MiMOMax Wireless Limited

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MiMOMax Wireless Ltd invites you to read the very first of many, bi-monthly MiMOMax e-newsletters. This e-newsletter is aimed to provide readers with informative, interesting and useful information for business purposes.

The latest updates include MiMOMax's 3.5 releases, forthcoming releases, and as an additional extra, please view the press release, featuring MiMOMax's exciting news of winning the FCS Business Radio Innovation Award.

MiMOMax 3.5 Release

MiMOMax 12.5kHz Capability

Now released is a 12.5kHz channel spacing option, available to all products using QPSK/16/64/256 QAM formats. Previously, channel spacing using the QAM formats was limited to 25kHz.

A 12.5kHz channel transmits approximately half of the data capacity, of that transmitted within 25kHz channel. However, as MiMOMax offers ultra spectrally efficient, low latency products, the data capacity of a 12.5kHz channel, still delivers highly efficient data rates. For example, a spectral efficiency of 12.8bit/Hz is achieved when 12.5kHz is configured with NitroBoost (256QAM). The raw data rates are an impressive 40/80/120/160 kb/s for QPSK/16/64/256 QAM.

A 12.5kHz channel essentially offers the same relative spectral efficiency as a 25kHz channel. However, it does provide increased flexibility, as it is compatible with more frequency bands, enabling an extensive range of available licensing options.

CCMS supporting 12.5 kHz

Included in the 3.5 release, MiMOMax has enabled their software programming tool, Control Configuration Management Systems (CCMS), to support 12.5kHz channels. CCMS now performs all of the same functions for 12.5kHz channels, as it does for 25kHz channels, which includes;

- Remote Data Logging
- SNMP Support
- Over-The-Air Re-Programming

- Remote CCMS/Over-The-Air Configuration (OTAC)
- Local CCMS

Having CCMS enabled to support 12.5 kHz channels, furthers the functionality of the channel, essentially making it a more compatible customer solution.

Full Duplex Support for Wired Ethernet

MiMOMax is now offering, as part of their 3.5 Release, a Full Duplex Mode (FDX) option. This forces a Wired Ethernet Interface to operate in FDX. The Wired Ethernet Interface on a MIMOMax Radio does not automatically negotiate the duplex mode and always defaults to Half Duplex Mode (HDX).

However, in order to take advantage of this beneficial FDX network operation, the network port to which the MiMOMax radio is connected, must also be configured to force it into FDX mode. This is because, in most instances, the switches and routers will automatically default to a "negotiating duplex mode", after which, if FDX is not successfully established, will default to an HDX mode. If in the case that the network port can not be configured to FDX mode, then this FDX option can not be used and must be set to HDX instead.

The core benefit of FDX, is the increased speed of the network connection to the radio. In FDX however, both devices are allowed to transmit at the same time, therefore, there are no packet collisions and therefore increases the connection speed.

MiMOMax X21- Sync Serial on 12.5kHz BW Systems

X-21 Sync Serial Interface has now been enabled to support a 12.5kHz bandwidth channel. A core benefit of the MiMOMax X21 Sync Serial Interface is the lowered latency and improved asymmetry when compared to that of the RS422 & G704 Sync Serial Interface, whilst supporting a 12.5kHz bandwidth radio channel.

When utilising a 12.5kHz channel and 16QAM a net user data rate of 64kb/s (80kb/s Gross) is available. This bandwidth may be applied to either the X21 Sync Serial Interface or Ethernet. Increasing the system modulation to use 64QAM, enables a 64kb/s X21 sync serial plus leaves 33.5kbps simultaneously available for Ethernet. This for example enables Protection Relay signalling and sub station monitoring to be carried over one 12.5kHz MiMOMax OPV radio link.

It should be acknowledged that moving to a 12.5kHz wide channel incurs a slightly higher latency for all of the interfaces, as opposed to a 25kHz channel. However, having the ability to deliver 64kb/s or greater (dependent on modulation scheme) in a 12.5kHz channel, may increase the ability to comply with specific frequency license issues. Additionally a dual (64kbps) X.21 solution is currently under development which will be available on 25kHz systems with 16 QAM and 64 QAM modulation schemes.

MiMOMax Constellation Capture

MiMOMax has added the ability to record the received signal at a symbol, level leading up to an event. This is known as “Constellation Capture”.

For example, an event may include an over the air Ethernet frame, which has a packet of corrupted data and does not pass a Cyclic Redundancy Check (CRC). Alternatively, the signal may no longer be received clearly, and therefore, needs to be retrained. Both of these causes are usually due to strong channel interference.

In such cases, Constellation Capture allows high resolution data to be captured for up to 500ms leading up to an event. Post processing of that data can produce constellation

diagrams; equalizer error charts even the periodicity of interferers, thus, thoroughly analysing the cause of the event. Constellation Capture is very useful for determining the nature of interference, proving to be an excellent risk mitigation tool for future events.

Forthcoming Releases

Programmable Power

MiMOMax will soon be including programmable RF power capability within CCMS, enabling customers to programme their own RF Transmitter output power, to fit specified requirements. The programmable power range will be 20db and include 10mW to 1W power levels.

