/Inritsu

MT8870A
Universal Wireless Test Set

MT8870A Universal Wireless Test Set
Product Introduction

Version 1.00
September 2012

Anritsu Corporation

Discover What's Possible™
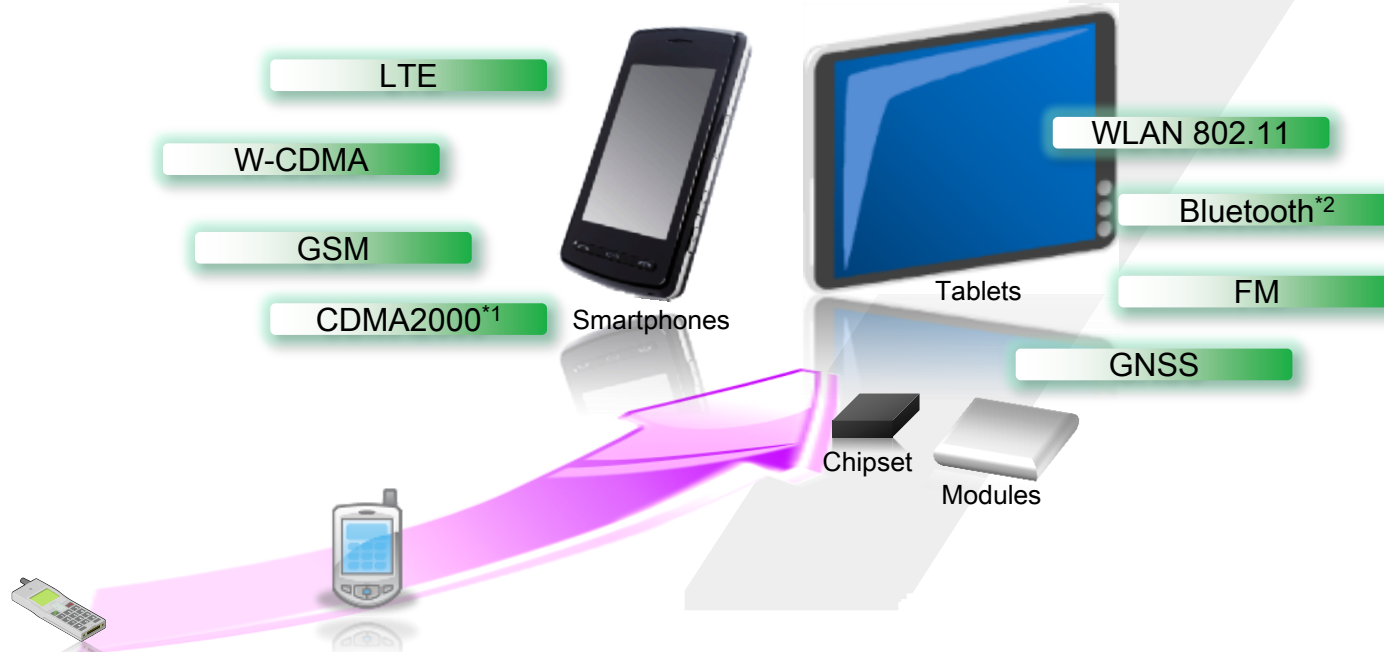
Anritsu

Contents

- Anritsu Mobile Communications Equipment Test Solution

- MT8870A Product Introduction

  ➢ Test set for Manufacturing

  ➢ MT8870A/MU887000A Features

- Application Examples

  ➢ Smartphone Manufacturing

  ➢ Communication Module Manufacturing

MT8870A Universal Wireless Test Set Introduction

- Anritsu Mobile Communications Equipment Test Solution

- MT8870A Product Introduction

  ➢ Test set for Manufacturing

  ➢ MT8870A/MU887000A Features

- Application Examples

  ➢ Smartphone Manufacturing

  ➢ Communication Module Manufacturing

Evolving Wireless Devices

- Today's smartphones and tablets use a variety of wireless standards. Wireless communications are continuing to evolve to meet users' needs and wireless applications are becoming part of everyday life.

- R&D and manufacturing of mobile terminals and communications modules require support for assorted wireless tests to assure continuing product quality.

- Manufacturing of multi-wireless-standard mobiles and modules requires configuration of an efficient and low-cost test environment.

LTE

W-CDMA

GSM

CDMA2000[*1]   Smartphones

WLAN 802.11

Bluetooth[*2]

FM

GNSS

Chipset

Modules

Tablets

[*1] : CDMA2000® is a registered trademark of Telecommunications Industry Association (TIA-USA).
[*2] : The Bluetooth word mark and logos are owned by the Bluetooth SIG, Inc and any use of such marks by Anritsu is under license.

Anritsu

MT8870A Universal Wireless Test Set Introduction

- Anritsu Mobile Communications Equipment Test Solution

- MT8870A Product Introduction

  - Test set for Manufacturing

  - MT8870A/MU887000A Features

- Application Examples

  - Smartphone Manufacturing

  - Communication Module Manufacturing

Test Set for Manufacturing

Fast Measurement/ Cut Costs

- All-in-one platform accommodating four test modules
- Platform for production lines
- High-speed CPU and large memory in each installed module
- Supports latest manufacturing technologies

Supports Multiple Wireless Technologies

- GSM/W-CDMA/C2K/LTE
- WLAN 802.11a/b/g/n/ac
- Bluetooth
- FM
- GNSS (GPS)
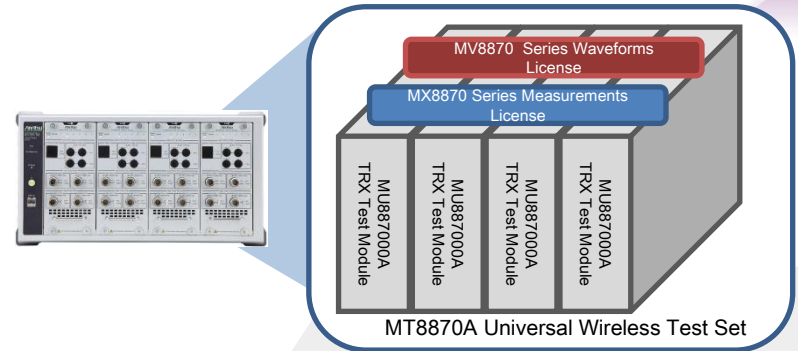- Digital broadcasting

Expandability/Potential

- All-in-one unit supporting assorted wireless standards tests
- Expandable by software
- Standards future-proof wideband hardware design

Discover What's Possible™

Slide 7

MT8870A-E-L-1

Anritsu

Supports Up to Four Modules
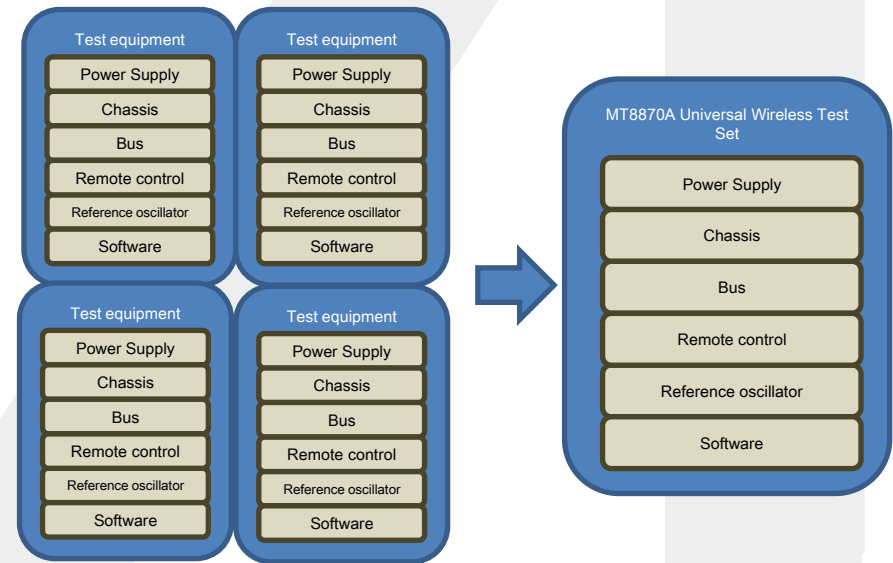
Cuts Costs

- **Supports Four Modules**

  - ➤ The MT8870A Universal Wireless Test Set supports up to four test modules in one main frame chassis.

  MV8870 Series Waveforms License

  MX8870 Series Measurements License

  MU887000A TRX Test Module

  MU887000A TRX Test Module

  MU887000A TRX Test Module

  MU887000A TRX Test Module

  MT8870A Universal Wireless Test Set

- **Shared Hardware Resources Cut Costs**

  - ➤ With four TRx modules installed in one MT8870A main frame, the shared power supply, chassis, internal communications bus, remote controller, reference frequency oscillator, software license, etc., cut capital costs.

  - ➤ Installing four test modules cuts cost per unit.

Test equipment
Power Supply
Chassis
Bus
Remote control
Reference oscillator
Software

Test equipment
Power Supply
Chassis
Bus
Remote control
Reference oscillator
Software

Test equipment
Power Supply
Chassis
Bus
Remote control
Reference oscillator
Software

Test equipment
Power Supply
Chassis
Bus
Remote control
Reference oscillator
Software

MT8870A Universal Wireless Test Set
Power Supply
Chassis
Bus
Remote control
Reference oscillator
Software

Modular Design Cuts Costs

- **Supports Flexible Manufacturing Line Changes**

  ➢ The MU887000A TRx Test Module easily supports production line configuration and model changes, eliminating backup instruments and cutting capital investment.

- **Cuts Line Downtime**

  ➢ Easy module swap-out cuts line downtime.

