

MCC Series™ Application Note



microlabtech.com

Passive Modular Carrier Combiner

MCC Series™

Application Note



The **MCC Series** is a Passive Modular Carrier Combiner that serves as a point-of-interface (POI) for neutral host Distributed - Radio Access Network (D-RAN) architectures and in-building or outdoor Distributed Antenna Systems (DAS). This solution helps service providers combine RAN remote heads or head-end services for RF distribution. Requirements commonly include the need to combine all commercial signals for all or some of the operators with cellular services extending from 4G/5G 617 MHz to LTE-LAA 6 GHz. The combiner covers the current Licensed C-Band, 3.45 GHz, & CBRS as well as future support for n77 applications. Its modularity enables cost-effective scalability to only pay for what is needed, when its needed.

Passive modular carrier combiner point-of-interface

- 5 bands per filter combiner for superior flexibility
- Frequency coverage from 617 to 5925 MHz for future-proof investment
- Low insertion loss for maximum transmit effective isotropic radiated power (EIRP)
- Low passive intermodulation (PIM) for maximum network throughput
- Guaranteed system specifications for ultimate reliability
- Modularity enables cost-effective scalability as requirements change
- Configurability supports one- or two-sector SISO/MIMO applications
- Various mounting options with passive cooling for easy installation

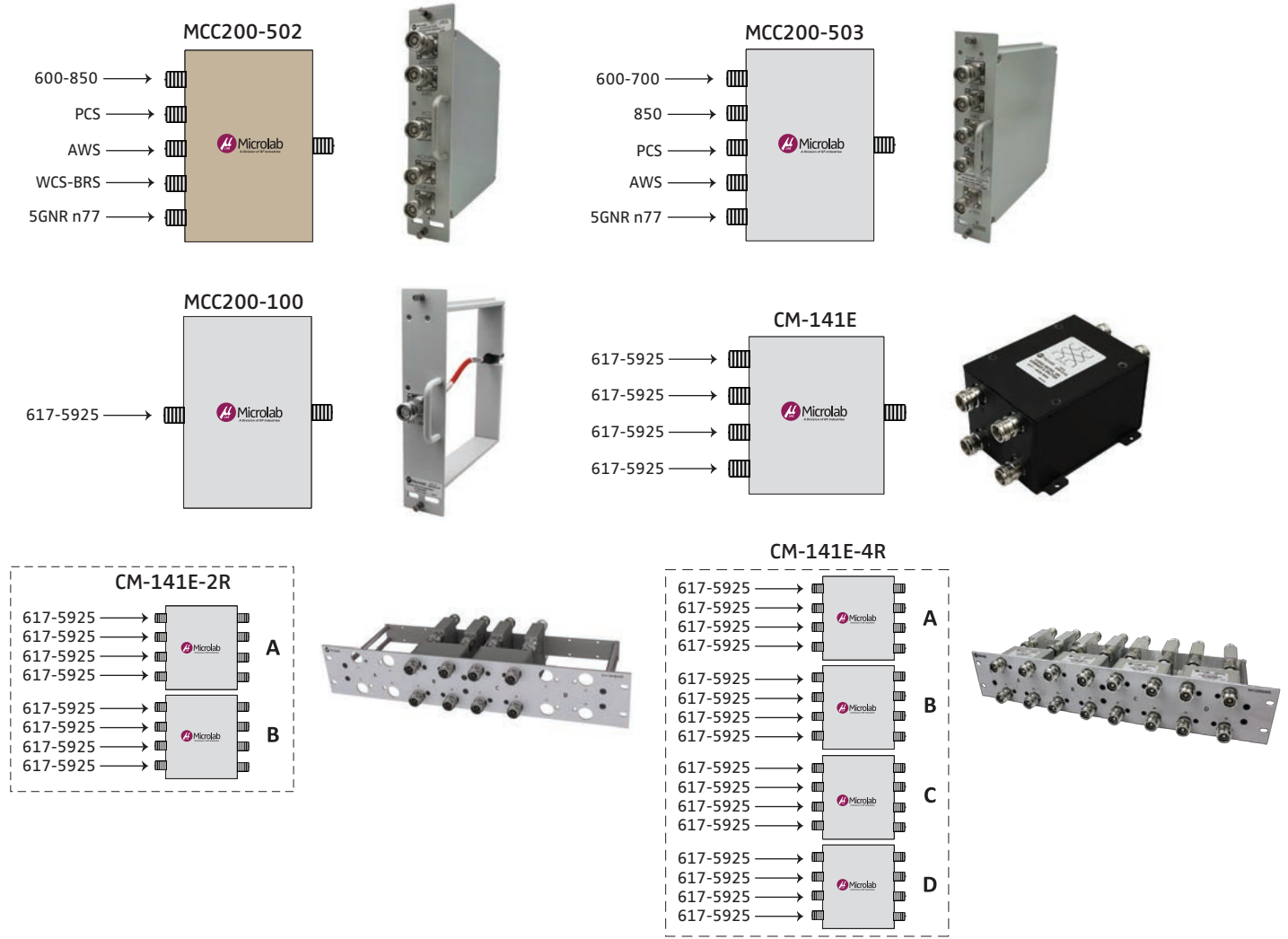
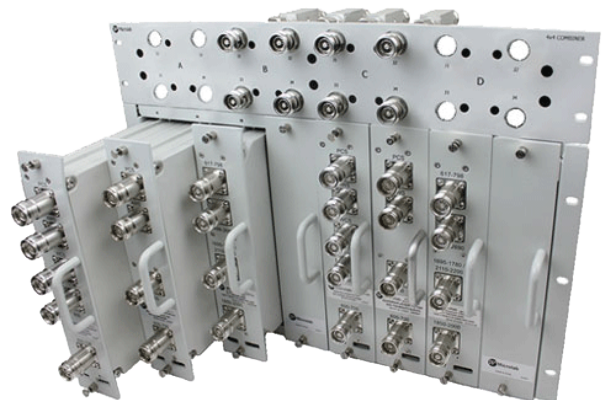


