TRIPLE·E
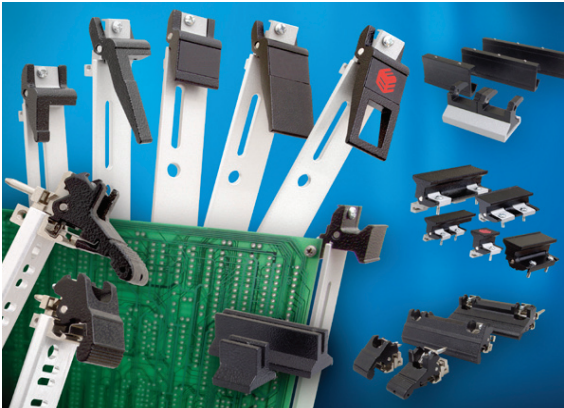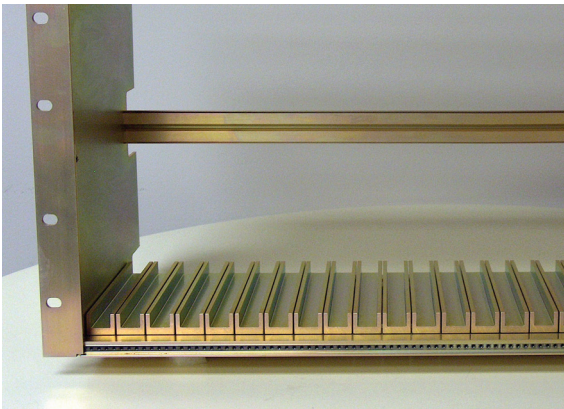
RUGGEDIZED EUROCARD PACKAGING

Level 1
Mechanical Components Only

Level 2
Mechanical Assembly

Level 3
Electronic Enclosure Assembly

Commercial Off the Shelf (COTS) & Ruggedized Mechanical Packaging

Triple E has more than three decades experience supplying ruggedized products to customers in aerospace, defense, harsh industrial and rugged commercial markets. With patents for extruded all metal handles, the Triple E front panels and all metal extruded card guides offer customers performance and durability. Triple E products are unique in their design and their ability to withstand extreme environments.

Injector/Ejector Handles
Triple E's all metal handles are fully compliant with the mechanical specifications of IEEE1101.1 and IEEE1101.10. Triple E features a new VPX handle design offering the all metal design – combined with enhanced locking.

Front Panels
Triple E offers a range of front panels – from sheet metal VME solutions to extruded U Channel designs. We offer standard kits and components via our **ONLINE STORE** , and fully customized solutions featuring your cutouts and accessory components. Unique features include optional integral pb holders – with the PB Holder integrated into the extruded front panel for extra reliability and durability. We provide a full range of labeling and finish options including Chromate (clear or yellow), powder coat, and anodizing.

Card Guide Clusters / Card Decks
Only Triple E offers all metal card guide clusters and guide decks for VME, VME64x, cPCI, PXI, VXI – and the NEW VPX designs which add the locking feature. And the 901 VPX series offers users the flexibility of mixing the different Pitch options typical of VPX configurations. Just let us design the right card cage for your requirements. Because they are extruded, our card guide clusters and decks eliminate the problems of flexing and breaking found with plastic guides.

Card Frames / Card Cages / Systems
Triple E manufactures and assembles a full line of rugged card cages and card frames which feature all aluminum construction, including the card guides. For fully integrated solutions – our applications team will help you to configure the backplane, cooling, and mechanical packaging solution which best addresses your requirements. For development we have a range of open frame systems – perfect for Debugging!

Table of Contents

About Triple E

Triple E offers a complete line of ruggedized Eurocard electronic packaging solutions including front panels, metal front panel handles, extruded aluminum card guide assemblies, rugged card cages, backplanes, power supplies and enclosures for VME (1101.1), VME64x (1101.10), VXI, VPX, VXS, PXI and cPCI (1101.10) systems.

UNIQUE SOLUTIONS

Triple E is the only vendor to offer a ruggedized stainless steel injector/ejector plate for VME64x, cPCI and PXI systems. Typical commercial solutions are aluminum injector/ejector plates, which can be easily damaged and prevent a board for being inserted into or ejected from the card cage. When Triple*Ease™ stainless steel plates are combined with Triple E's all metal injector/ejector handles, both handle and card cage will withstand virtually unlimited insertion/extraction cycles. From instruments which are being constantly reconfigured, to critical control systems, only Triple*Ease™ offers truly rugged sub-systems capable of confident operation, every time.

MARKET FOCUS

Triple E provides OEM's in the Military, Avionics, and Commercial industries with ruggedized system level components and complete turnkey system solutions.

COMPANY BACKGROUND

Triple E products are manufactured in Randolph, Massachusetts at an ITAR facility. From prototyping to volume production, we can support any customer need. Value added services offered include:

- Customized Designs
- Design and Applications Engineering
- Simulation and Testing Capabilities
- Standardized Expertise
- Labelling and Finishing Options
- Logistics and Support Services
- Program Management

FEATURES

Demanding Defense and Aerospace Requirements Make the Need for Rugged Hardware Paramount-Performance is Key

The VPX Architecture is a Defense Targeted Design-So We Built a Tool Box of Durable Parts to Keep Electronics Running Smoothly in Any Environment

From Metal Teeth Handles to Sturdy Front Panels and Ruggedized Card Cages, Our Extruded Aluminum Products Will Protect Delicate Electronics and Give Users a Simple Interface

Triple E - Ruggedized Eurocard Packaging

WWW.TRIPLEEASE.COM | 1-888-444-1644

HANDLES


1101.10 Handles with Die Cast Mounting Block made of Extruded Aluminum or Plastic with Locking Button

Handles are Hot Swappable

4 Metal Teeth Models:
  -COTS Hybrid, with Button
  -Stainless Steel, with Button
  -HT, with Lever Handle
  -DT, with Metal Spring

1 Plastic, Less Rugged Model:
  -COTS, with Button

These Handles are Designed to Grab the Chassis and Provide Excellent Insertion and Extraction Forces

FRONT PANELS
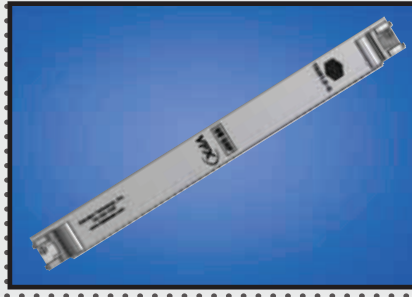
1101.10 Front Panels 6005-A Series Aluminum (Other Materials Available Upon Request)

Gasketing in 3 Versions:
  -Beryllium Copper (Be/Cu)
  -Stainless Steel
  -Fabric Over Foam (Special Request)

Standard Size Panels:
  -Height: 3U and 6U
  -Width: 4HP and 5HP
  -Other sizes available (i.e. 4.25HP), Please Contact Sales

Attached or Integral PCB Holders are Offered to Secure Your Printed Circuit Board to the Panel

Optional Metal Collar Sleeves in Round or Oval Shape on the 3U Panels (Screws Included)

CARD CAGES
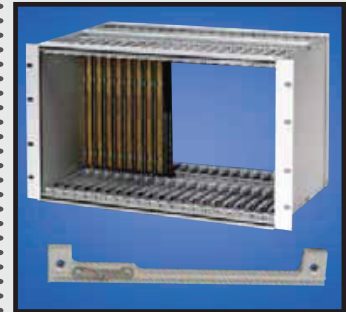
1101.10 Card Cages and Guides-Rugged Extruded Aluminum Construction

Rails are RoHS Compliant Clear Chromated, with Aluminum Front Ejector Bar (Stainless Steel Upon Request)

Includes Nutbars & Backplane Insulators

Side Plates with Gasket and Flanges for Rack Mounting are Included

Card Guides:
  - IEEE 1101.10, Dot Ten Compliant Standard 901 Version
  -VPX Version: Stopper Extruded into Guide to Prevent Backwards Instalation
  -Both guides feature ESD clip
  -Contact Sales for PSU (Green), Control (Red), or Other Colored Guides

New VPX Card Guide Features a Stopper to Prevent Backwards Installation!
Eliminates need to engineer a feature into chassis or backplane

Contact our Sales Department by phone at 1-888-444-1644 or by email at tripleesales@xtech-outside.com

Shop online at www.xtech-outside.com/store

ONLINE STORE

VITA
Open Standards, Open Markets

RoHS

COTS Plastic Molded Handles

All Metal, Stainless Steel Handle

HT All Metal Handle, High Torque

DT All Metal Handle

Our All Metal Handles are Available in Custom Colors- Contact Sales
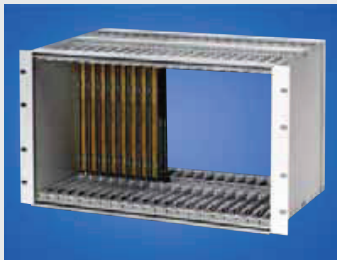
3U 4HP

