ShibaSoku®

PHS35M

COMMUNICATION INSTRUMENTS

PHS HANDY ANALYZER

General

The PHS35M handy analyzer is a handy type air sequence monitor designed to make real time monitoring of communication between CS and PS in compliance with PHS system standards (2nd generation wireless communication). This unit allows to take communication status and control data between CS and PS regarding service area survey. Sequential measurement analysis and diagnosis through monitoring descending /ascending control slot and communication slot in communication carriers make simply available such as RF level measurement, error rate measurement, control slot with CS-ID analysis, link protocol with seamless handover by large LCD screen on this unit. In combined use with PC, this unit enables to upgrade its processing for display/analysis/translate in protocol and CS time difference.

Features

- Compact, light-weight design enables to suit the field measurement even employing large scale LCD.
- Capable of long-hour operation by Ni-MH cell.
- USB port in PC I/F makes high performance on the PC.
- Cell station measurement
  - SCAN (Non-designate cell station measurement)
  - LCCH (Designate cell station measurement)
  - INTERVAL (Non-designate cell station time difference measurement)
  - WAVE (Burst waveform monitor)
- Spectrum measurement
  - RES MON (Designate cell station resource monitor)
- Link measurement
  - PROTOCOL (Link protocol monitor)
  - TCH ERR (Communication channel error measurement)
  - LCC+SCH (super framed and link monitor)
- Control channel setting
  - Enabling to assign carrier number 1 to 10 ch to control channel.

Specifications

- Electrical characteristics
- Reception frequency range
  1880.15 to 1929.65 MHz
- Reception frequency setting
  Carrier number 206 to 255, 1 to 116
- Reference frequency accuracy
  $\pm 3 \times 10^{-6}$
- Wireless access system
  TDMA-TDD
- Modulation system $\pi/4$ sift QPSK
- Signal transmission rate
  384 kbps
- Signal level measurement range and accuracy
  - Attenuator OFF
    10 to 45 dBμV (EMF), ±3 dBμV (251 to 255, 1 to 82 ch)
    13 to 45 dBμV (EMF), +1 dBμV/-5 dBμV (206 to 250, 83 to 116 ch)
  - Attenuator ON
    35 to 70 dBμV (EMF), ±3 dBμV (251 to 255, 1 to 82 ch)
    35 to 70 dBμV (EMF), +1 dBμV/-5 dBμV (206 to 250, 83 to 116 ch)
- Selectivity on adjacent channel
  ≥50 dBμV
- Reception signal input system
  Antenna input (Antenna gain 2.0 dBi)
  Connector input (Connector type; SMA-R)
- Detection outputs
  - Signal level
    0.7 Vp-p ±0.1 Vp-p (Input level of 50 dBμV with attenuator OFF)
  - Output impedance
    1 kΩ
- Physical slot for control
  - Measurement channel
    BCCH (A), BCCH (B), PCH, SCCH as used in descending.
    SCCH as used in ascending.
  - Data display format
    HEX display

Specifications

- Physical slot for communications
  - Measurement channel: Synchronous burst as used in descending/ascending, FACCH, SACCH
  - Handover tracing: FACCH/SACCH analyzed; TCH switching type, recall-type handover trace
  - Frame error measurements: Displays number of errors for every 240 slots. Display unique word errors and CRC errors.
- Time difference measurement
  - Measurement resolution: 0.42 μs
  - Measurement accuracy: ±1.0 μs
- CS-ID input method: CS-ID copy from non-designate cell station measurement or key input
- PS-ID input method: Auto input or key input

● Cell station measurement

- Non-designate cell station measurement
  - Carrier number setting: 206 to 255, 1 to 116
  - Carrier sensitive level setting: 10 to 80 dBμV
  - Measurement time setting: 0 to 90 sec
  - Measurement method: Sequential repeated measurement setting
- Designate cell station measurement
  - Carrier number setting: 206 to 255, 1 to 116
  - Carrier sensitivity level setting: 10 to 80 dBμV
  - Measurement method: Sequential repeated (real-time) or 1 super frame received.
  - CS-ID designate system: CS-ID copy from non-designate cell station measurement or key input.

● Spectrum measurement

- Measurement channel range: 206 to 255, 1 to 116 (Channel display Max. 87 ch)
- Measurement slot: All slots
- Measurement method: Sequential
- Measurement levels
  - Attenuator OFF: 10 to 45 dBμV (EMF) (251 to 255, 1 to 82 ch); 13 to 45 dBμV (EMF) (206 to 250, 83 to 116 ch)
  - Attenuator ON: 35 to 70 dBμV (EMF) (251 to 255, 1 to 82 ch); 35 to 70 dBμV (EMF) (206 to 250, 83 to 116 ch)
- Displays
  - Control carrier: Time constant attenuation
  - Call carrier: Updated every 3 sec

● Link measurement

- Protocol measurement
  - Display details: PS-ID, reception level, octet information elements, protocol identification, message category, information element identification
- TCH ERR measurement
  - Display details: Ascending/descending call channel signal level, unique word error, CRC error. Displayed each in 1.2 sec intervals (240 slots)
  - Note: Transceiver mode measurement is avairable. The mode is enabled with control software.

● Serial data input/output (For connecting to the external PC): USB interface (series B connector) RS232C interface

● Displays: STN LCD
- Dot configurations: 320 (H) x 240 (V)
- Dot size: 0.27 (H) x 0.27 (V) mm

● External file memory: Compact flash memory

● Number of storable data parameter: Approx. 1,000 data (Depend on file size)

● Measurement conditions storage memory: Approx. 96 parameters

● Measurement conditions storage time: Approx. 3 years (Back-up by lithium primary battery)

● Calendar display: Y/M/D; H/M/S

● Power supply: Dedicated battery or dedicated AC adapter

● Power saving management: Automatic power off system when no key operation occurs dulling 10/20/30 min. (Selectable)

● Battery management: Enforced power off system with warning display in case battery charge near end then voltage fall down.

● Battery voltage display: Remaining battery power displayed on graph, warning flashes when battery charge nears end and recharge warning LED (red) illuminates.

● Battery continuous operation time
- Standby (power on): Approx. 10 hours (Depend on charge conditions)
- Measurement (sequential): Approx. 8 hours (Depend on charge conditions)

● Dedicated battery
- Battery type: Ni-MH secondary battery (7.2 V, 3.5 Ah)
- Number of recharges: More than 500 times (Depend on the used conditions)

● Dedicated battery charger: Used for charging dedicated battery. Usable as AC adapter.
- Input power: AC 90 to 240V
- Output power charging: DC 9 V, 1000 mA
- Output power operation: DC 9 V, 500 mA
- Charge time: Approx. 5 hours (Depend on the battery discharge level)

Specifications

●General specifications

Operating temperature range	0℃ to 40℃ (10℃ to 40℃ for charger)
Relative humidity	≤90% RH (non-dewing)
Power consumption	
During standby (power on)	Approx. 350 mA
During measurement (sequential)	Approx. 420 mA (average)
Dimensions	215 (W) x 140 (H) x 50 (D) mm (without antenna extended)
Weight	Approx. 1 kg (including battery)
Accessories	Dedicated battery (Ni-MH) Dedicated battery charger (usable as AC adapter) Shoulder belt Hand strap User's manual Analysis software application (Including software for capturing file in the unit) RS-232C serial connection cable

●Options Compact flash memory card

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