



O-RAN Radio Unit Test Solution

ORAN Test Platform MX772000PC

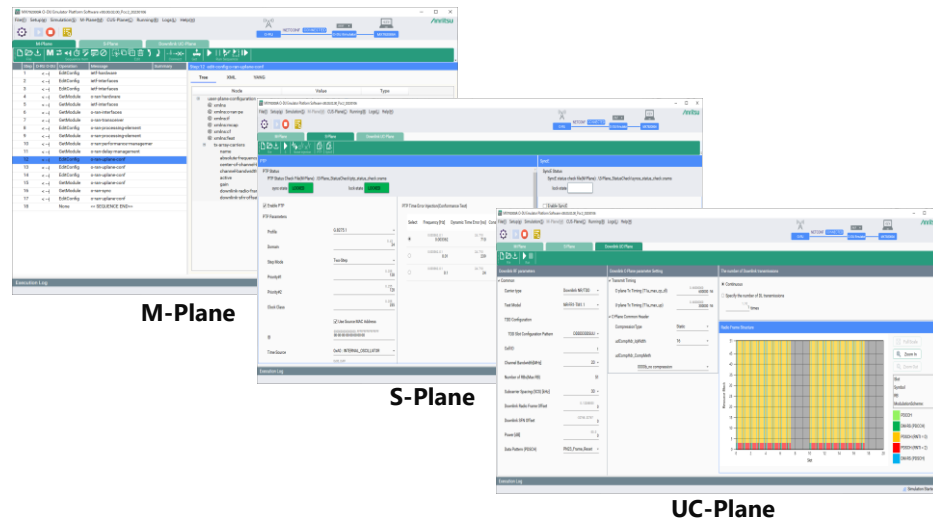
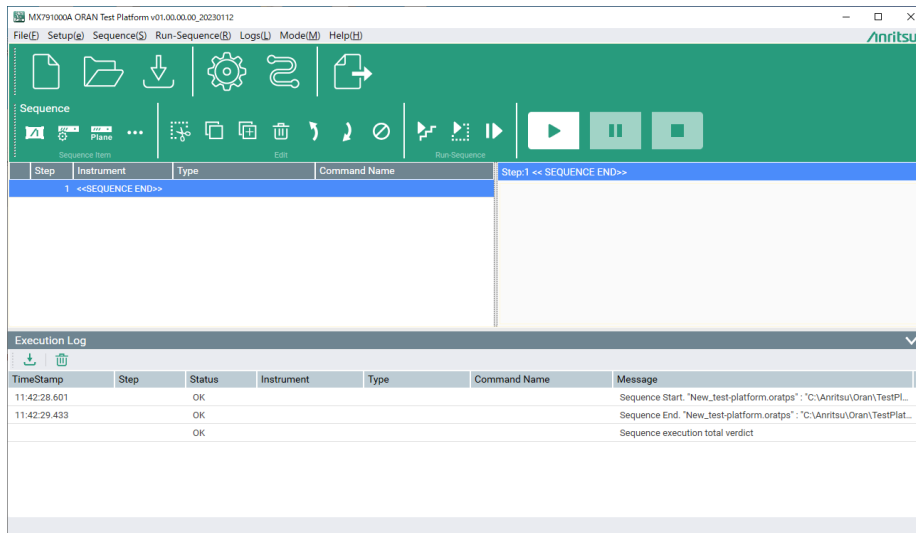
O-DU Emulator Platform Software MX773000PC

Product Outline

MX772000PC and MX773000PC constitute the O-RAN Radio Unit Test Solution to support O-RAN.WG4.CONF tests.

ORAN Test Platform O-DU Emulator Platform Software

MX772000PC MX773000PC



■ MX772000PC

Controls MT8000A to obtain test results, automates Pass/Fail evaluation, and tests O-RU efficiently. Additionally, controls and sets O-DU Emulator and MT8000A from GUI for easy creation of automation test sequences.

