
258FA Mounting Assembly

Section 1. Description	1
Section 2. Applications	2
Section 3. Installation	3
Section 4. Specifications	13
Section 5. Troubleshooting, Technical Assistance, Repair and Return.	14

1. Description

- 1.1 The 258FA is an electromagnetic compliant (EMC) front access mounting assembly. All power, alarm, PCM, and V.24 connections are made to the assembly's front side.
- 1.2 The 2585 alarm and access module is required in this mounting assembly for serial communications port (SCP) and external alarm functions.

Features

- 1.3 258FA mounting assembly features include . . .
 - fully EMC-compliant
 - all connections are made on the front of the assembly
 - capacity of up to fifteen 2581/2 modules without a 2581/2MC master canceller module installed, or up to fourteen 2581/2 modules with a 2581/2MC module installed
 - mounting brackets available in two models: 483mm (19-inch) Electronic Industries Association (EIA) mounting brackets (258FA-19); 515mm (20.28-inch) European Telecommunications Standards Institute (ETSI) mounting brackets (258FA-ETSI); along with heat shields
 - houses redundant 5140A plug-in DC power converters (one required)
 - DC input power range of -40 to -75VDC (nominal -48VDC), positive ground
 - 120-ohm PCM connections made via four 50-pin Centronics connectors
 - houses a 2585 alarm and access module that provides . . .
 - two V.24 SCPs with daisy-chain capability
 - alarm contact outputs for urgent, deferred, and service alarms

Reference Documentation

- 1.4 For additional information refer to the Tellabs manuals that are a part of the 258 Documentation Set, 80.4232, which is shipped with each mounting assembly, or can be obtained through your Tellabs representative.

Accessories List

- 1.5 A list of accessories for the 258FA mounting assembly is available in the E1 Echo Cancellor System Overview and Regulatory Information practice, 76.81258REG (part of the 258 Documentation Set, 80.4232).

2. Applications

- 2.1 The 258FA mounting assembly provides the following significant advantages . . .
- can be used by wireline and wireless service providers to install mounting assemblies in a “back-to-back” arrangement, allowing all electrical connections to be conveniently made to the front of the assembly
 - offers a high-density, space-efficient solution that allows for the installation of up to 150 echo cancellers in a 600x600mm (2x2-foot) area of floor space, making it ideal for sites where space is limited

Module Placement

- 2.2 Figure 2-1 shows the location of modules in the 258FA mounting assembly both with and without a master canceller installed.