  ➢ No wasted time disconnecting remote control cables, power cables and coaxial cables on back panel so changeovers only take minutes.

Test Station A — Test Station B

Different backup instruments

One type of instrument

Fault
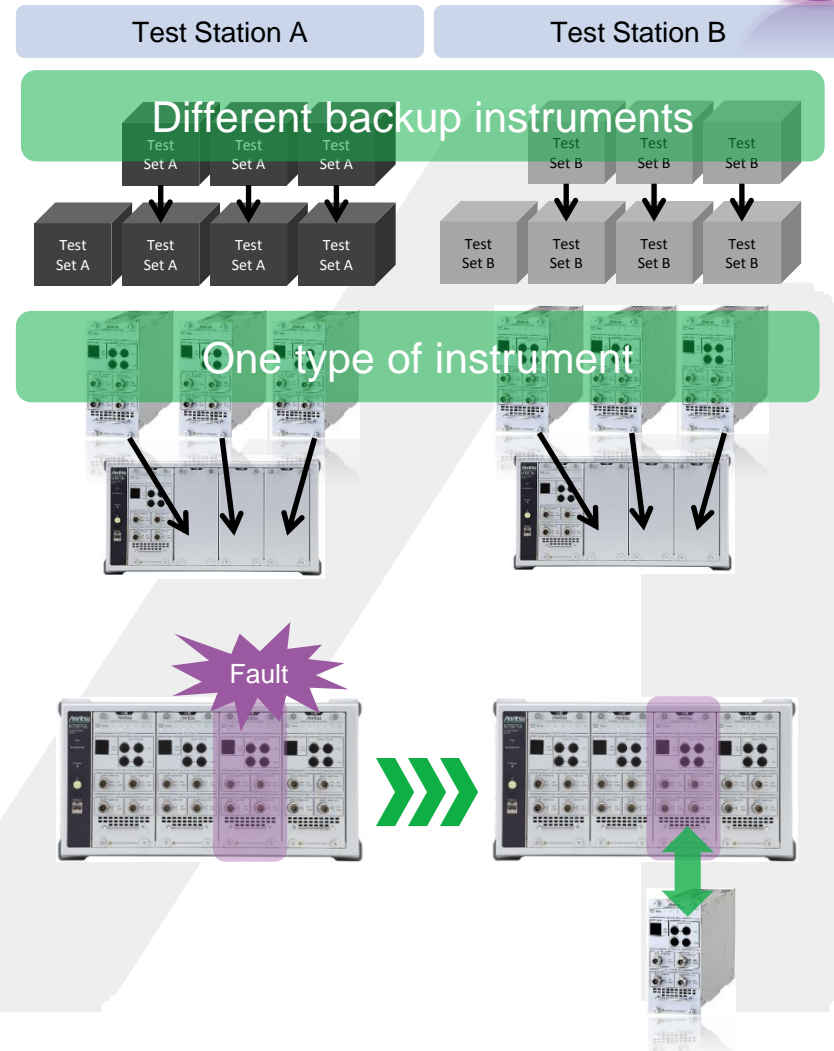
# Production Line Aware Platform

Cuts Costs

- **Slimmed Down Auto-Measurements**

  - Inspection production lines use auto-measurement programs to capture numeric measurement results from test set for pass/fail evaluation.

  - Eliminating line displays and instrument front-panel buttons while supporting remote control via Ethernet or GPIB cuts instrument costs, helping reduce device production costs.

- **50% to 75% Smaller Footprint**

  - Instead of four separate test stations each requiring setup, the all-in-one, high-performance MT8870A main frame with up to four installed test modules saves both production line space and setup time.

VSA/VSG		
VSA/VSG	OneBoxTester 2 x RF	
VSA/VSG		
VSA/VSG	OneBoxTester 2 x RF	MT8870A 4 modules
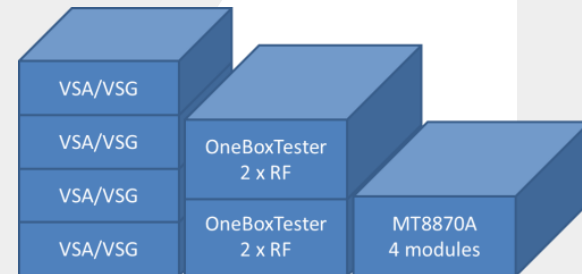
Compared to Anritsu products	VSA/VSG	All-in-one Tester (Parallel Phone)
MT8870A 4 Module Configuration	75% smaller	50% smaller

Shorter Measurement Times

- **Fast Measurements Independent of External PC**

  ➢ The Dual Core CPU, DDR3 memory and fast PCIe bus in each MU887000A TRx Test module assure fast measurements independent of the external PC.

- **Signal Generator and Signal Analyzer in Each Test Module**

  ➢ Each of the four test modules installed in the main frame has an independently operated signal generator and signal analyzer supporting separate parallel testing of up to four mobiles.
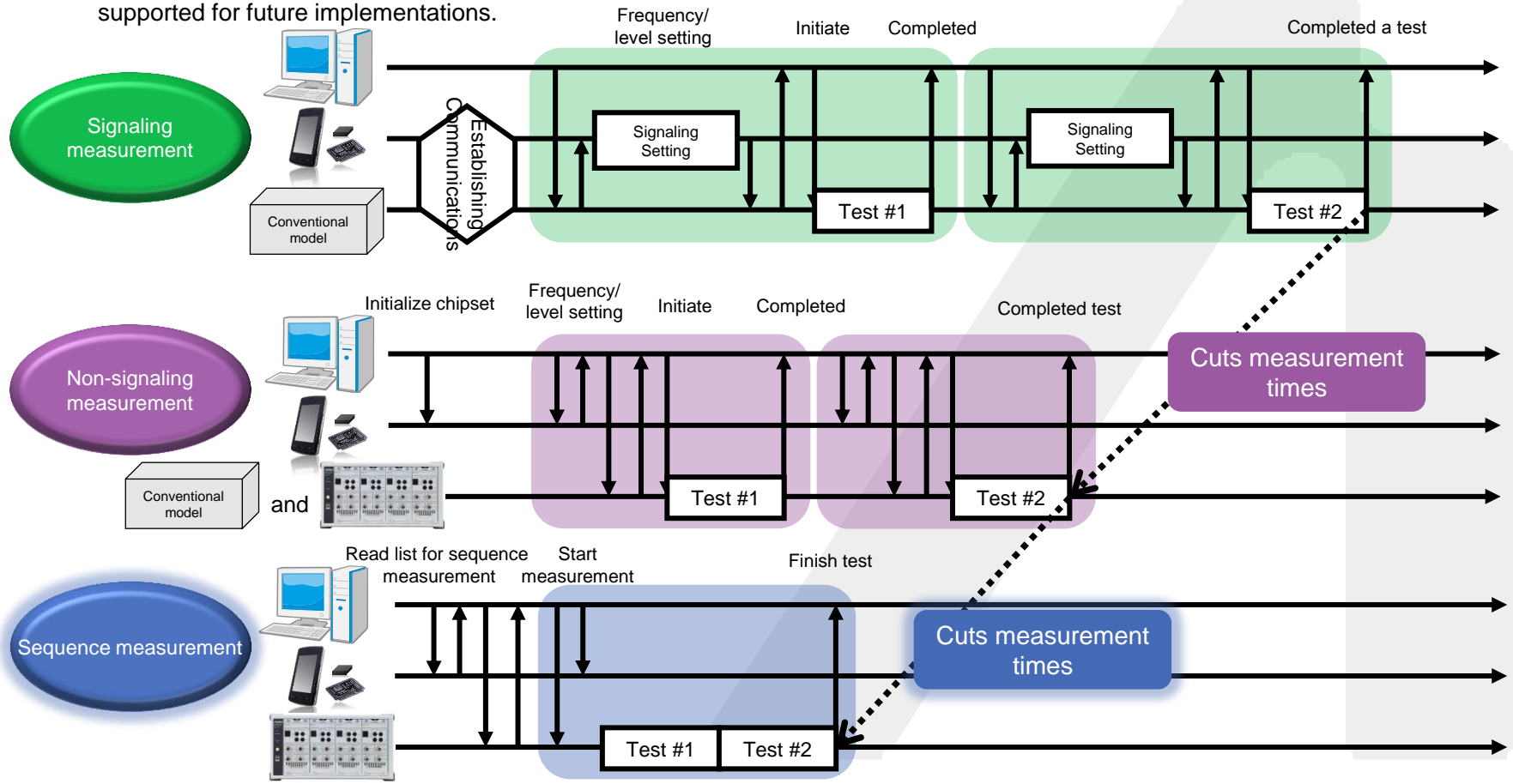
- **Large Memory**

  ➢ 2-GB digitizer memory for Tx tests supports one-run, long-term capture.

  ➢ Rx test waveforms can be preloaded into 4-GB ARB memory, cutting reload times when switching wireless standards.

Discover What's Possible™

Slide 11

MT8870A-E-L-1

/Inritsu
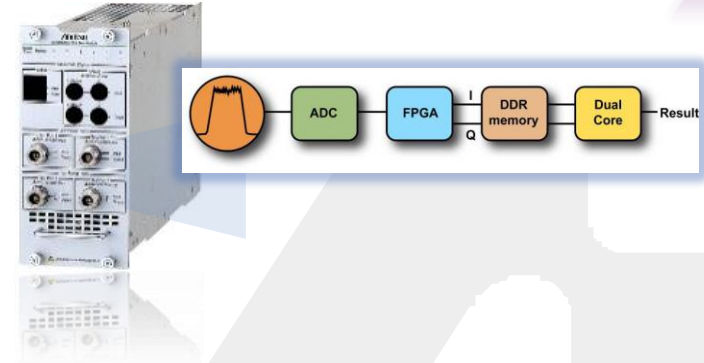
Supports Latest Manufacturing Technologies

- Signaling measurements using wireless communications to set devices and test set have long test times due to the time taken to establish wireless communications. The supported non-signaling method cuts test times by omitting wireless communications and controlling directly from an external PC. To eliminate communications with the external PC, the sequence measurement (List Mode) function performing measurement between the device and instrument according to a known measurement sequence, is also supported for future implementations.

