MiniMRP AVIONICS PACKAGING

DISTRIBUTED, INTEGRATED MODULAR AVIONICS PACKAGING . . . MINIATURIZED FOR COMMERCIAL AEROSPACE AND SPACE APPLICATIONS

The Modular Avionics Architecture, Based on ARINC 836A Standards, Saves Weight, Reduces Package Size, and Increases Design Flexibility Over Existing Architectures

Avionics Packaging Solutions
Modular Racking Principle – MiniMRP – ARINC 836A

Now Configurable to Your Custom Application

Increased Computing Power in a Smaller Package

MiniMRP is the next generation of avionic hardware, putting ever-increasing computing power into smaller packages at lower costs.

Small Form Factor Devices

The ability to interconnect small-form-factor electronic devices, either directly or over a network, enables distributed systems that replace traditional centralized systems.

DMC-M: Modular Connectivity

- Standardized Multi-Cavity – EN4165
- Quick Change – Compact – Lightweight
- Full Range of Modules Available
  Signal – Power – RF – Optical

ARINC 600
Legacy System

Double Width,
Single Height
MiniMRP

Single Width,
Single Height
MiniMRP

Distributed Architecture

- Distributed Avionics for Flexible Design in a Smaller, Lighter Package
- Easily Deployed Throughout the Aircraft
- Distributed Around a Fiber Optic or Copper Backbone

MiniMRP Avionics Packaging

Putting Intelligence Closer to the Action

A distributed avionics system creates flexible capabilities in a smaller, lighter package. The Mini Modular Rack Principle (MiniMRP), standardized in ARINC 836A, is fast emerging as one of the leading choices for packaging of distributed systems. The MiniMRP provides standardized modules that can be easily deployed through an aircraft, allowing information to be collected and distributed around a fiber optic or copper backbone.

Modularity Simplifies Configuration

By creating a series of standard modules, the MiniMRP system allows a mix-and-match approach to design and deployment. Modules can be used singly or combined as needed to create specific functionality throughout the aircraft. Module upgrades, replacements, or expansions are easily accomplished.

Lower Costs through Standardization

By providing compact, standardized modules, MiniMRP enhances the ability to distribute embedded computing functions throughout the aircraft. Standardization of both connector inserts and modular enclosures sizes provide a commonality of components within an aircraft and across a wide range of different aircraft platforms.

Lower Costs – COTS Components

Designers of avionic systems can take advantage of commercial off-the-shelf (COTS) components, thereby streamlining the design cycle to enable a faster time to market. Additionally, they give designers access to well-established, high-volume products that can lower costs through economies of scale. Standardization creates a competitive ecosystem.

Fiber Optic or Copper Backbone

Space Advantage

The small size of the MiniMRP enclosure can help optimize the design of the interior of a military vehicle or aircraft. Designers also have the ability to upgrade modules without changing out the entire connector. The entire design can be made custom per customer's requirements.

Meets Military Standard Needs

MiniMRP mounts connector systems conforming to the EN4165 European military aerospace standard. It is similar to MIL-DTL-38999 in performance, but with added benefits of a small footprint and versatility. The standard finish of the enclosure and tray components is Surtec 650V, which meets MIL-DTL-81706B and MIL-DTL-5541F for bare corrosion and accomodates ruggedized applications.

MiniMRP Avionics Packaging

Latched Enclosure

Product Features

- Vibration resistant latching mechanism
- Toolless operation
- Electrically conductive and corrosion resistant surface finish
- Interfaces with latched tray (Pg 6)
- Lightweight

TE Part Numbering System

SWSH-L - A - 1 - 1

Enclosure Size
SWSH-L Single Width, Single Height
DWSH-L Double Width, Single Height
SWDH-L Single Width, Double Height
DWDH-L Double Width, Double Height

Enclosure Material
A Aluminum with SurTec 650V surface treatment

Connector Cut-Out
1 EN4165 Type 5 Bay

Number of Connector Shells
0 No Connector Receptacles
1 1 Connector Receptacle
2 2 Connector Receptacles
3 3 Connector Receptacles
4 4 Connector Receptacles