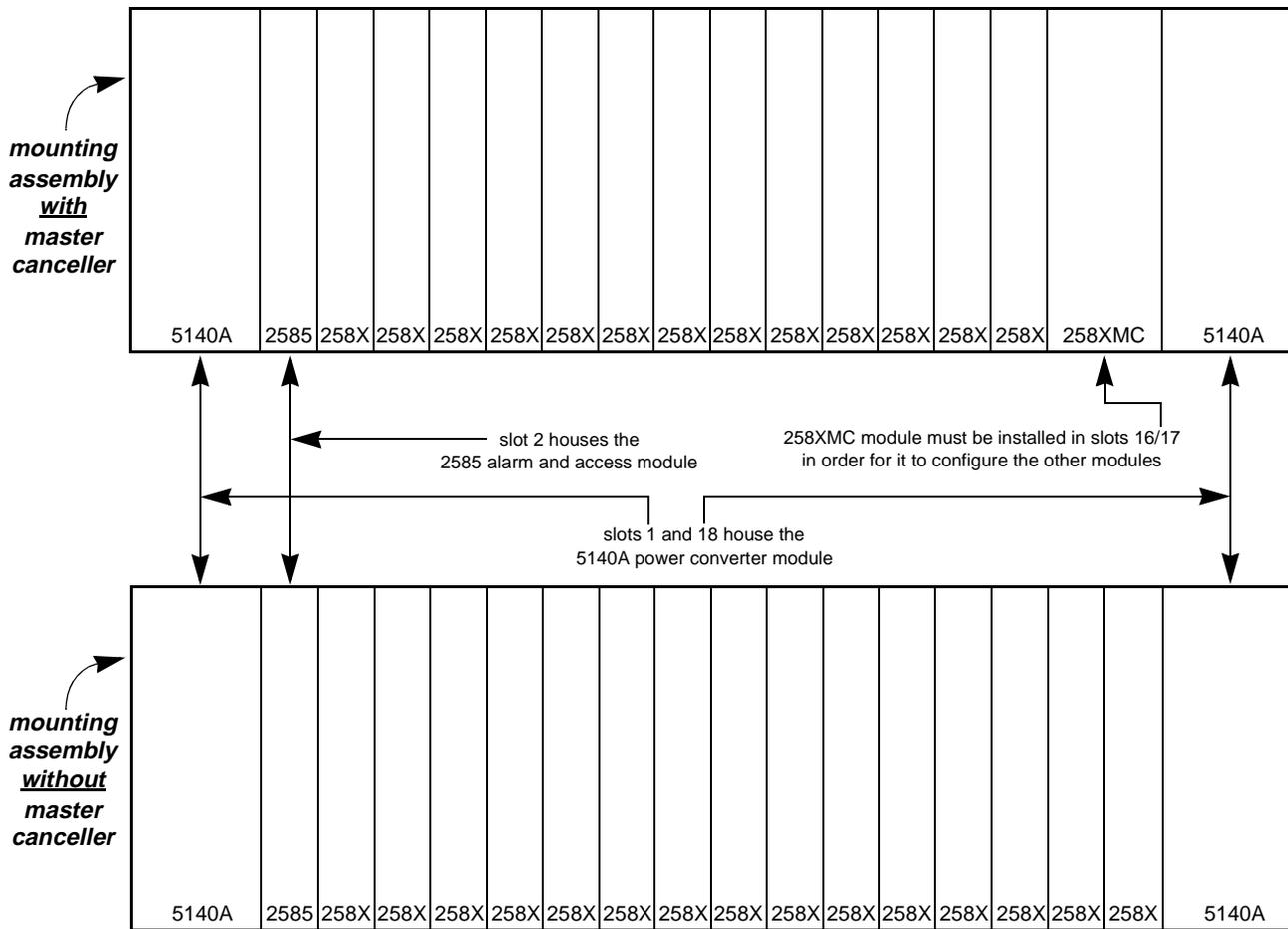


Figure 2-1 Module placement in 258FA mounting assembly

3. Installation

Caution: **STATIC-SENSITIVE EQUIPMENT!** When unpacking and handling the equipment, be sure to wear a grounded wrist strap to protect it from possible static-discharge damage.

Inspection

- 3.1 Inspect the equipment upon its arrival for any possible shipping damage. If damage is noted, immediately file a claim with the carrier. If the equipment has been in storage, reinspect it prior to installation.

Mounting

- 3.2 The 258FA mounting assembly installs in a 483mm (19-inch) EIA mounting (258FA-19) or in a 515mm (20.28-inch) ETSI mounting (258FA-ETSI).

Connections

Note: The 2585 alarm and access module is required for SCP and external alarm functions. See paragraph 3.18 for optioning information.

Danger: Improper connection of the equipment to a power source can be hazardous. Therefore, be sure to connect the equipment to a -48VDC supply source that is electrically isolated from the AC source. The -48VDC source must be reliably connected to earth ground.

- 3.3 Figure 3-1 shows the 258FA mounting assembly's connections.

