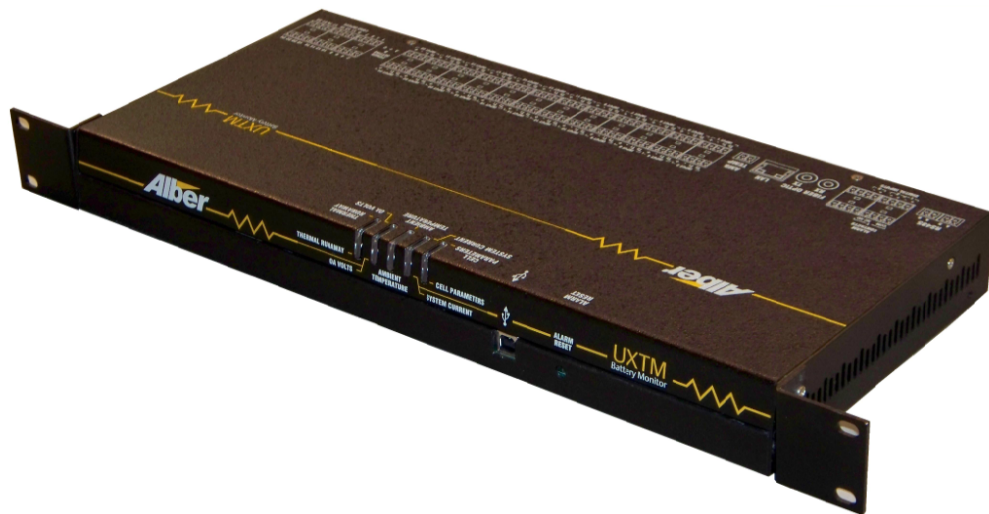


Alber Universal Xplorer Telecom Monitor (UXTM) Battery Monitor

Installation Guide



Albercorp
7775 West Oakland Park Blvd
Sunrise, FL 33351
Tel: (954) 623-6660
www.alber.com
4200-097

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Universal Xplorer Telecom Monitor (UXTM) Battery Monitor Installation Guide

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Alber Customer Service

Alber Customer Service is available Monday to Friday, 8:00AM to 4:30PM Eastern Time.

Telephone: (954) 377-7101

Email: service@alber.com

Website: www.alber.com

Corporate Office Address:

Albercorp

7775 West Oakland Park Blvd

Sunrise, FL 33351 USA

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FCC

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

LIMITED WARRANTY FOR ALBÉR PRODUCTS

This Warranty is given ONLY to purchasers who buy for commercial or industrial use in the ordinary course of each purchaser's business.

General:

Albér Corp. products and systems are, in our opinion, the finest available. We take pride in our products and are pleased that you have chosen them. Under certain circumstances, we offer with our products the following One Year Warranty Against Defects in Material and Workmanship.

Please read your Warranty carefully. This Warranty sets forth our responsibilities in the unlikely event of defect and tells you how to obtain performance under this Warranty.

ONE YEAR LIMITED WARRANTY AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP

ALBÉR PRODUCTS COVERED:

BDS-40, BDS 256XL, BDSU, MPM-100, and UXTM.

Terms of Warranty:

As provided herein, the Albér product is warranted to be free of defects in material and workmanship for a period of twelve (12) months from date of commissioning, not to exceed eighteen (18) months from date of shipment, provided that startup is performed by Albér authorized personnel, and the product has been stored in a suitable environment prior to start-up. The start-up date will be determined only from the completed ASCOMP file provided to Albér from User and accepted by Albér. The product shipment date will be determined only from the Albér bill of lading. If any part or portion of the Albér product fails to conform to the Warranty within the Warranty period, Albér, at its option, will furnish new or factory remanufactured products for repair or replacement of that portion or part.

Warranty Extends to First Purchaser for Use. Non-transferable:

This Warranty is extended to the first person, firm, association or corporation for whom the Albér product specified herein is originally installed for use (the "User"). This Warranty is not transferable or assignable without the prior written permission of Albér.

Assignment of Warranties:

Albér assigns to User any warranties which are made by manufacturers and suppliers of components of, or accessories to, the Albér product and which are assignable, but Albér makes NO REPRESENTATIONS as to the effectiveness or extent of such warranties, assumes NO RESPONSIBILITY for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this Warranty to such components or accessories.

Drawings. Descriptions:

Albér warrants for the period and on the terms of the Warranty set forth herein that the Albér product will conform to the descriptions contained in the approved drawings, if any, applicable thereto, to Albér's final invoices, and to applicable Albér product brochures and manuals current as of the date of product shipment ("Descriptions"). Albér does not control the use of any Albér product. Accordingly, it is understood that the Descriptions are NOT WARRANTIES OF PERFORMANCE and NOT WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE.

Warranty Claims Procedure:

Within a reasonable time, but in no case to exceed thirty (30) days after User's discovery of a defect, User shall contact Albér at 1-800-851-4632.

User shall ship the product, with proof of purchase, to Albér freight prepaid. Albér products shipped to Albér without a return authorization number will be refused and returned freight collect to User at User's expense. Products shipped by User to Albér which have incurred freight damage due to User's improper packaging of the product will not be covered by this Warranty and any replacement parts, components or products needed will be invoiced in the full current price amount and returned freight collect to User.

Subject to the limitations specified herein, Albér will replace, without charge for Albér labor or materials, subsequent to its inspection, and return freight prepaid F.O.B. Albér's facility, the product shipped to Albér with a return authorization number and warranted hereunder which does not conform to this Warranty.

Warranty coverage will be applicable only after Albér's inspection discloses the claimed defect and shows no signs of treatment or use that would void the coverage of this Warranty. All defective products and component parts replaced under this warranty become the property of Albér.

Warranty Performance of Component Manufacturers:

It is Albér's practice, consistent with its desire to remedy Warranty defects in the most prompt and effective manner possible, to cooperate with and utilize the services of component manufacturers and their authorized representatives in the performance of work to correct defects in the product components. Accordingly, Albér may utilize third parties in the performance of Warranty work, including repair or replacement hereunder, where, in Albér's opinion, such work can be performed in less time, with less expense, or in closer proximity to the Albér product.

Items Not Covered By Warranty:

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THIS WARRANTY DOES NOT COVER shipping costs, installation costs, or maintenance or service items and further, except as may be provided herein, does NOT include labor costs or transportation charges arising from the replacement of the Albér product or any part thereof or charges to remove or reinstall same at any premises of User.

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- IN NO EVENT SHALL ALBÉR ASSUME ANY LIABILITY FOR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES OF ANY KIND WHATSOEVER, INCLUDING WITHOUT LIMITATION LOST PROFITS, BUSINESS INTERRUPTION OR LOSS OF DATA, WHETHER ANY CLAIM IS BASED UPON THEORIES OF CONTRACT, NEGLIGENCE, STRICT LIABILITY, TORT, OR OTHERWISE.

Miscellaneous:

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- Albér obligations under this Warranty are conditioned upon Albér timely receipt of full payment of the product purchase price and any other amounts due. During the period when any amounts are overdue from User, Albér warranty obligations shall be suspended. The warranty expiration date shall not be extended upon payment of the overdue amount. Albér reserves the right to supplement or change the terms of this Warranty in any subsequent warranty offering to User or others.
- In the event that any provision of this Warranty should be or becomes invalid and/or unenforceable during the warranty period, the remaining terms and provisions shall continue in full force and effect.
- This Warranty shall be governed by, and construed under, the laws of the State of Florida, without reference to the conflict of laws principles thereof.
- This Warranty represents the entire agreement between Albér and User with respect to the subject matter herein and supersedes all prior or contemporaneous oral or written communications, representations, understandings or agreements relating to this subject.

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1. Safety Information

1.1 General

The protective features of this product may be compromised if it is used in a manner not specified in this guide and/or related operation or installation instructions. This manual describes general installation of the system. If the system has features or accessories not described in this manual, contact Albér.

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. Albér assumes no liability for the customer's failure to comply with these requirements.



Note

- Use safety equipment when working in and around the batteries.
- Never energize the UXTM until after the installation is complete.
- Never exceed equipment voltage, power ratings or capabilities.

1.2 Document Symbols

The symbols below appear in this manual or are affixed to the Albér device. It is important to review these symbols and to understand the type of instructional information they convey.



Warning

Highlights areas related to user safety.

Calls attention to a procedure, practice, or condition which, if not correctly followed, could result in personal injury. Do not proceed beyond a Warning symbol until the indicated conditions are fully understood and met. Always observe safety information when installing, setting up or operating this product.



Caution

Highlights areas related to product or data safety.

Calls attention to an operating procedure or condition which, if not correctly followed, could result in damage to the product or permanent loss of data. Do not proceed beyond a Caution symbol until the indicated conditions are fully understood and met.



Note

The Note symbol calls attention to important information.

Describes additional information to help the user.

1.3 Safety Symbols

The following symbols may appear on the system or individual equipment.



Caution. Risk of danger.



Equipment protected throughout by double insulation or reinforced insulation.

1.4 Product Safety Practices

The following describe safety practices particular to the installation or operation of the product.

Equipment Service

Proper installation and testing are essential to the correct functioning of the system. If you have questions, contact Albér and request monitor assistance. Except as explained in this manual, do not attempt to service Albér equipment.

Any adjustment, maintenance or repair of this product must be performed by qualified personnel. Contact an Albér customer service engineer and request assistance. Only qualified and trained personnel may perform the operations described in this manual. All safety information must be read, understood, and strictly adhered to before installing, powering up or using the equipment or software (the "system".)

Equipment Grounding

To minimize shock hazard, the system chassis must be connected to an electrical protective earth ground when required. When AC mains are used for the power source, the system must be connected to the AC power mains through a grounded power cable, with the ground wire firmly connected to an electrical safety ground at the power outlet.

Fuses

For continued protection, fuses with the required rated current, voltage, and type, such as normal, slow blow, fast blow or time delay, must be used.

Equipment Access

Operating personnel must not remove equipment covers, shields or panels. Component repair, replacement, and internal adjustments must be made only by qualified service personnel.

Operating Damaged Equipment

Do not operate damaged equipment. Equipment that appears damaged or defective must be made inoperative and secured against unintended operation until repaired by qualified service personnel. Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture or any other reason, remove power and do not use the product until safe operation can be verified by qualified service personnel. If necessary, contact Albér to ensure the safety features are maintained.

Servicing and Adjusting

Do not service or adjust alone. While in the battery circuit, do not attempt internal service or adjustment of this equipment unless another person, capable of calling for or rendering first aid and resuscitation, is present.

Substituting Parts or Modifying Equipment

Do not substitute parts or modify equipment. Due to the possibility of introducing additional hazards, do not substitute parts or perform any unauthorized modification to the product. If necessary, contact Albér to ensure the safety features are maintained.

Insulation Rating For Wires

Use only wire supplied with the installation kit.

Ventilation

Never block equipment ventilation ports or openings. The equipment must have adequate ventilation to prevent overheating. Ensure equipment is operated within specified temperature and humidity ranges.

2. Preventive Maintenance

This section describes preventive maintenance for the UXTM system.

2.1 Visual Inspection

Visually inspect all monitor system components for damaged or frayed power cords and cables and for damaged component panels, controls, and connectors. When damage is detected, remove the equipment from service until the damage is repaired.

2.2 System Component Cleaning

Clean system components using a soft cloth. Do not use commercial or industrial cleaners that may attack the computer display and housing. Never expose the computer or system components to water, high humidity or dampness.



Warning: Before cleaning equipment, ensure the system is disconnected and power to the units has been shut off. You must disconnect the system components and the monitor system cabinet, if a cabinet is being used, from AC and/or DC power sources.

2.3 Sense Lead and Ring Terminal Cleaning

On some applications, cleaning the sense leads where they connect to the battery may be necessary. This is normally needed when monitoring flooded batteries because electrolyte can drip or splash onto the sense lead connections. Sense leads exposed to electrolyte must be neutralized. Follow the battery manufactures recommendations for cleaning battery connections.

