



**Timing &  
Synchronization**



**Test &  
Measurement**



**Service Assurance  
& Fiber Management**



**RF Planning &  
Optimization**

## **KHUSHI COMMUNICATIONS PVT. LTD.**

705-706, 7th Floor, Kirti Shikhar Building, District Centre, Janak Puri, New Delhi-110058, INDIA.

T: +91-11-41615459 E: [info@khushicomms.com](mailto:info@khushicomms.com) W: [www.khushicomms.com](http://www.khushicomms.com)



• **DELHI**

• **BANGALORE**

• **MUMBAI**

# ABOUT US



We are technological solutions provider of Timing & Synchronization, Test & Measurement, Service Assurance & Fiber Management and RF Planning tools. Our solution has disrupted the market by converging the transport and timing for 5G xHaul Networks. We consistently strive to bring latest and introduce new product offering and services that meet and exceed the ongoing needs of our markets and customers.

# OUR PARTNERS





# LIST OF PRODUCTS

## 1 Timing and Synchronization

- Timing Aware Switch with PTP Grandmaster
- PTP Grandmaster & NTP Server
- Time & Frequency Distributor & GPS Accessories

## 2 Test & Measurement

- Transport, Datacom & Optical
- GPON Protocol Analyzer & OLT Emulator
- Network Emulator
- Fiber Optics
- Copper Tester & Cable Fault Locator
- RF Spectrum Analyzer & RF Safety
- TAPs (Copper & Fiber)
- Network Packet Brokers
- Traffic Capture & Analysis

## 3 Service Assurance and Fiber Management

## 4 RF Planning & Optimization

# Timing and Synchronization

## Timing Aware Switch with PTP Grandmaster

Integrated PTP GM

OCXO / Rubidium Osc

Supports LLS C1-C4

OC, BC, TC Support



μFalcon-RX

- 6 x 1/2.5/10G (SFP/SFP+)
- 2 x 1/2.5/10/25G (SFP/SFP+/SFP28)
- L2 Throughput: 110Gbps
- OCXO



μFalcon-MX/G

- 4 x 1/2.5G (SFP) | 2 x 1G (RJ45)
- 2 x 1/2.5/10G (SFP/SFP+)
- L2 Throughput: 34Gbps
- OCXO



Falcon RX

- 12 x 1/10G (SFP/SFP+)
- 8 x 1/10/25G (SFP/SFP+/SFP28)
- L2 Throughput: 200Gbps
- OCXO / Rb



Falcon MX/G

- 24 x 1G (SFP)
- 4 x 1G (RJ45)
- 4 x 1/2.5/10G (SFP/SFP+)
- L2 Throughput: 160 Gbps
- OCXO / Rb

## PTP Grandmaster & NTP Server



Net.Time

- 2x 1GbE RJ45/SFP Combo Ports
- GNSS, PTP, NTP and SyncE Support
- OCXO/Rubidium Oscillator
- I/O: BITS, MHz, 1PPS, 1RIG-B, ToD etc



μFalcon-ST/G

- 4x 1GbE RJ45 Ports | 4x 1GbE SFP ports
- 8x E1/MHz Balanced Port (120 ohm)
- OC, BC & TC configuration supported
- GNSS, PTP, NTP and SyncE Support
- OCXO Oscillator

## Time & Frequency Distributor & GPS Accessories



TFD-100/TFD-200



GNSS Antenna



GPS In-Line Amplifier



Surge Arrestor

- 1U, 19" Rack mount
- Frequency from 1PPS up to 10MHz
- Time Code Signals: IRIG, AFNOR, NASA
- Decoded signals GNSS, DCF77, TDF, WWVB
- GNSS, PTP, NTP input option available
- TCXO/OCXO Oscillator option
- 1 to 32 Signal Splitter