Programmable Frequency Settings

MiMOMax customers will soon be able to electronically tune their own Transmitter and Receiver frequencies to match desired requirements within the designed equipment band. If a significant frequency shift is required (for example, more than a few channels), internal Duplexers may also be required to be re-tuned.

Such frequency tuning options will allow customers more flexibility, in such instances, where a radio may need to be relocated to a new frequency, replace an older radio, or when the customer wants to purchase radios prior to gaining their frequency license.

2-Channel X.21 Mux Adapter

A forthcoming product release includes MiMOMax's 2-Channel X.21 Mux Adapter (Mux). The Mux is a small adapter box, which can either be mounted adjacent to a 19 inch Racj mount, or remotely for the Pole or Wall top Mount as required.

Functionally, the Mux will provide 2 X.21 Interfaces over a single radio mount, each operated at 64kb/s in Full-Duplex Mode. An identical Mux is required at each end of the radio link.

M-DAP- MiMOMax Data Acceleration Protocols

MiMOMax Wireless Limited has made available an optional suite of Data Acceleration Protocols (M-DAP). M-DAP is a suite of up to four individual protocols, which accelerate the transfer of data across all MiMOMax linking products. In addition to accelerated data transfer, M-DAP also offers a QOS solution that fragments low priory data traffic, to enable low jitter and ultra low latency, for high priority traffic (for example; VoIP). It compresses Ethernet, IP, UDP and RTP headers, to allow additional bytes for the voice payload. This is particularly useful when VoIP steams occupy more bytes than the voice payload. For example, a VoIP packet might ordinarily occupy up to 60 bytes, however, M-DAP can compress this down to an ultra efficient 3 bytes.

M-RAP – Routing Adaptation Protocols

M-RAP is a suite of protocols that provide dynamic re-routing in the event of a path failure where multiple paths are available. M-RAP would be able to learn the topology of the network and therefore reroute paths as the topology changes (links lost or added). OSPF routing protocol is used to determine which path to take, to achieve this re-routing functionality in a MiMOMax system. When a radio is "hard coded", as "the default gateway" into an area, then the area loses communications, even when other radios could potentially act as default gateways. In the event of a communications failure VRRP is used in the MiMOMax radios to

dynamically assign a virtual IP address so that the selected radio becomes the default gateway.

OSPF routers only communicate their state with the other routers in that "area". GRE (Generic Routing Encapsulation) protocol may be used to pipe this monitoring information from the "areas" to a monitoring system in the core of the customer's network.

MiMOMax's FCS Business Radio Innovation Award

"MiMOMax Wireless Limited Wins 2009 FCS Business Radio Innovation Award"

MiMOMax Wireless Limited is proud to announce that in the face of international competition, they have won 1st place in the 2009 FCS (Federation of Communication Services) Radio Business Innovation Award.

The prestigious award was intended for a company that was able to offer a product, which excelled in four key areas; Innovativeness, Originality, Commercial Application and Spectral Benefits.

MiMOMax entered their Optimised Protection Variant (OPV), which is specifically applicable to the UK Power Utility Protection Market.

The FCS is a UK Trade Association, providing support for businesses, who deliver communication products and services to radio, wireless and mobile markets, to name a few examples.

The (Gerald David OBE) FCS Business Radio Innovation Award has now been running for the previous six, consecutive years, and is sponsored by Team Simoco, who themselves, won the award in 2007. 2009 is the first year MiMOMax have entered an innovation award from the FCS, thus, to win it in the first year against such prestigious competition is a great honour for MiMOMax.

Paul Daigneault, Managing Director of MiMOMax Wireless Limited reports:

"Radio Spectrum; the most valuable resource in our business. They are not making any more of it and no amount of expenditure can create it. The only thing we can do is use it more wisely!

Our goal at MiMOMax (is) to deliver unequalled Spectral Efficiency in all our products. To be specific, high reliability Broadband in narrowband radio channels.

We were told by several academics on more than one occasion that what we were attempting could not be done, but today we are delivering solutions based on high order modulation narrowband MiMO, reliably providing up to 320 kb/s in 25 kHz licensed channels.

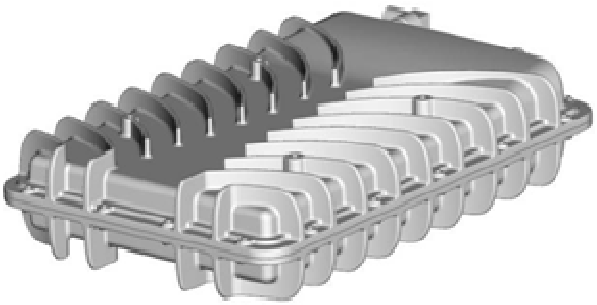
We are grateful to FCS for recognising the uniqueness in this value proposition and giving us the opportunity to showcase our wares."

To read more about the Business Innovation Award please visit: http://www.mimomax.com/mimomax-wireless-limited-wins-2009-fcs-business-radio-innovation-award/

ABOUT- MiMOMax Wireless

MiMOMax Wireless utilises MiMO and Space Time Coding technologies to provide high reliability, ultra high spectral efficiency, very low latency linking solutions in narrowband licensed channels to ensure reliable, and interference free operation for mission critical applications. To more about MMX, please visit our website via the link below:

www.mimomax.com



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