

V I V I S U N
LR3

VIVISUN® 
See it. Believe it.®

Aerospace Optics is the exclusive manufacturer of the VIVISUN brand of MIL-PRF-22885 lighted pushbutton switches and programmable displays. VIVISUN combines reliability, mil-spec quality and superior performance in sunlight readable, lighted pushbutton switches or indicators for avionics, naval shipboard or military ground applications in the most demanding environments.

VIVISUN is the choice of leading aircraft manufacturers and military services worldwide, and Aerospace Optics, Inc. has been a trusted supplier and technology leader for 40 years.

The **VIVISUN LR3** rectangular switch/indicator applies the same innovative LED integration techniques pioneered in the successful 3/4 inch square VIVISUN LED. Utilizing a uniquely engineered drive circuit in a fully separable cap design, the **VIVISUN LR3** integrates 24 LEDs into a 1 X 1.2 inch package producing the traditional VIVISUN high quality lighting. The VIVISUN LR3 fulfills an immediate industry need: a replacement for outdated incandescent rectangular switches.

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LR3 Application

The VIVISUN LR3 switches/indicators combine the rugged requirements of MIL-PRF-22885 with the extreme performance requirements of safety-critical designs. Where legend readability is important at extreme viewing angles, in direct sunlight and at NVIS levels, the LR3 meets these demands and others as detailed in the enclosed technical specification CD.

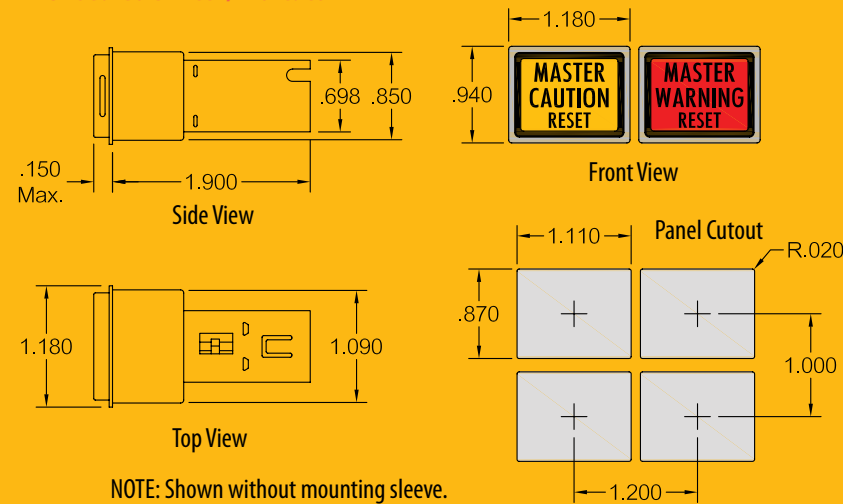
The increased legend capacity of the VIVISUN LR3 makes it possible to have four electrically separate messages that may be displayed on a single LR3 unit. Each message may appear in a different color and with character sizes that exceed most human-factor recommendations. Saving panel real estate and reducing costs through combining multiple discrete controls into a single VIVISUN LR3 is a distinct LR3 advantage.

The VIVISUN LR3, unlike other operator interface technologies, maintains a traditional tactile response and a raised bezel that assures a positive tactile signature, preventing inadvertent actuation. Further, the VIVISUN LR3 encompasses a patented, dedicated drive circuit that provides layered fault tolerance to the 24 LEDs in the pushbutton cap. Where safety-critical performance is imperative, the VIVISUN LR3 shines through.

