PACSystems*

IC695ACC302

GFK-2592
March 2011

Auxiliary Smart Battery Module

The IC695ACC302 Auxiliary Smart Battery Module is an Enhanced version of IC693ACC302. In addition to providing an extended RAM memory backup time compared to that of the standard memory backup batteries (IC698ACC701) for PACSystems CPUs, the smart battery module has a battery monitoring circuit that enables the user to detect the Low Battery state in advance before it is completely drained. The Auxiliary Smart Battery Module replaces the standard CPU RAM backup battery in your control system for the PACSystems CPUs.

Pre-installation Check

Upon receiving the battery pack, verify the package contents, which includes the following:

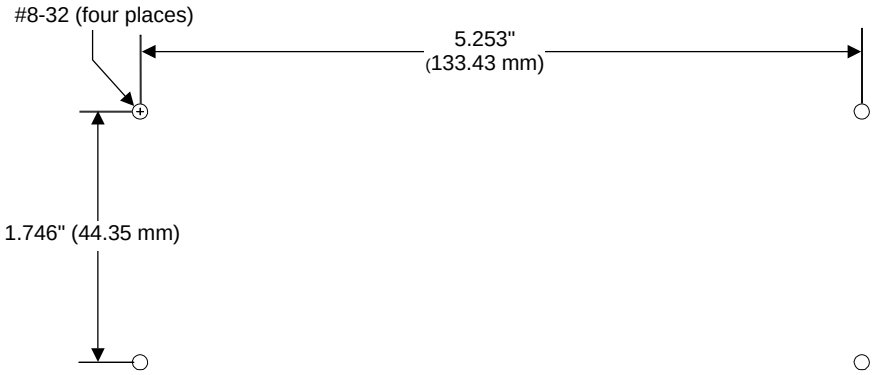
- IC695ACC302 Auxiliary Smart Battery Module having cable with 4-pin female JAE connector
- Enabling adapter cable with 4-pin male to 2-pin female connector

Date Code

The date code is located on the product label on the front of the auxiliary battery module. The date code consists of four digits, such as 1011. The first two digits represent the year of manufacture in the 21st century, such as 10 for the year 2010. The last two digits represent the fiscal week of manufacture for the indicated year; for example 11 stands for fiscal week 11.

Installation

1. With power removed from the equipment, drill four #29 (0.136”) holes in the panel mounting surface, and tap for #8-32 threads, according to the hole pattern shown in the following figure. Use care to keep metal chips from falling into other equipment.



2. Securely attach the Smart Battery Module to the panel mounting surface using four #8-32 x ½” flat head machine screws.
3. While installing the battery to the CPU, first connect the 4-pin Male JAE connector on the enabling adapter cable to the female 4-pin JAE connector on the battery pack as shown in the following figure. (Installing the 4-pin connector enables the battery.).

Note1: The battery will begin to drain immediately if attached to the CPU in Power OFF condition. To maximize battery life, it is recommended that you install the fresh battery after power has been turned ON to the attached CPU.

Note2: Once the enabling adapter cable is connected, the battery starts to drain, even if it is not attached to the CPU. So, it is recommended to disconnect the enabling adapter cable from the battery pack when the battery is not in use. Even though the discharge current would be negligible with just the enabling adapter cable connected, this can affect Battery life if left in this condition for long durations.

4. Connect the 2-pin female connector of the enabling adapter cable to the CPU battery terminals.

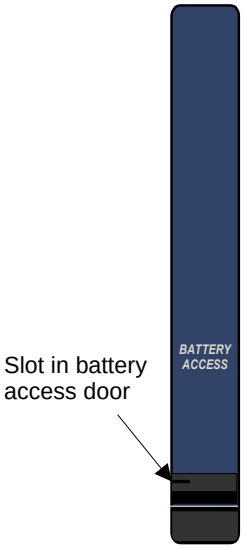
PACSystems RX3i

Run the battery cable into the notch at the bottom of the battery compartment and close the battery door.

PACSystems RX7i

Run the battery cable through the slot on the battery door and reinstall the battery door.

An earlier version RX7i CPU may not have a notch in its battery door. For these CPUs, replace the door (supplied with the IC698ACC701 replacement battery)



Be careful not to pinch the battery cable when closing the battery compartment cover.

