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FOREWORD

The South African **Telecommunications Regulatory Authority** issue the technical and functional specifications for **Telecommunication-Line Terminal Equipment (TLTE)**.

The following specifications are available for TLTE:

Specification	Description
TE-001	Standard Specification for Telephone Attachments for Connection to the Public Switched Telephone Network
TE-002	Functional Requirements for Telephone Answering Machines and Recording Equipment
TE-003	Functional Requirements for Repertory Dialling Equipment
TE-004	Functional Requirements for Remote Supervisory Equipment
TE-005	Functional Requirements for Loudspeaking Equipment
TE-006	Functional Requirements for Facsimile Transceivers
TE-007	Functional Requirements for Automatic Call Diverting Equipment
TE-008	Functional Requirements for Equipment for use in Industrial Environments
TE-009	Functional Requirements for Attachments connected to Leased-Line Circuits
TE-010	Functional Requirements for Calling Line Identification (CLI) Customer Premises Equipment (CPE)
TE-011	Reserved
TE-012	Functional Requirements for Second Generation Low-Power Digital Cordless Telephones (CT2); 864,100-868,100 MHz
TE-013	Functional Requirements for Low-Power Cordless Telephones; 46-49 MHz
TE-014	Functional Requirements for Automatic Fee Recording Equipment
TE-015	Functional Requirements for Call Restriction Devices
TE-016	Reserved
TE-017	Reserved
TE-018	Functional Requirements for Data Modems
TE-019	Reserved

Specification TE-009: Functional Requirements For Attachments Connected To Leased-Line Circuits states the requirements for TLTE intended for connection to leased line circuits. Leased line circuits are point-to-point voice grade communications circuits rented from Telkom SA Ltd.

In addition to these requirements, the equipment shall meet all relevant aspects of Specification TE-001.

LIST OF AMENDMENTS

No.	Date	Paragraph
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SPECIFICATION TE-009

FUNCTIONAL REQUIREMENTS FOR TLTE CONNECTED TO LEASED-LINE CIRCUITS

1. GENERAL TECHNICAL REQUIREMENTS

1.1 Impedance presented to line.

The line shall be correctly terminated at all times. The impedance of this termination shall be 600 Ω , with the following provisions:

- 1.1.1 Where the leased line circuit is to be connected by key or switch to either the Telkom terminal equipment or to the TLTE in turn, the provision of **Paragraph 1.1** above, shall apply.
- 1.1.2 Where the TLTE is connected to the line simultaneously with the Telkom terminal equipment, the impedance of the device shall be such that the insertion loss shall be less than 0,5 dB in the frequency range 300 Hz - 3400 Hz.

1.2 Maintenance.

Applicants are required to submit full details of local maintenance, calibration and modification facilities available to them. Unless these arrangements are to the satisfaction of SATRA, the application will not be considered. These facilities are to be maintained for the period that the licensed equipment is in service. Failure to do so will result in the withdrawal of approval.

2. TRANSMISSION TO LINE

2.1 Signal levels and frequency limitations.

- 2.1.1 The maximum permissible voltage between line terminals or between any line terminal and earth is 160 V dc and 100 V rms. ac for frequencies up to 60 Hz,
- 2.1.2 Where the voltage is applied continuously it shall not be possible to exceed a current of 75 mA dc or rms. ac through a resistance of 1000 Ω , for any voltage above 75 V when the resistance is connected between the transmission terminals or between any transmission terminal and earth.
- 2.1.3 Where the voltage is interrupted for signaling purposes, the maximum permissible current is 45 mA dc or rms. ac under the conditions given in **Paragraph 2.1.2**.

2.2 Transmission levels.

- 2.2.1 The maximum one minute mean-power-level permitted is 50 μ W, which corresponds to -13 dBm, or a sinusoidal signal of 0,5 V peak-to-peak when terminated in 600 Ω , for any frequency in the range 300 Hz - 3400 Hz.
- 2.2.2 The maximum power level of individual spectral components of the output signal to line, shall comply with **Chapter 2, paragraph 13.4 and figure 2.8 of Specification TE -001**.

2.3 Noncontinuous signals.

TLTE may send noncontinuous signals at -10 dBm providing the activity time is not more than 30 s in any one minute.

2.4 Part Bandwidth signals.

Where several types of signals are to be transmitted simultaneously the total signal levels must not exceed -13 dBm and the spectral distribution must conform to **Chapter 2, Paragraph 13.4 and Figure 2.8 of Specification TE-001**. The level permitted for individual signals is proportional to the nominal bandwidth used. Therefore, if the bandwidth occupied is 'x' Hz; the permitted one minute mean-power-level is:

$$\text{Mean power level} = -13 - 10 \log (3100/x) \text{ dB.}$$

3. RECEIVING FROM LINE

3.1 Chapter 2, Section 10 of Specification DPT-TE-001 shall apply.

4. SIGNALING

4.1 DC Signaling.

DC circuits can only be provided where both terminals are located within the same local exchange area. Leased line equipment requiring a dc path will not be licensed for general distribution and applications, since the use of the equipment will be governed by the availability of dc circuits in the proposed area. Due to the increasing employment of multi-channel transmission systems, even on circuits as short as 12 km, the provision of dc signaling paths cannot be guaranteed. The use of ac signaling systems, either in the frequency band of 300 Hz - 3400 Hz or at ringing frequencies of 16,67 Hz, are therefore preferred.

4.2 300 Hz - 3400 Hz signaling.

Signals in this frequency band shall conform to **Paragraph 3.2** of this specification. It must be noted that communications in the 300 Hz - 3400 Hz band is not possible for the duration of the ring signal.

4.3 16 Hz - 25 Hz signaling.

Bi-directional ringing can be provided on leased line circuits where ring current transmitted from one terminal is detected, regenerated and applied to the distant terminal.

4.4 Signal generators.

Signal generators and detectors for equipment employing 16 Hz - 25 Hz signaling, shall conform to the following requirements:

4.4.1 Generator:

- a. Frequency : 16,67 Hz to 25 Hz
- b. Output voltage with 4 kΩ load: 70 V to 100 V rms.
- c. Total harmonic distortion: 10 %
- d. Minimum output impedance: 1,5 kΩ.
- e. Minimum duration of CALL/CLEAR signal shall be 1 s.

4.4.2 Detector:

- a. Threshold: 35 V rms. at 16,67 Hz or 25 Hz
- b. Impedance: 4 k Ω minimum.

4.5 Loop resistance.

Applicants should note that a dc loop resistance of up to 3000 Ω may commonly be encountered on these circuits.

5. CONNECTION TO LINE

5.1 Unless specified to the contrary, the connection of any TLTE to leased line circuits, shall be accomplished as follows:

5.1.1 The supplier of the TLTE shall be responsible for installing and maintaining all leased line equipment which shall include a screw terminal tag-block for terminating the transmission line.

5.1.2 Telkom will install and maintain the transmission line up to the tag-block.

5.1.3 The tag-block marks the limit of responsibility between Telkom and the supplier of TLTE in respect of installation and maintenance.

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