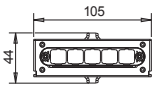
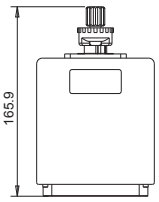
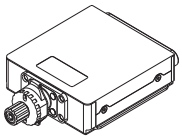
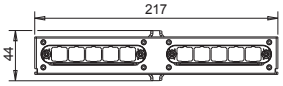
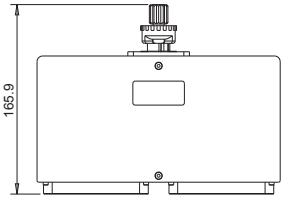
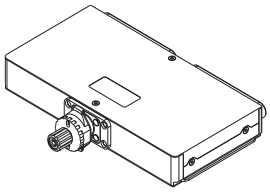
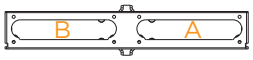
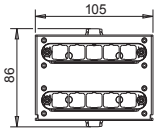
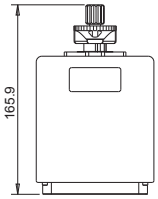
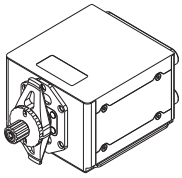
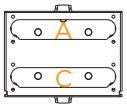
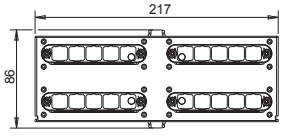
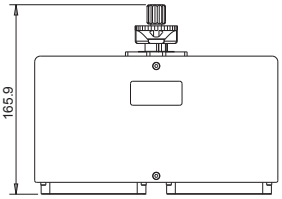
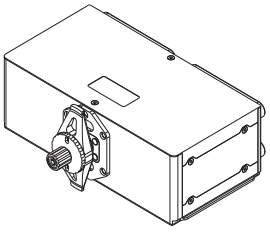
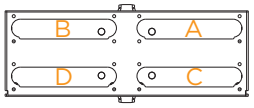
Note: connector shells are nickel plated aluminum alloy

TE recommends use of Low Profile DMC-M modules in this application. If standard DMC-M modules are to be used please refer to your TE Sales representative.

MiniMRP Avionics Packaging

Latched Enclosure

Configurations

	Front View	Top View	ISO View	Connector Positioning (View on mating face)
Single Width Single Height (SWSH)				
Double Width Single Height (DWSH)				
Single Width Double Height (SWDH)				
Double Width Double Height (DWDH)				

Measurements are in mm.

MiniMRP Avionics Packaging

Latched Tray

Product Features

- Optimized to be stiff yet lightweight
- Ability to stack together different tray sizes using built-in vibration resistant threads
- Electrically conductive and corrosion resistant surface finish
- Externally mounted connector shell reduces installation time
- Optional Mounting-Plate allows attachment of the tray to structure per ARINC 836A

TE Part Numbering System

SWSH-T - A - 1 - 1

Tray Size
SWSH-T Single Width, Single Height
DWSH-T Double Width, Single Height
SWDH-T Single Width, Double Height
DWDH-T Double Width, Double Height

Tray Material
A Aluminum with SurTec 650V surface treatment

Connector Cut-Out
1 EN4165 Type 5 Bay

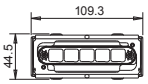
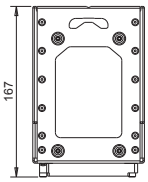
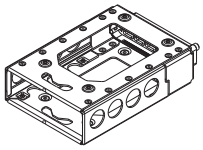
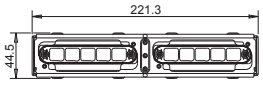
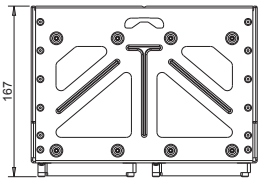
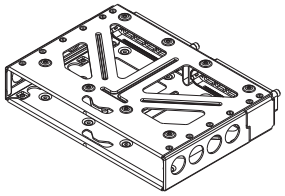
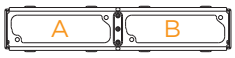
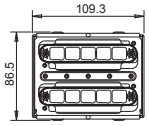
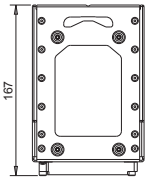
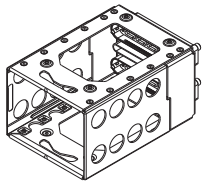
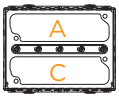
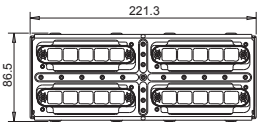
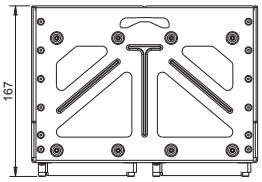
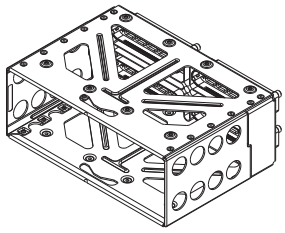
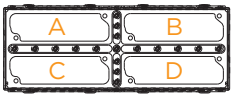
Number of Connector Shells
0 No Connector Plugs
1 1 Connector Plug
2 2 Connector Plugs
3 3 Connector Plugs
4 4 Connector Plugs

