DeltaNode™
Wireless Technology
A Bird Technologies® Company

fiber optical DAS
network overview

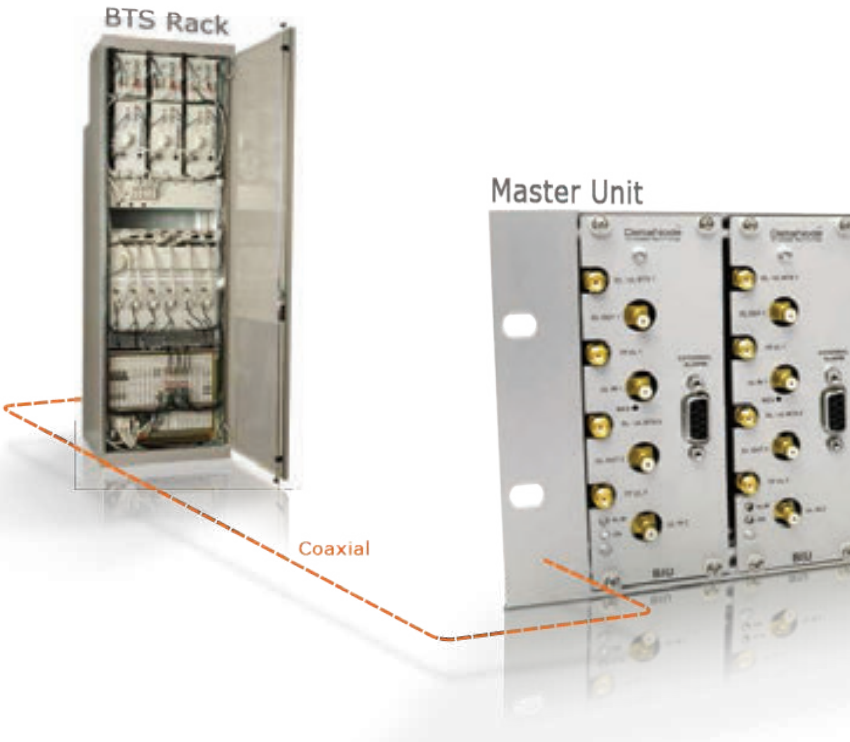
Connecting the World

OVERVIEW

Deltanode's fiber optical Distributed Antenna System (DAS) can distribute wireless services for voice and data to locations that are hard to reach with conventional methods. It can also be used to transport other services including Gigabit Ethernet backhaul for femto/picocells, and CPRI/OBSAI signals for remote radio heads. The Master Unit located at the base station site distributes the signal over dedicated fiber to small Remote Units designed for discrete mounting in both outdoor and indoor environments. Wideband RF links with both uplink and downlink running on the fiber secures coverage for both single and multi operator solutions.

The scope is a complete system from the interconnection point of the Master Unit, interfacing the base station, to the service antenna port of the remote unit. The DAS network