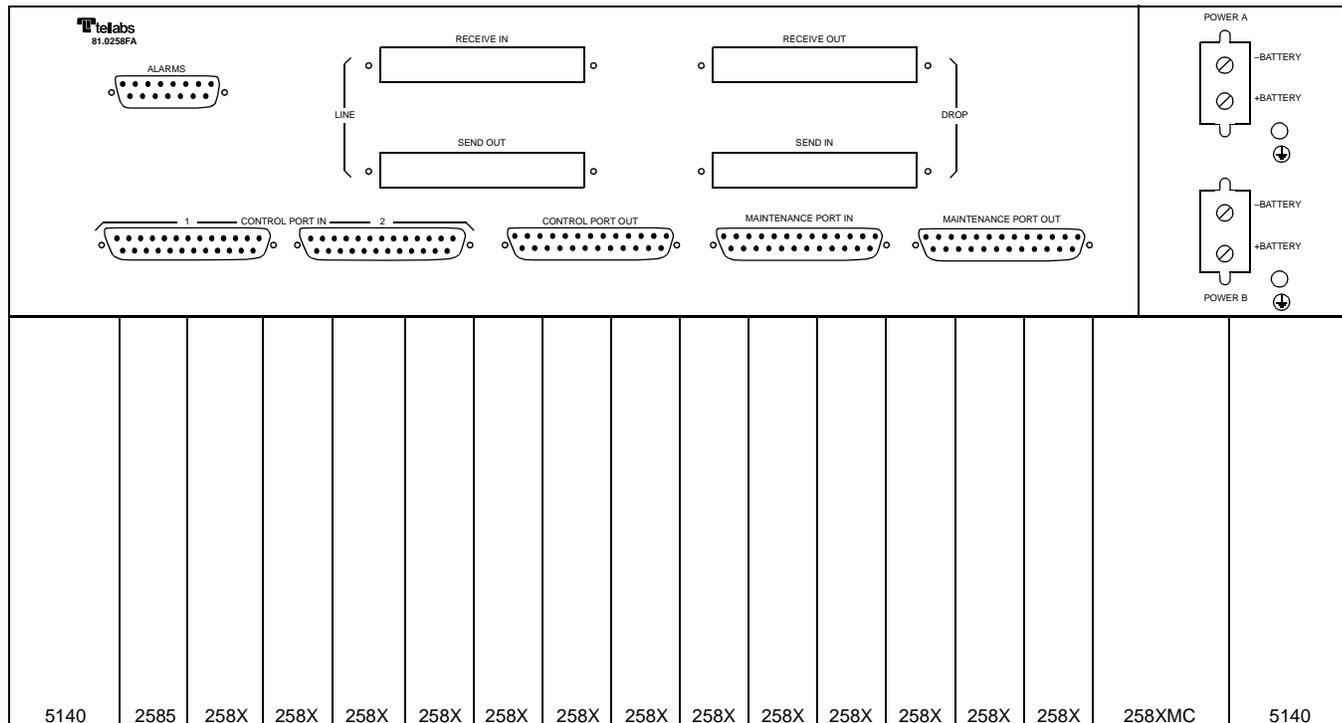


Figure 3-1 258FA mounting assembly connections

Power Connections

- 3.4 Input power connections to the 258FA mounting assembly are made from the front of the assembly to barrier-type screw terminal blocks labeled **POWER A** and **POWER B**. The terminal blocks provide connections for **-BATTERY** and **+BATTERY** (see Figure 3-1).

PCM Connections

- 3.5 The PCM connectors on the 258FA mounting assembly are 120-ohm, 50-pin female Centronics connectors. Table 3-1 provides pin-out assignments for the receive-in, receive-out, send-in, and send-out PCM connectors.

pin #	designator	pin #	designator
26	echo slot 1 tip	1	echo slot 1 ring
27	echo slot 2 tip	2	echo slot 2 ring
28	echo slot 3 tip	3	echo slot 3 ring
29	echo slot 4 tip	4	echo slot 4 ring
30	echo slot 5 tip	5	echo slot 5 ring
31	echo slot 6 tip	6	echo slot 6 ring
32	echo slot 7 tip	7	echo slot 7 ring
33	echo slot 8 tip	8	echo slot 8 ring
34	echo slot 9 tip	9	echo slot 9 ring
35	echo slot 10 tip	10	echo slot 10 ring
36	echo slot 11 tip	11	echo slot 11 ring
37	echo slot 12 tip	12	echo slot 12 ring
38	echo slot 13 tip	13	echo slot 13 ring
39	echo slot 14 tip	14	echo slot 14 ring
40	echo slot 15 tip	15	echo slot 15 ring
41	GND	16	GND
42	GND	17	GND
43	GND	18	GND
44	GND	19	GND
45	GND	20	GND
46	GND	21	GND
47	GND	22	GND
48	GND	23	GND
49	GND	24	GND
50	GND	25	GND

Table 3-1 Receive-in/-out and send-in/-out connections

Ground Connections

- 3.6 FRAME GND is connected to the cable shields of the Centronics connectors for the mounting assembly.

Alarm Connections

- 3.7 Alarm contact outputs for **urgent**, **deferred**, and **service** alarms are provided. Individual mounting position alarms, however, are not provided.
- 3.8 Urgent alarms are caused by . . .
- loss of signal, framing loss, multiframe (MF) sync loss, or excessive bit error rate (BER) at the send-in or receive-in ports
 - self-test failure of all channels
 - internal module fault
 - total loss of +5V supply
- 3.9 Deferred alarms are caused by . . .
- BER (remote) alarm MF remote at the send-in and receive-in ports
 - alarm indication signal (AIS) or MF AIS received at the send-in and receive-in ports
 - self-test failure of one or more channels
 - single power converter failure
- 3.10 Service alarms are activated to alert personnel to urgent or deferred alarms.
- 3.11 Table 3-2 provides alarm pin-out assignments.

pin #	function
1	urgent alarm contact — normally open
2	urgent alarm contact — common
3	urgent alarm contact — normally closed
4	GND
5	deferred alarm contact — normally open
6	deferred alarm contact — common
7	deferred alarm contact — normally closed
8	GND
9	service alarm contact — normally open
10	service alarm contact — common
11	service alarm contact — normally closed
12	GND
13	TST (test) input
14	ACO input (alarm cutoff)
15	GND

Table 3-2 Alarm connector pin assignments

Note: Refer to individual echo canceller practices for additional specific information regarding alarms.

Serial Communications Port Connections

- 3.12 The 258FA mounting assembly provides two V.24 SCPs: the control port and the maintenance port. Up to eight mounting assemblies (120 echo cancellers) can be daisy-chained on either or both SCPs. Connections to the SCPs are made via 25-pin female D-subminiature connectors on the front of the assembly.

- 3.13 The control port has higher priority. It is used with digital switching equipment when there is a direct interface for controlling the cancellers' individual channels. This port can also support all maintenance access, software downloading, and other functions normally intended for the maintenance port. If desired, the mounting assembly can be partitioned (via switch option) into two groups of cancellers. With it partitioned in this manner, two control ports are made available.
- 3.14 The maintenance port is used primarily for maintenance activities that do not require real-time speed — e.g., system-level commands, menu-driven software, and software downloads. (For example, the maintenance port normally handles the optioning process and also allows for reviewing alarm history information and viewing the performance screen.) These maintenance-type functions are accommodated through this port, leaving the control port free to handle live traffic on a priority basis. Because these commands are exercised on a relatively infrequent basis, slow access time is not a significant factor.

