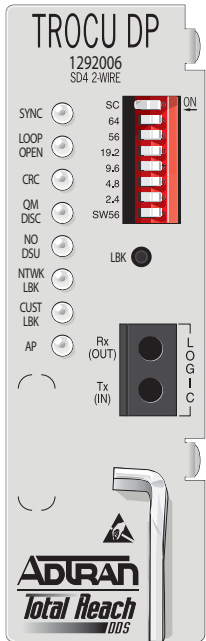


**Total Reach  
TR OCU DP**  
CLEI: D4D4AS1C\_  
P/N: 1292006L1

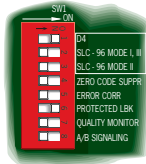


### STATUS LEADS

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

Note: When all LEDs are off, this indicates a loss of power or a malfunction.

### CIRCUIT BOARD DIP SWITCH (SW1)



The TR OCU DP has a DIP switch (SW1) that is located on the circuit board of the module.

The functions of SW1 are shown in the table below.

Switch	Function	On/Off	Notes
SW1-1	D4 Channel Bank (Default)	—	Selects bank type <b>Note:</b> Only one bank type can be selected or selection defaults to D4.
SW1-2	SLC 96 Mode I, III	—	Selects band type <b>Note:</b> Only one bank type can be selected or selection defaults to D4.
SW1-3	SLC 96 Mode II	—	Selects band type <b>Note:</b> Only one bank type can be selected or selection defaults to D4.
SW1-4	Zero Code Suppression	On Off	Ensures pulse density in T-carrier data stream for rates other than 64k. Disable for 64k operation
SW1-5	Error Correction	On	Ensures data integrity across T-carrier.
SW1-6	Protected Loopback	On	Enables Protected LBK mode <b>Note:</b> Latching loopback is always enabled.
SW1-7	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.
SW1-8	A/B Signaling	On Off	A/B signaling bits derived from backplane signals (for SW56 only) A/B signaling bits derived from incoming data stream.

### FRONT PANEL LOOPBACK PUSHBUTTON

Loopback (LBK) pushbutton initiates loopback tests without Central Office (CO) or Test Center coordination. Refer to “[LBK and Pushbutton Tests](#)” on the reverse side of this Job Aid. Depressing the LBK pushbutton for five seconds toggles between the hardware and software option settings.

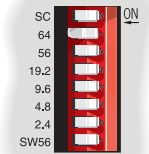
### FRONT PANEL DIP SWITCH

The Secondary Channel (SC) cannot 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

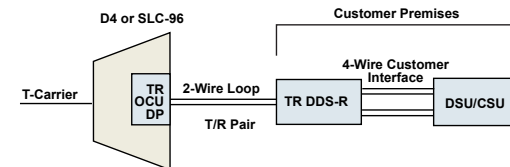
The TR OCU DP span powers the remote unit. Voltage measurement from Tip to Ring is -130 VDC. Ring to GND is 0 VDC. Tip to GND is -130 VDC or less, depending on voltmeter impedance.

### DEPLOYMENT GUIDELINES

The following deployment guidelines should be considered when installing the TR OCU DP:

- ◆ All loops must be non-loaded.
- ◆ AML should not exceed 50 dB at 13.3 kHz, 135 Ω 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).

A typical application of the TR OCU DP is shown below.



### INSTALLATION AND TURN UP

After unpacking the unit, inspect it for damage. If damage is noted, file a claim with the carrier and then contact ADTRAN. For more information, refer to the warranty.

Installation assumes that the TR DDS-R is already installed.

1. Wire T/R pair, pins 24 and 51, to the D4 backplane.
2. Select DIP switch SW1 options as required. Refer to the table under “[Circuit Board DIP Switch \(SW1\)](#)” for more information.
3. Select the data rate using the front panel DIP switch.
4. Insert the TR OCU DP into the designated slot; ensure the edge connector seats firmly into the backplane.  
After insertion, the TR OCU DP runs a self-test and performs a synchronization phase during which all LEDs undergo an On/Off sequence.
5. After synchronization, which can take up to 90 seconds, the **SYNC** LED is green. All other LEDs turn off until network occurrences cause them to turn on.
6. If LEDs in step 5 are as noted, proceed with loop testing per specifications. If LEDs in step 5 are in any other configuration, refer to “[Troubleshooting](#).”

For more information, refer to the Installation and Maintenance Practice (P/N 61292006L1-5) available online at [www.adtran.com](http://www.adtran.com).



**CAUTION!**  
SUBJECT TO ELECTROSTATIC DAMAGE  
OR DECREASE IN RELIABILITY.  
HANDLING PRECAUTIONS REQUIRED.

## HARDWARE VERSUS SOFTWARE PROVISIONING

When DIP switch SW1 is used for option selection, those options take effect when the module is inserted in the channel bank. Subsequent software provisioning overrides hardware options and vice versa. Depressing the **LBK** pushbutton for five seconds toggles between hardware and software provisioning.

## TROUBLESHOOTING

- ◆ No Power at the TR DDS-R:
  - ◆ Ensure the TR OCU DP is supplying necessary voltage to power the TR DDS-R. Measure tip/ring voltage at the frame (tip to ground should be -130 VDC or less depending on input voltmeter impedance; tip to ring should be -125 VDC to -130 VDC; ring to ground should be 0 VDC). The Total Reach DDS system is not polarity sensitive.
  - ◆ Measure tip/ring voltage at the TR DDS-R. If voltage is not present, 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/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 the signal meter reading on TR DDS-R during power up and the synchronization process. Refer to “Signal Loss Indication” on the applicable TR DDS-R job aid for definitions. Loop loss can 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 TR OCU DP to isolate suspect cable sections.
- ◆ Excessive Errors On Loop:
  - ◆ Measure the background noise; ensure that it does not exceed 34 dBrn.
  - ◆ Using a 50 kb filter, ensure that the impulse noise is not greater than -40 dBm (+50 dBrn).
  - ◆ Compare resistances of individual conductors. If different, high-resistance or intermittent opens could be indicated.
- ◆ Trouble Codes:
  - ◆ The TR OCU 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.

## COMPLIANCE

The TR OCU DP complies with the requirements covered under UL 60950 and is intended to be installed in restricted access areas only. Maximum current at the maximum load is 100 mA at -48 VDC.

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

## INSERTION LOSS MEASUREMENTS

The table at the top of the next column shows (for comparison only) the Total Reach design limits at traditional 4-wire frequencies. 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.

**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 online at [www.adtran.com/warranty](http://www.adtran.com/warranty).

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 and 64	36.0	61

## TESTING GUIDE

The TR OCU DP supports the following loopbacks and applications:

- ◆ Latching and alternating OCU and CSU loopbacks
- ◆ OCU latching bidirectional loopback from DS0 test set or remote test center
- ◆ Remote end initiated loopbacks from TR DDS-R
- ◆ Two-wire loop tests from remote end when TR OCU DP is in bi-directional 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 TR OCU DP or TR DDS-R

Refer to loopback diagrams below for all **LBK** pushbutton tests.

## LBK AND PUSHBUTTON TESTS

The figure below shows the LED indications for successful loopback tests that are initiated by the **LBK** pushbutton.

