



Battery Backup Unit

A selection of the Cisco WPAN advanced range extender models support one battery backup unit (BBU), which provide power to the range extender if the AC power supply fails or is not available. For more information about the WPAN advanced range extender models that support a BBU, see the [“WPAN Range Extender Models Supporting BBUs” section on page 3-1](#).

This chapter describes the BBU features and installation procedures, and includes the following sections:

- [Battery Backup Units, page 3-1](#)
- [BBU Configuration during Transportation, page 3-4](#)
- [Disabling and Enabling the BBU in the Range Extender, page 3-4](#)
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Battery Backup Units

This section contains information about:

- [WPAN Range Extender Models Supporting BBUs, page 3-1](#)
- [Battery Backup Operations, page 3-2](#)
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WPAN Range Extender Models Supporting BBUs

[Table 3-1](#) details the WPAN range extender models that support a BBU.

Table 3-1 WPAN Range Extender Models Supporting BBUs

WPAN Range Extender Model	Description	BBU Support
IR529WP-915S/K9	Connected Grid Base Range Extender—IEEE 802.15.4e/g WPAN 900 MHz	No
IR529UBWP-915S/K9	Connected Grid Advanced Range Extender, configurable with single antenna and battery backup support—IEEE 802.15.4e/g WPAN 900 MHz	Yes (BBU is optional)
IR529UBWP-915D/K9	Connected Grid Advanced Range Extender, configurable with dual antenna and battery backup support—IEEE 802.15.4e/g WPAN 900 MHz	Yes (BBU is optional)
IR529UWP-915D/K9	Connected Grid Advanced Range Extender, configurable with dual antenna—IEEE 802.15.4e/g WPAN 900 MHz	No

Battery Backup Operations

The battery backup unit (BBU) provides the WPAN range extender with an emergency power source if the AC power source is unavailable. The unit is mounted in the range extender housing.

[Table 3-2](#) describes the BBU model.

Table 3-2 BBU Models

BBU Model	Description
CGR-BATT-4AH	Battery backup unit, capacity = 48 Watt-hours

BBU Status

The BBU is automatically enabled and begins supplying power when the range extender detects that power is not being received from the AC power supply. The BBU continues to supply power to the range extender until at least one of the following conditions is met:

- BBU is completely discharged
- AC power to the range extender is enabled
- BBU is disabled via the Connected Grid Network Management System (CG-NMS) software application.

Battery Backup Mode

This section describes impact on the range extender configuration and operating capabilities when the range extender switches from AC power to BBU power.

The topics covered include:

- [Range Extender Configuration, page 3-3](#)
- [Range Extender Interface Operation, page 3-3](#)

Range Extender Configuration

The range extender software configuration is not impacted when the range extender switches from AC power to BBU power.

Range Extender Interface Operation

When the BBU is operating and powering the range extender, the range extender operates and performs normally. The range extender does not power off any interfaces to conserve power when AC power is not available, and the range extender is being powered by the BBU.

BBU Firmware Upgrade

It is only possible to use the CG-NMS to upgrade the BBU firmware and to show information about the BBU firmware upgrade.

To upgrade the BBU firmware and to show information about the BBU firmware upgrade, use the CG-NMS firmware upgrade option.

The firmware upgrade is executed in background and an output message is generated in the CG-NMS when the BBU firmware upgrade is complete. During the firmware upgrade, you can use the CG-NMS to view the state of the BBU firmware upgrade.

BBU Configuration during Transportation

The BBU configuration during transportation is controlled by a dedicated bit in the BBU NVRAM register called the Transportation bit or (T-bit).

The T-Bit is set at the factory and is used to place the BBU in a disabled (low power) state. This is necessary in order to preserve the battery charge while the WPAN range extender device (with BBU installed) is in storage, or being transported between the factory and the final installation site.

This sections contains:

- [Setting the BBU NVRAM Register T-bit, page 3-4](#)
- [BBU NVRAM Register T-bit Settings and BBU Status, page 3-4](#)

Setting the BBU NVRAM Register T-bit

The T-bit in the BBU NVRAM register is set to 1 using the CG-NMS.



Note

The T-bit is set to 1 by Cisco manufacturing at the factory. The T-bit is reset to 0 or cleared only by the CG-NMS during ZTD deployment.