Note: The master canceller interrupts maintenance communications while its display is active.

- 3.15 Baud rates for each port are independently adjustable and can be set to any one of the following: 300; 600; 1200; 2400; 4800; 9600; 19,200; or 38,400 baud. This is done either via the master canceller (if present) or a terminal. See the applicable echo canceller manual for details.

Alarm Cutoff and Test Connections

- 3.16 Alarm cutoff and test connections are made to the female DB-15 alarm connector, as described below.
 - Grounding the **ACO** (alarm cutoff) pin turns off external alarm indicators (typically, these are external audible alarms). The **ACO** pin is normally connected to ground via a push-button (or other switch) that allows for manual activation of the ACO function.
 - The **TST** (test) pin is connected to the **GND** (system ground) pin to perform a flash download of system software when doing a firmware upgrade. Refer to the Tellabs 2500-Series Universal Firmware Download Program (UFDP) manual, 76.812500UFDP, for instructions on performing such a firmware upgrade.

2585 Alarm and Access Module Optioning

- 3.17 Figure 3-2 provides a diagram of the 2585 module's option switch locations.

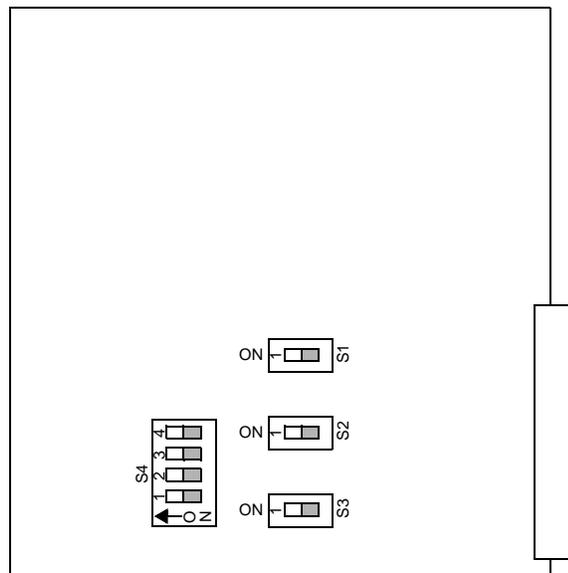


Figure 3-2 2585 module option switch locations

- 3.18 Dual in-line packaged (DIP) switches (**S1** through **S4**) enable the user to . . .
- determine how the backplane bus and control port are partitioned (**S2**)
 - when multiple mounting assemblies are deployed on a daisy-chain, set a unique address (position on the chain) for each mounting assembly (**S4**)
 - identify the mounting assembly as the last (or only) mounting assembly on a daisy-chain (**S1** and **S3**)
- Instructions for setting these switches follow.

Switch Settings and Cable Connections for Mounting Assembly Partitioning

SPLIT SHELF Option Switch Settings

- 3.19 **SPLIT SHELF** switch **S2** allows partitioning of the 258FA mounting assembly's backplane bus — which normally addresses all 15 echo cancellers in the mounting assembly — into two groups of cancellers. With the mounting assembly configured for one 15-canceller group, a single control port is established. With the mounting assembly partitioned into two groups of cancellers, two separate control ports are established, with control port #1 addressing cancellers 1 through 8 and control port #2 addressing cancellers 9 through 15. Details on these arrangements follow.
- 3.20 With **S2** off, a single control port addresses all 15 echo cancellers in the mounting assembly. Up to eight mounting assemblies optioned in this manner can be daisy-chained to data terminal equipment (DTE) via their control ports, in which case up to 120 echo cancellers are addressed via a single control port (see the following Notes). Refer to paragraph 3.15 for baud rate option selections and to Table 3-3 for a switch setting summary. Information on making control port daisy-chain connections appears later in this section.

Notes: Although up to eight mounting assemblies (120 echo cancellers) can be daisy-chained via the control port, Tellabs recommends that users minimize chaining control ports for the following reasons . . .

1. If the baud rate is not at maximum or if simultaneous status changes occur on many channels on the link, the cumulative echo canceller response time (for status changes) can increase drastically. This either slows traffic down on the switch or slows activation of echo cancellation at the beginning of the call.
 2. If the control port fails, communication is lost to **ALL** channels.
- 3.21 With **S2** in the **ON** position, two separate control ports that address eight cancellers for the first group and seven cancellers for the second group are established for the mounting assembly. Some customers use this capability to ensure that individual channel control activity is not blocked or disrupted in any manner under high-traffic conditions on the bus. Refer to paragraph 3.15 for baud rate option selections and to Table 3-3 for a switch setting summary. Be aware that control port daisy-chaining of mounting assemblies optioned for two control ports **is not possible**.

mounting assembly partitioning arrangement	switch S2 position
one bank of 15 echo cancellers	off
two banks of echo cancellers — one bank of eight cancellers — one bank of seven cancellers	set to ON

Table 3-3 Switch S2 settings

Cable Construction and Connection to Data Terminal Equipment

3.22 Two 25-pin female D-subminiature connectors, labeled **CONTROL PORT IN 1** and **CONTROL PORT IN 2**, are provided for connecting DTE to control port(s). When only a single connection is made (if the user intends to address all 15 canceller positions from a single digital switch connection), **CONTROL PORT IN 1** is used. When two connections are made (if the user intends to address two groups of canceller positions from two digital switch connections), both **CONTROL PORT IN 1** and **CONTROL PORT IN 2** are used.