Figure 1 4, 5 or more bands per filter combiner for superior flexibility

Multi-band combiners are offered in configurations to combine either 4, 5 or more licensed frequency bands. Frequency coverage spans 617 MHz to 5925 MHz. This enables the platform to address multiple combinations of frequency bands and operators per scenario.

The MCC allows many configurations to support neutral-host MIMO or SISO applications. This agile design can solve a variety of requirements with expansion capability for future integration.



The block diagram below demonstrates three unique filter modules and a through card being combined for a multiple-band neutral-host distribution (Figure 2).

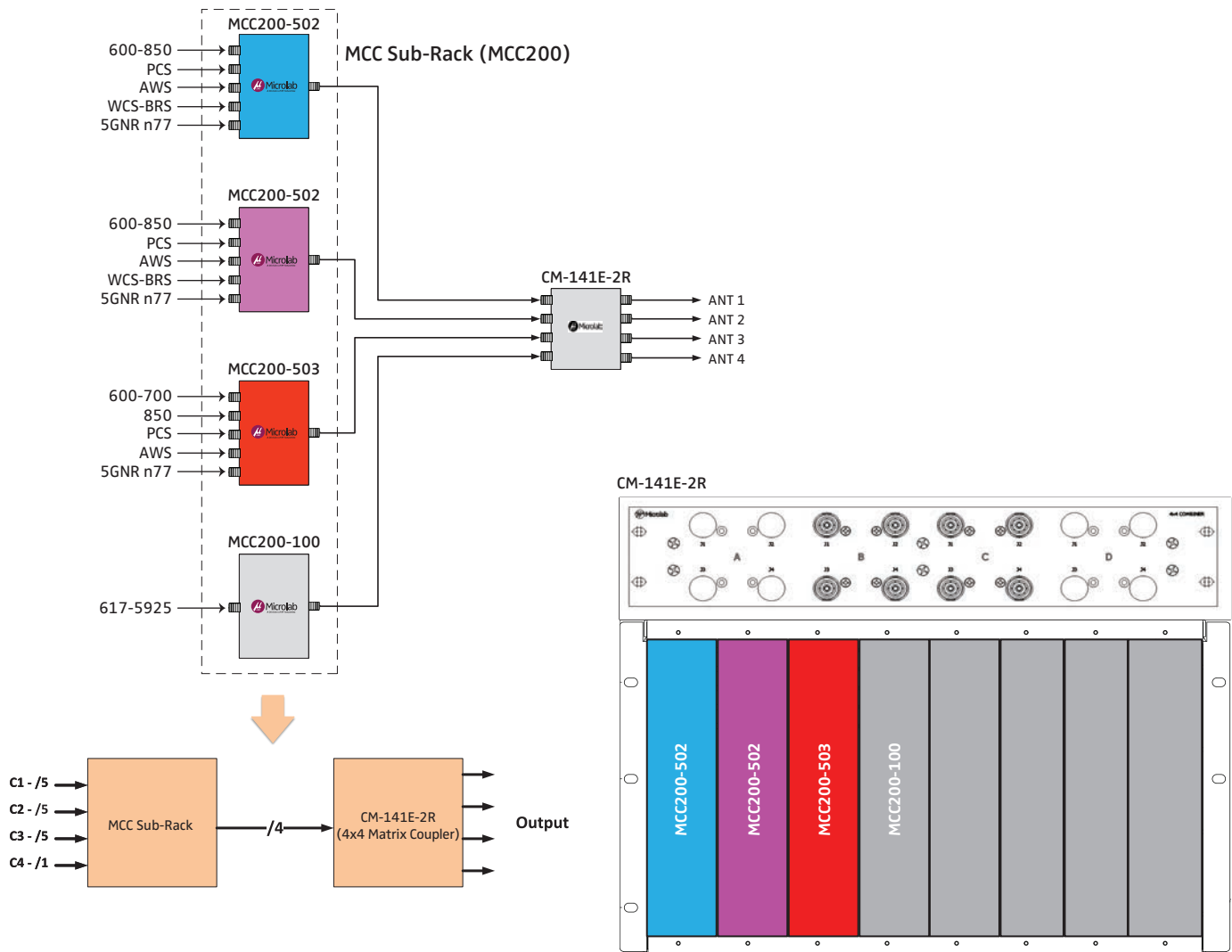