Note: connector shells are nickel plated aluminum alloy

MiniMRP Avionics Packaging

Latched Tray

Configurations

	Front View	Top View	ISO View	Connector Positioning (View on mating face)
Single Width Single Height (SWSH)				
Double Width Single Height (DWSH)				
Single Width Double Height (SWDH)				
Double Width Double Height (DWDH)				

Measurements are in mm.

MiniMRP Avionics Packaging

Feet Mount Enclosure

Product Features

- Provides an alternative where space is at a premium
- Further weight reduction (without tray)
- Electrically conductive and corrosion resistant surface finish
- Not available with EN4165 Type 5 Bay connector shell

TE Part Numbering System

SWSH-F - A - 2 - 1

Feet Mount Enclosure Size
SWSH-F Single Width, Single Height
DWSH-F Double Width, Single Height
SWDH-F Single Width, Double Height
DWDH-F Double Width, Double Height

Enclosure Material
A Aluminum with SurTec 650V surface treatment

Connector Cut-Out Style
2 EN4165 4-Bay
3 EN4165 4-Bay Low-Profile

Number of Connector Shells
0 No Connector Receptacles
1 1 Connector Receptacle
2 2 Connector Receptacles
3 3 Connector Receptacles
4 4 Connector Receptacles

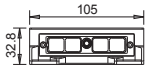
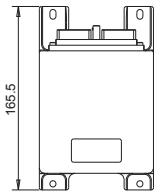
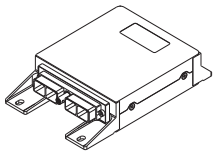
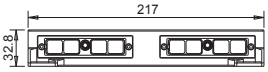
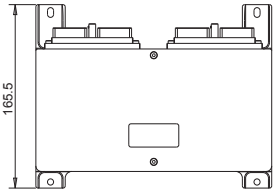
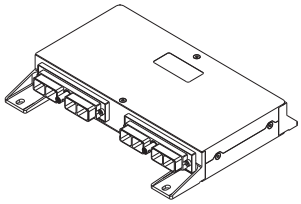
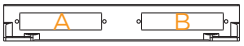
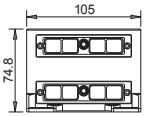
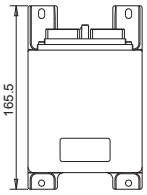
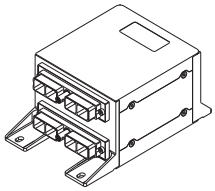
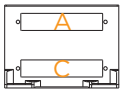
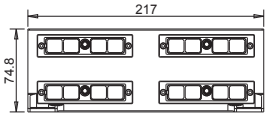
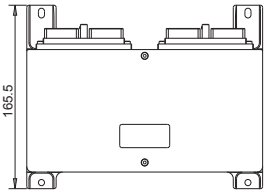
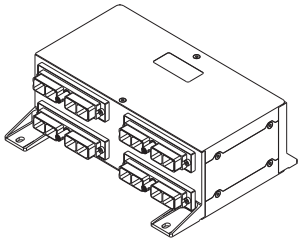
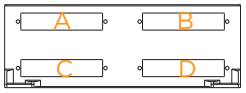
Note: connector shells are nickel plated composite

4-bay EN4165 connector receptacles are supplied with a disassembled keying component which requires a tool to mount and dismount. Please refer to your TE Sales representative and/or the Deutsch DMC-M Series Multicavity EN4165 Connector catalog.

