

Legato Telecommunications Interface



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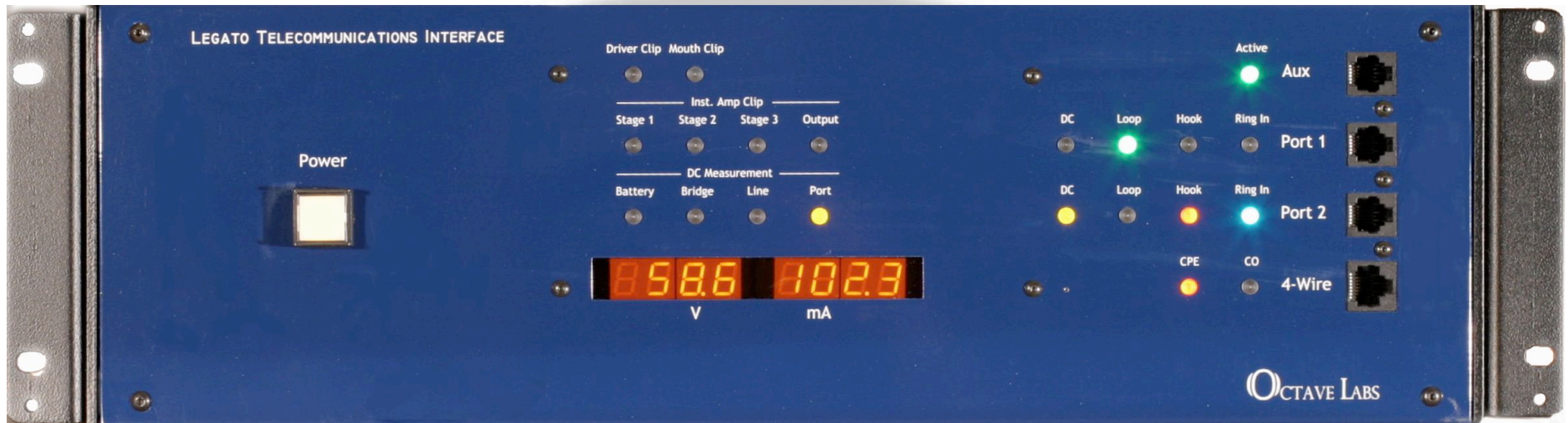
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Features and Uses:

- Testing analog telephones, speakerphones, conferencing systems, PBX systems, voice gateways, line cards, and other telecommunications equipment
- Test circuits available for performing electroacoustic measurements in compliance with TIA-470, IEEE1329, and TBR38
- Telecom to data acquisition interface supports a variety of electroacoustic test platforms
- USB control for easy integration with automated test systems

The Legato Telecommunications Interface from Octave Labs provides electrical test circuits needed for analog telecommunications testing, and provides integrated USB control to interface with electroacoustic test platforms. The Legato makes repeatable measurements possible with all electrical and acoustical ports working together as a calibrated, stable, and controlled system.

The Legato extends the capabilities of electroacoustic test platforms by providing a means to establish calls with a wide