2.4 Internal Component Replacement

The monitor system has no user replaceable components. Since high voltage exists in most of the system components, only knowledgeable users should remove the covers from components. Failure to comply with this restriction could pose a safety hazard and/or void the product warranty.

3. System Overview

The Albér Universal Xplorer Telecom Monitor (UXTM) Battery Monitor Diagnostic and Acquisition Module is a stationary battery monitor designed for use in telecommunications or DC powered data centers. The system architecture is a flexible design that allows for monitoring virtually any battery configuration using VLA, VRLA or NiCd technologies in 24 to 48VDC applications. What sets Albér monitors apart from others is the ability to provide early warning of potential battery problems. The monitor checks the state of health of each cell and its associated connections by performing a proactive, patented resistance test, a proven technology to predict battery performance reliably.

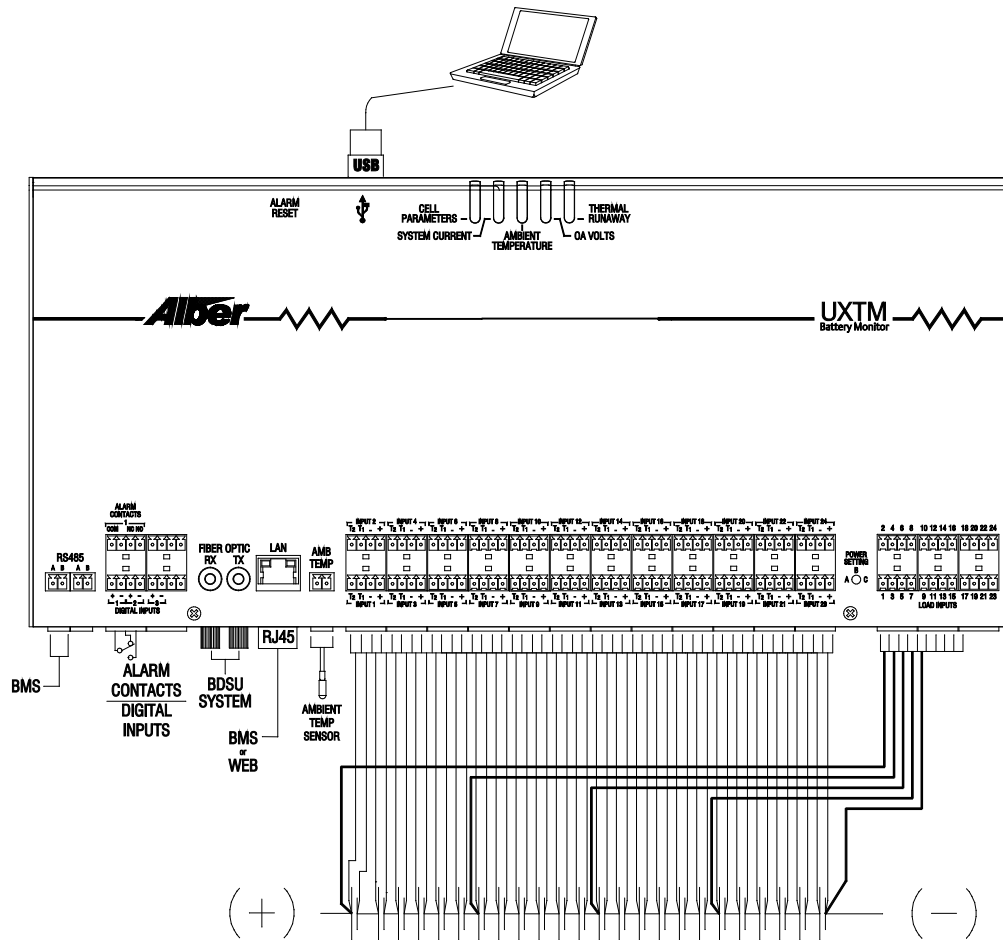


Figure 1 - Typical System Connection

4. System Installation



Note: The UXTM must be installed in a restricted access location.

UXTM installation requires nothing more than standard hand tools, cutters, strippers and screwdrivers. If the unit is to be wall mounted, a drill will also be required.

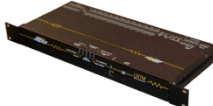







The following is a list of the steps required for successful UXTM system installation. Some items may not apply due to system requirements.

Installation Task	Refer to Section
Verify materials ordered and received	Materials Received List, page 5-1
Items to consider before system installation	System Installation Considerations, page 6-1
Isolate the battery string	Battery String Isolation, page 6-2
Identify cell/monobloc Number 1	Cell/Monobloc Number 1 Identification, page 6-2
Properly install the tab washers	Installation of Tab Washers, page 7-1
Configure the unit	Unit Configuration, page 8-1
Mount the equipment	Equipment Mounting, page 9-1
Connect the sense lead harnessing	Sense Lead Harness Connection, page 10-1
Connect the fused load lead harnessing	Fused Load Lead Harness Connection, page 11-1
Connect the ambient temperature sensor	Ambient Temperature Sensor Connection, page 12-1
Connect the digital inputs	Digital Inputs Connection, page 13-1
Connect RS-485 communications if applicable	RS-485 Communication Connection, page 14-1
Fiber Optic Communication Connection if applicable	Fiber Optic Communication Connection, page 15-1
Network Communication Connection if applicable	Network Communication Connection, page 16-1
Connect the alarm contacts if applicable	Alarm Contact Connection, page 17-1
Install the wire strain relief kit	Installing Strain Relief Kit Alarm Contact Connection, page 18-1

Table 1 - Installation Task List

5. Materials Received List

The following is a list of material that may have been received with your shipment. Refer to the packing slip delivered with the equipment for a complete list of materials supplied. Alber suggests you inventory all materials to ensure the order is complete. Report any shortages to Alber immediately.

Part Number	Photo/Drawing	Description
1007-XXX		UXTM module
1102-153-12 1102-153-25 1102-153-50		12', 25' or 50' sense lead harness with quick connect terminal
1102-160-12 1102-160-25 1102-160-50		12', 25' or 50' fused load lead with quick connect terminal
1102-161-12 1102-161-25 1102-161-50		12', 25' or 50' sense lead harness with ring terminal connection
1102-162-12 1102-162-25 1102-162-50		12', 25' or 50' fused load lead with ring terminal connection
2900-047-12 2900-047-25 2900-047-50		12', 25' or 50' harness with ring terminal temperature sensor
2900-048-12 2900-048-25 2900-048-50		12', 25' or 50' harness with quick connect temperature sensor
3703-006		25' Fiber Optic Cable Communication link between units

Materials Received List (Continued)

Part Number	Photo/Drawing	Description
KIT-3703-015		Fiber Optic Polishing Kit The kit provides the user with polishing materials to terminate the ends of plastic optical fiber correctly.
1102-154-12 1102-154-25 1102-154-50		12', 25' or 50' harness with quick connect ambient temperature sensor
4301-015		15 AMP SB fuse. One for each fused lead
2140-047		4 pin connector for terminating harnesses
2025-108		USB cable
2120-066B		5/16" dual tab washer for sense/load lead connections
2120-030B		5/16" single tab washer for sense/load lead connections
2027-029		Software installation CD
6004-001		Cable number labels
KIT-1200-376		Rack mounting kit
KIT-1200-377		Wall mounting kit
KIT-1200-378		Strain relief kit

Table 2 - Inventory List

6. System Installation Considerations

This section describes items that should be considered before installing the UXTM system.

6.1 Disconnect Device

The first load connector which plugs into load inputs 1, 3, 5 and 7 is the primary disconnect device. Unplug this connector to disconnect power from the UXTM.

6.2 Equipment Location



Note: Consider the placement of the equipment in the event service is required. For example, access to the rear of the equipment or visual access to the status lights may be needed. The equipment is convection cooled and no cooling fans are used. To maintain proper operating temperature, the equipment must not be enclosed in another cabinet without proper ventilation.

6.3 Rack Mounting

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified in the Product Description Guide.

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

6.4 Mounting Options

The equipment can accommodate two types of mounting: 19" rack mount or wall mount. If the rack mount option is used, brackets (included) will need to be installed.

6.5 Wire Length



Note: All sense lead harnesses come prefabricated to a 12', 25' or 50' length and, in most cases, should not require additional lengths. In fact, the sense leads are un-terminated on one end so they may easily be shortened for a cleaner installation. The resistance load test-wiring limits this length to the maximum distance the UXTM can be mounted from the battery string. This manual describes all harnesses at the standard 12', 25' or 50' length.

6.6 Battery String Isolation



Warning: Isolate the battery string prior to installing the system.

Important!: Never attempt installation on a battery string that is in service and not fully isolated from the DC bus and load circuits.

6.7 Cell/Monobloc Number 1 Identification

When referring to any material in this installation guide and reference is made to an actual cell number, always consider Number 1 as the most positive end of the battery with respect to the battery charger. As the cells increment toward the negative end of the string, increment the cell numbers as well.

7. Installation of Tab Washers

Tab washers allow connection of the monitoring system to the battery. Some tab washers are supplied with single or double tabs. These types are for use on cells that have exposed connections not restricted by safety covers. The tab washer style, location and quantity depend on whether the system is monitoring cell temperature. The actual placement of these tab washers in relation to the battery post and existing hardware is critical. In instances where a single tab washer is required, this should be placed closest to the cell post and underneath the double tab washer. The following figures illustrate some common applications.

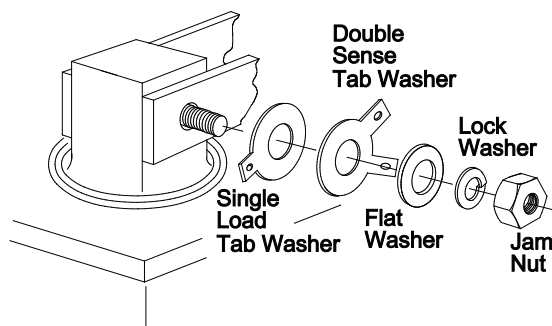


Figure 2 - Exposed Post Tab Washer Assembly

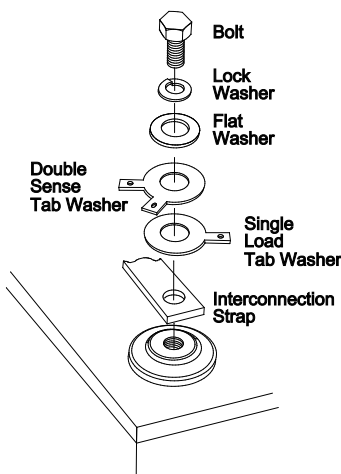


Figure 3 - Recessed Post Tab Washer Assembly

To determine tab washer placement, refer to the Configuration Connection Diagram at the back of this manual. Locate the desired configuration that will be installed and refer to the appropriate row of tabs: "for optional Cell Temperature" or "for no Cell Temperature." There is an actual image of the tab washer required. Using the wiring diagram above the tab washer image, install the appropriate tab on each required post.

8. Unit Configuration

8.1 Digital Input Configuration

Each digital input can be configured either for a voltage or contact closure input. Refer to the table below.

Note: Digital input configuration should be only performed by a qualified technician. Contact Technical Support for details.

Mode	Acceptable Input Range
Voltage	> 4V = False < 1V = True Maximum nondestructive input: 60Vdc
Open/Close Contact	< 2K = True

Table 3 - Digital Input Modes

Seven Jumpers are supplied with the UXTM for configuration. There is a pair of 2-pin jumpers associated with each digital input, which must be set according to the mode desired. The cover of the unit must be removed to gain access to these jumpers. Refer to the following table and drawing to identify what mode is required and where the jumpers are.

