

Company Profile



Kent Microwave Devices

BUSINESS HIGHLIGHTS

- Specialist in Tunnel & In-Building Communication Enhancement for Transport, Public Safety & Security Agencies
- FM Re-Broadcast and Voice Break-in System (RBBI) for Entertainment and Incident Management
- Wideband Fiber Optic Cell Enhancer, Off-Air Single & Dual Band Tetra, Dual Band Tetra & iDEN Cell Enhancer etc.
- Proven track record of deployments in Tunnels and Underground stations

Company Profile

KMD specializes in the design, manufacture, supply, installation, test and commissioning of Fiber Optic Cell Enhancer system, RBBI system, multi-band off-air cell enhancers and boosters for the transport and distribution of commercial FM broadcast, bi-directional radio systems (Private Mobile Radio, analogue & digital trunked radio, LTE etc.) in road and rail tunnels, in-building and large underground complexes. Our products are field proven, with installations in a number of tunnels and underground stations in Singapore. We are also the official distributor of [BHE Bonn Hungary Electronics and Sinclair products covering a wide range of RF accessories and antennas](#), critical communication solutions, satcom subsystems, telemetry transceivers and microwave defence solutions. Contact us for your RF communication needs today!

KMD - ABOUT US

BUSINESS HIGHLIGHTS

- Specialist in Audio Break-in and RF coverage solutions for Tunnels & In-Building
- Proven track record of deployments in Tunnels and Underground stations
- Deep expertise in RF system engineering
- Customized development of RF Filters, Splitters and Couplers
- Official Distributor of BHE Bonn Hungary Electronics
- Official Distributor of Sinclair Technologies

Kent Microwave Devices (KMD), established in [2016](#), [aspires to be a premier specialist provider of voice break-in and coverage enhancement solutions for mission critical communication systems in tunnels, in-building and large underground complexes](#). The company is helmed by a leadership team of Radio Frequency (RF) engineering professionals with several decades of experience implementing bespoke integrated communication systems for transport, emergency & security agencies in Singapore and regional countries. Over the years, KMD has successfully implemented FM Re-Broadcast and Break-in System (RBBI) and Fiber Optic-based coverage enhancement solutions for multiple radio systems such as Tetra, Tetrapol, LTE etc. in a number of tunnels, in-building and underground complexes in Singapore, earning recognition as a trusted provider of high quality RBBI and coverage enhancement solutions for mission critical communication systems.

Company Profile

Products & Solutions

- FM Re-Broadcast & Break-In (RBBI) solution for entertainment and incident management
- Wideband Fiber Optic Cell Enhancer System
- Off-Air multi-band Cell Enhancers for Tetra, Tetrapol and IDEN
- Customized RF splitters and directional couplers (power, frequency and bandwidth)
- Official Distributor for Bonn Hungary Electronics (BHE) and Sinclair (a Division of Norsat International)

FM Re-Broadcast & Break-In (RBBI) solution for Entertainment & Incident Management



Company Profile



The FM radio Re-broadcast and Break-in System (FM RBBI) is a highly effective tool for entertainment and emergency management in road tunnels, in-building and large underground stations. The system repeats normal FM broadcast with RDS data but in an emergency, can replace the content with real-time voice or prerecorded audio announcements to notify the public of emergency events like fire, accident or the need to evacuate the incident area.

The operating principle for the break-in is to substitute each of the re-broadcasted FM channels with real-time voice, RDS data or up to 100 prerecorded emergency advisory messages in different languages.

For robustness and high system availability, the RBBI system can be designed with

- Geographical redundancy, with active system in Main Operation Control Center (MOCC) and hot back-up in Alternate Operation Control Center (AOCC)
- N+1 redundancy for each language group of FM radio channels
- Duplicated work stations at both MOCC and AOCC for source selection, break-in voice announcements and playback of up to 100 prerecorded messages
- Fail-safe RF switch for source selection with manual by-pass
- Monitoring of off-air RF signals and audio announcements
- Interface to external management system for system monitoring and control

For long tunnels and large underground complexes where auxiliary RF distributed antenna system such as leaky coaxial cables LCX and indoor antennas are installed to improve RF coverage and overcome blind spots, the RBBI signals can be distributed through outdoor rated (both IP65 and IP66 versions are available) RF to fiber optic converters and amplifiers located at strategic locations to boost and inject the signals, ensuring seamless coverage throughout the service area.

