

# THE IDEA BOOK

## ExaMAX Cable Solutions Guide



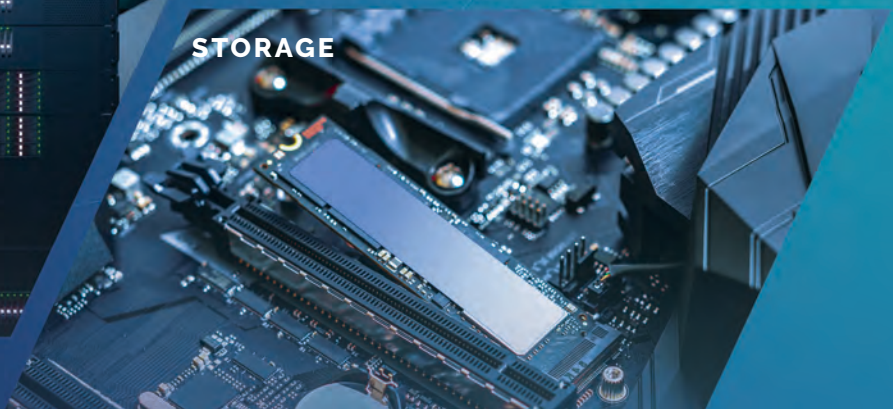
NETWORKING



TELECOM



SERVER



STORAGE

**Browse our new IDEA BOOK to see how Amphenol can create custom cabling solutions and configurations to meet your specific design requirements. The ExaMAX® I/O system is highly scalable and modular and is able to fit in almost any application.**

Amphenol's ExaMAX® I/O system offers cable assemblies and I/O connector solutions for both internal and external applications. ExaMAX® I/O products are capable of delivering high speed performance of 112Gb/s and beyond. The ExaMAX® I/O system delivers superior linear board signal density and meets the performance requirements of next gen standards.

# ExaMAX<sup>®</sup> IO Connector System

**ExaMAX<sup>®</sup> I/O system offers cable assemblies and I/O connector solutions for both internal and external applications.**



ExaMAX<sup>®</sup> I/O products are capable of delivering high speed performance of 25 Gb/s per channel with a path to 40 Gb/s and higher. The ExaMAX<sup>®</sup> I/O system delivers superior linear board signal density and meets the performance requirements of the OIF-CEI- 25G-LR industry standard.

The internal I/O system is offered in both cabled backplane and point-to-point internal cables that feature positive latching and integrated guidance to ensure a robust interconnection. The internal system is designed as a direct replacement for a vertical header connector on a backplane and/or midplane using hard metric design guidelines. OverPass applications can be designed to attach to Amphenol near chip connectors for customer-specific applications.

The external cable system features robust metal die castings in various exit configurations coupled with a braided shield and EMI gasket system to assure reliable EMI performance. Jackscrew mechanical mounting provides robust and flexible strain relief solutions.

Amphenol Cable Backplane Systems is able to create custom cabling solutions and configurations to meet specific design requirements. The ExaMAX<sup>®</sup> I/O system is highly scalable and modular and has the ability to fit in almost any application.

## FEATURES

- Capable of supporting 25Gb/s data rates
- Revolutionary beam-on-beam contact interface
- Hermaphroditic mating interface protects mating beams
- Efficient 92Ω design
- Internal & external IO systems
- Modular & scalable design
- Engineered wire management & termination
- Utilizes either ribbonized or individual twin-axial cable
- Integration of float, alignment and keying - all in one system
- Extra pins available for applications needing low speed/diagnostic signals

## BENEFITS

- Supports present and future data rate bandwidth needs without costly re-design or re-qualification
- Superior signal integrity performance due to minimized stub and impedance control; 40% lower mating force
- Durable, reliable and protected interface eliminates pin stubbing/ crushing
- Allows for support of both 85 and 100Ω systems
- Addresses IO needs whether for inside the box or outside the box cabling applications
- Enables designers to accommodate varying signal pair counts using different product configurations
- Impedance maintained and cross talk minimized in the wire termination area
- Accommodates either planar or single differential pair cable construction across different AWG wire sizes
- Address system tolerances, blind mating and proper keying considerations
- Offers designers the option to add low speed signaling when required with no major revisions needed to the IO system

## TARGET MARKETS



Switch  
Router and Server  
Wireless Base Station  
Telecom



Consumer Electronics  
Datacom/Networking Equipment  
Hubs  
Data center switching applications

# ExaMAX2<sup>®</sup> Cable Assembly

## ExaMAX2<sup>®</sup> Cable Blackplane System



ExaMAX2<sup>®</sup> Cable Backplane Systems offer high density cable assemblies for both internal and external applications that are capable of delivering high speed performance of 112Gb/s per channel. ExaMAX2<sup>®</sup> cable applications include internal OverPass™ cables, external I/O cables, cabled midplane and cabled backplane.

- 112G performance with backward compatibility to ExaMAX<sup>®</sup> and ExaMAX+<sup>®</sup>
- Durable, reliable and protected interface eliminates pin stubbing
- Supports both 85Ω and 100Ω systems
- Fully passive copper connector and cable performance to optimize system costs
- Addresses system tolerances, blind mating and proper keying

### FEATURES

- Capable of supporting 112Gb/s data rates
- Revolutionary beam-on-beam contact interface
- Hermaphroditic mating interface protects mating beams
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### BENEFITS

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- Addresses IO needs for both inside the box and outside the box cabling
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- Accommodates either planar or single differential pair cable construction
- Address system tolerances, blind mating and proper keying
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## TECHNICAL INFORMATION

### MATERIAL

- Contacts: High performance Copper Alloy
- Plating(s): Performance-based plating at separable interface (Telcordia GR-1217-CORE) Tin over Nickel on press-fit tails
- Housings: High Performance Thermoplastic, UL94-VO
- Raw Cable: Ag plated copper conductors with foam insulation covered by conductive foil

### MECHANICAL PERFORMANCE

- Mating Force: 0.45 N max. per contact
- Unmating Force: 0.1 N min. per contact
- Press-fit Insertion Force: 15 N max. per contact
- X and Y gatherability of +/- 1.4 mm
- Cable Strain Relief: 100 N min. when axial load is applied directly to cable
- Panel Retention Frame: 120 N min. when axial load applied to cable latched in frame

### ELECTRICAL PERFORMANCE

- Contact Resistance: 10 mΩ max - change from initial reading
- Current Rating (less than 30°C temperature rise above ambient): signal contact: 0.50 Amps/ contact - ground contact: 2 Amps/contact
- Operating Voltage: 50 VAC RMS

### APPROVALS AND CERTIFICATIONS

- EIA 364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- IC 60512: Connectors for Electronic Equipment -Tests and Measurement

### ENVIRONMENTAL

- Telcordia GR-1217-CORE Central Office qualification pending

### SPECIFICATION

- Amphenol Product Specification: GS-12-1184
- Amphenol Application Specification: GS-20-0361

### PACKAGING

- Cable Packaging Specification: GS-14-1272

### TARGET MARKETS/APPLICATIONS



Switch  
Router and Server  
Wireless Base Station  
Telecom



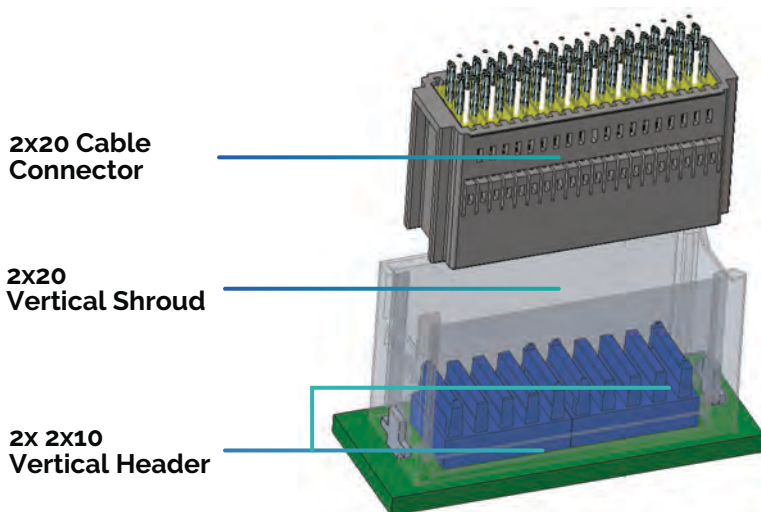
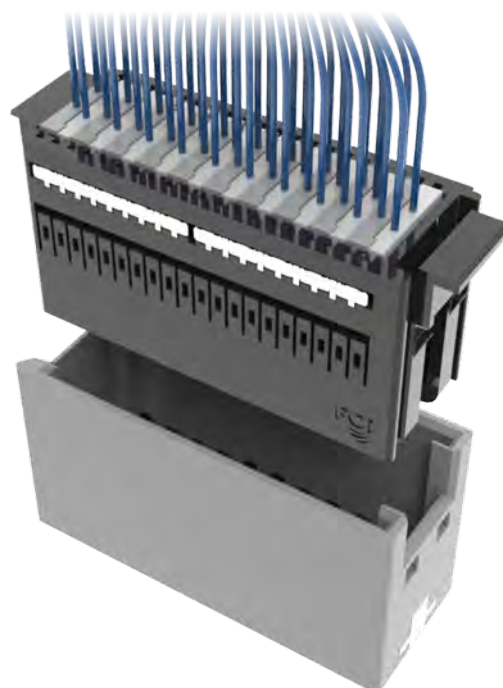
Consumer Electronics  
Datacom/Networking Equipment  
Hubs  
Data center switching applications  
Storage System  
Supercomputer  
High Density Ethernet Switching/Routing Products



Medical Diagnostic Equipment

# ExaMAX 2-Pair Cable Solutions

Optimized for UPI applications



Pairs per Column	2 Pairs
Columns per Connector	6 – 20
Diff Pairs Per Cable	12 – 40
Cable Gender	Female
Mating Connector	Vertical Header
Application Examples	OverPass
Protocol Examples	PCIe & UPI
Industry Specifications	Meets environmental, health and safety

## CONFIGURATION EXAMPLES



2x18 housing without guide module



2x18 housing with latch



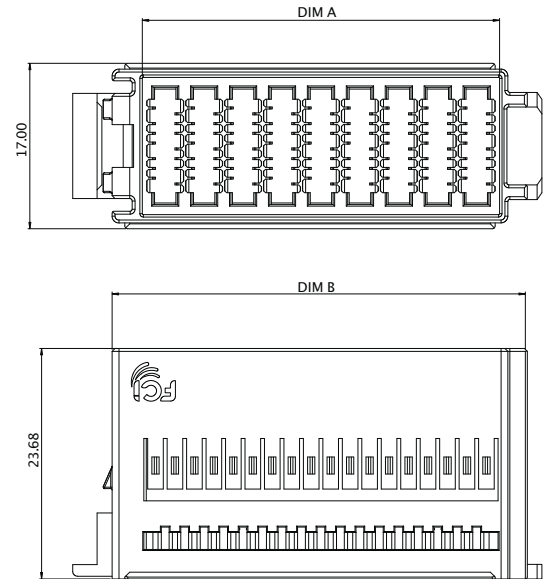
2x20 housing without latch



## Cable Connector Configurations

### CABLE CONNECTOR AVAILABILITY AND DIMENSIONS

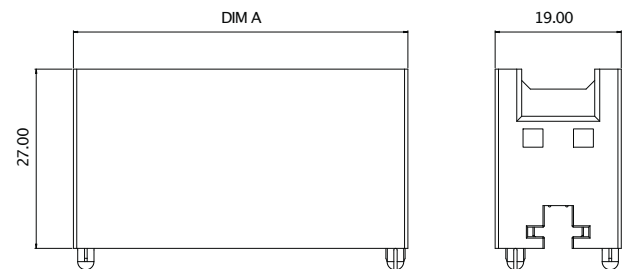
2 Pair Housing P/N	Columns	DIM A	DIM B	Tooling
10135860-006	6	12.7	18.65	N
10135860-008	8	23.15	29.1	Y
10135860-010	10	20.7	26.65	N
10135860-012	12	24.7	30.65	N
10135860-014	14	28.7	34.65	N
10135860-016	16	32.7	38.65	N
10135860-018	18	36.7	42.65	Y
10135860-020	20	40.7	46.65	Y
10135860-020A	20	40.7	46.65	Y



