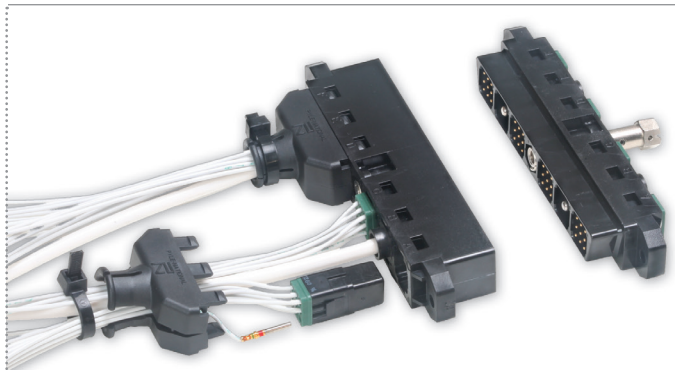


# Amphenol LMD/LMS Modular Connectors



## NO NEED FOR EXPENSIVE PC BOARDS AND HARDWARE

The LMD/LMS Connector Series was designed by Amphenol Pyle-National to provide flexibility in the assembly of wire harnesses that are used in instrumentation and avionic control environments. The modular design of the LMD provides rack and panel or cable to cable attachment. LMS allows an in-line splice using the same modules.

### APPLICATIONS

- Cockpit
- Airline Seats/Power Distribution
- Interior Lighting / LED
- Aircraft Galley
- In-flight Entertainment
- Railway
- Heavy Equipment
- Business Jets

### FEATURES

#### DESIGN FEATURES OF LMD CONNECTORS

An LMD Connector is comprised of a housing, modules and contacts - each ordered separately, requiring assembly

- Lightweight housings are offered black thermoplastic
- Four standard modules are available with the following contact arrangements: 1 #8, 4 #16, 9 #20, 16 #22
- Modules are available in sealed and unsealed versions
- Linear module design may be used for rack and panel or cable to cable applications
- Bussing modules available to allow for a plurality of circuit network configurations without extra hardware
- Diode modules provide a current protection system for avionic instrumentation packages and eliminate the need for dedicated PC boards and other hardware
- Miniature relay modules can be added which eliminate the need for printed circuit boards and hardware

#### LMD FEATURES AND OPTIONS

LMD's module options provide a mix of both active and passive devices within one connector. The features and options of this series describe the design flexibility in this connector series:

- LMD Standard components are molded of a U/L rated 94VO flame retardant, light-weight thermoplastic material. Alternate white nylon material (provides resistance to industrial oils and solvents) is available; consult Amphenol Aerospace for availability.
- The linear LMD connector may be used for rack and panel or cable-to-cable applications.
- Plug and receptacle housings may be front or rear panel mounted.
- Optional keying post provides six position keying capability.
- The optional center jackscrew provides ease of mating and unmating and insures high reliability under vibration.
- Cable strain reliefs are available for internal attachment.
- Variety of module types. Sealed and unsealed modules accept rear release #8, #16, #20 and #22 gauge contacts. Bussing, diode and relay modules available. PC tail contacts are also available.
- A variety of contacts accept #8 through #28 AWG wire. Commercially available automated crimp terminating equipment may be used.
- Wired or unwired modules are rear inserted and held by two retention tines. With the aid of a front release tool, the modules are easily removed from the rear.
- Pin or socket modules may be intermixed in plug or receptacle housings.

## MATERIALS AND FINISHES

Housing	Thermoplastic
Module	Thermoplastic UL94VO
Retention Tines	Thermoplastic Nylon
Module Seals	Silicone
Contacts	Copper Alloy
Plating	50 microinches Gold Plate

## ELECTRICAL DATA

### Contact Data

CONTACT SIZE	WIRE SIZE	TEST CURRENT (AMPERES)	DIELECTRIC WITHSTANDING VOLTAGE AC (RMS)	MAX. RECOMMENDED WORKING VOLTAGE AC (RMS)
22	22	5.0	1800	600
	28	1.5		
20	20	7.5	1800	600
	24	3.0		
16	16	13.0	2300	900
	20	7.5		
8*	12	23	2300	900
	14	17		
8	8	46	2300	900
	10	33		

### Wire sealing range

CONTACT SIZE	WIRE SIZE	CONTACT CRIMP TENSILE STRENGTH LBS. MIN.
22	28	3
	26	5
	24	8
	22	12
20	24	8
	22	12
	20	20
16	20	20
	18	30
	16	50
8*	14	70
	12	110
8	10	150
	8	220

\*with #12 wire well

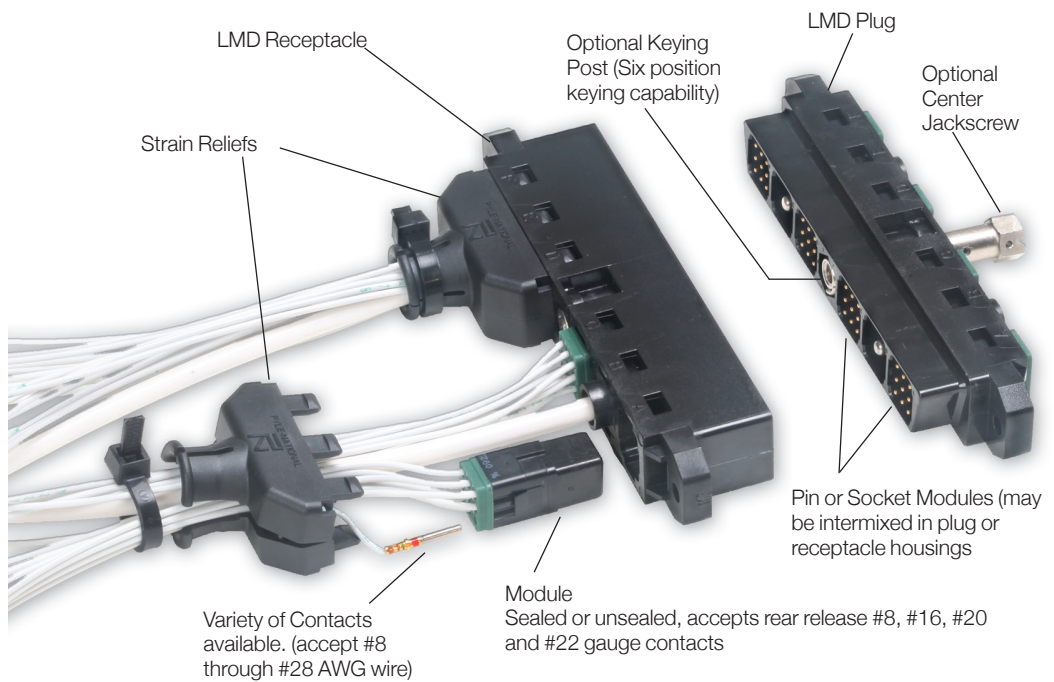
### Contact Resistance of Mated Contacts End to-End

