SOFTWARE FEATURE ENABLERS

UBIIK

Our advanced Software Feature Enablers (SFEs) enhance the performance of a MimoLink™ radio. As not all of our customers require the same features or protocols, these are optional and are offered separately to meet your requirements.

Enabled SFEs as Default

Our Tornado radio comes with a range of factory-standard Software Feature and Protocols, configured for Point-to-Multipoint, Point-to-Point or Optimized Protection (Teleprotection). See below:

Point-to-Multipoint Default SFEs
• CCMS & CLI • SNMP • M-CAM • M-DAP • M-SEC
Point-to-Point Default SFEs
• CCMS & CLI • SNMP • M-DAP
Optimized Protection Variant (Teleprotection) Default SFEs
• CCMS & CLI • SNMP • M-DAP • M-SYNC

Configuration

The SFEs are easily configured via Ubiik Mimomax's Command Line Interface (CLI) or Configuration, Control and Monitoring Software (CCMS) via direct, remote (ethernet) or Over-The-Air connection. Both options are provided as standard with the radio and allow secure access to radio configuration, calibration and alarm functions. For large multipoint networks, running multiple commands via the CLI is often the preference due to efficiency but for a simple point-to-point link, the CCMS offers a web-based configuration option.

Software Feature Enablers

M-AES - Over-the-Air AES Encryption

Key use: Encryption of sensitive data

Network: Point-to-Point, Point-to-Multipoint
Products: Tornado, Tornado X

Advanced Encryption Standard, or AES, is a symmetric-key block cipher which Ubiik has implemented as a software feature enabler to assist our customers to encrypt their sensitive data. Our radios can encrypt the entire data stream to as low as the Ethernet layer using the FIPS-Approved AES256+CBC or AES256+CCM encryption and authentication algorithms. Plain data encrypted using M-AES is also link- efficient by maintaining the compression ratios achieved on a plain link with RoHC.

M-CAM – Adaptive Modulation

Key use: Maintaining links in adverse RF conditions
Network: Point-to-Point, Point-to-Multipoint
Products: Tornado, Tornado X

Designed for Network Digital Linking, Ubiik's proprietary smart Adaptive Modulation scheme, M-CAM, optimizes data throughput and simultaneously maintains the radio link in adverse conditions. Scanning the RF channel conditions, M-CAM enables the radio unit to transverse between QPSK and the maximum modulation available.

M-DAP – Data Acceleration Protocol

Key use: Boosting data capacity & data priority
Network: Point-to-Point, Point-to-Multipoint
Products: Tornado, Tornado X

Ubiik's Data Acceleration Protocol (M-DAP) is designed to enhance real-time applications such a VoIP via significant increases in capacity and quality. This is achieved via:

1) compression of headers and payload to achieve better capacity over-the-air

2) classification and shaping for data packets via software configurable rules to ensure critical information is expedited.

M-PoD – Power On Demand

Key use: Power-saving Network: Point-to-Point
Products: Tornado, Tornado X

Ubiik's unique power-saving feature, Power On Demand, rapidly turns on the remote end of a radio unit transmitter (typically in 80ms) only when data needs to be transmitted between Remote Units. Ideally suited to remote sites where power consumption is an issue, the stand-by power consumption in idle mode is typically 6W.

M-RAP – Route Adaptation

Key use: Redundant communications and L3 communications
Network: Point-to-Point, Point-to-Multipoint
Products: Tornado, Tornado X

Providing dynamic routing, Ubiik's M-RAP is an optional suite of protocols that provides a set of standard routing, tunnelling and redundancy protocols. M-RAP allows communications to continue in the event of a failure if alternative communication links exist. The suite enables:

- OSPF (Open Shortest Path First)
- VRRP (Virtual Router Redundancy Protocol)
- GRE (Generic Route Encapsulation)
- PIM (Protocol Independent Multicast)

M-SEC – Network & Firewall Security

Key use: Network security
Network: Point-to-Point, Point-to-Multipoint
Products: Tornado, Tornado X

With a stateful firewall, Ubiik's M-SEC enhances the security of critical communications networks by distinguishing the legitimacy of data packets and their match with a known active connection. Provides a predetermined set of rules to allow the network user to securely manage web-administered devices.
This software feature offers a more granular approach to controlling network traffic in addition to protection against spoofing attacks.

This SFE includes: https, certificates, sec banners, RADIUS and the ability to disable unused profiles.

