GENERAL MICRO SYSTEMS, INC.
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PURPOSE

This document provides information on Coin Cell Batteries (also known as Button Cell Batteries) contained in GMS products or otherwise provided by GMS for use in its products.

The information in this document is based on information provided by battery manufacturers and is provided as a convenience to GMS's customers. This information is not intended to be comprehensive, nor is it a substitute for information provided directly by the manufacturers of coin cell batteries. Should manufacturer information differ from information in this document, the manufacturer's information should prevail.

ABBREVIATIONS

BIOS ..... Basic Input/Output System

FOD ..... Foreign Object Debris

ME..... Management Engine

OS..... Operating System

RTC..... Real Time Clock

TPM ..... Trusted Platform Module

REFERENCES

- Selecting the Right Lithium Battery, BR –vs- CR Chemistries.
  Retrieved from https://www.master-instruments.com.au/files/knowledge-centre/engineering/guides-and-selection-charts/panasonic___selecting_the_right_lithium_battery_br_or_cr_series.pdf
- Lithium and Micro Batteries Overview.
  Retrieved from https://industrial.panasonic.com/cdbs/www-data/pdf/AAA4000/AAA4000COL15.pdf

BATTERY FUNCTIONS

Batteries in GMS units are used for the following functions:

- **Real Time Clock (RTC):** The battery powers the real time clock and maintains the time when the unit is powered off. Without a battery, RTC settings will not be retained.

- **Management Engine (ME) and Trusted Platform Module (TPM):** The battery tracks the internal state of the ME and TPM. Without a battery, various write-once registers need to be cleared which can only be accomplished through a cold boot – this may result in multiple system reboots before finally loading the operating system.

Note that BIOS settings are stored in non-volatile flash memory, not CMOS memory, therefore they are unaffected by the battery, or lack thereof. That is, removing the battery will have no effect on the BIOS settings which remain in non-volatile storage.

GMS COMPUTING ENGINES
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BATTERY LIFESPAN

Coin cell battery life is strongly influenced by use and temperature. The typical lifespan is 3-5 years.

GMS recommends regular battery replacement every 3 years or sooner.

BATTERY REPLACEMENT

Most GMS products include a removable battery. The battery is user field-replaceable and can be replaced while the unit is powered on.

Some GMS products, such as displays, may require removal from the mounting structure to have sufficient clearance to access the battery. In such cases, the system should be powered down and cabling removed prior to dismounting.

A quick visual inspection of the GMS unit will reveal the location of the battery. Typical locations include:

- **Behind a front panel door**: Various Small Form Factor (SFF) units include a door at the front panel. Opening the door reveals the battery location. These units use a battery holder with a retaining clip at the host unit.
- **Direct external access**: Various SFF units and Displays provide a battery access panel directly on the unit's exterior, usually the top or rear panels. Often, but not always, the access panels are conspicuously marked with some sort of "BATTERY" terminology.
- **Assembly to Single Board Computer (SBC)**: Various SBC products include a battery assembly, usually coupled with a storage device assembly.

Generic battery replacement instructions follow. Where available, product-specific instructions should take precedence.

Behind Front Panel Door

On GMS units where the battery is located behind a font panel door, a battery holder and retainer, similar to that shown in Figure 1 below, are utilized.