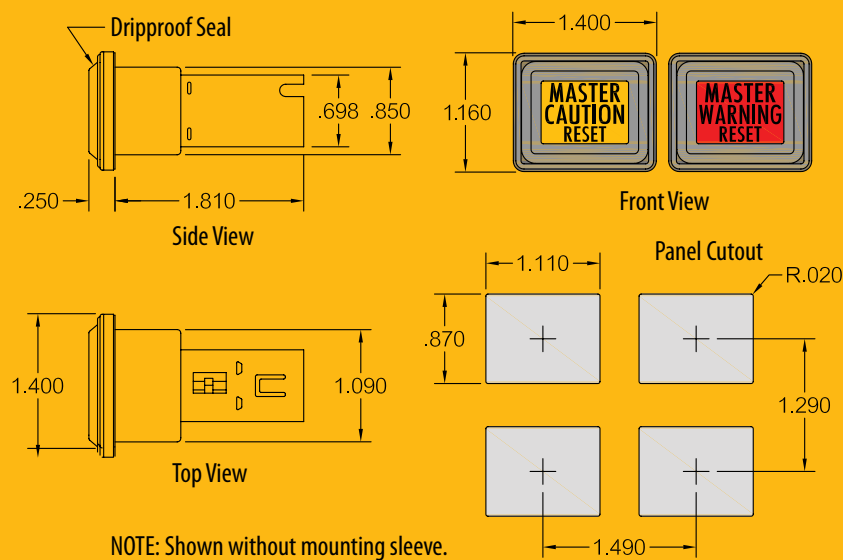
Outstanding Customer Service

Our commitment to customer service is unparalleled. We can handle quick turnaround time, and our team takes personal pride in delivering the right part within the customer's delivery requirements. At Aerospace Optics, you get the rare combination of quality, reliability, deliverability, and service.

Unsealed Switch/Indicator



Sealed Switch/Indicator



Technical Specification Summary

Features	Description / Compliance
Terminations	Solderless CTS, turret, PCB and wirewrap
Switch Poles	Indicator, 1, 2 or 4 poles
Enclosure Design	Unsealed or dripproof/watertight/splashproof
Actuation Types	Momentary, alternate action, indicator
Mechanical Life	100,000 cycles minimum
Electrical Life	100,000 cycles logic level, 50,000 cycles at 7A
Circuit Configurations	5 lighting circuit styles, 1 or 2 commons
Operating Voltage	28 VDC/28 VAC Polarity Insensitive
Power Consumption	1.5 watts typical at 28 VDC
EMC	RTCA/DO-160E and MIL-STD-461E
Reliability	MIL-HDBK-217F, AIC, 85°C, 150,000 hours MTTF MIL-HDBK-217F, NS, 85°C, 200,000 hours MTTF MIL-HDBK-217F, GB, 85°C, 1,400,000 hours MTTF
Environmental	MIL-PRF-22885G and MIL-STD-202F
Shielding Efficiency Option	60 dB, 0.1-1.0 GHz, on conductive panel
High Impact Shock Option	MIL-S-901 lightweight as sealed momentary
NVIS Option	MIL-L-85762A and MIL-STD-3009
Accessories	Switch guards/barriers and panel plugs

V I V I S U N LR3

Rugged Worry-Free Electronics

Polarity insensitive 28 VDC/28 VAC, 100% passive solid state circuitry that meets the RTCA/DO-160E and MIL-STD-461E EMC requirements, including 600 V spikes and 200 V/m radiated susceptibility.

Standard and NVIS Colors with Multiple Types and Styles

Blue, green, white, yellow, red and NVIS blue, NVIS green A, NVIS green B, NVIS white, NVIS yellow and NVIS red. For available Types and Styles, see pages 5 and 6.

Wide Temperature Range

-55°C to +85°C operating.

High Reliability

Life of the platform 150,000 hours MTTF, Airborne Inhabited Cargo environment at 85°C.

Wide Viewing Angle

Uniform LED lighting is readable over a 120° viewing cone.

Sunlight Readable and Low Power

Readable in direct sunlight and uses only 1.5 watts at 28 volts. Low touch temperature is provided by low power LEDs driven by a uniquely engineered, efficient, fault tolerant drive circuit.

Voltage Dimming

All colors, including red and green, trim together uniformly from over 300 fL down to 0.1 fL using simple voltage control.

Layered Fault Tolerance

The LR3 cap is comprised of 24 LEDs organized into four electrically independent quadrants of six LEDs each, designed to provide lighting fault tolerance at the quadrant level.

Mil-Spec Quality

Designed and tested to the requirements of MIL-PRF-22885 and manufactured under Aerospace Optics' ISO9001/AS9100 certified quality management system.

Easy Wiring

Wiring harness and connector can be wired and tested prior to switch installation. The CTS connector can accommodate 20, 22 or 24 gauge wires with mil-spec socket contacts.

