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TM Link Configuration Example



TRANSMITTERS

Multi-Mode Telemetry Transmitters

Fourth-Generation Powerhouse

Quasonix digital multi-mode telemetry transmitters are the benchmark of the industry, providing unparalleled performance and value in small, robust, power-efficient packages. We offer proven quality, with over 17,000 transmitters shipped.



TIMTER™

Advanced Engineering – TIMTER fourth-generation transmitters have a faster processor, improved frequency stability, and support for all six LDPC codes.

• LDPC forward error correction mode improves link margin, nearly tripling the operating distance of your telemetry link. Adopted by the Range Commander's Council, IRIG 106-17, Appendix 2-D.

Band Combinations for All Your Needs

- L, S, or C Band TIMTER When only single-band operation is needed.
- L/C Band TIMTER Single transmitter configuration covering a frequency tuning range spanning L and C bands.
- S/C Band TIMTER With output power up to 18 W, this configuration has a carrier frequency tuning range spanning S and C bands.
- L/S Band TIMTER Highly flexible solution available with all three legacy TM bands: lower L, upper L, and full S.
- L/S/C Band TIMTER Ultimate solution with lower L, upper L, full S, and full C bands.

Exceptional DC-to-RF Conversion Efficiency – Facilitates replacement of older 10 W transmitter with new 20 W transmitter at same current draw.

Output Power from 10 mW to 25 W – Several RF output choices, along with variable power and dual power options for software- or hardware-based power adjustment.

nanoTX[™] and nanoPuck[™]

Smallest ARTM Transmitters – The 1.4 in³ nanoTX and nanoPuck transmitters are ideal for applications with strict SWaP constraints. Available in S band, up to 5 W.

All Quasonix Transmitters

Automatic Data Rate Tracking – Premod filtering and deviation automatically track the data rate, with no programming or configuration required.

Clock-Free Input Option Available – Ideal for replacing analog transmitters or for use with encoders or cryptos that provide a data output only.



Scan for more product details

Transmitters

Scan for more product details

Rackmount Telemetry Transmitter Platform

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Easy Does It

With integrated cooling, a browser interface, a new API, and more, our Rackmount Transmitter Platform simplifies deployment and operation of your telemetry transmitters.

Rackmount Enclosure – Rugged 2U rackmount chassis provides a single box accommodating up to four (4) 2" x 3" or two (2) 4" x 3" transmitters (sold separately).

Flexible Transmitter Options – Choose up to four (4) single-output transmitters or up to two (2) dual-output transmitters.

Browser-Based GUI – Easy-to-use, intuitive web interface, using any ordinary browser to control the transmitters. Detailed logging includes history of changes made to the transmitters.

NEW! Applications Programming Interface (API) – Provides powerful access to status and control of the transmitters by a client computer.

Strong Administrative Functions – Manage transmitter names, user privileges, clock settings, IP address, and system.

Field Upgradable Software – Update to the latest software from the client browser.

Master RF On/Off – Ability to enable/disable RF on all channels via a secure locking toggle switch.

Exceptional Cooling – Internal heat sinks and fans provide the cooling power to keep transmitters operating at peak performance.

High Quality Connectors – Uses the same BNCs and N connectors found on our rackmount receivers.

Available 85 VAC to 264 VAC, 50/60 Hz or 12 to 37 VDC Operation — Specify AC or DC operation.





Receivers

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Space-Time Coding (STC) System



Scan for more

A better two-antenna solution

Experiencing unexpected signal fades and data dropouts during testing? Your problem may be antenna self-interference. If so, STC can save the day.

Adopted by the Range Commander's Council, IRIG 106-17, Appendix 2-E



Solves the "Two-Antenna" Problem — While a single transmitter output split between top and bottom antennas provides full RF spatial coverage, the signals can combine destructively. STC signals, orthogonal over the length of the code block, interact non-destructively.



As measured by the engineers at Eglin AFB, a traditional two-antenna split signal (green) results in deep signal fades at some angles, whereas STC (blue) preserves the original antenna pattern.



An F-16, used to test two-antenna interference and STC (chart at left), is mounted in the JPRIMES anechoic chamber at Eglin Air Force Base.

Based on SOQPSK-TG – Two STC data streams are applied to two phase-locked SOQPSK-TG modulators. As a result, STC has detection and spectral properties similar to SOQPSK-TG, including compatibility with Low-Density Parity Check (LDPC) coding to further improve performance.

