

TROCU DP 9004B

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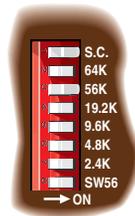


STATUS LEDs

SX	● RED	No sealing current present between TROCU DP and TR DDS-R
	○ OFF	Sealing current has been detected
SYNC LOSS	● RED	No synchronization with TR DDS-R
	○ OFF	Synchronization with TR DDS-R
NEAR CRC	● RED	CRC errors detected by the TROCU DP from the 2-wire loop
FAR CRC	● RED	CRC errors detected by the TR DDS-R from the 2-wire loop
QM	● RED	Customer transmit signal has been disabled due to errors on the loop, only when QM option is enabled
DSU	● YELLOW	Customer DSU/CSU is absent as determined by the TR DDS-R
LBK	● YELLOW	OCU or CSU loopback activated
IDLE	● YELLOW	Presence of the control mode idle code toward the network

FACEPLATE SWITCHES

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



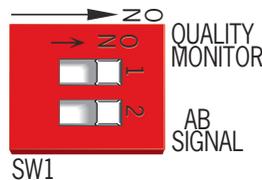
CIRCUIT BOARD SWITCH - SW1

Quality Monitor (SW1-1)

- TROCU DP monitors incoming 2-wire loop and 4-wire customer interface data for errors. Customer transmit data may be ignored if errors are excessive.

AB Signaling (SW1-2)

- This switch is typically OFF to allow the unit to search for frames containing signaling bits. (Only applicable for SW56 applications). When ON, the TROCU DP will take its signaling from the backplane of the channel bank.



Note: Only applicable for SW56 applications.

PREPROVISIONED PARAMETERS

Zero Code Suppression

- Ensures pulse density in the T-carrier data stream. This option is disabled for 64 kbps circuits and enabled for all others.

Latching Loopback

- Unit automatically responds to OCU and CSU latching loopback sequences.

MAC JACKS

NEAR and FAR logic level Mac test access jack. These test points are intrusive into the data stream.

Note: These jacks are for TPI 108/109, FIREBERD 6000 or other DSO level test set.

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. and Canada Carrier Networks Equipment Warranty: (877) 457-5007, Document #414.

INSERTION LOSS MEASUREMENTS

TR DDS 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.

Customer Rate	4-wire Qualifying Frequency (kHz)	TR DDS Loss Limit (dB)
2.4	1.2	21
2.4/SC	1.6	23
4.8	2.4	27
4.8/SC	3.2	30
9.6	4.8	35
9.6/SC	6.4	39
19.2	9.6	45
19.2/SC	12.8	50
56	28.0	59
56/SC & 64	36.0	61

DEPLOYMENT GUIDELINES

- All loops must be nonloaded.
- Actual Measured Loss (AML) should not exceed 50 dB at 13.3 kHz (135 ohm termination), the Nyquist frequency of Total Reach DDS.
- Loop length should not exceed 50 kft.
- Product is designed to be bridged tap (BT) tolerant. ADTRAN allows for 12 kft of BT, though further testing has shown no degradation up to 18 kft.
- Background noise level should not exceed 34 dBrn.
- Impulse noise should not exceed -40 dBm, (+50 dBm).
- Maximum cable lengths (6 dB margin still available) –50 kft of 22 gauge, 36 kft or 24 gauge, 27 kft of 26 gauge.

TROCU DP Wiring Connections

TIN Designations	Backplane PIN#
T/R	35/36

Total Reach DDS-R Connections

Pair	Terminal Designations	T400 PIN#	Customer RJ-48
To/From Network	TT,TR	41,47	–
To Customer	DRT, DRR	5,15	7,8
From Customer	DTR,DTT	49,55	1,2

Turnup Guide

1. Set DIP switches on both units according to circuit design and local practices.
2. Install TROCU DP and TR DDS-R.
 - a) TROCU DP fits in 9004 channel bank.
 - b) TR DDS-R fits in standard non-powered T200 or T400 NCTE mounting.
3. See reverse side of this Job Aid to ensure all LEDs are correct and synchronization has occurred.
 - a) TROCU DP DSU LED will be illuminated Yellow if customer DSU is not connected. No other LEDs should be illuminated.
 - b) TR DDS-R SYNC LED (in Green) and appropriate data rate LED will be illuminated. No other LEDs should be illuminated.
4. If LEDs in step 3 are as noted, proceed with loopback and BERT testing per DDS specifications.
5. If LEDs in step 3 are in any other configuration, see *Troubleshooting Guide* portion of this job aid.
6. If problem cannot be solved via the job aid, please call technical support for assistance (see number in page header).
7. The TR DDS system will be qualified at the 13.3 kHz frequency for all customer data rates.

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 = -125 to -130 Vdc, tip to ring = -125 to -130 Vdc, ring to ground = 0). The TR 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 place a measurable short between tip and ring. Cable resistance must be taken towards a manually applied short.

Power, but No Synchronization

- Check cable for load coils.
- Note signal meter reading on TR DDS-R during power up and synchronization process. See *Signal Loss Indication* portion of this job aid for definitions. Loop loss may be too great for synchronization to occur. Ensure loop length is within allowable deployment guidelines.
- Check for excessive bridged tap.

Excessive Errors on Loop

- Ensure background noise does not exceed 34 dBrn.
- Ensure impulse noise is not greater than -40 dBm (+50 dBm). *Note: Measure noise with 50 kilobit filter.*
- Compare resistances of individual conductors. If these are different, high-resistance or intermittent opens may be indicated. A TDR is commonly required to find such faults.

Testing Guide

1. Connect the DS0 digital test set (TPI 108/109 or equivalent) to the logic level bantam test jacks of the TROCU DP and configure the set for NEAR or FAR Logic (NEAR test toward the customer loop, FAR test towards the T-carrier) and select the desired data rate. Please note, remote testing is also acceptable.
2. Initialize the desired loopback (OCU or NIU). If FAR direction is selected, send appropriate latching loopback sequence which will loop the unit directly across the T-carrier system. If the NEAR direction is selected, the OCU latching loopback sequence will loop the unit directly connected to the portable test set. The TROCU DP will always invoke a bidirectional loopback.
3. The LBK LED will illuminate if the OCU or CSU loopback is successful. It will not illuminate if the loopback failed.
4. Send and receive test pattern (2047) to the established loopback and observe the DS0 digital test set for bit error count.
5. Drop OCU latching loopback and send an NIU loopback sequence to loopback the TR DDS-R. Run test pattern and observe bit error count as in step 4 to test integrity of local loop.
6. Testing from the TR DDS-R may be accomplished by connecting the DS0 digital test set to the customer-side jack of the TR DDS-R housing and running to a bidirectional TROCU DP loopback. Unseat and reseat the Total Reach DDS Remote unit before testing to gain access to the data stream.