Figure 2 4-Carrier SISO solution + UWB Port. Modularity enables cost-effective scalability.

As the point of interface, the MCC is tested as a system capitalizing on superior specifications that guarantee an optimal engine for combining and distribution. The filter characteristics are optimized with low insertion losses to provide maximum transmit EIRP at the antennas. Additionally, filter combiners and the hybrid combiner have low-PIM performance to ensure maximum network throughput.

Additional Example Configurations

By duplicating the filters and hybrid combiner seen in Figure 2, a user can either deploy this solution as a 2-sector, 4-carrier SISO or a 1-sector, 4-carrier 2x2 MIMO solution. (Figure 3)

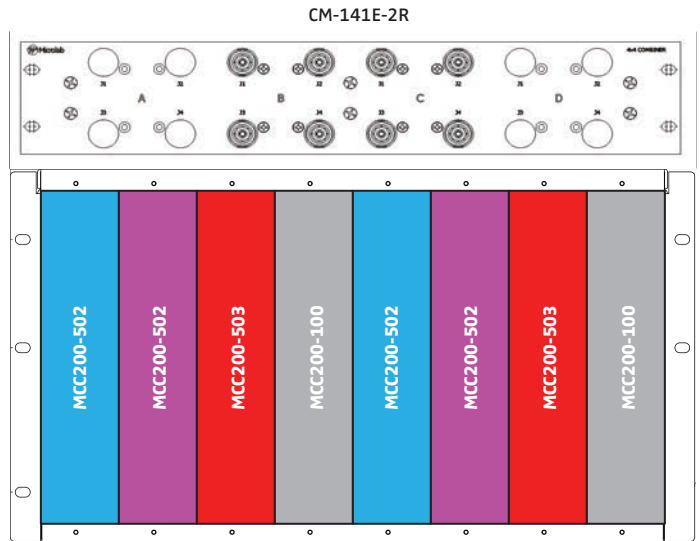
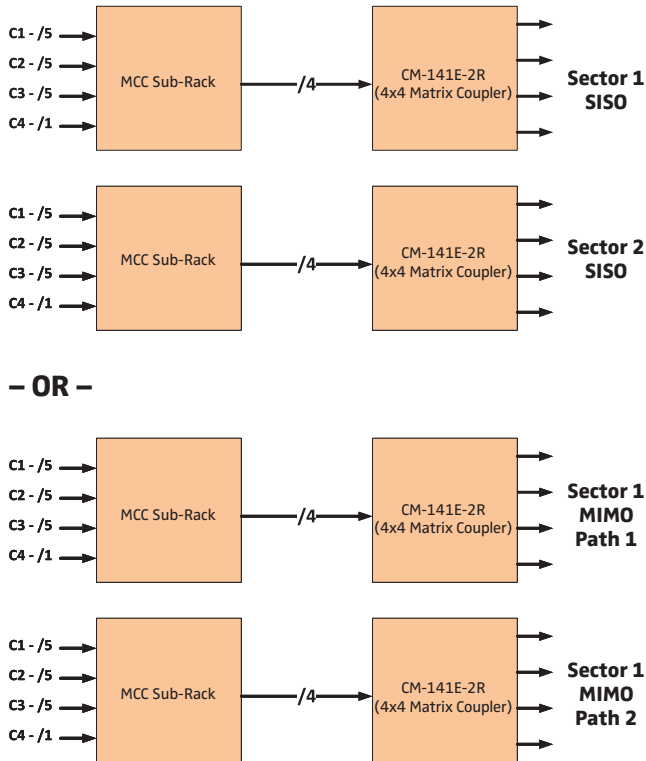


