

Active RF Equipment Catalog

Americas

COBHAM

The most important thing we build is trust

Flexible, On-Frequency and Frequency Shifting RF Repeaters
Public Safety and Commercial
Off-Air and Fiber Fed
Analog and Digital

Cobham Wireless, a leading provider of RF coverage solutions



Cobham Wireless is a leading developer and supplier of high-quality RF coverage solutions designed to maximize wireless network coverage in difficult RF environments and complex settings. The company specializes in extending radio coverage throughout rural areas, office buildings, subways, tunnels and shadowed areas. Cobham Wireless coverage solutions support all major mobile technologies and standards for Cellular, PCS, 700 LTE, AWS, VHF, UHF, LMR, ESMR and TETRA.

Cobham Wireless LMR and Mission Critical Solutions

Cobham Wireless offers a comprehensive portfolio of enhanced coverage solutions for the LMR and public safety markets. Based on RF-SAW filtering, patented DSP filtering™, Cobham Wireless' proven, indoor and outdoor solutions solve a wide range of network issues including interference and oscillation problems, challenging coverage holes, rapid response deployment and inadequate in-building coverage. Regardless of the technology or frequency, Cobham Wireless can provide customized coverage solutions that address any combination of unique and complex network needs for the LMR and public safety user.

Cobham Wireless Carrier Solutions

Cobham Wireless offers a comprehensive portfolio of enhanced coverage solutions for the wireless carrier market. Based on IF-SAW filtering, patented DSP filtering™ and SmartALC™ technologies, Cobham Wireless' proven, indoor and outdoor solutions solve a wide range of network issues including interference and oscillation problems, challenging coverage holes, inadequate in-building coverage and cell extension from the smallest structures to the largest venues. Regardless of the technology or frequency, Cobham Wireless can provide customized coverage solutions that address any combination of unique and complex network needs for the wireless carrier.



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D-CSR 3301-A for Americas

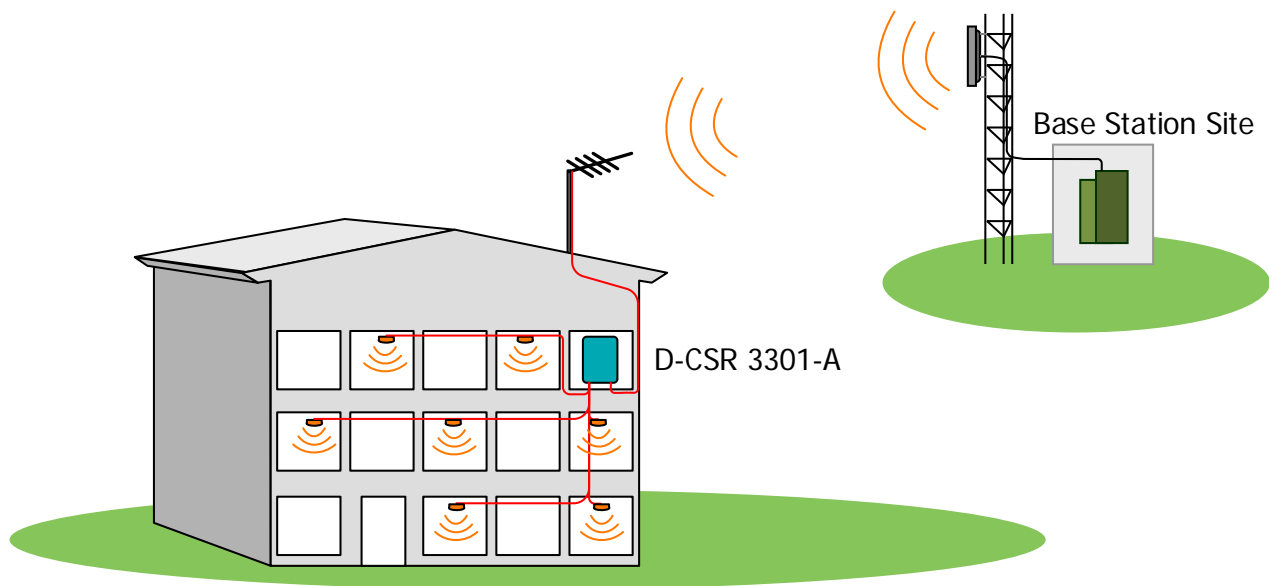
Digital channel/band selective FM repeater

Key features:

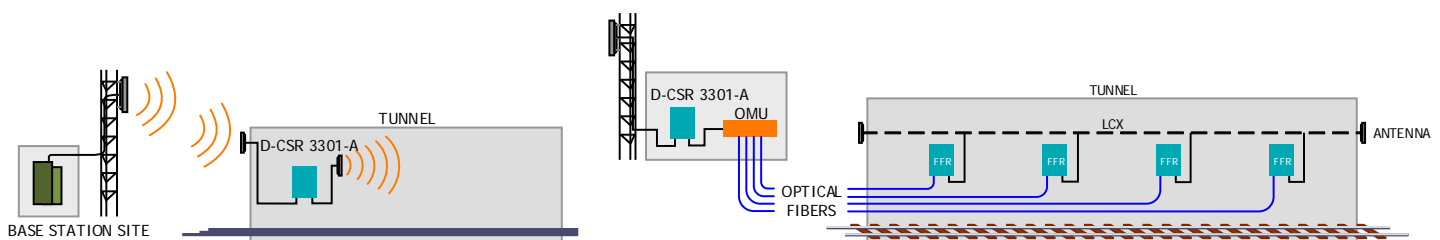
- Large repeater Tunnel coverage due to high output power and gain.
- Easy system implementation with built-in commissioning tools.
- Supervision available over radio modems.
- Remotely upgradable for future challenges.



The D-CSR 3301-A provides quick, cost-effective and secure radio coverage in the FM Broadcast band and can handle up to sixteen FM carriers. Through the use of the D-CSR 3301-A a tunnel operator can easily provide internal radio broadcast station coverage and Emergency Voice Break-in messaging into buildings and tunnels. The wireless interface permits the operator to remotely configure RF parameters as well as monitor alarms on a continuous basis.



The D-CSR 3301-A can be used to provide coverage in shorter tunnels. Longer tunnels can be covered by connecting the repeater to an Optical Master Unit (OMU) that feeds a number of fiber fed repeaters (FFR).



D-CSR 3301-A Specifications

Electrical

Frequency ranges available	87.5-108MHz Downlink
Number of channels	up to 24
Filter pass bandwidth	20MHz typical
Channel bandwidth	200kHz
Impedance	50Ω
Noise figure	4.5dB at maximum gain
Downlink Output power/carrier	+30dBm (2 carriers) +27dBm (4 carriers) +24dBm (8 carriers) +21dBm (16 carriers)
Gain	65 to 95dB in 1dB steps
Third order intercept	+54dBm, typical
Spurious emissions from RF port	< -13dBm FCC Compliant
Remote control and alarm supervision	Via modem GSM, P-25, PSTN, via Ethernet and SNMP
Power requirements	110VAC 60Hz or +24VDC
Power consumption	140W, typical

External connections

RF ports	7/16 DIN Female
External alarm inputs	4
Alarm relay output	Dry contact

Mechanical specification

Dimensions L x W x H	21" x 14.9" x 7.7" (540mm x 382mm x 198mm)
Enclosure	Aluminum IP65 (NEMA4)
Weight	50lbs Typical (23kg)
Cooling	Convection
Mounting	Wall mounted

Environmental specification

Operating Temperature	-13°F to +131°F (-25°C to +55°C)
Storage Temperature	-22°F to +158°F (-30°C to +70°C)
Humidity	ETSI EN 300 019-2-4
Complies with	FCC

D-CSR 3302-A for Americas

Digital channel/band selective repeater

Key features:

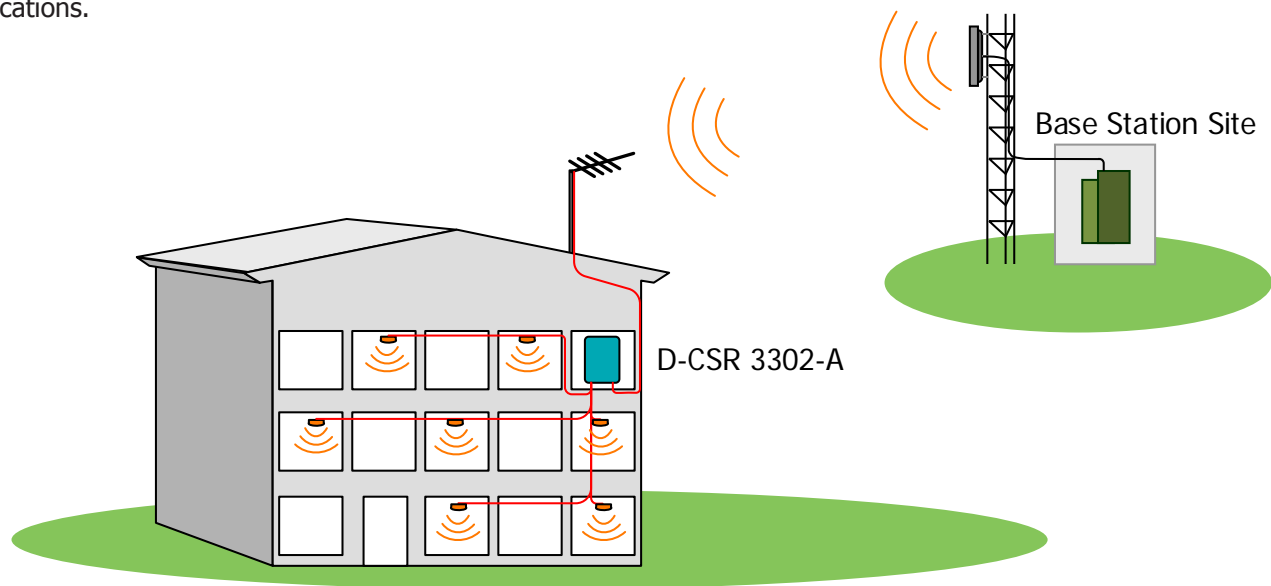
- Large repeater coverage footprint due to high output power and gain.
- Easy system implementation with built-in commissioning tools.
- Composite Downlink power 33dBm (20W HPA).
- Dynamic ALC.
- Adjustable Bandwidth, Dual Window Operation (Band selective option).
- Time slot ALC (Channel selective option).
- Supervision available over radio modems.
- Remotely upgradable for future challenges.



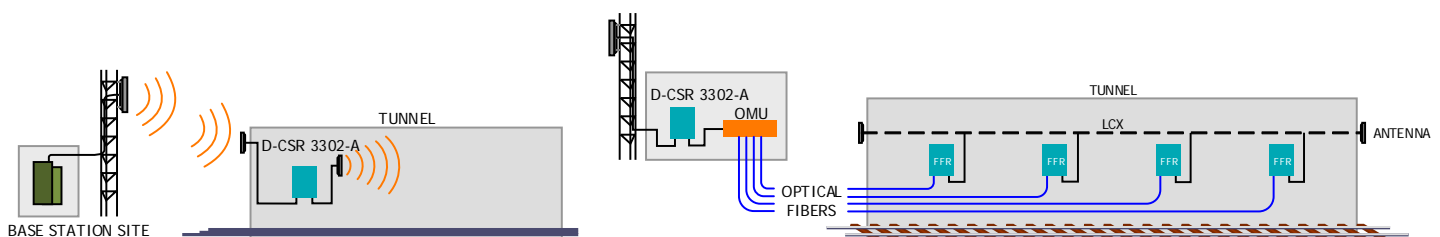
The D-CSR 3302-A provides quick, cost-effective and secure radio coverage in any VHF network and provides two variable bandwidth blocks of contiguous spectrum. Through the use of the D-CSR 3302-A an operator can easily expand a base station's service area by filling in coverage holes caused by terrain, buildings or tunnels.

Two product options are available: Channel selective (up to 8 channels) or Band selective (up to 2 sub bands).

The D-CSR 3302-A can also be used as an In-line booster to extend the radiating cable operating range in tunnel applications.



The D-CSR 3302-A can be used to provide coverage in shorter tunnels. Longer tunnels can be covered by connecting the repeater to an OMU (Optical Master Unit) that feeds a number of fiber fed repeaters.



D-CSR 3302-A Specifications

Electrical

Frequency ranges available	148–174MHz Downlink	148–174MHz Uplink
Number of Pass bands (Band selective)	Up to 2	
Number of Channels (Channel selective)	Up to 8	
Filter options (Channel selective)	15kHz / 30kHz, wider options for low delay	
Filter options (Band selective)	100kHz to 5MHz in 25kHz steps	
Duplex frequency spacing	5MHz typical with options down to 1MHz	
Filter options	Passband / Guardband	Filter Type
	1MHz / 2MHz	1
	2MHz / 2MHz	2
	3MHz / 2MHz	3
	5MHz / 2MHz	4
	1MHz / 1MHz	5
	User defined (external filtering)	6
Impedance	50Ω	
Noise figure	4dB typical at maximum gain	
Group delay	Channel filter dependant	
ALC (Channel Selective) ⁽¹⁾	Channel based	
ALC (Band Selective)	Fitted to prevent Composite power overload	
Selectivity	Dependent on filter selected	
Downlink Output – (20w HPA) ⁽²⁾	+33dBm Composite – FCC Compliant	
Uplink Output	+26dBm Composite – FCC Compliant	
Gain	55dB to 85dB in 1dB steps	
Third order intercept	+54dBm, typical	
Remote control and alarm supervision	Via modem GSM, P-25, PSTN, via Ethernet and SNMP	
Power requirements	110VAC 60Hz or -48VDC	
Power consumption	170W, typical	

External Connection

RF ports	N type female
Local maintenance terminal	RS232
Remote control and alarms	
External alarm inputs	2 external alarm inputs (NC or NO configuration)
Alarm relay output	Dry contact

Mechanical specification

Dimensions L x W x H	24.4" x 16.5" x 11.8" (620mm x 420mm x 300mm) (Options for larger filters & complex frequency bands)
Enclosure	Aluminum IP65 (NEMA4)
Weight	55lbs (25kg) Typical
Cooling	Convection
Mounting	Wall mounted

Environmental

Operating Temperature	-13°F to +131°F (-25°C to +55°C)
Storage Temperature	-22°F to +158°F (-30°C to +70°C)
Humidity	ETSI EN 300 019-2-4

⁽¹⁾ The squelch is set to -108dBm, which ensures correct operation for most repeater system scenarios. It will open approximately 3dB below the static sensitivity in the repeater cell thus it will be open to any mobile on the cell border.

⁽²⁾ The output power is dependent on the filter duplexer losses. Complex duplexing may reduce the available power output.

D-CSR 3302-A Ordering information

Type	Description	Part number
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, AC power feed Duplexer 1, 1 MHz Passband/2 MHz Guardband	D-CSR-3302-8-DP1-AC
D-CSR 3302-A	D-CSR 3302,33dBm,8 filters AC power feed Duplexer 2, 2MHz Passband/2 MHz Guardband	D-CSR-3302-8-DP2-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, AC power feed Duplexer 3, 3 MHz Passband/2 MHz Guardband	D-CSR-3302-8-DP3-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, AC power feed Duplexer 4, 5 MHz Passband/2 MHz Guardband	D-CSR-3302-8-DP4-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, AC power feed Duplexer 5, 1 MHz Passband/1 MHz Guardband	D-CSR-3302-8-DP5-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, AC power feed Duplexer 6, external filtering	D-CSR-3302-8-DP6-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, DC power feed -48 VDC Duplexer 1, 1 MHz Passband/2 MHz Guardband	D-CSR-3302-8-DP1-DC
D-CSR 3302-A	D-CSR 3302,33dBm,8 filters DC power feed -48 VDC Duplexer 2, 2MHz Passband/2 MHz Guardband	D-CSR-3302-8-DP2-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, DC power feed -48 VDC Duplexer 3, 3 MHz Passband/2 MHz Guardband	D-CSR-3302-8-DP3-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, DC power feed -48 VDC Duplexer 4, 5 MHz Passband/2 MHz Guardband	D-CSR-3302-8-DP4-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, DC power feed -48 VDC Duplexer 5, 1 MHz Passband/1 MHz Guardband	D-CSR-3302-8-DP5-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 8 filters, DC power feed -48 VDC Duplexer 6, external filtering	D-CSR-3302-8-DP6-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, AC power feed Duplexer 1, 1 MHz Passband/2 MHz Guardband	D-CSR-3302-4-DP1-AC
D-CSR 3302-A	D-CSR 3302,33dBm,4 filters AC power feed Duplexer 2, 2MHz Passband/2 MHz Guardband	D-CSR-3302-4-DP2-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, AC power feed Duplexer 3, 3 MHz Passband/2 MHz Guardband	D-CSR-3302-4-DP3-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, AC power feed Duplexer 4, 5 MHz Passband/2 MHz Guardband	D-CSR-3302-4-DP4-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, AC power feed Duplexer 5, 1 MHz Passband/1 MHz Guardband	D-CSR-3302-4-DP5-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, AC power feed Duplexer 6, external filtering	D-CSR-3302-4-DP6-AC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, DC power feed -48 VDC Duplexer 1, 1 MHz Passband/2 MHz Guardband	D-CSR-3302-4-DP1-DC
D-CSR 3302-A	D-CSR 3302,33dBm,4 filters DC power feed -48 VDC Duplexer 2, 2MHz Passband/2 MHz Guardband	D-CSR-3302-4-DP2-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, DC power feed -48 VDC Duplexer 3, 3 MHz Passband/2 MHz Guardband	D-CSR-3302-4-DP3-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, DC power feed -48 VDC Duplexer 4, 5 MHz Passband/2 MHz Guardband	D-CSR-3302-4-DP4-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, DC power feed -48 VDC Duplexer 5, 1 MHz Passband/1 MHz Guardband	D-CSR-3302-4-DP5-DC
D-CSR 3302-A	D-CSR 3302,33dBm, 4 filters, DC power feed -48 VDC Duplexer 6, external filtering	D-CSR-3302-4-DP6-DC
D-CSR 3302-A	D-CSR 3302 redundant AC power supply	D-CSR-3302-RPS-AC
D-CSR 3302-A	D-CSR 3302 redundant DC -48V power supply	D-CSR-3302-RPS-DC
D-CSR 3302-A	D-CSR 3302 GPRS modem	D-CSR 3302-MODEM-GPRS
D-CSR 3302-A	D-CSR 3302 modification for NFPA red box and alarms	D-CSR 3302-MOD-NFPA
D-CSR 3302-A	D-CSR 3302 modification for 19" rack mount	D-CSR 3302-MOD-19-RACK

D-CSR 3604-A for Americas

UHF 470-512MHz Digital channel selective repeater

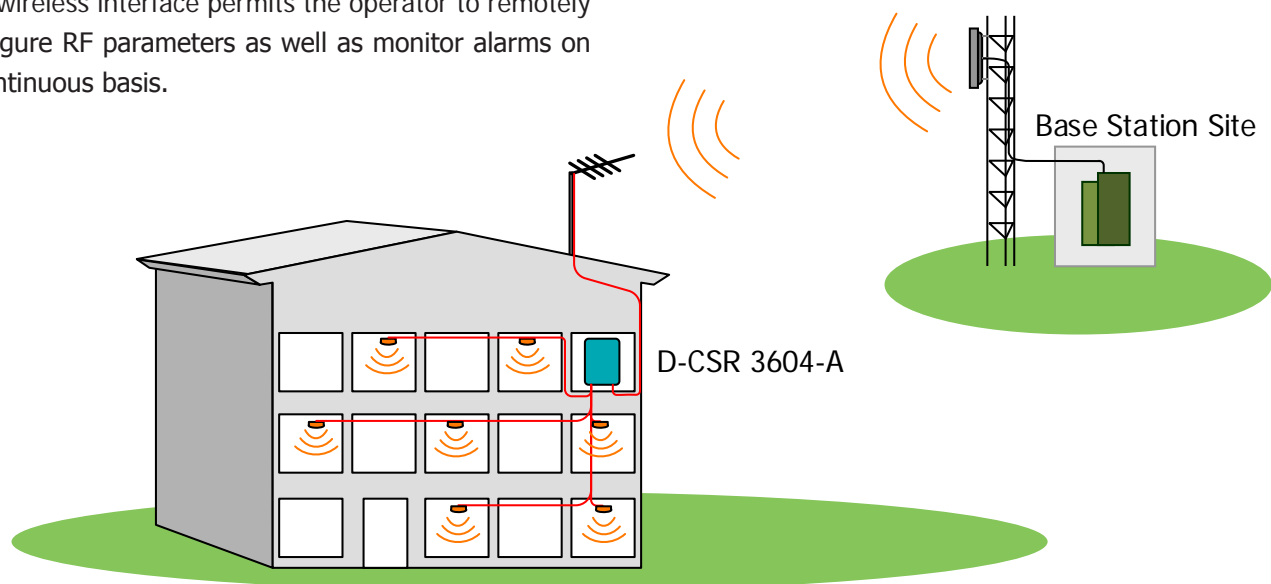
Key features:

- Large repeater coverage footprint due to high output power and gain.
- Easy system implementation with built-in commissioning tools.
- Fast ALC.
- Supervision available over Radio Modems.
- Remotely upgradable for future challenges.
- Very low propagation delay leading to higher security, resilience and availability of information.

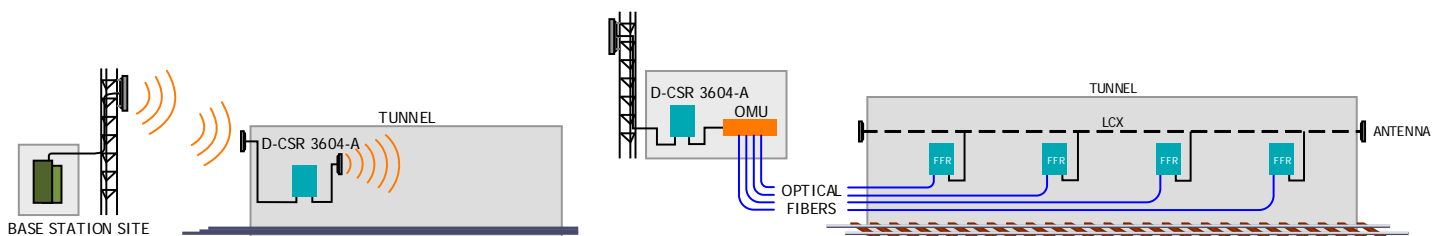


The D-CSR 3604-A provides quick, cost-effective and secure radio coverage in any UHF network and can handle up to eight carriers. Through the use of the D-CSR 3604-A an operator can easily expand a base station's service area by filling in coverage holes caused by terrain, buildings or tunnels.

The wireless interface permits the operator to remotely configure RF parameters as well as monitor alarms on a continuous basis.



The D-CSR 3604-A can be used to provide coverage in shorter tunnels. Longer tunnels can be covered by connecting the repeater to an Optical Master Unit (OMU) that feeds a number of fiber fed repeaters.



D-CSR 3604-A Specifications

Electrical				
Standard operational frequency ranges	Filter Configuration Duplexer Option	380-450MHz	450-470MHz	470MHz-512MHz
Duplexer Frequency Spacings		9 or 10MHz	5MHz	3MHz
Filter-Duplexer Options (Passband/Guardband)	DP1	5MHz / 5MHz	1.0MHz / 2.5MHz	0.5MHz / 2.5MHz
	DP2	2MHz / 8MHz	1.0MHz / 2.0MHz	1.0MHz / 2.0MHz
	DP3	---	1.5MHz / 1.5MHz	1.5MHz / 1.5MHz
	DP4	---	1.8MHz / 1.2MHz	1.8MHz / 1.2MHz
	DP5	---	2.0MHz / 1.0MHz	2.0MHz / 1.0MHz
	DP6	---	External Filters	External Filters
Impedance	50Ω			
Noise figure	4.5dB typical at maximum gain			
Group delay	<32μs (APCO 25 compliant) Alternative filter options programmed for narrow banding or IF band select.			
ALC	Time-slot based per channel			
Squelch ⁽¹⁾	Settable			
Channel bandwidth	15kHz to 110kHz (options for wider bandwidths)			
Selectivity	Dependant on filter selected			
Output power/carrier, Downlink ⁽²⁾	1 carrier: +36dBm; 2 carriers: +33dBm; 4 carriers: +30dBm; 8 carriers: +27dBm			
Output power/carrier, Uplink ⁽²⁾	1 carrier: +36dBm; 2 carriers: +33dBm; 4 carriers: +30dBm; 8 carriers: +27dBm			
Gain	55dB to 85dB in 1dB steps			
Third order intercept	+68dBm, typical			
Spurious Emissions from RF port	< -13dBm FCC Compliant			
Remote control and alarm supervision	IP-based via GSM/EDGE (850/900/1800/1900), GSM-R, UMTS, TETRA, Ethernet Circuit Switched via GSM/EDGE(850/900/1800/1900), GSM-R or PSTN			
Power Requirements	110VAC 60Hz or -48VDC			
Power Consumption	180W, typical			
External Connection				
RF ports	N Female			
External alarm inputs	4			
Alarm relay output	Dry contact			
Mechanical				
Dimensions L x W x H	Duplexer Options 1, 2 or 3: 24" x 16" x 10" (609mm x 406mm x 254mm) Duplexer Options 4 or 5: 24" x 24" x 10" (609mm x 609mm x 254mm) Duplexer Option 6: 24" x 16" x 10" (609mm x 406mm x 254mm)			
Enclosure	Aluminum IP65 (NEMA4)			
Weight based on Duplexer Option	DP1-DP3 77 lbs.; DP4-DP5 90 lbs., DP6 60lbs.			
Cooling	Convection			
Mounting	Wall mounted			
Environmental				
Operating Temperature	-13°F to 131°F (-25°C to 55°C)			
Storage	-22°F to 158°F (-30°C to 70°C)			
Complies with	FCC/IC			

⁽¹⁾ The squelch is set to -108dBm, which ensures correct operation for most repeater system scenarios. It will open approximately 3dB below the static sensitivity in the repeater cell thus it will be open to any mobile on the cell border.

