



Network Optimization Equipments

PROSE

Who We Are

Rosenberger Hochfrequenztechnik GmbH & Co. was founded in Germany in 1958 and ranks among the leading manufacturers of high-speed interconnect solutions worldwide. With its long tradition of excellence and innovation, Rosenberger has excelled and earned an outstanding reputation all over the world.

In early 2022 the Rosenberger Group announced the spinoff of its antenna and coverage solution product portfolio with a new brand entity PROSE. The strategic focus of PROSE will be on the development of base station antennas, microwave antennas, indoor and outdoor coverage solutions, Open RAN sub-systems, data center, cabling system, IoT solutions, Automotive and related services.

As an independent entity, PROSE, with its lean, agile, and decentralized organizational structure, will be better placed to serve global customers and manage growth by bringing new technologies and solutions, aligned with the changing needs of customers in the telecom industry. The PROSE product portfolio will uphold Rosenberger’s tradition of the highest innovation and quality while delivering improved technology expertise and enhanced local customer support around the globe.

PROSE consists of more than 3500 people, with 40+ subsidiaries sales/service offices, 4 factories, and 7 R&D centers covering mainly North America, Europe, the Middle East, Africa, and Asia. It will continue to serve more than 100 operators/service providers worldwide including a wide set of customized solutions for 5G deployments.

PROSE is an ISO 9001 quality system and ISO 14001 environmental system certified company. Equipped with advanced machinery, automatically assembly, and testing centers supported by a large group of more than 400 R&D engineers, state-of-the-art production assembly lines, and stringent product and quality control.

PROSE’s reliability and competitiveness are the cornerstones of this sustainable growth, which have resulted in long-term partnerships with most of the leading companies in their respective industries. PROSE will continue to provide excellent product solutions and services for its customers around the world.



A



B



C



D

A: Suzhou, China
B: Pune, India
C: New Jersey, USA
D: New South Wales, Australia

Mission

- Customer always comes first
- Drive innovation together with and for our customers
- Maintain a secure, humane and happy environment for our employees
- Develop our employees by investing in their education
- Take social responsibility
- Protect our environment with ecologically friendly products, production and processes

Core Value

- Value Innovation
- Customer Focus
- Sustainable Growth
- Social Responsibility

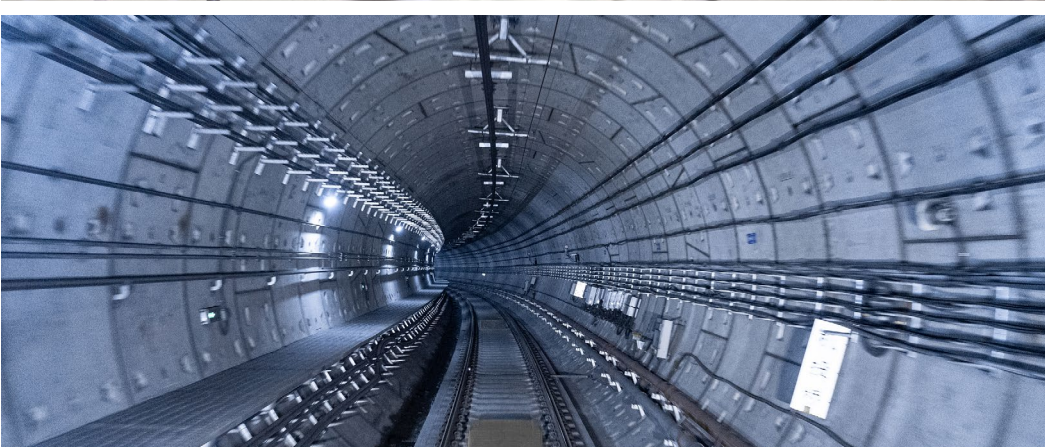
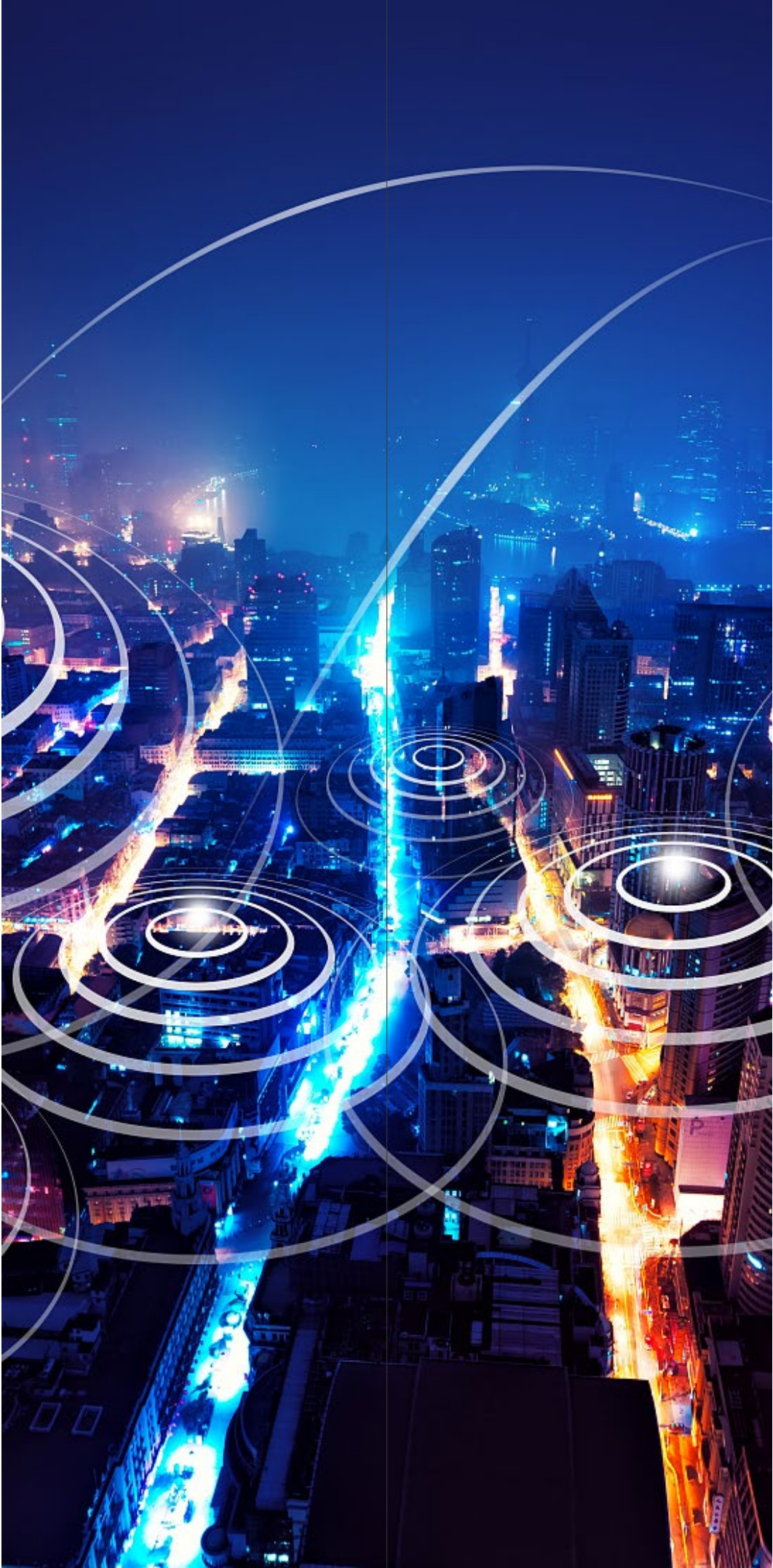


Products & Services

Network Systems	EPIC Active DAS Products Tetra DAS Products Wireless Repeater Passive DAS Products Site RF Components In-Cabinet RF Components
BTS Antennas	Multi-Band Antennas Multi-Beam Hybrid Antennas FDD+TDD Hybrid Antennas Small Cell Antennas 5G Massive MIMO Antennas TDD Beamforming Antennas
Microwave Products	class 3 Series class 4 Series E-Band Series Dual-Band Series Microwave Components
O-RAN Radios	Single-Band Portfolios Multi-Band Portfolios Beamforming Portfolios Massive MIMO Portfolios
Archer Site Accessories	Feeder System Power System Fiber Solution Hybrid Cable Solution Camouflaged Antennas Other SISO Accessories
Digital World Products	Automatic Infrastructure Management System Building Cabling System Data Center Cabling System Edge Computing Data Center Modular Data Center MDC Cloud Management Platform
Filter Solutions	5G Small Metal Filters 5G Mini Cavity Filters 5G Ceramic Filters AFU Integrated Filters Remote Radio Unit Filters Site Solution Filters
Anandale Automotive	Automotive Antennas Automotive Sensors

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EPIC ACTIVE DAS SOLUTION

OUTLINE

With the burgeoning demand for ubiquitous wireless coverage, in-building DAS are, and will continue be, an essential infrastructure of the radio network. DAS is a “Distributed Antenna Solution” for “Coverage and capacity”.

Prose’s EPIC DAS platform is a versatile, modular, and multi-technology platform designed to offer flexible and reliable wireless coverage and capacity for indoor and outdoor applications.

EPIC DAS solutions cater to multi-band, multi-operator applications, extending coverage, adding capacity, minimizing space requirements, and significantly reducing cost, which are more global approached as we have different bands for different countries, also are enhanced solution offering to service providers and enterprise customer.

EPIC DAS solutions support 2G, 3G, 4G, 5G (SISO and MIMO) and beyond for the global wireless community.

- EPIC High Power Remote Unit (EPIC-HPRU)
- EPIC Low Power Remote Unit (EPIC-LPRU)
- EPIC Medium Power Remote Unit (EPIC-MPRU)
- Tetra Fiber Optical Repeater

Active All-In-One in Building DAS Solution



Superior user experience

Flexible network combinations (SISO/MIMO) to ensure uniform, high quality service.



PROSE NMS system

A one-stop, intelligent management, configuration and monitoring by PROSE NMS.



Multiple-band and wideband

Maximum of penta-band in one unit to support the needs of most operators, with support for cascade expansions.



Simple and economical

Deployed via standard Ethernet or optic cabling, achieving rapid deployment, savings in time and installation costs.



WIFI option

It also supports Ethernet backbone for WIFI off-loading and internet surfing.



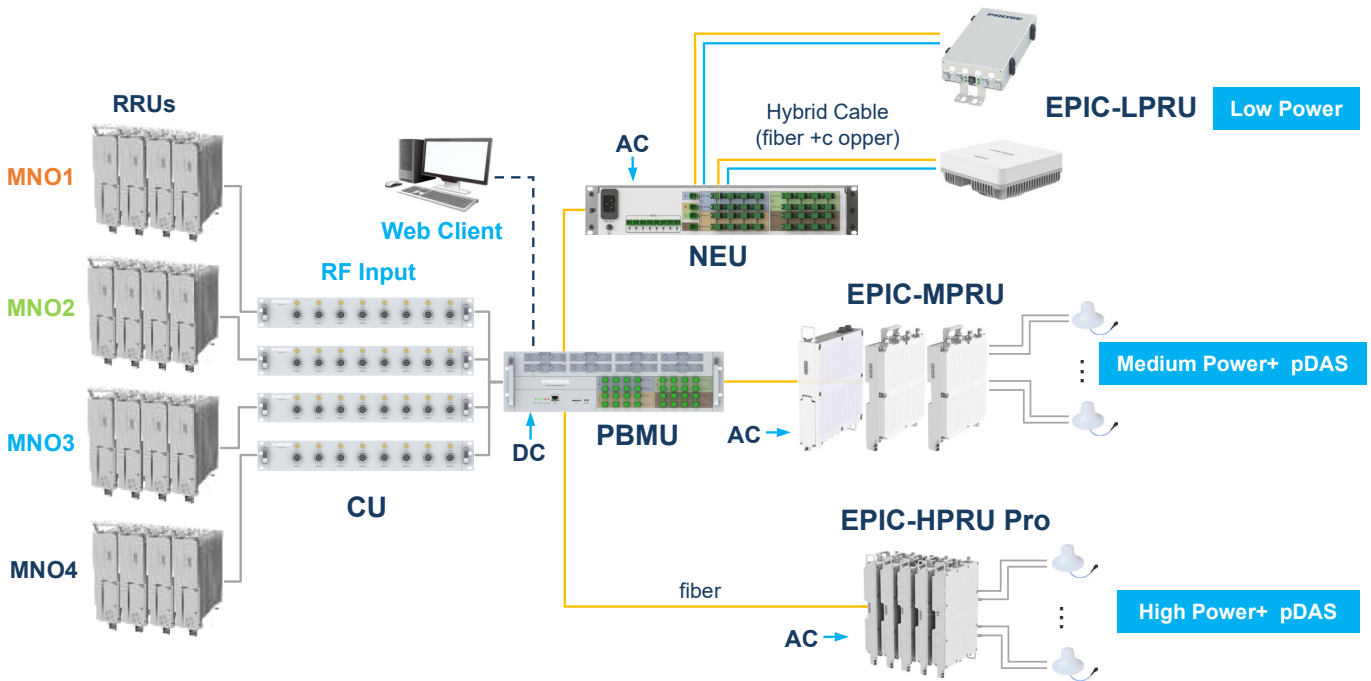
Tetra option

Specifically designed for use by government agencies and emergency services (police force, fire department, ambulance, etc.) for public safety networks, train radios for rail transport staff, transport services and the military via Tetra expansion unit.



Future-ready

Designed to support LTE-Advanced and IOT features, and even 5G via new expansion units.



- Combiner Unit (CU)
- Power Balance Master Unit (PBMU)
- Network Expansion Unit (NEU)
- Low Power Remote Unit (LPRU)
- Medium Power Remote Unit (MPRU)
- High Power Remote Unit (HPRU)

EPIC Low Power Remote Unit Series

Product Overview

The EPIC-LPRU system operates from 698 to 3980MHz and extends 2G, 3G, 4G and 5G broadband data coverage to indoor environments. PROSE's EPIC-LPRU solution supports multiple operators deploying multiple mobile technologies and is particularly suited for high-capacity installations such as business towers, shopping malls, offices, airports, event stadiums, and other indoor deployments.

The EPIC-LPRU system is much more than just replacing RF coaxial cables with optical fibers. The core of the system, consisting of the Power Balance Muster Unit (PBMU), the Network Extender Unit (NEU) and the integrated Remote Unit (IRU-O), deals with the signal processing and the conversion between RF signals and optical. The optical signals are transmitted over single mode fiber with very little loss and virtually no increased in noise floor. The NEU uses hybrid cable (an integrated power and fiber cable) to connect to the integrated Remote Unit (IRU-O), where each NEU can connect 16 units of IRU-O for 2x2 MIMO, or 8 units of IRU-O for 4x4 MIMO applications.

Main Features

- Easy and quick to design and deploy Fiber DAS, where RF radiated power is determined only by each IRU-O
- Easy to achieve uniform coverage, since each iRU-O has consistent output power
- Easy to adjust the RF output power level in specific applications
- No losses in signal transmission
- No PIM and VSWR issues
- Supports diversity network architecture, including SISO and MIMO configurations
- Up to 64 IRUs in 4x4 MIMO or 96 IRUs in 2x2 MIMO per PBMU



Electrical Specifications

		Uplink	Downlink
Frequency (Customized)	Band 1	1920 - 1980 MHz	2110 - 2170 MHz
	Band 3	1710 - 1785 MHz	1805 - 1880 MHz
	Band 5	824 - 849 MHz	869 - 894 MHz
	Band 7	2500 - 2570 MHz	2620 - 2690 MHz
	Band 8	880 - 915 MHz	925 - 960 MHz
	Band 12	698 - 716 MHz	728 - 746 MHz
	Band 13	776 - 787 MHz	746 - 757 MHz
	Band 14	788 - 798 MHz	758 - 768 MHz
	Band 20	832 - 862 MHz	791 - 821 MHz
	Band 25	1850 - 1915 MHz	1930 - 1995 MHz
	Band 28	703 - 748 MHz	758 - 803 MHz
	Band 30	2305 - 2315 MHz	2350 - 2360 MHz
	Band 40	2300 - 2400 MHz	2300 - 2400 MHz
	n41	2496 - 2690 MHz	2496 - 2690 MHz
	Band 66	1710 - 1780 MHz	2110 - 2180 MHz
	n78	3300 - 3700 MHz	3300 - 3700 MHz
	n78	3400 - 3800 MHz	3400 - 3800 MHz
	n77(DOD)	3450 - 3550 MHz	3450 - 3550 MHz
	n77(C-band)	3700 - 3980 MHz	3700 - 3980 MHz
Sysyrm Gain		14 ± 2 dB	14 ± 2 dB
RF Output Power		≤ -25 dBm	27/24/18 ± 1 dBm (RF per port)
Spurious emissions (Out of band)		≤ -36 dBm/9 KHz ~ 1 GHz	≤ -36 dBm/9 KHz ~ 1 GHz
		≤ -30 dBm/1 GHz ~ 12.75 GHz	≤ -30 dBm/1 GHz ~ 12.75 GHz
Max. operation Input Power		---	≤ 20 dBm
Impedance		50 Ω	50 Ω
Power Supply		DC-48V ± 10%	

Optical Specifications

		Uplink	Downlink
Optical Power	PBMU	---	-4 ± 2 dBm
	NEU	5 ± 2 dBm	-4 ± 2 dBm
	IRU-O	5 ± 2 dBm	---
Optical Wavelength		1310 nm + WDM	1550 nm + WDM
Optical connector		SC/APC	

Environmental Specifications

PBMU	
Operating temperature range	-10°C to +45°C
Storage temperature range	-40°C to +85°C
Relative humidity	10% - 95%
Ingress protection	IP40 for indoor
Cooling	Nature cooling

NEU	
Operating temperature range	-10°C to +45°C
Storage temperature range	-40°C to +85°C
Relative humidity	10% - 95%
Ingress protection	IP40 for indoor
Cooling	Nature cooling

IRU-O Indoor	
Operating temperature range	-10 °C to +45 °C
Storage temperature	-40°C to +85°C
Relative humidity	10% - 95%
Ingress protection	IP50
Monitoring and control	Remote control via IM2U/PBMU

IRU-O Outdoor	
Operating temperature range	-25 °C to +55 °C
Storage temperature	-40°C to +85°C
Relative humidity	5% - 98%
Ingress protection	IP65
Monitoring and control	Remote control via IM2U/PBMU

Mechanical Specifications

PBMU	
Dimensions	3U/2U 19" Rack
Optical connector	SC/APC
RF connector	QMA-Female
Installation	19" Rack Mounting

NEU	
Dimensions	2U 19" Rack
Fiber optical connectors	SC/APC
Mounting	Wall or rack

IRU-O Indoor	
Optical connector	SC/APC
Installation	Celling, wall or pole mounted
Antenna	Omni antenna Integrated

IRU-O Outdoor	
RF connector	4.3-10/N-Female
Optical connector	SC/APC
Installation	Celling, wall or pole mounted