CONTACT SIZE	MAXIMUM MILLIVOLT DROP
22	73
20	55
16	49
8	26

## MECHANICAL DATA

Temperature Rating	-55 °C to +140 °C (-67 °F to + 284 °F)
Insulation Resistance (min.)	5000 megohms initial: 1000 megohms after 96 hours humidity
Durability	250 cycles (mating and unmating)
Vibration	Maximum discontinuity of one microsecond when subjected to sinusoidal vibration of 10 to 2000 Hz at 15 gravity units
Physical Shock	Maximum discontinuity of one microsecond when subjected to 1/2 -sine-wave transient shock of 50 gravity units with pulse duration of 11 milliseconds
Module Insertion & Removal Force	5 lbs. maximum
Module Retention	70 lbs. minimum

## CROSS SECTION



HOW TO ORDER HOUSINGS

	<b>1</b>	<b>2</b>	<b>3</b>
<b>LMD-06</b>	<b>P</b>	<b>J</b>	<b>4</b>
PREFIX	SHELL STYLE	COUPLING MECHANISM	ALTERNATE KEYING

**STEP 1: SELECT SHELL STYLE, PLUG OR RECEPTACLE**

**PLUG** ← Mates with → **RECEPTACLE**



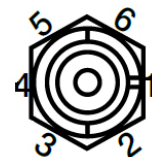
**STEP 2: SELECT COUPLING MECHANISM**



**STEP 3: SELECT ALTERNATE KEYING**

- 1** - Position 1 of Keypost
- 2** - Position 2 of Keypost
- 3** - Position 3 of Keypost
- 4** - Position 4 of Keypost

- 5** - Position 5 of Keypost
- 6** - Position 6 of Keypost
- 7** - Keyway Hardware Shipped Unassembled
- 8** - No Key Hardware Supplied



Plug mating face view is shown

**Example of Mating Housings: LMD-06PJ4 mates to LMD-06RK4**

**MODULES FOR CRIMP CONTACTS**

	NO. OF CONTACTS	SIZE CONTACT	PIN	SOCKET
	16	22	LMD-3003-P	LMD-3003-S
			LMD-4003-P*	LMD-4003-S*
	9	20	LMD-3001-P	LMD-3001-S
			LMD-4001-P*	LMD-4001-S*
	4	16	LMD-3005-P	LMD-3005-S
			LMD-4005-P*	LMD-4005-S*
	1	8	LMD-3004-P	LMD-3004-S

\*Sealed version  
Sealed size 8 module N/A

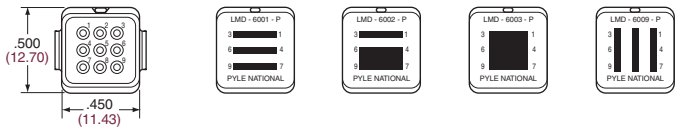
**MODULES FOR BUSSING**

BUSSING CIRCUIT	SIZE CONTACT	STANDARD MODULE	SEALED MODULE
3	20	LMD-6001-P	LMD-6101-P
2	20	LMD-6002-P	LMD-6102-P
1	20	LMD-6003-P	LMD-6103-P
4	22	LMD-6004-P	LMD-6104-P
2	22	LMD-6005-P	LMD-6105-P
1	22	LMD-6006-P	LMD-6106-P
1	16	LMD-6007-P	LMD-6107-P
3	22	LMD-6008-P	LMD-6108-P
3	20	LMD-6009-P	LMD-6109-P

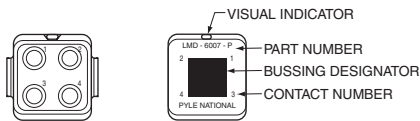
**Bussing Circuit for Size 22 Contacts**



**Bussing Circuit for Size 20 Contacts**



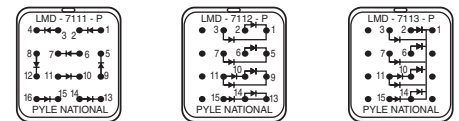
**Bussing Circuit for Size 16 Contacts**



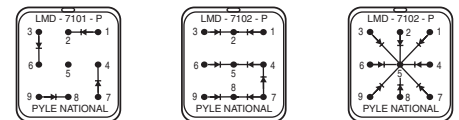
**MODULES WITH DIODES**

SIZE CONTACT	LMD DIODE MODULE	DESCRIPTION
22	LMD-7111-P	8 discrete diodes
22	LMD-7112-P	4 pair of diodes, each pair with common cathode
22	LMD-7113-P	8 diodes with common cathode (pin #1)
20	LMD-7101-P	4 discrete wires
20	LMD-7102-P	3 pairs of diodes, each pair with common cathode
20	LMD-7103-P	8 diodes with common cathode (pin #5)