⁽²⁾ Output power/carrier levels may vary by -2dB depending on Filter Configuration. For D-CSR operating in 450-490MHz a minimum of 2 carriers is required for the full composite output power to be attainable maintaining full FCC compliance.

D-CSR 3604-A Ordering information

Type	Description	Part number
D-CSR 3604 380-450	D-CSR 3604 380-450MHz UHF, 36dBm, Duplexer 1, 5MHz Passband/5MHz Guardband + Single Clamshell Case	D-CSR-3604-380-450-DP1
D-CSR 3604 380-450	D-CSR 3604 380-450MHz UHF, 36dBm, Duplexer 2, 2MHz Passband/8 MHz Guardband + Dual Clamshell Case	D-CSR-3604-380-450-DP2
D-CSR 3604 450-470	D-CSR 3604 450-470MHz 8 Channel, 36dBm, Excluding PSU/Dupl/Modem/Case	D-CSR-3604-8-450-470
D-CSR 3604 450-470	D-CSR 3604 450-470MHz 4 Channel, 36dBm, Excluding PSU/Dupl/Modem/Case	D-CSR-3604-4-450-470
D-CSR 3604 450-470	D-CSR 3604 450-470MHz UHF, 36dBm, Duplexer 1, 1MHz Passband/4 MHz Guardband + Single Clamshell Case	D-CSR-3604-450-470-DP1
D-CSR 3604 450-470	D-CSR 3604 450-470MHz UHF, 36dBm Duplexer 2 2MHz Passband/3MHz Guardband + Single Clamshell Case	D-CSR-3604-450-470-DP2
D-CSR 3604 450-470	D-CSR 3604 450-470MHz UHF, 36dBm Duplexer 3, 2.5MHz Passband/2.5 MHz Guardband + Dual Clamshell Case	D-CSR-3604-450-470-DP3
D-CSR 3604 450-470	D-CSR 3604 450-470MHz UHF, 36dBm Duplexer 4, 3MHz Passband/2 MHz Guardband + Dual Clamshell Case	D-CSR-3604-450-470-DP4
D-CSR 3604 450-470	D-CSR 3604 450-470MHz UHF, 36dBm Duplexer 4, 3.5MHz Passband/1.5MHz Guardband, legacy case 24x16x10"	D-CSR-3604-450-470-DP5
D-CSR 3604 450-470	D-CSR 3604 450-470MHz UHF, 36dBm No internal Duplexer, external Duplexer is required, legacy case 24x16x10"	D-CSR-3604-450-470-DP6
D-CSR 3604 470-512	8 Channel 470-512MHz, 36dbm, Excluding Duplexer/Modem/Case/Power Supply	D-CSR-3604-8-470-512
D-CSR 3604 470-512	4 Channel 470-512MHz, 36dbm, Excluding Duplexer/Modem/Case/Power supply	D-CSR-3604-4-470-512
D-CSR 3604 470-512	D-CSR 3604 470-512MHz Duplexer 1, 0.5 MHz Passband/2.5MHz Guardband, legacy case 24x16x10"	D-CSR-3604-470-512-DP1
D-CSR 3604 470-512	D-CSR 3604 470-512MHz Duplexer 2, 1MHz Passband/2MHz Guardband, legacy case 24x16x10"	D-CSR-3604-470-512-DP2
D-CSR 3604 470-512	D-CSR 3604 470-512MHz Duplexer 3 1.5MHz Passband/1.5MHz Guardband, legacy case 24x16x10"	D-CSR-3604-470-512-DP3
D-CSR 3604 470-512	D-CSR 3604 470-512MHz Duplexer 4 1.8MHz Passband/1.2MHz Guardband, legacy case 24x16x10"	D-CSR-3604-470-512-DP4
D-CSR 3604 470-512	D-CSR 3604 470-512MHz Duplexer 5 2MHz Passband/1MHz Guardband, legacy case 24x16x10"	D-CSR-3604-470-512-DP5
D-CSR 3604 470-512	D-CSR 3604 470-512MHz Duplexer 6 (external duplexer required) legacy case 24x16x10"	D-CSR-3604-470-512-DP6

BSR 1804

Band selective compact TETRA repeater

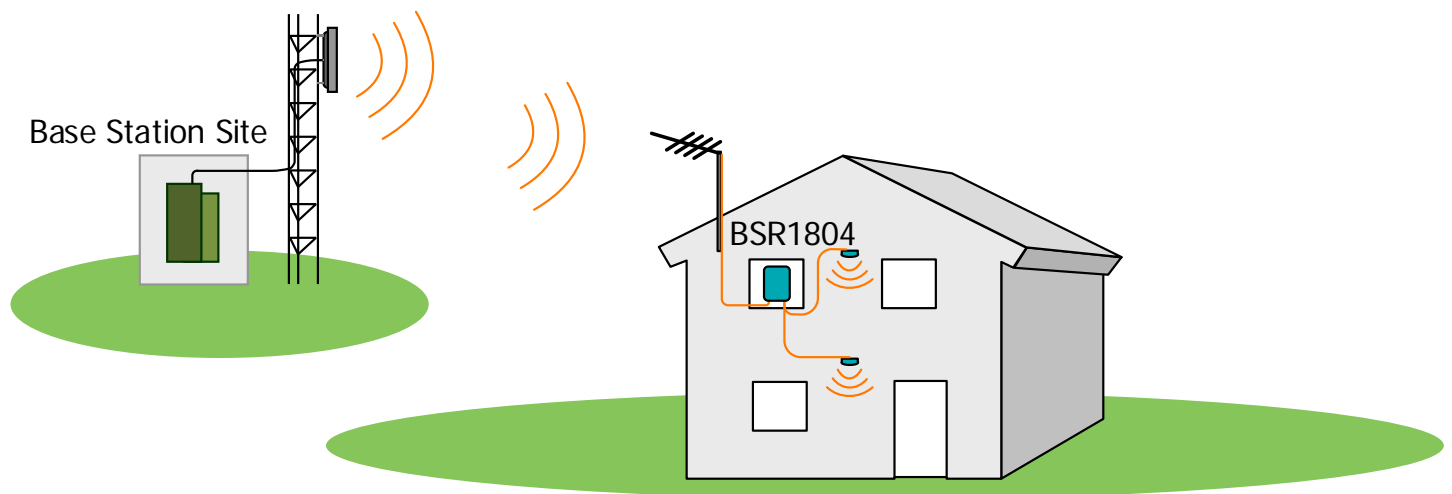
Key features:

- Compact design.
- 18dBm output power.
- 70dB gain.
- Low power consumption.



The BSR 1804 offers quick and easy coverage deployment for indoor applications such as police stations, garages, power plants or confined areas. An outside donor antenna picks up the signal, whilst the indoor server antenna provides the coverage inside the building.

The unit provides relatively high output power and amplifies the signals with a gain of up to 70dB. The low power consumption reduces the OPEX. Installation is further made easy through the use of a wall adapter. The simple and straight forward installation principle allows for a quick deployment.



BSR 1804 Specifications

Electrical	Downlink	Uplink
Frequency bands available	390-395MHz	380-385MHz
	395-400MHz	385-390MHz
	420-425MHz	410-415MHz
	425-430MHz	415-420MHz
	460-465MHz	450-455MHz
	465-470MHz	455-460MHz
Operator bandwidth	5MHz	
Duplex distance	10MHz	
Impedance	50Ω	
Output power/carrier (downlink/uplink)	+18dBm (1 carrier) +15dBm (2 carriers) +12dBm (4 carriers) +9dBm (8 carriers)	
Gain	50-70dB in 1 dB steps	
Intermodulation products	< -36dBm	
Remote control and alarm supervision	Via modem GSM, GSM-R or PSTN modem or Ethernet	
Power requirements	110VAC 60Hz or -48VDC	
Power consumption	< 20W	
External Connection		
Local Maintenance Terminal	RS232	
RF ports	N-Type Female	
External alarms inputs	4 external alarm inputs (N/C or N/O configurable)	
Alarm relay output	Normally open (N/O)	
Mechanical		
Dimensions	11" x 8.8" x 3.2" (280mm x 224mm x 83mm)	
Enclosure	Aluminum IP62	
Weight	8.8lbs (4kg)	
Cooling	convection	
Environmental		
Operating Temperature	32°F to 113°F (0°C to 45°C)	
Storage	-22°F to 158°F (-30°C to 70°C)	
Complies with	TS 101 789-1 73/23/EEG	

BSR 3604

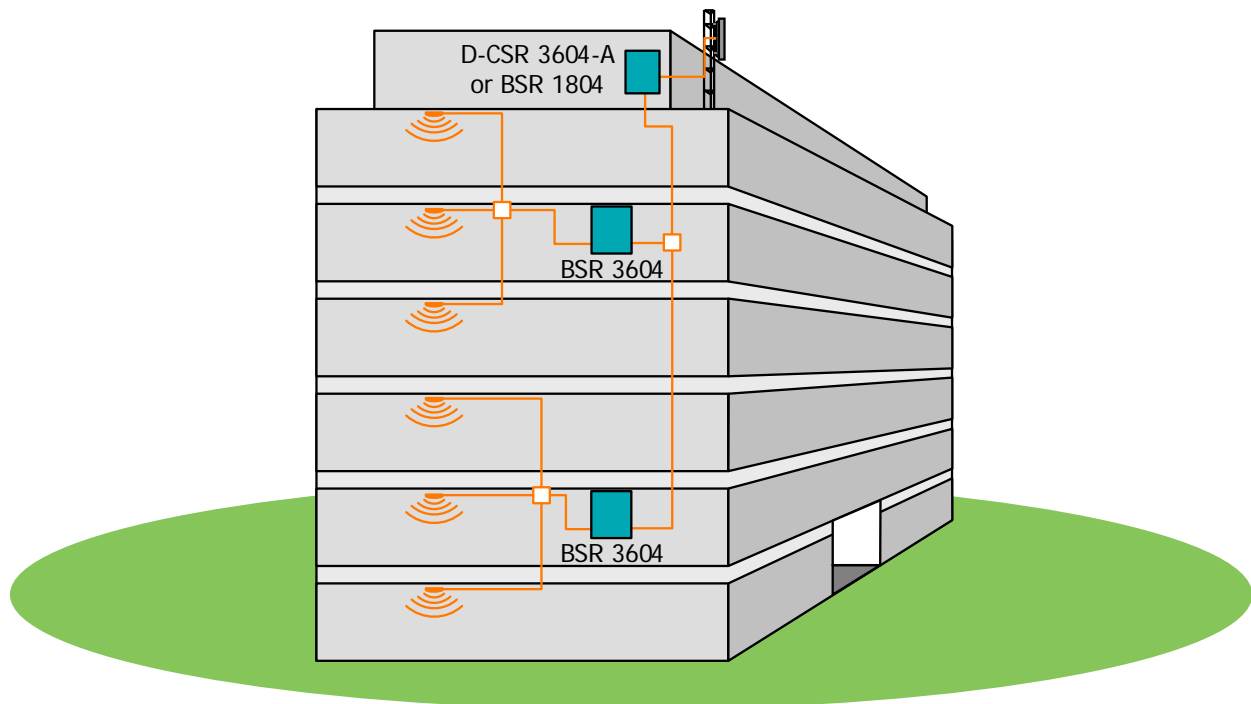
High power band selective TETRA booster

Key features:

The BSR 3604 offers quick and easy coverage deployment for indoor such as police stations, shopping centers, power plants or other types of confined areas. It can be used in combination with an optical distribution system, or as part of a system where an entry shelf unit such as an antenna fed repeater is used in combination with the BSR 3604.

The BSR 1804 (band selective) or D-CSR 3604-A (Digital channel selective) is ideal to use as an entry shelf unit. An outdoor donor antenna picks up the signal, feeds the signal via the BSR 1804 or D-CSR 3604-A to one or several BSR 3604 units.

The signals are then distributed via leaky feeder or indoor server antennas, thus providing sufficient coverage inside the building. The unit provides high output power and amplifies the signals with a gain of up to 60 dB



BSR 3604 Specifications

Electrical	Downlink	Uplink
Frequency bands available	390-395MHz	380-385MHz
	395-400MHz	385-390MHz
	420-425MHz	410-415MHz
	425-430MHz	415-420MHz
	460-465MHz	450-455MHz
	465-470MHz	455-460MHz
Operator bandwidth	5MHz	
Duplex distance	10MHz	
Impedance	50Ω	
Composite output power (UL)	-2dBm	
Output power/carrier (DL)	+36dBm (1 carrier)	
	+33dBm (2 carriers)	
	+30dBm (3-4 carriers)	
	+27dBm (8 carriers)	
Gain	Downlink, 45-60dB in 1dB steps	Uplink, 45-55dB in 1dB steps
IP3	> +68dBm	
Noise figure	<5dB typical at maximum gain	
Group delay	2μs max.	
ALC	Implemented	
Spurious emissions from RF port	< -36dBm	
Intermodulation products	< -36dBm	
Remote control and alarm supervision	Via modem GSM, GSM-R or PSTN modem or Ethernet	
Power requirements	110VAC 60Hz or -48VDC	
Power consumption	< 150W	
External Connection		
RF Ports	7/16 DIN Female	
External alarm inputs	4	
Alarm relay output	Dry contact	
Mechanical		
Dimensions	21.2" x 15" x 8" (540mm x 382mm x 198mm)	
Enclosure	Aluminum IP65 (NEMA4)	
Weight	48.5lbs (22kg)	
Cooling	convection	
Environmental		
Operating Temperature	-13°F to 131°F (-25°C to 55°C)	
Storage	-22°F to 158°F (-30°C to 70°C)	
Complies with	R&TTE D	

D-CSFT 3604

Digital frequency shifting repeater for TETRA

Key features:

- Large outdoor coverage footprint due to high gain and output power.
- Extensive remote control and supervision capabilities.
- Software Defined Radio technology gives low delay and high selectivity.
- Time slot based Automatic Level Control eliminates near-far effects.
- Frequency Shifting technology allows very high gain with low antenna isolation.



The frequency shifting TETRA repeater can provide a much large coverage compared to a conventional repeater. This is due to the reduced antenna isolation requirements, which allow higher gain and consequently higher output power from the repeater.

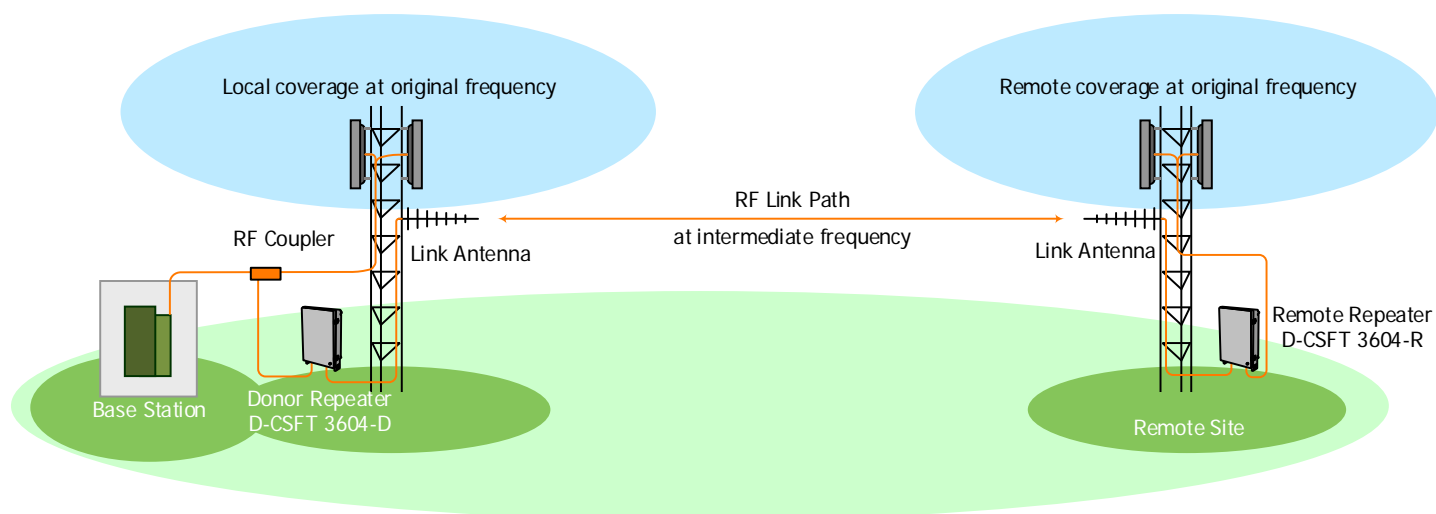
The D-CSFT 3604 is primarily intended for rural area applications, where the

terrain conditions normally would require a large number of base station sites for seamless coverage.

The frequency shifting concept is based on a donor unit D-CSFT 3604-D, placed near the base station, which connects to the remote unit D-CSFT 3604-R over the air using free channels within the operational frequency band.

The D-CSFT 3604 can distribute up to 8 channels from the selected donor base station. The donor unit D-CSFT 3604 can be physically connected to the base station transmit and receive ports through directional couplers.

Both the donor and the remote unit can be remotely controlled and supervised via a built-in wireless modem.



D-CSFT 3604 Specifications

Electrical	Downlink	Uplink
Standard frequency ranges available	390-395MHz	380-385MHz
	395-400MHz	385-390MHz
	420-425MHz	410-415MHz
	425-430MHz	415-420MHz
	460-465MHz	450-455MHz
	465- 470MHz	455-460MHz
Number of channels	up to 8	
Channel frequency	Any TETRA channel within the ordered frequency range	
Impedance	50Ω	
Noise figure	4.5dB at maximum gain	
Group delay	<12μs (14μs high selectivity)	
ALC	Time-slot based per channel	
Squelch ⁽¹⁾	Settable	
Selectivity	According to ETSI TS 101-789-1	
Output power/carrier	+36dBm (1 carrier)	
	+33dBm (2 carriers)	
	+30dBm (4 carriers)	
	+27dBm (8 carriers)	
Gain	65dB to 95dB (Remote and Donor units) in 1dB steps	
Third order intercept	+68dBm, typical	
Spurious Emissions from RF port	< -36dBm	
Intermodulation products	-60dBc (according to TS 101-789-1)	
Remote control and alarm supervision	Via modem GSM, GSM-R, TETRA, PSTN, via Ethernet and GPRS	
Power Requirements	110VAC 60Hz or -48VDC	
Power Consumption	180W, typical (Remote unit), 140W, typical (Donor unit)	
External Connection		
RF ports	7/16 DIN Female	
External alarm inputs	4	
Alarm relay output	Dry contact	
Mechanical		
Dimensions (H x W x D)	21.2" x 15" x 8" (540mm x 382mm x 198mm)	
Enclosure	Aluminum IP65 (NEMA4)	
Weight	48.5lbs (22kg)	
Cooling	Convection	
Mounting	Wall mounted	
Environmental		
Operating Temperature	-13°F to 131°F (-25°C to + 55°C)	
Storage	-22°F to 158°F (-30°C to + 70°C)	
Humidity	ETSI EN 300 019-2-4 (see compliance below)	
Complies with	R&TTE Directive including, EN 301 489-18 ETSI TS 101 789-1, EN 60 950	

⁽¹⁾ The squelch is set to -108 dBm, which ensures correct operation for most repeater system scenarios.

D-MBR 3007-3008 PS-NFPA (Class A)

700/800MHz digital multi-channel, class A, RF signal booster

Key features:

- Class A signal booster for SMR and public safety networks
- Supports APCO 25 phase 1 and 2 for public safety networks
- NFPA 72-2010, Chapter 24 and IFC 510.1 Compliant
- Patented DSP Filtering™ technology.
 - Supports up to 24 independent filters
 - User programmable bandwidth / frequency.
- IP65, (NEMA4) enclosure.
- SmartALC™ algorithm to protect the digital signal booster from oscillation and shutdown the signal booster when required
- Web based management , SNMP traps



D-MBR 3007-3008 PS NFPA (Digital Multi Band Repeater for Public Safety) is a Class A Digital Multi-Channel Signal Booster (DCSB). It features an array of up to 12 DSP based, software-controlled, variable bandwidth filters (up to 75kHz), that are user-programmable across the 700 and 800 MHz bands.

D-MBR 3007-3008 PS NFPA supports all public safety technologies. For each filter, the user can specify the start and stop frequencies to reduce the installation time of the signal booster and enable a very wide range of filters selection.

Every parameter of D-MBR 3007-3008 PS NFPA, including filter tuning and selection, can be controlled via web based management. The patented Cobham Wireless' digital RF filter enables simple initial setup for any channel plan and if necessary, allows some basic reconfiguration due to re-banding.

The SmartALC™ algorithm will reduce the gain to protect the signal booster from oscillation. When the gain cannot be reduced anymore a shut-down mechanism will be triggered.

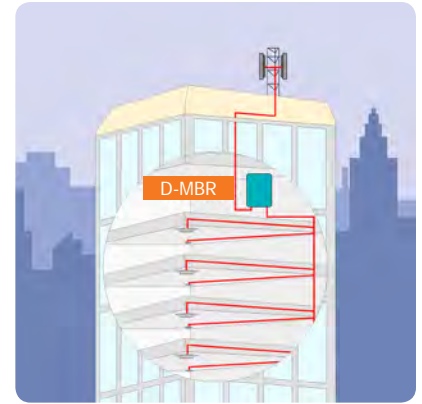
The signal booster protects against degradation of the system's sensitivity and coverage. This is implemented by the inbuilt AGC per-channel (filter) feature, which permits equalization of the channel levels for uniform coverage.

This Cobham Wireless product meets the rigid requirements as defined by the NFPA and International Fire Code developmental organizations. The amplifier is painted a Fire Life Safety Red, meets NEMA4 compliance for hose down, and provides all Alarming outputs as defined by NFPA 2010, Chapter 24 including system and antenna failures.

D-MBR 3007-3008 PS-NFPA Specifications

Class A

The D-MBR 3007-3008 PS NFPA is a digital, multi-channel signal booster which provides reliable and interference-free coverage when in the presence of other services in the adjacent channels.



Electrical	Downlink	Uplink
Frequency Range: SMR 700MHz	763-775MHz	793-805MHz
Frequency Range: SMR 800MHz	851-861MHz	806-816MHz
Passband Gain	55dB to 85dB Adjustable in 1 dB steps	
Passband Ripple	± 2.5 dB	± 2.5 dB
Gain attenuation range	30 dB	
Filter Bandwidth SMR 700MHz	Programmable BW 12.5kHz to 75kHz at 12.5kHz steps	
Filter Bandwidth SMR 800MHz	Programmable BW 12.5kHz to 75kHz at 12.5kHz steps	
Number of filters (SMR 700 & 800) ⁽¹⁾	12	
Composite Output Power SMR 700MHz ⁽²⁾	+ 30dBm	+ 24dBm
Composite Output Power SMR 800MHz ⁽²⁾	+ 30dBm	+ 24dBm
Noise Figure at Maximum Gain	5.0dB	
General		
Dimensions H x W x D	13.78" x 18.1" x 5.7" (350mm x 460mm x 145mm)	
Power Supply	110VAC 60Hz or -48VDC	
Power Consumption	<150W	
Total RF Input Power (no damage)	+10dBm	
Impedance Level	50Ω	
RF Connector	N-type, Female	
VSWR	1.5:1 maximum	
Compliance	IC/FCC	
Environmental		
Operating Temperature	-5°F to 122°F (-20°C to 50°C)	
Humidity	10% to 90% Condensed	
Weight	28.8lbs (13kg)	
Enclosure	Aluminum IP65 (NEMA4)	

⁽¹⁾ Each filter can support one or more channels according to the selected bandwidth of the filter

⁽²⁾ For single band 700 or 800MHz DL composite power is 3dB more (33dBm)

Ordering Information

Identification	Description	Part Number
D-MBR 3007-3008 PS with NFPA and Red painted case	Digital Multi Channel Selective Signal Booster Class A 700/800 MHz 12 filters, 30dBm composite per band, 85dB gain, AC powering with NFPA and IFC compliant Alarm Outputs and red painted case.	D-MBR 3007-3008-PS-NFPA-A
D-MBR 3007-3008 PS with NFPA and Red painted case	Digital Multi Channel Selective Signal Booster Class A 700/800 MHz 12 filters, 30dBm composite per band, 85dB gain, -48 VDC powering with NFPA and IFC compliant Alarm Outputs and red painted case.	D-MBR 3007-3008-PS-NFPA-DC-A

D-MBR 3007-3008 PS-NFPA (Class B)

700/800MHz digital multi-channel, class B, RF signal booster

Key features:

- Class B signal booster for SMR and public safety networks
- Supports APCO 25 phase 1 and 2 for public safety networks
- NFPA 72-2010, Chapter 24 and IFC 510.1 Compliant
- Support of 700MHz D block for LTE network
- Patented DSP Filtering™ technology.
 - Supports up to 24 independent filters
 - User programmable bandwidth / frequency.
- IP65, (NEMA4) enclosure.
- SmartALC™ mechanism to protect the digital signal booster from oscillation and shutdown the signal booster when required
- Web based management , SNMP traps



D-MBR 3007-3008 PS NFPA (Digital Multi Band Repeater for Public Safety) is a Class B Digital Multi-Channel Signal Booster (DCSB). It features an array of up to 12 DSP based, software-controlled, variable bandwidth filters, that are user-programmable across the 700 and 800 MHz bands.

D-MBR 3007-3008 PS NFPA supports all public safety technologies. For each filter, the user can specify the start and stop frequencies to reduce the installation time of the signal booster and enable a very wide range of filters selection.