Streamlines Hardware – No power splitter, high/low power, or top/ bottom selector circuitry is required. Source data is encoded by the transmitter, and each transmitter output is directly applied to its own antenna. This can save several dB of transmit losses and makes RF troubleshooting easier because individual channel performance is continually estimated and monitored during demodulation.

Transmitters

Multi-Mode Dual Telemetry Transmitters

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Scan for more

Ultimate Bitstream Accuracy Starts Here

Quasonix digital multi-mode dual telemetry transmitters provide the flexibility of two high-performance, independent transmitters in one package.



Industry Leader in Transmitter Technology – Proven quality and performance with over 17,000 transmitters shipped; TIMTER[™] dual transmitters combine compact designs with outstanding size-to power-ratios.

Compact Design – As small as 2.0" x 3.0" x 1.2", the dual transmitter can serve as a drop-in replacement for other common transmitters.

Two Independent RF Outputs – Dual RF outputs at 10 watts each with a single Micro-D input can be configured with a single or dual data input.

Improves EIRP (Effective Isotropic Radiated Power) – Direct connection to dual antenna platforms via dual outputs eliminates losses due to RF power splitters or couplers and yields robust, streamlined installation.

Troubleshooting Simplified – Independent outputs allow direct verification of each signal path without changing the hardware configuration - impossible with split systems.

Direct Support for Frequency Diversity – Supports F1/F2 operation that can significantly reduce self interference between antennas and allows frequency diversity combining at the ground receiver for improved performance.

Space-Time Coding Capable — With negligible bandwidth expansion, Space-Time Coding eliminates link outages caused by the "two antenna problem". Adopted by the Range Commander's Council, IRIG 106-17, Appendix 2-E.

Low-Density Parity Check (LDPC) Option Available – Add forward error correction mode and improve link margin, nearly tripling the operating distance of your telemetry link. Adopted by the Range Commander's Council, IRIG 106-17, Appendix 2-D; extended LCPC encoding provides all six implemented codes.

Quasonix Digital Switch Box (QSX-AC-DSWBX) Available – Adds the ability to change frequency, mode, LDPC, and STC without access to the serial communications port.

Airborne IntelliCool[™] Heat Sink Available – Add the cooling power you need: 2"x3" heat sink (QSX-AC-32-HS-28V-SP) or 4"x3" heat sink (QSX-AC-34-HS-28V-SP).

NEW

Firmware can now be updated via the serial communications port!

Transmitters

Heat Sinks for Multi-Mode Transmitters



Scan for more product details

Keep Your Cool

Even the most durable and efficient transmitters need substantial heat mitigation to ensure long life and problem-free operation. We have solutions to keep your equipment within operating-temperature specs, whether in the air or on the ground.



Quasonix offers several heat sinks for use with TIMTER[™] and nanoTX[™] transmitters. The heat sink required for a particular transmitter depends heavily on the installation. Factors such as altitude, air temperature, air flow, and mass of the mounting surface have a significant impact on the flow of heat away from the transmitter.

Please contact Quasonix for heat sink recommendations for your particular transmitter. Regardless of the heat sink, Quasonix strongly suggests using a thermal pad, such as Q-Pad[®] II from Bergquist.

Bench Heat Sink

Our copper heat sink with fan is compatible with most TIMTER and nanoTX models, with tapped holes to make mounting quick and easy. It includes an AC power supply for North American operation. For ground applications only.

Airborne IntelliCool™

This heat sink has an integral fan, power supply, and temperature-controlled power-on at +37°C. Two MDM- 15 connectors and a provided pigtail cable allow the heat sink to draw power directly from a TIMTER transmitter, eliminating the need for a separate external power supply.

By regulating fan speed to compensate for changes in air pressure/density under high-altitude conditions, Quasonix's IntelliCool heat sink provides excellent thermal protection for a variety of applications.

The male and female heat sink connectors, along with the dualgender cable, enable connection to any TIMTER transmitter. An SMA extender is included to ensure convenient RF connector access.

ANTENNAS

HyperTrack[™] Telemetry Antennas

Digital Dexterity

Quasonix antennas offer a new generation of performance, usability, and versatility. The bedrock of our systems is the HyperTrack[™] Antenna Controller (HTAC), where real-time processing is done in FPGA hardware, yielding faster response and extremely smooth, accurate tracking. We have an antenna to fit your needs – and exceed your expectations.



Decades of Innovation – The Quasonix antenna team comprises design, manufacturing, and test experience dating back to the 1980s, with several hundred systems delivered—many still in use 20 years or more after commissioning.

Complete Tracking Antenna Systems – Quasonix offers the entire system: pedestals, reflectors, feeds, motors, servos, slip rings, and the industry's most full-featured antenna control unit—all backed by our legendary technical support.