GPS Repeater  
Indoor GPS Coverage



GPS Splitter

# Test and Measurement

## Transport, Datacom & Optical



### FTB Platforms

#### Hand-held Multi-test Platform (1/2/4)

- Designed for Field/Lab & MDR applications



### LTB Platforms

#### Rack-mountable Multi-test Platform (2/8/12)

- Designed for Lab & Manufacturing applications

## ► Modules (Ethernet/SDH/PDH/OTN/OSA/OTDR/PM/LS/ Fiber Channel/eCPRI)



**FTBx-8870/8880**  
10G Multiservice



**FTBx-88260**  
100G Multiservice Test



**FTBx-88460**  
400G Ethernet



**FTBx-88800 Series**  
800G Ethernet



**FTBx-720C**  
OTDR



**FTBx-1750**  
High performance  
Power Meter



**FTBx-2150**  
Light Source



**FTBx-5245/5255**  
Optical Spectrum Analyzer

- Most flexible and future proof 1G to 800G multiservice test solution
- EtherBERT, RFC 2544, EtherSAM Y.1564, smart loopback and traffic TX & RX
- Supports QSFP28 ports and QSFP-DD port
- OTN testing - OTU1, OTU2, OTU3, OTU4 (ITU-T G.709), including FEC
- OTUCn/FlexO BER testing capabilities supporting 100G, 200G, 300G and 400G mapped in ODUflex over 400G interfaces
- DSn testing - DS1, DS3 and dual DS1/DS3 RX; PDH testing - E1, E3 and E4
- SDH Interfaces - STM-0, STM-1, STM-4, STM-16 and STM-64



### Max 800 Series

#### Ethernet & Transport Tester upto 100G

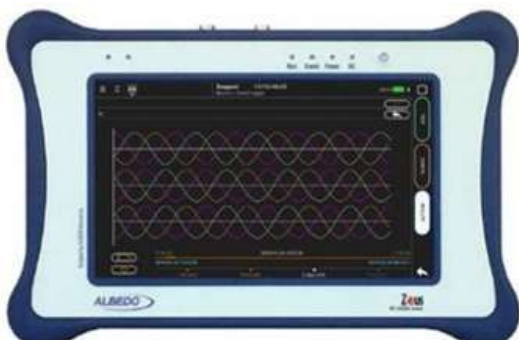
- Comprehensive testing for DSn/PDH, ISDN, SONET/SDH,
- OTN and Ethernet interfaces up to 100 Gbit/s
- Complete RFC 2544, eSAM & RFC 6349 test suite
- Quad-port testing up to 4 x 100GE links
- Multi-stream traffic generation, remote loopback, Ethernet traffic filter & capture
- OTN Testing (OTU1-4) including forward error correction
- L1-L4 testing with user defined parameters
- Simplified BER testing with pass/fail indicators based on user-defined thresholds





**xGenius**  
PTP/NTP Sync Tester

- PTP/SyncE/NTP Emulation & Test
- Clock Testing (MHz, BITS, ToD, PPS & 1R1G-B)
- MTIE/TDEV Measurement & TE Measurement
- BC/TC Testing
- 5G-ORAN Sync Testing
- Built in GNSS Receiver
- Clock Module: Ocxo/ Rubidium
- Dual port 10GbE Eth./IP traffic generation & monitoring
- Packet Capture



**Zeus**  
1GbE/Sync/C37.94/ Datacom/  
GOOSE/SV

- Dual port 1GbE Eth./IP traffic generation & monitoring
- Performance Test: RFC 2544,RFC 6349, eSAM, Y.1731, L1-L4 BERT
- C37.94, GOOSE, SV
- E1/T1 & Datacom Testing
- OWD Testing
- Built in GNSS Receiver
- PTP/SyncE/NTP Emulation & Test
- Clock Testing (MHz, BITS, ToD, PPS & 1R1G-B)
- MTIE/TDEV & TE Measurment



**Ether.Genius**  
1GbE/Sync/E1/T1/ Datacom Tester

- Dual port 1GbE Eth./IP traffic generation & monitoring
- Performance Test: RFC 2544, eSAM, Y.1731
- Ping/Traceroute
- L1-L4 BERT
- PTP/SyncE Emulation & Test
- Clock Testing (MHz, BITS, ToD)
- MTIE/TDEV Measurement
- E1/T1/Datacom Testing



**AT.2048/AT.ONE**  
E1/T1 BER & Datacom

- Dual Port 2048 kbps (E1)/1544 Kbps(T1)/ Generation/Analysis
- E0(Nx64Kbps) Generation/Analysis
- Datacom (V.11, V.24, V.35, V.36, EIA-530)
- Jitter & Wander Generation/Analysis
- Pulse Mask Analysis
- Voice Frequency Test
- Latency/Round Trip Delay Test
- Performance Test (G.821, G.826 & M.2100)
- Event Insertion & Pattern Analysis
- CAS signalling generation and monitoring

