NOTIFIER®
A Pittway Company

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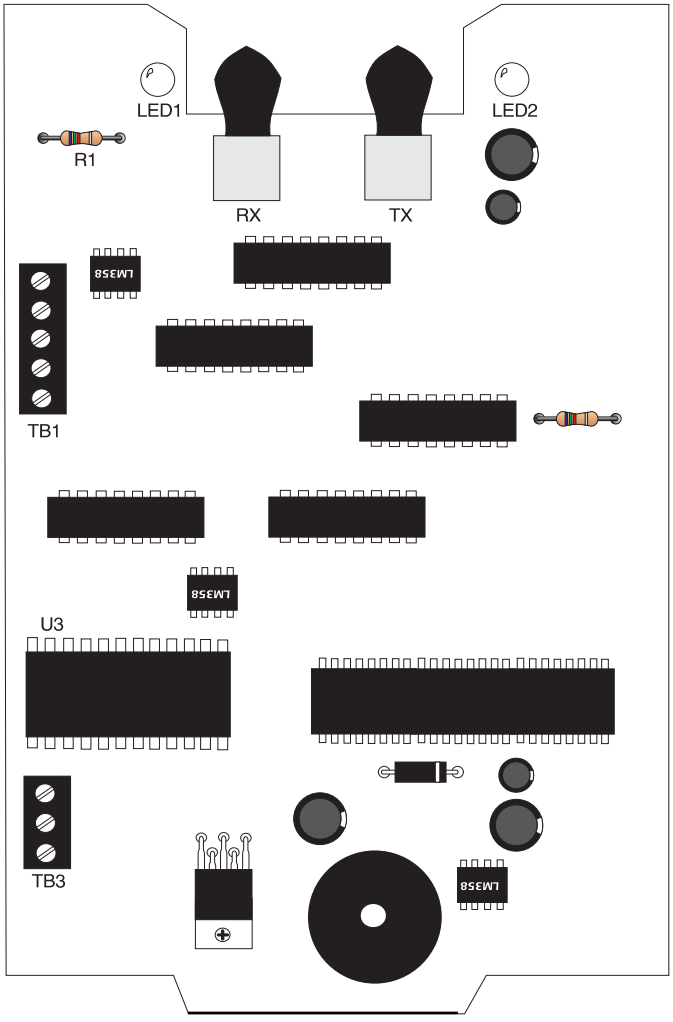
The RPT-485W/RPT-485WF

EIA-485 Annunciator Loop Repeater for Twisted Pair Wiring/Fiber Optic Cable



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Installation Precautions - *Adherence to the following will aid in problem-free installation with long-term reliability:*

WARNING - *Several different sources of power can be connected to the fire alarm control panel.* Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until this manual is read and understood.

CAUTION - *System Reacceptance Test after Software Changes:* To ensure proper system operation, this product must be tested in accordance with NFPA 72-1993 Chapter 7 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49° C/32-120° F and at a relative humidity of 85% RH (non-condensing) at 30° C/86° F. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a nominal room temperature of 15-27° C/60-80° F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interferences, proper grounding will reduce susceptibility. *Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes.* Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, and printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

Fire Alarm System Limitations

While installing a fire alarm system may make lower insurance rates possible, it is not a substitute for fire insurance!

An automatic fire alarm system - typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control with remote notification capability can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

Any fire alarm system may fail for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in walls, or roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second floor detector, for example, may not sense a first floor or basement fire. Furthermore, all types of smoke detectors - both ionization and photoelectric types, have sensing limitations. No type of smoke detector can sense every kind of fire caused by carelessness and safety hazards like smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches, or arson.

IMPORTANT! ***Smoke detectors*** *must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power.* If detectors are not so located, a developing fire may damage the alarm system, crippling its ability to report a fire.

Audible warning devices such as bells may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building.

A fire alarm system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time.

Rate-of-Rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist.

Equipment used in the system may not be technically compatible with the control. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled.

The most common cause of fire alarm malfunctions, however, is inadequate maintenance. All devices and system wiring should be tested and maintained by professional fire alarm installers following written procedures supplied with each device. System inspection and testing should be scheduled monthly or as required by National and/or local fire codes. Adequate written records of all inspections should be kept.

FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing device pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Contents

Section One:
Introduction

The RPT-485W/RPT-485WF ACS annunciator loop repeaters are designed to boost the EIA-485 annunciator signal from the fire alarm control panel (FACP). The RPT-485W is a repeater which supports twisted pair wire only; the RPT-485WF supports fiber optic cable between two repeaters. Any Notifier FACP that has an EIA-485 annunciator loop can employ RPT-485s. The boosted branch can have a maximum of 32 EIA-485 devices on it. These EIA-485 devices include AMG-1, AMG-E, UZC-256, NIB-96, ACM-16AT, all annunciators and other RPT-485s. Note there is a maximum of two RPT-485s that can be connected in series.

The source EIA-485 circuit in a Notifier Control Panel will support up to 32 devices and up to 32 addresses along a 6000 ft. (maximum) loop. Each RPT-485 can be employed to boost the distance of the circuit and/or add up to 32 additional EIA-485 devices (but not addresses) in the system. Figure 1.1 illustrates an electrically isolated system. Electrical isolation is maintained by employing separate power supplies for the source and boosted EIA-485 loops.

To remain isolated, connections between each EIA-485 device must have a reference wire from the power supply providing power to each device. This reference wire reduces the amount of noise on the communication wire. Both the source and boosted EIA-485 loop connection terminals are isolated from each other. These wires connect to REF A on TB1 and REF B on TB2. In order to maintain electrical isolation between separate system power supplies, REF A and REF B must be connected using a separate wire.

The source and boosted EIA-485 loops are isolated from each other, as well as from the RPT-485 power supply terminals. This important feature eliminates the need to interconnect power supplies. This feature also provides an easier method of locating ground fault conditions since it allows for separate ground fault zones. The isolation feature does not eliminate the need for reference connections between nodes on each isolated loop. The isolation feature will maintain isolation when networking slaves on an EIA-485 loop with the use of a NIB-96.

