

System 824

SLM/RTA

Larson
Davis



Everything you need...

The Larson Davis System 824 combines sound level meter and real-time analyzer capabilities in a small, rugged package. It empowers you with five different virtual instruments in one user-friendly hand held design.

1 Integrating Sound Level Meter (ISM) meeting Type 1 Standards with simultaneous measurement of sound pressure levels using fast, slow, and impulse detectors, for A, C, and flat frequency weightings which we call **ANY LEVEL™**. It measures 48 sound pressure parameters at once! All this with a 105 dB linearity range!

Sound Spectrum Analyzer (SSA) with **ANY LEVEL™** simultaneous sound pressure level measurement, real-time 1/3 octave frequency analysis, spectral Lns and multiple time histories. This is your *do everything at once* instrument.

Logging Sound Level Meter (LOG) provides data gathering of **ANY LEVEL™** broadband sound pressure levels. Advanced data logging over user-defined time intervals with complete statistical information.

Real Time Frequency Analyzer (RTA) optimized for characterizing steady state or high-speed transient events with 1/1 and 1/3 octave analysis over a 20 kHz frequency range. Includes advanced triggering functions, Autostore ByTime, direct RT60 calculation, RC and NCB curves.

5 Fast Fourier Transform Analyzer (FFT) with 400-line resolution from 1 Hz to 20 kHz for specific frequency investigations. Includes snapshot data storage, THD calculations, user definable linear units, and more.



Research & Development

- Building / Room Acoustics
- Statistics
- Product Noise Testing
- Machinery Noise Reduction
- Vibration Measurements



Environmental Noise

- Community Noise
- Aircraft Noise
- Transportation Noise
- Industrial Noise
- Transient Capture
- General Surveys



Industrial Hygiene

- Audiometer Calibration
- Workplace Noise Evaluation



...in the palm of your hand!



An Acoustic Chameleon

You no longer have to go through an equipment case full of acoustic instruments to choose the proper tool for the job. The System 824 is a quick-change artist, offering the following virtual instruments with the stroke of a key



LIST

Integrating Sound Level Meter (ISM)

This easy to use “point and shoot” meter provides a large 105dB (A) linearity range and a special feature we call **ANY LEVEL™**. You no longer have to set up the instrument before you start your measurement because the 824 ISM will measure sound with “any” frequency and “any” time weighting simultaneously. The 824 ISM measures Slow, Fast, Impulse, Peak and time-weighted average (LEQ) levels for A, C and Flat frequency weightings—all at the same time! The BACK-ERASE feature will prove useful in removing unwanted data from a measurement in case your test is disturbed by undesirable noise. Up to 32 seconds of prior data can be evaluated and edited as desired.

ASS

Sound Spectrum Analyzer (SSA)

Take an **ANY LEVEL™** sound level meter, add a real-time spectrum with statistics and time histories, and you have a powerful tool for analyzing short or long duration noise problems. The 1/3 octave RTA offers 33 filters from 12.5Hz up to 20kHz with both instantaneous and LEQ spectra displays; 1/1 octave display, and A, C, or Flat weighting of the frequency spectrum. Time data may also be stored in an advanced 'pick and choose' time history with records stored as fast as eight times per second and in a statistical interval history for a longer term time record. Statistical features include six calculated LN for broadband and spectra and a graph of all broadband percentiles from 1 to 99.



SHOT

Logging Sound Level Meter (LOG)

A Larson Davis hallmark, the Logging SLM will log your selected data in its advanced “pick and choose” time history, statistical interval history, daily history, event history, and multiple histogram tables. This **ANY LEVEL™** sound level meter has a very high dynamic range that makes it perfect for unattended measurements. With efficient memory usage and two megabytes of memory, the 824 logging instrument will record the data you need. Many measurements can be stored in the memory at the same time as well; even data from other instrument types such as the SSA, RTA or ISM. Special measurements such as SEL, Hourly-Noise-Level, LDN & CNEL make this a great environmental analyzer. With noise dose, sound exposure and L_{Ceq} - L_{Aeq}, it is highly suited for precision worker / area exposure measurements, especially if frequency data is desired.



Easy-On-You Interface

The System 824 was designed to be easy to Hold, Use, Carry, View...easy on You!

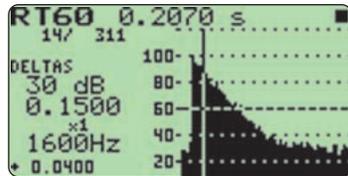
You will appreciate the comfort and feel of the 824 with its compact lightweight design, sleek shape, and rubberized grips. The result is an instrument that offers true one hand operation.