## Latching Shroud & Mating Board Connector

### SHROUD AVAILABILITY AND DIMENSIONS

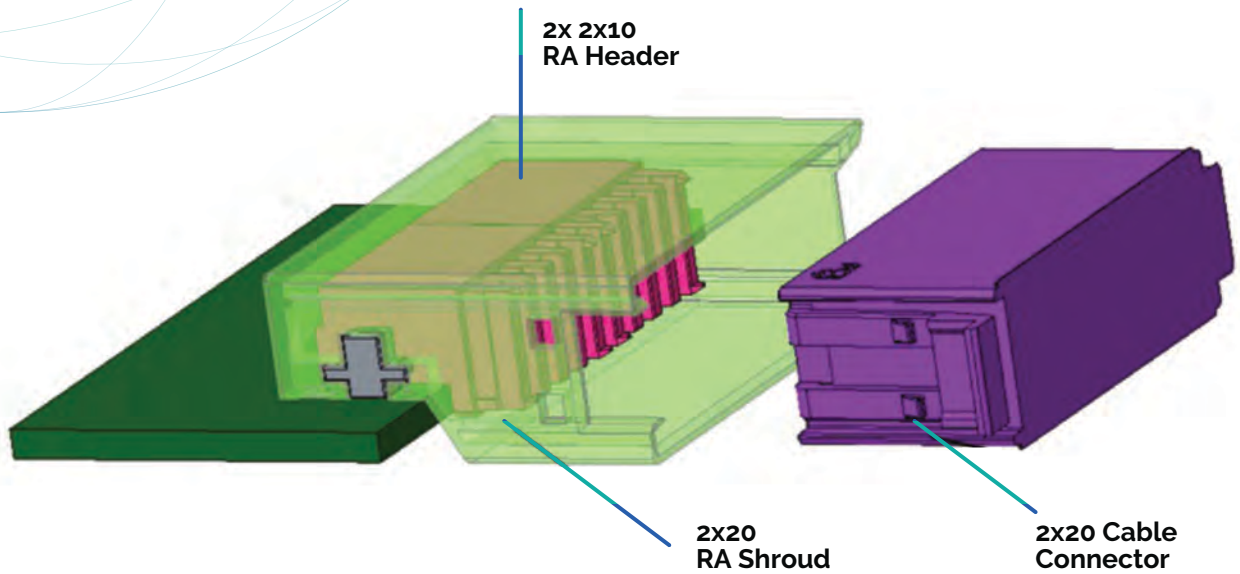
2 Pair Shroud P/N	Columns	DIM A	Tooling
10135764-006	6	22.4	N
10135764-008	8	26.4	N
10135764-010	10	30.4	N
10135764-012	12	34.4	N
10135764-014	14	38.4	N
10135764-016	16	42.4	N
10135764-018	18	46.4	N
10135764-020	20	50.4	Y



### MATING BOARD CONNECTORS

2 Pair Vertical Header P/Ns	
2X6	10128334-101LF
2X8	10124412-101LF
2X10	10124414-101LF

# ExaMAX 2-Pair Cable Solution With RA

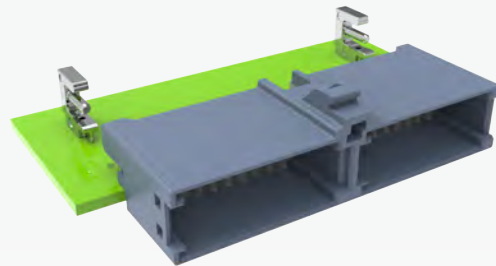


Pairs per Column	2 Pairs
Columns per Connector	4 – 20
Diff Pairs Per Cable	8 – 40
Cable Gender	Female
Mating Connector	Right Angle Header
Application Examples	OverPass

## CONFIGURATION EXAMPLES

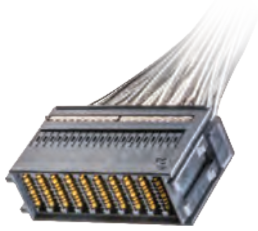


2x18 housing



2x18 dual port frame

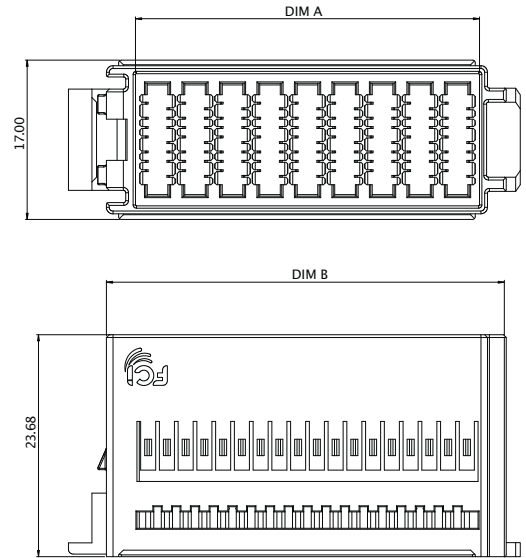




## Cable Connector Configurations

### CABLE CONNECTOR AVAILABILITY AND DIMENSIONS

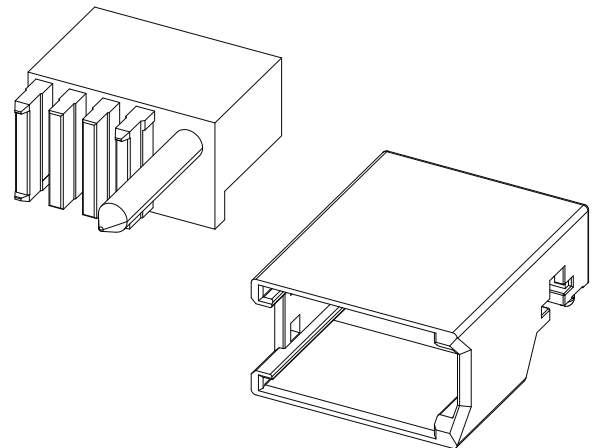
2 Pair Housing P/N	Columns	DIM A	DIM B	Tooling
10135860-004	4	8.7	14.65	N
10135860-006	6	12.7	18.65	N
10135860-008	8	23.15	29.1	Y
10135860-010	10	20.7	26.65	N
10135860-012	12	24.7	30.65	N
10135860-014	14	28.7	34.65	N
10135860-016	16	32.7	38.65	N
10135860-018	18	36.7	42.65	Y
10135860-020	20	40.7	46.65	Y



## Latching Shroud & Mating Board Connector

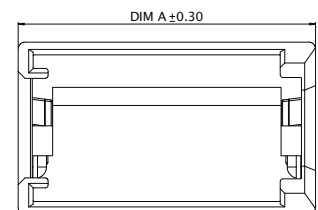
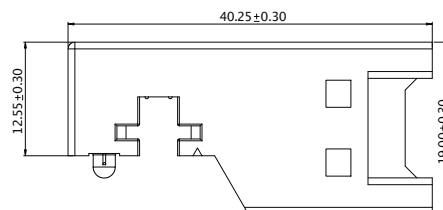
### SHROUD AVAILABILITY AND DIMENSIONS

2 Pair Shroud P/N	Columns	DIM A	Tooling
10139991-104LF	4	18.4	N
10139991-106LF	6	22.4	N
10154950-108LF	8	32.85	Y
10139991-110LF	10	30.4	N
10139991-112LF	12	34.4	N
10139991-114LF	14	38.4	N
10139991-116LF	16	42.4	N
10139991-118LF	18	46.4	N
10139991-120LF	20	50.4	N

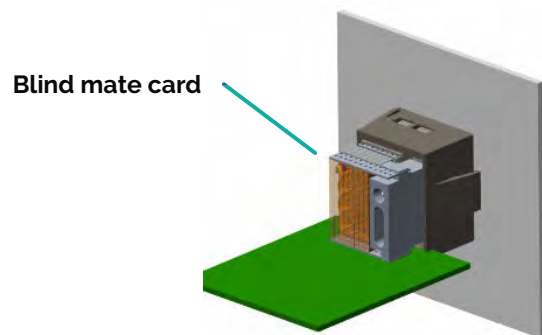
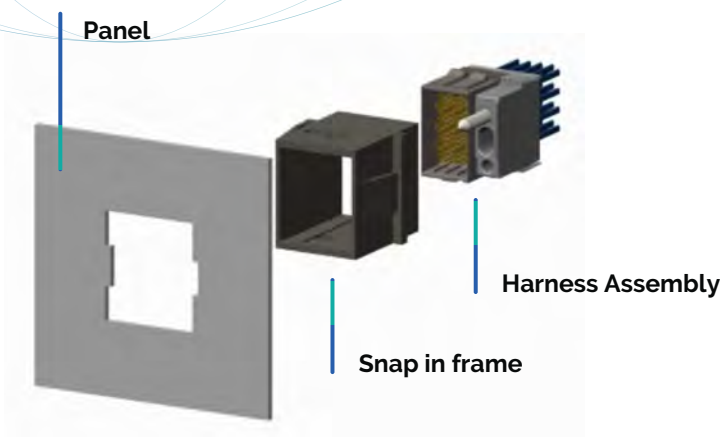


### MATING BOARD CONNECTORS

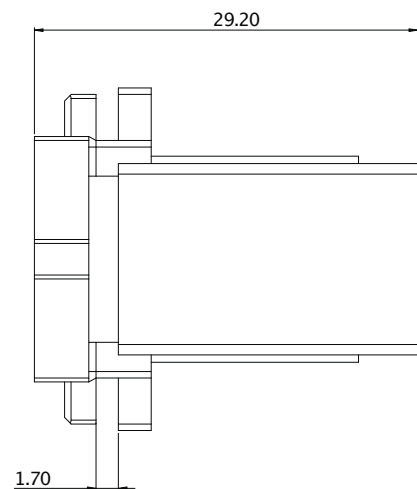
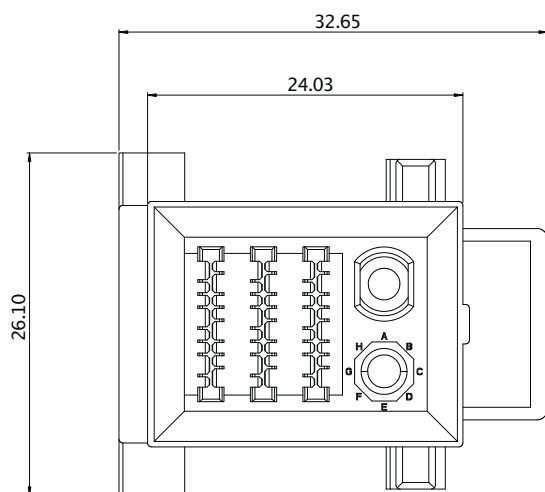
2 Pair Vertical Header P/Ns	
2X6	10128401-101LF
2X8	10128403-101LF
2X10	10128405-101LF



# ExaMAX 2-Pair Blind Mate Panel Mount Solution



Pairs per Column	2 Pairs
Columns per Connector	6
Diff Pairs Per Cable	12
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	Overpass