HyperTrack is a Complete System Approach – HyperTrack incorporates dynamic tracking loop adjustments, interference-mitigation techniques, and advanced system monitoring and feedback. All tracking calculations are done in FPGA hardware, with very low and very consistent latency. The improvement in tracking accuracy provided by HyperTrack renders conventional AM/AGC control schemes obsolete.

Revolutionary HyperTrack Digital Control Protocol

– In addition to the normal AM and AGC interfaces, the HyperTrack antenna control unit (HTAC) also supports the advanced HyperTrack digital control interface, included in every Third-Generation Quasonix RDMS[™] receiver shipped since late 2017.

Modular System Design – Robust tracking systems are available to support reflectors from 3 feet to 24 feet in diameter; Quasonix has right-sized antennas for fixed, mobile, or portable applications.

Plano-Centric Drive Systems – Advanced design delivers positioning accuracy and repeatability to 0.01 degrees. Sealed gearbox housings require no adjustments and have provided flawless operation for 20 years—and still counting.

Lifetime Updates and Support – All HyperTrack systems include free lifetime software updates, a three-year hardware warranty, and lifetime customer support from the team that designs and builds your antenna.



Scan for more product details

ADAPT™ PD750 Auto-Deployable Antenna System



Scan for more product details

Ready When You Are

Introducing the Quasonix Adapt[™] PD750 antenna system. This auto-deployable antenna gives you our best-in-class HyperTrack[™] data acquisition in a portable 12-foot (3.7-meter) reflector size with fast and easy setup, for the ultimate in mission readiness anywhere in the world.

HyperTrack – Incorporates dynamic tracking loop adjustments, interference mitigation techniques, and advanced system monitoring and feedback; all tracking calculations are done in FPGA hardware, with very low and very consistent latency. In addition to the normal AM and AGC interfaces, the HyperTrack antenna control unit (HTAC) also supports the advanced HyperTrack digital control interface and STRCI for seamless communication between your HTAC and RDMS[™] receivers.



Auto-Deployable – Remotely controllable "hands-free" setup and breakdown. Switch from the portable, stored position to fully deployed within minutes.

Electronic Scanning for Highly Dynamic Targets – Feed sweeps the beam electronically, allowing scan rates from 100 Hz to 2 kHz–greatly mitigating challenges inherent in tracking targets that impose high degrees of amplitude modulation on transmitted signal.

Seamless L, S, and C Band Operation — Future-proof, with support for legacy TM bands while being ready for the move to C, all in one unit.

Enhanced Environmental Protection – Designed with the harshest environments in mind. All assemblies are Sealed for Positive Pressure (SPP), including the positioner and control enclosures, for minimal maintenance.

Over 25 Years of Innovation – The Quasonix antenna team comprises design, manufacturing, and test experience dating back to the 1980s, with several hundred systems delivered—many still in use 20 years or more after commissioning. We are here for you, with legendary support and lifetime software updates.

Scan for more product details

The PD Antenna Revolution Continues

Better, Faster, Stronger

HyperTrack[™] is going places, through innovative engineering that allows for greater size, mobility, and utility, while maintaining extended durability and jitter-free precision tracking. Here are a few recent HyperTrack line extensions driven by requests for solutions from the marketplace.

PD300 – 4-foot (1.2-meter) reflector. The mobile version depicted here includes a 30-foot mast, allowing acquisition to be above obstructions.



PD500 - 8-foot (2.4-meter) reflector on a trailer. Digital Antenna: RF arrives, IP packets delivered.



PD900 – 24-foot (7.3-meter) system. Supports prime focus, Cassegrain and prime/Cassegrain configurations. Monopulse (SCM), CONSCAN, or combinations. The mobile version is compliant with US road standards and US military







QTrack[™] Portable Low-Gain Antenna

Scan for more product details

Self-Contained Ground Station

The QTrack[™] is a low-gain antenna based on the feed from our large-aperture PD-series antennas. Coupled with the industry-leading RDMS[™] telemetry receiver, it is the perfect solution for portable or mast-mounted antenna applications.

Automated Acquisition – Combined with our state-ofthe-art antenna control unit (ACU) with its straightforward user interface, the QTrack enables simple and robust data capture for your missions.

Portable — Two-person transport and setup (transport cases available). Free-standing antenna can be set up easily using a QTrack Antenna Tripod (part number QSX-AC-TRIPOD) or equivalent.

Simultaneous LHCP and RHCP RF Outputs – 2-channel rotary joint allows continuous azimuth travel.