Expandable Platform

- **Support Assorted Wireless Standards**

  - ➤ TRx measurements of all key wireless standards are supporting by installing the TRx test modules with optional measurement software packages and waveform files in the MT8870A Universal Wireless Test Set.

W-CDMA

LTE

HSPA

EDGE

802.11ac

802.11a

GSM

802.11b

802.11n

CDMA2000

802.11g

1xEV-DO

Bluetooth

FM

GPS

- **Easy Software Expansion**

  - ➤ Since hardware specifications are shared by all MU887000A modules, new standards are easily supported by adding software licenses.

Install License

WLAN

LTE
W-CDMA
GSM

LTE
W-CDMA
GSM
WLAN
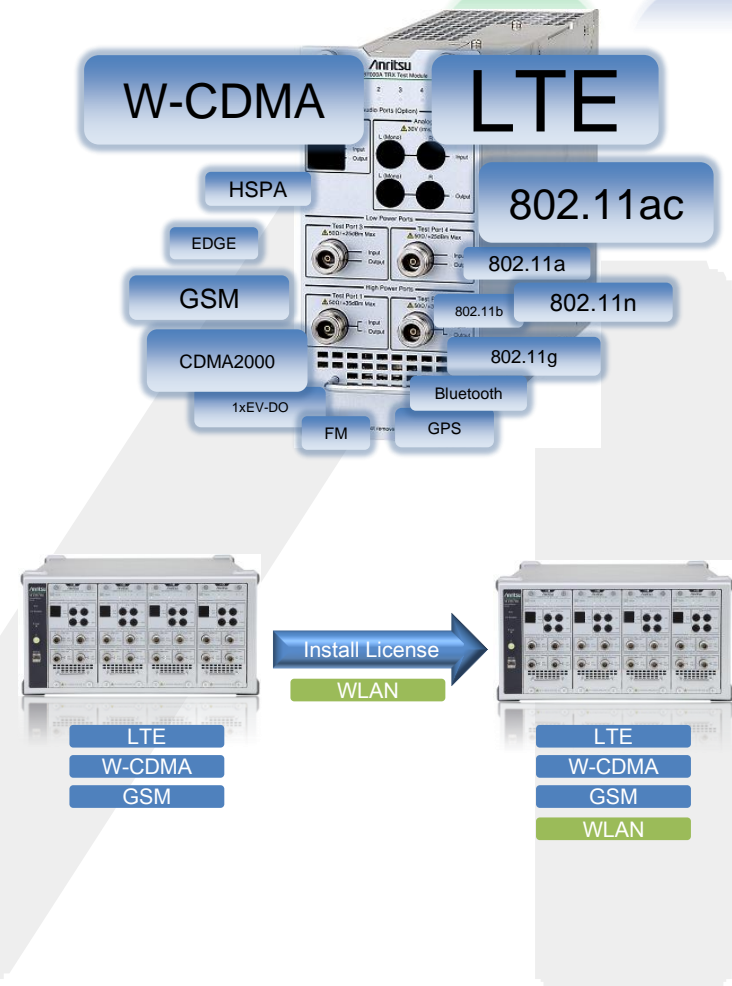
Four Ports on Each TRx Test Module

- **Two Connector Types**

  - Full-duplex (Test Port 1 and 2)

    - ✓ Test port for cellular applications supporting simultaneous TRx.

  - Half-duplex (Test Port 3 and 4)

    - ✓ Supports either Tx or Rx with better input sensitivity than full duplex. Useful for WLAN antenna coupling measurements.

  - All test ports are calibrated, eliminating the need for external couplers and switches.

MU887000A TRx Test Module

MU887000A TRX Test Module : VSA Noise Floor (Input Level -40dBm)
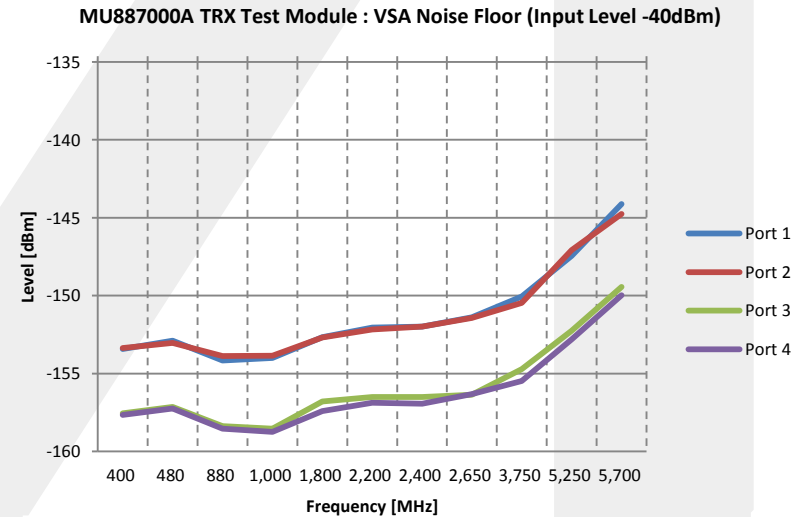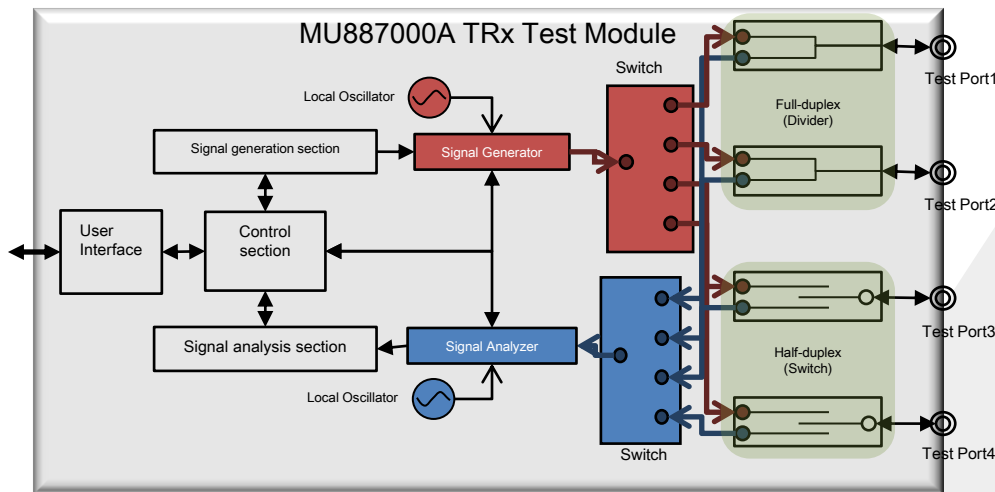
Note: This values are typical values

High-Performance/Wideband Platform

Multi Standard

Potential

- ## 160MHz Bandwidth as Standard

  - ➢ The latest 802.11ac wireless and LTE-Advanced bandwidth standards are supported as standard. Usually, upgrading bandwidth requires extra costs for changing instruments, adding options, etc., but since the MU887000A has a 160MHz wide bandwidth as standard, these extra costs are unnecessary.

- ## 10 MHz to 6 GHz Wide Frequency Range

  - ➢ To provide future-proof frequency-band extendibility, the frequency band covers a wide range from 10 MHz at the lower end to 6 GHz (option) at the upper end.

  - ➢ The wideband (10 MHz to 6 GHz) signal generator and signal analyzer support easy and smooth extendibility for new wireless standards, unlike dedicated test set supporting only specific frequencies.

Key Facts

Model/Name	Parameters	Specifications
MT8870A Universal Wireless Test Set	Number of Slots	4
	Remote Control	Individual control of each module Ethernet (standard) or GPIB (option)
	User Interface	PC Applications (CombiTest/CombiView)
	Size and Mass	426 (W) × 221.5 (H) × 498 (D) mm (excluding protrusions), ≤30 kg (4 modules)
MU887000A TRx Test Module	Supported Systems	LTE FDD, W-CDMA (HSPA), GSM (GSM/GPRS/EGPRS), CDMA2000 (EV-DO), WLAN (802.11a/b/g/n/ac), Bluetooth BR/EDR/BLE
	Frequency Range	10 MHz to 6 GHz (standard: 3.8 GHz*) *Extend to 6 GHz as option
	Bandwidth	VSA: 160 MHz max. (200 Msa/s max.) VSG: 160 MHz max. (20 k to 200 Msa/s)
	RF Test Ports	4
	ARB Memory	4 GB (1 Gsa)
	Digitizer Memory	2 GB (256 Msa)
	Measurement Methods	Non-signaling (Direct Mode)

See product brochure for more details

Discover What's Possible™

**Anritsu**
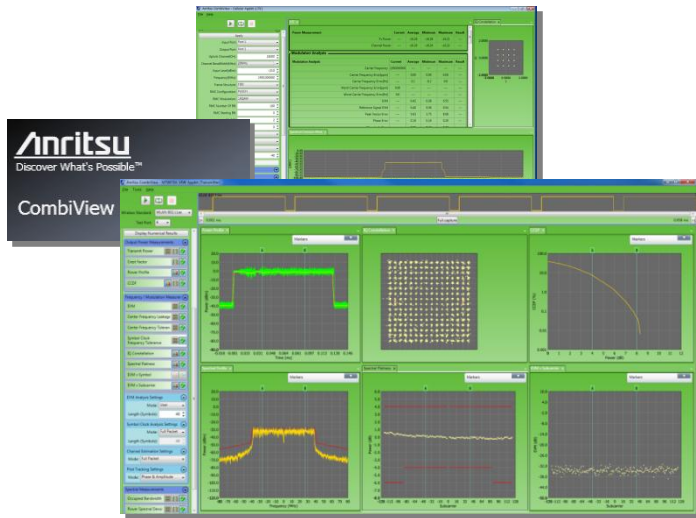
PC Applications

- **CombiView**

  - CombiView is PC application software with a GUI for displaying detailed information, such as the test device Tx power and status, modulation constellation, etc., on a PC for use at R&D, on production lines, and at troubleshooting.