Channel	Mode	Jumpers
Digital Input 1	Voltage	JP24 & 25 Not Installed
	Open/Close Contact	JP24 & 25 Installed (default)
Digital Input 2	Voltage	JP26 & 27 Not Installed
	Open/Close Contact	JP26 & 27 Installed (default)
Digital Input 3	Voltage	JP28 & 29 Not Installed
	Open/Close Contact	JP28 & 29 Installed (default)

Table 4 - Digital Input Jumper Settings

The location of the jumpers is shown in the figure below.

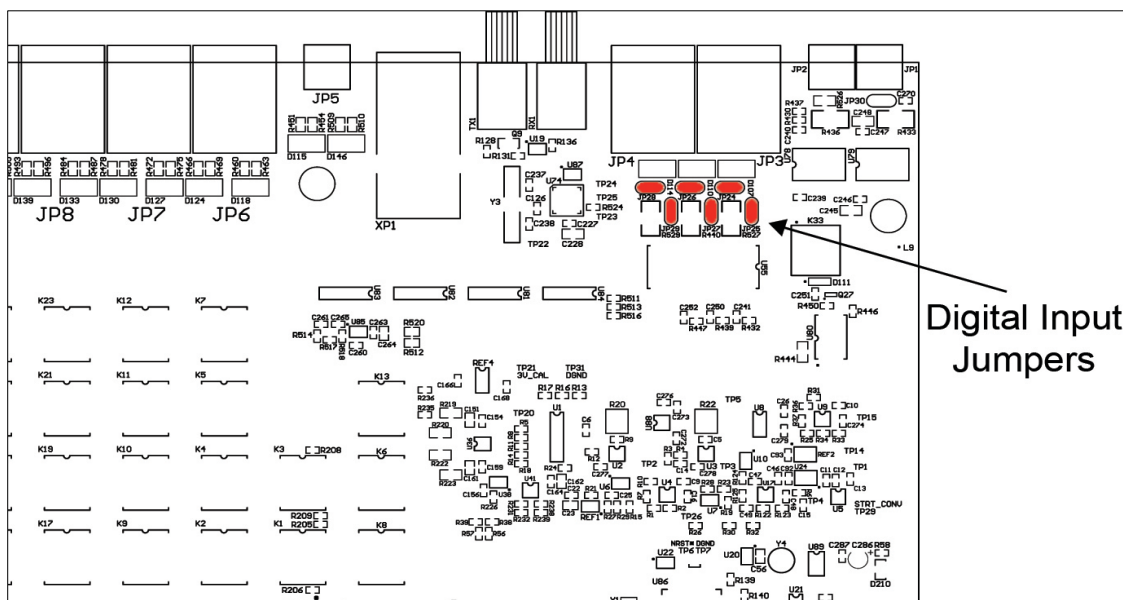


Figure 4 - Digital Input Jumper Locations

8.2 RS-485 Termination

A jumper on the circuit board is used for selecting a termination resistor for RS-485 connection. In most cases, RS-485 termination is not necessary because maximum baud rate is 19200 bps (default is 9600). RS-485 termination is recommended when intermittent communications occur. RS-485 termination is enabled when the jumper is across Pins 1 and 2 (default). It is disabled when the jumper is not inserted across Pins 1 and 2. The location of the jumper is shown in the figure below.

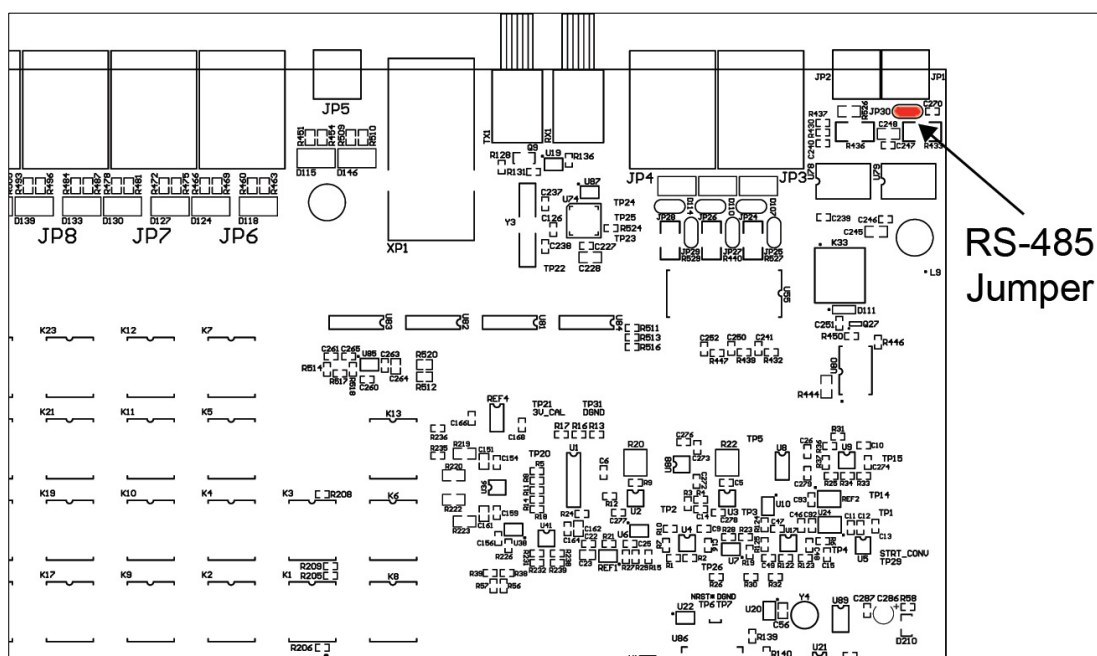


Figure 5 - RS-485 Jumper Locations

8.3 Power Setting Selection

The power setting identifies what load input wires will provide power to the equipment. There are three possible settings described in the chart below. In the chart, the battery configuration is defined as Number of Strings x Number of Jars/Cells x Voltage of each Jar/Cell.

Battery Configuration	Power Setting
1X18X1V	B
1X12X2V	B
2X12X2V	B
1X24X2V	C
1X6X4V	A
2X6X4V	A
3X6X4V	A
4X6X4V	A
1X12X4V	C
2X12X4V	C
1X4X6V	C
2X4X6V	C
3X4X6V	C
4X4X6V	C
1X8X6V	C
2X8X6V	C
3X8X6V	C
1X3X8V	B
2X3X8V	B
3X3X8V	B
4X3X8V	B
1X6X8V	B
2X6X8V	B
3X6X8V	B
4X6X8V	B
1X2X12V	A
2X2X12V	A
3X2X12V	A
4X2X12V	A
1X4X12V	C
2X4X12V	C
3X4X12V	C
4X4X12V	C

Battery Configuration	Power Setting
1X3X16V	B
2X3X16V	B
3X3X16V	B
4X3X16V	B

Table 5 - Configuration List (Continued)

The power setting switch is located on the rear of the UXTM and is shown below. Use a small screwdriver to set this switch to A, B or C.

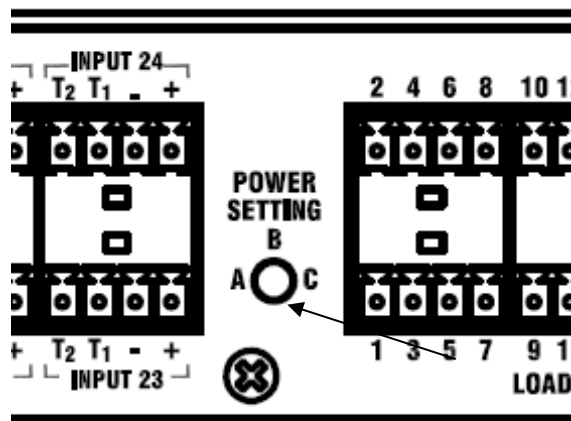


Figure 6 - Power Settings Switch Location

9. Equipment Mounting

The equipment can accommodate two types of mounting: 19" rack mount or wall mount.

9.1 Rack Mounting

If the rack mount option is used, optional angle brackets (included) will need to be installed on each side of the unit. To connect the rack mount brackets to the unit, align the screw holes of the brackets with the sides of the unit. Remove the upper flat head screws on each side and secure the rack mount brackets to the unit using the supplied screws. Mount the equipment in the 19" rack using appropriate screws and washers.

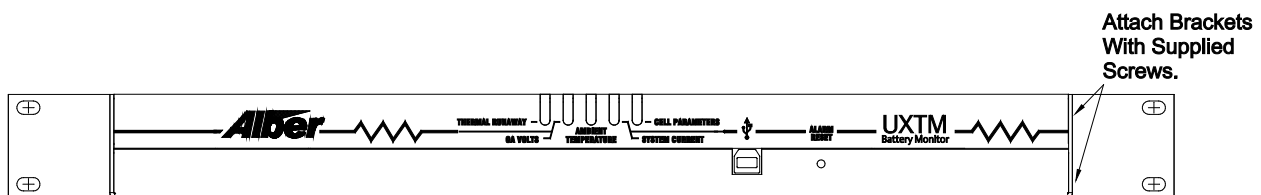


Figure 7 - 19" Rack Mount View

9.2 Wall Mounting

If wall mounting is used, optional right angle brackets are required (ordered separately) and must be attached to the unit using the supplied screws. To mount the unit on the wall, special consideration should be given to determine the best method for securing the unit. There are several types of anchoring techniques available, depending on the type of structure the mount is being attached to. The best anchoring technique must be determined by the installer at the time of installation.

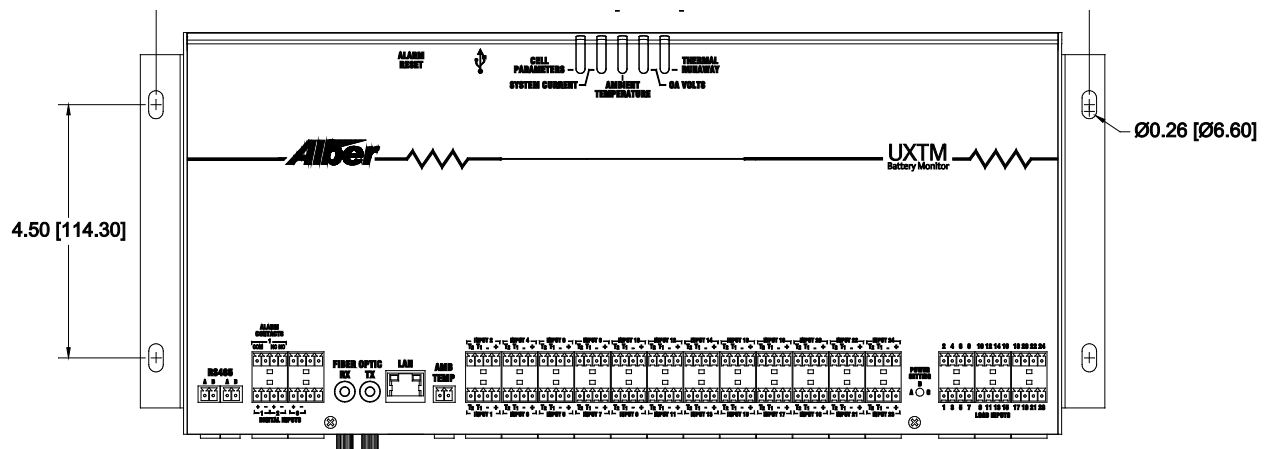


Figure 8 - Wall Mount View

10. Sense Lead Harness Connection

The type of battery and whether cell temperature is monitored determines what sense lead cable is used. Refer to the following sections to determine which applies to the installation being performed.

10.1 System without Cell Temperature

Systems that do not monitor the cell temperature will have only one sense lead attached to each terminal of the battery. There is one sense lead assembly with either a 12', 25' or 50' of cable for each cell being monitored. This cable is factory terminated on the end that attaches to the battery. The other end must be cut to length, stripped, and secured to the connector with the connector's set screws. After terminating the cable to the connector, be sure to place a wire marker at the connector end to identify which cell it is monitoring for connector placement.