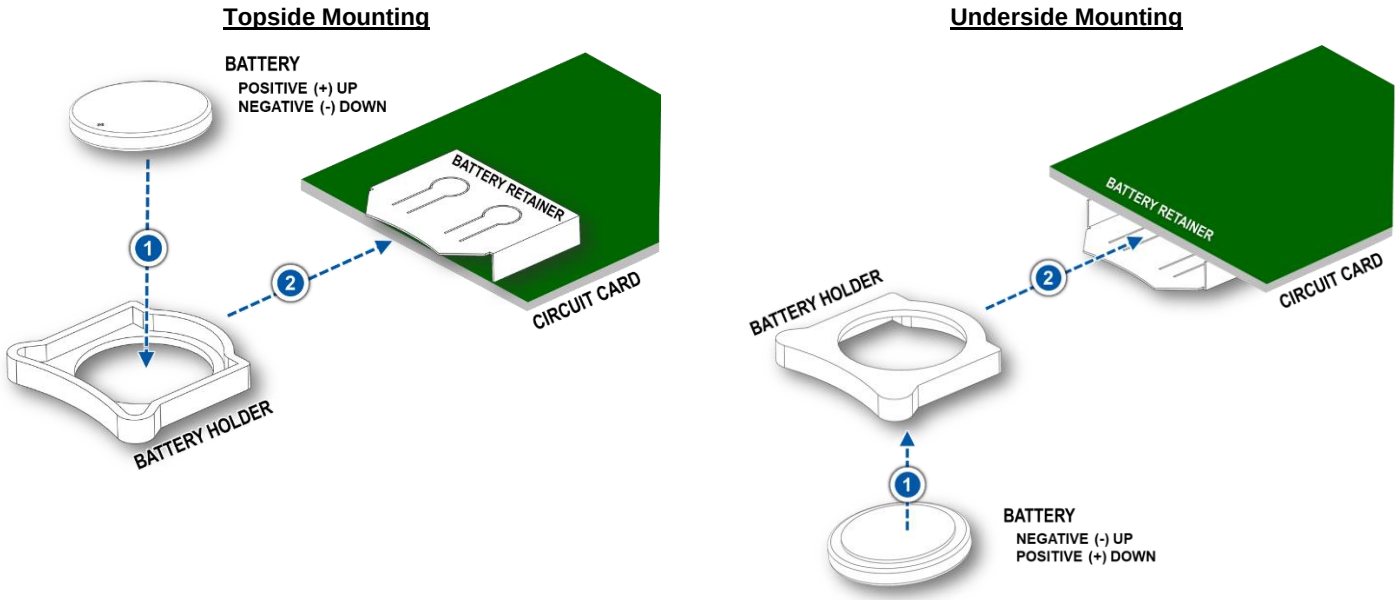


FIGURE 1. BATTERY HOLDER AND RETAINER

VERY IMPORTANT: As implemented on GMS units, the battery retaining clip is mounted on the underside of the host circuit card.

Depending on the unit, the front panel door is hinged at the top or the side. Opening the door reveals the battery location.

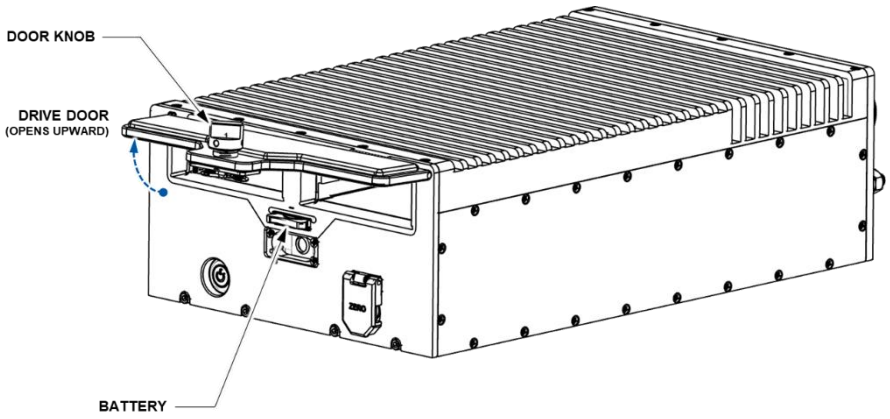
Replacing the battery:

- Open the drive door at the front panel.
- Pull the battery holder to release it from the retainer.
- Insert the new battery into the holder with the positive (+) terminal facing down.
- Return the battery holder into the retainer to secure it in place.

CAUTION: The battery retaining clip is mounted on the underside of the host circuit card. Be sure to observe the proper battery polarity – negative terminal (-) upward.