    - ✓ Graphical display of Tx measurement results using Windows interface

    - ✓ Remote control of MT8870A (MU887000A) via Ethernet and GPIB (option)

    - ✓ Setting of MT8870A (MU887000A)

    - ✓ Signal generator interface for Rx tests

- **MT8870A Utility Tool**

  - The MX887900A is a utility tool software package for installing in a PC. It can be used to detect the networked MT8870A via Ethernet or GPIB (option) and for block updates such as internal firmware.

    - ✓ Displays details of MT8870A and MU887000A TRx Test Module(s) detected on network

    - ✓ MU887000A TRx Test Module firmware upgrade

    - ✓ Transfer waveform file

    - ✓ License registration

Discover What's Possible™

/Inritsu
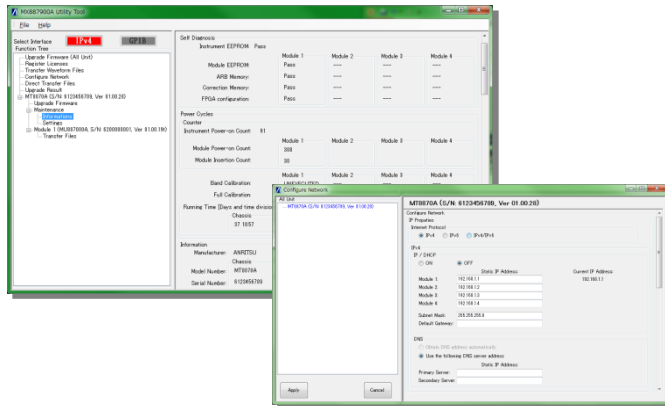
MT8870A Supported Systems

Category	Number	Description	W-CDMA / HSPA	GSM / EDGE	LTE-FDD	CDMA2000	CDMA2000 1xEV-DO	802.11bgn(2.4G)	802.11bgn(2.4G) + 802.11an (5G)	802.11ac (5GHz)	Bluetooth BR/EDR/BLE
Module	MU887000A	TRX Test Module	✔	✔	✔	✔	✔	✔	✔	✔	✔
	MU887000A-001	6GHz Frequency Extension							✔	✔	
Measurement Software	MX887010A	Cellular Standards Sequence Measurement	✔	✔	✔	✔	✔				
	MX887011A	W-CDMA/HSPA Uplink TX Measurement	✔								
	MX887012A	GSM/EDGE Uplink TX Measurement		✔							
	MX887013A	LTE FDD Uplink TX Measurement			✔						
	MX887015A	CDMA2000 Reverse Link TX Measurement				✔					
	MX887016A	1xEV-DO Reverse Link TX Measurement					✔				
	MX887030A	WLAN 802.11b/g/a/n TX Measurement						✔	✔		
	MX887031A	WLAN 802.11ac TX Measurement								✔	
	MX887040A	Bluetooth TX Measurement									✔
Waveforms	MV887011A	W-CDMA/HSPA Downlink Waveforms	✔								
	MV887012A	GSM/EDGE Downlink Waveforms		✔							
	MV887013A	LTE FDD Downlink Waveforms			✔						
	MV887015A	CDMA2000 Forward Link Waveforms				✔					
	MV887016A	1xEV-DO Forward Link Waveforms					✔				
	MV887030A	WLAN 802.11b/g/a/n Waveforms						✔	✔		
	MV887031A	WLAN 802.11ac Waveforms								✔	
	MV887040A	Bluetooth Waveforms									✔

Discover What's Possible™

Anritsu

MT8870A Summary

● **Low-cost instrument for production lines**
- ➢ Low cost due to resource sharing by four modules in one main frame
- ➢ Shared modules cut equipment investment

● **Cuts measurements times**
- ➢ Supports fast calibration and fast verification sequence measurement
- ➢ Each module has Dual Core CPU and high-speed bus
- ➢ 4-slot module configuration supports four parallel measurements

● **Supports mobile communications (cellular) and short range wireless**
- ➢ Supports assorted short range wireless standards, such as FM/Audio, as well as cellular

● **Expandability**
- ➢ Individually controlled modules
- ➢ Shared platform supports expansion by adding software

● **Future-proof**
- ➢ Supports frequencies and bandwidths required for LTE-Advanced and IEEE802.11ac
- ➢ Modular design offers low-cost expandability

MT8870A Universal Wireless Test Set Introduction

- Anritsu Mobile Communications Equipment Test Solution

- MT8870A Product Introduction

  ➢ Measurement Instrument for Manufacturing

  ➢ MT8870A/MU887000A Features

- **Application Examples**

  ➢ **Smartphone Manufacturing**

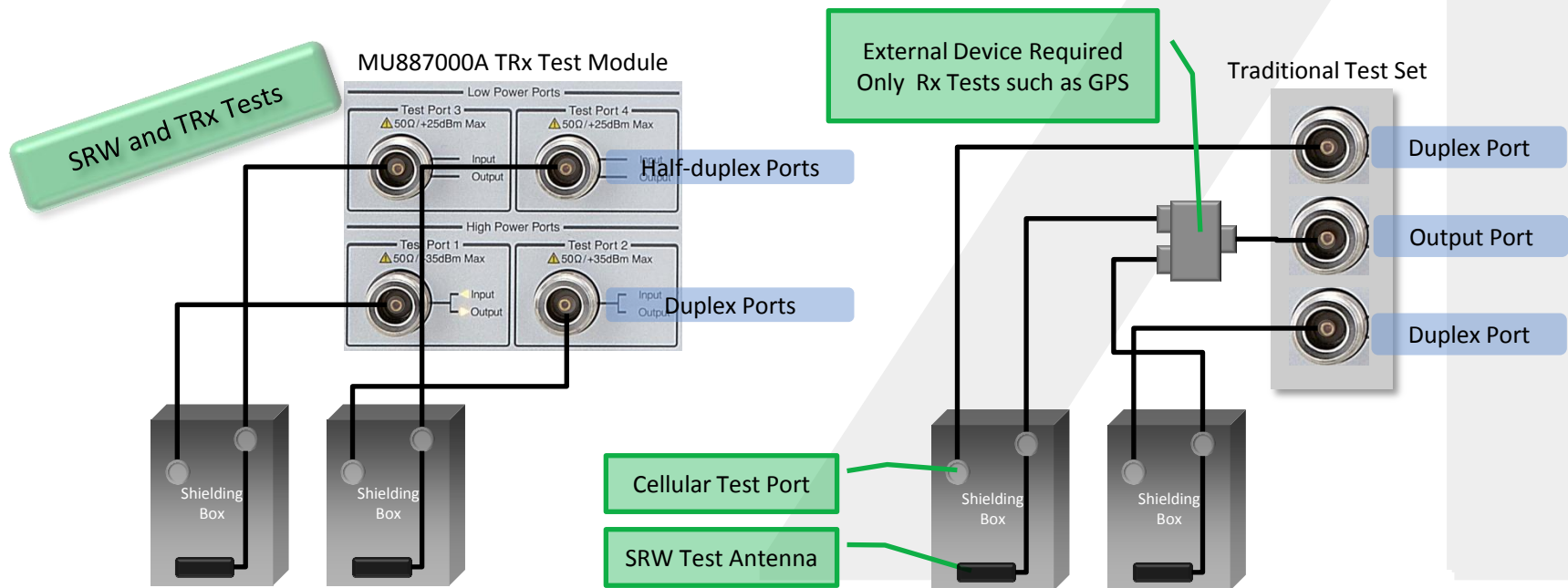 ➢ Communication Module Manufacturing
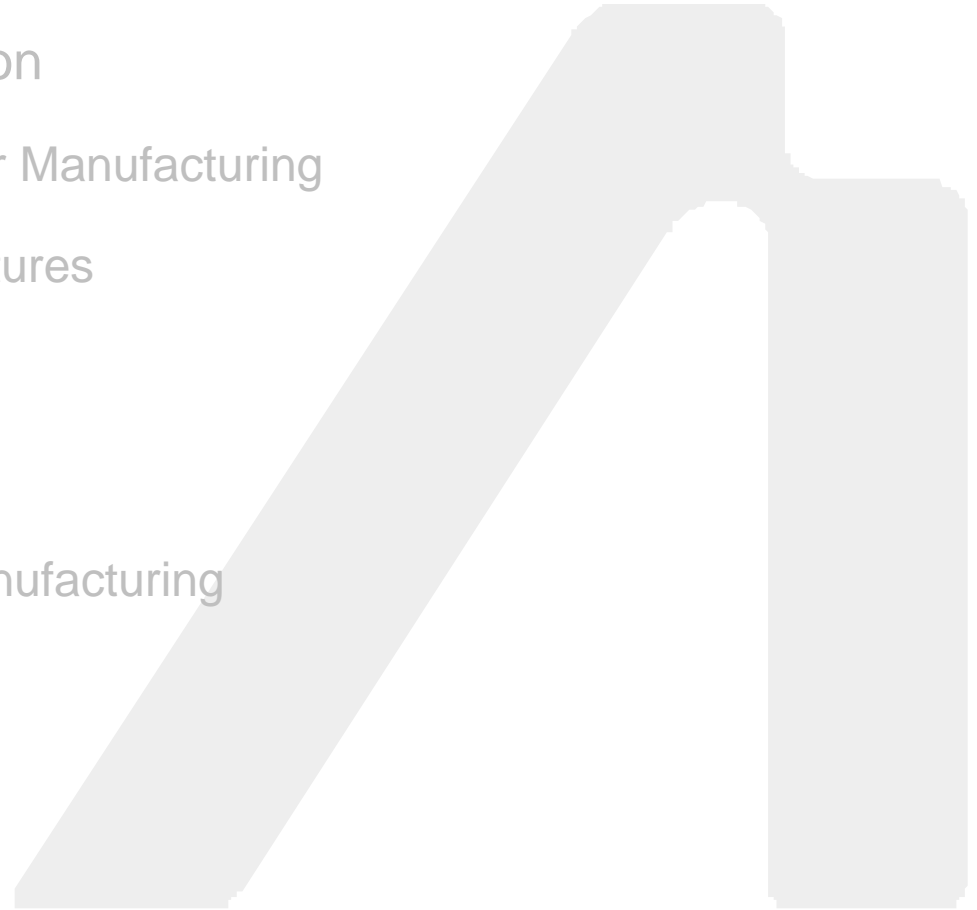
Advantages for Cellular Calibration

