

Photonic Deployment of Software Define Radio (SDR) Hardware and Support Software

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Paul D Turner, TSS TSI



The Kestrel TSCM[®] Professional Software fully supports fiber-optic remote connectivity of various hardware components including multiple SDR Receivers, RF (Antenna) Switches, Vector Signal Generators (VSG), and many other remote system devices.

There are many advantages in deploying a Photonic network for Remote Spectrum Surveillance and Monitoring (RSSM)[™] at the facility level such as enhanced network security and RF immunity where extended lengths of coaxial cable would otherwise need to be deployed.

As noted in the September 2019 newsletter.

“Even at a professional service delivery level of 240 hours annually or (20 hours / Month), the Probability of detection (POD) is only 2.73% that the technical operator will detect and identify even a moderately sophisticated Technical Surveillance Device (TSD), which is actually operating within the current RF spectrum collection window of opportunity.

Now consider all the other variables, such as inexperienced technical operator’s, non-optimal equipment resources or deployment techniques, working blind in an unknown threat risk environment, etc., it is easy to understand why Probability of Detection (POD) by the numbers, is an essential due-diligence consideration in a modern training and certification model”.

The above information is an important consideration and is the rationale behind the Remote Spectrum Surveillance and Monitoring (RSSM)[™] methodology under the TSB 2000 (Technical) Standard. What has always been missing, is the ability to remote deploy active TSCM sensors beyond a standard local area network infrastructure connection.

The technical operator who understands the basic workings of a fiber-optic network will clearly see a tremendous advantage over competitive interests.

So lets dive into some of the fundamental concepts in understanding a powerful Photonic Kestrel[®] network.

Multi-Mode Fiber Types

Multi-Mode fiber-optic cable falls into several different deployment categories based on the requirement and type, of fiber described as OM1, OM2, OM3, OM4 and OM5.

The choice of multi-mode fiber will depend on the system requirements, including anticipated TCP/IP traffic; the need for switching and routing; high-bandwidth applications and other factors such as distance.

For the purpose of this discussion it is assumed that the TSCM | SIGINT deployment will include a dedicated paired fiber-optic module operating within a secure closed network.

Multi-Mode OM1 | OM2

OM1 fiber specifies 62.5-micron cable and OM2 fiber specifies 50-micron fiber, are typically deployed indoors and support Ethernet rates of 10 Mbps to 1 Gbps, and are not suitable for complex high-speed network operation.

Multi-Mode OM3 | OM4 | OM5

50-micron fiber-optic cable typically provides longer link lengths and / or higher speeds, up to 10 Gbps, 40 Gbps and 100 Gbps, ideal for complex command and control.

The above standards are generally recommended for facility level applications and this is where we start the TSCM fiber-optic deployment discussion.

For the purpose of TSCM and RSSM[™] deployment, multi-mode OM3 and OM4 fiber provides the best operational length and support for multiple system devices such as multiple high-speed SDR receivers.

OM3 and OM4 fiber-optic cables are 50-micron laser optimized multi-mode fiber (LOMMF) and have an aqua-coloured sheath rather than orange (OM2).

Multi-mode fiber is designed to carry multiple light rays concurrently, each at a slightly different reflection angle within the optical fiber core.

Multi-mode fiber is used for relatively short distances because the light rays tend to disperse over longer lengths.

Kestrel TSCM[®] Professional Software

Our Mission is Enhanced National Security with the
Developed in Canada “Kestrel TSCM[®] Professional Software”

Professional Development TSCM Group Inc.

Technical Security Branch (TSB)

The Kestrel TSCM[®] Professional Software fully supports and integrates with the ICRON USB 3.0 SPECTRA 3022 up to 100 meters (328 feet) and the ICRON USB 3.1 2.0 1.1 RAVEN 3124 up to 200 meters (656 feet) to remotely deploy multiple hardware devices.



ICRON SPECTRA 3022

The ICRON USB 3.0 Spectra[™] 3022 which supports USB 3.0 5 Gbps throughputs up to 100 meters over OM3 multimode fiber optic cabling, delivering 900 mA to each USB 3.0 port.



