

RLYLA102V2 Rev A Datasheet

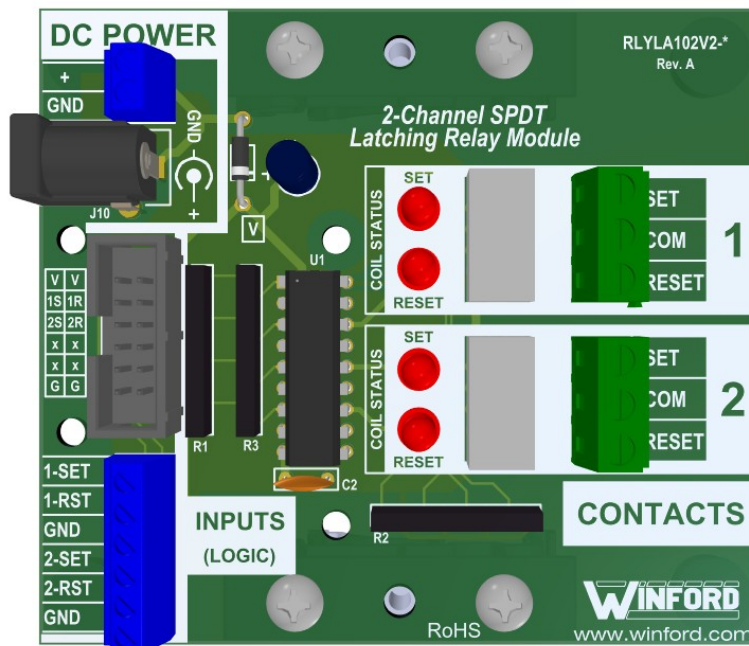
Overview

The RLYLA102V2 provides two latching SPDT signal relays with convenient screw terminal connections and a 2x6 header for the inputs, and screw terminal connections for the contacts. The board includes active driver circuitry allowing relatively low-current input signals (such as 3.3V or 5V signals from a microcontroller) to be used. LEDs provide visual indication of the activation status of each coil.*

Since latching relays are used, the relay coils only have to be energized when it is desired to switch them from one state to the other. Thus, this product is particularly well-suited to low-power applications.

Due to the gold plating on the relay contacts, this relay board is suitable for switching very low-power signals (down to 10uA @ 10mV DC).