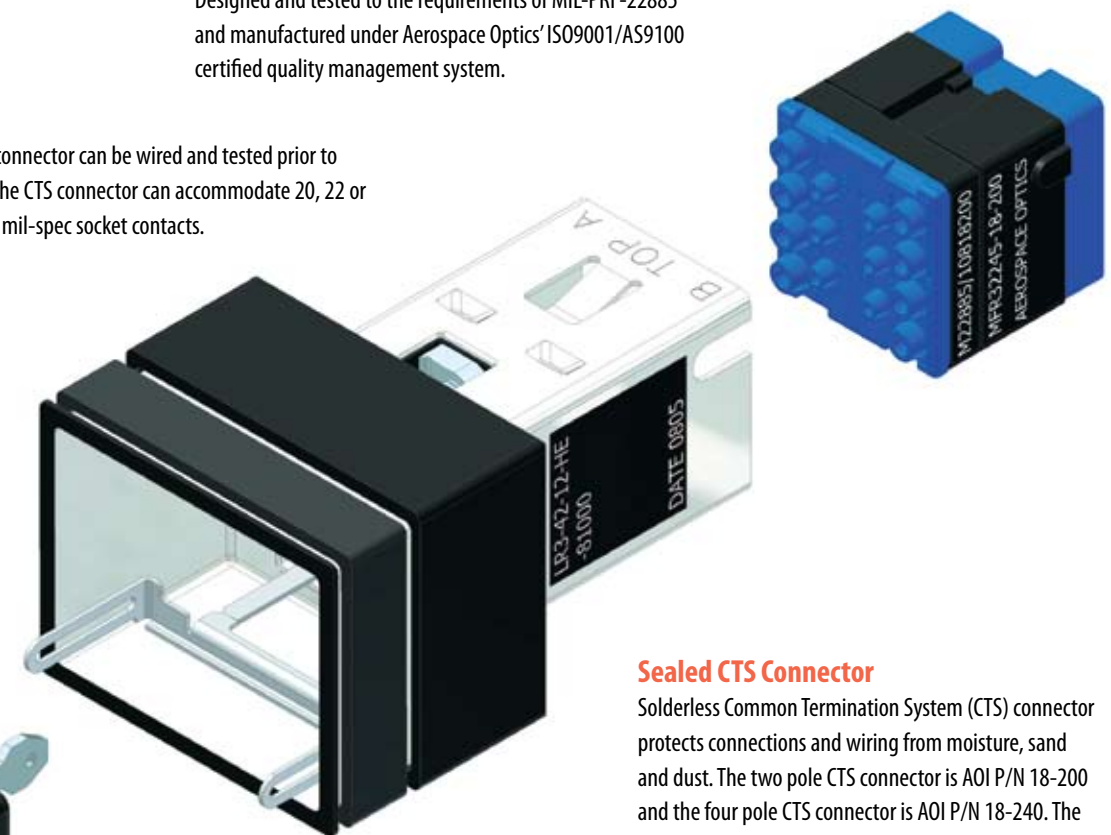
Modular Construction

Switch body, cap and connector may be ordered separately for immediate delivery.

Space Saving Design

Compact design with less weight.

Unsealed Switch



Sealed CTS Connector

Solderless Common Termination System (CTS) connector protects connections and wiring from moisture, sand and dust. The two pole CTS connector is AOI P/N 18-200 and the four pole CTS connector is AOI P/N 18-240. The CTS connector extraction tool is AOI P/N 18-234.

High Reliability Switches

100,000 cycles for logic level or 50,000 cycles at 7 amps.

Easy Installation/Pushbutton Cap Replacement

Front mountable using two internal screws, including a mounting spacer that provides multiple panel mounting configurations. Pushbutton cap retainer provides for extraction and separation as needed for upgrades without switch body replacement.

Pushbutton Cap Markings

Part number, circuit diagram, operating voltage and date code are permanently marked on pushbutton cap. NVIS Class and Type designations are marked when applicable.

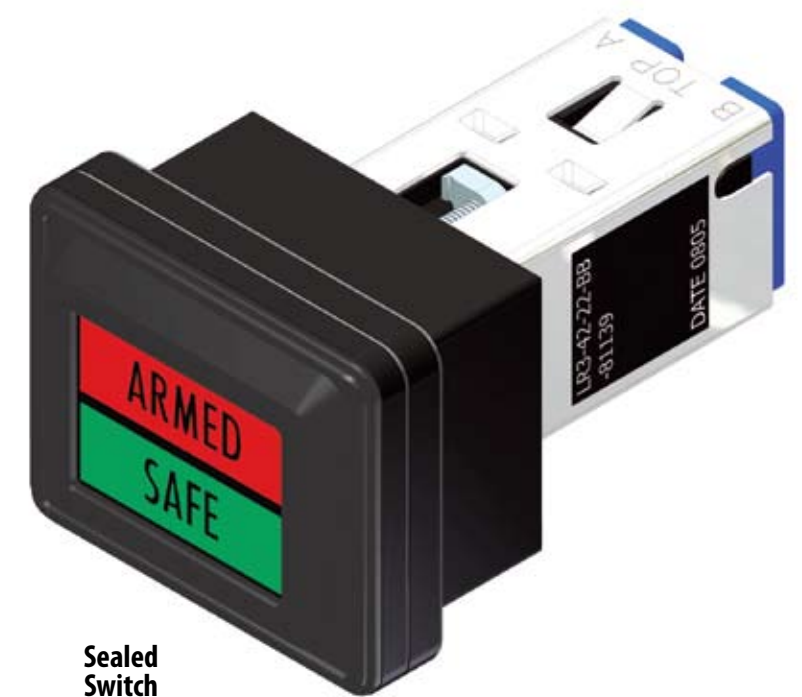
Advanced Electrical and Structural Materials

