



Installing and Operating a 120A Channel Service Unit with Avaya Communication Manager

03-601508
Issue 1
Material ID 700417140
October 2006

© 2006 Avaya Inc.
All Rights Reserved.

Notice

While reasonable efforts were made to ensure that the information in this document was complete and accurate at the time of printing, Avaya Inc. can assume no liability for any errors. Changes and corrections to the information in this document may be incorporated in future releases.

For full support information, please see the complete document, *Avaya Support Notices for Hardware Documentation*, document number 03-600759.

To locate this document on our Web site, simply go to <http://www.avaya.com/support> and search for the document number in the search box.

Documentation disclaimer

Avaya Inc. is not responsible for any modifications, additions, or deletions to the original published version of this documentation unless such modifications, additions, or deletions were performed by Avaya. Customer and/or End User agree to indemnify and hold harmless Avaya, Avaya's agents, servants and employees against all claims, lawsuits, demands and judgments arising out of, or in connection with, subsequent modifications, additions or deletions to this documentation to the extent made by the Customer or End User.

Link disclaimer

Avaya Inc. is not responsible for the contents or reliability of any linked Web sites referenced elsewhere within this documentation, and Avaya does not necessarily endorse the products, services, or information described or offered within them. We cannot guarantee that these links will work all of the time and we have no control over the availability of the linked pages.

Warranty

Avaya Inc. provides a limited warranty on this product. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya's standard warranty language, as well as information regarding support for this product, while under warranty, is available through the following Web site: <http://www.avaya.com/support>.

Copyright

Except where expressly stated otherwise, the Product is protected by copyright and other laws respecting proprietary rights. Unauthorized reproduction, transfer, and or use can be a criminal, as well as a civil, offense under the applicable law.

Avaya support

Avaya provides a telephone number for you to use to report problems or to ask questions about your product. The support telephone number is 1-800-242-2121 in the United States. For additional support telephone numbers, see the Avaya Web site: <http://www.avaya.com/support>.



Installing and Operating a 120A Channel Service Unit with Avaya Communication Manager

This document contains procedures for installing and operating a 120A channel service unit (CSU) on a media gateway.

The document includes:

- Introduction
- Installing the 120A CSU
- Verifying the installation
- Operating the 120A CSU

Introduction

The 120A CSU module, when combined with a DS-1 circuit pack, provides an integrated CSU that:

- Converts digital frames for communications between a local area network and wide area network
- Provides a barrier for electrical interference from either side of the unit
- Echoes loopback signals for testing the network

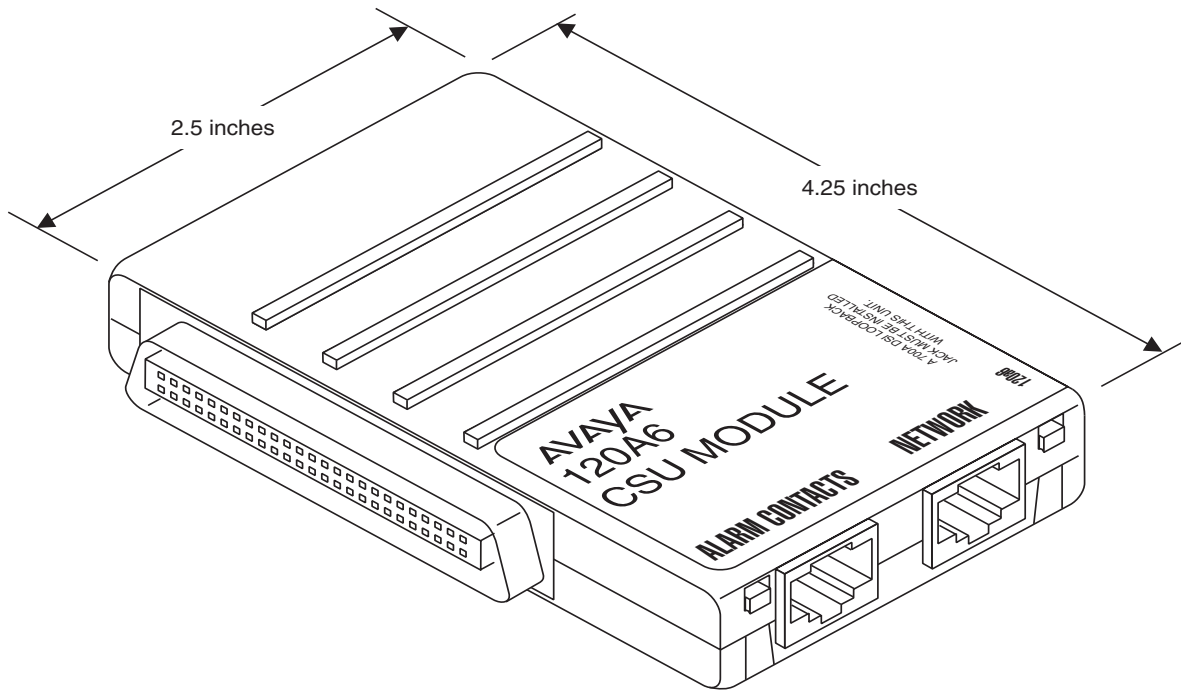
The 120A CSU performs similar functions to an external CSU but with the following advantages:

- Increased reliability
- Uses less equipment and space
- Powered by the system
- Easier to install and operate

The 120A CSU connects to a DS1 circuit pack via the I/O connector panel on the back of the cabinet. A modular cable plugs into the CSU module at one end and into a 700A loopback jack, smart jack, or other service-provider interface on the other end.

[Figure 1](#) shows a 120A CSU:

Figure 1: 120A CSU



h1dfcsu1 LAO 072506

The following circuit packs support the 120A CSU:

- TN464E to TN464HP
- TN2464CP and earlier
- TN767D or TN767E
- TN2313 or TN2313AP

The 120A CSU is supported on DEFINITY, Multivantage, and Communication Manager media servers that support TN circuit packs.

Installing the 120A CSU

Before you begin installation, make sure you have the required parts:

- 120A CSU module -- 120A3, 120A4, 120A5, 120A6 or later model
- 700A DS1 loopback jack
- H600-383 CSU-to-network smart jack cable

Group 1, 25-ft. (7.7 m) cable, or
Group 2, 50-ft (15.2-m) cable

- Cord DW8A-DE
4-pair modular cord to alarm contacts
- DS1 circuit pack

 **CAUTION:**

Always wear an antistatic wrist strap when installing a 120A module. Do not touch the external alarm cable when it is connected to the 120A. Static discharge can damage connector terminals and relays.

 **Important:**

Make sure the DS1 circuit pack is set for 24-channel operation (1.544 Mbps). The 120A CSU does not operate with the 32-channel interface. The 24-channel option can be set by a switch on the circuit pack and through administration for E1 or T1.

Refer to [Figure 2](#) through [Figure 4](#) and [Table 1](#) when you install the 120A CSU.

[Figure 2](#) shows connections for the 120A CSU installation.

