

Link Master™ High Performance Multi-Band Receiver

ML87110A

LTE 700, Cellular 850, PCS 1900, AWS 2100 Bands

LTE 800, E-GSM 900, DCS 1800, UMTS 2100, LTE 2600 Bands

Introduction

Designed to work with Link Master LML Air Interface Logging Tools, the high performance Multi-Band Receiver ML87110A collects network independent data for determining the quality of coverage for wireless networks such as LTE, UMTS/W-CDMA, GSM, CDMA, and EV-DO. Measurement data is collected up to 23 times per second, providing accurate coverage detail during a drive test regardless of the speed of the vehicle. Each Link Master Multi-Band Receiver can capture data from multiple frequency bands. Link Master LML can log data from one to four Multi-Band Receivers at one time.

With Link Master LMA Air Interface Analysis Tools, one can do an in-depth analysis of the post processed log data on a PC. You can overlay the coverage of the Multi-Band Receiver with data collected from a UE device to verify that network dependent coverage matches network independent coverage; for example, if the neighbor lists were correct in the UE to hand off to the closest cell sites.

The ML87110A is air interface independent. The Link Master LML determines which air interface will be used for collecting measurement data for the respective frequency bands in the Multi-Band Receiver.

Air Interfaces

- LTE FDD
- UMTS/W-CDMA
- GSM
- CDMA
- EV-DO

Frequency Bands

- LTE 700 Band
- Cellular 850 Band
- PCS 1900 Band
- AWS 2100 Band
- LTE 800 Band
- E-GSM Band
- DCS 1800 Band
- UMTS 2100 Band
- LTE 2600 Band



Link Master™ ML87110A Multi-Band Receiver
Handheld Size: 152 mm x 76 mm x 229 mm (6 in x 3 in x 9 in), Lightweight: 2.4 kg (5.2 lb)



Multi-Band Receiver Measurements

LTE FDD

Max # Carriers	8 if LTE only
Channel Bandwidths (MHz)	1.4, 3, 5, 10, 15, 20
Cyclic Prefix	Normal or Extended
Reference Channels	R_0 , R_1
Measurement Modes	Top N
Measurement Data	CID, RSRP, RSRQ, RSCINR, Delay, MIB/SIB1
RSRP Minimum Detection Level	-127 dBm
RCINR Dynamic Range, @ -35 dBm	52 dB
RCINR Dynamic Range, @ -65 dBm	44 dB
Measurement Rate	18/s @ 5 MHz, maximum per single carrier 17/s @ 10 MHz, maximum per single carrier

UMTS/W-CDMA

Max # Carriers	16 if UMTS only
Channel Bandwidths	3.84 MHz
Measurement Modes	Top N
Measurement Data	I_0 /RSSI, E_C , E_C/I_0 , Agg E_C , Agg E_C/I_0 , PSCH, SSCH, SC/CPICH, SC Delay Spread, SC Multipath
Minimum Detection Level, HS	-119 dBm (HS = High Speed)
Minimum Detection Level, HDR	-122 dBm (HDR = High Dynamic Range)
E_C/I_0 Measurement Range	-25.0 dB to 0 dB
Measurement Rate	14/s, HS; 8/s, HDR, maximum per single carrier

GSM

Channel Bandwidths	200 kHz
Measurement Modes	Top N
Measurement Data	RSSI, BSIC
Minimum Detection Level	-105 dBm
Measurement Rate	10/s, for BSIC decode

CDMA

Max # Carriers	24 if CDMA only
Channel Bandwidths (MHz)	1.25
Measurement Modes	Top N
Measurement Data	Pilot PN#, I_0 , E_C , E_C/I_0 , Agg E_C/I_0 , Delay, Delay Spread, Multipath
Minimum Detection Level	-128 dBm
E_C/I_0 Measurement Range	-25.5 dB to 0 dB
Measurement Rate	23/s, maximum per single carrier

EV-DO

Max # Carriers	24 if EV-DO only
Channel Bandwidths (kHz)	1.25
Measurement Modes	Top N
Measurement Data	Pilot PN#, I_0 , E_C , E_C/I_0 , Agg E_C/I_0 , Delay, Delay Spread, Multipath
Minimum Detection Level	-121 dBm
E_C/I_0 Measurement Range	-18 dB to 0 dB
Measurement Rate	5.5/s, maximum per single carrier

CW/Channel Power

IFBW	200 kHz or 5 MHz
Resolution Bandwidth (RBW) Range	1 kHz to 4 MHz
Measurement Mode	List
Measurement Data	Power in RBW or Channel Bandwidth
Measurement Rate	CW: 1500/s, maximum per single carrier Channel Power: 400/s, maximum per single carrier



General Specifications

Multi-Band Receiver

Downlink Frequency Bands	E-UTRA Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 20
Frequency Accuracy	± 5 ppb
Amplitude Accuracy	± 1 dB (20 °C to 30 °C), ± 1.5 dB (0 °C to 55 °C)
Noise Figure	8 dB typical
1 dB Compression	-15 dBm typical
Third Order Intercept (TOI)	-0 dBm typical
Residuals	-120 dBm
Adjacent Channel Rejection	55 dBc
Resolution Bandwidth (RBW)	10 kHz to 5 MHz

Frequency Ranges

LTE 700	698 MHz to 806 MHz
Cellular 850	864 MHz to 899 MHz
PCS 1900	1925 MHz to 1995 MHz
AWS	2100 MHz to 2180 MHz
LTE 800	780 MHz to 899 MHz
E-GSM	900 MHz to 962 MHz
DCS 1800	1800 MHz to 1885 MHz
UMTS 2100	2100 MHz to 2180 MHz
LTE 2600	2590 MHz to 2690 MHz

Connectors

RF In	Type N, female, 50 Ω
Maximum Safe Input Level	+10 dBm, 20 VDC
GPS	SMA, female
External Power	2.5 mm barrel connector
Control/Data	USB 2.0
USB Interface	One Type B
1 PPS	BNC, female, 50 Ω, 10 MHz

Electromagnetic Compatibility

European Union	CE Mark, EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC
Australia and New Zealand	C-tick N274
Interference, Emissions, Immunity	EN 61326-1, EN 55011, EN 61000-4-2/3/4/5/6/11

Safety

Product Safety	IEC 60950-1 when used with Company supplied Power Supply
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Environmental

Operating Temperature	0 °C to 55 °C
Humidity	95 % RH, non-condensing
Vibration, Shock	MIL-PRF-28800F Class 2
Storage	-40 °C to 70 °C

Size and Weight

Size	152 mm x 76 mm x 229 mm (6 in x 3 in x 9 in)
Weight	2.4 kg (5.2 lb)



Ordering Information

Part Number	Description
ML87110A-10	Link Master North American Multi-Band Receiver (LTE 700, Cellular 850, PCS 1900, AWS 2100 Bands)
ML87110A-20	Link Master International Multi-Band Receiver (LTE 800, E-GSM 900, DCS 1800, UMTS 2100, LTE 2600 Bands)
2000-1647-R	Mag-Mount Broadband Antenna Cable 1: 698 MHz to 1200 MHz, 2 dBi peak gain, 1700 MHz to 2700 MHz, 5 dBi peak gain, N(m), 50 Ω, 10 ft Cable 2: 3000 MHz to 6000 MHz, 5 dBi peak gain, N(m), 50 Ω, 10 ft Cable 3: GPS 26 dB gain, SMA(m), 50 Ω, 10 ft

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