EXPLOSION WARNING – Do not Install or replace battery pack unless the area is known to be non-hazardous.

5. If installed, remove the standard RAM memory backup battery from the system after installing the new auxiliary smart battery module.

Note: Refer to the *PACSystems CPU Reference Manual,* GFK-2222 for details on avoiding loss of PLC RAM memory contents when replacing a RAM memory backup battery. ***The standard RAM memory backup battery must be removed from the system when using the auxiliary battery module.***

Diagnostics

Note: Only qualified personnel, who are trained in electrical safety practices and procedures, should perform testing of the IC695ACC302 auxiliary smart battery module. This module is not user-serviceable. The IC695ACC302 contains a built-in 1-Amp fuse that will open if the unit is subjected to a short-circuit or severe overload condition. This fuse is sealed inside the battery pack and is not replaceable.

To test the unit for an open fuse condition:

- Turn off PLC power.
- Unplug the IC695ACC302 auxiliary smart battery module from the CPU.
- Carefully check the auxiliary smart battery module enabling adapter cable connector pins (2 pin Female connector) for presence of voltage (>2.0V) with a DC voltmeter. If the indicated voltage is present, the fuse is not open. If no voltage is present, the internal fuse has probably opened and the IC695ACC302 auxiliary smart battery module will have to be replaced.

Safe Handling and Disposal

For Safe handling and disposal of dead battery modules, reference the manufacturer's Material Safety Data Sheet (MSDS) and the Battery Disposal Document that are included with this product.

CAUTION – Risk of fire, explosion, and burns. Do not short-circuit, crush, incinerate, or disassemble battery.

Specifications

Parameter	*Specification*
Battery capacity	15.0 Amp-hours
Lithium (Li) content	5.1 grams (3 cells @ 1.7 grams/cell)
Physical dimensions	5.713" long x 2.559" wide x 1.571" high (145.1 x 65.0 x 39.9 mm)
Weight	224 grams
Case material	Black, flame-retardant ABS plastic
Connection	2.0' (0.6 meter) twisted red/black 22 AWG Rated 80°C leads with female 4-pin JAE connector
Connector Assembly	2" (50mm) twisted Red/Black 22AWG with 4-pin male to 2-pin female adapter cable for compatibility with battery connectors on PAC Systems CPUs. Included in the Battery Pack
Operating temperature range	0 to +60ºC
Nominal shelf life	7 years at Storage temperature of 20ºC

Nominal Memory Backup Life*

CPU Model	*Battery Life in Good State*	*Battery Life in Low State*	*Total Battery life*
PACSystems RX3i IC695CPU310, IC695CMU310	185 days	15 days	200 days
PACSystems Rx7i IC698CPE010, IC698CPE020, IC698CRE020	160 days	15 days	175 days
PACSystems RX3i IC695CPU320/CRU320 IC695CPU315	8 days	15 days	23 days

*****The nominal backup values are estimated at 20ºC. Backup time increases approximately 17% at 60ºC and decreases approximately 32% at 0ºC.

Note: The CPU detects the low battery condition only while the CPU has power. If a low battery condition occurs while the CPU is powered down, the CPU logs a *Low Battery* fault upon powerup as soon as it detects the signal from the smart battery.

However, because the current drain on the battery is negligible with the CPU powered up, logging of a *Low Battery* fault is not likely to occur, unless a good battery is replaced with a low battery while the CPU has power. This would indicate to the user that a good battery has been accidentally replaced with a depleted battery.

The *Battery* LED or the fault table indicates the battery status. For details on the operation of specific CPU models, refer to the PACSystems CPU Reference Manual, GFK-2222.