Easy on the Environment

Each rechargeable NiMH battery pack can keep over 800 batteries out of our landfills. Protect the environment and save money!

High Speed Real Time Frequency Analyzer (RTA)

This option is ideal for measuring and analyzing pure tones, machinery vibration levels, and noise reduction effectiveness. It provides rapid automatic measurement and storage of 1/3 or 1/1 octave band data. The **Autostore ByTime** feature of the RTA option can store up to 400 spectra per second. With advanced triggering capability, it can capture most any type of transient event, giving the user superior *hands off* data gathering.



Whether the noise event is an aircraft flyover or an impulsive noise such as a pistol shot, the 824 is able to capture its frequency information. After it is captured, it is stored automatically in sequence. If reverberation time is needed, the 824 provides direct calculation of RT60 over the time-decay profiles of each frequency band. If your interest is in the evaluation of room parameters as required by ANSI S12.2-1995, the 824 is equipped with RC and NCB at the touch of a button. This option is perfect for airborne sound transmission loss, HVAC noise studies, and transient event capture.

Complete your system with the SRC20 Noise Source and powerful software



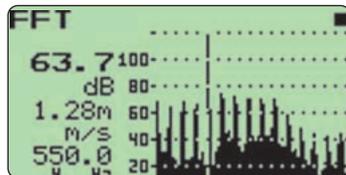
The SRC20 digital signal generator is ideal for laboratory and field tests. It provides extremely stable and repeatable sine, swept sine, pink and white noise signals for reverberation measurements, vibration excitation, audio system equalization, and electronic measurements. With the 824-RTA triggering capabilities, you have a very portable system where source and analyzer do not have to be linked by cables.

DNA: Data, Navigation & Analysis

DNA™ software includes architectural acoustics wizards and extensive reporting capabilities for a complete solution.

Fast Fourier Transform Analyzer (FFT)

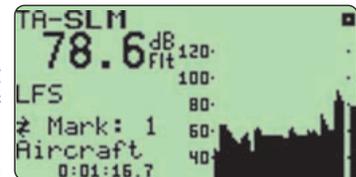
When greater frequency determination is required, this feature offers 400-line FFT analysis with upper frequency bands adjustable from 200 Hz to 20 kHz. With selectable time windows (Hanning, rectangular, and flat top), flexible averaging and user defined linear units showing the actual input voltage, the System 824 provides a lot of versatility in a hand held FFT analyzer. A full range of accessories allows you to quickly interface with accelerometers or direct signals to measure vibration levels, frequency or even total harmonic distortion (THD). Additionally, there are snapshot data storage and display zoom with a factor of 2, 4, or 8.



Tonality Analyzer, TA-LARM (TAL)

This specialty instrument is used to perform the complex tonality calculations required by DIN 45681. Tonal components in a sound generally accentuate its unpleasant nature (e.g. whining turbine, howling wind). The TAL option contains an **ANY LEVEL™** sound level meter with the advanced time history and time history markers (used to identify noise sources such as aircraft, truck, animal, etc.), RTA with 1/3 octave filters from 8Hz to 12.5kHz, and a tonality analyzer.

The tonal parameters measured are the frequency of a dominant tone (f_T), the level of the tone (L_T), the bandwidth of the tonal group (ΔF), the level of the group (L_G) and difference of the two levels ($L_T - L_G$). The SLM measures L_A , L_C , L_{Aeq} , L_{Ceq} , L_{Amax} , L_{Cmax} , L_{AFTM5} , L_{95} , and $L_{Ceq} - L_{Aeq}$. A snapshot history is provided to store and display data from the various modes.