Dual-Axis Pedestal – Multi-band SCM feed mounted in a dual axis pedestal; includes power supplies, slip rings, and rotary joint; custom dual-axis positioner based on the rugged industry-standard Quickset MPT-50. **Electronic Scanning for Highly Dynamic Targets** – Feeds sweep the beam electronically allowing scan rates from 500 Hz to 2 kHz–greatly mitigating challenges inherent in tracking targets that impose high degrees of amplitude modulation on transmitted signal.

Seamless L, S, and C Band Operation – Future-proof, with support for legacy TM bands while being ready for the move to C, all in one unit.

Bidirectional (Transmit/Receive) Configurations Available – Ideal for use with Ethernet Via Telemetry (EVTM); contact Quasonix for more information.

Optional QTrack Camera Kit Available – 1080p, 30fps, h.264 Ethernet Camera



Watch the agility of a QTrack as it auto-tracks a drone. Can your antenna do this?

QPatch™ 180° Coverage Antenna

Panoramic Performance

Higher-gain fixed antennas, with their attendant narrower beamwidths, are unable to receive targets over widely varying angles, frequently requiring installation of multiple fixed antenna systems. The QPatch[™], with its full 180° of coverage, eliminates this issue, giving you simple, robust, worry-free data capture.

Surprising Sensitivity – QPatch accommodates reception from targets up to 50 miles away within line of sight (dependent on transmit power, mode, bit rate, and forward error correction). Gain on beam is +8 dBi. Built-in AGC limits in-band signal levels. Built-in filtered low-noise amplifiers (LNAs) provide optimal sensitivity and rejection of interference (primarily cellular), resulting in filtered LNA gain of greater than 40 dB.

Wide-Angle Coverage – QPatch offers extraordinary widebeamwidth performance, covering 53 degrees at -3 dB and a full 180 degrees at -20 dB. This allows it to capture data not only from sources in front of the antenna but also off to the side, no steering required.

Rugged – Built for durability and to withstand the elements, such as marine environments. Includes grade 316 stainless steel components and internal RF lightning surge protection.

Easy Set-Up — With just two coaxial cables, QPatch can be controlled remotely from a receiver over 400 feet away. RF outputs are powered through the coaxial connection, eliminating extra power cabling and connectors. Bias Tees are located at the receiver input.









Scan for more

product details

QBeam™ Digital Beamformer



Scan for more

Fix Your Fixed Antennas

Just mount your antennas where they can see the target. The QBeam[™] digital beamformer takes care of the rest, automatically "pointing" receive antennas for best signal reception without physically moving any antenna element. The possibilities are endless.



Stationary Antenna Patches or Elements – No mechanical steering required; the antenna beam is electronically steered to maximize signal-to-noise ratio and to minimize distortion.

No Special Antennas or Arrangement Required – Works with antennas you may already own, regardless of type, degree of directivity, physical configuration, or location.

Beamformed Steering – The QBeam Digital Signal Processor (DSP)–nucleus of any QBeam system– automatically phase aligns and optimally sums the incoming signals, no tracking signal required; acquisition is extremely rapid, comparable to best-in-class demodulators, orders of magnitude faster than mechanically steered antennas. Superb System Performance – Together with the QBeam DSP, optional Quasonix RF Conditioners or Downconverters can be co-located with antenna elements to provide excellent noise figure, interference rejection, and high signal integrity; finish with optional Quasonix demodulators or RDMS[™] receivers for ultimate end-to-end system performance.

Easily Expandable for More Gain – Each QBeam DSP module can accommodate up to 8 wideband RF inputs, each carrying up to 8 target signals. Multiple modules may be cascaded to support larger antenna arrays or fed into dualchannel receivers for a final stage of combining.

Optional Advanced Capability – Using sophisticated algorithms, the QBeam DSP can provide auxiliary functionality, such as real-time direction finding.

QBeam technology can be customized to meet your specific needs. Contact Quasonix for more information.

RECEIVERS

Third-Generation RDMS[™] Rackmount Receivers

The Final Word on Data Integrity

The higest-performing telemetry receiver on the market is available in an elegant, compact 1U rackmount package and a 3U package with dual, 7-inch full-color touchscreens. Experience the industry's fastest synchronization, best SOQPSK-TG detection, premier Best-Channel Selector and Apaptive Equalizer, and much more.

Complete Receiver – RF to Bits – A single-box solution that includes downconversion, demodulation, and bit synchronization.