EPIC High Power Remote Unit Sub 3G+5G Series

Main Features

- Ideal for a wide variety of indoor and outdoor applications to provide coverage enhancement for multi-band and multi-operator environments
- Provides up to 46dBm RF power per band at the output port
- A compact modular platform that supports combination from 1 to 4 frequency bands, plus 2 additional bands for MIMO, or up to 2 bands with redundant LPAs
- Supports 2G, 3G, 4G and 5G applications
- Standard module for plug & play
- Can be locally and remotely monitored and controlled via its integrated software, with remote control software of OMT and NMS available as per customer's requirements



Electrical Specifications

		Uplink	Downlink
Frequency (Customized)	Band 1	1920 - 1980 MHz	2110 - 2170 MHz
	Band 3	1710 - 1785 MHz	1805 - 1880 MHz
	Band 5	824 - 849 MHz	869 - 894 MHz
	Band 7	2500 - 2570 MHz	2620 - 2690 MHz
	Band 8	880 - 915 MHz	925 - 960 MHz
	Band 20	832 - 862 MHz	791 - 821 MHz
	Band 28	703 - 748 MHz	758 - 803 MHz
	Band 40	2300 - 2400 MHz	2300 - 2400 MHz
	n41	2496 - 2690 MHz	2496 - 2690 MHz
	n78	3400 - 3800 MHz	3400 - 3800 MHz
RF Output Power (dBm)		-10dBm	43/46dBm
Typical System Gain (dB)		43	43
VSWR		≤1.5	≤1.5
Typical Noise Figure (dB)		≤5	---
Attenuator Range(dB)		≥30	≥30

Mechanical Specifications

Power Supply	AC/DC
Ports	4.3-10/DIN/N-F
Operating Temperature	-25 °C to +55 °C
Ingress Protection	IP65

Software Specifications

Local Control	Ethernet port Via LAN
Remote Control	Ethernet port Via LAN
	Wireless Modem

EPIC High Power Remote Unit 5G NR Series

Main Features

- Support n78 2x2 MIMO with 5G technology
- A compact modular platform
- Management via OMT or NMS management software
- Easy be installed on the wall, tunnel, and ground



Electrical Specifications

		Uplink	Downlink
Frequency	n78 (2x2 MIMO)	3400 - 3800 MHz	3400 - 3800 MHz
Typical Gain		50 ± 3 dB	50 ± 3 dB
Max RF Power		---	43/46 ± 2 dBm
Optical Power		5 ± 2 dBm (O/P)	
Gain Flatness		± 1.5 dB/carrier	± 1.5 dB/carrier
Attenuation range		25 dB/1 dB step	25 dB/1 dB step
Automatic Level Control		10 dB, auto gain setting	10 dB, auto gain setting
VSWR		≤ 1.5	≤ 1.5
Optical wavelength		1310 nm	1550 nm
Power Supply		AC90 ~ 264V, 50/60Hz	

Environmental Specifications

Operating temperature range	-25°C to +55°C
Storage temperature range	-40°C to +85°C
Relative humidity	10% - 95%
Ingress Protection	IP65

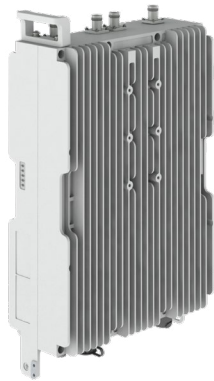
Mechanical Specifications

Connector	4.3-10 / N-Female
Optical Connector	SC/APC
Mounting	Wall/ground

EPIC High Power Remote Unit Pro 5G NR Series

Product Overview

- Integrated design for 5G NR 2x2 MIMO
- Support up to 4 operators for co-construction
- High system gain and high power output to support 4x43dBm
- High reliability and stability
- Low delay is suitable for 5G TDD system, which support great length for fiber route especially for BTS hotel application
- Natural heat dissipation to improve product reliability
- Redundant backup and automatically switch over in case of failure to ensure network service
- Good dustproof and waterproof performance to support indoor and outdoor installation



Electrical Specifications

		Uplink	Downlink
Frequency (Customized)	n41 (2x2 MIMO)	2496 - 2690 MHz	2496 - 2690 MHz
	n78 (2x2 MIMO)	3300 - 3700 MHz	3300 - 3700 MHz
	n78 (2x2 MIMO)	3400 - 3800 MHz	3400 - 3800 MHz
	n77(DOD) (2x2 MIMO)	3450 - 3550 MHz	3450 - 3550 MHz
	n77(C-band) (2x2 MIMO)	3700 - 3980 MHz	3700 - 3980 MHz
Sysrm Gain		33 ± 2 dB	33 ± 2 dB
RF Output Power		-30 ± 2 dBm	46 ± 2 dBm (RF per port)
Spurious emissions		Meets 3GPP TS 38.104 for NR	
EVM (256 QAM)		≤ 3.5%	≤ 3.5%
Max. operation Input Power		---	≤ 20 dBm
Impedance		50 Ω	50 Ω

Optical Specifications

		Uplink	Downlink
Optical Power	PBMU	---	0 ± 2 dBm
	HPRU	9 ± 2 dBm	---
Optical Wavelength		1310 nm	1550 nm
Optical connector		SC/APC	

Environmental Specifications

HPRU	
Operating temperature range	-40°C to +55°C
Storage temperature range	-40°C to +85°C
Relative humidity	5% - 95%
Ingress protection	IP67
Monitoring and control	LAN-RJ45 (local)
Cooling	Nature cooling

EPIC High Power Remote Unit Pro Sub 3G+5G Series

Product Overview

- Modular design for flexible configuration
- Support 2G, 3G, 4G, 5G technologies
- Support up to 8 bands SISO or 4 bands 2x2 MIMO
- Independent gain control and filtering
- Low-noise and high reliability
- Natural heat dissipation
- 2 channels individual to support MIMO for same band or SISO for different bands



Electrical Specifications

		Uplink	Downlink
Frequency (Customized)	Band 1	1920 - 1980 MHz	2110 - 2170 MHz
	Band 3	1710 - 1785 MHz	1805 - 1880 MHz
	Band 5	824 - 849 MHz	869 - 894 MHz
	Band 7	2500 - 2570 MHz	2620 - 2690 MHz
	Band 8	880 - 915 MHz	925 - 960 MHz
	Band 12	698 - 716 MHz	728 - 746 MHz
	Band 13	776 - 787 MHz	746 - 757 MHz
	Band 14	788 - 798 MHz	758 - 768 MHz
	Band 20	832 - 862 MHz	791 - 821 MHz
	Band 25	1850 - 1915 MHz	1930 - 1995 MHz
	Band 28	703 - 748 MHz	758 - 803 MHz
	Band 40	2300 - 2400 MHz	2300 - 2400 MHz
	n41	2496 - 2690 MHz	2496 - 2690 MHz
	Band 66	1710 - 1780 MHz	2110 - 2180 MHz
	n78	3300 - 3700 MHz	3300 - 3700 MHz
Sysrm Gain	Sub3G	35 ± 2 dB	35 ± 2 dB
	5G	33 ± 2 dB	33 ± 2 dB
RF Output Power	Sub3G	-30 ± 2 dBm	43.5 ± 2 dBm (RF per port)
	5G	-30 ± 2 dBm	46 ± 2 dBm (RF per port)
Spurious emissions		Meets 3GPP TS 36.106 for LTE, 3GPP TS 38.104 for NR	
Impedance		50 Ω	50 Ω

Environmental Specifications

HPRU	
Operating temperature range	-40°C to +55°C
Storage temperature range	-40°C to +85°C
Relative humidity	5% - 95%
Ingress protection	IP67
Monitoring and control	LAN-RJ45 (local)
Cooling	Nature cooling

EPIC Medium Power Remote Unit Series

Product Overview

- 2W comprehensive output power
- Compact size with low weight
- Up to 8 x 4T4R MPRU can be connected with single PBMU/IM2U
- Flexible installation and maintenance



Electrical Specifications

		Uplink	Downlink
Frequency	n78 (4x4 MIMO)	3400 - 3800 MHz	3400 - 3800 MHz
Instantaneous Bandwidth		400 MHz	400 MHz
Gain		40 ± 2 dB	40 ± 2 dB
RF output power		---	33 ± 1 dBm
Optical output power		5 ± 1 dBm	---
ALC control		10 dB overdrive protection	10 dB overdrive protection
Gain control range		15 dB / 1 dB step	15 dB / 1 dB step
Ripple in band		≤ ±3 dB	≤ ±3 dB
Spurious Emission (Out of band)		≤ -36 dBm@9KHz - 1GHz	≤ -36 dBm@9KHz - 1GHz
		≤ -30 dBm@1GHz - 12.75GHz	≤ -30 dBm@1GHz - 12.75GHz
EVM (256QAM)		≤ 3%	≤ 3%
Max. non-destructive input power		-10 dBm	---
Impedance		50 Ω	50 Ω
Power supply		90 ~ 264 VAC	

Environmental Specifications

Operating temperature range	-40°C to +55°C
Storage temperature range	-40°C to +85°C
Relative humidity	5% - 98%
Ingress protection	IP67
Monitoring and control	LAN-RJ45 (local)
	Remote control via PBMU/IM2U

PROSE WIRELESS SOLUTION



High Power 5GNR Digital Wireless Repeater

Main Features

High power 5GNR digital wireless repeater is designed to support 5G technology applications and features:

- Up to 95dB gain with an integrated design which offers exceptional coverage
- Variable single sub-band to support multi- technology applications with variable instantaneous bandwidth to support evolving network requirements
- User adjustable gain control, Automatic Gain Control



Electrical Specifications

		Uplink	Downlink
Frequency	n78	3400 - 3800 MHz	3400 - 3800 MHz
Bandwidth		100 MHz	100 MHz
Output Power		23 ± 2 dBm	37 ± 2 dBm
Max Gain		90 ± 3 dB	95 ± 3 dB
AGC Range		≥ 30 dB	≥ 30 dB
Attenuation range		30 dB/1 dB step	30 dB/1 dB step
Ripple in band		≤ 3 dB	≤ 3 dB
VSWR (Return loss)		≤ 1.5 (>14 dB)	≤ 1.5 (>14 dB)
Max input power (non-destructive)		10 dBm	10 dBm
Impedance		50 Ω	50 Ω
Power Supply		176 ~ 264 VAC	

Environmental Specifications

Operating temperature range	-20°C to +55°C
Storage temperature range	-40°C to +85°C
Relative humidity	5% ~ 95%
Ingress Protection	IP65

Mechanical Specifications

Connectors type	N female
Mounting	Pole
Local Control	RJ45

Tri-band High Power Digital Wireless Repeater

Main Features

- Superior RF performance, High Efficiency
- Digital System for LTE technology
- High Gain and Low Noise Figure
- IP65 for indoor/outdoor application
- Operating Frequency and working bandwidth can be customized by OMT software and NMS
- Intelligent wireless modem monitoring, automatic alarm report and remote control
- Easy installation, operation, and maintenance



Electrical Specifications

		Uplink	Downlink
Frequency	Band 1	1920 - 1980 MHz	2110 - 2170 MHz
	Band 3	1710 - 1785MHz	1805 - 1880MHz
	Band 8	880 - 915 MHz	925 - 960 MHz
Output power		27 ± 2 dBm	43 ± 2 dBm (per band)
Gain		85 ± 3 dB	90 ± 3 dB
Gain control range		30 dB/1 dB step	30 dB/1 dB step
Ripple in band		≤ ±2 dB Typical @ per sub-band	≤ ±2 dB Typical @ per sub-band
VSWR		≤ 1.5	≤ 1.5
Transmission delay		≤ 5 μS	≤ 5 μS
Max. non-destructive input power		-10 dBm	-10 dBm
Impedance		50 Ω	50 Ω
Power supply		110-260 VAC,47/63 Hz	

Functions-Variable Multiple Sub-bands

Max bandwidth of Sub-band	200 kHz - 20 MHz (100 kHz /step)
Sub-bands per band	2
Total sub-bands	6

Environmental Specifications

Operating temperature range	-25°C to +55°C
Storage temperature range	-40°C to +85°C
Relative humidity	5% - 95%
Applications	IP65
Monitoring and control	RJ45 (local)
	Wireless modem (remote)

Mechanical Specifications

Connectors type	N female
Mounting	Wall or pole
Packing	1 Pcs in box

Tri-band Low Power Digital Wireless Repeater

- Up to 95dB gain with an integrated design which offers exceptional coverage
- high out band rejection to prevent the unwanted interference from outdoor or from other operators
- variable single sub-band to support multi-operator applications with variable instantaneous bandwidth to support evolving network requirements
- Support isolation detection and AGC



Electrical Specifications

		Uplink	Downlink
Frequency	Band 1	1920 - 1980 MHz	2110 - 2170 MHz
	Band 3	1710 - 1785MHz	1805 - 1880MHz
	Band 8	880 - 915 MHz	925 - 960 MHz
Max Gain		90 ± 3 dB	95 ± 3 dB
Output Power		20 ± 2 dBm	27 ± 2 dBm
Attenuation range		30 dB/1 dB step	30 dB/1 dB step
Automatic Level Control		≥ 20 dB, auto gain setting	≥ 20 dB, auto gain setting
VSWR		≤ 1.8	≤ 1.8
Impedance		50 Ω	50 Ω
Maximum input power, no damage		-10 dBm	-10 dBm
Power Supply		100/220 VAC,50/60Hz	

Functions -Variable Single Sub-band

Bandwidth of sub-bands	1MHz - 20 MHz (1MHz step)
Center Frequency of Sub-bands	1MHz/step
Sub-bands per band	3
Total sub-bands	9

Environmental Specifications

Operating temperature range	-25°C to +55°C
Storage temperature range	-40°C to +85°C
Relative humidity	5% - 95%
Ingress Protection	IP65

Mechanical Specifications

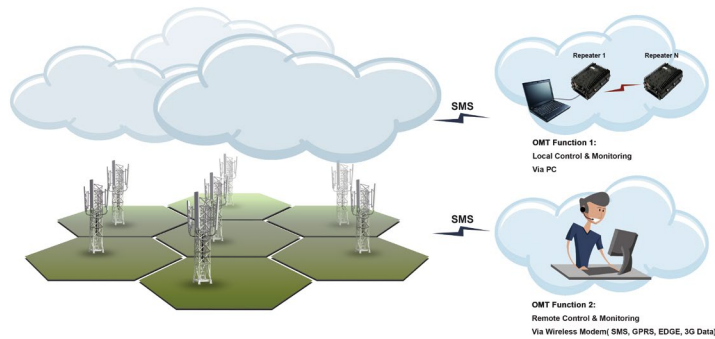
Connectors type	N female
Mounting	Pole / Wall
Packing	1 Pcs in box

OMT & NMS



Operation and Maintenance Terminal (OMT)

Communication



Main Features

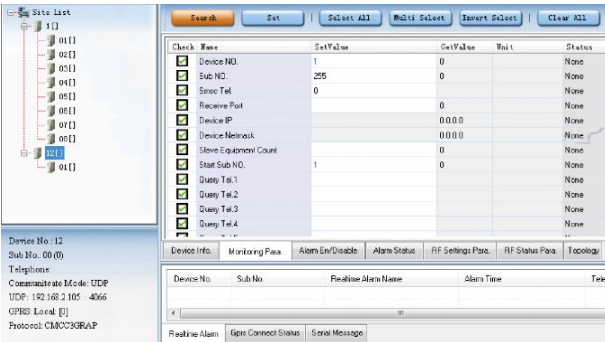
- OMT for Local and remote monitoring
- Free and simply installation
- Able to control and monitor different types of repeaters (2G/ 3G/ LTE, etc.)
- Automatic alarm reporting
- Local and remote upgrade firmware of repeater through UDP mode
- Support UDP, SMS and GPRS data communication with repeater

Description

OMT is a completely local and remote monitoring and control tools with repeaters by maintainer

- Support connecting to all types of repeater with LAN or SMS or GPRS modem base on UDP/TCP and SMS
- Monitoring alarms and controlling parameters of repeaters are all available with this software.

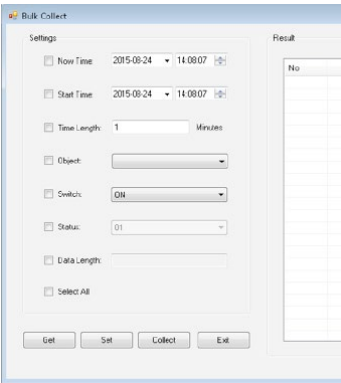
Main Features



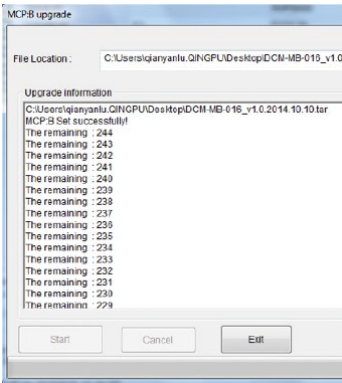
Control Parameter

Device No.	Sub No.	Realtime Alarm Name
Site 5364	NEU(0)-IRU-O(0)	Master Slave Module Comm. Failure
Site 5364	NEU(0)-IRU-O(0)	PD4 Alarm
Site 5364	NEU(0)-IRU-O(0)	PD3 Alarm
Site 5364	NEU(0)-IRU-O(0)	PD1 Alarm
Site 5364	NEU(0)-IRU-O(0)	DownLink Low InputAlarm(WCDMA)
Site 5364	NEU(0)-IRU-O(0)	DownLink Low InputAlarm(DCS)

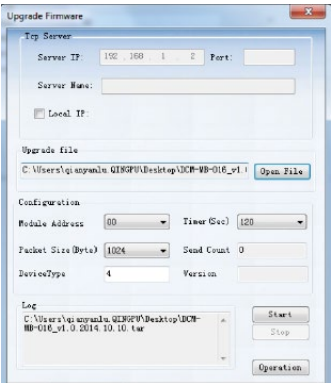
Alarm Monitor



Performance Getting



Remote Upgrade Module



Remote Upgrade Firmware

Operation and Maintenance Center (OMC/NMS)

Product Overview

PROSE Operation and Maintenance Center is the network management solution for all PROSE repeaters and distribution systems and provides basic functions of TMN and solution for integrate monitor equipment, including configuration, alarm monitor, topology view, task, security management, log management etc.