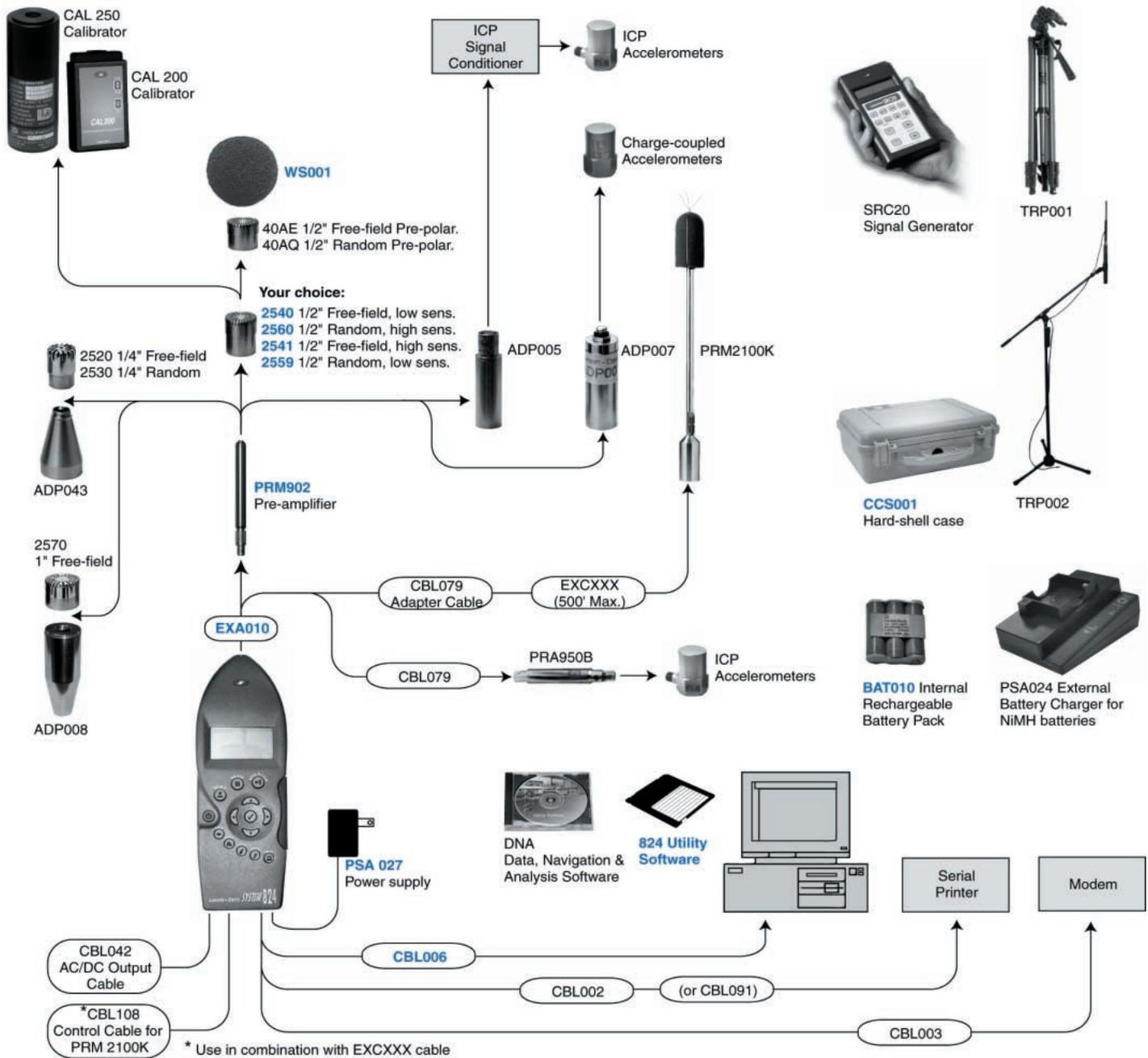
Modem Capability

The 824 can be connected to a modem for remote data acquisition from unattended portable or permanent monitors. *Contact Larson Davis for information on short and long term environmental protection for the System 824.*

Random Incidence Microphone Correction

The 824 gives you the option of turning on a digital filter to correct for random incidence response when measuring with a Larson Davis 2450 or 2541 free-field microphone.

RTA
TAL
TAL



NOTE: Items in blue type are included accessories

The 824 is a true multi-tasking instrument capable of measuring while printing or communicating with a PC.

The 824 is available in the following configurations:

Model	Description	ISM	LOG	SSA	ACC
824S	Type 1 SLM with 1/2" Mic, PRM902, WS001	✓			
824L	Type 1 SLM with 1/2" Mic, PRM902, WS001, includes accessories	✓	✓		✓
824A	Type 1 SLM with 1/2" Mic, PRM902, WS001, includes accessories	✓		✓	✓
824	Type 1 SLM with 1/2" Mic, PRM902, WS001, includes accessories	✓	✓	✓	✓

At any time, your 824 can be upgraded with these options:

Options	Description	LOG	SSA	ACC
824-LOG	Logging capability	✓		
824-SSA	Sound spectrum analysis capability		✓	
824-ACC	Accessories: CCS001, CBL002, CBL006, CBL042, BAT010, EXA010, PSA026, 824-Util			✓
824-RTA	Real-time analysis capability option with fast autostore, RT60, noise criteria	The RTA and FFT options can be added to any of the above configurations.		
824-FFT	Narrow band, 400-line FFT option			

