6007 Dual Ground-Start-to-Loop-Start Converter Module

CLEI code: MTSCA004*

Contents

1. Description/Application

Description

1.1 The 6007 Dual Ground-Start-to-Loop-Start Converter module interfaces two ground-start circuits with two loop-start circuits, and provides two sets of relay contacts that can be used to indicate line seizure.

Reason for Revision

1.2 This practice section is being revised to correct the 'seizure delay from CO' specification and to convert to the latest practice format.

Application

1.3 Typically, the 6007 is used to provide signaling conversion between a ground-start PBX trunk and a loop-start CO line circuit. The ground extended on the ring lead from the PBX is detected by the loop-current sensing circuit in the 6007, which responds by closing a normally open relay contact on the tip lead. The contact closure on the tip lead extends a ground toward the PBX trunk, which responds by removing its ring-lead ground. As a result, the PBX trunk is converted to loop-start operation, and the 6007 becomes electrically transparent. The slow-release characteristic of the tip-continuity relay keeps the relay operated throughout the dial pulse train.

1.4 Incoming ringing (60Vac minimum) from the CO line is sensed by the 6007, which operates the tip-continuity relay, closing the tip cut-through and extending a ground toward the PBX trunk as an indication of seizure. A nominal 6-second delay circuit maintains the tip-closure throughout the normal 2-second-on/4-second-off ringing pattern.

1.5 The front panel of the 6007 contains two LEDs, 'line A busy' and 'line B busy', that provide a local indication of line seizure. The module also provides two sets of form-C relay contacts for each line that can be used for traffic measurements when connected to a peg-count meter, or for remote busy indications.

1.6 The 6007 is designed to operate on filtered input potentials between -44 and -54Vdc, ground-referenced. The positive side of the supply (Pin 17) should be connected to earth ground and the negative (Pin 35) to -48Vdc office battery. The power supply is protected against input power reversal by a steering diode and against voltage transients by a zener diode.

1.7 The 6007 mounts in one position of a Tellabs Type 10 Mounting Shelf, versions of which are available for relay-rack and apparatus-case installation. In relay-rack applications, up to 12 modules can be mounted across a 19-inch rack, while up to 14 modules can be mounted across a 23-inch rack. In either case, 6 inches of vertical rack space is used. **See the note following paragraph 2.2 for special mounting instructions for applications involving long cable runs.**

2. Installation

Inspection

2.1 The 6007 Dual Ground-Start-to-Loop-Start Converter module should be visually inspected upon arrival to find possible damage incurred during shipment. If damage is noted, a claim should immediately be filed with the carrier. If stored, the module should be visually inspected again prior to installation.

Mounting

2.2 The 6007 module mounts in one position of a Tellabs Type 10 Mounting Shelf. The module plugs physically and electrically into a 56-pin connector at the rear of the shelf.

Note: On long cable runs, to minimize false tripping due to the effects of noise spikes generated by the building's wiring, it is recommended that the 6007 be mounted in close proximity to its associated PBX.

Installer Connections

2.3 Before making any connections to the mounting shelf, make sure that power is **off** and modules are **removed**. Modules should be put into place only **after** wiring is completed.

2.4 Table 2-1 lists external connections to the 6007 module. All connections are made via wire wrapping at the 56-pin connector at the rear of the module's mounting shelf position. Pin numbers are found on the body of the connector.

Options and Alignment

2.5 The 6007 contains no options and requires no alignment.

Connect:	To pin:
GROUND-START PBX TRUNK A TIP	55
GROUND-START PBX TRUNK A RING	49
GROUND-START PBX TRUNK B TIP	5
GROUND-START PBX TRUNK B RING	15
LOOP-START CO LINE A TIP	41
LOOP-START CO LINE A RING	47
LOOP-START CO LINE B TIP	7
Table 2-1 continued on next page	