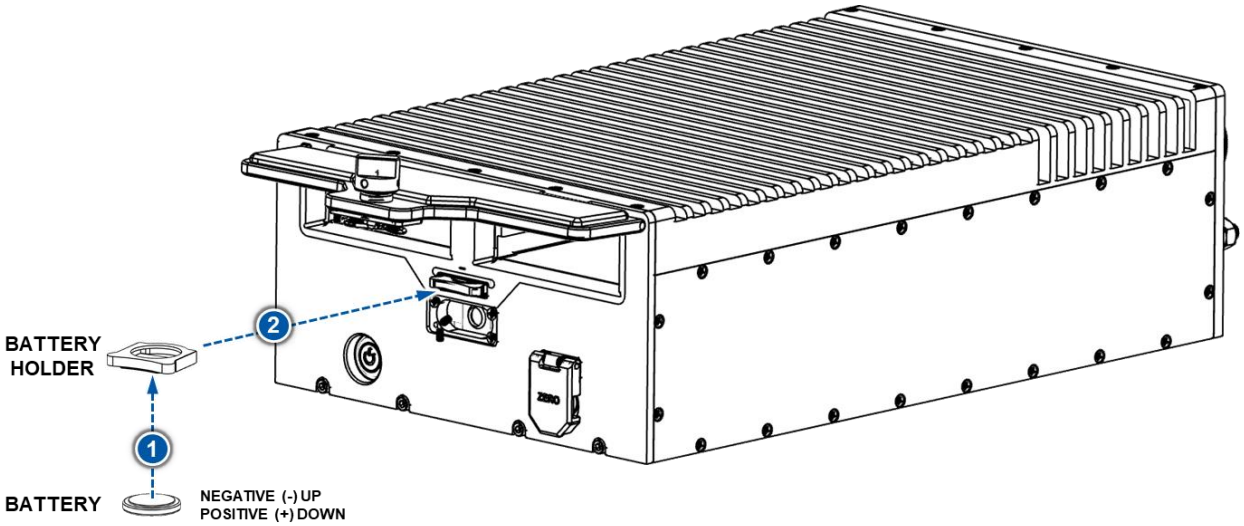
Door Hinges at Top - Opens Upward

Battery Location



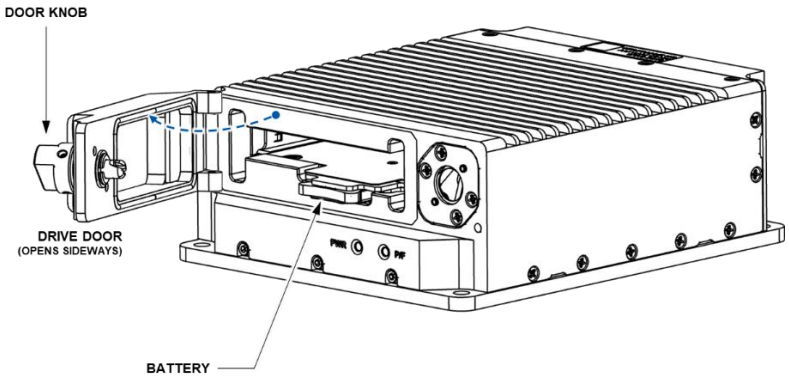
Representative Units
S402-LC
S402-SW
S422-SW

