ELMA
Your Solution Partner

SureLock

CLAMSHELL & CARD RETAINERS WITH HIGH CLAMPING FORCE

SYSTEM SOLUTIONS
BACKPLANES
ENCLOSURES
ROTARY SWITCHES
CABINETS

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SERIES SURELOCK

EXPANDING PCB RETAINERS

DESCRIPTION

Excessive shock and vibration is common in computing platforms deployed in harsh environments across a range of defense and industrial applications. Also systems with limited or no airflow and containing high wattage board payloads are expected to operate with high reliability in extreme ambient temperatures every day.

Elma's SureLock family of card edge retainers are multi-segment, extruded aluminum retaining devices that secure printed circuit boards in place when mounted directly to the board and slid into a channel in the cold plate. A simple turn of a screw enables the SureLock to expand and securely hold the card assembly in place to ensure high, evenly distributed clamping forces over the length of the retainer. This provides solid mechanical rigidity while the consistent surface to surface contact ensures maximum heat transfer. The design facilitates conduction cooling by conducting heat from a circuit card to a cold plate or the extruded side walls of an enclosure.

Effective clamping force is critical in applications demanding resistance to high shock and vibration and low thermal resistance ensures efficient heat transfer away from board components.

CHALLENGING ENVIRONMENTS

Excessive shock, vibration and high ambient temperatures are common in computing platforms deployed in harsh environments across a range of defense and industrial applications.

BENEFITS

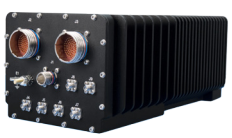
- Design flexibility without tooling costs
- Ideal solution for holding boards in place in mobile applications
- Multiple size options for all Small Form Factor enclosures
- Proven and tested solution for all environments
- Provides thermal solutions for conduction cooled systems
- Economical solution from small prototype needs to production quantities

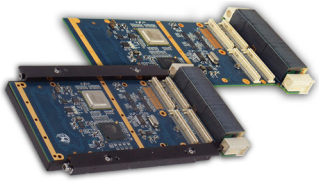
FEATURES

- Dimensions (nominal cross section)
  - 290 Series: 5.7mm x 5.7mm [0.225" x 0.225"]
  - 325 Series: 6.4mm x 6.6mm [0.251" x 0.260"]
  - 460 Series: 9.3mm x 9.5mm [0.365" x 0.375"]
- Uniform retention force across entire length protects cards under extreme shock and vibration
- Light weight design with superior thermal transfer
- Body and wedge alignment maintained for easy insertion
- Captive rear wedge
- Locking feature included on all SureLocks
- Options include choice of hex drive sizes, finishes and mounting hole sizes
- DFARS versions available on request

RELATED APPLICATIONS AND PRODUCTS

- In flight aerospace electronics (commercial and military)
- Mobile communication systems and networks
- Railway electronic systems (train controls)
- Electronic monitoring, control and guidance equipment
- Conduction cooled Small Form Factor Systems
- Police and fire networks
- Satellite and space electronic systems





- Convection- and conduction-cooled ATR boxes
- Rugged rackmount enclosures
- Shock-isolated chassis and racks
- COTS, MIL compliant products
- Embedded computing boards, integration & testing

APPLICATIONS

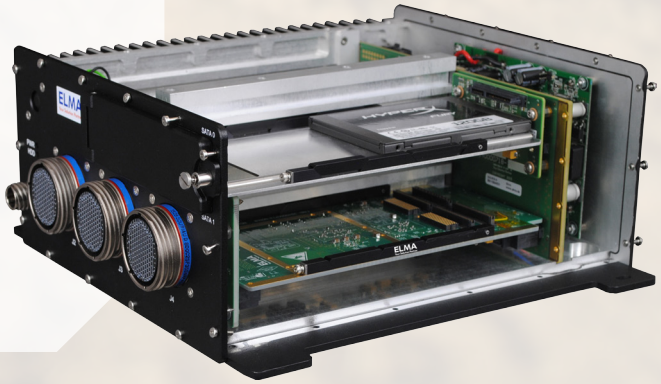
VPX card with SureLock

Card with SureLock assembly

HIGHLIGHTS

- Ideal for securing PCBs in extremely high shock and vibration environments
- Reliable clamping mechanism insures that your cards will remain securely in position
- Optimized surface contact through even clamping forces ensure maximum heat transfer
- Safely secure PCB in position for maximum protection from shock and vibration

Card SureLock assembly in Flexcom platform



CLAMPING FORCE PERFORMANCE DATA AND THERMAL TESTING

Elma SureLock card retainers (length 4.8") were tested by applying a controlled torque to their locking screw and measuring the resulting clamping force using a specially designed test fixture.