Company Profile

Wideband Fiber Optic Cell Enhancer System



The KMD Fiber Optic Cell Enhancer system combines long range operation (up to 25km) with wide RF bandwidth and choice of RF power (from 1 to 100W per channel) to deliver multiple wireless services to all areas covered by the distributed antenna system. It employs RF to Optical conversion and all remote optical repeaters are outdoor rated (IP 65 or IP66), **fan free and natural air cooled to improve reliability and reduce maintenance requirements**. The large bandwidth from 30 MHz to 3 GHz enables multiple wireless services ranging from FM broadcast, analogue PMR / trunked radio, Tetra, P25, LTE etc. to be transported and distributed, maximizing the use of the RF infrastructure to provide reliable communications inside the tunnels and underground complexes.

Key Features of Fiber Optic Cell Enhancer System

- Long range (25km) and wide frequency range (30 MHz - 3GHz)
- Support of multiple radio technologies, analogue and digital
- Simultaneous transmission and reception
- Outdoor rated (IP65 or IP66), fan free optical repeaters
- Choice of RF power output from Low to High
- Remote monitoring and control
- Optional Re-Broadcast & Voice Break-in System (RBBI) for commercial FM radio

Company Profile



Applications:

- TETRA System
- Extended Coverage in Tunnel, In-Buildings
- Frequency 380~430Mhz

The Fiber Optic Cell Enhance is an Outdoor rated (IP65 and IP66 versions available) and natural air cooled bi-directional Radio Frequency (RF) signal repeater operating in 380~430 Mhz TETRA band via fiber optic cables. **This product is customisable and can support other radio systems up to 3 Ghz.**

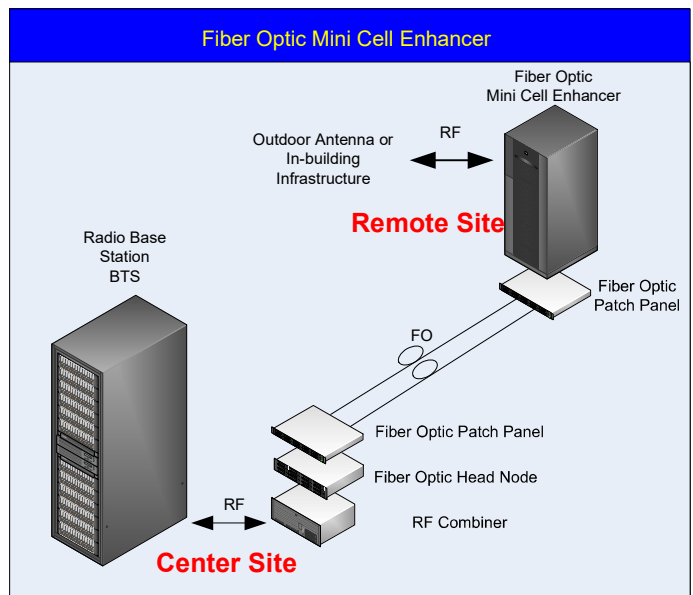
Typical application of the Fiber Optic Cell Enhancer is to improve RF signal coverage areas such as underground tunnels, in-building car parks, offices, and shopping malls for TETRA System.

The Fiber Optic Cell Enhancer provides 50dB Gain to both downlink and uplink RF signal from the Base Stations via Fiber Transceivers, amplifying the RF signal in the blind spot area to sufficient level for reliable 2-way communication.

Fiber Optic Cell Enhancer comes in various models, Low Power Model is designed for low out put power of 5, 10 or 25 Watts (37dBm, 40dBm or 44dBm respectively, single carrier), suitable for small coverage areas.

Medium and High Power Model is designed for high output power of 50 or 100 Watts (47dBm or 50dBm, single carrier) suitable for wide coverage areas.

The Fiber Optic Head Node converts signal between RF and Optic at the Center Site. The Head Node comes in 4 models, With 1, 2, 4 and 8 FO channels. Models supporting more than 2 channels operate together with a RF combiner to distribute RF signal from multiple Radio Base Stations.





Company Profile

Specifications:

MCE Electrical Specifications:

Models	MCE-1	MCE-5	MCE-10	MCE-25	MCE-50	MCE-100
Frequency Ranges	380~430 Mhz					
Nominal Impedance	50 ohm					
Minimum Return Loss	-18 dB					
Maximum Output Power (per channel)	1 Watt	5 Watts	10 Watts	25 Watts	50 Watts	100 Watts
Gain	50~80 dB (specified before order)					
Connector Type	N Type, Female					
Power	110/230 AC, 5A max.					

MCE Mechanical Specifications:

Dimension (LxBxH)	500x500x300mm					
Weight	35 kg					

MCE Environmental Specifications:

Operating Temperature	0~+55 °C					
Humidity	95% non-condensing					

Head Node Electrical Specifications:

Models	HN-1	HN-2	HN-4	HN-8
No of FO Channel	1	2	4	8
No of RF Tx/Rx Port	1/1	2/2	4/4	8/8
LED Wavelength	1310nm			
LED Output Power	>1mW (0dBm)			
Max LED Input Power	2mW			
Optic Receiver Sensitivity	-22dBm (Typ.)			
Fiber Connector	FC/APC			
Combiner Input Level	0~-20Bm	3~-17dBm	6~-14dBm	9~-11dBm
Combiner Return Loss	< -18dB			
Combiner Connector	N/SMA/UHF (specified before order)			
Power	110/230 AC, 2A max.			

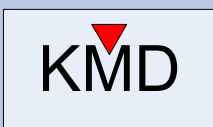
Head Node Mechanical Specifications:

Dimension (LxBxH)Standard 19" Rack	3U	6U	6U	9U
Weight	25 kg max			

Head Node Environmental Specifications:

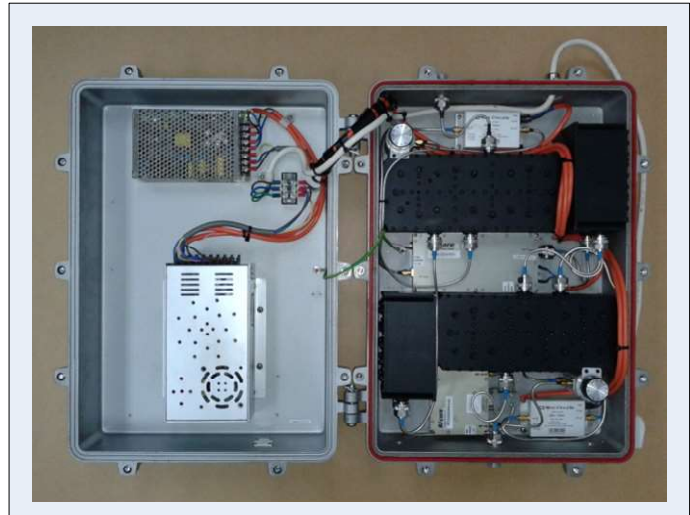
Operating Temperature	0~+55 °C			
Humidity	95% non-condensing			

Network Management: 1. Standard IBM compatible PC with Windows OS.
2. System Monitoring Via modem/IP/GSM .



Company Profile

Off-Air Cell Enhancers for Tetra, Tetrapol and IDEN



Complementing the Fiber Optic-based coverage enhancement solutions for long tunnels and large underground stations is a range of single and dual band off-air cell enhancers for in-building car parks, offices, shopping malls and short tunnels for Tetra, Tetrapol and IDEN radio systems in the UHF band

- Dual Band Tetra Cell Enhancer
- Dual Band Tetra & iDEN Cell Enhancer
- Off-Air Tetra Cell Enhancer
- Tetra Booster
- Wall Mounted Duplexer

Company Profile

Customized RF Splitters and Directional Couplers



We also specialize in developing customized products and systems as per the customer's unique specifications. Some examples of low VSWR, high power and wide band RF conditioning products developed for our customer projects include

- 2 Port Power Splitter
- 3 Port Power Splitter
- 4 Port Power Splitter
- 6dB Directional Coupler
- 10dB Directional Coupler
- 20dB Directional Coupler
- GPS Splitter - GPS-4-1000

Company Profile

Official Distributor for BHE Bonn Hungary Electronics and Sinclair (a Division of Norsat International)

BHE Ltd. is a major designer of numerous **RF and microwave** products, applications for mobile operators, government, defence, space and aeronautics organizations worldwide. Its key product areas include:

- Critical Communication solutions - FM / DAB Voice Break-in
- Mission Critical Communications - Tetra Family
- Tetra Digital Off-Air Repeaters
- Tetra band Optical Repeaters
- Analogue Off-Air Repeaters
- High performance modules for Defence & Security applications
- Oscillators
- Synthesizers
- Converters
- SATCOM systems and subsystems - LNA, Frequency Converters, SSPA etc.
- Telemetry transceivers
- Microwave defence solutions
- Radar equipment
- CUAV – Counter UAV applications

Powered by its technology competence, BHE offers complex civil safety solutions from counter-UAV systems to many areas of modern telecommunications, e.g. development of satellite communication products including advanced digital modulators, **TT&C and high data rate onboard transmitters**, high power efficiency **SSPAs**, phase coherent up & down converters, and IFF transmitters.

To mobile service providers as well as to critical communication operators **TETRA, GSM, DCS, UMTS (W-CDMA), LTE, FM, VHF and DAB** solutions are offered. These units support single, multiple bands and DAS architectures as well. The full **TETRA** offering covers a complete spectrum of active and passive products such as repeaters, splitters, combiners and couplers.



Company Profile

Official Distributor for BHE Bonn Hungary Electronics and Sinclair (a Division of Norsat International)



Phase Locked Oscillator



Microwave Synthesizer



200W X-band Outdoor Power Amplifier



200W Redundant X-band Outdoor Power Amplifier

Company Profile

Official Distributor for BHE Bonn Hungary Electronics and Sinclair (a Division of Norsat International)

Sinclair Technologies, a division of Norsat International Inc, is a leading designer and manufacturer of antenna and RF signal conditioning products, systems and coverage solutions. Sinclair products are used extensively in public safety and private industry communication networks, such as emergency services (police, fire, ambulance etc.), transportation, natural resources and utilities. Sinclair offers more than 2,000 different products covering greater than 1 GHz, 800 MHz, UHF, VHF, TETRA, 5G and other bands

- Base Station Antennas (Frequency Bands <100 MHz, VHF, UHF & Tetra, >700MHz, Multi-band etc.)
- Collinear
- Aviation
- Exposed Dipole
- Enclosed Dipole
- Panel/Flat
- Ground
- Yagi
- Corner Reflector
- Mobile/Transit Antennas
- Whip
- Transportation
- Stealth
- Filters, Transmitter Combiner, Duplexer, Receiver Multicoupler, Coupler and Accessories (Frequency Bands <100MHz, VHF, UHF & Tetra, >700MHz etc.)



The broad product range enables us to offer our customers complete one-stop solutions for all their communication needs. Whether you are looking for a single antenna or a complete system, we have it all.

Company Profile

Contact Us

Kent Microwave Devices

Address 39 Woodlands Close
 #06-33 Mega@Woodlands
 Singapore 737856

Reg. No.

Tel - (65) 6316 1351

Fax - (65) 6316 1351

Email - sales@kentmicrowave.com

Website - www.kentmicrowave.com