**Diode Modules for Size 22 Contacts**

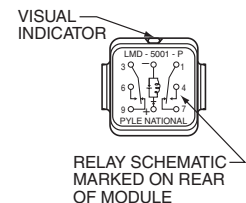


**Diode Modules for Size 20 Contacts**



**MODULES WITH RELAYS**

**Relay Module for Size 20 Contacts**



RELAY MODULE	
STANDARD MODULE	SEALED MODULE
LMD-5001-P	LMD-5101-P

CONTACTS

PINS & SOCKETS

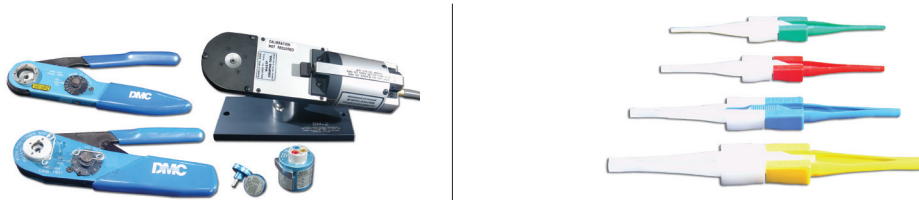


SIZE	WIRE SIZE (AWG)	CONTACTS		WIRE STRIP LENGTHS	WIRE RANGE MAX.
		PIN	SOCKET		
22	22, 24, 26, 28	LMD-4022-36LJ	LMD-4122-96LD	.156 - .125 (3.96 - 3.18)	0.054 (1.37)
20	20, 22, 24	LMD-4020-96LD LMD-4020-10(*)	LMD-4120-96LD LMD-4120-10(*)	.185 - .155 (4.70 - 3.94)	0.083 (2.11)
16	16, 18, 20	LMD-4016-96LD LMD-4016-10(*)	LMD-4116-96LD LMD-4116-10(*)	.260 - .230 (6.60 - 5.84)	0.103 (2.61)
8	10, 8	LMD-4008-36L	LMD-4108-36L	.395 - .365 (10.03 - 9.27)	0.255 (6.48)

(\*) = Thermocouple Plating  
 P = Chromel  
 R = Alumel  
 N = Constantan  
 C = Copper

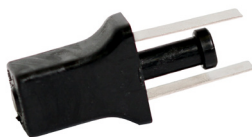
CONTACT TOOLS

PINS & SOCKETS

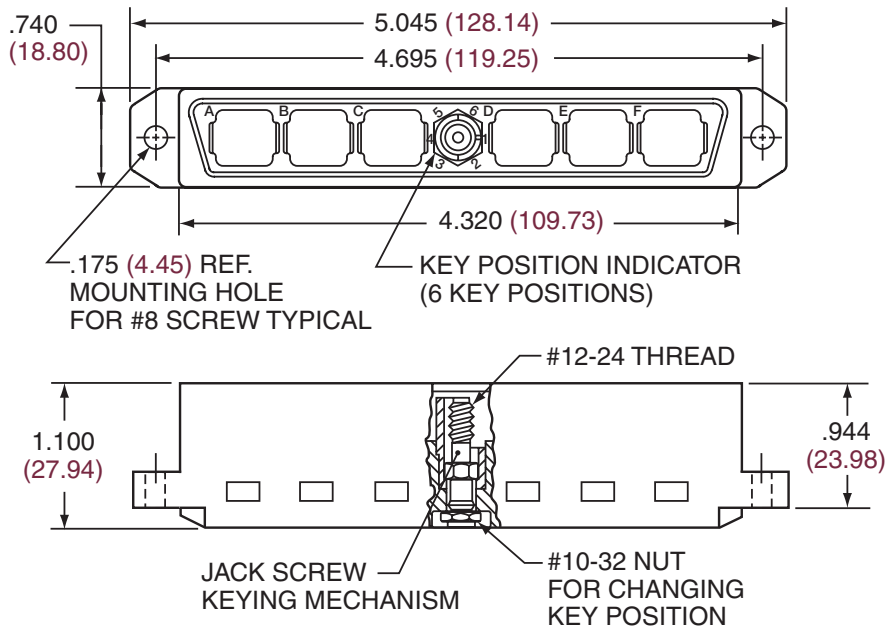


SIZE	WIRE SIZE (AWG)	CRIMP TOOL	POSITIONER/LOCATOR		INSERTION/EXTRACTION	INSERTION TIP COLOR	EXTRACTION TIP COLOR
			PIN	SOCKET			
22	22, 24, 26, 28	M22520/2-01	K703	M22520/2-07	M81969/14-01	Green	White
20	20, 22, 24	M22520/1-01	M22520/1-02		M81969/14-02	Red	White
16	16, 18, 20				M81969/14-03	Blue	White
8	10, 8	TP-201393	TP-201408		M81969/14-06	-	Red

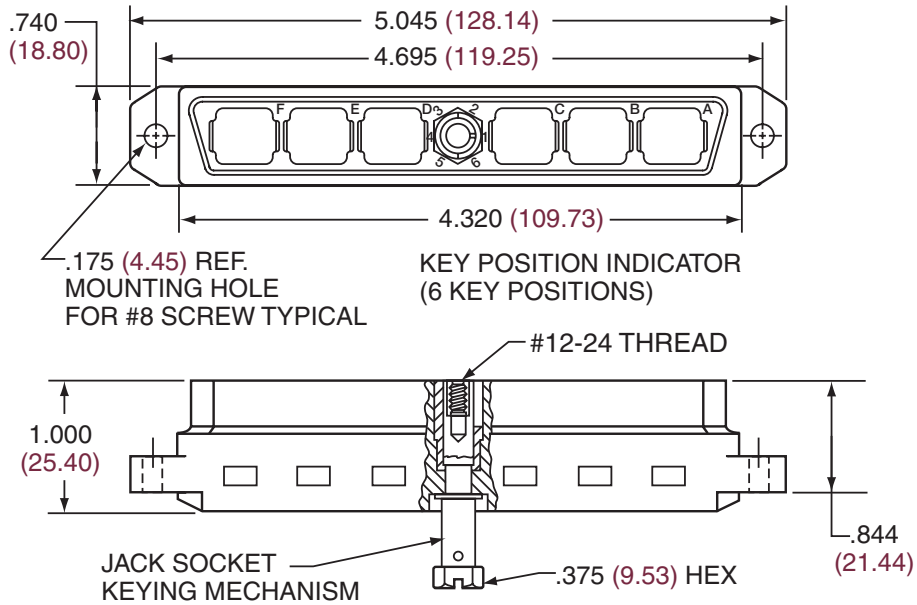
**Module Extraction Tool:**  
 TP-201397