Figure 2: 120A CSU module installation

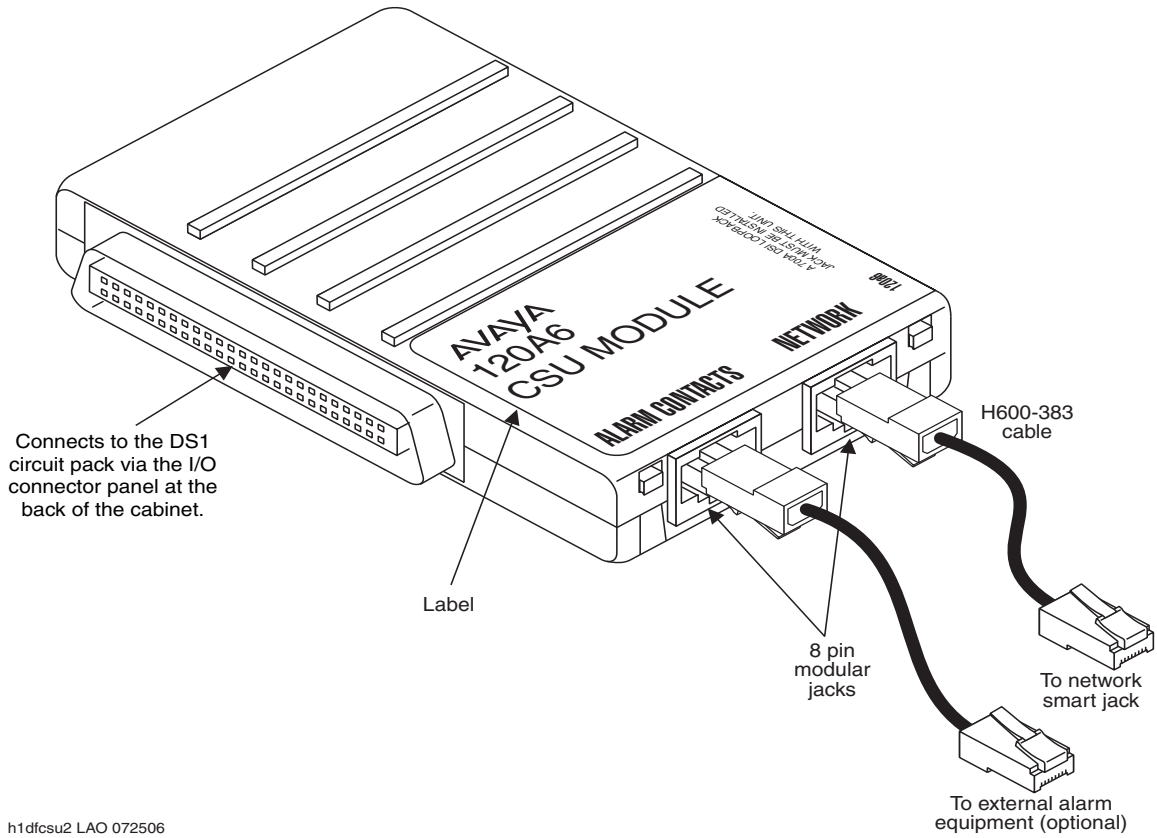
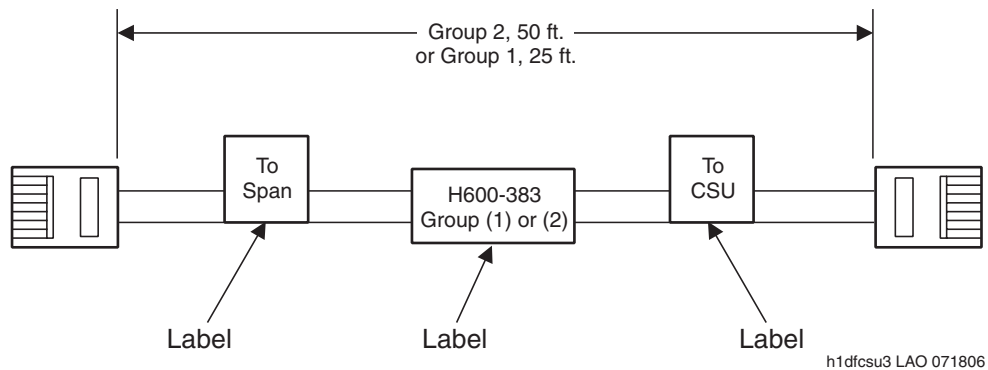


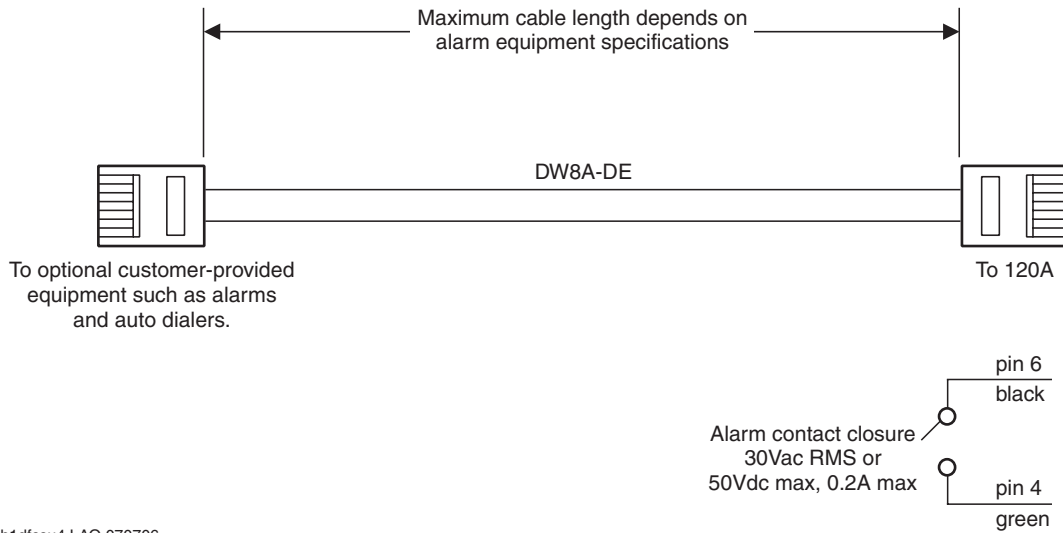
Figure 3 shows connections using the H600-383 CSU-to-network smart jack cable.