- The MU887000A TRx Test Module RF front end is useful for cellular calibration. Conventional instruments support only one connector for diversity antenna tests and require an external switch to connect two shield boxes. The MU887000A TRx Test Module has four RF test ports for connecting to two shield boxes without external devices. As a result, not only does it eliminate external devices but it also simplifies control software, supports fast switching, and controls external losses.
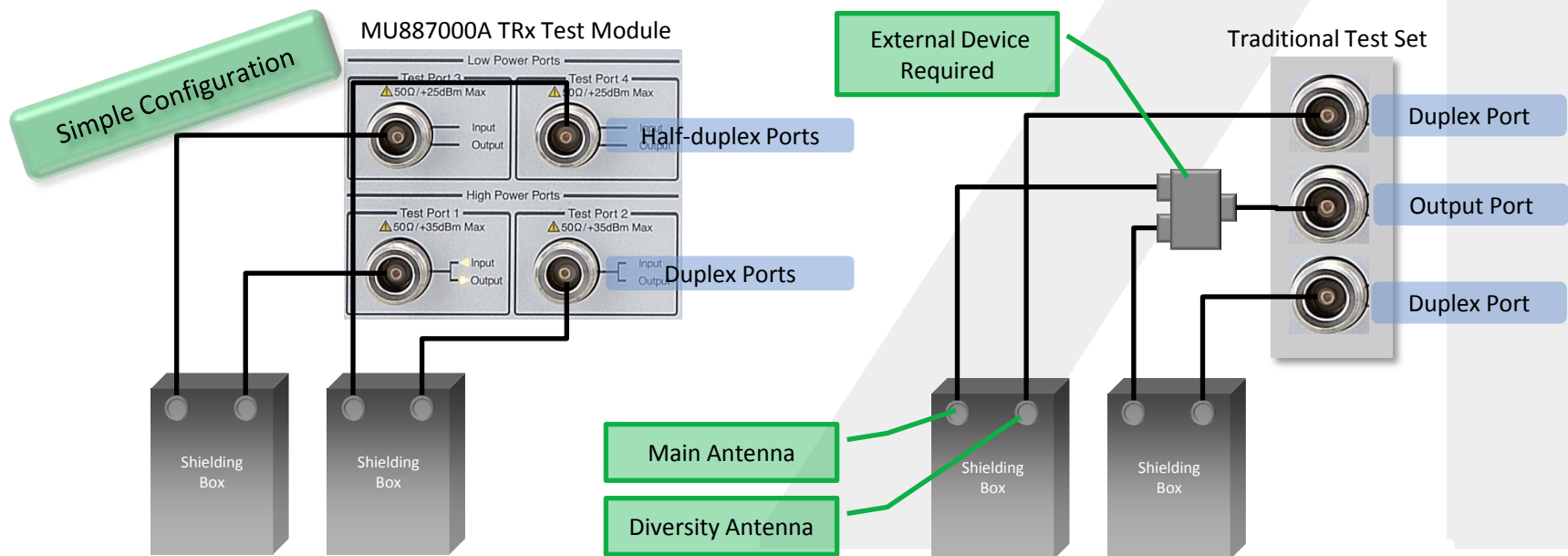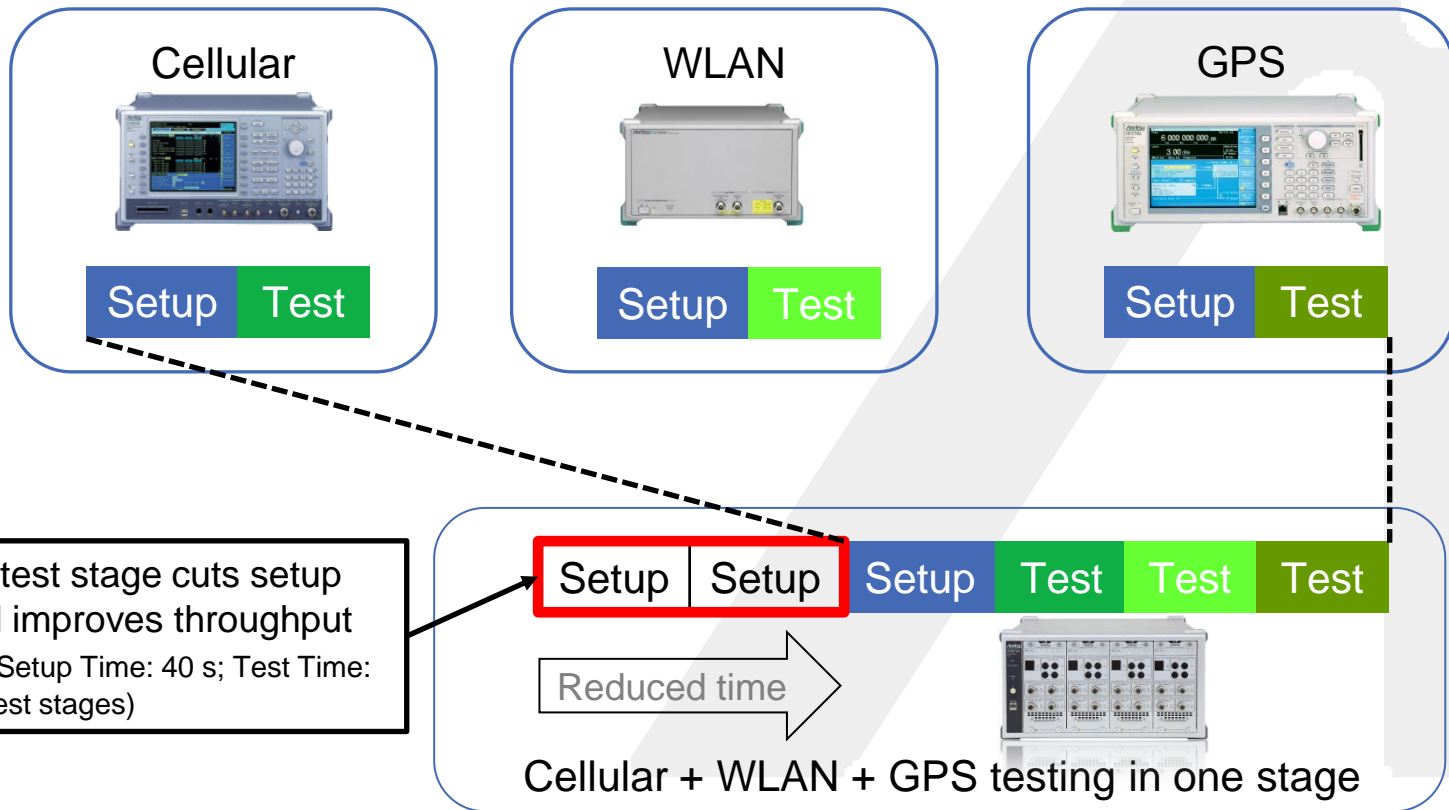
Advantages for Short-Range Wireless Tests

- Smartphone manufacturing requires both cellular and short-range wireless tests, such as WLAN, and the RF front end of the MU887000A TRx Test Module is useful for this too. Conventional instruments usually only have dedicated output ports in addition to the duplex ports for cellular tests and such ports only support Rx tests like GPS. These TRx modules each have two duplex and two half-duplex ports for running WLAN and Bluetooth tests as well.

