Discover What's Possible™

Anritsu

ML8720B

W-CDMA Area Tester

2110 to 2200 MHz

For W-CDMA Base Station Area Investigation and Maintenance

Measuring W-CDMA Base Station Area

The ML8720B is used for investigation and maintenance to evaluate the radio wave propagation characteristics in the area of a W-CDMA base station. When it is connected to a GPS receiver, the measured data can be correlated with positioning information (latitude and longitude).
The measurement items include functions for measuring the RSCP*1, Ec/No*2 and SIR*3, which is used to evaluate the strength of the radio wave received from each base station, and the delay profile, which is used to evaluate the delay characteristics of the radio wave caused by multipath propagation.

There are two measurement modes: the unspecified base station measurement mode, and the specified base station measurement mode. The CPICH and SCH from the base station are measured in both cases. The unspecified base station measurement mode is used when the base station scrambling code is unknown. Search methods of scrambling code include SCH search method with SCH*4 and P-CPICH search method to directly search P-CPICH*5 without depending on SCH. The specified base station measurement mode is used when the base station scrambling code is known.

*1: RSCP (Received Signal Code Power)
*2: SIR (Signal Interference Ratio)
*3: CPICH (Common Pilot Channel)
*4: SCH (Synchronization Channel)
*5: P-CPICH (Primary CPICH)

High-speed and High-accuracy Area Analysis

RSCP, Ec/No and SIR can be measured at 30 cm intervals (at specified base station and single-channel measurement) while travelling at 100 km/h in a monitoring vehicle to provide fast and accurate area analysis.

High-speed Search with SCH

When SCH search is selected in unspecified base station mode, CPICH can be searched at high speed using the same SCH search method as user equipment. As one measurement example, 10 channels are searched for 4 sec on average and then the measurement is started.

Correlation with GPS Positioning Data

The measured data can be correlated with GPS positioning data (latitude and longitude) and saved to a memory card. In addition, the measured data and positioning information can be downloaded at real time to an external PC via the RS-232C interface.

High-accuracy Measurement using Diversity Function

When used in combination with the optional diversity function, even higher-accuracy measurements, such as CPICH transmit diversity format and receive antenna diversity can be performed.

Simultaneous Measurement of Two Carrier Frequencies

The optional Two Carrier Measurement function enables simultaneous measurement of two carrier frequencies in the specified base station measurement or the unspecified base station measurement.

Indoor Measurement Support

Useful functions are offered for indoor measurement use; the fixed-point measurement for saving the data of specific measured points, the addition of comments to measured data and the automatic naming of data files before saving them.

Handy Type

At only 4 kg, the ML8720B is easily portable for both outside and inside work. 8.4-inch transparent color TFT-LCD display has been adopted (Standard).
For the use under direct sunlight, 7.8-inch reflective color STN-LCD display model is also available (Option 02)*.

*: Factory option (Display units can not be exchanged by customers)

3-hour Battery Operation

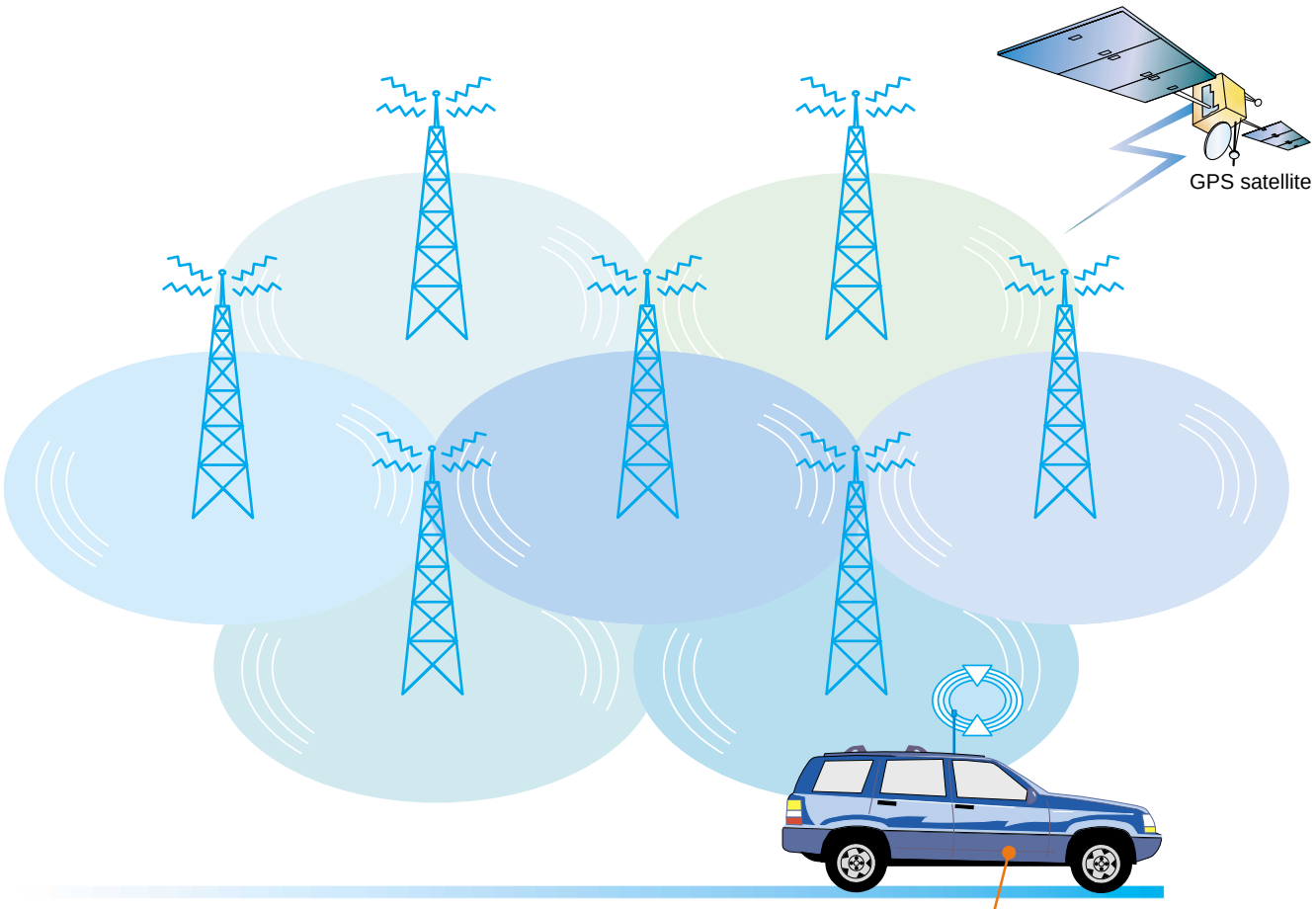
In the case of standard composition, the lithium-ion battery pack provides more than 3 hours of operation and a spare battery pack solves even long-term measurement problems.

