

Tellabs® 1000 Multi-Service Access Series 2/4-Wire Special Services Plug-in Card (SS 2/4)

Overview

The Tellabs® 1000 Multi-Service Access (MSA) Series 2/4-Wire Special Service plug-in card (SS 2/4) offers a multitude of two-wire and four-wire non-locally switched and non-switched intra-LATA voice and data services. These include Foreign Exchange (FXS) and long-distance lines, WATS, 800, Centrex, secretarial and off-premises extension lines as well as two-point and multi-point private line services. The SS 2/4 card supports two circuits. Each circuit on the SS 2/4 card can be used as a two-wire or four-wire circuit. The card supports FXS, Foreign Exchange Office (FXO), Direct Inward Dialing (DID), Equalized Transmission Only (ETO) Private Branch eXchange (PBX) and Private Line, Automatic Ringdown (PLAR) functionality.

FXO or FXS service can be ordered from telcom service providers outside the subscriber's exchange area. With this service, a user can pick up a phone in one city and receive dial tone and a local number from a "foreign" city. FX trunks provide the connection. Analog or T-1 links transport the signal.

Connecting POTS telephones to a computer telephony system via T-1 links requires a channel bank configured with FX-type connections. Generating a call from the POTS set to the computer telephony system requires a configured FXO connection. Generating a call from the computer telephony system to the POTS set requires a configured FXS connection.

For all signaling modes, the Tellabs 1000 MSA series SS 2/4 plug-in card supports full equalization for two-wire interfaces, and built-in precision balancing with each equalization setting for echo cancellation over any loop. For four-wire interfaces, post-equalization (transmit direction only) is provided. These equalization settings are available via provisionable selections for different cable configurations. Passive, mismatch equalization is also available in four-wire mode, via selectable 150 ohm/600 ohm settings, for both transmit and receive directions.

Also available in four-wire mode is selectable normal or reversed simplex signaling. In both two-wire and four-wire interfaces, provisionable, wide range gain/attenuation settings are provided. For ETO mode, both sourcing or sinking sealing current options are available when sealing current is required. The SS 2/4 card is not software upgradeable.

Features and Benefits

- Two circuits per card, each able to support two- or four- wire operation
- Two- or four-wire FXO
- Two- and four-wire FXS
- Two- and four-wire ETO
- Two- and four-wire PLAR
- Two- and four-wire DID
- Equalization
- Gain transfer
- Normal or reverse simplex
- Loop start or ground start

LEDs on the SS 2/4 faceplate indicate the following:

- A red Fail — a hardware failure is detected on the card or the card is unable to communicate with the CPU
- A green BUSY — either channel is in any state other than Idle or Invalid Signaling, and no hardware failure is detected on the card

Specifications

Signaling

- Signaling Types (two-wire and four-wire)
- D4 FXS, FXO, loop start and ground start
- D4 DPO, D4 DPT, TR-8 DPT, TR-8 FXS
- D4 PLAR, D4 FXS/PLAR, D4 PLAR D4, ETO

Current Sink Interface

- End-to-end signaling delay (normal and reverse battery): < 50 ms
- Wink distortion for any off wink > 50 ms: ±15 ms
- On-hook interval distortion for intervals > 50 ms: ±25 ms
- Maximum DC supervisory range: ≤ 1600 Ohms
- Ring Detection: < 100 ms
- AC Ringing load (20 Hz): > 2.3 k Ohms but < 4.0 k Ohms
- Nominal DC input resistance: Selectable — 500 ohms, 250 Ohms
- Ring Ground resistance: 600 Ohms

Current Feed Interface

- End-to-end signaling delay (normal and reverse battery): < 50 ms
- Wink distortion for any off wink > 50 ms: ± 15 ms
- Maximum DC supervisory range
 - Includes 1600 ohms maximum cable resistance plus 430 Ohms for station: $\leq 2,030$ Ohms
- Off-hook detection threshold: < 2 k Ohms
- On-hook detection threshold: > 10 k Ohms
- Loop current: Typically 25 to 30 mA; minimum 20 mA at 2030 Ohms
- Ring trip delay: < 150 ms
- Open circuit voltage: < -43V

Audio

- Transmit gain adjustment (towards DLC)
 - Two-wire terminal mode: -5.0 dB to +4.5 dB
 - Two-wire cable mode: 0.0 dB to +9.0 dB
 - Four-wire terminal mode: -7.0 dB to +17.5 dB
 - Four-wire cable mode: -6.0 dB to +9.0 dB
- Receive gain adjustment (from DLC)
 - Two-wire terminal mode: -10.0 dB to 0.0 dB
 - Two-wire cable mode: +6.0 dB to -9.0 dB
 - Four-wire terminal mode: -16.0 dB to +8.5 dB
 - Four-wire Cable mode: -9.0 dB to +6.0 dB
- Line impedance
 - Two-wire terminal mode (COT and RST): selectable 600 ohms + 2.16 μ F or 900 ohms + 2.16 μ F
 - Two-wire cable mode (RST and COT): 900 ohms + 2.16 μ F
 - Four-wire Terminal mode: 600 ohms
 - Four-wire Cable mode: Selectable 150 ohms or 600 ohms for unloaded cable; fixed 1200 ohms for loaded cable

Return loss

- At RT with COT in terminal mode:
 - ERL: 19 dB min
 - SRL: 11 dB min
- At COT with RT in terminal mode:
 - ERL: 22 dB min
 - SRL: 14 dB min
- At RT with COT in cable mode:
 - ERL: 15 dB min
 - SRL: 9 dB min
- At COT with RT in cable mode:
 - ERL: 10 dB min
 - SRL: 5 dB min
- Longitudinal balance:
 - 200 Hz to 2 kHz, > 58 dB
 - 3 kHz, > 53 dB
- Idle channel noise: < 20 dBmC

Equalization

- Meets GR-57-CORE requirements for attenuation distortion for supported cable configurations.
 - Two W cable mode: active equalization provided in both directions of transmission.
 - Four W cable mode: active post-equalization in transmit direction. Passive equalization using 150 ohm mismatch also provided.
- Supported cable configurations:
 - Two-wire and four-wire terminal interface: up to 3,000 feet of intraoffice cable, but = 1.5 dB 1 kHz loss
 - Two-wire and four-wire cable interface: maximum cable length is limited to 10 dB 1 kHz loss, or 1,600 Ohms DC cable resistance.

- Supported cable facilities
 - Nonloaded cable: 19, 22, 24 and 26 gauges are supported up to 18,000 ft, including bridge taps. Maximum bridge tap length is limited to 6,000 ft. for two-wire and 12,000 ft. for four-wire.
- Mixed gauges are allowed with any combination. All loops longer than 18,000 ft. must use H-88 loading.
 - Loaded cable: Only H-88 loading is supported. Gauges of 19, 22, 24, and 26 are supported, including any gauge combinations. Maximum customer end-section length including bridge taps is 9,000 ft. for two-wire and 15,000 ft. for four-wire (from last load coil). No bridge taps are allowed in, or between, the loaded sections.

Environmental

- Operating temperature: -40° to +149° F (-40° to +65° C)
- Humidity (relative): 5–95% noncondensing
- Average power consumption: 3.0 W
- Maximum power consumption: 8.8 W

Dimensions

- Height: 5.125 in (13.018 cm)
- Width: 0.563 in (1.429 cm)
- Depth: 10.5 in (26.67 cm)
- Weight: 0.5 lb (0.23 kg)

Compliance

- Telcordia
- GR-57-CORE
- TR-000335
- GR-1089-CORE (for lightning and power cross)

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