Warning: Connect the wires at the terminated end (UXTM) first, then terminate the sense leads to the appropriate cell/unit. Be sure to, measure the potential across leads and connectors for correct voltage before connecting the UXTM to the battery. Once the load cables and sense lead connections are verified with a DMM, the wires can then be connected to the UXTM. Do not install fuses to the UXTM until it is appropriate. Follow the order to terminate the sense leads. The potential for shorting the circuits here is significant.

The following illustrations show this scenario and must be duplicated for each cell.

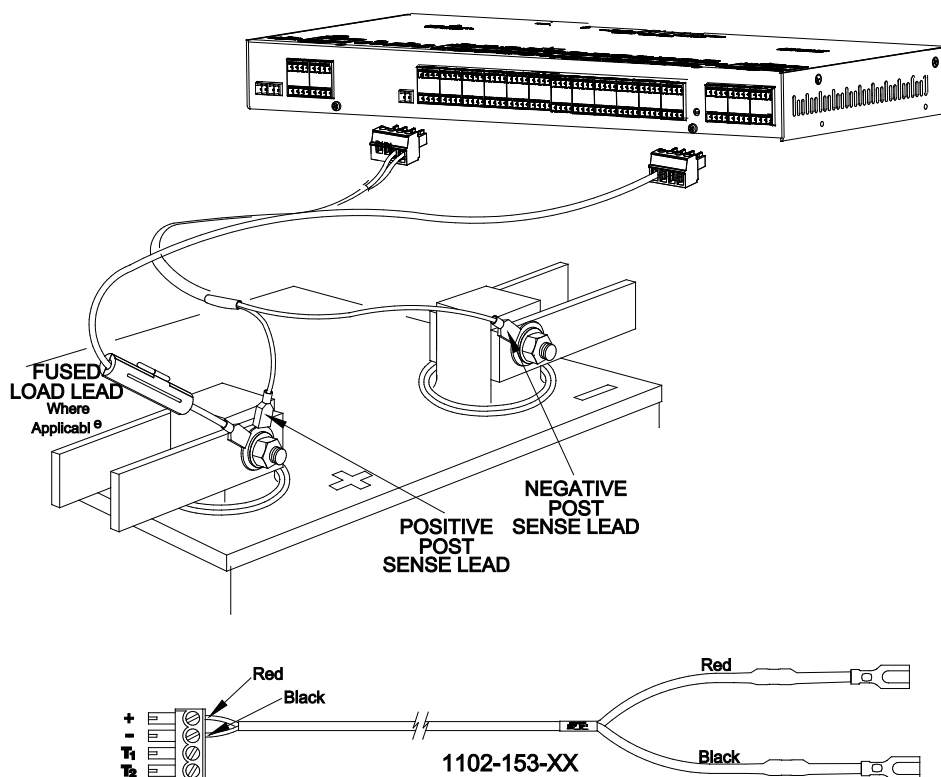


Figure 9 - Exposed Post with Standard Tab Washers without Cell Temperature Sensor

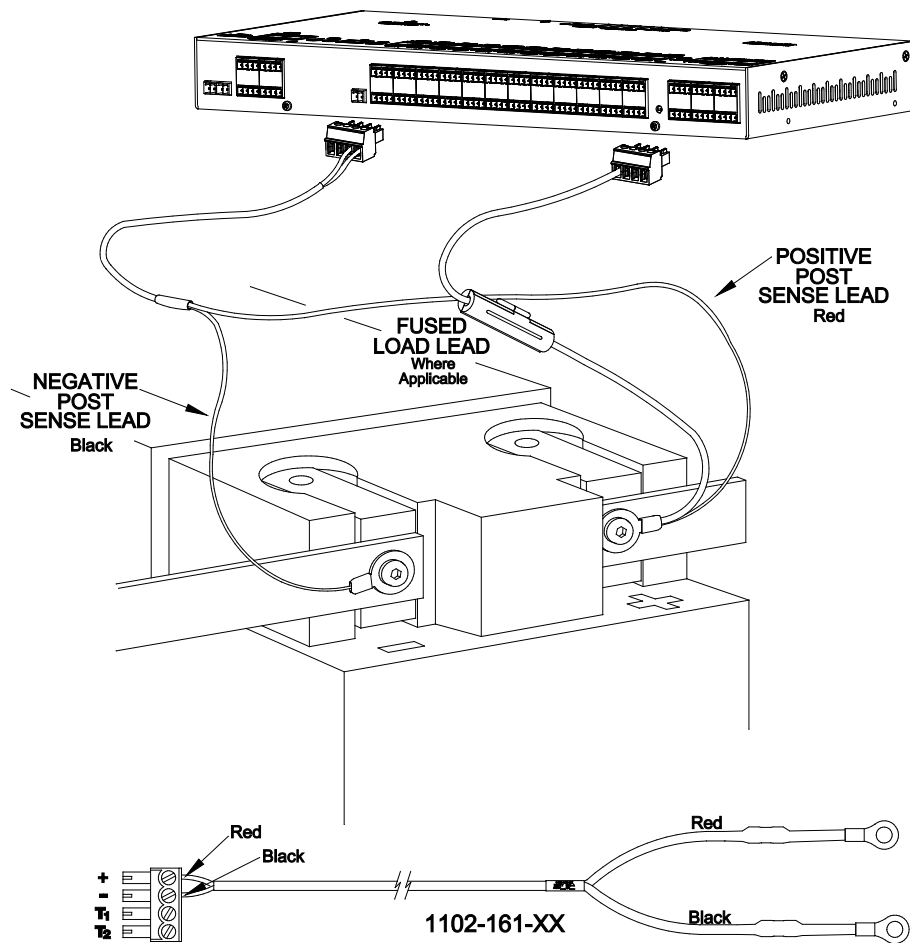


Figure 10 - Recessed Post with Ring Terminal Washers without Cell Temperature Sensor

10.2 System with Cell Temperature

Systems that monitor the cell temperature will have a choice of two types of sense lead harnesses. The first harness uses a quick connect for the temperature sensor, and the second harness uses a ring terminal for the temperature sensor. In either case, the red and black leads of the harness attach to the corresponding terminals of the battery (red-positive, black-negative). The temperature sensor will either connect to a tab washer quick connect or be secured under the bolt for the intercell connector, depending on the type of cell being monitored. This cable is factory terminated on the end that attaches to the battery. The other end must be cut to the desired length, stripped, and attached to the connector with the connector's set screws. After terminating the cable to the connector, be sure to place a wire marker at the connector end to identify which cell it is monitoring for connector placement. The following illustrations show this scenario and must be duplicated for each cell.

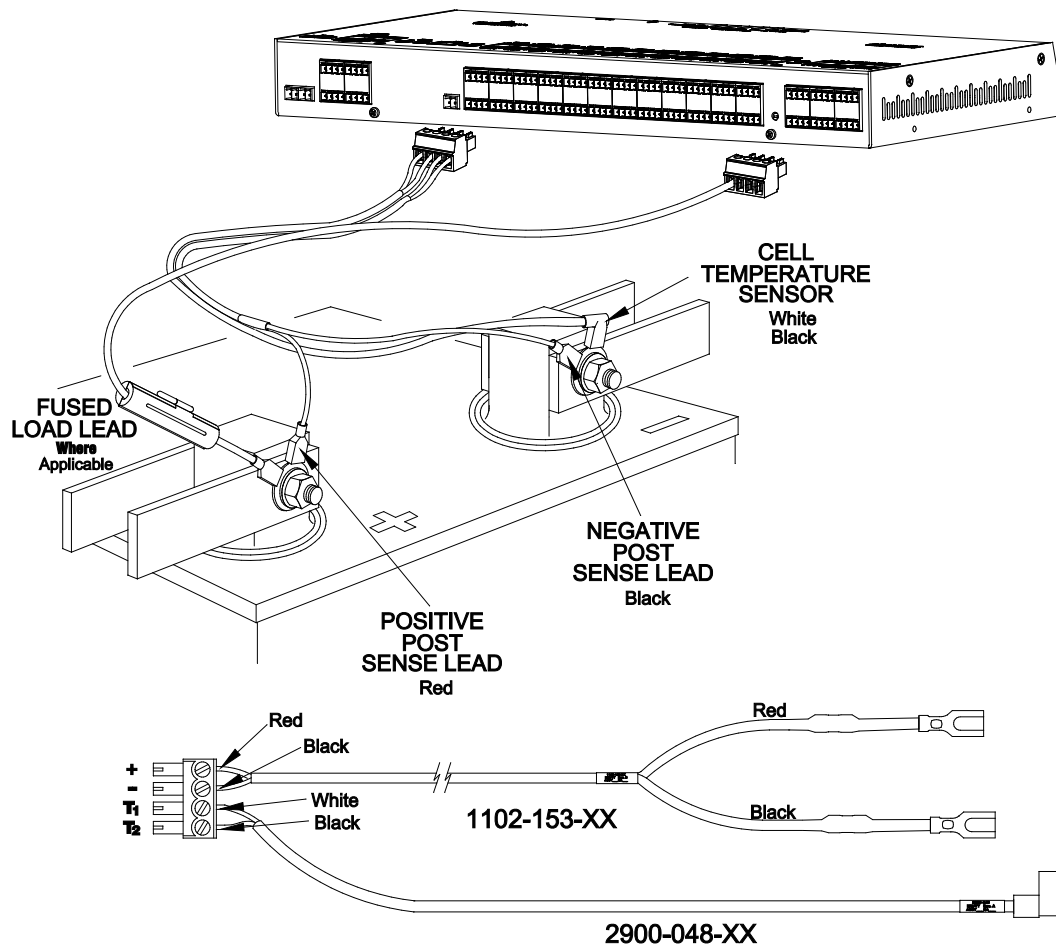


Figure 11 - Exposed Post with Wired Tab Washers with Cell Temperature Sensor

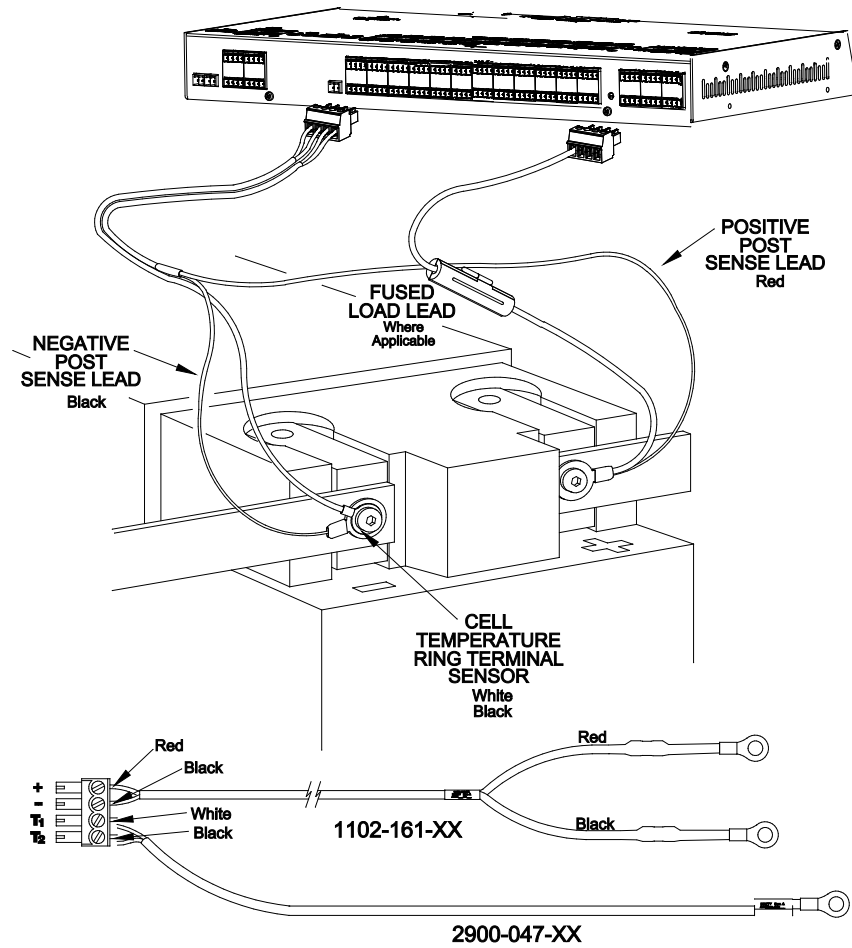


Figure 12 - Recessed Post with Ring Terminal Washers with Cell Temperature Sensor

10.3 System with Dual or Multiple Positive and Negative Posts

Systems may have dual or multiple positive and negative posts to connecting to sense lead harnesses. The red and black leads of the harness attach to the corresponding terminals of the battery (red-positive, black-negative). This cable is factory terminated on the end that attaches to the battery. The other end must be cut to the desired length, stripped, and attached to the connector with the connector's set screws. After terminating the cable to the connector, be sure to place a wire marker at the connector end to identify which cell it is monitoring for connector placement. The following illustrations show a scenario of dual or multiple positive and negative posts and must be duplicated for each cell.