The stated value is the result of averaged data taken over a large sample population of SureLocks being load-tested. Each SureLock was tested 4 times. All tests were performed at sea level.

MEASUREMENT RESULTS
retainer length 4.8" (122mm)

Elma Series	Torque	Average Measured Load		
		Yellow Alodine Finish	Black Anodize Finish	Nickel Finish
290	6in-lb	650lbs	550lbs	530lbs
325	6in-lb	550lbs	425lbs	425lbs
460	20in-lb	1000lbs	850lbs	700lbs

Note: Clamping force is highly dependent on the SureLock finish.

THERMAL RESISTANCE TESTS OF SURELOCK RETAINERS SET UP DETAILS

A conduction cooled 3U VPX board was used for thermal testing, representing a 90W load
Ambient temperature: 0 °C (32 °F)
Length of Surelock retainers: 4.8" (122 mm)
Using a test fixture, the thermal resistance of pairs of SureLock retainers was measured across three different models and two finish types.

DUAL 4.8" LENGTH RETAINERS - THERMAL RESISTANCE

290 Series, yellow alodine finish =
0.42°C/W at 4.8" (.21°C/W at 9.6")

290 Series, black anodize finish =
0.96°C/W at 4.8" (.48°C/W at 9.6")

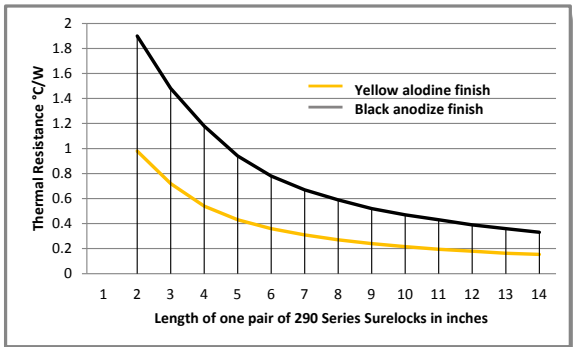
325 Series, yellow alodine finish =
0.40°C/W at 4.8" (.2°C/W at 9.6")

325 Series, black anodize finish =
0.72°C/W at 4.8" (.36°C/W at 9.6")

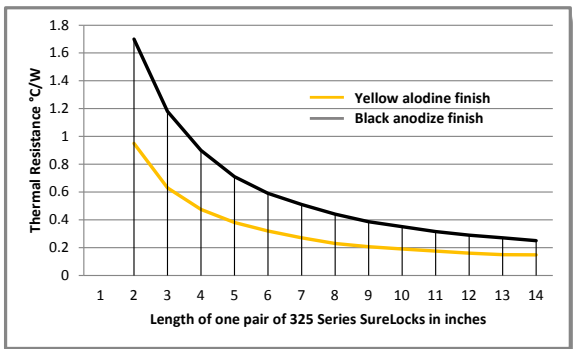
460 Series, yellow alodine finish =
0.38°C/W at 4.8" (.19°C/W at 9.6")

