Loudness Authority

New meter conforming to Europe, US and Japan standards

LM2

PRECISION LOUDNESS AND TRUE-PEAK METER

By itself, LM2 is a full-featured stereo loudness and true-peak level meter for use in post and live production, broadcast ingest, linking and transmission. Check the numbers you need to comply with on LM2's front panel, or bring up the Stats display for even more details. Connect to PC or Mac via USB and open the included Icon application to get the full Radar screen picture.

Delivery Specs and Metadata

Global broadcast guidelines now recognize the need for keeping audio transmission easy and predictable; the main facilitators being transparent normalization and fixed metadata. LM2 facilitates precision normalization and optimum use of dialnorm metadata in AC3 transmission in order to avoid level jumps between regular programming and promos or commercials.

Standard Support

LM2 comes pre-loaded with factory presets compliant with new ITU-R BS.1770, ATSC A/85, EBU R128, NABJ, OP-59, BCAP and more guidelines. LM2 is easily field upgradeable and will keep synchronized with global practices as they refine. Undoubtedly, standards will be updated within LM2's warranty period which is a whopping 5 years.

Connections

LM2 always offers a wide variety of 24 bit resolution audio inputs and outputs: AES/EBU, TOS, SPDIF / AES3 id, ADAT and Analog. Analog I/Os are scaled in the analog domain for max utilization of converter dynamic range. Analog inputs may be trimmed at 0.01 dB precision. LM2 may connect via USB to PC or Mac for access to the Radar display, Logging, Remote control, Preset management etc.

24/7 Logging

As a standard feature, LM2 comes with hindsight: The radar can show the past 24 hours, but LM2 actually includes so much memory of its own that you can take a detailed look one week back in time, even if it has had no connection to a computer. Dump log files routinely to PC or to Mac, import files into the included graphing templates, or design your own in Excel, Numbers etc.

Ingest Normalization

The primary application for LM2 is as a loudness meter but it does one more thing very well: Automatic level offset of programs at a no-compromise resolution (48 bit, fixed point). LM2 therefore includes a precison true-peak limiter to avoid output overload when positive gain normalization is required. For fans of speech normalization, allow LM2 to measure some regular dialog and normalize to that. Otherwise, let its relative gate function automatically take care of all sources. Presets are included, the choice is yours.

Global Loudness, True-peak Standardization and TC Electronic

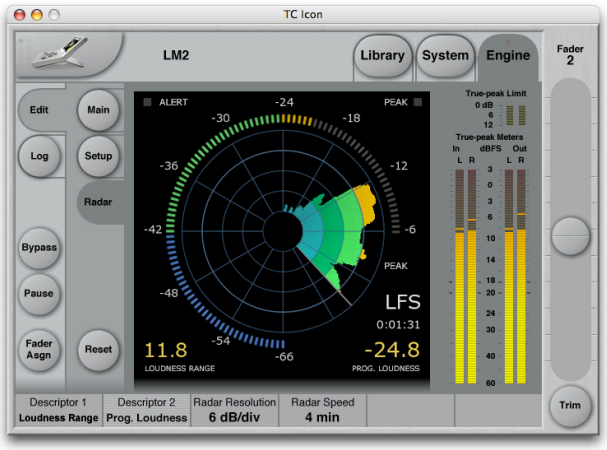
Ten years ago, the ITU-R launched a study group that eventually produced recommendation BS.1770. The worthy goal of this recommendation was to change the focus of the broadcast industry away from sample peak and quasi-peak level to program loudness. Thereby commercials, promos and pop music would no longer automatically be louder than other programming. Having studied this challenge for years, TC Electronic early on decided to contribute to the diverse group of ITU researchers.

One of the reasons why BS.1770 today represents a big leap forward for the entire audio industry is the dedication and amount of expertise that research institutes, broadcasters and companies brought into the process: CRC, IRT, USC, McGill University, numerous broadcasters, drive and film experience from Dolby Labs, research and music/post experience from TC Electronic, etc.

Once the relatively simple, yet accurate loudness measure of the BS.1770 had been independently verified through a number of listening experiments, the search began for a complementary and modern measure of peak level. To this end, the Audio Engineering Society lent a helping hand. Consequently, our industry now also holds a superior and standardized way of measuring peak level in the digital domain.

BS.1770 has recently been put to practical use in different recommended guidelines by BCAP, ATSC, EBU, Japanese and Australian broadcasters. In particular, EBU's Expert Community on Audio, ECA, and its P/LOUD group has put great effort into standardizing important features of loudness measurement and normalization, building on top of BS.1770, thereby specifying truly cross-genre, cross-platform solutions based entirely on open standards, the EBU R128.