# GPON Protocol Analyzer & OLT Emulator



**GPON DOCTOR 4K5/9K5/10K**  
GPON/XGS-PON Protocol Analyzer

- Portable battery Operated; Chip-set Independent operation
- Diagnosis and analysis of incidents and operation in an established XGS-PON/GPON network
- Evaluation of compliance with the protocol in the development of OLTs/ONTs XGS
- ITU-T G.9807.x / ITU-T G.984.x / ITU-T G.988 interoperability test
- Evaluates the degree of compliance with the ITU-T G.9807.x, ITU-T G.984.x and ITU-T G.988 standard
- Captures OAM + PLOAM control data and OMCI messages + negotiation in real time
- Bandwidth analysis per T-CONT for each ONT



**GPON DOCTOR OLT-e**  
OLT Emulator

- Meets the requirements of ITU-G984.3
- Supports management entities defined in ITU-T G.988
- Assess protocol compliance in OLT/ONT development
- Generation of PLOAM messages to activate and configure a detected ONT
- Generating and forwarding Ethernet traffic encapsulated in GEM frames

## Network Emulator



**WanRaptor**  
Multiport Network Emulator (up to 40G)

- 2U 19" Rack mountable modular design
- Traffic generation & emulation up-to 40 Gb/s
- Emulation Supported:  
Bandwidth, Latency, Jitter, BER, Packet Loss, Packet re-ordering, Packet duplication
- Bridge & Router mode operation for Ethernet & IP traffic
- HTTP web browser based GUI for real-time statistics



**PDS - 1/10G**  
LAN/WAN Emulator (up to 10G)

- 1U desktop design
- Fixed 1G/10G Electrical & Optical slots
- Emulation Supported:  
Bandwidth, Latency, Jitter, BER, Packet Loss, Packet re-ordering, Packet duplication
- Bridge & Router mode operation for Ethernet & IP traffic
- HTTP web browser based GUI for real-time statistics



**Net.Storm**  
Impairment Generator (1G)

- Hand-held, battery operated & in-built display
- Fixed 1G Electrical & optical slots
- Emulation Supported:  
Bandwidth, Latency, Jitter, Packet Loss, Packet duplication
- Real time statistics
- VNC based remote control

# Fiber Optics

## OTDR



**MAX Series**  
OTDR (up to 45dB)



**FTB-1 Pro platform**  
OTDR Modules ( up to 50dB)



**Mercury Series**  
OTDR (up to 45dB)

## Tunable Laser Source & Optical Spectrum Analyzer



**T200S/T500S/T100**  
Tunable Laser Source



**OSA20**  
Optical Spectrum Analyzer

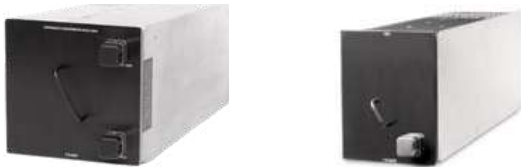
## Electrical BER, Sampling Oscilloscope and PMD/CD Analyzer



**BA-4000**  
Electrical 800G BER Tester



**EA-4000 Eye Analyzer**  
Optical & Electrical Sampling Oscilloscope



**FTB-500 with FTB-5500B / FTB-5800 Modules**  
PMD and CD Analyzer

## Tunable Optical Filter, Optical Component Tester and Optical Switch



**XTA-50**  
Tunable Optical Filter



**CTP-10**  
Passive Optical Component  
Testing Platform



**MXS-9100**  
MEMS Matrix Optical Switch



Handheld Optical Testers



**Optical Power Expert**  
Optical Power Meter

**PPM-350D**  
Next-gen PON  
Power meter

**KI-2600XL Series**  
POF Optical Power Meter

**FLS-600**  
Light Source

**FOT-600**  
Optical Loss  
Test Set



**FVA-600**  
Variable Optical  
Attenuator



**FIP-500**  
Fiber Inspection Scope



**LED-300B / TG-300B**  
Fiber Identifier



**ARGUS 300**  
10GbE/CPON/Optical  
/Wi-Fi Testing



**EX-1**  
Gigabit, GPON &  
Wi-Fi testing

Copper Tester & Cable Fault Locator



**ACT 6000**  
Selective Level Meter  
& Generator



**Max Tester 610**  
Smart Copper Testing



**BLL-200**  
Locator Buried Line



**EML-100**  
Electronic Marker Locator

RF Spectrum Analyzer & RF Safety



**5G Pro**  
5G FR1/FR2  
Spectrum Analyzer



**RF-8/ RF-60 WaveMon**  
EMF Exposure Monitoring

## TAPs (Copper & Fiber)



### Copper TAPs (100M/1G/10G)

Portable / Rack Mountable (Multiple Links)