Space-Time Coding (STC) with SOQPSK Mode – Space-Time Coding (STC) operates with Quasonix STC-enabled transmitters to eliminate the dropouts caused by transmit antenna pattern nulls due to inter-antenna interference.

Low-Density Parity Check (LDPC) Coding with SOQPSK Mode – Low-Density Parity Check coding operates with Quasonix LDPC-enabled transmitters to improve link margin by up to 9 dB, while still using 22% less bandwidth than PCM/FM at the same payload data rate.

Data Quality Encapsulation (DQE) and Data Quality Metric (DQM) — Data Quality Encapsulation (DQE) is a process of bundling Data Quality Metric words with payload data, including a sync word to aid BSS time alignment; builtin real-time DQM display.

Best-Channel Selector (BCS) – Combiner data output seamlessly selects the best channel (Channel 1, Channel 2, or Pre-Detection Diversity Combiner) based on DQM.

Built-In Integrated Three-Channel Spectrum Analyzer – Spectrum analyzer shows frequency domain view for up to three channels simultaneously.

Optional Adaptive Equalizer – Powerful decision-directed equalizer mitigates multipath distortion.

Pre-Detection Multi-Mode Diversity Combiner -

Provides Maximal Ratio Combining with gain virtually indistinguishable from theory. Also features a revolutionary dynamic time alignment function which increases the allowable time skew between channels by over 1300 nanoseconds—more than 60 bits at high bit rates!

Built-In Playback Demodulator – IF Inputs for each channel, 75 kHz to 20 MHz, or 70 MHz with selectable SAW filter.

Simultaneous RS-422 and TTL Outputs with All Units – One RDMS does it all—no need to order separate output options.

Tuning Range from 200 MHz to 5250

MHz – Optional contiguous tuning from 200 MHz through 2500 MHz and 4400 MHz through 5250 MHz.



Scan for more product details

Third-Generation RDMS™ Compact Receiver-Combiner



Scan for more

The Industry's Premier Receiver Takes to The Air

The highest-performing telemetry receiver on the market is now available in a compact, flightready package. Experience the industry's fastest synchronization, best SOQPSK-TG detection, premier Best-Channel Selector and Adaptive Equalizer, and all the advantages of diversity combining - anywhere your test article takes you.



Complete Receiver – RF to Bits – A single-box solution that accepts RF signals and delivers baseband clock and data. No external add-ons required.

Rugged, Space-Efficient Design – Ultra-compact 52 cubic-inch chassis affords flexibility with system integration.

Space-Time Coding (STC) with SOQPSK Mode – Space-Time Coding (STC) operates with Quasonix STC-enabled transmitters to eliminate the dropouts caused by transmit antenna pattern nulls due to inter-antenna interference.

Low-Density Parity Check (LDPC) with SOQPSK Mode – Low-Density Parity Check coding operates with Quasonix LDPC- enabled transmitters to improve link margin by up to 9 dB, while still using 22% less bandwidth than PCM/FM at the same payload data rate; fully integrated forward error correction system.

Data Quality Encapsulation (DQE)/Data Quality Metric (DQM) — Data Quality Encapsulation (DQE) is a process of bundling Data Quality Metric words with payload data, including a sync word to aid BSS time alignment; built-in real-time DQM display via the browser interface. **Best-Channel Selector (BCS)** – Combiner data output seamlessly selects the best channel (Ch1, Ch2, or Pre-Detection Diversity Combiner) based on DQM.

Pre-Detection Multi-Mode Diversity Combiner –

Provides Maximal Ratio Combining with gain virtually indistinguishable from theory. Also features a revolutionary dynamic time alignment function which increases the allowable time skew between channels by over 1300 nanoseconds.

Built-In Integrated Three-Channel Spectrum Analyzer – Spectrum analyzer shows frequency domain view for up to three channels simultaneously, via the browser interface

Modulation Index Tracking* for PCM/FM – Maintains superior BER performance even if the received signal's modulation index varies by as much as 500%, a breakthrough for tracking legacy analog transmitters (*patented).

Phase Noise Compensation – Optimizes demodulator performance for use with legacy TM packs and transmitters with excessive phase noise.

Receivers

Scan for more product details

Third-Generation Compact RDMS™ Telemetry Receiver

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Airborne Accuracy

The Quasonix multi-mode compact RDMS[™] telemetry receiver features an extremely sensitive RF downconverter integrated with our market-leading ARTM demodulator and bit synchronization in a compact 12 cubic inch flight-ready package. When compared to the competition, RDMS[™] offers a remarkable 6 to 8 dB sensitivity advantage. What you choose to do with the extra link margin is up to you. Contraction of the contraction o

Complete Receiver – RF to Bits – A single-box solution that accepts RF signals, and delivers baseband clock and data. No external add-ons required.