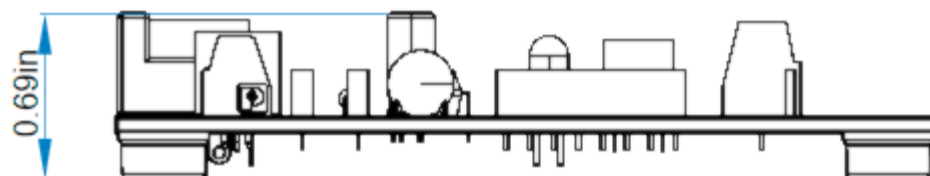
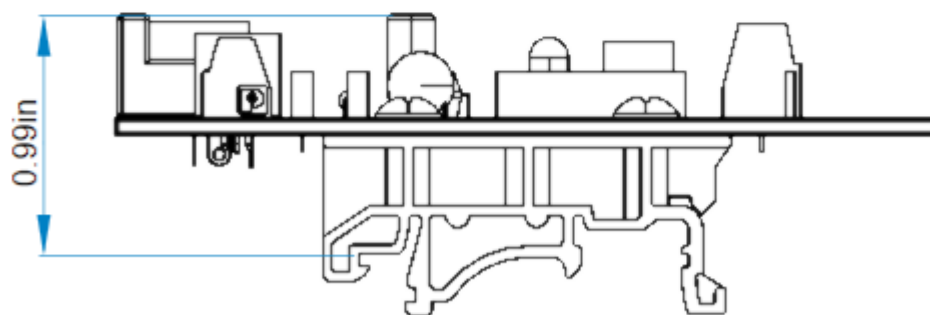
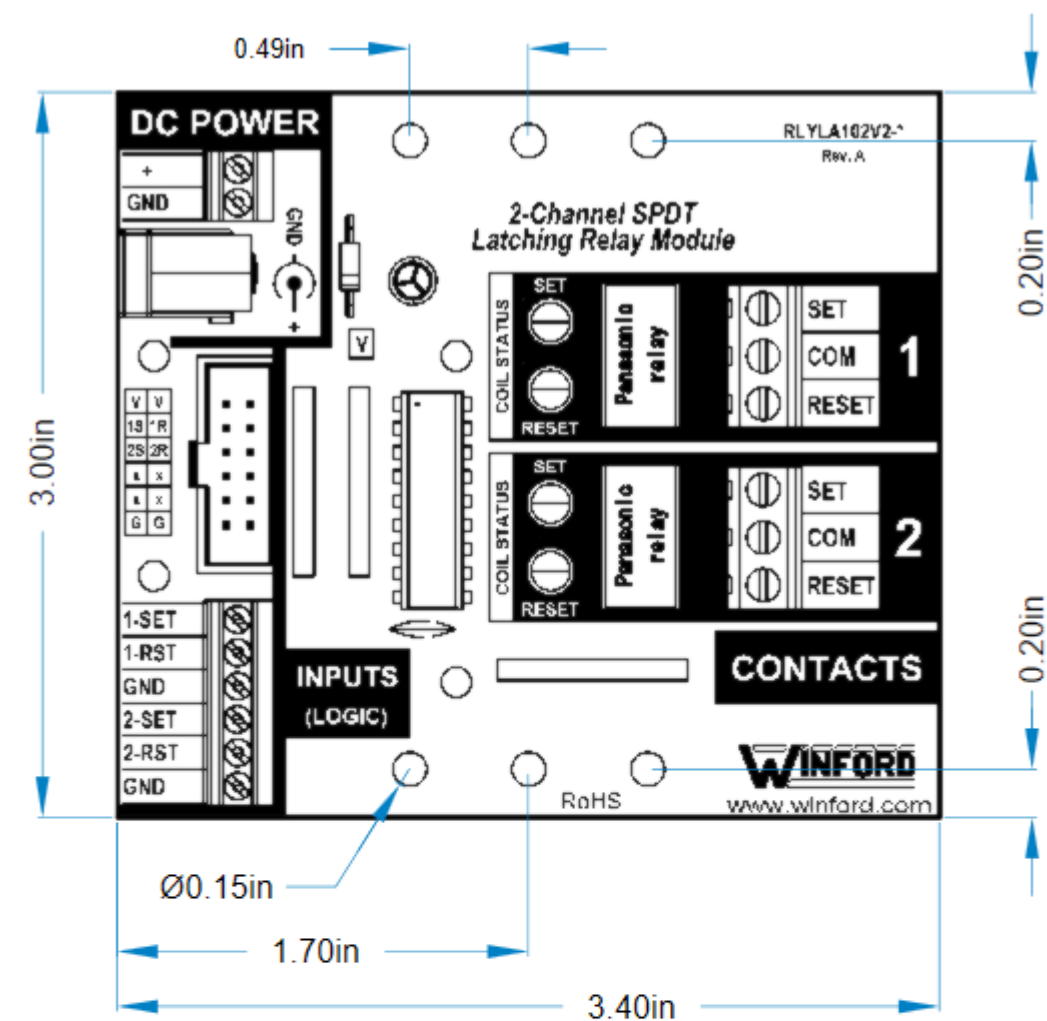
The relays used on this board are rated for resistive loads.



DIN Mounting Option Shown

*As should be expected when using latching relays, note that the LEDs indicate the activation status of each coil, not necessarily the state of the contacts. This is described in more detail later in this document.