MU887000A TRx Test Module

SRW and TRx Tests

Low Power Ports
Test Port 3
⚠ 50Ω/+25dBm Max
Test Port 4
⚠ 50Ω/+25dBm Max
Input
Output
Half-duplex Ports

High Power Ports
Test Port 1
⚠ 50Ω/+35dBm Max
Test Port 2
⚠ 50Ω/+35dBm Max
Input
Output
Duplex Ports

Shielding Box
Shielding Box

External Device Required
Only Rx Tests such as GPS

Traditional Test Set

Duplex Port

Output Port

Duplex Port

Cellular Test Port

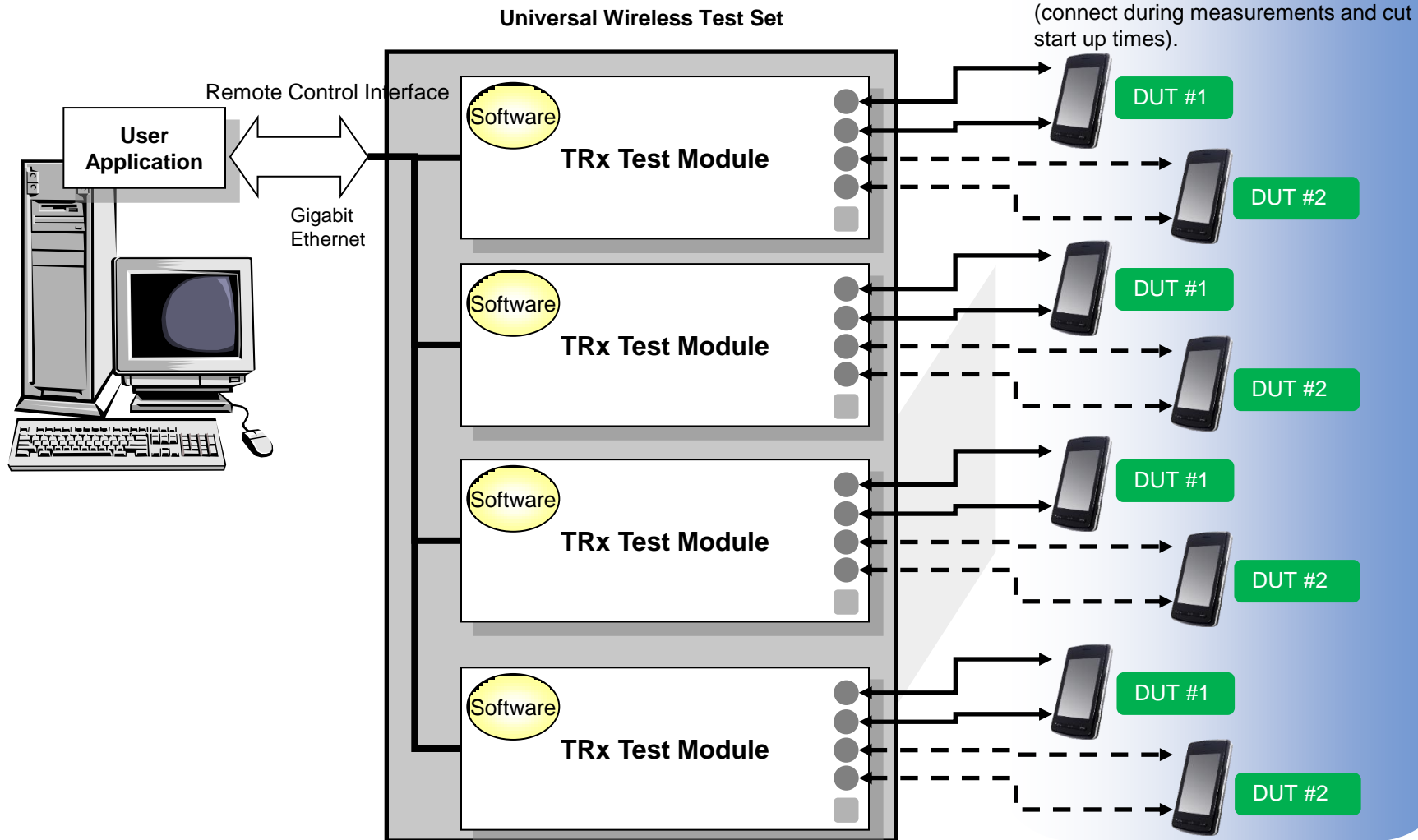SRW Test Antenna

Shielding Box
Shielding Box

Improve Manufacturing Throughput by Cutting Setup

- Setup time is a large burden on manufacturing efficiency. Since one MT8870A main frame supports every test, wasteful setup time is eliminated.

Cellular

WLAN

GPS

Setup | Test

Setup | Test

Setup | Test

Reduced test stage cuts setup times and improves throughput by **22%.** (Setup Time: 40 s; Test Time: 80 s for all test stages)

Setup | Setup | Setup | Test | Test | Test

Reduced time

Cellular + WLAN + GPS testing in one stage

Streamline Cellular Production Line

Using four test ports supports connecting second DUT while measuring first DUT (2 antennas) (connect during measurements and cut start up times).

Universal Wireless Test Set

Streamline Cellular Production Line including Non-cellular

Universal Wireless Test Set

Testing cellular and short-range wireless using conventional instruments requires various external devices. The MT8870A unique RF front end supports connection with minimum external devices.

Remote Control Interface

User Application

Gigabit Ethernet

Software
TRx Test Module

Software
TRx Test Module

Software
TRx Test Module

Software
TRx Test Module

Cellular

WLAN/Bluetooth

Diversity Antenna

GPS[1]

[1]: GPS in development

Discover What's Possible™

Slide 25

MT8870A-E-L-1

Anritsu

Smartphone Manufacturing (Parallel Test)

Universal Wireless Test Set

Supports parallel measurements of different wireless technologies (multi-standard measurements)

Remote Control Interface

User Application

Gigabit Ethernet

Software

TRx Test Module

Cellular

Diversity Antenna

Software

TRx Test Module

WLAN Bluetooth

Software

TRx Test Module

GPS*1

FM, Audio*1

Software

TRx Test Module

Broadcast*1

*1: FM/GPS/Audio/Broadcast in development

Discover What's Possible™

Slide 26

MT8870A-E-L-1

Anritsu

Compatibility with Anritsu MT8820C

- The MT8870A Universal Wireless Test Set supports two types of remote commands: Native and SCPI.

- The Native commands are based on the MT8820C remote command set and have high compatibility, particularly for sequence measurements and calibration.

- Compatibility with the MT8820C helps minimize MT8870A installation costs.

Smartphone Manufacturing

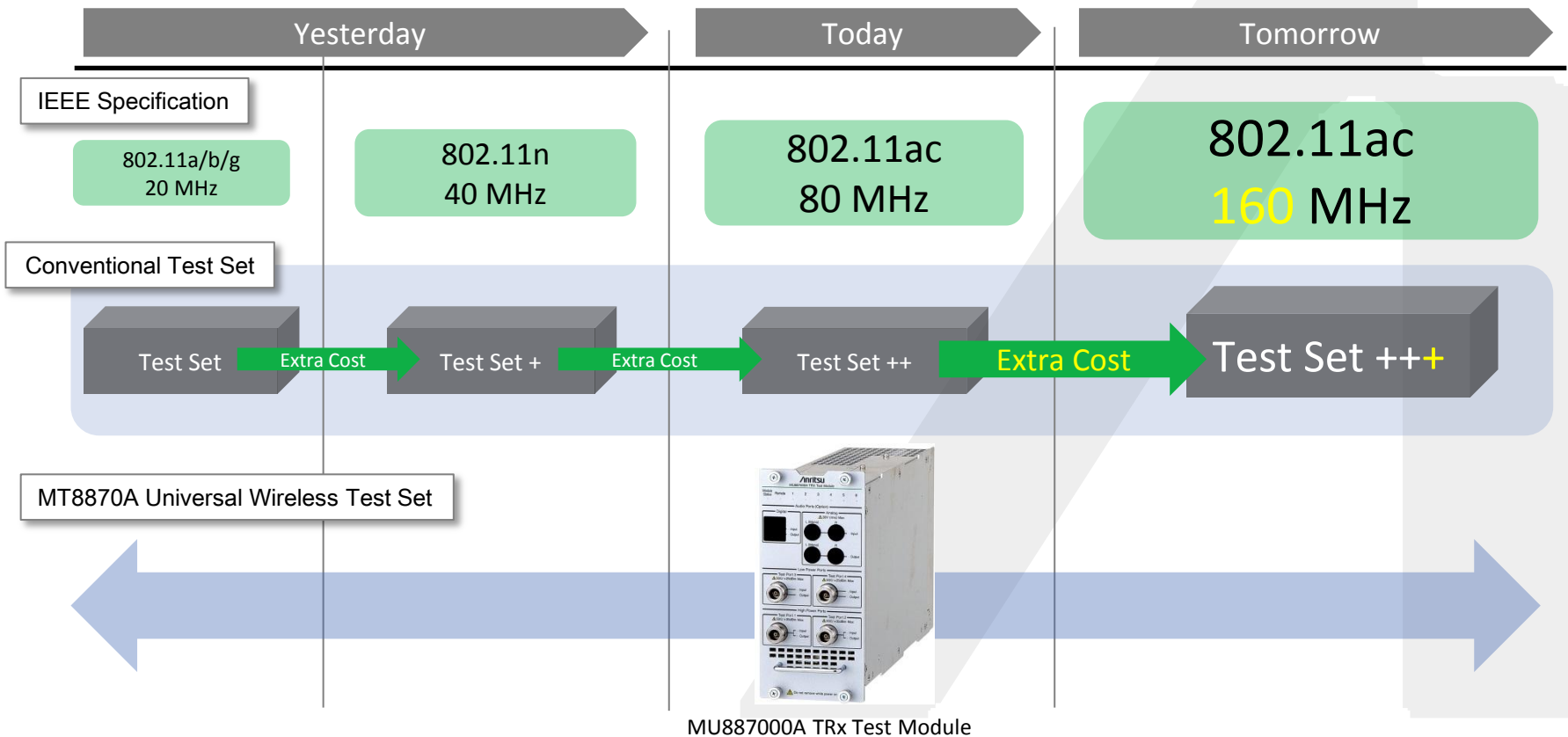The MT8870A supports smartphone manufacturing flexibility.

