



# LOGIC MODULE CONFIGURATION GUIDE

ELECTRONIC SWITCHING

LOGIC & INTERFACE

SENSORS & DETECTORS

The LOGIC Module can accommodate a wide range of components with specific electronic functionality such as electronic flip-flops, solid state relays, diodes, and other more complex devices. The LOGIC Module can be used for system-to-system interface or can be combined with man-machine interface devices such as illuminated pushbutton switches. NEXSYS LOGIC Modules can replace the expense and certification delays that are typically encountered when creating a circuit board to solve design challenges. With three different mounting options, LOGIC Modules deliver a powerful combination of configurable electronic components in a single robust package designed and tested in accordance with DO-160.

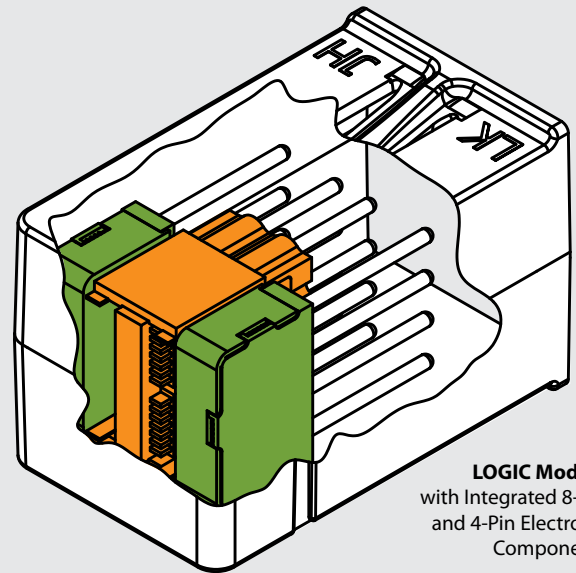
## Overview

The LOGIC Module allows electrical designers to mix-and-match specific electrical LOGIC components and create a ruggedized behind-the-panel unit that meets the exact capabilities they require. LOGIC Component Technology currently consists of:

- **Electronic Switching:** Electronic Latch, Electronic Rotary, and Solid State Relay
- **Logic & Interface:** Defined Logic, Diode Pack, and Terminal Block
- **Sensors & Detectors:** Pulse /Timer and Voltage Sensor

A single LOGIC Module can accommodate up to 4 individual LOGIC components, providing unparalleled design flexibility. See *How To Order* for detailed information about configurations and part numbers.

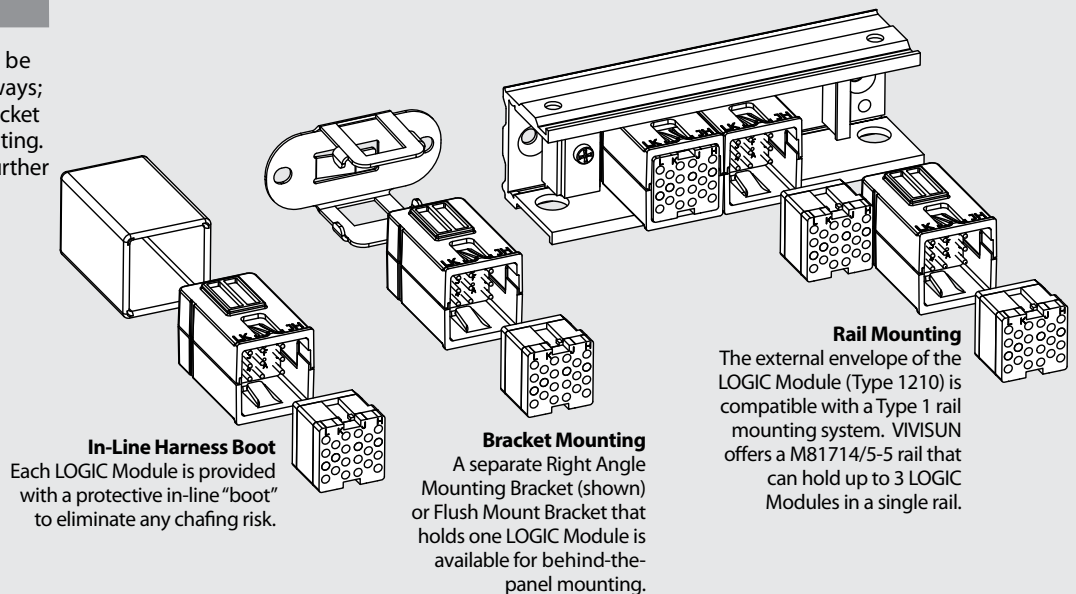
The LOGIC Module is ideal for many applications such as communications systems, computer/logic level interface to electro-mechanical systems, fire suppression systems and IFE systems. LOGIC Modules can be used on a stand-alone basis or can be used in conjunction with lighted pushbutton switch applications.