3U 5HP

6U 4HP

6U 5HP

Made of 6005A-T5 Extruded Aluminum with a Clear Chromate Finish

With Be/Cu Gasket or Stainless Steel
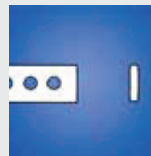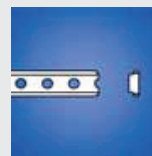*(Fabric Over Foam Profile Available Upon Request)*

Standard Size is 21 Slots- Available in Custom Widths

VPX Card Cage

Cage Includes:

Insulating Strips

Nutbars

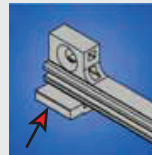Rails with Ejector Front Bar

Flanged Sideplates

Guides

Powder Coated 901 Series or VPX Specialty Card Guides

-Standard 160mm Length, Power Supply, and RTM Versions Available

-Stopper Feature Extruded into Card Guide for VPX Compliance

Shop online at www.xtech-outside.com/store

ONLINE STORE

Download 3D Models and Drawings at
http://www.tripleease.com/drawing-download-registration-login.htm

TRIPLE·E

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358 North Street, Randolph, MA 02368
www.tripleease.com
US Sales: 1-888-444-1644

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FEATURES

All metal handles in extruded aluminum, with patented mounting block

Conform to IEEE 1101.1 specifications for VME and VXI applications

Our aluminum handles completely eject the PCB from the backplane

Handles have flat plane for board labeling by either silkscreen or overlay

All metal construction offers significant improvement over plastic
No risk of out-gassing or burning in extreme environments

Triple E - Ruggedized Eurocard Packaging

Single CAM (VM-N, VM-W)
Versions

Unique, robust design for rugged COTS VME applications

Finger grips are extruded into the handles for a sure eject every time

- N Style is direct replacement for Schroff VME plastic handle

- W Style is direct replacement for APW plastic handle

1	Handle
2	Screw to Chassis
3	Screw to PCB Mount
4	Plastic Screw Sleeve
5	PCB Mount
6	Bushing
7	Screw for PCB

VM-N in Smooth Black
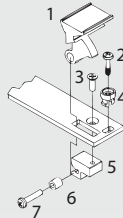
Twin CAM (VM-T, LM-T)
Versions

Patented, all metal handle with traditional VME look

Applies even ejection pressure across panel, reducing stress on PCB - even with stacked boards or wide panels

Come in two versions: VM and LM

1	Handle
2	Dowel Pin
3	Screw to Chassis
4	Screw for PCB
5	Patented Mounting Block
6	Screw to Mount Block
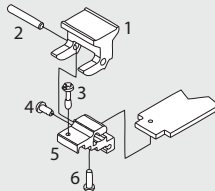
VM-T in Smooth Aluminum

LM-T in Medium Black

Contact our Sales Department by
phone at 1-888-444-1644 or by email
at tripleesales@xtech-outside.com

ONLINE STORE

VITA Open Standards, Open Markets

RoHS

TECHNICAL SPECIFICATIONS

Kits include:

Handle and PCB Mounting Block (Sets contain 2)

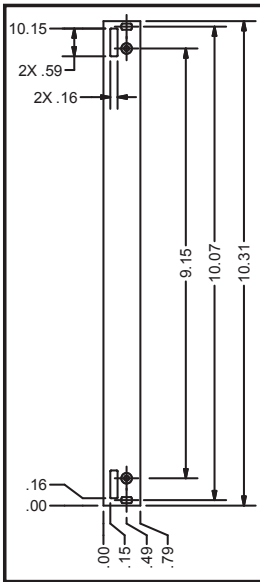3 Screws per Handle for PCB, Handle, & Chassis Mounting

Single: SS FHP M2.5 X 8, PHP M2.5 X 2, Combo Slot M2.5 X 10.5

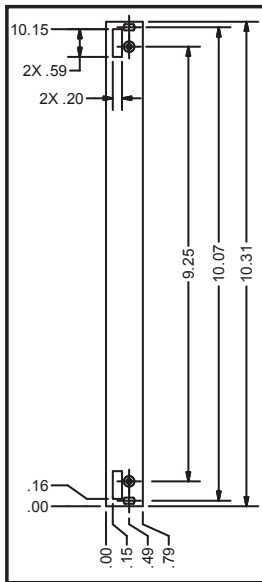Twin: 2 SS PHP M2.5 X 8, and 1 Combo Slot M2.5 X 10.5

Plus, per Handle:

Single Cam	Twin Cam
Pivot Bushing	Dowel Pin
Press in Plastic Screw Sleeve	

Each Ejector is made of Extruded Aluminum and finished with a Robust Powder Coat
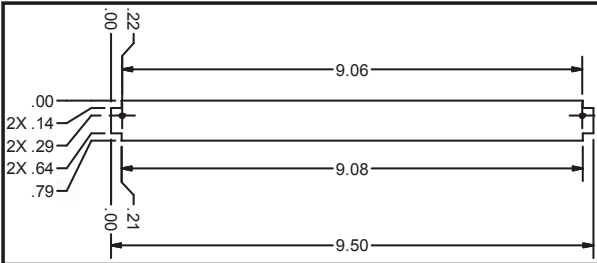
Material is 6005 Extruded Aluminum

.61 .78 .12

.61 .78 .16

Twin LM-T
Version

Twin VM-T
Version

2.07 .78

.85 .78

Single, Narrow Cam Handle Front Panel Cutouts

Single, Wide Cam Handle Front Panel Cutouts

10.15
2X .59
2X .16
9.15 10.07 10.31
.16 .00
.00 .15 .49 .79

10.15
2X .59
2X .20
9.25 10.07 10.31
.16 .00
.00 .15 .49 .79

Twin Cam Handle Front Panel Cutouts

.22 .00
9.06
.00
2X .14
2X .29
2X .64
.79
9.08
.00 .21
9.50
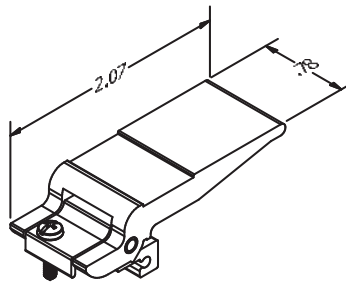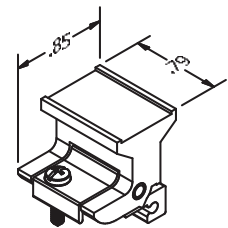
PN	Model	Description	Finish	Color	Order Qty
127259	EJL-VM-N-X4-X4-B2	Single, Standard, Lower	Smooth	Black	Multiples of 10
128211	EJS-VM-N-X4-X4-B2	Single Cam, Upper/Lower Set	Smooth	Black	Multiples of 10
130084	EJL-VM-W-X4-X4-B2	Single, Wide, Lower	Smooth	Black	Multiples of 10
130063	EJS-VM-W-X4-X4-B2	Single Cam, Upper/Lower Set	Smooth	Black	Multiples of 10
	EJU-LM-T-X4-X4-A1	Twin, Low Profile, Long, Upper	Smooth	Aluminum	Multiples of 10
	EJL-LM-T-X4-X4-A1	Twin, Low Profile, Long, Lower	Smooth	Aluminum	Multiples of 10
	EJU-LM-T-X4-X4-AX	Twin, Low Profile, Long, Upper	Fine	Aluminum	Multiples of 10
	EJL-LM-T-X4-X4-AX	Twin, Low Profile, Long, Lower	Fine	Aluminum	Multiples of 10
	EJU-LM-T-X4-X4-BX	Twin, Low Profile, Long, Upper	Medium	Black	Multiples of 10
	EJL-LM-T-X4-X4-BX	Twin, Low Profile, Long, Lower	Medium	Black	Multiples of 10
128307	EJU-VM-T-X4-X4-A1	Twin, Standard VME, Upper	Smooth	Aluminum	Multiples of 10
128306	EJL-VM-T-X4-X4-A1	Twin, Standard VME, Lower	Smooth	Aluminum	Multiples of 10
126422	EJU-VM-T-X4-X4-AX	Twin, Standard VME, Upper	Fine	Aluminum	Multiples of 10
126421	EJL-VM-T-X4-X4-AX	Twin, Standard VME, Lower	Fine	Aluminum	Multiples of 10
126692	EJU-VM-T-X4-X4-BX	Twin, Standard VME, Upper	Medium	Black	Multiples of 10
126693	EJL-VM-T-X4-X4-BX	Twin, Standard VME, Lower	Medium	Black	Multiples of 10
127761	SC-000237	Screw for Chassis Mounting	M2.5 X 10.5	SS	Pkg of 100
131163	SC-00330	Screw for PCB Mount	M2.5 x 8	SS	Pkg of 25

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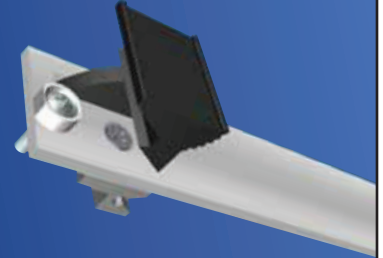1-888-444-1644