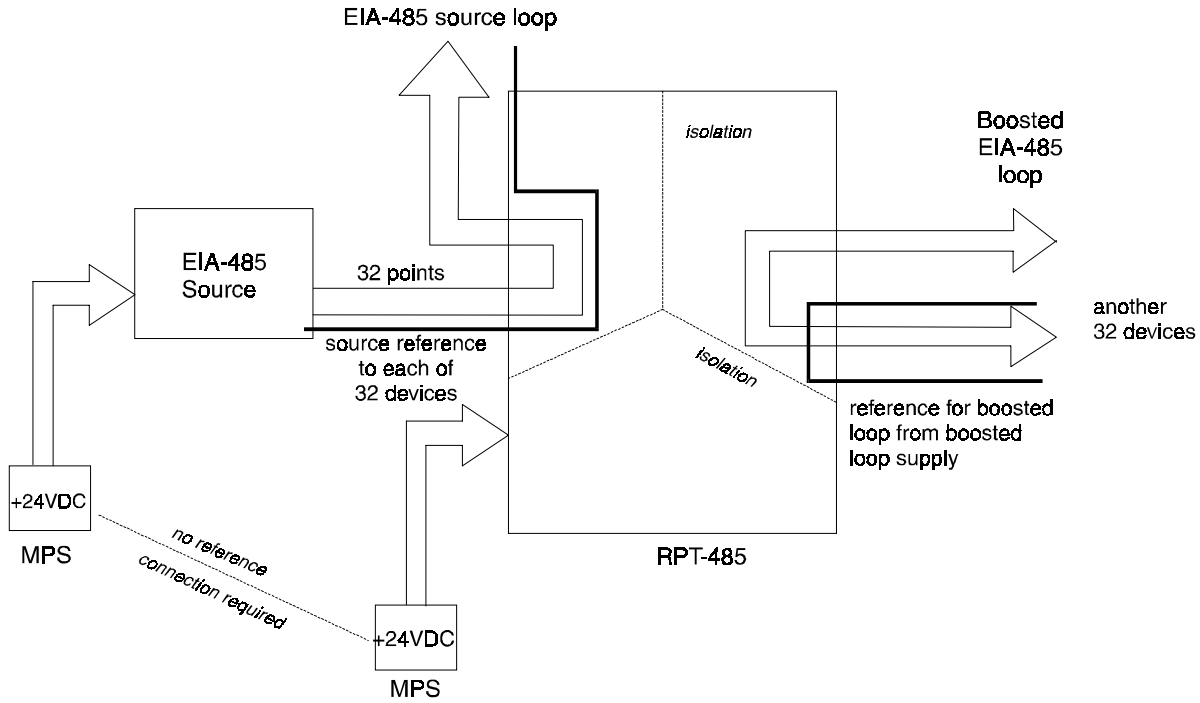


Figure 1-1: Isolated System with Remote Supplies

Section Two:
The RPT-485W

Purpose

The RPT-485W is an ACS annunciator loop repeater for twisted pair wiring which extends the loop length and node capacity of the EIA-485 Annunciator Loop. The RPT-485W electrically isolates the EIA-485 Annunciator Loop.

Features

- ✓ Extends EIA-485 distances in 4000 ft. increments.
- ✓ Allows additional boosted EIA-485 loops.
- ✓ Each boosted loop increases annunciator node capacity by 32.
- ✓ EIA-485 branch connections are electrically isolated to prevent ground fault detection problems.
- ✓ Two LEDs indicate data reception.
- ✓ Removable terminal blocks.
- ✓ A variety of mounting options.

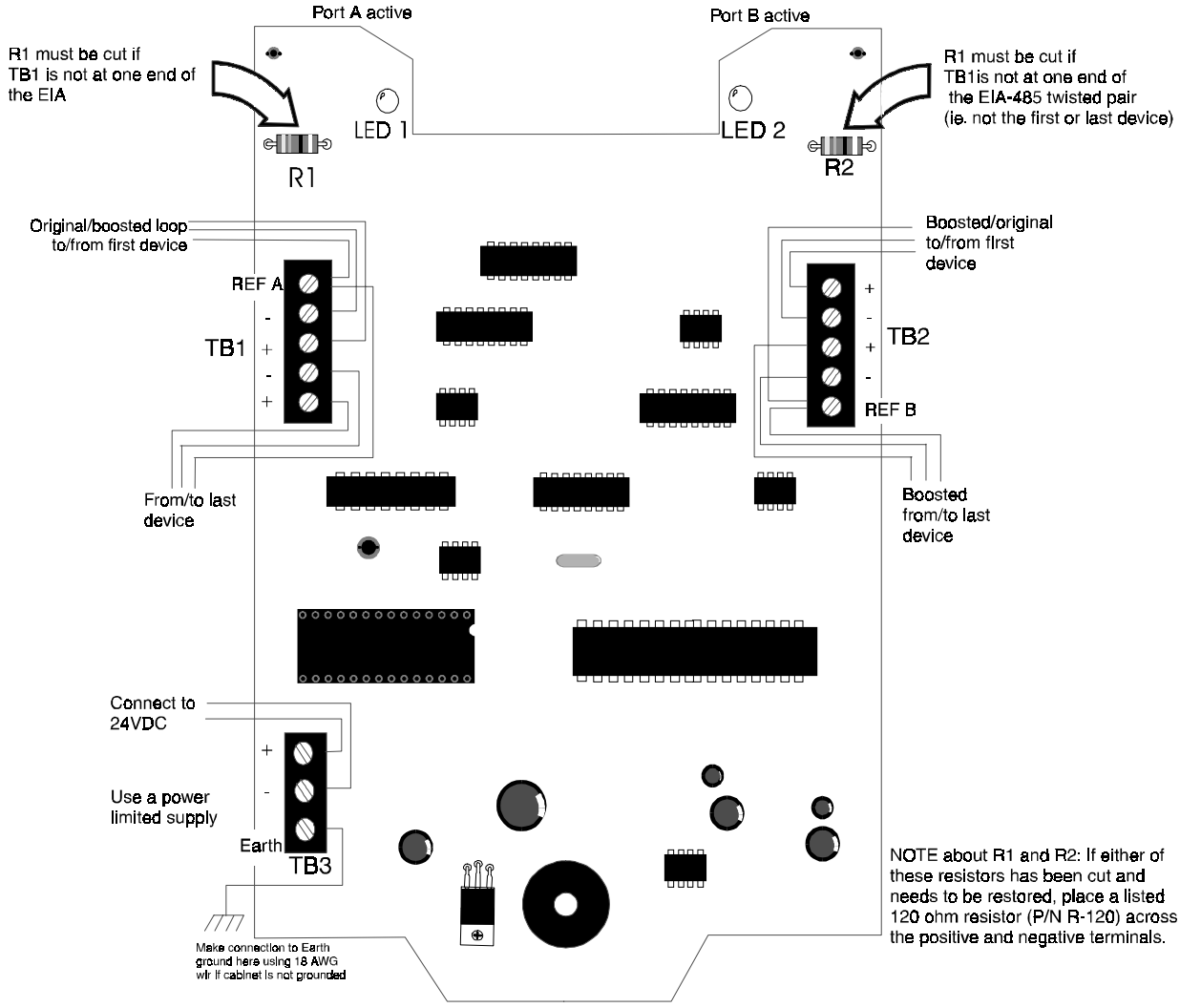


Figure 2-1: The RPT-485W

Two RPT-485Ws In Series Configuration

In order to further extend the EIA-485 loop, 2 RPT-485s can be arranged in a series connection. Between the two RPT-485s, 32 EIA-485 devices, 32 RPT-485s, or a combination of both can be hung from the loop. The source EIA-485 loop can extend up to 6,000 feet and have 32 EIA-485 devices (including the RPT-485s) hung from it. An example of wiring an EIA-485 loop using RPT-485Ws is pictured in Figure 2-2. Notice that both ends of every EIA-485 loop must be terminated by a 120 ohm resistor and there cannot be more than 2 RPT-485s connected in series.

