

TransTel Group Inc.
Installation and Operating Guide 803141
ML500D Five-Line Digital Cellular System
For Voice and Data Communication

Introduction

The ML500D houses either a DC or AC power supply and up to five digital transceiver modules with CDMA or GSM transceivers in a compact 19-inch rack-mountable chassis. Each transceiver module is identified by a TransTel serial number (SN). Also listed are for CDMA transceivers the ESN (electronic serial number) and for GSM transceivers the IMEI number (International Mobile Equipment Identity). The labels can be found on the inside front panel of each transceiver module, on the attached parts list, and on the packing list. The ESN or IMEI numbers are required by cellular carriers for assignment of the cellular telephone numbers.

Installation

The ML500D is shipped fully assembled and is ready for rack-mounting. The chassis can be mounted in a standard 19-inch wide rack. Mounting screws can be either 10-24 x 1 inch or 12-24 x 1 inch. The mounting screws must be firmly tightened in order to secure the chassis to the rack.

In the event that the above parts or packing lists are not available, this is a good time to record the ESN or IMEI numbers from the serial number labels of each transceiver module. Make sure the power is off and remove any power, telephone, and antenna cables from rear of chassis. Then loosen the screws at the top of the face plate and at the bottom at each extractor handle and, using this handle, pull out the module far enough so that you can read the ESN or IMEI on the serial number label attached to the inside front panel of each transceiver module.

Reinsert the modules and secure them by tightening the screws at the top of each module and in the extractor handles. Described below is an alternate method for obtaining the ESN or IMEI numbers.

If the chassis is not mounted in a rack, provide at least for a one-inch air space below the chassis. This air space is necessary for air-cooling of the power supply and transceiver modules.

After mounting the chassis, follow the grounding practice used with your PBX or other switching equipment. If required, terminate an appropriately sized ground wire at the stainless steel grounding screw on the rear panel of the chassis.

Make sure the switch at the rear panel of the power supply is turned off and connect the supplied AC cord to a suitable 115 VAC outlet.
 Connect the cable of a suitable omni-directional, directional, or patch antenna to the TNC connector at the rear panel of each transceiver module or the TNC connector of the MPLK-D dual-frequency PentaLink antenna combiner.

Turn on the switch on the rear panel of the power supply to activate AC power. The CELLULAR and TELCO dual-color LEDs on the front panel of the power supply will come on and blink red-green. The display on the front panel of each transceiver module will blink briefly and will show all pixels on.

LED Indications

The cellular and telco LEDs can blink in a variety of modes. These modes and the red or green colors indicate the following:

<u>Cellular LED</u>	<u>Indication</u>
Green solid	Cellular mode of operation, all good.
Green dbl (double blink)	Cellular call in telco mode (e.g. incoming call or no dial tone in telco mode).
Green blip	Telco mode of operation, all good.
Red/green	Waiting for cellular registration.
Red blink	Cellular initialization.
Red dbl	No SIM card, no OTA, no setup.
Red solid	Cellular down.
<u>Telco LED</u>	
Green solid	Telco mode, all good
Green blip	Cellular mode.
Green blink	Telco good, manual cellular mode from MODE button
Red/green	Telco local loop, but no dial tone.
Red solid	Telco bad or not present
Red blink	Telco off-hook at startup
Off	Primary set to No-T(elco)

The LED indications are a function of the setup and selected operating modes. The following listing describe how to select these modes by using the MODE and DISPLAY buttons.

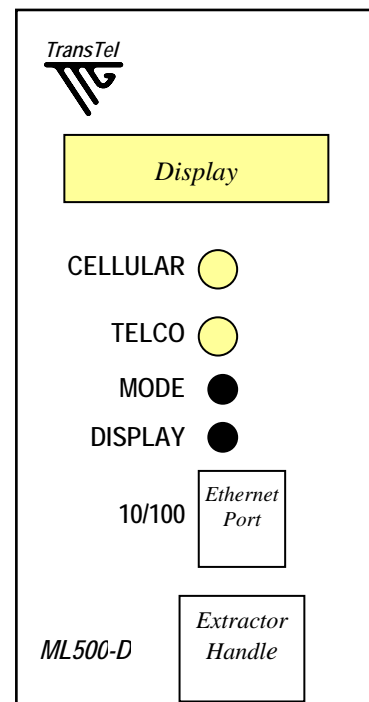


Figure 1. Front panel of ML500D voice and data transceiver module

Setup and Programming Using Mode and Display Buttons.