Main Features

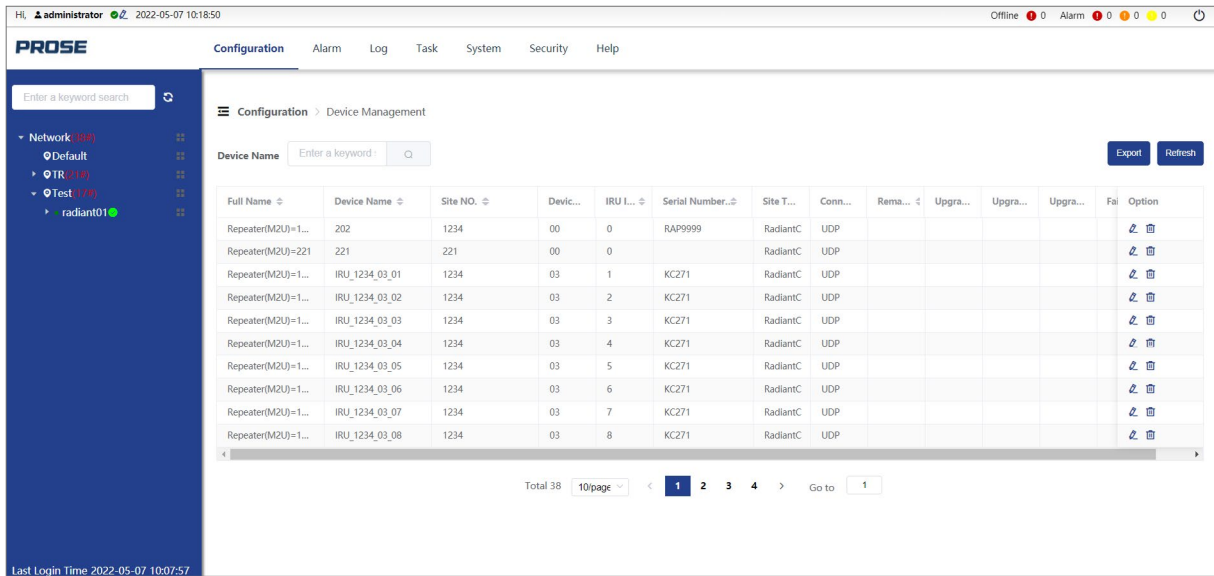
- Support integration with other NMS by SNMP North Bound Interface.
- The location of repeaters can be located on E-Map by longitude and latitude.
- The OMC can detect faults and keep alarms informed of any changes as they arise or clear.
- The OMC provides customized functions such as alarm severity redefinition to meet requirements in various scenarios.
- The parameters of repeaters can be configured remotely by web browser.
- The polling parameters and batch operation are supported by task management.
- The OMC records system and NE communication log and analyze the NE communication log.
- The OMC allows for single or multiple batch upgrades to devices that are attached to OMC.

Software Requirements

OMC Server	Operation system	Windows Server 2016 or above
	Database	MySQL 8.0.28
User Client	Operation system	Windows 7 or above
	Browser	Google Chrome

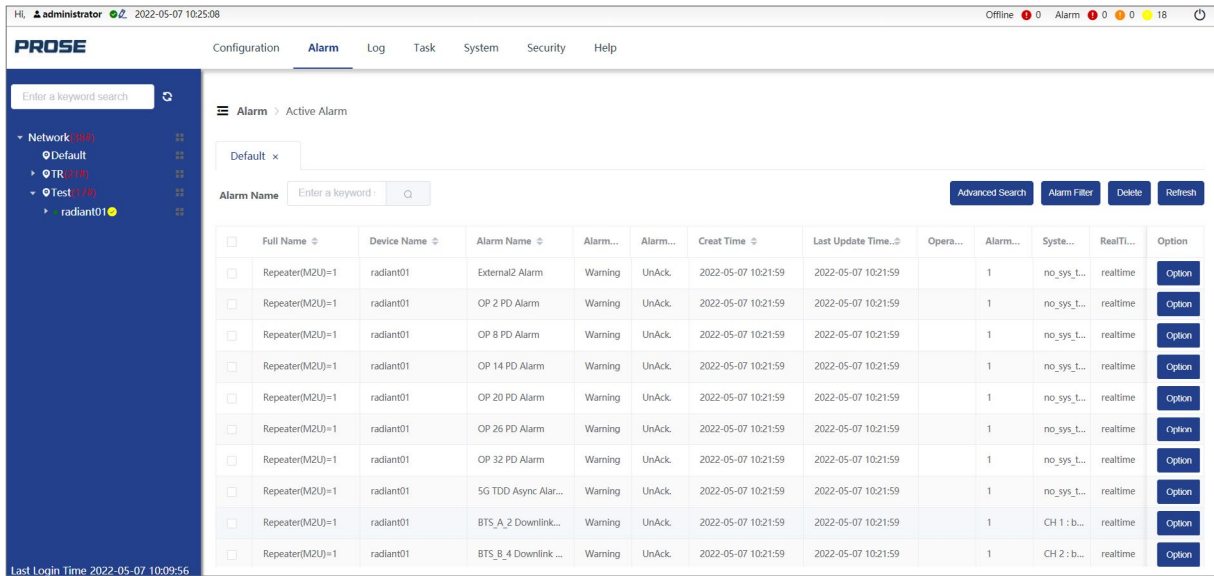
Topology View

Topo Tree View of Network by Domain/Area	Create/Modify basic NE attributes
Devices Statistics by Network Domain/Area	Display main menu bar
Add connected physical devices in the topology	Alarm Statistics
Refresh Devices	Fault Status of Device



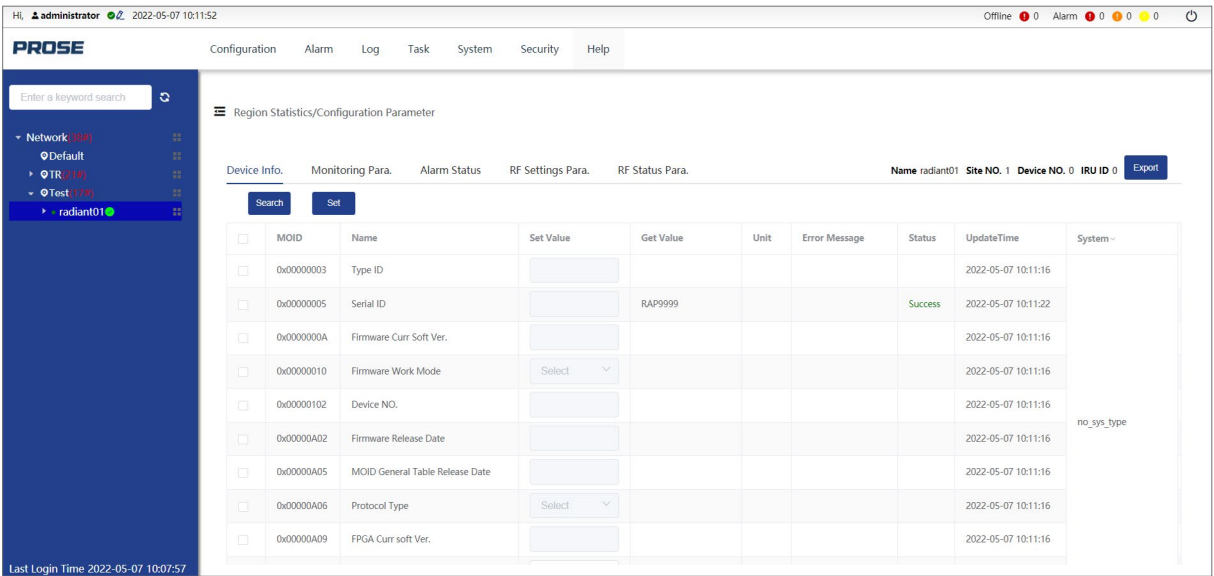
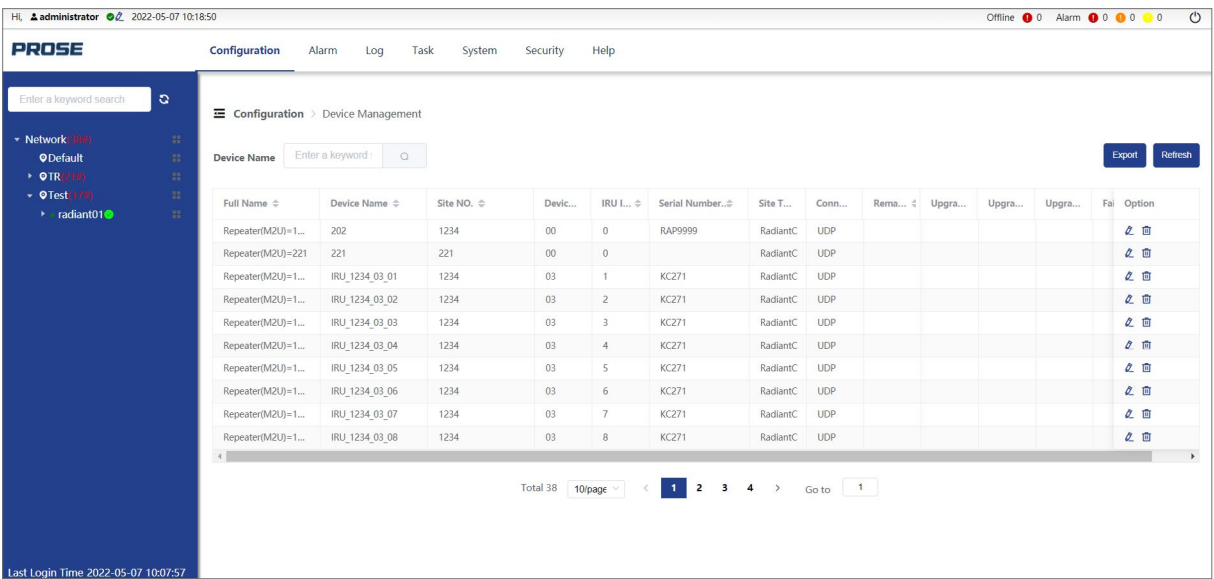
Alarm Management

Alarm Filters	Alarm Alerted by Icon
Auto-Refresh Real-time Alarm List	Manual Alarm Synchronization
Alarm History	Alarm Clearing
Alarm Level Customized	Alarm Acknowledgement
Export alarm information	Forward Alarms to other maintainer by North Bound Interface



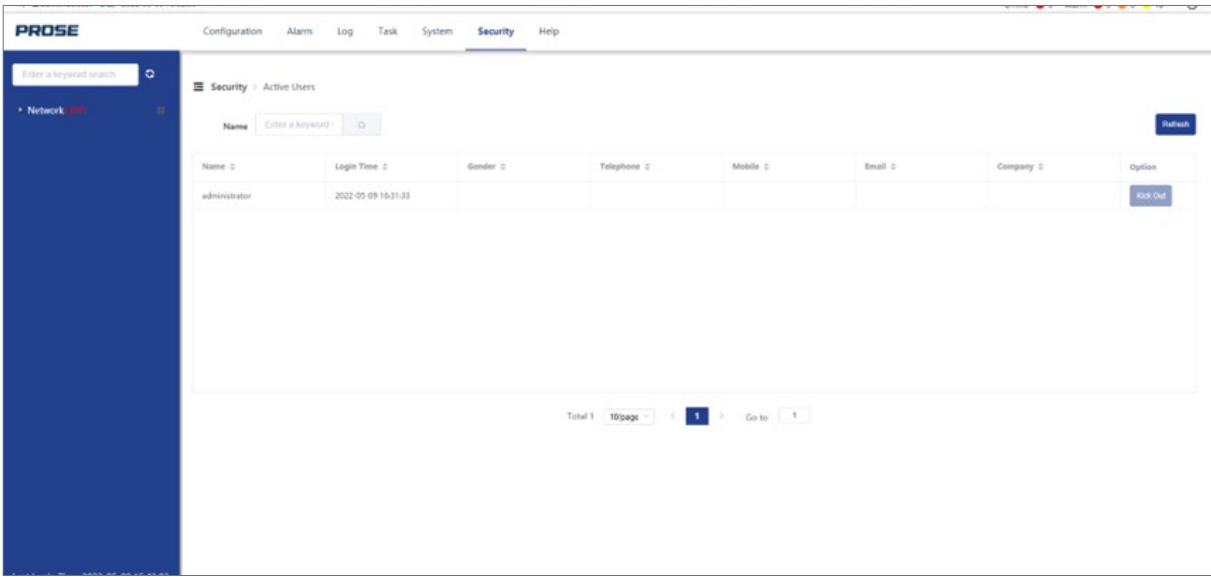
Configuration

Network Element Node Management	Query/set for a device parameter
Export the information about all devices on the OMC	Set the parameters of one or more devices in batches



Security Management

Display Online Users	User Group Management
Manage the sensitive keyword	Privilege Management by Function, Area/Device, Parameters
Lock user/kick user	Reset users password



Add User

User Name

Gender

Male

Fem

Password

Confirm Password

Telephone

Mobile

Email

Company

User Group

administrators

Add Group

Basic Information

Group Name

Specific Privileges

Privilege

Area

Log Management

Fault

Task Management

Configuration

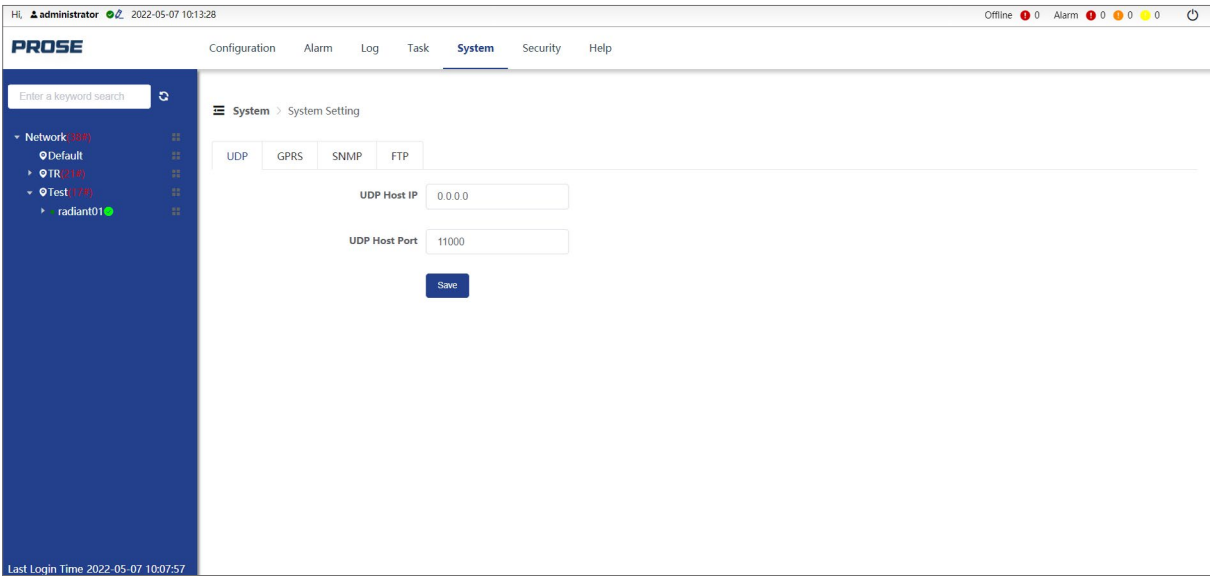
Security Management

Topology

System

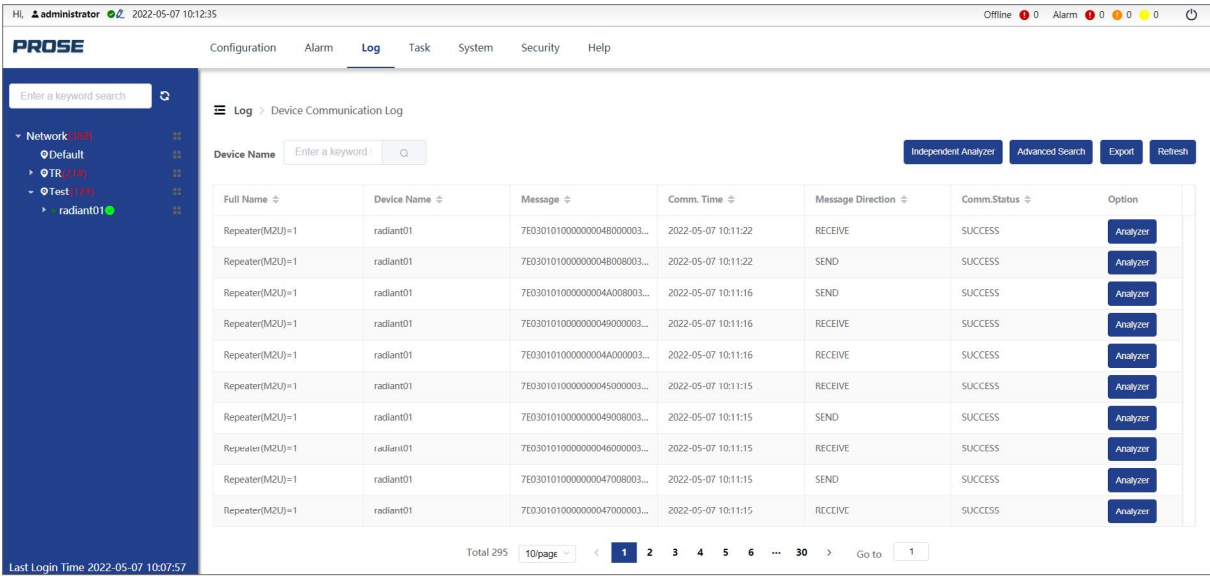
System Management

Alarm Forward Settings	SNMP Settings
GPRS/UDP IP and Port settings	Configure FTP upgrade information
Log/password and other general information Settings	



Log Management

Operation Log & System Log	Log Data Export
Device Communication Log	Analyze Log Tool



Polling Task of Parameters	Operation Task of parameters
Firmware Download Task	Export to Task Report

Hi, administrator 2022-05-07 10:12:35

Offline 0 Alarm 0 0 0

PROSE

Configuration Alarm Log Task System Security Help

Enter a keyword search

Log > Device Communication Log

Device Name Enter a keyword

Independent Analyzer Advanced Search Export Refresh

Full Name	Device Name	Message	Comm. Time	Message Direction	Comm. Status	Option
Repeater(M2U)=1	radiant01	7E030101000000048000003...	2022-05-07 10:11:22	RECEIVE	SUCCESS	Analyzer
Repeater(M2U)=1	radiant01	7E0301010000000048008003...	2022-05-07 10:11:22	SEND	SUCCESS	Analyzer
Repeater(M2U)=1	radiant01	7E030101000000004A008003...	2022-05-07 10:11:16	SEND	SUCCESS	Analyzer
Repeater(M2U)=1	radiant01	7E030101000000004A000003...	2022-05-07 10:11:16	RECEIVE	SUCCESS	Analyzer
Repeater(M2U)=1	radiant01	7E0301010000000045000003...	2022-05-07 10:11:15	RECEIVE	SUCCESS	Analyzer
Repeater(M2U)=1	radiant01	7E0301010000000049008003...	2022-05-07 10:11:15	SEND	SUCCESS	Analyzer
Repeater(M2U)=1	radiant01	7E0301010000000046000003...	2022-05-07 10:11:15	RECEIVE	SUCCESS	Analyzer
Repeater(M2U)=1	radiant01	7E0301010000000047008003...	2022-05-07 10:11:15	SEND	SUCCESS	Analyzer
Repeater(M2U)=1	radiant01	7E0301010000000047000003...	2022-05-07 10:11:15	RECEIVE	SUCCESS	Analyzer

Total 295 10page 1 2 3 4 5 6 ... 30 Go to 1

Last Login Time 2022-05-07 10:07:57

PROSE Service

PROSE offers professional services that improve network design, reliability, scalability and efficiency.

