DATA SHEET

Flex Max® RF Amplifiers

FMB180

1.8 GHz Bridger Amplifier

FEATURES

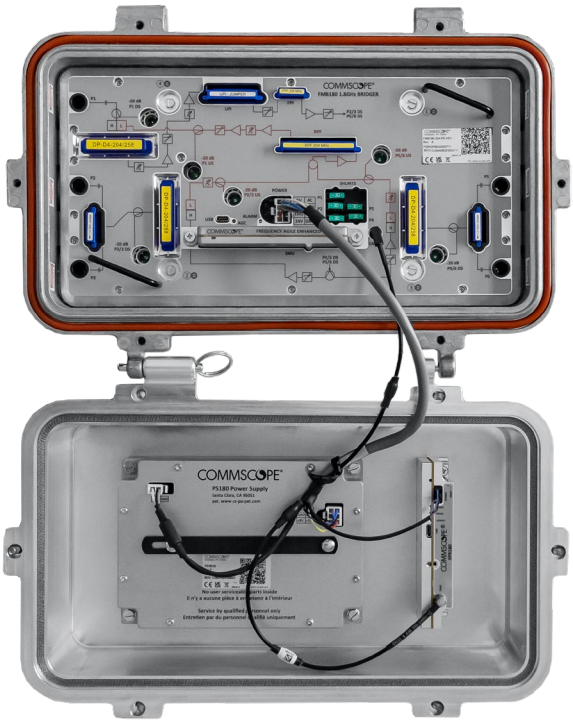
- Supports 1.8 GHz Downstream and up to 684 MHz Upstream operation for DOCSIS® 4.0 migration
- Electronic set-up and control supports easy activation and maintenance
- Optional plug-in Transponder module supports Smart Operation
- Modular RF electronics with field upgradable frequency split options
- Mechanically compatible with legacy 1 GHz C-COR™ and 1.2 GHz ARRIS Flex Max amplifier housings
- Expanded return path bandwidth with support up to 684 MHz
- Signal Monitoring Unit (SMU) plug-in module supports dual-pilot, frequency agile AGC operation; SMU also supports auto-setup and spectrum analysis features
- Supports legacy 1.2 GHz networks

With the ever-growing demand for bandwidth, Cable Operators continue to look for strategies to meet their subscribers' needs. Extended Spectrum DOCSIS (ESD) helps support that demand. To that end, Aurora Networks is introducing its new 1.8 GHz Flex Max Series Amplifiers.

Aurora Networks has engineered 1.8 GHz Flex Max amplifiers to provide a smooth upgrade with minimal subscriber disruption. Designed to maximize reuse of existing network infrastructures, our 1.8 GHz Flex Max amplifiers help enable operators to optimize infrastructure investments and minimize operational challenges. Underpinning our approach:

- Maintaining legacy services to provide service continuity through the upgrade
- Maximum infrastructure reuse and minimal upgrade costs
- Maximized throughput gains, for maximum upgrade longevity

Cable Operators can continue to evolve their HFC networks with this latest generation of Flex Max amplifiers.



Electronic Set-up and Control

The FMB180 amplifier employs next-generation technology that supports electronic setup and control—including the ability to set downstream and upstream attenuation, gain, and tilt electronically—for simplified setup and maintenance. The electronic setup option minimizes the need to keep a large inventory of attenuators and equalizers for technicians and installation partners during network deployment and the future maintenance of the plant.

For added system reliability, the FMB180 utilizes a frequency agile Signal Monitoring Unit (SMU) that provides flexible, "on the fly" management of pilot control frequencies as required across today's diverse set of operational networks. The SMU supports a dual-pilot gain hold feature in the event of pilot loss to eliminate the possibility of extreme level conditions and poor performance. Additionally, there is an AGC LED indicator to provide visual confirmation of the selected mode and pilot presence.

XPR180 Transponder

The optional XPR180 Transponder plug-in module leverages LoRaWAN technology to provide operators with enhanced, real-time monitoring of essential network parameters and fault reporting for fielded FMB180 amplifiers. The XPR180 also supports a variety of remote functions, including firmware updates, amplifier configuration, and operational diagnostics. Utilizing the XPR180's ability to establish long-range communications with amplifiers deployed throughout the network, operators can maximize operational efficiencies, provide enhanced QoS for their subscribers, and more effectively utilize their field technicians to identify and resolve network issues.

Aurora Networks' hand-held Mobile Smart Access Manager (MSAM) enhances XPR180 operation by enabling field technicians to remotely access amplifiers equipped with the transponders from a common node location. From this central location, field technicians can utilize the MSAM Web GUI to monitor, configure, upgrade, and troubleshoot an entire series of amplifiers across the network. The MSAM features a rechargeable battery, enables Over-the-Air-Activation (OTAA) and Firmware Update Over the Air (FUTA), and supports Wi-Fi® connectivity to maximize convenience and useability for technicians in the field.