FEATURES

Rugged Aluminum Front Panels

Conform to IEEE 1101.1 specifications for VME and VXI applications

Fit all of the Triple E Single Cam, all metal handles

Optional PCB mount configurations

Variety of customizable features: cutouts, finishing, labeling
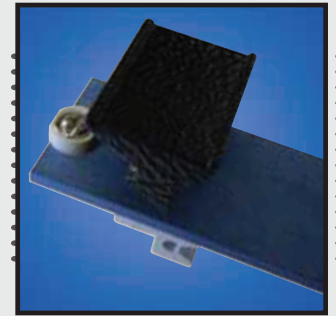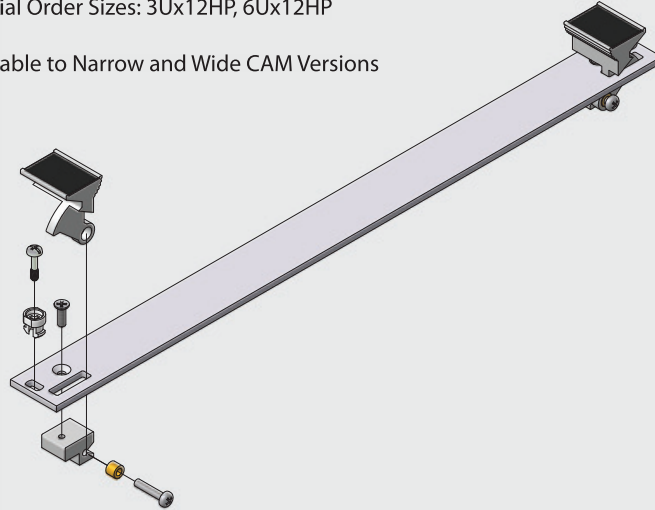
Triple E - Ruggedized Eurocard Packaging

Unshielded Single CAM Panel
Narrow (1N) and Wide (1W) Versions

Standard Sizes: 3Ux4HP, 3Ux8HP, 6Ux4HP, and 6Ux8HP
    Standard Panels come with black powdercoat VM handles

Special Order Sizes: 3Ux12HP, 6Ux12HP

Available to Narrow and Wide CAM Versions

XTech can modify your front panel with finishes, cutouts, and labeling. Contact our Sales Department for more information on customizing your front panels.

Powder Coating

Cutouts

Silkscreening

Contact our Sales Department by phone at 1-888-444-1644 or by email at tripleesales@xtech-outside.com

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RoHS

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Kits include:
Front Panel, Handle(s), PCB Holders (as noted),
Two (2) Plastic Press-In Sleeves, Six (6) Screws for
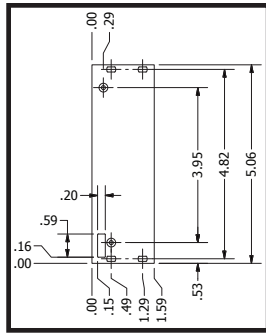PCB, Handle, & Chassis Mounting

Standard Features:
Handle: VM-N in Medium Black Finish
Gasket: Be/Cu
Finish: Chromate (RoHS Compliant)

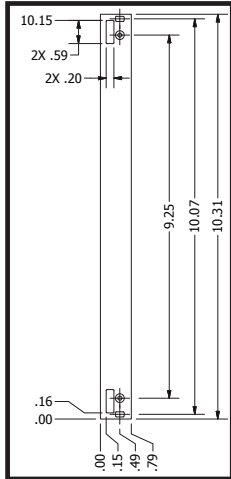Please Contact Sales for any Substitutions

Front Panels are made of 6005-T5 Series

3U 4HP
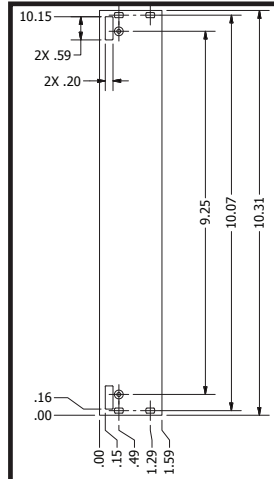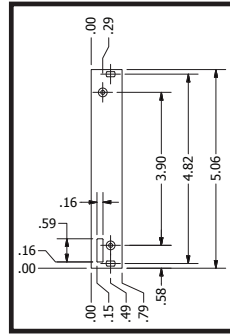Narrow CAM

3H 8HP
Narrow CAM

6U 4HP
Narrow CAM
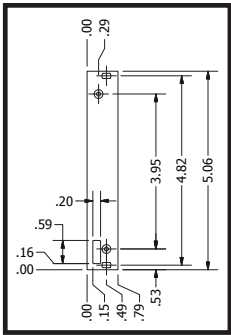
6U 8HP
Narrow CAM

3U 4HP
Wide CAM

3U 8HP
Wide CAM

6U 4HP
Wide CAM
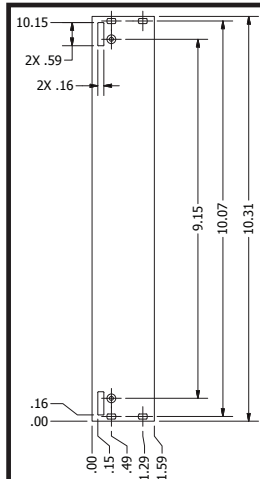
6U 8HP
Wide CAM

Integral Printed Circuit Board Holders
are available in the below configurations
as a Special Order. Please consult Sales
for more information.

Model	Description	Sheilding
FP-X3-X4-F3-1N-BX-IC	3Ux4HP, 1 Free Standing Attached PCB Mount	Unshielded
FP-X3-X8-F3-1N-BX-IC	3Ux8HP, 1 Free Standing Attached PCB Mount	Unshielded
FP-X6-X4-F1-1N-BX-IC	6Ux4HP, 0 Free Standing PCB Mounts	Unshielded
FP-X6-X8-F1-1N-BX-IC	6Ux8HP, 0 Free Standing PCB Mounts	Unshielded
FP-X3-X4-F3-1W-BX-IC	3Ux4HP, 1 Free Standing Attached PCB Mount	Unshielded
FP-X3-X8-F3-1W-BX-IC	3Ux8HP, 1 Free Standing Attached PCB Mount	Unshielded
FP-X6-X4-F1-1W-BX-IC	6Ux4HP, 0 Free Standing PCB Mounts	Unshielded
FP-X6-X8-F1-1W-BX-IC	6Ux8HP, 0 Free Standing PCB Mounts	Unshielded

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http://www.tripleease.com/drawing-download-registration-login.htm

Ruggedized VME Twin Cam Front Panels
Assemblies and Kits For VME and VXI

TRIPLE·E

FEATURES

Rugged Aluminum Front Panels

Conform to IEEE 1101.1 specifications for VME and VXI applications

Fit all of the Triple E Twin Cam, all metal handles

Optional shielding and PCB mount configurations

Variety of customizable features: cutouts, finishing, labeling

Triple E - Ruggedized Eurocard Packaging

Unshielded VME Panel
Versions

Standard Sizes: 3Ux4HP, 3Ux8HP, 6Ux4HP, and 6Ux8HP

Special Panel Sizes: 3Ux12HP, 6Ux12HP

Standard Panels come with Black Powder Coat VM-T Handles

Without Gasket

Shielded VME Panel
Versions

Shielding is Be/Cu

Special Order Sizes: 3Ux12HP, 6Ux12HP

Standard Panels come with Black Powder Coat VM-T Handles

With Be/Cu Gasket

XTech can modify your front panel with finishes, cutouts, and labeling. Contact our Sales Department for more information on customizing your front panels.