Dimensions (typical shown)



Signal Descriptions

Signal at Input Terminal Block	Signal at 2x6 Header	Description
--	V	Supply Voltage, after the reverse-polarity protection diode
1-SET	1S	Ch.1 input control for SET coil
1-RST	1R	Ch.1 input control for RESET coil
2-SET	2S	Ch.2 input control for SET coil
2-RST	2R	Ch.2 input control for RESET coil
GND	G	Ground reference for inputs

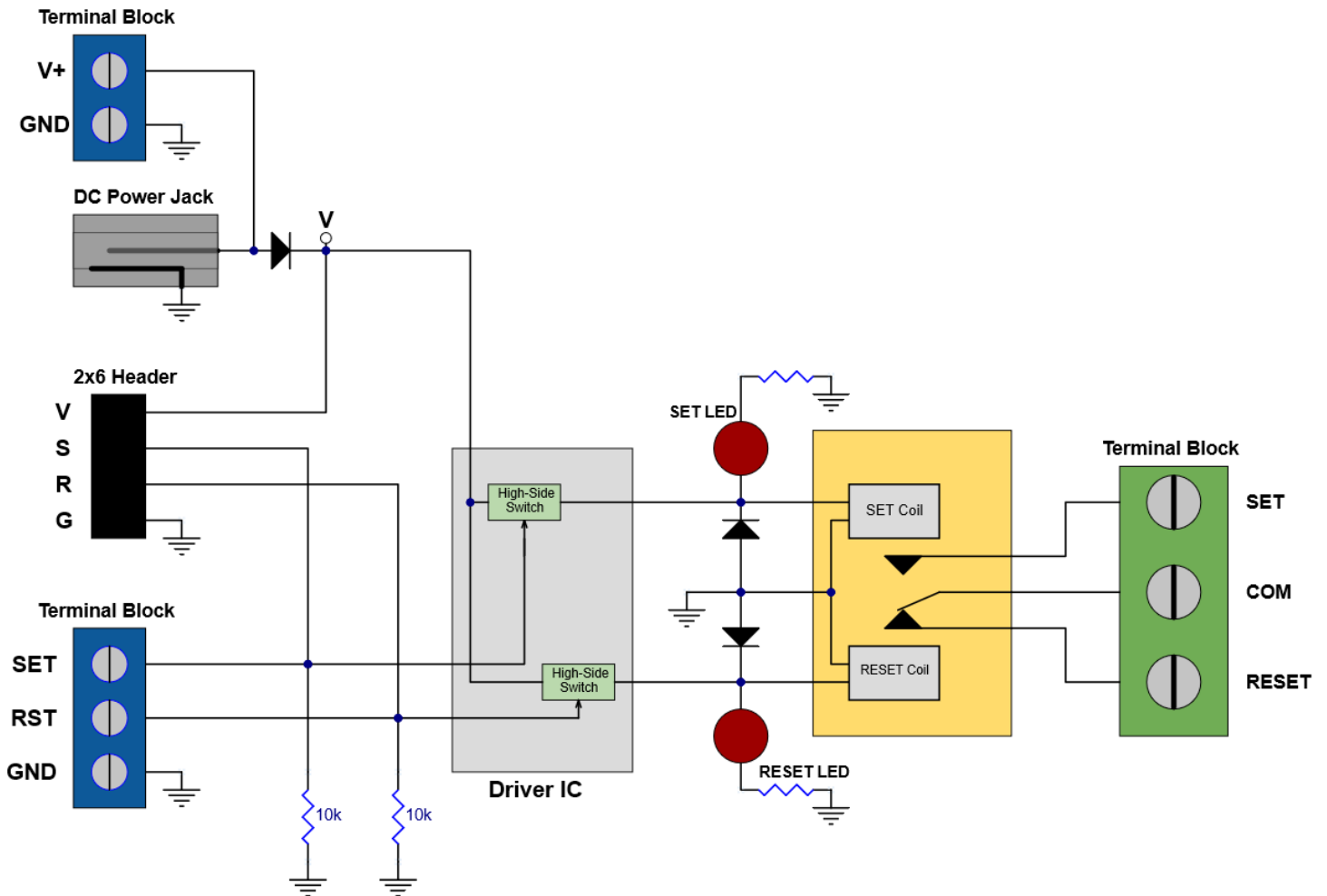
Contacts for Channel 1

Signal at Output Terminal Block	Description
SET	Relay contact that connects to COM in the SET state
COM	Relay contact, common
RESET	Relay contact that connects to COM in the RESET state

