



Part 101 STL Links For Broadcasting

High Capacity 6-40GHz studio to transmitter microwave links resolve spectrum congestion, interference, and deliver high capacity where you need it most



Studio-To-Transmitter (STL) design has advanced rapidly as the demands for high definition audio and video streams has increased. Demand is increasing for higher capacity on these links, and the traditional Part 74 Broadcast Auxiliary Service (BAS) spectrum in 944MHz to 952MHz is congested in most of the United States with no licensed alternatives in place. Many broadcasters have experimented with Part 15 unlicensed transmitters (primarily in the 5.8GHz range) but have found that unlicensed operation can cause harmful interference at any time and that Time Division Duplex (TDD) systems typical for unlicensed bands are poorly suited for broadcast traffic.

With that in mind, the Federal Communications Commission (FCC) October of 2011 eliminated the Final Link Rule that prohibited the use of Part 101 Frequencies (6GHz, 7GHz, 11GHz, 18GHz, 23GHz) for STL links. Many broadcasters are unsure of the advantages of using Part 101 frequencies over Part 74 or Part 15, this short paper helps explain the benefits to the broadcaster.

Interference Free Operation

Radio and television broadcasters inherently understand

the value and protections licensed spectrum gives them as it is critical for the day to day broadcast of their video and audio programming. Part 101 microwave links operate under similar protection from the FCC as Part 74 BAS links allowing the operator to feel comfortable that the programming will be broadcast without distortion or interruption. Links operating in unlicensed Part 15 frequencies do not offer this protection, where any user at any time can cause harmful interference that distorts the programming or causes interruption of the broadcast signal.

High Capacity for Multiple High Definition Audio and Video Streams

Part 101 STL links also provide a significant advantage over Part 74 or Part 15 STL links by offering capacities up to 1Gbps Full Duplex at wire speeds. Part 74 links are often limited to a single audio or video stream, while Part 15 transmitters typically only support speeds up to 50Mbps "full duplex." Part 101 links offer plenty of extra capacity to add programming streams later while supporting a whole host of applications at the transmitter site including internet, VoIP, video surveillance, and more.

Native ASI, TDM, and Full-Duplex Ethernet Interfaces



External ASI module for Phoenix C IDU,
4x BNC, 2x SFP ports with Time Synchronization



16E1/T1 external module for CFIP Phoenix C IDU,
16x RJ-45, 2x SFP ports

Microwave radio systems have the advantage of providing native ASI interfaces for video broadcasters or T-1 interfaces for legacy equipment support. Most Part 15 transmitters only provide Ethernet interfaces, which require expensive multiplexers. Licensed radios are capable of providing these native interfaces due to the full-duplex (FDD) operation of the equipment. Part 15 transmitters often utilize time division duplex (TDD) technology which requires each transmitter to listen 50% of the time, regardless of what data is being carried (broadcast is typically one direction). Since Part 101 transmitters operate in both directions 100% of the time, traffic is carried without interruption with sub one millisecond



latency. It is these attributes that allow SAF Tehnika to certify our equipment for Livewire™ operation.

Hardware Redundancy, High Availability, and High MTBF

These are the hallmarks of Part 101 transmitters that make them ideally suited for mission critical video and audio broadcast. Cheap Part 15 transmitters are designed to fail and be replaced which may be acceptable for internet service providers but can severely disrupt broadcast operations, causing significant financial impact. Part 101 transmitters are designed for high availability (often exceed 99.999%) and often carry at >35 year mean time between failure (MTBF) rating. Furthermore, Part 101 transmitters can be designed for 1+1 Hot Standby operation allowing a second, redundant, transmitter to automatically take over should the master transmitter fail.

How Do I Find Out More?

For the broadcast engineer unfamiliar with the benefits of Part 101 transmitters over Part 74 or Part 15 equipment, comparing and contrasting can be daunting. SAF Tehnika has been a global supplier of Part 101 licensed equipment since 1995 providing STL links for broadcasters worldwide, including many of the largest groups in the United States. If your interested in finding out more and receiving a complimentary path engineering analysis, please e-mail salesna@saftehnika.com or online at www.saftehnika.com