Our service core competences include:

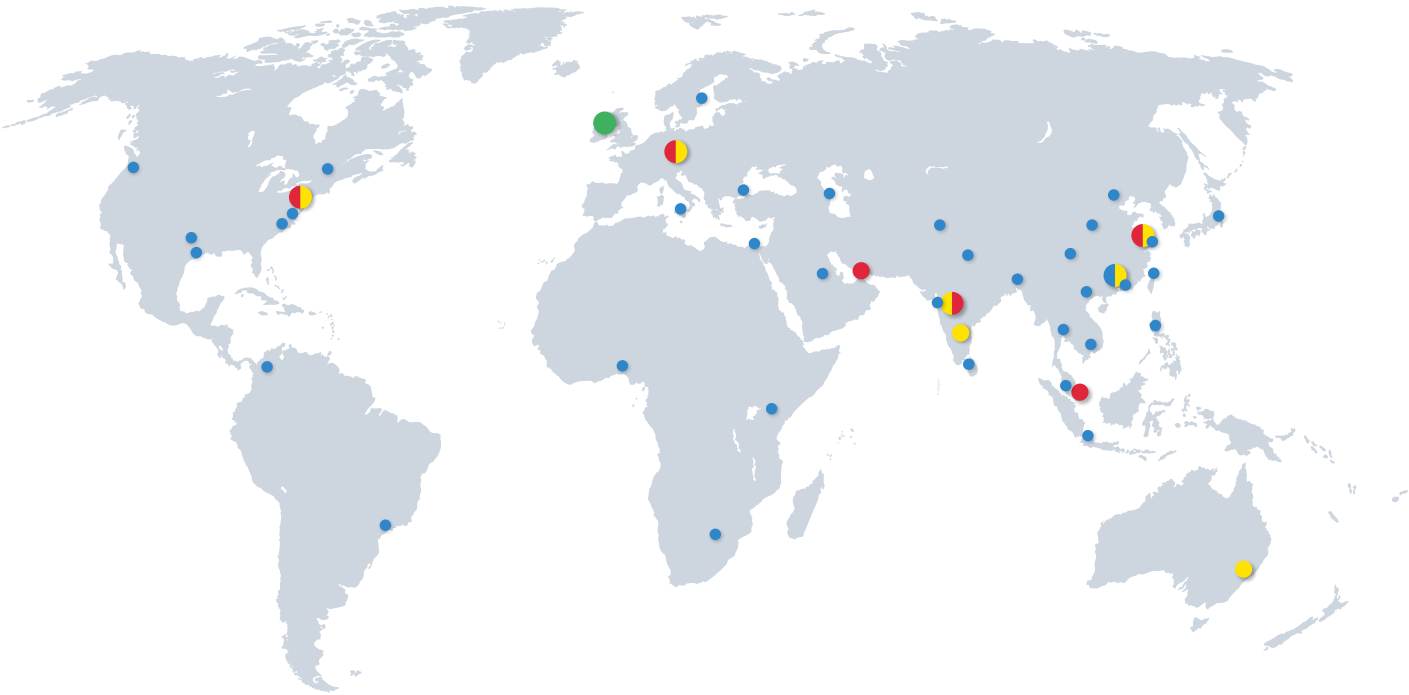
- Network optimization
- Technical consultation
- Customized product design
- Installation & commissioning
- Onsite training & supervision
- System troubleshooting
- After-sales services

In addition, we also offer professional training, technical support and workshops for distributors and agents. We are committed to offering exceptional services for our customers.

PROSE is much more than just a supplier – PROSE is a valued development partner and we will strive to meet new challenges in order to scale to new heights.



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- PRODUCTION / OPERATIONAL HUB
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- SUBSIDIARIES / SALES REPRESENTATIVES



For more information refer to our website:
www.ProseTechnologies.com

PROSE



PROSE Active DAS with Intelligent Antenna (RADiAnt)

PROSE

Radiant Series

Radiant 5G

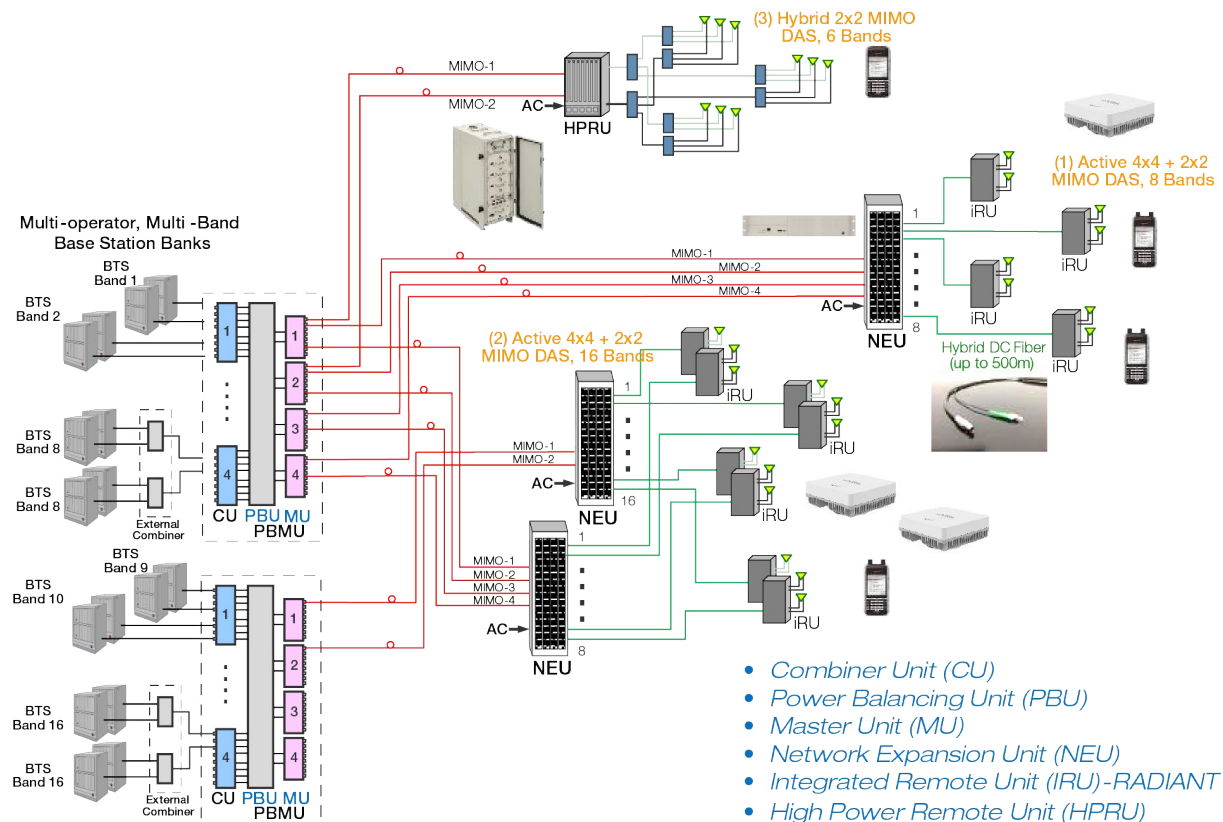
Product Overview

- The RADiAnt system consists of PBMU, NEU and IRU-O
- Power Balance Master Unit (PBMU) is recommended for Power level aligning If multiple operators accessing
- Network Extender Unit (NEU) deals with the signal processing and the extension optical ports
- Integrated Remote Unit (IRU-O) built in antenna
- The optical signals are transmitted over single mode fiber with low loss
- The NEU uses hybrid cable (an integrated power and fiber cable) to connect to the integrated Remote Unit (IRU-O), where each NEU can connect 16 units of IRU-O for SISO, and 16 units of IRU-O for 2x2 MIMO, and 8 units of IRU-O for 4x4 MIMO applications.

Main Features

- Supports customized band combination, including 2x2MIMO and 4X4 MIMO
- PBMU has 32 RF input ports, 4 RF ports in a group, each group supports one frequency band, independent ATT per each port
- Support 2G, 3G, 4G and 5G technologies
- Automatically balance the input power for multi operator's RRU input
- Provides the input power detection function
- MAX support 256 IRUs for 2X2 MIMO, and 64 IRUs for 4x4 MIMO
- Management via OMT or NMS management software

Block Diagram



Electrical Specifications

		Uplink	Downlink
Frequency (Customized)	Band 1 (2x2 MIMO)	1920 - 1980 MHz	2110 - 2170 MHz
	Band 3 (2x2 MIMO)	1710 - 1785 MHz	1805 - 1880 MHz
	Band 5 (2x2 MIMO)	824 - 849 MHz	869 - 894 MHz
	Band 7 (2x2 MIMO)	2500 - 2570 MHz	2620 - 2690 MHz
	Band 8 (2x2 MIMO)	880 - 915 MHz	925 - 960 MHz
	Band 20 (2x2 MIMO)	832 - 862 MHz	791 - 821 MHz
	Band 28 (2x2 MIMO)	703 - 748 MHz	758 - 803 MHz
	Band 40 (2x2 MIMO)	2300 - 2400 MHz	2300 - 2400 MHz
	Band 41 (2x2 MIMO)	2496 - 2690 MHz	2496 - 2690 MHz
	n78 (4x4 MIMO)	3300 - 3800 MHz	3300 - 3800 MHz
Sysyrm Gain		14 ± 2 dB	14 ± 2 dB
RF Output Power		≤ -25 dBm	27/24/18 ± 1 dBm (RF per port)
Spurious emissions (Out of band)		≤ -36 dBm/9 KHz ~ 1 GHz	≤ -36 dBm/9 KHz ~ 1 GHz
		≤ -30 dBm/1 GHz ~ 12.75 GHz	≤ -30 dBm/1 GHz ~ 12.75 GHz
Max. operation Input Power		---	≤ 20 dBm
Impedance		50 Ω	50 Ω
Power Supply		DC-48V ± 10%	

Optical Specifications

		Uplink	Downlink
Optical Power	PBMU	---	-4 ± 2 dBm
	NEU	4 ± 2 dBm	-4 ± 2 dBm
	IRU-O	4 ± 2 dBm	---
Optical Receiver Sensitivity	PBMU	≥ -12 dBm (I/P)	---
	NEU	≥ -12 dBm (I/P)	≥ -12 dBm (I/P)
	IRU-O	--	≥ -12 dBm (I/P)
Optical Wavelength		1310 nm	1550 nm
Optical connector		SC/APC	

Environmental Specifications

PBMU

Operating temperature range	-10°C to +45°C
Storage temperature range	-40°C to +85°C
Relative humidity	10% - 95%
Ingress protection	IP40 for indoor
Monitoring and control	LAN-RJ45 (local)
Cooling	Nature cooling

NEU

Operating temperature range	-10°C to +45°C
Storage temperature range	-40°C to +85°C
Relative humidity	10% - 95%
Ingress protection	IP40 for indoor
Monitoring and control	LAN-RJ45 (local)
Cooling	Nature cooling

IRU-O Indoor

Operating temperature range	-10 °C to +45 °C
Storage temperature	-40°C to +85°C
Relative humidity	10% - 95%
Ingress protection	IP50
Monitoring and control	Remote control via IM2U/PBMU

IRU-O Outdoor

Operating temperature range	-25 °C to +55 °C
Storage temperature	-40°C to +85°C
Relative humidity	5% - 98%
Ingress protection	IP65
Monitoring and control	Remote control via IM2U/PBMU

Mechanical Specifications

PBMU

Dimensions	3U 19" Rack
Optical connector	16 sets x SC/APC (4G 2x2 MIMO)
	8 sets x SC/APC (5G 4x4 MIMO)
RF connector	24 x QMA-Female (rear) 32 x QMA-Female (front)
Installation	19" Rack Mounting

NEU

Dimensions	2U 19" Rack
Fiber optical connectors	32 x SC/APC (to IRU)
	4 x SC/APC (to IM2U/PBMU)
Mounting	Wall or rack

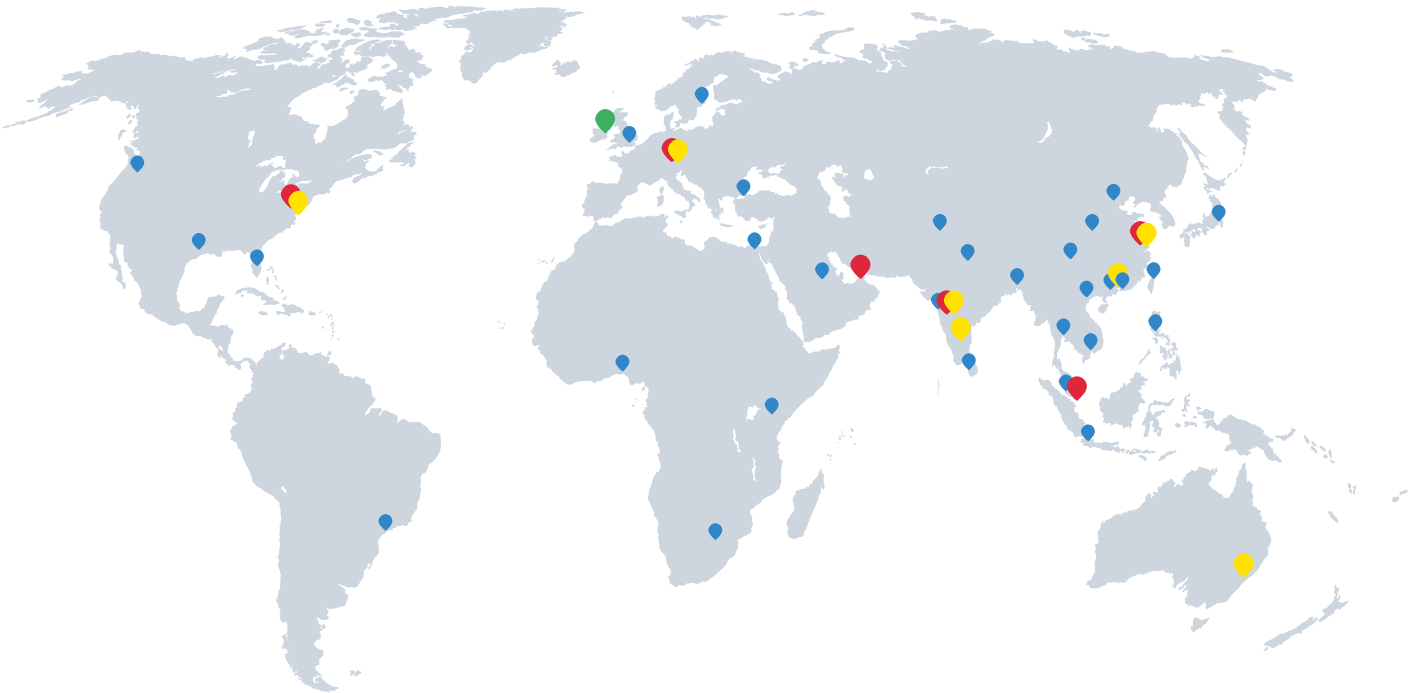
IRU-O Indoor

Optical connector	4 x SC/APC (4x4 MIMO) 2 x SC/APC (2x2 MIMO)
Installation	Ceiling, wall or pole mounted
Antenna	Omni antenna Integrated

IRU-O Outdoor

RF connector	4 x 4.3-10/N-Female (4x4 MIMO) 2 x 4.3-10/N-Female (2x2 MIMO)
Optical connector	4 x SC/APC (4x4 MIMO) 2 x SC/APC (2x2 MIMO)
Installation	Ceiling, wall or pole mounted

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PROSE



Passive Components & In-building Antennas

PROSE

Who We Are

Rosenberger Hochfrequenztechnik GmbH & Co. was founded in Germany in 1958 and ranks among the leading manufacturers of high-speed interconnect solutions worldwide. With its long tradition of excellence and innovation, Rosenberger has excelled and earned an outstanding reputation all over the world.

In early 2022 the Rosenberger Group announced the spinoff of its antenna and coverage solution product portfolio with a new brand entity PROSE. The strategic focus of PROSE will be on the development of base station antennas, microwave antennas, indoor and outdoor coverage solutions, Open RAN sub-systems, data center, cabling system, IoT solutions, Automotive and related services.

As an independent entity, PROSE, with its lean, agile, and decentralized organizational structure, will be better placed to serve global customers and manage growth by bringing new technologies and solutions, aligned with the changing needs of customers in the telecom industry. The PROSE product portfolio will uphold Rosenberger’s tradition of the highest innovation and quality while delivering improved technology expertise and enhanced local customer support around the globe.

PROSE consists of more than 3500 people, with 40+ subsidiaries sales/service offices, 4 factories, and 7 R&D centers covering mainly North America, Europe, the Middle East, Africa, and Asia. It will continue to serve more than 100 operators/service providers worldwide including a wide set of customized solutions for 5G deployments.

PROSE is an ISO 9001 quality system and ISO 14001 environmental system certified company. Equipped with advanced machinery, automatically assembly, and testing centers supported by a large group of more than 400 R&D engineers, state-of-the-art production assembly lines, and stringent product and quality control.

PROSE’s reliability and competitiveness are the cornerstones of this sustainable growth, which have resulted in long-term partnerships with most of the leading companies in their respective industries. PROSE will continue to provide excellent product solutions and services for its customers around the world.



A



B



C



D

A: Suzhou, China
B: Pune, India
C: New Jersey, USA
D: New South Wales, Australia

Mission

- Customer always comes first
- Drive innovation together with and for our customers
- Maintain a secure, humane and happy environment for our employees
- Develop our employees by investing in their education
- Take social responsibility
- Protect our environment with ecologically friendly products, production and processes

Core Value

- Value Innovation
- Customer Focus
- Sustainable Growth
- Social Responsibility



Products & Services

Network Systems	Active DAS Products Tetra DAS Products Wireless Repeater Passive DAS Products Site RF Components In-Cabinet RF Components
BTS Antennas	Multi-Band Antennas Multi-Beam Hybrid Antennas FDD+TDD Hybrid Antennas Small Cell Antennas 5G Massive MIMO Antennas TDD Beamforming Antennas
Microwave Products	class 3 Series class 4 Series E-Band Series Dual-Band Series Microwave Components
O-RAN Radios	Single-Band Portfolios Multi-Band Portfolios Beamforming Portfolios Massive MIMO Portfolios
Archer Site Accessories	Feeder System Power System Fiber Solution Hybrid Cable Solution Camouflaged Antennas Other SISO Accessories
Digital World Products	Automatic Infrastructure Management System Building Cabling System Data Center Cabling System Edge Computing Data Center Modular Data Center MDC Cloud Management Platform
Filter Solutions	5G Small Metal Filters 5G Mini Cavity Filters 5G Ceramic Filters AFU Integrated Filters Remote Radio Unit Filters Site Solution Filters
Anandale Automotive	Automotive Antennas Automotive Sensors

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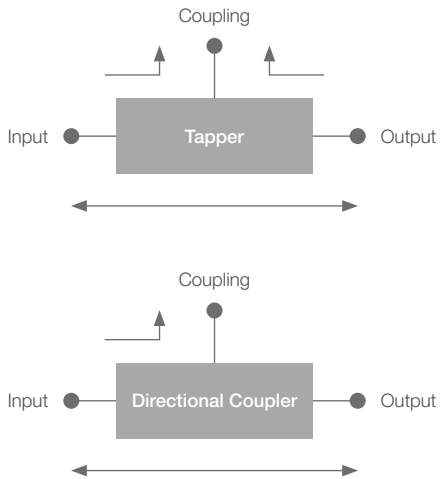
Passive Components

Electronic components that display their characteristics without the need for an external power source. Passive components are mainly resistance, inductance and capacitance components. Its common feature is that it can work when there is a signal without adding power in the circuit. PROSE provides high quality power splitters, directional couplers, and dummy loads and so on, which are manufactured to higher standards to ensure that active or passive system keeps the more efficient wireless networks.