- Portable & modular (up-to 3) chassis-based design
- Non-intrusive, zero failover, redundant power supply operation
- Link speed: 100M/1000M/10G
- Smooth operation up-to 100 meters
- IEEE 802.3/802.3af, VoIP and PoE compliant



### Fiber TAPs (1-400Gbps)

Portable / Rack Mountable (Multiple Ports)

- Portable & modular (24 TAP) chassis-based design
- Non-intrusive, zero failover, Passive operation
- Fiber TAPs: Diode, LC, SC, MTP & BiDi
- Link Speed: up-to 400G
- Single mode and Multi mode fiber support
- Available Split Ratio: 50/50, 60/40 70/30

## Network Packet Brokers

- L2-L7 Filtering, DPI
- Load Balancing
- Any-to-any Replication and Aggregation
- Passive SSL/TLS decryption SSL 3.0, TLS 1.0 - TLS 1.2
- Data masking, Packet deduplication
- TCP packet reordering and fragments re-assembling
- Full tunnelling capability, Packet Slicing
- IMSI Filtering, Timestamping
- Export NetFlow V5/V9
- Redundant AC/DC power supply
- Management: Local CLI, SSH, SNMPv2/v3, HTTP/HTTPS



### X2/X3 Series

Advanced Network Packet Brokers

## Traffic Capture & Analysis



### IOTA (Probe, Capture & Analyze)

All-in-One Network Traffic Monitoring Solution

- Portable 1G/10G Non-intrusive monitoring
- SPAN and In-Line modes
- Integrated software to help analyze the captured data in real-time
- Packet slicing
- Programmable autonomous capture functions
- 8 ns hardware timestamp
- Real-time traffic analysis
- 1 TB or 2 TB swappable SSD in-built storage
- GNSS (GPS/GLONASS) UTC timestamping



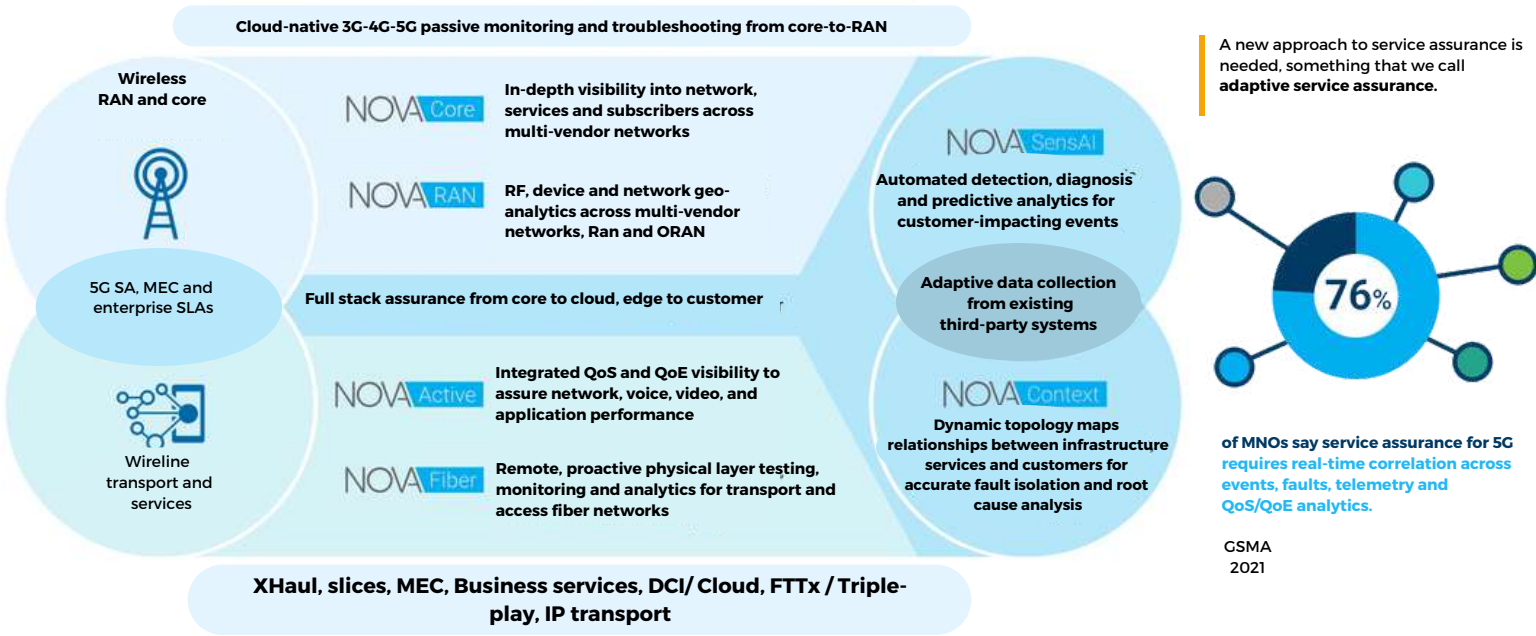
### Profishark (1G/1G+/10G/10G+)

