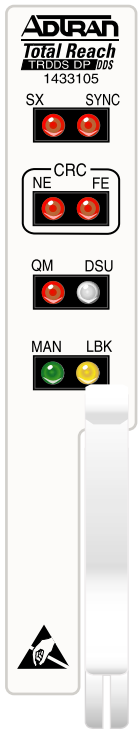
TR DDS-DP

JOBAID

61433105L2-22A
0005

TR DDS-DP

CLEI: 5SC531PF_ _



STATUS LEDs

SX	○ OFF	Sealing current detected
	● RED	No sealing current detected between the TR DDS-DP and the TR OCU-R unit (see *Troubleshooting Guide*)
SYNC	○ OFF	Units are synchronized
	● RED	No sync between the TR DDS-DP and the TR OCU-R (see *Troubleshooting Guide*)
NE CRC	● RED	CRC errors on incoming data stream
FE CRC	● RED	CRC errors towards the TR OCU-R
QM	● RED	Customer transmit signal has been disabled due to errors on the loop (see *Troubleshooting Guide*)
DSU	● GREEN	Customer DSU is present as determined by the TR OCU-R
	● YELLOW	No DSU signal detected at TR OCU-R
MAN	● GREEN	Rate has been optioned manually via SW2 on printed circuit board
LBK	● YELLOW	DS0, OCU or CSU loopback activated

SLOT PROVISIONING - CIU

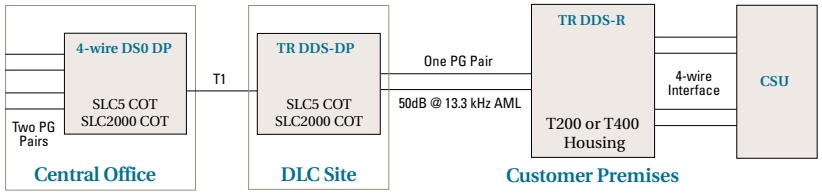
For the SLC Series 5/SLC 2000 TR DDS-DP to operate properly, the slot being utilized in the channel bank should be optioned via the craft interface for OCU operation. This is done as follows:

- Connect the craft interface to the appropriate CTU in the channel bank
- From the terminal, select Circuit Activities and choose the appropriate system ID assigned to the SLC Series 5/SLC 2000 bank
- Select the appropriate slot being utilized from the terminal as 5SCU48. Press return on the terminal keyboard to accept this CLEI. This options the slot for TR DDS operation. Software Provisioning can now be completed.

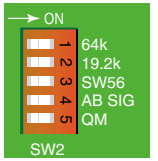
DEPLOYMENT GUIDELINES

- All loops must be non-loaded.
- Maximum Loop Loss measures at a Nyquist of 13.3 kHz is 50 dB AML or 47 dB EML (135Ω termination).
- Maximum Loop Loss measures at a Nyquist of 28 kHz is 65 dB AML or 62 dB EML (135Ω termination).
- When calculating EML, use 13.3 kHz Nyquist for all data rates (2.4 to 64 kbps).
- Bridged tap length should not exceed 12 kft.
- Impulse noise should not exceed -40 dBm (+50 dBrn)

TYPICAL APPLICATION



SW2 - HARDWARE PROVISIONING



SW2-1	Selects 64k clear channel operation.
SW2-2	Selects 19.2k operation.
SW2-3	Selects SW56 dial up service.
SW2-4	Selects A/B signaling for SW56 mode of operation.
SW2-5	Selects quality monitor function for monitoring errors on the cable pair. Unit will automatically disconnect circuit if excessive errors are present and illuminate the QM LED.

Note: *Hardware options are provided for parameters not supported by the SLC Series 5/SLC 2000 BCU. When selected, hardware options override software options in the BCU.*

SOFTWARE PROVISIONING - CIU

Data Rate

- 2.4, 4.8, 9.6 or 56k

Error Correction (Choose One)

- **None** — no error correction
- **MVEC** — error correction for 2.4, 4.8, 9.6 and 19.2k operation
- **SCEC** — error correction for 56k and 64k operation

Zero Code

When Zero Code is enabled, the Series 5 Total Reach DDS-DP allows DS0 bytes of all zeros to enter the T-carrier data stream. On Alternate Mark Inversion (AMI) facilities, this function should be disabled. B8ZS carrier facilities that accommodate 64 kbps clear channel operation do not require the zero code to be suppressed, therefore zero code is automatically enabled when 64 kbps is selected.

- **Yes** — for all data rates except SW56, 56 SC and 64k
- **No** — for 64k, 56 SC and SW56

Secondary Channel (SC)

- **Yes** — enables secondary channel
- **No** — disables secondary channel

Note: *For 19.2k with error correction, option unit for 9.6/MVEC via the CIU and 19.2 on SW1.*

SPAN POWER

The TR DDS-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.

TIP / RING PAIR

The TR DDS-DP uses Tip (pin 31) and Ring (pin 32) for the 2-wire loop on the Series 5 backplane.

