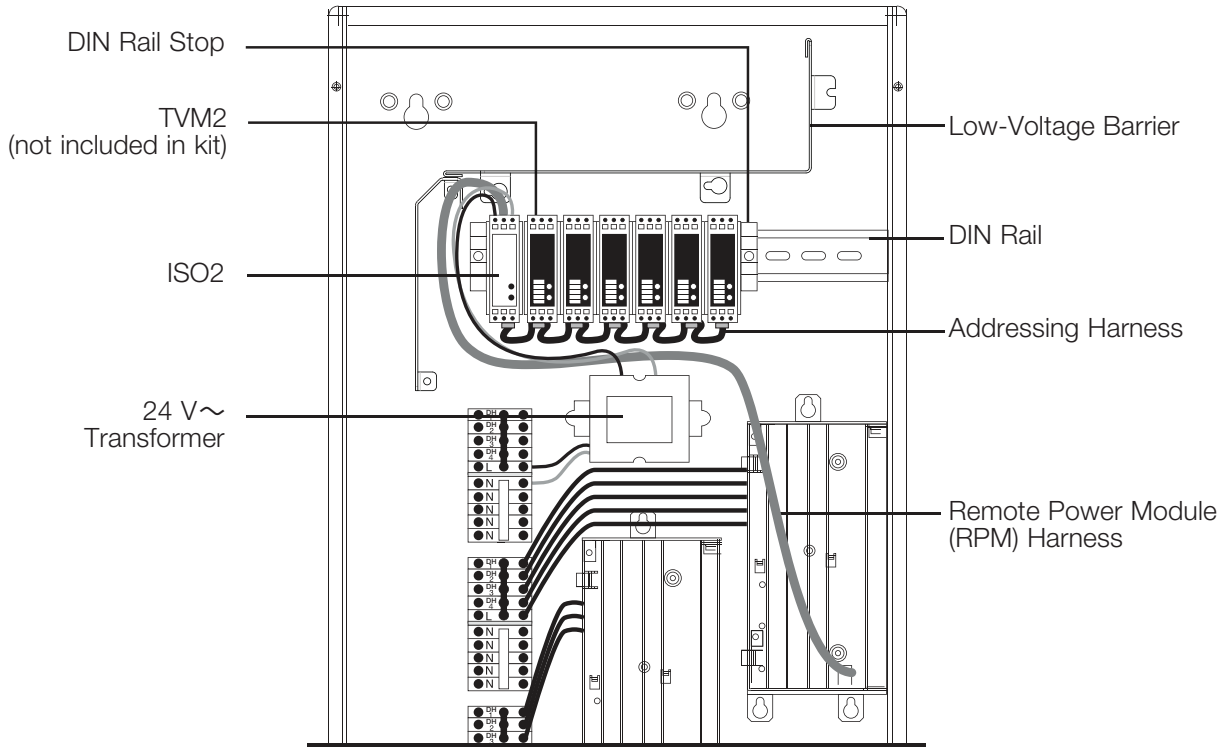
† See page 5 for DALI® compatibility requirements.

Customer Assistance:
1.844.LUTRON1 (U.S.A./Canada)
+44.(0)20.7680.4481 (Europe)

Ten Volt Module and Kit

Specifications
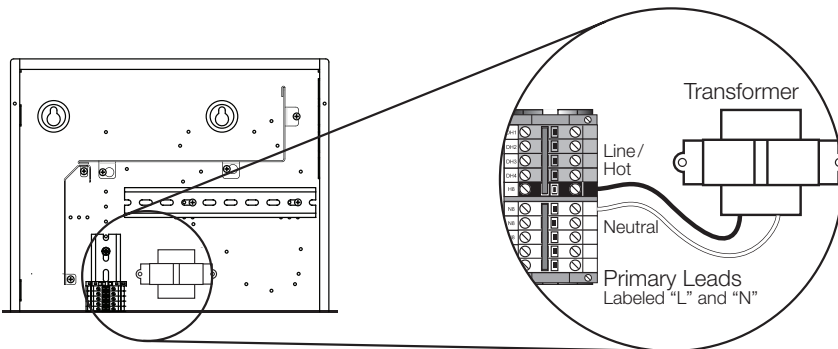
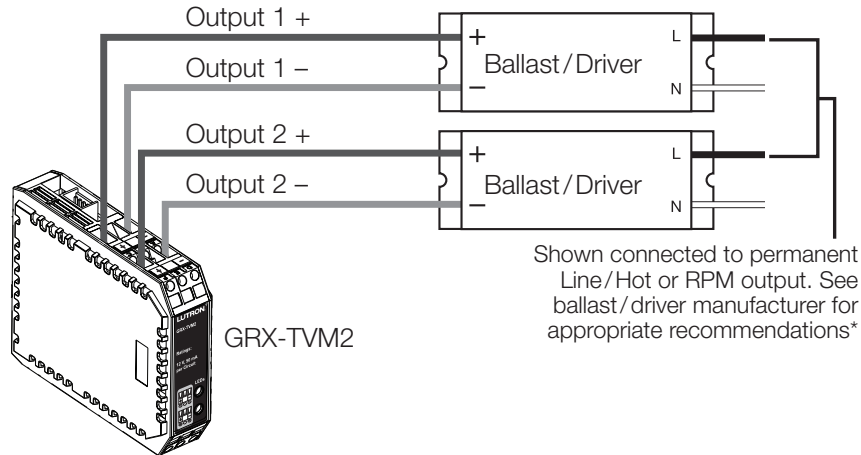|	
Model Numbers	GRX-TVM2 (Ten Volt Module) HW-TVMKIT-120 (120 V∼ Ten Volt Module Kit) HW-TVMKIT-230 (230 V∼ Ten Volt Module Kit) *Replacement Kit Accessories:* 163198 (Low-Voltage Transformer for 120 V∼ Kit) 163227 (Low-Voltage Transformer for 230 V∼ Kit) GRX-TVM-ISO2 (ISO2)