Available with Adaptive Equalization – Reduces dropouts caused by multipath reflections.

Compact Flight-Ready Package – Ultra-compact 12 cubicinch chassis affords flexibility with system integration.

True Trellis Demodulation in all ARTM Modes – Provides true trellis detection in all three ARTM modes for optimal demodulation.

3.5 to 5 dB Improvement in PCM/FM Performance – Improves BER performance by 3.5 to 5 dB over the best single-symbol demodulators, to within 0.2 dB of the theoretical limit.

Modulation Index Tracking* for PCM/FM – Maintains superior BER performance even if the received signal's modulation index varies by as much as 500%, a breakthrough for tracking legacy analog transmitters (*patented). **Phase Noise Compensation** – Optimizes demodulator performance for use with legacy TM packs and transmitters with excessive phase noise.

Best SOQPSK-TG Detection in the Industry – RDMS's trellis detection for SOQPSK-TG yields improvements of 2 dB or more over the competition's single-symbol detectors.

Lowest Noise Figure – 3.5 dB noise figure bests all other ARTM receivers on the market, hands down.

Rapid Synchronization – Synchronizes up to 100 times faster – and maintains sync at lower signal-to-noise ratios – than any other ARTM demodulator.

Lower L, upper L, full S, C, or multiple bands available

Transmitters

Low-Density Parity Check (LDPC)

Error Correction System



Scan for more product details

If it seems too good to be true, it probably is. Unless it's LDPC.

Errors in a telemetry link can be costly, resulting in lost data and re-testing. LDPC coding dramatically reduces the number of errors; it does so more cost effectively than any other approach; and you can only get both ends of the link from Quasonix.

Adopted by the Range Commander's Council, IRIG 106-17, Appendix 2-D



Improves Link Margin by 8.8 to 9.4 dB at BER = 1e-5 – Link margin improvement is equivalent to nearly **tripling** the operating distance on your telemetry link



Adaptive Decoder – Decoding performance is within 0.2 dB of theory. Iterative decoding is optimized to fully utilize available time, improving coding gain even further as the bit rate is reduced.

Fully Integrated Forward Error Correction System – Transmitter automatically synthesizes expanded overthe-air bit rate for encoded blocks and receiver seamlessly converts back to continuous output at the user bit rate. Operation is completely transparent to data devices.

Robust Synchronization – Reliable synchronization achieved as low as $-4 \text{ dB E}_{b}/N_{0}$.

Uses Spectrally Efficient SOQPSK Modulation – Even with the LDPC coding overhead, bandwidth can be 22%–or even 34%–less than PCM/FM at the same payload bit rate. Payload bit rates up to 35 Mbps are supported.

Simple ON / OFF Control – Allows transmitter/receiver operation with or without correction.

Tested on Multiple DoD Ranges – Proven effective under challenging real-world conditions.

Already own Quasonix equipment?

The LDPC mode can be retrofitted to most Quasonix transmitters and receivers. Contact Quasonix for details.

Networking

Scan for more product details

Maximum Likelihood Stream Combiner™

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"Best" Just Got Better

Introducing the Quasonix Maximum Likelihood Stream Combiner[™], a new approach to Best Source Selection that extracts optimal data from multiple received signals. The MLSC[™] leverages Data Quality Encapsulation (DQE), Maximum Likelihood Bit Detection (MLBD), and proprietary Quasonix algorithms to improve your received data accuracy under the most challenging conditions.



Industry-Leading Implementation of the DQM/DQE

Industry Standard – The MLSC faithfully implements MLBD, using the Data Quality Metric (DQM) for each bit of every bit stream to determine the most likely correct output bit. Not only does the MLSC derive the lowest achievable output bit error rate possible, it also constructs accurate DQM for the output stream, which can be used in cascaded MLSC[™] arrangements or by other downstream equipment.

Superior Dynamic Acquisition and Tracking Performance

- MLBD is only optimal if all received data streams are able to participate in the combining process at all times. This requires seamlessly maintaining stream alignment at the bit level, while tracking signals through the deep fades that are typical of serial streaming telemetry channels, and almost instantly reacquiring and realigning those streams that lose lock. The resulting system can easily track Doppler rate differentials due to the fastest of targets, well above Mach 25. Affordable and Scalable – Twelve PCM I/O and twelve TMoIP I/O are independently configurable as input or output for MLSC groups, with up to twelve input channels and four channel groups (outputs) per unit. MLSC units can be cascaded to achieve any number of channels for larger systems and can be paralleled to support any number of channel groups.

