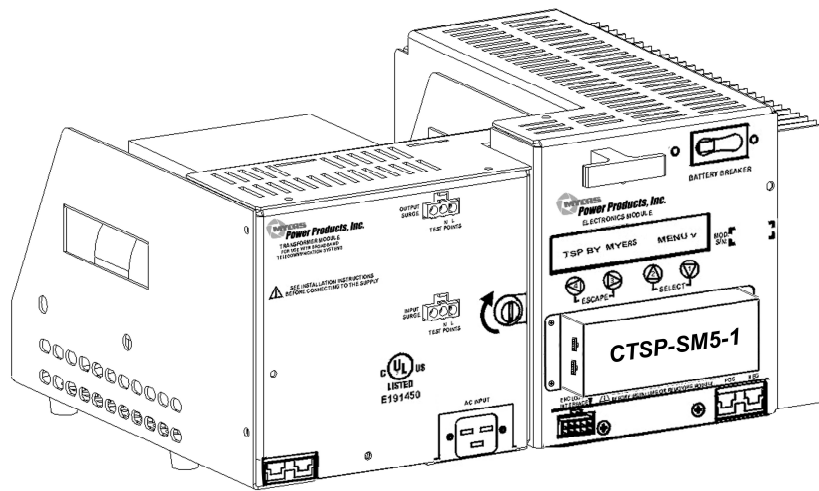




Power Products, Inc. CTSP-SM5-1

Status Monitoring Communication Interface Option

User Manual



General Information

The CTSP-SM5-1 Status Monitoring Interface Option plugs into the face of the CTSP-Electronics Module (CTSP-EM).

The CTSP-SM5-1 can be used only with CTSP-EM models having firmware versions 2.00 and higher.

The CTSP-SM5-1 option provides:

- System status monitoring in a telecommunications system
- Battery monitoring for the CTSP system
- With EM firmware prior to 3.xx, enhanced LVCO (low voltage cutoff), features for the CTSP system

Safety

This Safety Guide contains important instructions that should be followed during installation and maintenance of the Myers Power Products (Myers) equipment and batteries. It is intended for Myers customers who setup, install, relocate, or maintain Myers equipment.

Changes and modifications to this unit not expressly approved by Myers Power Products could void the warranty.

Failure to observe these warnings may result in serious injury, death or damage to the equipment.

ELECTRICAL WARNINGS

- Do not work alone under hazardous conditions.
- Do not handle any metallic connector before the power has been disconnected.
- Servicing this equipment may require working with protective covers removed and utility power connected. Use extreme caution during these procedures.
- High current through conductive materials could cause severe burns.
- When grounding cannot be verified, disconnect the equipment from the utility power outlet before installing or connecting to other equipment. Reconnect the power cord only after all connections are made.
- Check that the power cord(s), plug(s), and sockets are in good condition.
- Replacement of fuses or other parts must be with identical types and ratings. Substitution of nonidentical parts may cause safety and fire hazards.

Unpacking

Inspect the unit upon receipt. Notify the carrier if there is damage.

The packaging is recyclable; save it for reuse or dispose of it properly.

The package should contain:

- CTSP-SM5-1 with bracket attached
- Four screws
- Four panel grommets
- This product documentation

CTSP-SM5-1 Improvements

The improvement to the CTSP-SM5-1 is that the “SM5-1” can now provide adequate power to a connected DOCSIS transponder via the RS-485 cable.

The older CTSP-SM5 was compliant to the SCTE/HMS022 physical interface in that it could supply 24Volts at a maximum 180mA to power a connected transponder. That powering capability was fine prior to the introduction of DOCSIS status monitoring transponders. DOCSIS transponders require about 225mA at 24Volts to be properly powered which exceeded the capability of the older CTSP-SM5. When the CTSP-SM5 is used with a DOCSIS transponder, the transponder needs to be directly connected to the batteries in some way to be adequately powered.

The CTSP-SM5-1 now meets the powering requirements of SCTE/HMS151 which was specifically developed to satisfy the power requirements of DOCSIS transponders. A DOCSIS transponder can be powered by simply connecting the CTSP-SM5-1 to a DOCSIS transponder via RS-485 cable.

Installation

Do not install/attach the CTSP-SM5-1 to the TSP until instructed to do so.