Table 2-1 External Connections to 6007

Connect:	To pin:
LOOP-START CO LINE B RING	13
*N.O. (normally open K1 contact)	29
*COM. (common K1 contact)	33
*N.C. (normally closed K1 contact)	31
*N.O. (normally open K1 contact)	45
*COM. (common K1 contact)	43
*N.C. (normally closed K1 contact)	51
**N.O. (normally open K2 contact)	11
**COM. (common K2 contact)	19
**N.C. (normally closed K2 contact)	21
**N.O. (normally open K2 contact)	23
**COM. (common K2 contact)	25
**N.C. (normally closed K2 contact)	27
-48Vdc (office battery)	35
Gnd (ground)	17
*Circuit-A external relay contacts **Circuit-B external relay contacts	

Table 2-1 External Connections to 6007

3. Circuit Description

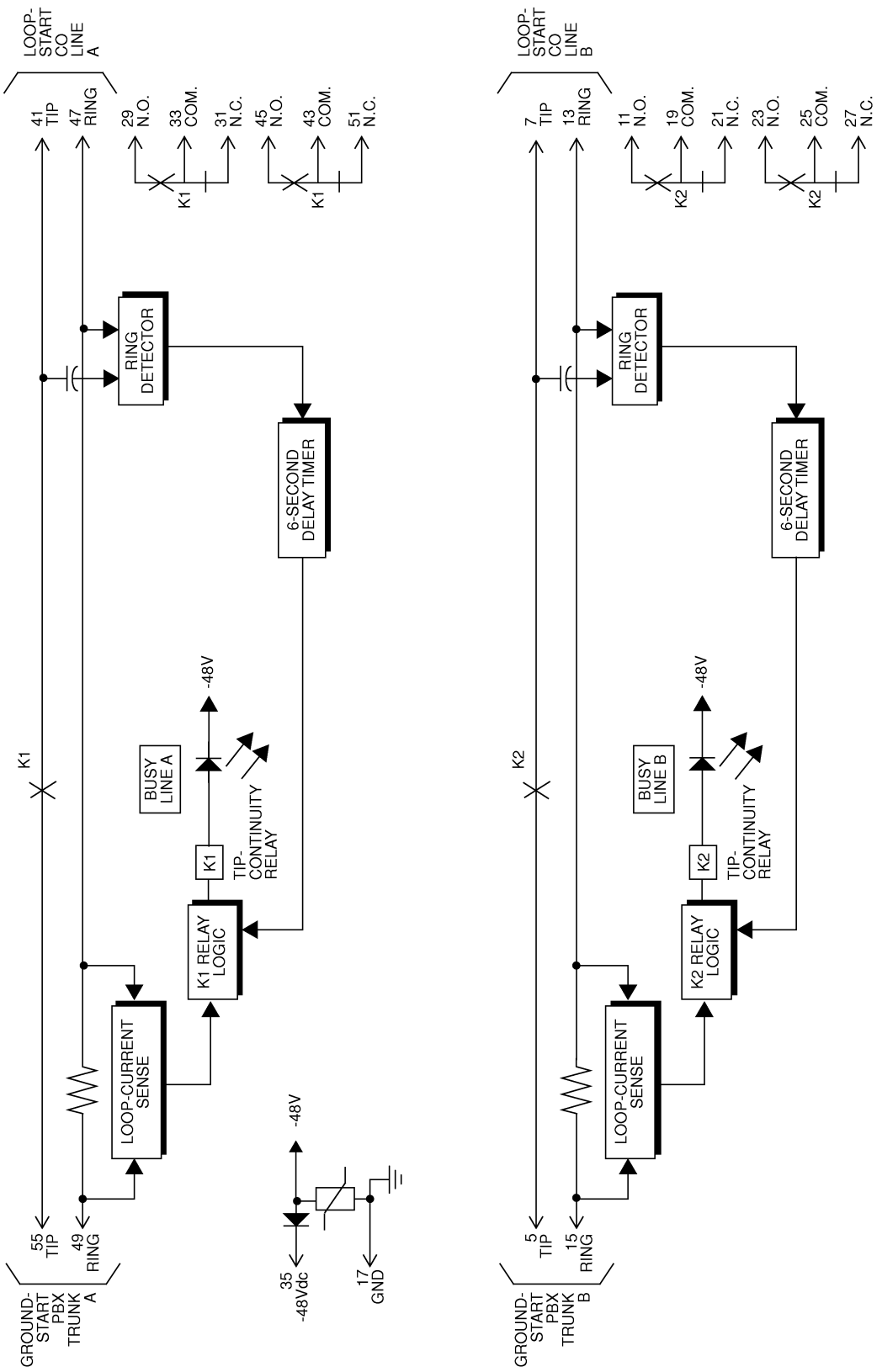
3.1 This circuit description is designed to familiarize you with the 6007 Dual Ground-Start-to-Loop-Start Converter module for engineering and application purposes only. Attempts to test or troubleshoot the 6007 internally are not recommended. Troubleshooting procedures should be limited to those prescribed in Section 6. of this practice. Refer to the Block Diagram, Section 4. of this practice, as an aid in following the circuit description. Since the 6007 contains two identical circuits, the following description covers only circuit A.