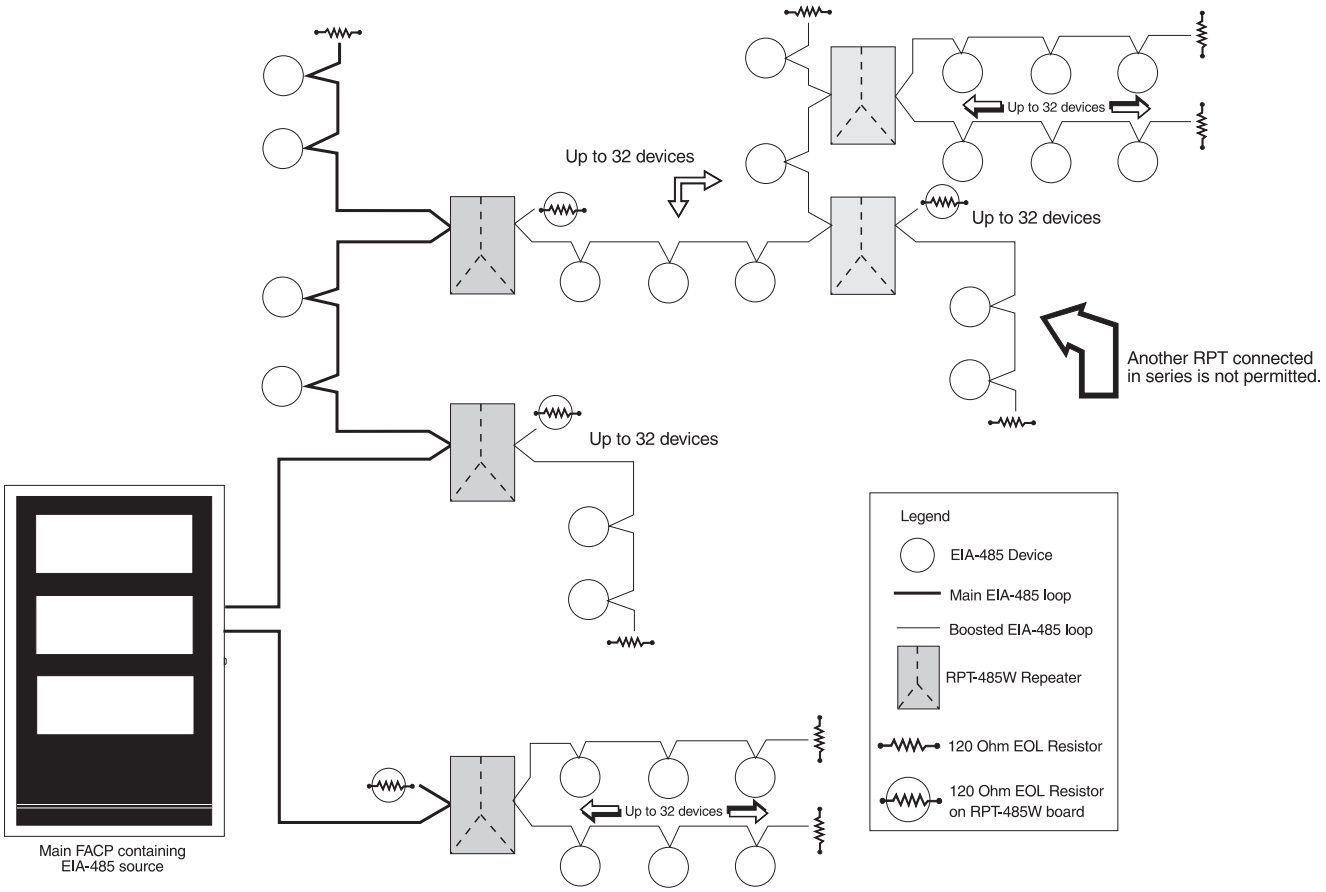


Figure 2-2: Parallel/Series Connection of RPT-485Ws

Section Three:
RPT-485WF

Purpose

The RPT-485WF is used to provide fiber optic capability, which may be necessary in environments exposed to strong electromagnetic interference such as power plants and areas with frequent lightning or in areas where a high level of security is required. The RPT-485WF optically isolates the EIA-485 annunciator loop eliminating ground loops and noise.

Features

- ✓ Extends the EIA-485 loop up to 10,000 ft with a 10dB maximum guaranteed (15dB typically achievable) attentuation for 820-850 nM fiber optic cable.
- ✓ Allows additional boosted EIA-485 loops.
- ✓ Each boosted loop increases annunciator node capacity by 32.
- ✓ Optically isolated.
- ✓ Two LEDs indicate data reception.
- ✓ Removable terminal blocks.
- ✓ A variety of mounting options.

Fiber Optic Cable Requirements

Dual Fiber 62.5/125um, with ST* Bayonett style connectors.

Note: Use the protective caps to protect the cable connections from damage and dirt accumulation when the cable is not connected.

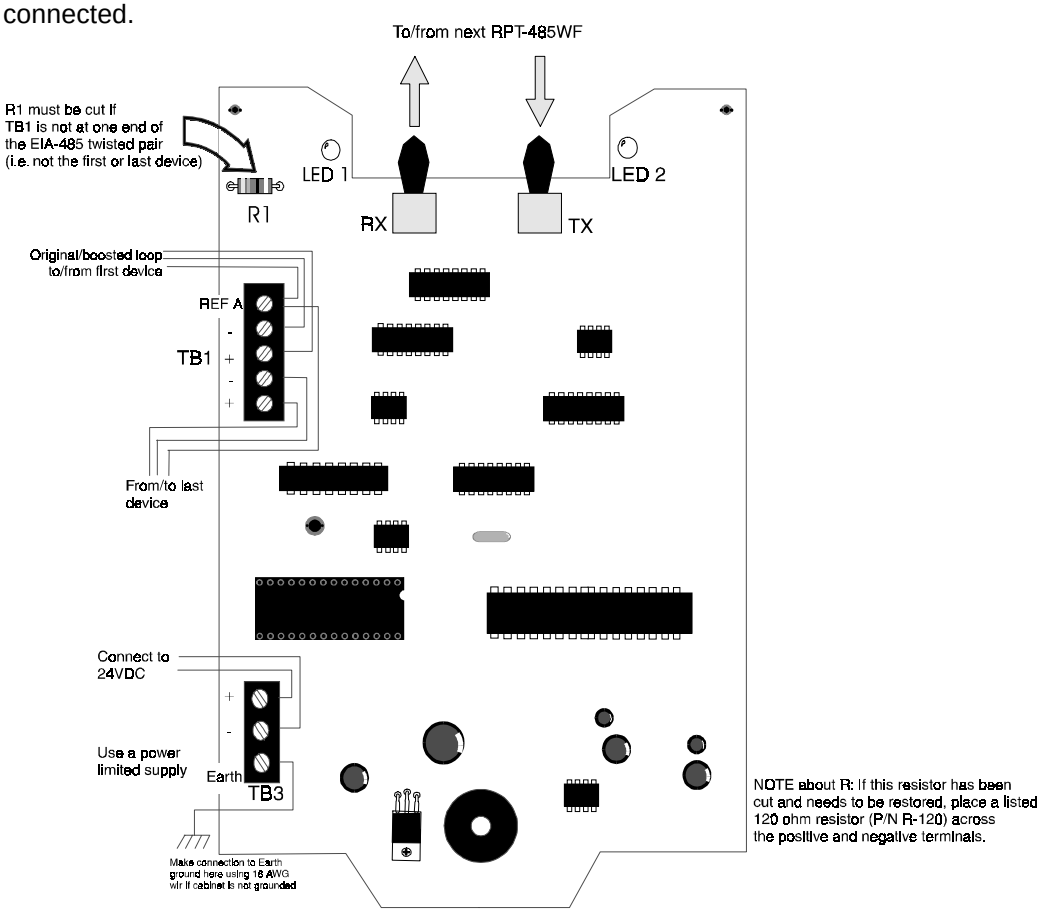


Figure 3-1: RPT-485WF

*ST is a registered trademark of AT&T Lightguide Cable Connectors.