Battery Replacement



Door Hinges at Side - Opens Sideways

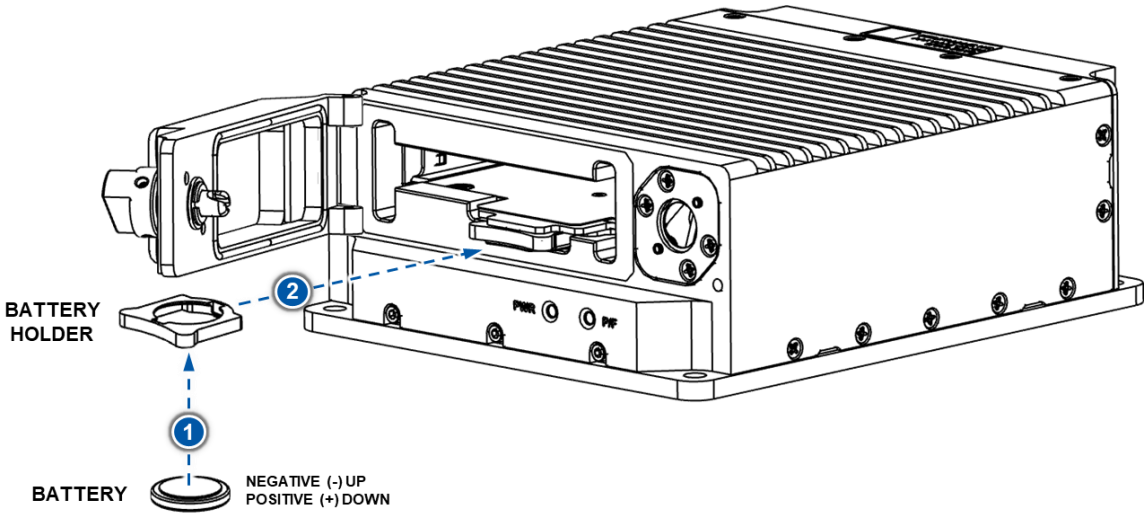
Battery Location



Representative Units

S1202-FG
S1202-HS
S1202-LC
S1202-MD
S2002-LC
S2002-HS
S2002-MD

Battery Replacement



Direct External Access

A battery access panel directly on the unit's exterior, usually the top or rear panels.

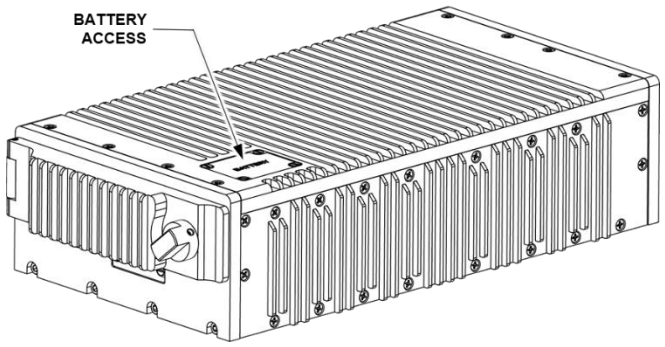
NOTE: Opening the battery compartment to replace the battery will not affect the GMS warranty (if still in effect) but may adversely affect the chassis seal or integrity of the system. When in doubt, return the unit to GMS for battery replacement.

Replacing the battery:

- Remove the battery cover access. The four retention screws are captive to the cover. Avoid any FOD from entering the unit.
- Remove the battery by using a nonmetallic pry tool.
- Insert the new battery with the positive (+) terminal facing up.
- Replace gap pads, as needed.
- Before replacing the access cover, ensure that the O-ring inside the unit is clean and undamaged, then ensure that the mating surface on the inside of the access cover is also clean.
- Replace the battery cover by tightening the four retention screws. Torque screws to 40 in-oz.

