InterReach Fusion® Wideband

2.5 GHz WiMAX

In-Building Wireless Networking System

InterReach Fusion is the latest addition to ADC's portfolio of Distributed Antenna Systems. It offers the same superior performance as Unison in an easy-to-install, economical package. It is ideal for mid-sized to large installations containing dense, hightraffic environments such as convention centers, sporting arenas and airports.

InterReach Fusion features an easy-todeploy Double-star architecture with just three types of components: A Main Hub that receives its radio frequency (RF) signals from a MetroReach Focus system, a base station or a repeater; up to 4- Expansion Hubs that connect to the Main Hub via Single-mode or Multi- Mode fiber optics; and up to 32- Remote Access Units (RAUs) that connect to the Expansion Hub via CATV cabling. Each RAU sends and receives RF signals to wireless devices located within its coverage area. Administration is web-based via a PC running Internet Explorer.

Product Highlights

- More than 10,000 ADC distributed antenna systems shipped to more than 100 countries
- WiMAX 2x2 MIMO system with single set of electronics cabling and dedicated capacity per band
- Delivers in-building wireless voice and data coverage over standard CATV cable
- Unparalleled RF performance featuring high output power, low noise, zero-loss distributed amplifier system that supports more channels and delivers the ability to cover large areas with a minimal amount of equipment
- Software-selectable hub frequencies, system gain, and antenna output power
- Requires no electrical power at the remote antennas
- Uses common CATV wiring for easy, non-disruptive installation
- Intelligent, web-based software-controlled operations, administration and maintenance capabilities support both on-site and remote configuration and monitoring

SPEC SHEET

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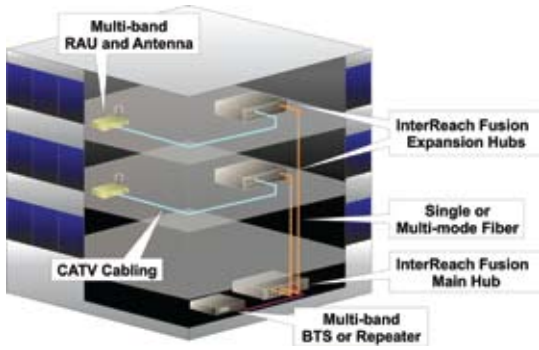
The Fusion Hubs are 19" rack-mountable units. The plenum rated Remote Access Units and the antennas connected to them are typically mounted in ceiling spaces throughout a facility.



The CATV cabling between the hub and each of the eight Remote Access Units can be up to 130 meters (426 feet) long using 0.21 inch (5.5 mm) diameter RG-59 cabling. This length can be extended to 140 meters (459 feet) with use of RG-6 cabling, or to 235 meters (771 feet) using RG-11 cabling. Different cable types can be used simultaneously on a single hub.

With a minimum of components and use of industry-standard 75 ohm CATV cabling, InterReach Fusion is simple and inexpensive to install, especially compared to heavy, inflexible, and invasive coaxial cabling. In addition, because power for the Remote Access Units is provided over the CATV cabling, no local power is required, further simplifying installations.

Flexible Output Levels

The system gain can be adjusted from 0 to 20 dB in 1 dB increments. In addition, the output of any individual RAU can be attenuated 0 or 10 dB to provide controlled coverage in specific building areas.

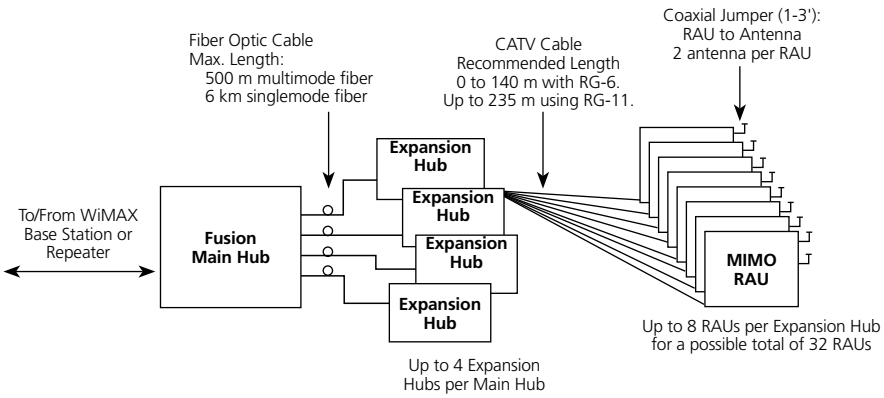
Alarming

Fusion monitors over 170 parameters within the system. Three levels of alarms are available:

- LEDs: Each unit has LEDs to indicate a fault in the unit or a unit that is connected to it. For example, if an RAU has a fault its LED will light red, the fault information is sent to the Fusion Hub which also displays a red LED at the RAU's port connector.
- Contact Closures: Connect the Fusion Hub to a base station or external monitoring equipment.
- Status, Warning, and Fault messages are displayed on a PC/laptop that is running a standard Internet Explorer browser or Standard Network Management System SNMP application software tools.

System Architecture

The minimum configuration of a single Fusion system is one Main Hub, one Expansion Hub, and one RAU (1-1-1). The maximum configuration of a single system is one Main Hub, four Expansion Hubs, and 32 RAUs (1-4-32). Multiple systems may be deployed to cover larger areas or campus applications.