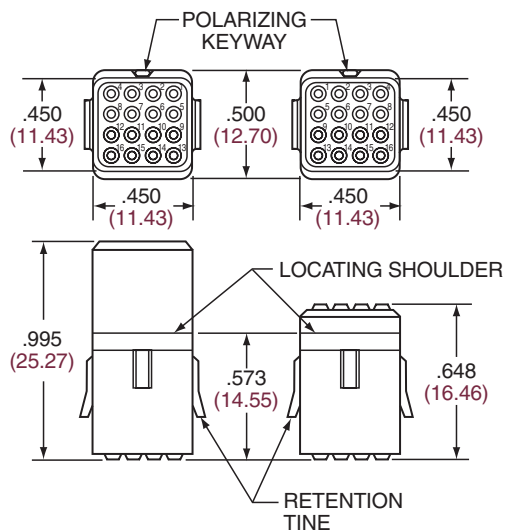
RECEPTACLE HOUSING 6 BAY



PLUG HOUSING 6 BAY

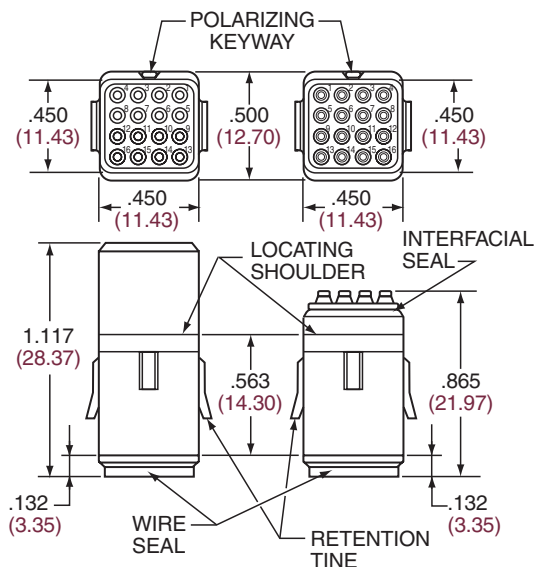


**MODULES WITH 16 SIZE 22 CONTACTS**



**Socket Module**  
LMD-3003-S

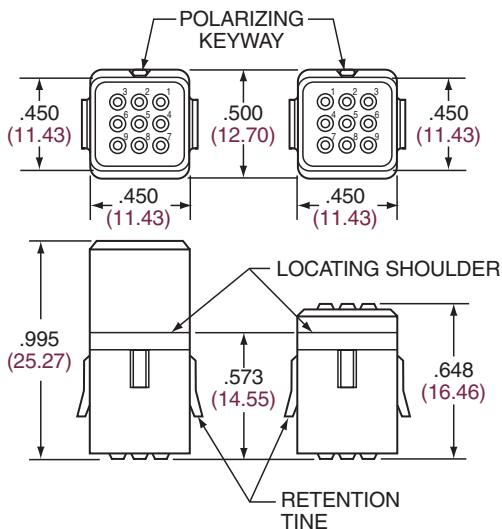
**Pin Module**  
LMD-3003-P



**Sealed Socket Module**  
LMD-4003-S

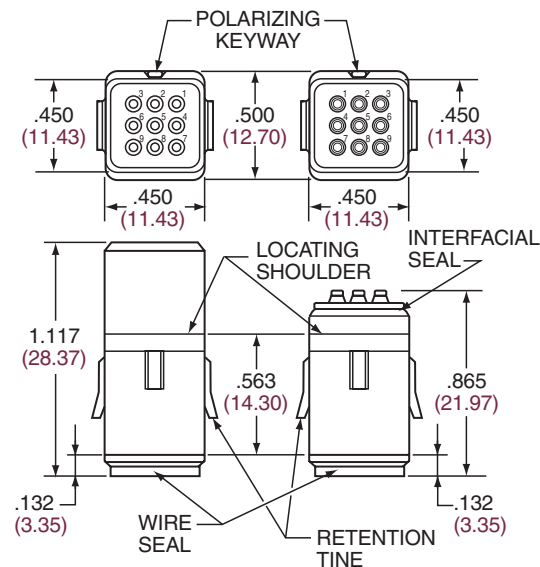
**Sealed Pin Module**  
LMD-4003-P

**MODULES WITH 9 SIZE 20 CONTACTS**



**Socket Module**  
LMD-3001-S

**Pin Module**  
LMD-3001-P



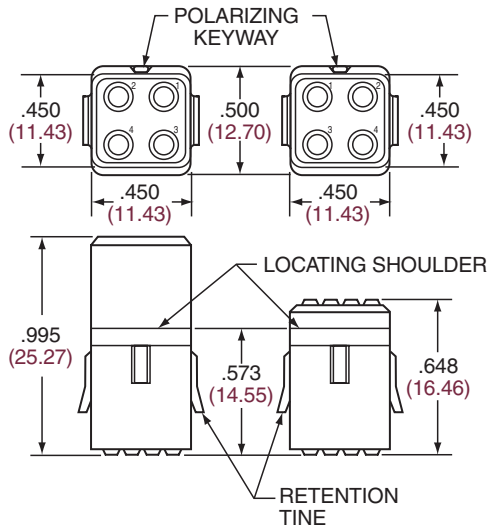
**Sealed Socket Module**  
LMD-4001-S

**Sealed Pin Module**  
LMD-4001-P

All dimensions in inches (millimeters in parenthesis)