# ExaMAX 4-Pair Blind Mate Panel Mount Solution

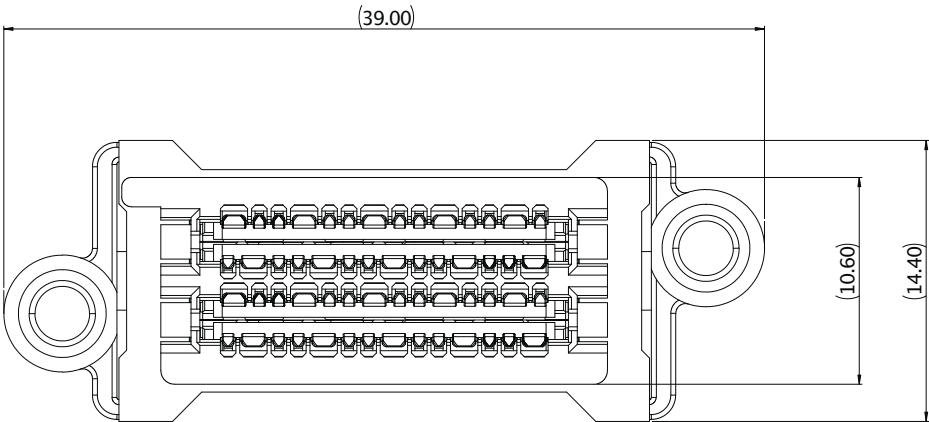


PART NUMBER: ExaMAX® - 10139215-101LF

Pairs per Column	4 Pairs
Columns per Connector	4
Diff Pairs Per Cable	16
Cable Gender	Female
Mating Connector	Vertical Header
Application Examples	Internal IO

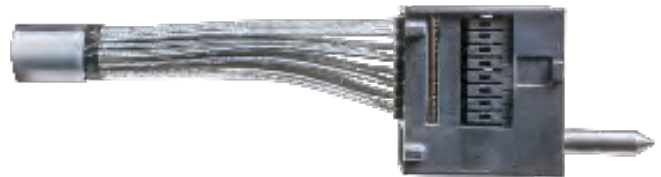
4x4 housing: 10136826-001 (tooled), female  
ASM: 10136508

PART NUMBER: ExaMAX® - 10139215-101LF

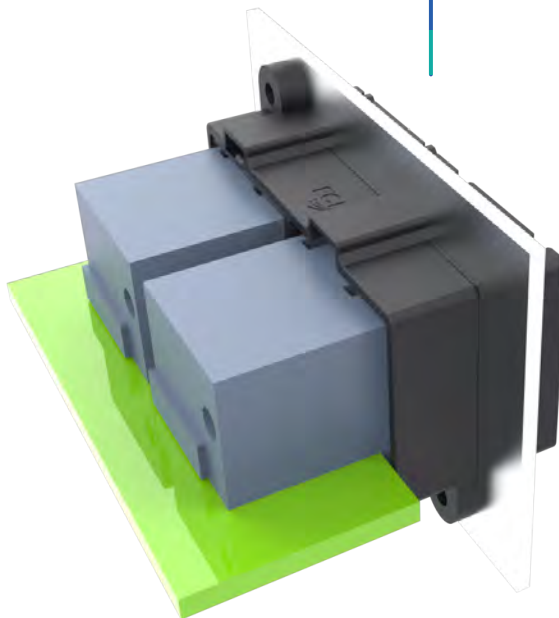


4x4 VH P/N: 10139215-101LF (tooled)

# ExaMAX 4-Pair Blind Mate Panel Mount Solution



Panel Mount Frame

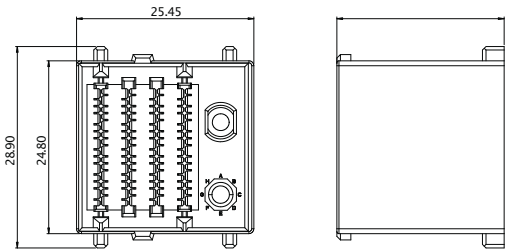


4x8 male ExaMAX

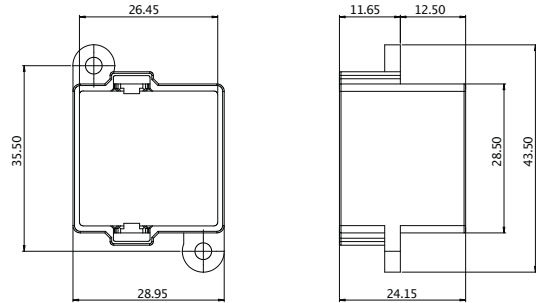
Pairs per Column	4 Pairs
Columns per Connector	8, 10
Diff Pairs Per Cable	32, 40
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	Overpass

# Cable Connector Configurations

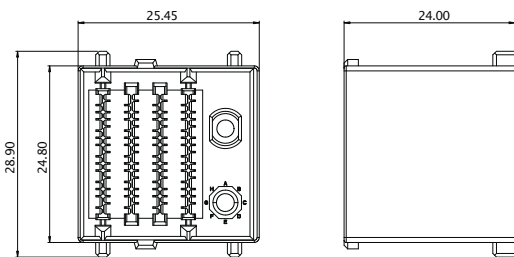
4x8 left guide pin housing-10126109-001 (tooled)



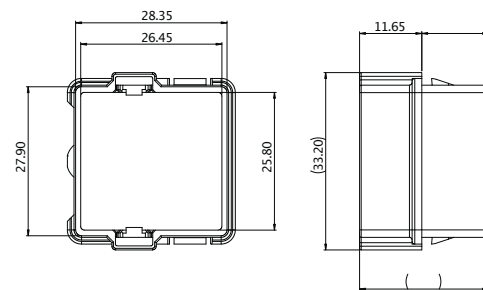
4x8 screw frame-10127037-101LF (tooled)



4x8 left guide pin housing-10126109-001 (tooled)

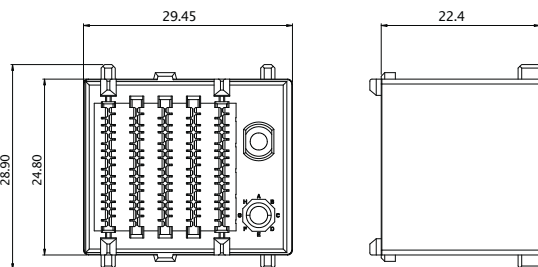


4x8 snap-in frame-HS-30813-002 (tooled)

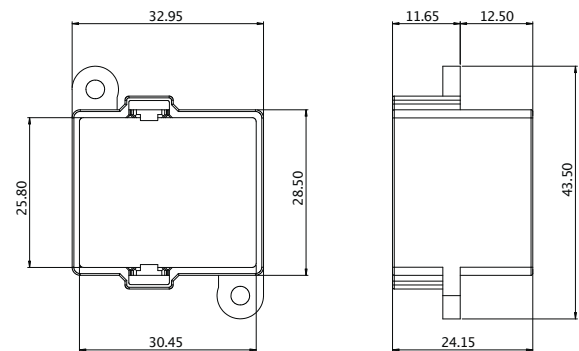


4x8 RAR P/N: 10137002-12JLF (tooled)

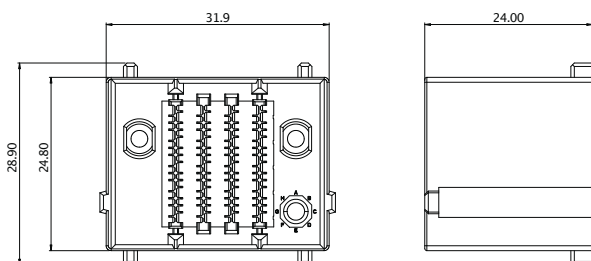
4x10 left guide pin housing-10130874-001 (tooled)



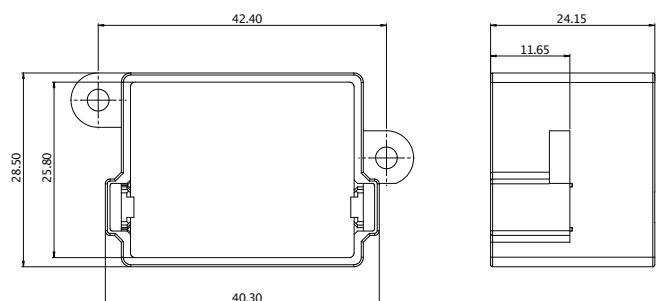
4x10 screw frame-HS-31507-001 (tooled) 10131981



4x8 dual guide pin housing-10131896-001 (tooled)



4x10 screw frame-HS-31507-001 (tooled) 10131981

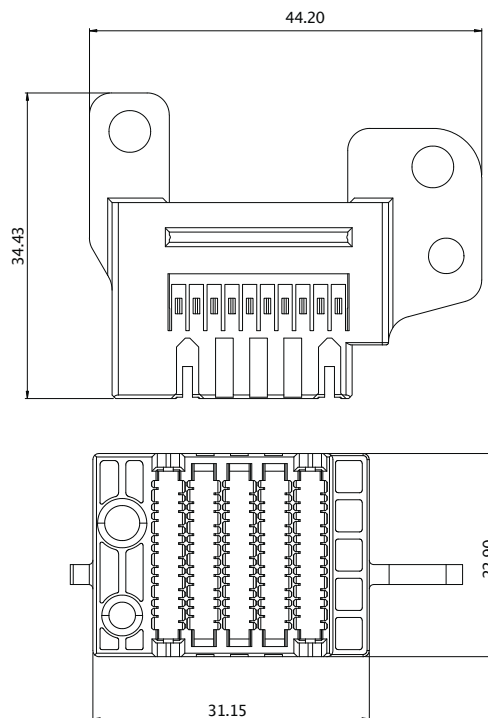


4x10 RAR P/N: 10137004-12JLF (tooled)

# ExaMAX 4-Pair Solution



4x10 left guide pin housing-10154379-001 (tooled)

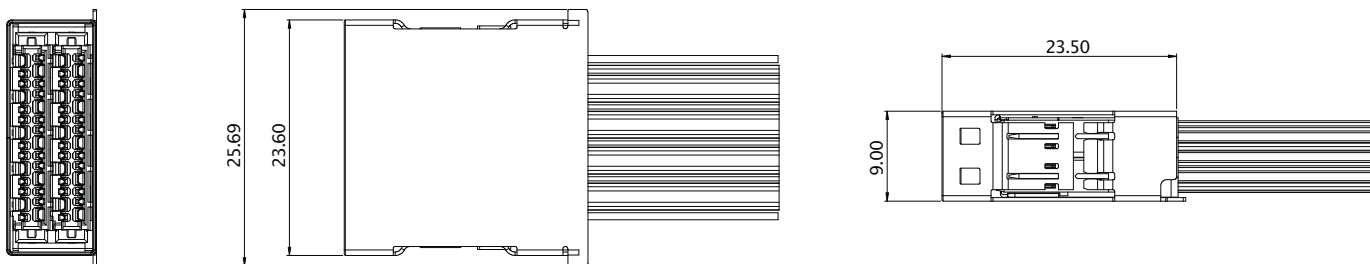


# ExaMAX 4-Pair 4XP Solution

Pairs per Column	4 Pairs
Columns per Connector	4
Diff Pairs Per Cable	16
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	External IO