ICRON RAVEN 3124

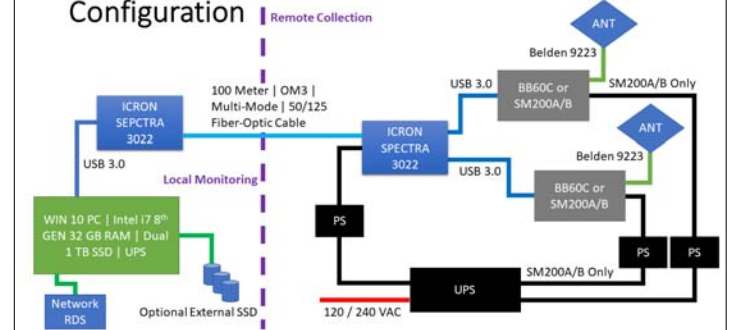
The ICRON USB 3-2-1 Raven[™] 3124 allows users to extend all USB 3.1 Gen 1 (5 Gbps) device types and is backwards compatible to USB 2.0 and 1.1 across a point-to-point connection of up to 200 meters over a single duplex Multimode Fiber-optic cable, delivering 1.2 Amps to each USB port.

Fiber-optic links provide a number of significant advantages including a dedicated closed communication network and isolation from the clients network infrastructure.

Enhanced system security, traffic integrity and RF immunity are realized during deployment.

The ability to deploy light weight fiber-optic cable for either permanent or temporary assignments are possible with minimal disruption. There are significant deployment advantages in implementing Remote Spectrum Surveillance and Monitoring (RSSM)[™] on a fiber-optic remote when access to the target area may be limited or restricted.

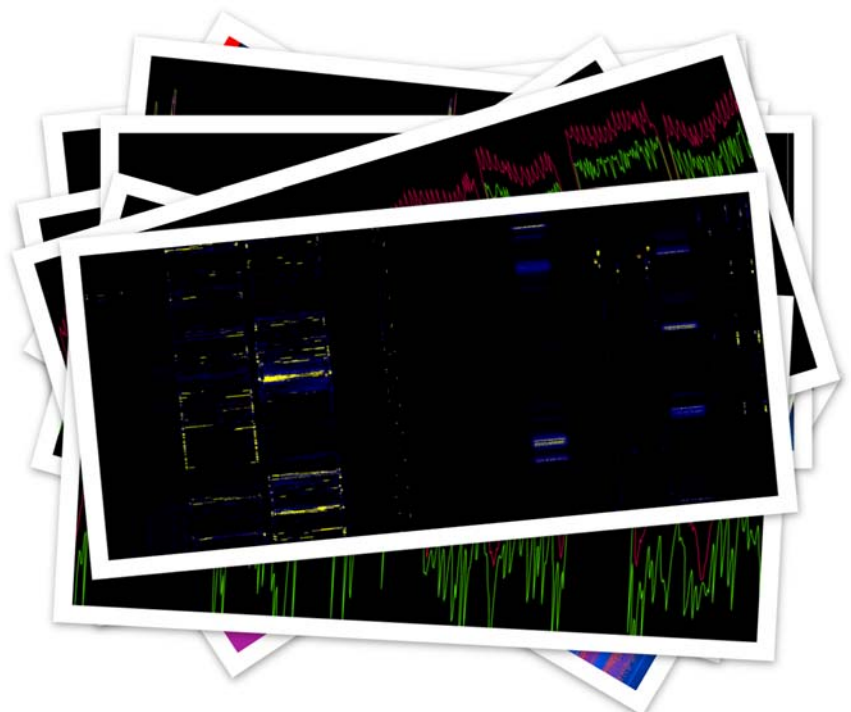
Dual SDR | Single Fiber-Optic Remote Radio Configuration



The simplicity of dropping a portable monitoring system with collection antenna within the target area and running a single 50/125 OM3 Multi-mode fiber-optic cable back to the monitoring infrastructure is efficient and permits the full command and control, programming, real-time and post analytics to be performed on site or remotely from virtually any where with a network connection.

Innovation is Simply the Beginning!

| www.pdtg.ca | www.kestreltscm.com | pdtturner@pdtg.ca |



Kestrel TSCM[®] Professional Software is innovative industry