Small Form Factor

Battery Location



Representative Units

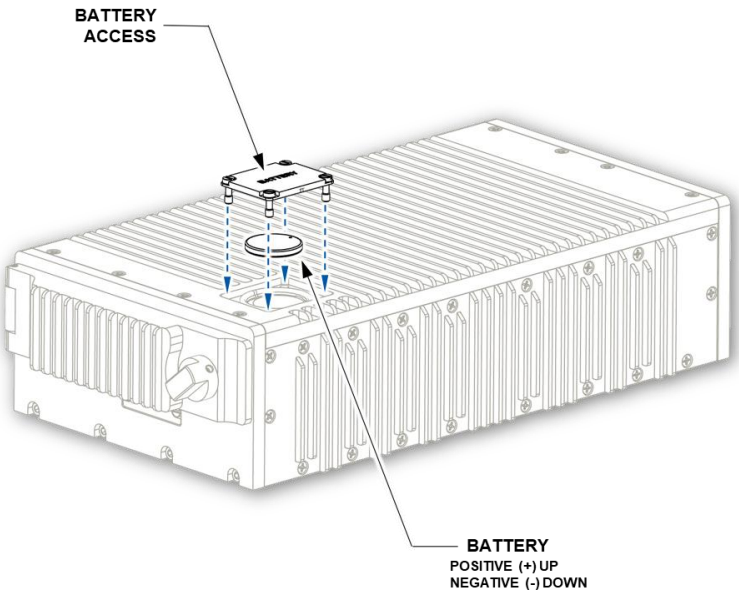
S902R
S902R-3VM

S1202-XVE

S2002-SW

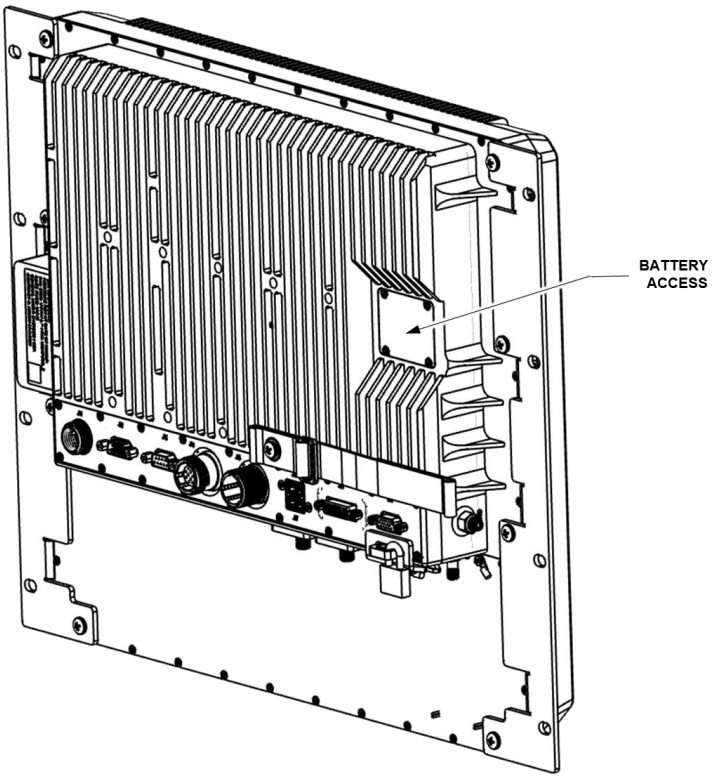
SB1002-LC	SB1102-LC
SB1002-HDVR	SB1102-HDVR
SB1002-HS	SB1102-HS
SB1002-MD	SB1102-MD
SB1002-RT	SB1102-RT
SB1002-XV	SB1102-XV

