Charles Universal Broadband Enclosures (CUBE) are a comprehensive and highly-configurable solution set of enclosures designed for a broad range of wireless, wireline and utility applications. With more than 500 configurations designed to date, it is likely that there is an existing CUBE to fit your backhaul, power, wireless infrastructure or multipurpose application. When a new custom design is needed, Charles has the ability to respond quickly with innovative new enclosure designs.

CUBE Cabinets are constructed of welded aluminum or steel and have a powder coated finish to withstand the elements and provide superior environmental and thermal protection. Their compact size and weight allow technicians to install these terminals in virtually any location quickly and easily. Designed to flexibly and efficiently accommodate a variety of mission-critical communications equipment, CUBE may be ordered with integrated equipment to meet your power, protection and physical interface requirements.
CUBE Applications

Macro Cell Equipment
With the strong push to roll out LTE, large numbers of new macro cells are being built. Cell site equipment has gotten smaller and more efficient over the years, and movement towards CRAN architecture further reduces the footprint. Charles has developed a line of CRAN solutions to assist these deployments with rugged and compact enclosures for today’s dynamic cell site needs. Various thermal options are available to ensure your equipment is protected and your site is reliable.

Site Support (Power)
One of the biggest challenges wireless service providers face is to provide reliable power in an efficient and environmentally friendly manner. Charles has a line of site support cabinets which allow providers to install new, highly efficient rectifiers and batteries in a compact and durable enclosure. With varied options for economical thermal management, Charles' line of site support cabinets protects your network integrity with an environmentally friendly, energy efficient solution.

Small Cell Enclosures & Concealment Shrouds
To address the ever growing demand for mobile data consumption, Small Cells are being rapidly deployed in urban environments. Charles works with mobile operators, wireline backhaul providers and OEMs to develop compact enclosures for Small Cell deployments. Charles Small Cell enclosures house Ethernet demarcation devices, AC/DC rectifiers, Small Cell radios and batteries for backup. Rugged enough to stand up to the outside plant environment, yet small and lightweight, Charles Small Cell CUBE Enclosures are poised to play a key part in the cellular network's future!

Backhaul
As cell sites and distributed antenna systems (DAS) across the country are upgraded to support 4G services, the Charles CUBE portfolio offers a number of compact, robust and cost effective outdoor enclosures for wireless backhaul electronics. With flexible mounting options and support for multi-chamber designs and power options, CUBE RL and select CUBE PM Series solutions will help maximize the profits of your backhaul service offering.

Multi-Purpose
CUBE MP Series enclosures are rugged, compact environmental enclosures with steel mesh or wooden backboards designed to support a wide assortment of equipment and slack storage. These versatile indoor/outdoor solutions include compliant options for both NEMA 3R (vented) and 4X (sealed) standards.

Indoor
A growing number of deployments are being made in indoor environments, such as telecom equipment rooms. These spaces are common areas in which access by the general public may occur. Charles has developed a line of vented enclosures to provide safe and secure placement of equipment in indoor areas.

DAS Enclosures & Concealment Shrouds
Outdoor Distributed Antenna System (ODAS) deployments continue at an unprecedented rate. Charles addresses DAS applications with equipment cabinets for head-end gear and shrouds which enclose DAS remotes for security and aesthetic improvements to the communities in which they are deployed.

Ethernet / GPON / RFoG
Whether in a business park or a residential multi dwelling unit, carriers are delivering broadband solutions to increasing number of subscribers. CUBE solutions specifically targeted at supporting these services at MDUs have been developed. Customizable sizes, features and optional equipment provide the flexibility to meet your MDU applications.

Utility
Rugged enough to stand up to the rigors of the utility marketplace, but compact and cost effective to protect your investment while helping to bring your project in on budget, several CUBE options are available for housing aggregation equipment, smart meters and other utility equipment.