Large-capacity Memory Cards

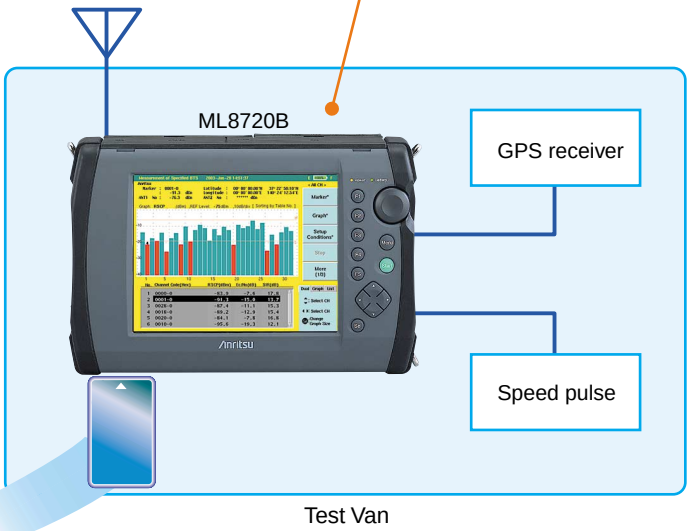
Large amounts of measured data can be saved to large-capacity flash-memory cards.

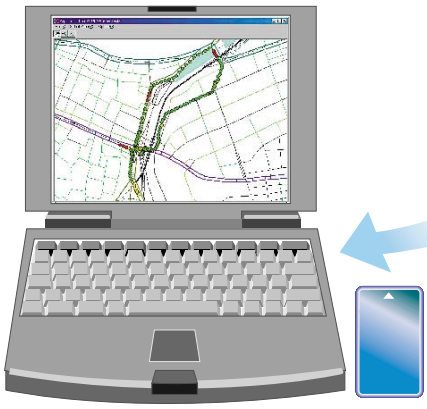
Standalone Operation

The control PC is not required externally. Basic measurements and data collection can be performed only by the ML8720B mainframe. Of course, the system can be extended in combination with area analysis software.



When the ML8720B is connected to a GPS receiver, measured data such as RSCP, etc., can be correlated with positioning data. There is no need of an external PC when measuring. The measured data can be saved to a memory card with CSV format for transport back to the office workbench and further data analysis. However, an external PC is required to read the measured data at real time.