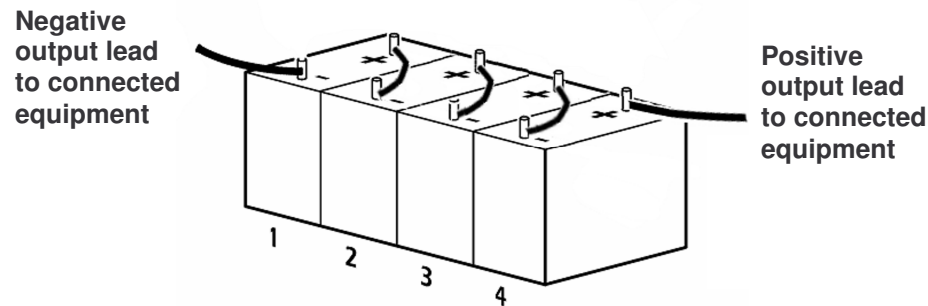
Battery Installation

Battery sense cables are required to connect the CTSP-SM5-1 to the batteries. When a ICBM Battery Manager is **not** used, the Myers cable CTSPBCK-31 (not provided, must be ordered separately) is required to connect the CTSP-SM5-1 to one string of batteries. Should there be two battery strings, another CTSPBCK-31 is required. There are multiple options to monitor battery voltages. Please consult your Sales Representative for more information.

Identify Battery 1:

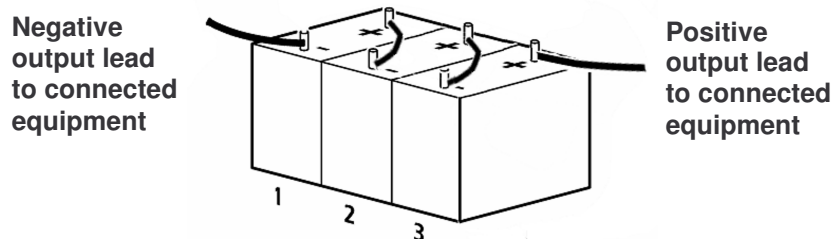
- Following the SCTE-HMS standards, the battery with the main output lead connected to the negative terminal is **always** Battery 1.
- It may be helpful to mark the enclosure shelf in front of each battery to identify the battery location in the string.

48VDC Battery String Example*



*Note: Battery arrangement in the enclosure may differ.

36VDC Battery String Example*

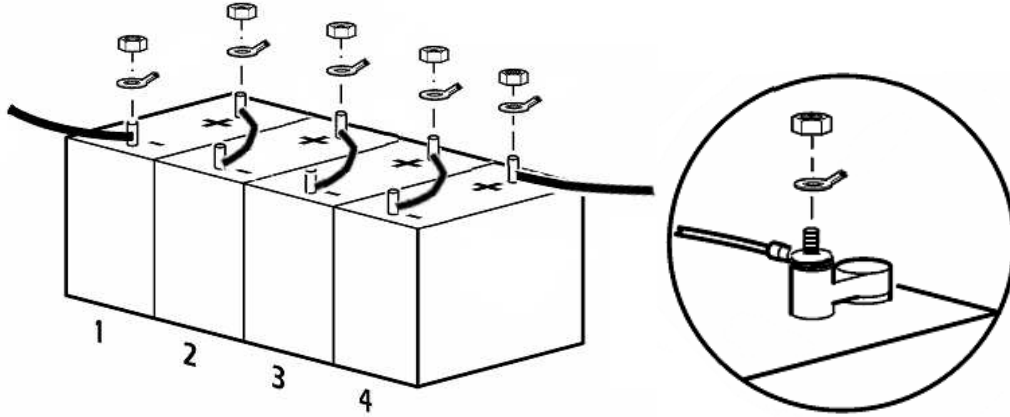


*Note: Battery arrangement in the enclosure may differ.

Ring Terminal Installation

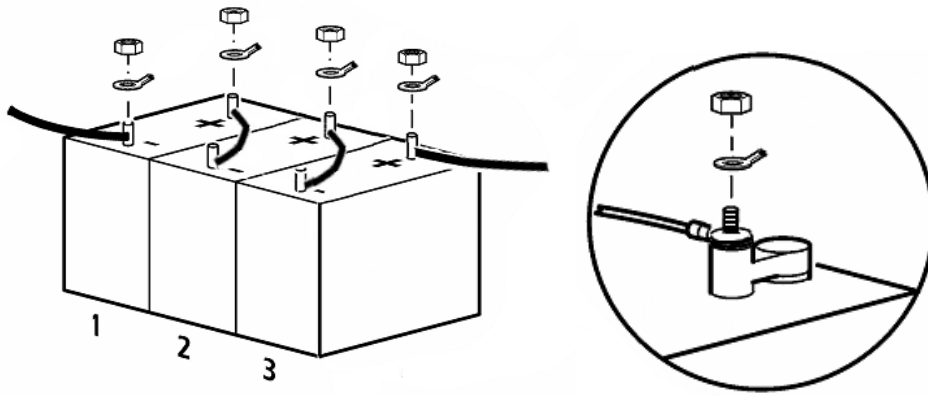
Completely install one ring terminal at a time. Remove the existing battery nut, leaving the existing battery connection intact. Starting with the negative terminal on Battery 1, add the ring terminals provided in the cable kit to the battery terminal and secure the connection with the battery nut. Repeat this for each positive terminal on every battery.

