

# design Save Space Using Ganged RF Connector and Cable Assemblies

# FAQs

## FREQUENTLY ASKED QUESTIONS

**Q: Why use a ganged RF connector/cable assembly rather than separate RF connectors and cables?**

**A:** With the ongoing trend toward more dense packaging in electronic circuit and system design, the number of interconnections is increasing even as the space for those interconnections is shrinking. Ganged RF connector and cable assemblies from Cinch Connectivity Solutions are designed and manufactured to enable more connector interfaces in tighter spaces than possible with separate multiple cable and connector assemblies. Ganged RF connector and cable assemblies can achieve much tighter, more consistent spacing between connectors than possible with individual connector/cable assemblies, with a much smaller number of total size of cables for easier installation and maintenance in electronic systems.

**Q: What types of connector interfaces are available in these ganged assemblies? Do they need to be all the same connector types?**

**A:** The ganged RF connector and cable assemblies can be configured with SMA, SMP, SMPM, or MCX connector interfaces on one side of the assembly and cables on the other side of the assembly. The assemblies typically feature 50- $\Omega$  impedance although ganged assemblies are available with 75- $\Omega$  MCX connectors as required. Available connectors cover a total frequency range of DC to 65 GHz. The ganged assemblies typically include a single connector type although, again, custom ganged assemblies can be designed and manufactured with multiple connector types.

**Q: Are certain applications better candidates for ganged RF connector/cable assemblies than separate RF connectors and cables?**

**A:** Ganged RF connector and cable as-

semblies are not only suitable for applications with multiple interconnections that are tight on space, but also for system designs in need of "assembly simplification," since multiple connections can be made with these assemblies through a single installation, rather than having to interconnect separate connector and cable assemblies.

**Q: Is there any compromise in performance when using a ganged RF connector/cable assembly instead of separate RF connector/cable assemblies?**

**A:** There are no performance compromises when using a ganged RF connector and cable assembly compared to separate connector and cables. The ganged assemblies can be supplied with matched, equal-length cables or to precision, specified lengths as needed.

**Q: How many connector positions can be combined in a single ganged RF connector/cable assembly and what are the mechanical and electrical differences between assemblies with more or fewer positions?**

**A:** The ganged connector and cable assemblies are configured with 4 to 28 connectors in a single or double-row format that is well suited for through-hole mounting on printed circuit boards (PCBs). Machined guide pins are used for precise alignment of two mating assemblies, with a center screw to secure the connection. The performance with frequency is consistent for each connector in an assembly regardless of the number of connector positions with performance a function of connector type. Mechanical integrity is consistent regardless of connection positions, with the main mechanical different being the larger housing sizes for the greater numbers of connector positions.

**Q: How much isolation is possible between connector positions in a**

**ganged assembly?**

**A:** Although the ganged connector and cable assemblies from Cinch Connectivity Solutions offer extremely tight spacing between connector positions, each connector and its cable are well isolated from each other. Depending on the final design solution, isolation levels of 60 to 100 dB have been achieved through 18 GHz between two side-by-side connector positions.

**Q: Do you measure essential electrical characteristics for each ganged RF connector/cable assembly and what are those characteristics?**

**A:** All of the connectors and cables in a ganged connector and cable assembly are fully characterized for the same performance parameters that apply to individual connector and cable assemblies, such as insertion loss, return loss (VSWR), and passive intermodulation (PIM), as a function of frequency using calibrated commercial RF test equipment, including microwave vector network analyzers (VNAs).

**Q: Do the multiple connector positions make these connector/cable assemblies difficult to mate? Does the mating force increase with the number of connector positions?**

**A:** Along with electrical performance specifications, each ganged RF connector and cable assembly is provided with mechanical specifications, including the mating force specification for each connector interface. The total mating force is a function of the number of individual connector positions, increasing with the number of connector positions.

**Q: How mechanically secure and electrically stable are these ganged connector interfaces once mated? How difficult are they to disconnect, such as for equipment maintenance? Are they meant more for permanent**

installations or can they also be used for short-term interconnections, such as with test equipment?

**A:** Ganged connector and cable assemblies provide low VSWR, low-reflection interfaces at all connector positions, with consistent electrical performance at all connector positions. Assemblies are typically designed with guide pins for precise alignment and repeatable performance with each disconnect/connect cycle as required in test and measurement systems. The ganged RF connector and cable assemblies typically include a center screw for secure mating in permanent installations.

**Q:** Can ganged connector/cable assemblies be specified for harsh environments, such as in military and aerospace environments?

**A:** Popular use for ganged RF connector and cable assemblies from Cinch Connectivity Solutions is in military radio systems. The high reliability and compliance with MIL-STD-202 requirements for shock and vibration over wide operating temperatures make these ganged RF connector and cable assemblies viable candidates for demanding applications in military and aerospace systems.

**Q:** How does the cost of a ganged connector/cable assembly for a given number of connector positions compare to the use of the same number of separate connector/cable assemblies with the same cable length?

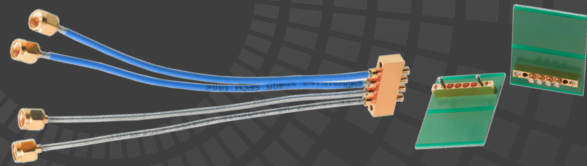
**A:** The cost for standard assemblies with a given number of connector positions is actually less than the equivalent number of separate connector/cable assemblies, assuming equivalent cable lengths, connector types, and two halves of a mating connector pair.

**Q:** What types of materials and manufacturing approaches are used in ganged RF connector/cable assemblies? Do they provide the same operating lifetimes as standard coaxial connector/cable assemblies?

**A:** Ganged RF connector and cable assemblies are manufactured with the highest-quality materials, using low-loss RF/microwave connectors and coaxial cables and precision-machined housings consisting of metallized plastic and die-cast metal components. In terms of reliability and operating lifetimes, they meet or exceed the specifications of individual high-performance coaxial cable assemblies for each connector type. ■

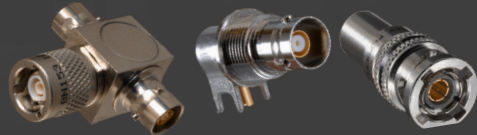
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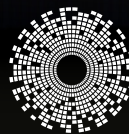


Ganged RF Connectors  
Cable Assemblies

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