

RF Routers™

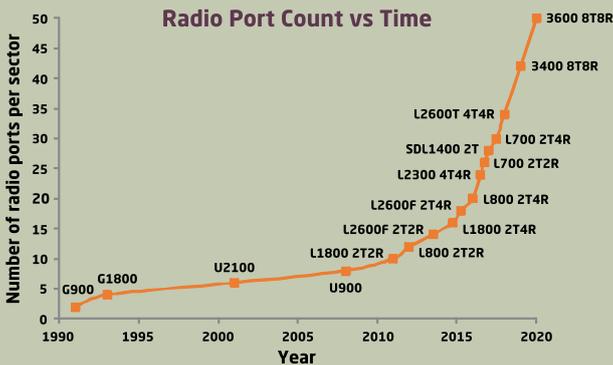
radio design™

Radio Design's patent pending RF Routers™ are a brand new concept that greatly simplify site design, bringing cost savings and performance benefits.

SMARTER WIRELESS

Background

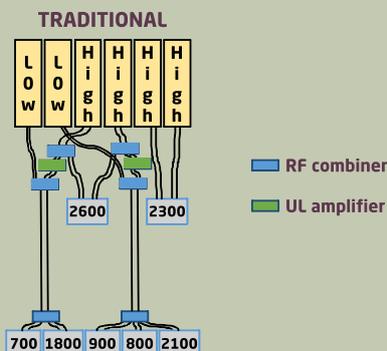
Site design complexity is increasing rapidly, driven by an increasing number of radio ports per sector. The figure below clearly demonstrates how introducing new bands and higher order MIMO schemes quickly increases the number of radio ports and this rate of change shows no sign of slowing.



The consequences are profound as designers struggle to accommodate the radios on site and manage the extremely complex interconnect between radios and antennas. Dedicated cables and antenna ports for each radio port are not feasible due to: prohibitive cost, insufficient space, wind loading, mechanical stability and the need to achieve planning permission for the new equipment - in particular the number and size of the antennas.

An additional issue is radio location. Due to the number of radios it is extremely common to have some - but not all - in close proximity to the antennas, with the remainder some distance away using a feeder system to connect to the antenna. The challenge is finding efficient site designs in such scenarios.

The straightforward, traditional approach is to use low loss RF combiners to share cables and antenna ports between radios. However, as the number of bands and ports increase this can lead to rather complex site designs as shown below:



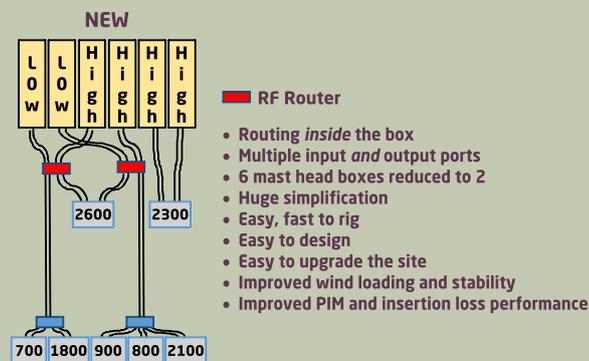
The problems with designs as complicated as this are obvious and include:

- Difficult and expensive to install
- Site revisit likely to fix errors
- Maintenance and upgrade difficult
- Wind loading / stability issues
- Insertion loss and PIM.

RF Router™ Solution

The RF Router is a revolutionary concept from Radio Design that takes the complexity out of site design by putting the splitting, combining and - if required - uplink amplification all into one box. In short, a single box with multiple input and multiple output ports and the necessary routing in between.

An example is shown in the figure below for the site considered previously. This demonstrates how the RF Router significantly simplifies site designs, in this case replacing 6 boxes and 8 jumper cables with two boxes. The cost savings that can be achieved through the resulting simplification are substantial.



Radio Design offer two RF Router families: the Passive RF Router and the Active RF Router. The Active RF Router amplifies the high band FDD uplinks giving the ability for TMA functionality to be incorporated, whereas the Passive RF Router is a purely passive product. For each family the external dimensions and mechanical interfaces are identical other than the number of connectors. Each family offers a huge range of variants with the operator free to select the number of distinct frequency paths (up to four) through the unit, the number of input connectors (up to eight), the number of output connectors (up to eight) and the required inter connections.

In addition, the Passive RF Router can be equipped with Radio Design's Auto Bypass feature and with integrated smart bias-T's if required.

RF Router Advantages

These revolutionary products simplify site design, bringing many advantages:

- Fast and straightforward installation
- Lower CAPEX as fewer components
- Lower insertion loss improving coverage and capacity
- Improved reliability due to lower part count
- Far fewer site revisits / fewer installation errors to fix
- Straightforward modular site design, easy to maintain and upgrade
- Lower wind loading with improved stability
- Improved PIM
- Maximum reuse of existing expensive infrastructure leading to cost savings.

White Paper