*48VDC Battery String – Ring Terminal Installation**



Note: Battery arrangement in the enclosure may differ.

*36VDC Battery String – Ring Terminal Installation**



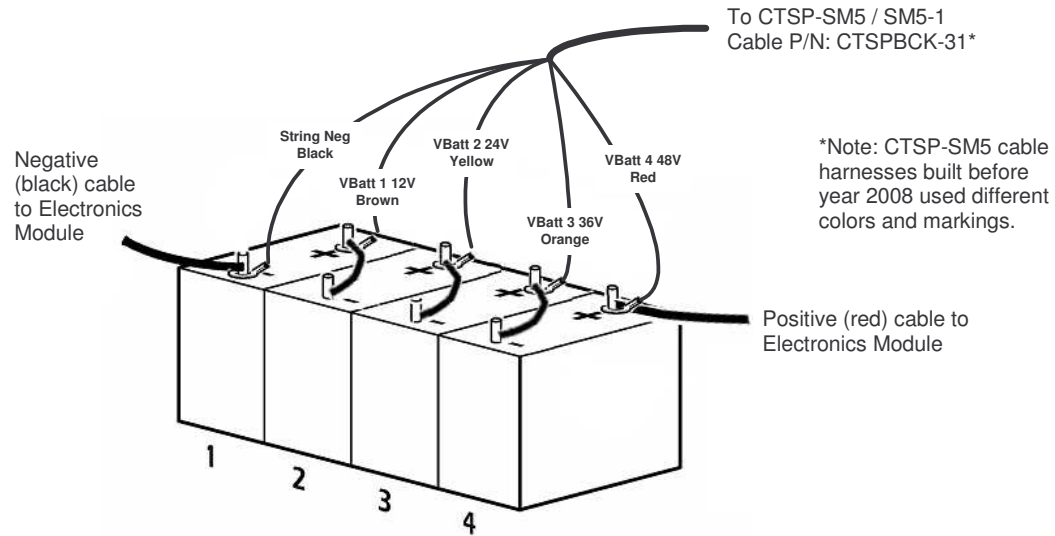
Note: Battery arrangement in the enclosure may differ.

Battery Harness Installation – New Late-2008 Format

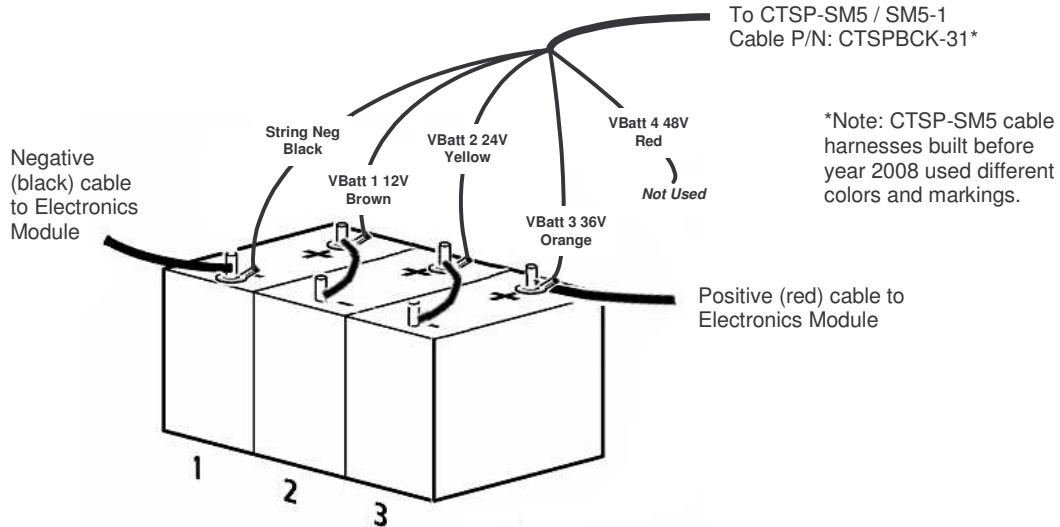
Starting in late-2008, the battery harness for the CTSP-SM5 series has changed. The new harness is marked CTSPBCK-31 and the colors used now correspond to other manufactures equipment.