flexible solutions to fit your requirements

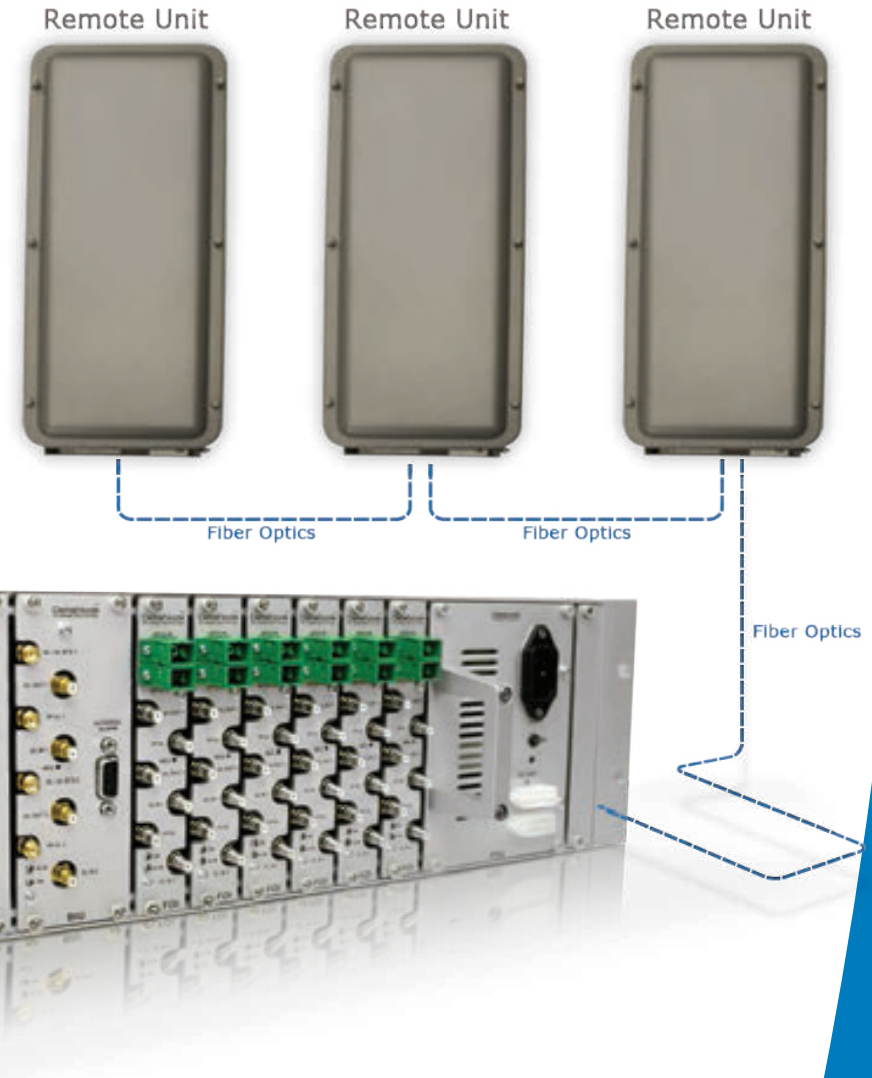


supports redundancy with the possibility to feed signals from two different locations into the same antenna system.

All units are equipped with remote control and the communication is performed via a sub-carrier on each optical link. Each Remote Unit has a web interface accessible from a PC with a standard web browser. The system is managed by the Base Station Gateway (BGW) - the overall interface point of the system's management function.

SYSTEM ARCHITECTURE

The system is built out of three main components: the Base Station Gateway, the Master Unit and the Remote Unit.



KEY FEATURES

- Supports WDM and CWDM
- Fiber lengths up to 25 km
- Dynamic network configuration
- Flexible system design
- Single and multi operator solutions
- IP65 classed remote units
- Supports
  - › LTE
  - › GSMR/GSM900/GSM1800
  - › IS95/CDMA2000/EVDO
  - › UMTS
  - › TETRA
  - › APCO P25
  - › DVB-H
  - › Broadcast

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BASE STATION GATEWAY

The Base Station Gateway (BGW) is the interface point to higher level Operation and Maintenance (O&M) functions and alarms. It has routing and firewall functionality, alarm log and access control for the complete DAS network.

The main function is to interconnect all control communication, monitor the modules in the DAS network and forward alarms to one or multiple alarm receivers via email and/or SNMP.

MASTER UNIT

The Master Unit is the interface between the Base Stations and Remote Units. It consists of a 19" 3U casing where power supply modules, Fiber Optic Interfaces (FOI) and Base Station Interface Units (BIU) are fitted depending on the system configuration.

a solid platform
to customize your system

KEY FEATURES

- 19" mounted industrial PC
- Built-in firewall
- DHCP server
- HTTPS connection
- Web interface
- Alarm forwarding via email or SNMP
- Supports unlimited number of remote units

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BASESTATION INTERFACE UNIT

The BIU is used as an RF interface between the base station and the FOI. It has configuration utilities for optimizing the performance of the system. Two separate RF strips allow the BIU to be used in a diverse range of applications. Optionally, two operators or two sectors can be used in one BIU.