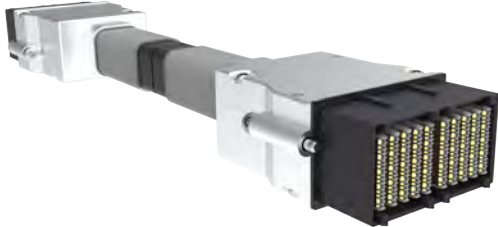
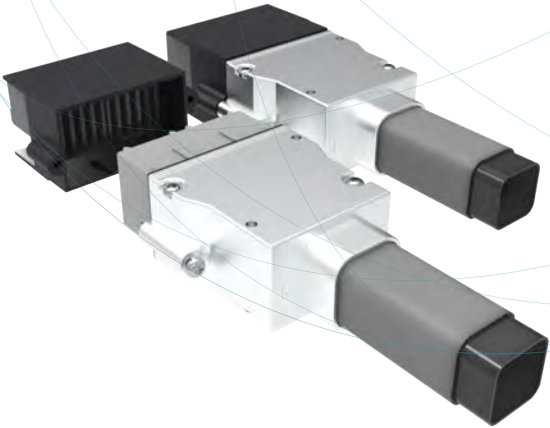


4x4 4XP cable assembly stamping shell 10142923-001LF (tooled)



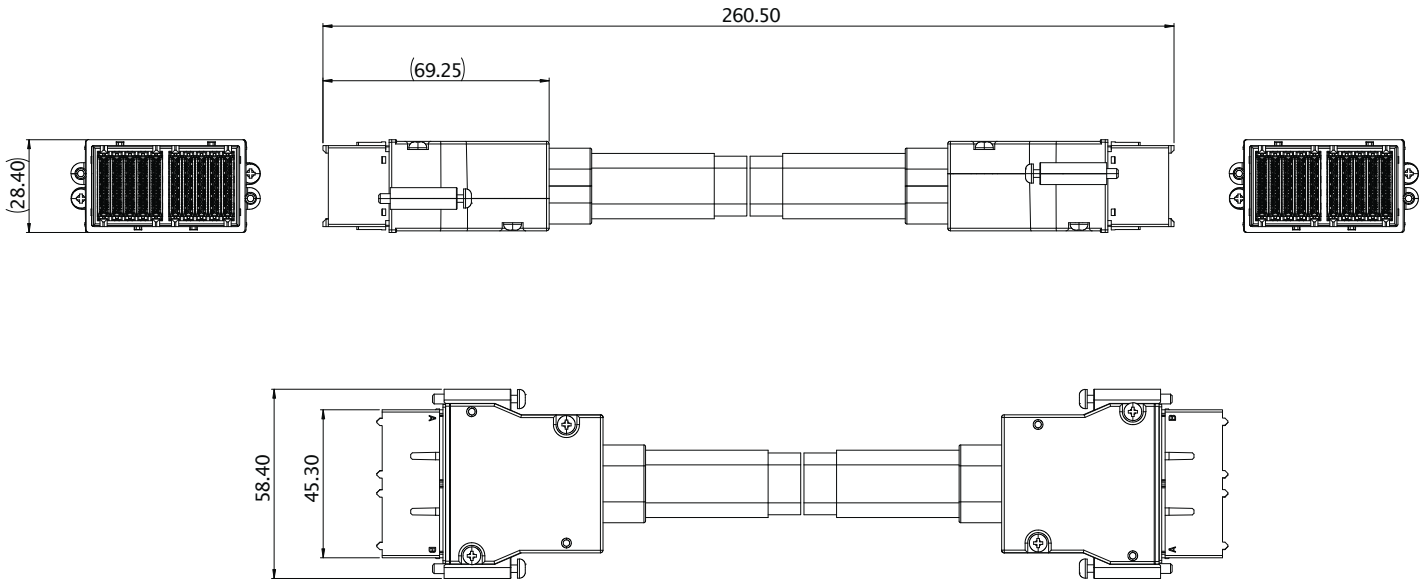
4x4 RAR P/N: 10136998-101LF (tooled)

# ExaMAX 4-Pair 20-Column External Cable Solution



Pairs per Column	4 Pairs
Columns per Connector	20
Diff Pairs Per Cable	80
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	External IO

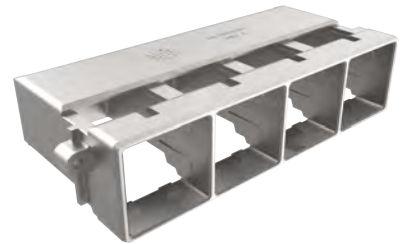
4x20 External cable assembly  
Die-cast 10146737-001/10146738-001 (tooled)



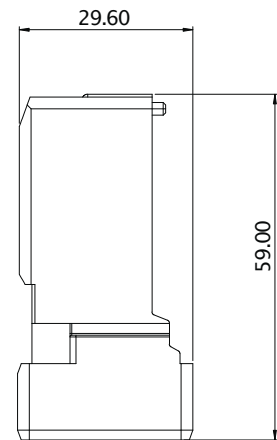
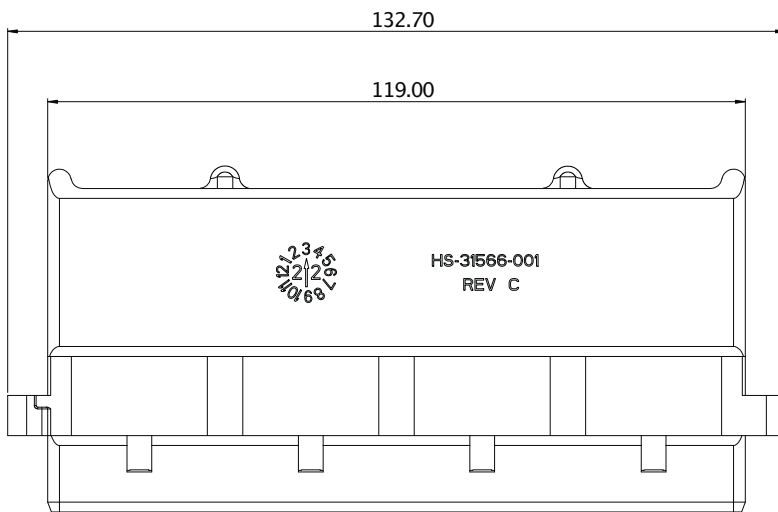
4x10 RAR P/N: 10137004-301LF(x2)(tooled)

# ExaMAX 4-Pair 12 Column Solution

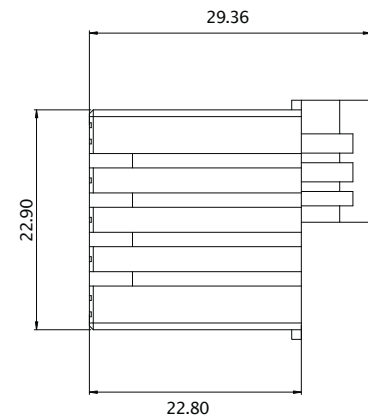
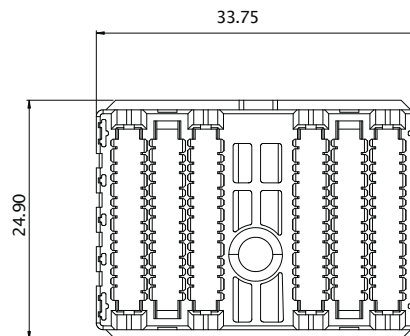
Pairs per Column	4 Pairs
Columns per Connector	12
Diff Pairs Per Cable	48
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	External IO