When utilizing multiple battery strings in an enclosure, place string A on the top shelf and subsequent strings sequentially on lower shelves.

48VDC Battery String – Cable Installation – New Format



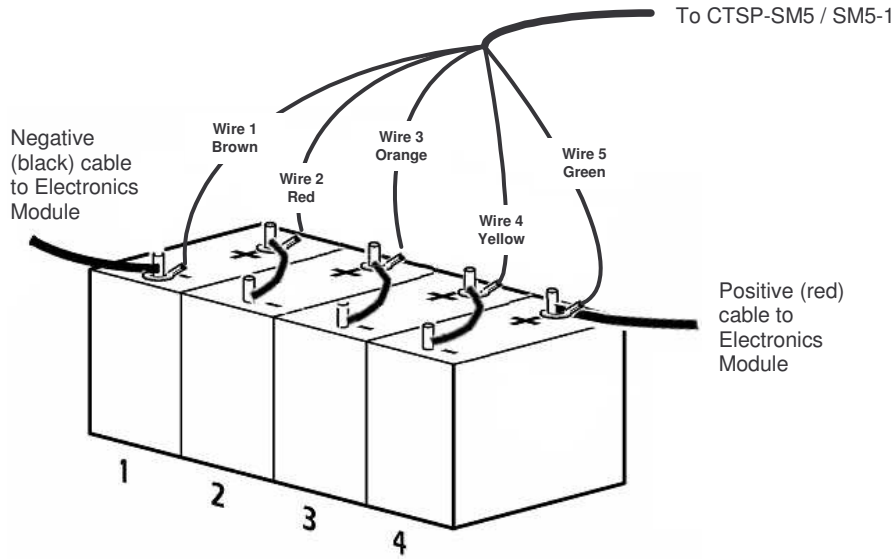
36VDC Battery String – Cable Installation – New Format



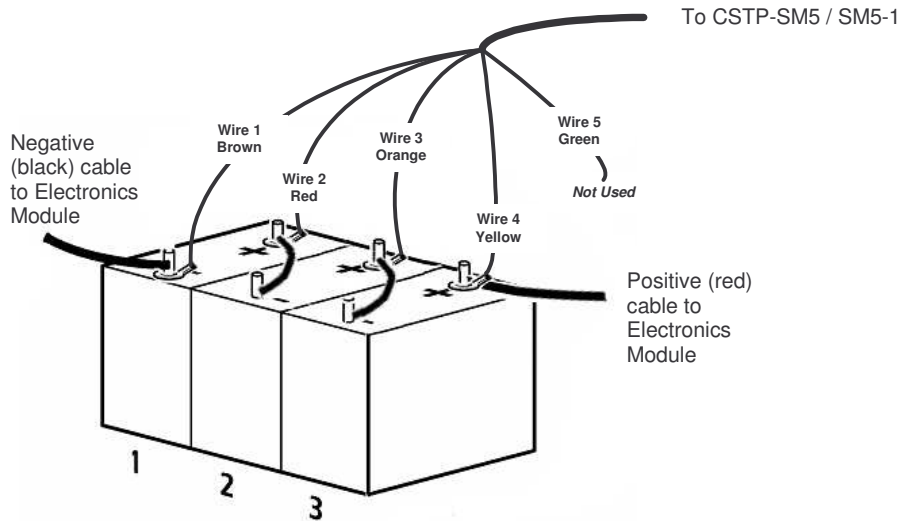
Battery Harness Installation – Older Format

For existing installations that have the older cabling, the following connection diagrams are provided for reference purposes. Fuse links (no longer required) may also exist.

48VDC Battery String – Cable Installation – Older Pre-2008 Format



36VDC Battery String – Cable Installation – Older Pre-2008 Format



Power Station Surge Protection

The CTSP-SM5-1 is typically used with a status monitoring transponder of some sort. This transponder is then connected to the cable network via a RG-6 or other coaxial cable. ***Myers recommends the use of a ground-block/surge suppressor in the cable that feeds the transponder.***

