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MS10 Firmware Upgrade Notes v3.05

MAJOR NEW FEATURES IN THIS VERSION:

Phase measurement is now available. Hold level and press key 1 to access manual measurement on the unit. The readout is displayed using the 'shadow bar'. -9dB represents -180° and +9dB +180°. 1dB steps are therefore equivilant to a positive or negative phase shift of 20°. A positive readout indicates that the right channel is leading the left. Lin4WinXP now displays decimal phase below the frequency measurement on the control panel when the 'Freq' button is selected. The unit must be in level mode before allowng frequency and phase measurements to be made. The phase measurements are accurate to ±2° below 20kHz with reduced accuracy up to 40kHz.

A plot of phase verses frequency above 1kHz can be generated using segment 'z'. This segment must be used with a sweep segment e.g. 'uz' or 'wz' because phase measurements are made at the same time as the frequency response measurements and segment z flags the showing of the results. Lin4WinXP versions v5.14 and above support phase plots, users can download the latest version from www.lindos.co.uk/lin4win.html.

Long signal paths, such as satellite links and long landlines, can introduce a time delay of 100ms or more, enough to make conversation difficult. The MS10 measures the delay on any return path by timing its FSK, and this is listed in milliseconds as 'DELms' on Lin4Win results whenever a master-seg (m or n) is run, under the TL heading. Delays of 1ms to 10secs can be measured to an accuracy of ±0.05% ±1ms. Basic LA100 sequence support is also included in this version. See below for the full segment list.

Standard Sequences (v3.05 firmware chip)

MS1 Units have SEQ1 only, but can be upgraded

No:	Description:	Segs:	Measures:
SEQ0	'Line-Up'	j	0dB/+8dB line-up/chan ident
SEQ1	'Sweep'	u	sweep 20Hz-20kHz 5 secs
SEQ2	'Broadcast Test'	n,u,r,z	sweep, phase, noise, dist to +8dB
SEQ3	'Digital Test'	n,u,r,q,z	sweep, phase noise, dist to +18dB
SEQ4	'Sound-card Test'	n,u,r,q,l	digital test plus 20s noise plot
SEQ5	'Slow Sweep'	s	sweep 20Hz-20kHz 20 secs
SEQ6	'Tape/FM Test'	m,v,r,z	sweep @ -10dB, & high ranges
SEQ7	'GLITS Test'	g	channel ident and line-up
SEQ8	'Wideband Sweep'	w	sweep 40Hz-40kHz 5 secs
SEQ9	'Headroom plot'	h	level versus level 0dB to +18
SEQ10	'Long Noise plot'	l	noise peak and mean 20 secs
SEQ11	'Distortion segs'	r,q	distortion residue „20 to +18dB
SEQ12	'PPM tone bursts'	p	5 'inverse-level‹ tone-bursts
SEQ13	'Crosstalk'	c	crosstalk at 100Hz 3.15k 10kHz

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Special LA100 Sequences: (startup option 9)

SEQ1	'Sweep, Phase, TL'	TUY	sweep 20Hz-20kHz 5 secs
SEQ2	'General'	TRINY	sweep @-10 phase, noise, dist
SEQ3	'Digital Test'	TUDNY	sweep @ 0dB, phase noise, dist
SEQ4	'Broadcast Test'	VRAGNY	sweep etc with 50us de-emphasis

Notes: To run LA100 Sequences, hold SEQ while turning on the power

Segments available (v2.99 firmware)