Figure 3: H600-383 CSU-to-network smart jack cable



[Figure 4](#) shows the optional alarm cable.

Figure 4: Alarm equipment cable



h1dfcsu4 LAO 070706

! CAUTION:

Alarm contact closure must be 30Vac RMS or 50Vdc max, 0.2A max. Customer alarm circuit must also meet the requirements for a Safety Extra-low Voltage (SELV) circuit. The alarm circuit power source must be a power supply or transformer meeting the UL 60950 SELV, Level 3 or Level 5 requirements.

[Table 1](#) shows cable pinouts for the H600-383 cable.

Table 1: Cable pinouts for the H600-383 cable

Pin	CSU End	Network Smart Jack End	Function
1	Line in 0	R1	RCV
2	Line in 1	T1	RCV
3	Shield		
4	Line out 0	R	XMT
5	Line out 1	T	XMT
6	Shield		
7			Not assigned
8			Not assigned

Installing and Operating a 120A Channel Service Unit with Avaya Communication Manager

To install the 120A CSU:

1. Unplug the **DS1** circuit pack from its slot.
2. Install the provided 4C retainer at the position of the 50-pin plug associated with the **DS1** circuit pack slot.
3. Plug the 120A's 25-pair connector directly into the plug associated with the **DS1** circuit pack slot.
4. Secure the 4C retainer around the 120A.
5. Attach the H600-383 cable to the 120A and to the 700A loopback jack. Follow the labels on the cable.

Alternatively (if labels are missing), determine the end that connects to the 120A by performing a continuity test between pins 3 and 6. The end with this continuity is the 120A end. The shield is grounded only at the 120A end.

If cabling other than the H600-383 is used, observe the following guidelines:

- Use 24-gauge wire that provides individually shielded, twisted pairs for transmit and receive signals. Use the cable between the network interface and the **120A**. Ground the shields of this cable only at the **120A** end to avoid ground loops.
- Cabling between the network interface and **120A** can have no bridge taps.
- If using standard house riser cable for connections between the network interface and the **120A**, maintain a 100-pair separation between the receive and transmit twisted pairs.
- If using standard house riser cable for connections between the network interface and the **120A**, allow no more than 2 cross connects to 110-type cross connect blocks.
- Never use quad cable (untwisted two pair telephone cable) or LAN cable (for example, CAT 5) in a **DS1** line.

Note:

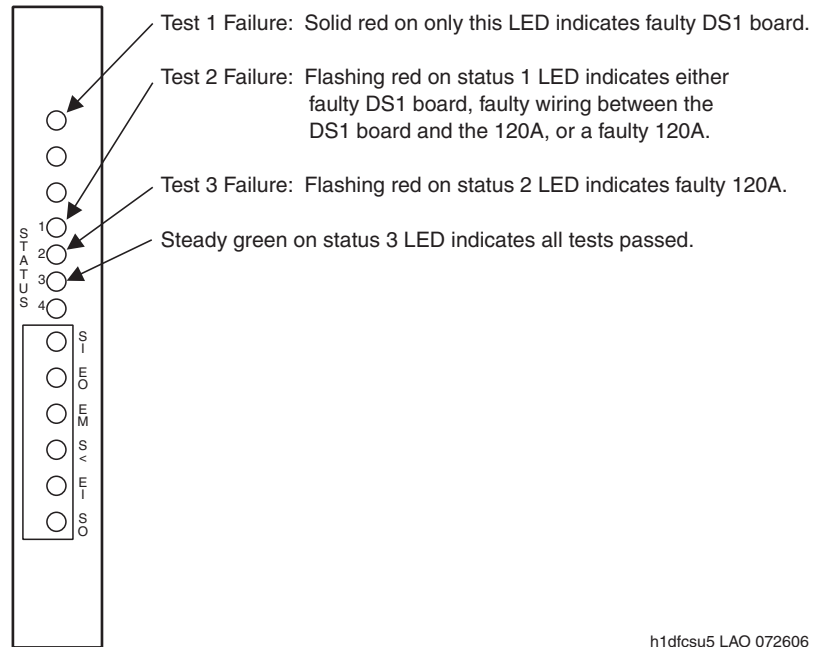
Avoid mixing wires of different gauges in a **DS1** line.