460 Series, black anodize finish =
0.70°C/W at 4.8" (.35°C/W at 9.6")

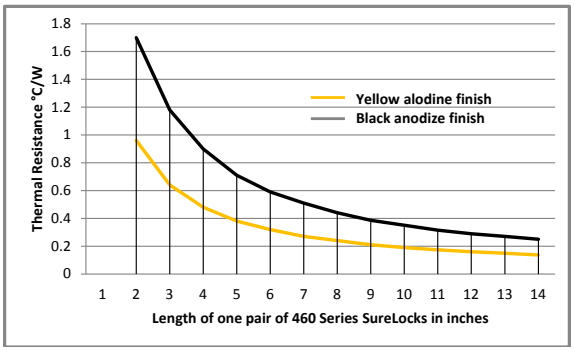
290 SERIES – THERMAL RESISTANCE



325 SERIES – THERMAL RESISTANCE

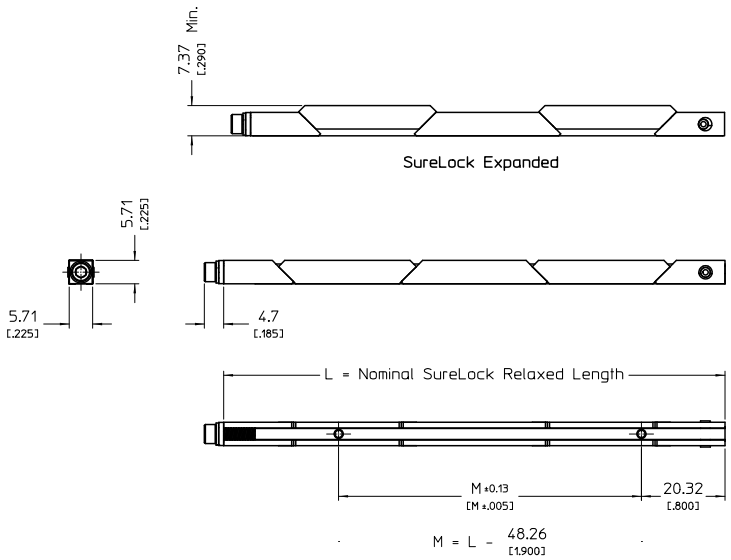


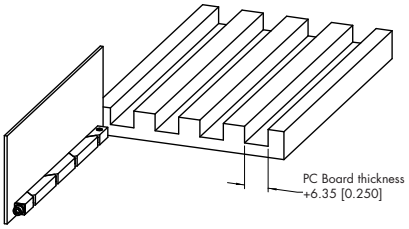
460 SERIES – THERMAL RESISTANCE



LINE DRAWINGS

› 290

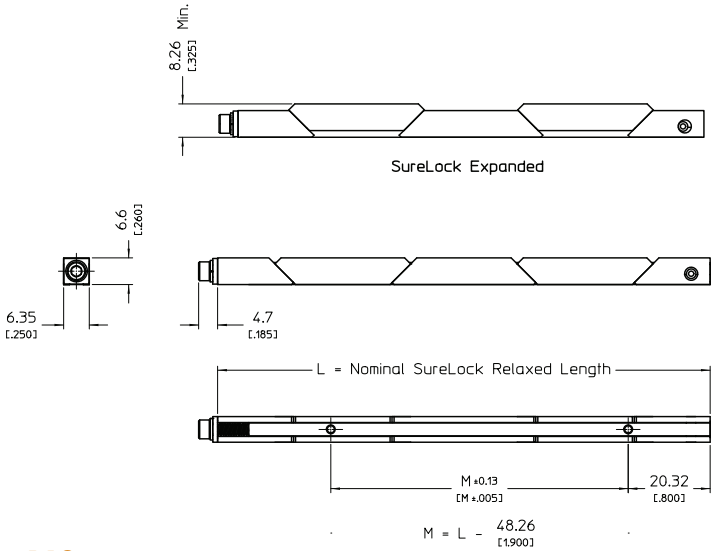


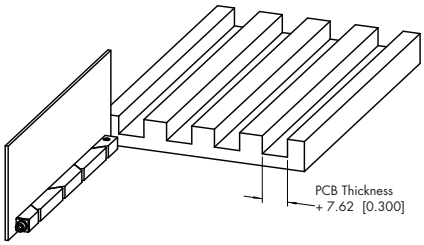


Recommended Drive Screw Torque:
0.85 Nm [7.5 in-lb]

SureLock Weight:
2.27g [0.080 oz.] per inch of Assembly Length (L)

› 325

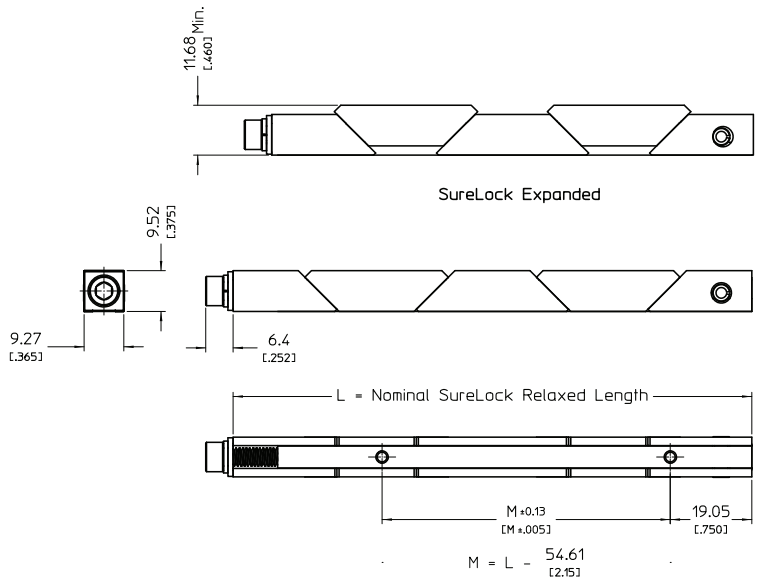


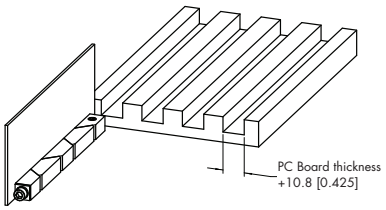


Recommended Drive Screw Torque:
0.85 Nm [7.5 in-lb]