Name:	Description:	Details:
SEG n	Masterseg	Test level/Normalise 1kHz /Noise (-85 to -50dB)
SEG m	Tape/FM Masterseg	Test level/Normalise 400Hz/Noise (-60 to -30dB) /Speed err
SEG t	Test-Tape Intro	3.150kHz 10s, 1kHz 10s, then as SEGm (set azimuth etc)
SEG u	Sweep	20Hz - 20kHz @ 0dB 5 secs
SEG v	Tape Sweep	20Hz - 20kHz @ -10dB 5 secs
SEG w	Wide Sweep	40Hz - 40kHz @ 0dB 5 secs
SEG s	Slow Sweep	20Hz - 20kHz @ 0dB 20 secs
SEG r	Distortion Residue	Dist Res 1kHz @ -20, 0, +8dB
SEG q	Dist Res to +18	Dist Res 1kHz @ 0, +12, +18dB
SEG c	Crosstalk	Crosstalk at 100Hz, 3.15kHz, 10kHz @ 0dB IBA-wtd
SEG h	Headroom Plot	1kHz 0dB to +18dB in 1dB steps 5 sec plot
SEG l	Long Noise Plot	Noise Wtd 468 (-72 to -40dB) L-chan 20 sec plot
SEG p	PPM Tone-burst test	'Inverse Tone Bursts' 1, 1.5, 5, 10, 100ms
SEG y	468 Tone-bursts	'Inverse Tone Bursts' 1, 1.5, 5, 10, 100ms
SEG b	Tonebursts	General Tone Bursts 100, 10, 5, 1, 0.5ms @ 0Db
SEG e	Flutter Cal Wobble	Flutter-meter cal wobble (should read 1.1% IEC Wtd)
SEG f	Flutter Test	3.15kHz 20 sec (provisional - not yet recognised)
SEG i	Channel Ident	1kHz 0dB 1 sec, 1kHz „6dB 1 sec, repeating
SEG j	Lindos Lineup	1kHz 0dB L+R 2secs, +8 dB L 2s, +8 L+R 2s repeating
SEG g	'GLITS' test	1kHz -3dB 6s total 1 mute on L , 2 mutes R repeating
SEG z	Phase (fsk only)	Phase Plot (valid only above 1kHz) (Use with u,v,s, or w)

LA100 Segments:		(* = not currently logged by the MS10)
SEGT	Test Level	1kHz 1kHz @ 0dB (includes 'MS10' start text) 1 sec
SEGV	Test Level	400Hz 400Hz @ 0dB (includes 'MS10' start text) 1 sec
SEGU	Sweep	20Hz - 20kHz @ 0dB 5 secs
SEGR	Tape Sweep	20Hz - 20kHz @ -10dB 5 secs
SEGD*	Distortion (THD)	100Hz, 1kHz, 6.3kHz @ +8dB 6 secs
SEGG*	Distortion 50us	40, 100, 315, 1k, 6k3, 10kHz with 50us de-emphasis 18 secs
SEGI*	Distortion (THD)	100, 1kHz @ +8 and -10dB 8 secs
SEGA*	Crosstalk	40, 100, 315, 1k, 6k3, 10kHz with 50us de-emphasis 6 secs
SEGN	Noise	mute for 8 secs
SEGW*		Wow & Flutter 3.150kHz for 12 secs
SEGY	Phase (and stop)	40, 100, 1k, 6k3, 10k, 15k (includes stop and seg count)

Notes: SEQ0 only runs at initial switch-on

To run SEQ5 hold the SEQ key down while pressing key 1
To run SEQ6 hold the SEQ key down while pressing key 2 (etc to SEQ 8)
To run SEQ9 hold the SEQ key down while pressing LEV
To run SEQ10, 11, 12, 13, hold the SEQ key down while pressing NOISE, DIST, PPM, REL

NB: Because sequence results are held until cleared by the running of a master-seg (n or m) or by resetting, extra segments can be run to add in to results already displayed in Lin4Win. For example, it can be useful to run SEQ3 and then run SEQ5 (slow sweep) or SEQ8 (wideband sweep), replacing the original sweep. Or to run SEQ3 and then SEQ10 (noise plot), which will add to the results. Running SEQ13 will add crosstalk results. Segs added in this way will use normalising if SEGn or m was previously run.

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Any combination of segments (up to 6) can be sent as a sequence using the Lin4Win support software running on a PC, with the following provisos:

- Only one 'MasterSeg' can be sent (usually n) (or m or t)
- Only one Sweep seg can be sent (usually u) (or s, or v, or w, or h)
- Only one extra plot can be sent (l or z)
- SEG z only works with a sweep (it signals the showing of phase)
- SEG t used in place of SEG m adds (azimuth) alignment tones
- SEGq runs SEGr too (share common text header in results)

Segment letters can be entered in any order, either in the control panel or at the top of the main (results) window (press return to send) - the sending order is fixed (eg nurqcl)

SEGq actually tests distortion at +11.5, +14.5, and +17.5dB rather than the +12,+15 and +18dB quoted for simplicity. This provides a margin of safety to avoid 'just clipping' when equipment is not precisely aligned.

Extra segments can be added to results, as described on the previous page, provided MasterSeg (n, m or t) is not sent again.

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