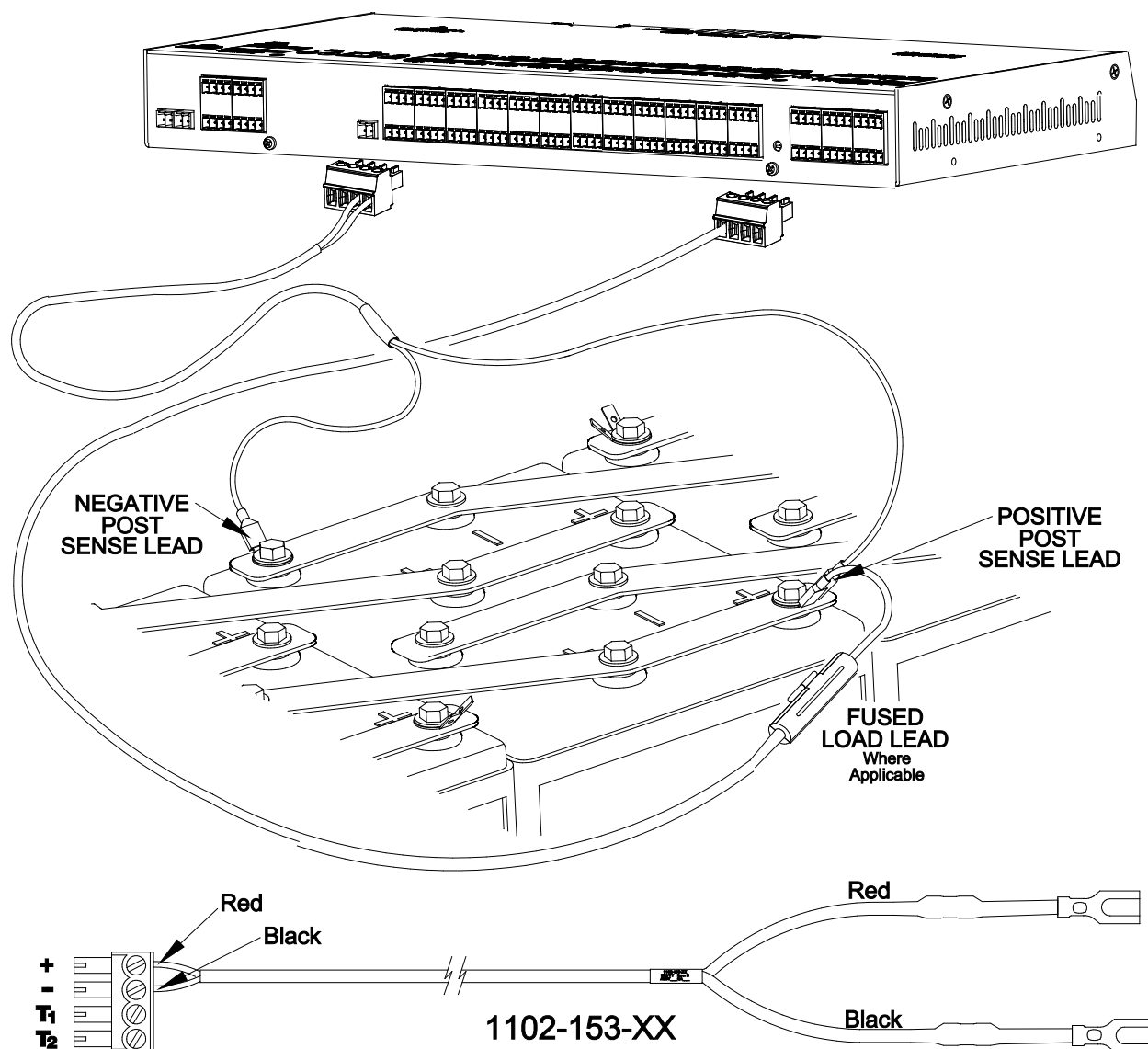


Figure 13 - Exposed Dual or Multiple Posts with Wired Tab Washers without Cell Temperature Sensor

Depending on the battery design, there could be single, double or triple post per polarity. Below is an illustration of how to position the wires for each of these configurations. Establishing the best cross section of the battery for the sense lead placement is the best scenario. In any case, when attaching the leads, being consistent across the installation is most important and will yield the most uniform reading when observing the internal and intercell resistance measurements.

If a load lead is required to be attached, it should be landed on the same position as the sense lead, however, actual placement should adhere to the instructions in [Section 7 – Installation of Tab Washers](#).

If a temperature sensor is required, then place this on one of the open double tabs as illustrated in [Section 10.2 - System with Cell Temperature](#).

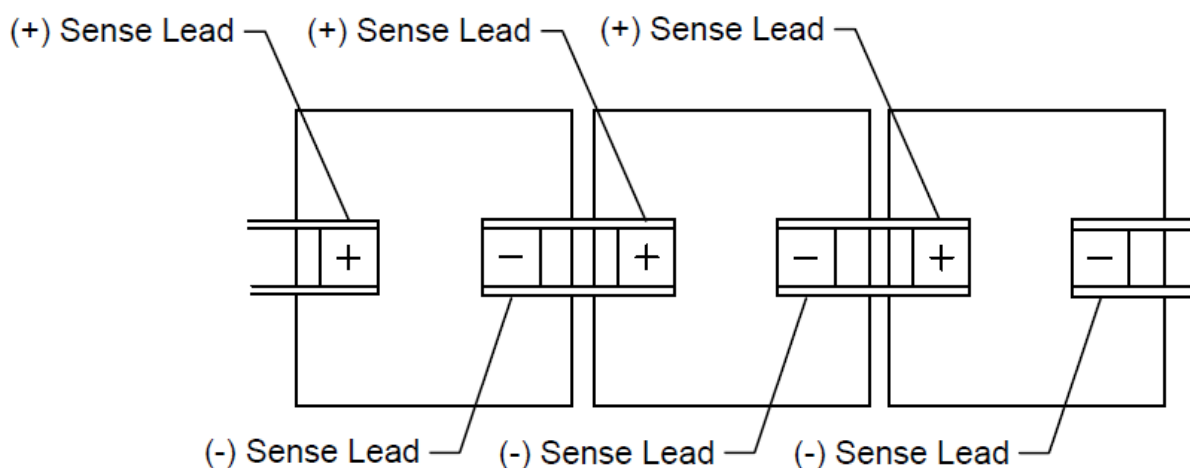
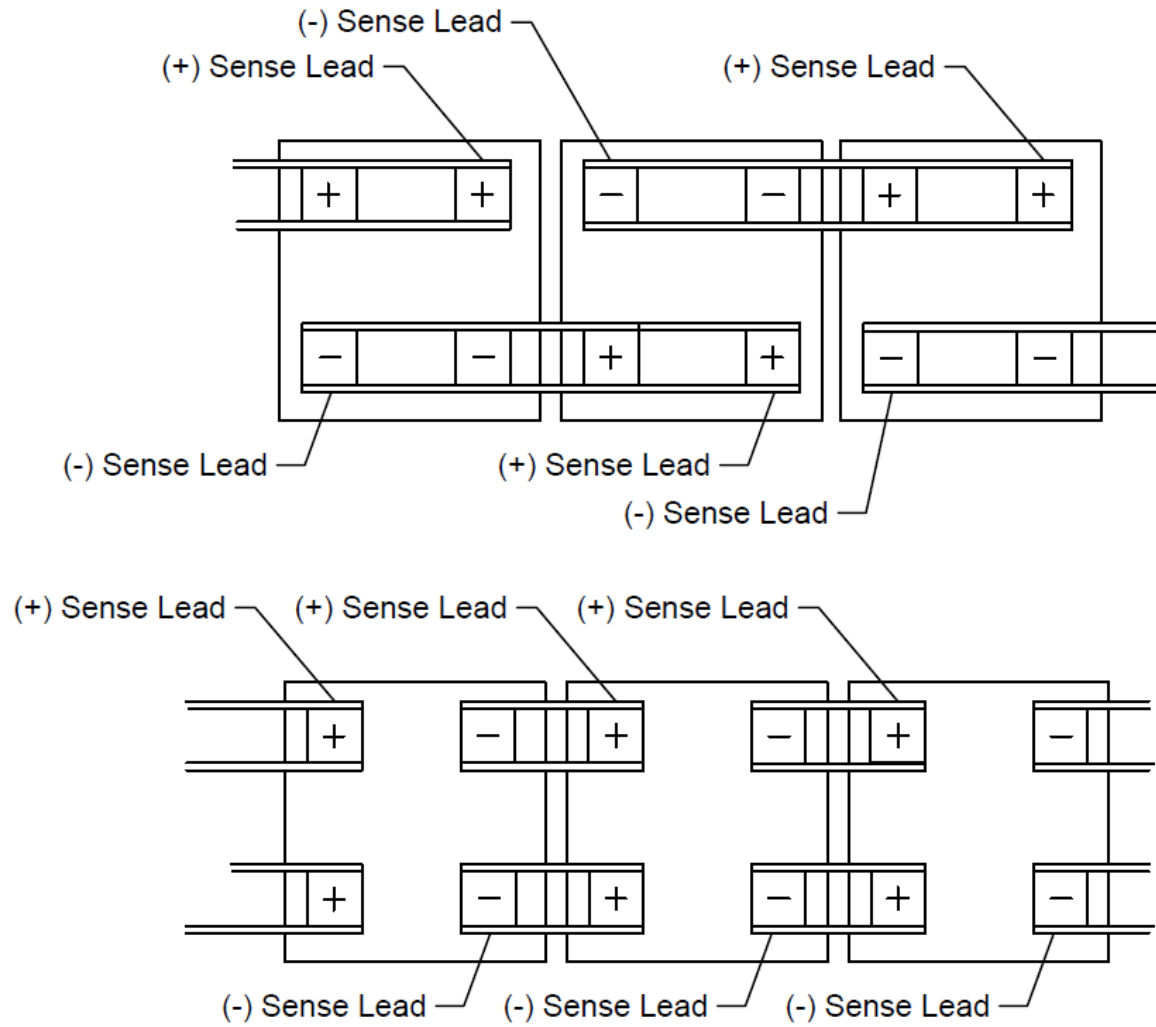
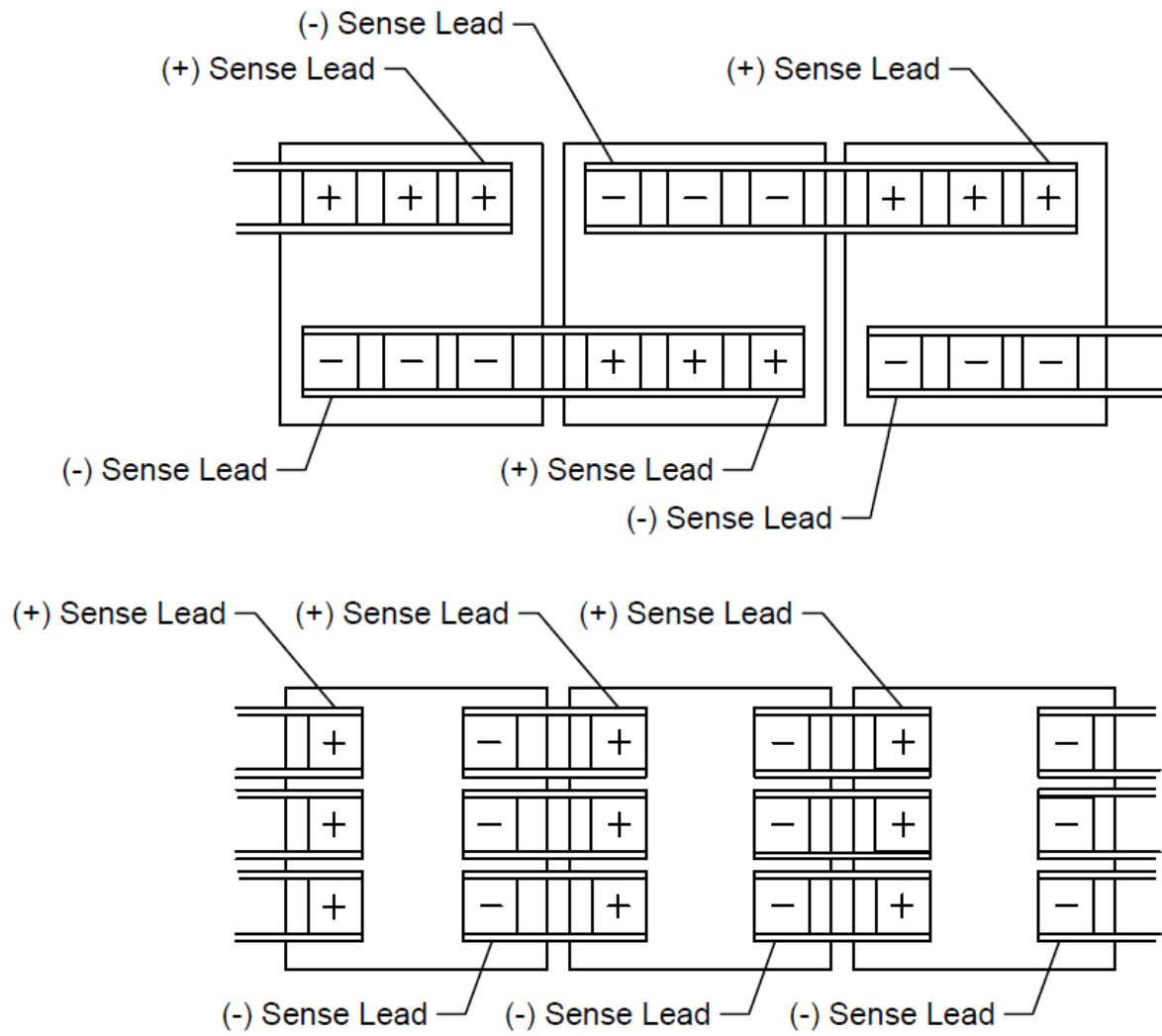