Couplers / Tappers

The couplers and tappers have different coupling values, which are used for different applications. PROSE has already formed a passive portfolio to ensure that customer will get their preferable couplers / tappers.



Part Number	Description	Frequency Band	PIM	Insertion Loss	VSWR	Connector Type
C-5-0127-NF-B02	5dB	146-2700MHz	-155dBc	2.1dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-6-0127-NF-B02	6dB	146-2700MHz	-155dBc	1.7dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-7-0127-NF-B02	7dB	146-2700MHz	-155dBc	1.5dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-10-0127-NF-B02	10dB	146-2700MHz	-155dBc	1.0dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-15-0127-NF-B02	15dB	146-2700MHz	-155dBc	0.5dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-20-0127-NF-B02	20dB	146-2700MHz	-155dBc	0.4dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-30-0127-NF-B02	30dB	146-2700MHz	-155dBc	0.3dB	1.5 for Low-Band 1.3 for High-Band	N Female

Part Number	Description	Frequency Band	PIM	Insertion Loss	VSWR	Connector Type
C-5-0360-NF-B02	5dB	340-6000MHz	-155dBc	2.1dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-6-0360-NF-B02	6dB	340-6000MHz	-155dBc	1.7dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-7-0360-NF-B02	7dB	340-6000MHz	-155dBc	1.5dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-10-0360-NF-B02	10dB	340-6000MHz	-155dBc	1.0dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-15-0360-NF-B02	15dB	340-6000MHz	-155dBc	0.5dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-20-0360-NF-B02	20dB	340-6000MHz	-155dBc	0.4dB	1.5 for Low-Band 1.3 for High-Band	N Female
C-30-0360-NF-B02	30dB	340-6000MHz	-155dBc	0.3dB	1.5 for Low-Band 1.3 for High-Band	N Female

* 4.3-10 connector interface is also available for the above tapper products.

Directional Couplers

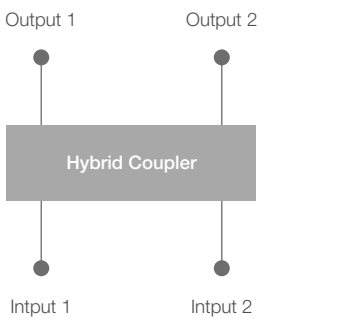
The directional coupler could be a good choice if there is isolation requirement between output port and coupling port. That will minimize the interference in the transmission link. PROSE has released complete series for different bands and coupling values.

Part Number	Description	Frequency Band	Directivity	PIM	Insertion Loss	VSWR	Connector Type
DC-5-9F-64F-04-T	5dB	698-4000MHz	20dB	-161dBc	2.1dB	1.25	4.3-10 Female
DC-5-9F-64F-07-T		698-3800MHz	20dB	-160dBc	2.1dB	1.25	4.3-10 Female
DC-5-9F-DF-01		698-3800MHz	20dB	-155dBc	2.1dB	1.25	DIN Female
DC-5-9F-NF-06		698-4000MHz	20dB	-155dBc	2.1dB	1.25	N Female
DC-6-9F-64F-04-T	6dB	698-4000MHz	20dB	-161dBc	1.7dB	1.25	4.3-10 Female
DC-6-9F-64F-07-T		698-3800MHz	20dB	-160dBc	1.7dB	1.25	4.3-10 Female
DC-6-9F-DF-01		698-3800MHz	20dB	-155dBc	1.7dB	1.25	DIN Female
DC-6-9F-NF-06		698-4000MHz	20dB	-155dBc	1.7dB	1.25	N Female
DC-7-9F-64F-04-T	7dB	698-4000MHz	20dB	-161dBc	1.5dB	1.25	4.3-10 Female
DC-7-9F-64F-07-T		698-3800MHz	20dB	-160dBc	1.5dB	1.25	4.3-10 Female
DC-7-9F-DF-01		698-3800MHz	20dB	-155dBc	1.5dB	1.25	DIN Female
DC-7-9F-NF-06		698-4000MHz	20dB	-155dBc	1.5dB	1.25	N Female
DC-10-9F-64F-04-T	10dB	698-4000MHz	20dB	-161dBc	1.0dB	1.25	4.3-10 Female
DC-10-9F-64F-07-T		698-3800MHz	20dB	-160dBc	1.0dB	1.25	4.3-10 Female
DC-10-9F-DF-01		698-3800MHz	20dB	-155dBc	1.0dB	1.25	DIN Female
DC-10-9F-NF-06		698-4000MHz	20dB	-155dBc	1.0dB	1.25	N Female
DC-15-9F-64F-04-T	15dB	698-4000MHz	20dB	-161dBc	0.5dB	1.25	4.3-10 Female
DC-15-9F-64F-07-T		698-3800MHz	20dB	-160dBc	0.5dB	1.25	4.3-10 Female
DC-15-9F-DF-01		698-3800MHz	20dB	-155dBc	0.5dB	1.25	DIN Female
DC-15-9F-NF-06		698-4000MHz	20dB	-155dBc	0.5dB	1.25	N Female
DC-20-9F-64F-04-T	20dB	698-4000MHz	20dB	-161dBc	0.4dB	1.25	4.3-10 Female
DC-20-9F-64F-07-T		698-3800MHz	20dB	-160dBc	0.4dB	1.25	4.3-10 Female
DC-20-9F-DF-01		698-3800MHz	20dB	-155dBc	0.4dB	1.25	DIN Female
DC-20-9F-NF-06		698-4000MHz	20dB	-155dBc	0.4dB	1.25	N Female
DC-30-9F-64F-04-T	30dB	698-4000MHz	20dB	-161dBc	0.3dB	1.25	4.3-10 Female
DC-30-9F-64F-07-T		698-3800MHz	20dB	-160dBc	0.3dB	1.25	4.3-10 Female
DC-30-9F-DF-01		698-3800MHz	20dB	-155dBc	0.3dB	1.25	DIN Female
DC-30-9F-NF-06		698-4000MHz	20dB	-155dBc	0.3dB	1.25	N Female

Part Number	Description	Frequency Band	Directivity	PIM	Insertion Loss	VSWR	Connector Type
DC-5-10F-64F-01-T	5dB	600-6000MHz	20dB	-161dBc	2.1dB	1.25	4.3-10 Female
DC-6-10F-64F-01-T	6dB	600-6000MHz	20dB	-161dBc	1.7dB	1.25	4.3-10 Female
DC-7-10F-64F-01-T	7dB	600-6000MHz	20dB	-161dBc	1.5dB	1.25	4.3-10 Female
DC-10-10F-64F-01-T	10dB	600-6000MHz	20dB	-161dBc	1.0dB	1.25	4.3-10 Female
DC-15-10F-64F-01-T	15dB	600-6000MHz	20dB	-161dBc	0.5dB	1.25	4.3-10 Female
DC-20-10F-64F-01-T	20dB	600-6000MHz	20dB	-161dBc	0.4dB	1.25	4.3-10 Female
DC-30-10F-64F-01-T	30dB	600-6000MHz	20dB	-161dBc	0.3dB	1.25	4.3-10 Female

Hybrid Couplers

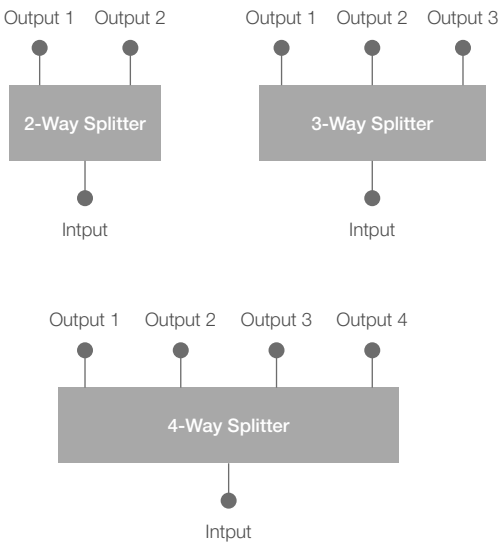
Hybrid coupler are often used for coupling the same band signal, which is one of special couplers. A hybrid coupler is a special case of directional coupler that divides an input signal evenly between two output ports with 3 dB coupling. PROSE offers different kinds of hybrid coupler with variety of connector type and levels of power handling for choice.



Part Number	Description	Frequency Band	PIM	VSWR	Connector Type
HM-3-9F-64F-04-T	2in/2out 3dB Type	698-4000MHz	-161dBc	1.3	4.3-10 Female
HM-3-9F-64F-08-T		698-3800MHz	-160dBc	1.3	4.3-10 Female
HM-3-9F-DF-06		698-4000MHz	-155dBc	1.3	DIN Female
HM-3-9F-NF-06		698-4000MHz	-155dBc	1.3	N Female
HM-3-10F-64F-01-T		600-6000MHz	-161dBc	1.3	4.3-10 Female
HM-5-8F-64F-A01	3in/3out 5dB Type	698-2700MHz	-160dBc	1.3	4.3-10 female
HM-5-10F-64F-A01		698-4000MHz	-160dBc	1.3	4.3-10 female
HM-6-8F-DF-01	4in/4out 6dB Type	698-2700MHz	-155dBc	1.3	DIN Female
HM-6-8F-NF-01		698-2700MHz	-155dBc	1.3	N Female
HM-6-9F-64F-A07		698-4000MHz	-155dBc	1.3	4.3-10 Female
HM-6-9F-DF-06		698-4000MHz	-155dBc	1.3	DIN Female
HM-6-9F-NF-06	2in/1out 3dB Type	698-4000MHz	-155dBc	1.3	N Female
HM-3-AF-DF-04		698-960MHz	-150dBc	1.3	DIN Female
HM-3-BF-DF-04		1710-2200MHz	-150dBc	1.3	DIN Female

Power Splitters

Predominantly there are two types of power splitters: coaxial and microstrip. Withing the PROSE portfolio, both variants are available up to 6GHz frequency range.



Part Number	Description	Frequency Band	PIM	Power Rating	VSWR	Connector Type
S-2-9F-NF-06	2-way	698-4000MHz	-155dBc	300W	1.3	N Female
S-2-9F-DF-04		698-4000MHz	-155dBc	500W	1.3	DIN Female
S-2-9F-64F-07-T		698-3800MHz	-160dBc	500W	1.3	4.3-10 Female
S-2-9F-64F-04-T		698-4000MHz	-161dBc	500W	1.3	4.3-10 Female
S-3-9F-NF-06	3-way	698-4000MHz	-155dBc	300W	1.3	N Female
S-3-9F-DF-04		698-4000MHz	-155dBc	500W	1.3	DIN Female
S-3-9F-64F-07-T		698-3800MHz	-160dBc	500W	1.3	4.3-10 Female
S-3-9F-64F-04-T		698-4000MHz	-161dBc	500W	1.3	4.3-10 Female
S-4-9F-NF-06	4-way	698-4000MHz	-155dBc	300W	1.3	N Female
S-4-9F-DF-04		698-4000MHz	-155dBc	500W	1.3	DIN Female
S-4-9F-64F-07-T		698-3800MHz	-160dBc	500W	1.3	4.3-10 Female
S-4-9F-64F-04-T		698-4000MHz	-161dBc	500W	1.3	4.3-10 Female

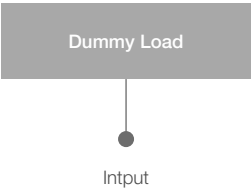
Part Number	Description	Frequency Band	PIM	Power Rating	VSWR	Connector Type
S-2-10F-64F-01-T	2-way	600-6000MHz	-161dBc	500W	1.3	4.3-10 Female
S-3-10F-64F-01-T	3-way	600-6000MHz	-161dBc	500W	1.3	4.3-10 Female
S-4-10F-64F-01-T	4-way	600-6000MHz	-161dBc	500W	1.3	4.3-10 Female

Part Number	Description	Frequency Band	PIM	Power Rating	VSWR	Connector Type
S-2-3F-NF-01	2-way	300-500MHz	-155dBc	300W	1.3	N Female
S-3-3F-NF-01	3-way	300-500MHz	-155dBc	300W	1.3	N Female
S-4-3F-NF-01	4-way	300-500MHz	-155dBc	300W	1.3	N Female

Part Number	Description	Frequency Band	PIM	Power Rating	VSWR	Connector Type
SM-2-3F-NF-B01	2-way with isolation	300-500MHz	-155dBc	50W	1.3	N Female
SM-3-3F-NF-B01	3-way with isolation	300-500MHz	-155dBc	50W	1.3	N Female
SM-4-3F-NF-B01	4-way with isolation	300-500MHz	-155dBc	50W	1.3	N Female

Dummy Loads

In this place, various kinds of dummy loads are listed with power handling up to 200W for representatively comprehensive use. In fact, in order to chase after customers' challenging requirements, the higher power handling up to 300W is also available.

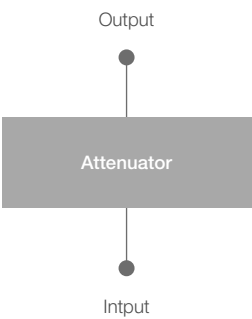


Part Number	Description	Frequency Band	PIM	VSWR	Connector Type
L-2-64M-04	2W	DC-4000MHz	/*	1.25	4.3-10 Male
L-2-NM-01S	2W	DC-4000MHz	/	1.25	N Male
L-2-64M-B02	2W	DC-6000MHz	/	1.25	4.3-10 Male
L-2-NM-B02	2W	DC-6000MHz	/	1.25	N Male
L-5-64M-01S	5W	DC-4000MHz	/	1.25	4.3-10 Male
L-5-NM-01S	5W	DC-4000MHz	/	1.25	N Male
L-5-64M-B02	5W	DC-6000MHz	/	1.25	4.3-10 Male
L-5-NM-B02	5W	DC-6000MHz	/	1.25	N Male
L-50-64F-05-T2	50W	698-4000MHz	-155dBc	1.25	4.3-10 Female
L-100-64F-05-T2	100W	698-4000MHz	-155dBc	1.25	4.3-10 Female
L-200-64F-05-T2	200W	698-4000MHz	-155dBc	1.25	4.3-10 Female
L-50-64F-16-T3	50W	600-6000MHz	-161dBc	1.35	4.3-10 Female
L-100-64F-16-T3	100W	600-6000MHz	-161dBc	1.35	4.3-10 Female
L-200-64F-16-T3	200W	600-6000MHz	-161dBc	1.35	4.3-10 Female

* "/" means there is no PIM influence for the low power dummy loads.

Fixed Attenuators

In this place, various of fixed attenuators are listed with frequency of DC-3GHz & DC-4GHz for representatively comprehensive use. PROSE has attenuators which could achieve up to 18GHz if needed, meanwhile some special connector types such as SMA or some coaxial variable attenuators are also available.



Part Number	Power Handling	Frequency Band	Attenuation	PIM	VSWR	Connector Type
A-XX-2-64-01	2W	698-4000MHz	(XX=1-9,10,20,30,40dB)	/*	1.25	4.3-10 male to female
A-XX-2-N-01	2W	698-4000MHz	(XX=1-9,10,20,30,40dB)	/	1.25	N male to female
A-XX-5-64-01S	5W	698-4000MHz	(XX=1-9,10,20,30,40dB)	/	1.25	4.3-10 male to female
A-XX-5-N-01S	5W	698-4000MHz	(XX=1-9,10,20,30,40dB)	/	1.25	N male to female
A-XX-5-64-11-T2L	5W	698-3800MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	4.3-10 male to female
A-XX-5-N-11-T2L	5W	698-3800MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	N male to female
A-XX-10-64-11-T2L	10W	698-3800MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	4.3-10 male to female
A-XX-10-N-11-T2L	10W	698-3800MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	N male to female
A-XX-25-64-11-T2L	25W	698-3800MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	4.3-10 male to female
A-XX-25-N-11-T2L	25W	698-3800MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	N male to female
A-XX-50-64-05-T2	50W	698-4000MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	4.3-10 male to female
A-XX-50-D-05-T2	50W	698-4000MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	DIN male to female
A-XX-50-N-05-T2	50W	698-4000MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	N male to female
A-XX-100-64-05-T2	100W	698-4000MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	4.3-10 male to female
A-XX-100-D-05-T2	100W	698-4000MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	DIN male to female
A-XX-100-N-05-T2	100W	698-4000MHz	(XX=5,6,7,8,10,13,20,30,40dB)	-155dBc	1.3	N male to female

* "/" means the items are mainly used for low-power and non-PIM rated applications.

IBS Antennas

For the in-building network system, IBS antennas are the devices that ensure the signal coverage, whose performance plays a very important role in whole system. PROSE constantly drives the innovation to make better IBS antenna products for more comprehensive use.