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Specifications

2.5 GHz WiMAX Specifications	Downlink	Uplink
RF Frequency (full band):	2496 to 2690 MHz	2496 to 2690 MHz
Bandwidth[1]:	30 MHz	30 MHz
Spurious Emissions (dBm):	< –37	—
System Group Delay (not including cable) (µs):	< 2 µs	< 2 µs

RF Specifications	2.5 GHz WiMAX Typical	
	Downlink	**Uplink**
Average gain with 140 m CATV at 25°C (77°F) (dB)[2]:	20	15
Ripple with 140 m CATV (dB):	4.5	4.5
Output IP3 (dBm):	42.5	
Input IP3 (dBm):		-5
Output 1 dB Compression Point (dBm):	32	
Noise Figure 1 MH-1 EH-8 RAUs (dB)		17
Noise Figure 1 MH-4 EH-32 RAUs (dB)		23

ENVIRONMENTAL

	Main Hub and Expansion Hub	Remote Access Unit
Operating Temperature:	0° to +45°C (+32° to +113°F)	–25° to +45°C (–13° to +113°F)
Non-Operating Temperature:	–20° to +85°C (–4° to +185°F)	–25° to +85°C (–13° to +185°F)
Operating Humidity; Non-Condensing:	5% to 95%	5% to 95%

COMPLIANCE

Safety:	UL, CSA, CB Scheme certificate to IEC 60950, 3rd Edition, and IEC 60950-1, 1st Edition, with all national deviations
EMC:	FCC part 15 class A
Radio:	FCC part 27
Class 1 Laser Product:	IEC 60825-1:1998-01 and IEC 60825-2:2000-05

CE MARK

EMC:	EN 301 489-4
Radio:	EN 302 326-2 V1.2.2

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PHYSICAL	Main Hub	Expansion Hub	Remote Access Unit
IF/RF Connectors:	4 N, female (50 ohms), 1 Downlink/Uplink pair per MIMO Channel	8 F, female (CATV-75 ohms)	1 F, female (CATV-75 ohms) 2 N, female (antenna-50 ohms)
External Alarm Connector (contact closure):	1 9-pin D-sub, female	–	–
ADMIN/LAN Interface Connector:	1 RJ-45, female 1 9-pin D-sub, male for optional modem	1 RJ-45, female 1 9-pin D-sub, male	–
Fiber Connectors[3]:	4 Pair, SC/APC	1 Pair, SC/APC	–
AC Power (Volts):	Rating: 100-240V AC, 1A, 50-60 Hz Operating Range: 90-132V AC/170-250V AC auto-ranging	Rating: 100-240V AC, 6A, 50-60 Hz Operating Range: 90-132V AC/170-250V AC auto-ranging	54V DC (from the E Hub)
DC Power (Volts)	Rating/Operating Range: 38-64V DC, 2.5A	Rating/Operating Range: 38-64V DC, 14A	–
Power Consumption (W)[3]:	30	4 RAUs: 310 typical, 350 max. 8 RAUs: 545 typical, 600 max.	–
Enclosure Dimensions[4]: (height x width x depth)	89 mm x 438 mm x 381 mm (3.5" x 17.25" x 15") 2U	89 mm x 438 mm x 381 mm (3.5" x 17.25" x 15") 2U	54 mm x 286 mm x 281 mm (2.13" x 11.25" x 11.13")
Weight:	<5.5 kg (<12 lb)	<6.6 kg (<14.5 lb)	<2.1 kg (<4.6 lb)
CATV	The specifications in this document assume that CATV RG-59 cable is Belden 1506A, CATV RG-6 cable is Belden 1695A, and CATV RG-11 cable is Belden 7732A or equivalent, with 75 ohm F connectors.		
CATV Lengths	Minimum: 0 m (0'); Maximum: 130 m (426') with RG-59 Maximum: 140 m (459') with RG-6 Maximum: 235 m (771') with RG-11		

1. 30 MHz in MIMO or 2-30 MHz bands in SISO mode.
2. Downlink system gain is adjustable in 1dB steps from 0dB to +20dB. Uplink system gain is adjustable in 1dB steps from –5dB to +15dB. The downlink and uplink gain of each individual RAU can be attenuated 0 or 10dB.
3. It is critical to system performance that only SC/APC fiber connectors are used throughout the fiber network, including fiber distribution panels.
4. Excluding angle-brackets for 19" rack mounting hub.

Note: Fusion Hub typical power consumption assumes that the CATV RG-59 cable length is no more than 130 meters and RG-6 is no more than 140 meters.

CABLING	
Optical Fiber:	These specifications assume that the fiber optic cable, single-mode or multi-mode, is Corning with SC/APC connectors.
Optical Power Budget:	Uplink and Downlink Maximum: 3 dB optical Optical power budget between Main Hub and Expansion Hub Optical loss = ∑ (fiber loss + connector losses + splice losses + patch cord losses)
CATV:	The specifications in this document assume that CATV RG-59 cable is Belden 1506A, CATV RG-6 cable is Belden 1695A, and CATV RG-11 cable is Belden 7732A or equivalent, with 75 ohm F connectors.
CATV Lengths:	Minimum: 0 meters (0 ft); Maximum: 130 meters (426 ft) with RG-59 Maximum: 140 meters (459 ft) with RG-6; Maximum: 235 meters (771 ft) with RG-11

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Output Power at RAU

	Power per Antenna Port (dBm) 2.5 GHz WiMAX
Max. composite DL	20.0

Note: Operation at or above the output power levels may prevent Fusion from meeting RF performance specifications or EMC requirements. Please see the Fusion Installation, Operation, and Reference manual for system design information.

Ordering Information

Description	Catalog Number
InterReach Fusion WiMAX - 2.5 GHz	
Main Hub	
AC Power option	FSN-1-MH-2-WMAX
DC Power option	FSN-1-MHDC-2-WMAX
Expansion Hub	
AC Power option	FSN-EH-2-WMAX
DC Power option	FSN-EHDC-2-WMAX
Remote Access Unit	FSN-2500-2-WMAX

SPEC SHEET

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