TAP with Traffic Capture & Analysis

- Portable 1G/10G Non-intrusive monitoring
- SPAN and In-Line modes
- Hardware filtering, deep packet inspection
- Packet slicing
- Capture and configuration options, through the ProfiShark Manager
- 5 ns hardware timestamp
- Real-time traffic analysis
- Direct capture to disk over 3.0 USB
- GNSS (GPS/GLONASS) UTC timestamping

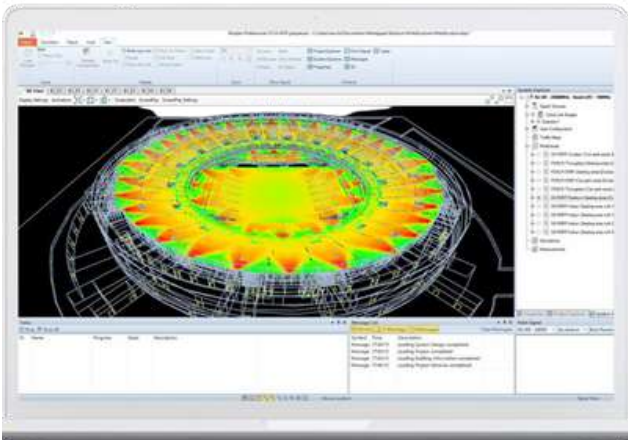
# Service Assurance & Fiber Management

## Adapting how you capture, transport, store and analyse data



# RF Planning & Optimization

## Design, Optimize & Automate complex in-building & outdoor wireless networks



- Ranplan Professional**  
Radio planning and optimization software to simultaneously design in-building and outdoor wireless networks
- Ranplan In-building**  
Only Indoor wireless network design tool
- Ranplan In-building Lite**  
Cost effective design tool for small to medium enterprise projects.
- Ranplan Tablet**  
It helps onsite RF engineers to produce in-building site surveys.

- Multi-technology support**  
Support multiple technologies such as 3G, 4G (LTE), 5G NR, IoT, WiFi, Public Safety and Smart Cities.
- Accurately predict and optimize coverage and traffic capacity**  
Full traffic capacity simulation and analysis using the Wireless Network Simulation tool.
- Fast indoor 3D ray-tracing**  
Realistic 3D modelling capability and advanced propagation engine for design precision.

- Rapid and Cost-Effective**  
Reduce network design time by 50% & designing cost by 30%. Generate buildings into 3D from auto CAD files.
- Large and comprehensive multi-vendor component database**  
Unbiased representation of devices for network system predictions and simulations.
- Complete HetNet Design**  
Outdoor to Indoor and Indoor to Outdoor HetNet wireless network design capability.





# SUPPORT & SLA

Service Level Agreement		GOLD	SILVER
TECHNICAL SUPPORT Response Time/Initial Troubleshooting	04/08 Hours	08/24 Hours	
ONSITE RESPONSE Resolution/Timeline	Included 03 working days	Paid 05 working days	
ADVANCE REPLACEMENT Resolution/Timeline	Included 05 working days	Paid Sub. Availability	
REPAIR & RETURN Timeline/Logistics	Within 30 days Both Ways	Within 30 days One Way	
HARDWARE REPAIR	Full Repair	Full Repair	
SOFTWARE RELEASE	Full Support	Full Support	

## Our Services



Repair  
Calibration Services



I&C and  
Acceptance Testing



Rentals & Engineering  
Services



Synchronization  
Audit & Testing



SLA, Support &  
Maintenance



Training



011-4161 5459



info@khushicomms.com



www.khushicomms.com