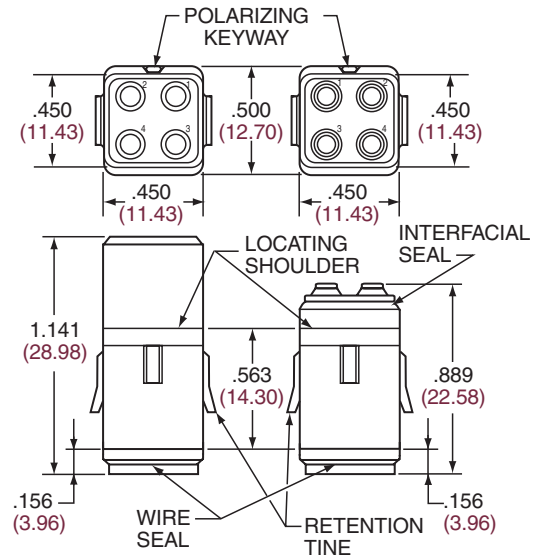


MODULES WITH 4 SIZE 16 CONTACTS



**Socket Module**  
LMD-3005-S

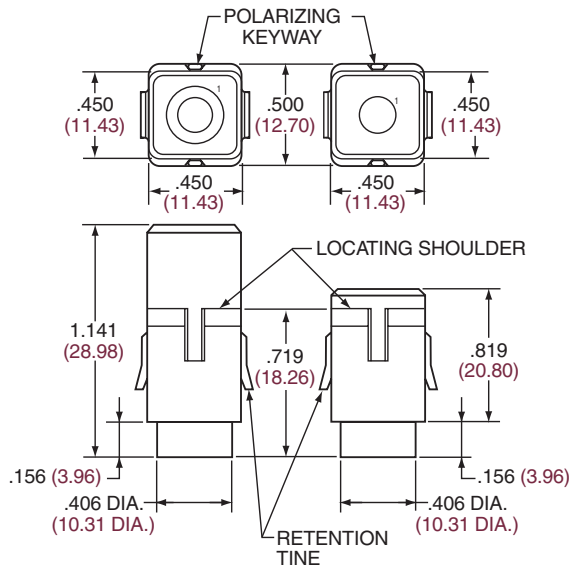
**Pin Module**  
LMD-3005-P



**Sealed Socket Module**  
LMD-4005-S

**Sealed Pin Module**  
LMD-4005-P

MODULES WITH 1 SIZE 8 CONTACTS

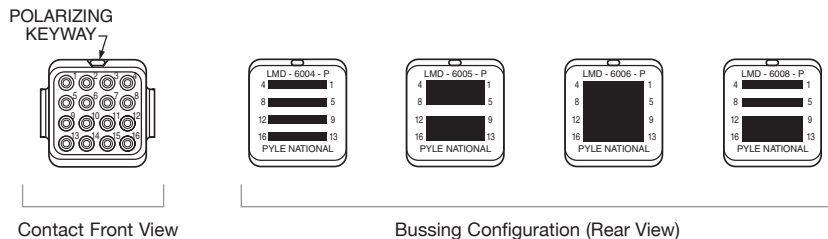


**Socket Module**  
LMD-3004-S

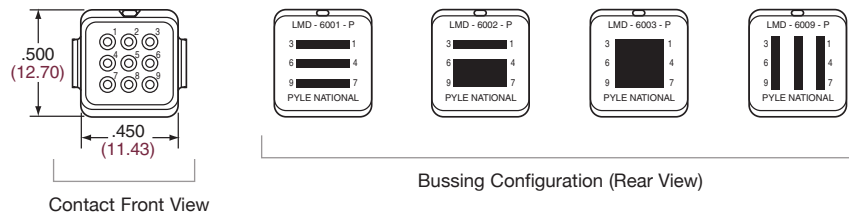
**Pin Module**  
LMD-3004-P

All dimensions in inches (millimeters in parenthesis)

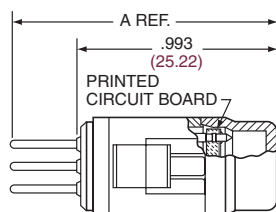
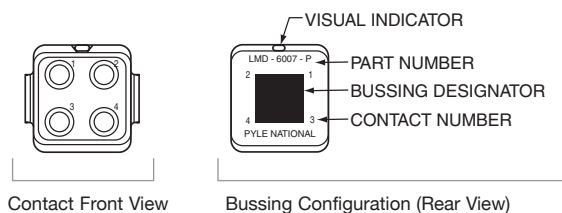
**MODULES WITH SIZE 22 CONTACTS**