Every parameter of D-MBR 3007-3008 PS NFPA, including filter tuning and selection, can be controlled via web based management. The patented Cobham Wireless' digital RF filter enables simple initial setup for any channel plan and if necessary, allows some basic reconfiguration due to re-banding.

The SmartALC™ algorithm will reduce the gain to protect the signal booster from oscillation. When the gain cannot be reduced anymore a shut-down mechanism will be triggered.

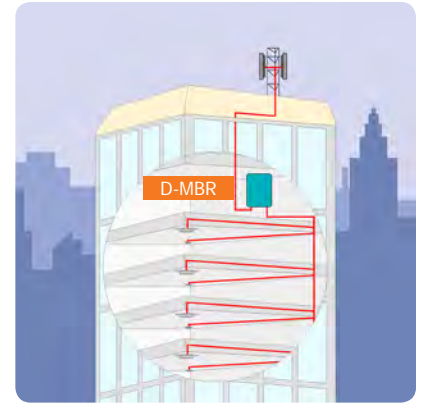
The signal booster protects against degradation of the system's sensitivity and coverage. This is implemented by the inbuilt AGC per-channel (filter) feature, which permits equalization of the channel levels for uniform coverage.

This Cobham Wireless product meets the rigid requirements as defined by the NFPA and International Fire Code developmental organizations. The amplifier is painted a Fire Life Safety Red, meets NEMA4 compliance for hose down, and provides all Alarming outputs as defined by NFPA 2010, Chapter 24 including system and antenna failures.

D-MBR 3007-3008 PS-NFPA Specifications

Class B

The D-MBR 3007-3008 PS NFPA is a digital, multi-channel signal booster which provides reliable and interference-free coverage when in the presence of other services in the adjacent channels.



Electrical	Downlink	Uplink
Frequency Range: SMR 700MHz, D block	758-763MHz	788-793MHz
Frequency Range: SMR 700MHz	763-775MHz	793-805MHz
Frequency Range: SMR 800MHz	851-861MHz	806-816MHz
Passband Gain	55dB to 85dB Adjustable in 1dB steps	
Passband Ripple	± 2.5dB	± 2.5dB
Gain attenuation range	30dB	
Filter Bandwidth SMR 700MHz (*)	Programmable 75kHz to 1MHz at 12.5kHz steps, 1MHz-17MHz at 200kHz steps	
Filter Bandwidth SMR 800MHz (*)	Programmable 75kHz to 1MHz at 12.5kHz steps, 1MHz-10MHz at 200kHz steps	
Number of filters (SMR 700 & 800)	12	
Composite Output Power SMR 700MHz	+ 30dBm	+ 24dBm
Composite Output Power SMR 800MHz	+ 30dBm	+ 24dBm
Noise Figure at Maximum Gain	5.0dB	
General		
Dimensions H x W x D	13.78" x 18.1" x 5.7" (350mm x 460mm x 145mm)	
Power Supply	110VAC 60Hz or -48VDC	
Power Consumption	<150W	
Total RF Input Power (no damage)	+10dBm	
Impedance Level	50 Ω	
RF Connector	N-type, Female	
VSWR	1.5:1 maximum	
Compliance	IC/FCC	
Environmental		
Operating Temperature	-5°F to 122°F (-20°C to 50°C)	
Humidity	10% to 90% Condensed	
Weight	28.8lbs (13kg)	
Enclosure	Aluminum IP65 (NEMA4)	

(*) Every filter above 10MHz utilize 2 FPGA resources

Ordering Information

Identification	Description	Part Number
D-MBR 3007-3008 PS with NFPA and Red painted case	Digital Multi Channel Selective Signal Booster Class B 700/800 MHz 12 filters, 30dBm composite per band, 85dB gain, AC powering with NFPA and IFC compliant Alarm Outputs and red painted case.	D-MBR 3007-3008-PS-NFPA
D-MBR 3007-3008 PS with NFPA and Red painted case	Digital Multi Channel Selective Signal Booster Class B 700/800 MHz 12 filters, 30dBm composite per band, 85dB gain, -48 VDC powering with NFPA and IFC compliant Alarm Outputs and red painted case.	D-MBR 3007-3008-PS-NFPA-DC

D-MBR 3707-3708 PS-NFPA (Class A)

700/800MHz digital multi-channel, class A, RF signal booster

Key features:

- Class A signal booster for SMR and public safety networks
- Supports APCO 25 phase 1 and 2 for public safety networks
- NFPA 72-2010, Chapter 24 and IFC 510.1 Compliant
- Patented DSP Filtering™ technology.
 - Supports up to 24 independent filters
 - User programmable bandwidth / frequency.
- IP65, (NEMA4) enclosure.
- SmartALC™ mechanism to protect the digital signal booster from oscillation and shutdown the signal booster when required
- Web based management , SNMP traps



D-MBR 3707-3708 PS NFPA (Digital Multi Band Repeater for Public Safety) is a Class A Digital Multi-Channel Signal Booster (DCSB). It features an array of up to 12 DSP based, software-controlled, variable bandwidth filters (up to 75kHz) per band , that are user-programmable across the 700 and 800 MHz bands.

D-MBR 3707-3708 PS NFPA supports all public safety technologies. For each filter, the user can specify the start and stop frequencies to reduce the installation time of the signal booster and enable a very wide range of filters selection.

Every parameter of D-MBR 3707-3708 PS NFPA, including filter tuning and selection, can be controlled via web based management.

The patented Cobham Wireless' digital RF filter enables simple initial setup for any channel plan and if necessary, allows some basic reconfiguration due to re-banding.

The SmartALC™ algorithm will reduce the gain to protect the signal booster from oscillation. When the gain cannot be reduced anymore a shut-down mechanism will be triggered.

The signal booster protects against degradation of the system's sensitivity and coverage. This is implemented by the inbuilt AGC per-channel (filter) feature, which permits equalization of the channel levels for uniform coverage.

This Cobham Wireless product meets the rigid requirements as defined by the NFPA and International Fire Code developmental organizations.

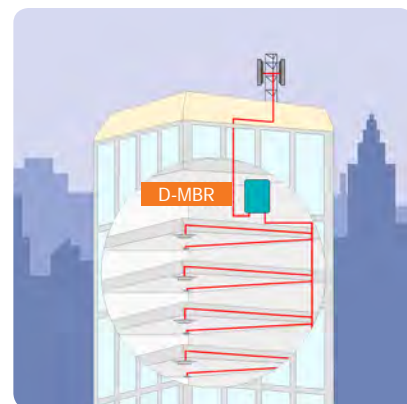
The amplifier is painted a Fire Life Safety Red, meets NEMA4 compliance for hose down, and provides all Alarming outputs as defined by NFPA 2010, Chapter 24 including system and antenna failures.

The signal booster is a DC fed unit. An external battery charger unit is also available. The charger unit is powered by an AC supply and includes a circuit to charge external batteries. The charger unit is also equipped with a range of dry contact alarms as defined in the NFPA standard: AC failure, Charger failure and Low battery.

D-MBR 3707-3708 PS-NFPA Specifications

Class A

The D-MBR 3707-3708 PS NFPA is a digital, multi-channel signal booster which provides reliable and interference-free coverage when in the presence of other services in the adjacent channels.



Electrical	Downlink	Uplink
Frequency Range: SMR 700MHz	763-775MHz	793-805MHz
Frequency Range: SMR 800MHz	851-869MHz	806-842MHz
Passband Gain	65dB to 95dB Adjustable in 1dB steps	
Passband Ripple	± 2.5dB	± 2.5dB
Gain attenuation range	30dB	
Filter Bandwidth SMR 700MHz	Programmable BW 12.5kHz to 75kHz at 12.5kHz steps	
Filter Bandwidth SMR 800MHz	Programmable BW 12.5kHz to 75kHz at 12.5kHz steps	
Number of filters (SMR 700 & 800)	Up to 12	
Composite Output Power SMR 700MHz	+ 37dBm	+ 28dBm
Composite Output Power SMR 800MHz	+ 37dBm	+ 28dBm
Noise Figure at Maximum Gain	5.0dB	
General		
Dimensions H x W x D	21.3" x 15" x 12.3" (540mm x 382mm x 313mm)	
Power Supply	36-76 VDC	
Power Consumption	350W	
Total RF Input Power (no damage)	+10dBm	
Impedance Level	50Ω	
RF Connector	N-type, Female	
VSWR	1.5:1 maximum	
Compliance	IC/FCC	
Environmental		
Operating Temperature	-5°F to 122°F (-20°C to 50°C)	
Humidity	10% to 90% Condensed	
Weight	73lbs (33kg)	
Enclosure	Aluminum IP65 (NEMA4)	

Ordering Information

Identification	Description	Part Number
D-MBR 3707-3708 PS with NFPA and Red painted case	Digital Multi Channel Selective Signal Booster Class A 700/800 MHz 12 filters per band, 37dBm composite per band, 95dB gain, DC powering with NFPA and IFC compliant Alarm Outputs and red painted case.	D-MBR 3707-3708-PS-NFPA-DC-CLASS-A

D-MBR 3707-3708 PS-NFPA (Class B)

700/800 MHz digital multi-channel RF signal booster

Key features:

- Class B signal booster for SMR and public safety networks
- Supports APCO 25 phase 1 and 2 for public safety networks
- NFPA 72-2010, Chapter 24 and IFC 510.1 Compliant
- Support of 700MHz D block for LTE network
- Patented DSP Filtering™ technology.
 - Supports up to 12 independent filters
 - User programmable bandwidth / frequency.
- IP65, (NEMA4) enclosure.
- SmartALC™ mechanism to protect the digital signal booster from oscillation and shutdown the signal booster when required
- Web based management , SNMP traps



D-MBR 3707-3708 PS NFPA (Digital Multi Band Repeater for Public Safety) is a Class B Digital Multi-Channel Signal Booster (DCSB). It features an array of up to 12 DSP based, software-controlled, variable bandwidth filters per band , that are user-programmable across the 700 and 800 MHz bands.

D-MBR 3707-3708 PS NFPA supports all public safety technologies. For each filter, the user can specify the start and stop frequencies to reduce the installation time of the signal booster and enable a very wide range of filters selection.

Every parameter of D-MBR 3707-3708 PS NFPA, including filter tuning and selection, can be controlled via web based management.

The patented Cobham Wireless' digital RF filter enables simple initial setup for any channel plan and if necessary, allows some basic reconfiguration due to re-banding.

The SmartALC™ algorithm will reduce the gain to protect the signal booster from oscillation. When the gain cannot be reduced anymore a shut-down mechanism will be triggered.

The signal booster protects against degradation of the system's sensitivity and coverage. This is implemented by the inbuilt AGC per-channel (filter) feature, which permits equalization of the channel levels for uniform coverage.

This Cobham Wireless product meets the rigid requirements as defined by the NFPA and International Fire Code developmental organizations.

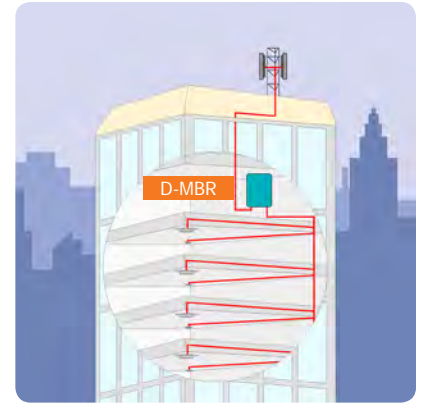
The amplifier is painted a Fire Life Safety Red, meets NEMA4 compliance for hose down, and provides all Alarming outputs as defined by NFPA 2010, Chapter 24 including system and antenna failures.

The signal booster is a DC fed unit. An external battery charger unit is also available. The charger unit is powered by an AC supply and includes a circuit to charge external batteries. The charger unit is also equipped with a range of dry contact alarms as defined in the NFPA standard: AC failure, Charger failure and Low battery.

D-MBR 3707-3708 PS-NFPA Specifications

Class B

The D-MBR 3707-3708 PS NFPA is a digital, multi-channel signal booster which provides reliable and interference-free coverage when in the presence of other services in the adjacent channels.



Electrical	Downlink	Uplink
Frequency Range: SMR 700MHz, D block	758-763MHz	788-793MHz
Frequency Range: SMR 700MHz	763-775MHz	793-805MHz
Frequency Range: SMR 800MHz	851-869MHz	806-824MHz
Passband Gain	65dB to 95dB Adjustable in 1dB steps	
Passband Ripple	± 2.5dB	± 2.5dB
Gain attenuation range	30dB	
Filter Bandwidth SMR 700MHz (*)	Programmable 75kHz to 1MHz at 12.5kHz steps, 1MHz-17MHz at 200kHz steps	
Filter Bandwidth SMR 800MHz (*)	Programmable 75kHz to 1MHz at 12.5kHz steps, 1MHz-18MHz at 200kHz steps	
Number of filters (SMR 700 & 800)	Up to 12	
Composite Output Power SMR 700MHz	+ 37dBm	+ 28dBm
Composite Output Power SMR 800MHz	+ 37dBm	+ 28dBm
Noise Figure at Maximum Gain	5.0dB	
General		
Dimensions H x W x D	21.3" x 15" x 12.3" (540mm x 382mm x 313mm)	
Power Supply	36-76 VDC	
Power Consumption	350W	
Total RF Input Power (no damage)	+10dBm	
Impedance Level	50Ω	
RF Connector	N-type, Female	
VSWR	1.5:1 maximum	
Compliance	IC/FCC	
Environmental		
Operating Temperature	-5°F to 122°F (-20°C to 50°C)	
Humidity	10% to 90% Condensed	
Weight	73lbs (13kg)	
Enclosure	Aluminum IP65 (NEMA4)	

Ordering Information

Identification	Description	Part Number
D-MBR 3707-3708 PS with NFPA and Red painted case	Digital Multi Channel Selective Signal Booster Class B 700/800 MHz 12 filters per band, 37dBm composite per band, 95dB gain, DC powering with NFPA and IFC compliant Alarm Outputs and red painted case.	D-MBR 3707-3708-PS-NFPA-DC-CLASS-B

AC Feeder / Battery Charger

AC Feeder & Battery Charger for signal boosters complying with NFPA requirements

Key features:

- Provides a DC supply for the Signal Booster
- Float charges back-up batteries
- Complies with NFPA 2010 , Chapter 24 alarm requirements
- IP65, (NEMA4) enclosure.



The battery charger unit is connected to the Mains AC supply and provides the following features:

- Converting AC input (110VAC) to -48VDC to feed the signal booster from AC power
- Automatic switch to Battery when AC Fail
- Battery charger for external Lead Acid batteries (200Ah)
- Selection of 2 or 3 or 8 stage battery charging for longer battery life
- All dry contact alarms as defined in the NFPA 2010, chapter 24 requirement.

The dry contact alarms as defined in the NFPA standard include: AC failure, Charger failure and Low battery

AC Feeder / Battery Charger Specifications

AC Feeder and Battery Charger

Dimensions H x W x D	21.3" x 15" x 12.3" (540mm x 382mm x 313mm)
Power Supply	110VAC 60Hz
Power Consumption	<50 Watt
Output voltage	-48VDC
Dry contact alarms	3 relays for AC fail, charger fail and low battery
Charging time (200Ah) for external Lead Acid batteries	20 hours

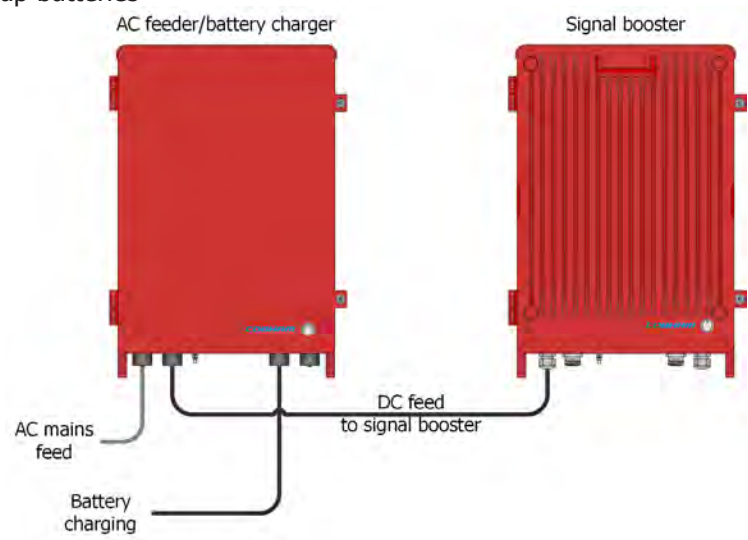
Environmental

Operating Temperature	-5°F to 122°F (-20°C to 50°C)
Humidity	10% to 90% Condensed
Weight	44lbs (20kg)
Enclosure	Aluminum IP65 (NEMA4)

AC Feeder / Battery Charger

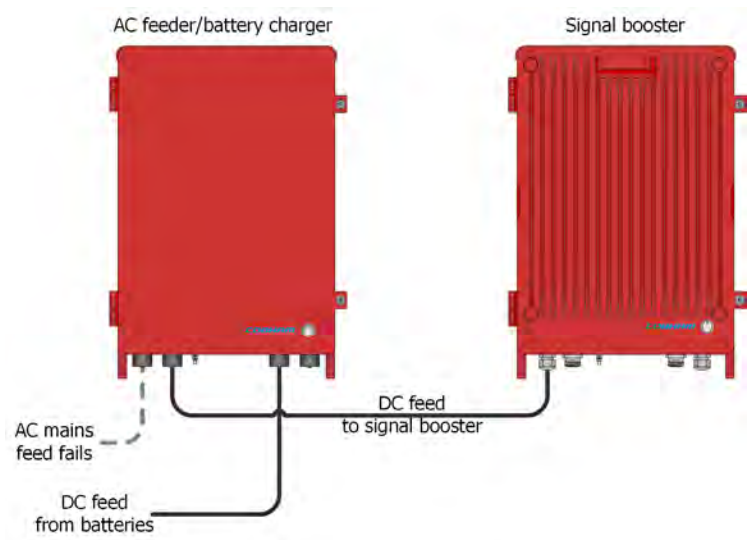
Scenario 1

The AC Feeder / Battery Charger receives AC power from the mains supply, provides a DC supply for the signal booster and float charges the back-up batteries



Scenario 2

The AC mains supply has failed; the AC Feeder / Battery Charger provides a DC supply for the signal booster from the back-up batteries



Ordering Information		
Identification	Description	Part Number
AC feeder and battery charger	AC feeder and battery charger for 200AH batteries with NFPA and IFC compliant Alarm Outputs and red painted case.	BATT-CHARGER-110VAC-200AH-NFPA

BSR 3308 PS NFPA

SMR 800 MHz RF Signal Booster, medium power

Key features:

- Class B - Band selective signal booster for SMR, ESMR and public safety networks.
- NFPA 72-2010, chapter 24 and IFC 510.1 compliant.
- IF-SAW filtering – high out-of-band rejection.
- Indoor coverage up to 100,000 square feet.
- Features CobhamWireless' SmartALC™ technology, to prevent oscillation and shutdown the signal booster when required.
- Switchable bandwidth option;
 - User-selectable and tunable across the 800MHz band.
 - Accommodates all rebanding phases without changing hardware.
- Web Based management, SNMP traps.



The BSR 3308 PS NFPA is available with a switchable bandwidth feature. With this feature, the unit is configured with three possible frequency blocks that the operator can specify. One of the three blocks is selected by the user and tuned to the desired frequency during set up. This permits the user to select the optimum pass band for each of the re-banding phases without the need to change any hardware. The standard configurations accommodate most of the pass band requirements for public safety, ESMR and SMR networks.

The BSR 3308 PS NFPA includes Cobham Wireless' proprietary SmartALC™ power control algorithm. SmartALC™ prevents oscillations, reduces the amount of

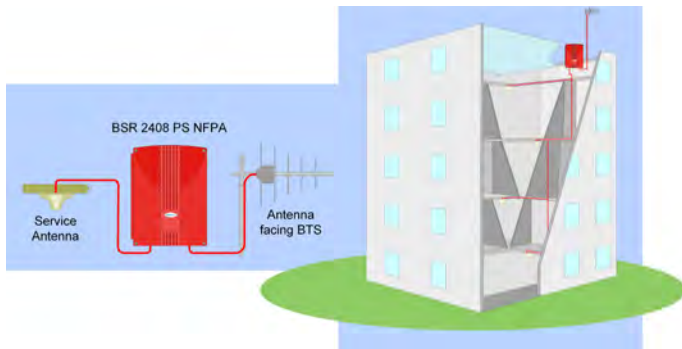
isolation required by the system and optimizes the system to minimize noise rise at the donor site. SmartALC™ allows the installer to quickly set up the unit, yet still achieve the design goals specified by the system engineer.

In the case that oscillation has been detected the gain will be reduced respectfully to the isolation level, and if the oscillation still exists above user max power setting, the signal booster power amplifier will shut-down.

The BSR 3308 PS NFPA features two color front panel LEDs that provide ongoing status and alarm indication. In addition, the DL LED can be used during setup as a received signal strength

level indicator to help align the donor antenna for optimal performance. The efficient thermal characteristics of the BSR 3308 PS NFPA careful component selection and robust design result in high system reliability.

This Cobham Wireless product meets the rigid requirements as defined by the NFPA and International Fire Code developmental organizations. The amplifier is painted a Fire Life Safety Red, meets NEMA4 compliance for hose down, and provides all Alarming outputs as defined by NFPA 2010, Chapter 24 including system and antenna failures.



The BSR 3308 PS NFPA signal booster is a cost-effective solution for medium sized buildings for coverage of up to 100,000² ft. It can be also be used for outdoor coverage or as a feeder to fiber optic DAS (Distributed Antenna System).

BSR 3308 PS NFPA Specifications

Electrical	Downlink	Uplink
Frequency Range ⁽¹⁾	851MHz-869MHz	806MHz-824MHz
Passband Gain	85dB	85dB
Passband Ripple	± 1.5dB	± 1.5dB
Gain Attenuation Range	0dB to 27dB (in 1dB steps)	0dB to 27dB (in 1dB steps)
Composite Output Power (per carrier)	+33dBm	+27dBm
Noise Figure at Maximum Gain (typical)	5dB	5dB
Propagation Delay	<5µs	<5µs
⁽¹⁾ 3 selectable and tunable sub-bands are standard		
General		
Power Supply	110VAC 60Hz or -48VDC	
Power Consumption	120W	
Total RF Input Power (no damage)	+10dBm	
RF Connector	N-type, Female	
VSWR	1.7:1	
Compliance	FCCID : NEOBSR3308PS – please refer to the new FCC guidelines below	
Environmental		
Operating Temperature	-4°F to 122°F (-20°C to 50°C)	
Storage Temperature	-22°F to 176°F (-30°C to 80°C)	
Humidity	10% - 90% Condensed	
Dimensions W x H x D	13.78" x 18.11" x 5.7" (350mm x 460mm x 145mm)	
Weight	28.8lbs (13kg)	
Enclosure	Aluminum IP65 (NEMA4)	

Ordering Information

Identification	Description	Part Number
BSR 3308 PS NFPA	BSR 3308 SMR 800, 33dBm 18/10/3MHz NFPA	BSR 3308-PS-18-10-3-NFPA
BSR 3308 PS NFPA	BSR 3308 SMR 800, 33dBm 18/10/3MHz NFPA 48VDC	BSR 3308-PS-18-10-3-NFPA-DC

New FCC guidelines



WARNING: This is NOT a CONSUMER device. The BSR-3308 is designed for installation by FCC LICENCEES and QUALIFIED INSTALLERS.

You must have an FCC LICENCE or express consent of an FCC Licensee to operate this device.

This is a Class B signal booster. You MUST register Class B signal boosters (as defined in 47 CFR 90.219) online at

www.fcc.gov/signal-boosters/registration

Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.

The installation procedure must result in the signal booster complying with FCC requirements 90.219(d). In order to meet FCC requirements 90.219(d), it may be necessary for the installer to reduce the UL and/or DL output power for certain installations.

D-SBR 4008 PS-NFPA (Class A)

800 MHz digital multi-channel class A, RF signal booster

Key features:

- Class A signal booster for SMR and public safety networks
- Supports APCO 25 phase 1 and 2 for public safety networks
- NFPA 72-2010, Chapter 24 and IFC 510.1 Compliant
- Patented DSP filtering™ technology
 - Supports up to 24 independent filters
 - User programmable bandwidth / frequency
- NEMA4 enclosure
- SmartALC™ mechanism to protect the digital signal booster from oscillation and shutdown the signal booster when required
- Web based management , SNMP traps



D-SBR 4008 PS NFPA (Digital Multi Band Repeater for Public Safety) is a Class A Digital Multi-Channel Signal Booster (DCSB). It features an array of up to 24 DSP based, software-controlled, variable bandwidth filters (up to 75kHz) per band, that are user-programmable across 800 MHz bands.

D-SBR 4008 PS NFPA supports all public safety technologies. For each filter, the user can specify the start and stop frequencies to reduce the installation time of the signal booster and enable a very wide range of filters selection.

Every parameter of D-SBR 4008 PS NFPA, including filter tuning and selection, can be controlled via web based management. The patented Cobham Wireless' digital RF filter enables simple initial setup for any

channel plan and if necessary, allows some basic reconfiguration due to re-banding.

The SmartALC™ algorithm will reduce the gain to protect the signal booster from oscillation. When the gain cannot be reduced anymore a shut-down mechanism will be triggered.

The signal booster protects against degradation of the system's sensitivity and coverage. This is implemented by the inbuilt AGC per-channel (filter) feature, which permits equalization of the channel levels for uniform coverage.