POINT OF INTERCONNECT

The POI is a 19" mounted combining/splitting unit used for cross coupling the RF signals between the BIU's and the FOI's. It provides a high level of flexibility for multiplexing the signals in the network.

full expandability
to futureproof your system

BIU SPECIFICATIONS

- Interface for VHF, 400, 700, 800, 900, 1800, 1900, 2100, 2600 MHz
- Supports all modulations
- Alarm for low input level
- Web interface
- Supports diversity
- Available in duplex & Tx/Rx versions
- Available in high & low level versions

FIBER OPTIC INTERFACE

The FOI is a wideband optical converter unit used for converting RF signals into optical signals. It consists of an optical interface with a transmitter and receiver. A subcarrier is used for communication with the Remote Units. Available with WDM and CWDM.

FOI SPECIFICATIONS

- Wideband 88-2700 MHz
- Subcarrier with Ethernet
- Web interface
- Available in 1310, 1550 nm & CWDM configuration
- Simplex RF ports for UL & DL

POI SPECIFICATIONS

- Wideband combiner/splitter
- Port configuration depending on multiplexing requirements

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REMOTE UNIT

The Remote Unit is a wideband radiohead designed for modularity and high performance. It is the end unit in the system and connects directly to the antenna system. Multiple power levels and multiple combinations of frequency bands are available. The medium power remote units can house up to four bands in one chassis and the high power remote units can house up to two.

KEY FEATURES

- Best-in-class noise figure
- Rugged chassis for use in any environment
- High reliability
- Remote control with Ethernet over the fiber optical connection
- Operational parameters are set in a web interface, only a web browser is needed for control
- Wide band amplification
- DHCP client for automatic IP configuration from the BGW
- WDM/CWDM
- External alarm in & out
- Diversity as option

DAS Remote Units

- Houses up to 4 bands or sectors in the same enclosure
- Full band and sub band solutions available
- Modulation agnostic
- Support for WDM or CWDM
- Web interface
- IP65 class aluminum enclosure

- Supported Frequency bands
  - › VHF
  - › 400 MHz
  - › 700 MHz
  - › 800 MHz
  - › 900 MHz
  - › 1800 MHz
  - › 1900 MHz
  - › 2100 MHz
  - › 2600 MHz

- Output power (composite):
  - › 33 dBm
  - › 41 dBm
  - › 43 dBm
  - › 46 dBm

Proven Concept

SEAMLESS INTEGRATION: LAS VEGAS, USA

With a track record of installations throughout the world, our equipment has proven the benefit of using fiber fed DAS to improve the coverage and capacity of an existing network. Our discrete Remote Units can be used for wall and pole mounting, seamlessly integrating into both rural and urban environments such as the Strip in Las Vegas, USA.

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OPERATION & MAINTENANCE

The communication is IP based and all active units have a built-in web server for configuration, data collection and alarm management. The BGWs DHCP server automatically assigns IP addresses to all units in the network. The fiber optic link has a subcarrier that transports Ethernet over the fiber. Since the repeaters and the central equipment have their own web server, only a standard web browser is needed to operate the system. This means that no unique software is required.