MT8870A Universal Wireless Test Set Introduction

- Anritsu Mobile Communications Equipment Test Solution

- MT8870A Product Introduction

  - Measurement Instrument for Manufacturing

  - MT8870A/MU887000A Features

- **Application Examples**

  - Smartphone Manufacturing
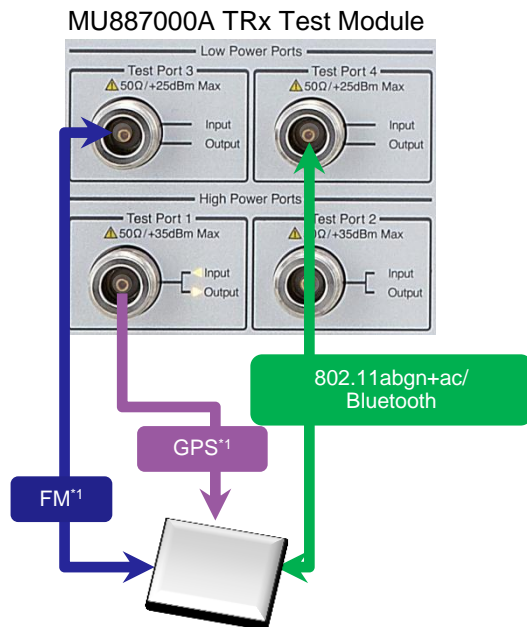
  - Communication Module Manufacturing

ANRITSU CORPORATION

Anritsu

Advantages for 802.11ac Manufacturing

● Testing 802.11ac does not require extra costs because the MU887000A TRx Test Module supports the 160MHz bandwidth as standard.
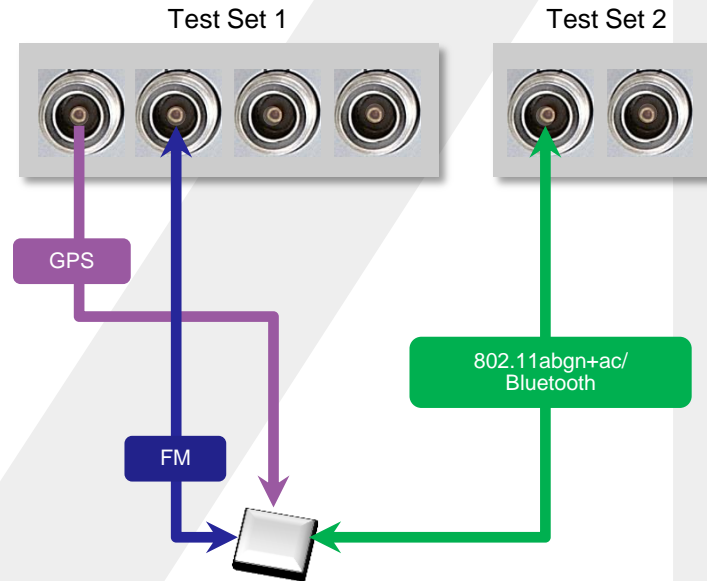
Yesterday	Today	Tomorrow

IEEE Specification

802.11a/b/g 20 MHz	802.11n 40 MHz	802.11ac 80 MHz	802.11ac 160 MHz

Conventional Test Set

Test Set → Extra Cost → Test Set + → Extra Cost → Test Set ++ → Extra Cost → Test Set +++

MT8870A Universal Wireless Test Set

MU887000A TRx Test Module

All-in-one Unit Supports 11ac Combo Module

- The MU887000A TRx Test Module with four RF test ports supports connection with 802.11ac Combo Modules (80/160 MHz) without external devices.

- Wide frequency range from 10 MHz to 6 GHz (option) supporting multiple wireless technologies in one unit.

MU887000A TRx Test Module

Low Power Ports
Test Port 3
⚠ 50Ω/+25dBm Max
Test Port 4
⚠ 50Ω/+25dBm Max

Input
Output

Input
Output

High Power Ports
Test Port 1
⚠ 50Ω/+35dBm Max
Test Port 2
⚠ 50Ω/+35dBm Max

Input
Output

Input
Output

802.11abgn+ac/
Bluetooth

GPS[*1]

FM[*1]

[*1]: FM/GPS support in development

Test Set 1

Test Set 2

GPS

FM

802.11abgn+ac/
Bluetooth

16 Simultaneous Connections

- Versatile development flexibility with four devices connected to each of four modules

- Up to 16 test fixtures can be connected to a single MT8870A test set when fully loaded with 4 MU887000A TRX modules. As each module is completely independent, this facilitates the testing of four devices in parallel. This test system approach eliminates the need for external combiners in a test system which have poor isolation, and also reduces the required test fixture path calibration.
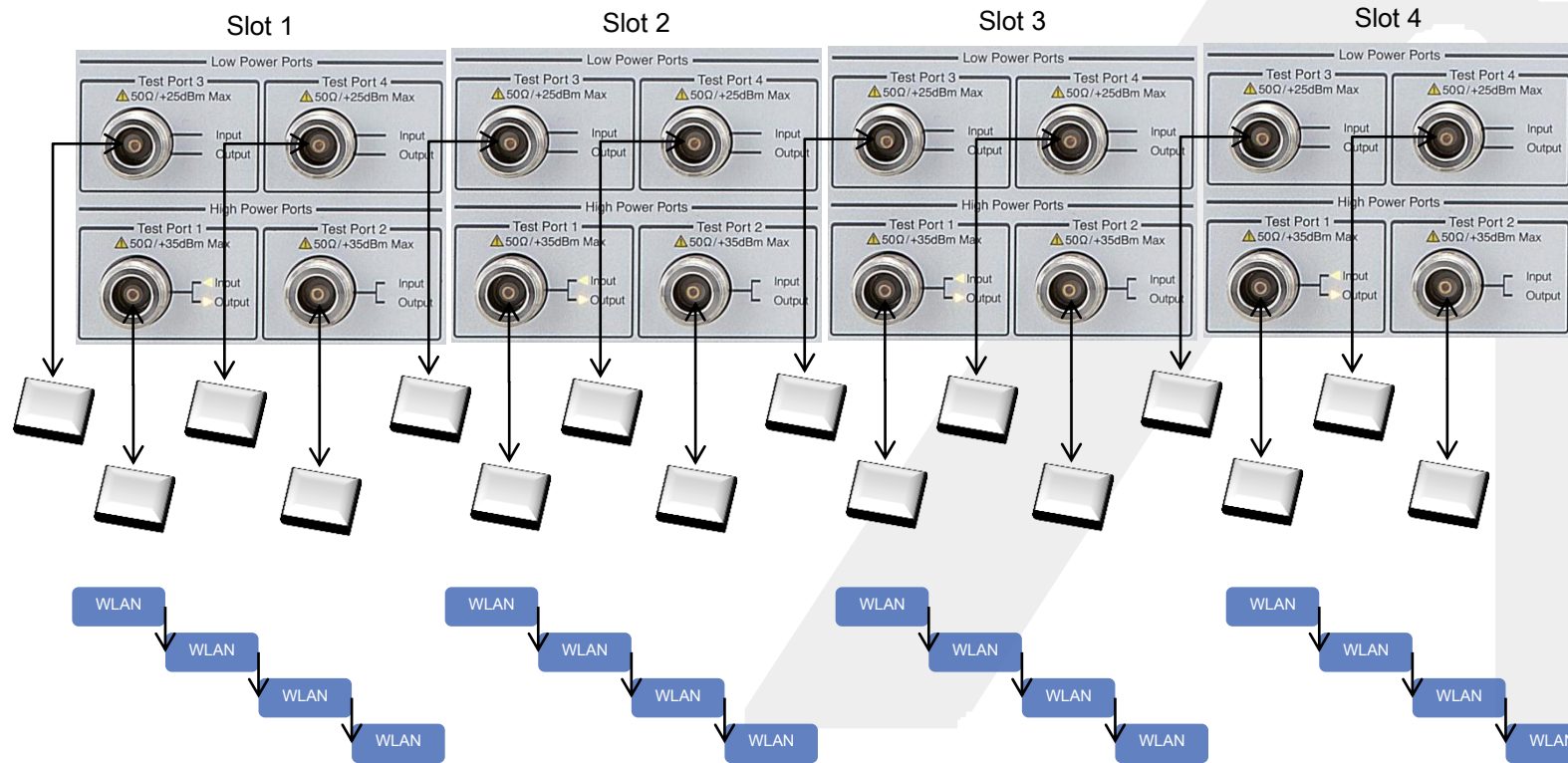
Improves System Efficiency

- Versatile development flexibility with four devices connected to each of four modules