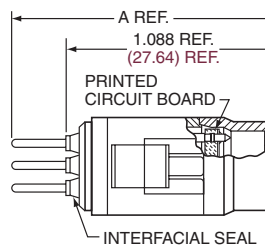
**MODULES WITH SIZE 20 CONTACTS**



**MODULES WITH SIZE 16 CONTACTS**



Standard Bussing Module

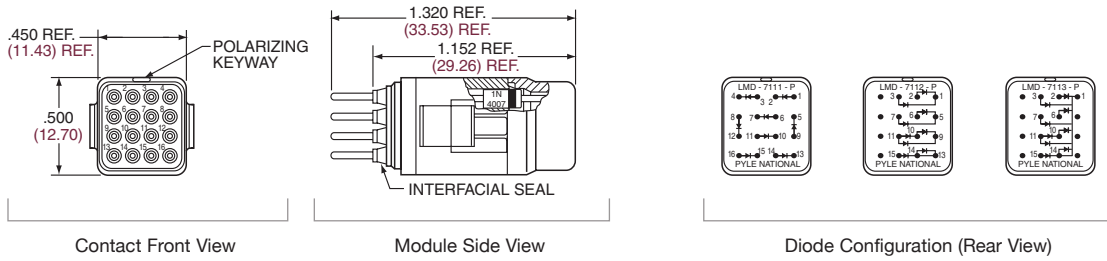


Sealed Bussing Module

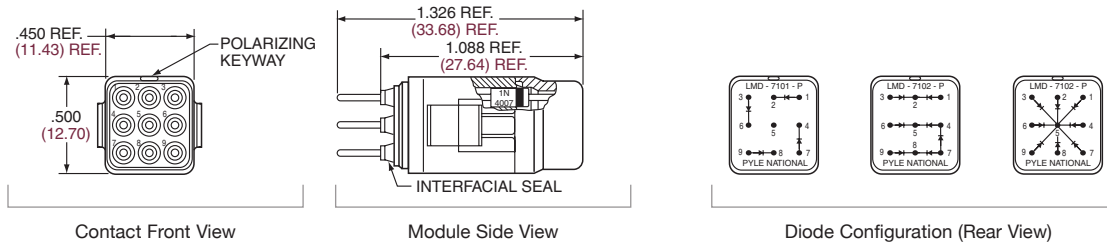
LMD BUSSING MODULE PART NUMBER		CONTACT SIZE	BUSSING CIRCUITS	A. REF.
STANDARD MODULE	SEALED MODULE			
LMD-6001-P	LMD-6101-P	20	3	1.326
LMD-6002-P	LMD-6102-P	20	2	1.326
LMD-6003-P	LMD-6103-P	20	1	1.326
LMD-6004-P	LMD-6104-P	22	4	1.256
LMD-6005-P	LMD-6105-P	22	2	1.256
LMD-6006-P	LMD-6106-P	22	1	1.256
LMD-6007-P	LMD-6107-P	16	1	1.326
LMD-6008-P	LMD-6108-P	22	3	1.326
LMD-6009-P	LMD-6109-P	20	3	1.326

All dimensions in inches (millimeters in parenthesis)

DIODE MODULES WITH SIZE 22 CONTACTS



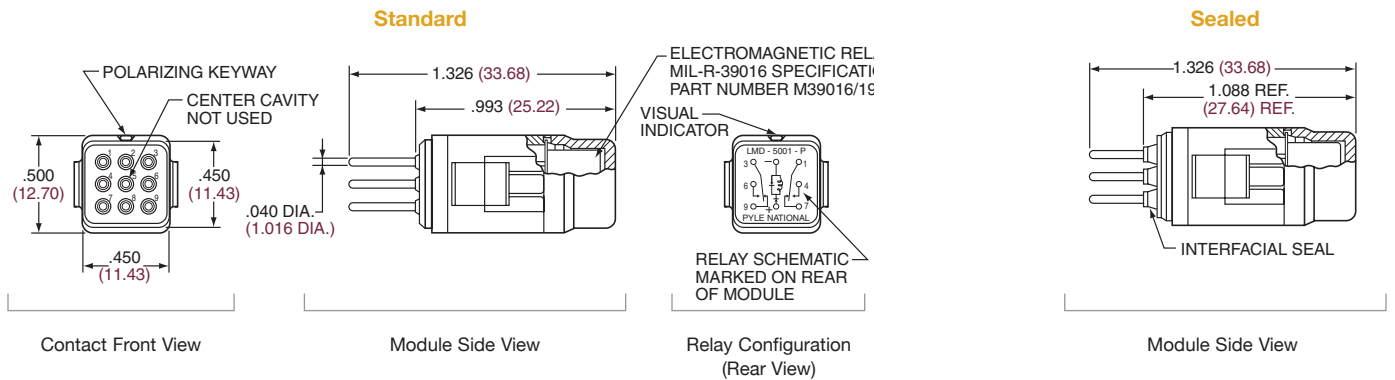
DIODE MODULES WITH SIZE 20 CONTACTS



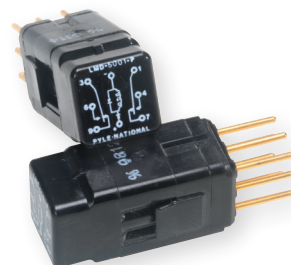
LMD DIODE MODULE PART NUMBER	CONTACT SIZE	CIRCUIT DESCRIPTION
LMD-7111-P	22	8 discrete diodes
LMD-7112-P	22	4 pair of diodes, each pair with common cathode
LMD-7113-P	22	8 diodes with common cathode (pin #1)
LMD-7101-P	20	4 discrete diodes
LMD-7102-P	20	3 pair of diodes, ear pair with common cathode
LMD-7103-P	20	8 diodes with common cathode (pin #5)



RELAY MODULES WITH SIZE 20 CONTACTS

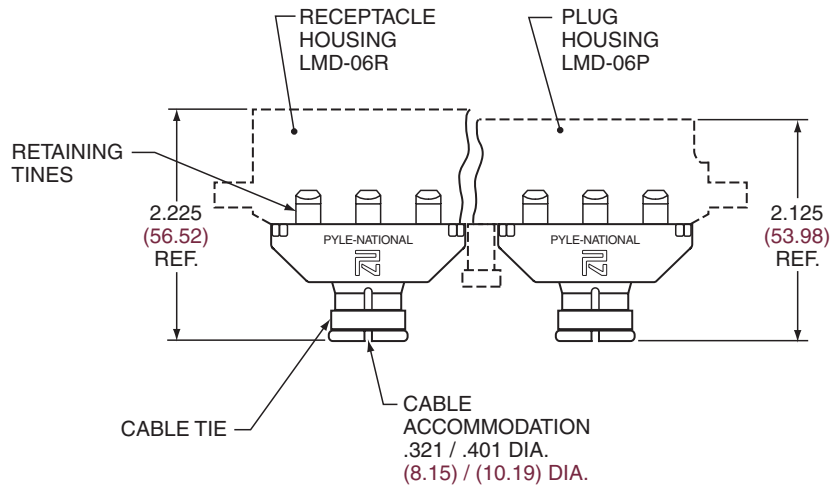


LMD RELAY MODULE PART NUMBER	
STANDARD MODULE	SEALED MODULE
LMD-5001-P	LMD-5101-P

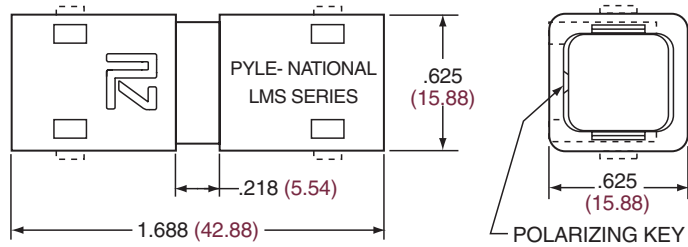


All dimensions in inches (millimeters in parenthesis)

