

TR DDS DP

CLEI: 5SC53X4F_ _



STATUS LEDs

- | | | |
|---------------|---|---|
| SX | <input type="radio"/> OFF | Sealing current detected |
| | <input checked="" type="radio"/> ON | No sealing current detected between the Total Reach DDS DP and the DDS-R unit (see <i>Troubleshooting Guide</i>) |
| SYNC | <input type="radio"/> OFF | Units are synchronized |
| | <input checked="" type="radio"/> ON | No sync between the DDS DP and the DDS-R (see <i>Troubleshooting Guide</i>) |
| NE CRC | <input checked="" type="radio"/> ON | CRC errors on incoming data stream |
| FE CRC | <input checked="" type="radio"/> ON | CRC errors towards the DDS-R |
| QM | <input checked="" type="radio"/> ON | Customer transmit signal has been disabled due to errors on the loop (see <i>Troubleshooting Guide</i>) |
| DSU | <input checked="" type="radio"/> GREEN | Customer DSU is present as determined by the DDS-R |
| | <input checked="" type="radio"/> YELLOW | No DSU signal detected at DDS-R |
| MAN | <input checked="" type="radio"/> ON | Rate has been optioned manually via SW2 on printed circuit board |
| LBK | <input checked="" type="radio"/> ON | OCU or CSU loopback activated |
| | <input checked="" type="radio"/> FLASHING | DDS-R has activated DDS-DP loopback toward customer |

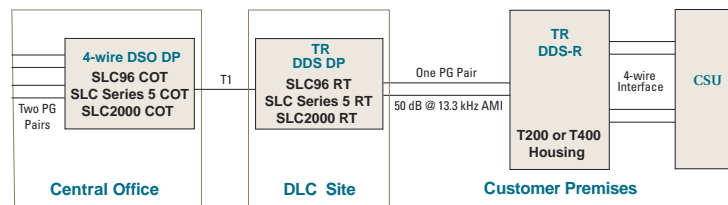
SLOT PROVISIONING – CIU

For the Series 5 Total Reach 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 Series 5 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 OCU DP operation. Any provisioning needing to be done through software can now be completed.

NOTE: The SLC Series 5 Total Reach DDS DP may be used in SLC Series 5 and SLC 2000 or equivalent channel banks.

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

- This switch is typically OFF to allow the unit to search for frames containing signaling bits. (Only applicable for SW56 applications).

SW2-5

- When ON, Total Reach DDS DP monitors incoming 2-wire loop and 4-wire customer interface data for errors. Customer transmit data is blocked if errors are excessive. This switch should be enabled on multipoint branches.

NOTE: Hardware options are provided for parameters not supported by the SLC5 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

- **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 SW2.

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 tolerant to 12 kft; however testing has shown no degradation up to 18 kft.
 - Background noise level should not exceed 34 dBm.
 - Impulse noise should not exceed -40 dBm (+50 dBm).
- NOTE: Measure noise with 50 kbit filter.*
- Maximum cable lengths (6 dB margin still available) 50 kft of 22 gauge, 36 kft of 24 gauge, 27 kft of 26 gauge.

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, faxback Document 414.

INSERTION LOSS MEASUREMENTS

Total Reach DDS Design Limits at Traditional 4-wire Frequencies

The chart below is for comparison only. The Total Reach DDS system operates at 13.3 kHz for all customer data rates.

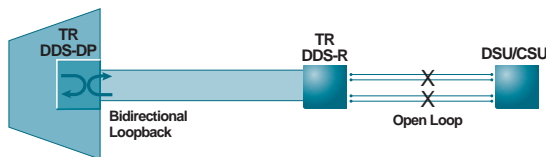
Customer Rate	4-wire Qualifying Frequency (kHz)	TR DDS Loss Limit (dB)
2.4	1.2	21
2.4/SC	1.6	23
4.8	2.4	27
4.8/SC	3.2	30
9.6	4.8	35
9.6/SC	6.4	39
19.2	9.6	45
19.2/SC	12.8	50
56	28.0	59
56/SC & 64	36.0	61

REMOTE END TEST MODE

Normal Mode

- Does not allow remote end testing. Normal mode is indicated by a solid LBK LED on the DDS-R. Pass-thru mode may be activated by unseating and reseating the DDS-R while in normal mode.