**LOGIC Module**  
with Integrated 8-pin  
and 4-Pin Electronic  
Components

## Mounting Options

The LOGIC Module can be mounted one of three ways; In-Line Harness Boot, Bracket Mounting and Rail Mounting. See *Specifications* for further information on mounting.



**In-Line Harness Boot**  
Each LOGIC Module is provided with a protective in-line "boot" to eliminate any chafing risk.

**Bracket Mounting**  
A separate Right Angle Mounting Bracket (shown) or Flush Mount Bracket that holds one LOGIC Module is available for behind-the-panel mounting.

**Rail Mounting**  
The external envelope of the LOGIC Module (Type 1210) is compatible with a Type 1 rail mounting system. VIVISUN offers a M81714/5-5 rail that can hold up to 3 LOGIC Modules in a single rail.

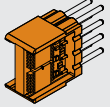
## LOGIC Component Options

The LOGIC Module can be populated with a wide variety of available LOGIC component options described below. The following page describes the way these can be combined in a LOGIC Module and includes ordering and part numbering information.

## Electronic Switching



### Electronic Latch (8-pin)

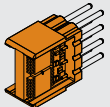


EL1, EL2

- Uses an internal electronic flip-flop to replace Magnetic or Solenoid Switches
- Set, Reset and Toggle Capabilities with built-in Blink circuitry
- Provides a significant weight, power and reliability improvement over traditional electromechanical latching options.
- **EL1** powers up in RESET state with BLINK off; **EL2** powers up in the SET state with BLINK active
- Ability to reset to an off or “safe” position on power up
- Local, Remote and Lockout Control
- See *Data Sheet DS-EL1-12* for complete information



### Electronic Rotary (8-pin)

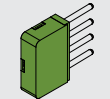


ER1

- Allows a single illuminated pushbutton switch to cycle through up to 4 latched states
- Hold the current latched state until either the next increment input (high to low transition) or a remote reset occurs
- Sink up to 2 amps with a resistive load
- Accepts reset from an external input for external override
- Maintain operational status with power drop to 200ms
- See *Data Sheet DS-ER1-11* for complete information



### Solid State Relay (4-pin)



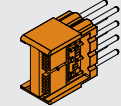
SSR1H, SSR2H  
SSR1M, SSR2M  
SSR1L, SSR2L

- Normally open (**SSR1H, SSR1M, SSR1L**) and normally closed (**SSR2H, SSR2M, SSR2L**) options available
- Switch power or ground up to 0.75 amps normally open and 0.25 amps normally closed.
- Convert logic level input to 28 VDC aircraft power
- Provide signal polarity reversal (High to Low or Low to High)
- SSR activates when an input voltage of 4 to 6 VDC (**SSR1L, SSR2L**), 8 to 18 VDC (**SSR1M, SSR2M**) or 18 to 32 VDC (**SSR1H, SSR2H**) is applied
- Provide output switching up to 32 VDC or 28 VAC rms
- See *Data Sheet DS-SSR1-11* for complete information

## Sensors & Detectors



### Pulse/ Timer (8-pin)

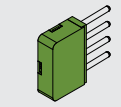


PT1

- Dual independent edge detecting one-shot pulse generators each producing a timed output signal that can be active high or low with specified time intervals from 125 ms to 20 seconds
- Replaces external pulse generators, timers and time delay relays
- Responds to any reciprocal transition such as “Weight On/Off Wheels” or “Open/Close”
- Channels may be connected in series for custom timing options
- See *Data Sheet DS-PT1-12* for complete information and additional coding parameters