3.2 When a call is originated through the PBX, ground-start PBX Trunk A extends a ring ground toward Pin 49 of the 6007 as a request for service. The ground on Pin 49 causes current to flow in the 6007's ring lead, which is detected by the 'loop-current sense circuitry'. After a nominal 10ms delay, the 'K1 relay logic' circuitry operates relay K1, closing its normally open contact in the tip lead. The tip ground from loop-start CO Line A then converts the trunk to loop operation. Current flowing in the loop holds the 'tip-continuity relay' in the operated condition for the duration of the call. In addition to the contact in the tip lead, relay K1 also provides two sets of form-C contacts that can be connected to a peg-count meter for traffic monitoring or used to provide remote busy indications.

3.3 Ringing from loop-start CO Line A is sensed by the 'ringing detector' and, after a nominal delay of 100ms, the signal from this circuit operates K1 as described in paragraph 3.2. The '6-second delay timer' bridges the silent period in standard ringing patterns to ensure that the 'K1 relay logic' circuitry maintains the K1 relay in an operated condition. After ground-start PBX Trunk A provides answer supervision, current flow in the loop holds K1 operated.

3.4 A series diode in the negative input lead protects the circuit against reversed input power connections, and a high-voltage transient suppressor between input battery and ground limits high-level supply transients to a safe level.

4. Block Diagram



5. Specifications

loop resistance range	• 0 to 1500 ohms
ringing voltage	• 60Vac minimum, 17 to 33Hz
seizure delay from CO	• 100±60ms
seizure delay from PBX	• 10±5ms
PBX release delay	• 150±50ms
K1 or K2 release delay after CO ringing	• 5 to 8 seconds
power requirements	• voltage: -44 to -54Vdc, filtered, ground referenced • current: idle, 15mA; one circuit busy, 30mA; both circuits busy, 45mA
operating environment	• 20° to 130°F (-7° to 54°C), humidity to 95% (no condensation)
dimensions	• 5.58 inches (14.17cm) high • 1.42 inches (3.61cm) wide • 5.96 inches (15.14cm) deep
weight	• 7 ounces (198g)
mounting	• relay rack or apparatus case via one position of Tellabs Type 10 Mounting Shelf

6. Troubleshooting, Technical Assistance, Repair and Return

Using Testing or Troubleshooting Procedures

6.1 The Testing Guide Checklist in this section may be used to assist in the installation, testing, or troubleshooting of the 6007 Dual Ground-Start-to-Loop-Start Converter module. The testing and troubleshooting procedures in this practice are intended as an aid in the localization of trouble to the specific equipment covered in this practice. If a situation arises that is not covered, contact Tellabs Technical Assistance via telephone. If the equipment seems to be defective, substitute new equipment (if possible) and conduct the test again. If the substitute operates correctly, the original should be considered defective and returned to Tellabs, as directed in paragraph 6.3. We strongly recommend that no internal (component-level) testing or repairs be attempted on the equipment. Unauthorized testing or repairs may void its warranty.

