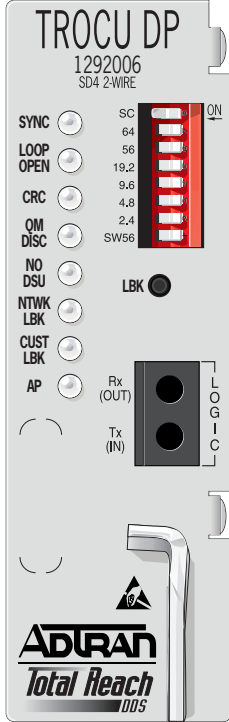


TROCU DP

CLEI: D4D4ASUC_



STATUS LEDS

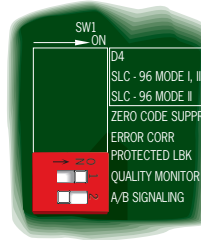
SYNC	● Green	Loop synchronized.
	● Red	Loop not synchronized.
LOOP OPEN	● Red	No sealing current on local loop.
CRC	● On	Errors on 2-wire loop.
QM DISC	● On	Quality Monitor Disconnect occurred.
NO DSU	● On	Customer DSU/CSU not responding/installed.
NTWK LBK	● On	OCU loopback toward network exists.
	* Flashing	TR DDS-R in loopback toward network, or channel loopback at CSU exists.
CUST LBK	● On	TROCU DP in loopback toward customer.
AP	● On	Unit has been remotely provisioned.
	* Flashing	Remote control link active.

Note: All LEDs OFF indicates loss of power or other malfunction.

CIRCUIT BOARD DIP SWITCH SW1

DIP Switch SW1 options must be made prior to installing the TROCU DP circuit card.

SW1-1	Quality Monitor	ON	TROCU DP monitors incoming 2-wire loop and 4-wire customer interface for errors. Excessive errors blocks data transmission and sends ASC (9Eh) to network.
SW1-1	A/B Signaling (For SW56 only)	ON	A/B signaling bits derived from backplane signals.
		OFF	A/B signaling bits derived from incoming data stream.



FRONT PANEL LBK PUSHBUTTON

Loopback pushbutton initiates loopback tests without CO or Test Center coordination. Refer to LBK Pushbutton in *Testing* section. Depressing the LBK pushbutton for five seconds will toggle between hardware and software option settings.

FRONT PANEL DIP SWITCH

- SC (Secondary Channel) may not be selected if circuit is SW56 or 64 kbps.
- Only one data rate can be selected.

Note: If SW56 is selected, Error Correction must be OFF.

FRONT PANEL BANTAM JACKS

Logic level bantam jacks provide access to the transmit and receive sides of the data stream for testing with a portable test set.

SPAN POWER

The TROCU DP span powers the remote unit. Voltage measurement from Tip to Ring is -130 Vdc. Ring to GND is 0. Tip to GND is -130 Vdc or less depending on voltmeter impedance.

DEPLOYMENT GUIDELINES

- All loops must be non-loaded.
- AML should not exceed 50 dB at 13.3 kHz, 135Ω termination.
- Loop length should not exceed 50 kft.
- Bridge tap tolerant to 12 kft (tests show no degradation to 18 kft).
- Background noise should not exceed 34 dBm.
- Impulse noise should not exceed -40 dBm (+50 dBm).

INSTALLATION & TURNUP

Installation assumes the TR DDS-R is installed.

1. Wire T/R pair, pins 24 and 51, to the D4 backplane.
2. Select required/desired options on SW1.
3. Select desired data rate with front panel DIP switch.
4. Insert the TROCU DP into its designated slot ensuring the edge connector seats firmly into the backplane.
5. After insertion the TROCU DP will run a self-test and synchronization phase during which all LEDs undergo an On/Off sequence.
6. After synchronization, which may take up to 90 seconds, the following LED indication will show:

- SYNC LED - Green
- All other LEDs will be off until network occurrences cause them to turn on.

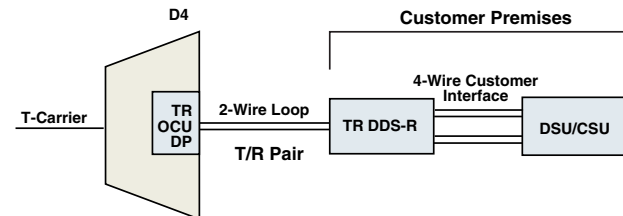
If LEDs in step 6 are as noted, proceed with loop testing per specifications.

If LEDs in step 6 are in any other configuration, refer to *Troubleshooting Guide*.

HARDWARE VERSUS SOFTWARE PROVISIONING

When SW1 is used for option selection, those options take effect when the card is inserted in the channel bank. Subsequent software provisioning will override hardware options and vice versa. Depressing the LBK pushbutton for five seconds will toggle between hardware and software provisioning.

TYPICAL APPLICATION



TROUBLESHOOTING GUIDE

No Power at the TR DDS-R

- Ensure TROCU DP is supplying necessary voltage to power the TR DDS-R. Measure T/R voltage at the frame (tip to ground = -130 Vdc or less depending on input voltmeter impedance, tip to ring = -125 to -130 Vdc, ring to ground = 0). The Total Reach DDS system is not polarity sensitive.
- Measure T/R voltage at the TR DDS-R.
- If voltage is not present at the TR DDS-R, check continuity of cable pair.
- If voltage is measured at the TR DDS-R, replace the unit.
- The TR DDS-R does not invoke a measurable short between tip and ring, thus cable resistance measurements must be made with a manually applied short, and the Total Reach elements removed.