### Voltage Sensor (4-pin)



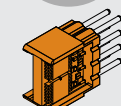
VSD1

- Monitor DC under-volt or over-volt condition and deliver a discrete output signal
- Set point range from 2 VDC to 50 VDC
- Output selectable as active low or open (high impedance)
- Units can be combined with an Electronic Latch to create a wide hysteresis voltage sensor with separate pull-in and drop-out voltages.
- See *Data Sheet DS-VS-14* for complete information and additional coding parameters

## Logic & Interface



### Defined Logic (8-pin)

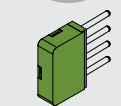


DL1, DL2,  
DL3, DL4

- Boolean AND, OR, NOT (Inverter), and Exclusive OR capability
- Replaces power or ground drop-out relays, and traditional diode and relay logic devices
- Available as 2 input Exclusive OR (**DL1**), dual-channel 2 input (**DL2**), 4 input with 2 cascaded levels (**DL3**) and 4 input decoder (**DL4**)
- See *Data Sheet DS-DL-13* for complete information and additional coding parameters



### Diode Pack (4-Pin)

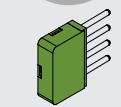


DP2C, DP2M

- 2 independent diodes per component
- Can be configured with two commercial diodes (**DP2C**) or two military diodes (**DP2M**)
- Increases design flexibility
- See *Data Sheet DS-DP-13* for complete information



### Terminal Block (4-Pin)

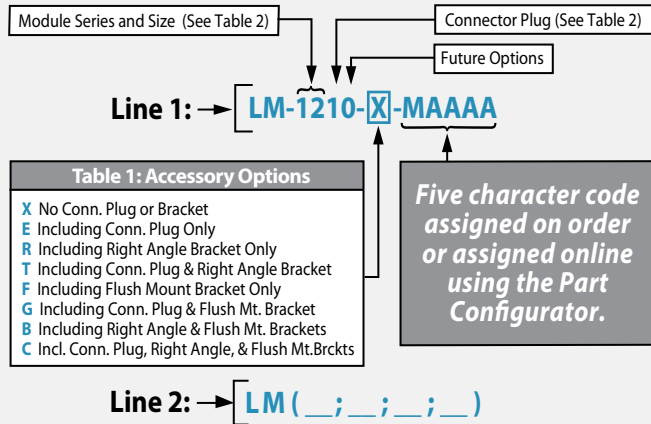


TB4

- Carries up to 5 amps
- Can occupy unused switch poles to increase design flexibility
- 10 pin external terminal block also available
- See *Data Sheet DS-DP-13* for complete information

## How To Order

Specifying a LOGIC Module (LM) requires a **2-line part number**. Line 1 describes the type of housing and mounting options. Line 2 describes the specific functionality of the LOGIC Series components desired. Once specified, ordering the part only requires using Line 1. Full sample part numbers are provided below.



<b>X</b>	No Conn. Plug or Bracket
<b>E</b>	Including Conn. Plug Only
<b>R</b>	Including Right Angle Bracket Only
<b>T</b>	Including Conn. Plug & Right Angle Bracket
<b>F</b>	Including Flush Mount Bracket Only
<b>G</b>	Including Conn. Plug & Flush Mt. Bracket
<b>B</b>	Including Right Angle & Flush Mt. Brackets
<b>C</b>	Incl. Conn. Plug, Right Angle, & Flush Mt.Brckts

LOGIC Module Code	Module Series & Size	Boot <sup>(1)</sup>	Connector Plug <sup>(2)</sup>	Brackets <sup>(3)</sup>	
				Flush Mount	Right Angle
LM-1210-X	Fits Type 1 Rail M81714/5-5 22-006	22-004	18-440	22-011	22-005

- (1) A Boot is included with each LOGIC Module. This P/N is for ordering replacement boots.
- (2) Connector Plugs can be ordered separately or can be included with your LOGIC Module by selecting codes E, T, G, or C from Table 1. Connector Plugs are removed using an Extraction Tool (P/N 18-234).
- (3) Brackets can be ordered separately using the appropriate P/N and type or can be included with your LOGIC Module by selecting codes R,T,F,G,B or C from Table 1.