Wiring RPT-485WFs

The RPT-485WFs must be used in pairs. The source EIA-485 loop can extend up to 6,000 feet and have 32 EIA-485 devices (including the RPT-485s) hung from it. An example of wiring an EIA-485 loop using RPT-485WFs is pictured in Figure 3-2. Notice that both ends of every loop must be terminated by a 120 ohm resistor.

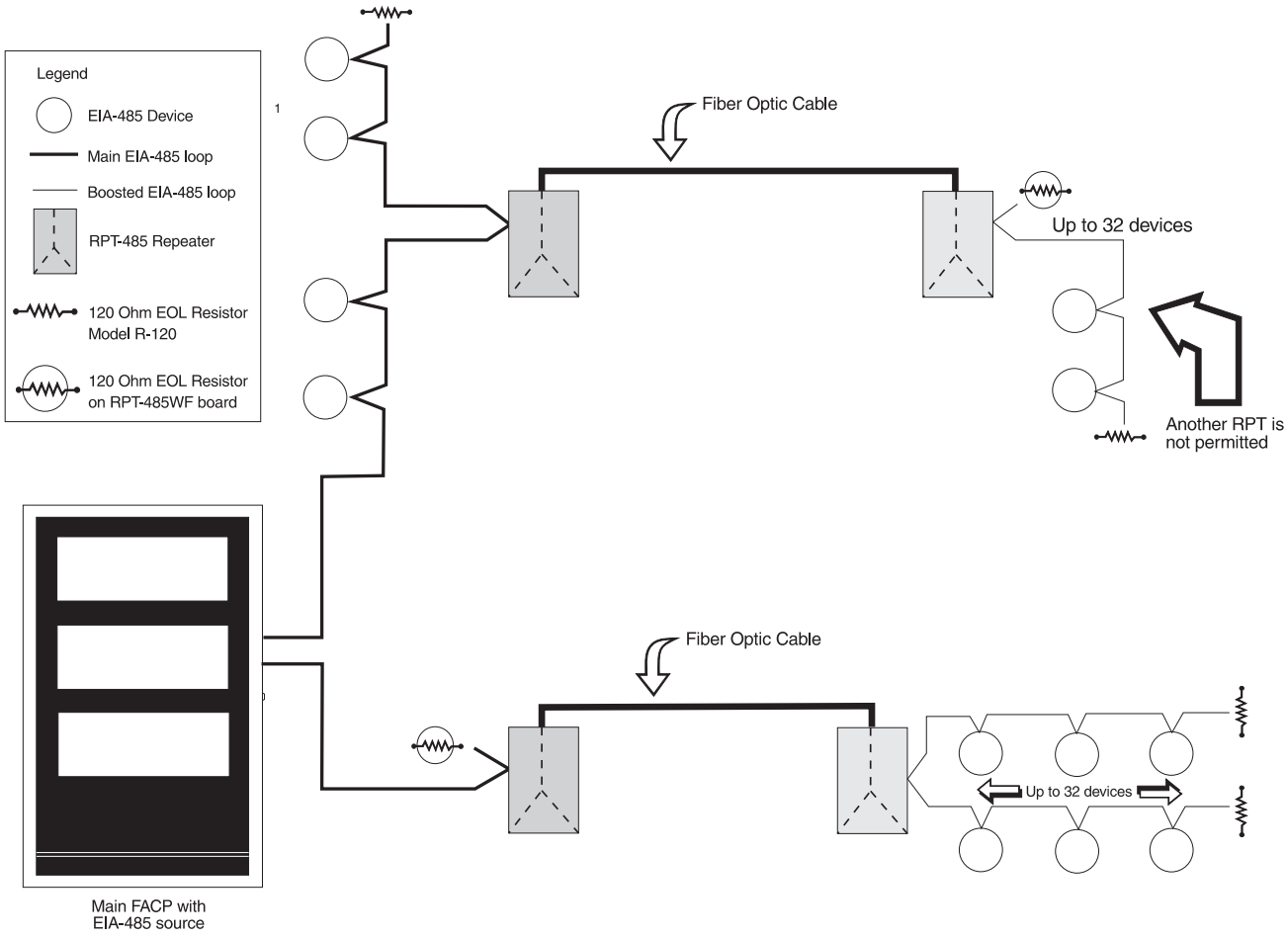


Figure 3-2: Parallel/Series Connections of the RPT-485WF

Section Four:
Installation

Installation

The RPT-485W/RPT-485WF board can be mounted in a listed CHS-4, CHS-4L, or an ABS-8R (remote). When mounting on a CHS-4L, use the inner position. When the RPT-485WF is mounted on the CHS-4 and CHS-4L, adequate clearance above the board is required. Outer position mounting on the CHS-4 is also possible but the board has to be mounted with components facing inward. For the RPT-485WF, using the ABS-8R, use the upper center knockout for the fiber optic cable's entry/exit.

CAB-3 Mounting

CHS-4

Inner Position (RPT-485W ONLY): Screw (2) 6-32 standoffs onto PEM studs in chassis. Screw (2) 4-40 screws into top holes of board and attach (2) 4-40 standoffs. Place tab on bottom of board into slot. Screw boards into 6-32 standoffs with (2) 6-32 screws (refer to Figure A). The top standoffs should just rest on the back of the chassis.

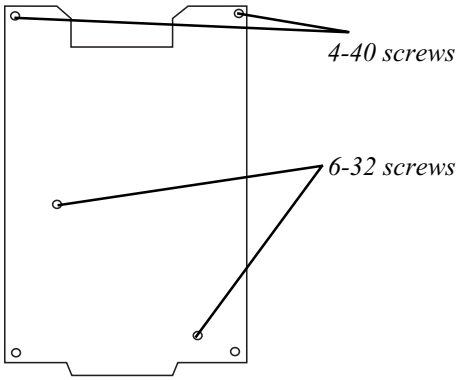
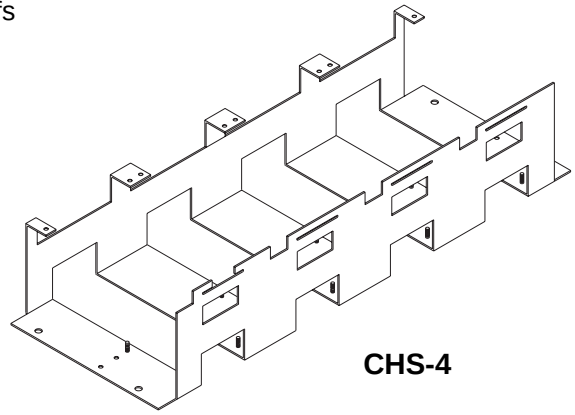


Figure A



CHS-4

Outer Position: ***The board's components must be facing inward!*** Slip the tab of the board into the top slot on CHS-4 with the components facing the back of the chassis. Rest the top of the board on the mounting tabs at the top of the CHS-4. Screw the board on using (2) 4-40 screws.