Omni SISO



Part Number	Description	Frequency Band	Gain (dBi)	VSWR	PIM	Dimension (mm)	Weight (kg)	Metal Ground Plane	Connector Type
S-Wave 0640-OD-6-64K-O7	SISO	698-4000MHz	2.2 for Low-Band 6.0 for High-Band	1.8	-153dBc	Ø220×18	0.6	No	4.3-10 Female
S-Wave 0640-OD-6-O7	SISO	698-4000MHz	2.2 for Low-Band 6.0 for High-Band	1.8	-153dBc	Ø220×18	0.6	No	N Female
S-Wave 0660-OD-5-64K-O1	SISO	698-6000MHz	2.0 for Low-Band 4.5 for High-Band	1.8	-153dBc	Ø203×115	0.5	No	4.3-10 Female
S-Wave 0660-OD-5-O1	SISO	698-6000MHz	2.0 for Low-Band 4.5 for High-Band	1.8	-153dBc	Ø203×115	0.5	No	N Female
S-Wave 0360-OD-5-B01	SISO	340-6000MHz	3.0 for Low-Band 5.0 for High-Band	2.5 for Low-Band 1.8 for High-Band	-150dBc	Ø290×10	0.5	No	N Female
S-Wave 0305-OD-2-NF-A21	SISO	380-450MHz	2.0 for full band	2.0	-153dBc	Ø298×150	0.9	No	N Female

Omni MIMO



Part Number	Description	Frequency Band	Gain (dBi)	VSWR	PIM	Dimension (mm)	Weight (kg)	Metal Ground Plane	Connector Type
S-Wave 0640/0640-OD-6-64K-O7	2×2 MIMO	698-4000MHz	"1.5 for Low-Band 6.0 for High-Band"	1.8	-153dBc	Ø266×18	0.6	No	4.3-10 Female
S-Wave 0640/0640-OD-6-O7	2×2 MIMO	698-4000MHz	"1.5 for Low-Band 6.0 for High-Band"	1.8	-153dBc	Ø266×18	0.6	No	N Female
S-Wave 0660/0660-OD-6-64K-O5	2×2 MIMO	617-6000MHz	"1.5 for Low-Band 6.0 for High-Band"	1.8	-153dBc	Ø266×18	0.6	No	4.3-10 Female
S-Wave Q0640-OD-6-64K-O2	4×4 MIMO	698-4000MHz	"3.0 for Low-Band 4.5 for High-Band"	1.8	-153dBc	Ø360×24	0.9	No	4.3-10 Female
S-Wave Q0640-OD-6-O2	4×4 MIMO	698-4000MHz	"3.0 for Low-Band 4.5 for High-Band"	1.8	-153dBc	Ø360×24	0.9	No	N Female

Panel SISO



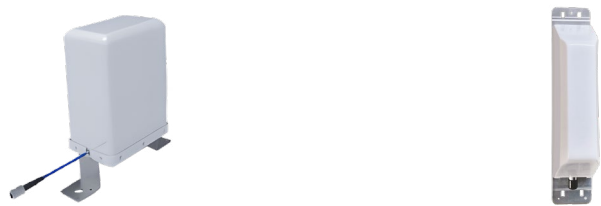
Part Number	Description	Frequency Band	Gain (dBi)	VSWR	PIM	Dimension (mm)	Weight (kg)	Metal Ground Plane	Connector Type
S-Wave 0640-65-9-64K-O7	SISO	698-4000MHz	4.5 for Low-Band 8.5 for High-Band	2.0	-153dBc	180x170x60	0.5	Yes	4.3-10 Female
S-Wave 0640-65-9-O7	SISO	698-4000MHz	4.5 for Low-Band 8.5 for High-Band	2.0	-153dBc	180x170x60	0.5	Yes	N Female
S-Wave 0660-65-6-64K-B1C	SISO	617-6000MHz	5.5 for Low-Band 6.0 for High-Band	2.0	-153dBc	420x180x62	1.3	Yes	4.3-10 Female
S-Wave 0660-65-7D-B1	SISO	790-6000MHz	6.0 for Low-Band 6.0 for High-Band	2.0	-150dBc	420x180x85	1.3	Yes	N Female
S-Wave 0360-65-6-B01	SISO	340-6000MHz	2.0 for Low-Band 6.0 for High-Band	3.0 for Low-Band 2.0 for High-Band	-150dBc	308x190x65	0.8	Yes	N Female
S-Wave 0305-65-3D-NF-A01	SISO	380-500MHz	3.0 for full band	2.5	-153dBc	308x190x65	0.8	Yes	N Female

Panel MIMO



Part Number	Description	Frequency Band	Gain (dBi)	VSWR	PIM	Dimension (mm)	Weight (kg)	Metal Ground Plane	Connector Type
S-Wave 0640/0640-65-9D-64K-O7	2×2 MIMO	698-4000MHz	5.0 for Low-Band 7.5 for High-Band	2.0	-153dBc	400x180x62	1.3	Yes	4.3-10 Female
S-Wave 0640_0640-65-9D-O7	2×2 MIMO	698-4000MHz	5.0 for Low-Band 7.5 for High-Band	2.0	-153dBc	400x180x62	1.3	Yes	N Female
S-Wave 0660/0660-65-7D-64K-B2	2×2 MIMO	617-6000MHz	6.0 for Low-Band 6.5 for High-Band	2.0	-150dBc	308x420x100	1.6	Yes	4.3-10 Female
S-Wave Q0640-65-9D-64K-B1	4×4 MIMO	698-4000MHz	6.5 for Low-Band 8.5 for High-Band	1.8	-153dBc	380x420x82	2.0	Yes	4.3-10 Female
S-Wave Q0640-65-9D-B1	4×4 MIMO	698-4000MHz	6.0 for Low-Band 8.5 for High-Band	1.8	-153dBc	308x420x82	1.8	Yes	N Female

Bi-Directional



Part Number	Description	Frequency Band	Gain (dBi)	VSWR	PIM	Dimension (mm)	Weight (kg)	Connector Type
S-Wave 8FW-BD-5	SISO	698-2700MHz	3.5 for Low-Band 4.5 for High-Band	2.0	-150dBc	195x125x260	1.3	N Female
S-Wave 8FW-BD-6	SISO	698-2700MHz	4.0 for Low-Band 5.0 for High-Band	2.0	-150dBc	400x180x80	0.9	N Female
S-Wave 8FW-BD-5-64K	SISO	698-2700MHz	3.5 for Low-Band 4.5 for High-Band	2.0	-150dBc	195x125x260	1.3	4.3-10 Female
S-Wave 8FW-BD-6-64K	SISO	698-2700MHz	4.0 for Low-Band 5.0 for High-Band	2.0	-150dBc	400x180x80	0.9	4.3-10 Female

Log-Periodic



Part Number	Description	Frequency Band	Gain (dBi)	VSWR	PIM	Dimension (mm)	Weight (kg)	Connector Type
S-Wave 8FW-10/11-LP-B5	SISO	698-2700MHz	9.5 for Low-Band 10.5 for High-Band	1.8	-150dBc	440x210x65	0.7	N Female
S-Wave 8FW-10/11-LP-64K-B5	SISO	698-2700MHz	9.5 for Low-Band 10.5 for High-Band	1.8	-150dBc	440x210x65	0.7	4.3-10 Female
S-Wave 0640FW-10/12-LP	SISO	698-4000MHz	9.5 for Low-Band 10.5 for High-Band	1.8	-153dBc	440x210x65	0.7	N Female
S-Wave 0640FW-10/12-LP-64K	SISO	698-4000MHz	9.5 for Low-Band 10.5 for High-Band	1.8	-153dBc	440x210x65	0.7	4.3-10 Female

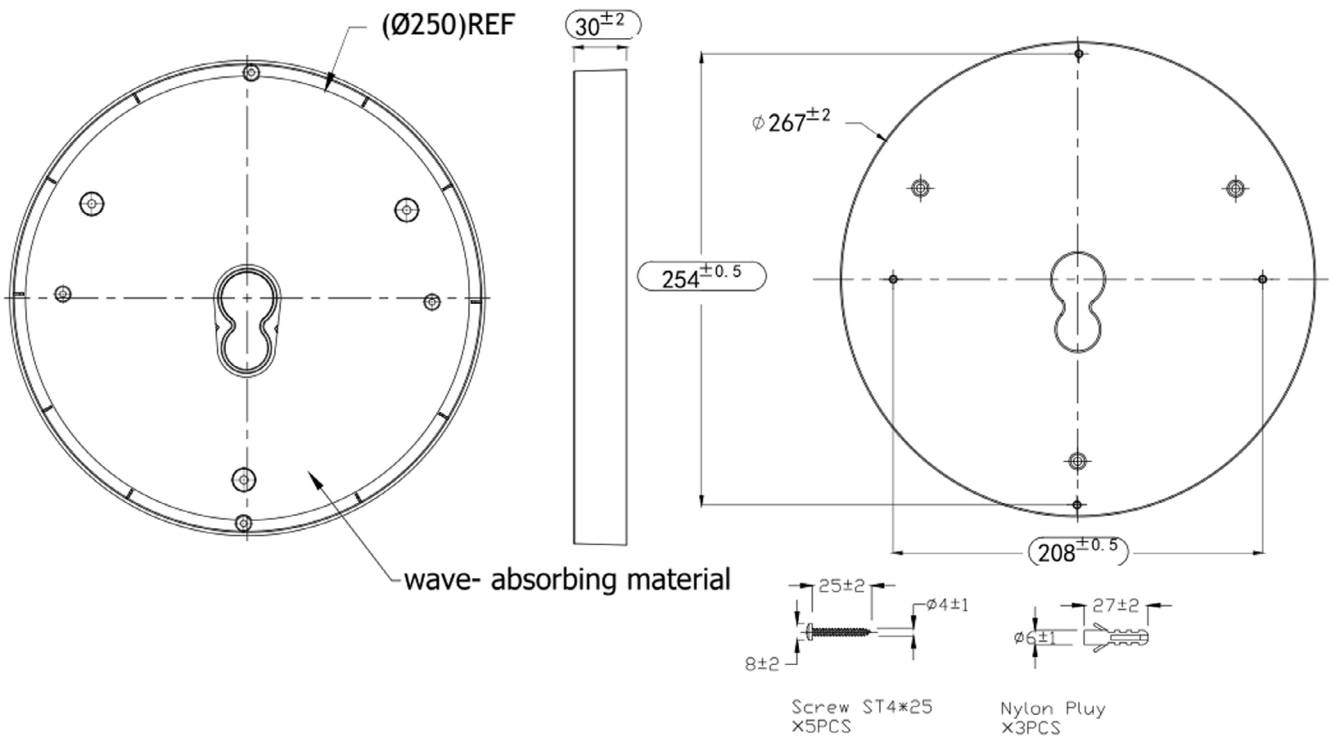
Accessories

Besides the components and antennas, PROSE can provide the accessories for mounting/installation as well, including the antenna absorber and mounting bracket.

Antenna interference absorber

The antenna absorber is to be installed between the slim indoor antenna and the metal ceiling, so as to minimize the negative influences caused by the reflection power by the ceiling. The standard diameter model is for common usage and different diameter models also could be customized on request.

Part Number	S-Wave OD IA267-B01
Size	Ø267×30 (mm)
Weight	0.38kg
Locking Mode	ST4*25 ×5pcs; NYLON PIUY ×3pcs
Color	White
Material	ABS



Mounting brackets

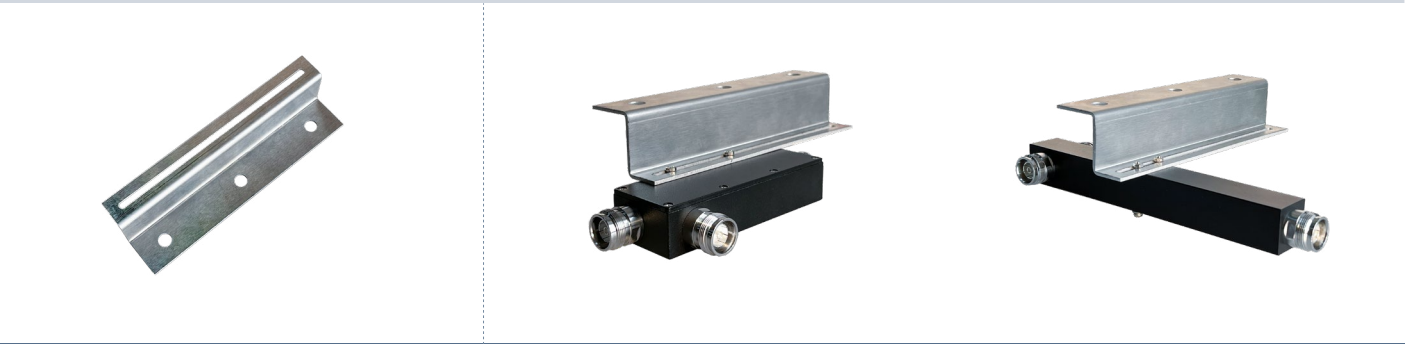
For some certain scenarios, the antenna is difficult to be installed without the hanging ceiling. PROSE has prepared the right-angle brackets to provide the mounting support for the omni antenna. Besides, there is also “Z” type brackets available for the coupler/splitter installation. The various mounting brackets help to install the devices with flexibility.

Part Number	Shape Type	Applicable Products	General Usages
PR-MTK-ME01	“Z” type	Coupler / Splitter	Flexible installation
PR-MTK-ME02	Right-angle type	Ceiling antenna	Flexible installation
PR-MTK-ME03	Right-angle type	Ceiling antenna	Flexible installation

Right Angle Type



Z Type

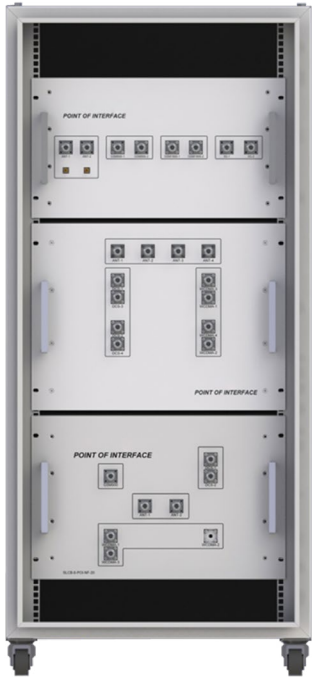


POI

POI (Point of Interface) is a kind of passive system that combines multi-band and multi-operator. Compared to the distributed components, POI works with less interference and long-term reliability. PROSE has more than 15 years of experience for the POI developments and productions, offering cost competitive products with short lead time and stable quality.

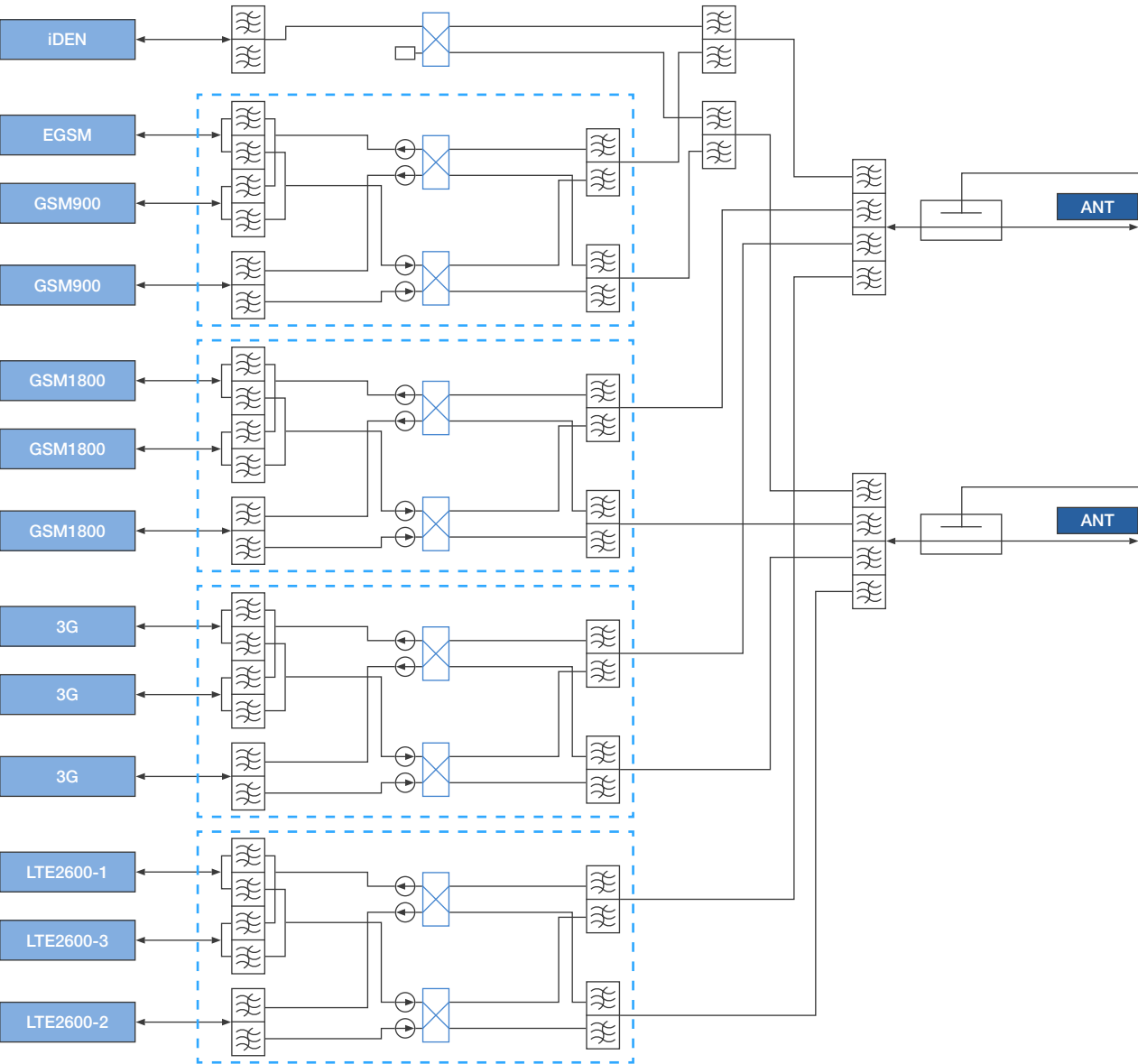
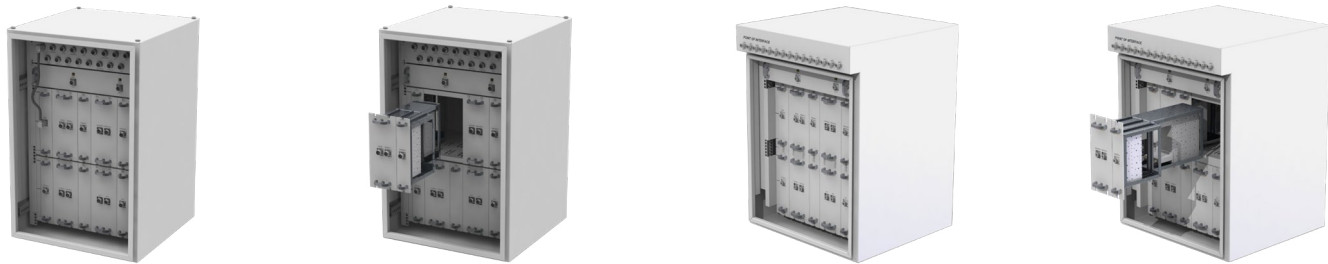
19" Cabinet POI

The 19" cabinet POI is designed flexibly and cost optimized. PROSE with its efficient R&D platform develops the POI as per customer request, including a variety of frequency bands and operator input ports. The advantages are fast technical evaluation, standard production, and fast delivery.



Modular POI

PROSE placed great emphasis on maximum modularity when developing the POI. The individual unit for each frequency band is plug-and-play module. The modular design aims for easy maintenance and low-cost upgrading. By such advanced design, the POI could be upgraded flexibly for any frequency refarming. The PROSE modular POI could be customized for different operators and frequency bands with low MOQ requirement.



PROSE Service

PROSE offers professional services that improve network design, reliability, scalability and efficiency.