Figure 3 2-sector, 4-carrier SISO solution

In cases where there are only two operators, a single MCC sub-rack can house all filter combiners for an entire 4x4 MIMO application. (Figure 4)

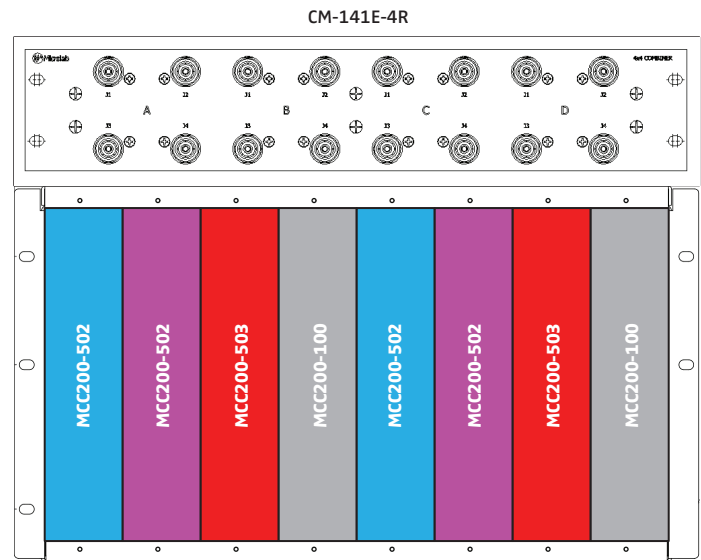
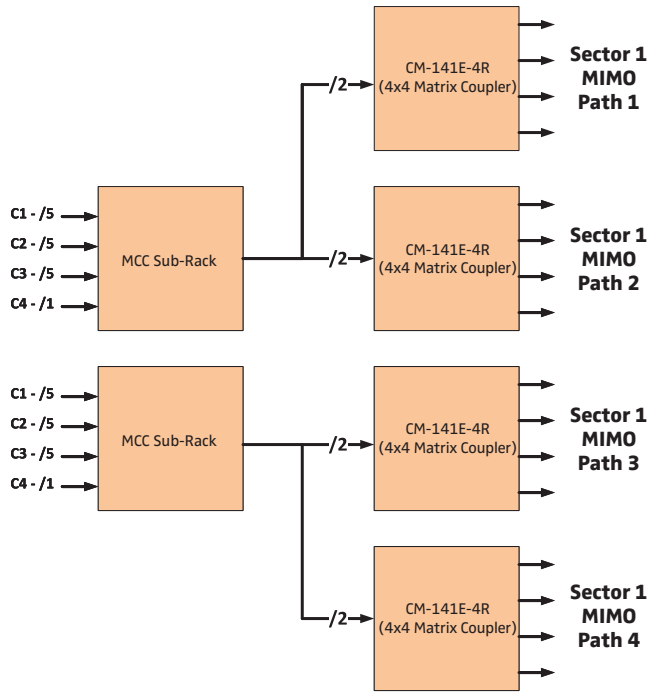


Figure 4 1-sector, 2-carrier 4x4

Note: The same configuration for two operators, can be utilized for two sector 2x2 MIMO.