This Cobham Wireless product meets the rigid requirements as defined by the NFPA and International Fire Code developmental organizations. The

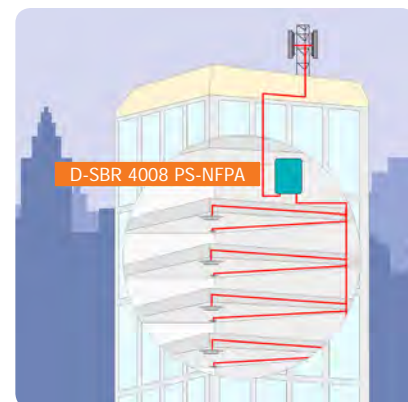
amplifier is painted a Fire Life Safety Red, meets NEMA4 compliance for hose down, and provides all Alarming outputs as defined by NFPA 2010, Chapter 24 including system and antenna failures.

The signal booster is a DC fed unit. An external battery charger unit is also available. The charger unit is powered by an AC supply and includes a circuit to charge external batteries. The charger unit is also equipped with a range of dry contact alarms as defined in the NFPA standard: AC failure, Charger failure and Low battery.

D-SBR 4008 PS-NFPA Specifications

Class A

The D-SBR 4008 PS NFPA is a digital, multi-channel signal booster which provides reliable and interference-free coverage when in the presence of other services in the adjacent channels.



Electrical	Downlink	Uplink
Frequency Range	851-869MHz	806-824MHz
Passband Gain	65dB to 95dB Adjustable in 1 dB steps	
Passband Ripple	± 2.5dB maximum	± 2.5dB maximum
AGC Dynamic Range	30dB	
Filter Bandwidth	Programmable BW 12.5kHz to 75kHz at 12.5kHz step	
Number of filters	Up to 24	
Composite Output Power	+40dBm	+28dBm
Noise Figure at Maximum Gain	5.0dB	
General		
Dimensions W x D x H	21.3" x 15" x 12.3" (540mm x 382mm x 313 mm)	
Power Supply	36-76 VDC	
Power Consumption	280W	
Total RF Input Power (no damage)	+10dBm	
Impedance Level	50Ω	
RF Connector	N-type, Female	
VSWR	1.5:1 maximum	
Compliance	IC/FCC	
Environmental		
Operating Temperature	-5°F to 122°F (-20°C to 50°C)	
Humidity	10% - 90% Condensed	
Weight	73lbs (33kg)	
Enclosure	Aluminum IP65 (NEMA4)	

Ordering Information

Identification	Description	Part Number
D-SBR 4008 PS with NFPA and Red painted case	Digital Multi Channel Selective Signal Booster Class A 800 MHz 24 filters per band, 40dBm composite per band, 95dB gain, DC powering with NFPA and IFC compliant Alarm Outputs and red painted case.	D-SBR 4008-PS-NFPA-24-DC-CLASS-A

D-SBR 4008 PS-NFPA (Class B)

800 MHz digital multi-channel class B, RF signal booster

Key features:

- Class B signal booster for SMR and public safety networks
- Supports APCO 25 phase 1 and 2 for public safety networks
- NFPA 72-2010, Chapter 24 and IFC 510.1 Compliant
- Patented DSP filtering™ technology
 - Supports up to 24 independent filters
 - User programmable bandwidth / frequency
- NEMA4 enclosure
- SmartALC™ mechanism to protect the digital signal booster from oscillation and shutdown the signal booster when required
- Web based management , SNMP traps



D-SBR 4008 PS NFPA (Digital Multi Band Repeater for Public Safety) is a Class B Digital Multi-Channel Signal Booster (DCSB). It features an array of up to 24 DSP based, software-controlled, variable bandwidth filters per band , that are user-programmable across 800 MHz bands.

D-SBR 4008 PS NFPA supports all public safety technologies. For each filter, the user can specify the start and stop frequencies to reduce the installation time of the signal booster and enable a very wide range of filters selection.

Every parameter of D-SBR 4008 PS NFPA, including filter tuning and selection, can be controlled via web based management. The patented Cobham Wireless' digital RF filter enables simple initial setup for any

channel plan and if necessary, allows some basic reconfiguration due to re-banding.

The SmartALC™ algorithm will reduce the gain to protect the signal booster from oscillation. When the gain cannot be reduced anymore a shut-down mechanism will be triggered.

The signal booster protects against degradation of the system's sensitivity and coverage. This is implemented by the inbuilt AGC per-channel (filter) feature, which permits equalization of the channel levels for uniform coverage.

This Cobham Wireless product meets the rigid requirements as defined by the NFPA and International Fire Code developmental organizations. The

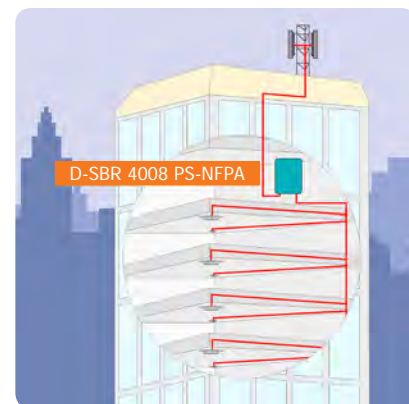
signal booster is painted a Fire Life Safety Red, meets NEMA4 compliance for hose down, and provides all Alarming outputs as defined by NFPA 2010, Chapter 24 including system and antenna failures.

The signal booster is a DC fed unit. An external battery charger unit is also available. The charger unit is powered by an AC supply and includes a circuit to charge external batteries. The charger unit is also equipped with a range of dry contact alarms as defined in the NFPA standard: AC failure, Charger failure and Low battery.

D-SBR 4008 PS-NFPA Specifications

Class B

The D-SBR 4008 PS NFPA is a digital, multi-channel signal booster which provides reliable and interference-free coverage when in the presence of other services in the adjacent channels.



Electrical	Downlink	Uplink
Frequency Range	851-869MHz	806-824MHz
Passband Gain	65dB to 95dB Adjustable in 1dB steps	
Passband Ripple	± 2.5dB maximum	± 2.5dB maximum
AGC Dynamic Range	30dB	
Filter Bandwidth (SMR 800MHz) ⁽¹⁾	Programmable 75kHz to 1MHz at 12.5kHz steps, 1MHz-18MHz at 200kHz steps	
Number of filters	Up to 24	
Composite Output Power	+40dBm	+28dBm
Noise Figure at Maximum Gain	5.0dB	
General		
Dimensions W x D x H	21.3" x 15" x 12.3" (540mm x 382mm x 313mm)	
Power Supply	36-76 VDC	
Power Consumption	280W	
Total RF Input Power (no damage)	+10dBm	
Impedance Level	50Ω	
RF Connector	N-type, Female	
VSWR	1.5:1 maximum	
Compliance	IC/FCC	
Environmental		
Operating Temperature	-5°F to 122°F (-20°C to 50°C)	
Humidity	10% - 90% Condensed	
Weight	73lbs (33kg)	
Enclosure	Aluminum IP65 (NEMA4)	

⁽¹⁾ Every filter above 10MHz utilizes 2 FPGA resources

Ordering Information

Identification	Description	Part Number
D-SBR 4008 PS with NFPA and Red painted case	Digital Multi Channel Selective Signal Booster Class B 800MHz 24 filters per band, 40dBm composite per band, 95dB gain, DC powering with NFPA and IFC compliant Alarm Outputs and red painted case.	D-SBR 4008-PS-NFPA-24-DC-CLASS-B

D-SBR 3709S

SMR 900MHz Digital Channel Selective and Band Selective Repeater

Key features:

- Supports all modulation technologies in one unit.
- Supports SMR 900MHz frequency band.
- Supports up to 12 sub-bands with optional non-contiguous sub-bands enabled by programmable innovative DSP filtering.
- Specific gain and power setting for each sub-band supporting single and multi-operator applications.
- MCPA technology supporting top level EVM, ACRR and emission performance.

D-SBR 3709S (Digital Single Band Repeater) is specifically designed for both outdoor and inbuilding SMR 900MHz applications. It supports up to 12 sub-bands in the SMR 900MHz band (with optional for non-contiguous sub-bands). Due to its state of the art DSP filtering, it can support all technologies in the same repeater.

Highly linear MCPA components and unparalleled innovative DSP filtering provide top level performance that supports high throughput of the latest modulation technologies such as HSPA and LTE .

D-SBR 3709S utilizes Cobham Wireless proprietary SmartALC™ power control algorithm. This algorithm provides more than gain control: it automatically

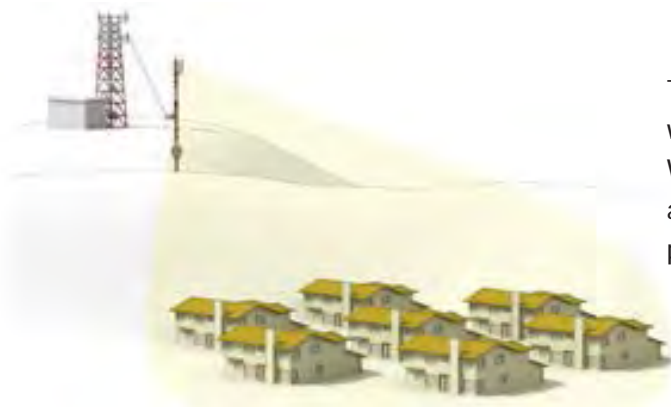
optimizes the gain setting by learning the actual range of RSSI levels over a user-specified period of time. In addition, SmartALC™ prevents oscillations, reduces the amount of isolation required by the system which in turn improves network performance.

The SmartALC™, together with the low noise figure of the repeater, minimizes noise rise at the donor cell site. SmartALC™ allows the installer to quickly set up the unit yet achieve the design goals specified by the system engineer.

The DSP based technology provides a specific gain and power setting for each sub-band. This allows the provision of different levels according to the requested service.



Every parameter of D-SBR 3709S, including filter tuning and selection, is software-controlled either locally or remotely via a wireless modem. This is done via web based management tools supporting SNMP traps.



The D-SBR 3709S high power digital repeater is a cost-effective way to complete the coverage in a cellular network. Cobham Wireless' proprietary SmartALC™ technology guarantees a quick and simple setup that will meet coverage needs without network performance degradation.

D-SBR 3709S Specifications

Electrical	Downlink	Uplink
Frequency Range	896-901MHz	935-940MHz
Passband Gain	90dB	
Passband Ripple	± 2dB	± 2dB
Gain Attenuation Range	0dB to 25dB (in 1dB steps)	
Composite Output Power	+ 37dBm	+ 23dBm
Number of filters (*)	1 to 12 or 1 to 8	1 to 12 or 1 to 8
Noise Figure @ Maximum Gain (typical)	5dB	
Propagation Delay	6µs	
General		
Power Supply	110VAC 60Hz or -48VDC	
Total RF Input Power (no damage)	+10dBm	
Impedance Level	50Ω	
RF Connector	N-type, Female	
VSWR	1.5:1	
Environmental		
Operating Temperature	-20°C to +50°C	
Dimensions W x H x D	21.3" x 15" x 12.3" (540mm x 382mm x 313mm)	
Weight	73lbs (33kg)	
Enclosure	Aluminum IP65 (NEMA4)	
Conformance standard	FCC	

(*) Supports any BW option 200kHz - 5MHz by setting the start-stop frequency

Ordering Information

Identification	Description	Part Number
D-SBR SMR 900MHz	Single-band SMR 900MHz, 37dBm, 90dB gain per band, 8 filters	D-SBR 3709S

DIGImini - Americas

Digital Multi-Band Mini Repeater

Key features:

- Innovative digital mini repeater for the price of a legacy analog mini repeater.
- Up to four frequency bands in two compact enclosures.
- Software Defined Filtering of up to 8 sub-bands.
- Single and dual band units for 700MHz/1700MHz and 850MHz/1900MHz.
- Individual gain and ALC settings for each sub-band for single and multi-operator applications.
- Ideal for flexible In-building applications.
- Interference Mitigation Oscillation Prevention (IMOP) algorithm.

Cobham Wireless' new DIGImini repeater (digital mini repeater) is an innovative and flexible multiband coverage solution optimized for in-building applications which offers a completely new range of possibilities.

With multi band technology (e.g. GSM/WCDMA/LTE) applications, multiple filters are required in the operation bands. The DIGImini is designed to provide high performance digital filters with a price competitive to legacy analog mini repeaters.

Up to four different frequency bands can be implemented in 2 dual band DIGImini repeaters. Each DIGImini repeater can be a dual band 700/1700MHz, 850/1900MHz or 1700/2600MHz.

Easy "plug and play" architecture allows our customers to add services

as needed, thus minimizing their CAPEX. Software Defined Filtering of up to 8 sub-bands in each dual band configuration and up to 16 sub-bands for quad band configuration. Individual Gain and ALC settings are available for each sub-band for multi-technology applications (e.g. GSM/WCDMA/LTE) for both single and multi-operator applications.

The DIGImini is connected to two antennas, a donor antenna placed on the roof of the building and a radiating coaxial cable or antennas in the area to be covered.

A state-of-the-art Interference Mitigation and Oscillation Prevention (IMOP) algorithm is used to monitor the isolation between the antennas and should oscillation be present the gain is adjusted immediately to prevent it.

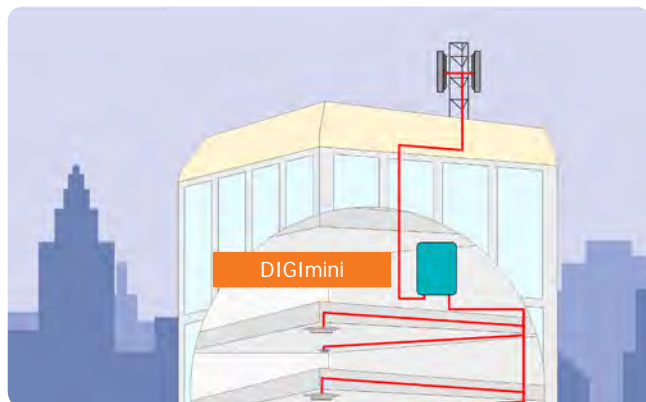
Single-band / Dual-band



Tri-band / Quad-band



Configuration and monitoring of the DIGImini can be done through an intuitive web management GUI. Remote management is done via wireless modem. With the Cobham Wireless' advanced supervision and control software, the entire fleet of digital multi-band repeaters can be monitored.



The Cobham Wireless DIGImini repeater is powerful enough to drive a passive Distributed Antenna System (DAS) for coverage areas up to 25,000 ft² (2,322m²) in buildings, parking lots, malls, warehouses and offices.

DIGImini Specifications

	Downlink	Uplink
700MHz Frequency band		
Operating Frequency Range	Lower band 728-746MHz Upper band 746-757MHz	Lower band 698-716MHz Upper band 776-787MHz
Composite O/P power at antenna port ⁽¹⁾	21dBm	21dBm
Pass band maximum gain	73dB	73dB
1700MHz (AWS) Frequency band		
Operating Frequency Range	2110-2155MHz	1710-1755MHz
Composite O/P power at antenna port ⁽¹⁾	20dBm	20dBm
Pass band maximum gain	73dB	73dB
850MHz (Cellular) Frequency band		
Operating Frequency Range	869-894MHz	824-849MHz
Composite O/P power at antenna port ⁽¹⁾	21dBm	21dBm
Pass band maximum gain	73dB	73dB
1900MHz (PCS) Frequency band		
Operating Frequency Range	1930-1990MHz	1850-1910MHz
Composite O/P power at antenna port ⁽¹⁾	20dBm	20dBm
Pass band maximum gain	73dB	73dB
2600MHz Frequency band		
Operating Frequency Range	2620-2690MHz	2500-2570MHz
Composite O/P power at antenna port ⁽¹⁾	20dBm	20dBm
Pass band maximum gain	73dB	73dB
Values common to all bands		
Gain attenuation range	0-25dB (in 1dB steps)	0-25dB (in 1dB steps)
Pass band ripple	± 2.5dB	± 2.5dB
Noise figure @ max gain	6dB	6dB
Propagation delay	6µs	6µs
Number of filters per band ⁽²⁾	Up to 8	Up to 8
Power supply	110VAC 60Hz	
Power consumption	<70W for dual band, <45W for single band	
Environmental specification		
Operating temperature range	14°F to 122°F (-10°C to 50°C)	
Humidity	85%, ETS 300 019-1-3 Class 3.1	
Dimensions (W x H x D) (single band unit)	11.77" x 12" x 3.03" (299mm x 305mm x 77mm)	
Installation	Wall mount	
Weight	8.9 lbs for dual band (4kg)	
Ingress protection	IP41	
Complies with	FCC (NEO-DMINI21082019, NEODMINI2107L2017, NEODMINI2107U2017) IC (8794A-DM7L17, 8794A-DM7U17, 8794A-DM819)	

⁽¹⁾ 3.5dB less in quad-band configurations due to combining loss

⁽²⁾ Supports every BW option 200kHz-25MHz by setting the start-stop frequency. Total number of filters is 8 in dual band

Ordering Information

Identification	Description	Part Number
DIGImini 850/1900	DIGImini 850/1900 21/20dBm 8 Filters	D-MINI-2108-2019
DIGImini 700U/1700	DIGImini 700 Upper /1700 21/20dBm 8 Filters	D-MINI-2107U-2017
DIGImini 700L/1700	DIGImini 700 Lower /1700 21/20dBm 8 Filters	D-MINI-2107L-2017
DIGImini 1700/2600	DIGImini 1700/2600 20/20dBm 8 Filters	D-MINI-2017-2026
DMCU	External DIGImini Control Unit with GPRS Modem	DMCU
DMCU	External DIGImini Control Unit with CDMA1X Modem	DMCU-CDMA
DMCU	External DIGImini Control Unit with WCDMA (Telit 864) Modem	DMCU-WCDMA
DIGImini Accessory Kit	DIGImini 4 bands Accessory upgrade kit	D-MINI-4B-AK
DIGImini 19" bracket	DIGImini 19" bracket	D-MINI 19-BRKT

D-MBR - Americas

Digital Multi-Band Repeater

Key features:

- Designed to meet North American frequency requirements.
- Up to four frequency bands in one compact enclosure.
- Software Defined Filtering of up to 8 sub-bands in each frequency band.
- Band modules for 700MHz (LTE), 850MHz (Cellular), 1700MHz (AWS), 1900MHz (PCS) and 2600MHz.
- Individual gain and ALC settings for each sub-band for single and multi-operator applications.
- Ideal for flexible In-building applications.
- Complies with TS 36.106 (LTE) and TS 25.106 (WCDMA) standards.
- Supports 700 MHz upper and lower bands simultaneously.
- Interference Mitigation Oscillation Prevention (IMOP) mechanism.



The new Digital Multi-Band Repeater (D-MBR) from Cobham Wireless is a flexible, multi-band coverage solution optimised for in-building applications.

The D-MBR is based on the Cobham Wireless' patented and innovative digital filtering technology (DSP) which supports current and future frequency allocations.

Up to four different frequency bands can be implemented in one repeater casing. The solution can be equipped with modules covering the 700MHz, 850MHz, 1700MHz, 1900MHz and 2600MHz bands. For each frequency band, the D-MBR can provide selection and amplification of up to 8 sub bands of programmable bandwidth with the new software defined filtering module.

Using an advanced ALC mechanism each one of the sub bands has an individual gain and ALC setting.

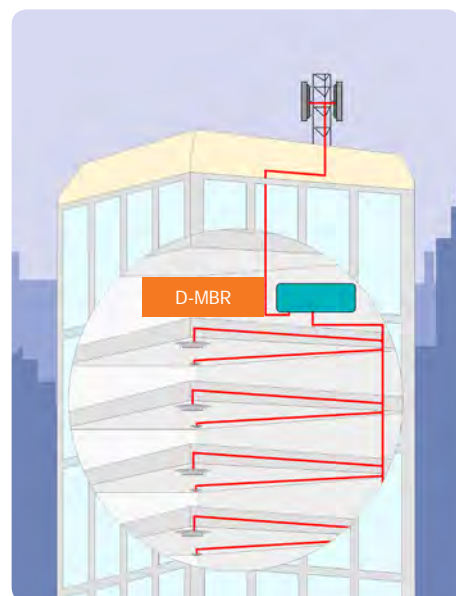
A state-of-the-art Interference Mitigation and Oscillation Prevention (IMOP) is used to measure the isolation between the antennas and gain is reduced immediately to prevent oscillation.

The Digital multi-band repeater has a separate module per each frequency band. This architecture allows redundancy, i.e. failure in one of the band modules will not have any impact on the other band modules. A dedicated DSP per band allows the support of full bandwidth per each band without any limitation.

The D-MBR is connected to one donor antenna placed on the roof of the building and the radiating coaxial cable or antennas in the area to be covered.

Configuration and monitoring of the D-MBR can be done through an intuitive web management GUI, either locally or remotely via a wireless modem. With the Cobham Wireless advanced supervision and control software, an entire fleet of digital multiband repeaters can be monitored.

The Cobham Wireless D-MBR repeater is powerful enough to drive a passive Distributed Antenna System (DAS) for coverage areas over 100,000ft² (9,290m²) in buildings, parking lots, malls, warehouses and offices



D-MBR Specifications

	Downlink	Uplink
Radio Module for 700MHz		
Operating Frequency Range	Lower band 728-746MHz	Lower band 698-716MHz
	Upper band 746-757MHz	Upper band 776 -787MHz
Composite O/P power at antenna port	33dBm	27dBm
Pass band maximum gain	82dB	82dB
Radio Module for 850MHz (Cellular)		
Operating Frequency Range	869-894MHz	824-849MHz
Composite O/P power at antenna port	33dBm	27dBm
Pass band maximum gain	82dB	82dB
Radio Module for 1700MHz (AWS)		
Operating Frequency Range	2110-2155MHz	1710-1755MHz
Composite O/P power at antenna port	30dBm	27dBm
Pass band maximum gain	82dB	82dB
Radio Module for 1900MHz		
Operating Frequency Range	1930-1990MHz	1850-1910MHz
Composite O/P power at antenna port	30dBm	27dBm
Pass band maximum gain	82dB	82dB
Radio Module for 2600MHz		
	Downlink	Uplink
Operating Frequency Range	2620-2690 MHz	2500-2570MHz
Composite O/P power at antenna port	30dBm	23dBm
Pass band maximum gain	80dB	80dB
Values common to all band modules		
Gain attenuation range	0-25dB (in 1dB steps)	0-25dB (in 1dB steps)
Pass band ripple	± 2.5dB	± 2.5dB
Noise Figure @ max gain	5dB	3.5dB
Propagation delay	6 µsec	6 µsec
Number of filters ⁽¹⁾	1 to 8	1 to 8
Power Supply	110VAC 60Hz or 230VAC 50Hz	
Power Consumption	max 320W for 3 bands, max 400W for 4 bands	
Environmental specification		
Operating Temperature Range	14°F to 122°F (-10°C to +50°C)	
Humidity	85%	
Dimensions (W x H x D)	19" x 8.75" x 19.7" (445mm x 222mm x 500mm), (5U, 19" rack-mount)	
Installation	19" Rack-mount (wall-mount optional)	
Weight	77lbs (35kg) for 3 bands, 86lbs (39kg) for 4 bands	
Complies with	UL, FCC (NEO-DFR-LTE-3380, NEO-DFR-CELL-3380, NEO-DFR-AWS-3080, NEO-DFR-PCS-3080)	

All parameters are typical at +77°F (+25°C)

⁽¹⁾ Supports BW option up to 20MHz by setting the start-stop frequency

D-MBR Ordering Information

Identification	Description	Part number
D-MBR Kit 700/850/1700/1900	Quad Band Kit 700/850/AWS/PCS, 8 filters per band, CDMA 1x modem	DR33-78-30-1719
D-MBR Kit (Canada) 850/1700/1900/2600	Quad Band Kit 850/AWS/PCS/2600, 8 filters per band, WCDMA modem	DMBR 3308-3017-3019-3026
D-MBR Kit 700/850/1900	Tri Band Kit 700/850/PCS, 8 filters per band, CDMA 1x modem	DR33-78-30-19
D-MBR Kit 700/850/1900	TriBand Kit 700/850/PCS, 8 filters, 9 Plexer for AWS, CDMA 1x modem	DR33-78-30-19-AD
D-MBR Kit 850/1700/1900	Tri Band Kit 850/AWS/PCS, 8 filters per band, CDMA 1x modem	DR3308-3017-3019
D-MBR Kit 850/1700/1900	Tri Band Kit 850/AWS/PCS, 8 filters, 9 Plexer for 700, CDMA 1x modem	DR3308-30-1719-AD
D-MBR Kit 700/850	Dual Band Kit 700/850, 8 filters, CDMA 1x modem	DR3307-3308
D-MBR Kit 700/850	Dual Band Kit 700/850, 8 filters, CDMA 1x modem, 7 Plexer for AWS	DR3307-3308-AD
D-MBR Kit 700/1900	Dual Band Kit 700/1900, 8 filters, CDMA 1x modem	DR3307-3019
D-MBR Kit 700/1900	Dual Band Kit 700/1900, 8 filters, CDMA 1x modem, 7 Plexer for AWS	DR3307-3019-AD
D-MBR Kit 850/1900	Dual Band Kit 850/1900, 8 filters, CDMA 1x modem	DR3308-3019
D-MBR Kit 850/1900	Dual Band Kit 850/1900, 8 filters, CDMA 1x modem, 6 Plexer for AWS	DR3308-3019-AD

Note : Other kit combinations are available.