**4x12 -4 port die-cast frame : HS-315805-001 (Tooled)**  
**4x12 - external cable (Tooled)**



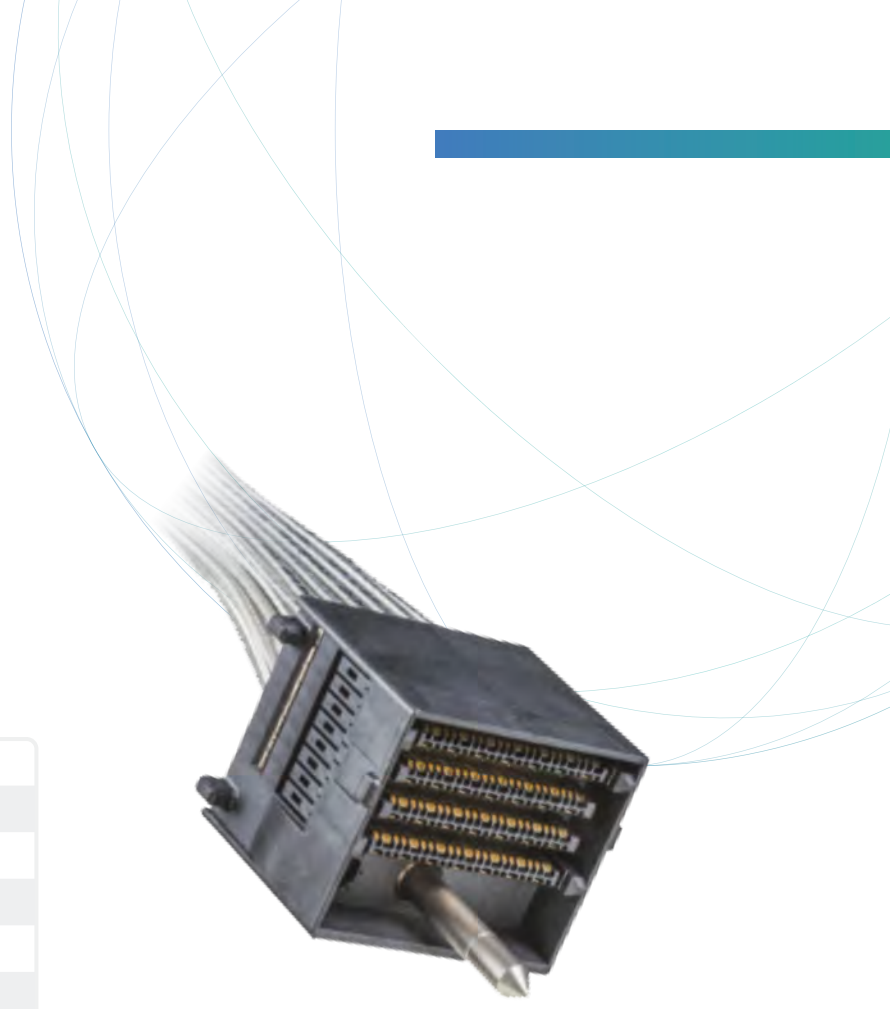
**4x12 Examax HSG 1015963-001(tooled)**



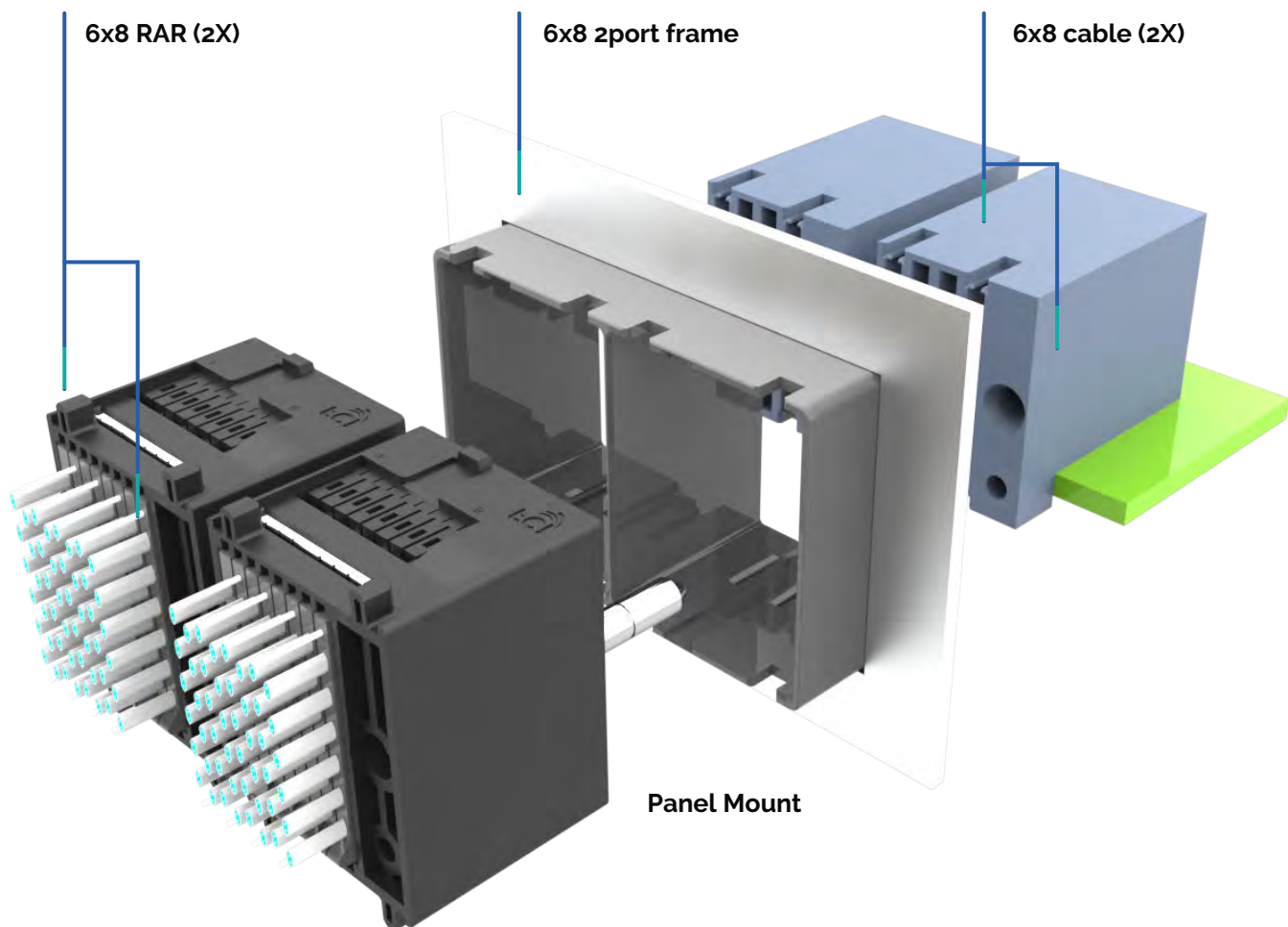
**Board connector : 10127896 (tooled)**



# ExaMAX 6-Pair Blind Mate Panel Mount Solution



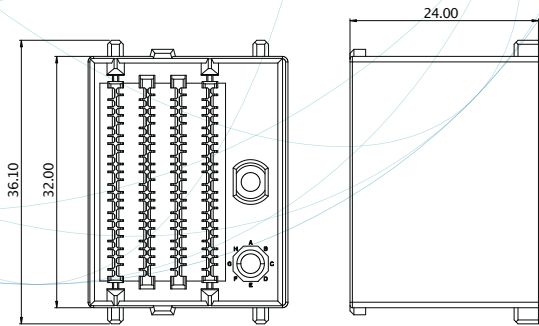
Pairs per Column	6
Columns per Connector	8,16
Diff Pairs Per Cable	48,96
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	Internal IO



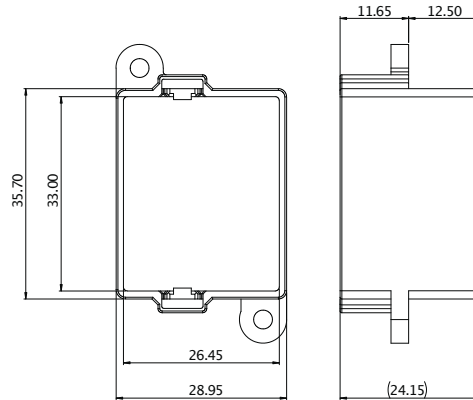
# ExaMAX 6-Pair Blind Mate Panel Mount Solution

## Cable Connector Configurations

6x8 left guide pin housing-10137632-001 (tooled)

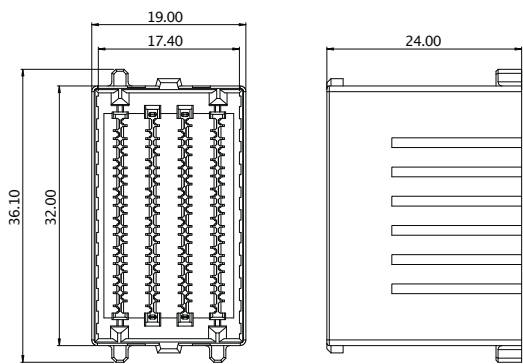


6x8 screw frame-10133122-101LF (tooled)

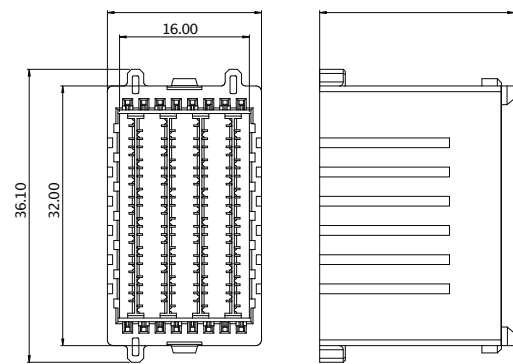


6x8 RAR P/N: 10131762-12JLF (tooled)

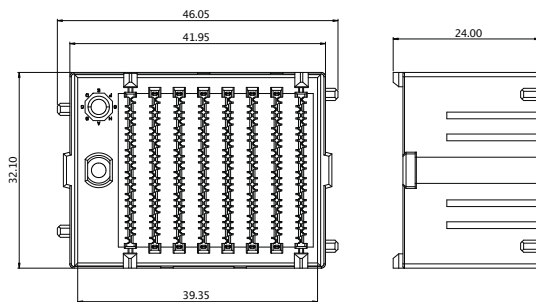
6x8 No guide pin housing-10159270-001 (tooled)  
FRAME NOT TOOLED



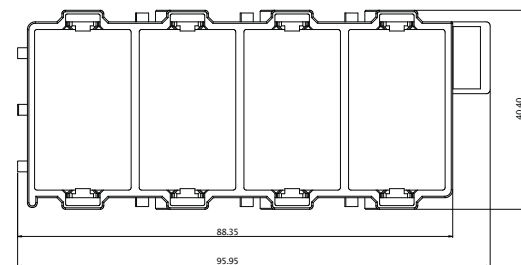
6x8 left guide pin housing-10159720-002 (tooled)



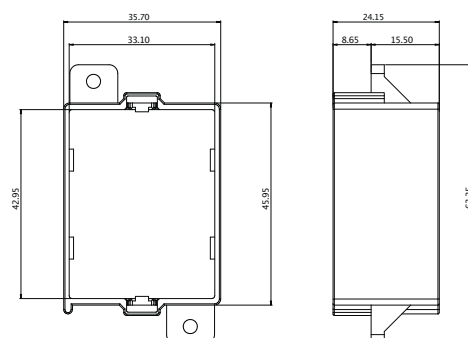
6x16 right guide pin housing-10160861-001 (tooled)



6x8 slide lock frame-HS-31542-001 (tooled)



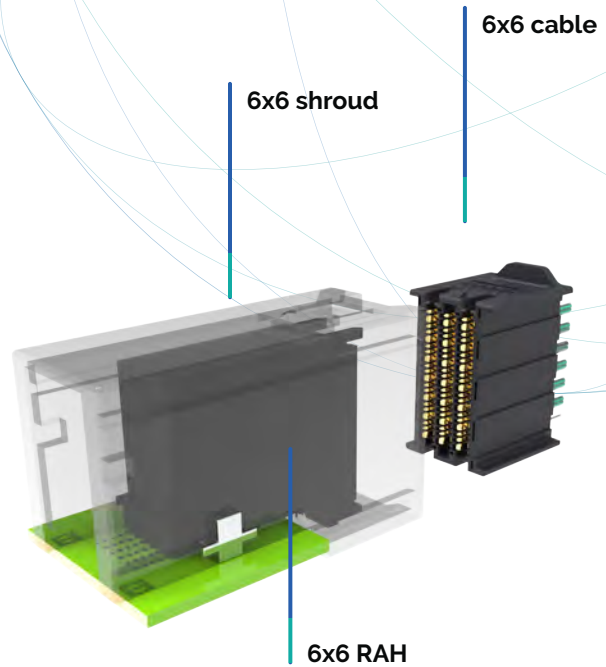
6x16 screw frame-10133122-101LF (tooled)



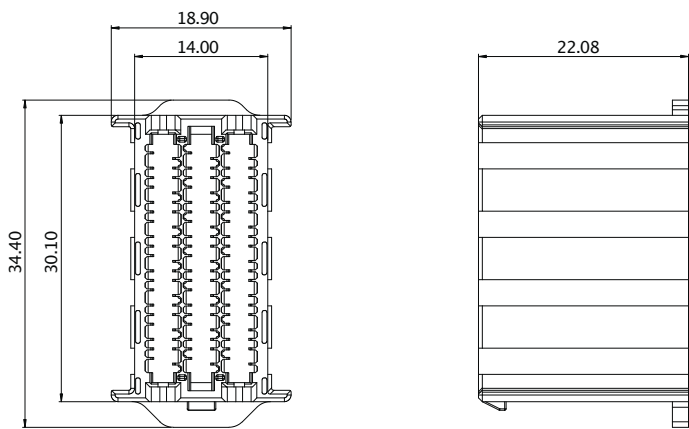
Board connector  
ExaMAX RAR 6X16 Right guide  
PN: 10131770-11JLF

# ExaMAX 6-Pair Latch Solution (RAH)

Pairs per Column	6
Columns per Connector	6
Diff Pairs Per Cable	36
Cable Gender	Female
Mating Connector	Right Angle Header
Application Examples	Internal IO



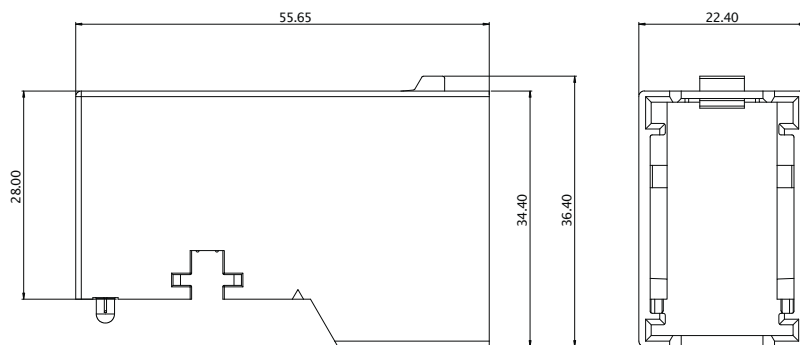
6x6 housing for RAH-10148462-002 (tooled)



6x6 RAH P/N: 10125350-101LF (tooled)

