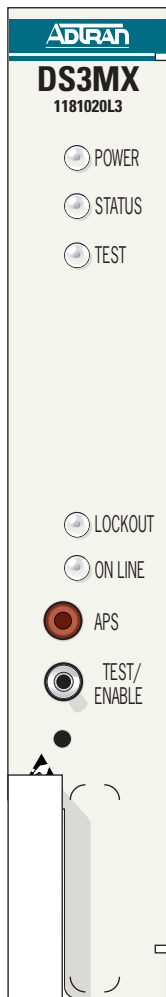


DS3MX

CLEI: M3C3EE5A_



LED STATUS

POWER	<input type="radio"/> Off	No power is present on the unit
	<input type="radio"/> Yellow	Unit is Out-of-Service
	<input type="radio"/> Green	Unit is In-Service
STATUS	<input type="radio"/> Off	Unit is Out-of-Service, Unassigned
	<input type="radio"/> Green	DS3 signal is present and synchronized
	<input type="radio"/> Red	Local alarm or local and remote alarm condition detected
	<input type="radio"/> Yellow	Remote alarm condition detected
TEST	<input type="radio"/> Off	Unit is not in loopback
	<input type="radio"/> Yellow	Loopback active
LOCKOUT	<input type="radio"/> Off	APS enabled
	<input type="radio"/> Yellow	APS disabled due to INHIBIT
	<input type="radio"/> Red	APS is locked out due to three non-forced APS events within a 24-hour period
ONLINE	<input type="radio"/> Off	Unit is standby unit (unit receives from network but does not transmit to network)
	<input type="radio"/> Green	Unit is online unit (unit receives from and transmits to network)

APS PUSHBUTTON

- When pressed simultaneously with the Test/Enable switch on the Offline unit, a protection switch is forced.
- When pressed with the Test/Enable switch on the Online unit, it toggles APS status.
- When pressed during startup, loads Software Upgrade Menu.

TEST/ENABLE BUTTON

- When pressed alone, tests all unit LEDs (multicolor LEDs appear YELLOW).
- When pressed simultaneously with the APS switch on the Offline unit, a protection switch is forced.
- When pressed during startup, restores factory defaults

INSTALLATION PROCEDURE

- Ensure the Total Access 3000 system chassis is properly mounted and wired for power. BNC Adapter Module, P/N 1181004L1, or P/N 1181004L2 is required for DS3 operation. The adapter is mounted to connector J34 (J20 on 19" shelf), located in the lower right corner of the backplane.
- Ensure SCU is seated and receiving power.
- Plug DS3 module into slot A or B of system chassis. Gently but firmly push the DS3 MUX into one of the MUX slots, A or B, at the left end of the shelf. Simultaneous thumb pressure at the top (above the POWER LED) and bottom (below the Test/Enable button) of the unit will ensure a good seat of the DS3 pins into the backplane connector. Push the ejector tab up and closed against the DS3 front panel.
- Allow the self-test LED sequence to complete. The self-test should take about 40 seconds. Upon completion, the POWER LED will be YELLOW, indicating the unit is Out-of-Service and the STATUS LED will be OFF indicating the unit is in the Unassigned state.

PROVISIONING THE DS3 MULTIPLEXER

To provision the DS3 MUX, connect a terminal emulator via the RS-232 (DB-9) connector on the front panel of the SCU. The terminal must be VT100 or compatible and set for 9600 bps, 8 data bits, no parity and 1 stop bit.

- At the LOGON screen, enter the system username and password. Note the default username is "ADMIN" and the password is "PASSWORD" (case sensitive) and can be changed upon initial login.
- Select Common A or Common B from the Total Access Menu.
- Select option 2, *Provisioning*, and press <Enter>.

The following table lists the provisioning settings and their default values.