Test	Test procedure	Normal result	If normal conditions are not met, verify:
Outgoing call on Line A	Initiate call through PBX using Trunk A, or apply ground to Pin 49	'line A busy' LED lights	Power Wiring Replace module and retest
Outgoing call on Line B	Initiate call through PBX using Trunk B, or apply ground to Pin 15	'line B busy' LED lights	Power Wiring Replace module and retest
Incoming call on Line A	Apply ringing (50Vac minimum, 16 to 33Hz) across Pins 41 and 47	'line A busy' LED lights	Power Wiring Replace module and retest
Incoming call on Line B	Apply ringing (50Vac minimum, 16 to 33Hz) across Pins 7 and 13	'line B busy' LED lights	Power Wiring Replace module and retest

Table 6-1 Testing Guide Checklist

Technical Assistance

6.2 Contact Tellabs Technical Assistance as follows:

Canada	• Tellabs Canada, Mississauga, Ontario. Telephone 416/858-2058; FAX 416/858-0418
Europe	• Tellabs Ltd., County Clare, Ireland. Telephone +353-61-471433; FAX +353-61-471000/472004 • Tellabs Ltd., Dublin, Ireland. Telephone +353-1-676-6333; FAX +353-1-676-2646 • Tellabs International, Inc., Stockholm, Sweden. Telephone +46-8-678-4040; FAX +46-8-678-4041 • Tellabs U.K. Ltd., Buckinghamshire, England. Telephone +44-628-660345; FAX +44-628-667735 • Tellabs SA, Brussels, Belgium. Telephone +32-2-646-5380; FAX +32-2-646-6811
Middle East	• Tellabs International, Inc., Dubai, U.A.E. Telephone +971-4-373250; FAX +971-4-376526 • Tellabs Turkey A.S., Ankara, Turkiye. Telephone +90-4-467-4330; FAX +90-4-467-6664
Australia	• Tellabs Pty Ltd., North Rocks, NSW, Australia. Telephone +61.2.890.1918; FAX +61.2.890.1817 • Tellabs N.Z. Ltd., Wellington, New Zealand. Telephone +64-4-495-2130; FAX +64-4-495-2133
Far East	• Tellabs H.K. Ltd., Hong Kong. Telephone +852-866-2983; FAX +852-866-2965 • Tellabs International, Inc., Seoul, South Korea. Telephone +82-2-589-0667 or -0668; FAX +82-2-589-0669
Japan	• Tellabs Japan, Chiyoda-ku, Tokyo 102 Japan. Telephone +81-3-3237-7977; FAX +81-3-3239-6990
USA, Caribbean, and South America	• USA and Puerto Rico, telephone (800) 443-5555. All other Caribbean and South American locations, or if the toll-free number is busy, telephone 708/969-8800; FAX 708/512-7097
Central America	• Tellabs S.A. DE C.V., Mexico. Telephone 525-282-1107, -1432, -1050, or -0981; FAX 525-282-0218

Repair and Return

6.3 If equipment needs repair, contact Tellabs' Product Services Department with the equipment's model and issue numbers and warranty date code. You will be issued a Material Return Authorization (MRA) number and instructions on how and where to return the equipment.

Canada	• Tellabs Canada Ltd., Mississauga, Ontario. Telephone 416/858-2058; FAX 416/858-0418
Europe	• Tellabs Ltd., County Clare, Ireland. Telephone +353-61-471433; FAX +353-61-471000/472004
USA and Other International	• Tellabs Operations, Inc., Lisle, IL, USA. Telephone (800) 443-5555 (USA and Puerto Rico only); 708/969-8800 (other International); FAX 708/852-7346 (both)

6.4 Repair service includes an attempt to remove any permanent markings made by customers on Tellabs equipment. If equipment must be marked, it should be done with nonpermanent materials and in a manner consistent with the correct handling of electrostatically sensitive devices.