LEADER

LW 360 (S1 version)

DIGITAL TUNER MEASURING SYSTEM

ADDENDUM INSTRUCTION MANUAL (For firmware version 2.4 and later)



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1. INTRODUCTION

This manual describes the features that have been added LW 360 firmware version 2.4 and the specifications of the LW 360 (S1).

For information about other features, see the LW 360 Instruction Manual.

2. New Firmware Features

2.1 Additional Tuner Model Settings

The number of tuner model settings that can be stored in the internal memory and memory card has been increased from 20 to 40.

To view the available tuner model settings, press F1 File in the Wave screen.



Fis Selection										
File Tune: Tuner Model File (".tmd)										
the open										
Memory Card Plash Rom										
Directory: /memorycard		FIXED ITEM full								
Directories	Na Massa Data	No. Nines Date								
sample 1	No. Name Date	01 FIXED ITEM full 2005 03 12								
sample_2	02	02								
	03	03								
	05	05								
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	10	10								
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19 20 20 20 20 20 20 20 20 20 20 20 20 20		17		18						
20 20 20 206.04.28		19		19						
		20		20 Operation Check	2006.04.28					
		 								

2.2 Additional Items for Setting the Frequency

Items F1 to F4 now appear in the Data Select lists under PLL Format in the PLL (Pattern) screen when the PLL output mode is set to PLL Pattern. The frequency can be calculated automatically using the order specified by F1 to F4. Use these items when the byte order across the frequency setting registers and the byte order used in automatic calculation are different.

F only allowed you to specify up to 24 bits, but F1 to F4 allow you to specify up to 32 bits. (Each item from F1 to F4 allows you to set up to 24 bits.)

	OFF	PLL (Pattern)	
IC Name XXX	Δ	K Bus Mode 12	с
ON O	с	OFF OFF OFF OFF	OFF
Sheet1 §	в	Sheet3 Sheet4 Sheet5 Sheet6 Sheet7	Sheet8 Common
PLL Format	F		Band Data
Send Byt	F1	T Continuous Start_Stop	Band SW
	F2	2 3 4 5 6 7 8 9 10	VHF(L)
Data Selec	F3	FF OFF OFF OFF OFF OFF OFF C	VHF(M)
Bit Length	F4		VHF(H)
rWrite Data F	BA	-	
Byte	BB	D7 D6 D5 D4 D3 D2 D1 D0 HEX	Freq Calc
1	CA1		Freq =
	CA2		No.1 IF =
	CA3		Resolution Freq
	CA4		Unlock Freq =
	CB1		Common Control-
	CB2		Lock Wait
	CB3		Repeat Mode
4	CB4		

The way you can use F1 to F4 will be explained using the following PLL IC as an example.

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0			
Byte 1		Address Byte									
Byte 2		Contro	ol Byte	N11 N10 N9 N8							
Byte 3	N7	N6	N5	N4	N1	N0					
Byte 4	N14	N13	N12	Control Byte							
Byte 5				Band							
Byte 6				Contro	ol Byte						

The bits that are used to automatically calculate the frequency are N14 to N0 (the 15 bits enclosed by a thick frame in the figure), but the PLL IC is designed to send the higher three bits last. The LW 360 generates data in order, starting from the MSB, based on the specified equation to determine the frequency, but with the above PLL IC, the order in which data is generated will be incorrect. In this case, you can set bits N11 through N0 to F2 and bits N14 through N12 to F1 in order to specify the priority of bits for the automatic calculation.

To configure the LW 360 for the PLL IC described on the previous page, follow the procedure below.

Tuner Power screen



PLL screen

IC Name Socccccccccccccccccccccccccccccccccccc	- 2
ON OFF	3
Sheet1 Sheet2 Sheet3 Sheet4 Sheet5 Sheet6 Sheet7 Sheet8 Common PLL Format 6 Continuous Ctext_Ctop Band Data Rand SW Band Data Rand SW 1 2 3 4 5 6 7 8 9 10 Data Select A C F2 F1 C B C DFF DFF C VHF(L) VHF(M) Bit Length 8 4 12 3 5 8 0 0 0 VHF(M) VHF(M) Write Data Format Byte D7 D6 D5 D4 D3 D2 D1 D0 HEX Freq = Freq = I I 0 0 0 0 0 0 I DC C2 No.1 IF = Resolution Freq I I I 0 0 0 I I I I I I	3
PLL Format Band Data Send Byte 6 Continuous Ctext_Ctep Rand SW 1 2 3 4 5 6 7 8 9 10 Data Select A C F2 F1 C B C OFF OFF C VHF(L) VHF(M) Bit Length 8 4 12 3 5 8 8 0 0 0 VHF(M) Write Data Format Byte D7 D6 D5 D4 D3 D2 D1 D0 HEX Freq Calc Freq Calc Freq Calc Freq Calc Freq Calc Freq Calc I I 0 0 0 1 0 C No.1 IF I Resolution Freq I I 0 0 0 - - - 0 0 I <t< td=""><td>3</td></t<>	3
Send Byte 6 Continuous Ottot_Ctop Rand SW 1 2 3 4 5 6 7 8 9 10 Data Select A C F2 F1 C B C OFF OFF C VHF(L) VHF(M) Bit Length 8 4 12 3 5 8 8 0 0 0 VHF(M) UHF Write Data Format Byte D7 D6 D5 D4 D3 D2 D1 D0 HEX Freq Calc Freq Calc Freq Calc Freq = 1 I 1 0 0 0 1 0 C2 No.1 IF = Resolution Freq I Unlock Freq = I I 0 0 - - - 0 0 0 I I I 0 0 0 I I I I I I I I	- 3
1 2 3 4 5 6 7 8 9 10 VHF(L) Data Select A C F2 F1 C B C DFF DFF C VHF(L) VHF(M) Bit Length 8 4 12 3 5 8 8 0 0 0 VHF(L) VHF(M) Write Data Format Byte D7 D6 D5 D4 D3 D2 D1 D0 HEX Freq Calc Freq Calc Freq Calc Freq Calc Freq Calc Freq Calc Image: Colored	4
Data Select A C F2 F1 C B C DFF DFF C VHF(M) Bit Length 8 4 12 3 5 8 0 0 0 Vmr(m) UHF Write Data Format Byte D7 D6 D5 D4 D3 D2 D1 D0 HEX Freq Calc I 1 0 0 0 1 0 C2 No.1 IF I Resolution Freq I I 0 0 - - - 0 Unlock Freq I I I 0 0 - - - 0 Unlock Freq I I I 0 0 - - - 0 Unlock Freq I	4
Bit Length 8 4 12 3 5 8 8 0 <th< td=""><td></td></th<>	
UHF UHF UHF Byte D7 D6 D5 D4 D3 D2 D1 D0 HEX Freq Freq Calc 1 Byte D7 D6 D5 D4 D3 D2 D1 D0 HEX Freq Calc Freq = Image: Calc Freq Image: Calc Freq Image: Calc Freq Image: Calc Freq Image: Calc Image: Calc Freq	
Byte D7 D6 D5 D4 D3 D2 D1 D0 HEX Freq Calc 1 Byte1 A7 A6 A5 A4 A3 MA1 MA0 R/W Freq Calc Freq =] Freq =] 2 Byte1 A7 A6 A5 A4 A3 MA1 MA0 R/W Freq Calc Freq =] Freq	
1 Byte1 A7 A6 A5 A4 A3 MA1 MA0 R/W Freq =	
1 1 0 0 0 1 0 C2 No.1 IF = 2 Byte2 C16 C15 C14 C13 N11 N10 N9 N8 0 0 0 0 - - - 00 Unlock Freq = 3 Byte3 N7 N6 N5 N4 N3 N2 N1 N0 - - - - - - 00 00 Common Control-Lock Wait 4 Fyte4 N14 N13 N12 C12 C11 C10 C9 C8 9 Byte5 BS7 BS6 BS5 BS4 BS3 BS2 BS1 BS0 Pulse Width	,
2 Byte2 C16 C15 C14 C13 N11 N10 N9 N8 Resolution Freq Image: Constraint of the second	1
0 0 0 0 0 0 0 0 0 0 0 0 0 Unlock Freq = 1 1 1 1 1 N2 N1 N0 1 Common Control-Lock Wait Repeat Mode 1 <th1< th=""> 1 1<</th1<>	
3 Byte3 N7 N6 N5 N4 N3 N2 N1 N0 - - - - - - 00 Common Control-Lock Wait 4 Zyte4 N14 N13 N12 C12 C11 C10 C9 C8 - - - 0 0 0 0 Pulse Mode 5 Byte5 BS7 BS6 BS5 BS4 BS3 BS2 BS1 BS0 Pulse Width	
- - - - - - 00 Common Control 4 Zyte4 N14 N13 N12 C12 C11 C10 C9 C8 Repeat Mode 4 Zyte4 N14 N13 N12 C12 C11 C10 C9 C8 5 Byte5 BS7 BS6 BS5 BS4 BS3 BS2 BS1 BS0 Pulse Width	ſ
4 Kyte4 N14 N13 N12 C12 C11 C10 C9 C8 Repeat Mode - - 0	
- - 0	
5 Byte5 BS7 BS6 BS5 BS4 BS3 BS2 BS1 BS0 Pulse Width	•
Devel Dete	_
	E
6 Byte6 C7 C6 C5 C4 C3 C2 C1 C0	
	Ç

1. Set the PLL output mode

In the Tuner Power screen, set PLL Output Mode to PLL_Pattern.

2. Configure the PLL table

In the PLL screen, set Sheet1 to ON.

3. Set the number of bytes to send

Set Send Byte.

4. Select data types and bit lengths

From the Data Select list, select the appropriate data type, and then set the corresponding bit length.

Set bits N11 through N0 to F2 and bits N14 through N12 to F1. This will cause the LW 360 to automatically calculate the frequency starting with F1 and ending with F2.

F1		F2
N14 to N12	N11 to N8	N7 to N0

The LW 360 sends data in the order specified by Data Select.

А	С	F2	F1	С	
Address	Control	N11 to N8 N7 to N0	N14 to N12	Control	

2.3 Addition of Level_L% and Level_R%

Level_L% and Level_R% have been added to the Measure Mode item in the Judge screen.

Overview

Measure	Setting			Judge value range
Mode	REF	Target	Line	Measure Mode description
Level_L%	-	Yes	Yes	0.0 to 100.0 %
				Measures the specified marker level as a percentage with the waveform peak level assumed to be 0%. The LW 360 only measures this level when the IF Tuning marker (No. 12) is on the left side of the waveform peak. Use Level_L% and Level_R% as a pair. You can set different Judge values depending on whether the IF Tuning marker is on the left side or the right side of the peak.
				Set Peak Overlap f in the Sweep/Marker screen. Set Log/Lin to Linear in the Tuner/Sweep screen.
Level_R%	-	Yes	Yes	0.0 to 100.0 %
				The LW 360 only measures this level when the IF Tuning marker (No. 12) is on the right side of the waveform peak. For other details, see the above description for Level_L%.

Measurement screen

When the IF Tuning marker (No. 12) is on the left side of the waveform peak, the LW 360 measures the level using Level_L%. No value is displayed for Level_R%.



When the IF Tuning marker (No. 12) is on the right side of the waveform peak, the LW 360 measures the level using Level_R%. No value is displayed for Level_L%.

Step:01/PCS LEVEL	MB1:	0mA	MB2:	85mA	MB3:	1mA	MB4:	0mA	CH:R	Band:UHF
P-PK(D.fM):	0.74									
P (Lev_L%):				_						
P (Lev_R%):	5.1			Pe	ак					
					-					
						- Tunir	ng Mar	kor		
					\mathcal{V} "	i uni	ig mai			
					∇					
			,	Y						
					4	7				
						{				
			/			1				
			Y			1				
	/	Y								
							~			
							\sim			
			1				1			

Setting

In the Judge screen, select Level_L% and Level_R% from the Mode list, and then set the corresponding Target and Judge values.

F										Judge	;														A
ŀ								Measure				R	EF	Tar	get				Judge	1				Ī	
Þ	٥	St	ep	L	Μ	R		Mode	Nam	е	AVE	SWF	MKF	SWF	MKR	Lower	ι	Jppe	r	Line	POS	RNG	OFS	Í	
Ľ	1	Г	r	Г	Г	Г		D.fMHz	P-PK(D.f	M)	1	A	0	A	12	-4.50		.00	MHz	OFF					
	2	Г	r	Г	Г	Г		Level_L%	P (Lev_L	%)	1			A	12	0.0	6	40.0	%	L/U	1			ĺ	
	3	Г	r	П	Г	Г		Level_R%	P (Lev_R	%)	1			A	12	0.0		5.0	%	L/U	J			Ī	
Ē	4		I																		[Ĩ	
	5		L				Τ																	ĺ	
	6		I																					Ī	

Set Log/Lin to Linear in the Tuner/Sweep screen.

	Tuner / Sweep									
Step Name: PCS LEVEL Ch.Mode: R Band: UHF										
Max Sweep 1 L M R										
Ch.Comment										
No. Setting Item ewo Common Data		Step	Data							
No. Setting item swp Common Data	Al	L	M	R						
01 Sweep Wait A	10									
02 Log/Lin A	Linear									
03 PLL TU Mode A Band	CH_Cont									

Set Peak Overlap f in the Sweep/Marker screen.

Peak Overlap f adds tolerance to the detection of the waveform peak to make the switching between Level_L% and Level_R% smooth (see section 5.3.6, "Operations and Settings on the Sweep/Marker Screen" in the LW 360 Instruction Manual).

Sweep / Marker										
Sweep Marker(IF) ChNameTable	Γ	Marker(RF)								
Ch Mode B		Ch Group	USA							
		[Band Data	Table							
		Band	No. Name	Freq[MHz]						
Sweep Width[MHz] 27.00		VHE(L)	11 2	55 250						
Sweep Time[ms] 6.4		*****	1M 6	83.250						
RF ATT(Wave)[dB] 40	<u> </u>			107.050						
RF ATT(IF Auto)[dB] 40			וחוס	127.250						
	_	VHF(M)	1L	0.000						
IF Input	.		1MA-5	91.250						
IF ATT[dB] 30			1B	0.000						
IF Mode Upper										
DET In Int_IF_Det		VHF(H)	1L C	133.250						
DET Polarity +	ī		1M 11	199.250						
LIN Range Auto	ī		18 W11	361.250						
ARC IND Range 6	ī. U		11 19/10	007.050						
	_	UHF	1L W12	367.250						
Peak Overlap f[MHz] 0.100	TI		1M_14	471.250						
	ון ו		1R 69	801.250						

2.4 Software Modifications

Previously, when a short circuit was detected and an All Scan data output request (AS0) or an All Scan judgment output request (AS1) was received through the RS232C or LAN interface, the judgment result was "Pass" (because the LW 360 made no measurements or judgments). This has been changed so that the judgment result is "NG."

2.5 Software Fixes

- Previously, repeating the All Scan operation made the operation performance time longer, but this problem has been fixed.
- Previously, selecting the Calibration (F9) menu disabled the Quit (F12) command, but this problem has been fixed.

Description of the LW 360 (S1) 3.

3.1 **Rear Panel Modifications**

The positions of the following connectors on the rear panel have been changed: Ethernet, Monitor, PS/2, and USB. In addition, the PS/2 connector specifications and the PS/2 distribution cable that is supplied with the LW 360 have been changed. The connectable devices have been changed as shown in the following figure.

No changes have been made to the specifications of the USB connector and the front-panel PS/2 connector. You can connect a keyboard or mouse to the USB connector, and you can connect a keyboard to the front-panel PS/2 connector.



LW 360 (S1)

3.2 Additional IF ATT Settings

To support digital tuners with high dynamic ranges, 40 and 50 dB settings have been added to the IF ATT item (0, 10, 20, and 30 dB settings were available previously).

You can set the IF ATT value in the Sweep/Marker screen for the Common settings and in the Tuner/Sweep screen for the Step settings. You cannot select the 40 and 50 dB settings on the standard LW 360.

IF ATT setting screens

Sweep/Marker screen

	Sw	/eep / Ma	rker		
Sweep Marker(IF) (ChNameTable	Γ	Marker(RF)		
Ch.Mode	R		Ch Group ⊤Band Data	USA Table	
RF Output		i	Band	No. Name	Freq[MHz]
Sweep Width[MHz]	27.000			11 2	55 250
Sweep Time[ms]	6.4		****(2)	114 0	00.200
RF ATT(Wave)[dB]	40				103.250
RF ATT(IF Auto)[dB]	40			в	127.250
	,		VHF(M)	1L	0.000
IF Input				1 M A-5	91.250
IF ATT[dB]	30			18	0.000
IF Mode	20 er				
DET In	10 F_Det		VHF(H)	1L C	133.250
DET Polarity	0			1M 11	199.250
LIN Range	40			18 W11	361.250
ARC IND Range	50			11 1/40	267.250
				11/11/2	471.050
Peak Overlap f[MHz]	0.100			10 14	4/1.250
	,			18 69	801.250
			L		

Tuner/Sweep screen

Tuner / Sweep														
Step Name: PCS LEVEL Ch.Mode: R Band: UHF														
Ma	x Sweep 1		L				R							
Ch.Comment														
No.	Setting Item	swp	Common Data		Step Data									
		<u> </u>			1	L	<u> </u>	R						
01	Sweep Wait	A		30dB	10									
02	Log/Lin	A		20dB										
03	LEV SWP	Α		10dB										
04	VT Mode	Α	LCH_VR	40dB		LCH_VR_Fix	MCH_VR_Fix	RCH_VR_Fix						
05	IF ATT	Α	30dB	50dB										
									ĥ					
M														

Operation Check

To accommodate the new IF ATT settings, two new steps, 27 and 28, have been added to the operation check.

Operation check refers to the program used to check the LW 360 operation. By factory default, this program is in tuner model setting number 20.

On the standard LW 360, measurements for steps 27 and 28 are invalid. To perform All Scan, clear the Scan check boxes for steps 27 and 28 in the Step All screen.

The step screens that have been added are shown below. To check the LW 360 operation, connect IF IN to RF OUT using a 50-cm 3C2W coaxial cable.

Step:27/IF ATT 40dB	MB1:	OmA	MB2:	OmA	MB3: 1mA	MB4:	OmA	CH:Triple	Band:VHF(L)
40M PG: -(FC-10M: (FC+10M: (0.3 0.1 0.1		70M PG: FC-10M: FC+10M:	0.1 0.2 0.0		100MPG: FC-10M: FC+10M:	0.0 0.1 -0.1		
						+			-
									-

Step:27/IF ATT 40dB (40M PG, 70M PG, 100MPG: ±0.8 dB. FC±10M: ±0.7 dB)

Step:28/IF	ATT	50dE	3 (40N	1 PG	, 70	ΜF	PG,	100	DMI	PG:	±C).8 c	lΒ.	FC	±1	0M:	±C).7	dB
Step:28/IF ATT 50dB		MB1:	OmA	MB	2:	0mA		MB	3:	1mA		MB	4:	Omf	1	CH: T	riple	Bano	H:∀HF(L)
40M PG: FC-10M: FC+10M:	-0.3 0.2 0.0			70M FC-1 FC+1	PG: .0M: .0M:	0).0).2).0					100M FC-10 FC+10	PG: DM: DM:		0.2 0.1 0.0				
	-	_	F		-		+		-				-		-	-	_	-	
Ŧ	Ť		F				+		-				-		-	-	4	-	
	fc = 40 MHz					fc =	: 70 MHz							fc	= 100	MHz			

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