CHS-4L

Inner position only: Screw (2) 4-40 standoffs onto the top row of PEM studs on the CHS-4L. Slide tab of board into inner slot of CHS-4L and rest on standoffs. Use (2) 4-40 screws to fix the board onto the chassis (refer to Figure B).

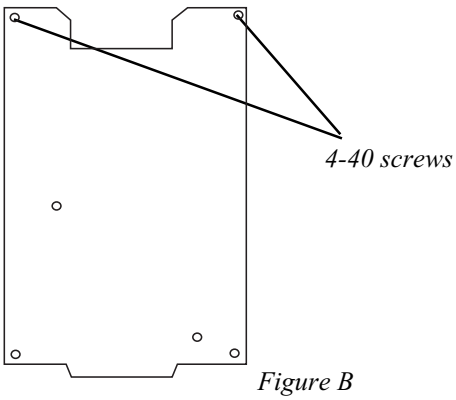
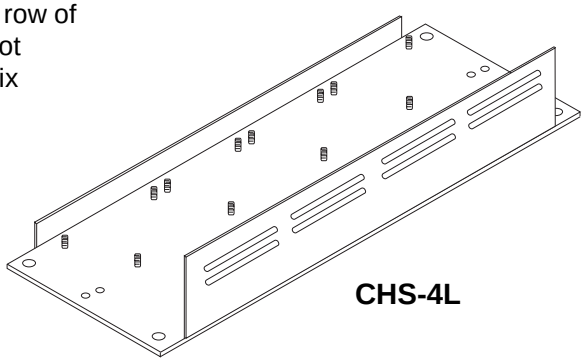


Figure B



CHS-4L

ABS-8R Mounting

Before mounting the ABS-8R, determine which knockouts are needed to wire the RPT-485. *If you are using an RPT-485WF, you must use the center top knockout for the fiber optic cable.* Remove knockouts. Mount the ABS-8R. Place the RPT-485 in the box and afix into PEM standoffs using (4) 4-40 screws (refer to Figure C). Draw appropriate wiring in through knockouts.

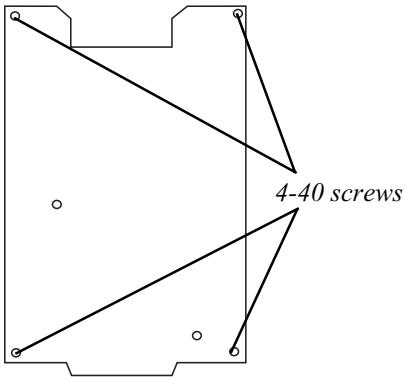
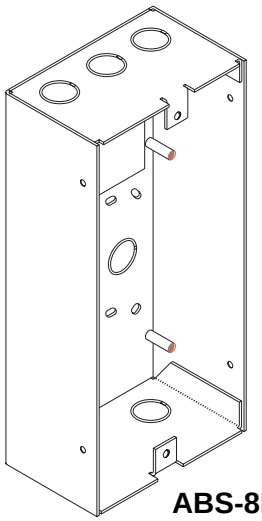


Figure C



ABS-8R

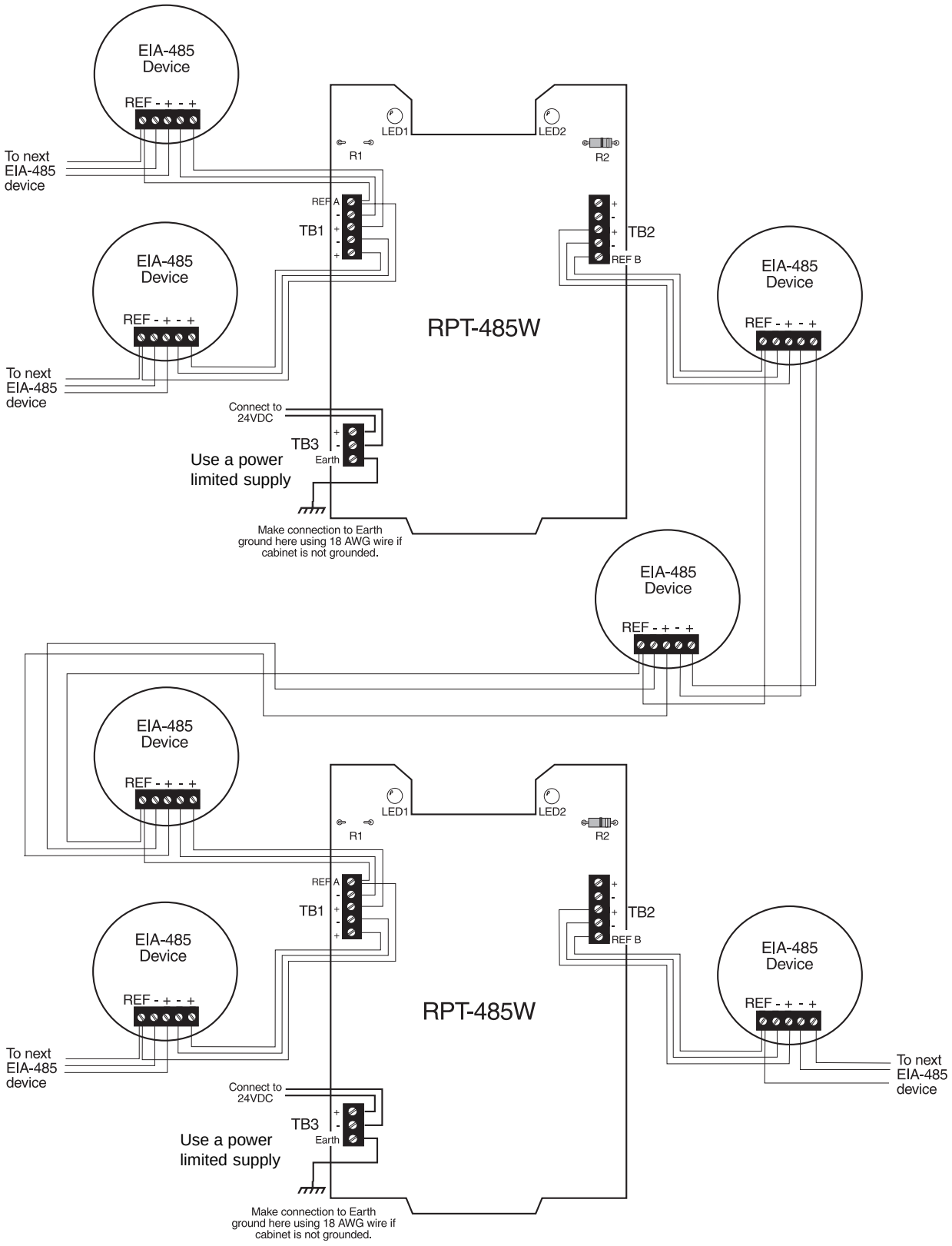


Figure 4-1: Wiring the RPT-485W

NOTE: For EIA-485 device terminals connections, see Table 4-1.