Power	**GRX-TVM2:** 12 V⎓ 50 mA per circuit
	
	HW-TVMKIT-120
	  ISO2: 24 V∼ 50/60 Hz 750 mA per ISO2
	  Transformer Input: 120 V∼ 50/60 Hz 40 W
	  Transformer Output: 24 V∼ 1.6 A IEC PELV/NEC® Class 2
	
	HW-TVMKIT-230
	  ISO2: 24 V∼ 50/60 Hz 750 mA per ISO2
	  Transformer Input: 220 V∼ to 240 V∼ 50 Hz 40 W
	  Transformer Output: 24 V∼ 1.6 A IEC PELV/NEC® Class 2

Capacity	Each GRX-TVM2 can control up to 2 circuits. Each HW-TVMKIT-xxx can hold up to 12 GRX-TVM2s.
Low-Voltage Connections	11-pin harness connects ISO2 to each TVM2. Low-voltage MI harness connects the ISO2 units to panel interface.
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °F to 40 °F). Ambient operating humidity: 0%–90% humidity, non-condensing. Indoor use only.
Mounting	Mounts in HWI-PNL-8, HWAP-8, HWBP-8, PBK-8 in place of Remote Power Module (RPM) #8.
Warranty	www.lutron.com/TechnicalDocumentLibrary/Warranty.pdf www.lutron.com/TechnicalDocumentLibrary/Intl_Warranty.pdf

Ten Volt Module and Kit

Installation
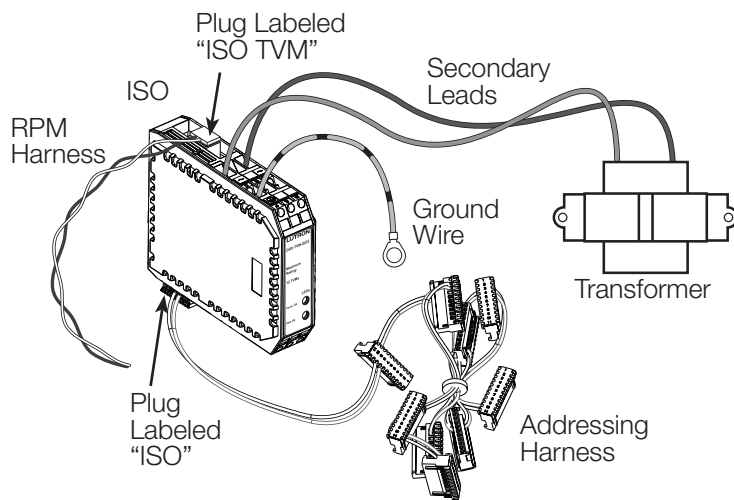
DIN Rail Stop

TVM2
(not included in kit)

ISO2

24 V∼
Transformer

Low-Voltage Barrier

DIN Rail

Addressing Harness

Remote Power Module
(RPM) Harness

Wiring

Transformer

Line/
Hot

Neutral

Primary Leads
Labeled "L" and "N"

Ten Volt Module and Kit

Connecting the Low-Voltage Signal Wires

Output 1 +
Output 1 −
Output 2 +
Output 2 −

+ Ballast/Driver L N
+ Ballast/Driver L N

GRX-TVM2

Shown connected to permanent Line/Hot or RPM output. See ballast/driver manufacturer for appropriate recommendations*

ISO2 Wiring Example

Plug Labeled "ISO TVM"
Secondary Leads
ISO
RPM Harness
Ground Wire
Transformer
Plug Labeled "ISO"
Addressing Harness

* Some ballasts/drivers require a permanent Line/Hot connection while others must be switched off, by the output of an RPM-4U module, in conjunction with the TVM. Consult ballast/driver manufacturer instructions for details.

DALI® Compatibility

In order to ensure compatibility with Lutron DALI® controllers, the connected DALI® LED drivers and fluorescent ballasts must be DALI-2® certified and marked. In addition to compatibility, it is important to select high-quality and high-performance LED drivers and fluorescent ballasts. DALI-2® certified devices are readily available from many manufacturers and are tested for compatibility with the standard. For a complete list of available DALI-2® certified devices, see the DiiA® website at https://www.digitalilluminationinterface.org/products. DALI® devices that are not listed on the DiiA® website and are not marked DALI-2® cannot be considered DALI-2® certified.

The DALI® version-1 standard does not ensure compatibility. To apply the original DALI® version-1 mark on LED drivers and fluorescent ballasts, no verification of the test results was required, and manufacturers could self-declare compliance and apply the DALI® mark. If you would like to use an LED driver or fluorescent ballast that is not DALI-2® certified but carries a DALI® version-1 logo, Lutron recommends that these devices be tested to ensure compatibility. Lutron is able to perform this testing on request. Samples of the drivers and light engines must be submitted to Lutron and the expected turnaround time is 6 to 8 weeks after the drivers are received. Fees for testing may apply. Lutron recommends that this testing be performed before the fixtures and lighting controls are purchased and installed. Contact your Lutron sales representative for more information.