Note: Connector **CONTROL PORT OUT** is only used when two or more 258FA mounting assemblies are to be daisy-chained to one another via their control ports.

3.23 With the 258FA mounting assembly configured for **one bank of 15 echo cancellers** . . .

- Connect a straight-through cable wired as shown in Figure 3-3 from the DTE to **CONTROL PORT IN 1** on the mounting assembly's V.24 port subassembly.

3.24 With the 258FA mounting assembly configured for **two banks of echo cancellers** . . .

- Connect a straight-through cable wired as shown in Figure 3-3 from DTE No. 1 (DTE 1) to **CONTROL PORT IN 1** on the mounting assembly's V.24 port subassembly for echo cancellers 1 through 8.
- Connect a straight-through cable wired as shown in Figure 3-3 from DTE No. 2 (DTE 2) to **CONTROL PORT IN 2** on the mounting assembly's V.24 port subassembly for echo cancellers 9 through 15.

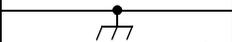
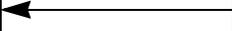
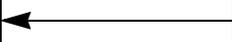
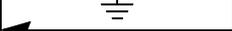
DTE side		cable wiring	258FA side (data communication equipment [DCE])	
signal	pin no.		pin no.	signal
FRAME GND	1		1	FRAME GND
TXD	2		2	TXD
RXD	3		3	RXD
RTS	4		4	RTS
CTS	5		5	CTS
DSR	6		6	DSR
GND	7		7	GND
DCD	8		8	DCD
DTR	20		20	DTR

Figure 3-3 Control port-to-DTE cable wiring

Mounting Assembly Addressing in Daisy-Chains

3.25 Mounting assembly addressing in a daisy-chain is assigned via 4-position **SHELF SELECT** DIP switch **S4**. This switch must be correctly set for proper communication with each 258-series echo canceller in the chain. The slot or canceller address is the same for the control port and maintenance port. (Stated another way, regardless of which SCP is being used, the address of a particular slot is the same.) A daisy-chain from the control port, the maintenance port, or both ports can be configured. If daisy-chains from both ports are used, the chains can contain the same number or different numbers of mounting assemblies. If the chains contain different numbers of mounting assemblies, switch **S4** on each mounting assembly must be set in accordance with its position on the **longer** chain.

- 3.26 See Table 3-4 for setting mounting assembly addresses via switch **S4**. As previously mentioned, up to eight mounting assemblies (120 cancellers) can be programmed. Note that **S4** address settings for positions 1 through 8 on the daisy-chain equate to 0 through 7 binary, respectively.

SHELF SELECT switch (S4) settings				mounting assembly position in daisy-chain
S4-1	S4-2	S4-3	S4-4	
0 (ON)	0 (ON)	0 (ON)	0 (ON)	1
0 (ON)	0 (ON)	0 (ON)	1 (OFF)	2
0 (ON)	0 (ON)	1 (OFF)	0 (ON)	3
0 (ON)	0 (ON)	1 (OFF)	1 (OFF)	4
0 (ON)	1 (OFF)	0 (ON)	0 (ON)	5
0 (ON)	1 (OFF)	0 (ON)	1 (OFF)	6
0 (ON)	1 (OFF)	1 (OFF)	0 (ON)	7
0 (ON)	1 (OFF)	1 (OFF)	1 (OFF)	8

Table 3-4 SHELF SELECT switch (S4) settings

Connections and Switch Settings for Non-Daisy-Chained Mounting Assemblies

- 3.27 For a non-daisy-chained mounting assembly — i.e., for a single mounting assembly connected to digital switching equipment — connections from DTE to the mounting assembly's one or two control ports are made via the straight-through cable shown in Figure 3-3. See paragraphs 3.19 through 3.21 for instructions.
- 3.28 Connections from DTE to the maintenance port of a non-daisy-chained mounting assembly are made via the straight-through cable shown below in Figure 3-4. This cable can also be connected to the echo canceller's front panel.
- 3.29 Set the option switches on a non-daisy-chained mounting assembly as follows . . .
- **S1 (END OF PORT CONTROL)** to **ON**
 - **S2 (SPLIT SHELF)** as required for either one or two control ports; see paragraphs 3.19 through 3.21
 - **S3 (END OF MAINTENANCE CONTROL)** to **ON**
 - **S4 (SHELF SELECT)**: don't care. Although switch **S4** is essentially non-functional in a single mounting assembly application, it is recommended in such applications that all positions of **S4** be set to **0 (ON)**, denoting position 1

Connections and Switch Settings for Control Port Daisy-Chain

- 3.30 Connector **CONTROL PORT OUT** is a 25-pin female D-subminiature connector, only used when two or more mounting assemblies are to be daisy-chained to one another via their control ports (see Note below). In this case, **CONTROL PORT OUT** connects to **CONTROL PORT IN 1** on the next mounting assembly in the daisy-chain.