■ MX773000PC

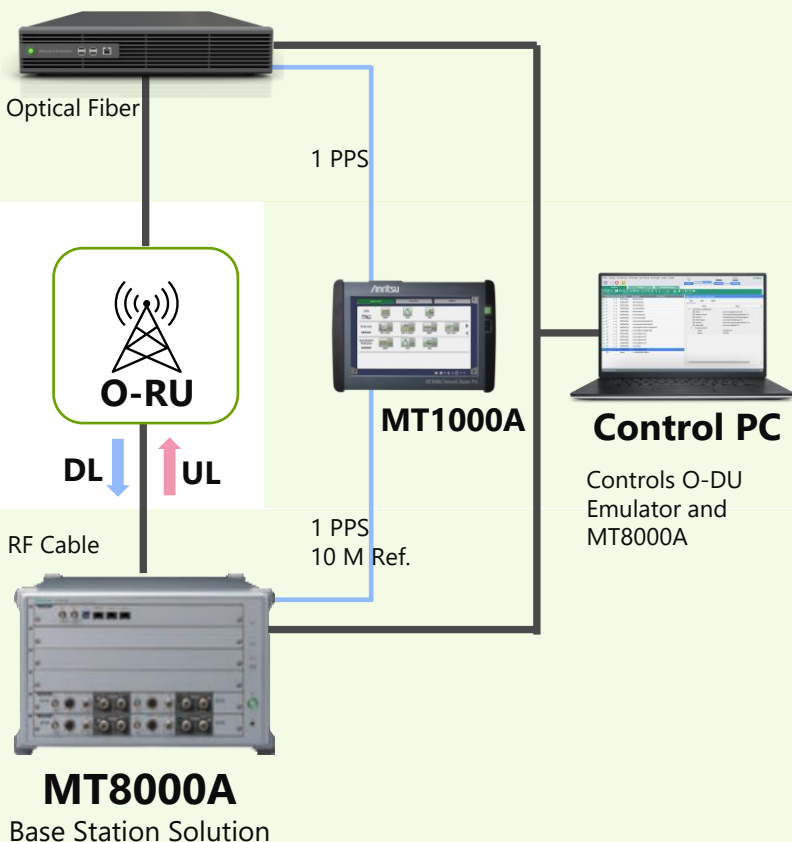
Simulates O-DU functions and sets and controls test O-RU via O-RAN Fronthaul standards-compliant CUSM-Plane

O-RAN O-RU Test Solution

O-RAN O-RU test solution has below key features to improve O-RU quality and test efficiency.