Powder Coating

Cutouts

Silkscreening

Contact our Sales Department by phone at 1-888-444-1644 or by email at tripleesales@xtech-outside.com

ONLINE STORE

VITA Open Standards, Open Markets

RoHS

TECHNICAL SPECIFICATIONS

Kits include:
Front Panel, Handle(s), PCB Holders (as noted),
Two (2) Plastic Press-In Sleeves, Six (6) Screws for
PCB, Handle, & Chassis Mounting

Standard Features:
  Handle: VM-T in Medium Black Finish
  Gasket: Be/Cu
  Finish: Chromate (RoHS Compliant)

Please Contact Sales for any Substitutions

Front Panels are made of 6005-T5 Series
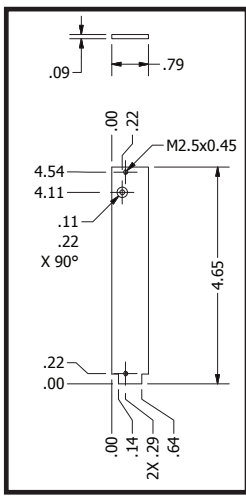
Sizes Available

	4HP	8HP
3U	●	●
6U	●	●

6U 4HP

6U 8HP

3U 4HP
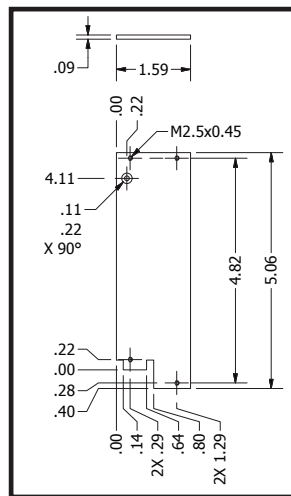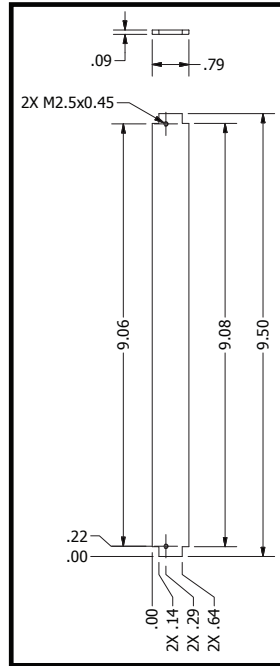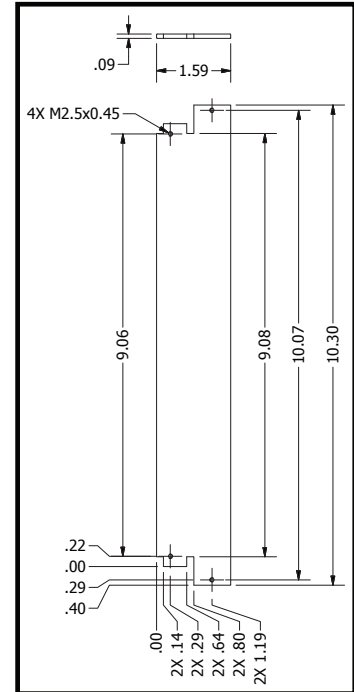
3U 8HP

Model	Description	Sheilding
FP-X3-X4-F3-14-BX-IC	3Ux4HP, 1 Free Standing Attached PCB Mount	Unshielded
FP-X3-X8-F3-14-BX-IC	3Ux8HP, 1 Free Standing Attached PCB Mount	Unshielded
FP-X6-X4-F1-14-BX-IC	6Ux4HP, 0 Free Standing PCB Mounts	Unshielded
FP-X6-X8-F1-14-BX-IC	6Ux8HP, 0 Free Standing PCB Mounts	Unshielded
FP-X3-X4-R3-14-BX-IC	3Ux4HP, 1 Free Standing Attached PCB Mount	Shielded
FP-X3-X8-R3-14-BX-IC	3Ux8HP, 1 Free Standing Attached PCB Mount	Shielded
FP-X6-X4-R1-14-BX-IC	6Ux4HP, 0 Free Standing PCB Mounts	Shielded
FP-X6-X8-R1-14-BX-IC	6Ux8HP, 0 Free Standing PCB Mounts	Shielded

Integral Printed Circuit Board Holders
are available as a Special Order. Please
consult Sales for more information.

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Download 3D Models and Drawings at
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358 North Street, Randolph, MA 02368
www.tripleease.com
US Sales: 1-888-444-1644

Rugged Metal IEEE 1101.10 Handles
For cPCI, VME64x, VXS, and VPX

TRIPLE·E

FEATURES

All metal handles in extruded aluminum

Conform to IEEE 1101.10 specifications for electrostatic discharge, keying, and hot swap

Designed specifically for ruggedized applications

All metal handles offer significant improvement over nylon
   No risk of out-gassing or burning in extreme environments
   Extremely strong, will not warp

Custom Colors and Labeling available upon request

Triple E - Ruggedized Eurocard Packaging

D T
Version

Special Order

Standard

Classic-shaped handle, great for many applications

Multiple black finishes standard

Available via online store - XTech Direct

H T
High Torque
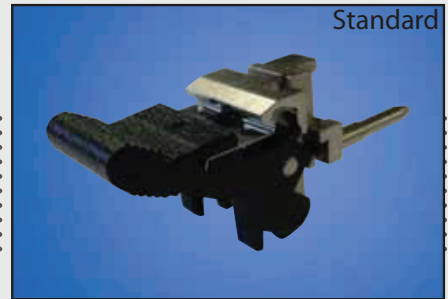
Special Order

Standard

Low profile handle, for use especially in applications with high insertion force

Long handle withstands high actuation force

Multiple black finishes standard

Available via online store - XTech Direct

L T
Low Profile

Special Order

Standard

Low profile handle - maximize panel space for cutouts/labels

Arrives as a kit to facilitate board mounting

New assembly video online

Available via online store - XTech Direct

Contact our Sales Department by
phone at 1-888-444-1644 or by email
at tripleesales@xtech-outside.com

ONLINE STORE

VITA Open Standards, Open Markets

RoHS

cludes:

andle and PCB Mounting Block

T & HT - Fully Assembled

- Arrives as Kit

rews for PCB, Handle, and Chassis Mounting
(SS PHP M2.5 X 6, and SS Combo Slot M2.5 X 10.5)

ded Aluminum with Robust Standard
er Coat Finish
om Finishing (Alternate Powder Coat Color, Anodizing)
able as a Special Order

pring for Reliable Latching Performance

ial is 6005 Extruded Aluminum

D T
Standard

H T
'High Torque'

L T
Low Profile

1101.10 Compatible Front Panel

9.06

8.79

.14
.00

.00
2X .39
.79

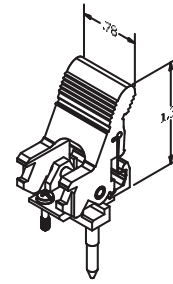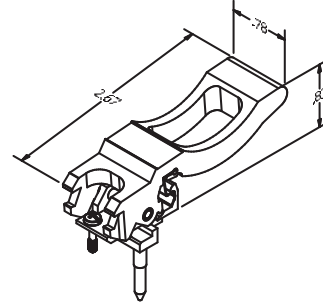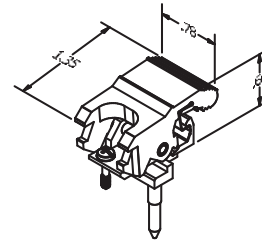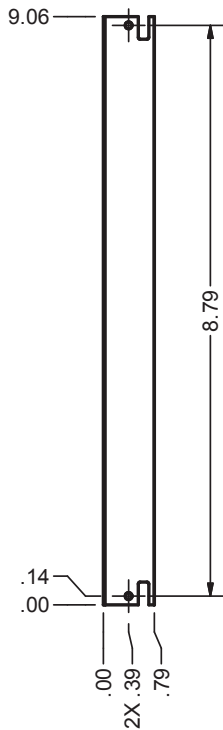| P/N	Model	Description	Finish	Color	Order Qty
124398	EJU-DT-T-X4-X4-AX	Upper, Standard Profile	Fine	Aluminum	Multiples of 10
127113	EJL-DT-T-X4-X4-AX	Lower, Standard Profile	Fine	Aluminum	Multiples of 10
126549	EJU-DT-T-X4-X4-BX	Upper, Standard Profile	Medium	Black	Multiples of 10
126537	EJL-DT-T-X4-X4-BX	Lower, Standard Profile	Medium	Black	Multiples of 10
129416	EJU-DT-T-X4-X4-B1	Upper, Standard Profile	Fine	Black	Multiples of 10
124399	EJL-DT-T-X4-X4-B1	Lower, Standard Profile	Fine	Black	Multiples of 10
124334	EJU-HT-T-X4-X4-AX	Upper, Low Profile, High Force	Fine	Aluminum	Multiples of 10
131407	EJL-HT-T-X4-X4-AX	Lower, Low Profile, High Force	Fine	Aluminum	Multiples of 10
124426	EJU-HT-T-X4-X4-B1	Upper, Low Profile, High Force	Fine	Black	Multiples of 10
124322	EJL-HT-T-X4-X4-B1	Lower, Low Profile, High Force	Fine	Black	Multiples of 10
129217	EJU-HT-T-X4-X4-BX	Upper, Low Profile, High Force	Medium	Black	Multiples of 10
129216	EJL-HT-T-X4-X4-BX	Lower, Low Profile, High Force	Medium	Black	Multiples of 10
131408	EJU-LT-T-X4-X4-AX	Upper, Low Profile	Fine	Aluminum	Multiples of 10
131409	EJL-LT-T-X4-X4-AX	Lower, Low Profile	Fine	Aluminum	Multiples of 10
	EJU-LT-T-X4-X4-B1	Upper, Low Profile	Fine	Black	Multiples of 10
	EJL-LT-T-X4-X4-B1	Lower, Low Profile	Fine	Black	Multiples of 10
126744	EJU-LT-T-X4-X4-BX	Upper, Low Profile	Medium	Black	Multiples of 10
126745	EJL-LT-T-X4-X4-BX	Lower, Low Profile	Medium	Black	Multiples of 10
127761	SC-00237	Screw for Chassis Mounting	M2.5 X 10.5	SS	Pkg of 100
131163	SC-00330	Screw for PCB Mount	M2.5 x 8	SS	Pkg of 25