Power, but No Synchronization

- Check cable for load coils.
- Note signal meter reading on TR DDS-R during power up and synchronization process. Refer to "Signal Loss Indication" on TR DDS-R job aid for definitions. Loop loss may be too great for synchronization to occur.
- Ensure loop length is within allowable deployment guidelines.
- Relocate the TR DDS-R to splice points sequentially closer to the TROCU DP to isolate suspect cable sections.

Excessive Errors On Loop

- Ensure background noise does not exceed 34 dBm.
- Ensure impulse noise is not greater than -40 dBm (+50 dBm). *Note: Measure noise with 50 kbit filter.*
- Compare resistance of individual conductors. If these are different, high-resistance or intermittent opens may be indicated.

Trouble Codes

The TROCU DP transmits an ASC (9Eh) trouble code toward the network under the following fault conditions:

- 2-wire DSL loss of signal.
- Loss of synchronization.
- Open loop.
- The TR DDS-R transmits an ASC (9Eh) trouble code toward the network from the customer premises for similar 4-wire customer interface fault conditions.
- ASC (9Eh) is transmitted to the network during loopback conditions initiated by the TR DDS-R.

INSERTION LOSS MEASUREMENTS

Total Reach Design Limits at Traditional 4-wire Frequencies

The table below is for comparison only. The Total Reach DDS system operates at 13.3 kHz for all customer data rates. Loss should not exceed 50 dB at 13.3 kHz.

Customer Rate	4-Wire Qualifying Frequency (kHz)	TR OCU Loss Limit (dB)
2.4	1.2	21
2.4/SC	1.6	23
4.8	2.4	26
4.8/SC	3.2	29
9.6	4.8	33.5
9.6/SC	6.4	37
19.2	9.6	44
19.2/SC	12.8	50
56	28.0	59
56/SC & 64	36.0	61

WARRANTY

Warranty for Carrier Networks products manufactured by ADTRAN and supplied under Buyer's order for use in the U.S. is ten (10) years. For a complete copy of ADTRAN's U.S. Carrier Networks Equipment Warranty statement, call (877) 457-5007, Document #414.

TESTING GUIDE

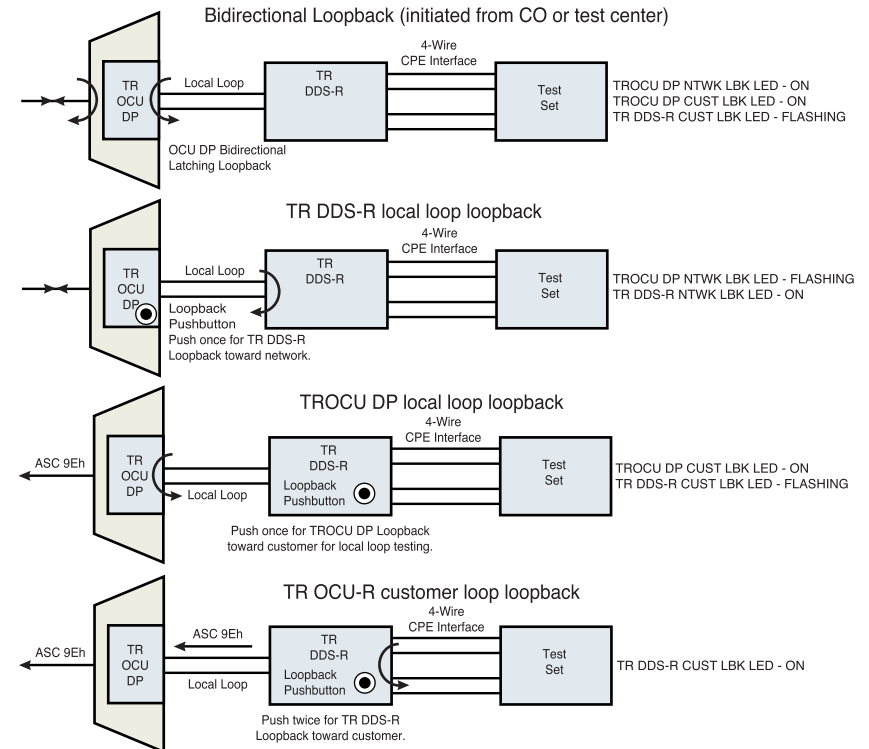
The TROCU DP supports the following loopbacks and applications:

- Latching and alternating OCU and CSU loopbacks.
- OCU latching bidirectional loopback from DSO test set or remote test center.
- Remote end initiated loopbacks from TR DDS-R.
- Supports 2-wire loop tests from remote end when TR OCU DP is in bidirectional loopback.
- All existing Total Reach system loopbacks release in response to 35 DDS loop down TIP bytes or by pressing the LBK button on the TROCU DP or TR DDS-R.

Refer to loopback diagrams for all LBK pushbutton tests.

LBK and Pushbutton Tests

Successful loopback tests initiated by the LBK pushbutton will show the following LED indications:



COMPLIANCE REQUIREMENTS

CAUTION: This product for installation in a restricted access location in a Type B or E enclosure only.

Max input current @ max load = 100 mA @ -48 Vdc.

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