Contacts for Channel 2

Signal at Output Terminal Block	Description
SET	Relay contact that connects to COM in the SET state
COM	Relay contact, common
RESET	Relay contact that connects to COM in the RESET state

Simplified Schematic Diagram

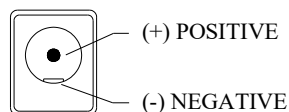


Note that while just one channel is shown in the figure above, both channels are identical.

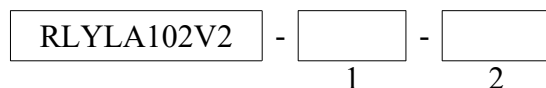
The simplified schematic diagram is not an exact representation of the actual device implementation.

DC Power Jack

The DC power jack accepts connectors with a 2.1mm inside diameter and 5.5mm outside diameter. The jack requires a center-positive supply.



Part Number Ordering Information



1. Relay Coil Voltage (DC)

- 5V
- 12V
- 24V

2. Mounting Option

- **FT** Rubber Feet on bottom side of PCB
- **DIN** DIN Rail Mounting Clips

RLYLA102V2 Stocked Part Numbers

The following part numbers represent standard options:

- RLYLA102V2-5V-FT
- RLYLA102V2-12V-FT
- RLYLA102V2-24V-FT
- RLYLA102V2-5V-DIN
- RLYLA102V2-12V-DIN
- RLYLA102V2-24V-DIN

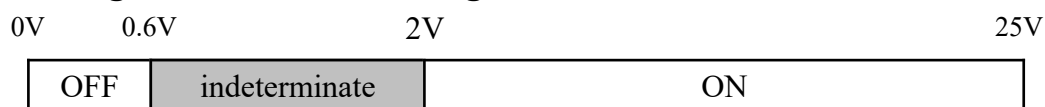
Electrical Characteristics

Specifications at 25°C unless indicated otherwise

<i>Specification</i>	<i>RLYLA102V2 -5V</i>	<i>RLYLA102V2 -12V</i>	<i>RLYLA102V2 -24V</i>	<i>Unit</i>
DC Power Supply Input Range*	4.5 - 6.5	10.5 – 15	21.5 - 30	V
Nominal supply current per activated relay (coil current + LED current) (Power supply: RLYLA102V2-5V=5.0V, RLYLA102V2-12V=12.0V, RLYLA102V2-24V=24.0V)	32	15	9	mA
Maximum leakage current (power supply current with no relays activated)	0.1			mA
Minimum turn-off threshold for input control signals (see diagram below)	0.6			V
Maximum turn-on threshold for input control signals (see diagram)	2			V
Maximum allowable input control signal voltage	25			V
Input control signal current requirement, typical (per channel) Input signal @ 3.3V Input signal @ 5.0V Input signal @ 12V Input signal @ 24V	0.4 0.6 1.6 3.2			mA
Input signal logic-high pulse time required (minimum) to transition relay from SET to RESET, or from RESET to SET state	20			ms
Relay contact max switching voltage	220V DC, 250V AC			V
Relay contact max switching power (DC, resistive load)	60			W
Relay contact max switching current (DC, resistive load)	2			A
Relay contact max switching power (AC, resistive load)	60			VA
Relay contact max carrying current rating	3			A
Expected life - Mechanical	Min. 1x10 ⁸			cycles
Expected life – Electrical	Min 1 x 10 ⁵ (2A 30VDC resistive) Min 5 x 10 ⁵ (1A 30VDC resistive) Min 1 x 10 ⁵ (0.5A 125VAC resistive)			cycles