Options	Settings	Default
Framing	M13, C-Bit, Auto detect	Auto detect
Line Build Out	Short, Long	Short
Clock Source	Local, Loop	Loop
Service State	In Service, OOS-Unassigned, OOS-Maint	OOS-Unassigned
Linked Provisioning	Enabled, Disabled	Enabled
Line Code	B3ZS (cannot be changed)	B3ZS

- Framing – sets the DS3 framing.
- Line Build Out – set LBO to either Short or Long.
 - Short – cable length is less than 225 feet of 734A or equivalent coaxial cable or less than 100 feet of Lucent 735 or equivalent coaxial cable.
 - Long – cable length is greater than 225 feet of 734A or equivalent coaxial cable or greater than 100 feet of Lucent 735 or equivalent coaxial cable.
- Clock Source – selects where the transmit clock derives its timing.
 - Local – derives its clock from an onboard oscillator.
 - Loop – derives its clock from the incoming DS3 data stream.
- Service States – the following table lists the operations allowed in each state.

Service State	Report Alarms	Report TL1 PM Data	Switch to Provide Service on Fault	Allow Forced Switch into Unit	Trib Data	Ntwrk Data	Allow Dwnld	Allow Prov	Allow Maint
OOS, Un	N	Y	N	N	AIS	IDLE	Y	Y	Y
OOS, Ma	N	Y	Y	Y	Norm	Norm	Y	Y	Y
In Service	Y	Y	Y	Y	Norm	Norm	N	N	N

- Linked Provisioning – when enabled, automatically transfers provisioning changes to the other unit.
- Line Code – this value is hardcoded to B3ZS and cannot be changed.

LOOPBACK INFORMATION

External Coax DS3 Loopbacks

Two types of External Coax DS3 loopbacks can be used to isolate trouble and verify proper DS3 data path operation. For accurate isolation, this type of loopback is preferred over the menu selected loopbacks since it checks the entire signal path and isolates the equipment at each end. An external coax loopback cannot reliably be done if the total length of coax exceeds 900 feet. Both of these types of loopback disrupt normal traffic on the coax.

■ An **External Coax DS3 Local Loopback** can be performed to verify proper DS3 MUX data operation by looping the DS3 transmit output to the DS3 receive input either locally with a short coax or at the DS3 cross connect. The Line Build Out option should be set to Short for a total coax length of 0-225 feet and Long for 226-900 feet. The clock source must be LOCAL for a coaxial loopback. Verify that the STATUS LED turns GREEN after about ten seconds. The Status menu should show that the DS3 Tx and Rx Status is NORMAL. Also, zero errors should be seen in the first 15-minute column of the DS3 Qtr-Hourly report under the Performance Monitoring menu. Select "Reset Performance Registers" if necessary to clear previously reported errors.

■ An **External Coax DS3 Line Loopback** can be performed to verify proper far-end equipment DS3 data operation by looping the DS3 transmit coax from the far-end to the receive coax, either locally near the Total Access shelf or at the DS3 cross connect. The far-end clock source must be local for a coaxial loopback. The far-end equipment Line Build Out option must be set for the length of coax present. The far-end equipment must be checked for receive DS3 signal status and no errors.

Menu Selected DS3 Loopbacks

■ A MUX **Menu Selected DS3 Line Loopback** can be used to verify that the far-end equipment can talk to itself over the entire length of coax with the Online MUX receiving and then re-transmitting the same data. All loopbacks will disrupt any normal traffic on the coax. Receive clock, data recovery, and B3ZS decoding/encoding is performed before re-transmitting the data.

■ A MUX **Menu Selected DS3 Local Loopback** should not be used to verify the DS3 data path since it does not test the entire DS3 data path. A Local Loopback should be used only to internally loopback the DS3 signal on the MUX to verify Access card T2/E1/T1 data paths.