Advanced engineering polymers for high performance, strength and low weight.

Dripproof/Watertight/Splashproof Seal

Silicone rubber seal meets the sealing requirements of MIL-PRF-22885 over the full operating temperature range of -55°C to +85°C.

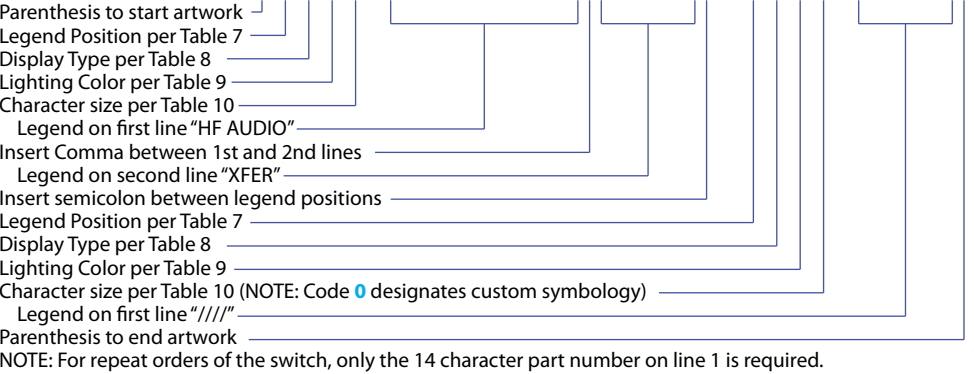
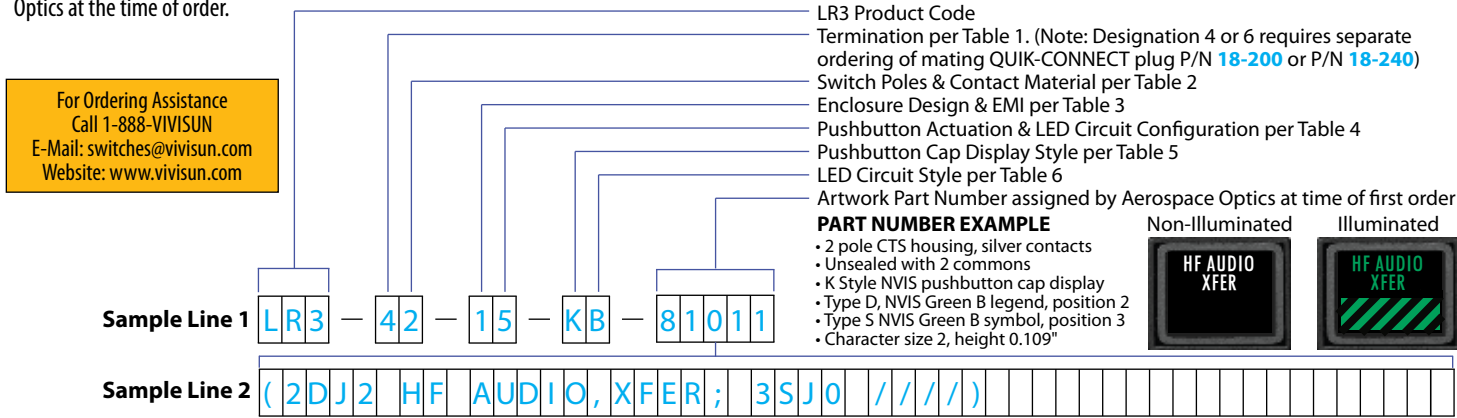
Sealed Switch



HOW TO ORDER
VIVISUN LR3 SWITCHES

VIVISUN LR3 pushbutton switches/indicators are ordered by specifying a basic 14 character part number as shown on Line 1. The detailed artwork description on Line 2 includes detail on legend position, type of lighting, color, character height and specific legend. The 5 digit artwork number at the end of Line 1 is determined by Aerospace Optics at the time of order.