OEM
Charles has a diverse range of cabinet sizes and configurations. We leverage our state of the art sheet metal fabrication and powder coating manufacturing facility to deliver customized, integrated enclosure solutions to house and protect your electronics. Solutions for wireless backhaul, BTS, DSLAM and GPON MDU products have already been developed for many of the top OEM companies in the telecom market.
Macro Cell Cabinets

CUBE Padmount (PM), Site Support (SS) and Battery Backup (BB) Series cabinets combine to form a complete macro site solution set. Equipment can be placed in the PM639, while power and battery equipment is combined in the SS enclosures. A standalone BB cabinet may be utilized to provide additional reserve capacity. All three of these cabinet series are built to the same height, width and depth dimensions to provide an aesthetically pleasing lineup that facilitates uniform space requirements. Front and rear access doors allow technicians access to equipment storage areas and cable routing. All cabinets are GR-487 approved and ideal for CRAN architecture. Multiple thermal management options are available, including heat exchangers and air conditioners.
Small Cell Cabinets

To address the ever growing demand for mobile data consumption, Small Cells are being rapidly deployed in urban environments. Charles works with mobile operators, wireline backhaul providers and OEMs to develop compact enclosures for Small Cell pole or ground mount deployments. Charles Small Cell CUBE enclosures house Ethernet demarcation devices, AC/DC rectifiers, Small Cell radios and batteries for backup. Rugged enough to stand up to the outside plant environment, yet small and lightweight, Charles Small Cell CUBE Enclosures meet NEMA 4X or NEMA 3R standards. Select CUBE RL Series Cabinets also have Small Cell applications.

<table>
<thead>
<tr>
<th>CUBE Series</th>
<th>Height</th>
<th>Weight</th>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW-PROFILE SMALL CELL CABINETS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUBE-SC104 Series</td>
<td>24&quot;-48&quot;</td>
<td>10.5&quot;</td>
<td>19&quot;</td>
<td>Power &amp; Battery Only, 4RU, 19&quot; Fixed Rail, Battery Compartment for Battery String</td>
</tr>
<tr>
<td>HIGH-POWER SMALL CELL CABINETS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUBE-SC204/209/304 Series</td>
<td>24&quot;-72&quot;</td>
<td>24-48&quot;</td>
<td>21&quot;</td>
<td>4RU or 9RU Power Compartment, 1 or 2 Battery Trays, Radio Shroud, Meter Socket, for 40W RRH</td>
</tr>
<tr>
<td>CUBE-SC216 Series</td>
<td>48&quot;</td>
<td>24&quot;</td>
<td>21&quot;</td>
<td>16RU Power Compartment, 1 Battery Tray, Radio Shroud, for 60W RRH</td>
</tr>
<tr>
<td>RL207XX SERIES SMALL CELL CABINETS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUBE-RL207 Series</td>
<td>27&quot;</td>
<td>28&quot;</td>
<td>20&quot;</td>
<td>7RU Equipment Chamber, 48VDC 580W Heat Exchanger, Battery Compartment for Battery String</td>
</tr>
</tbody>
</table>
Concealment Shrouds

Charles Industries radio concealment shrouds offer aesthetically-pleasing concealment of radios at small cell, densification, and DAS remote sites. Both pole and ground mount shrouds are designed to conceal and protect high value radio assets while paving the way to municipal approval. Various shroud solutions have been created to address different radio and deployment options. Powder-coated finishes are available in multiple colors to match local surroundings. The SHRD60 series is curved to enhance the aesthetic look and feel of the solution. All solutions are subjected to extensive thermal analysis to ensure appropriate operating temperatures are maintained for the enclosed RAN equipment.