6. If using external alarm equipment, attach the supplied DW8 cable to the **120A** and the external equipment. The maximum length of this cable depends on the alarm equipment.
7. When you perform **DS1** administration, set the **line compensation** field to **1** (0-133 ft) (40.6 m). Set the **Near-end CSU Type** to **integrated**.
8. Reset the 120A by reseating the **DS1** circuit pack.

When you reinsert the **DS1** circuit pack after installing a 120A CSU the 120A resets. The **DS1** circuit pack initializes and tests the **120A**. When initialization and testing is complete, the green **LED** goes off. If the RED indicator is OFF after the test, the 120A CSU is working.

[Figure 5](#) shows interpretation of DS1 circuit pack LEDs.

Figure 5: DS1 Circuit Pack LED interpretation



Verifying the installation

To verify the installation and isolate faults, make sure the RED indicator turns OFF after the test. If the RED indicator does not turn off, use the LEDs on the DS1 circuit pack to determine possible faults. See [Table 3: Interpretation of DS1 circuit pack LEDs](#) on page 9.

Operating the 120A CSU

Note:

If the 120A CSU fails during normal operation, reinitialize the DS1 circuit pack and observe the LEDs to isolate faults to the 120A. Refer to [Table 3: Interpretation of DS1 circuit pack LEDs](#) on page 9 for a list of the LEDs and their meaning.

Default mode

The 120A CSU operates in default mode as shown in the following table.

Table 2: 120A CSU default mode

Function	Setting
Equipment loop back	Off
Repeater loop back	Off
Line loop back	Disabled and under control of the in-band line loop back signal detector
Receive automatic line build out (ALBO)	Maximum of 26 dB of gain
Transmit LBO	0 dB

In normal operating mode, the 120A CSU performs the following functions:

- If the 120A CSU loses power, it loops the signal from the network back to itself until power is restored. This is a passive loop back performed by closing a relay.
- After 10 seconds of signal loss, the 120A CSU will loop the signal from the DS1 circuit pack using the passive loop back.
- The 120A CSU provides a network loop back and transmit alarm indication signal (AIS) to the DS1 circuit pack in response to a LLB request from the network. The 120A responds to 00001 loop up code and the 001 loop down code present for greater than 5 seconds with a bit error rate less than or equal to 10^{-3} . The 120A will respond to both embedded and overwrite codes.
- The 120A closes the alarm contact in the event of LOS, LFA, AIS, or A\RFA alarm conditions or when the 10^{-4} error rate is exceeded.

LEDs

See [Table 3: Interpretation of DS1 circuit pack LEDs](#) on page 9 for a guide to interpreting LEDs on the DS1 circuit pack.

Note:

On the status LEDs on the DS1 circuit pack faceplate, loopback indications share the same LEDs as alarm indications. Loopback indications take priority over alarm indications. Disregard alarm indications shown while loopbacks are active. For example, if the status 2 LED is yellow, indicating a loopback, disregard status 3 and status 4 alarm indications.