For Ordering Assistance
Call 1-888-VIVISUN
E-Mail: switches@vivisun.com
Website: www.vivisun.com



- HOW TO ORDER SPARE COMPONENTS**
1. To order a typical spare VIVISUN LR3 pushbutton cap only (from example above):
LR3 - XX - 15 - KB - 81011
Insert X's in body type spaces to denote pushbutton cap only.
 2. To order a typical spare VIVISUN LR3 2 pole QUIK-CONNECT body only (from example above):
LR3 - 42 - 15
 3. To order a 2 pole or indicator QUIK-CONNECT plug specify P/N **18-200**.
 4. To order a 4 pole QUIK-CONNECT plug specify P/N **18-240**.
 5. To a order CTS Extraction Tool specify P/N **18-234**.

YOUR PART NUMBER

Line 1 LR3 - - - - - ##### — 5 digit artwork P/N assigned by Aerospace Optics

Line 2

TABLE 1 Terminations	Designation	Termination Type		Switch Poles		(1) The QUIK-CONNECT Common Termination System (CTS) uses a QUIK-CONNECT plug ordered as P/N 18-200 for 1 or 2 pole switches or indicators and P/N 18-240 for 4 pole switches.			
	1	Solder Terminals							
	2	Turret		1 and 2 Pole or Indicator					
	3	Spade		1 and 2 Pole or Indicator					
	4	Wire wrap		1 and 2 Pole or Indicator					
TABLE 2 Switch Poles and Contact Material	4	Solderless QUIK-CONNECT ⁽¹⁾		1 and 2 Pole or Indicator					
	6	Solderless QUIK-CONNECT ⁽¹⁾		4 Pole Only					
	Switch Poles	Contact Material		Switch Poles	Contact Material				
	SPDT-SB	Silver	Gold Plate	4PDT-SB	Silver	Gold Plate			
	DPDT-SB	1	5	4PDT-DB	A	F			
TABLE 3 Enclosure Design and EMI	SPDT-DB	2	6	Indicator	C	H			
	DPDT-DB	3	7		0				
	DPDT-DB	4	8						
	1 - Unsealed	4 - Unsealed with EMI Shielding ⁽²⁾		(2) 60 dB Shielding Efficiency from 0.1 to 1.0 GHz per MIL-PRF-22885					
	2 - Dripproof/Watertight/Splashproof	5 - Dripproof/Watertight/Splashproof with EMI Shielding ⁽²⁾							
3 - Dripproof, etc. with High Impact Shock	6 - Dripproof, etc. with High Impact Shock and EMI Shielding ⁽²⁾								
TABLE 4 Pushbutton Actuation and LED Circuit Configuration	LED Circuit Configuration		Actuation Designation			(3) MIL-S-901 Lightweight High Impact Shock available as sealed momentary			
	Description	Block Diagram	Momentary ⁽³⁾	Alternate	Indicator				
	Single Circuit, One Common		1	4	7				
	Horizontal Split Circuit, Two Commons		2	5	8				
	TABLE 5 Pushbutton Cap Display Styles	Top of Switch (Shown in landscape orientation)							
Standard Cap Style									
NVIS Cap Style		H	B	C	D	E	F	G	J
		S	K	L	M	N	P	Q	R
TABLE 6 LED Circuit Styles								Note: Pushbutton Cap Display Styles F, G, J, P, Q and R from Table 5 are only available in Circuit Style A.	

TABLE 7 Legend Position	<div><div><div>1</div><div>2</div><div>3</div></div><div><div>8</div><div>9</div></div></div> <div><div><div>4</div><div>5</div><div>3</div></div><div><div>6</div><div>7</div></div></div> <div><div><div>4</div><div>5</div><div>6</div></div><div><div>7</div></div></div> <div><div><div>2</div><div>6</div><div>7</div></div></div> <div>·Top of Switch</div> <div><div><div>A</div><div>B</div><div>C</div></div><div><div>H</div><div>J</div><div>F</div></div><div><div>G</div><div>E</div><div>C</div></div><div><div>D</div><div>E</div><div>F</div></div><div><div>F</div><div>G</div><div>C</div></div><div><div>D</div><div>J</div><div>F</div></div></div> <div>·Top of Switch</div> <div>Landscape Orientation</div> <div>Switch in Normal Orientation</div> <div>Portrait Orientation</div> <div>Switch Rotated 90° Clockwise</div>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			



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