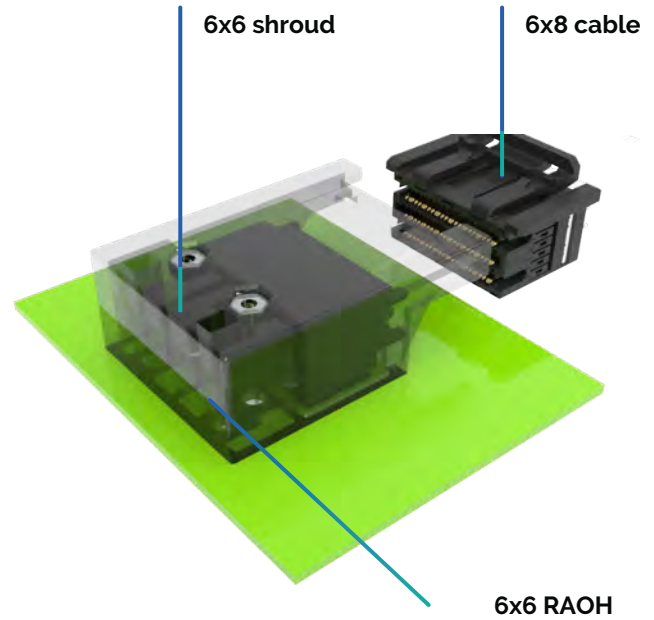


6x6 housing for RAH-10148462-002 (tooled)

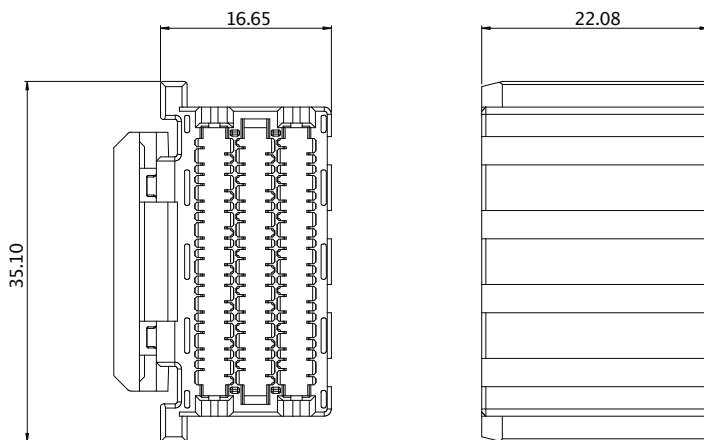


# ExaMAX 6-Pair Latch Solution (RAOH)

Pairs per Column	6
Columns per Connector	6
Diff Pairs Per Cable	36
Cable Gender	Female
Mating Connector	Right Angle Orthogonal Header
Application Examples	Internal IO

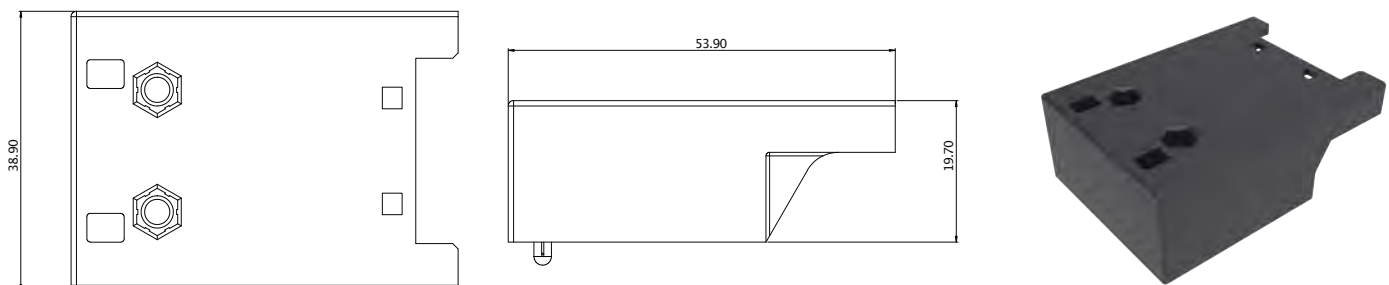


6x6 housing for RAOH-10148462-001 (tooled)



6x6 RAOH P/N: 10129476-102LF (tooled)

6x6 housing shroud for RAOH-10150641-106LF (tooled)

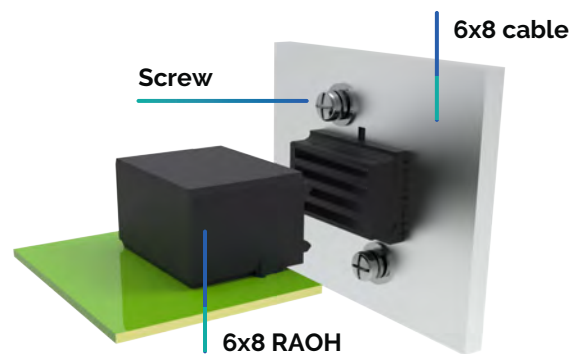
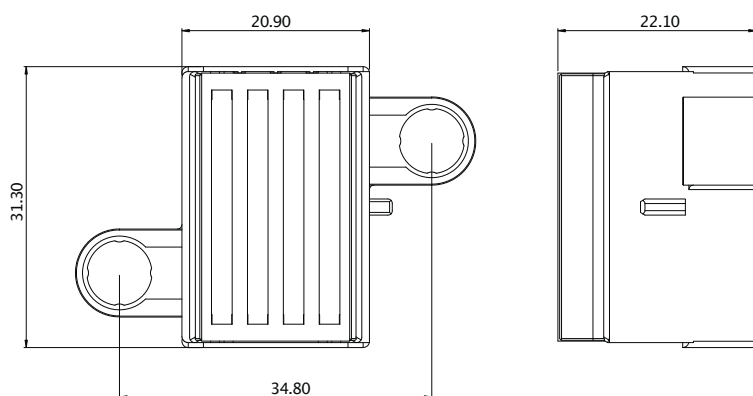


# ExaMAX 6-Pair Solution

Pairs per Column	6 Pairs
Columns per Connector	8
Diff Pairs Per Cable	48
Cable Gender	Female
Mating Connector	Right Angle Orthogonal Header
Application Examples	Internal IO



## 6x6 housing for RAOH-10148462-001 (tooled)

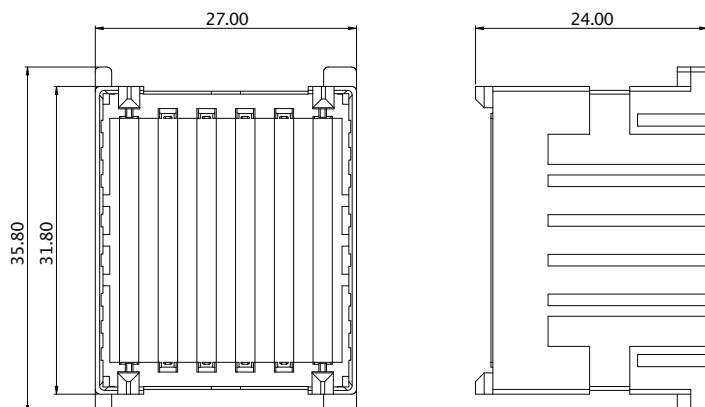


## 6x8 RAOH P/N: 10136743-101LF (tooled)

Pairs per Column	6 Pairs
Columns per Connector	12
Diff Pairs Per Cable	72
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	OverPass



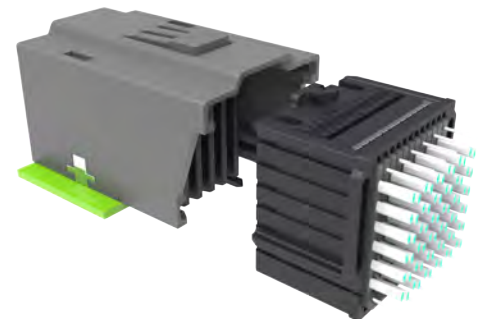
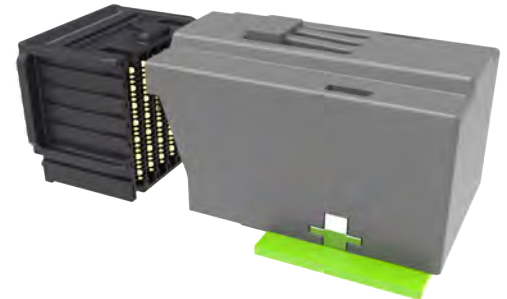
## 6x12 housing for RAR-10137677-001 (tooled)



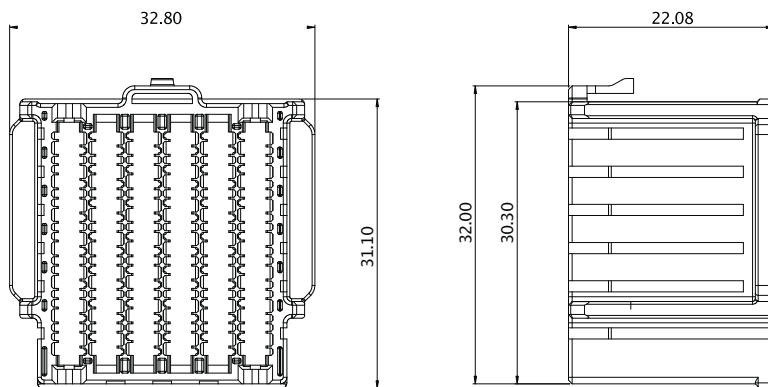
## 6x12 RAR P/N: 10131766-101LF (tooled)

# ExaMAX 6-Pair Solution

Pairs per Column	6 Pairs
Columns per Connector	12
Diff Pairs Per Cable	72
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	Internal IO

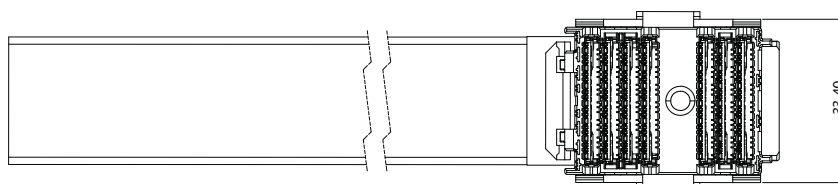
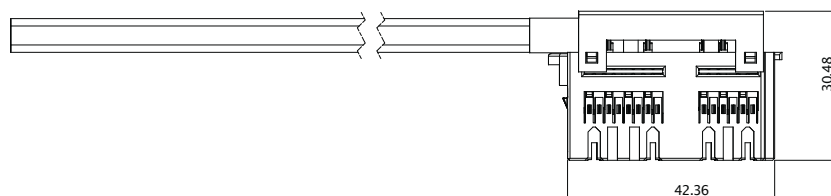
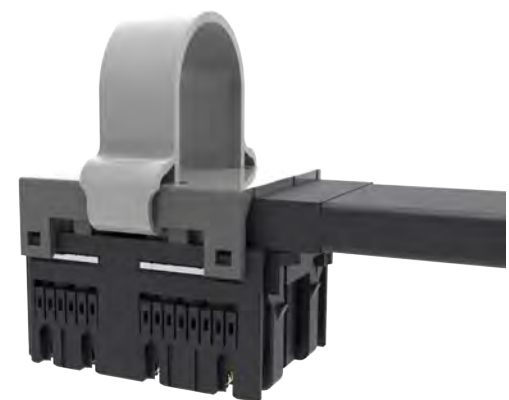


## 6x12 with top Latch-housing P/N: 10146389-001 (tooled)



## 6x12 RAR P/N: 10124560-101LF (tooled) 6x12 RA shroud P/N: 10150841-112LF (tooled)

Pairs per Column	6 Pairs
Columns per Connector	14
Diff Pairs Per Cable	84
Cable Gender	Female
Mating Connector	Vertical Header
Application Examples	OverPass