The loudness revolution has begun, leading to improved transparency and quality for the benefit of all music lovers, cinema goers and TV listeners. TC Electronic is proud to have contributed with research, verification, true-peak techniques, loudness descriptors, and new tools to develop the full potential of these new international standards.



Power Input 100-240V Power Switch | Balanced Analog Inputs XLR | Balanced Analog Outputs XLR | Optical ADAT & S/PDIF | Sync In | AES/EBU Input/ Output | SPDIF/ AES3 id | COM In/Out Thru | USB

Digital Inputs and Outputs		**EMC**	
Connectors:	XLR (AES/EBU)	Complies with:	EN 55103-1 and EN 55103-2
	RCA Phono (S/PDIF)		FCC part 15, Class B
	Optical (Tos-link, ADAT)		CISPR 22, Class B
Formats:	AES/EBU (24 bit),		
	S/PDIF (24 bit), EIAJ CP-340, IEC 958,	**Safety**	
	EIAJ Optical (Tos-link),	Certified to:	IEC/EN/UL/CSA 60065, CSA FILE#
	ADAT Lite pipe (24 bit)		108093
Output Dither:	HPF/TPDF dither 16-24 bit, independent dithered output		
Word Clock Input:	RCA Phono, 75 ohm, 0.6 to 10 Vpp	**Environment**	
Sample Rates:	44.1 kHz, 48 kHz	Operating Temperature:	32° F to 122° F (0° C to 50° C)
Processing Delay:	0.2 ms @ 48 kHz	Storage Temperature:	-22° F to 167° F (-30° C to 70° C)
Frequency Response DIO:	DC to 23.9 kHz ± 0.01 dB @ 48 kHz	Humidity:	Max. 90 % non-condensing
Processing Resolution:	48 bit fixed point		
By-pass on AES (optional):	Through relay	**PCMCIA Interface**	
		Connector:	PC Card, 68 pin type 1 cards
		Standards:	PCMCIA 2.0, JEIDA 4.0
Analog Inputs		Card Format:	Supports up to 2 MB SRAM
Connectors:	XLR balanced (pin 2 hot)		
Impedance:	20 Kohm	**Control Interface**	
Max. Input Level:	+22 dBu (balanced)	COM:	In/Out/Thru: 5 Pin DIN
Min. Input Level (for 0 dBFS):	-10 dBu	USB:	USB 1.1, cable included
Sensitivity:	@ 12 dB headroom: -22 dBu to +10 dBu		
A to D Conversion:	24 bit (1 bit, 128 times oversampling)	**General**	
D to A Conversion:	24 bit (1 bit, 128 times oversampling)	Finish:	Anodized aluminum front
A to D Delay:	0.8 ms @ 48 kHz		Plated and painted steel chassis
Dynamic Range:	>103 dB (unweighted, BW = 22 kHz), >106 dB(A)		
THD:	-95 dB (0,0018 %) @ 1 kHz, -6 dBFS (FS @ +16 dBu)	Display:	56 x 128 dot graphic LCD
Frequency Response:	10 Hz to 20 kHz : +0/-0.2 dB @ 48 kHz	Dimensions:	19" x 1.75" x 8.2" (483 x 44 x 208 mm)
Crosstalk:	<-80 dB, 10 Hz to 20 kHz	Weight:	5.2 lb. (2.35 kg)
	typical –100 dB @ 1 kHz	Mains Voltage:	100 to 240 VAC, 50 to 60 Hz (auto-select)
Analog Outputs		Power Consumption:	<20 W
Connectors:	XLR balanced (pin 2 hot)	Backup Battery Life:	>10 years
Impedance:	100 ohm (active transformer)		
Max. Output Level:	+22 dBu (balanced)	**Warranty**	
Full Scale Output Range:	-10 dBu to +22 dBu	Parts and labor:	1 year
D to A Conversion:	24 bit (6.144 MHz delta sigma @ 48/96 kHz)		
D to A Delay:	0.57 ms @ 48 kHz		
Dynamic Range:	>+100 dB (unweighted, BW = 22KHz), >+104 dB(A)		
THD:	-82 dB (0.008 %) @ 1 kHz, -6 dBFS (FS @ +16 dBu)		
Frequency Response:	10 Hz to 20 kHz : +0/-0.5 dB @ 48 kHz		
Crosstalk:	<-60 dB, 10 Hz to 20 kHz		
	typical –90 dB @ 1 kHz		*Note:The USB connection is for passing control data only*

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