Individual Components

D-MBR AK	Wall mount accessory kit for DMBR	D-MBR-WM-AK
DMBR Chassis	4 band D-MBR chassis, power supply, communication card	D-MBR-CH
DMBR Modem	D-MBR CDMA 1X Modem	D-MBR-CDMA-M
DMBR Modem	D-MBR WCDMA Modem Telit 864	D-MBR-WCDMA-M
DMBR Modem	D-MBR GPRS Modem	D-MBR-GPRS-M
DMBR 700 33dBm module	33dBm, 8 filter 700 LTE module for DMBR	D-BM-3307
DMBR 850 33dBm module	33dBm, 8 filter 850 Cellular module for DMBR	D-BM-3308
DMBR 1700 30dBm module	30dBm, 8 filter 1700 AWS module for DMBR	D-BM-3017
DMBR 1900 30dBm module	30dBm, 8 filter 1900 PCS module for DMBR	D-BM-3019

Digital Multi-Band Repeater (D-MBR)



- Supports up to four different bands in one compact enclosure
- Supports upper and lower 700MHz bands with the same hardware
- Distributed Digital Signal Processors (1 per band); twice the processing bandwidth of our competitors. Failure in the active RF or digital modules will not affect any other bands
- Supports up to 12 sub-bands per band (48 in total)
- Multi-Operator and Multi-band Applications
- Specific gain and power setting for each sub-band
- Web based, remote management via wireless modem
- Compact design

Cobham Wireless is a leading global provider of wireless coverage solutions and a market leader in the provision of solutions for the public safety market. With over 40 years of RF engineering expertise Cobham Wireless delivers seamless coverage supported by a commitment to exceptional service levels.



Optical Master Unit

Key features:

- Supports Cellular 2G, 3G and 4G services up to 2700MHz and public safety FM/VHF/UHF/LMR in the same enclosure.
- Single enclosure supports both the high power (MBF-40) and low power (MBF-20) remote units.
- MIMO support.
- Web based remote management via wireless modem.
- Flexible configuration to support up to 8 sectors via single enclosure.
- Simple integration to AEM or any other 3rd party NOC via SNMP traps.



The OMU II is used to convert signals from RF to light when fibre-fed repeaters are used at the remote end of the optical link. The OMU II is a headend system that can be connected directly to a base station or off-air device such as a digital repeater or bi-directional amplifier. For larger venues with multiple services and multiple bands, a Point Of Interface (POI) unit may be required to condition Uplink and Downlink RF signals between the BTS/Off-air Repeater and the OMU.

In the downlink direction, the OMU picks up the signal from the BTS, converts it into an optical signal and transfers it over a fibre optical cable to the repeater. In the uplink direction, the OMU receives the signal from the remote repeater via the fibre optical cable, converts it to a RF signal and sends it back to the base station.

Architecture

Each OMU II has a dedicated control card, alarm and battery backup card, rack communication board (RCB), optional modem card and 2 AC/DC power supplies on the back of the chassis. It has 12 slots in the front to support the Opto Module cards and Signal Conditioning Card/Optical Splitter Module (OSM). The OSM cards

include a 1:4 optical splitter hence it can support up to 4 MBF-20 units from a single OSM.

The OMU II can support up to 8 of our standard high powered MBF-40 or 24 low powered MBF-20 remotes. For the maximum number on MBF-20 remote units, 6 Opto Modules and 6 OSM are used which may be configured according to the number of sectors used in the project – up to 6 sectors in this configuration.

If only MBF-40 units are required, up to 8 Opto Module cards are used (no OSM cards) which may be configured according to the number of sectors used in the project – up to 8 sectors in this configuration. You can mix and match between the MBF-40 and MBF 20 remote units. Please refer to the 2nd page for all the available options.

Automatic Optical Gain Setting

The fibre optic system Cobham Wireless has designed puts a clear focus on user friendliness and ease of installation and commissioning. Through an automatic optical gain setting, the commissioning is easily performed, thus reducing the time it takes to put the equipment in service. This also means that the training is significantly simplified and the need

for installation effort is decreased.

Remote Supervision

Only one modem is needed to communicate with an OMU II and its fibre fed repeaters. The modem types available are GSM, UMTS, CDMA 1x, PSTN, and TCP/IP. The modem is found inside the OMU II and communication with the fibre-fed remote units is transparently handled via the fibre that connects them. The system can be monitored and controlled via the Cobham Wireless' network management software tool called AEM.

AEM communicates with each fibre remote unit via the OMU over the same single mode fibre strand that carries the RF signals. Both data communications and the RF signals are managed over the same fibre link which results in a very reliable supervision of the radio link.

The OMU II supports: public safety services (VHF, UHF, TETRA, SMR 700/800/900), cellular bands for EMEA and APAC (800 / 900 / 1800 / 2100 / 2600) and LTE700, 850, PCS and AWS for Americas and is always used in combination with one or several fibre fed repeaters.

OMU II Specifications

RF Parameters										
Frequency bands	68-500MHz / 380-2200MHz / 700-2700MHz									
Gain flatness	typical 2dB (p-p)									
Nominal RF input power	+10dBm composite power									
Absolute maximum RF input power	+23dBm composite power									
Number of optical modules	1-24 (depends on low/high power configuration)									
The table below lists the various high power (MBF-40) and low power (MBF-20) remote unit configurations and how it affects the total number of links supported. For example: if the OMU Mk. 2 supports two high power fiber remotes, then the number low power links available is 20										
	MBF-40 (high power)	8	7	6	5	4	3	2	1	0
	MBF-20 (low power)	0	4	8	12	16	16	20	20	24
Optical Module Electrical										
Laser Class	Class 1									
Downlink Optical Wavelength (± 10nm)	1310nm									
Uplink Optical Wavelength (± 3nm)	1510nm or 1530nm or 1550nm or 1570nm or 1590nm									
Maximum optical input power	+5dBm									
Maximum output power (TX)	+7dBm									
Automatic fibre optic loss compensation	Yes									
Optical Splitter Electrical										
Optical splitter (OSM) input power	+5dBm ± 1dBm									
Insertion loss	7dBo									
Power Requirements										
Supply voltage	110VAC 60Hz or -48VDC									
Power Consumption	Typical 50W (fully equipped)									
External electrical interfaces										
Local maintenance terminal	Ethernet, USB, RS232									
RF ports	N-type Connector Female for 1-2 sectors. SMA connectors for 8 sectors									
Optical ports	SC/APC									
AC mains input	IEC Connector with mains lead supplied according to the region.									
DC mains input	flying leads for connection to terminal block									
External alarms	Via Front panel									
Modem connector	RJ45 for wireless modem , RJ11 for PSTN modem									
Wireless Modem antenna connector	SMA									
Ethernet connector	RJ45									
Mechanical										
Dimensions (W x H x D)	19" x 5.2" x 11.4" (482.6mm x 132.5mm x 289.5mm) 3U, 19" rack-mount									
Weight	33lbs (15kg) (fully equipped)									
Environmental										
Operating temperature	41°F to 113°F (5°C to 45°C)									
IP rating	IP20									

BSF 3301 for Americas

Band selective fiber optic FM repeater

Key features:

- Supports the use of WDM (Wavelength Division Multiplexing) technology resulting in the need for fewer optical fiber links.
- Remote supervision and alarm handling in the BSF 3301 is realized through the fiber connection via the OMU's modem or optionally through a built-in modem.
- The unique combination of high output power and highly linear power amplifiers ensures large coverage with uniformly excellent signal quality.
- The BSF 3301 can optionally be upgraded with a second optical transceiver module for redundant fiber applications.



The BSF 3301 is a fiber optic fed FM repeater, part of a system that is fed from an Optical Master Unit (OMU).

the most distant remote unit that the OMU supports.

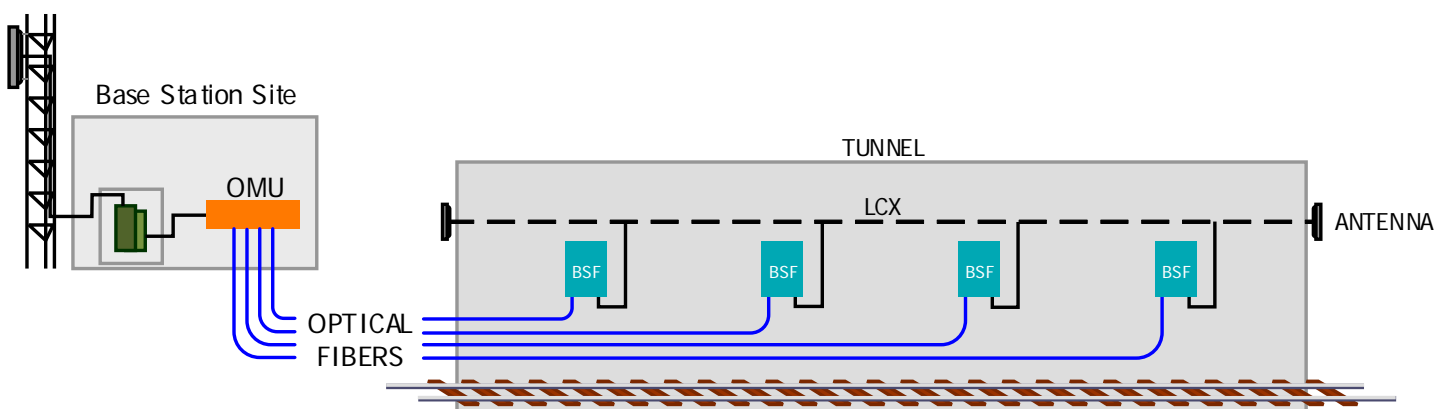
The fiber optic system is easily remotely monitored and controlled by Cobham Wireless' effective supervision tool, the Active Element Manager (AEM).

The maximum optical loss allowed for is 10 dB of fiber between the OMU and

This offers great flexibility when providing RF coverage in areas where it is not possible to rely on off air transmission.

Automatic optical gain setting

The optical gain is adjusted in the downlink chain by measuring the level of a pilot carrier sent from the Optical Master Unit (OMU). The level of the received pilot carrier is continuously monitored.



BSF 3301 Specifications

Electrical		Downlink
Frequency ranges available (MHz)	87.5-108MHz	
Impedance	50 Ω	
Output power composite (20W DL HPA)	+33dBm Composite – FCC Compliant	
Gain	30dB to 60dB in 1dB steps	
Noise figure	<4dB typical at maximum gain	
Group delay	2μs max	
ALC	Implemented	
Power Requirements	110VAC 60Hz or -48 VDC	
Power Consumption	160W, typical	
External Connection		
Local Maintenance Terminal	RS232	
Optical port	SC/APC	
RF Port	N type female	
Remote Control And Alarms		
External alarm inputs	2 external alarm inputs (N/C or N/O configurable)	
Remote connection	Via GSM, GSM-R or PSTN modem or Ethernet	
Mechanical		
Dimensions	21.2" x 15" x 7.8" (540mm x 382mm x 198mm)	
Enclosure	Aluminum IP65 (NEMA4)	
Weight	48lbs (22kg) Typical	
Cooling	Convection	
Mounting	Wall mounted	
Environmental		
Operating Temperature	-13°F to +131°F (-25°C to +55°C)	
Storage	-22°F to +158°F (30°C to +70°C)	
Humidity	ETSI EN 300 019-2-4 (see compliance below)	
Complies with	FCC	

BSF 3302 for Americas

Digital Fiber Fed Band Selective Repeater for VHF

Key features:

- Large repeater coverage footprint due to high output power and gain
- Easy system implementation with built-in commissioning tools
- Downlink: High Power 20W Class A Amplifier
- Dynamic ALC
- Adjustable Bandwidth, Dual Window Operation
- Supervision available over Radio modems
- Remotely upgradeable for Future Challenges



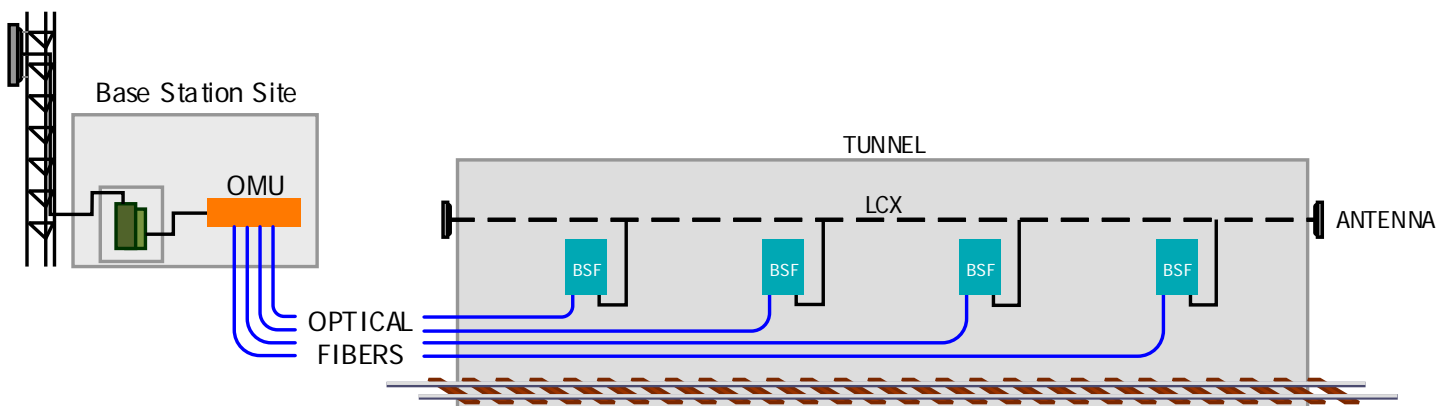
The BSF3302 provides quick, cost effective and secure radio coverage in any VHF network and provides two variable bandwidth blocks of contiguous spectrum.

Through the use of the BSF3302 an operator can easily expand a base station's service area by filling in coverage holes caused by terrain,

buildings or tunnels. The wireless interface permits the operator to remotely configure RF parameters as well as monitor alarms on a continuous basis.

The maximum optical loss allowed for is 10 dB of fiber between the OMU and the most distant remote unit that the OMU supports. This offers great

flexibility when providing RF coverage in areas where it is not possible to rely on off air transmission. The fiber optic system is easily remotely monitored and controlled by Cobham Wireless' effective supervision tool, the Active Element Manager (AEM).



BSF 3302 Specifications

Electrical	Downlink	Uplink
Frequency ranges available	148-174MHz	148-174MHz
Filter Pass Bandwidth	100kHz to 5MHz	
Duplex frequency Spacing	5MHz typical with options down to 1MHz	
Duplexer filter options	Passband / Guardband	Filter Type
	1MHz / 2MHz	1
	2MHz / 2MHz	2
	3MHz / 2MHz	3
	5MHz / 2MHz	4
	1MHz / 1MHz	5
Impedance	50 Ω	
Output Power Composite (20W DL HPA)	+33dBm Composite – FCC Compliant ⁽¹⁾	
Gain	30dB to 60dB in 1dB steps	
Noise Figure	<4dB typical at maximum gain	
Group Delay	2 μ s max	
ALC	Implemented	
Power Requirements	110VAC 60Hz or -48VDC	
Power Consumption	160W, typical for 20W Downlink	
External Connection		
Local Maintenance Terminal	RS232	
Optical port	SC/APC	
RF port	N type female	
Remote Control And Alarms		
External alarm inputs	2 external alarm inputs (NC or NO configurable)	
Alarm relay output	Dry contact	
Mechanical		
Dimensions L x W x H	24.4" x 16.5" x 11.8" (620mm x 420mm x 300mm)	
Enclosure	Aluminum IP65 (NEMA4)	
Weight	55lbs (25kg) Typical	
Cooling	Convection	
Mounting	Wall mounted	
Environmental		
Operating Temperature	-13°F to +131°F (-25°C to +55°C)	
Storage Temperature	-22°F to +158°F (-30°C to +70°C)	
Humidity	ETSI EN 300 019-2-4	

⁽¹⁾ The output power is dependent on the filter duplexer losses. Complex duplexing may reduce the available power output.

Ordering Information

Type	Description	Part number
BSF 3302	BSF 3302, 33dBm, Duplexer option 1, 1MHz Passband/2MHz Guardband	BSF-3302-DP1
BSF 3302	BSF 3302, 33dBm, Duplexer option 2, 2MHz Passband/2MHz Guardband	BSF-3302-DP2
BSF 3302	BSF 3302, 33dBm, Duplexer option 3, 3MHz Passband/2MHz Guardband	BSF-3302-DP3
BSF 3302	BSF 3302, 33dBm, Duplexer option 4, 5MHz Passband/2MHz Guardband	BSF-3302-DP4
BSF 3302	BSF 3302, 33dBm, Duplexer option 5, 1MHz Passband/1MHz Guardband	BSF-3302-DP5

BSF 3604-A

UHF Band selective fiber optic repeater for Americas

Key features:

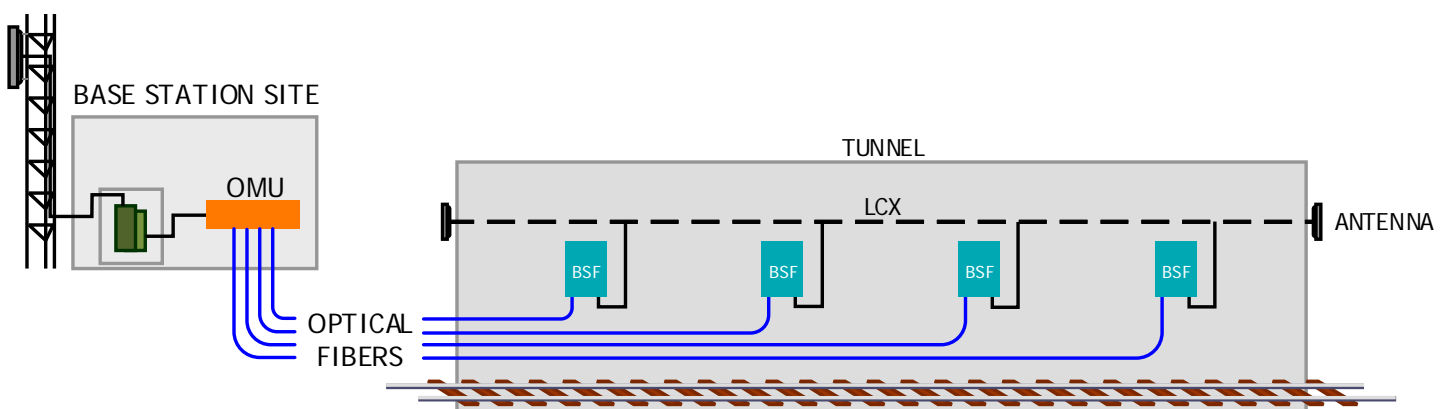
- Remote supervision and alarm handling in the BSF 3604-A is realized through the fiber connection via the OMU unit's modem or through an optional built in modem.
- The unique combination of high output power and highly linear power amplifiers ensures large coverage with uniformly excellent signal quality.
- The BSF 3604-A can optionally be upgraded with a second optical transceiver module for redundant fiber applications.



The BSF 3604-A is a fiber optic fed UHF repeater. The repeater is part of a system that is fed from an Optical Master Unit (OMU). The maximum optical loss allowed for is 10 dB of fiber between the OMU and the most distant last remote unit that the OMU supports. This offers great flexibility when providing RF coverage in areas where it is not possible to rely on off air transmission. The fiber optic system is easily remotely monitored and controlled by Cobham Wireless' effective supervision tool, the Active Element Manager (AEM).

Automatic optical gain setting

The optical gain is adjusted in the downlink chain by measuring the level of a pilot carrier sent from the Optical Master Unit (OMU). The level of the received pilot carrier is continuously monitored.



BSF 3604-A Specifications

Electrical				
Standard Operational Frequency Range	380-430MHz	450-470MHz	470-512MHz	Filter Config.
Duplexer Frequency Spacings	9MHz or 10MHz	5MHz	3MHz	Type
Filter options (passband/guardband)	5MHz / 5MHz	0.5MHz / 4.5MHz	0.5MHz / 2.5MHz	1
	2MHz / 8MHz	2.0MHz / 3.0MHz	1.0MHz / 2.0MHz	2
	-	2.5MHz / 2.5MHz	1.5MHz / 1.5MHz	3
	-	3.0MHz / 2.0MHz	1.8MHz / 1.2MHz	4
	-	3.5MHz / 1.5MHz	2.0MHz / 1.0MHz	5
Impedance	50Ω			
Output power/carrier (DL)	1 carrier: +36dBm, 2 carriers: +33dBm, 3-4 carriers: +30dBm 8 carriers: +27dBm			
IP3	> +63dBm			
Noise figure (UL)	<6dB, 5dB typical at maximum gain			
Group delay	2μs max.			
System net gain at 10 dB optical loss	Uplink & Downlink Net Gain = 30dB with OMU			
Spurious Emissions from RF port	Complies with FCC			
Optical Module Electrical				
Optical Wavelength	Downlink 1310 ± 10nm		Uplink 1550 ± 3nm	
Maximum optical output power	+3dBm ±2dB			
Maximum optical input power	+2dBm			
Power Requirements	110VAC 60Hz or -48VDC			
Power Consumption	<120W, typical			
External Connection				
Local Maintenance Terminal	RS232			
Server Port	7/16 DIN female			
Optical Ports	SC/APC			
Modem antenna connector	SMA			
Remote connection	Via OMU or optional GSM, GSM-R PSTN modem or Ethernet			
Mechanical				
Dimensions	Filter Configuration Type 1 & 2: 21.3" x 13.78" x 5.9" (541mm x 350mm x 150mm) Filter Configuration Type 3: 21.25" x 13.75" x 12.0" (539mm x 349mm x 304mm) Filter Configuration Type 4 & 5: 24" x 24" x 10.0" (609mm x 609mm x 254mm)			
Enclosure	Aluminum IP65 (NEMA4)			
Approx. weight based on filter type	Filter type: 1 & 2 62lbs (28kg)			
	Filter type: 3 74lbs (33.5kg)			
	Filter type: 4 & 5 87lbs (39.5kg)			
Cooling	Convection			
Environmental				
Operating Temperature	-13°F to +131°F (-25°C to + 55°C)			
Storage	-22°F to +158°F (-30°C to + 70°C)			
Compliance	FCC			

MBF-40 Series for SMR 700/SMR 800

MBF-RADIO HEAD - High Power for Public Safety

Key features:

- High Output Power.
- One or Two frequency Bands in one compact enclosure.
- Low Noise Figure Leading to Higher System Sensitivity.
- Advanced and User-friendly Remote Control and Supervision.
- Convection Cooling.

Single band

The Single band version is available for SMR 800 MHz

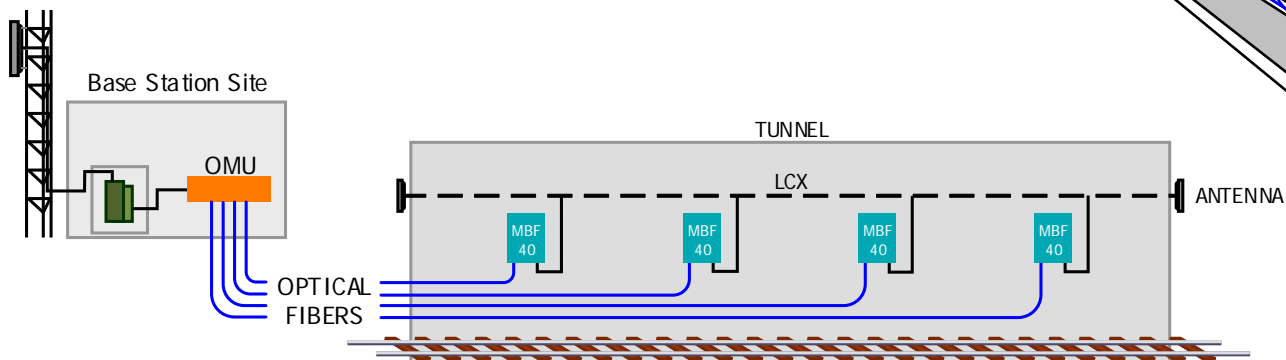
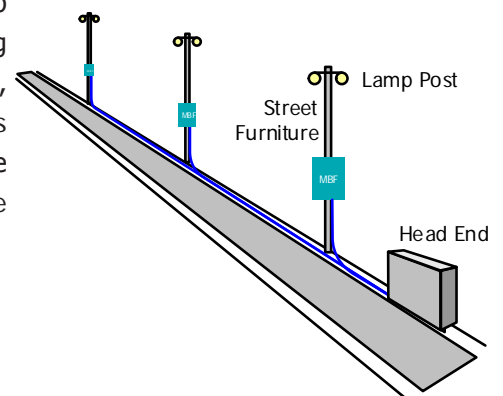
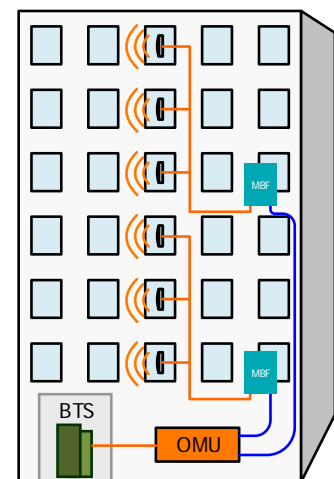
Dual band

The Dual band version is available for SMR 700 MHz / SMR 800 MHz

The Multi-Band Fiber Optic fed 40 series (MBF-40) radio head provides solutions for indoor and outdoor environments. It offers seamless coverage for indoor environments such as tunnels, subways and large buildings and for outdoor environments the MBF-40 can be deployed to augment and/or replace Macro Cells.

The MBF-40 provides up to +37dBm composite output power while utilizing convection cooling techniques eliminating the need for fans and increasing Mean Time Between Failure values. The higher output power levels decrease the number of MBF nodes required for deployment which in turn lowers capital and reoccurring costs.

Cobham Wireless' robust fiber optic system allows MBF nodes to be installed up to 12.5 miles from the base station providing greater flexibility when designing radio frequency coverage for outdoor distributed antenna systems. Furthermore, Cobham Wireless can provide a complete line of passive products such as combiners, filters and couplers as well as a state-of-the-art software tool, the Active Element Manager (AEM) which is used to remotely monitor and supervise the entire fiber optic system.