Features & Specifications

General

Time weighting:	Slow, Fast, Impulse, TWA, peak (in parallel with all frequency weightings)
Frequency weighting:	A, C, Flat (in parallel with all time weightings)
Linearity range:	>105 dBA (ISM & LOG), >80 dBA (SSA)
RMS noise floor:	<16 dBA (2541 mic.) typical
RMS overload level:	157 dBA (2540 mic.) typical
Peak Range:	> 65 dB
Peak level:	160 dB (2540 mic.)
Octave band frequencies:	1/3 octave - 12.5 Hz to 20 kHz 1/1 octave - 16.0 Hz to 16 kHz
400-line FFT:	1 Hz to 20 kHz

Measurements

SPL:	A, C, Flat for Slow, Fast, and Impl
Lmin:	A, C, Flat for Slow, Fast, and Impl
Lmax:	A, C, Flat for Slow, Fast, and Impl
Peak:	A, C, Flat
Leq:	A, C, Flat
SEL:	A, C, Flat
TAKT3 & TAKT5:	A, C, Flat, for Slow, Fast
Additional metrics:	TWA, SE, Dose, Projected Dose, C minus A,
Real-time 1/3 octave frequency analysis:	Six Ln values (user selectable) Live, Leq, @max, Lmin spectra with 1/3 or 1/1 display, six spectral Ln's (overall or interval)

Memory

2 Megabytes of memory sufficient to store any one of the following:	2 million point time history (1.0 dB resolution) 1 million point time history (0.1 dB resolution) 70,000 RTA 1/1 octave spectra 60,000 LOG intervals without Lns 35,000 LOG intervals with Lns 28,000 point 1/3 octave SSA Leq time history 28,000 RTA 1/3 octave spectra 20,000 intervals with 1/3 octave Leq spectrum 12,300 SSA intervals with Leq and Max 1/3 octave spectra 2400 FFT 400-line snapshots
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Communications Interface

RS-422/RS-232 serial interface with speeds of up to 115 Kbps, modem mode

Display / Keypad

Large backlit true bit-mapped graphic display (64 x 128 pixels)
14 backlit silicone rubber sealed keys with icons and silent operation

Power

Internal:	Battery power: 3 AA cells, NiMH pack or alkaline Operating time: up to 4 hours of operation (mode dependent) Internal smart charger: <7 hrs; external charger <2.5 hrs (PSA024)
External:	Voltage range: 6 to 15 Vdc Typical current: 150 mA @ 12 Vdc

Physical Characteristics

Dimensions:	9.9" L x 3.4" W x 1.6" D (251 mm x 86 mm x 41 mm) excluding preamplifier
Weight (excluding mic and preamp):	1.1 lbs. (0.53 kg)

Environmental

Operating temperature:	14 to 122° F (-10 to 50° C)
Storage temperature:	14 to 140° F (-10 to 60° C)

Standards Compliance

IEC 60804 (1985) Type 1
IEC 60651 (1993)
IEC 61260 (1995) Class 1
IEC 61672 (<i>draft</i>)
ANSI S1.4 - 1983
ANSI S1.11 - 1986 - Type 1D
☉ indicates compliance with EMC Directive and Low Voltage Directive

824 Optional System Configurations

824-SSA:	Upgrades 824S or 824L to sound spectrum analysis capability
824-LOG:	Upgrades 824S or 824A to logging capability
824-FFT:	Adds 400-line FFT analysis to any 824
824-RTA:	Adds RTA module for spectra autostore, RT60's, NC, RC, to any 824
824-RTA/FFT:	Adds both RTA and FFT modules to any 824
824-ACC:	Adds standard accessories package to 824S (CCS001, CBL006, CBL042, BAT010, EXA010, PSA026, 824-UTIL)

824 Accessories (included with 824L, 824A, & 824)

Documentation:	Operator's and training manual
Choice of ½" microphone:	2540, 2541, 2559, 2560
PRM902:	Microphone preamplifier
*CBL006:	Serial computer interface cable
*WS001:	3 ½" windscreen
*PSA027:	Universal AC power adapter, 12 volt output
*BAT010:	NiMH rechargeable battery pack
*CCS001:	Hard shell carrying case
*EXA010:	Ten foot microphone extension cable
*824 UTIL:	Windows™ based software for instrument setup, data download, and data export