Easy to Set Up and Use – Automatic DQE frame detection; local front panel interface with four displays for health and status monitoring, including presentation of DQM, time skew, and source-selection state; browser interface for health status monitoring, including integrated status reporting and logging such as input and output quality and quantifications of improvement.

The MLSC is supported by lifetime software updates and is easily field upgradeable.

NETWORKING

Ethernet via Telemetry

Redefine the "Local" in Local Area Network

With the Quasonix Ethernet Via Telemetry (EVTM) system, your test article can be on your ground station LAN, just like any other computer or Ethernet appliance. Connect cameras, Voice over IP, computers, and more, with a variety of hardware configurations to meet your needs.

High Speed Ethernet Traffic Over Telemetry Links – Ethernet telemetry data rates up to 40 Mbps using standard Ethernet protocols.

Enables Ethernet Data Transmission for a Wide Variety of Applications – Multimedia streaming, data source selection, data source isolation and forwarding, source rate and coding control in reaction to channel impairments, network extension, Voice over IP (VoIP), COTS based Ethernet products such as Industrial Control Sensor Devices and data recorders.

Supports all TCP/IP Packet Types – Streaming UDP packets, TCP connections, ICMP and SNMP messages are all passed over the air. (Connection-oriented traffic requires a bidirectional link.)

Time Division Duplex (TDD) or Frequency Division Duplex (FDD) Operation – TDD bidirectional operation synchronizes EVTMs to a selected schedule master. The option to synchronize to an external common clock reference is also available. TDD switching modules can be added to extend existing FDD systems to single-frequency operation.

Optional COTS Devices Provide Tremendous Additional Capability – An industrial computer module between the data sources and the transmitter allows sophisticated control of the downlink traffic. Ethernet enabled data recorders provide an interface for legacy sensors.

Flexible, Comprehensive Solutions – EVTM can be added to existing systems or tailored to specific needs.



Scan for more product details

Contact Quasonix for a live video demonstration of EVTM and consultation on the right solution for you.

Networking

TMoIP Processor

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Reliable, simple, and accurate packetized telemetry transport

The Quasonix TMoIP Processor (QTP[™]) is the ideal solution for distributing telemetry data across your network. It provides IRIG 218-20 compatible telemetry transport in both a bidirectional 12-channel 1U form factor (TMOIP-12) and a 3-channel integrated solution embedded in a 1U or 3U RDMS[™] receiver.



PCM Telemetry Interface

Stand Alone: 6 or 12 Channel; Integrated: 3 Channels – 1U standalone processor supports 6 or 12 channels of PCM input/output (field upgradeable from 6 to 12); RDMS integrated solution supports 3 channels of PCM input, one each for Channel 1, Channel 2, and Combiner.

PCM Telemetry Clock and Data Rates of 100 kbps to 50 Mbps Per Channel – Each channel supports an independent clock rate; bit rate detected automatically–no configuration needed.

Bidirectional – To provide maximum flexibility, each channel can serve as a PCM input or output (TMoIP-12 only).

Electrical Interface via TTL or RS-422 – Clock and data for each channel can be configured for TTL via 75 ohm BNC, or for RS-422 via MDM-25 connectors (TMoIP-12 only).

Configurable TX/RX Clock and Data Polarity with Auto Clock Edge Detection – Clocking edge can be automatically determined via relationship with data (most reliable edge is selected).

Network Interface

Two 1000 Base-T Gigabit Ethernet RJ45 Ports – Separate ports for configuration and data.

IRIG 218-20 Format – With first payload bit timestamping.

Time Synchronization – Via Network Time Protocol (NTP) or Precision Time Protocol (PTP) IEEE-1588/PTPv2.

Per Channel Configuration – Each channel is independently configurable for maximum flexibility.

Configurable DQE Frame Alignment – TMoIP packet starts with a DQE frame and contains its full payload.

User Interface

Local and Remote Management for Configuration and Monitoring – LCD and LEDs for Health and Status; Browser Based UI for Command, Control, Health, and Status.

BER Test Mode with Generator and Analyzer – Allows full testing of system configuration and cabling prior to mission start.

Networking

Network Assistant



Scan for more

Enjoy Some Uptime

Just because you have Quasonix equipment running all over the range doesn't mean you need to be. The Quasonix Network Assistant is a browser-accessible server that identifies all Quasonix network-addressable equipment on the network and makes it simple to monitor and manage. Some things really are as easy as they should be.