Note: Remember that only mounting assemblies whose backplane buses are configured to address all 15 cancellers in the mounting assembly — i.e., mounting assemblies with one control port — can be daisy-chained via their control ports. Thus, switch **S2** on all mounting assemblies in a control port daisy-chain must be off.

3.31 Up to eight mounting assemblies can be placed on the same V.24 control port daisy-chain. Connections to the first mounting assembly in the daisy-chain are made via the straight-through cable shown in Figure 3-4. Connections between mounting assemblies in the daisy-chain are made via the straight-through cable shown in Figure 3-3 (see Figure 3-5 for the correct control port daisy-chain setup).

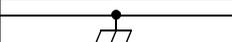
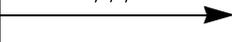
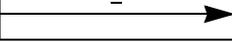
from CONTROL PORT OUT in daisy-chain (DCE)		cable wiring	to CONTROL PORT IN 1 in daisy-chain (DCE)	
signal	pin no.		pin no.	signal
FRAME GND	1		1	FRAME GND
TXD	2		2	TXD
RXD	3		3	RXD
GND	7		7	GND
DTR	20		20	DTR

Figure 3-4 Control port-to-control port daisy-chain cable wiring

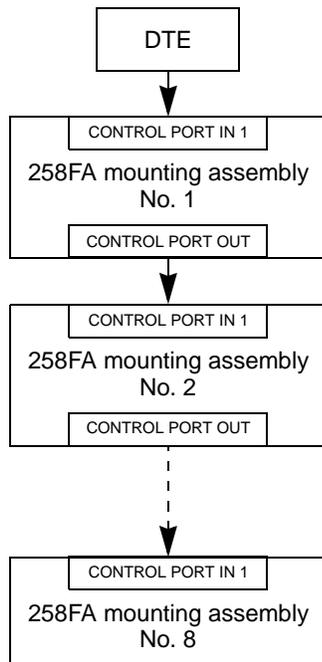


Figure 3-5 V.24 control port daisy-chain

- 3.32 Set the mounting assembly option switches as follows for control port daisy-chain setup . . .
1. On the **last** mounting assembly in the daisy-chain, set **S1 (END OF PORT CONTROL)** to **ON**. On all other mounting assemblies in the daisy-chain, **S1** should be off.
 2. Switch **S2 (SPLIT SHELF)** on all mounting assemblies in the daisy-chain should be off.
 3. Set **S4 (SHELF SELECT)** on each mounting assembly according to its position on the daisy-chain. See Table 3-4 for **S4** settings. If daisy-chains from both the control and maintenance ports are being used, set **S4** on each mounting assembly according to its position on the **longer** of the two daisy-chains.
 4. If a maintenance port daisy-chain **is not** being used, **S3 (END OF MAINTENANCE CONTROL)** is essentially non-functional and can therefore be left in the **ON** position or switched off. If a maintenance port daisy-chain **is** being used, see the subsection entitled “Connections and Switch Settings for Maintenance Port Daisy-Chain” for instructions on setting **S3**.

Connections and Switch Settings for Maintenance Port Daisy-Chain

- 3.33 Connector **MAINTENANCE PORT IN** is a 25-pin female D-subminiature connector, used to connect DTE to the maintenance port. Connector **MAINTENANCE PORT OUT**, also a 25-pin female D-subminiature connector, connects to **MAINTENANCE PORT IN** on the next mounting assembly on the daisy-chain.
- 3.34 Up to eight mounting assemblies can be placed on the same V.24 remote maintenance port daisy-chain. Connections to the first mounting assembly are made via the straight-through cable shown in Figure 3-6. Connections between mounting assemblies in the daisy-chain are made via the straight-through cable shown below in Figure 3-7 (see Figure 3-8 for the correct maintenance port daisy-chain setup).

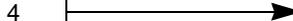
DTE side		cable wiring	258FA side MAINTENANCE PORT IN (DCE)	
signal	pin no.		pin no.	signal
FRAME GND	1		1	FRAME GND
TXD	2		2	TXD-C
RXD	3		3	RXD-C
RTS	4		4	RTS
CTS	5		5	CTS
DSR	6		6	DSR-C
GND	7		7	GND
DCD	8		8	DCD-C

Figure 3-6 Maintenance port-to-DTE cable wiring

from MAINTENANCE PORT OUT in daisy-chain (DCE)		cable wiring	to MAINTENANCE PORT IN in daisy-chain (DCE)	
signal	pin no.		pin no.	signal
FRAME GND	1		1	FRAME GND
TXD-C	2		2	TXD-C
RXD-C	3		3	RXD-C
MENU	4		4	MENU
GND	7		7	GND