O-RAN O-RU Test Solution

O-DU Emulator



■ Features

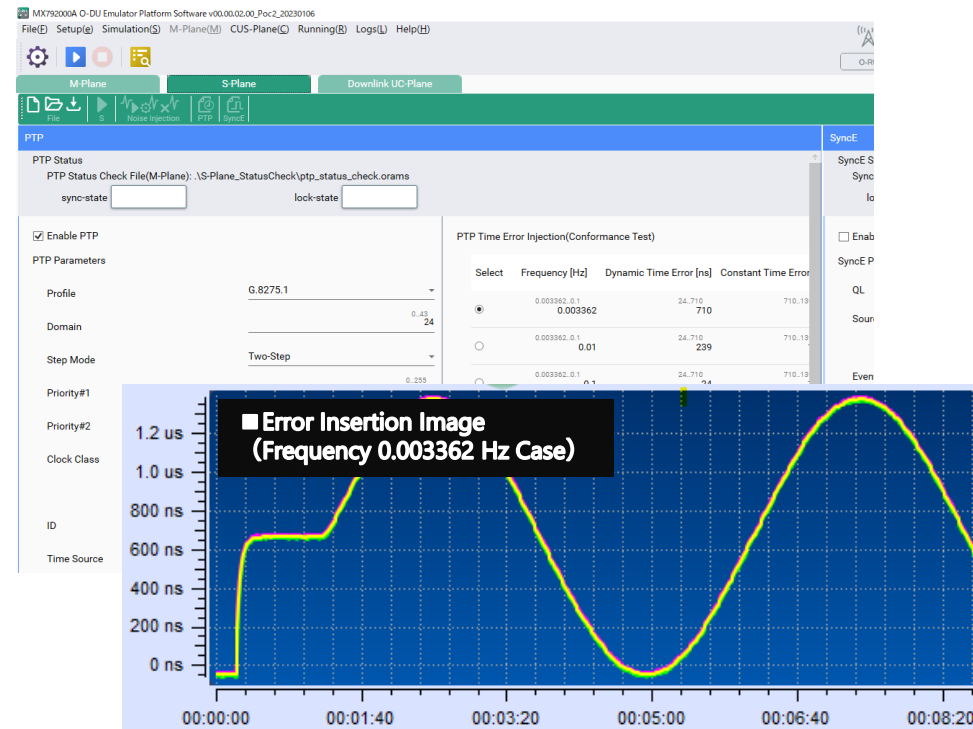
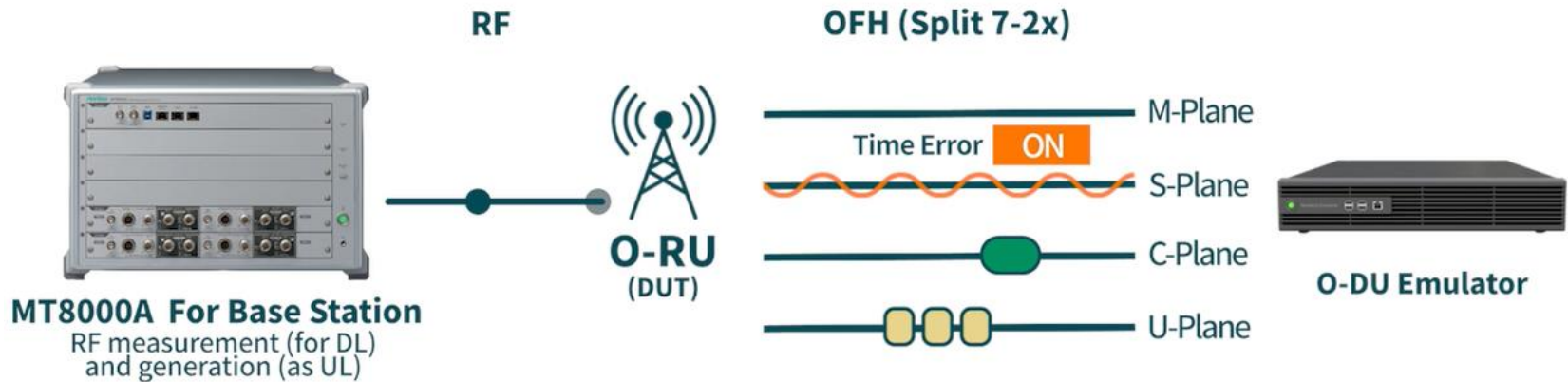
- ✓ **Time Synchronization Tolerance Evaluation**
Evaluates O-RU by simulating reduced clock quality due to multi-stage switch connections, transmission equipment, etc. Simulates live network conditions to help improve O-RAN quality.
- ✓ **Efficient M-Plane Setting**
Simplifies different M-Plane settings for each mobile network operator and vendor. Efficiently creates M-Plane sequence required to connect O-RU and O-DU Emulator.
- ✓ **Automated Higher Test Efficiency**
Automatically controls both RF test equipment and O-DU Emulator and creates test sequences at GUI for automated and efficient O-RU testing.

ORAN test solution specification overview

O-RAN fronthaul link	10 Gbps / 25 Gbps (SFP + / SFP28)
Reference standard	O-RAN.WG4.CUS.0-v07.00 O-RAN.WG4.MP.0-v07.00 O-RAN.WG4.CONF.0-v04.00.00

Features ①: Time Synchronization Tolerance Evaluation

MX773000PC supports S-Plane time error injection test defined by O-RAN.WG4.CONF. This feature enables to measure RF signal quality when time error is injected to S-plane.



