The MX882005C PHS Measurement Software supports transmitter and receiver measurements of PHS mobile terminals now spreading worldwide centered on Asia, including Japan. Installing the MX882005C PHS Measurement Software in one MT8820C main frame supports evaluation of major transmitter and receiver characteristics of PHS terminals and base stations. Advanced DSP and parallel measurement technologies greatly reduce manufacturing and test times for PHS terminals and base stations.

In addition, multiple measurement items can be selected freely for batch processing, while the number of repeat measurements can be set for each individual measurement. At PHS measurement, selected items can be batch-measured by one touch for quick and simple Pass/Fail evaluation of major items, such as transmit frequency, modulation accuracy, transmit power, adjacent channel power and BER.

The standard GPIB and Ethernet interface allows the MT8820C to be built into automated production lines and test systems at service and repair depots.

### Solution for PHS Terminals and Base Stations Production Lines

#### PHS Measurement

<table>
<thead>
<tr>
<th>Transmitter Tests</th>
<th>Output Power</th>
<th>Modulation Accuracy</th>
<th>Occupied Bandwidth</th>
<th>Adjacent Channel Power</th>
<th>Transmission Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver Tests</td>
<td>Bit Error Ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Transmitter Measurement

Transmit Power

The RF power and carrier-off leakage power of PHS terminals and base stations are measured and the max., average and min. values are displayed by setting the number of repeat measurements to 2 or more, so variations in PHS terminal characteristics can be assessed. This repeat measurement function is also supported for other measurements.

Wide Dynamic Range Mode

The absolute value and On/Off ratio of carrier-off leakage power are measured. When the carrier-off level is low, measurement can be performed in the wide dynamic range mode.

Modulation Accuracy

The frequency, frequency errors (kHz and ppm), modulation accuracy, phase error, amplitude error and origin offset of PHS terminals and base stations are measured simultaneously. A waveform display function is also provided.
**Burst Waveform Display**

The burst waveform can be displayed graphically. Magnified display of the entire time slot and whole frame as well as the rising/falling edges enables users to easily check whether or not the burst waveform meets the PHS standard template.

**Transmission Rate**

Transmission rate and transmission speed error of PHS terminals and base stations can be measured.
Occupied Bandwidth

Occupied bandwidth of PHS terminals and base stations is measured. The bandwidth ratio for total power can be changed within the range of 80.0 to 99.9%. Measurements can be performed in the high-speed mode. Waveform can be displayed in the normal mode.

Adjacent Channel Power

The adjacent channel power of PHS terminals and base stations is measured. The power spectrum is measured at four frequency points (–900, –600, +600 and +900 kHz) offset from the carrier frequency. Advanced DSP technology and parallel processing of the power spectrum with other measurements enable high-speed measurement. And the waveforms can be displayed too.
**Receiver Measurement**

**Bit Error Rate (BER)**

The bit error rate can be measured on receipt of demodulation data and clocks output from a PHS terminal/base station by controlling the PHS terminal with an external PC etc. This measurement can be performed in parallel with transmitter measurement.

**Call Processing Function**

**Connection Test**

The call processing function supports various connection tests, including location registration, terminal call origination, network call origination, call communication, network disconnection, terminal disconnection, and handover. During a call, the user’s voice can be echoed back from the PHS terminal to provide a simple voice communication test.

**Connection with DUT**

**TRx Measurement**

Mobile terminal information reported by a PHS terminal is displayed on the screen. This information includes the identification code (PS-ID) and phone number of the PHS terminal, as well as the dial network number.

**Mobile Terminal Report Monitor**

- Provide by user
Sequence Monitor

The functions of a PHS terminal can be operated and verified using the call processing function. The MT8820C simulates the PHS base station and displays the sequence screen, so Pass/Fail results of the connection test for location registration, call origination, call termination, communication, handover (for THC switch type), network disconnection, terminal disconnection, etc., can be checked at a glance.

Transmitter Test in Communication State

A transmission test can be performed in the communication state. As well as conducting evaluations during actual communications with the base station, transmission measurement can be performed regardless of restrictions on test controls, which vary with carrier and manufacturer. This function greatly improves production and maintenance efficiency.

Measurement Result Evaluation Function

The upper and lower limits of the normal value can be specified for each item and Pass/Fail can be displayed for measurement results. This function is useful for identifying faults at service centers and repair depots.
The MX882005C-011 Advanced PHS Measurement Software is a software option to enable Advanced PHS measurements in compliance with the PHS measurement specification (ARIB RCR-STD-28 edition 5.0). It evaluates the transmitter and receiver characteristics of Advanced PHS terminals and base stations. Transmitter and receiver measurement is accomplished by installing the MX882005C-011 Advanced PHS Measurement Software in the MT8820C main frame and selecting the required modulation method from π/4DQPSK, 8PSK, and 16QAM.