MBF-40 SMR 700/SMR 800 Specifications

Frequency Range	SMR 700MHz	SMR 800MHz	
Downlink	763-775MHz	851-869MHz	
Uplink	793-805MHz	806-824MHz	
Operational Bandwidth	12MHz	18MHz	
Composite Output Power	37dBm	37dBm	
Gain U/L and D/L	Nominal 30dB, adjustable in 1dB steps.		
System impedance	50Ω		
Return loss at antenna connections	> 16dB		
Antenna connectors	7/16 DIN, female duplex		
Electrical ratings	110VAC 60Hz or -48VDC		
Passband Ripple	< 2dB		
Total Power Consumption	Single Band	Dual Band	
37dBm	140W	220W	
Noise Figure	3dB typical (maximum gain)		
Propagation Delay	< 2μs		
Optical parameters			
Wavelength DL/UL	1310nm - 1550nm		
Max optical loss	10dB		
F/O connector	SC/APC		
Mechanical	Enclosure	Dimensions	Weight
Single band	IP65 (NEMA4)	21" x 14.9" x 7.7" (540 mm x 382 mm x 198mm)	44lbs (20kg)
Dual band	IP65 (NEMA4)	21" x 14.9" x 7.7" (540 mm x 382 mm x 198mm)	48.5lbs (22kg)
Environmental			
Operational Temperature Range	-13°F to 131°F (-25°C to 55°C)		
Storage Temperature Range	-22°F to 158°F (-30°C to 70°C)		
Complies with:			
Radio	FCC part 15 Subpart B (2002), Class B , Radio frequency devices, Unintentional radiators. FCC part 24 Subpart E (2002). Personal communications services. Broadband PCS.		

Note:

This specification covers the RF-part of a typical Fiber Fed repeating system. Optimum levels for fiber to RF and typical fiber link noise figures are assumed.

Please refer to the Optical Master Unit specification (qv.) for more details on the RF to Fiber properties.



Optical Master Unit

MBF TETRA 800MHz

MBF Radio Head – High power for public safety TETRA applications

Key features:

- High output power.
- Low noise figure leading to higher system sensitivity.
- Advanced and user-friendly remote control and supervision.
- Convection cooling.

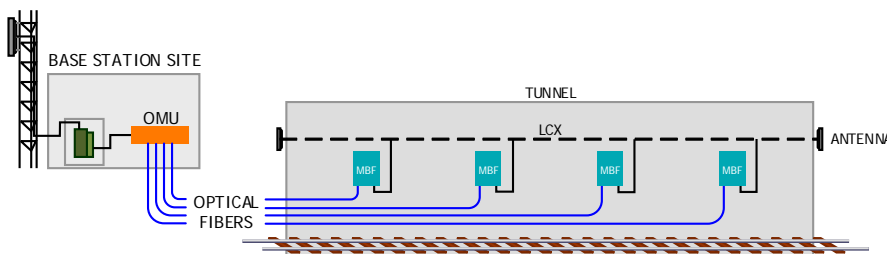
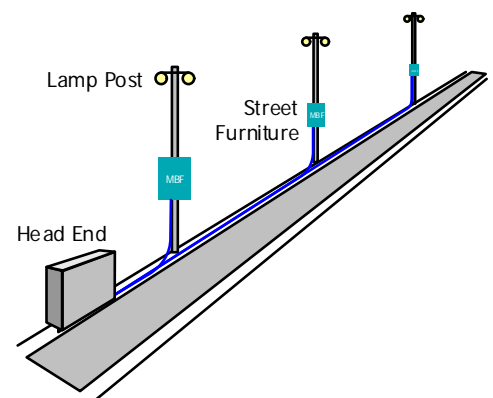
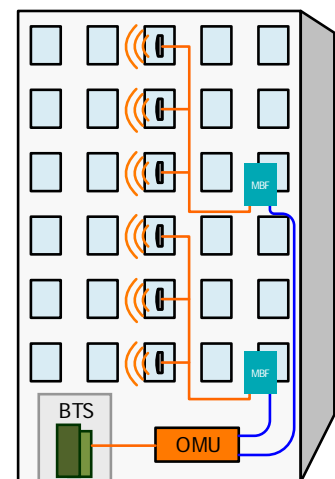
The Multi-Band Fiber Optic (MBF) fed radio head provides solutions for indoor and outdoor environments. It offers seamless coverage for indoor environments such as tunnels, subways and large buildings and for outdoor environments the MBF can be deployed to augment and/or replace Macro Cells.

The MBF-High Power provides up to +37dBm composite output power while utilizing convection cooling techniques eliminating the need for fans and increasing Mean Time Between Failure (MTBF) values. The higher output power levels decrease the number of MBF nodes required for deployment which in turn lowers capital and reoccurring costs.

Cobham Wireless' robust fiber optic system allows MBF nodes to be installed up to 12.5 miles from the base station Optical Master Unit (OMU) providing greater flexibility when designing radio frequency coverage for outdoor distributed antenna systems.

Furthermore, Cobham Wireless can provide a complete line of passive products such as combiners, filters and couplers as well as a state-of-the-art software tool, the Active Element Manager (AEM) which is used to remotely monitor and supervise the entire fiber optic system.

The MBF-High Power product family includes single, dual and triple band options conveniently co-located in one small enclosure.



MBF TETRA 800MHz Specifications

Electrical	Downlink	Uplink
Frequency Range TETRA 800MHz	851-869MHz	806-824MHz
Operational bandwidth	18MHz	
Composite Output Power	37dBm	
Gain DL/UL	Nominal 30dB, adjustable in 1dB steps.	Nominal 30dB, adjustable in 1dB steps.
System impedance	50Ω	
Return loss at antenna connections	> 16dB	
Antenna connectors	7/16 DIN, female duplex	
Electrical ratings	110VAC 60Hz or -48VDC	
Passband ripple	< 2dB	
Total power consumption	220W	
Noise figure	3dB typical (maximum gain)	
Propagation delay	<2 μs	
Mechanical		
Dimensions (H x W x D)	21.26" x 13.78" x 7.8" (540mm x 350mm x 198mm)	
Weight	46.3lbs (21kg)	
Enclosure	Aluminum IP65 (NEMA4)	
Environmental		
Operating temperature	- 13°F to + 131°F (-25°C to + 55°C)	
Storage temperature	- 22°F to + 158°F (-30°C to + 70°C)	
Lifetime (MTBF)	>100,000 hours	
Complies with	R&TTE Directive including EN 301 489-18, ETSI TS 101 789-1, EN 60 950	

Ordering Information

Part Number	Description
MBF-S-8TR	MBF for Tetra 800 MHz,37dBm

Note:

This specification covers the RF-part of a typical Fiber Fed repeating system. Optimum levels for fiber to RF and typical fiber link noise figures are assumed.

Please refer to the Optical Master Unit specification (qv.) for more details on the RF to Fiber properties.



Optical Master Unit

MBF-40 Series for SMR 900MHz

MBF Radio Head – High power for public safety

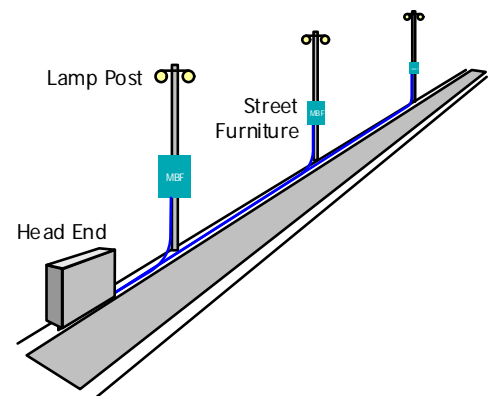
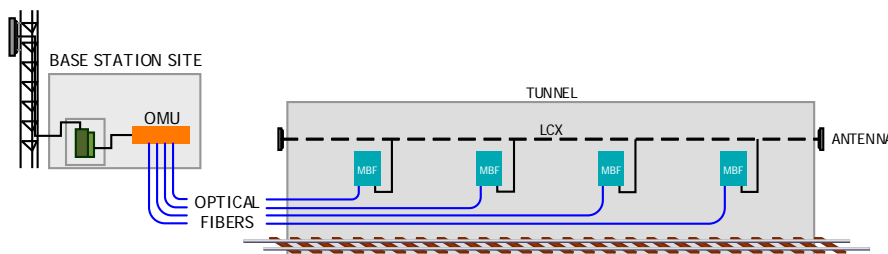
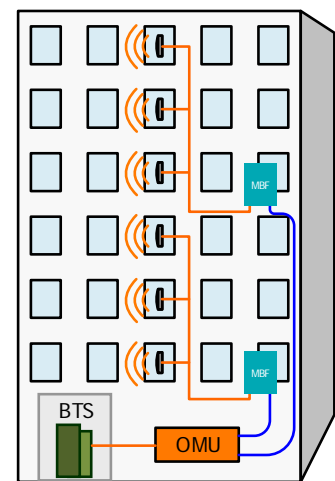
Key features:

- High output power.
- Low noise figure leading to higher system sensitivity.
- Advanced and user-friendly remote control and supervision.
- Convection cooling.

The Multi-Band Fiber Optic fed 40 series (MBF-40) radio head provides solutions for indoor and outdoor environments. It offers seamless coverage for indoor environments such as tunnels, subways and large buildings and for outdoor environments the MBF-40 can be deployed to augment and/or replace Macro Cells.

The MBF-40 provides up to +37dBm composite output power while utilizing convection cooling techniques eliminating the need for fans and increasing Mean Time Between Failure values. The higher output power levels decrease the number of MBF nodes required for deployment which in turn lowers capital and reoccurring costs.

Cobham Wireless' robust fiber optic system allows MBF nodes to be installed up to 12.5 miles from the base station providing greater flexibility when designing radio frequency coverage for outdoor distributed antenna systems. Furthermore, Cobham Wireless can provide a complete line of passive products such as combiners, filters and couplers as well as a state-of-the-art software tool, the Active Element Manager (AEM) which is used to remotely monitor and supervise the entire fiber optic system.



MBF-40 Series for SMR 900MHz Specifications

Electrical	Downlink	Uplink
Frequency range (SMR900MHz)	929-941MHz	896-902MHz
Operational Bandwidth	5MHz	
Composite Output Power	37dBm	
Gain UL/DL	Nominal 30dB, Adjustable, in 1dB steps.	
System impedance	50Ω	
Return loss at antenna connections	> 16dB	
Antenna connectors	7/16DIN, female duplex	
Electrical ratings	110VAC 60Hz or -48VDC	
Passband Ripple	< 2dB	
Power consumption	140W	
Noise Figure	3dB typical (maximum gain)	
Propagation Delay	< 2μs	
Optical Parameters		
Wavelength DL/UL	1310/1550nm	
Max optical loss	10dB	
F/O connector	SC/APC	
Mechanical		
Dimensions	21" x 14.9" x 7.7" (540mm x 382mm x 198 mm)	
Enclosure	Aluminum IP65 (NEMA4)	
Weight	44lbs (20kg)	
Environmental		
Operational Temperature	-13°F to +131°F (-25°C to +55°C)	
Storage temperature	-22°F to +158°F (-30°C to +70°C)	
Compliance		
Radio	FCC in accordance with part 90, IC in accordance with RSS-131	

Note:

This specification covers the RF-part of a typical Fiber Fed repeating system. Optimum levels for fiber to RF and typical fiber link noise figures are assumed.

Please refer to the Optical Master Unit specification (qv.) for more details on the RF to Fiber properties.



Optical Master Unit

MBF-20 Series

Fiber Optic Remote Unit for Americas

Key features:

- Comprehensive in-building coverage in a simple and cost effective manner.
- Up to 6 frequency bands in 2 compact enclosures supported on one fiber strand with full multi-operator support.
- Very low noise figure (10 dB) to minimize BTS interference and increase data throughput.
- Easy “plug and play” to add additional services without adding F/O cables.



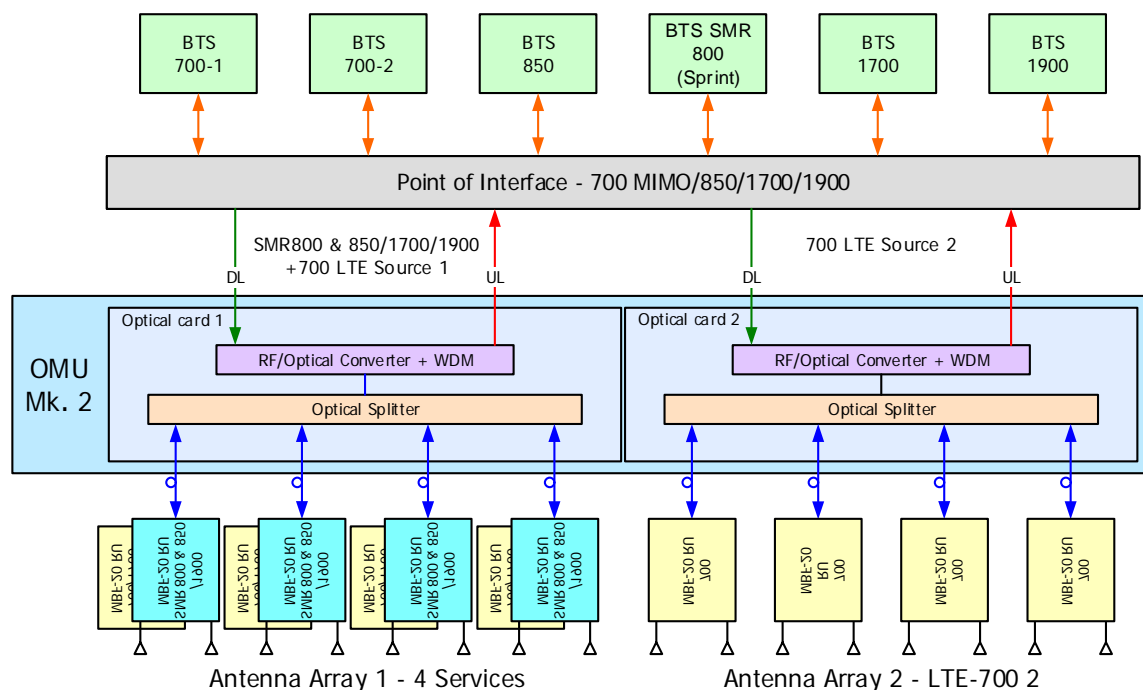
The Multi-Band Fiber Optic system is composed of two building blocks: The OMU (Optical Master unit) and the MBF-20 (Fiber Distributed Antenna System) Remote Unit. This is an indoor solution for single or multi operator use.

A radical price point ensures that operators will have seamless in-building coverage in a simple and cost effective manner.

Signals are coupled off from a nearby base station or off-air repeater to the OMU and then distributed via fiber to one or several MBF-20 remote units. These MBF-20 remote units can be installed up to 2 km from the base station site, offering great flexibility when providing RF coverage in areas where off-air transmission is not a preferable solution. A distributed antenna system can be used to distribute the signal throughout the area to be covered.

A single F/O cable is used to connect the MBF-20 remote units to the OMU. Different colors (wavelengths) are used in order to combine the uplink of different MBF-20 remote units in a very cost effective way.

Cobham Wireless can provide a complete solution including design, site surveys and POI (Point Of Interface) solutions to allow easy connection to the BTS.



Example of MIMO Coverage on 700MHz with POI, OMU Mk. 2 and MBF-20 remote units

MBF-20 Series (Americas) Specifications

Frequency Range	Downlink		Uplink	
700MHz Lower band	728-746MHz		698-716 MHz	
700MHz Upper band	746-757MHz		777-787 MHz	
SMR 800 (Sprint)	862-869MHz		817-824 MHz	
850MHz (Cellular)	869-894MHz		824-849 MHz	
1700MHz	2110-2155MHz		1710-1755 MHz	
1900MHz	1930-1995MHz		1850-1915 MHz	
Versions	700MHz	SMR800/850MHz	1700MHz	1900MHz
Operational bandwidth	29MHz	32MHz	45MHz	65MHz
Composite O/P power at antenna port (UL/DL)	+23dBm	+23dBm	+23dBm	+23dBm
Ripple in passband	±2dB		±2dB	±3dB
Number of antenna ports ⁽¹⁾			2	
noise figure			10dB typical (maximum gain)	
Propagation delay			< 2µs	
Modulation Accuracy At Nominal Output Power				
GSM/GMSK			<2.5% RMS and <10% peak	
EDGE/8-PSK			< 3% EVM RMS	
WCDMA/EVM			<12.5% RMS (composite ETSI TS 25.106 with TM 1 / 64 DPCH)	
PKCDE			<-33dB (ETSI TS 25.106 with TM 1/64DPCh, spreading factor 256)	
LTE			<8% EVM RMS (ETSI TS 136.106)	
General Parameters				
Gain UL/ DL (w/o RF splitter)			30dB/30dB Adjustable, in 1 dB steps.	
System impedance			50Ω	
Antenna connectors			N-Type female	
Electrical ratings			110VAC 60Hz or -48VDC	
Power Consumption	Single/Dual Band 30W/50W		Tri/Quad Band 75W/100W	
Optical Parameters				
DL Wavelength			1310nm	
UL Wavelengths			1510nm, 1530nm, 1550nm, 1570nm, 1590nm ⁽²⁾	
F/O Connector			SC/APC	
Max Optical Loss			2 dB	
Mechanical				
Dimensions & Weight	Single/Dual Band	11.8" x 8.66" x 2.91" (300mm x 220mm x 74mm) 8.9 lbs (4kg)		
	Tri/Quad Band	11.8" x 8.66" x 5.8" (300mm x 220mm x 148mm) 17.8 lbs (8kg)		
Enclosure			Aluminum IP30	
Environmental				
Operating Temperature			-13°F to 131°F (-25°C to 55°C)	
Storage			-22°F to 58°F (-30°C to 70°C)	
Humidity			ETSI EN 300 019-2-4	
Complies with			FCC	

⁽¹⁾ A four ports output option is available. Output power is reduced by 3dB per band

⁽²⁾ 1590nm is reserved for maintenance spare units

Ordering Information

Identification	Description	Part Number
MBF-2308-2319	MBF-20 RU SMR 800 (Sprint) + 850/1900 MHz, master unit ,1510 nm	MBF-2308-2319-M-1510
	MBF-20 RU SMR 800 (Sprint) + 850/1900 MHz, master unit ,1530 nm	MBF-2308-2319-M-1530
	MBF-20 RU SMR 800 (Sprint) + 850/1900 MHz, master unit ,1550 nm	MBF-2308-2319-M-1550
	MBF-20 RU SMR 800 (Sprint) + 850/1900 MHz, master unit ,1570 nm	MBF-2308-2319-M-1570
MBF-2307-2317	MBF-20 RU 700 Upper C and A, B, C lower/1700 MHz, slave unit (no F/O interface)	MBF-2307-2317-S

MBF-20 Series

Fiber Optic Remote Unit for Brazil

Key features:

- Low power concept to optimize S/I and data throughput
- Comprehensive in-building coverage in a simple and cost effective manner.
- Up to 4 frequency bands in 2 compact enclosures supported on one fiber strand.
- Very low noise figure (10 dB) to minimize BTS interference and increase data throughput.
- Easy "plug and play" to add additional services without adding F/O cables.
- Supports all technologies including GSM, W-CDMA and LTE



The MBF-20 family targets the demand for high data throughput. Due to the low power concept the passive loss between the mobile and the MBF-20 remote unit can be minimized, which leads in conjunction with the very low noise figure to optimized throughput. Especially 3G and 4G systems will benefit from this MIMO can be supported in the entire system or in a hot spot approach.

The Multi-Band Fibre Optic system is composed of two building blocks: Optical Master Unit (OMU) and MBF-20 (Fibre Distributed Antenna System) Remote Unit. This is an indoor solution for single or multi operator use.

A radical price point ensures that operators will have seamless in-building coverage in a simple and cost effective manner.

Signals are coupled off from a nearby BTS or off-air repeater to the OMU and then distributed via fibre to one or hundreds of MBF-20 remote units. These MBF-20 remote units can be installed 2 km and more from the base station site. A single F/O cable is used to connect the MBF-20 remote units to the OMU. Different colours (wavelengths) are used in order to combine the uplink of different MBF-20 remote units in a very cost effective way.

The standard dual band unit can be easily upgraded to 4 bands by attaching a slave unit in a simple sandwich method.

A combination with the Cobham Wireless MBF-40 high power remote units is possible within the same system.

Cobham Wireless can provide a complete solution including design, site surveys and POI (Point Of Interface) solutions to allow easy connection to the BTS.

MBF-20 Series (Brazil) Specifications

Frequency range	Downlink		Uplink	
850 MHz	869-894 MHz		824-849 MHz	
1800 MHz	1805-1880 MHz		1710-1785 MHz	
2100 MHz	2110-2170 MHz		1920-1980 MHz	
2600 MHz	2620-2690 MHz		2500-2570 MHz	
Versions	850MHz	1800MHz	2100MHz	2600MHz
Operational bandwidth	25MHz	75MHz	60MHz	70MHz
Composite O/P power at antenna port (UL/DL)	+23dBm	+18dBm	+18dBm	+19dBm
Ripple in passband	±2dB	±2.5dB	±2dB	±3dB
Number of antenna ports	2			
Noise figure	10 dB typical (maximum gain)			
Propagation delay	< 2 μs			
IMD	ETSI for 1800/2100/2600MHz , FCC for 850MHz			
Modulation Accuracy At Nominal Output Power				
GSM/GMSK	<2.5% RMS and <10% peak			
EDGE/8-PSK	<3% EVM RMS			
WCDMA/EVM	<12.5% RMS (composite ETSI TS 25.106 with TM 1 / 64 DPCH)			
PkCDE	<-33dB (ETSI TS 25.106 with TM 1/64DPCH, spreading factor 256)			
General Parameters				
Gain UL/ DL (w/o RF splitter)	18dB/18dB Adjustable, in 1 dB steps.			
System impedance	50Ω			
Antenna connectors	N-Type female			
Electrical ratings	230VAC 60Hz			
Power Consumption	Single/Dual Band 50W		Tri/Quad Band 100W	
Optical Parameters				
DL Wavelength	1310nm			
UL Wavelengths	1510nm, 1530nm, 1550nm, 1570nm, 1590nm			
F/O Connector	SC/APC			
Max Optical Loss	10dB (approx. 3dB using OMU 1:4 splitter)			
Mechanical				
Dimensions & Weight	Single/Dual Band	300mm x 220mm x 74mm (4kg)		
	Tri/Quad Band	300mm x 220mm x 148mm (8kg)		
Enclosure	Aluminum IP30			
Environmental				
Operating Temperature	-25°C to 55°C			
Storage	-30°C to 70°C			
Humidity	ETSI EN 300 019-2-4 (see compliance below)			
Complies in applicable parts, relevant on different markets, to:	R&TTE Directive including ET S EN 301 502 (ET S EN 300 609-4/GSM 11.26)			
	ET SI TS 25.106, ET SI 25.143			
	ET SI EN 301 908-11 - ET S EN 301 498-8 - EN 60 950, EN 50 385			
	ET SI TS 36.106 V9.0.0 - FCC 47CFR Parts 22 and 24			

Ordering Information

Identification	Description	Part Number
MBF-1818-1926	MBF-20 RU 1800/2600 MHz, master unit, 1510nm	MBF-1818-1926-M-1510
	MBF-20 RU 1800/2600 MHz, master unit, 1530nm	MBF-1818-1926-M-1530
	MBF-20 RU 1800/2600 MHz, master unit, 1550nm	MBF-1818-1926-M-1550
	MBF-20 RU 1800/2600 MHz, master unit, 1570nm	MBF-1818-1926-M-1570
MBF-2308-1821	MBF-20 RU 850/2100 MHz, slave unit (no F/O interface)	MBF-2308-1821-S

MBF-40 Series

Single, Dual, Tri and Quad Band for Americas

Key features:

- High output power.
- High efficiency MCPA amplifier technology.
- Advanced and User-friendly Remote Control and Supervision.
- Up to four frequency bands in one enclosure, MIMO support in one enclosure.
- Fan-less convection cooling⁽¹⁾.



The MBF - Multi-Band Fiber optic fed system encapsulates solutions for both indoor and outdoor environments for single or multi-operator use. It offers seamless coverage in any indoor environment such as tunnels, metros and larger buildings.

Signals are coupled off from a nearby base station and then distributed via fiber to one or several MBF repeaters. This solution offers very high output power, yet uses convection cooling, which increases the MTBF

figures compared to if active fans were to be used. The high output power results in a need to deploy a fewer number of sites, which in turn lowers the capital expenditures for the roll-out as a whole.

These remote units can be installed up to 12 miles (20km) from the base station site, offering a great flexibility when providing RF coverage in areas where off air transmission is not a preferable solution. A distributed antenna system can be used to distribute the signal

throughout the area to be covered.

Cobham Wireless can provide a complete solution including design, site surveys and equipment related to the POI (Point Of Interface) such as combiners, filters, cross band couplers, etc.

The MBF product family includes version for single band, dual band, tri band and quad band and also MIMO variants available in the following combinations:

Single band	Dual band	Tri-band	Quad band	MIMO
• 700LTE	• SMR700/SMR800	• 700/SMR800&850/AWS	• 700/SMR800&850/AWS/1900	• AWS/AWS (MIMO)/1900
• APAC700	• SMR800&850/1900	• 700/SMR800&850/1900		
• SMR700	• 700/AWS	• 700/AWS/1900		
• SMR800&850				
• AWS				
• 1900				
• 2600				

Other combinations are available on request

The technical performances for each band are shown opposite.

Regardless of the MBF-40 repeater version (single, dual, tri or quad band) these high performances remain constant.