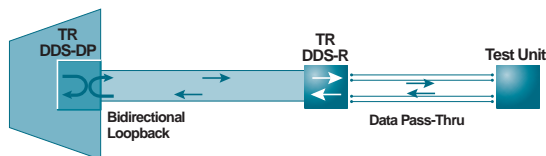
DDS-DP Bidirectional Loopback — Normal Mode



Pass-Thru Mode

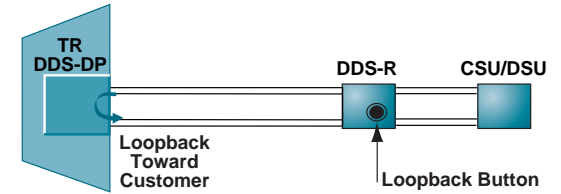
- Loop testing to the DDS-DP is performed by connecting a standard portable DDS test set to the customer interface. Pass-thru mode is indicated by a flashing LBK LED.

DDS-DP Bidirectional Loopback — Pass-Thru Mode



Loopback Pushbutton (Remote Unit)

The DDS-DP initiates a loopback in response to the loopback pushbutton on the remote units equipped with that feature. This allows a field technician to conduct loop testing from the remote end independent of the test center or CO. The DDS-DP LBK LED will flash to indicate the test has been initiated.



Turnup Guide

- Option the DDS DP SW2 for desired parameters when applicable (see *Provisioning* section for details).
- Install the DDS DP into the appropriate slot of a working Series 5 bank. Unit should cycle through a self-test upon insertion. If unit does not cycle through LEDs, see *Troubleshooting* section.
- Provision the Series 5 bank slot for OCU DP/CLEI 5SCU48 through the CIU as explained in *Provisioning* section.
- Provision any software options that need to be set for the DDS DP through the CIU.
- With a DDS-R attached to the cable pair, all LEDs should go out within 30-90 seconds with the exception of the MAN and DSU LED. The MAN LED will be ON if a rate is turned on in SW2. The DSU LED will be Yellow if no customer DSU or DDS test set is attached to the DDS-R. The DSU LED will be Green if a DDS test set or the customer DSU is attached to the DDS-R. If the LEDs do not operate in this manner, see *Troubleshooting* section.
- If all LEDs indicate proper operation, proceed with loopback and BERT testing per local DDS testing guidelines.

NOTE: Two pairs are still required from the SLC5 COT channel slot to the central office network.

Troubleshooting Guide

Self-Test does not Initiate

- Usually indicates an absence of -48 Vdc on Series 5 channel bank.
- Verify -48 VDC present on Series 5 bank. If -48 VDC is absent, correct bank problem.
- If -48 VDC present, replace unit.

SYNC and SX LEDs do not go OFF after a Short Period of Time

- Usually indicates a lack of continuity between the DDS DP and the DDS-R.
- Verify that a DDS-R is attached and wired in properly.
- Measure voltage across T/R cable pair to verify -130 VDC being presented to the DDS-R. If voltage is not present on pair, verify measurement is being performed on correct pair. If pair is correct, replace unit. If voltage is still not present on pairs, remove Total Reach units and check pairs for opens on tip-ring. Also, check pairs for tip-ground or ring-ground shorts. The DDS-R can be moved to various splice points closer to the DDS DP to help isolate cable problems. The DDS-R can be placed immediately next to the DDS DP.

SX LED OFF and SYNC LED ON

- Usually indicates the DDS-R is present and wired correctly on the 2-wire side, but impairments exist between the DDS DP and the DDS-R, most commonly load coils. Verify the cable pair meets all parameters specified in the *Deployment Guidelines* section. The DDS-R can be moved to various splice points closer to the DDS DP to help isolate cable problems. The DDS-R can be placed next to the DDS DP.

NE CRC, FE CRC and/or QM LEDs ON

- Usually indicates impairments causing errors on Total Reach pair or 4-wire side of DDS-R. Errors on either interface will cause the Quality Monitor function, if enabled on the DDS DP, to disconnect the circuit after seven consecutive seconds which contain errors. Verify the cable pair meets the *Deployment Guidelines* criteria. The DDS-R can be moved to various splice points closer to the DDS DP to help isolate cable problems. The DDS-R can be placed immediately next to the DDS DP.

Testing Guide

- DDS DP responds to OCU loopback. DDS DP always performs bidirectional loopback in response to OCU loopback command.
- DDS-R responds to NIE loopback.
- The LBK LED will illuminate if the OCU or CSU loopback is successful. It will not illuminate if OCU or CSU loopback fails or during DSU or NIE loopback.
- Testing from the DDS-R may be accomplished by connecting the DDS test set to the customer side jack of the DDS-R housing and running to a bidirectional loopback at the DDS DP, unseat and reseat the Total Reach DDS remote unit before testing to gain access to the data stream.

NOTES: Latching loopbacks must be used when testing at 64k. All other data rates will respond to latching or non-latching loopbacks. Total Reach DDS includes an algorithm feature that eliminates false latching loopbacks.