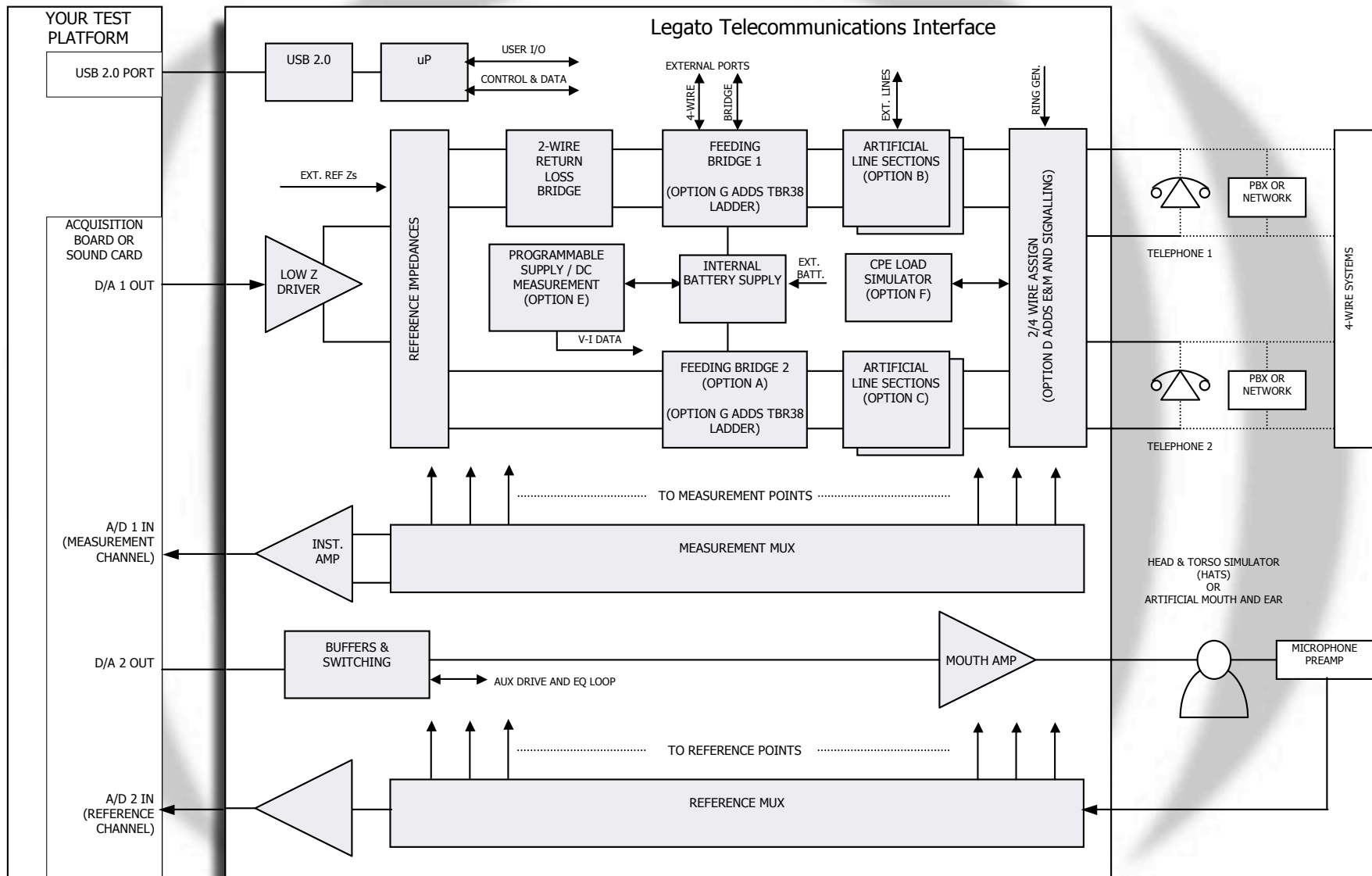
variety of telecommunication interfaces. Since the architecture supports two talk paths, Legato can be configured to negotiate 2-wire, simultaneous 2-wire, and 4-wire connections. With optional support for 4 to 8 wire E&M interfaces the Legato has the ability to establish connections with analog ports on digital systems, such as PBXs, VoIP gateways, and channel banks.

AC mains, audio, and digital isolation are provided allowing the Legato to be located remotely from systems under test. Systems under test may reside outside the lab in telecom closets or air-conditioned IT rooms.

The interface is a clean and complete solution. All control functions are accessible from the USB 2.0 interface port. Manual intervention typically encountered in required telecommunications testing is greatly reduced. This can result in fewer measurement errors, faster regulatory approvals, and reduced time-to-market. With the Legato, standard PC soundcards, acquisition boards, and other integrated test platforms can be used for telecommunication testing.