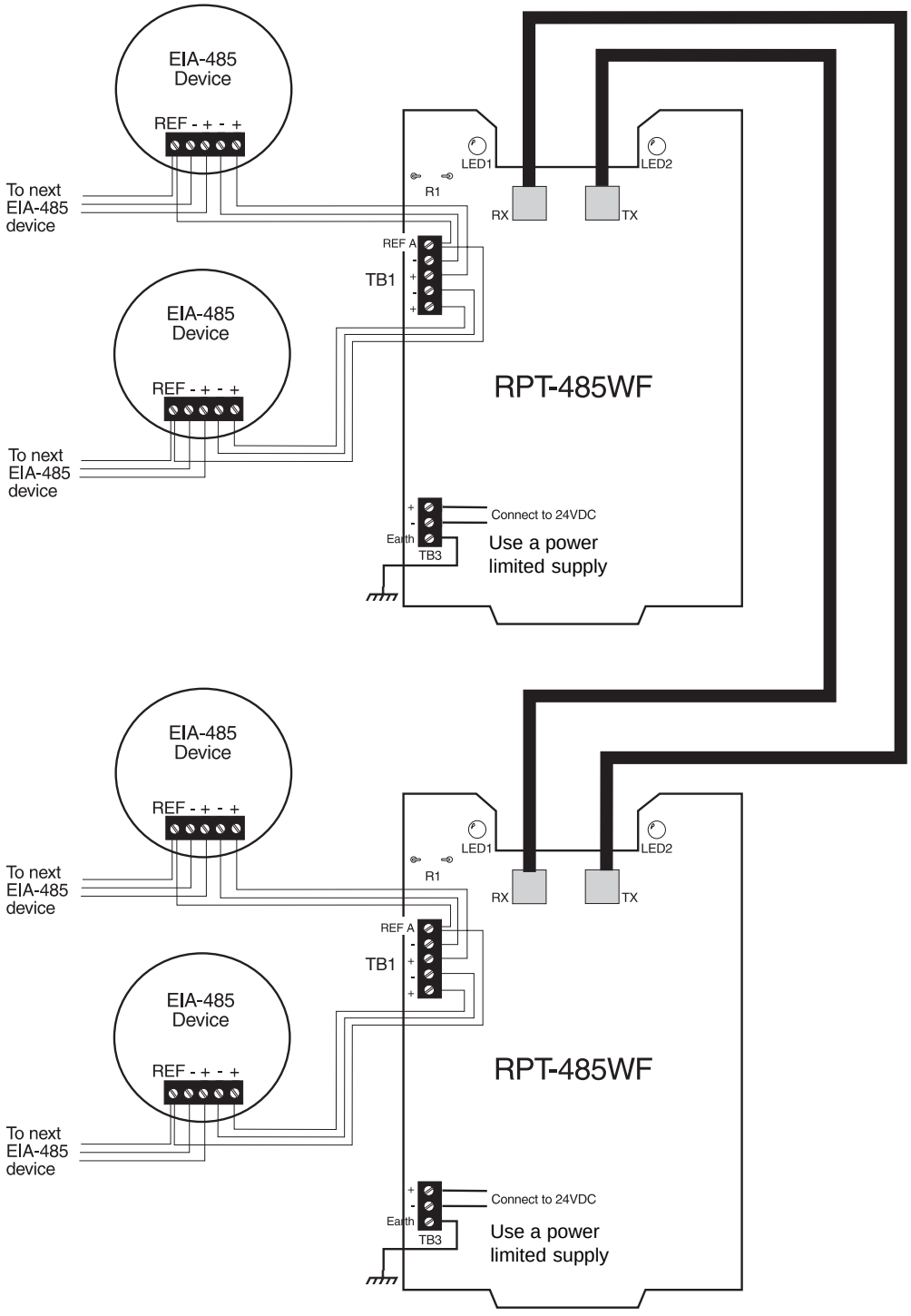


Figure 4-2: Wiring the RPT-485WF

NOTE: For EIA-485 device terminal connection, see Table 4-1.

	EIA-485 IN		EIA-485 OUT		REF
	(+)	(-)	(+)	(-)	
ACS Series ACM-8R LDM Series SCS/SCE	TB2-1	TB2-4	TB2-2	TB2-3	TB1-4/1-5
AFM-16A	TB2-1	TB2-2	TB2-1	TB2-2	TB1-1
AFM-16AT AFM-32A	TB2-1	TB2-2	TB2-1	TB2-2	TB1-2
AMG-1 AMG-E	P3-6	P3-4	P3-5	P3-3	P4-6
LCD-80	P2-2	P2-4	P2-1	P2-3	P1-4/1-5
NIB-96	P4-5	P4-3	P4-6	P4-4	Power Supply Batt Neg
UZC-256	TB2-3	TB2-5	TB2-4	TB2-6	TB2-2/2-1

Table 4-1: Connections between the RPT-485 and EIA-485 Devices

NOTE: For additional information, reference the respective manuals listed in Table 4-2.

The ACS Series Annunciators	15842
The ACM-8R Annunciator	15342
The LDM Series Annunciators	15885
The SCS/SCE Smoke Control Station	15657
The AFM-16A Annunciator	15207
The AFM-16/AFM-32A Annunciators	15048
The AMG-1/AMG-E (VAM-2020)	15889
The LCD-80 Liquid Crystal Display	15037
The NIB-96 Network Interface Board	15666
The UZC-256 Universal Zone Coder	15216

Table 4-2: EIA-485 Device Manuals

Section Five:
Power Supply Specifications

A power limited power supply, listed for Fire Protection Signaling, (may be located remotely) with both Primary and Secondary power, must be used for Fire Protective Signaling Applications.

Operating Voltage Range
18-28 VDC

Maximum current draw; (All states)
RPT-485W 0.047 A
RPT-485WF 0.049 A

The maximum allowed voltage drop along the supply loop is limited by the minimum input voltage (18VDC) measured across TB3 (+24V, power supply common) of the RPT-485W/WF.

Calculating the maximum wiring resistance (Rmax) permitted for the +24V power supply connection.

Formula:

$$Rmax = \frac{(\text{Lowest Power Supply Voltage Possible}) - (\text{Minimum Operating Voltage of RPT-485W/WF})}{\text{Maximum Current Required by RPT-485W/WF}}$$

For a Listed Power Supply (listed for Fire Protective Signaling use) with battery supplied secondary power, the lowest supply voltage possible is 20.4V.