Figure 3-7 Maintenance port-to-maintenance port daisy-chain cable wiring

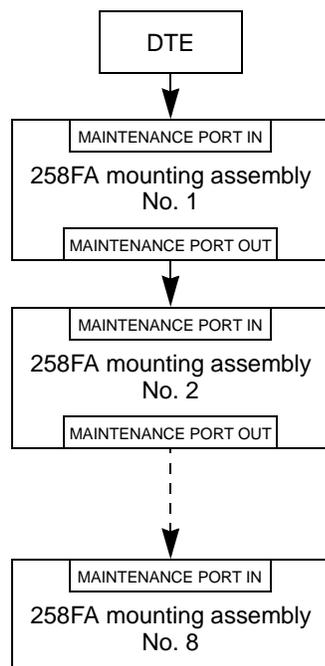


Figure 3-8 V.24 maintenance port daisy-chain

- 3.35 Set the mounting assembly's option switches as follows for maintenance port daisy-chain setup . . .
1. On the **last** mounting assembly in the daisy-chain, set **S3 (END OF MAINTENANCE CONTROL)** to **ON**. On all other mounting assemblies in the daisy-chain, **S3** should be off.
 2. If a control port daisy-chain **is** being used, **S2 (SPLIT SHELF)** on all mounting assemblies in the daisy-chain should already be off per the preceding procedure. If a control port daisy-chain **is not** being used, set **S2** on each mounting assembly as required per the instructions in paragraphs 3.19 through 3.21 (if you have not already done so).
 3. Set **S4 (SHELF SELECT)** on each mounting assembly according to its position on the daisy-chain. See Table 3-4 for **S4** settings. If daisy-chains from both the control and maintenance ports are being used, set **S4** on each mounting assembly according to its position on the **longer** of the two daisy-chains.
 4. If a control port daisy-chain **is not** being used, **S1 (END OF PORT CONTROL)** is essentially non-functional and can therefore be left in the **ON** position or switched off. If a control port daisy-chain **is** being used, see the subsection entitled "Connections and Switch Settings for Control Port Daisy-Chain" for instructions on setting **S1**.

4. Specifications

258FA Mounting Assembly Specifications

physical

<i>dimensions</i>	<ul style="list-style-type: none"> height: 358mm (14.11 inches) width: 462mm (18.20 inches) (without ears) depth: 225mm (8.85 inches)
<i>weight</i>	<ul style="list-style-type: none"> 7.88kg (17.5 pounds) empty
<i>heat dissipation</i>	<ul style="list-style-type: none"> air convection

electrical

<i>input voltage</i>	<ul style="list-style-type: none"> -40 to -75VDC, positive ground referenced
<i>input current</i>	<ul style="list-style-type: none"> 6.0A, maximum
<i>redundancy</i>	<ul style="list-style-type: none"> accepts two nominal -48VDC sources that are isolated
<i>power connections</i>	<ul style="list-style-type: none"> via screw terminals that accept 10 to 14AWG wire
<i>alarm connections</i>	<ul style="list-style-type: none"> via 15-pin female D-subminiature connector
<i>120-ohm PCM connections</i>	<ul style="list-style-type: none"> via four 50-pin Centronics female connectors
<i>RS-232 connections</i>	<ul style="list-style-type: none"> via five 25-pin female D-subminiature connectors

environmental

<i>operating temperature</i>	<ul style="list-style-type: none"> 0° to +50° C (+32° to +122° F), humidity from 5 to 95 percent (no condensation)
<i>storage temperature</i>	<ul style="list-style-type: none"> -40° to +60° C (-40° to +140° F)

2585 Alarm and Access Module Specifications

<i>dimensions</i>	<ul style="list-style-type: none"> height: 222mm (8.7 inches) width: 20mm (.8 inches) depth: 202mm (7.9 inches)
<i>weight</i>	<ul style="list-style-type: none"> approx. 280 grams (10 ounces)
<i>input power requirements</i>	<ul style="list-style-type: none"> .55 watts maximum on 5V supply; .68 watts maximum on 48V supply

5. Troubleshooting, Technical Assistance, Repair and Return

- 5.1 Table 5-1 will serve as an aid in the localization of trouble to the specific equipment covered in this practice. If a situation arises that is not covered, contact Tellabs Technical Assistance — see paragraph 5.4 for phone numbers.
- 5.2 If the equipment seems to be defective, substitute new equipment (if possible) and test the substitute. If the substitute equipment operates correctly, the original equipment should be considered defective and returned to Tellabs for repair or replacement, as directed in paragraph 5.5.
- 5.3 We strongly recommend that no internal (component-level) testing or repairs be attempted on this equipment; unauthorized testing or repairs may void its warranty.

trouble condition	solution
power LED is off, or echo cancellers do not power up	<ul style="list-style-type: none"> • Verify that the proper DC input voltage is applied to the mounting assembly (determined by the power converters) and that polarity is correct. • Check the mounting assembly for physical damage and check the power converter and alarm connectors for bent or broken pins. • If one power converter is used, verify that nominal –48VDC power is applied to the terminal block directly behind the slot where the converter is installed. Also verify that both power converters' power LEDs are lit. • If two power converters are used, verify that nominal –48VDC power is applied to the terminal blocks directly behind the slots that contain the converters. Also verify that both power converters' power LEDs are lit. If one of the two converters is malfunctioning, it can be isolated by checking for proper power-up indications with each converter plugged in separately.
for problems not related to power . . .	<ul style="list-style-type: none"> • Verify that all echo cancellers are properly seated. • Ensure that all PCM and V.24 connections are secure and in the correct locations. • Ensure that all external equipment connected to the mounting assembly (muxes, switch interfaces, office repeaters, etc.) is operating properly. • If the problem still exists, refer to the echo canceller troubleshooting guides in their respective practices.