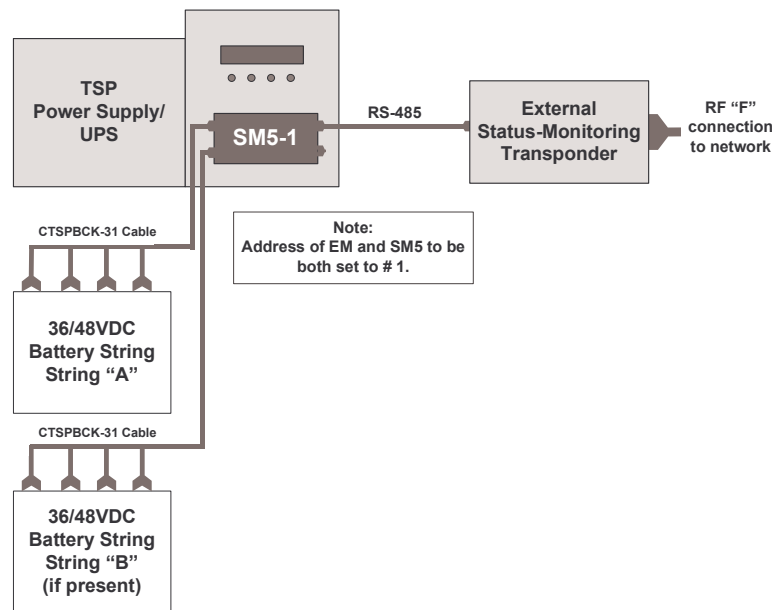
As the power supply electronics provides an excellent ground, electrical surges can easily find their way from the cable network to the transponder which is then connected to the CTSP-SM5-1. Use of a ground-block/surge suppressor will help protect the computer-grade electronics in both the transponder and the CTSP-SM5-1.

Typical CTSP-SM5-1 Configurations

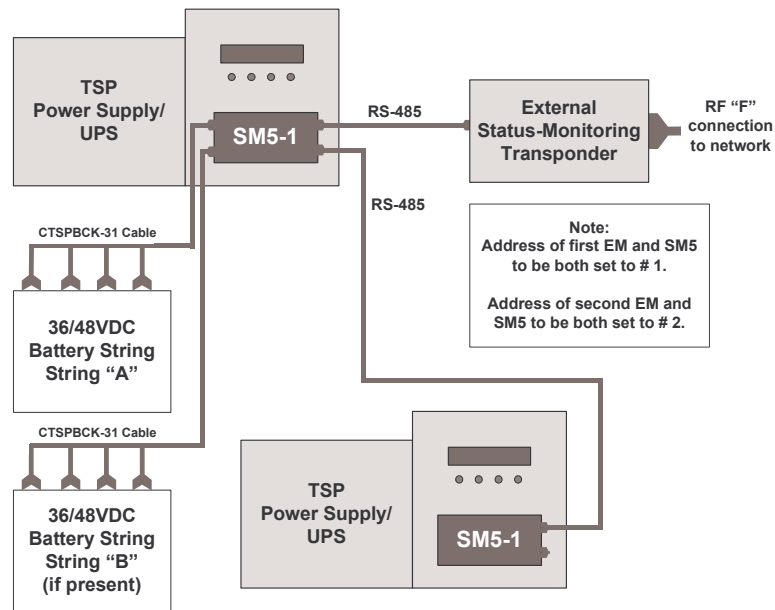
There are three basic configurations where the CTSP-SM5-1 will be used. These are;

1. Single Supply with External Transponder
2. Dual Supplies with External Transponder
3. Dual Supplies with CTSP-SM8 Embedded Transponder for the TSP.

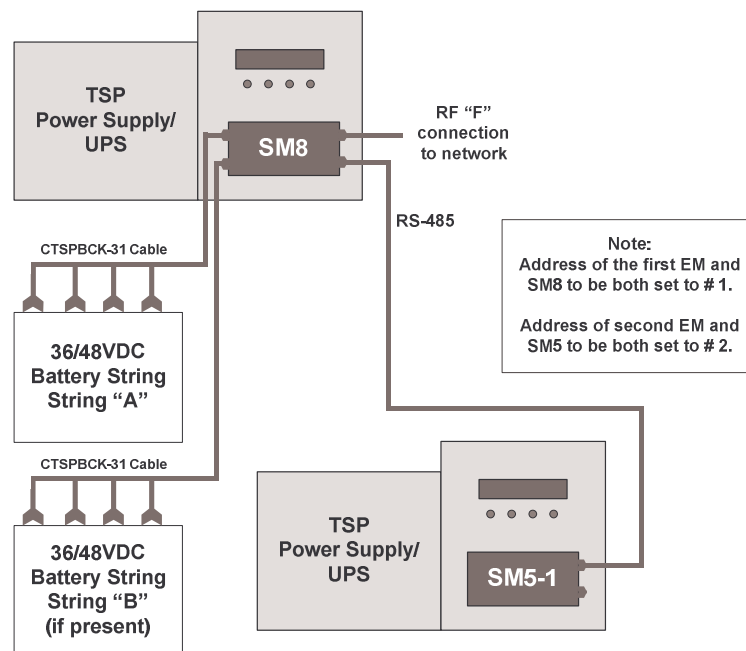
Configuration: Single Supply with External Transponder