The result of any action using the mode and display buttons is shown on the display, usually in the form of scrolling text. The latter is indicated as [ST] in the following description of the setup menu. Stationary (non-scrolling text) is indicated by [T].

To make a selection is indicated in the following as *SELECT*. This means *to press the MODE button, if necessary repeatedly, until the desired value or parameter is displayed and then press the DISPLAY button to select that value.*

The mode button scrolls through options from the menu, the display button selects this option for further data input.

STARTUP

LED's blink red and green

Display shows all pixels on

[ST] *TransTel Group ML-500-D <version>*

[ST] *Initializing cellular*

If no SIM card on GSM

[ST] *No SIM Card*

SETUP REQUIRED

If programming required on Alltel or Sprint (or Verizon)

[ST] *Alltel setup required*

or

[ST] *Sprint setup required*

Press MODE button to go to **SETUP** section.

Press/release DISPLAY button go to **DISPLAY** sect..

Press and hold DISPLAY button to go to **MENU** sect.

REGISTRATION

Waiting for registration with cell network

[ST] *Looking for Cell Network*

After registration (scrolls several times)

[ST] *RSSI: <-##> dBm*

Display then continuously shows RSSI <-##>

Press/release DISPLAY button go to **DISPLAY**.

Press and hold DISPLAY button go to **MENU**.

Press MODE button in telco mode to place a cell call.

SETUP

On Alltel

[ST] *Enter SID.*

Number entry required.

On Sprint

[ST] *Enter MSL*

Number entry required.

On Alltel and Sprint (Verizon)

[ST] *Enter MIN.*

Number entry required.

[ST] *Enter MDN*

Number entry required.

SHOW SETUP

On Alltel, cycle through

[T]SID:

[T]<SID value>

Note: First [T]SID then the SID value is displayed.

Press DISPLAY button to cycle through

[T]MDN

[T]<MDN area code>

[T]<MDN prefix>

[T]<MDN last four> *Continued in right column*

Continued from left column.

Press DISPLAY button to cycle through

[T]MIN:

[T]<MIN area code>

[T]<MIN prefix>

[T]<MIN last four>

Press DISPLAY button

[ST] *Values correct??*

SELECT one of

[T]NO - go back to SETUP

[T]Chk (check) - go back to SHOW SETUP

[T]Yes! - go to PROGRAM

[T]Cncl (cancel) - go back to Setup Required.

PROGRAM

[ST] *Programming module*

Go to **Registration** section

DISPLAY

On GSM

Cycle through

[T]MSDN

[T]<MSDN area code>

[T]<MSDN prefix>

[T]<MSDN last four>

Note: First [T]MSDN then the MSDN number is displayed.

Press DISPLAY button. If programmed, cycle through

[T]VCE(voice)

[T]<VCE area code>

[T]<VCE prefix>

[T]<VCE last four>

Press DISPLAY button. If programmed, cycle through

[T]CSD (circuit-switched data):

[T]<CSD area code>

[T]<CSD prefix>

[T]<CSD last four>

Press DISPLAY button. If programmed, cycle through

[T]FAX: See instructions regarding jumpers.

[T]<FAX area code>

[T]<FAX prefix>

[T]<FAX last four>

Press DISPLAY button to cycle through

[T]CID (SIM card ID number):

[T]<digits>

[T]<digits>

[T]<digits>

[T]<digits>

Press DISPLAY button to cycle through

[T]IMEI

[T]<digits>

Continued in left column of page 4.

Continued from right column of page 3.

[T]<digits>
[T]<digits>
[T]<digits>

Press DISPLAY button

On Alltel/Sprint (if module programmed), cycle through

[T]MDN:
[T]<MDN area code>
[T]<MDN prefix>
[T]<MDN last four>

Cycle through

[T]MIN:
[T]<MIN area code>
[T]<MIN prefix>
[T]<MIN last four>

On Alltel cycle through

[T]SID:
[T]<SID value>

On Alltel/Sprint, programmed or not, cycle through

[T]ESN in decimal representation:
[T]<digits>
[T]<digits>
[T]<digits>
[T]ESN in hex representation
[T]<hex digits>
[T]<hex digits>

To set User Busy Call Forward number, cycle through

[T]UBCF
[T]<UBCF area code>
[T]<UBCF prefix>
[T]<UBCF last four>

To set No Answer Call Forward number, cycle through

[T]NACF
[T]<NACF area code>
[T]<NACF prefix>
[T]<NACF last four>

MENU

SELECT one of

[ST]Menu

go back to RSSI

[T]<-##>

[ST]Call Type

SELECT one of

[T]Vce

[T]Fax

[ST]Primary

Continued in right column.