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358 North Street, Randolph, MA 02368
www.tripleease.com
US Sales: 1-888-444-1644

TRIPLE·E

FEATURES

Ruggedized, all metal, COTS front panels

Conform to IEEE 1101.10 specifications for electrostatic discharge, keying, and hot swap

Designed specifically to withstand rugged applications

All metal construction offers significant improvement over plastic
        No risk of out-gassing or burning in extreme environments

Optional Inegral Printed Circuit Board Holders for Enhanced Performance

Triple E - Ruggedized Eurocard Packaging

Shielded 1101.10 Panel

Standard Sizes: 3Ux4HP, 3Ux8HP, 6Ux4HP, and 6Ux8HP

Standard Panels come with Black Powder Coat DT Style Handles

Unique, robust design for rugged COTS cPCI, VPX, and VME64X applications
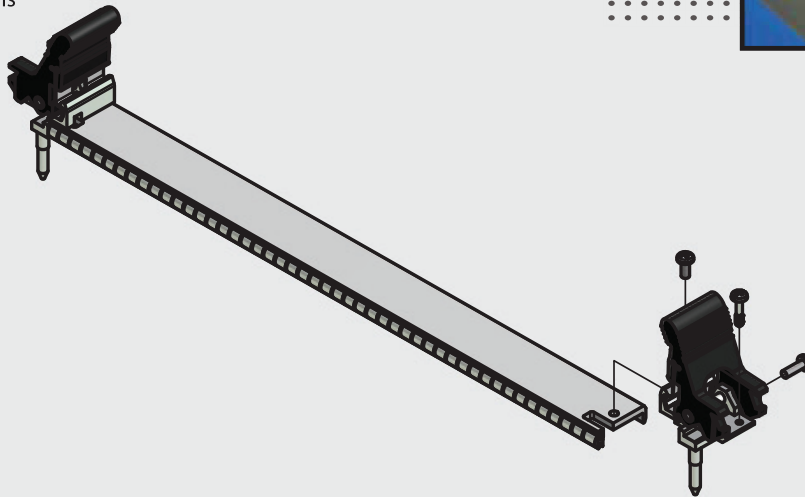
With Be/Cu Gasket

XTech can modify your front panel with finishes, cutouts, and labeling. Contact our Sales Department for more information on customizing your front panels.

Powder Coating

Cutouts

Silkscreening

Contact our Sales Department by phone at 1-888-444-1644 or by email at tripleesales@xtech-outside.com

ONLINE STORE

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RoHS

TECHNICAL SPECIFICATIONS

Kits Include:

Front Panel, Handle(s), PCB Holders (as noted),
Two (2) Plastic Press-In Sleeves, Six (6) Screws for
PCB, Handle, & Chassis Mounting

Standard Features:

Handle: DT in Medium Black Finish
Gasket: Be/Cu
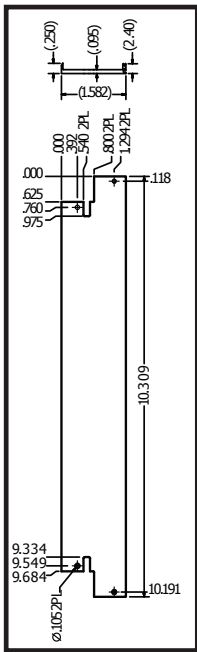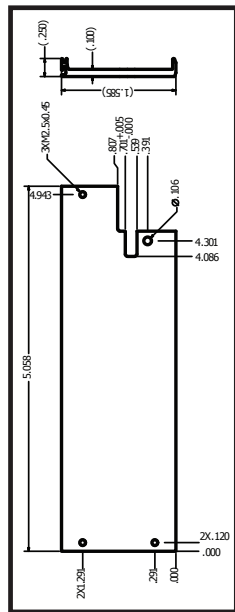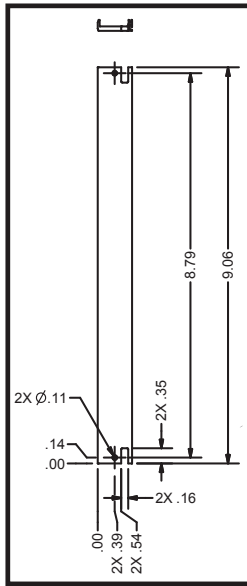Finish: Chromate (RoHS Compliant)

Please Contact Sales for any Substitutions

Front Panels are made of 6005-T5 Series

6U 4HP

3U 4HP

6U 8HP
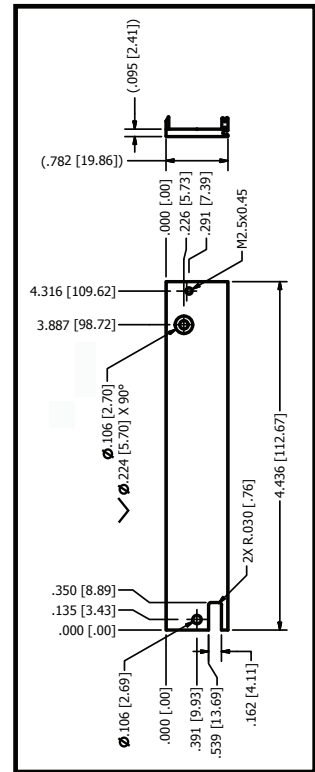
3U 8HP

Integral Printed Circuit Board
Holders are available in the below
configurations as a Special Order.
Please consult Sales for more
information.

Model	Description	Finish	Order Qty
FP-X3-X4-E3-24-BX-IC	3Ux4HP, 1 Free Standing Attached PCB Mount	Clear Chromate	
FP-X6-X4-E1-24-BX-IC	6Ux4HP, 0 Free Standing PCB Mounts	Clear Chromate	
FP-X3-X8-E3-24-BX-IC	3Ux8HP, 1 Free Standing Attached PCB Mount	Clear Chromate	
FP-X6-X8-E1-24-BX-IC	6Ux8HP, 0 Free Standing PCB Mounts	Clear Chromate	
FP-X3-X4-D1-24-BX-IC	3Ux4HP, 2 Free Standing Integral PCB Mounts	Clear Chromate	MOQ 10
FP-X3-X8-D1-24-BX-IC	3Ux8HP, 2 Free Standing Integral PCB Mounts	Clear Chromate	MOQ 10
FP-X3-X8-D2-24-BX-IC	3Ux8HP, 4 Free Standing Integral PCB Mounts	Clear Chromate	MOQ 10
FP-X3-X4-E1-24-BX-IC	3Ux4HP, 1 Free Standing Integral PCB Mount	Clear Chromate	MOQ 10
FP-X3-X8-E1-24-BX-IC	3Ux8HP, 1 Free Standing Integral PCB Mounts	Clear Chromate	MOQ 10
FP-X6-X4-D1-24-BX-IC	6Ux4HP, 2 Free Standing Integral PCB Mounts	Clear Chromate	MOQ 10
FP-X6-X8-D1-24-BX-IC	6Ux8HP, 2 Free Standing Integral PCB Mounts	Clear Chromate	MOQ 10
FP-X6-X8-D2-24-BX-IC	6Ux8HP, 4 Free Standing Integral PCB Mounts	Clear Chromate	MOQ 10

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Rugged Metal Card Guides, Decks, and Frames
## 901 Series for VME, VME64X, VXS, and cPCI

FEATURES

Triple E offers single piece card guides made of extruded aluminum

All metal construction offers significant improvement over plastic
No risk of out-gassing, burning, or breaking in extreme environments

Designed to withstand harsh military and industrial applications

Custom width decks can be configured
Visit our website for more information: www.tripleease.com

Flexible - can be configured to accomodate different board widths

Triple E - Ruggedized Eurocard Packaging
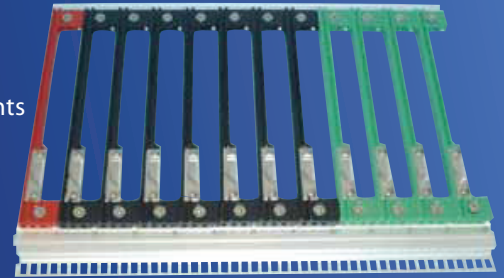
9 0 1   S e r i e s   C a r d   G u i d e

1101.10 Single Card Guide with Interface with Alignment Pin

Sold as Pair of Top and Bottom

ESD Clip is Included and Removable

Gray and Green (PSU) Powder Coat Finish is Standard
Other Finishes Available Upon Request

9 0 1   S e r i e s   C a r d   D e c k

Uses Single 901 Series Card Guides

Sold as Pair of Top and Bottom

Standard Offering is 21 Slots
Contact Sales to Custom Configure Other Slot Widths
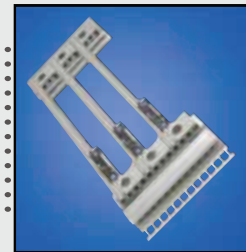
9 0 1   S e r i e s   C a r d   F r a m e