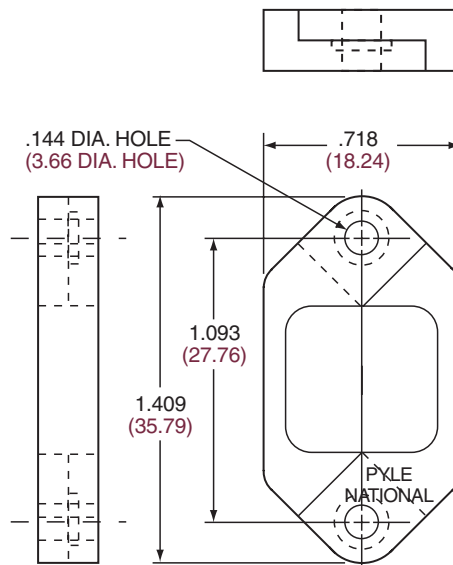
**STRAIN RELIEF 2 PIECE**



**LMS IN-SPLICE HOUSING**



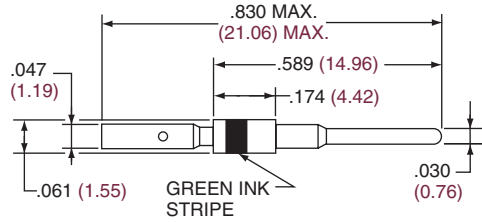
**LMS PANEL MOUNTING BRACKET**



All dimensions in inches (millimeters in parenthesis)

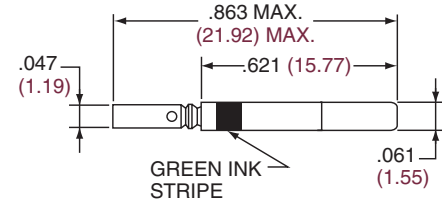
**PIN CONTACT SIZE 22**

LMD-4022-36LJ



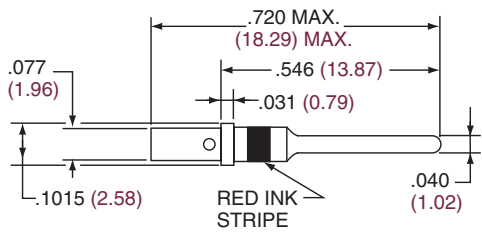
**SOCKET CONTACT SIZE 22**

LMD-4122-96LD



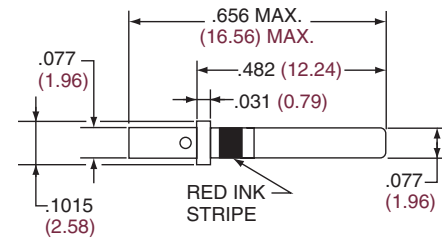
**PIN CONTACT SIZE 20**

LMD-4020-96LD & LMD-4020-10 Types



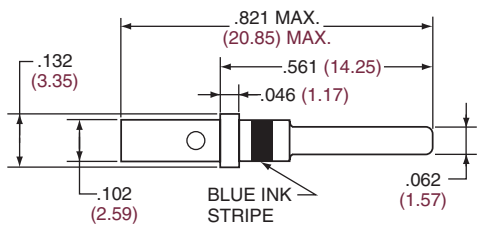
**SOCKET CONTACT SIZE 20**

LMD-4120-96LD & LMD-4120-10 Types



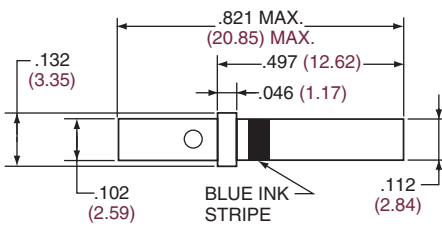
**PIN CONTACT SIZE 16**

LMD-4016-96LD & LMD-4016-10 Types



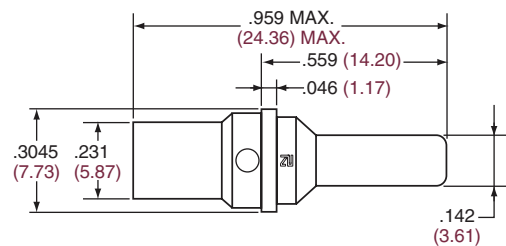
**SOCKET CONTACT SIZE 16**

LMD-4116-96LD & LMD-4116-10 Types



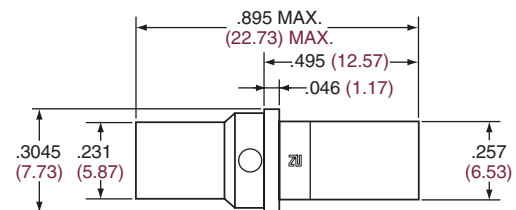
**PIN CONTACT SIZE 8**

LMD-4008-36L



**SOCKET CONTACT SIZE 8**

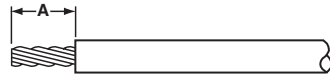
LMD-4108-36L



All dimensions in inches (millimeters in parenthesis)

**WIRE STRIPPING**

Strip wires to dimension "A" shown in table at right. Avoid cutting or nicking wire strands.