* Requires MT8820C-002 and MX882005C

### Advanced High-speed and Batch Measurement Methods Supporting Advanced PHS Base Station Production Lines

- **Advanced PHS Measurement**

<table>
<thead>
<tr>
<th>Transmitter Tests</th>
<th>Output Power</th>
<th>Modulation Accuracy</th>
<th>Occupied Bandwidth</th>
<th>Adjacent Channel Power</th>
<th>Transmission Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver Tests</td>
<td>Bit Error Ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Modulation Type Select Pop-up Window

- Burst Waveform (Entire Time Slot: 8PSK)
Transmitter Measurement

Modulation Accuracy

The frequency, frequency errors (kHz and ppm), modulation accuracy, phase error, amplitude error, and origin offset of Advanced PHS terminals and base stations are measured simultaneously. A waveform display function is also provided.

Receiver Measurement

Bit Error Rate (BER)

The bit error rate can be measured on receipt of demodulation data and clocks output from an Advanced PHS terminal/base station by controlling the PHS terminal with an external PC etc. This measurement can be performed in parallel with transmission measurement.

Call Processing Function

Connection Test

The call processing function enables various connection tests including location registration, terminal call origination, network call origination, call communication, network disconnection, terminal disconnection, and handover.

The added π/2DBPSK voice communication function is based on the existing PHS standard (ARIB RCR-STD-28, π/4DQPSK modulation). During a call, the user’s voice can be echoed back from the advanced PHS terminal to provide a simple voice communication test.

The mobile terminal report monitor, sequence monitor, transmission test in communication state, and measurement result evaluation operations are similar to the MX882005C.

The output power, wide dynamic range mode, burst waveform display, transmission rate, occupied bandwidth and adjacent channel power operations are similar to the MX882005C.
Specifications

• MT8820C-002 TDMA Measurement Hardware, MX882005C PHS Measurement Software

| Frequency/Modulation | Frequency: 300 MHz to 2.7 GHz  
|----------------------|----------------------------------|
| Input level          | Average power within burst, Main:  
|                      | –30 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC)  
|                      | –30 to +35 dBm (Measurement object: Continuous wave)  
| Carrier frequency accuracy | ± (setting frequency x accuracy of the reference oscillator + 10 Hz)  
| Modulation accuracy | ± (2% of indicated value + 0.7%)  
| Origin offset accuracy | ±0.5 dB to signal level of –30 dBc  
| Transmission rate | ±1 ppm (Measurement range 384 kbps ±100 ppm)  

| Amplitude measurement | Frequency: 300 MHz to 2.7 GHz  
|-----------------------|----------------------------------|
| Input level (Average in-burst power, Main): | –30 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC)  
| –30 to +35 dBm (Measurement object: Continuous wave)  
| Measurement accuracy (After calibration): | ±0.5 dB (–20 to +40 dBm), ±0.7 dB (–30 to –20 dBm)  
| Linearity: | ±0.2 dB (–40 to 0 dB, ≥ –30 dBm)  
| Carrier-off power measurement range: | ≥55 dB  
| ≥ (Magnitude measurement value [dBm] + 70) dB, (Wide dynamic range power measurement)  

| Occupied bandwidth | Frequency: 300 MHz to 2.7 GHz  
|--------------------|----------------------------------|
| Input level (Average in-burst power, Main): | –10 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC)  
| –10 to +35 dBm (Measurement object: Continuous wave)  

| Adjacent channel power | Frequency: 300 MHz to 2.7 GHz  
|-----------------------|----------------------------------|
| Input level (Average in-burst power, Main): | –10 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC)  
| –10 to +35 dBm (Measurement object: Continuous wave)  
| Measurement range: | ≤–60 dB (600 kHz offset), ≤–65 dB (900 kHz offset)  

| RF signal generator | Output frequency: 300 MHz to 2.7 GHz, 1 Hz step  
|-------------------|----------------------------------|
| Modulation accuracy:  | ≤3% rms  
| Modulation data: | PN9, PN15  

| Error rate | Function: Bit error rate measurement  
|-----------|----------------------------------|
| Measurement object: | Serial data inputted from the Call Proc. I/O terminal of a rear panel  

| Call processing | Call control: Location registration, Call origination, Call termination, Call communication, Network disconnection, Terminal disconnection, Handover  

• MT8820C-002 TDMA Measurement Hardware, MX882005C-011 ADVANCED PHS Measurement Software

| Measurement object | The specifications are the same as for the MX882005C. The measurement objects are as follows.  
|-------------------|----------------------------------|
| PS-TCH | (π/4DQPSK, π/2BPSK, 8PSK, 16QAM)  
| PS-SYNC | (π/4DQPSK, π/2BPSK)  
| PS-SCCH | (π/2BPSK)  
| CS-TCH | (π/4DQPSK, π/2BPSK, 8PSK, 16QAM)  
| CS-SYNC | (π/4DQPSK, π/2BPSK)  
| For modulation measurement: Guaranteed only when no bias in symbol point when measurement object modulation type is 16QAM.  

| Call processing | Call control with π/4DQPSK or π/2BPSK:  
|----------------|----------------------------------|
| Location registration, Call origination, Call termination, Call communication, Network disconnection, Terminal disconnection, Handover  

<table>
<thead>
<tr>
<th>Model/Order No.</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT8820C</td>
<td>Radio Communication Analyzer</td>
</tr>
<tr>
<td>W3220AE</td>
<td>W822002 Operation Manual (CD-ROM): 1 pc</td>
</tr>
</tbody>
</table>