**CISH51**
Pole or ground mount shrouds for Commscope ION and JMA TEKO DAS Remotes

**SHRD52**
Pole mount shrouds for Nokia 40/60/90W Remote Radio Heads

**SHRD56**
Ground mount shrouds for Nokia 40W Remote Radio Heads or Nokia cMRO Radios

**SHRD60**
Pole mount curved shoruds for low and high power Remote Radio Heads

<table>
<thead>
<tr>
<th>Shroud Code</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISH51</td>
<td>49”x22.5”x12.5”</td>
<td>65 lbs.</td>
</tr>
<tr>
<td>CISH51LG</td>
<td>49”x32”x12.5”</td>
<td>95 lbs.</td>
</tr>
<tr>
<td>CISH51ST</td>
<td>42”x22.5”x12.5”</td>
<td>55 lbs.</td>
</tr>
<tr>
<td>SHRD52-101/401</td>
<td>48”x24”x20”</td>
<td>80 lbs.</td>
</tr>
<tr>
<td>SHRD52-601</td>
<td>64”x23”x14”</td>
<td>80 lbs.</td>
</tr>
<tr>
<td>SHRD56-101/401</td>
<td>36”x32”x22”</td>
<td>170 lbs.</td>
</tr>
<tr>
<td>SHRD56-601</td>
<td>36”x32”x22”</td>
<td>55 lbs.</td>
</tr>
<tr>
<td>SHRD60-051</td>
<td>46”x13.5”x14”</td>
<td>99 lbs.</td>
</tr>
<tr>
<td>SHRD60-401</td>
<td>70”x20”x18”</td>
<td>99 lbs.</td>
</tr>
</tbody>
</table>
CUBE RL Series enclosures are single or multi-compartment cabinets designed for housing and protecting traditional 19" or 23" rackmount equipment. Options exist for wall, H-Frame or pole mounts for most models. Separate locking compartments on multi-chamber models offer division of provider and customer equipment access. At cellsites and other multi-user locations, this division of access allows customers to service their equipment and drops without the need to have the proprietary cabinet owner's technician open the cabinet for them. RL Series cabinets are certified to Telcordia GR-487 specifications for electronic equipment cabinets and are designed to meet NEMA 3R or 4X standards, depending upon configuration. Select CUBE PM Series cabinets are also frequently utilized for backhaul applications requiring a larger capacity padmount enclosure.
Many different CUBE enclosures provide critical equipment and battery protection for Distributed Antenna Systems (DAS) installed at stadiums and other venues. Charles has created solutions for both head-end equipment as well as remote equipment. For the head-end, the CUBE-PM639 equipment cabinet provides security and storage for head-end gear and fiber equipment. CFRS panels help to manage and terminate incoming fiber. CUBE Site Support (SS) and RL Series power and battery enclosures can be used to power remote units. An array of sizes and battery capacities ensures a right-sized solution for all deployment needs. Additionally, the CISH51 Concealment Shroud is useful for concealing and protecting up to three DAS remotes in a single location. Available in a variety of colors, the CISH51 blends into local surroundings for visually-aesthetic placements.
**Multi-Purpose Cabinets**

CUBE MP Series cabinets are rugged, compact enclosures designed for economical protection of a wide assortment of remotely deployed equipment. These multi-purpose cabinets with steel mesh or wooden backboards are versatile performers adaptable to many common remote terminal applications for copper, fiber and coaxial splices and equipment. Common applications include housing small electronics, splice trays, smart meters, SCADA equipment, and security/monitoring hardware. MP Series cabinets are designed to meet NEMA 4X (sealed cabinets) or NEMA 3R (vented cabinets) standards.

**MP Common Sizes:**

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP1818</td>
<td>18&quot;x18&quot;x10&quot;</td>
</tr>
<tr>
<td>MP2020</td>
<td>20&quot;x20&quot;x10&quot;</td>
</tr>
<tr>
<td>MP2424</td>
<td>24&quot;x24&quot;x8&quot;</td>
</tr>
<tr>
<td>MP3624</td>
<td>36&quot;x24&quot;x12&quot;</td>
</tr>
<tr>
<td>MP3636</td>
<td>36&quot;x36&quot;x12&quot;</td>
</tr>
</tbody>
</table>

Common sizes (HxWxD) represent existing CUBE designs typically stocked by Charles authorized distributors. Custom sizes are available by special order.
Indoor Cabinets & Battery Racks

CUBE ID Series cabinets address the needs of indoor wireless applications. ID Series enclosures feature power, equipment and optional battery compartments, and are direct air cooled operation in indoor equipment areas. They provide up to 18RU front or 36RU front and rear mounting space for 23” rack mount equipment, with DAS electronics mounted on slanted, vented shelves. Select CUBE RL Series multi-function enclosures also house power, Ethernet transport, and radio equipment in a compact footprint with optional battery backup compartments available. CIBR modular battery racks are a Seismic Zone 4 rated rack solution for up to six strings of batteries.
Utility Cabinets

As private, leased line T1 services become unavailable through local incumbent telecom carriers, utility providers have a need to replace their internal communications networks with an internal network of their own. This takes the form of either a dedicated fiber network or secure wireless infrastructure. Charles CUBE outside plant cabinets are ideally suited for small, medium, or large size deployments of fiber or wireless gear. Many sizes and options are available, such as separate battery chambers; AC/DC power supplies; and fiber termination, patching, and management.