- Connecting two DUT devices each with two RF terminals to each of the four TRx test modules supports simultaneous connection of 8 test devices, simplifying system setup for 802.11 diversity antenna tests.
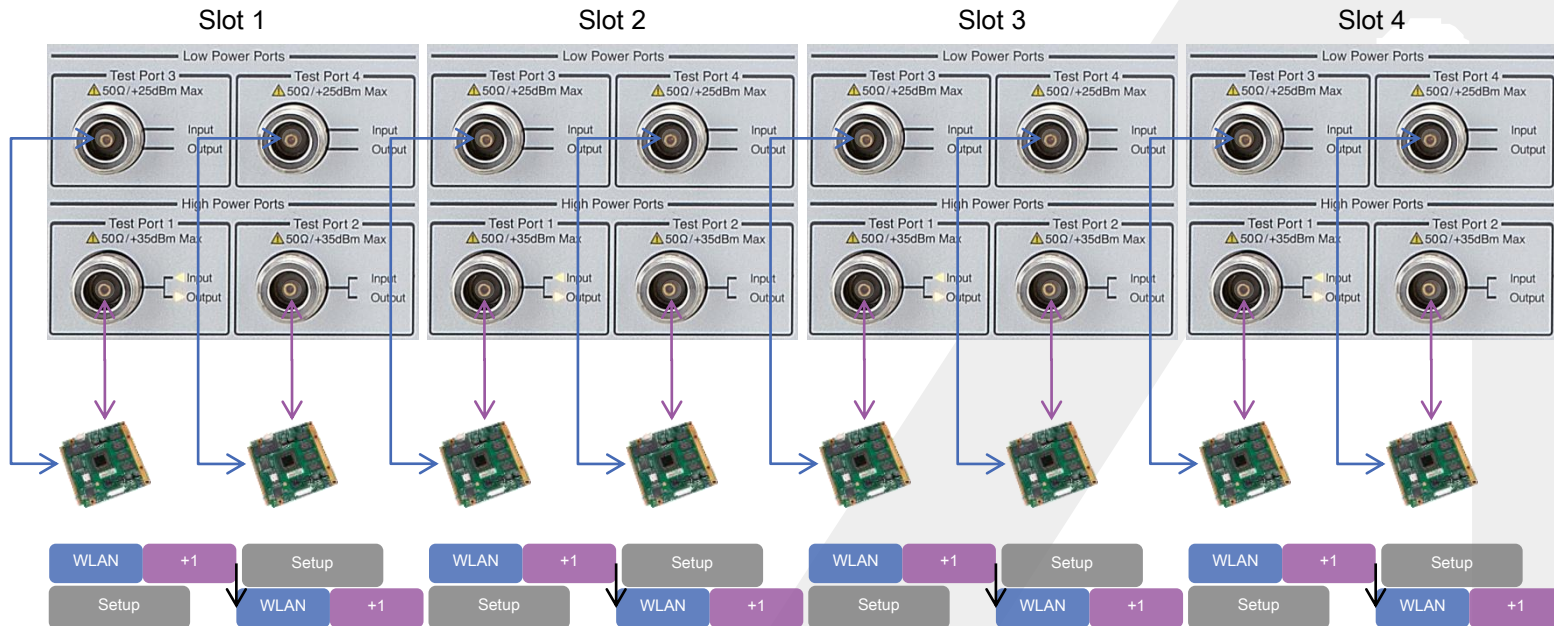
CombiTest Supporting Control of Key Chipsets

- **Simple and fast PC application for creating individual calibration, validation and manufacturing test plans.**

  - Easy drag-and-drop interface.

  - Create and execute test plans including 802.11 and Bluetooth TRx test cases.

  - Automatically save results including graphic displays to database.

- **Chipset control package**

  - Control packages developed in cooperation with major chipset developer.

  - Automatically set and control chipset.

  - Create and edit completely automated test in few minutes.
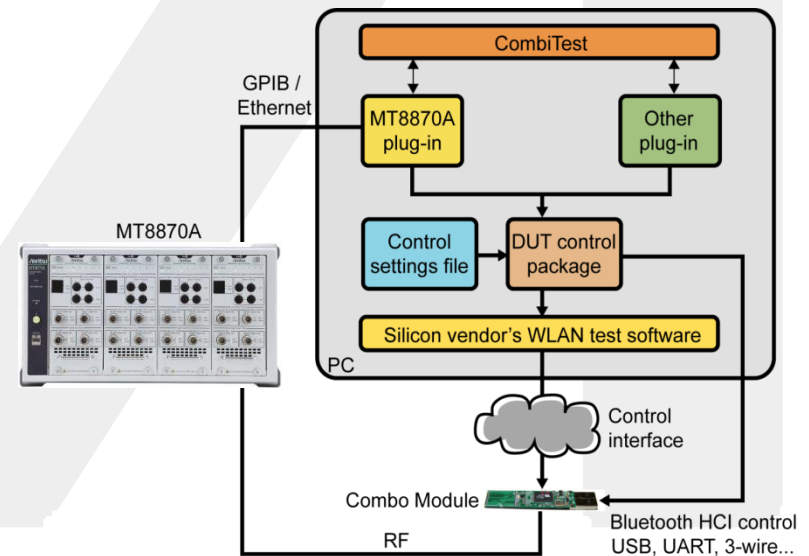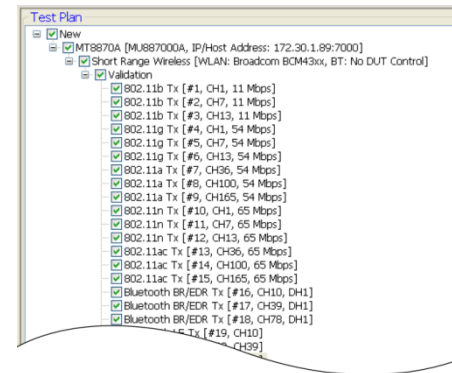
Manufacturing Communications Modules

The MT8870A cuts communication module manufacturing costs.

Anritsu

Note

Anritsu

- **United States**
Anritsu Company
1155 East Collins Blvd., Suite 100, Richardson,
TX 75081, U.S.A.
Toll Free: 1-800-267-4878
Phone: +1-972-644-1777
Fax: +1-972-671-1877

- **Canada**
Anritsu Electronics Ltd.
700 Silver Seven Road, Suite 120, Kanata,
Ontario K2V 1C3, Canada
Phone: +1-613-591-2003
Fax: +1-613-591-1006

- **Brazil**
Anritsu Eletrônica Ltda.
Praça Amadeu Amaral, 27 - 1 Andar
01327-010 - Bela Vista - São Paulo - SP - Brazil
Phone: +55-11-3283-2511
Fax: +55-11-3288-6940

- **Mexico**
Anritsu Company, S.A. de C.V.
Av. Ejército Nacional No. 579 Piso 9, Col. Granada
11520 México, D.F., México
Phone: +52-55-1101-2370
Fax: +52-55-5254-3147

- **United Kingdom**
Anritsu EMEA Ltd.
200 Capability Green, Luton, Bedfordshire, LU1 3LU, U.K.
Phone: +44-1582-433200
Fax: +44-1582-731303

- **France**
Anritsu S.A.
12 avenue du Québec, Bâtiment Iris 1- Silic 612,
91140 VILLEBON SUR YVETTE, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

- **Germany**
Anritsu GmbH
Nemetschek Haus, Konrad-Zuse-Platz 1
81829 München, Germany
Phone: +49-89-442308-0
Fax: +49-89-442308-55

- **Italy**
Anritsu S.r.l.
Via Elio Vittorini 129, 00144 Roma, Italy
Phone: +39-6-509-9711
Fax: +39-6-502-2425

- **Sweden**
Anritsu AB
Borgarfjordsgatan 13A, 164 40 KISTA, Sweden
Phone: +46-8-534-707-00
Fax: +46-8-534-707-30

- **Finland**
Anritsu AB
Teknobulevardi 3-5, FI-01530 VANTAA, Finland
Phone: +358-20-741-8100
Fax: +358-20-741-8111

- **Denmark**
Anritsu A/S (Service Assurance)
Anritsu AB (Test & Measurement)
Kay Fiskers Plads 9, 2300 Copenhagen S, Denmark
Phone: +45-7211-2200
Fax: +45-7211-2210

- **Russia**
Anritsu EMEA Ltd.
Representation Office in Russia
Tverskaya str. 16/2, bld. 1, 7th floor.
Russia, 125009, Moscow
Phone: +7-495-363-1694
Fax: +7-495-935-8962

- **United Arab Emirates**
Anritsu EMEA Ltd.
Dubai Liaison Office
P O Box 500413 - Dubai Internet City
Al Thuraya Building, Tower 1, Suit 701, 7th Floor
Dubai, United Arab Emirates
Phone: +971-4-3670352
Fax: +971-4-3688460

- **Singapore**
Anritsu Pte. Ltd.
60 Alexandra Terrace, #02-08, The Comtech (Lobby A)
Singapore 118502
Phone: +65-6282-2400
Fax: +65-6282-2533

- **India**
Anritsu Pte. Ltd.
India Branch Office
2nd & 3rd Floor, #837/1, Binnamangla 1st Stage,
Indiranagar, 100ft Road, Bangalore - 560038, India
Phone: +91-80-4058-1300
Fax: +91-80-4058-1301

- **P.R. China (Shanghai)**
Anritsu (China) Co., Ltd.
Room 1715, Tower A CITY CENTER of Shanghai,
No.100 Zunyi Road, Chang Ning District,
Shanghai 200051, P.R. China
Phone: +86-21-6237-0898
Fax: +86-21-6237-0899

- **P.R. China (Hong Kong)**
Anritsu Company Ltd.
Unit 1006-7, 10/F., Greenfield Tower, Concordia Plaza,
No. 1 Science Museum Road, Tsim Sha Tsui East,
Kowloon, Hong Kong, P.R. China
Phone: +852-2301-4980
Fax: +852-2301-3545

- **Japan**
Anritsu Corporation
8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan
Phone: +81-46-296-1221
Fax: +81-46-296-1238

- **Korea**
Anritsu Corporation, Ltd.
502, 5FL H-Square N B/D, 681
Sampyeong-dong, Bundang-gu, Seongnam-si,
Gyeonggi-do, 463-400 Korea
Phone: +82-31-696-7750
Fax: +82-31-696-7751

- **Australia**
Anritsu Pty. Ltd.
Unit 21/270 Ferntree Gully Road, Notting Hill,
Victoria 3168, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

- **Taiwan**
Anritsu Company Inc.
7F, No. 316, Sec. 1, NeiHu Rd., Taipei 114, Taiwan
Phone: +886-2-8751-1816
Fax: +886-2-8751-1817

1203

Please Contact: