COMMSCOPE®

Distributed Coverage and Capacity

TETRA Solutions

High reliability ensures best communication
in security and safeguard sectors.
Being safe with CommScope in any situation!

TETRA—Security Anywhere at Anytime

TETRA is the modern digital trunking system used for the private and public mobile radio communication (transport agencies, airports, energy companies) and for security agencies (police, fire brigades, rescue services, army). Especially users in the security areas have high requirements on the overall system.
These requirements are covered in a highly reliable and cost-effective way by the Andrew Solutions TETRA coverage solution for RF- and optical networks. Thanks to the modular design of the equipment and to an outstanding flexibility on a very service-friendly basis, tailored solutions can be provided at minimum cost.

RF Solutions with Node A Series

With Andrew Solutions digital Node A RF repeaters, buildings and tunnels can be covered fast and easily with TETRA signals. A directive donor antenna usually picks-up the base station signal. The Node A digitally filters (band- or channel-selective) and amplifies the TETRA signal up to the desired output power (available up to 4W). The Node A usually drives a passive distribution system with radiating cable or antennas, but can also be used as a pick-up repeater for active distribution systems. All Andrew Solutions repeater and TETRA equipment provides the option for remote configuration, supervision, monitoring, and maintenance via modem connection (GSM, UMTS, CDMA, PSTN, LAN,...).

RF In-house Coverage

Uplink	Downlink
380—385 MHz	390—395 MHz
385—390 MHz	395—400 MHz
410—415 MHz	420—425 MHz
415—420 MHz	425—430 MHz
450—455 MHz	460—465 MHz
455—460 MHz	465—470 MHz

Frequency Ranges at a Duplexer Bandwidth of 5 MHz

Advantages

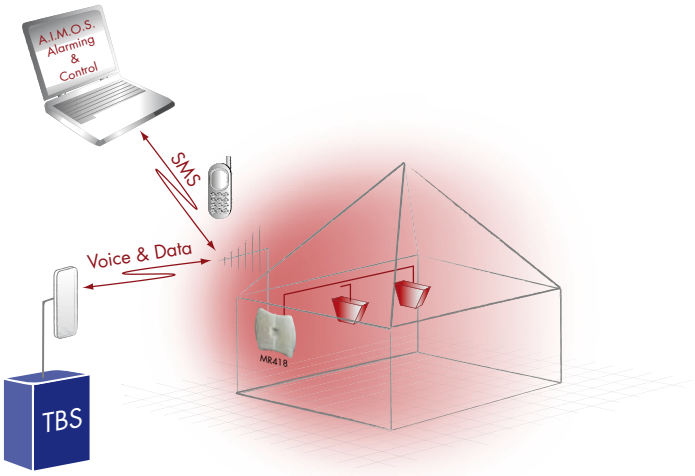
- Higher MTBF than with a TBS (TETRA Base Station) and therefore enhanced system reliability
- No leased-line back haul network and network infrastructure necessary
- Flexible use (easy installation and operation)
- More cost-effective than numerous TBS

RF Solutions with MRx18 Series

Andrew Solutions TETRA miniRepeaters extends coverage in small indoor areas with up to 2300 square meters, such as offices, shops and basements. Typically, an antenna which has been installed outside the building receives the signal from the TBS (TETRA Base Station). The repeater boosts the signal and the indoor antenna or a distributed antenna system—consisting of several splitters and antennas—serves the TETRA signal to the desired "dark spots". Vice versa the signal is forwarded from indoors to the TBS. Locally the TETRA miniRepeater can be monitored/configured via a web-based browser. Remote monitoring and configuration via SMS or A.I.M.O.S is optionally available by adding a wireless GSM modem.

Uplink	Downlink
380—385 MHz	390—395 MHz
410—415 MHz	420—425 MHz

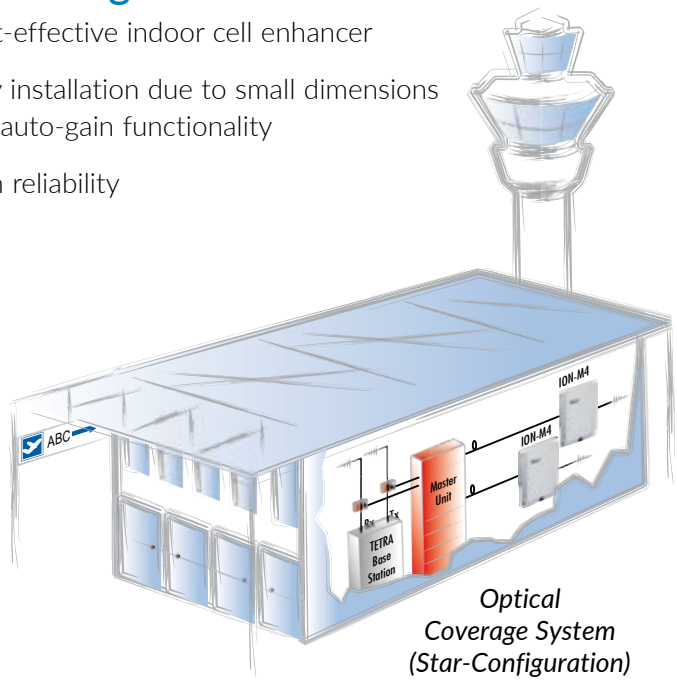
Frequency Ranges of miniRepeaters (Others Available on Demand)



miniRepeater Inhouse Coverage

Advantages

- Cost-effective indoor cell enhancer
- Easy installation due to small dimensions and auto-gain functionality
- High reliability



Optical Coverage System (Star-Configuration)

Optical Solutions with ION™ Series

The optical remote unit (RU) is connected to a master unit via optical fiber. The TBS signals are interfaced to the master unit for electrical/optical conversion. These converted signals are transmitted via optical fiber to the remote units and finally to the antenna. By utilizing optical fiber cables, high attenuation losses on long coaxial cables are avoided. This increases the potential distance between remote unit and master unit up to 20 km. A subcarrier is fed into the signal path on the optical fiber to act as a remote control and supervision channel for all equipment. Due to the modular concept later expansion and upgrade is possible. System redundancy can also be provided at low cost impact.

Uplink	Downlink
380—385 MHz	390—395 MHz
385—390 MHz	395—400 MHz
410—415 MHz	420—425 MHz
415—420 MHz	425—430 MHz
450—455 MHz	460—465 MHz
455—460 MHz	465—470 MHz

Frequency Ranges of Wideband Remote Units

Advantages

- Active units can be mounted close to the antennas due to their small size. Therefore shorter and thinner coaxial cables are used
- Optical fiber cables can be installed easier and more cost-effective because of their design
- Remote units show a considerable higher MTBF compared to a TBS. Therefore total system reliability is quite higher

Configurations

Point-to-Point-Configuration

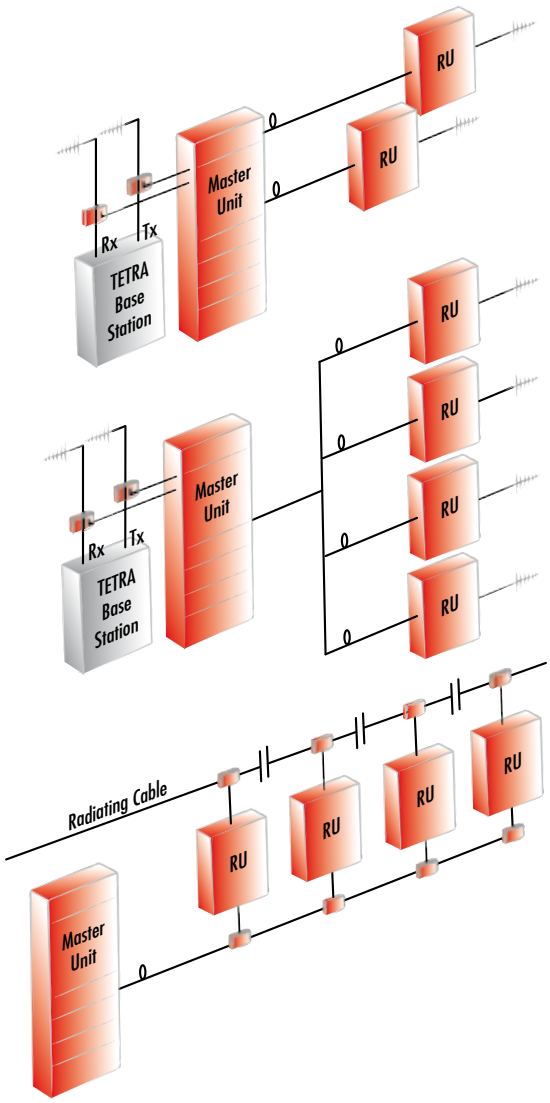
Each remote unit is connected to one optical fiber. One single fiber supports uplink and downlink at the same time. This configuration gives the best interference immunity and reliability, assuming the number of fibers is sufficient.

Star-Configuration

A number of remote units is connected via an optical splitter to the same optical transceiver (OTRx) in the master unit. Up to 4 remote units can be connected to a single OTRx while the maximum optical budget is 10 dB.

Backbone-Configuration

In many situations optical fiber is the limited and most valuable resource. In this case the backbone feature provides the option of connecting up to 4 remote units to only one single optical fiber. The maximum optical loss of 10 dB must not exceed.



Redundancy Scenarios

Network Redundancy

Is ensured by a special network topology where two independent networks interleave in a way that in case of a failure each of them could carry the traffic load.

Equipment Redundancy

Is ensured by a special distribution network topology where coverage is even guaranteed in case of fibre break, optical link fail or remote unit fail.

Module Redundancy

Is ensured by doubling critical modules inside the network elements of the distribution network e.g. doubling the power amplifier and /or the power supply inside a unit.

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