White Paper:
5 Ways the Latest Trend in Data Centers Reduces Costs and Increases Profitability

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Demand for Data Centers is increasing exponentially and forcing the industry as a whole to reevaluate their processes. This is most obvious in rented Data Centers and mobile Data Centers. Having said that, changes in standards are occurring at every level of the Data Center, especially in design, installation, and maintenance. Newer standards are giving those in the know a competitive edge.

One of the newest standards is using connectorized cable assemblies to distribute power from the Data Center's UPS (uninterrupted power supply) to the PDUs (power distribution unit). Using a connectorized cable assembly streamlines the entire Data Center by decreasing costs and installation time while increasing profitability.

Connectorized Cable Assembly: The New Trend Everyone is Talking About

What is a connectorized cable assembly? And how is it different than what was used on data centers in the past?

A connectorized cable assembly consists of a cable between one or two connector hoods. Inside the connector is an insert or multiple inserts where the conductors from the cable are terminated. The connectors hoods mate with a matching housing wired to the PDU and/or UPS.

Think of a phone charger – on each end is some sort of connector (e.g. a micro-USB) that plugs into your phone and on the other is a different connector that plugs into your computer or a wall. A connectorized cable assembly is a similar concept just on a larger scale.

In the past, Data Center designers hardwired the conductors inside the cable directly to the UPS and PDU. To do this, a portion of the outer jacket of the cable is stripped and each individual conductor is soldered to a board or terminal block inside the PDU. Back to the phone charger analogy, using the hardwiring method would be like opening up your PC and soldering the wires in the cables to the motherboard every time your phone was dead.

Why was this done?

If you are connecting something that will never change or never be disconnected, hardwiring costs less than connectorizing because you are only paying for the labor to connect the wires. With a cable assembly you pay for the connector material and the labor to install the insert. If you disconnect and reconnect once, however, the story changes. First, only a skilled electrician can disconnect and reconnect a hardwired PDU. Even if the disconnection and reconnection goes as smoothly as possible, you still pay a premium for their time. Second, if there is a mistake, which is not uncommon, there are additional costs for their time to troubleshoot as well as unplanned downtime, which results in lost revenue and frustrated customers.

Connectorized cable assemblies consists of a cable, connector hood and inserts and a matching housing.

When using a connector, it's plug-and-play. You no longer need to hire a electrician and since everything is pre-wired and pre-tested, wiring errors are virtually eliminated.

In addition to the installation benefits, connectorized cable assemblies offer benefits during the design and prototype phase and when it's time for maintenance. Overall, this new trend of using connectorized cable assemblies in Data Centers streamlines electrical power distribution.

Here are 5 ways using connectorized cable assemblies will reduce cost and increase the profitability of your Data Center.

1. Simplify and Shorten the Design Phase with a Standard Footprint.

When designing a Data Center one of the first steps is laying out all of the power requirements from the UPS and the individual racks. In the past, completely new models of PDUs were designed whenever a new requirement arose. These PDUs were varying sizes, but other than the power they handled, were very similiar to one another. The problem with this is that a designer would have to start at square one for each new PDU and then would need to integrate the individual designs into the rack and UPS.

A connectorized cable assembly gives the option of standardizing the size of the PDU by having a uniform footprint for where power would enter the PDU. Whenever a system has a unique requirement, the inserts inside the connector are changed to fit the individual application instead of the whole PDU, shortening and simplifying the design phase.

2. Optimize Space and Easily Incorporate Different Power with Modular Connectors.

Modular connectors feature a variety of off-the-shelf, standard inserts that can be mixed in one connector, allowing the combination of various power requirements or even combining power and signal into a single connection point, saving space on the PDU. Along with the standard footprint, a design can be quickly made.

The flexibility of the modular connectorized cable assembly increases the benefits to the Data Centers as PDUs can be more flexible as the market improves and develops to accommodate IIoT. Dummy modules also allow future proofing designs by functioning as a placeholder. If another module is needed in the future, the dummy module can be replaced quickly instead of an entire cable assembly.

3. Improve the Safety and Reliability of a Data Center.

Connectorized cable assemblies have been the standard for many industries, such as machinery, for decades. The reason for this is the increased reliability they provide to overall systems. In addition to the pre-testing and pre-wiring that eliminates wiring errors, connector hoods and housings offer additional protection from dust and water that can cause outages. They also offer additional safety with a latching clip that prevents disconnection while the connector is under load.

The standard in these markets is and has been for many decades the grey rectangular connector made of aluminium. Now connectors are available in thermoplastic material. This material offers the same protection as the aluminium housing, but is lightweight and less expensive. This type of connector has become the new standard for Data Centers.

4. Reduce Installation Time with Plug-and-Play Assemblies.

In this high-demand market, Data Centers need to be established quickly. When changes are made, such as implementing new server racks, installation needs to be quick.

Connectorized cable assemblies are pre-tested, pre-wired, and plug-and-play. Once the server is in place, the assembly just needs to be plugged in. This takes minutes compared to the hours to hardwire directly to the PDU and does not require any special labor.

5. Minimize Downtime During Maintenance or Power Failures.

Service and accessability is critical to Data Centers, and minimizing any downtime due to maintenance is a must. When it comes time for maintenance, it's quick and easy to disconnect and reconnect, reducing the amount of time offline compared to hardwiring.

Although using a connector will increase the reliability of a system, power failures can never be 100% prevented. If a cable assembly needs to be replaced due to failure, downtime is only a few minutes as opposed to several frustrating hours.

New connectors are being developed that are IIOT compatible. These "smart" connectors have sensors that will let a system know when maintenance needs to be done. If there is an issue with the power, the sensor can send a notice so the problem can be dealt with before an users

notice or any critical information is lost. This is extremely important for Data Centers that are monitored remotely.

Han-Eco® – The New Standard in Data Centers.

The Han® series has been the gold standard in connectors since HARTING's founding in the 1940s. For Data Centers, the standard is the Han-Eco® thermoplastic hood and housing series with Han-Modular® inserts. The power inserts in the Han-Modular® Series is rated for up to 600VAC power service, and up to 250V signal service. Power and signal inserts for the connector are available in different configurations for different wire sizes and current carrying capacities. Using the Han-Modular® inserts, PDU design engineers are able to create fully customized cable assemblies quickly and easily using standard, off the shelf modules.

Technical Features:

- Solutions for 40, 70, and 100 amp 3-phase neutral, plus ground
- Latching prevents accidental disconnection
- IP65 rating to protect against dust and splashes
- PCB mountable housings are available
- Thermoplastic hood and housing
- Smaller footprint than circular connectors
- Cable-to-cable, and cable-to-hood options

Benefits:

- Standard footprint
- Fully customizable with off-the-shelf components
- Able to handle multiple power inputs
- Reduced installation time with plug-and-play technology
- Eliminates wiring errors
- Maintenance is quick and easy

HARTING manufactures cable assemblies in their facilities in Elgin, IL, US and Silao, GT, MX. The assemblies can buit according specifications listed by the PDU manufacturer or the end customers themselves. This means that the PDU unit and the cable assembly to the Data Center UPS system can be sent to the end customer as a completed solution.

About the Author: McKenzie Reed is the Industry Segment Manager for Data Centers at HARTING, Inc. of North America. McKenzie holds a Bachelor of Science in Mechanical Engineering from Florida State University, Tallahassee, FL.

Contact: **McKenzie.Reed@HARTING.com | +1 (847) 717-9271**