Configuration: Dual Supplies with External Transponder



Configuration: Dual Supplies with CTSP-SM8 Embedded Transponder for the TSP

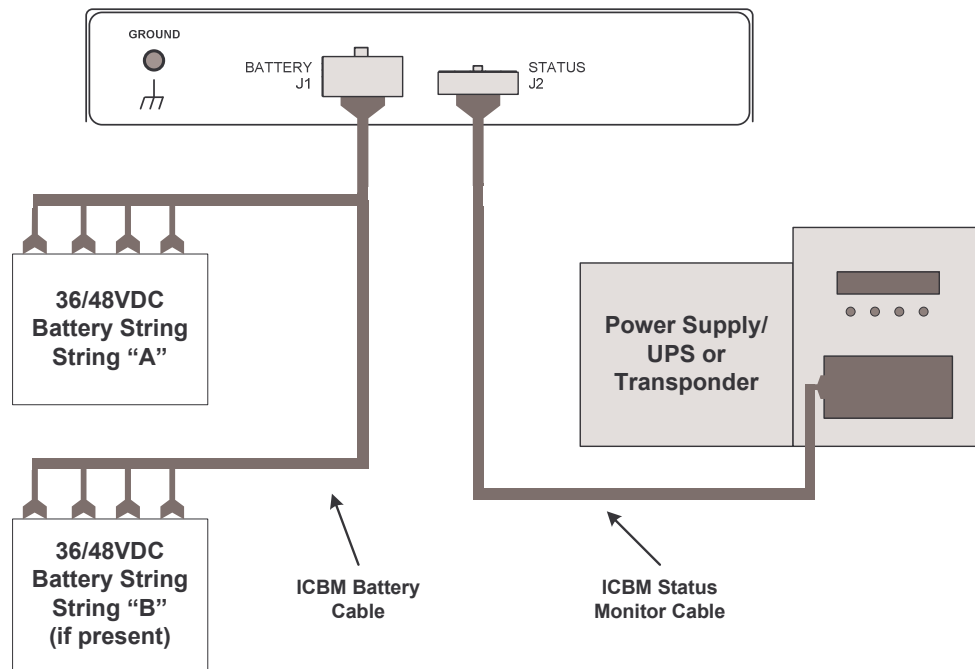


TSP system and Battery Managers

The Myers ICBM AP9930 Battery Manager maximizes battery life by equalizing the charge across all batteries.

This diagram below shows a typical ICBM application with the CTSP-SM5-1. The ICBM J1-Battery connection can be made to 1 or 2 strings of batteries. The ICBM J1 battery cable is different from the CTSPBCK-31.

The ICBM Status Monitor Cable is optional. The ICBM will perform its function regardless if it is connected to a power supply/UPS, transponder, or other device to measure battery voltages or to monitor the contact closure. Please review for the ICBM AP9930 manual for details on cables.



Configure the DIP Switches

The CTSP-SM5 DIP switches are used to set the Unit Address for HMS and LVCO settings.

The CTSP-SM5 Unit Address should always be configured to match the address of the connected CTSP-EM as shown in previous wiring scenarios.

To change DIP switch settings use a pointed object such as a pen. Stand facing the front of the unit. Turn a DIP switch OFF by pushing the switch away from you. Turn a DIP switch ON by pulling the switch toward you.

DIP switches #1-3 are for Unit Addressing: Switch #1 is on the right as you face the unit.

ADDRESS:	SWITCH #3	SWITCH #2	SWITCH #1
1 (default setting)	OFF (default setting)	OFF (default setting)	OFF (default setting)
2	OFF	OFF	ON
3	OFF	ON	OFF
4	OFF	ON	ON
5	ON	OFF	OFF
6	ON	OFF	ON
7	ON	ON	OFF
8	ON	ON	ON

DIP switch #4 is for the LVCO setting.