MX792000A O-RAN Control Software v0.00.02.00_Poc2_2021215

File(F) Setup(e) Simulation(S) M-Plane(M) CUS-Plane(C) Running(R) Logs(L) Help(H)

M-Plane S-Plane Downlink UC-Plane

File Sequence Item Edit Connect Get Run Sequence

Step	O-RU O-DU	Operation	Message	Summary
1	<-1	edit-config	ietf-hardware	
2	<-1	edit-config	ietf-interfaces	
3	<-1	edit-config	ietf-interfaces	
4	<-1	get(xpath)	o-ran-hardware	
5	<-1	get(xpath)	ietf-interfaces	
6	<-1	get(xpath)	o-ran-interfaces	
7	<-1	get(xpath)	o-ran-transceiver	
8	<-1	edit-config	o-ran-processing-element	
9	<-1	get(xpath)	o-ran-processing-element	
10	<-1	get(xpath)	o-ran-performance-management	
11	<-1	get(xpath)	o-ran-delay-management	
12	<-1	edit-config	o-ran-uplane-conf	
13	<-1	edit-config	o-ran-uplane-conf	
14	<-1	edit-config	o-ran-uplane-conf	
15	<-1	get(xpath)	o-ran-uplane-conf	
16	<-1	get(xpath)	o-ran-sync	
17	<-1	edit-config	o-ran-uplane-conf	
18			<< SEQUENCE END>>	

Step:8 edit-config:o-ran-proc

Tree XML

Node

- processing-element
 - @ xmlns
 - @ xmlns:yang
 - @ xmlns:inet
 - @ xmlns:if
 - @ xmlns:ip
 - @ xmlns:o-ran-int
 - transport-session
 - ru-elements
 - name
 - transport-flow
 - interface-r
 - eth-flow
 - ru-mac
 - vlan-id
 - o-du-m

Stepped display of M-Plane messages for each module

MPlane C:\Users\ai105014\Desktop\PoC2_Startup_MTC_1215_1.orams

M-Plane (New)

Operation: edit config
Module: Filter
Instance: pramaplane-conf
API: none

YANG data tree display
Represents complex large YANG data automatically as tree to eliminate description while loading YANG data.

Imports existing XML files
Displays existing XML files for import as tree.

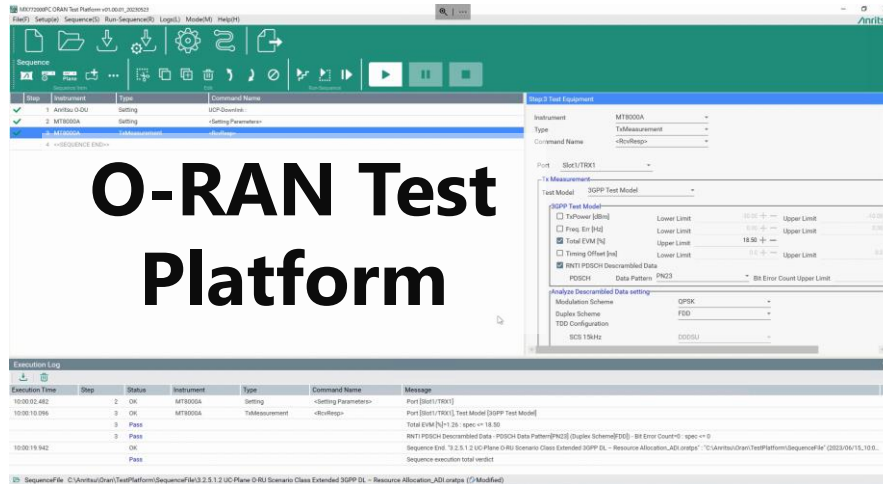
Parameter YANG data display
Displays data for parameter setting range from YANG data, eliminating need to verify YANG data when setting.