Precision reference impedances and feeding bridge are provided. A second feeding bridge and two line simulation banks are available as options. An internal battery supply is provided. Options permit feeding bridge voltage, current, and resistance to be controlled and DUT V-I characteristics to be measured.

Legato System Diagram



Measured V-I values are displayed on the front panel and transmitted over the USB bus.

For higher accuracy and efficient control, analog stimulus and measured signals are isolated, conditioned, amplified, and switched as required. A high headroom calibrated power amplifier is provided to drive your mouth simulator. It is capable driving mouths with high crest factor signals (such as speech and P.50) from the test platform without clipping.

Under USB control, variables in the signal chain can be altered during testing to assess DUT performance under many conditions. Values can be measured at any point in the signal chain. Return loss and longitudinal balance measurements are fully supported.

For flexibility, connections to external bridges, battery feeds, reference impedances, artificial lines, reference codecs and other test equipment are provided. An external ring generator is required for ring-out functionality. An auxiliary port on the front panel allows calls to be established with PBXs and line cards prior to testing.

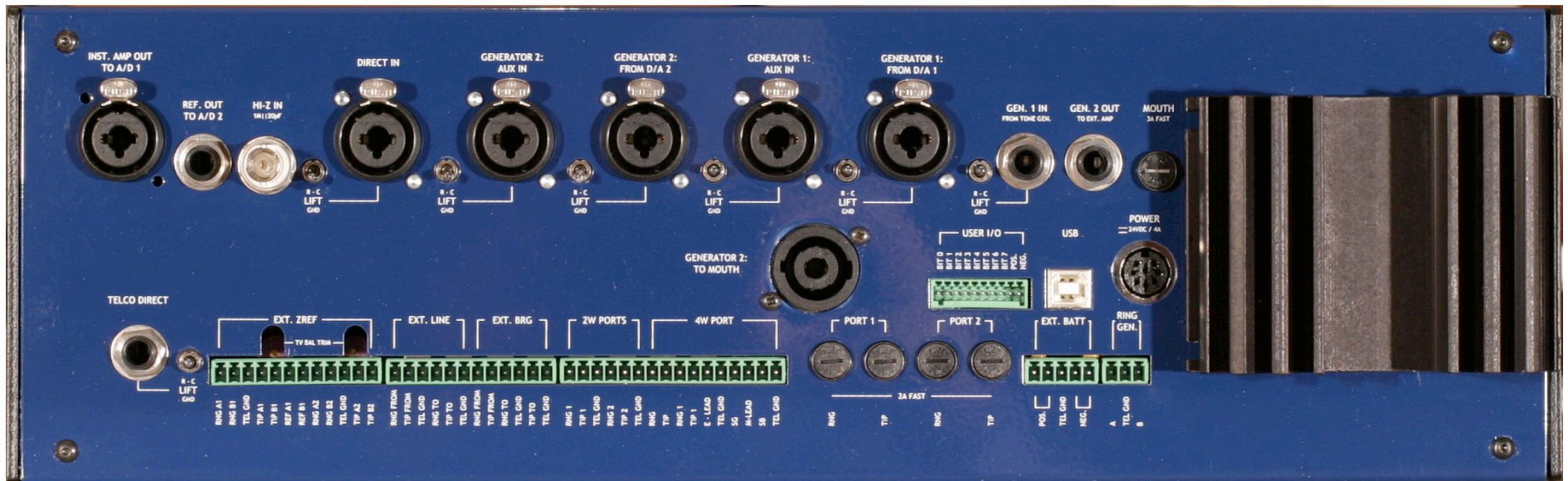
Preliminary Specifications

Power Input: 24VDC, 120W max – provided from an external, regionally approved mains-to-24VDC supply

Control Interface: USB 2.0

Available Options:

- Option A – Second feeding bridge
- Option B – Artificial Lines Bank 1 (up to 8 sections)
 - B01 or C01 – Four TIA470 line sections
 - Bxx or Cxx – Custom lines upon request
- Option C – Artificial Lines Bank 2 (up to 8 sections)
 - B01 or C01 – Four TIA470 line sections
 - Bxx or Cxx – Custom lines upon request
- Option D – Signaling options:
 - E&M types I – V; CO and CPE modes
 - Loop hold for both paths
- Option E – Programmable Supply & DC Measurement:
 - Feeding 1 port: $V_{limit} = 0$ to 60V in 100mV steps; $I_{limit} = 10\text{mA}$ to 150mA in 1mA steps
 - Feeding 2 ports: $V_{limit} = 0$ to 60V; $I_{limit} = 300\text{mA}$
 - Battery and DUT V-I displayed on front panel & transmitted via USB



- Option F – CPE Load Simulator per TIA470 requirements
- Option G – TBR38 R-Ladder for Feeding Bridge
 - R adjustable from 200Ω to 3.4KΩ in 25Ω steps
 - Can be fitted to either or both feeding bridge cards

Internal Battery Supply:

- Can be manually set from 20 to 60VDC; $I_{limit} = 300\text{mA}$
- Battery reversal and float provided
- Positive or negative terminal of battery can be ground

Instrumentation Amplifier: Isolated; $Z_{in} = 100\text{K}\Omega$; gain programmable from -40 to +40dB in 16 steps; -20 to +60dB for Hi-Z and Direct inputs

Artificial Mouth Interface:

- +26.4dB $\pm 0.1\text{dB}$ voltage gain
- 10W_{RMS} continuous output power into 4Ω
- 50W peak power for high crest factor test signals

Reference Impedances: Standard bridge includes return loss Z_{ref} and $Z_{ref}/2$; only $Z_{ref}/2$ for optional bridge

- Included: 900Ω, 600Ω, TBR38 [270Ω + (750Ω || 150nF)]
- One user configurable internal complex Zref set
- Rear panel connections for external Zref sets

Feeding Bridges: Insertion loss & return loss exceed TBR38 and TIA470 requirements

- R = 400Ω fixed (customizable; see Option G for programmable R-Ladder)
- L = 2 x $\geq 10\text{H}$ matched $\leq 3\%$
- C = 2 x $\geq 100\mu\text{F}$ matched $\leq 0.1\%$
- As an option 500uF electrolytic caps (20% tolerance) are available
- 2-Wire wet or dry
- Simultaneous 2-Wire wet or dry with Option A
- 4-Wire wet or dry

Sound Card / Acquisition Board Interface:

- D/A In: 50KΩ balanced; 25KΩ unbalanced; +20dBV maximum input; programmable +10 /+20dB receive path gain
- A/D Out: 100Ω balanced or unbalanced; +20dBV maximum output level

Front panel I/O and indicators:

- 3 x RJ-11 – one for each 2-wire port and Aux port
- 1 x RJ-45 – for 4-wire; pinout is user configurable
- Indicators for each 2-wire port: Hook, Loop, Terminated, Inbound Ring
- Front panel indication of measured DC voltage and current and measurement location (Option E only)
- Indicators for E&M enabled 4-wire port (Option D only): CO Off-Hook, CPE Off-Hook
- Clipping indicators for four instrumentation amp stages, low impedance line driver, and artificial mouth amplifier

Auxiliary I/O:

- 8 bits of user definable, USB controlled I/O
- Auxiliary generator inputs
- Auxiliary analyzer outputs
- Direct instrumentation amplifier input for general testing and measurement: 50KΩ balanced and 1MΩ || 20pF unbalanced
- Programmable reference channel output for dual channel analyzers
- Phoenix Contact 3.5mm Combicon connectors provided on the rear panel for external devices:
 - Ring generator
 - Auxiliary battery
 - Line simulators
 - Reference impedances
 - Paralleled pins for front 2 & 4-wire connections

Dimensions: 19" EIA 3U rack-mountable enclosure; dimensions with rack ears removed: 17"W x 5.25"H x 16"D

NOTE: Specifications are subject to change. Please contact Octave Labs for the most current information, questions about this product, or any requests for customization.