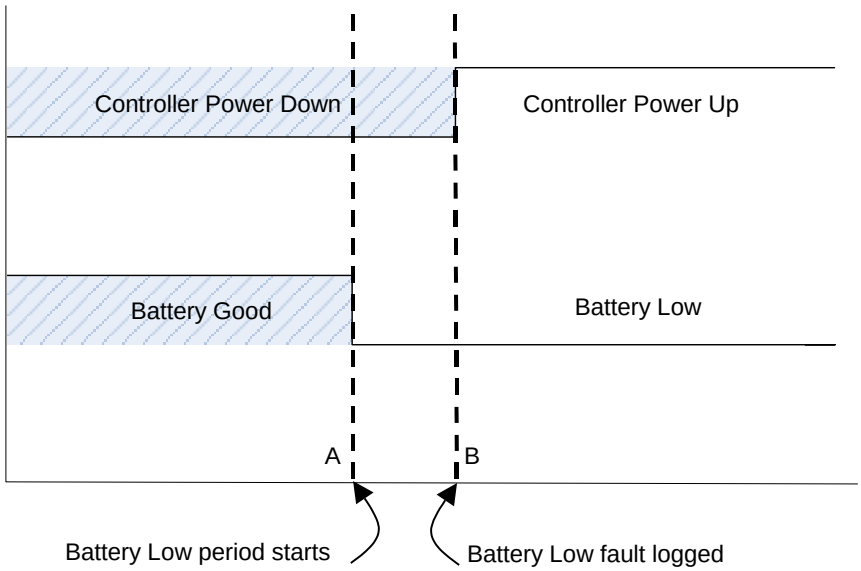
Smart Battery Operation

The battery output voltage is > 2.5 V when the battery is operating in its good state. At the end of the battery good period, the battery output drops to <2.5 V for the battery low state. The period for the battery low state is 15 days for all CPU models. Once battery output voltage drops to <2.5V, the PACSystems CPU detects this as a battery low condition, a Low Battery fault is logged in the CPU fault table and the Battery LED on the CPU starts blinking in red (depending upon the CPU).

Once the battery low state is active, the user has 15 days of accumulative battery backed energy left for CPU RAM retention during power loss. If the battery is not replaced within 15 days of accumulative power loss, the CPU RAM memory contents will be lost as the battery output voltage drops to 0V.

If the Battery Low condition occurs when the controller is in the Power OFF state, a low battery fault will be logged in the Fault table only at the time when the controller is powered ON. The Battery Low period of 15 days is counted as soon as the Battery Good period is over, but not necessarily when the low battery fault is logged.

Consider the following scenario.



The Battery Low period of 15 days starts at Point A, but the low battery fault is logged only at Point B, once the controller is powered ON. So, the user should make a note that the timestamp of the Low Battery fault may not give the exact start of the 15 days Battery Low period.

The Battery Low indication is not supported on all the PACs CPUs. The table shown below lists the compatible CPU models.

Family	*CPU type*	*Auxiliary Smart Battery Module*
Rx3i	CPU310/CMU310	√
	CPU320-Fx onwards	√ (Refer to Note 2)
	CRU320-Cx onwards	√ (Refer to Note 3)
	CPU315	√
Rx7i	CPE010	√
	CPE020/CRE020	√
	CPE030/CRE030	× (Refer to Note 1)
	CPE040/CRE040	× (Refer to Note 1)

Note 1: √- Denotes compatibility of the battery pack with the CPU model.

× - Denotes the CPU and battery pack combination is not suitable. (Use of the battery with the CPE030/CRE030 and CPE040/CRE040 is possible, but not recommended due to reduction in battery life as compared to IC693ACC302.)

Note2: For CPU320-Fx with CPU Firmware Revisions 6.02 and higher, the battery packs are compatible. The previous revisions of the CPU320 do not support Battery Low detection; hence these new battery packs are not compatible.

Note3: For CRU320-Cx with CPU Firmware Revisions 6.02 and higher the battery packs are compatible. The previous revisions of the CRU320 do not support Battery Low detection; hence these new battery packs are not compatible.

Agency Certifications

This product is a Listed Accessory for PACSystems Rx3i and Rx7i family of PLC's and has been evaluated to the following standards for use in ordinary and hazardous areas.

- UL 2054:2004
- ANSI/ISA 12.12.0.1:2007 (UL File E157515)
- EN 60079-0:2006
- EN 60079-15:2005

In order to maintain agency certifications this product must be mounted in an enclosure with mechanical impact strength equal or greater than 3.5 Joules.

ATEX Marking and Information

II 3 G Ex nA IIC T6 Ta: 0-60C