Our service core competences include:

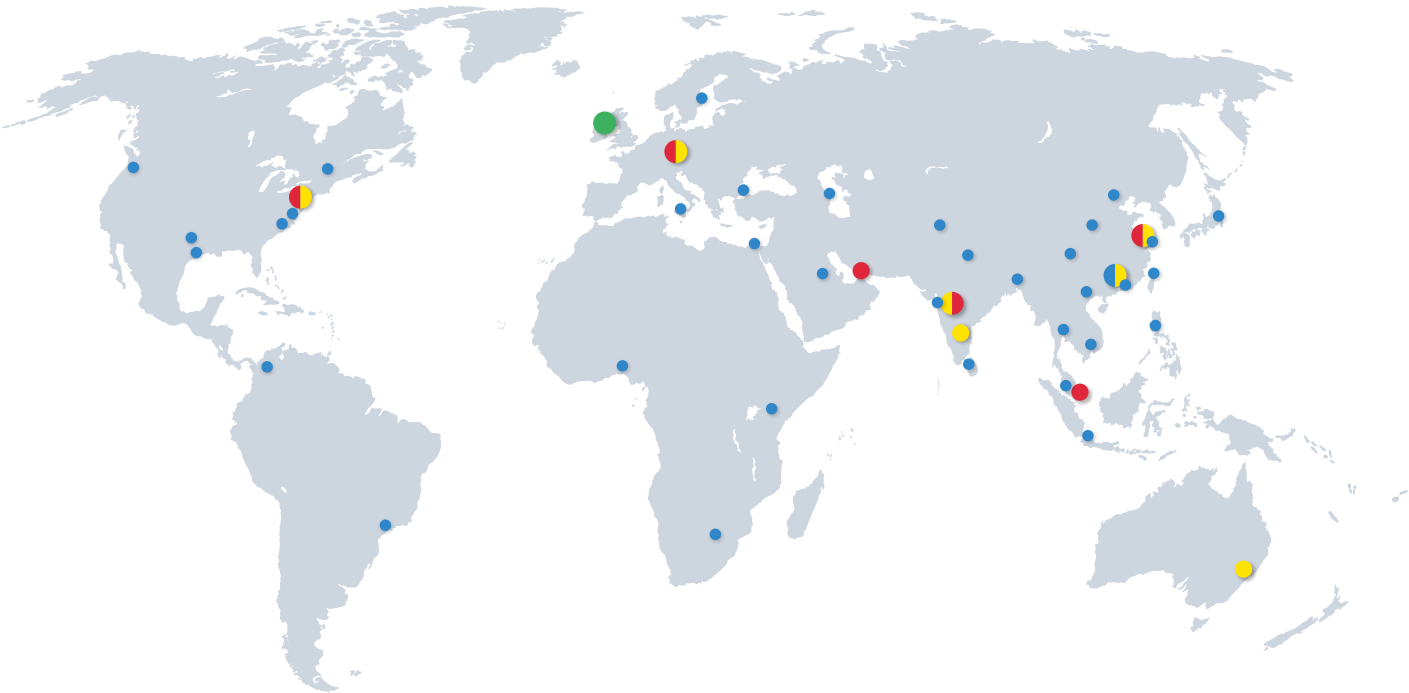
- Network optimization
- Technical consultation
- Customized product design
- Installation & commissioning
- Onsite training & supervision
- System troubleshooting
- After-sales services

In addition, we also offer professional training, technical support and workshops for distributors and agents. We are committed to offering exceptional services for our customers.

PROSE is much more than just a supplier – PROSE is a valued development partner and we will strive to meet new challenges in order to scale to new heights.



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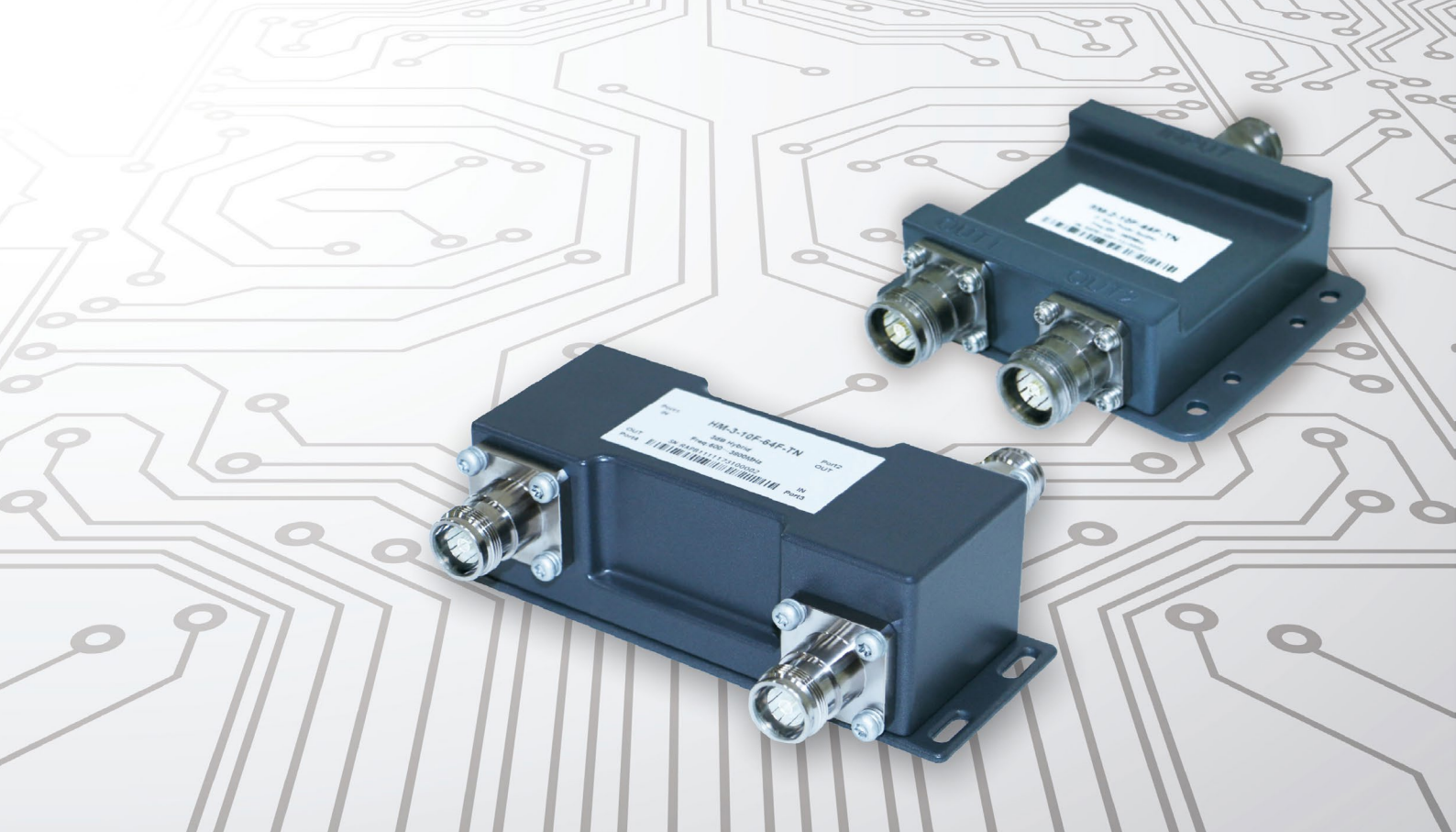
PROSE



Passive Solution

IBS COMPONENTS WITH 4.3-10 INTERFACE | COMBINERS | SMART POI

PROSE



IBS components with 4.3-10 Interface

As one of the 4.3-10 standard-setters, Prose has developed a full range of IBS products with 4.3-10 interface to help our customers improve the PIM performance of their networks by reducing the uplink interference levels and hence ensuring better data throughputs.



Hybrid Coupler (HM-3-10F-64F-TN)

It supports ultra-wideband combining from 500~3800MHz, with good isolation and excellent 3rd order PIM levels of -161 dBc.



Directional Coupler (DCM-6-10F-64F-TN)

It couples 6dB RF signal from the main line, covering ultra-wideband 500~3800MHz with good directivity and excellent 3rd order PIM levels of -161 dBc.



Power Splitter (SM-XX-10F-64F-TN)

It can divide the signal equally into 2-way / 3-way / 4-way in ultra-wideband 500~3800 MHz applications, with good isolation and excellent 3rd order PIM levels of -161 dBc.

Combiners



Combiners are used for co-siting application, which can combine different systems into one common port to feed to antennas. Prose has complete and developed combiner products series. We provide different combining site solutions for different deployments, with good isolation and excellent PIM level.



Directional Coupler (DCM-6-10F-64F-TN)

Used for 876~960/694~862MHz combining, with double unit design, 0.5dB insertion loss, 30dB isolation and -155dBc PIM level.



Dual-band combiner (CB-2-LH-64F-01-T3)

Used for 698~960/1710~2700MHz wide band combining, with 0.25dB insertion loss, 50dB isolation and -155dBc PIM level.



Dual-band combiner (CB-2-PW-64F-02)

Used for 1710~1780/2110~2180MHz and 1850~1990MHz combining, with 0.25dB insertion loss, 50dB isolation and -155dBc PIM level.



Triple-band combiner (CB-3-GDU-64F-10)

Used for 698~960/1710~1880/1920~2170MHz combining, with 0.4dB insertion loss, 50dB isolation and -155dBc PIM level.



Quad-band combiner (CB-4-LCAP-64F-01)

Used for 698~787MHz, 824~894MHz, 1710~1755/2110~2155MHz, and 1850~1990MHz combining, with less than 1.0dB insertion loss, 50~70dB isolation and -155dBc PIM level.

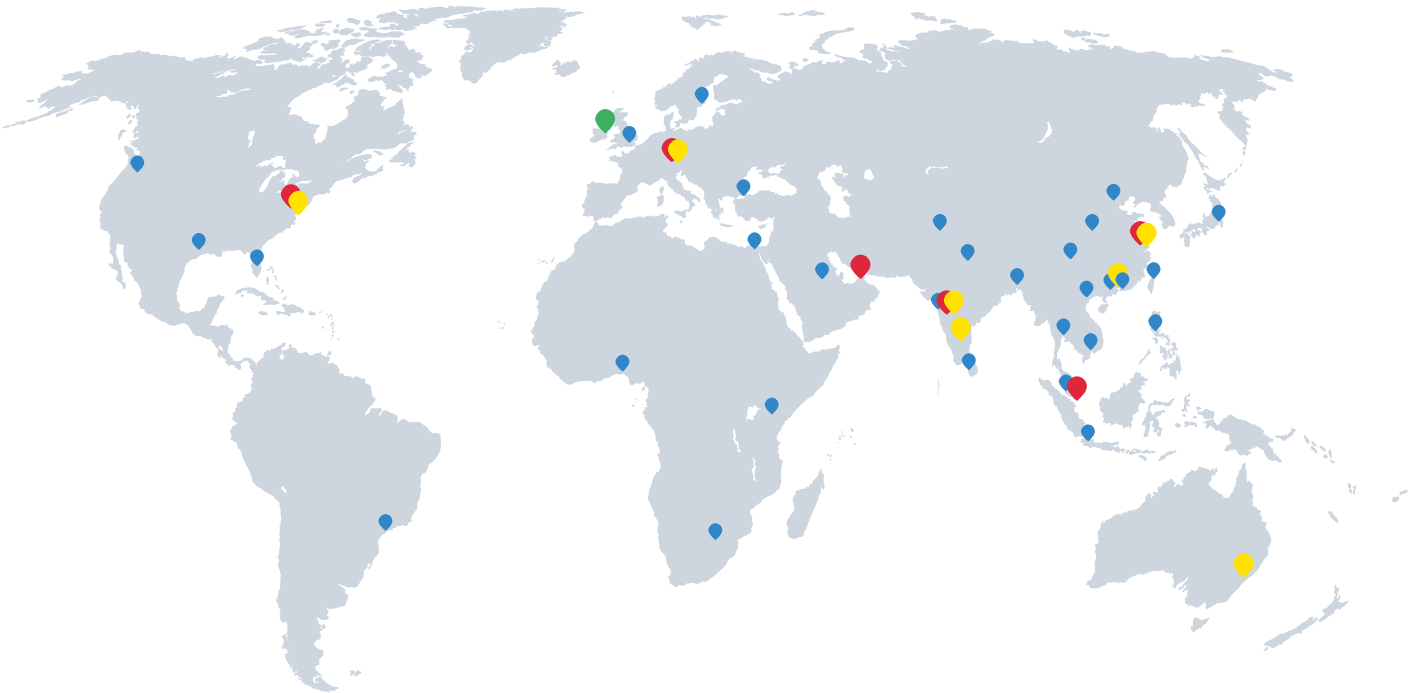


Smart POI

Smart POI is used to improve the ease of configuring base stations in an IBS DAS. The main features include:

- Support a universal compatible DAS with adequate coverage and capacity for wireless providers;
- Modular design to fit all the base station interface components;
- RF Signal power balance from multiple operators using different technologies via built-in digital attenuators;
- Monitoring of base station output power for each channel via built-in power detectors;
- Support dynamic capacity routing;
- Support 2 x 8 BTS cards;
- Support 32 fiber optic ports;
- Standard 19" mounting rack.

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PROSE

Revolutionizing Connectivity on Ho Chi Minh City's Metro Line 1 with EPIC DAS Solutions



■ Background

The Urban Railway of the City of Ho Chi Minh, a visionary rapid transit network, is poised to transform transportation in Vietnam's bustling urban hub. Anchoring this ambitious endeavor is Metro Line 1, a groundbreaking project that embarked on its construction journey in 2012, with completion anticipated by the close of 2023. This vital artery of transportation, stretching 19.7 kilometers (comprising 2.6 kilometers underground and 17.1 kilometers elevated)*, seeks to knit together communities, catalyze economic growth, and foster a new era of connectivity.



■ Challenges

As the Urban Railway of Ho Chi Minh City materialized, a pressing challenge emerged – the dire need for enhanced network coverage to serve the sprawling metro line. The first metro line, Line 1, was at the forefront of this endeavor, but it encountered significant

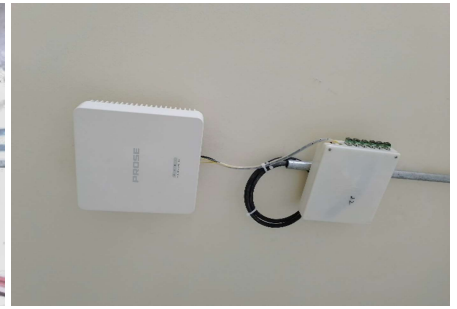
hurdles. While its construction symbolized progress and modernity, the ground network's existing infrastructure grappled with the lack of network coverage. This not only obstructed seamless communication and transactions within the metro but also threatened to foster a digital divide among its diverse travelers. Additionally, the endeavor aimed to not only

enhance connectivity but also to improve operational efficiency and deliver an outstanding passenger experience. This necessitated innovative solutions that could encompass these multifaceted objectives.

Solutions

In response to the connectivity challenge, the Enhanced PROSE Integrated Coverage Distributed Antenna System (EPIC DAS) proposed a transformative solution tailored to conquer the requirements of Metro Line 1. Using a comprehensive range of frequencies, including UMTS2100, LTE1800, and LTE2300, EPIC DAS stepped up to address the complexities of the urban landscape. In the initial phase of implementation, an intricately designed strategy came into play. This involved the strategic incorporation of MIMO for 1800MHz, 2100MHz, and 2300MHz bands, an ingenious solution that laid the foundation for tackling the impending capacity crunch.

With the involvement of three leading major local operators in the country, this collaboration transformed Metro Line 1 into a veritable hub of connectivity. Notably, the implementation encompassed 12pcs CU, 12pcs IM2U, 21 NEU, 132 IRU, and 14pcs HPRU, seamlessly integrating a trifecta of bands to usher in a new era of multi-operator harmony.

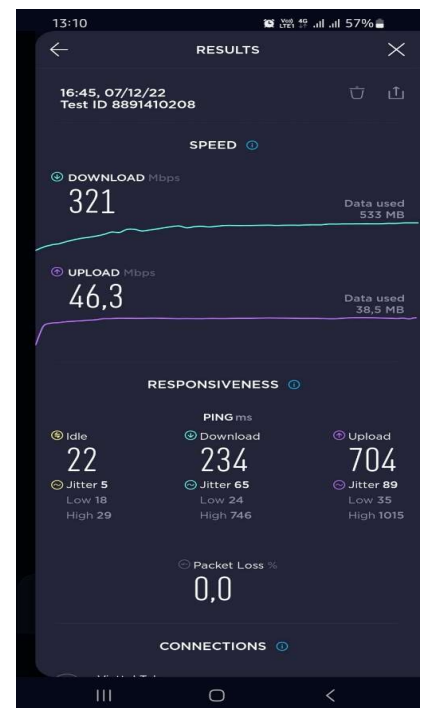


Benefits / Results

The results of EPIC DAS's strategic deployment unveiled a transformative landscape of Metro Line 1:

- **Exceeding Coverage Expectations:** EPIC DAS triumphantly transcended coverage Key Performance Indicators, rendering seamless network connectivity a reality.
- **Multi-Band Synchronization:** The synergy of 2G, 3G, and 4G bands not only bolstered coverage and capacity but also embodied a harmonious multi-operator ecosystem.
- **Efficiency Redefined:** Low latency and formidable output power redefined application reliability, fostering a superlative passenger experience.
- **Design Ingenuity:** EPIC DAS's compact, energy-efficient design with natural cooling mechanisms heralded a new era of sustainable power consumption.
- **Elevated Quality Unveiled:** Amplified uplink performance, expanded cell coverage, and heightened network quality underscored the essence of enhanced digital interactions.
- **Economical Brilliance:** The deployment showcased cost-effectiveness, accompanied by streamlined field-testing requisites and remote unit power autonomy.

EPIC DAS's triumphant integration into HCM Metro Line 1 encapsulated a journey from limited connectivity to an immersive digital landscape. In transcending the barriers of communication difficulties, this solution catalyzed an inclusive digital experience for residents and travelers alike, thus reshaping their quality of life and invigorating economic endeavors. Amid rapid urban metamorphosis, EPIC DAS emphasized that the future of connectivity is both seamless and sustainable, poised to shape a future where technology converges with urban living in perfect harmony.



Network Performance Test for Metro Line 1
After the Implementation of EPIC DAS Solutions

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Transforming Connectivity at Tan Son Nhat International Airport in Vietnam with EPIC DAS Solutions

Explore how Enhanced PROSE Integrated Coverage Distributed Antenna System (EPIC DAS) solutions revolutionized connectivity at Tan Son Nhat International Airport (IATA: SGN), Vietnam, overcoming network coverage challenges and delivering unparalleled experiences to travelers and staff. This case study unveils the strategic implementation of EPIC DAS, a testament to the power of innovative telecom solutions that bridge the digital divide in the largest city of Vietnam.

■ Background

SGN Airport, situated 6 km north of Ho Chi Minh City, stands as Vietnam's busiest airport, catering to over 40 million passengers in 2019. Two terminal buildings, Domestic Terminal 1 and International Terminal 2, have an area of 40,948m² and 115,834m² respectively. The airport faced substantial network capacity challenges amid a steady rise in passenger numbers over the past decade. *



■ Challenges

As passenger numbers soared, SGN Airport confronted significant hurdles in providing seamless network coverage. Inadequate connectivity hindered communication, transactions, and the overall travel experience, calling for an innovative solution.

Each operator wanted to install their own DAS system, but the Airport Authority wanted one shared system capable of handling multiple technologies with multiple operators.

■ Solutions

EPIC DAS solutions emerged as the strategic answer for shared DAS, addressing SGN Airport's network coverage challenges with precision. PROSE fulfilled diverse connectivity needs by leveraging frequencies such as UMTS2100, LTE1800, and LTE2600. Initially, a smart combination of Single Input Single Output (SISO) for 1800MHz and 2100MHz bands, integrated with Smart Point of Interface (SPOI), High Power Remote Unit (HPRU), and passive DAS solution, facilitated support for three leading major local

operators in the country. The surge in airport users necessitated an increased capacity.