* Not included with 824S

824 Accessories (optional)

SRC20:	Stand-alone compact hand-held signal and noise generator
PSA024:	External battery charger for BAT010
Software:	DNA Data, Navigation, and Analysis software
CBL002:	Serial printer cable with 25 pin male 'D' connector
CBL003:	Serial modem cable with 25 pin male 'D' connector
CBL091:	HP serial printer cable with 9 pin male 'D' connector
MDM001:	Battery powered telephone modem
MDM006:	AC powered telephone modem
MDM010:	Radio frequency modem
Acoustic calibrators:	CAL200, CAL250
Outdoor environmental cases:	EPS024, EPS026, EPS028
Tripods:	TRP001, TRP002
Extension cables:	EXAxxx (where "xxx" is length in feet; standard cable lengths, in feet, include: 1.5, 6, 10, 20, 25, 35, 50, 66, 100, and 200.)

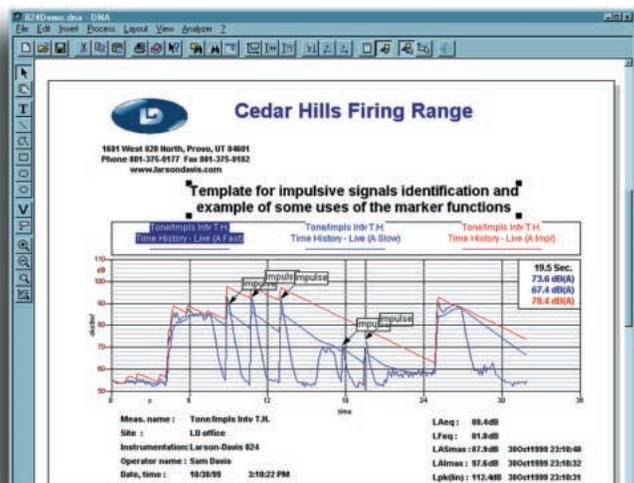
Your local representative

Software features and functions apply only to supported Larson Davis products. All specifications are subject to change without notice.

Listen  with Larson Davis

Software Solutions

Larson Davis offers a wide variety of seamless software solutions for the versatile System 824



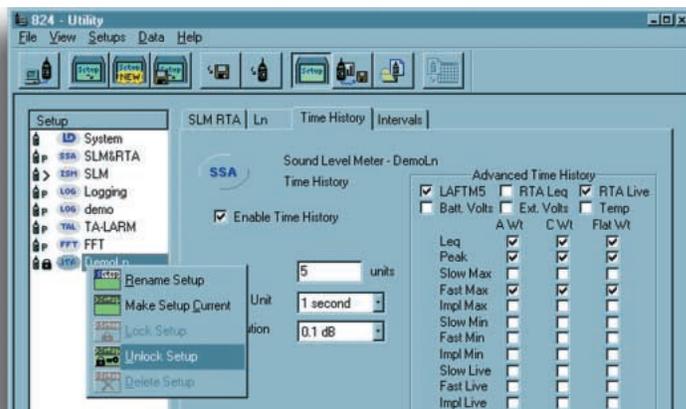
824-Util: Powerful, free software for the 824

Once you have tried this software, you will not believe it comes with the 824 at no charge! Connect serially with the 824 at speeds of up to 28.8 Kbaud/s, for full control and download. Create, store and upload instrument setups. Download measurement files and view text and numerical data collected on the instrument. Even export history, event and spectral data to other programs, such as Excel™, or, to a printer. 824-Util can also upgrade your instrument's internal firmware via RS-232.

DNA-824: Data, Navigation and Analysis Software

DNA is a complete software environment offering real time control, extensive analysis and top notch presentation features. Linked cursors, live spectrograms and event capture are all available. Drag and drop 824 data onto report templates customized with your logo and other information. Perform instantaneous, automatic capture of .wav files: an ideal way of annotating graphical data with an actual sound clip of the noise event! Data can also be streamed to a PC's hard disk for long term unattended measurements.

DNA is loaded with analysis tools for building acoustics, sound power, environmental noise measurement, noise mapping, etc. After using DNA, you will agree that it is the single most powerful software available for any sound level meter.



Expanded data and sound recording on your PDA

For a compact solution to long duration noise measurements, choose Windows CE™ software for the 824. This useful application communicates with the 824 via RS-232 and can trigger a sound recording (.wav file) upon exceeding a set threshold level. Data can be downloaded automatically to the personal data assistant (PDA) or palm computer's memory or compact flash card - for up to 340 MB of truly compact memory capacity! Of course, the data is then available for analysis by DNA or 824-Util software.



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