

Baffled by WiFi Connectors?

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Today's wireless market utilizes many new, and some familiar, coaxial connectors. The wide range of wireless broadband equipment now available to meet WiFi IEEE 802.11a/b/g requirements can sometimes seem bewildering.

What are the input and output connectors used with WiFi certified products, which include access points, gateways, routers, cellular devices, point-to-point networks, Bluetooth, antennas, residential gateways, PDAs, PCI cards, PCMCIA cards, USB devices, wireless print servers, WLAN-enabled computers, PC peripherals, antennas, LANs and Internet access devices? Many of these connectors are not easily recognizable so read on for help in identifying them.

Variations on old standards

In addition to specialized interfaces that are relatively new to the coaxial market, such as DMX, MC Card, MHF, there are variations on standard RF connectors' styles that satisfy FCC Part 15 and 802.11 requirements. The most popular compliance method creates reverse polarity, or gender, versions of BNC, MCX, MMCX, N, SMA, SMB, SSMB and TNC connectors. You will also find reverse, or left-handed thread, versions of N, SMA and TNC, connectors. Another compliance method replaces unified threads with metric threads to prevent mating with standard connectors. (If you try to mate threaded connectors, stop at once if you meet any resistance! You may be working with a device connector having reverse or metric threads. To force mating can result in damage to both connectors.)

When choosing adapters or pigtailed for your WiFi devices, you will gain better performance by using straight rather than right-angle connectors. If you have a choice, consider the trade-off between compactness and performance.

Specialized WiFi connectors

MC-Card connectors were designed for wireless and telecom devices operating at frequencies up to 8 GHz where board and chassis space is limited. They are used on many Apple, Buffalo, Dell, Enterasys, Filotex, Lucent, and Proxim/Orinoco products.



MCX connectors (not shown) share the same inner contact and dielectric dimensions as SMBs, but the outer diameter is approximately 30 percent smaller. MCXs offer broadband performance from DC to 6 GHz and coupled connectors can be rotated 360 degrees for precision alignment without performance loss.

MCX plugs (not shown) have a center pin, insulation that extends beyond the pin, and six slotted spring fingers surrounding that insulation. The MCX plug inserts into the jack body. MCX jacks have a larger diameter body which houses the locking mechanism for the plugs springs, recessed insulation and a slotted socket contact. MCX connectors are found on Apple Airport Extreme and SMC devices.

MMCX plugs have no shell, a center pin and a visible external snap-ring. MMCX jacks have a larger body, center socket contact and internal spring slots to receive the external snap-ring of the plug. To differentiate MCX and MMCX plugs, remember that the MCX has slotted external spring fingers while the MMCX has a solid external contact with snap-ring.



RPMMCX (Reverse Polarity - note female center pin) plugs have the dielectric and center socket of the MMCX jack inside the MMCX body. If you find a socket contact in a body with external snap-ring, you have an RP MMCX plug. They will not mate with standard MMCX jacks. To attempt to do so will damage contacts in both connectors. All performance and function characteristics of the MMCX connector apply to the RP MMCX. They are used on Demarc, Proxim/Orinoco and Zcomax/Zcom devices.



SMA, subminiature version A connectors, are one of the most common RF/microwave connector types used for frequencies from DC to 18 GHz. SMA males have hex shells with an internal gasket and a pin extending beyond the dielectric. SMA females have external threads and slotted sockets flush to the top of their dielectric. SMAs are used in 3Com, Clarion, Nokia and Senao devices.



RPSMA (Reverse Polarity) connectors and standard SMAs share the same performance characteristics, but the pin and socket are reversed. If you are looking into the shell of the male connector body and see a flush socket and dielectric rather than raised pin, you have a reverse polarity SMA male. A raised pin in an SMA female connector indicates reverse polarity SMA female. RP-SMAs are found in

AeroComm, Belkin, D-Link, GRE, Intel, Linksys, Maxtech, Netgear, Proxim/Orinoco, Siemens, Smart Bridge, Trango, US Robotics, WaveAccess, Zcomax and Zoomair devices.



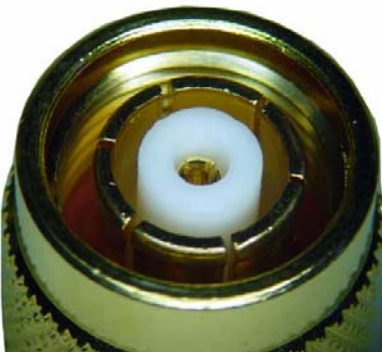
Reverse-Thread SMA (not shown) connectors are otherwise identical to standard SMA connectors, but will not mate with them. To attempt to do so could damage both connectors. RT-SMAs are used in some Proxim/Orinoco Harmony devices.

TNC is a 7/16-28 threaded connector, internally identical to BNCs, weatherproofed with an internal gasket, and operating from DC to 11 GHz.

The standard TNC male has a rotating shell with gasket, slotted ground ring with dielectric material extending to its edge, and a large air gap between this dielectric ring and the center pin. The TNC female has external threads and a slotted socket contact surrounded by a cylinder of dielectric material. When mated, the central dielectric of the female connector fits into the cavity of the dielectric ring in the TNC male and the tapered inner wall of the TNC female makes contact with the spring fingers of the slotted ground ring of the TNC male. TNCs are found on EnGenius, Senao and Wi-Lan devices.



RPTNC (Reverse Polarity) swap the dielectric and contact configuration of the male with the female. The ground ring and body of the male are not affected. All other performance characteristics remain the same. RP-TNCs are used by Brezecom/Alvarion, Cisco/Aironet, EnGenius, Hyperlink, Linksys, Proxim/Orinoco, Senao, SMC, and US Robotics equipment.



MHF / U.FL micro-coax connector is equivalent to the Hirose U.FL and IpeX series connectors found in many WiFi products. They are low profile [2.5 millimeter mating height] and support dual-band 3-6 GHz applications. These connectors are used on EnGenius, Proxim/Orinoco, Senao and Zcomax/Zcom devices.