Line 2 describes the specific functionality internal to a configured LOGIC Module. See "Component Options" for a description of the types of components that can be included. Several components have complex part coding of their own and will require referencing the specific Data Sheets for proper Line 2 configuration. Using the Part Configurator ([www.appliedavionics.com/configurator](http://www.appliedavionics.com/configurator)) will ensure that the entire LOGIC Module part number is configured properly.

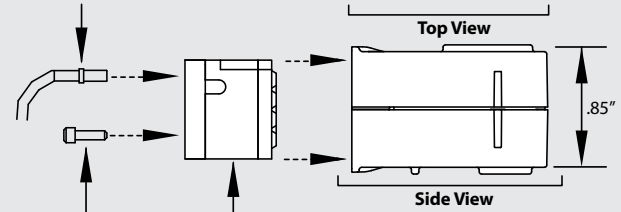
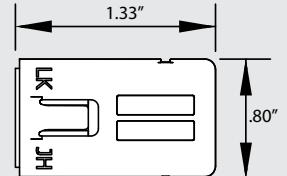
Position Schematic and Configuration Combination Examples	Sample P/N and Circuit Diagram	Connector Plug
<b>LOGIC Module (LM) – Only 4 Pin Components</b>		
<p><b>Line 2:</b></p> <p>LM ( ; ; ; ; )</p> <p>LM ( {4-pin}; {4-pin}; 0; 0 )</p> <p>LM ( {4-pin}; {4-pin}; {4-pin}; 0 )</p> <p>LM ( {4-pin}; {4-pin}; {4-pin}; {4-pin} )</p>	<p>LM-1210-X-MAAAD <b>LM (SSR1H; SSR1H; SSR1L; 0)</b></p>	<p>X configurations require Connector Plug 18-440 to be ordered separately. Replacing X with E denotes a part number with the Connector Plug included.</p>
<b>LOGIC Module (LM) – With 8 Pin Component</b>		
<p><b>Line 2:</b></p> <p>LM ( ; ; ; ; )</p> <p>LM ( 0; {8-pin}; 0 )</p> <p>LM ( {4-pin}; {8-pin}; 0 )</p> <p>LM ( {4-pin}; {8-pin}; {4-pin} )</p>	<p>LM-1210-E-MAAAE <b>LM (SSR1H; DL4/F7/UD; SSR1L)</b></p>	<p>E denotes a part number with Connector Plug 18-440 included. Replacing E with X requires the Connector Plug to be ordered separately.</p>
<b>LOGIC Module (LM) – Double 8-Pin Component</b>		
<p><b>Line 2:</b></p> <p>LM ( ; ; ; ; )</p> <p>LM ( {8-pin}; {8-pin} )</p> <ul style="list-style-type: none"> <li>• Must contain two 8 pin components.</li> <li>• Note specific pin-out designations (H&amp;J and K&amp;L).</li> </ul>	<p>LM-1210-X-MSACK <b>LM (EL2; DL1/XR/UU)</b></p>	<p>X configurations require Connector Plug 18-440 to be ordered separately. Replacing X with E denotes a part number with the Connector Plug included.</p>

## Performance Specifications

Description	Parameter
<b>Physical</b>	
Weight (Includes Connector Plug)	Module: 14 grams (0.5 ounces) max. Module and boot: 22 grams (0.8 ounces) max. Module and bracket: 22 grams (0.8 ounces) max.
Materials	Housing (Thermoplastic), Bracket (Stainless Steel)
<b>Environmental (Tested to meet the following levels using both MIL-STD-202 and DO-160)</b>	
Temperature	Operating / Non-Operating -55C to + 85C
Altitude	-15,000 to + 55,000 feet
Salt and Humidity	Humidity: 240 hours, Salt: 96 hours
Shock	20 G Saw tooth, 75 G half-sine
Vibration	10 – 2000 Hz 15 G
<b>Electrical and Functional Performance</b>	
Functional descriptions and test levels are defined in the applicable component Data Sheets. Testing meets or exceeds the defined levels for RTCA/DO-160, MIL-STD-202 and MIL-STD-810.	