Figure 14 - Single Post Design

**Figure 15 - Double Post Design**

**Figure 16 - Triple Post Design**

11. Fused Load Lead Harness Connection

There is a maximum of 20 load connections available. The quantity used is dependent on the battery configuration. The installation kit will include the appropriate quantity of harnesses for the configuration ordered. Depending on the configuration, as few as three or as many as twenty load connections will be required. To identify quantities and connection locations, refer to the Load Inputs section of the Configuration Connection Diagram at the back of this manual. Each configuration on this drawing shows exactly where these cables connect to the battery. Sometimes this connection will be made on one of the tabs of a double tab washer and, at other times, it will be positioned on a single tab. It is critical in cases where it is used on a single tab that the load connection be placed closest to the battery post.

Before installation, verify that the fuse is not installed. The fuse will be installed at time of startup. As the cables are routed and inserted into the connector on the rear of the unit, apply a number label that associates the cable to the proper Load Input connection. Proper location and termination of these cables is critical and could cause equipment failures if done improperly.



Note: When installing load lead cables, cut them to the appropriate length. Do not coil these cables. Failure to cut cables to the correct length could result in inaccurate readings.

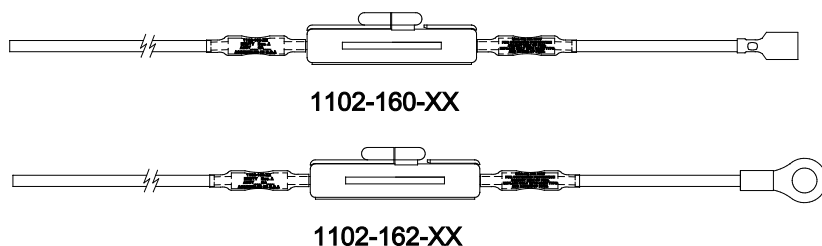


Figure 17 - Fused Load Lead

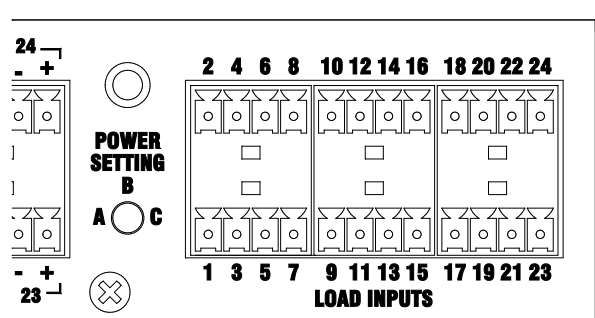


Figure 18 - Load Input Connections



Note: It is very important that the load connection is the closest connection to the post if two tab washers are used. Failure to do this could result in inaccurate resistance readings.



Caution: Connecting the load wires incorrectly could cause an equipment failure if a resistance test is performed. Such failures are not covered under warranty.



Warning: Do not install load lead fuses until instructed to do so in the Getting Started Guide.

12. Ambient Temperature Sensor Connection

There is one ambient temperature sensor included with each unit. This sensor comes with a prefabricated harness with 12', 25' or 50' of cable. Route the cable to the desired location and plug the connector into the rear of the unit.



1102-154-XX

Figure 19 - 12', 25' or 50' Temperature Harness

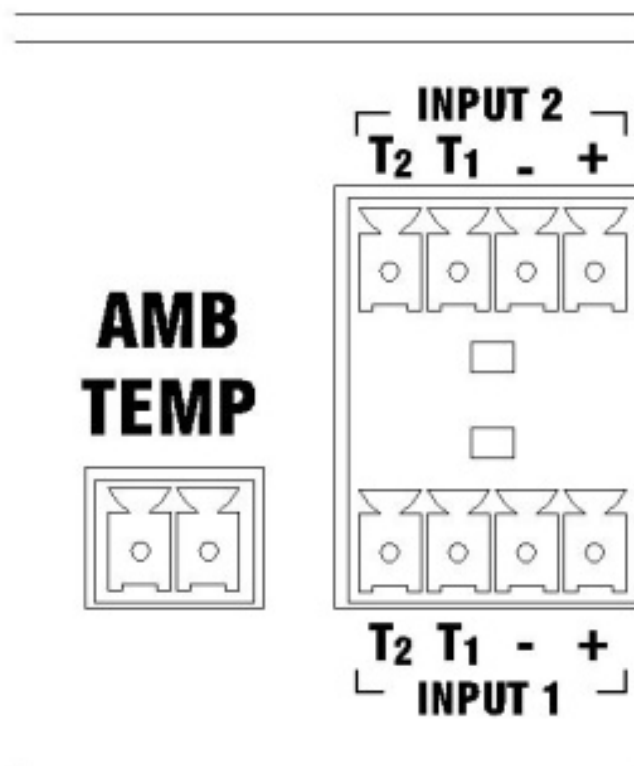


Figure 20 - Ambient Temperature Input

13. Digital Inputs Connection

There are provisions for three separate digital inputs. These can be configured to operate in two different ways. Refer to Digital Input Configuration section on page 8-1 for configuration details. To connect the device monitored, connect to one of the three inputs located on the rear of the unit. If only a switch "open/close contact" mode is being used, then polarity is not important. However, if a voltage source is being used, then the polarity will need to be correct.

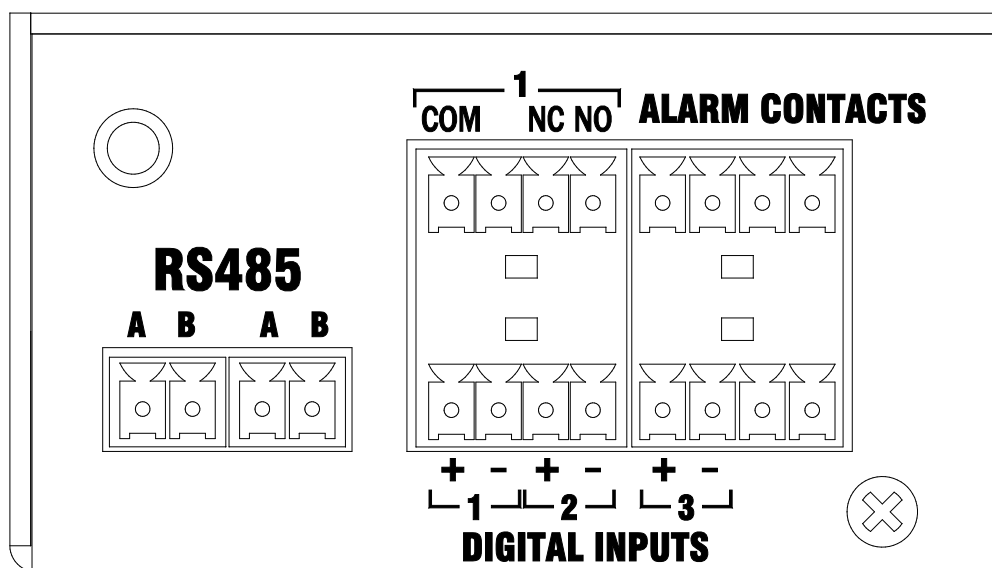


Figure 21 - Digital Inputs



Caution: Pay close attention to polarity and voltage when making these connections. Connecting the digital inputs polarity backwards or exceeding 60Vdc in voltage mode will damage the equipment.

14. RS-485 Communication Connection

Communication between the UXTM and remote controllers is accomplished through the RS-485 port. The unit has four RS-485 terminals. When multiple units are used together or with another remote controller, these modules can be networked together using the RS-485 terminals.

Note: Each slave device on the RS-485/Modbus network must have a unique address. This address is set from the General tab under Setup in the UXTM Configurator application.