Continued from left column

SELECT one of

[T]TLCO - set telco primary

[T]Cell - set Cell primary

[T]No-T - no telco line expected

[T]Pckt - Packet data enabled for access to

Internet through the Ethernet port via PPPoE (point to point protocol over Ethernet).

The user configures a PPPoE interface on their computer/router. For CDMA, the service name is set to 1XRTT. For GSM, the service name is set to GPRS:APN=<apn> (where <apn> is the value of the APN for GPRS service, for example, GPRS:APN=isp.cingular for the APN isp.cingular). The user name and password are also configured in the PPPoE settings of the computer/router.

[ST] Call Forward

NOTE: a value of 000 000 0000 for CF means disable/turn-off

Enter CF number

[ST] Enter User Busy CF:

Number entry required

[ST] Enter NO-Answer CF:

Number entry required.

To show CF number to cycle through

[T]UBCF

[T]<UBCF area code>

[T]<UBCF prefix>

[T]<UBCF last four>

Press DISPLAY button to cycle through

[T]NOCF (NO answer Call Forward)

[T]<NOCF area code>

[T]<NOCF prefix>

[T]<NOCF last four>

Press DISPLAY button to show

[ST] *Values correct??*

SELECT one of

[T]NO - go to enter CF number

[T]Chk - go to Show CF number

[T]Yes! - set and return to *MENU*

[T]Cncl - cancel and return to *MENU*

[ST] *Program*

To *SETUP* and return to *MENU*

NUMBER ENTRY

Press MODE button, repeatedly if necessary, to select digit

Press DISPLAY button to advance to next digit

For variable length numbers (i.e. SID) select a blank digit (which shows after 9) to end the value.

Alignment of Directional Antenna

If a directional antenna (Yagi or log periodic dipole array) is being used, the RSSI display of the ML500D is useful for positioning the cellular antenna to achieve maximum signal strength. A pc or laptop should be left plugged into the RS-232 port of the MMD transceiver modules.

Obtain the RSSI as described above. Rotate the antenna in 45 degree-degree increments, pause to allow for the signal to stabilize, and check the RSSI readout as previously indicated. When a full circle is completed, note the optimum antenna position.

Signal Alarm

Your ML500D modules are equipped with a circuit that monitors the cellular signal. If the signal is too low (RSSI number smaller than -105 dBm) for acceptable transmission over the cellular network, the cellular LED will turn solid red. At the same time, a relay closes a pair of dry contacts in the terminal block on the right rear side (as viewed from the front) of the armor plate of the ML500D chassis. These contacts can be used to connect an alarm system (not provided by TransTel) to alert the user when the cellular signal is unacceptable or the antenna has been disconnected.

When the signal returns to an acceptable level, the cellular LED will return to a normal green mode. At the same time, the dry contacts in the terminal block on the rear of the chassis are opened.

Primary Interface Settings

As indicated on the previous page, the following primary interface settings are possible:

TELCO (default): Outgoing calls will use the telco interface or fail over cellular.

CELL Outgoing calls will use the cellular interface or fail over telco.

NO-T The telco line will not be used.

PCKT The cellular module is set up to provide internet access.

The following section describes the use of the telco primary mode.

Line Sensor – Telco Primary Mode

Your ML500D is equipped with the TransTel Line Sensor. When you connect the telco line to the RJ11 jack marked **TELCO**, the transceiver module will default to this line and the green **TELCO** LED will be illuminated.

When the telco line is cut or disconnected, the Line Sensor will switch to the cellular mode of operation within five to ten seconds depending on the impedance of the peripheral equipment. In this mode, the Telco LED will turn a solid red.

If use of the telco line is restored or if the telco line is connected again, the Line Sensor will switch the module to the telco mode of operation within five seconds. However, the Line Sensor will not interrupt a call in progress or switch if the cellular line is off-hook.

In the telco mode of operation, the Line Sensor will switch to the cellular mode of operation if the cellular number of the module receives a call. This allows for the convenient check-out of the cellular operating mode even if a telco line is connected. The switch-over is only for the duration of the call and will not occur if a call on the telco line is in progress.

In the telco mode of operation, the module can also be forced to switch to the cellular operating mode by depressing the CELLULAR MODE switch. The module will stay in this operating mode for at least one minute or for the duration of the cellular call even if it exceeds one minute.

For additional questions concerning the operation of the ML500D contact TransTel.

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