Battery Replacement



Display

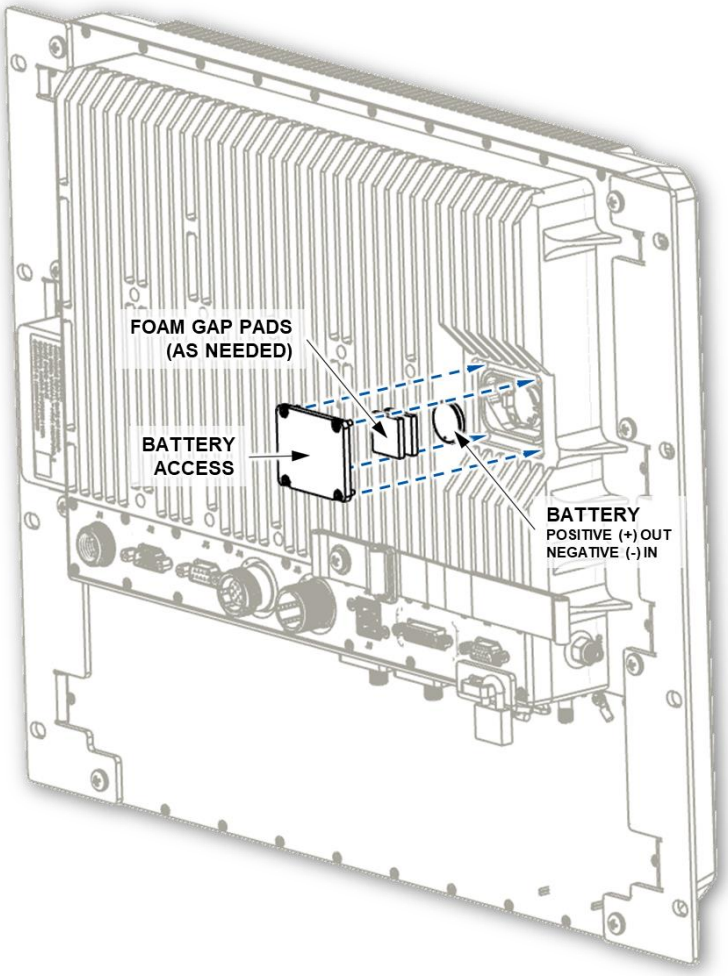
Battery Location



Representative Units
SD1202-12
SD1202-17
SD1202-19S
SD1202-24

HD12W
HD17W
HD24W

Battery Replacement



NOTE: Displays may require removal from the mounting structure to have sufficient clearance to access the battery. The system should be powered down and cabling removed prior to dismounting.

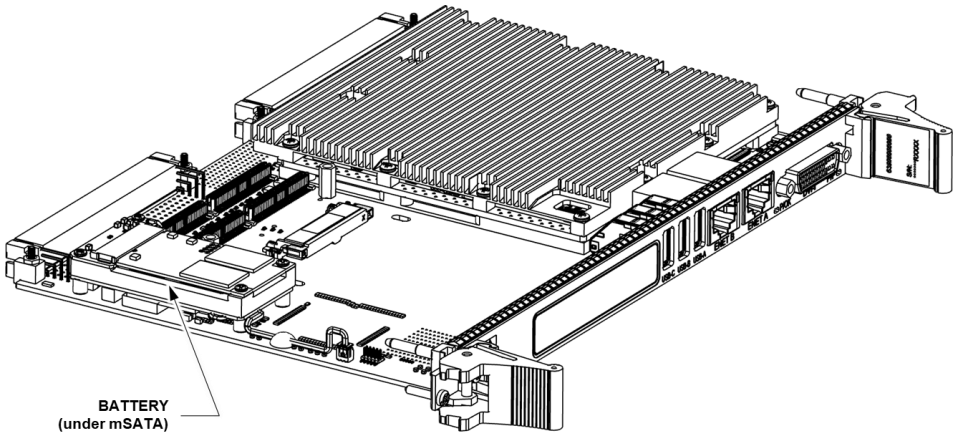
Assembly on Single Board Computer

A battery assembly is provided, usually coupled with a storage device assembly.

Replacing the battery:

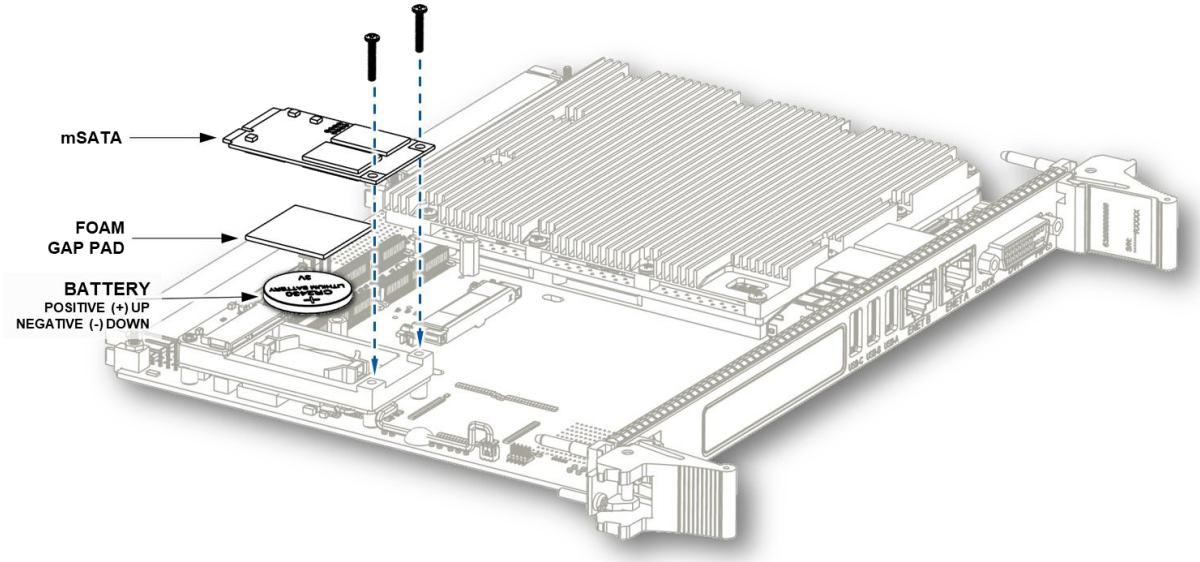
- Remove the two screws that secure the mSATA card.
- Remove the mSATA card.
- Remove any gap pads to access the coin cell battery.
- Remove the battery by using a nonmetallic pry tool.
- Insert the new battery with the positive (+) terminal facing up.
- Replace gap pads, as needed.
- Replace mSATA card.
- Secure the mSATA card with the two screws. Torque the screws to 40 in-oz.

Battery Location



Representative Units
VSB2102
VME120
VME120-PPC
VME120-WSIO

Battery Replacement



BATTERY IDENTIFICATION

The models typically utilized in GMS products are specified in Table 1 below.

TABLE 1 – BATTERY MODELS IN GMS PRODUCTS

GMS P/N	Manufacturer	Model	Chemistry	Weight (g)	Diameter (mm)	Height (mm)	Nominal Capacity (mAH)	Voltage (V)
39-031A-W	Panasonic™	BR2032	LiCF - Lithium Carbon Monofluoride	2.5	20.0	3.2	200	3.0
39-012A-R	Renata™	CR2032	$LiMnO_2$ - Lithium Manganese Dioxide	2.8	20.0	3.2	260	3.0
39-2029-000	Energizer™	CR2430	$LiMnO_2$ - Lithium Manganese Dioxide	4.6	24.5	3.0	320	3.0
39-2030-000	muRata®	CR2032x	$LiMnO_2$ - Lithium Manganese Dioxide	3.0	20.0	3.2	220	3.0

MANUFACTURER REFERENCES

TABLE 2 – MANUFACTURER REFERENCES

GMS P/N	Manufacturer	Model	Reference
39-031A-W	Panasonic™	BR2032	https://industrial.panasonic.com/ww/products/pt/lithium-batteries/models/BR2032
39-012A-R	Renata™	CR2032	https://www.renata.com/en-us/products/lithium-batteries/cr2032-consumer-goods/
39-2029-000	Energizer™	CR2430	https://www.energizer.com/specialty-batteries/2430-battery
39-2030-000	muRata®	CR2032x	https://www.murata.com/en-us/products/productdetail?partno=CR2032X

ABOUT GENERAL MICRO SYSTEMS:

General Micro Systems (GMS) is the industry expert in highest-density, modular, compute-intensive, and rugged small form-factor embedded computing systems, servers, and switches. These powerful systems are ideal for demanding C4ISR defense, aerospace, medical, industrial, and energy exploration applications. GMS is an IEC, AS9100, and MIL-SPEC supplier with infrastructure and operations for long-life, spec-controlled, and configuration-managed programs. Designed from the ground up to provide the highest performance and functionality in the harshest environments on the planet, the company's highly customizable products include GMS RuggedDNA™ with patented RuggedCool™ cooling technology. GMS is also the leader in deployable high-end Intel® processors and a proud Intel® partner since 1986. For more information, visit www.gms4sbc.com

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