**It is assumed that the DC supply voltage is stable, and that coil activation occurs at a low duty cycle. If this is not the case, then this may impact the operation of the relays. For example, if a relay coil is continuously energized at max allowed DC supply voltage and max temperature, it is possible that it will need to cool down before operating at minimum DC supply voltage. This is because a relay coil at high temperature will have relatively high resistance, in which case a low DC supply voltage may not be sufficient to achieve the relay coil current necessary to activate the relay.*

Input Control Signal Thresholds Diagram



Operating Conditions

Ambient Temperature Range	-25°C to 50°C
Relative Humidity Range - not freezing or condensing	5% to 85% RH

Screw Terminal Wire Sizes

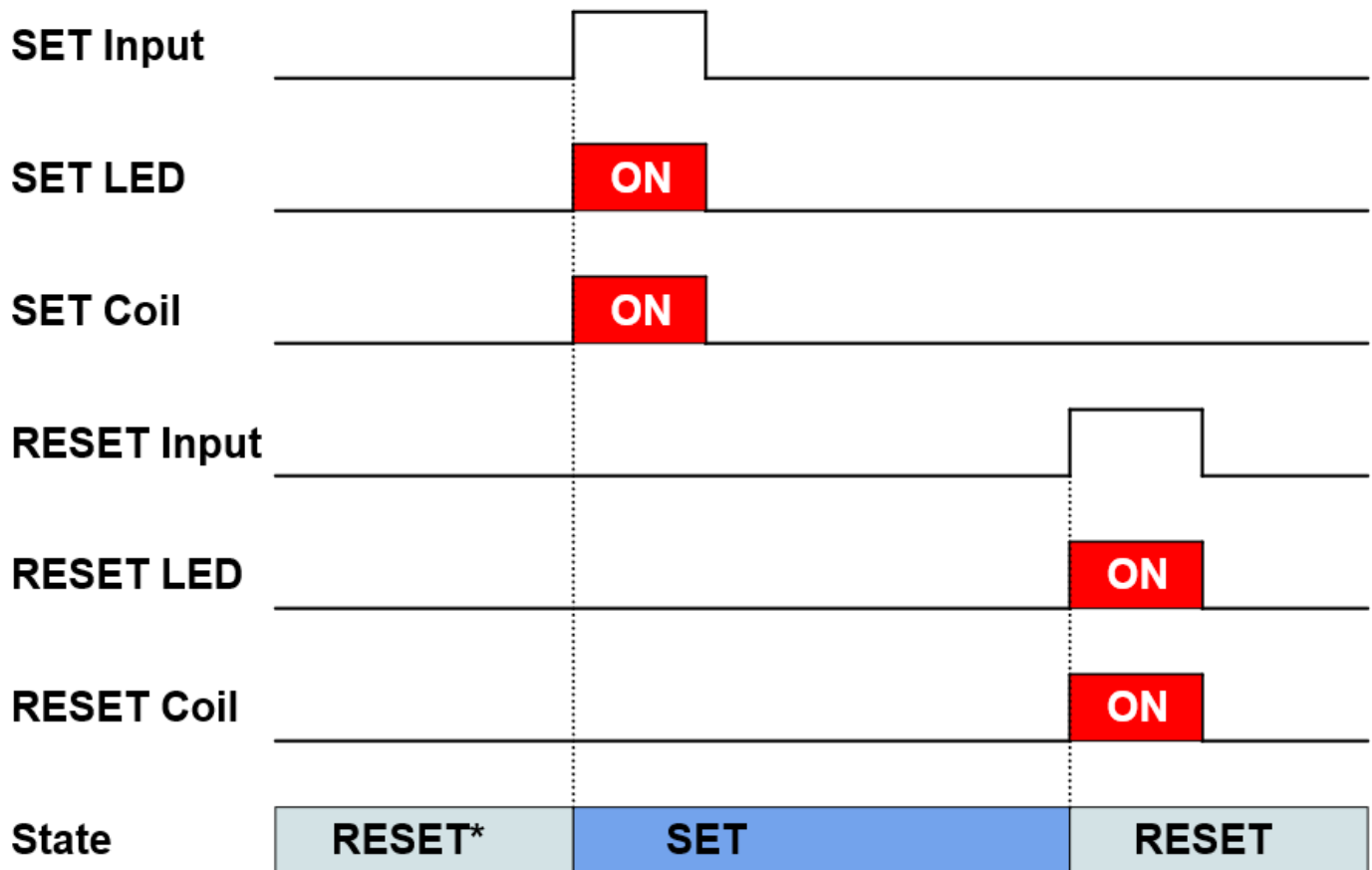
- Input control signals and Power: 16-26 AWG
- Relay contacts: 16-30 AWG