Example: MPS-24A with batteries

RPT-485W: $Rmax = \frac{20.4V-18V}{0.047A} = 51\ Ohm$

RPT-485WF: $Rmax = \frac{20.4V-18V}{0.049A} = 49\ Ohm$

	MPS-24A	MPS-24B
RPT TB3 (+)	TB3-1	TB2-1
RPT TB3(-)	TB3-2	TB2-2

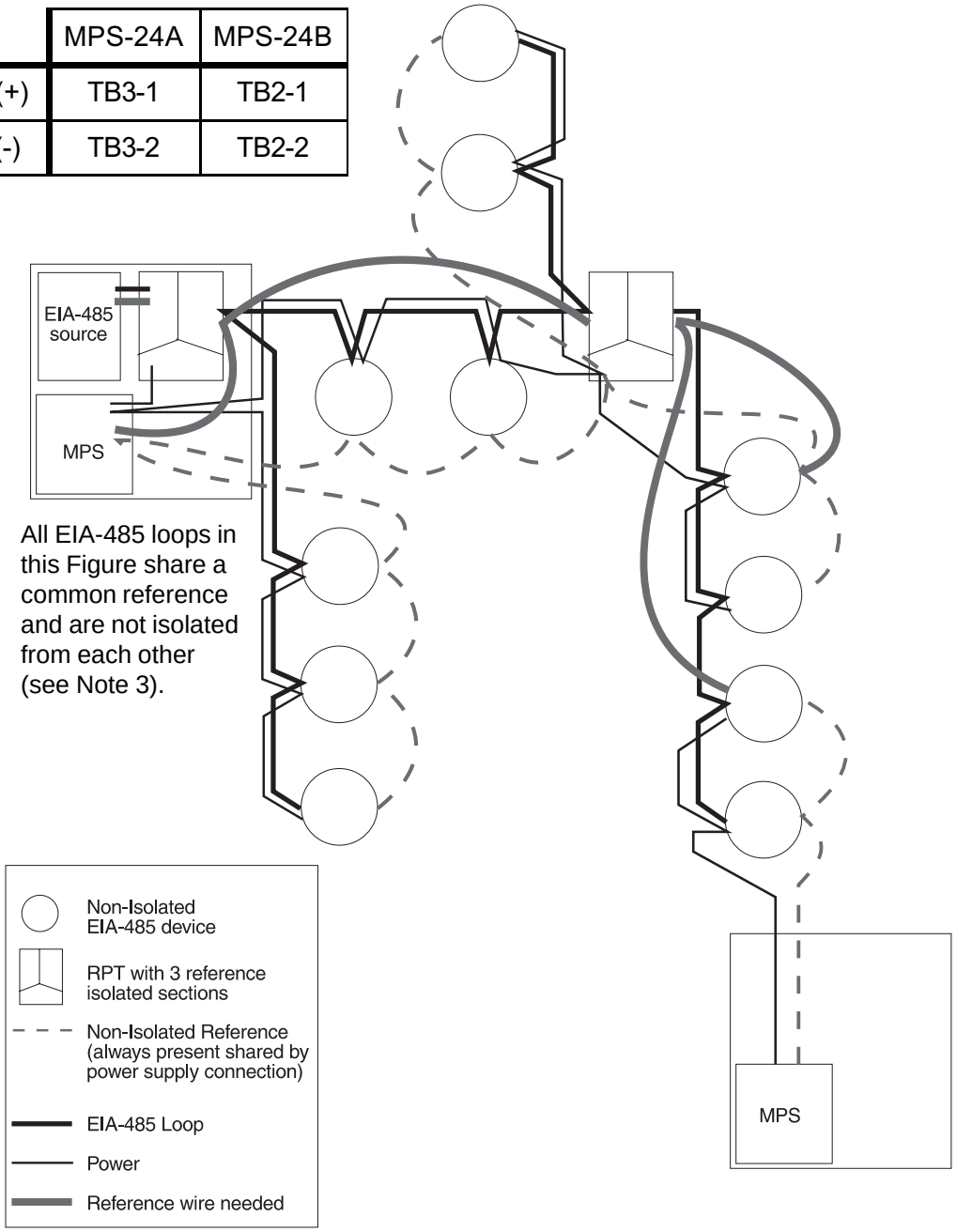


Figure 5-1: Main FACP Wiring for Power

AM2020/AFP1010 Installation Manual	15335
System 5000 Installation	15583
System 2500 Manual	15969
System 500	15019
AFP-200	15511
ID-200 (U.K. only)	15633

Table 5-2: EIA-485 Source Manual

NOTES:
1) For connections between the RPT-485 and EIA-485 devices, refer to Table 4-1.
2) For connections between the RPT-485 and EIA-485 sources, refer to Table 5-2.
3) Most EIA-485 devices and sources manufactured by Notifier are not isolated. When making reference connections to non-isolated EIA-485 devices powered by separate power supplies, care must be taken to ensure that only one power supply has Earth Fault detection enabled within a group of power supplies sharing the same reference connection.