<table>
<thead>
<tr>
<th>Series</th>
<th>PM4000</th>
<th>PM5000</th>
<th>PM6000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>28&quot;</td>
<td>28&quot;</td>
<td>32&quot;</td>
</tr>
<tr>
<td>Overall Depth</td>
<td>20&quot;</td>
<td>27&quot;</td>
<td>32&quot;</td>
</tr>
<tr>
<td>Equipment Chamber Capacity</td>
<td>16RU, 20RU, 24RU</td>
<td>14RU, 16RU, 20RU, 24RU, 27RU, 31RU</td>
<td>16RU, 24RU, 27RU, 31RU, 36RU, 39RU</td>
</tr>
<tr>
<td>Front and Rear Doors</td>
<td>Optional</td>
<td>Optional</td>
<td>✓</td>
</tr>
<tr>
<td>Optional Battery Chamber</td>
<td>Up to (4) 100AH</td>
<td>Up to (4) 190AH</td>
<td>Up to (4) 190AH</td>
</tr>
<tr>
<td>Optional Handoff Chamber</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Third-Party Equipment Integration

As a full-service enclosure provider with its own U.S. based design, production and assembly facilities, Charles Industries is uniquely qualified to provide you directly with integrated equipment solutions. Our professionally trained workforce can install your valuable network electronics and powering hardware directly into a CUBE enclosure solution at the company’s controlled integration facilities. This improves compliance and saves you time and money from having technicians do the work in uncontrolled worksite conditions.

Charles’ CUBE experts will work with you to best determine powering and thermal management options, wiring harnesses and cable organization, alarms and relays, power/surge protection, and other options to meet your unique integration requirements. Integrated solutions may then be tested for conformance and drop shipped to service provider worksites for installation convenience and time savings.

SITE ACCESS CONTROL

INTELLIGENT SITE MONITORING

SURGE PROTECTION

CABLE INGRESS/EGRESS

UPS MODULES

CPRI PANELS MODULES
CUBE Thermal Management & Accessories

Many optional features are available to optimize your CUBE to your specific application:

- Thermal systems, including:
  - Heat Exchangers
  - Air Conditioners
  - Direct Air Cooling
- Pre-wired cable harnesses
- Fiber splice and splitter trays
- Protector block interfaces (screw, punchdown, other)
- Integrated power (AC, AC with battery backup, DC)
- Surge protection
- Padlockable rackmount equipment cages

- Pre-stubbed cable types and lengths
- Door locks, security bolts, and door alarms
- Swing rack mounting rails
- Plinth bases
- Slide-out laptop trays
- Solar shielding
- Venting
- Aesthetic shrouds
- LED interior lighting
- Customer-specific labeling

Several other Charles product lines complement CUBE cabinet installations. For more information on these products, please visit www.charlesindustries.com or call 847-806-6300.

CUBE Configurations

The cabinets shown on these pages are representative of the more than 300 designed configurations Charles has developed for the CUBE family of environmental enclosures. To view the full line of CUBE Cabinets, please visit www.charlesindustries.com or scan the QR Code (requires QR Code Reader App) with your smart phone.

Multi-faceted design and manufacturing capabilities uniquely allow Charles Industries to meet its customers’ deployment challenges with time-sensitivity and individual responsiveness. To discuss custom CUBE configurations, please call Charles at 847-806-6300 with your specific application information and requirements. Charles provides full engineering support and application consultation and will work with you to create the most reliable and cost-efficient enclosure solution for the deployment of your network’s mission-critical equipment.

With Charles, You Can Depend On:

- Field-proven and unequalled 24-hour technical support
- Individualized application consultation
- Responsive customer service

Visit our website at http://www.charlesindustries.com