Standard Configuration is 21 Slots, 4HP Spacing
Contact Sales to Custom Configure Other Slot Widths

Perfect Kit for Lab/Prototyping

Flexible - Can be Configured for 4HP, 8HP, and 12HP Pitch to Accomodate
Various Board Widths
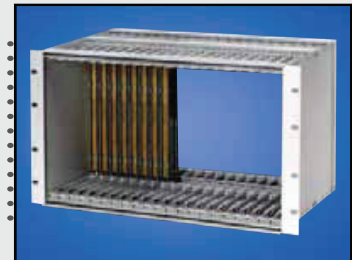
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phone at 1-888-444-1644 or by email
at tripleesales@xtech-outside.com

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RoHS

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Delivery Includes:

Card Decks:
Two (2) Backplane Insulators (.060" thick) for Top and Bottom Rail
Four (4) Nutbars (Zinc Chromated-RoHS Compliant)
Front and Rear Rails (Chromated-RoHS Compliant), Front Rails with Ejector Lip

Subracks:
Two (2) Backplane Insulators (.060" thick) for Top and Bottom Rail
Four (4) Nutbars (Zinc Chromated-RoHS Compliant)
Front and Rear Rails (Chromated-RoHS Compliant), Front Rails with Ejector Lip
Two (2) Flanged Side Plates (Gray Powder Coated)

Complete
901 Card Frame in
Standard 21 Slot Configuration

Standard 901 Card Guide (Gray)
Model: CGS-902-S-01-16-A1
PN: 128549

5.864
4.830
.517
.300
.534
5.330
.267
.310
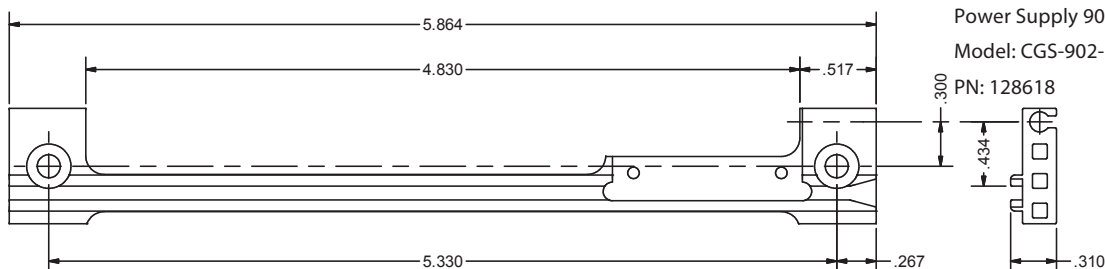
Power Supply 901 Card Guide (Green)
Model: CGS-902-P-01-16-GN
PN: 128618

5.864
4.830
.517
.300
.434
5.330
.267
.310

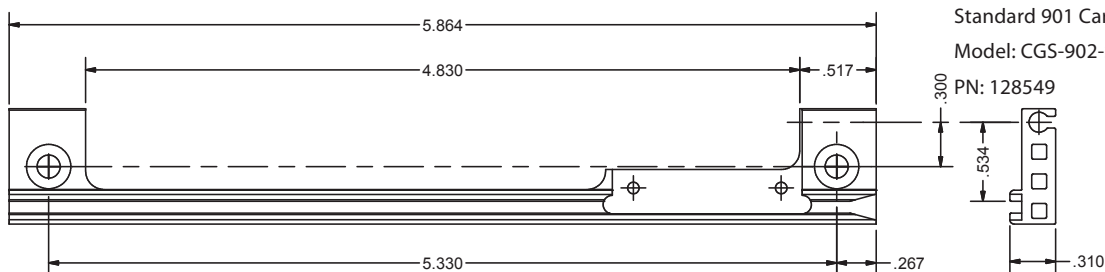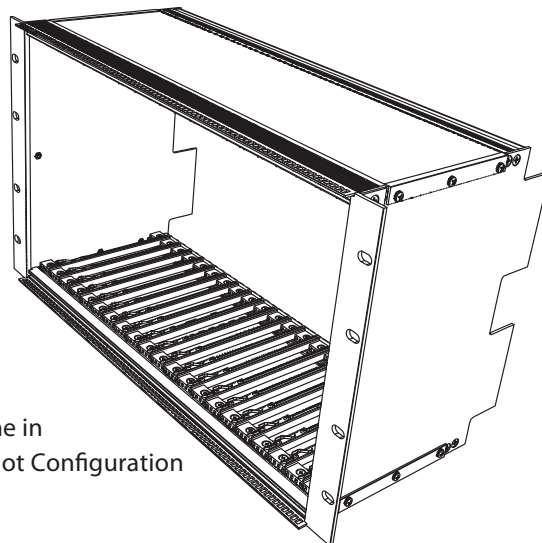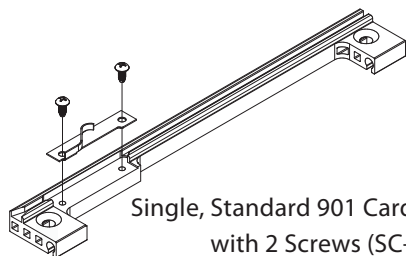Single, Standard 901 Card Guide
with 2 Screws (SC-01248)
and ESD Clip

PN	Model	Description	Finish	Color	Order Qty
128549	CGS-902-S-01-16-A1	160mm, 1 Slot, with Clip	Powder Coat	Gray	
128618	CGS-902-P-01-16-GN	160mm, 1 Slot for PSU, with Clip	Powder Coat	Green	
128502	CGS-902-R-01-08-A1	80mm, RTM 1 Slot, with Clip	Powder Coat	Gray	

PN	Model	Description	Finish	Color	Order Qty
131393	GDCT-21-16-S-A-IC	21 Slot 160mm Card Guides, 85HP Wide	Chromate		MOQ 5
131394	GDCT-21-16-S-A-A1	21 Slot 160mm Card Guides, 85HP Wide	Powder Coat	Gray	MOQ 5

PN	Model	Description	Finish	Color	Order Qty
131392	CC90-6U-21-160-19-A1	21 Slot, 6U, 160mm, with Flanges	Powder Coat	Gray	MOQ 5

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Rugged Metal Card Guide Decks and Frames
MaxAir Series for VME, VME64x, VXS, and cPCI

TRIPLE·E

FEATURES

Triple E offers patented card guides made of extruded aluminum

All metal construction offers significant improvement over plastic
      No risk of out-gassing, burning, or breaking in extreme environments
      Allows for greater air flow and heat dissipation than plastic

Designed to withstand harsh military and industrial applications

Custom sizes can be accomodated via different length extruded guides
      Visit our website for more information

Triple E - Ruggedized Eurocard Packaging

MaxAir Series Card Decks
1101.1 and 1101.11 Versions

Available in 1101.1 and 1101.10 Configurations

Standard Slot Number is 21, Custom Sizes Available

Sold as a Set (Top and Bottom Guide Decks)
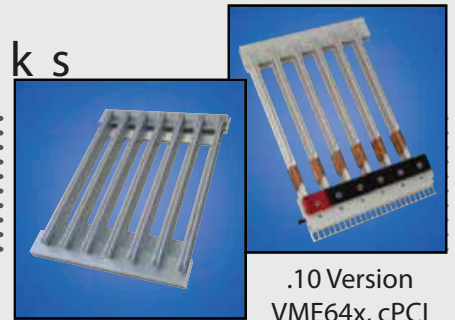
.10 Version
VME64x, cPCI

.1 Version
VME

MaxAir Series Card Frame
1101.1 and 1101.11 Versions

Uses MaxAir .1 or .10 Card Decks

Lengths of 240mm and 340mm are Available as Special Order

Standard Offering is 21 Slots
  Contact Sales to Custom Configure Other Slot Widths

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18

Delivery Includes:

Card Decks:
Two (2) Nutbars (Zinc Chromated-RoHS Compliant)
Top and Bottom Rail (Chromated-RoHS Compliant)

Version .10 Also ESD/Ground Clips and One (1)
Insulating Strip per Guide

Version .1 Also Backplane Insulating Strip for Top and
Bottom Rails

Subracks:
Center Rail (Chromated-RoHS Compliant)
Nut Bar (Zinc Chromated-RoHS Compliant)
Insulating Strip
Two (2) Flanged Side Plates (Gray Powder Coated)

Version .10 Also Gaskets on Flanges & Trim Strips and
Top & Bottom Vented Covers (Gray Powder Coated)

Complete MaxAir Card Frame
in Standard 21 Slot Configuration

MaxAir
Pressed-In Card Deck
Top View

.800

.531

.080
TYP

.200
TYP
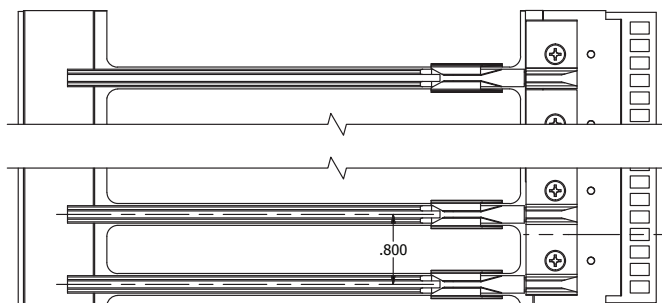
MaxAir
Pressed-In Card Deck
Front View
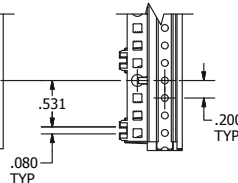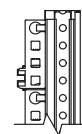
CARD GUIDE