TROUBLESHOOTING INFORMATION

1. **POWER LED Alternating between GREEN and YELLOW.**
 - Equipment fault.
 1. Momentarily unseat and then reseat the MUX to clear LED.
 2. Replace MUX if trouble persists.
2. **POWER LED OFF and Power LEDs of all other cards in shelf are ON.**
 - -48V fuse on MUX is blown.
 1. Replace the MUX. Fuse is not field replaceable.
3. **POWER LED is ON YELLOW, Status LED is OFF and MUX does not pass traffic.**
 - MUX is provisioned for OOS-Unassigned.
 1. Provision MUX to be In Service.
4. **No alarms are ON in MUX and it does not pass traffic.**
 - The DS3 channels are not mapped to access card slots.
 1. Provision each channel to the desired slot.
5. **LEDs do not turn ON when pushing Test/Enable button.**
 - There is an equipment fault.
 1. If MUX is still Online, force switch to the other MUX.
 2. Momentarily unseat and reseat the MUX to clear trouble.
 3. Replace MUX if trouble persists.
6. **STATUS LED is ON RED in MUX A and B and Status Menu shows DS3 Rx LOS.**
 - DS3 receive signal is not present.
 1. Check for correct Rx coax connection. Ensure Tx and Rx coaxes are not reversed.
 2. Check for faulty coax or coax connector.
 3. Check far-end equipment for proper Tx signal. Perform External Coax DS3 Line Loopback.
 4. Perform an External Coax DS3 Local Loopback to verify that MUX units and shelf are OK.
7. **STATUS LED is on red in MUX A and B and Status Menu shows DS3 Rx OOF.**
 - Receive DS3 signal is present but valid DS3 framing is not being received.
 1. Check for correct Tx LBO setting on far-end equipment.
 2. Check far-end equipment for proper TX signal. Perform External Coax DS3 Line Loopback.
 3. Perform an External Coax DS3 Local Loopback to verify that MUX units and shelf are OK.
 4. Ensure framing format for both units is the same.
 - Check to ensure the clock source is not identical at both ends (i.e., both ends set to Local or both ends set to Loop).
8. **Status LED is ON RED in one MUX only.**
 - Faulty MUX DS3 receiver.
 1. If this MUX is still Online, force a protection switch to the other MUX.
 2. Momentarily unplug and then plug in MUX to see if trouble clears.
 3. Replace MUX if trouble persists.

TROUBLESHOOTING CONT.

9. **No alarms are active in either MUX but receive DS3 PM errors occur in both MUX units.**
 - Marginal DS3 receive signal
 1. Check for correct Tx LBO setting on far-end equipment.
 - Total length of coax cable > 900 feet (728A or 734A).
 1. Reduce cable length to ≤ 900 feet.
 - AC current is flowing in Rx coax shield due to a frame ground potential difference at ends of cable.
 1. Improve grounding or isolate one end of coax shield from frame ground.
 - Check to ensure the clock source is not identical at both ends (i.e., both ends set to Local or both ends set to Loop).
10. **Status LED is ON YELLOW in one or both MUX units.**
 - Marginal DS3 receive signal at far-end equipment.
 1. Check for correct Tx LBO setting on both MUX units.
 - Far-end's receive DS3 signal is bad.
 1. Force a MUX protection switch. If the trouble clears, the MUX which is now Offline has a bad DS3 Tx output.
 2. Unseat and reset the now Offline MUX.
 3. Force the Offline MUX back Online and see if the trouble clears.
 4. Replace MUX if trouble persists.
 - Check to ensure the clock source is not identical at both ends (i.e., both ends set to Local or both ends set to Loop).
11. **DS3 PM errors occurring and/or DS3 status indicates OOF.**
 - Check to ensure the clock source is not identical at both ends (i.e., both ends set to Local or both ends set to Loop).
 1. Change clock source to loop if the current clock source is local or vice-versa.

COMPLIANCE

- This product is intended for installation in a restricted access location in a Type "B" or "E" enclosure only.

Code	Input	Output
Power Code (PC)	F	C
Telcommunication Code (TC)	-	-
Installation Code (IC)	A	-

WARRANTY

ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found at www.adtran.com/warranty. U.S. and Canada customer Faxback: 877-457-5007, Document 414.