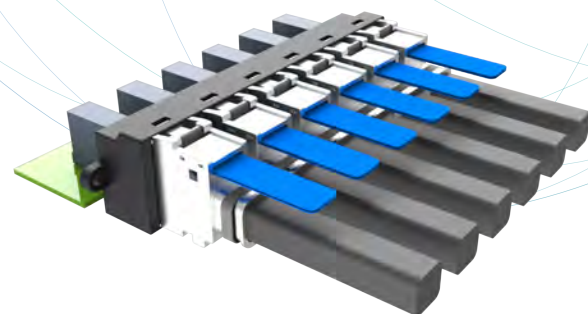


Board conn P/N: 6x8 VH 10124752-101LF+ 6X6 VH 10128351-12JLF (tooled)

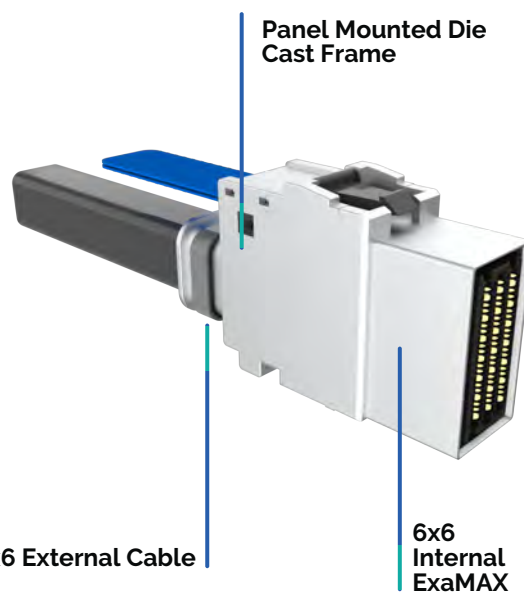
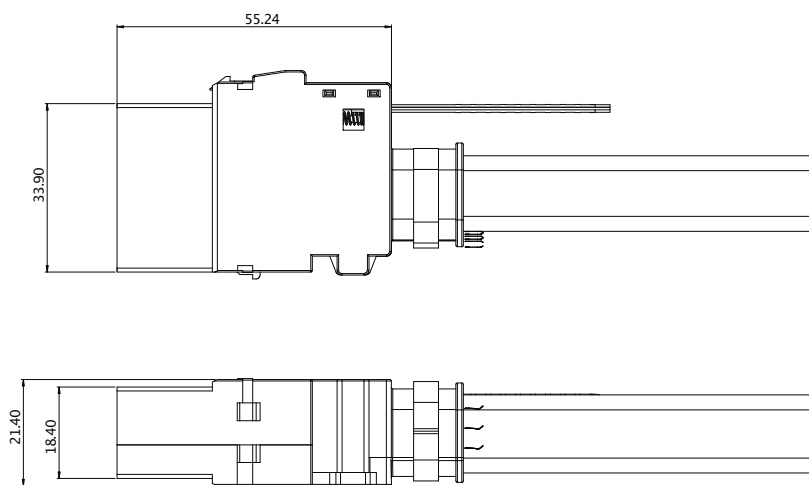
Vertical Shroud P/N: 10153326-114LF (tooled)

# ExaMAX 6-Pair External Cable Solution

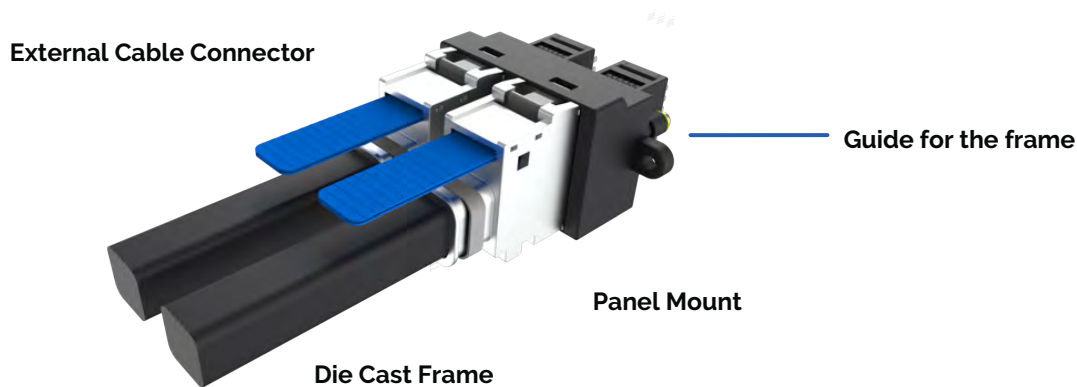
Pairs per Column	6 Pairs
Columns per Connector	6
Diff Pairs Per Cable	36
Cable Gender	Female
Mating Connector	Right Angle Header
Application Examples	External IO



6x6 –Die-cast 10153058-001/ 10153059-001 and housing 10148462-003 (tooled)

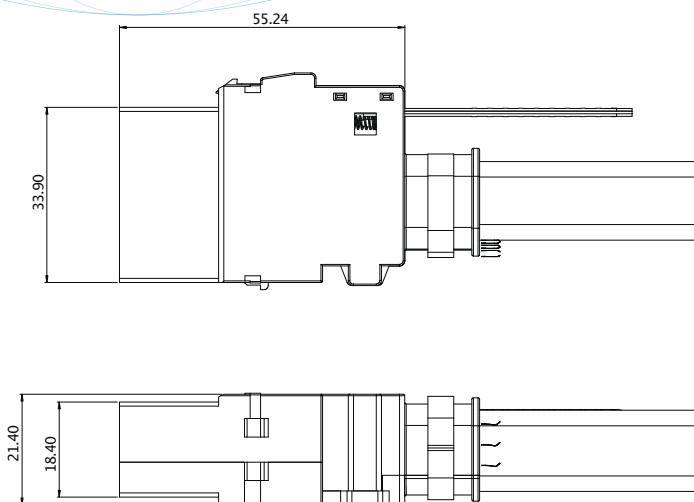


6x6 RAH P/N: 10125350-101LF or mated to internal cable with housing 10153056-001 (both tooled)

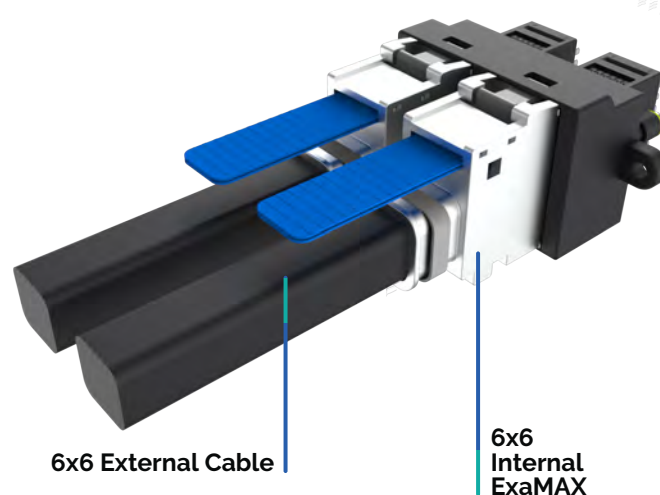


# ExaMAX 6-Pair Frame Solution

6x6-single port die-cast frame for cable to connector  
HS-31048-001 (tooled)



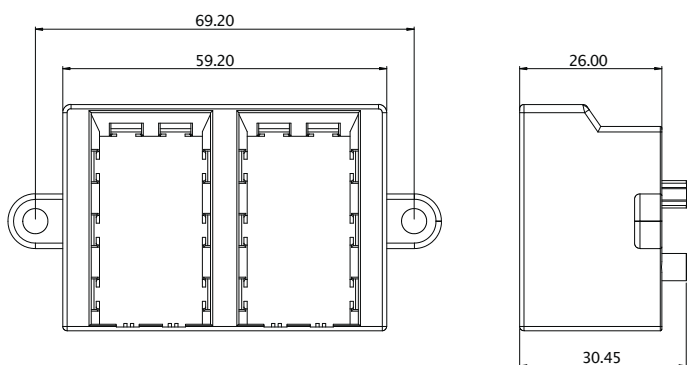
Panel Mounted Die Cast Frame



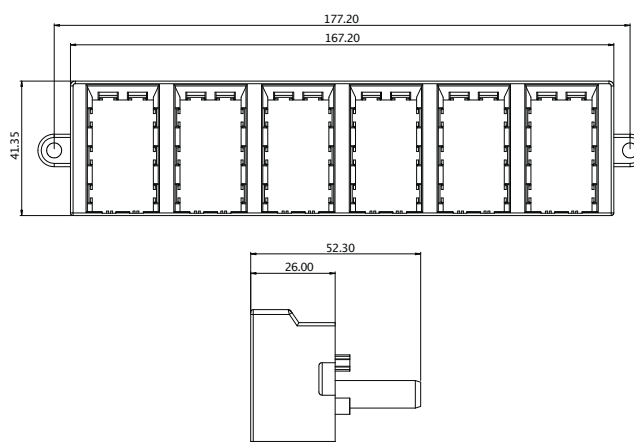
6x6 External Cable

6x6 Internal ExaMAX

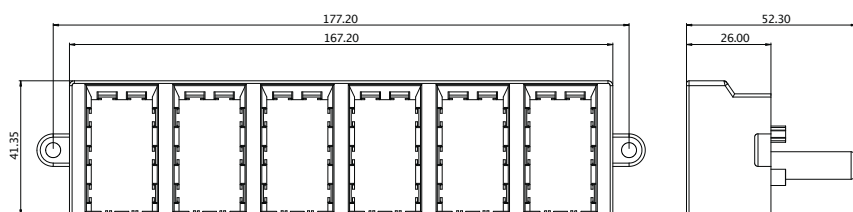
6x6-dual port die-cast frame  
HS-31120-050 (tooled)



6x6-six port die-cast frame right side  
HS-31049-001 (tooled)



6x6-six port die-cast frame left side HS-31049-002 (tooled)



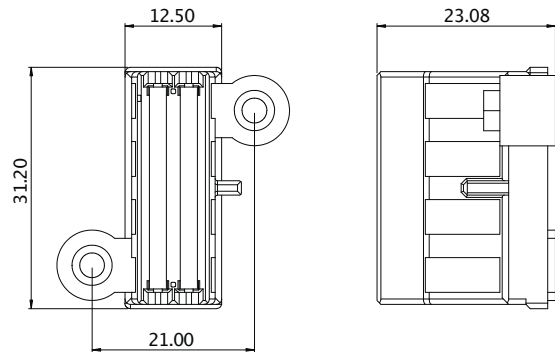


# ExaMAX 6-Pair 4-Column Solution

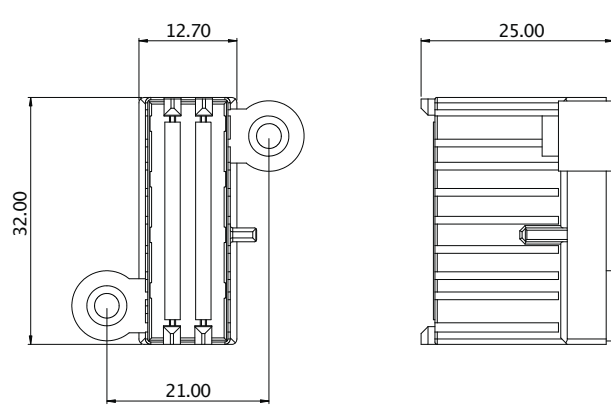
Pairs per Column	6 Pairs
Columns per Connector	4
Diff Pairs Per Cable	24
Cable Gender	Male & Female
Mating Connector	Receptacle & Header
Application Examples	Internal IO



6x4 housing Female housing 10148570-001 (tooled)

