Anritsu

Cell Master™ MT8212A

Cable, Antenna and Base Station Analyzer

CellMaster

An Integrated Multi-Function Base Station Test Tool
for Greater Flexibility and Technician Productivity

From the Industry Leader in Handhe

The Cell Master from Anritsu is a single instrument that combines all of the tools required to simplify the job of maintaining and troubleshooting base stations.

Easy-to-Use

A single, lightweight, handheld, battery-operated package, the Cell Master combines the functionality of a cable and antenna analyzer, spectrum analyzer, power meter, T1 and E1 analyzer.

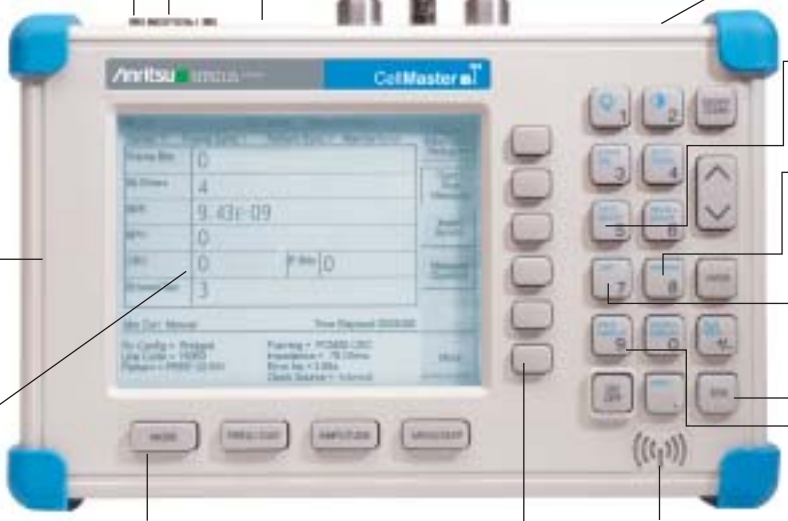
This optimal combination of network test capability eases the job of a network technician by eliminating the need for several independent test instruments, and reducing the number of tools the technician must carry and learn to operate.

The Cell Master is a low-cost, easy-to-use, and rugged solution that has been designed specifically for field-based network technicians and engineers.

- Cable and Antenna Analyzer (25 MHz to 4.0 GHz)
  - Return Loss/SWR measurement
  - Cable Loss measurement
  - Distance-to-Fault measurement
- Spectrum Analyzer (10 MHz to 3.0 GHz)
  - Signal identification
  - Interference analysis
  - ACPR, OBW, Channel Power, Field Strength
- Power Meter (10 MHz to 3.0 GHz)
  - Transmitter power
- T1 and E1 Analyzer
  - Local and Remote Loopback
  - BER, FER testing
  - Voltage peak-to-peak measurement
  - Histogram

eld Field Application Instrumentation – a M

The Cell Master is the only instrument you need for complete base station maintenance and trouble-shooting



RS-232 Interface
Transfer stored data to and from a personal computer (PC) or download to a printer via a serial cable for further analysis. Use PC to automatically control and collect data in the field.

Snap-in Field replaceable battery location

External DC Power Port

Spectrum Analyzer & Power Meter Port

External Trigger & External Reference In

Cable & Antenna Analyzer Port

T1/E1 Receive & Transmit Port

Save & Recall Setup
25 setups for fast repeatable testing.

Marker
Six markers for more comprehensive measurements.

Limit
Create simple pass/fail measurements with a single limit line, upper and/or lower mask limit lines.

Multilingual User Interface
Multi-language user interface features on-screen menus and messages in six different languages.

Save & Recall Display
Up to 200 memory locations. Alphanumeric data labeling and automatic time/date stamp simplify data management.

Rugged & Reliable Chassis Design
Ruggedized, lightweight, compact, high-impact housing is designed to withstand repeated drops and rough handling. Weather resistant seals and rubber membrane keypad protect unit from dirt and moisture.

Large High Resolution Display
VGA (640x480) display featuring contrast and variable back-lighting capability. Easy viewing under a variety of conditions, including direct sunlight.

Function Keys
Four dedicated function keys simplify measurement tasks.

Soft Keys
Intuitive soft key menu and user interface.

AM/FM Receiver with Internal Speaker
Built-in AM/FM demodulator enables testing and trouble-shooting of wireless communications systems. An internal speaker and jack are included.

Cable and Antenna Analyzer

The cable and antenna analyzer tool provides for return loss / SWR and Distance-to-Fault measurements. This enables quick evaluations of the health and status of transmission lines and antenna systems, and speeds the benchmarking of new cell site installations at the time of commissioning.

Test / Capability	Benefits
25 MHz to 4000 MHz	Covers all cell site frequency ranges without additional plug-ins or instruments
Built-in calibration intelligence	Ensures accurate and proper calibration
FlexCal™	Allows troubleshooting cable and antenna systems without multiple calibrations and calibration setups
Superior immunity to interference	Accurate and repeatable measurements in RF-noisy environments
130, 259 and 517 data points	Optimizes distance measurement resolution and fault locations
< 500 msec per sweep	Enables easier identification of intermittent, real-time problems

Multi-Function Base Station Analyzer

Spectrum Analyzer

The spectrum analyzer enables field technicians to analyze and identify over-the-air interference and transmitter characteristics easily, without having to lug a separate instrument.

Test / Capability	Benefits
Built-in worldwide signal standards and frequency channels	Common language to cell technicians and eliminates the need to perform channel-to-frequency translation
–135 dBm amplitude sensitivity	Able to examine low level interference and reverse link signal

Power Meter

The power meter tool performs accurate power measurements, reducing coverage holes and interference.

Test / Capability	Benefits
Requires no additional power sensors	No additional parts to carry to the field

T1 and E1 Analyzer

The Cell Master performs full T1/E1 functional tests, simplifying the task of determining if the source of problems is on the wireline or the wireless side.

Test / Capability	Benefits
Full function T1 and E1 tests	No need to purchase or carry separate wireline testers
Histogram display	Provide continuous monitoring or overnight monitoring of wireline health

AM/FM/SSB Demodulator

A built-in demodulator for AM, narrowband FM, wideband FM and single sideband (selectable USB and LSB) allows a technician to easily identify interfering signals.

Powerful PC based Data Management and Analysis Software

A comprehensive data management and analysis software suite comes with every Cell Master unit, providing users with a simple and easy method of managing, archiving, and analyzing system performance, trends, and the general health of monitored base stations. Handheld Software Tools also provides a professional report generator, for those times when recorded data must be communicated.

- The Cell Master PC software program is Windows 95/98/NT4/2000/ME/XP compatible, and supports long alpha-numeric file names for descriptive data labeling
- Stores an unlimited number of data traces for comparison of historical performance measurements, easing the task of trend analysis
- Transfer data traces between the Cell Master and the PC with a single menu selection

Specifications

All specifications apply when calibrated at ambient temperature after a five minute warm up. Typical values are given for reference, and are not guaranteed.

Cable and Antenna Analyzer

Frequency Range: 25 MHz to 4.0 GHz
Frequency Accuracy: ≤ ±75 ppm @ +25˚C
Frequency Resolution: 100 kHz
Output Power: < 0 dBm (–10 dBm nominal)
Immunity to Interfering Signals:
on-channel +17 dBm
on-frequency –5 dBm
Measurement speed: ≤3.5 msec / data point (CW ON)
Number of data points: 130, 259, 517
Return Loss: Range: 0.00 to 60.00 dB
Resolution: 0.01 dB
VSWR: Range: 1.00 to 65.00
Resolution: 0.01
Cable Loss: Range: 0.00 to 30.00 dB
Resolution: 0.01 dB
Measurement Accuracy: > 42 dB corrected directivity after calibration
Distance-To-Fault
Vertical Range: Return Loss: 0.00 to 60.00 dB
VSWR: 1.00 to 65.00
Horizontal Range: 0 to (# of data pts -1) x Resolution to a maximum of 1197 m (3929 ft), # of data pts = 130, 259 or 517
Horizontal Resolution (Rectangular windowing): Resolution (meter) = (1.5 x 10^^{8}) x (Vp)/DF
Where Vp is the cable's relative propagation velocity and where DF is the stop frequency minus the start frequency (in Hz)

Spectrum Analyzer

Frequency:
Frequency Range: 10 MHz to 3.0 GHz
Frequency Reference (Internal Timebase):
Aging: ±1 ppm/yr
Accuracy: ±2 ppm
Frequency Span: 10 Hz to 2.99 GHz in 1, 2, 5 step selections in auto mode, plus zero span
Sweep Time: ≤ 1.1 sec full span;
≤ 50 µsec to 20 sec zero span
Resolution Bandwidth (–3 dB):
100 Hz to 1 MHz in 1-3 sequence ± 5% Accuracy
Video Bandwidth (–3 dB):
3 Hz to 1 MHz in 1-3 sequence ± 5% Accuracy typical
SSB Phase Noise (1 GHz) @ 30 kHz Offset:
≤–75 dBc/Hz
Spurious Responses Input Related: ≤–45 dBc
Spurious Residual Responses:
≤–90 dBm, ≥10 MHz
(10 kHz RBW, pre-amp on)
Amplitude:
Total Level Accuracy:
±1 dB typical (±1.5 dB max), ≥10 MHz to 3 GHz, for input signal levels ≥ –60 dBm, excluding input VSWR mismatch
Measurement Range: +20 dBm to –135 dBm
Input Attenuator Range: 0 to 51 dB, selected manually or automatically coupled to the reference level. Resolution in 1 dB steps.
Displayed Average Noise Level:
≤–135 dBm, ≥10 MHz (preamp on)
≤–115 dBm (preamp on)
for input terminated, 0 dB attenuation, RMS detection, 100 Hz RBW
Dynamic Range: >65 dB, typical
Display Range: 1 to 15 dB/division, in 1 dB steps, 10 divisions displayed
Scale Units: dBm, dBV, dBmV, dBµV, V, W
RF Input VSWR: (with ≥20 dB atten.) 1.5:1 typical, (10 MHz to 2.4 GHz)

Power Meter

Frequency Range: >10 MHz to 3.0 GHz
Measurement Range: –80 dBm to +20 dBm
(+80 dBm with 60 dB external attenuator)
Display Range: –80 dBm to +80 dBm
Offset Range: 0 to +60 dB
Accuracy**: ±1 dB typical (±1.5 dB max), ≥10 MHz to 3 GHz
VSWR: 1.5:1 typical (P_{in} >–30 dBm, >10 MHz to 2.4 GHz)
Maximum Power: +20 dBm (0.1W)
without external attenuator
**(Excludes Input VSWR)

T1 Analyzer

Line Coding: AMI, B8ZS
Framing Modes: D4 (Superframe),
ESF (Extended Superframe)
Connection Configurations:
Terminate (100Ω)
Bridge (≥1000Ω)
Monitor (Connect via 20 dB pad in DSX)
Receiver Sensitivity: 0 to –36 dBdsx
Transmit Level: 0 dB, –7.5 dB, and –15 dB
Clock Sources: External
Internal: 1.544 MHz ± 30 ppm
Pulse Shapes: Conform to ANSI T1.403
Pattern Generation and Detection: PRBS: 2-9, 2-11, 2-15, 2-20, 2-23 Inverted and non-inverted, QRSS, 1-in-8 (1-in-7), 2-in-8, 3-in-24, All ones, All zeros, T1-Daly, User defined (≤ 32 bits)
Circuit Status Reports: Carrier present, Frame ID and Sync., Pattern ID and Sync.
Alarm Detection: AIS (Blue Alarm)
RAI (Yellow Alarm)
Error Detection: Frame Bits, Bit, BER, BPV, CRC, Error Sec
Error Insertion: Bit, BPV, Framing Bits, RAI, AIS
Loopback Modes: Self loop, CSU, NIU, User defined, In-band or Data Link
Level Measurements: Vp-p (± 5%)
Data Log: Continuous, up to 48 hrs

E1 Analyzer

Line Coding: AMI, HDB3
Framing Modes: PCM30, PCM30CRC, PCM31, PCM31CRC
Connection Configurations:
Terminate (75Ω, 120Ω)
Bridge (≥1000Ω)
Monitor (Connect via 20 dB pad in DSX)
Receiver Sensitivity: 0 to –43 dB
Clock Sources: External
Internal: 2.048 MHz ±30 ppm
Pulse Shapes: Conform to ITU G.703
Pattern Generation and Detection:
PRBS: 2-9, 2-11, 2-15, 2-20, 2-23 Inverted and non-inverted, QRSS, 1-in-8 (1-in-7), 2-in-8, 3-in-24, All ones, All zeros, T1-Daly, User defined (≤ 32 bits)
Circuit Status Reports: Carrier present, Frame ID and Sync., Pattern ID and Sync.
Alarm Detection: AIS, RAI, MMF
Error Detection: Frame Bits, Bit, BER, BPV, CRC, E-Bits, Error Sec
Error Insertion: Bit, BPV, Framing Bits, RAI, AIS
Loopback Modes: Self loopback
Level Measurements: Vp-p (± 5%)
Data Log: Continuous, up to 48 hrs

General

Language Support: English, Spanish, French, German, Chinese, Japanese
Internal Trace Memory: Up to 200 traces
Setup Configuration: 25
Display: VGA, monochrome LCD with adjustable backlight
Inputs and Outputs Ports:
RF Out: Type N, female, 50Ω
Maximum Input without Damage: +20 dBm, ± 50 VDC
RF In: Type N, female, 50Ω
Maximum Input without Damage: +43 dBm (Peak), ± 50 VDC
Ext. Trig In: BNC, female (5V TTL)
Ext. Freq Ref In (2 to 20 MHz): Shared BNC, female, 50Ω, (–15 dBm to +10 dBm)
T1/E1 (Receive & Transmit): Bantam Jack
Serial Interface: RS-232 9 pin D-sub, three wire serial
Electromagnetic Compatibility: Meets European Community requirements for CE marking
Safety: Conforms to EN 61010-1 for Class 1 portable equipment
Temperature:
Operating: –10°C to 55°C, humidity 85% or less
Non-operating: –51°C to +71°C (Recommend the battery be stored separately between 0°C and +40°C for any prolonged non-operating storage period.)
Power Supply:
External DC Input: +12.5 to +15 volt dc, 3A max
Internal: NiMH battery: 10.8 volts, 1800 mA maximum
Dimensions:
Size (w x h x d): 25.4 cm x 17.8 cm x 6.1 cm
(10.0 in x 7.0 in x 2.4 in)
Weight: <2.28 kg (<5 lbs) includes battery

Ordering Information

Model: MT8212A - Cable & Antenna Analyzer (25 MHz to 4.0 GHz),
with Built-in DTF, Spectrum Analyzer (10 MHz to 3.0 GHz),
Power Meter, T1/E1 Analyzer, AM/FM/SSB Demodulator

Standard Accessories Include

User's Guide
Soft Carrying Case
AC-DC Adapter with Power Cord
Automotive Cigarette Lighter/12 Volt DC Adapter
One Year Warranty
CDROM containing Fault Location (DTF), Smith Chart and Software Management Tools
Serial Interface Cable
Rechargeable Battery, NiMH

