

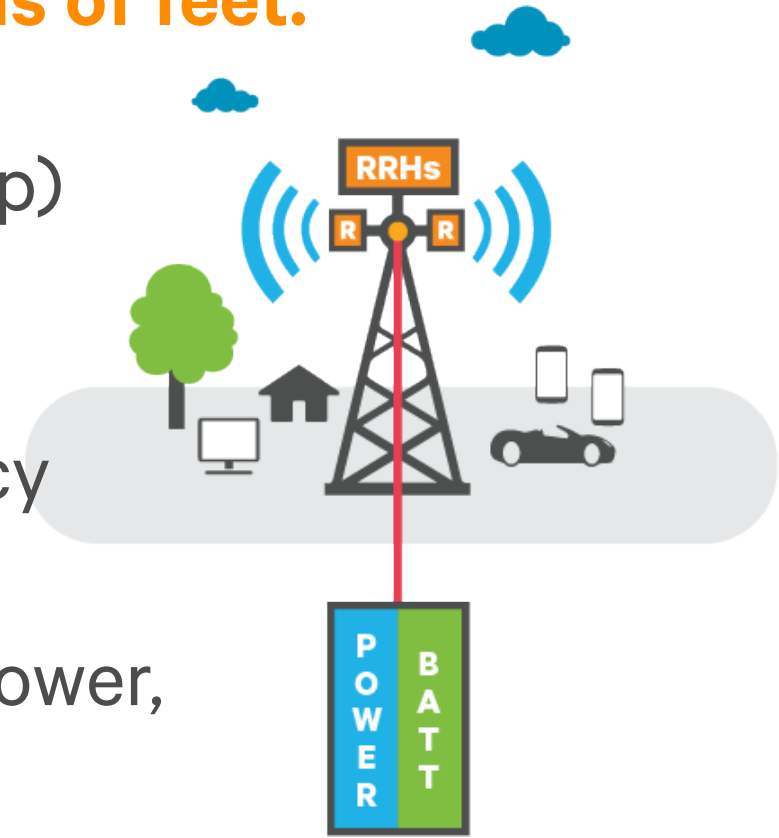


PLUG-IN BULLET CONVERTER

C48/58-1000B

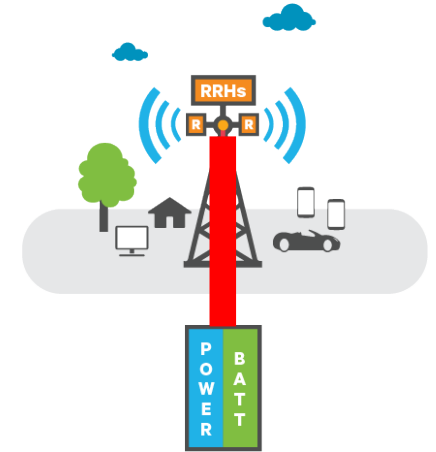
48 VDC rectifier/battery plants provide power to remote radio heads (RRHs) at wireless base stations, which are connected through an extended cable length, up to hundreds of feet.

- Distance between power system and RRHs results in voltage drop (longer cable, higher drop)
- Voltage drop is causing RRHs to shut down before the battery reaches end of discharge
- Voltage drop results in lower operating efficiency
- Required hold-up time is not being met
- As RRHs continue to evolve and require more power, all of these issues will intensify



OPTION 1: Replace the existing cable with larger gauge cable

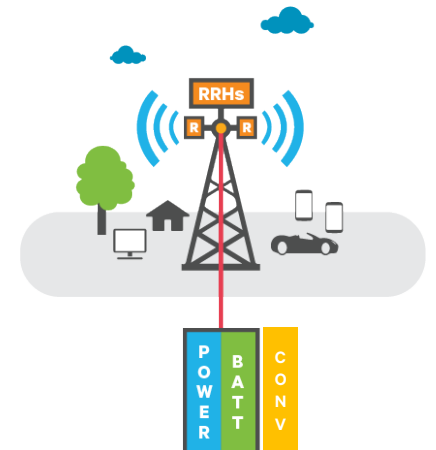
- Larger cables with more copper are expensive
- Increased weight on tower is more risky
- Lease rates increase due to added weight
- Someone has to climb up the tower



OPTION 2: Add a converter shelf to the power system

A traditional stand-alone converter shelf could be connected to the existing power system to boost the voltage.