Low Voltage Cut Off Setting:	Switch #4
1.75 V/Cell = 10.50 V/Battery	OFF (default setting)
1.67 V/Cell = 10.02 V/Battery	ON

LED and Alarm Functionality

HMS ACTIVITY LED Key:

STATUS:	STEADY ON	OFF	BLINKING
HMS Activity (Green):	OK	Communications Lost or Not Started	Exchanging HMS Data

Alarm LED Key:

STATUS:	STEADY ON	OFF	BLINKING 1x/SEC	BLINKING 4x/SEC
Alarm (Red):	OK (SM5-1 Power On)	Inactive	Minor Alarm	Major Alarm

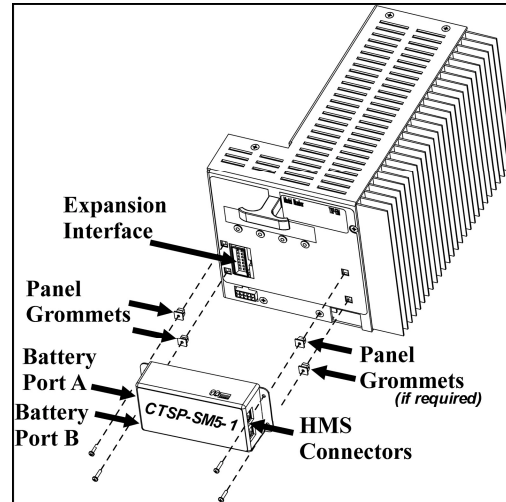
Table of Alarms:

FAULT	SEVERITY	CRITERIA
AC line failure, inverter ON	Minor	CTSP present and HMS inverter status is 2 (ON - AC line fail).
LVCO warning	Major	This is a low battery warning. CTSP present and HMS inverter status is 2 and any single battery is within 0.5 volts of cutoff (as selected by the CTSP-SM5-1 configuration switch)
Standby unavailable	Major	CTSP present and HMS inverter status is 5 (OFF – dead battery or last test failed). This alarm is delayed for 60 seconds following power-up to allow time for the system to stabilize.
String configuration	Minor	At least one battery is detected in at least 1 string, but not all batteries 1-3 or 1-4. No alarm shall be given if no batteries are detected. Can also be caused when one or more CTSP power supplies disagrees with the detected string configuration (i.e. CTSP needs 4 batteries, CTSP-SM5 detected 3). This error must persist for at least 10 seconds to trigger the alarm.
Battery capacity imbalance/shorted cell	Major	The difference between the voltages of any 2 batteries within a single string is more than 2 volts, i.e. $ \text{battery 1} - \text{battery 2} > 2$.

CTSP-SM5-1 Installation

Powering down the TSP Electronics Module (EM) is optional when installing the CTSP-SM5-1. However, when installing onto an operating TSP, the TSP EM must be reset after installation by pressing at the same time the two outside buttons on the TSP EM (buttons ◀ and ▼). Once the TSP EM has been reset, the CTSP-SM5-1 will be recognized by the EM and function normally.

1. Open the enclosure.
2. If powering down the station (optional);
 - Switch the battery circuit breaker OFF.
 - Switch the utility circuit breaker OFF.
3. If required, install the four panel grommets (provided), in the appropriate holes on the of the CTSP-EM.
4. Plug the CTSP-SM5-1 into the expansion interface on the CTSP-EM.
5. Secure the CTSP-SM5-1 using four screws (provided).
6. If connecting the CTSP-SM5-1 to a SCTE-HMS device such as a transponder;
 - Plug one end of a RS-485 (HMS022) cable into one of the RS-485 I/O ports on the CTSP-SM5-1, the other into the SCTE-HMS device.
7. If the RS-485 cable is very long a RS-485 terminator may be required. The connected SCTE-HMS device may have a terminator, or a RS-485 terminator can be plugged into an unused RS-485 I/O port on the CTSP-SM5-1.
8. Ensure that the batteries and battery harness have been installed properly. Refer to the section *Installation* in this document.
9. Connect the battery harness for Battery String A into the Battery String A port on the CTSP-SM5-1. Repeat for String B / Port B (if present).
10. Active the CTSP-SM5-1 by either;
 - Restoring power by switching the utility and battery circuit breakers ON,
 - Or,
 - Reboot the TSP EM by pressing at the same time the two outside buttons on the TSP EM (buttons ◀ and ▼).
11. Allow the unit to run for 1 minute, then verify the functionality of the interface.
12. Close the enclosure.



Troubleshooting

Use the table below to solve minor installation and operation problems. Please contact Myers Power Products Technical Assistance for help with complex CTSP system problems.

<i>Problem: CTSP-SM5-1 alarm LED is flashing slowly (once per second)</i>	
Possible Cause:	Solution:
CTSP system is operating on standby mode	Check that utility power is within tolerances and that connections to the unit are secure. <i>Note: This will happen if the CTSP-SM-5-1 is installed onto an operating CTSP-EM without resetting the CTSP-EM. Resetting the CTSP-EM should resolve this.</i>
Inadequate/improper cable connections	<ol style="list-style-type: none">1. Check the battery monitoring cable connections. Refer to <i>Installation</i> in the document.2. In the event of a faulty connection, verify that the CTSP system is operating on utility power. Switch the battery breaker OFF and correct the battery connection fault(s). NOTE: Switching the battery breaker OFF will cause a Major alarm occurrence until the battery breaker is switched ON. Once the battery breaker is switched OFF, the connected equipment is not protected from power outages.3. Switch the battery breaker ON and allow the CTSP system to verify the batteries. Refer to the CTSP-EM user manual.