Frequency Split Upgrades

The FMB180 employs pluggable, field-upgradable diplex filters and associated pluggable devices that are accessible through the RF module cover, providing operators with the flexibility to change band splits in the future without having to remove or disassemble the RF module. This feature significantly reduces the complexity of a standard split upgrade procedure while also minimizing down times that would typically occur during plant upgrades.

The FMB180 supports a flexible range of frequency split options to support DOCSIS 4.0 requirements. The amplifier supports a downstream frequency of up to 1794 MHz and an upstream frequency of up to 684 MHz, while also maintaining performance for legacy services currently deployed by operators. FMB180 amplifiers have an available upstream gain of up to 32 dB to support increased span losses at higher upstream frequencies. The upstream also includes enhanced RF level stability control via an onboard AGC circuit for maximum level stability.

Backward Compatibility

The FMB180 is available as a complete amplifier station or as a drop-in RF module for economical upgrades of legacy C-COR FM901 1 GHz or ARRIS FM902 1.2 GHz amplifiers. The FMB180 features internal -20 dB test points only; there is no option for external test points. The RF module, however, can be installed into an earlier housing that does support external test points without invoking mechanical interference.

SPECIFICATIONS[1]

Characteristics		Specification
Physical		
Housing Dimensions, L x W x D		16.05 x 11.35 x 7.16 in 40.7 x 28.8 x 18.2 cm
Environmental		
Operating Temperature Range		-40°C to +60°C (-40°F to +140°F)
Downstream Parameter		
Frequency Range, MHz[2]		102–1794 258–1794 492–1794 606–1794 834–1794
Flatness, dB[3,6]		± 1.0
Operational Gain, dB[4]		50
Internal Gain and Slope Adjustment		Electronic
Noise Figure, dB[5]		11 @ F_{min}, 12 @ F_{max} (typical)
Test Points, dB		-20 ± 1.0
Return Loss, dB[6,7]		16 (up to 1218 MHz); 14 (1218–1794 MHz)
Hum Modulation, dBc[8]		> 55, F_{minfwd} to 1600 MHz > 50, 1601 MHz to 1794 MHz
Upstream Parameter		
Frequency Range, MHz[2]		10–85 10–204 10–396 10–492 10–684
Flatness, dB[6]		± 1.0
Operational Gain, dB[9]	085 Split 204 Split 396 Split 492 Split 684 Split	27 27 29 30 32
Internal Gain and Slope Adjustment		Electronic
Noise Figure, dB[10]		11 (typical)
Test Points, dB		-20 ± 1.0
Return Loss, dB[6]		16
Hum Modulation, dBc[8]		> 55, 10 MHz to $F_{maxreturn}$ MHz
Powering		
AC Input Voltage Range, VAC		45–90
AC Power (typical)[11]		46 W @ 90 V
AC Bypass Current, A		15

NOTES:
1. Specifications are subject to change without notice.
2. Operating passband of station, determined by the diplex filters, Forward Path Filter, Return Path Filter, and equalization installed in the amplifier.
3. Flatness is measured with respect to slope. Slope is calculated using best fit.
4. Includes gain control back-off and minimum operational input attenuation and equalization loss.
5. Specified at the housing cable entry facility with amplifier in default tilt/gain condition. Includes all input loss. Typical value may derate 0.5 dB over temperature (worst case).
6. As shipped from the factory.
7. Measured with a jumper in the Distribution accessory location. Return loss may derate to 12 dB at frequencies greater than 320 MHz after a frequency split upgrade.
8. Typical performance at less than 12 Arms AC passing through the port under test. Greater than 12 Arms AC current passing through the port under test may degrade by up to 5 dB.
9. Operational gain is specified for the station with minimum input and output attenuation and is inclusive of input losses.
10. Specified at the housing cable entry facility with the amplifier in default gain/tilt condition. Includes all input loss. Typical value may derate 1 dB (worst case). 684 MHz upstream is derated 1 dB typical, 2 dB worst case.
11. The typical AC power does not include a remote monitoring transponder.

FMB180 BRIDGER AMPLIFIER ORDERING GUIDE

In the example below, part number FMB180-204-PT-XFX corresponds to the shaded rows in the Key Guide.

F	M	B	1	8	0	–	2	0	4	–	P	T	–	X	F	X

Key	Model
FMB180	Flex Max 1.8 GHz Bridger
Key	**Frequency**
085	10–85 MHz/102–1794 MHz
204	10–204 MHz/258–1794 MHz
396	10–396 MHz/492–1794 MHz
492	10–492 MHz/606–1794 MHz
684	10–684 MHz/834–1794 MHz

Key	SMU
P	Enhanced
C	Enhanced w/UPI Switch
Key	**Control**
E	Electronic
T	Transponder

Key	Control
X	Standard
U	Upgrade Kit
Key	**Control**
F	Full Station
E	EPACK Module
P	Upgrade Kit
Key	**Control**
X	Standard
G	Upgrade Kit

Contact Customer Care for product information and sales:

- United States: +1-888-944-4357
- International: +1-215-323-2345

Aurora™ NETWORKS

7865363_FMB180_DS_RevB