In the event that a four operator 4x4 MIMO configuration is needed; an additional fully populated Subrack can be added to support this arrangement (Figure 5).

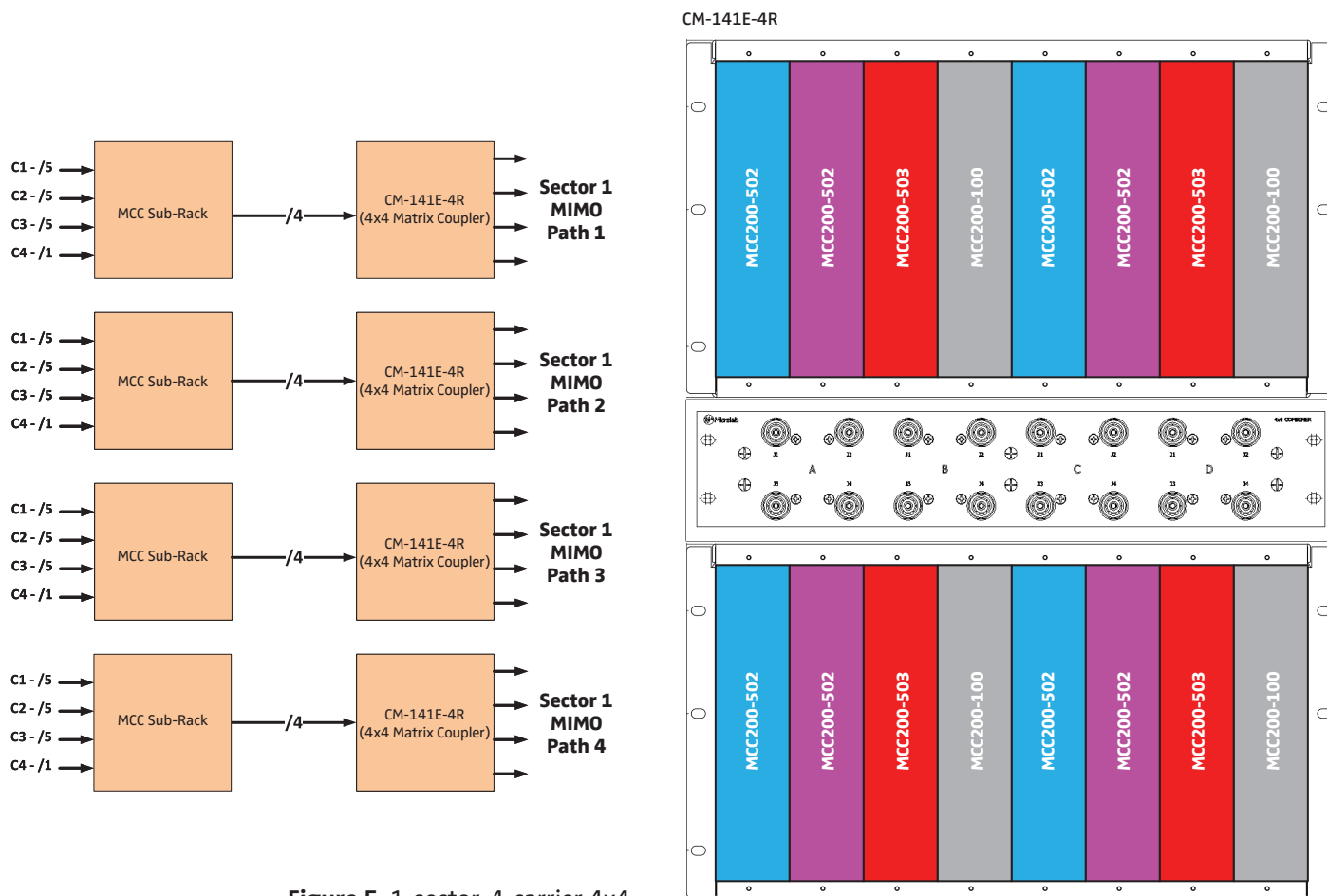


Figure 5 1-sector, 4-carrier 4x4

Table 1 summarizes the key technical and commercial advantages of the MCC Series platform versus using individual discrete components.