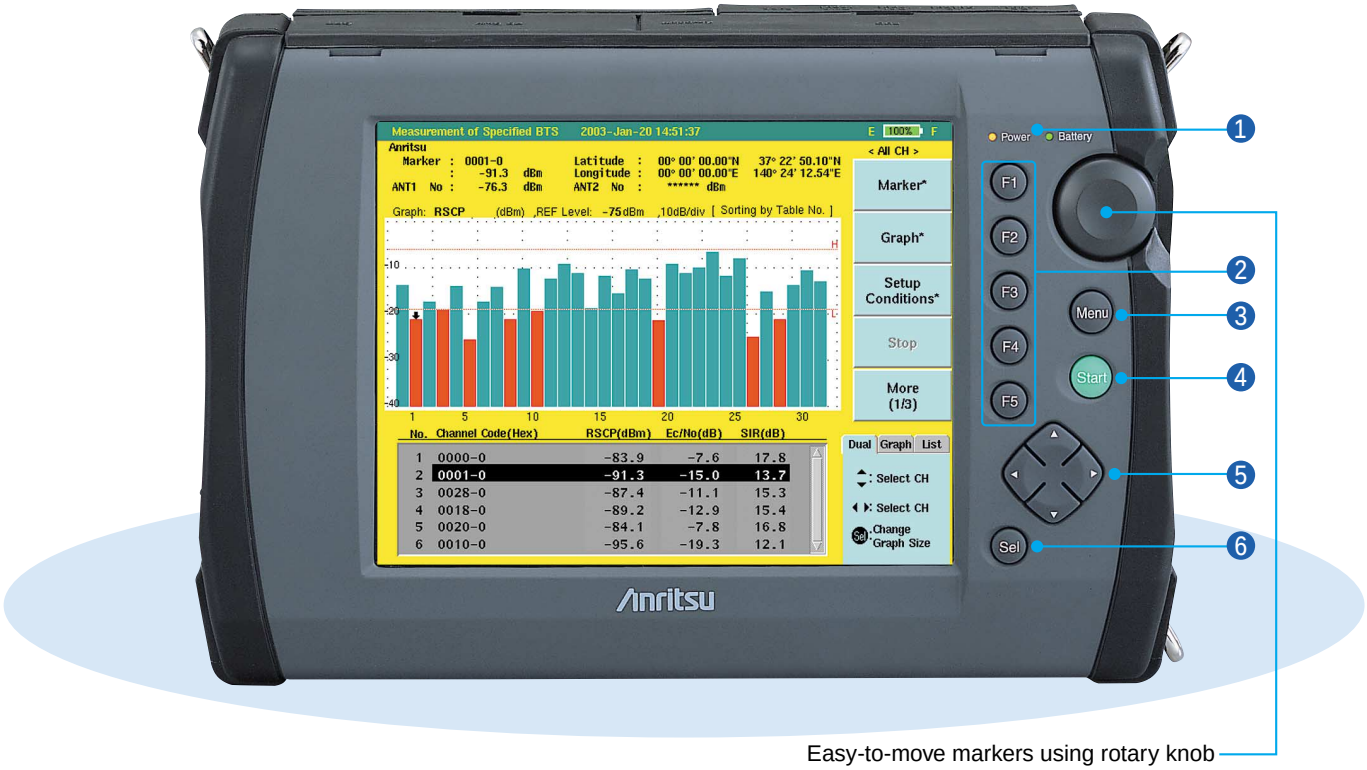


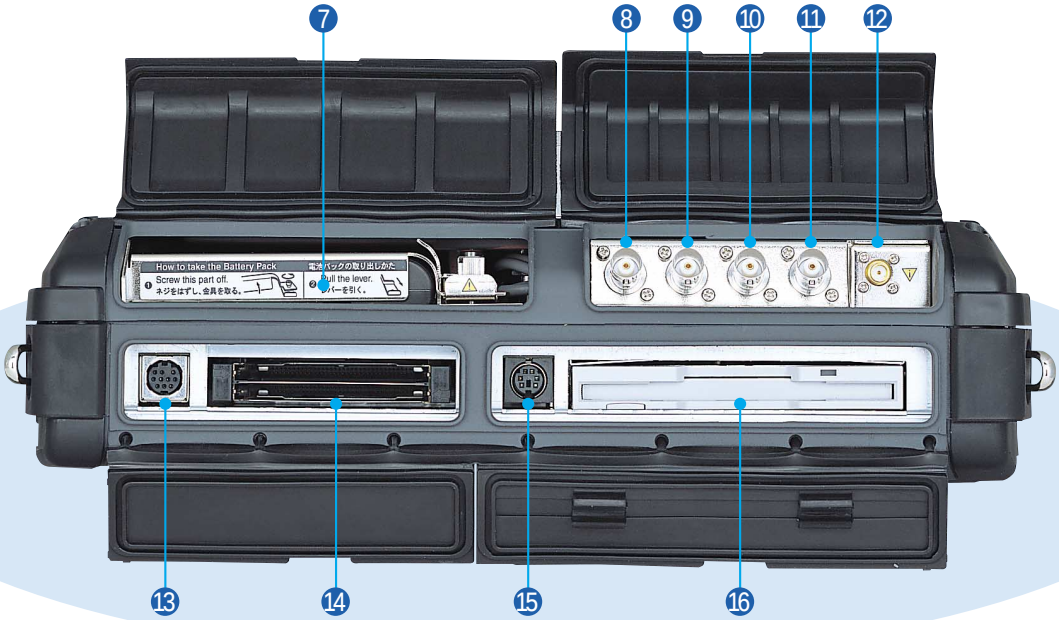


MX872022B Data Conversion Software (Optional) is able to convert measured data into the input format supporting MapInfo professional*.
Data analysis can be visually performed on the map when MapInfo (prepared by users) is used.

*: Registered trademark of MapInfo Corporation, U.S.A.

Small and Lightweight with Excellent Operability





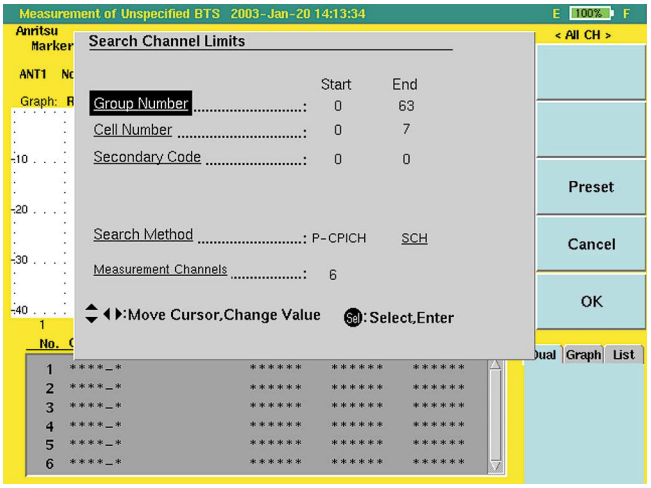
1 Status indicator
2 Function keys
3 Menu key
4 Start key
5 Up/Down, Left/Right key
6 Select key
7 Battery pack
8 Sync output connector
9 External trigger input connector
10 External reference input connector
11 IF output connector
12 RF input connector 1 (for connecting antenna)
13 External monitor (VGA) connector
14 PC card slots: Two cards can be installed.
15 External keyboard connector
16 FD drive
17 AC adapter connector
18 Power switch
19 Backlight adjuster
20 RS-232C-1 connector
21 Centronics connector
22 RS-232C-2 connector

Build in option 03/23/43

Measurement Examples

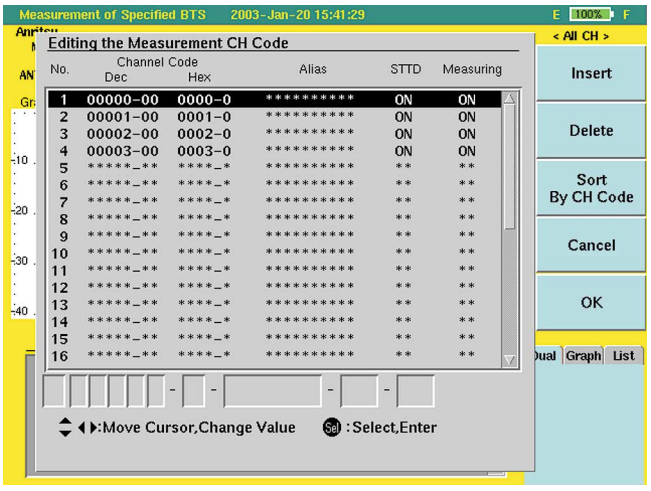
Unspecified Base Station Measurement

This screen is used to search for a receivable common pilot channel (CPICH) and to measure received signal code power (RSCP), ratio of desired receive power per chip to receive power density in band (Ec/No), and signal interference ratio (SIR) for up to 32 channels. Search method can be selected from either [SCH search] method to search in the same way as user equipment using SCH or [P-CPICH search] method to in order search 512 types of P-CPICH (Primary CPICH). Furthermore, hybrid measurement function, simultaneous measurement of searched CPICH and specified scrambling code's CPICH, is also available. With this function, the other receivable channels can be searched and measured with measuring known channels.



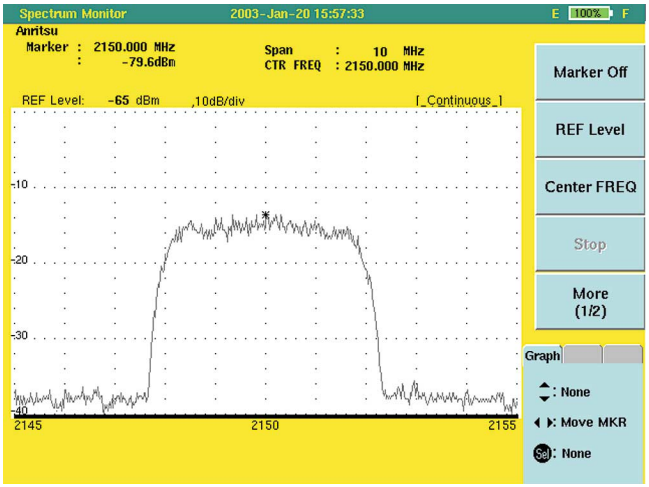
Specified Base Station Measurement

Primary PCICH (P-CPICH) and secondary CPICH (S-CPICH) can be specified for up to 32 channels and RSCP, Ec/No and SIR can be measured in the same way as unspecified base station measurement.



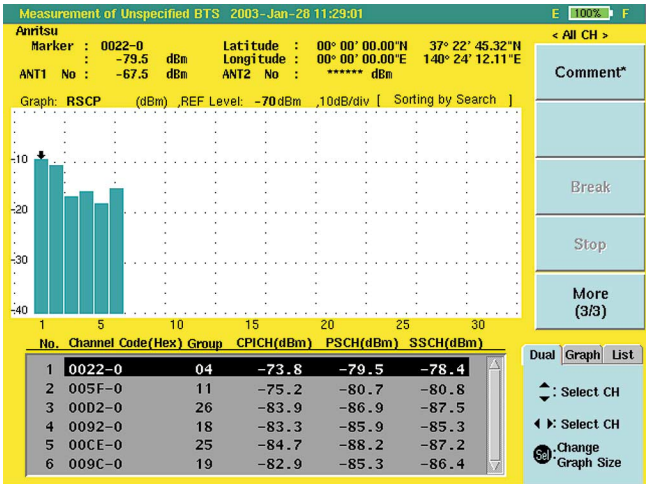
Spectrum Monitor

This screen is used to visually confirm the in-band wave. Frequency span can be selected from 4 MHz, 10 MHz and 90 MHz.



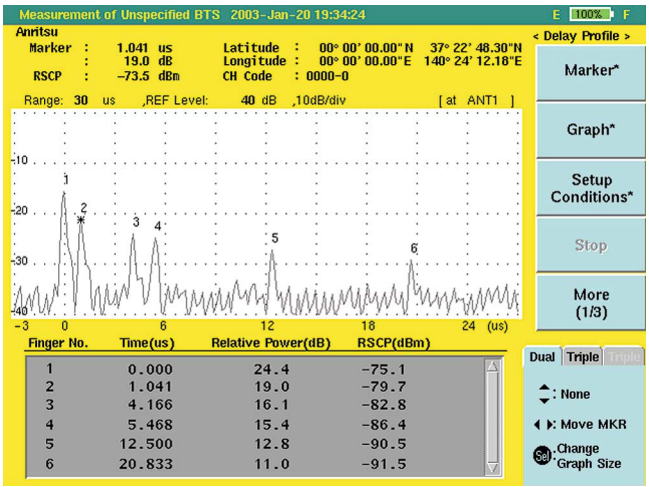
Channel Display

The measured results for all receive channels (32 max.) can be simultaneously displayed with a graph and data. Additionally, measurement interval setting and the cumulative processing (max., min., median, average) for the internally accumulated data within the span can be selected.



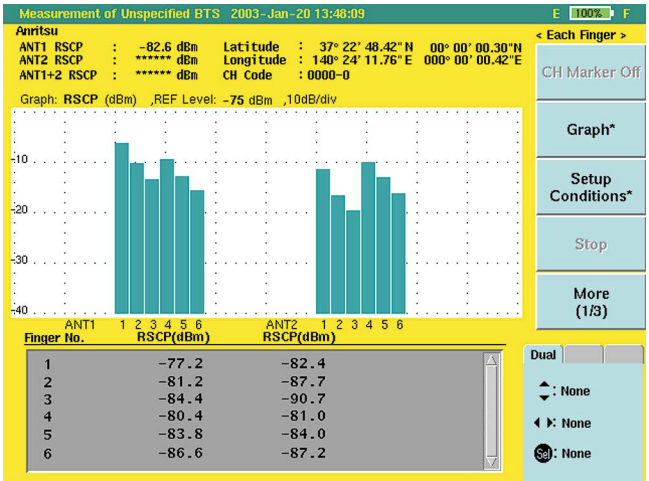
Delay Profile Display

This displays the delay profile for one selected channel and the multipath can be visually confirmed. Furthermore, time, distance or the number of chip is selected for the horizontal axis.



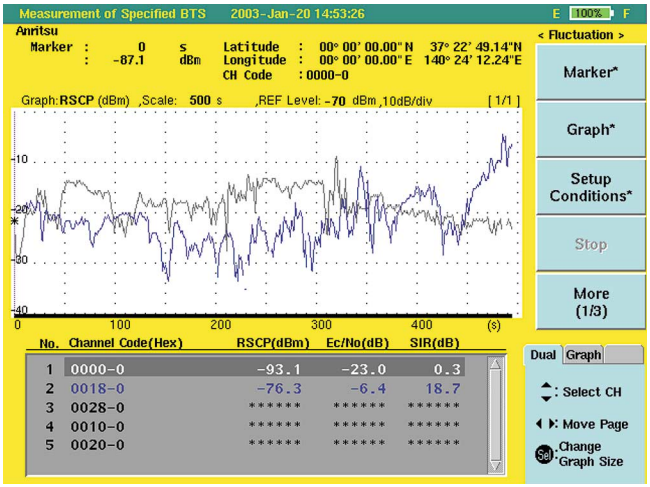
Finger Display

This displays the measured result for one selected channel path (finger). The RSCP for up to 12 paths can be simultaneously evaluated when the diversity option is installed. RSCP per Finger can be outputted to a file for all channels under measurement when the measurement is performed in activated Each Finger data output. It is effective for multi-path environment analysis and indoor simulation based on acquired data.



Time/Distance Variation Display

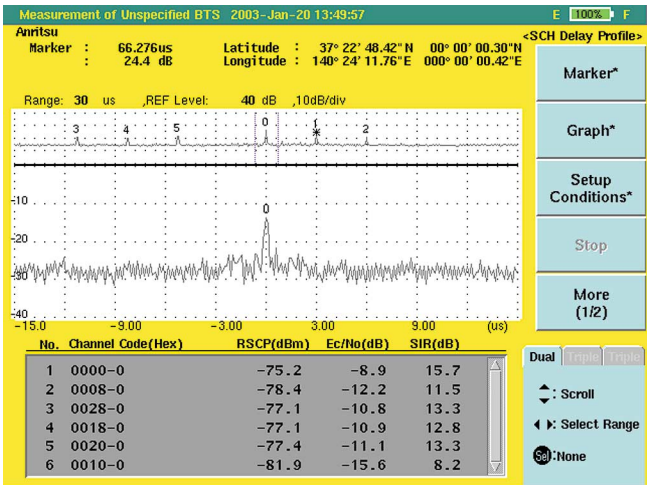
A time/distance variation of the RSCP, Ec/No and SIR are displayed for the selected channel (6 max). The time variation can be measured in 10ms intervals for 10ms to 500s and the max., min., median or average value of the cumulative totals can be displayed. The distance variation can be measured using the vehicle wheel pulse (external trigger) for 1 to 500 pulses and the max., min., median or average value of cumulative totals can be displayed.



SCH Delay Profile Display

This displays the relative delay status between each base station with correlative value of P-SCH. This screen is used to confirm frame transmission timing gap or overlap between base stations.

Group No. is displayed on the graph to recognize base stations. Time or the number of chip can be selected for the horizontal axis.



Options

Option 02 (ML8720B-02)

The STN color display offers clear view for outdoor use.

Option 03 (ML8720B-03)

• Two Carrier Measurement function

Two carrier frequencies can be measured simultaneously in the specified base station measurement and the unspecified base station measurement.

• Diversity function

The signal from the base station that supports transmit diversity can be measured per transmit antenna in the specified base station measurement. (The Option 03 should be specified together with the ML8720B mainframe when ordering.)

Option 23 (ML8720B-23)

The functionality of Option 03 is added to the ML8720B of standard configuration (The mainframe is taken back for retrofitting the Option 23 to the ML8720B mainframe).

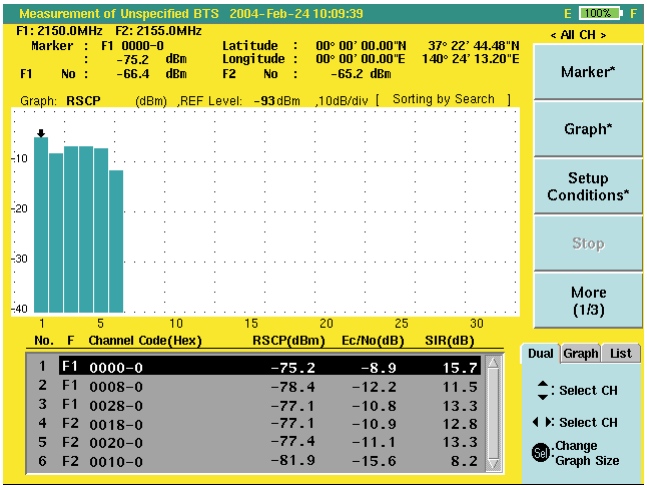
Option 43 (ML8720B-43)

Diversity function (formerly Option 01) is upgraded to “Two Carrier Measurement function + Diversity function” (Option 03). (The mainframe is taken back for retrofitting the Option 43 to the ML8720B mainframe.)

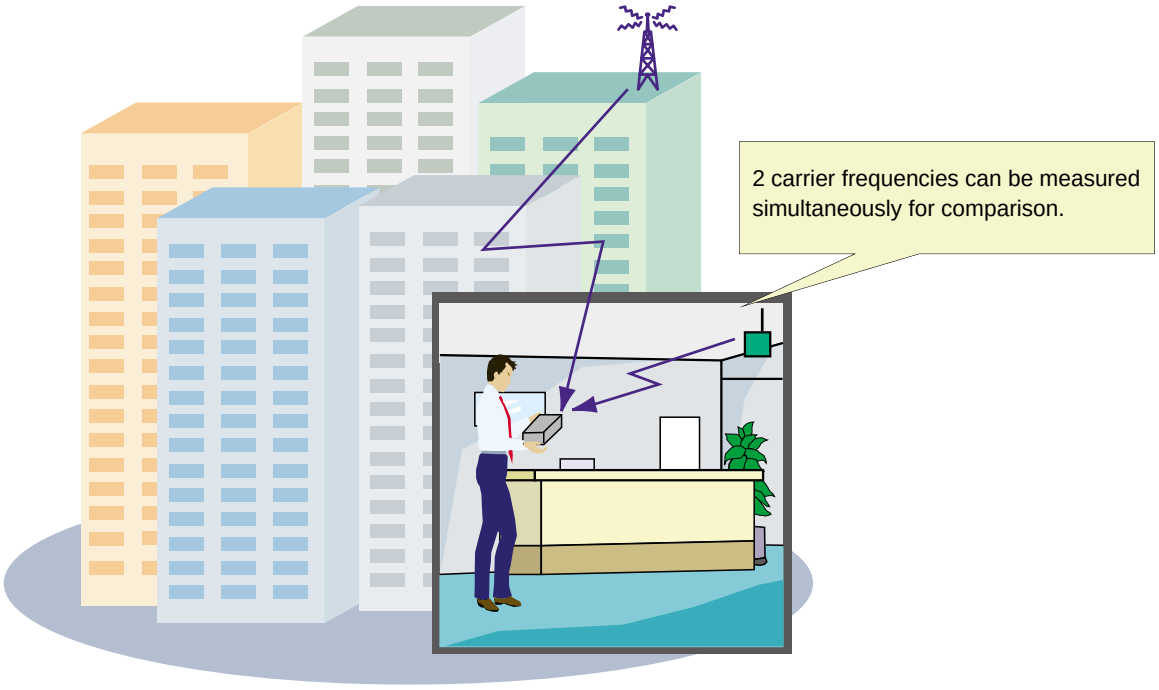
Screen Display of Two Carrier Frequency Measurement (All Channel Display)

The number of channels to be measured is 32 at max. for two carrier frequencies.

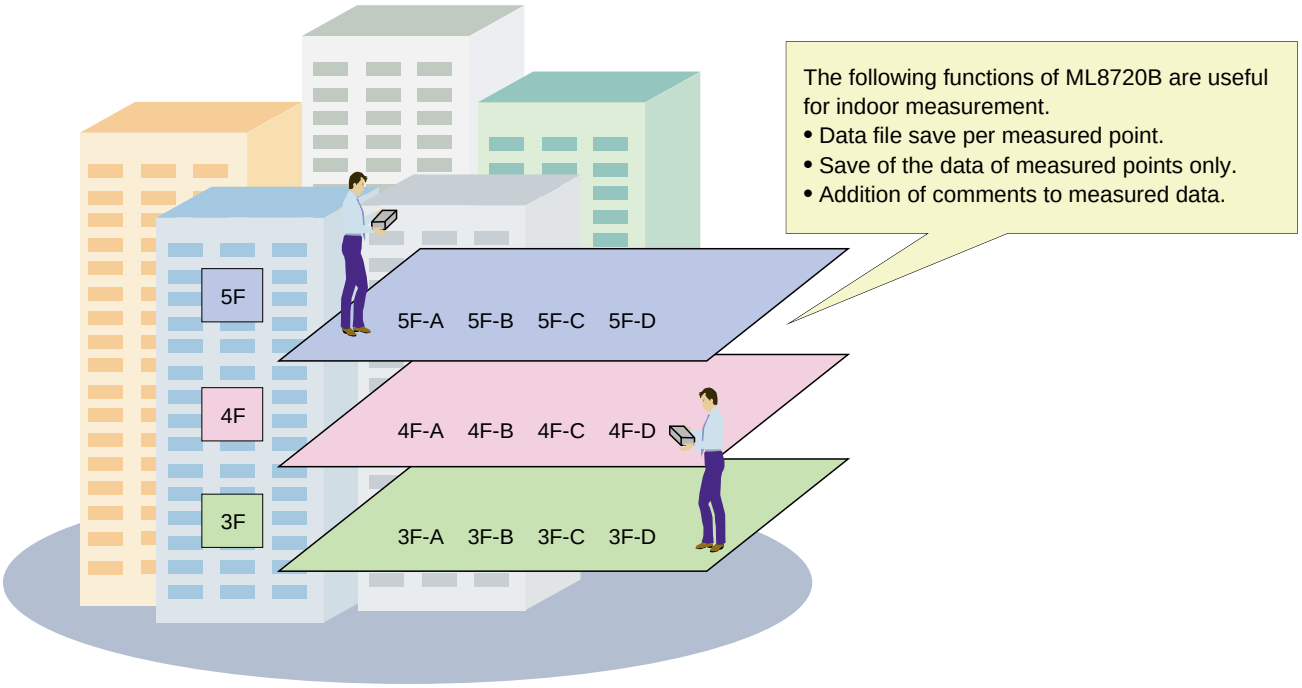
Simultaneous measurement of multiple carrier frequencies enhances the measurement efficiency. Also, carrier frequencies of others can be simultaneously measured for comparison.



Two Carrier Frequency Measurement (Image)



Indoor Measurement (Image)



Specifications

Frequency range	2110 to 2200 MHz
Input impedance	50 Ω (SMA-type connector)
Frequency setting resolution	200 kHz (W-CDMA measurement mode), 1 kHz (spectrum monitor mode)
Reference oscillator	Aging rate: ±1 x 10^{-6}/year
Receive signals	P-CPICH, S-CPICH, P-SCH, S-SCH
Power measurement	Measurement range W-CDMA measurement mode: –117* to –33 dBm, Power at the end of RF input connector 1 and RF input connector 2 (when any of the Option 03/23/43 is equipped). Spectrum monitor mode: –123* to –33 dBm, Power at the end of RF input connector. *: When the built-in divider of option 03/23/43 is used, the level of minimum reception sensitivity is raised due to the divider's loss (Typ. 4.0 dB). Resolution: 0.1 dB Display units: dBm, dBµV, dBµV/m (spectrum monitor mode) Accuracy: CPICH-RSCP ±2 dB (at dynamic range: –117 to –33 dBm, –9 dB ≤ Ec/No) (at dynamic range: –110 to –33 dBm, –19 dB ≤ Ec/No) CPICH-SIR ±3 dB (at dynamic range: –100 to –40 dBm, SIR: 5 dB to 20 dB) SCH-RSCP ±3 dB (at dynamic range: –117 to –33 dBm, –9 dB ≤ Ec/No) (at dynamic range: –110 to –33 dBm, –19 dB ≤ Ec/No) Spectrum monitor ±2 dB (–118 dBm ≤ CW input ≤ –33 dBm), ±3 dB (–123 dBm ≤ CW input ≤ –118 dBm) Noise level: –127 dBm (typ., RBW: 4 kHz, spectrum monitor mode) Dynamic characteristics: RSCP, SIR measurement at 0 to 100 km/h (averaged distance: 50 m)
Measurement items	Specified base station, unspecified base station, spectrum monitor
Base station measurement	Measurement items: Received signal code power (RSCP), ratio of desired receive power per chip to receive power density (Ec/No), signal interference ratio (SIR) Measurement modes: Time variation (internal trigger) distance variation (external trigger) Sampling interval: 10 ms min. (at 1 channel measurement) Measurement channels: 32 max. Sync acquisition time: 600 ms x the number of search channel (CPICH mode), 4 sec on average for TOP 10 display (SCH mode) Search method of BTS: CPICH mode, SCH mode (Only measurement of unspecified BTS) Data processing method: Average, median, max., min., 10%, 20%, 30%, 40%, 60%, 70%, 80%, 90% Measurement displays: All channel, delay profile, each finger, fluctuation (specified base station measurement), SCH delay profile (unspecified base station measurement)
Spectrum monitor function	Frequency span: 4 MHz, 10 MHz, 90 MHz Resolution bandwidth: 4 kHz
Other functions	Master/slave function: Daisy chain of multiple ML8720B, parallel measurement GPS connection: Supports NMEA-0183 format Remote control: Via RS-232C File I/O: Read measurement conditions, output measured results file Diversity function: Transmit diversity, receive antenna diversity (Option 03/23/43) RAKE diversity: Six fingers Two carrier measurement function: Two carrier frequencies can be measured simultaneously in the specified base station measurement and the unspecified base station measurement (Option 03/23/43)
Interface	IF output: ≥10 dBµV (190 MHz), BNC connector External reference input: 2 to 5 Vp-p (10 MHz), BNC connector External trigger input: 1.5 Vdc ±(2 to 13 Vp-p), BNC connector Sync output: TTL level, BNC connector RS-232C-1: For external computer (max. 115.2 kbps), D-sub 9-pin connector RS-232C-2: For GPS (supports NMEA-0183 format), mini-DIN 8-pin connector Printer: 8-bit parallel I/F (conform to Centronics), D-sub 25-pin connector Keyboard: IBM US ENGLISH (101 keys) 106 supported, Mini-DIN 6-pin connector External monitor: VGA, mini-DIN 10-pin connector
Storage media	FDD (3.5", 2HD), ATA flash card
Display	640 x 480 dots, 8.4" color LCD, 7.8" color LCD (Option 02)
Environment conditions	Temperature and humidity: 0˚ to +40˚C/≤85% (operating), –25˚ to +60˚C/≤85% (storage) Vibration: MIL-T-28800E Class 3 Drop test: 76 cm drop (Bellcore standard) EMC EN61326: 1997/A2: 2001 (Class A), EN61000-3-2: 2000 (Class A), EN61326: 1997/A2: 2001 (Annex A) LVD EN61010-1: 2001 (Pollution Degree 2)
Power	10 to 26.4 Vdc 100 to 240 Vac, 50/60 Hz (with AC adapter) Battery: Z0619 Lithium Ion Battery Pack Power consumption: 35 W max., 20 W (typical), 30 W (typical with Option 03/23/43) Battery continuous operation time: 3 h (typical), 2 h (typical with Option 03/23/43)
Dimensions and mass	290 (W) x 194 (H) x 78 (D) mm, ≤4.5 kg (with battery pack) 290 (W) x 194 (H) x 123 (D) mm, ≤6.5 kg (with Option 03/23/43 and battery pack)