MiniMRP Avionics Packaging

Feet Mount Enclosure

Configurations

	Front View	Top View	ISO View	Connector Positioning (View on mating face)
Single Width Single Height (SWSH)				
Double Width Single Height (DWSH)				
Single Width Double Height (SWDH)				
Double Width Double Height (DWDH)				

Measurements are in mm.

MiniMRP Avionics Packaging

Customization Options

Integrated Solutions

TE can support fully integrated solutions with embedded electronics, fiber optics and wireless connectivity

Thermal

Integrated design features can be tailored to support the thermal management requirements

Connectivity

Custom connector interfaces can be easily integrated for the specific application, such as:

- Single Module EN4165
- 369 Series Connectors
- Non-Aerospace Connectors

Material

Lightweight polymer/hybrid variants are in development, including:

- Fully Composite Design
- Hybrid Metal and Composite Design

Design

Enclosures can be modified for custom requirements including sizes, mount positions and external features, such as antennas

MiniMRP Avionics Packaging

Advantages of MiniMRP-Based Distributed Systems

Reduced Package Size

MiniMRP modules are smaller than existing MRP modules, allowing them to fit into smaller spaces.

Reduced Weight

MiniMRP modules are made of lightweight aluminum or even lighter weight composite materials. Distributed modules also reduce the amount of copper cabling throughout the aircraft. MiniMRP components, in combination with an integrated modular avionics architecture, allows connectivity through a lightweight, high-speed fiber-optic or copper backbone to simplify the cabling system further.

Reduced Complexity through Common Components

Standardized modular enclosures and interconnect components enable users to pick from a wide variety of standard choices.

Increased Flexibility

The ability to mix and match modules simplifies the task of meeting specific application goals.

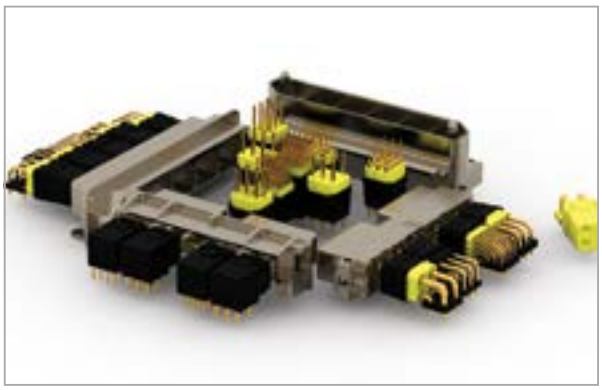
Easier Deployment and Upgrades

Configuration is easy by specifying the type and location of modules. The MiniMRP modules provide quick and easy tool-less installation, and changes, maintenance, and upgrades are simply accomplished by swapping out modules.

One Concept Fits Multiple Platforms

While the ARINC 836 MiniMRP is aimed at cabin systems in commercial aircraft, it is also finding use in military applications. The advantages of TE's MiniMRP modules make them ideal for application in military aircraft, helicopters, and unmanned aerial vehicles:

- Easy installation and maintenance
- Flexible modularity and industry standardization



DEUTSCH DMC-M Series Connectors

DEUTSCH DMC-M connectors from TE Connectivity (TE) are an excellent connector solution for MiniMRP modules.

Standardized in European Standard EN4165, DMC-M connectors provide a modular, flexible, and reliable system.

- Available in both multi-cavity and single-module configurations
- Compact, lightweight connectivity
- Composite housings, aluminum wire capability, fiber optics, higher densities, and shunting configurations available
- DMC-M connectors are offered in a variety of layouts, and in sizes 8, 12, 16, 20 and 22
- Contacts can be crimped on copper wire, aluminum wire, or PCB mounting

Empower Engineers to Solve Problems, Moving the World Forward.

AMP | AGASTAT | CII | DEUTSCH | DRI | HARTMAN | KILOVAC
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CONNECT WITH US

We make it easy to connect with our experts and are ready to provide all the support you need.
Visit **te.com/support** to chat with a Product Information Specialist.

QUALITY STARTS WITH THE RIGHT APPLICATION TOOLING

Creating a quality crimp connection is essential to delivering high performance and reliability in extreme environments. From low to high volume wire processing, TE has you covered with a full range of application tooling and a global field service team.

- **View all application tooling**
- **Connect with our experts to find the right tool for your application**

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1-1773857-9 05/21

MiniMRP AVIONICS PACKAGING

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