<i>Problem: CTSP-SM5-1 alarm LED is flashing rapidly (four times per second)</i>	
Possible Cause:	Solution:
CTSP system is operating on standby mode	<p>This is a low battery warning.</p> <p>Check that utility power is within tolerances and that connections to the unit are secure.</p> <p>In the event that no utility power is present or power is out of tolerance, connect a generator to the CTSP system to avoid the shutdown of any equipment connected to the CTSP system.</p>
CTSP system display indicates battery failure	<p>Check that utility power is within tolerances and that connections to the unit are secure.</p> <p>In the event that no utility power is present or power is out of tolerance, connect a generator to the CTSP system to restore power to any equipment connected to the CTSP system.</p> <p>In the event that an AC generator is utilized the system will self-start.</p> <p>In the event that a DC generator is utilized the system can be started by using the cold start feature. Refer to the CTSP-EM user manual for cold start details.</p>
<i>Problem: CTSP-SM5-1 alarm LED is flashing rapidly (four times per second)</i>	
Possible Cause:	Solution:
CTSP system display reads NORMAL or NORMAL CHARGING	<p>Measure and record voltage for every battery. Voltages must not vary more than two volts within a battery string. Replace any battery(s) that register two volts or more, lower than any other battery(s) in a particular string. It is likely that the battery has a shorted-cell condition.</p>
<i>Problem: CTSP-SM5-1 HMS LED is off</i>	
Possible Cause:	Solution:
An HMS compatible transponder is connected via an RS-485 (HMS022) cable	<p>Check the RS-485 (HMS022) cable connections and the RS-485 cable terminator. Reset the transponder by cycling power to it. Refer to the transponder user manual for details.</p>
Transponder status LEDs indicate that there is no power	<p>Ensure that the CTSP system is ON and not in SLEEP mode, as this will cause the transponder to shut off in order to conserve battery power.</p> <p>If the situation persists, replace the RS-485 cable.</p>
There is no HMS022 compatible transponder or docsis modem connected in the system.	<p>HMS LED is OFF indicating that HMS communications have not started.</p>

Service and Contact Information

Myers Power Products makes every effort to ensure parts and equipment arrive in working condition. Occasionally, it may be necessary to return parts or equipment that are not in working condition.

If the unit requires service do not return it to the dealer. Follow these steps:

1. Contact Myers Technical Customer Service by telephone at (610) 868-5400 Monday - Friday 8AM to 5PM U.S. Eastern time. Sales and Accounting issues use (610) 868-3500.
 - Note the product model number, the serial number, and the date purchased. If you call Myers Customer Service, a technician may ask you to describe the problem and try to solve it over the phone. If this is not possible the technician will issue a Returned Material Authorization Number (RMA#).
 - If the product is under warranty, repairs are free. If not, there is a repair charge.
 - Procedures for servicing or returning products may vary internationally. Contact Myers Power Products for country specific instructions.
2. If possible, pack the product in its original packaging. If the original packaging does not exist, pack the product carefully in a sturdy carton with sufficient padding.
 - Pack the unit properly to avoid damage in transit. Never use Styrofoam beads for packaging as the static electricity that is generated may damage electronics. Damage sustained in transit is not covered under warranty.
3. Mark the RMA# on the outside of the package.
4. Return the unit by insured, prepaid carrier to the address given to you by Customer Service.



Be sure to deliver spent batteries to a recycling facility or ship to the manufacturer in the replacement battery packing material.

Myers Power Products contact information:

For Customer Service...	Mailing/Shipping Address...
Technical (610) 868-5400 Sales/Accounts (610) 868-3500 Monday – Friday 8AM to 5PM US Eastern	Myers Power Products, Inc. 2000 Highland Ave. Bethlehem, PA 18020

Limited Warranty

Myers Power Products, Inc. (Myers) warrants this product to be free from defects in materials and workmanship for a period of five (5) years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. To obtain service under warranty you must obtain a Returned Material Authorization (RMA) number from customer support. Products must be returned with; transportation charges prepaid, accompanied by a brief description of the problem encountered. This warranty does not apply to equipment that has been damaged by accident, negligence, misapplication, or has been altered or modified in any way. This warranty applies only to the original purchaser.

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