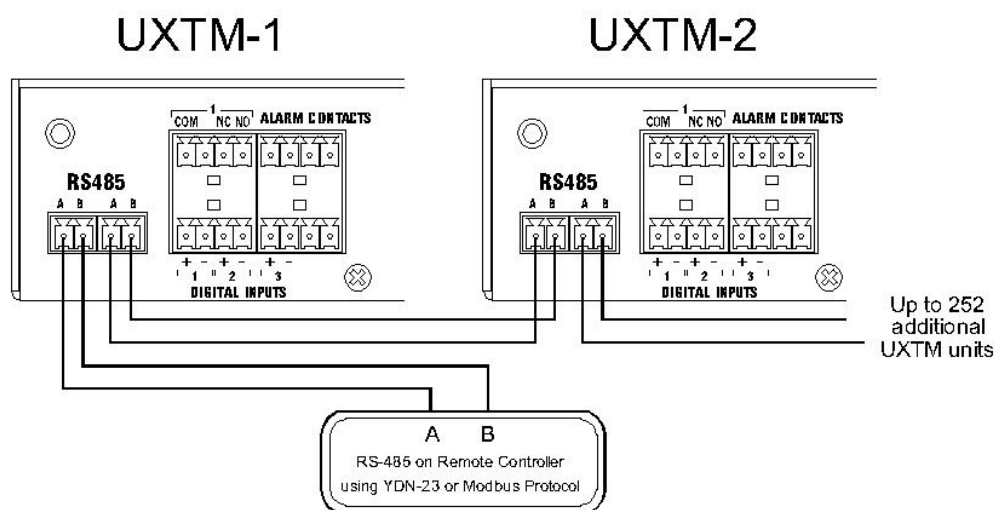


Figure 22 - RS-485 Connections

The recommended baud rate of 9600 should work in most cases. If intermittent communications are experienced, using a lower baud rate usually will correct this. Available baud rates are 1200, 2400, 4800, 9600, and 19200. If intermittent communications still exist after adjusting the baud rate, the termination jumper must be inserted on the last unit on the bus. By default, these jumpers are installed and therefore must be removed on units connected previous to the last unit on the bus. Refer to Unit Configuration, section 8.2 for additional details.

15. Fiber Optic Communication Connection

The Fiber Optic ports are an optional communications port used to connect to a BDSU Linker module - UXCM. When integrated with a UXCM, the UXTM will inherit a host of advanced features outlined in the BDSU Product Description Guide.

To connect to a UXCM, use the supplied fiber optic cable (if option is installed) and connect the TX of the UXCM to the RX of the UXTM and then the TX of the UXTM to the RX of the UXCM.

When cutting the fiber optic cable to length, the ends must be properly cut and polished to achieve reliable communications. Follow the instructions supplied with the polishing kit.

When routing and terminating the fiber optic cable, the following should be considered.

- The minimum bend radius should not be less than 35mm or 1.4"
- The maximum length between modules cannot exceed 250' or 76 meters. Exceeding 250' will cause degradation in the signal which will manifest itself as intermittent or no communications.

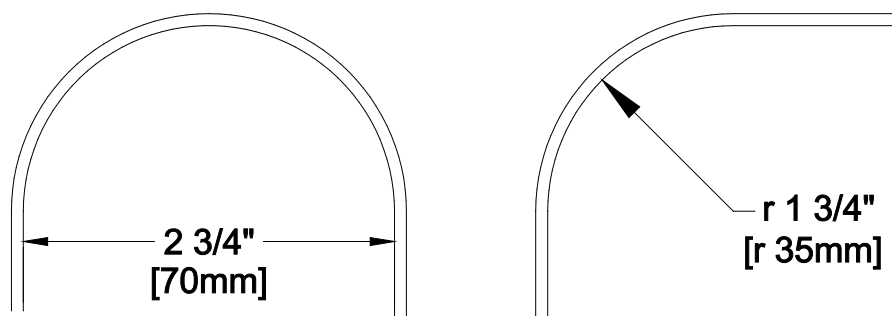
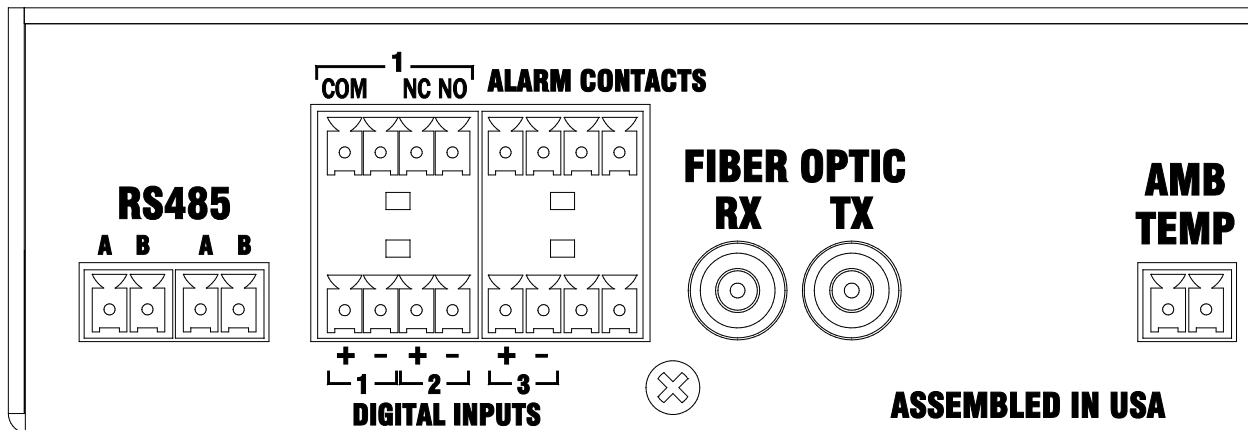


Diagram Not To Scale

Figure 23 - Minimum Fiber Optic Bend Radius

16. Network Communication Connection

The LAN network connector allows the UXTM to be connected to a Ethernet network. From an existing network, connect the network cable to the LAN connector on the UXTM.

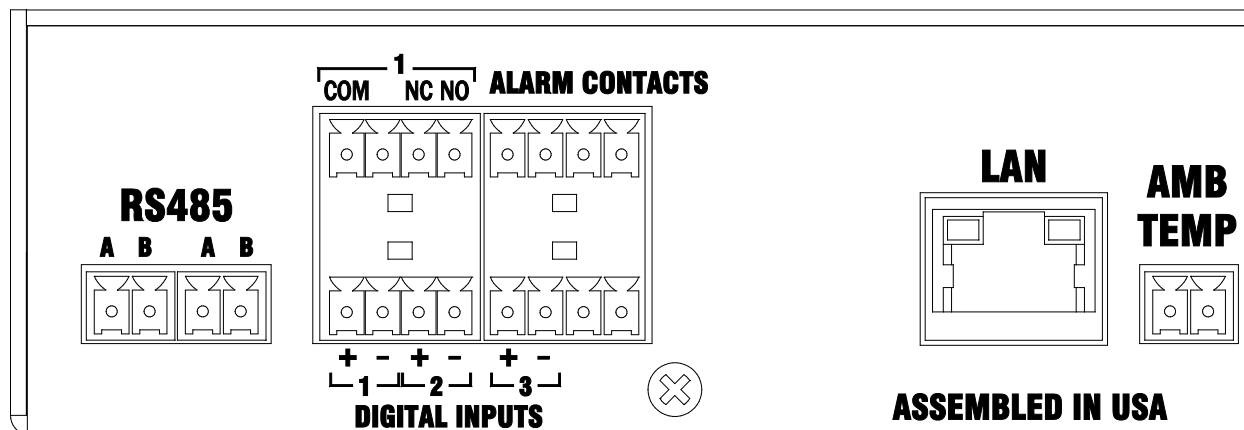


Figure 24 - Network Connection

16.1 Network Protocols Supported

There are several protocols supported by the network interface and will require specific ports to be opened up on the network. The following lists the supported protocols that can be used:

- TCP 502 (Modbus)
- TCP 3002 (Application debug port)
- TCP 9999 (Telnet setup)
- TCP 10001 (TCP to serial pass through)
- UDP 69 (TFTP), only to load code updates
- UDP 161 (SNMP)
- UDP 162 outbound (SNMP traps)

17. Alarm Contact Connection

There is one Form C alarm contact. This contact has three connections: COM (common), NC (normally closed) and NO (normally open). Connection can be made directly to the facility's alarm reporting system. If multiple units are used, then these contacts can be connected in series or parallel, depending on the requirements for the facility's NC or NO.

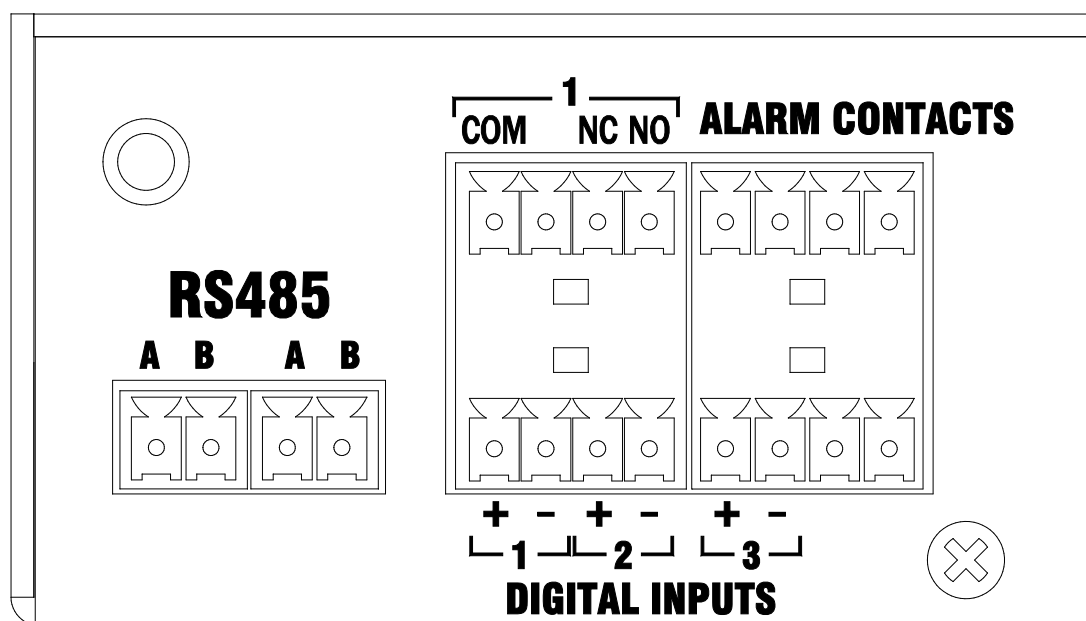


Figure 25 - Alarm Contacts

18. Installing Strain Relief Kit

To complete the wiring installation, install the strain relief kit (KIT-1200-378) which is supplied with your UXTM installation kit. After all wires are connected to the UXTM unit, install the wire routing bracket behind the wire bundle. The alignment groove on the bracket will mate with the tab on the rear of the UXTM unit. Move the bracket into place, lifting the wire bundle and secure the bracket with the supplied mounting screws. The wires should then be routed over the bracket's edge and secured in place using the strain relief bracket as shown in the diagram below.

