

Economical Rack Systems

Choices in Building an Economical 19" Rack System

In the post 9/11 economy, engineers and system integrators have a challenging task of finding values when it comes to building an economical 19" rack system. There is an abundance of racks and accessories that are being offered and advertised by a large number of manufacturers and suppliers. The following are some guidelines that may help you select the proper rack style and system components for your exact need.

When selecting a rack vendor, choose one that offers a variety of styles, sizes, finishes and accessories.

by Ravi Jain, Bud Industries

natural exhausting of hot air and help keep the rack cool inside. Some manufacturers such as Bud provide ventilated tops with pre-punched holes for mounting an exhaust fan. This is very convenient if an exhaust fan is needed.

Most manufacturers supply racks with fixed or adjustable EIA equipment mounting rails. Although fixed rails provide cost savings, they limit the flexibility of mounting different types of equipment. Front rails may need to be moved back in order to clear components and wires in the front. Rear rails may need adjustment to suit

the depth of equipment. The shape of the mounting rails also varies between various manufacturers. The typical L-shaped mounting rail may be less expensive; it makes assembly of accessories tedious. Some manufacturers such as Bud provide a specially shaped rail with a second accessory-mounting flange. This additional flange makes it much easier to assemble accessories such as shelves, drawers, brackets, etc. Pre-tapped rails are preferred over rails with square or round holes that require expensive cagenuts for assembly of equipment.

Construction Features

Most racks are available in welded or knockdown styles. Welded racks are more rigid and sturdy. However, they are more expensive, difficult to modify and require more warehouse space for storage prior to use. Knockdown styles are less expensive to ship and store. If you select a knockdown style, make sure it is easy to assemble. Total cost including assembly cost must be used for making cost comparisons.

Bud Economizer (welded) and LPR Series (shipped knocked-down) 19" racks loaded with accessories. (click image to enlarge)

Removable side panels are preferred because they provide easy access to interior components. Racks with fixed or integrated side panels are less expensive and are easier to seal against environmental factors such as dust, moisture and EMI/RFI. Side panels could be flush-mounted or surface-mounted. Although flush-mounted sides require no additional space, they limit the space between frame and side that could be used for wire routing. Surface mounted sides provide more wire-routing space and are easier to seal.

Both solid and see-through doors are available in flush-mount as well as surface-mount styles. Flush styles are generally less expensive; however, they reduce available space in front of panels that may be needed to clear panel-mounted components such as knobs, switches, etc. When selecting a see-through door, make sure that the width of the see-through opening is wide enough for your application. See-through doors are available in extruded aluminum or steel construction. Extruded aluminum provides attractive appearance while keeping weight light. Steel construction is less expensive.

Top covers could be either fixed or removable and ventilated or non-ventilated. While fixed covers are cheaper, they block access from the top and make it difficult to machine cable access or fan-mounting holes. Ventilating covers allow



Bud Economizer (welded) and LPR Series (shipped knocked-down) 19" racks loaded with accessories.



Accessories		
Name	Application	Features to look for
Add-A-Racks (Racks without sides)	<ul style="list-style-type: none"> Use to create a bay of racks bolted together side by side. 	<ul style="list-style-type: none"> Racks must be easy to bolt together with easy access to assembly hardware.
Shelves	<ul style="list-style-type: none"> Use to support equipment that cannot be mounted directly to EIA mounting rails. 	<ul style="list-style-type: none"> Must be sturdy enough to support the maximum equipment weight. Must have a choice of stationary, sliding, ventilated and non-ventilated versions.
Power Strips	<ul style="list-style-type: none"> To provide power to various internal components. Vertical versions are suitable for tall racks. Horizontal versions can be mounted to EIA rails. 	<ul style="list-style-type: none"> Surge suppression feature is desirable to protect equipment against power surges. Reset switch and power on indicator light are desirable features. UL listed units are recommended for safety and reliability.
Cooling Fans	<ul style="list-style-type: none"> Used for exhausting hot air from the rack. Also used on fan trays to blow air on specific spots. Suitable for low to moderate backpressure conditions. 	<ul style="list-style-type: none"> Fans with ball bearings are preferred for longer life. Insure that the fan will provide adequate air flow (CFM) under the actual backpressure created by your system.
Blowers	<ul style="list-style-type: none"> Suitable for cooling of racks with densely packed equipment that cause high back-pressure. 	<ul style="list-style-type: none"> Insure that the blower has adequate CFM under actual backpressure. Check noise level of the blower. 50-65 db noise rating is typical.
See-Thru Doors	<ul style="list-style-type: none"> Used when visibility of panel-mounted component is required along with security. 	<ul style="list-style-type: none"> Doors are available in flush or surface-mount style. Flush mount doors are generally less expensive. However, they may not provide enough clearance in front of the panel-mounted equipment.

Accessories

Many accessories are needed to build a complete system. Availability of a variety of off-the-shelf accessories at reasonable cost should be a key factor in selecting the rack manufacturer. The chart shown on the previous page provides a guide for selecting some of the most common accessories that are used in a 19" rack system.

In addition to the above key accessories, many manufacturers offer a wide selection of off-the-shelf accessories other such as drawers, desk-tops, mounting brackets, casters, levelers, slides, handles and wire-management accessories that can be

used to build your system. When selecting a rack vendor, it is important to look for a vendor who a wide selection of styles, sizes, finishes and accessories and the ability to provide custom modifications. If you need to build a complex system, it is important to get expert design help. Manufacturers such as Bud have in-house design staff that could provide you advice and help in designing the exact system to suit your needs. About the author

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