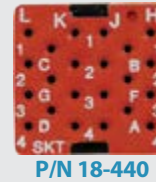
## Module & Connector Plug Wiring

MIL-C-39029/22-192 sockets crimped onto 20, 22, or 24 gauge wire - typical up to 16 places. Sockets (P/N 18-219) not supplied with Connector Plug. Wires with sockets crimped on are inserted into and extracted from the Connector Plug by use of a M81969/14-02 (P/N 18-216) tool.



MS2788-20 (P/N 18-215) sealing plugs, provided

Keyed Connector Plug (shown unplugged)



LOGIC Modules require a specially keyed QUIK-CONNECT™ Connector Plug (P/N 18-440). Plugs can be ordered with modules or ordered separately. An Extraction Tool (P/N 18-234) is required to remove the Connector Plug from the module.

P/N 18-440

## Installation & Mounting

**For all mounting types:** The Connector Plug can be inserted into the module before or after insertion into any of the mounting variations. The Connector Plug can be removed from the module using an Extraction Tool (P/N 18-234) without removing the module from the mounting.

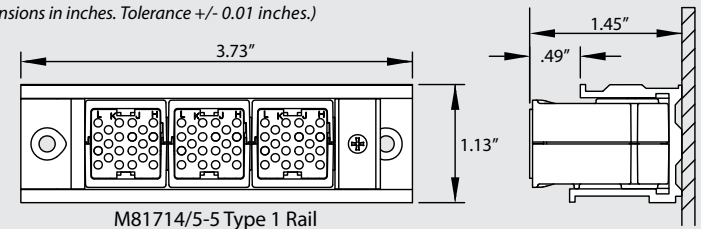
**In-Line Harness Boot:** Module should be encased in the boot provided and secured to the harness using industry standard methods for in-line harness wiring.

**Flush Mount Bracket:** Enclose module in bracket and mount bracket using customer provided fasteners. Removal of the module requires unfastening of the mounting bracket. Bracket hole spacing is consistent with many standard relay mountings.

**Right Angle Bracket:** Bracket can be mounted (using customer provided fasteners) with or without module inserted. Slide module into bracket and ensure module has positively "clicked" into bracket. The module can be removed from the bracket (without removal of the bracket from the mounting surface) by releasing side retaining clips. Bracket hole spacing is consistent with many standard relay mountings.

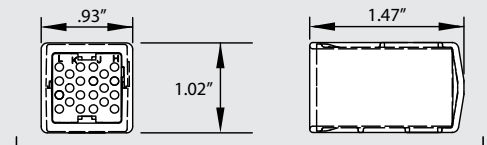
**Rail Mounting:** Slide the module into the rail and secure using the lock-down bar that accompanies the rail. The module can be removed from the rail by releasing the lock-down bar and sliding the module out.

(Dimensions in inches. Tolerance +/- 0.01 inches.)

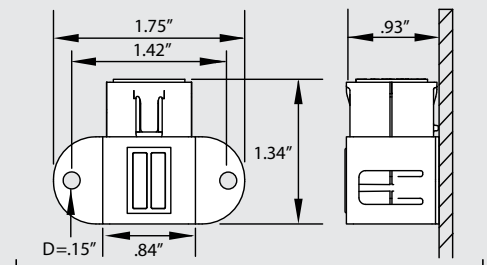


M81714/5-5 Type 1 Rail

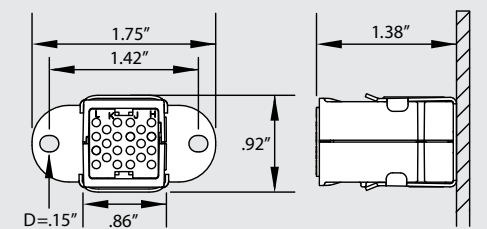
Type 1 Rail Mounting (P/N 22-006)



In-Line Harness Boot (P/N 22-004)



Flush Mount Bracket (P/N 22-011)



Right Angle Bracket (P/N 22-005)