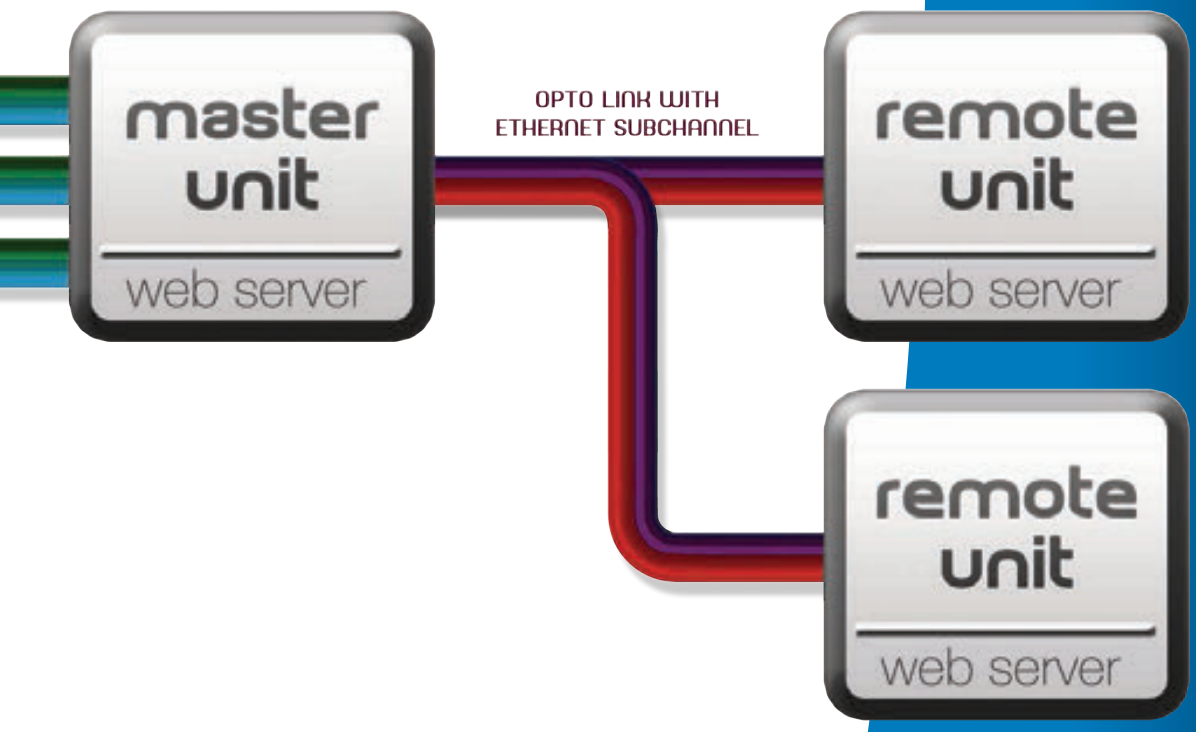
At the BGW, the entire system is presented in an intuitive Graphical User Interface (GUI), where a simple click will grant access to each unit's local web interface and functions.

The BGW functions include DHCP allocation of IP addresses to all units, alarm collection and alarm generation to external targets. The entire system is operated and managed from the BGW, with access obtained either locally or remotely via a standard web browser from a connected PC.

For a common interface to multiple BGWs in a network, a Central Gateway (CGW) can be used. The CGW can interconnect all control communication and monitor all units via a VPN tunnel. At the CGW the entire system is presented in a GUI and each BGW can be accessed from one common point.

KEY FEATURES

- Scalable system architecture
- No unique software required
- Easy access over Ethernet
- SNMP support
- Advanced alarming
  - › Low BTS signal
  - › No BTS signal
  - › Low optical power
  - › Lost optical connection
  - › Low output power (RU)
  - › No output power (RU)
  - › High temperature
  - › Configurable external alarm
  - › Lost unit



ABOUT US

Deltanode™ is a total solution provider of high performance, quality coverage extension equipment and services to the global wireless voice, data and multimedia market. Our core business includes infrastructure products and sub systems such as Repeaters and Distributed Antenna Systems.

The company began operations in 2005, led by a team of wireless entrepreneurs with extensive experience in the communications marketplace including product development, manufacturing, sales and marketing.

DeltaNode was acquired by Bird Technologies/Tx Rx Systems in Sept. 2013. Bird is a leading worldwide supplier of RF test and measurement solutions as well as infrastructure products for communications systems worldwide.

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