SureLock Weight:
2.41g [0.085 oz] per inch of Assembly Length (L)

› 460





Recommended Drive Screw Torque:
2.6 Nm [23 in-lb]

SureLock Weight:
5.52 g [0.195 oz] per inch of Assembly Length

STANDARD PRODUCT ORDER INFORMATION

PART NUMBER	DESCRIPTION
290-Y0480T21LNNN	.225" square assembly, 4.8" long, yellow alodine finish, 2x 2-56 tapped holes
290-B0480T21LNNN	.225" square assembly, 4.8" long, black anodize finish, 2x 2-56 tapped holes
290-B0480T21LNKN	.225" square assembly, 4.8" long, black anodize finish, 2x 2-56 tapped holes, captive
290-B0480T21LVKN	.225" square assembly, 4.8" long, black anodize finish, 2x 2-56 tapped holes, captive, visual
290-B0480M24LNNN	.225" square assembly, 4.8" long, black anodize finish, 2x M2 tapped holes

PART NUMBER	DESCRIPTION
325-Y0480T21LNNN	.250" x .260" assembly, 4.8" long, yellow alodine, 2 x 2-56 tapped holes
325-B0480T21LNNN	.250" x .260" assembly, 4.8" long, black anodize finish, 2x 2-56 tapped holes
325-B0480T21LNKN	.250" x .260" assembly, 4.8" long, black anodize finish, 2x 2-56 tapped holes, captive
325-B0480T21LVKN	.250" x .260" assembly, 4.8" long, black anodize finish, 2x 2-56 tapped holes, captive, visual
325-B0480M22LNNN	.250" x .260" assembly, 4.8" long, black anodize finish, 2x M2.5 tapped holes
325-B0480M22LNKN	.250" x .260" assembly, 4.8" long, black anodize finish, 2x M2.5 tapped holes, captive
325-B0480M22LVKN	.250" x .260" assembly, 4.8" long, black anodize finish, 2x M2.5 tapped holes, captive, visual

PART NUMBER	DESCRIPTION
460-Y0480T26LNNN	.365" x .375" assembly, 4.8" long, yellow alodine, 2x 4-40 tapped holes
460-B0480M27LNNN	.365" x .375" assembly, 4.8" long, black anodize finish, 2x M3 tapped holes

- No setup charges for standard products
- Lead time is stock to 6 weeks for most standard configurations

PRODUCT CONFIGURATOR

SERIES		FINISH	LENGTH	DRIVE TYPE	MTG HOLES	HOLE STYLE	LOCKING	VISUAL INDICATOR / CAPTIVE HARDWARE	DFARS
290 325 460	-	_	_	_	_	_	_	_	_

FINISH

Y = Yellow Alodine film
R = RoHS compliant clear alodine film
B = Black Anodized
H = Black Hard Anodized (on request)
N = Electroless Nickel (on request)

LENGTH (IN INCHES)

0280 = 2.8" long (standard)
0380 = 3.8" long (standard)
0480 = 4.8" long (standard),
used for 160mm boards
xxxx = xx.xx inches long, increments of 0.50" starting at 2.30" for the 290 and 325 and 2.8" for the 460

DRIVE TYPE

M = 2.5mm hex drive (M3) – 290 and 325 Series
T = 3/32" hex drive (4-40) – 290 and 325 Series
M = 3mm hex drive (M4) – 460 Series
T = 9/64" hex drive (8-32) – 460 Series

NO. OF MOUNTING HOLES

2 = two holes (standard)
3 - 5 holes

HOLE STYLE

1 = 2-56 tapped (standard)
2 = M2.5 tapped (standard)
3 = 0-80 tapped
4 = M2 tapped
5 = thru hole Ø 1.8mm (.071")
6 = 4-40 tapped (standard 460 series)
7 = M3 tapped (standard 460 series)

LOCKING

L = Included

VISUAL INDICATOR / CAPTIVE HARDWARE

NN = Not required
NK = Captive required
VK = Visual and Captive required

DFARS

D = DFARS compliant
N = Non DFARS

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