Parameters reflected automatically as XML
Input parameters automatically reflected in XML code values and automatically formatted.

M-Plane Module Setting Window

Features ③: Automated Higher Test Efficiency

MX772000PC improves O-RU test efficiency by automated test and, helps test engineers create O-RU evaluation test cases with "No Code".

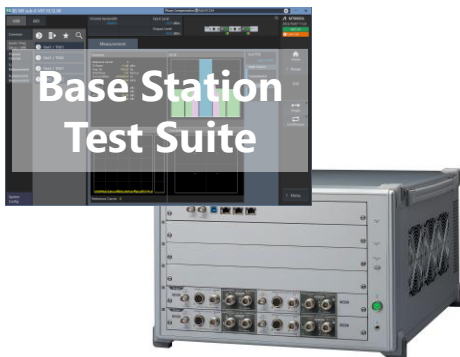


Simple Sequences

Referencing typical prepared test cases helps cut burden of creating and editing new test cases.

- M-Plane Start-up Sequence
- Supported Conformance Test Items

The MT8000A can be set from the dedicated GUI. Control parameter settings at the dedicated screen can be switched by remote command.

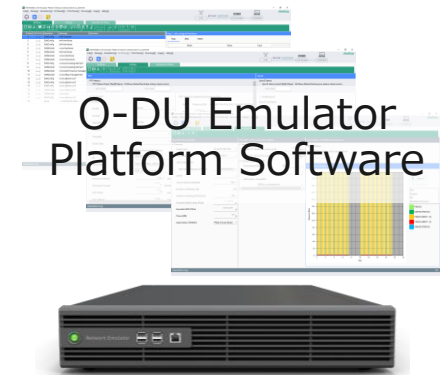


Each piece of measurement equipment* can be controlled by SCI command scripts.

*: Required by TCP/IP controllable test equipment.



The MX773000PC can be controlled by specifying an M-Plane sequence file and CUS-Plane settings file created using the MX773000PC software.



O-RAN Fronthaul Interface Specifications

	Specification
CU-Plane, S-Plane	
O-RAN Fronthaul Ethernet Link	SFP28 (25 Gbps, FEC), SFP+ (10 Gbps)
L2 Protocol	Ethernet, VLAN *IP/UDP and multi-VLAN tags not supported
eCPRI	O-RAN Split Option 7-2x C-Plane for Downlink Scheduling U-Plane for Downlink IQ C-Plane for Uplink Scheduling U-Plane for Uplink IQ
S-Plane Protocol	PTPv2, SyncE (ESMC)
Frequency Range	FR1
O-RAN Specification	O-RAN.WG4.CUS.0-v07.00
M-Plane	
M-Plane Interface	RJ45 (1000BASE-T) SFP28 (25 Gbps, FEC), Connected by same Fronthaul Ethernet Link as CU-Plane
TCP/IP	IPv4, IPv6
DHCP	DHCPv4, DHCPv6, Static IP
SSH/TLS	SSHv2
O-RAN Specification	O-RAN.WG4.MP.0-v07.00

CU-Plane Specifications

	Specification
Sub-carrier Spacing	15 kHz, 30 kHz Can select 15 kHz only for 20 MHz channel bandwidth
Channel Bandwidth	20, 40, 60, 80, 100 MHz
Duplex Mode	TDD and FDD
Downlink Signal	NR-FR1-TM1.1 NR-FR1-TM1.2 NR-FR1-TM2 / 2a NR-FR1-TM3.1 / 3.1a NR-FR1-TM3.2 NR-FR1-TM3.3
Uplink Signal	G-FR1-A1-1 G-FR1-A1-2 G-FR1-A1-4 G-FR1-A1-5 G-FR1-A1-7 G-FR1-A1-8 G-FR1-A2-4 G-FR1-A2-5