Optional Accessories

1N50C	Limiter, N(m) to N(f), 50Ω, 10 MHz to 18 GHz
42N50-20	Attenuator, 20 dB, 5 watt, DC to 18 GHz, N(m)-N(f)
42N50A-30	Attenuator, 30 dB, 50 watt, DC to 18 GHz, N(m)-N(f)
ICN50	InstaCal™ Calibration Module, 2 MHz to 4.0 GHz, N(m), 50Ω
22N50	Open/Short, DC to 18 GHz, N(m), 50Ω
22NF50	Open/Short, DC to 18 GHz, N(f), 50Ω
SM/PL	Precision Load, DC to 4 GHz, 42 dB, N(m), 50Ω
SM/PLNF	Precision Load, DC to 4 GHz, 42 dB, N(f), 50Ω
OSLN50LF	Precision Open/Short/Load, DC to 4 GHz, 42 dB, 50Ω, N(m)
OSLNF50LF	Precision Open/Short/Load, DC to 4 GHz, 42 dB, 50Ω, N(f)
2000-767	Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(m), 50Ω
2000-768	Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(f), 50Ω
15NN50-1.5C	Test Port Cable Armored, 1.5 meters, N(m)-N(m), 6 GHz, 50Ω
15NN50-3.0C	Test Port Cable Armored, 3.0 meters, N(m)-N(m), 6 GHz, 50Ω
15NN50-5.0C	Test Port Cable Armored, 5.0 meters, N(m)-N(m), 6 GHz, 50Ω
15NNF50-1.5C	Test Port Cable Armored, 1.5 meters, N(m)-N(f), 6 GHz, 50Ω
15NNF50-3.0C	Test Port Cable Armored, 3.0 meters, N(m)-N(f), 6 GHz, 50Ω
15NNF50-5.0C	Test Port Cable Armored, 5.0 meters, N(m)-N(f), 6 GHz, 50Ω
15ND50-1.5C	Test Port Cable Armored, 1.5 meters, N(m)-7/16 DIN(m), 6 GHz, 50Ω
15NDF50-1.5C	Test Port Cable Armored, 1.5 meters, N(m)-7/16 DIN(f), 6 GHz, 50Ω
34NN50A	Precision Adapter, N(m)-N(m), DC to 18 GHz, 50Ω
34NFNF50	Precision Adapter, N(f)-N(f), DC to 18 GHz, 50Ω
1091-26	Adapter, N(m)-SMA(m), DC to 18 GHz, 50Ω
1091-27	Adapter, N(m)-SMA(f), DC to 18 GHz, 50Ω
1091-80	Adapter, N(f)-SMA(m), DC to 18 GHz, 50Ω
1091-81	Adapter, N(f)-SMA(f), DC to 18 GHz, 50Ω
1091-172	Adapter, N(m)-BNC(f), DC to 1.3 GHz, 50Ω
510-90	Adapter, 7/16 DIN(f)-N(m), DC to 7.5 GHz, 50Ω
510-91	Adapter, 7/16 DIN(f)-N(f), DC to 7.5 GHz, 50Ω
510-92	Adapter, 7/16 DIN(m)-N(m), DC to 7.5 GHz, 50Ω
510-93	Adapter, 7/16 DIN(m)-N(f), DC to 7.5 GHz, 50Ω
510-96	Adapter, 7/16 DIN(m)-7/16 DIN(m), DC to 7.5 GHz, 50Ω
510-97	Adapter, 7/16 DIN(f)-7/16 DIN(f), DC to 7.5 GHz, 50Ω
2000-1030	Portable Antenna, SMA (m), 1.71 to 1.88 GHz, 50Ω
2000-1031	Portable Antenna, SMA (m), 1.85 to 1.99 GHz, 50Ω
2000-1032	Portable Antenna, SMA (m), 2.4 to 2.5 GHz, 50Ω
2000-1200	Portable Antenna, SMA (m), 806-869 MHz, 50Ω
2000-1035	Portable Antenna, SMA (m), 896-941 MHz, 50Ω
806-16	Bantam Plug to Bantam Plug
806-116	Bantam Plug to BNC
806-117	Bantam "Y" Plug to RJ48
551-1691	USB to RS-232 adapter cable
48258	Soft Carrying Case
760-229	Transit Case
633-27	Rechargeable Battery, NiMH
2000-1029	Battery Charger, NiMH, w/ Universal Power Supply
40-115	AC/DC Adapter
806-62	Automotive Cigarette Lighter/12 Volts DC Adapter
800-441	Serial Interface Cable
2300-347	Software Tools
10580-00083	Cell Master User's Guide (for Model MT8212A)
10580-00094	Cell Master Programming Manual (for Model MT8212A)
10580-00095	Cell Master Maintenance Manual (for Model MT8212A)

Printers

2000-1214	HP DeskJet Printer, Model 450: Includes printer cable, 2000-1216 black print cartridge and U.S. power cord. Also includes 2000-753 serial-to-parallel Centronics converter cable and 1091-310 Centronics-to DB25 adapter. Rechargeable battery is optional and is not included.
2000-753	Null Modem Serial-to-Parallel Centronics Converter Cable
1091-310	Adapter 36-pin Centronics female-to-DB25 female
2000-1216	Black Print Cartridge
2000-663	Power Cable (Europe) for DeskJet Printer
2000-664	Power Cable (Australia) for DeskJet Printer
2000-667	Power Cable (S. Africa) for DeskJet Printer
2000-1217	Rechargeable Battery for DeskJet Printer, Model 450
2000-1218	Power Cable (U.K.) for DeskJet Printer

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