Table 3: Interpretation of DS1 circuit pack LEDs

LED	Color	Condition	Notes
Solid red only on top circuit-pack LED	Red	Faulty DS1 circuit pack	
STATUS1	Green	Far end line loop back (LLB) active	A near end DS1 circuit pack-initiated line loop back is active at the far end CSU.
	Yellow	Bit error rate (BER) alarm active	Error rate from the network exceeds 10^{-4} .
	Solid red	Loss of signal (LOS) from DS1 circuit pack	If DS1 circuit pack fails to send a signal to the CSU module, the top LED on the circuit pack will turn on red.
	Steady flashing red	Failed equipment loop back (ELB) test	Flash rate is .5 seconds on and off. Could indicate a bad DS1 circuit pack where the problem is between the circuit pack loop back and the edge of the circuit pack, bad wiring between the DS1 and the CSU module, or a bad CSU module.
	Off	Normal operation	
STATUS2	Green	CSU repeater loop back (RLB) or ELB active	
	Yellow	Near end CSU module LLB or PLB active	
	Solid or randomly flashing red	Span alarm indicated by STATUS3 or STATUS4 is active	
	Flashing red	Failed RLB test	Flash rate is .5 seconds on and off. Replace the 120A.
	Off	Normal operation	

1 of 2

Table 3: Interpretation of DS1 circuit pack LEDs (continued)

LED	Color	Condition	Notes
STATUS3	Green	Pulses present	If this LED is off, the STATUS4 LED will be red, indicating LFA or LOS from the span. Either STATUS3 or STATUS4 will always be on if a 120A is present. Pulses from the span might be intermittent. In this case, the LED might go off for several seconds, then back on. During the seconds it is off, other status LEDs will indicate alarms.
	Yellow	Bipolar violation (BPV) received from span	Flashes each time a BPV is received from the network. B8ZS BPVs are not reported.
	Red	CRC or frame bit error from span	Flashes each time a CRC or bit error received from the network.
	Off	No pulses	Triggers the STATUS4 red LED.
STATUS4	Green	Alarm indication signal (AIS) received from span	Blue alarm, indicating equipment is down on the far end.
	Yellow	Remote frame alarm (RFA) received from span	Indicates the far end cannot frame on the DS1 circuit pack's signal.
	Red	Loss of frame alignment (LFA) from span	
	Off	Normal operation	

2 of 2

Facility Alarms

[Table 4: Facility alarms](#) on page 11 describes some of the facility alarms indicated by the DS1 circuit pack LEDs. For more information see *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers (03-300430)* and *Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers (03-300432)*.

Table 4: Facility alarms

Alarm	Description
Cyclic Redundancy Check (CRC) Errors	May be produced by marginal or faulty line repeaters, network circuit terminating equipment (NCTE), noise on the transmission line, or by the circuitry that generates the framing pattern or CRC at the transmit end. Bit errors in a DS1's signal are detected via CRC errors when Extended Super Frame (ESF) is used.
Loss of Frame (LOF) Alarm, Red Alarm	<p>Occurs when the near-end interface cannot frame up on the DS-1's signal. A red LED lights on D4-channel banks when this alarm is on. A frequent cause is an incorrect setting of the framing option at one end of the transmission facility or within the network. This scenario will cause the LFA at both ends of the transmission link. Other possible causes are an intermittent cable, broken cable, and a rain-attenuated signal (with microwave transmission facilities).</p> <p>This alarm is tripped several seconds after detecting a continuous loss of framing, and clears several seconds after restoring the in-frame condition. The end of the span with the LFA sends an RFA to the other end to indicate it cannot frame on the other's signal.</p>
Remote Frame Alarm (RFA) Yellow Alarm	When received at the near end, shows that the far end is unable to frame up on the signal sent by the near end. The far-end interface is in an LFA state. A yellow LED lights on D4-channel banks. Something is wrong with the part of the transmission facility that transmits the DS1's signal from the near end to the far end. May be caused by a broken conductor in the transmission cable wiring or within the network.
Loss of Signal (LOS) Alarm	Shows that there is no bipolar signal present at the receiver input. Occurs in parallel with the LFA alarm. Usually caused by cable-related problems such as a broken pair inside a cable, an intermittent cable at a cross-connect point, or a cable connector not completely seated.
Alarm Indication Signal (AIS), Blue Alarm	<p>Shows that maintenance activities are in progress and that the out-of-service condition exists for that DS1 facility. The alarm is recognized as a continuous stream of 1s with no framing bit.</p> <p>This alarm condition may be treated differently depending on the particular network circuit terminating equipment (NCTE) used. It may result in the NCTE automatically looping the signal back to the switch. If the looped facility is providing synchronization, then the synchronization subsystem must detect that the facility is looped and deal with that condition. Otherwise, synchronization problems will occur.</p>