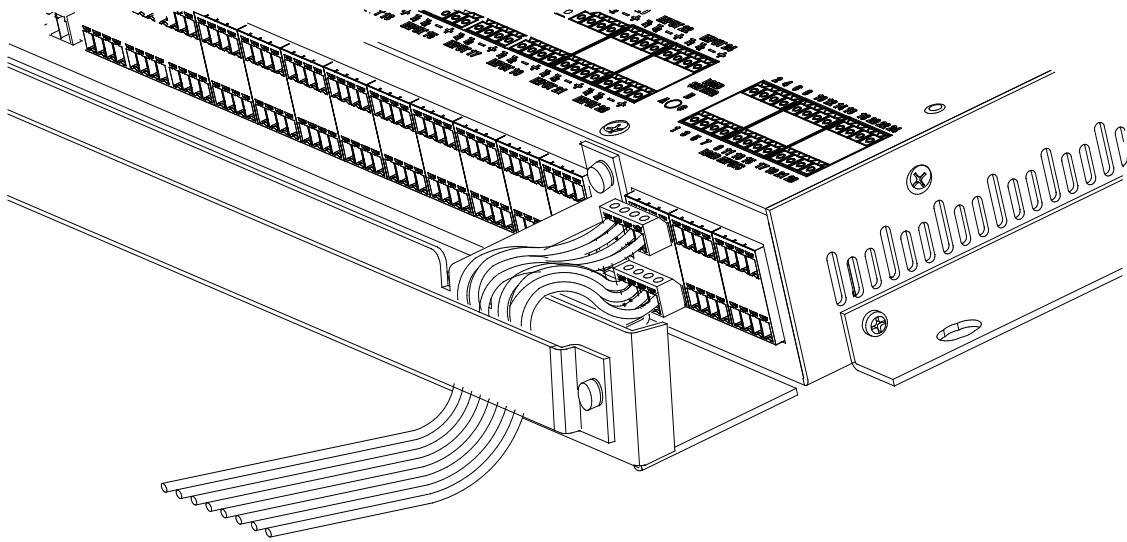
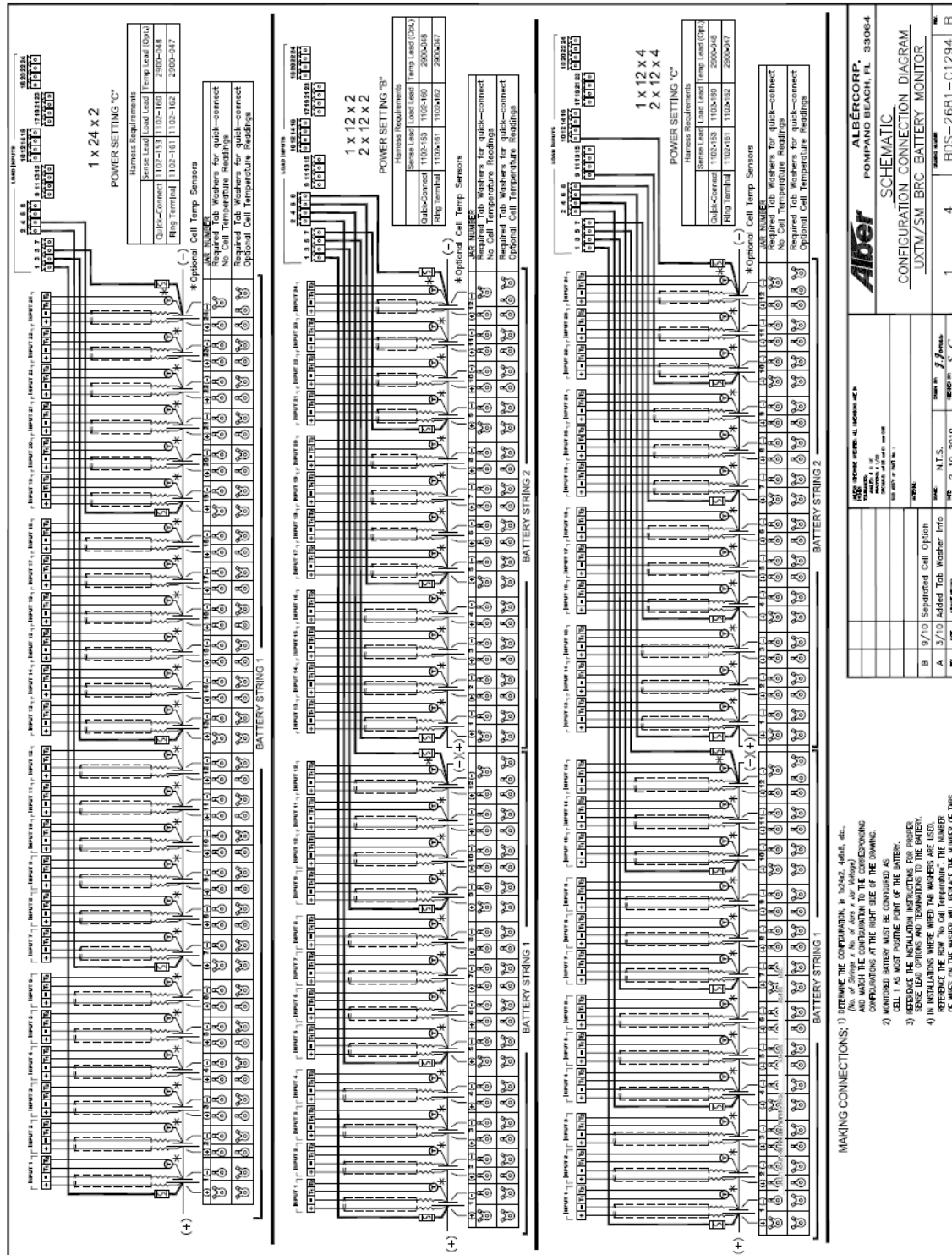
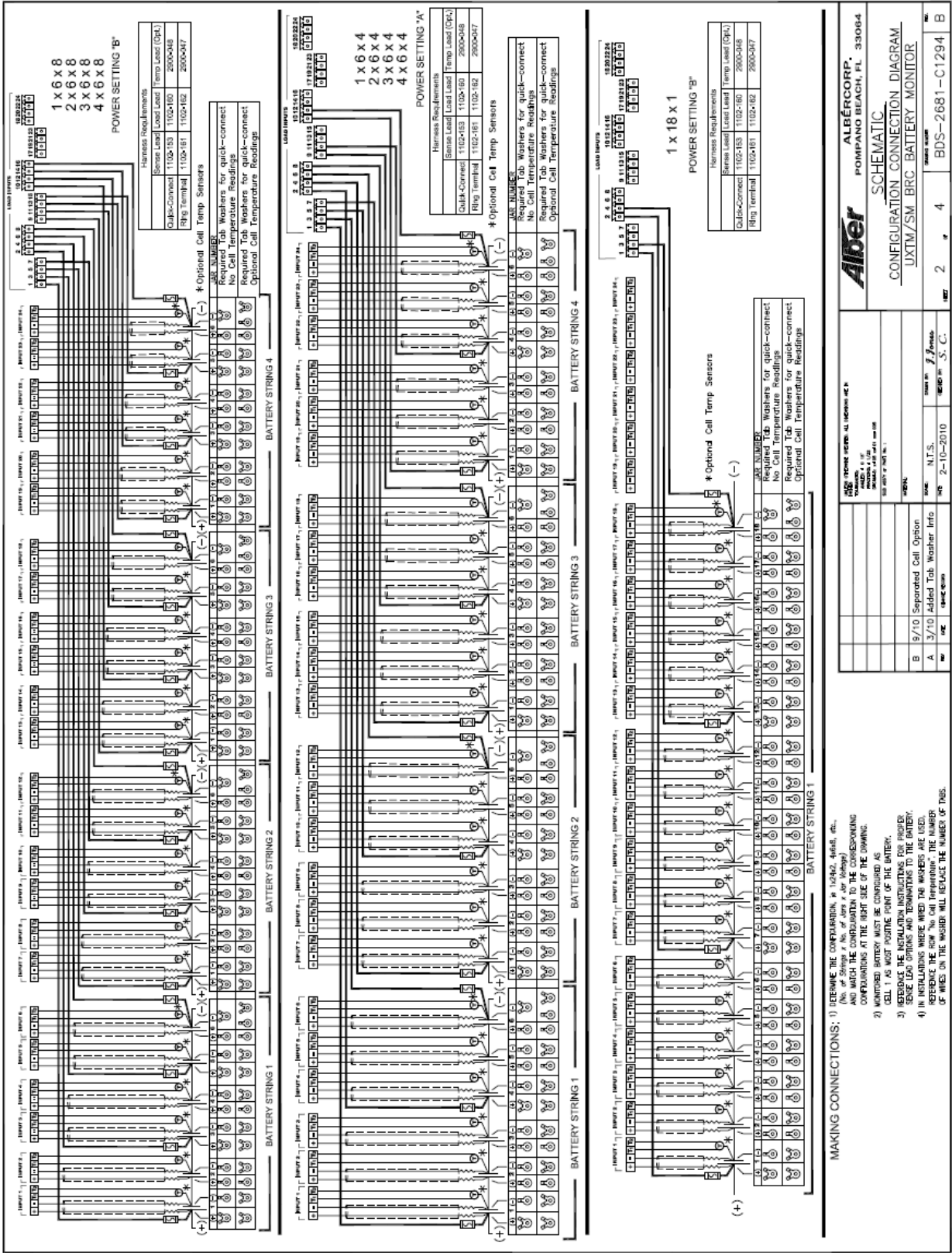


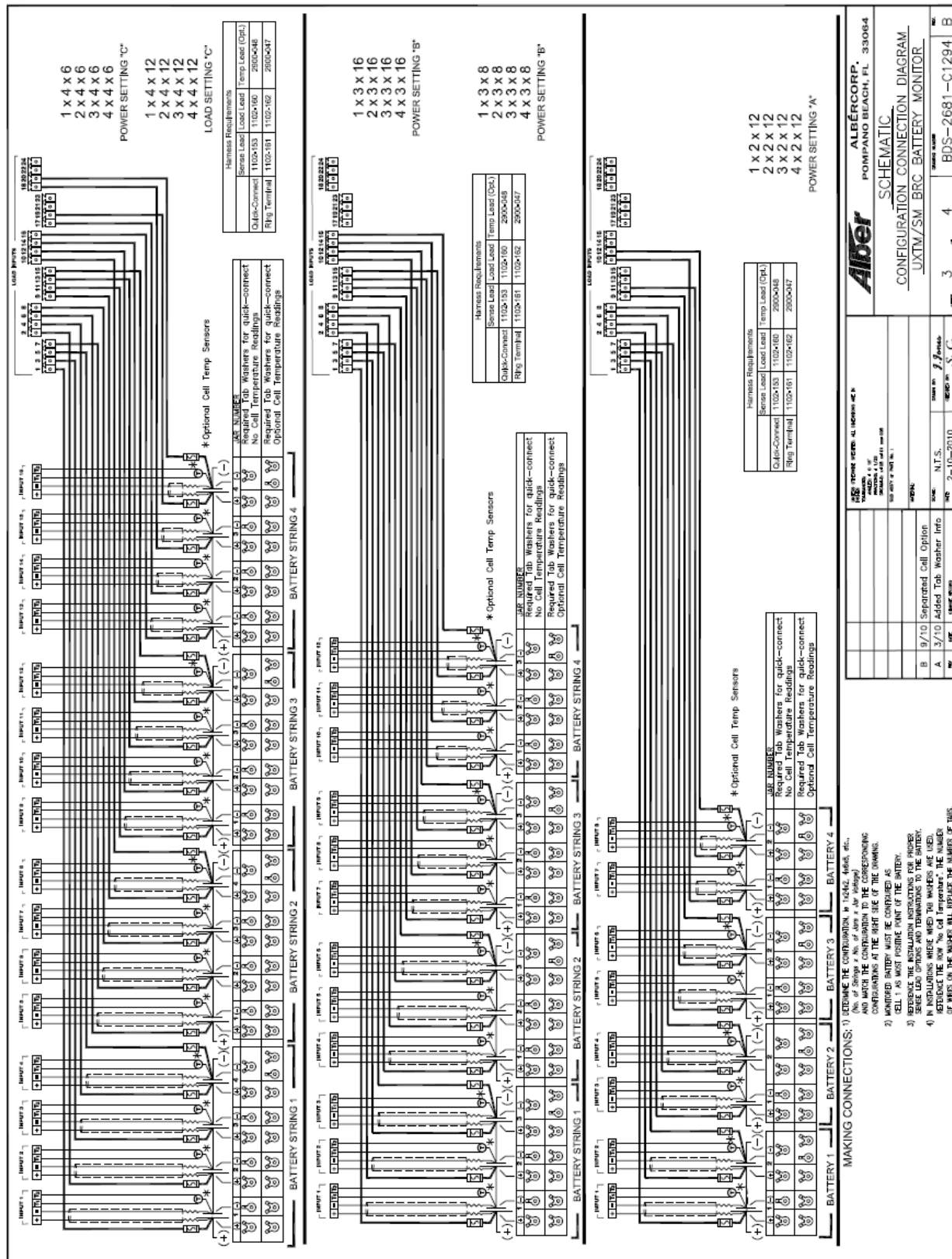
Figure 26 - Installed Strain Relief Kit with Wires Running through Strain Relief Bracket

19. Drawings

The following UXTM drawings are for reference only. A package of full size drawings will be part of the materials received with the UXTM device.









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