CONTROL PORT OPERATION

The SLC Series 5 TR DDS-DP may be remotely controlled via the craft interface on the TR OCU-R. The terminal interface operates at baud rates from 2.4 to 19.2 kbps, asynchronous, 8 data bits, no parity, and one stop bit. Terminal sessions provide access to screen menus for the following:

- Testing
- Performance Monitoring

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

■ For a complete Installation and Maintenance Practice: (877) 457-5007, Document #280. Please have your fax number available. ■

TR DDS-DP

Pricing and Availability 800.827.0807
Tech Support 800.726.8663
Return for Repair 256.963.8722
www.adtran.com
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SERVICE RATE OVERRIDE

The SLC Series 5 BCU does not support 19.2 kbps, 64 kbps, or Switched 56 service rates. However, these rates can be provisioned by selecting them on SW2 which overrides BCU provisioned rates.

INSERTION LOSS MEASUREMENTS

Total Reach Design Limits at Traditional 4-wire Frequencies

The table shown is for comparison only. The TR 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 DDS 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

TURN-UP GUIDE

1. Provision the TR DDS-DP for desired hardware options.
2. Install the unit in the designated slot, ensure it is properly seated and channel bank is active.
3. Observe LED sequences during Self-Test/Synchronization. During this time all LEDs should momentarily turn On at least once.
4. The unit can take several minutes to synchronize depending on network configuration. After synchronization, LED indication will be as follows:
   - DSU - Green or Yellow - indicating there is, or is not, a remote unit installed.
   - SYNC - Off or Red - indicating sync, or non sync, with the remote unit.
   - MAN - On or Off - indicating SW2 does, or does not, have a rate selected.

Remaining LEDs will be Off until network occurrences establish conditions to turn LEDs On.

TROUBLE CODES

The TR DDS-DP transmits an alternating MOS (9Ah)/ASC (9Eh) trouble code towards the network under the following fault conditions:

- 2-wire DSL loss of signal.
- Loss of synchronization (possibly due to mismatched Total Reach and CSU/DSU data rates).
- Open loop.

The TR OCU-R transmits an ASC (9Eh) trouble code towards the network from the customer premises for similar 4-wire customer interface fault conditions.

TESTING GUIDE

The TR DDS-DP supports the following loopbacks and applications:

- DS0 latching bidirectional loopback from DS0 test set or remote test center.
- Remote end initiated loopbacks from TR OCU-R.
- Supports 2-wire loop tests from remote end when TR DDS-DP is in bidirectional loopback.
- All existing Total Reach system loopbacks release in response to 35 DDS loop down TIP bytes, by pressing the LBK button on the TR DDS-DP or TR OCU-R, or via a terminal through the DB-9.
- Loopback tests may also be initiated via the craft interface by selecting "Loopbacks" from the main menu.

Refer to loopback diagrams for all LBK pushbutton tests.

TROUBLESHOOTING GUIDE

No Power at the TR OCU-R

- Ensure TR DDS-DP is supplying necessary voltage to power the TR OCU-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 TR DDS system is not polarity sensitive.
- Measure T/R voltage at the TR OCU-R.
- If voltage is not present at the TR OCU-R, check continuity of cable pair.
- If voltage is measured at the TR OCU-R, replace the unit.
- The TR OCU-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 TR elements removed.

Power, but No Synchronization

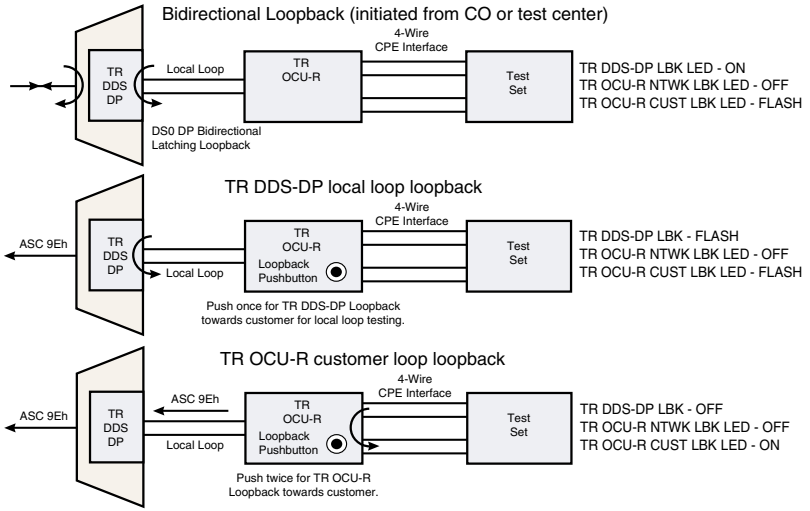
- Check cable for load coils.
- Note signal meter reading on TR OCU-R during power up and synchronization process. Refer to "Signal Loss Indication" on TR OCU-R job aid for definitions. Loop loss may be too great for synchronization to occur.
- Ensure loop length is within allowable deployment guidelines.

Excessive Errors On Loop

- Ensure background noise does not exceed 34 dBrn.
- Ensure impulse noise is not greater than –40 dBm (+50 dBrn). Note: measure noise with 50 kbit 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.

LBK & 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 = 165 mA @ -48 Vdc.
Max output current @ max load = 41 mA @ -140 Vdc.

CODE	INPUT	OUTPUT
PC	F	C
TC	–	X
IC	A	–

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.