ESD CLIP

MaxAir
Pressed-In Card Deck
Side View
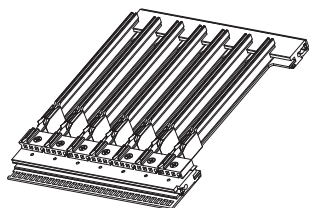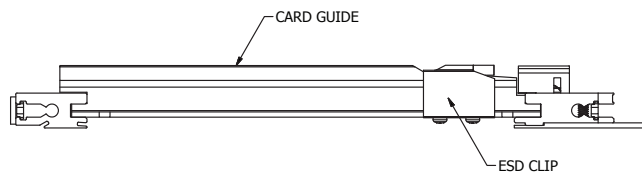
Standard MaxAirCard Deck
with Front Ejector Lip
and ESD Clips

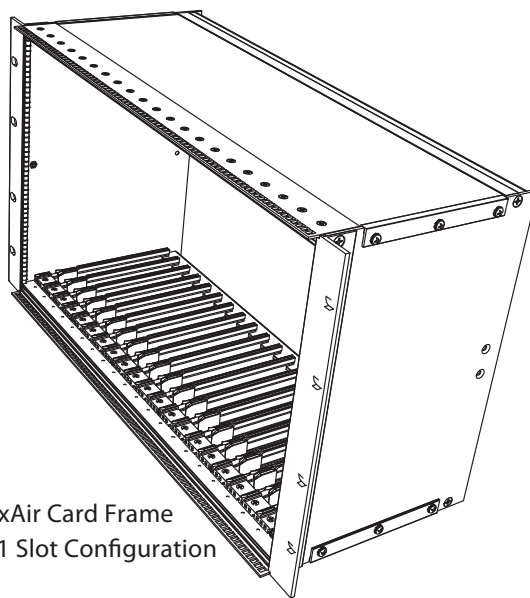| PN	Model	Description	Finish	Color	Order Qty
130830	GDMT-21-16-S-4-N-IC	21 Slot 160mm Card Guides, 85HP Wide-1101.10	Clear Chromate		
131400	GDMT-21-16-S-4-N-A1	21 Slot 160mm Card Guides, 85HP Wide-1101.10	Powder Coat	Gray	
131070	GDMV-21-16-S-4-N-IC	21 Slot 160mm Card Guides, 85HP Wide-1101.1	Clear Chromate		
131401	GDMV-21-16-S-4-N-A1	21 Slot 160mm Card Guides, 85HP Wide-1101.1	Powder Coat	Gray	

PN	Model	Description	Finish	Color	Order Qty
131403	CC01-6U-21-160-19-A1	21 Slot, 6U, 160mm, With Integral Flanges-1101.1	Powder Coat	Gray	MOQ 5
131402	CC10-6U-21-160-19-A1	21 Slot, 6U, 160mm, With Removable Flanges-1101.10	Powder Coat	Gray	MOQ 5
131406	CC11-6U-21-160-19-A1	21 Slot, 6U, 160mm, With Removable Flanges and Rear I/O-1101.10	Powder Coat	Gray	MOQ 5

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Triple E Solutions -

Helping to Solve your Mechanical Packaging Challenges with Products that Perform!

From standard components to customized mechanical eurocard solutions - the Triple E applications engineering team will work with you to configure the solution which best meets your requirements.

We offer a full range of standard components - from front panel extractors to fully assembled custom card cages.

Vibration an issue?

Take a look at our front panel solutions with integral board mounts, eliminating the screw attachment of a key component.

Extractor Breakage?

Check out the all metal Triple E handles for VME, VME 64X, VXS, and now an all new VPX handle. They feature all metal construction and are available in a variety of finishes.   From stainless springs, to die cast bases to all metal extractors - the Triple E handles are all about ruggedized performance.

Board Stability a Problem?

In high vibration or shock environments - card guide stability and rail rigidity are often a major challenge. Triple E offers a wide range of solutions including:

• Ruggedized rails - heavy duty rails to provide a strong, more rigid card cage

• All Metal Card guides (with or without ESD clip) - minimize any bending or flexing which might occur. In addition they are secured to rail which eliminates the possibility that they would 'pop' out in a high shock event.

• Rail Wear - in a high vibration environment - concerns over wear on the front lip of the rail can occur. To address this - Triple E offers a stainless front lip option on IEEE 1101.10 rails.
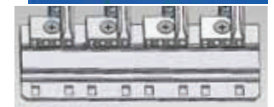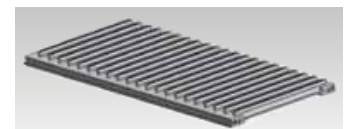
Bottom Line - When it comes to performance in Eurocard Packaging - Triple E is the solution!

Triple E Online Store -

Buy blank panels, ejectors, card guides, and compnents now!
Best for quick prototypes, small orders, and replacement parts

Visit www.tripleease.com to learn about all our products. From the product pages, you can request a sample or download drawings and STP models. Then buy right away by clicking on the store button-which will take you directly to the product's store page.

On the store, you can see pricing, quantity breaks, lead time, and even estimated shipping costs before you buy. We also post datasheets at the top of each store page, so you have dimensional drawings and special configuration options right at your fingertips.

ONLINE STORE

Triple E Accessories

Screws
Coding Keys
PCB Holders
Be/Cu Gasket

VME Ejectors

Single Cam Ejectors
Twin Cam Ejectors
in a variety of finishes

Triple E Accessories

Screws
Coding Keys
PCB Holders
Be/Cu Gasket

Dot Ten Ejectors

DT-Standard
LT-Low Profile
HT-High Torque
in a variety of finishes

Front Panel Kits

3Ux4HP, 3Ux8HP
6Ux4HP, 6Ux8HP
*includes all the hardware to
build your own blank panel*

Terms & Conditions: All online orders must have a subtotal greater than $100 to be processed.

Email tripleesales@xtech-outside.com for more information and visit www.tripleease.com to view all of our products, find datasheets, and download STP models of our standard products.

Glossary

1U Height is specified by the unit 'U' ('Unit'), with 1 U being 1.75 inches (44.5 mm).

6063 Aluminum AA 6063 is an aluminium alloy, with magnesium and silicon as the alloying elements. The standard controlling its composition is maintained by The Aluminum Association. It has generally good mechanical properties and is heat treatable and weldable. It is similar to the British aluminium alloy HE9. 6063 is mostly used in extruded shapes for architecture. It is typically produced with very smooth surfaces fit for anodizing.

6005 Aluminum Alloy Aluminum alloy 6005/6005A is a medium strength, heat treatable alloy with excellent corrosion resistance. Alloy 6005/6005A has properties between those of alloys 6106 and 6082 and can sometimes be used interchangeably with these alloys but 6005/6005A has better extrusion characteristics. It has a better mill surface finish, but it is difficult to produce thin-wall complicated shapes in 6005/6005A.

6063-T5 T5 temper 6063 has an ultimate tensile strength of at least 22,000 psi (152 MPa) in thicknesses up to 0.5-inch (13 mm), and 21,000 psi (145 MPa) from 0.5 to 1.0-inch (25 mm) thick, and yield strength of at least 16,000 psi (110 MPa) up to 0.5-inch (13 mm) and 15,000 psi (103 MPa) (from 0.5 to 1.0-inch (25 mm). It has elongation of 8%.

CPCI - CompactPCI CompactPCI (cPCI) system is a 3U or 6U Eurocard-based industrial computer, where all boards are connected via a passive PCI backplane. The connector pin assignments are standardized by the PICMG US and PICMG Europe organizations. The connectors and the electrical rules allow for 8 boards in a PCI segment. Multiple segments are allowed with bridges.

EIA - Electronic Industries Alliance The Electronic Industries Alliance (EIA, until 1997 Electronic Industries Association) is a trade organization composed as an alliance of trade associations for electronics manufacturers in the United States. Those associations in turn govern sectors of EIA standards activity. The associations include: ECA – The Electronic Components, Assemblies, and Materials Association, GEIA – The Government Electronics and Information Technology Association, JEDEC – The JEDEC Solid State Technology division, formerly Joint Electron Devices Engineering Councils, TIA – The Telecommunications Industry Association. EIA is accredited by ANSI to help develop standards on electronic components, consumer electronics, electronic information, telecommunications, and Internet security. The recommended standards (formerly designated as RS-#, currently EIA-#) are designed so that manufacturer's equipment can be interchanged and compatible.