CONTACT SIZE	WIRE SIZE	SEALING RANGE WIRE O.D.	STRIPPING LENGTH DIMENSION "A"
		MAX.	
22	20-24-26-28 AWG	0.054 (1.37)	.156 - .125
20	20-22-24 AWG	0.083 (2.11)	.185 - .155
16	16-18-20 AWG	0.103 (2.61)	.260 - .230
8	8-10 AWG	0.255 (6.48)	.395 - .365

All dimensions in inches (millimeters in parenthesis)

**CONTACT CRIMPING**

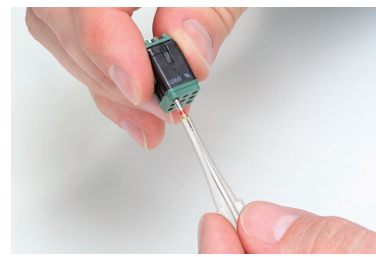
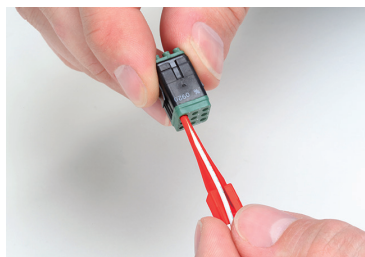
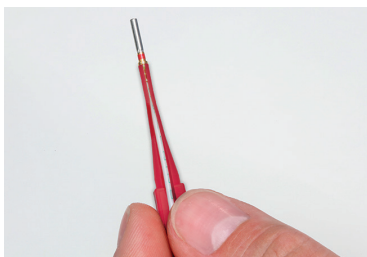


**STEP 1:** Fully insert wire into contact crimp pocket. Wire must be visible through wire inspection hole.

**STEP 2:** Insert contact into tool (use proper crimping tool as listed on preceding page). Crimp contact to wire. Tool will not open if contact is not fully crimped.

**STEP 3:** After crimping, wire should be visible through wire inspection hole.

**CONTACT INSERTION**



**STEP 1:** Using proper insertion/removal tool as listed on previous page, slip wire into insertion end (colored end), placing crimp end of contact inside the slotted portion and contact shoulder against end of tool.

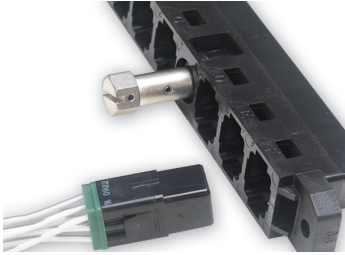
**STEP 2:** Align contact with the cavity at the rear face of the module. Carefully push the contact into the full depth of the cavity. Withdraw tool. A slight axial pull on the wire will confirm contact is locked in proper position.

**STEP 1:** Snap the extraction end (white end) of the tool over the wire of the contact selected for removal. Carefully push the tool into the full depth of the contact cavity releasing the contact retaining collet. Hold the wire against the serrations on the tool, and withdraw the tool and the wired contact from the module.

## MODULE INSERTION/REMOVAL & USE OF STRAIN RELIEF

Pin or socket modules, wired or unwired, can be inserted or intermixed in plug or receptacle housings. The next instructions illustrate the proper method of insertion and removal of modules within the LMD connector.

### MODULE INSERTION

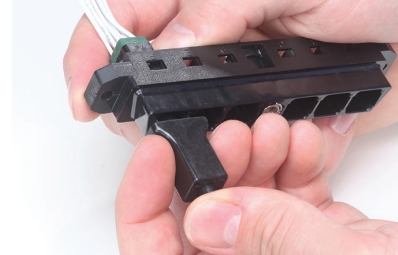


**STEP 1:** Align the module with the proper cavity at the rear of the housing. The module keyway must be positioned to accept key in housing cavity. Carefully insert the module straight in to the cavity until fully seated and locked in place. A slight axial push on the front of the module or a pull on the cable bundle will confirm module is locked in proper position.

### MODULE REMOVAL



**STEP 1:** Insert contact into tool (use proper crimping tool as listed on preceding page). Crimp contact to wire. Tool will not open if contact is not fully crimped.



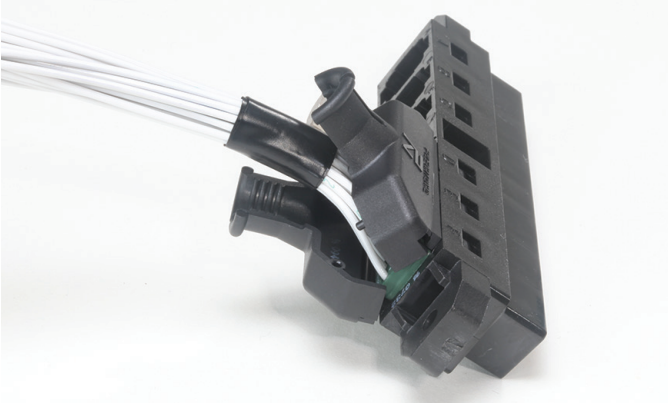
**STEP 2:** After crimping, wire should be visible through wire inspection hole.

## ASSEMBLY OF INTERNAL STRAIN RELIEF

Strain reliefs, if required, may be assembled to plug or receptacle connectors which have a full complement of modules installed. The following is instruction for assembling the internal attachment strain relief, part number LMD-5300-10A.



**STEP 1:** Tape wire bundle in area of cable clamp, and build up diameter to approx. 3/8 inches, if required. Align self-locking tines of the strain relief housing with the cavities adjacent to each module. Push the strain relief housing into place until the self-locking tines snap and lock strain relief into position. Assemble opposite half of strain relief housing to connector and tighten tie-strap to provide clamping force on the wire bundle.

**OPENING STRAIN RELIEF TO SERVICE MODULES AND CONTACTS**

**STEP 1:** Internal attachment strain reliefs may be opened to provide module and/or contact accessibility. To service connectors, first cut and discard tie-strap on strain relief. Open strain relief halves approx. 45° each by bending along integral flexible hinge. After servicing, close strain relief halves and install and tighten new tie-strap. To completely remove strain relief from the housing in order to provide module access; first remove tie-strap, open strain relief halves 45° each, then remove module, then remove strain relief.