



**SOFTWARE
FEATURE
ENABLERS**

mimomax

Our advanced Software Feature Enablers (SFEs) enhance the performance of a Mimomax 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 and Optimized Protection (Teleprotection). See below:

Point-to-Multipoint Default SFEs
<ul style="list-style-type: none">• CCMS• SNMP• M-CAM• M-DAP• M-SEC
Point-to-Point Default SFEs
<ul style="list-style-type: none">• CCMS• SNMP• M-DAP
Optimized Protection Variant (Teleprotection) Default SFEs
<ul style="list-style-type: none">• CCMS• SNMP• M-DAP• M-SYNC

Configuration

The SFEs are easily configured via 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

T-MAC – Turbo Medium Access Control

Key use: Boosts efficiency of uplink traffic, ensures contention-free transmission

Network: Point-to-Multipoint, Point-to-Point

Products: Tornado only

Requirements: CCMS

Providing symmetrical capacity for both the downlink and up-link and a much higher user data rate than with the standard MAC, TMAC is Mimomax's new, ultra-fast, contention-free, medium access control scheme. Managed centrally by the base station, TMAC ensures contention-free transmission based on the priority level of the data from each remote radio.

M-PoD – Power On Demand

Key use: Power-saving

Network: Point-to-Point

Products: Tornado only

Requirements: CCMS

Mimomax'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-CAM – Adaptive Modulation

Key use: Maintaining links in adverse RF conditions

Network: Point-to-Point, Point-to-Multipoint

Products: Tornado only

Requirements: CCMS

Designed for Network Digital Linking, Mimomax'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, the M-CAM enables the radio unit to transverse between QPSK and the maximum modulation available.

M-RAP – Route Adaptation

Key use: Redundant communications and L3 communications

Network: Point-to-Point, Point-to-Multipoint

Products: Tornado only

Providing dynamic routing, Mimomax'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-DAP – Data Acceleration Protocol

Key use: Boosting data capacity & data priority

Network: Point-to-Point, Point-to-Multipoint

Products: Tornado, Pyxis

Mimomax Data Acceleration Protocol (M-DAP) is designed to enhance real-time applications such as 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-SEC – Network & Firewall Security

Key use: Network security

Network: Point-to-Point, Point-to-Multipoint

Products: Tornado, Pyxis

With a stateful firewall, Mimomax'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-AES - Over-the-Air AES Encryption

Key use: Encryption of sensitive data

Network: Point-to-Point, Point-to-Multipoint

Products: Tornado, Pyxis

Advanced Encryption Standard, or AES, is a symmetric-key block cipher which Mimomax 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-SYNC – Synchronous Serial

Key use: Provide ultra-low latency for teleprotection

Network: Point-to-Point

Products: Tornado only

Requirements: CCMS

Optimized to meet teleprotection requirements, Mimomax Synchronous Protocols provide low latencies designed for category 1, 2 and 3 teleprotection. Our radio links can also be cascaded to cover greater distances.

Mimomax Synchronous 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:

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

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

OTAP – Over-The-Air Programming

Key use: Remote configuration and upgrades

Network: Point-to-Point (BRU), Point-to-Multipoint (BRU & RRU)

Products: Tornado, Pyxis

With this feature enabled, the user can perform complete software and database updates or upgrades remotely via the radio link. In the absence of this feature, the software and database on the radio can only be updated or upgraded locally via the wired Ethernet port. The OTAP feature also includes Over the Air Configuration (OTAC) plus local CCMS.

cNMS – Complementary Network Management System

Key use: Carry out OTAP on large networks

Network: Point-to-Multipoint

Products: Tornado, Pyxis

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

Standard Control & Monitoring Protocols

SNMP

Key use: Network health and events monitoring

Mimomax 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 Mimomax 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, Mimomax 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, Mimomax 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.



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