Front Panel The official definition of a front panel is: "Any type of metal or plastic plate designed to fit over a device or computer component to enhance the device's functionality or its looks." As it relates to circuit boards, the terms front panel and face plate are often used interchangeably. They are typically metal panel which enable a board to be attached/installed in a chassis, and to facilitate attaching cabling/connectors. The metal plate also protects the board from environmental factors and tampering.

HP Width is specified by the unit 'HP' ('Horizontal Pitch') or 'T' with 1 HP equal to 0.20 inches (5.08 mm).

IEEE1101.1 IEEE Std 1101.1 – 1998 IEEE Standard for Mechanical Core Specifications for Microcomputers Using IEC 60603-2 Connectors. The basic dimensions of a range of modular subracks conforming to 60297-3 (1984-01) and 60297-4 (1995-03) for mounting in equipment according to 60297-1 (1986-09) and 310-D-1992, together with the basic dimensions of a compatible range of plug-in units, printed boards, and backplanes, are covered. The dimensions and tolerances necessary to ensure mechanical function compatibility are provided. This standard offers total system integration guidelines with attendant advantages, such as reduction in design and development time, manufacturing cost savings, and distinct marketing advantages.

IEEE1101.10 IEEE Std 1101.10 – 1996 IEEE Standard for Additional Mechanical Specifications for Microcomputers Using the IEEE Std 1101.1-1991 Equipment Practice. A generic standard that may be applied in all fields of electronics where equipment and installations are required to conform to the 482.6 mm (19 in) equipment practice based on IEEE 1101.1-1991, IEC 297-3 (1984), and IEC 297-4 (1995). Dimensions are provided that will ensure mechanical interchangeability of subracks and plug-in units.

Mill Finish The natural appearance of aluminum as it comes from the rolling mill (Alcoa, Reynolds, Kaiser, or Alcan) or the extrusion mill. It is "as is" with no external mechanical or chemical finishing. Extruded metal is considered "mill finish."

PICMG (PCI Industrial Computers Manufacturers Group) A consortium of companies who collaboratively develop open specifications for high performance telecommunications and industrial computing applications. The consortium members have a long history of developing leading edge products.

The Shingo Prize Named for Japanese industrial engineer Shigeo Shingo. Established in 1988 as the standard of excellence to educate, assess, and recognize organizations that achieve the highest level of world-class operational excellence. The philosophy behind the prize is that sustainable results are achieved through the application of universal, self-evident principles of operational excellence plus the alignment of management systems and improvement techniques through the entire organization. The Prize is administered by the Jon M. Huntsman School of Business at Utah State University. www.shingoprize.org

VITA - VMEBUS INDUSTRY TRADE ASSOCIATION Accredited as an American National Standards developer and a submitter of Industry Technical Agreements to the IEC, the VITA Standards Organization provides its members with the ability to develop and promote open technology standards. The VSO has created more than 30 standards in the past 10 years that promote open technology systems. No one member decides which technology becomes standard, it is a membership-wide decision.

VME VMEbus is a computer bus standard, originally developed for the Motorola 68000 line of CPUs, but later widely used for many applications and standardized by the IEC as ANSI/IEEE 1014-1987. It is physically based on Eurocard sizes, mechanicals and connectors (DIN 41612), but uses its own signalling system. It was first developed in 1981 and continues to see widespread use today.

VPX VPX, formerly known as VITA 46, is an ANSI standard (ANSI/VITA 46.0-2007) that provides VMEbus-based systems with support for switched fabrics over a new high speed connector. Defined by the VITA (VME International Trade Association) working group (comprising major industry organizations such as Boeing, Curtiss-Wright, Elma Electronic, GE Fanuc Embedded Systems, Hybricon, Kontron, Mercury Computer Systems and Northrop Grumman), it has been designed specifically with defense applications in mind, with an enhanced module standard that enables applications and platforms with superior performance. VPX retains VME's existing 6U and 3U form factors, supporting existing PCI Mezzanine Card and XMC mezzanines (PMC with high-speed serial fabric interconnect), and maintaining the maximum possible compatibility with VMEbus.

VXS ANSI/VITA 41, VMEbus Switched Serial or VXS, is an ANSI standard that combines parallel VMEbus with enhancements to support switched serial fabrics including PCI Express, RapidIO, StarFabric and InfiniBand over a new high speed P0 connector. Backward compatibility is maintained with existing backplanes that do not have a conflicting P0 scheme. Combining the VME2eSST parallel bus with switch fabric technologies for multi-point, high-speed data transfers creates choices for embedded computing designs of all types. The standard also incorporates ANSI/VITA 1.7, allowing more DC power input into each board.

TRIPLE E – PROVIDING RUGGEDIZED SOLUTIONS GLOBALLY

For ITAR requirements for North American Customers, Triple E products are manufactured in our ITAR compliant facility in Randolph, Massachusetts. In Randolph, we have a full range of design, quality, and manufacturing services to support our customers throughout the product lifecycle.

For international or non-ITAR requirements – we have global support and manufacturing capabilities with two facilities in China.

With a focus on eurocard based solutions, Triple E offers VME, CPCI, VXS, and VPX solutions – including ejectors, front panels, card guides and card cages, as well as integrated solutions.

Markets served include Security and Defense, Aerospace, Transportation, Energy, and other applications where ruggedized performance is key. Contact our applications engineering team at tripleesales@xtech-outside.com for assistance with your application requirements.

	USA Randolph, MA	CHINA Xiamen
Square ft	60,000	20,000
Extrusions	Y	OS
Engineering	Y	Y
Fabrication	Y	OS
Finishing	Y/OS	OS
Die Cast	OS	OS
Assembly	Y	Y
Sales	Y	Y
Supply Management	Y	Y
ISO9000	Y	Y

OS – Manufacturing Partners

MANUFACTURING CAPABILITIES

Manufacturing of Triple E products is vertically integrated enabling us to be more responsive to your lead-time and support requirements. From standard components off-the-shelf to customized configurations, our focus is on eurocard front panels, card cages, and enclosures. This enables us to optimize our capabilities to best meet customer demands. Our advanced in-house manufacturing equipment includes:

- 8" Extrusion press
- CNC machines
- High-speed routers
- Press brakes
- Turret punch presses
- Flat bed presses
- Powder coat line
- Time savers
- EDM machines
- Tool-making shop
- Full assembly area
- High efficiency in-line machines

ISO9000:2008 CERTIFIED COMPANY

Our vertically integrated manufacturing for front panels – includes both sheet metal fabrication and aluminum extruding. This truly differentiates us from other front panel suppliers. A core competency of the company is the design and manufacture of front panels and extrusions. Specific products include aluminum extruded products – front panels (with and without integral pb holders), extruded aluminum enclosures, circuit board extractors and custom aluminum extrusions, with a complete range of secondary manufacturing, assembly and finishing services.

ALUMINUM EXTRUSION CAPABILITIES
- Fully Equipped Aluminum Billet Extrusion Press
- 2400 ton Capability With a Maximum Die Diameter of 8.0" (4" Diameter in Xiamen)
- Extrudes at a Rate of 40' – 50' per Minute, From Billets in Excess of 100 lbs
- Fully Automated Handling System
- Capable of Handling a Wide Range of Volumes and Configurations

MANUFACTURING, ASSEMBLY AND FINISHING CAPABILITIES
- Die Casting
- CNC Machining
- Punch Presses
- Time Saver / Graining

SHEET METAL FABRICATION CAPABILITIES
- Turret Presses
- Press Brakes
- Aluminum or Steel
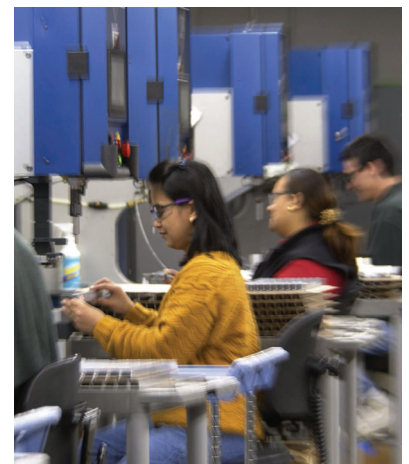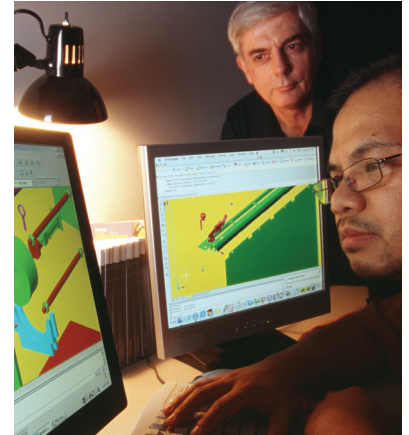- Wide Range of Standard Punch Tooling

ASSEMBLY CAPABILITIES
- Assemble Hardware, Handles, LED's, Gasketing, Connectors, Panels
- Installation of PEM's, Alignment Pins, PCB Holders

TRIPLE E ASSEMBLY AND FINISHING SERVICES FINISHING CAPABILITIES
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