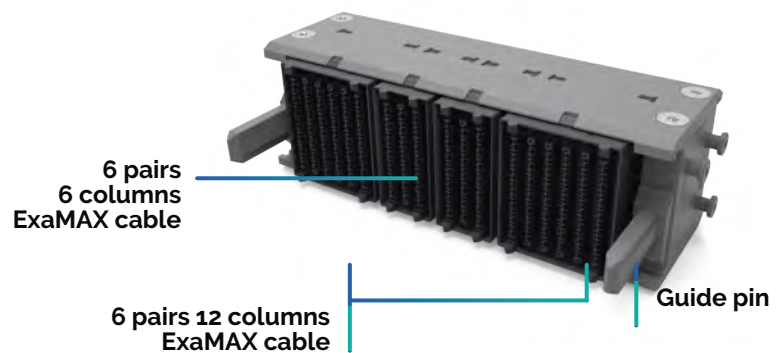


6x4 Male housing 10147504-001 (tooled)

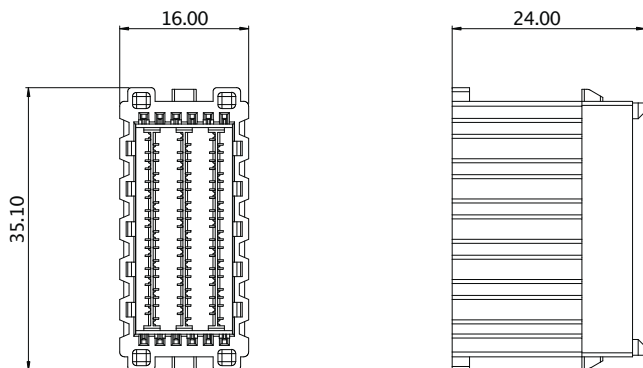


# ExaMAX 6-Pair 6+12-Column Solution

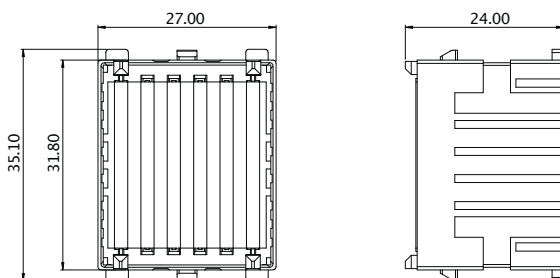
Pairs per Column	6 Pairs
Columns per Connector	6, 12
Diff Pairs Per Cable	36, 72
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	Internal IO



6x6 Male housing 10154628-001 (tooled)



6x12 Male housing 10154629-001 (tooled)

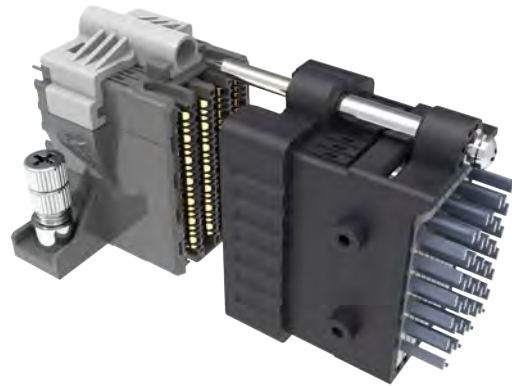


Board connector : 10135221-101LF (tooled)

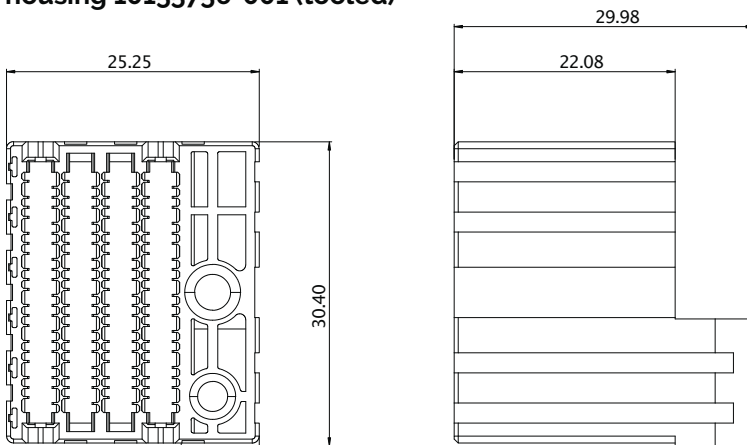
# ExaMAX 6-Pair 8-Column Solution

6x8 female housing 10160206-001 (tooled)  
6x8 male housing 10160205-001 (tooled)

Pairs per Column	6 Pairs
Columns per Connector	8
Diff Pairs Per Cable	48
Cable Gender	Male & Female
Mating Connector	Receptacle & Header
Application Examples	External IO

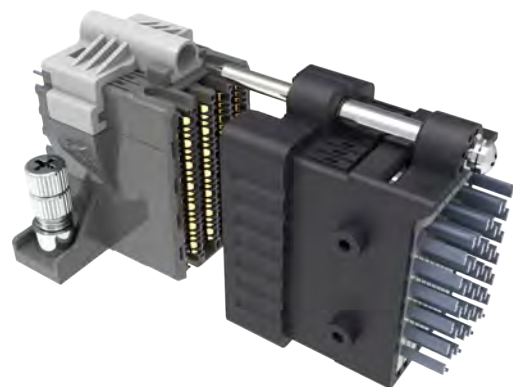


6x8 left guide pin female housing 10155756-001 (tooled)

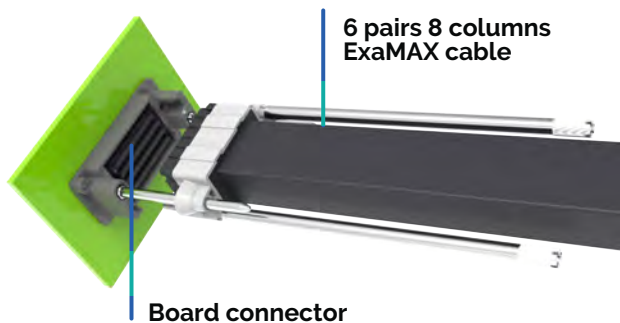


Board connector : 10124752 (tooled)  
6x8 male housing 10159032-001 (tooled)  
6x8 female housing 10159031-001 (tooled)

Pairs per Column	6 Pairs
Columns per Connector	8
Diff Pairs Per Cable	48
Cable Gender	Male & Female
Mating Connector	Receptacle & Header
Application Examples	OverPass

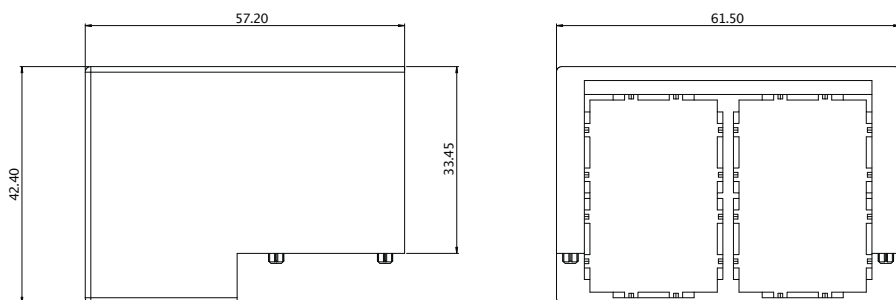


6x8 housing 10162441-001 (tooled)  
 Guide Block : HS-31543-001 (tooled)  
 Board connector : 10124752 (tooled)

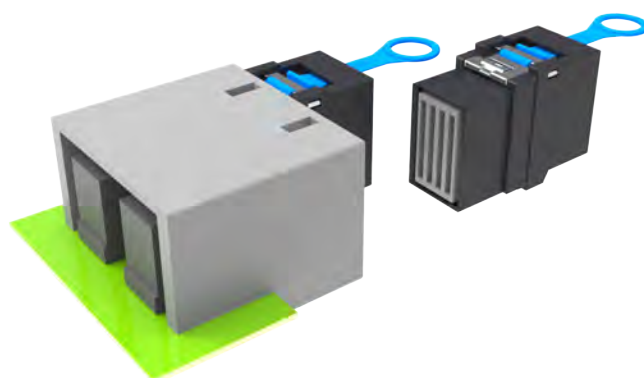


Pairs per Column	6 Pairs
Columns per Connector	8
Diff Pairs Per Cable	48
Cable Gender	Female
Mating Connector	Vertical Header
Application Examples	OverPass

6x8 Female housing 10162441-002 (tooled)  
 6x8 dual port die-cast frame HS-31539-001 (tooled)  
 Board connector : 10124558-101LF (tooled)

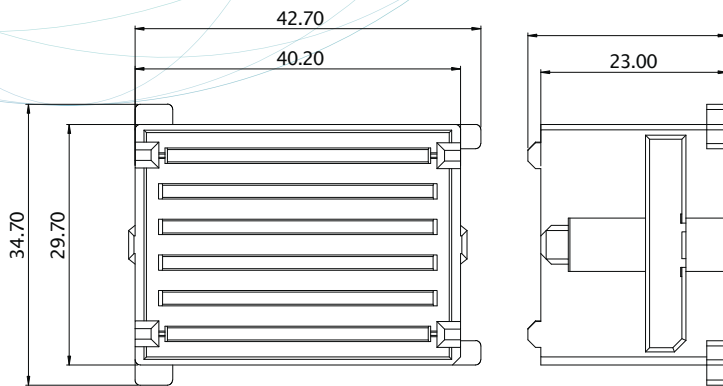


Pairs per Column	6 Pairs
Columns per Connector	8
Diff Pairs Per Cable	48
Cable Gender	Female
Mating Connector	Right Angle Header
Application Examples	External IO



# ExaMAX 8-Pair Solution

8x8 Male housing 10147711-001 (tooled)



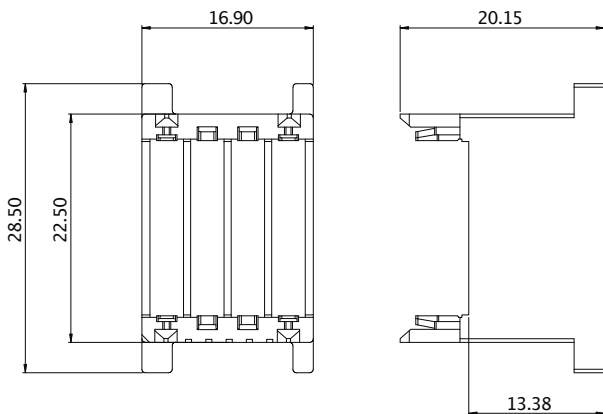
8X8 RAR P/N: 10143011-101LF (tooled)



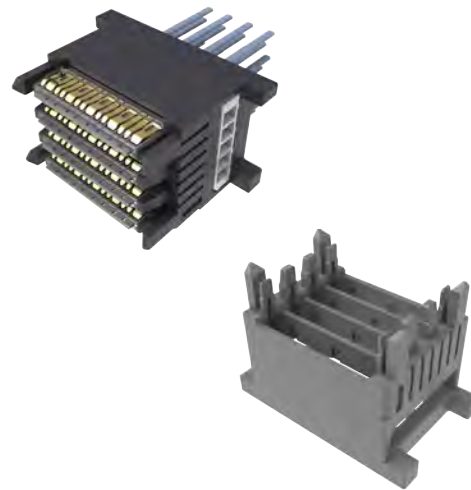
Pairs per Column	8 Pairs
Columns per Connector	8
Diff Pairs Per Cable	64
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	Internal IO

# ExaMAX2 4-Pair Solution

EXAMAX2 4X8 No guide cable 10155717 (tooled)



Board connector : 10153370-101LF (tooled)



Pairs per Column	4 Pairs
Columns per Connector	8
Diff Pairs Per Cable	32
Cable Gender	Male
Mating Connector	Right Angle Receptacle
Application Examples	OverPass

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