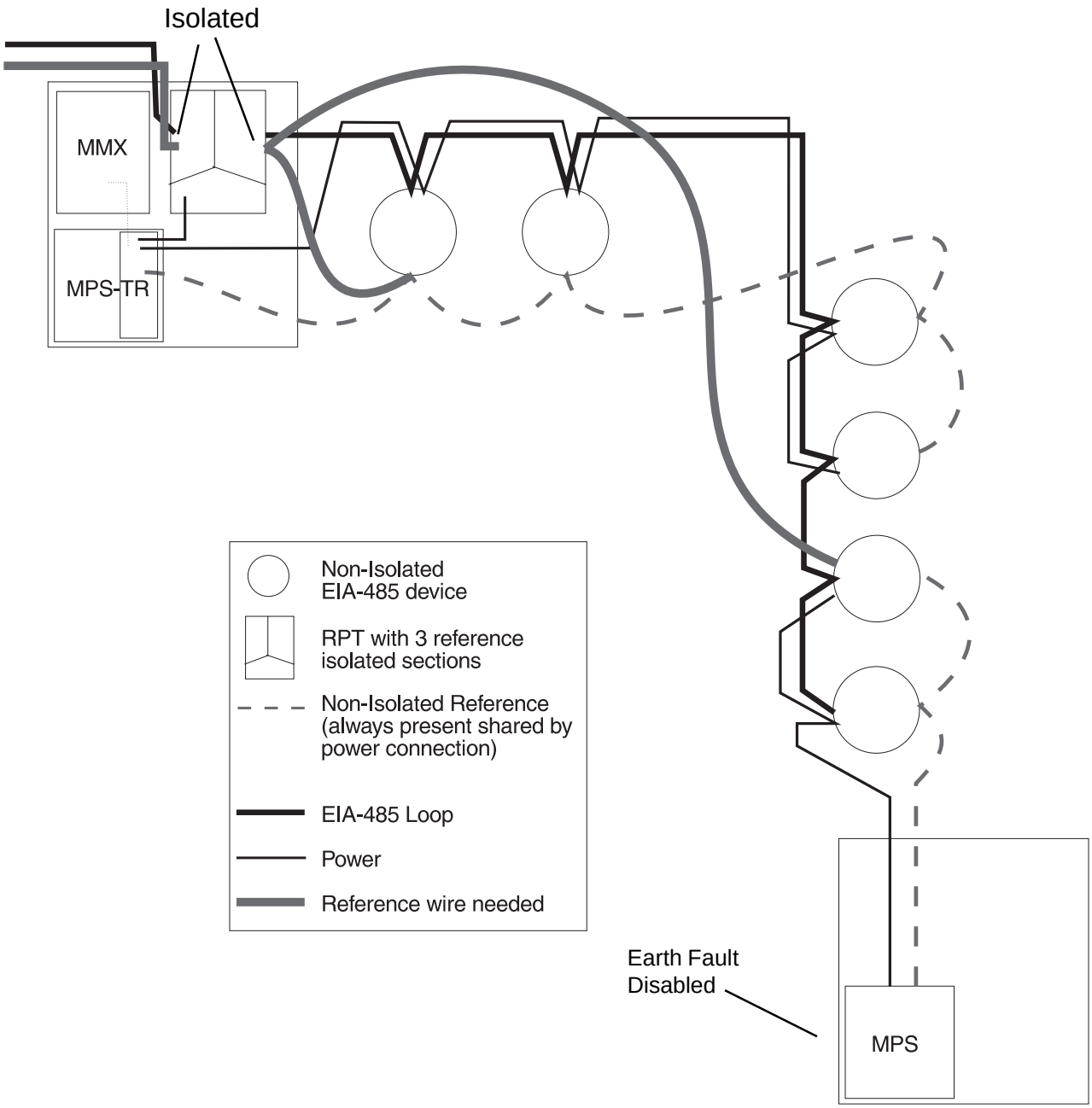


Figure 5-2: Power and Reference wiring for a Remote RPT-485

NOTES:
1) A remote CAB-3 containing an RPT-485 must be connected to the SLC loop via an MMX and MPS-TR for detection of troubles. Refer to the MPS-TR Product Installation Drawing, Document 15331 for specific terminal connections.
2) Most EIA-485 devices and sources manufactured by Notifier are not isolated. When making reference connections to non-isolated EIA-485 devices powered by separate power supplies, care must be taken to ensure that only one power supply has Earth Fault detection enabled within a group of power supplies sharing the same reference connection.

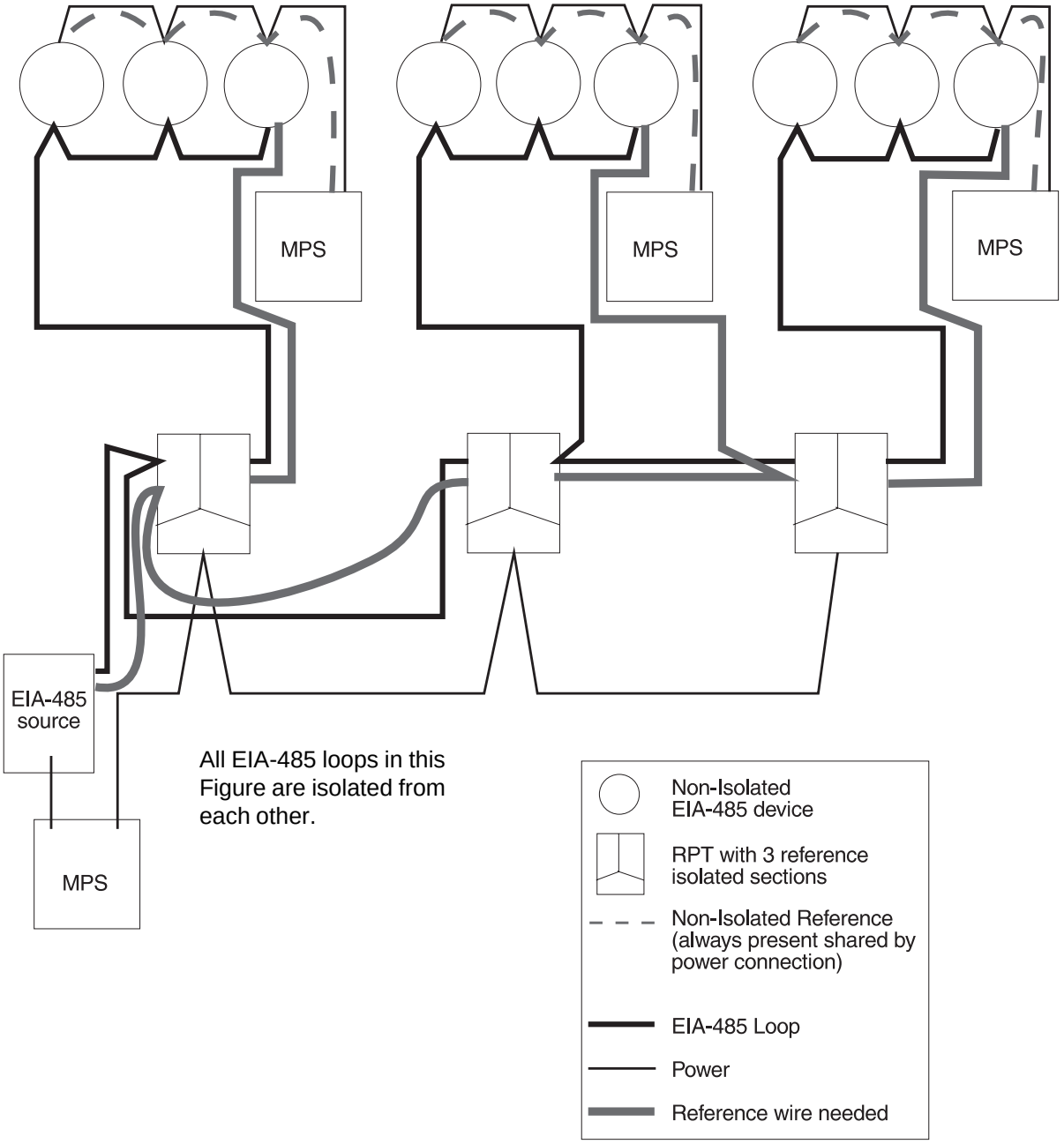


Figure 5-3: Power/Reference Wiring for Multiple RPT-485s

NOTE: Most EIA-485 devices and sources manufactured by Notifier are not isolated. When making reference connections to non-isolated EIA-485 devices powered by separate power supplies, care must be taken to ensure that only one power supply has Earth Fault detection enabled within a group of power supplies sharing the same reference connection.

Notes

Notes

Limited Warranty

NOTIFIER® warrants its products to be free from defects in materials and workmanship for eighteen (18) months from the date of manufacture, under normal use and service. Products are date stamped at time of manufacture. The sole and exclusive obligation of **NOTIFIER®** is to repair or replace, at its option, free of charge for parts and labor, any part which is defective in materials or workmanship under normal use and service. For products not under **NOTIFIER®** manufacturing date-stamp control, the warranty is eighteen (18) months from date of original purchase by **NOTIFIER®**'s distributor unless the installation instructions or catalog sets forth a shorter period, in which case the shorter period shall apply. This warranty is void if the product is altered, repaired or serviced by anyone other than **NOTIFIER®** or its authorized distributors or if there is a failure to maintain the products and systems in which they operate in a proper and workable manner. In case of defect, secure a Return Material Authorization form from our customer service department. Return product, transportation prepaid, to **NOTIFIER®**, 12 Clintonville Road, Northford, Connecticut 06472-1653.

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