Table 5-1 Troubleshooting guide

Technical Assistance

5.4 Contact Tellabs Technical Assistance as follows . . .

location	telephone	FAX
Argentina — Tellabs International, Inc., Sucursal Buenos Aires	+541.393.0764, .0892, or .0835	+541.393.0732
Australia — Tellabs Pty Ltd., Milson's Point NSW, Sydney	+61.2.9966.1043	+61.2.9966.1038
Brazil — Tellabs International, Inc., Rio de Janeiro	+5521.518.2224	+5521.516.7063
Brazil — Tellabs International, Inc., Sao Paulo	+55.11.5505.3009	+55.11.5506.7175
Canada — Tellabs Comm. Canada Ltd., Mississauga, Ontario	905.858.2058	905.858.0418
China — Tellabs International, Inc., Beijing	+86.10.6510.1871	+86.10.6510.1872
Colombia — Tellabs International, Santa Fe de Bogota	+571.623.3162 or .3216	+571.623.3047
England — Tellabs U.K. Ltd., Bucks	+44.1494.555800	+44.1494.555801
Finland — Tellabs Oy, Espoo	+358.9.413.121-main #	+358.9.4131.2815
France — Tellabs SAS, Guyancourt	+33.1.345.20838	+33.1.309.60170
Germany — Tellabs GmbH, Munich	+49.89.54.90.05.+ext. or 0 (switchboard)	+49.89.54.90.05.44
Hong Kong — Tellabs H.K. Ltd.	+852.2866.2983	+852.2866.2965
Hungary — Tellabs GmbH Rep. Office, Budapest	+36.1.2681220	+36.1.2681222
India — Tellabs International, Inc., Bangalore	+91.80.2261807 or .2266850	+91.80.2262170
India — Tellabs International, Inc., New Delhi	+91.11.6859824	+91.11.6859824
Ireland — Tellabs, Ltd., County Clare	+353.61.703000	+353.61.703333
Italy — Tellabs Italia SRL, Roma	+39.6.52207.205	+39.6.52207.206
Japan — Tellabs International, Inc., Tokyo	+81.3.5322.2977	+81.3.5322.2929
Lebanon — Tellabs International, Inc., Dbayeh	+961.1.525.929	+961.1.525.171
Mexico — Tellabs de Mexico	+525.255.0057	+525.255.0061
Netherlands — Tellabs Netherlands b.v.	+31.30.6004070	+31.30.6004090
Philippines — Tellabs International, Inc., Sucat, Muntinlupa City	+63.2.838.0970	—
Singapore — Tellabs Singapore Pte, Ltd.	+65.3367.611	+65.3367.622
Republic of South Africa — Tellabs Pty Ltd., Hennopsmeer	+27.12.672.8025	+27.12.672.8024
South Korea — Tellabs International, Inc., Seoul	+82.2.589.0667	+82.2.589.0669
Spain — Tellabs Southern Europe s.a., Barcelona	+34.3.414.70.16	+34.3.414.69.25
Sweden — Tellabs AB, Stockholm	+46.8.440.4340	+46.8.440.4341
Thailand — Tellabs International, Inc., Bangkok	+662.642.7817	+662.642.7820
USA and Puerto Rico	800.443.5555*	630.512.7097
*All other Caribbean and South American locations, or if the toll-free number is busy, telephone 630.378.8800		

3.13.98

Repair and Return

- 5.5 If equipment needs repair, contact Tellabs' Product Services Department with the equipment's model and issue numbers and warranty date code. You will be issued a Material Return Authorization (MRA) number and instructions on how and where to return the equipment.

Location	Telephone	FAX
Finland — Tellabs Oy, Espoo	+358.9.413.121-main #	+358.9.4131.2815
Canada — Tellabs Comm. Canada Ltd., Mississauga, Ontario	905.858.2058	905.858.0418
Ireland — Tellabs, Ltd., County Clare	+353.61.703000	+353.61.703333
Lisle, IL USA — Tellabs Operations, Inc.	800.443.5555 (USA and Puerto Rico only) 630.378.8800 (other International)	630.512.7097 (both)

3.13.98

- 5.6 Repair service includes an attempt to remove any permanent markings made by customers on Tellabs equipment. If equipment must be marked, it should be done with non-permanent materials and in a manner consistent with the correct handling of electrostatically sensitive devices.