M-SYNC – Synchronous Serial

Key use: Provide ultra-low latency for teleprotection
Network: Point-to-Point
Products: Tornado, Tornado X

Optimized to meet teleprotection requirements, Ubiik's Synchronous Protocols provide low latencies designed for category 1, 2 and 3 teleprotection. Our radio links can also be cascaded to cover greater distances. Serial ports also provide electrical isolation between the radio and the interface to prevent ground loops and ground noise problems. Our Tornado point-to-point links support the following sync serial interfaces at 64, 128, 192 and 256 kbps:

- X-21
- G.703 (64 kbps co-dir only)
- IEEE C37.94 (64 kbps only)
- RS-422
- V.11
- V.35
- RS-530

Note: some of the above protocols may require a media converter.

OTAP – Over-The-Air Programming

Key use: Remote configuration/upgrades via cNMS
Network: Point-to-Point (BRU), Point-to-Multipoint (BRU & RRU)
Products: Tornado, Tornado X

With this feature enabled, the user can perform centralized upgrade and configuration of multiple remote radios accessible via their base station. Background image transfer and upgrade can also occur without interrupting mission-critical user communications. OTAP therefore significantly reduces operational effort, upgrade time, and service disruption compared to manual over-the-air or local upgrade methods.

OTAR – Over-The-Air Re-keying

Key use: Remote re-keying of RRUs
Network: Point-to-Multipoint (BRU & RRU)
Products: Tornado & Tornado X (from software version 4.9.0 onwards)

With this feature enabled, via the cNMS, the Tornado radios can manually update encryption keys, automatically update encryption keys at a user-configurable interval (scheduled rekeying) plus allow remotes to dynamically update their encryption keys if they lose synchronization with their associated base station

SISO – SISO Failover and Diversity

Key use: Link Resilience
Network: Point-to-Point
Products: Tornado, Tornado X

Failover: Designed to allow the radio to failover to a SISO link to maintain a communications link at all times, our SISO Failover mode offers a level of insurance to customers with critical links.

Should there be an issue anywhere within one of the RF paths (channels), the radio will automatically switchover to SISO mode and keep operating on the good channel.

Spatial Diversity: As radio signals reflecting off obstructions arrive at the receiver at different phases, they can cancel themselves out, causing a deep fade.

By enabling Spatial Diversity Mode, the use of two physically separated antennas mitigates this RF fading and multipath effect, improving both Signal to Noise Ratio (SNR) and link stability.

TMAC

Key use: Faster uplink and contention-free transmission
Network: Point-to-Multipoint
Products: Tornado, Tornado X

The Turbo MAC scheme's primary benefit is to offer, on average, a doubling of data throughput on uplink traffic via the introduction of symmetrical capacity for the uplink and downlink.

Central management by the base station (as opposed to random access) via a combination of fast polling and scheduling ensures a more even sharing of the uplink between different remotes, resulting in system-wide Quality of Service.

Contention-free transmission is also ensured by only permitting one remote to transmit at a time, thereby allowing links to be more heavily loaded.

Standard Control & Monitoring Protocols

SNMP

Key use: Network health and events monitoring

Ubiik radios can be accessed via SNMPv2/v3 (Simple Network Management Protocol) for network monitoring purposes. Our SNMP is bandwidth-centric – by implementing a large database of unsolicited events (traps) our radios support a push notification approach which enables the user to reduce polling to a minimum, thereby saving bandwidth. SNMP also offers options for plain connection or secure authentication with DES/AES.

DNP3 (Monitoring)

Key use: Enable SCADA DNP3 equipment to connect over IP

A highly robust inter-operable communications protocol, DNP3 (Distributed Network Protocol version 3.0) can be used by Ubiik radios for network monitoring purposes.

For customers who prefer to run the Control & Monitoring (C&M) of their entire network solely using the DNP3 protocol, Ubiik enables DNP3 C&M support of the radio itself – ideally suited for radios acting as DNP slaves. Additionally, DNP3 supports the generation of system critical unsolicited events (traps).

DNP3 Control (DNP3-C)

Key use: Implementing control of devices

In addition to supporting external SCADA protocols like DNP3 from RTUs, the radio itself is capable to support DNP3 for Control & Monitoring (referred to as DNP3-C). In this instance, the radio itself acts as a DNP RTU (Slave) for a SCADA Master. The radio can be optionally added to the DNP3 monitored network of devices, if applicable.

Beyond this, Ubiik supports four independent I/O lines which can implement control by the DNP Master remotely as Binary Outputs. This is relevant for relay-like applications where the use of an RTU may be excessive or non-economical.

Network Management

cNMS – Complementary Network Management System

Key use: Carry out RSYNC, OTAP & OTAR on large networks
Network: Point-to-Multipoint
Products: Tornado, Tornado X

Providing a web interface for centralized control over a large network of Pyxis and/or Tornado units, the cNMS from Ubiik Mimomax utilizes a live graphical representation of the network tree for a quick identification of remote and base radio statuses.

Interested to add any of our Software Feature Enablers to your Tornado radio network?

Reach out to your Regional Sales Manager for a quote.

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