EPIC DAS showcased its versatility with the introduction of the HPRU LPA (Low Power Amplifier) plug and play function and Smart POI's plug and play function. Seamlessly adding new 1800/2600 BTS (Base Transceiver Station) card modules in SPOI cabinets and 1800/2600 LPA modules in HPRU cabinets enabled Multiple-Input Multiple-Output (MIMO) 2x2 updates for the 1800MHz band and included MIMO 2x2 for the new 2600MHz band.

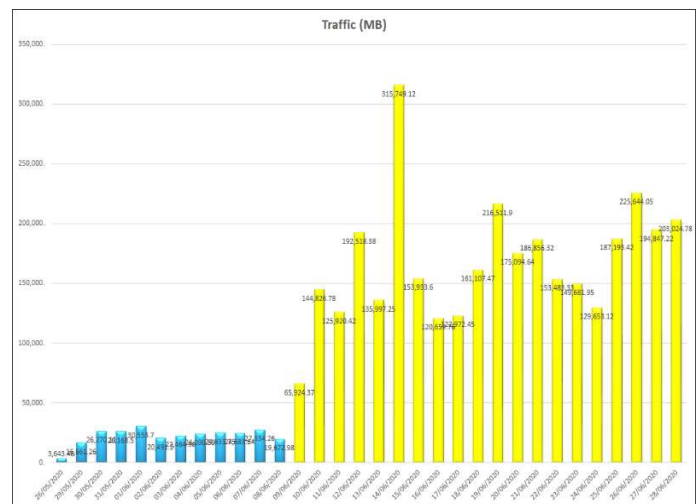
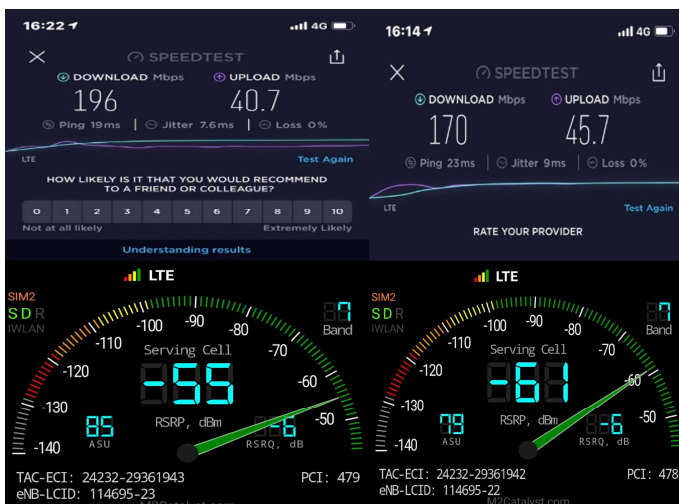
■ Benefits

The deployment of EPIC DAS solutions at SGN Airport yielded remarkable outcomes, transforming connectivity on multiple fronts:

- Consistent output surpassing coverage KPIs, ensuring uninterrupted network connectivity for all airport users.
- Multi-operator sharing across three bands, optimizing coverage and capacity, elevating the overall digital experience.
- Seamless integration of 2G, 3G, and 4G in a unified unit, simplifying network management and future-proofing connectivity.
- Low latency and high output power, empowering reliable applications for travelers and airport services.
- Compact and energy-efficient design with natural cooling, reducing environmental impact while maintaining peak performance.
- Enhanced uplink performance, increased cell coverage, and improved overall network quality, elevating communication for all airport users.
- Cost-effective deployment with reduced field testing and no additional localized power needs for remote units, streamlining implementation.



The successful implementation of EPIC DAS solutions at SGN Airport revolutionized network coverage, providing consistent and reliable connectivity for travelers and staff alike. EPIC DAS exemplifies the power of innovative telecom solutions, bridging the digital divide, empowering communities, and enhancing the quality of life. Together, we're forging a future where distance is no longer a barrier, and seamless connectivity prevails.



Network Performance Test for SGN Airport After the Implementation of EPIC DAS Solutions

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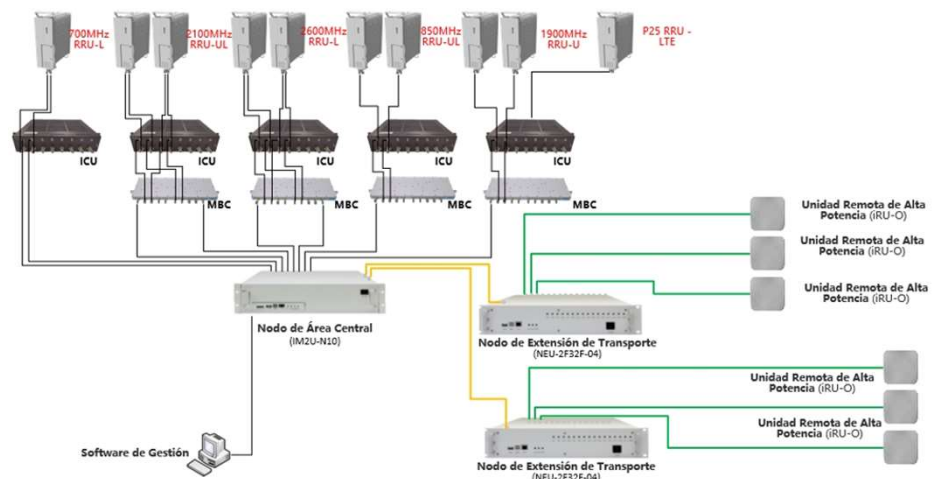


Revolutionizing Connectivity: How AIFA Achieved Seamless Connectivity

■ Background

Felipe Ángeles International Airport, also known as AIFA (Spanish: Aeropuerto Internacional Felipe Ángeles), stands as Mexico's newest and most sophisticated aviation landmark. Unveiled in March 2022, AIFA's architectural grace harmoniously blends with state-of-the-art interior facilities, offering passengers a delightful shopping and dining experience. Situated close to Mexico City, the airport is seamlessly accessible to the nation's capital.

AIFA's pivotal mission revolves around alleviating the immense burden borne by Mexico City International Airport (AICM). In 2021, AICM accommodated a staggering 36 million passengers, straining its operational limits. This pressure reached a peak in 2019 when AICM recorded 50 million travelers, significantly surpassing recommended security thresholds. Temporary relief came in the form of the pandemic and the suspension of Interjet operations in 2020. Still, as normalcy returns, AICM faces an inevitable pressure.¹



■ Requirements

The terminal of AIFA has been designed with a floor area of 384,128.16 square meters and an annual capacity of 20 million passengers.²

A critical requirement for the Airport Authority was to implement one shared system capable of handling 5 different frequencies and multiple technologies with multiple operators.

■ Solutions

To address this challenge, PROSE provided a robust wireless indoor communication solution: Enhanced PROSE Integrated Coverage Low Power Remote Unit (EPIC-LPRU). Terminal 1, the epicenter of AIFA's activity, witnessed the installation of around 100 iRUs (Integrated Remote Units). These iRUs operate across multiple frequencies, including 850, PCS, AWS, 2600, and 700,

catering to the requirements of the Airport Authority and carriers AT&T and Telcel.

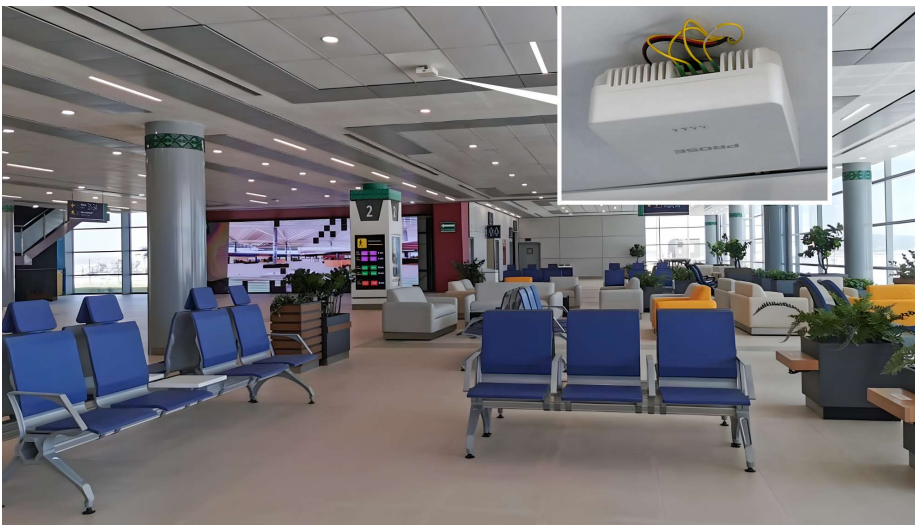
1. Mexico's new international airport gets ready for takeoff, english.elpais.com

2. AIFA Informa, aifa.aero

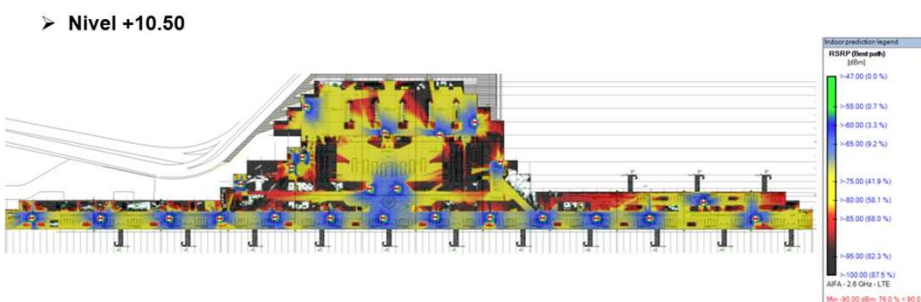
■ Benefits

The successful implementation of EPIC-LPRU's solution has ushered in a new era of connectivity at AIFA, offering an array of benefits that revolutionize the digital landscape:

- **Multi-Operator Harmony:** The integration of different bands from three carriers seamlessly optimizes coverage and capacity, promising an unparalleled digital experience for passengers and staff.
- **Unified Connectivity:** The solution unifies 2G, 3G, and 4G into a single, efficient unit, streamlining network management and future-proofing connectivity.
- **Reliability Redefined:** With low latency and high output power, travelers and airport services now enjoy robust and reliable applications, ensuring seamless operations.
- **Eco-Conscious Design:** The compact and energy-efficient design of EPIC-LPRU, coupled with natural cooling mechanisms, not only reduces environmental impact but also maintains peak performance.
- **Expanded Coverage:** The uplink performance enhancements translate to increased cell coverage and overall network quality, elevating communication for all users within the airport.
- **Cost-Effective Excellence:** The implementation offers a cost-effective approach with reduced field-testing requirements, eliminating the need for additional localized power sources for remote units, thereby streamlining deployment.



The Felipe Ángeles International Airport now stands as a testament to innovation, where enhanced connectivity has alleviated the pressure on Mexico City International Airport and elevated the digital experience for passengers and staff. With EPIC-LPRU's solution in place, AIFA has embraced the future of aviation, where technology and operational efficiency converge seamlessly.



Simulation of ETP (Encounter Transfer Protocol) - 2,600 Mhz LTE - Departure Level

PROSE



Building Dreams into Reality: The Tech Innovation with Ultimate Luxury in Mediterranean

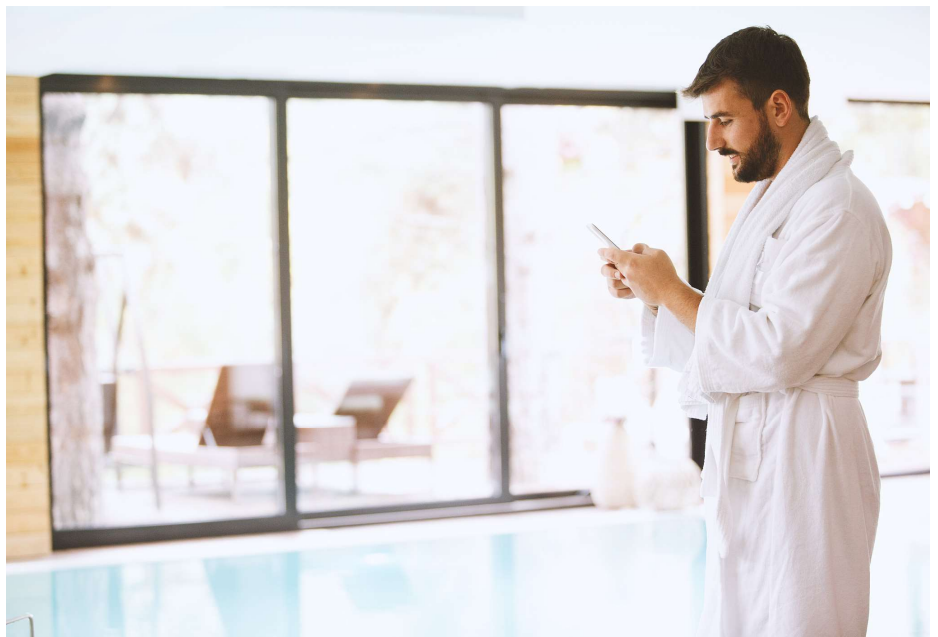
■ Background

Nestled amidst the enchanting landscape of Cyprus, PROSE Technologies has left an indelible mark on the City of Dreams Mediterranean, setting the stage for a tale of luxury, innovation, and connectivity. As the avant-garde architect of Europe's premier integrated casino resort, PROSE Technologies has seamlessly woven technology into the fabric of this iconic destination, offering an unmatched experience that transcends the boundaries of conventional hospitality.

At the heart of the City of Dreams Mediterranean lies a commitment to excellence, where opulent casino floors, sumptuous hotel accommodations, expansive conference halls, and a myriad of dining and entertainment options converge to create a haven for discerning patrons. Recognizing that superior connectivity is not just a convenience but an essential element of the extravagant City of Dreams mythology, PROSE Technologies embarked on a mission to craft a cutting-edge network infrastructure that would meet the diverse needs of both guests and service providers.

■ Challenges

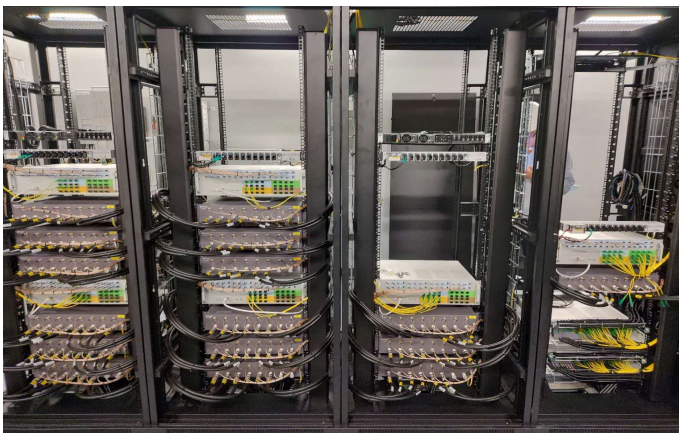
The challenge was formidable—creating an uninterrupted network coverage across the sprawling expanse of the resort, navigating through a maze of underground offices, vibrant gaming floors, bustling public areas, and private hotel rooms. The objective was clear: to deliver a top-tier experience for every visitor and employee on the premises.



Solutions

In response to this challenge, PROSE Technologies introduced the EPIC-LPRU system, a low-power solution meticulously engineered to seamlessly integrate with the resort's elegant aesthetics.

Divided into two ambitious phases, the project began with a focus on core areas such as underground office zones, the hotel lobby, casino, restaurants, and public spaces. The deployed system included a dual-operator 5G-3500 network solution, under the stewardship of CYTA and EPIC, alongside a 2/3/4G network, involving PTL as the third operator. The meticulously planned installation comprised 1 5G sector, 5 Sub-3G sectors, 6 Power Balance Master Units (PBMUs), 25 Network Extender Units (NEUs), 164 Sub-3G Integrated Remote Units (iRUs), and 48 5G iRUs. This formidable array ensured optimal signal reception in every corner of the designated areas.

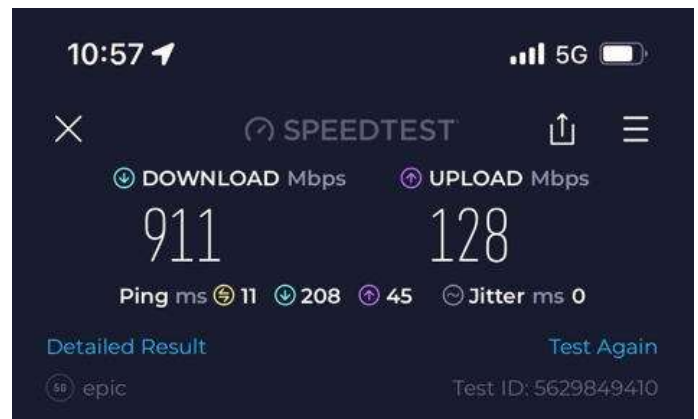


Results

The successful deployment of the EPIC-LPRU network not only met but surpassed the lofty expectations set by the City of Dreams Mediterranean management and its discerning clientele. The network's performance exceeded all benchmarks, delivering a virtually uninterrupted and robust signal that seamlessly aligned with preconfigured coverage predictions. This achievement has transformed the digital experience for both guests and staff, providing a smoother and unbroken connection—an imperative aspect of the resort's offerings.

The relentless pursuit of the ultimate connectivity experience by the City of Dreams Mediterranean was brought to fruition through PROSE's nuanced and effective strategy. The EPIC-LPRU system's ability to cater to the diverse needs of bustling public zones and the sanctuaries of private spaces has elevated the resort to the pinnacle of hospitality innovation. Guests and staff now revel in an unparalleled digital experience, marking a significant milestone in the City of Dreams Mediterranean's commitment to providing the utmost in luxury and connectivity. PROSE Technologies, as the orchestrator of this technological symphony, stands as a beacon of success, setting new standards in the integration of cutting-edge solutions in the realm of integrated casino resorts..

The second phase extended connectivity to private realms, encompassing 500 hotel rooms and elevators. An additional Sub-3G sector was introduced, accompanied by the installation of 1 PBMU, 9 NEUs, and 82 iRUs, enveloping personal spaces with strong, reliable mobile signal reception. The sophistication in installation matched the advanced technology, with iRUs discreetly integrated into ceilings and behind the scenes in public areas, preserving the elegance of the resort. Special measures were taken for unique spaces, such as elevators, where a single centrally-located iRU ensured signal continuity even on the move.



Network Performance Test
After the Implementation of EPIC Solutions

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FEBRUARY 28, 2025

Certificate

PROSE Technologies (Suzhou) Co., Ltd hereby confirms that:

RZ Communications

(Certificate of Incorporation No. 53496061L)

1 Venture Avenue, Perennial Business
City, Singapore 608521

is an authorized local business partner of PROSE products in the Singapore market, the cooperation may include marketing, sales and after sales services.

This certificate is valid from the date of this certification until February 28, 2026.

Jack Li

President, SEA & NEA

PROSE Technologies (Suzhou) Co., Ltd