Ordering Information

Please specify the model/order number, name, and quantity when ordering.

Model/Order No.	Name		Remarks
	Main frame		
ML8720B[*1]	W-CDMA Area Tester		
	Standard accessories		
W1893AE	ML8720B operation manual	: 1 copy	
Z0619	Lithium Ion Battery Pack	: 1 pc	
J1069	AC adapter	: 1 pc	
	Power cord	: 1 pc	
Z0402A	Protective cover	: 1 pc	
Z0403A	Belt with hook	: 1 pc	
Z0516	Antenna	: 1 pc (2 pc)[*2]	
Z0703	Antenna mount	: 1 pc (2 pc)[*2]	With 5 m cable
J1161	BL82-5133-02	: 1 pc (2 pc)[*2]	SMA Plug-SMA Jack
J1248	SMA connecting cable (Type L)	: (2 pc)[*3]	
J0977	Serial interface cable	: 1 pc	For connecting GPS (2 m)
	Options		
ML8720B-02[*1]	Display unit (STN-LCD)		7.8 inch
ML8720B-03	Two Carrier Measurement		Selected when ordering a mainframe
ML8720B-23	Two Carrier Measurement Retrofit		Retrofitted to the already-shipped mainframe (Mainframes need to be taken back.)
ML8720B-43	ML8720B-03 Upgrade for ML8720B-01		Upgrade of ML8720B-01 to ML8720B-03 (Mainframes need to be taken back.)
	Application Software		
MX872022B	Data Conversion Software		Date conversion output for MapInfo
	Maintenance Service		
ML8720B-90	Extended three year warranty service		
ML8720B-91	Extended five year warranty service		
	Application parts		
P0020	Compact flash 64 MB		Requires J1254
P0021	Compact flash 128 MB		Requires J1254
P0022	Compact flash 256 MB		Requires J1254
P0023	Compact flash 512 MB		Requires J1254
J1254	Compact flash adapter		Adapter
Z0436	Hard carrying case		
Z0435	Soft carrying case		430 (W) x 300 (H) x 170 (D) mm, use with an option
B0442	Soft carrying case		440 (W) x 310 (H) x 110 (D) mm
Z0526	Case for installation		For main frame
J0127D	BNC cable		For external trigger connection
J0654A	Serial interface cable		For connecting IBM-PC/AT
J0978	VGA conversion cable		For connecting external monitor
J1117	DC Power Cord		For cigarette lighter, minus grounding vehicle, 3 m
J1118	DC Power Cord		With spade lugs, 3 m
Z0697	Battery Charger		Two Z0619 batteries can be charged simultaneously.
Z0705	Antenna mount		With 3.5 m cable

∗1: There are two type displays, transparent color TFT-LCD type for indoor use and reflective color STN-LCD type for outdoor use. Specify display type when ordering. Display units can not be exchanged by customers.
∗2: Antenna, Antenna mount and SMA Plug-SMA Jack are provided 2 packs each when any of the option03/23/43 (ML8720B-03/ML8720B-23/ML8720B-43) is equipped.
∗3: Attached only when any of the option03/23/43 (ML8720B-03/ML8720B-23/ML8720B-43) is equipped.

Hard carrying case (Z0436)

Soft carrying case (B0442, Z0435)

Case for installation (Z0526)

Battery charger (Z0697)

Battery pack (Z0619)

Antenna (Z0516)
Antenna mount (Z0703)

Anritsu

Specifications are subject to change without notice.

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