Component Part Numbers

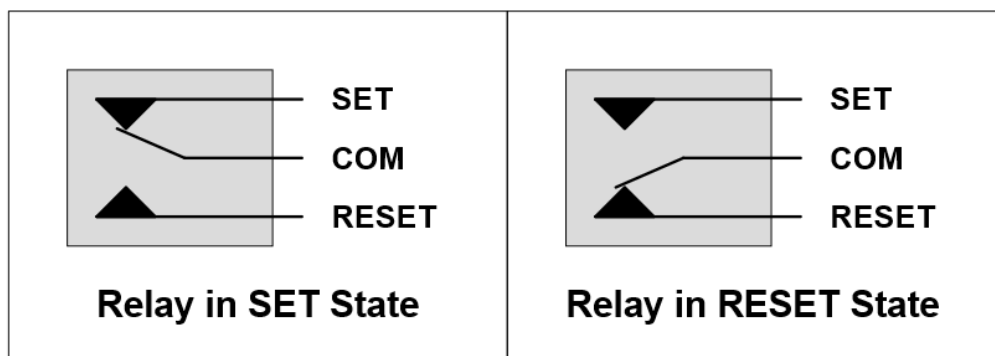
- Relays: Panasonic Electric Works TX2-LT-xxV-TH (xx=voltage)
 - *Note that this is a DPDT relay that is used as an SPDT relay in this application*
- Relay driver: Toshiba TBD62783APG

Typical Operation

The diagram below illustrates the operation of a latching relay channel. Both channels are identical.



*It is assumed that the relay is initially in the RESET state.



Note About Inductive Loads

It is of primary importance to ensure that the relay used in a given application is rated for the given load type (e.g., resistive, inductive) as well as the load current. Although the relays used on this particular product (RLYLA102V2) may function properly in various inductive-load applications, please note that they are only rated for resistive loads.

Note About Initial Relay State

Since the relays used on this product are latching relays, it is important to note that the relay may be in either the SET or RESET state when initially received. When sent out from Winford Engineering, the relays are in the RESET state. However, during shipment, it is possible that any given relay could end up in either the SET state or RESET state. If the end application requires a certain initial relay state, then it is advisable to put the relays into the required state prior to installation in the application.

Note About Latching Relay Operation

Throughout this datasheet, it is assumed that a pulse of 500ms or less will be used to transition the relay from one state to the other (SET to RESET, or RESET to SET), with a relatively low duty cycle, in order to minimize self-heating in the relay coil. Per the Electrical Characteristics section of this datasheet, the pulse time may be significantly less than this. If a given relay coil is activated for significantly longer periods of time, the relay coil resistance will rise due to self-heating, and the ability to meet all parameters specified in this datasheet may be impacted.

Note also that activating both the SET and RESET coils in a latching relay will result in indeterminate operation and is not advised.

Note About Indicator LEDs

When a control signal input is asserted high to activate a given relay coil, the associated indicator LED will light up, and the relay will assume the commanded state (SET or RESET). When the control signal input transitions back to a logic low state, the relay remains in its current state since this product uses latching relays. However, the indicator LED will no longer be lit. Please note that the LEDs provide status indication for the coils (LED is lit when the corresponding coil is energized), but do not provide an indication of the current state of the relay if none of the coils are energized.

The above information is illustrated in the diagram on the previous page of this datasheet.

Notice

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