Automatic optical gain setting

The gain is adjusted in the downlink chain by measuring the level of the pilot carrier sent from the Optical Master Unit (OMU). The level of the received pilot carrier is continuously monitored

MBF-40 (Americas) Specifications

Frequency Range	Downlink	Uplink	Bandwidth	Composite power
700MHz (LTE) (lower)	728-746MHz	698-716MHz	29MHz	37dBm
700MHz (LTE) (upper)	746-757MHz	776-787MHz	29MHz	37dBm
APAC 700MHz (LTE)	758-803MHz	703-748MHz	45MHz	40dBm
SMR 700MHz	763-775MHz	793-805MHz	12MHz	37dBm
SMR 800 MHz	851-869MHz	806-824MHz	18MHz	37dBm
SMR800 (Sprint)	862-869MHz	817-824MHz	32MHz	37dBm
850 MHz (Cellular)	869-894MHz	824-849MHz	32MHz	37dBm
1900 MHz	1930-1995MHz	1850-1915MHz	65MHz	37dBm
1700 MHz (AWS)	2110-2155MHz	1710-1755MHz	45MHz	39dBm
2600MHz	2620-2690MHz	2500-2570MHz	70MHz	43dBm

General Parameters

Noise figure	3dB typical (maximum gain)
Ripple	± 2dB
Propagation delay	< 2µs
Gain UL/DL	Adjustable, in 1dB steps.
System impedance	50Ω
Return loss at antenna connections	>14dB
Antenna connectors	7/16 DIN
Number of antenna ports	1 for single/dual/tri/quad band, 2 connectors for MIMO
Electrical ratings	110VAC 60Hz or -48VDC
Cooling	Convection in single, dual and tri-band. Quad band requires fan hood ⁽¹⁾

Optical Parameters

Wavelength DL/UL	1310/1550nm
Maximum optical loss	10dBo
F/O connector	1 SC/APC , 2 SC/APC for MIMO

Modulation accuracy at nominal output power

GSM/GMSK	<2.5% RMS and <10% peak
EDGE /8-PSK	<3% EVM RMS
WCDMA/EVM	<12.5% RMS (composite E TSI TS 25.106 with TM 1 / 64 D PCH)
LTE / EVM	< 8% (composite 3GPP TS 136 106)
PKCDE	<-33 dB (E TSI TS 25.106 with TM 1/64DPCH and spreading factor 256)
Power Consumption ⁽¹⁾	Single Band 140W Dual Band 220W Tri Band MIMO 350W Quad Band 430W

Mechanical

Dimensions & weight	Single Band	21.3" x 15" x 7.8" (540mm x 382mm x 198mm) 44lbs (20kg)
	Dual Band	21.3" x 15" x 7.8" (540mm x 382mm x 198mm) 48.5lbs (22kg)
	Tri band	21.3" x 15" x 12.3" (540mm x 382mm x 313mm) 76lbs (34kg)
	Quad band	25.1" x 15" x 12.3" (640mm x 382mm x 313mm) 83lbs (38kg) (inc. fan hood)
Enclosure	Aluminum IP65 (NEMA4)	

Environmental

EMC	FCC
Operating temperature	-13°F to +131°F (-25°C to +55°C)
Storage temperature	-22°F to +158°F (-30°C to +70°C)
Humidity	ETSI EN 300 019-2-4

⁽¹⁾ Above 400 watts a fan hood accessory kit is required

Ordering Information

Type	Description	Part Number
APAC 700MHz	MBF-40 APAC 700MHz 40dBm 110VAC	MBF-4007A-110V
SMR 800&850 /1900MHz	MBF-40 SMR 800&850/1900 37dBm 110VAC	MBF-3708-3719-110V
700/1700MHz	MBF-40 7/17 37/39 dBm 110VAC	MBF-3707-3717-110V
700/SMR800&850/1700MHz	MBF-40 700/SMR 800&850/17 37/37/39dBm 110VAC	MBF-3707-3708-3917-110V
700/SMR800&850/1900MHz	MBF-40 700/SMR 800&850/1900MHz 37/37/37dBm 110VAC	MBF-3707-3708-3719-110V
SMR800&850/1700/1900MHz	MBF-40 SMR 800&850/17/19 37/39/37dBm 110VAC	MBF-3708-3917-3719-110V
700/1700/1900MHz	MBF-40 700/1700/1900 37/39/37dBm 110VAC	MBF-3707-3917-3719-110V
700/SMR800&850/1700/1900MHz	MBF-40 700/ SMR 800&850/1700/1900 37/37/39/37dBm 110VAC	MBF-3707-3708-3917-3719-110V
1700 MIMO/1900MHz	MBF-40 1700/1700MIMO/1900 39/39/37dBm 110VAC	MBF-3917-3917M-3719-110V

MBF-40 Series 43dBm

Single, Dual, Tri and Quad Band for Americas

Key features:

- High output power.
- High efficiency MCPA amplifier technology.
- Advanced and User-friendly Remote Control and Supervision.
- Up to four frequency bands in one enclosure, MIMO support in one enclosure.
- Up to 5 frequency bands over the same F/O cable (2 enclosures, master-slave configuration)



The MBF - Multi-Band Fiber optic fed system encapsulates solutions for both indoor and outdoor environments for single or multi-operator use. It offers seamless coverage in any indoor environment such as tunnels, metros and larger buildings.

Signals are coupled off from a nearby base station and then distributed via fiber to one or several MBF repeaters. Up to 5 frequency bands can be supported over single F/O cable to allow future upgrades w/o the need to add additional cables, done thru

master unit (with F/O interface) and slave unit (w/o F/O) connected to the master unit.

The high output power results in a need to deploy a fewer number of sites, which in turn lowers the capital expenditures for the roll-out as a whole.

These remote units can be installed up to 12 miles (20km) from the base station site, offering a great flexibility when providing RF coverage in areas where off air transmission is not a preferable solution. A distributed antenna system

can be used to distribute the signal throughout the area to be covered.

Cobham Wireless can provide a complete solution including design, site surveys and equipment related to the POI (Point Of Interface) such as combiners, filters, cross band couplers, etc.

The MBF product family includes version for single band, dual band, tri band and quad band and also MIMO variants available in the following combinations:

Single band	Dual band	Tri-band	Quad band
• 700LTE	• SMR700/SMR800	• 700/SMR800&850/AWS	• 7700/SMR800&850/AWS/1900
• APAC700	• AWS/1900	• 700/SMR800&850/1900	• SMR800&850/AWS/1900/2600
• SMR700	• 7AWS/2600	• 700/AWS/1900	
• SMR800&850	• 700LTE/700LTE MIMO		
• AWS			
• 1900			
• 2600			

Other combinations are available on request

The technical performances for each band are shown opposite.

Regardless of the MBF-40 repeater version (single, dual, tri or quad band) these high performances remain constant.

Automatic optical gain setting

The gain is adjusted in the downlink chain by measuring the level of the pilot carrier sent from the Optical Master Unit (OMU). The level of the received pilot carrier is continuously monitored

MBF-40 (Americas) Specifications

Frequency Range	Downlink	Uplink	Bandwidth	Composite power
700MHz (LTE) (lower)	728-746MHz	698-716MHz	29MHz	43dBm
700MHz (LTE) (upper)	746-757MHz	776-787MHz	29MHz	43dBm
APAC 700MHz (LTE)	758-803MHz	703-748MHz	45MHz	43dBm
SMR 700MHz	763-775MHz	793-805MHz	12MHz	37dBm
SMR 800 MHz	851-869MHz	806-824MHz	18MHz	37dBm
SMR800 (Sprint)	862-869MHz	817-824MHz	32MHz	43dBm
850 MHz (Cellular)	869-894MHz	824-849MHz	32MHz	43dBm
1900 MHz	1930-1995MHz	1850-1915MHz	65MHz	43dBm
1700 MHz (AWS)	2110-2155MHz	1710-1755MHz	45MHz	43dBm
2600MHz	2620-2690MHz	2500-2570MHz	70MHz	43dBm

General Parameters

Noise figure	3dB typical (maximum gain)
Ripple	± 2dB
Propagation delay	< 2µs
Gain UL/DL	Adjustable, in 1dB steps.
System impedance	50Ω
Return loss at antenna connections	>14dB
Antenna connectors	7/16 DIN
Number of antenna ports	1 for single/dual/tri/quad band, 2 connectors for MIMO
Electrical ratings	110VAC 60Hz or -48VDC
Cooling	Convection in single, dual and tri-band. Quad band requires fan hood ⁽¹⁾

Optical Parameters

Wavelength DL/UL	1310/1550nm
Maximum optical loss	10dBo
F/O connector	1 SC/APC , 2 SC/APC for MIMO
Modulation accuracy at nominal output power	
GSM/GMSK	<2.5% RMS and <10% peak
EDGE /8-PSK	< 3% EVM RMS
WCDMA/EVM	<12.5% RMS (composite E TSI TS 25.106 with TM 1 / 64 D PCH)
LTE / EVM	<8% (composite 3GPP TS 136 106)
PKCDE	<-33 dB (E TSI TS 25.106 with TM 1/64DPCH and spreading factor 256)
Power Consumption ⁽¹⁾	Single Band 140W Dual Band 220W Tri Band 350W Quad Band 430-600W

Mechanical

Dimensions & weight	Single Band	21.3" x 15" x 7.8" (540mm x 382mm x 198mm) 44lbs (20kg)
	Dual Band	21.3" x 15" x 7.8" (540mm x 382mm x 198mm) 48.5lbs (22kg)
	Tri band	21.3" x 15" x 12.3" (540mm x 382mm x 313mm) 76lbs (34kg)
	Quad band	25.1" x 15" x 12.3" (640mm x 382mm x 313mm) 83lbs (38kg) (inc. fan hood)
Enclosure	Aluminum IP65 (NEMA4)	

Environmental

EMC	FCC, IC
Operating temperature	-13°F to +131°F (-25°C to +55°C)
Storage temperature	-22°F to +158°F (-30°C to +70°C)
Humidity	ETSI EN 300 019-2-4

⁽¹⁾ Above 400 watts a fan hood accessory kit is required

Ordering Information

Type	Description	Part Number
700MHz (LTE)	MBF-40 700MHz LTE 43dBm 110VAC slave unit	MBF-4307-110V-SL
APAC 700MHz (LTE)	MBF-40 APAC 700MHz LTE - 43dBm 110VAC slave unit	MBF-4307A-110V-SL
700MHz MIMO (LTE)	MBF-40 LTE 700/700 MIMO 43/43dBm 110VAC slave	MBF-4307-4307-M-110V-SL
SMR 700/800 MHz	MBF-40 SMR 700/800MHz 37/37dBm 110VAC, master unit	MBF-3707S-3708S-110V
AWS/1900MHz	MBF-40 AWS/1900MHz 43/43dBm 110VAC, master unit	MBF-4317-4319-110V
AWS/2600MHz	MBF-40 AWS/2600MHz 43/43dBm 110VAC, master unit	MBF-4317-4326-110V
SMR800&850/AWS/ 1900/2600	MBF-40 SMR800&850/AWS/1900/2600 43/43/43/43dBm 110VAC, master unit ready for add-on with fan hood	MBF-4308-4317-4319-4326-110V-F
700/SMR800&850/AWS/1900	MBF-40 700/SMR800&850/AWS/1900 43/43/43/43dBm 110VAC, master unit with fan hood	MBF-4308-4308-4317-4319-110V-F

Intelligent Digital DAS

Key features:

- An all-digital CPRI-based transport DAS.
- Robust low noise, high dynamic range architecture.
- Multi-operator and multi-sector support.
- Software-controlled dynamic capacity management.
- Cobham Wireless patented DSP RF filtering technology.
- Inherent and simple MIMO capability over the same single backbone which lowers costs and simplifies deployment.
- 8 frequency bands and more over the same F/O cable.
- Cable agnostic - supports SMF, MMF, Cat5/6.
- Plug-and-play capability.
- Modular mixable and expandable architecture.
- Embedded "last mile" 1 Gbit/s IP backhaul for Wi-Fi access points and small cells.
- Ready for direct CPRI baseband interface.
- Digital combining of cellular carrier's resources - ideal for neutral host applications as well as integration with public safety vendors.

The Cobham Wireless Intelligent Digital Distributed Antenna System - idDAS provides a flexible, customizable and expandable cellular and data coverage solution for multiple operators and services over a common infrastructure.

Analogue RF services and sectors from a range of macro BTS, low power BTS as well as small cells are conditioned, digitized and then transported utilizing CPRI links over SMF, MMF, Cat 5/6 cable infrastructure to remote locations. Cellular services are converged with Wi-Fi and small cells' IP backhaul for distribution over the same CPRI link infrastructure.

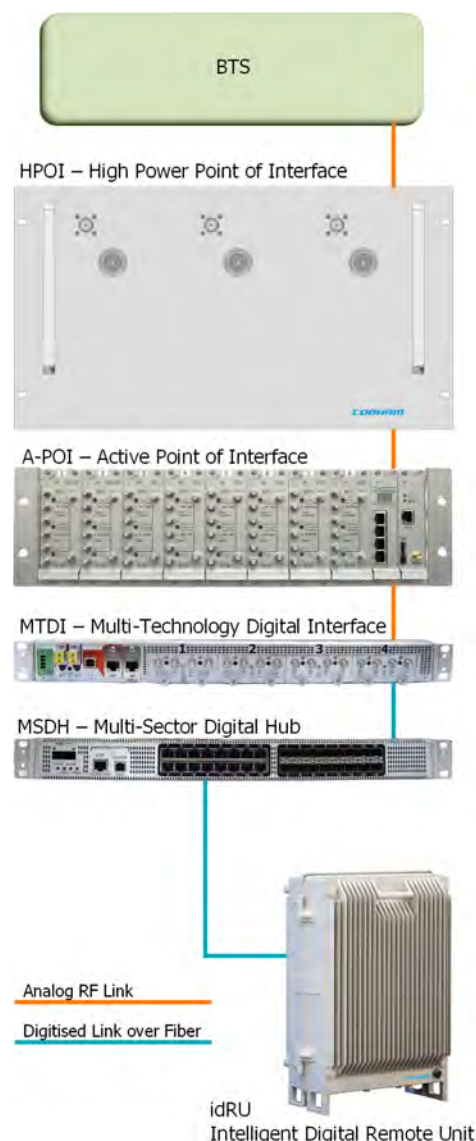
BTS sectors are dynamically allocated across the different zones of the building. The process is software controlled according to user-defined profiles. These different profiles can

be manually selected or based on time schedules, thus dynamically changing the allocation of RAN resources across the building.

For example, an office building may require more sectors and Ethernet data during the daytime workday and less in the evenings and weekends - quite the opposite of what the adjacent mall or hotel may need. idDAS facilitates resource allocation according to specific profiles and schedules.

An intuitive, web-based software management application is used for single-source management of all system elements by opening a web session to any-one of the system's digital central switching hubs (MSDHs).

The solution can be expanded and customized according to changing

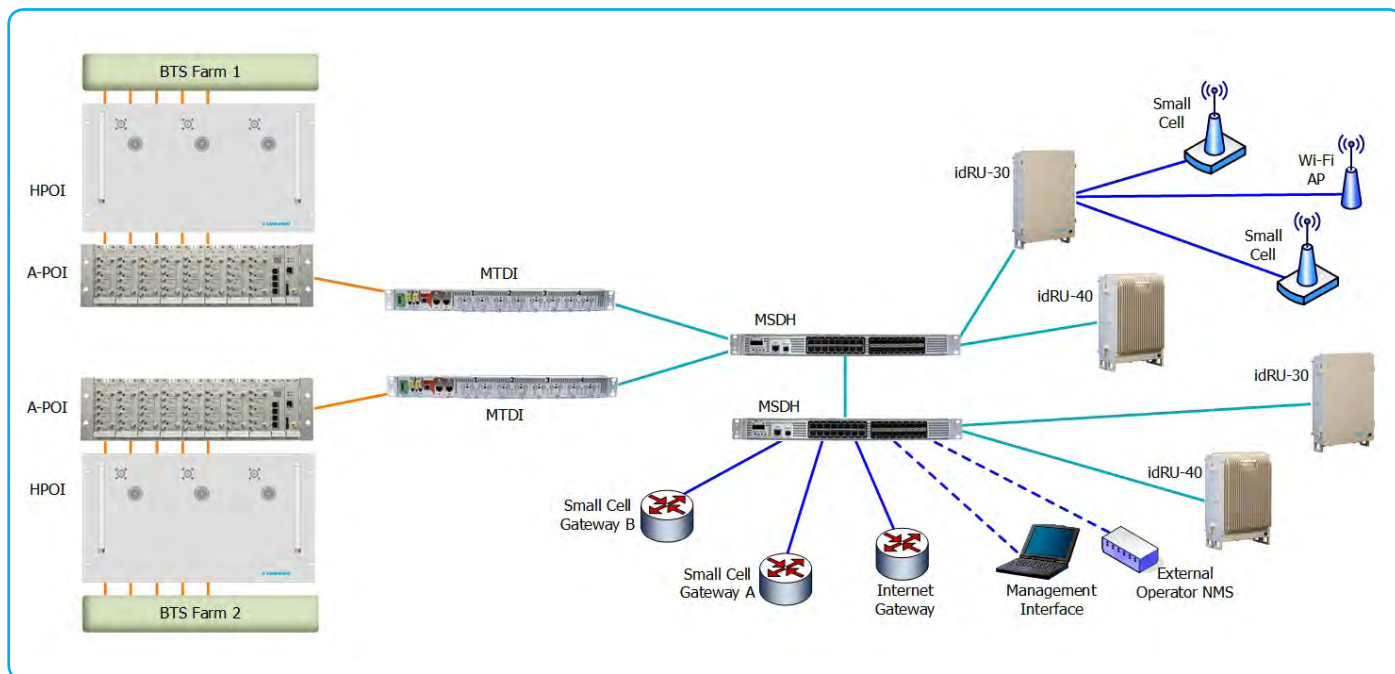


coverage and capacity needs: additional sectors can be easily added for more coverage, while existing sectors or even cellular carriers can easily be reallocated via the web based management system. Base Stations and Sectors as well as individual carriers can be routed anywhere across the building along with data services.

Cobham Wireless can provide a complete solution including design, site surveys and ancillary equipment related to the idDAS.

The idDAS solution consists of the following main elements:

- **HPOI** - High-Power Point of Interface. A passive POI covering the frequencies 698-2700MHz and providing signal attenuation for up to eight BTS sector signal paths of up to 50dBm, attenuating the signals levels by 20 to 30 dBm as required by the A-POI and MTDI units.
- **A-POI** - Active Point of Interface. A headend service conditioning unit that supports up to 16 BTS sectors (+30dBm max input power). Supports up to eight, modular plug in band-modules, where each module interfaces to two, same-frequency sectors with individual RF power management for each sector port. The SmartALC™ algorithm enables automatic power management thus simplifying commissioning processes.
- **MTDI** - Multi-Technology Digital Interface. This unit digitizes and filters all the cellular carriers and sends them over CPRI links to the digital central hub of the system (MSDH). Each MTDI shelf consists of four plug-in bandmodules covering all common frequencies. Each MTDI interfaces with the A-POI units and routes digitized services towards MSDH. Thus, each MTDI can support up to 16 BTS sector ports.
- **MSDH** - Multi-Sector Digital Hub. This unit is the central switching hub of the id DAS as well as the central control system. All the digitized cellular resources are converged to the MSDH through CPRI links and from the MSDH are distributed through CPRI links to the different remote units. Distribution is based on the pre-defined allocation profiles. It thus provides cell resource distribution routing, sector switching and broadcasting according to user defined software configuration. Each MSDH supports up to 16, 10Gbit/s CPRI links connected to MTDI's or idRU's. For idRU the CPRI link can support one idRU or more idRU's (in cascade mode) with embedded 1Gbit/s IP backhaul in each link. Several MSDH units can be cascaded for a large infrastructure. The MSDH is ready for direct CPRI interface with any RAN equipment.
- **idRU** - The idRU is an IP 65, outdoor as well as indoor, four-band remote unit, where two units can be cascaded through a CPRI link to support eight bands. Each band can provide medium-power of 30dBm per band or high-power of 40dBm per band. The Remote Units can serve as the backhaul port for any nearby IP device or switch; thus, it distributes combined cellular and data services according to user defined configuration profiles. The idRU is connected to the MSDH via 10 Gbit/s CPRI interfaces, where each interface contains an embedded 1Gbit/s IP backhaul link.



idDAS overview schematic

HPOI, A-POI, MTDI and idRU Supported Frequencies

Frequency range	Downlink	Uplink
LTE700 Lower band	728-746MHz	698-716MHz
LTE700 Upper band	746-757MHz	776-787MHz
800MHz Sprint	862-869MHz	817-824MHz
850MHz Cellular	869-894MHz	824-849MHz
1900MHz PCS	1930-1995MHz	1850-1915MHz
1700MHz AWS	2110-2155MHz	1710-1755MHz
2600MHz	2620-2690MHz	2500-2570MHz

HPOI

HPOI Specifications



Parameter	Specification					
Attenuator Modules						
Frequency Range	698-2700MHz					
Attenuation	3dB	6dB	10dB	15dB	20dB	30dB
Attenuation tolerance	± 0.5dB	± 1.0dB	± 1.3dB	± 1.5dB	± 1.5dB	± 1.5dB
VSWR	1.25 : 1					
Maximum average power	100W					
Impedance (nominal)	50Ω					
IMD (2 x +43 dBm) 3rd order	-165dBc typical (-160dBc max.)					
Shelf Assembly						
Input Connector type	7/16 DIN female					
Output Connector type	N female					
Dimensions (W x H x D)	19" x 10.5" x 16.4" (482.6mm x 266.7mm x 416.5mm), (6U, 19" rack-mount)					
Weight	30.8lbs (14kg)					
Environmental Protection	IP65 (attenuator module only)					

A-POI

A-POI Specifications



RF parameters

Frequencies	See Supported Frequencies, above.
Gain flatness	3 dB (p-p)
RF input power range	+20 to +30 dBm composite power per band

General

BTSI cards	Up to 8
BTS sector inputs per BTSI card	Up to 2
BTS side RF interfaces	4 QMA Connector Female (2 per sector) Simplex / Duplex connections per sector.
DAS side RF interfaces	4 QMA Connector Female (Simplex) 2 sectors can be converged to a single simplex connection
Management	Advanced, Web based, management and control system Management via MTDI
Power feeding	110VAC 60Hz or -48VDC
Power consumption	60 Watt max (A-POI rack with 8 band modules). Fan-less configuration.
Operating temperature	23°F to 130°F (-5°C to +55°C)

Mechanical

Dimensions (W x H x D)	19" x 5.2" x 11.4" (482.6mm x 132.5mm x 289.5mm) 3U, 19" rack-mount
Weight	20lbs (9kg)

MTDI

MTDI Specifications



RF parameters

Frequencies	See Supported Frequencies, above.
Gain flatness	3 dB (p-p)
RF input power range	From APOI 20 to +30 dBm composite power per band

General

Number of Digitization Modules	4 band-specific modules
Max number of sectors per Digitization Module	4 sectors per module (via 2, A-POI band modules in combined mode)
RF Ports per module	4 QMA Connector Female Two simplex Tx/Rx connections.
CPRI ports	2 CPRI ports for connection to MSDH and MTDI cascading: <ul style="list-style-type: none"> • L1- MM connector • L2 -SM connector

Management	2 Ethernet ports: <ul style="list-style-type: none"> • APOI – A-POI control connection • LAN – idDAS Web Management (local or remote) • Console – USB port for local connection
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Power feeding	110VAC 60Hz or -48VDC
Power consumption	140 Watt max (MTDI rack with 4 band modules)
Operating temperature	23°F to 130°F (-5°C to +55°C)

Mechanical

Dimensions (W x H x D)	19" x 1.75" x 11.4" (482.6mm x 45mm x 290 mm), (1U, 19" rack-mount)
Weight	7.72lbs (3.5kg)

CPRI interface media types

	Distance	Supported bandwidth
Single mode fibre	Up to 24 miles (40km)	Up to 266 MHz
Multi mode fibre	Up to 980 feet (300m)	Up to 266 MHz

MSDH

MSDH Specifications



Interfaces

CPRI Ports (MTDI/idRU)	16 ports, 10 Gbit/s per port. Up to 4 MTDI connections
Ethernet Ports (RJ45)	16 ports 1 Gbit /s per port. Internally connected to the corresponding CPRI ports
Management	1 RJ45 Ethernet port – idDAS Web management (local or remote) Console – USB port for local connection
External sync interface	Optional

General

Power feeding	110VAC 60Hz or -48VDC
Power consumption	100W max
Operating temperature	23°F to 130°F (-5°C to +55°C)
Mechanical	
Dimensions (W x H x D)	19" x 1.75" x 11.4" (482.6mm x 45mm x 290 mm), (1U, 19" rack-mount)
Weight	7.72 lb (3.5 kg)

CPRI interface media types		Distance	Supported bandwidth
Single mode fiber	1310, 1550 nm	Up to 24 miles (40km)	Up to 266 MHz
Multi mode fibre	850 nm	Up to 980 feet (300m)	Up to 266 MHz
Twisted Pair Ethernet ⁽¹⁾	CAT 5a, CAT6, CAT6a	Up to 330 feet (100m)	Up to 36 MHz

⁽¹⁾ Will be available in future releases

idRU

idRU Specifications



Medium Power idRU



High Power idRU

RF parameters						
Frequency Range	Downlink (DL)	Uplink (UL)	Operational BW	High Power Composite Output Power	Medium Power Composite Output Power	Technologies (tested)
LTE700 Lower band	728-746MHz	698-716MHz	29MHz	+43 dBm ⁽²⁾	+30 dBm	LTE
LTE700 Upper band	746-757MHz	776-787MHz	29MHz	+43 dBm ⁽²⁾	+30 dBm	LTE
800MHz (Sprint)	862-869MHz	817-824MHz	32MHz	+43 dBm ⁽³⁾	+30 dBm	GSM ⁽¹⁾ , CDMA, WCDMA, LTE
850MHz (Cellular)	869-894MHz	824-849MHz	32MHz	+43 dBm ⁽³⁾	+30 dBm	GSM ⁽¹⁾ , CDMA, WCDMA, LTE
1900MHz (PCS)	1930-1995MHz	1850-1915MHz	65MHz	+43 dBm ⁽³⁾	+30 dBm	GSM ⁽¹⁾ , CDMA, WCDMA, LTE
1700MHz (AWS)	2110-2155MHz	1710-1755MHz	45MHz	+43 dBm ⁽²⁾	+30 dBm	WCDMA, LTE
2600MHz	2620-2690MHz	2500-2570MHz	70MHz	+43 dBm ⁽²⁾	+30 dBm	LTE