BBU NVRAM Register T-bit Settings and BBU Status

Table 3-3 *BBU NVRAM T-bit Settings and BBU Status*

T-bit Setting	BBU Status
T-bit = 1	• AC ON: BBU enabled automatically (to allow battery to charge) • AC OFF: BBU disabled automatically (to prevent battery from discharging)
T-bit = 0	The BBU can be set to a disabled or enabled status for AC ON or OFF conditions.  Note If the BBU is disabled due to being < 5% capacity, it will be enabled automatically when AC power resumes. If the customer disables the BBU, the customer must enable the BBU manually.

Disabling and Enabling the BBU in the Range Extender

In normal operating mode (T-bit is off), the BBU automatically begins to supply power to the range extender when it detects that power is not being received from the AC power supply. You may wish to disable and enable the BBU for the following reasons:

- To inhibit the BBU discharge during storage, shipping or transportation in order to preserve battery life.
- To replace the battery in an installed and operating range extender.

The BBU can be disabled and enabled by using the CG-NMS. These steps are described in the following sections:

- [Disabling the BBU, page 3-5](#)
- [Enabling the BBU, page 3-5](#)

Disabling the BBU

For information on how to disable the BBU, see the *Cisco Connected Grid Network Management System User Guide*.

Enabling the BBU

For information on how to enable the BBU, see the *Cisco Connected Grid Network Management System User Guide*.

Installing a BBU in the Range Extender

A BBU can only be installed in the WPAN range extender by a Cisco trained technician. Contact your Cisco representative for support.

BBU Technical Specifications

This section describes the specifications and standards supported by the BBU.

- [Range Extender Power Path Selection, page 3-5](#)
- [Discharge Conditions, page 3-6](#)
- [Charge Conditions, page 3-6](#)
- [Operating and Storage Temperatures, page 3-7](#)
- [Battery Life, page 3-7](#)

Range Extender Power Path Selection

During normal operation, the range extender is powered by the integrated AC power supply. The BBU enters discharge mode and begins providing power to the range extender when the AC power is interrupted outside a range of 85V to 250V for more than 20 ms. The BBU charges or discharges only; it does not support both simultaneously.

Discharge Conditions

Table 3-4 Battery Backup Unit—Discharging Specifications

Discharge Conditions	Description
Power load	4–6 W typical
Duration	8–12 hours typical
Entry to discharge ¹	- AC power (range of 85V to 250V) not detected for more than 20 ms - Remaining BBU capacity >5% - External ambient temperature is within -40 to 122°F (-40 to 50°C)
Exit discharge ²	- AC power restored in the range of 85V to 250V for more than 20 ms. - Remaining BBU capacity <5% - External ambient temperature is outside of -40 to 122°F (-40 to 50°C)

1. All conditions met.

2. Any condition met and system is detected.

Charge Conditions

Table 3-5 Battery Backup Unit—Charge Specifications

Charge Conditions	Description
Power draw	No more than 20 W when charging
State of charge	No more than 90%
Entry to charging limit ¹	- Charge is enabled - State of Charge (SOC) <85% - AC power detected in the range of 85V to 250V for more than 20 ms. - External ambient temperature is within -4 to 104°F (-20 to 40°C)
Exit charging ²	- Charge is disabled - AC power (range of 85V to 250V) not detected for more than 20 ms. - External ambient temperature is outside of -4 to 104°F (-20 to 40°C)

1. All conditions are met.

2. Any condition is met

Operating and Storage Temperatures

Table 3-6 Battery Backup Unit—Operating and Storage Temperatures

BBU State	Local BBU Internal Temperature ¹	External Ambient Temperature
Charging	+32 to 122°F (0 to 50°C)	-4 to 104°F (-20 to 40°C)
Discharging	-4 to 140°F (-20 to 60°C)	-40 to 122°F (-40 to 50°C)
Operation (Idle)	-4 to 140°F (-20 to 60°C)	-40 to 158°F (-40 to 70°C)
Storage and shipping	+14 to 113°F (-10 to 45°C) for 3 months maximum	Short-term: +14 to 113°F (-10 to 45°C) for 3 months maximum Long-term: +27 to 77°F (-3 to 25°C) - 65% Relative Humidity - 40 to 90% SOC

1. Internal BBU heaters allow the outside ambient temperature to drop much lower than the BBU internal temperature, thereby preserving battery life and expanding the operating temperature.

Battery Life

Table 3-7 Battery Backup Unit — Battery Life

Product ID	Battery Life	Charge-Discharge Cycles
CGR-BATT-4AH	5 years	500