- Helps alleviate voltage drop issue
- Requires purchasing a converter shelf
- Takes up additional equipment space in the rack
- Requires rewiring of existing connections



OPTION 3: Boost voltage of existing power system with plug-in bullet converter

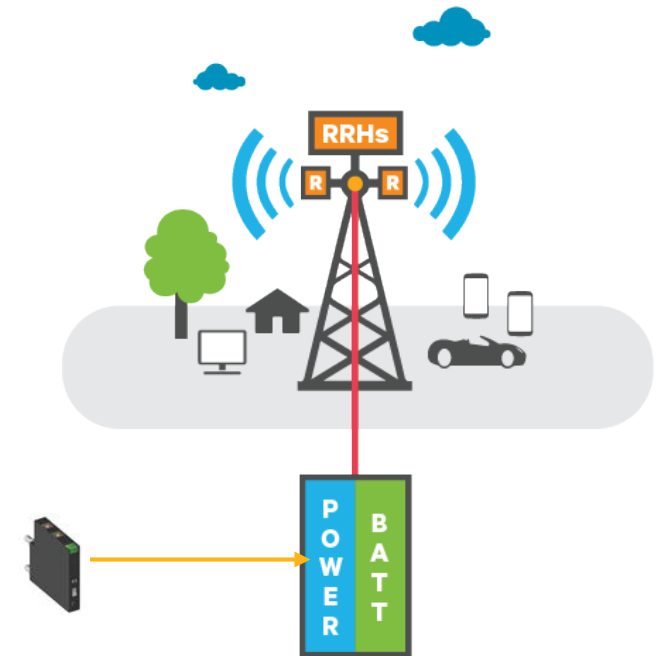
Regulating higher voltage at the source with a field replaceable bullet device has multiple benefits.

Reduces CapEx

- Existing cable can be retained
- Costs less than adding a complete shelf
- Costs way less to install
 - ✓ Simply plug-in to existing distribution panel
 - ✓ No one has to climb up the tower

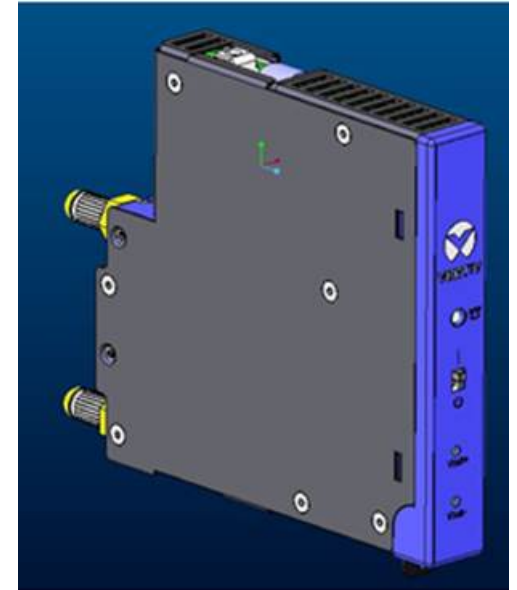
Lowers OpEx

- Efficiency and performance are optimized with higher RRH voltage
- RRH operation is maintained to end of battery discharge



The bullet plug-in converter increases output of the DC power system to support higher power RRUs.

- Combines the functionality of an overcurrent protection device and a converter.
- Technology packaged for mounting in a standard bullet breaker panel.
 - 4.22" x 0.73" x 5.3" (H x W x D)
- Ideal for DC power plants that utilize bullet style circuit breakers
- Field trial unit (safety compliant) – Jan 2019
- Production availability – April 2019



TECHNICAL SPECIFICATIONS

PRE-RELEASE /
PATENT PENDING

Input Voltage Range	42 VDC to 58 VDC
Output Voltage	Up to 58 VDC
Output Power	Single pole 1000 W at 40°C; 1000 W at 65°C with airflow
Efficiency	98.5% peak
Input / Output Connections	Standard bullet terminals + return
Pole Options	Single pole or multi-pole packages
Operating Temperature	-40°C to +65°C
Switch	Enable/disable toggle switch
Test Points	Front accessible
MTBF	Extremely low failure rate

TECHNICAL SPECIFICATIONS (CONTINUED)

PRE-RELEASE /
PATENT PENDING

Agency Certifications	FCC rules Part 15, Subpart B, Class B for radiated and Class A conducted emissions limits UL60950 Recognized Telcordia GR63, GR1089, GR3108 Class 2
Protection	Overcurrent protection fuse – branch circuit rated Output current limitation High voltage shutdown
Alarming and Monitoring	Alarm contact Local bi-color LED

If space or alarming prevents installation in primary plant, a converter panel option is available.

- Individual input and output per pole
- Input and output poles can be paralleled
- (24) positions for 23" panel and (18) positions for 19" panel
- Form C Alarm card