⁽¹⁾ For GSM modulation in high power idRU ETSI IMD is measured with 2 tones each of them is 6dB less than composite power

⁽²⁾ PAR 8.5dB

⁽³⁾ PAR 8.5dB for WCDMA/LTE

General parameters

Noise Figure	3.5 dB Typical (maximum gain)
Ripple	±2 dB
Downlink power	Adjustable, in 1 dB steps
System Impedance	50Ω
Return loss at antenna port	>14dB
Antenna Connectors	DIN 7/16
No. of CPRI Ports	2 (1 connects to MSDH, 1 to cascade to another idRU)
No. of Ethernet Ports	2 (1 for Ethernet Backhaul, 1 for LAN)
No. of Bands	4 (8 when cascading two idRUs)
Cascading	2 units can be cascaded via CPRI link ⁽⁵⁾
No. of antenna ports	1 connector for SISO, 2 connectors for MIMO
Electrical ratings	110VAC 60Hz or -48VDC
External alarms	4 external inputs , 1 external dry contact output

CPRI interface media types

	Distance	Supported bandwidth
Single mode fiber	1310, 1550nm	Up to 24 miles (40km)
Multi mode fibre	850nm	Up to 980 feet (300m)
Twisted Pair Ethernet ⁽⁴⁾	CAT 5a, CAT6, CAT6a	Up to 330 feet (100m)

Modulation Accuracy at nominal output power

WCDMA/EVM	Typ. 3.5% RMS (composite according to ETSI TS 25.106 with TM1/64 DPCH)
LTE/EVM	Typ. 3.5% RMS (composite according to 3GPP TS 136 106)
PkCDE	<-33dB (ETSI TS 25.106 with TM 1/64 DPCH and spreading factor 256)

Power Consumption

Medium Power Models

High Power Models

max 210W

Max 770W

Mechanical

Medium Power Models

High Power Models

Dimensions	21.3" x 15" x 7.8" (540mm x 382mm x 198mm)	21.3" x 15" x 12.3" (540mm x 382mm x 313 mm)
Weight	55lbs (25kg)	84lbs (38kg)

Environmental

Enclosure	Aluminum (IP65)
EMC	FCC, IC
Operating Temperature	14°F to 131°F (-10°C to + 55°C)
Storage Temperature	-22°F to 150°F (-30°C to + 70°C)
Humidity	ETSI EN 300 019-2-4

⁽⁴⁾ Will be available in future releases

⁽⁵⁾ Cascading of multiple units will be available in future releases

Ordering Information

A-POI	Description	Part Number
A-POI Chassis	A-POI chassis AC feeding including controller	APOI-CH-AC-CN
	APOI chassis 48VDC feeding including controller	APOI-CH-48VDC-CN
	A-POI chassis AC feeding redundant power supply including controller	APOI-CH-AC-R-CN
	A-POI chassis 48VDC feeding redundant power supply including controller	APOI-CH-48VDC-R-CN
A-POI SW/DIS card	A-POI switch and Display card	APOI-SW-DISP
A-POI BTSI card	APOI BTS interface 700LTE up/low band	APOI-BTSI-700LTE
	APOI BTS interface 700LTE upper band	APOI-BTSI-700LTE-UP
	APOI BTS interface 700LTE lower band	APOI-BTSI-700LTE-LOW
	APOI BTS int SMR800(7M)/ 850MHz	APOI-BTSI-800/850
	APOI BTS interface 1700MHz	APOI-BTSI-1700
	APOI BTS interface 1900MHz	APOI-BTSI-1900
	APOI BTS interface 2300MHz FDD	APOI-BTSI-2300
	APOI BTS interface 2600MHz	APOI-BTSI-2600
	APOI-BTSI-2600	APOI-BLNK-PNL
A-POI Jumper	APOI QMA-QMA jumper to MTDI 70 cm	APOI-QMA-JUMPER-70CM
MTDI	Description	Part Number
MTDI Chassis	id-DAS MTDI 4 CH 1 SM & 1 MM SFP 48VDC	id-DAS-MTDI-4-CH-SM-MM-48VDC
	id-DAS MTDI 4 CH 1 SM & 1 MM SFP AC	id-DAS-MTDI-4-CH-SM-MM-AC
MTDI RF board	id-DAS RF board 700LTE	id-DAS-RFB-700LTE
	id-DAS RF board SMR800(7M)/850MHz	id-DAS-RFB-800/850
	id-DAS RF board 1700MHz	id-DAS-RFB-1700
	id-DAS RF board 1900MHz	id-DAS-RFB-1900
	id-DAS RF board 2300MHz FDD	id-DAS-RFB-2300
	id-DAS RF board 2600MHz	id-DAS-RFB-2600
MSDH	Description	Part Number
	id-DAS MSDH DC feeding	id-DAS-MSDH-48VDC
	id-DAS MSDH AC feeding	id-DAS-MSDH-AC
SFP+ modules	Description	Part Number
	id-DAS SFP MM 850 NM 10 Gbit/s 400m separate Tx/Rx LC simplex	id-DAS-SFP-MM-10G-850NM-400M
	id-DAS SFP SM 1310 NM 10 Gbit/s 10km separate Tx/Rx LC simplex	id-DAS-SFP-SM-10G-1310NM-10KM
	id-DAS SFP SM 1271NM 10 Gbit/s 10Km WDM LC duplex	id-DAS-SFP-SM-10G-1271NM-10KM-WDM
SFP+ Jumpers	Description	Part Number
	id-DAS MM jumper 3m 2 F/O	id-DAS-MM-JUMPER-2WIRE- 3M
	id-DAS SM jumper 3m 2 F/O	id-DAS-SM-JUMPER-2WIRE-3M
	id-DAS SM jumper 3m WDM	id-DAS-SM-JUMPER-WDM- 3M
idRU	Description	Part Number
idRU 30 quad band 700/800/1700/1900 30dBm	ID-DAS RRU Master 7/8/17/19 30dBm per band 48VDC	id-DAS-RRU-M-3007-3008-3017-3019-DC
idRU 30 quad band 700/800/1700/1900 30dBm	ID-DAS RRU Master 7/8/17/19 30dBm AC	id-DAS-RRU-M-3007-3008-3017-3019-AC
idRU 30 single band 2300 30dBm	ID-DAS RRU Slave 2300 FDD 30 dBm per band 48VDC	id-DAS-RRU-S-3023-DC
idRU 30 single band 2600 30dBm	ID-DAS RRU Slave 2600 FDD 30 dBm per band 48VDC	id-DAS-RRU-S-3026-DC
idRU 43 quad band 700/800/1700/1900 43dBm	ID-DAS RRU Master 7/8/17/19 43dBm 48VDC with fan hood	id-DAS-RRU-M-4307-4308-4317-4319-DC-F
idRU 43 single band 2300 43dBm	ID-DAS RRU Slave 2300 FDD 43dBm 48VDC	id-DAS-RRU-S-4323-DC
idRU 43 single band 2600 43dBm	ID-DAS RRU Slave 2600 43dBm 48VDC	id-DAS-RRU-S-4326-DC

HPOI

High Power, Point of Interface

- Frequency bands range: 698-2700MHz
- Provides attenuation for three signal paths
- Power handling 100W per signal path
- Impedance (nominal) 50 Ohm
- Operating temperature range: -30°C to +85°C
- RoHS compliant
- 19" rack mount configuration



The H-POI is a Passive Point of Interface that covers the frequency range 698-2700MHz. The unit is used in conjunction with the A-POI and MTDI units (qv.) and provides the step-down attenuation of BTS signals required by these units. The H-POI utilizes high performance, low PIM components to attenuate and minimize interference of up to three BTS sectors of up to 50dBm, to levels of 20 to 30dBm. The H-POI provides high PIM resistance, enabling support for active high DATA throughput in LTE networks.

HPOI Specifications

Parameter		Specification				
Attenuator Modules						
Frequency Range		698-2700MHz				
Attenuation	3dB	6dB	10dB	15dB	20dB	30dB
Attenuation tolerance	± 0.5dB	± 1.0dB	± 1.3dB	± 1.5dB	± 1.5dB	± 1.5dB
VSWR	1.25 : 1					
Maximum average power	100W					
Impedance (nominal)	50Ω					
IMD (2 x +43 dBm) 3rd order	-165dBc typical (-160dBc max.)					
Shelf Assembly						
Input Connector type	7/16 DIN female					
Output Connector type	N female					
Dimensions (W x H x D)	19" x 10.5" x 16.4" (482.6mm x 266.7mm x 416.5mm), (6U, 19" rack-mount)					
Weight	30.8lbs (14kg)					
Environmental Protection	IP65 (attenuator module only)					

A-POI

Active - Point of Interface

Key features:

- Up to 16 BTS ports per A-POI shelf, supported by 8 BTS Interface modules (BTSI).
- Up to of 80 BTS ports supported by 5 cascaded A-POI shelves.
- SmartALC™ algorithm enables auto calibration per port or Manual calibration per port.
- Multiple operator and multiple sector support via single APOI shelf.
- Compact 3U, 19" rack-mount configuration.
- Internal pilot tones per each band enable to test the DAS installation and verify all DAS RF connections.
- Web based management, remote management thru wireless modem.
- Simple integration to AEM or any other 3rd party NOC via SNMP traps.



The A-POI is an Active Point of Interface used to connect various DAS feeders like BTSs (Base Transceiver Stations), Small Cells, or Signal booster to the DAS Optical Master Unit (OMU).

Up to 16 different services can be connected to each A-POI shelf. Each A-POI shelf consists of 8 plug in BTS interface modules (BTSI). Each BTSI covers one single band and supports up to 2 BTS sectors. The supported services are: 800, 900, 1800, 2100, 2600 plus 700LTE, SMR 800 (Sprint), Cellular 850, 1900 and AWS.

Each BTSI can be either un-duplexed (separate ports for TX/RX) or duplexed (single port for TX/RX) configuration. Thus allowing different connections to different BTSs.

The two output ports of each Band Module can be either connected

separately to the DAS OMU or can be internally combined together and then connected to an external passive POI combining network box. The output of this combining network box is feeding the OMU.

The APOI has an RF power control and monitor algorithm that guarantees the transmit RF power is precisely matched to each operators budget in multi-operator scenarios. This control loop prevents each operator from exceeding the power allocated to him.

The A-POI has a patented SmartALC™ algorithm control loop that enables auto calibration per each APOI port. The SmartALC™ algorithm will cause the APOI to provide constant pilot signals in all traffic scenarios while maintaining the output power levels required.

The A-POI also enables manual

calibration per port when required by the operators. Up to 5 APOI shelves can be cascaded together via IP switch and display card. The LCD will display the APOI shelf number.

The maximum input power from the BTS to the A-POI is 30dBm. When the APOI is connected directly to Macro BTSs, an external high power attenuator shelf can be provided by Cobham Wireless which increases the BTS input power to 50dBm with focus on excellent PIM performance.

Remote management is achieved via wireless modem or Ethernet. The modem types available are GSM, WCDMA or CDMA 1x. The system can be monitored and controlled via the Cobham Wireless' network management software - AEM.

A-POI Specifications

RF parameters

Supported Frequencies	Frequency range	Downlink	Uplink
	LTE700 Lower band	728-746 MHz	698-716 MHz
	LTE700 Upper band	746-757 MHz	776-787 MHz
	800MHz Sprint	862-869 MHz	817-824 MHz
	850MHz Cellular	869-894MHz	824-849 MHz
	1900MHz PCS	1930-1995 MHz	1850-1915 MHz
	1700MHz AWS	2110-2155 MHz	1710-1755 MHz
	2600MHz	2620-2690MHz	2500-2570MHz
Gain flatness	3 dB (p-p)		
RF input power range	+20 to +30 dBm composite power per band		
Attenuator step width UL + DL	1 dB		
Attenuation range	7-10 dB* to 41 dB (*depending on frequency)		
UL level offset	+10 to -20 dB		
PIM	>135dBc		

General

BTSI cards	Up to 8
BTS sector inputs per BTSI card	Up to 2
BTS side RF interfaces	4 QMA Connector Female (2 per sector) Simplex / Duplex connections per sector.
DAS side RF interfaces	4 QMA Connector Female (Simplex) 2 sectors can be converged to a single simplex connection
Management	Advanced, Web based, management and control system Management via MTDI
Power feeding	110VAC 60Hz or -48VDC
Power consumption	60W max (A-POI rack with 8 band modules). Fan-less configuration.
Operating temperature	23°F to 130°F (-5°C to +55°C)

Mechanical

Dimensions (W x H x D)	19" x 5.2" x 11.4" (482.6mm x 132.5mm x 289.5mm) 3U, 19" rack-mount
Weight	20lbs (9kg)

Ordering Information

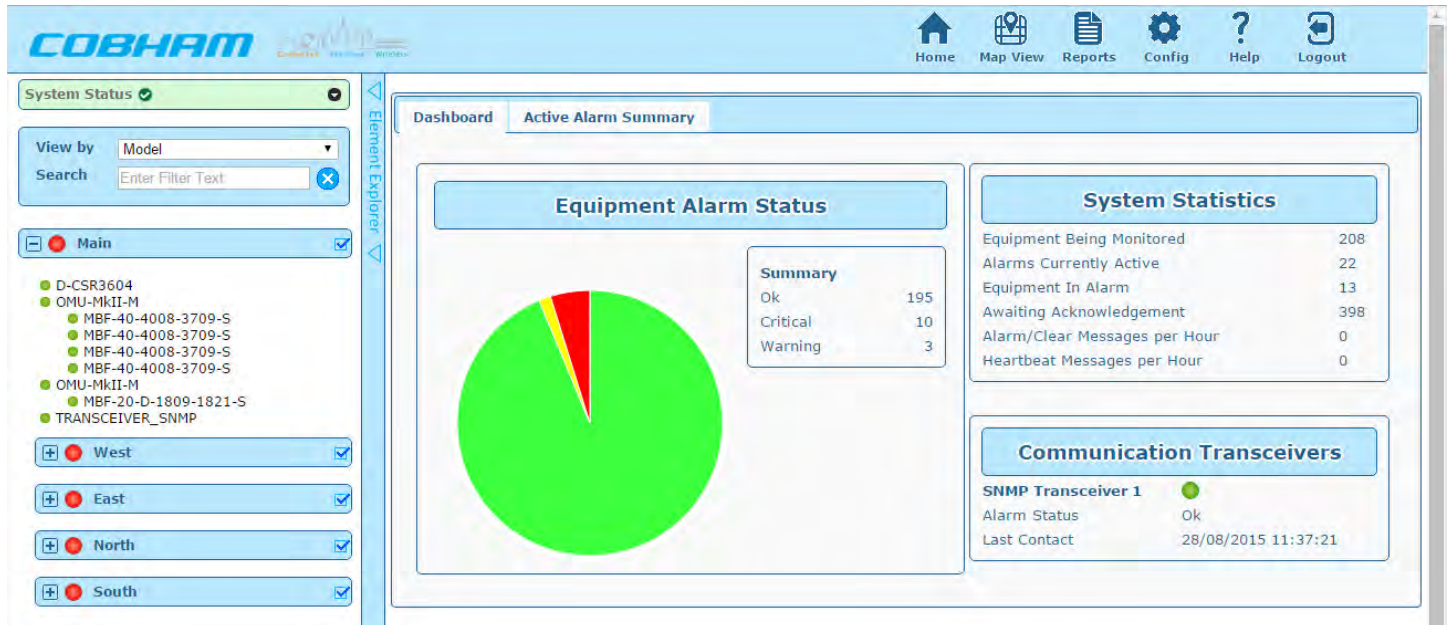
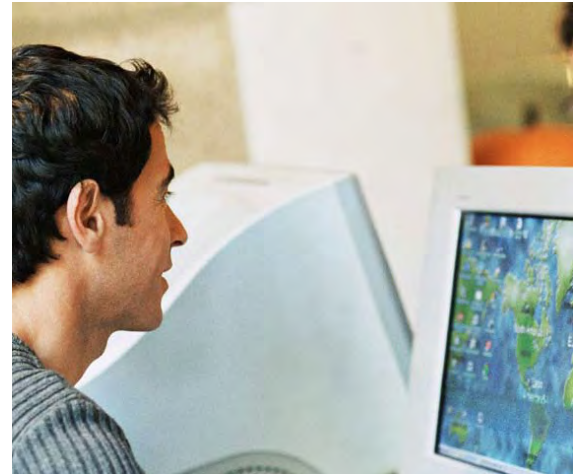
Type	Description	Part Number
APOI Chassis	APOI chassis AC feeding	APOI-CH-AC
APOI Chassis	APOI chassis -48 VDC feeding	APOI-CH-48VDC
APOI SW/DIS card	APOI switch and Display card	APOI-SW-DISP
APOI modem	APOI MC55 GSM modem	APOI-MC55-MDM
APOI modem	APOI Telit 864 WCDMA modem	APOI-T864-MDM
APOI modem	APOI Q26 CDMA 1X modem	APOI-Q26-MDM
APOI BTSI card	APOI BTS interface 800LTE	APOI-BTSI-800LTE
APOI BTSI card	APOI BTS interface 900MHz	APOI-BTSI-900
APOI BTSI card	APOI BTS interface 1800MHz	APOI-BTSI-1800
APOI BTSI card	APOI BTS interface 2100MHz	APOI-BTSI-2100
APOI BTSI card	APOI BTS interface 2600MHz	APOI-BTSI-2600
APOI BTSI card	APOI BTS interface 700LTE up/low band	APOI-BTSI-700LTE
APOI BTSI card	APOI BTS interface 700LTE upper band	APOI-BTSI-700LTE-UP
APOI BTSI card	APOI BTS interface 700LTE lower band	APOI-BTSI-700LTE-LOW
APOI BTSI card	APOI BTS int SMR800(7M)/ 850 MHz	APOI-BTSI-800/850
APOI BTSI card	APOI BTS interface 1700MHz	APOI-BTSI-1700
APOI BTSI card	APOI BTS interface 1900MHz	APOI-BTSI-1900
APOI Blank Panel	APOI Blank Panel	APOI-BLNK-PNL
POI combining network	Passive POI combining network 4/8 ports	POI-CN-4-8-PORT

AEM 3

Active Element Manager

Key features:

- Supports over 10,000 elements.
- Uses SNMP protocol for communications.
- Auto-discovery of new or replaced elements.
- Powerful alarm search and statistics features.
- Support for laptops and tablet devices.
- Optional SMS alarm reporting.
- Client browsers: Internet Explorer, Google Chrome, Firefox, Safari.
- SNMP Alarm forwarding from AEM to NOC.
- Support for static & dynamic repeater IP addresses.
- Logical & Geographical Maps.



The Cobham Wireless Active Element Manager (AEM) software is a complete management, operations and support center for Cobham Wireless DAS and coverage products.

The latest release of AEM (AEM 3) is supplied as an optimized package to meet the monitoring needs of customers managing large and complex deployments of Cobham Wireless active DAS and off air repeater systems (the network Elements).

AEM 3 is designed with a focus on Alarm Management and supervision allowing operators to quickly and efficiently identify issues with repeaters on their network.

A direct link function allows quick and easy connection to each Element whilst accessing the internal web server to change the configuration or view detailed parameters. A mute function enables critical elements to be disabled quickly if the need arises.

Communication between the various network Elements and the AEM is through SNMP, which integrates easily with operators' IP networks.

Multiple clients can access the system simultaneously, using PC, Laptop or Tablet.

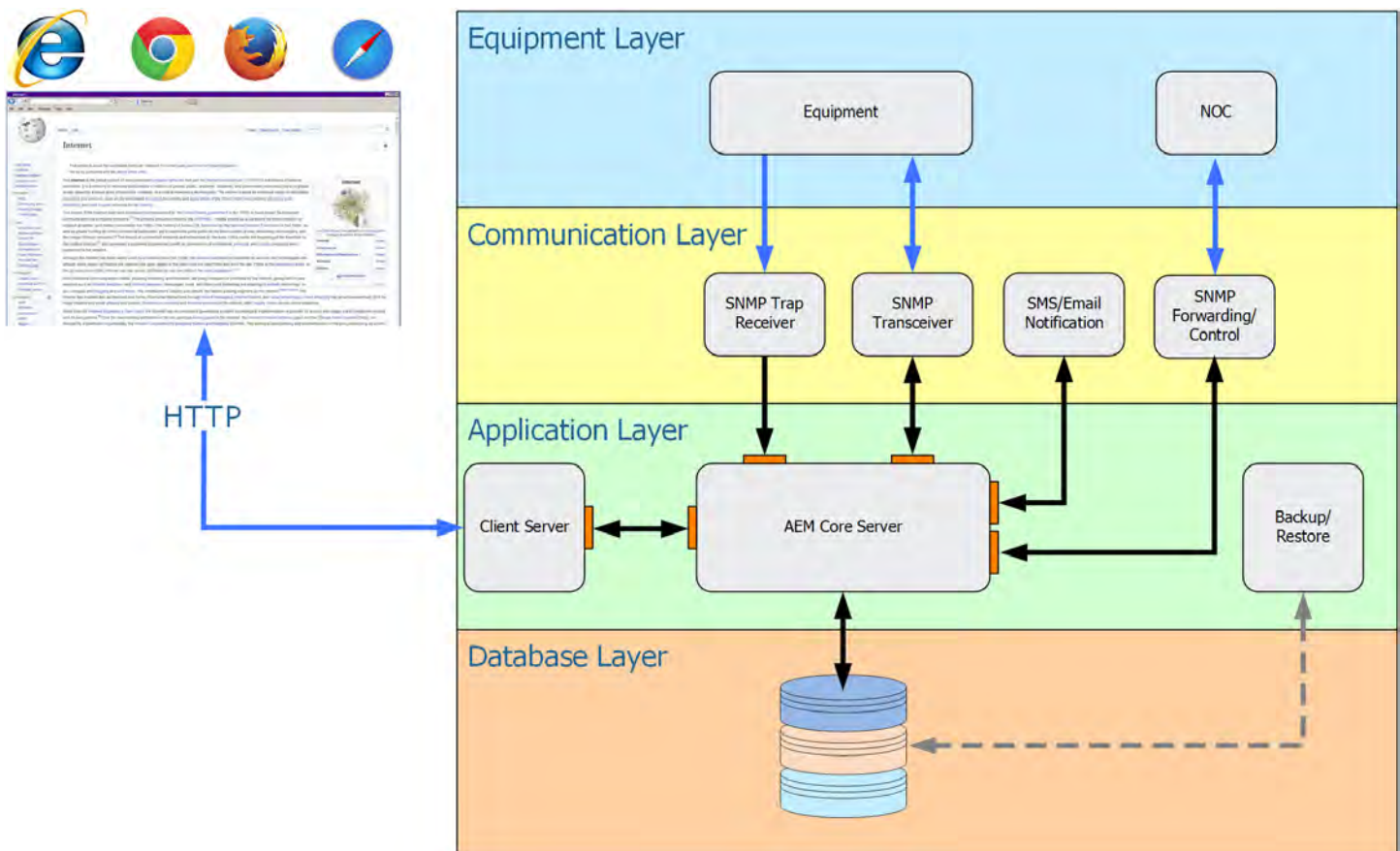
AEM 3 Specifications

RF parameters

Processor	Quad core, 2GHz
RAM	8GB
Hard disk	300GB, RAID 1 or RAID 5 recommended
Additional Drive	DVD-ROM
Operating System	Microsoft Windows® Server 2008 or 2012 64-Bit

General

PC Web Browser	Internet Explorer 11+, Chrome 24+, Firefox 18+
Tablet	Internet Explorer 11+, Chrome 24+, Safari IOS 7
Protocol	SNMP v2c / v3
External interfaces	Email, SMS, northbound SNMP, Relay interface, IP to elements
Supported elements	>10,000
Element functions	Install/Delete elements, static/dynamic IP addresses, identify elements by ID, SN or user defined tag, auto discovery for new or replaced elements, history on deleted elements, advanced alarm filtering, always on architecture support opens a channel when required, SNMP muting
GUI features	Multi-level tree view, equipment search, logical & geographical maps, alarm, heartbeat and system logs, user defined alarm severity, history of deleted elements, multiple simultaneous client access
Administrator functions	Admin/operator/viewer rights, password aging, login failure logout, minimum password length, Configure SNMP/email/SMS alerts, scheduled backups
Report output format	Microsoft Excel™ (csv)



Some recent projects undertaken in the Americas

World Trade Center Complex, Manhattan

St. Elizabeth Dept. of Homeland Security Campus

Mark Center, Washington D.C.

Pentagon

Grand Central Terminal, Manhattan

Jacob Javits Convention Center, Manhattan

Von Braun Buildings, Redstone National Arsenal

Microsoft Data Centers

Portland Trimet

MWAA - Dulles Airport

Baltimore Metro

Baltimore Harbor Tunnels

Plus numerous office buildings, hospitals, apartment complexes, power plants, casinos, hotels, and factories

Pittsburgh LRT

WMATA

SEPTA

Lincoln & Holland Tunnels

John Wayne Airport

Seattle Sound Metro

Maracana Stadium, Brazil

Maneiro Stadium, Brazil

Mosaic Stadium, Canada

Rio de Janeiro Metro, Brazil

Mexico City Metro, Mexico

Contact details

Cobham Wireless
15950 North Dallas Parkway
Suite 400 Dallas
Texas 75248
USA
Tel: (972) 361-8038
Fax: (972) 361-8005