**Standard accessories**
- Power Cord: 1 pc
- CF Card: 1 pc
- PC Card Adapter (For CF card): 1 pc

**Options**
- Extended RF Hardware: 1 pc

**Software options**
- W-CDMA Measurement Software (requires MT8820C-003 and MX882002C)
- TD-SCDMA HSDPA Evolution Measurement Software (requires MT8820C-011 and MX882002C)
- TD-SCDMA HSDPA Measurement Software (requires MT8820C-017, MT8820C-119, or MT8820C-120)
- CDMA2000 1x EV-DO Measurement Software (requires MT8820C-001 and MX882000C)
- W-CDMA Call Processing Software (requires MT8820C-003, MX882013C, and MX882050C)
- W-CDMA Video Phone Test (requires MX882050C and MX882013C)
- DC-HSPA Measurement Software (requires MT8820C-001, MX882000C, MX882000C-011, and MX882001C)
- TD-SCDMA HSDPA Measurement Software (requires MT8820C-001, MX882000C-001, and MX882000C-003)
- 4G HSDPA Measurement Software (requires MT8820C-001, MX882000C-001, and MX882000C-003)
- GSM Measurement Software (requires MT8820C-001, MX882000C-001, and MX882000C-003)
- GSM External Packet Data (requires MX882000C)

**Product Brochure**
- 2 years Extended Warranty Service
- 3 years Extended Warranty Service
- 5 years Extended Warranty Service

**Application parts**
- P003B W-CDMA/GSM Test USIM
- P003B W-CDMA/GSM Test USIM
- P013A6 Anritsu Test UICC GA (Nano UICC size)
- P013A7 Anritsu Test UICC GA (Micro UICC size)
- P025A6 Anritsu Test UICC CT (Nano UICC size)
- P025A7 Anritsu Test UICC CT (Nano UICC size)
- P026A6 Anritsu Test UICC GM (Nano UICC size)
- P026A7 Anritsu Test UICC GM (Nano UICC size)
- P015B6 Anritsu Test UICC GA (Nano UICC size)
- P015B7 Anritsu Test UICC GM (Nano UICC size)
- P026B6 Anritsu Test UICC GM (Nano UICC size)
- A005B Handset
<table>
<thead>
<tr>
<th>Model/Order No.</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1195A</td>
<td>PP2S Output Cable</td>
</tr>
<tr>
<td>J1249</td>
<td>CDMA2000 Cable</td>
</tr>
<tr>
<td></td>
<td>[D-Sub (15 pin, P-type) - D-Sub (15 pin, P-type), used in combination with J1267 (sold separately)]</td>
</tr>
<tr>
<td>J1267</td>
<td>CDMA2000 Cross Cable</td>
</tr>
<tr>
<td></td>
<td>[D-Sub (9 pin, P-type) - D-Sub (9 pin, P-type), reverse cable used in combination with J1249 (sold separately)]</td>
</tr>
<tr>
<td>J1606A</td>
<td>Coaxial Cord, 1 m (N-P) - 5D-2W - N-P</td>
</tr>
<tr>
<td>J0576B</td>
<td>Coaxial Cord, 2 m (N-P) - 5D-2W - N-P</td>
</tr>
<tr>
<td>J0127A</td>
<td>Coaxial Cord, 1 m (BNC-P - RG58A/U - BNC-P)</td>
</tr>
<tr>
<td>J0127C</td>
<td>Coaxial Cord, 0.5 m (BNC-P - RG58A/U - BNC-P)</td>
</tr>
<tr>
<td>J0007</td>
<td>GPIB Cable, 1 m</td>
</tr>
<tr>
<td>J0008</td>
<td>GPIB Cable, 2 m</td>
</tr>
<tr>
<td>MN8110B</td>
<td>I/O Adapter (for card processing I/O)</td>
</tr>
<tr>
<td>B0332</td>
<td>Joint Plate (4 pcs/ set)</td>
</tr>
<tr>
<td>B0643A</td>
<td>Rack Mount Kit (MT8820C)</td>
</tr>
<tr>
<td>B0499B</td>
<td>Carrying Case (Hard type) (with protective cover and casters)</td>
</tr>
<tr>
<td>B0499</td>
<td>Carrying Case (Hard type) (with protective cover, without casters)</td>
</tr>
</tbody>
</table>

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1. MT8820C-017 has been a standard option that MT8820C are shipped with until July 2012 (Simultaneous order is required MT8820C and MT8820C-017).
2. For terminal connectivity, contact your Anritsu sales representative.
3. MX882000C-032 is required a Parallelphone measurement configuration of W-CDMA HSPA Evolution. For use MT8820C 2 units, contact your Anritsu sales representative.
4. MX882000C-033 (034) is required W-CDMA DC-HSDPA configuration.
5. The following measurement hardware supports the Parallelphone measurement configuration: MT8820C-001, MT8820C-002, MT8820C-003, MT8820C-007, MT8820C-008. All the measurement hardware can be installed simultaneously.

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