| | Discrete Components | MCC Series |
|--|---------------------------------|-----------------------------|
| Modular Design and Platform | No | Yes |
| Passives Performance | Guaranteed by part – Not System | 100% Guaranteed as a system |
| Form-factor / Footprint | Variable | Fixed |
| Ease of Deployment | No | Yes |
| Capability to Upgrade after deployment | No | Yes |
| Labor & Installation Cost | High | Low |

Table 1 Summary of MCC Series Advantages

Modular Filters

MCC200-503

- Integrates:
 - 600-700: 617-798
 - 850: 817-894
 - PCS: 1850-2000
 - AWS: 1695-1780 & 2110-2200
 - 5GNR n77: 3300-4200
- 40dB Input Isolation
- 40 W/input



MCC200-502

- Integrates:
 - 600-850: 617-894
 - PCS: 1850-2000
 - AWS: 1695-1780 & 2110-2200
 - WCS-BRS: 2300-2700
 - 5GNR n77: 3300-4200
- 40dB Input Isolation
- 40 W/input



MCC200-100

- Ultra-Wideband 617-5925 MHz
- "Through" Card for injecting bands like CBRS, C-Band & unlicensed bands in the network
- 4.3-10 Connectors



CM-141E

- Ultra-Wideband 617-5925 MHz
- 100W up to 2.6 GHz[†], 3kW peak
- 4.3-10 Connectors



CM-141E-2R

- Ultra-Wideband 617-5925 MHz
- 2RU Rack Mount
- High Isolation & Low VSWR
- 100 W/input
- Dual Channel Configuration



CM-141E-4R

- Ultra-Wideband 617-5925 MHz
- 2RU Rack Mount
- High Isolation & Low VSWR
- 100 W/input
- Quad Channel Configuration



Sub-Rack

MCC200-SRC-01

- Compact Wall-Mount Sub-rack with (1) integrated Ultra-Wideband 4x4 617-5925 MHz
- Combines up to 4 MCC filter cards
- 10" depth from the wall



MCC200-SRC-02

- Compact Wall-Mount Sub-rack with (2) integrated Ultra-Wideband 4x4 617-5925 MHz
- Combines up to 4 MCC filter cards
- 10" depth from the wall



MCC200

- Compatible with MCC200-x01 modular filters
- Slots for up to 8 MCC Filter Cards in 6RU
- Front Access to Filter inputs for ease of installations



MCC200-SRC-00

- Modular Wall Mount 4-Slot Sub-Rack Only



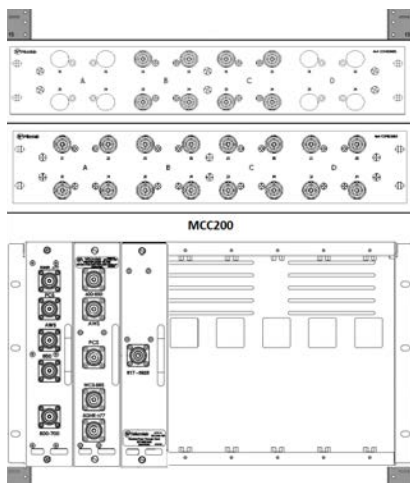
MCC200-500-BKT

- Modular Filter Mounting Kit



Mounting Options

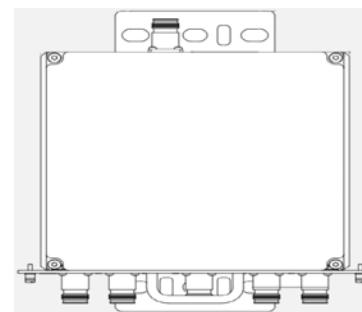
19" Rack mount Sub-rack



Wall mount Sub-rack



Discrete Filter card wall mount bracket



Learn more at: microlabtech.com

For more information about Microlab contact your local representative.
Find a complete list here: microlabtech.com/sales/



Microlab, A Division of RF Industries

300 Interpace Parkway
Parsippany NJ 07054
Phone: +1 (862) 328-1101
sales@microlabtech.com