Single Site to Manage Network Addressable Units

Provides easy access to units without requiring a list of IP addresses.

Features:

- The Assistant links to Quasonix units, user manuals, and programming pages via browser
- Detailed Log shows timestamped events such as when a unit connects on the network, when a unit leaves the network, and when configurations change
- Provides local label and location information to manage assets
- Server stores product software updates for easy access to perform unit updates
- · Batch updates (planned for future release)

Monitors all Quasonix Network Addressable Product Families

Just one unit provides detailed information about:

- RDMS[™] receivers
- Transmitters with API server
- Status Loggers
- EVTM units
- TMoIP standalone units
- QSight[™] systems
- MLSC[™] units

Integrates an NTP time server with IRIG-B and GPS Inputs

1U rack-mount unit with integrated power supply, display, and NTP time server; USB and SD card slot on the front panel.

TEST EQUIPMENT

Receiver Analyzer

Measure Twice, Launch Once

Verify your pre-flight receiver configuration with the Quasonix Receiver Analyzer. With a system-wide total of four signal sources and six channel path emulators, complex scenarios can be effectively modeled and tested. The powerful new UI allows extensive customization, flexibility, and automation.

Versatile Rack-Mount Enclosure with USB Interface – Compact 1U 19" rack-mount chassis provides a single-box receiver analyzer solution, with USB plug and play; RA 3.0 extends capability and performance dramatically using existing fielded hardware.

Internal Signal Generators – Includes two complete ARTM signal generators covering 200 MHz to 2500 MHz and 4.4 GHz to 5.25 GHz contiguously, with power levels from 0 dBm to –125 dBm.

Multipath Channel Emulator – Provides 6-ray multipath emulation plus line-of-sight for static and dynamic multipath testing.

Internal Bit Error Rate Testers (BERTs) – Eight bit error rate testers with integrated synchronization detection/ measurement and bit rate counters.

Powerful User Interface Runs on Any Windows 10 or 11 PC – Easy-to-use, fully configurable graphical user interface provides incredibly responsive control of all Receiver Analyzer functions and monitoring of all receiver status; make the interface as simple or as full-featured as needed.

NEW

Receiver Performance and Functionality Tests – Comprehensive telemetry receiver test suite includes

DQE/DQM verification, bit error rate, noise figure, receiver latency, acquisition time, acquisition threshold, combiner/ BSS break frequency, combiner gain, equalizer multipath performance, and PCM/FM modulation index tests.

User-Definable Automated Tests – Fully customizable test capability allows modifying standard tests or defining new test scenarios to provide almost limitless automatic receiver testing.

Dynamic Graphing and Logging of Automated Test Results – Automated tests display results in interactive charts, in real time, and allow saving acquired data in several formats including customizable .CSV files for post-test processing and analysis.

DQM-Based Testing – Use calibrated DQM rather than bit error rate measurements to decrease test time by orders of magnitude.



Scan for more product details

RA 3.0 - available as a free upgrade to existing Receiver Analyzers

RDMS[™] Status Logger

That which is measured, improves.

That which is measured and reported improves exponentially.

The RDMS[™] Status Logger is a powerful way to analyze receiver/demodulator mission dynamics, allowing you to view status metrics in a real-time graphics display and store that data in a file. What other tool can access and log receiver metrics, enabling unparalleled postmission analysis? None that we know of.

> New Version with Browser Support – The newest version of software implements a full-function web server. This allows control and graphics through a common web browser on a remote computer. The browser support is designed to provide intuitive access to control and monitoring of the status loggers and provides a straightforward way to move status logs to the client computer.

Chapter 10 Publishing – In the newest version of software, a chapter 10 publisher (IRIG 106) provides near real-time status to remote subscribers. Chapter 10 subscribers can view and record status.

System Integration – System integration is a breeze. A single connection is made to the RDMS[™] Receiver from the interface hardware. If desired, the RDMS browser can be launched from the status logger, which opens the RDMS interface in a new browser window.

Complete API – A complete API (Application Programming Interface) allows the user to implement custom software to access control of the status logger and retrieve status logs.

The Status Logger system consists of a hardware interface, integrated controller, and application software. The hardware interface is housed in a 1U rackmount package, optionally supporting one, two, three, or four RDMS units. The Status Logger application runs on an internal controller, and status information is saved to internal storage.

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Rackmount Status Logger with Integrated Controller –

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Quasonix





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QSight™ L/S/C-Band Boresight System

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Trust But Verify

The QSight[™] system is a multi-band, highpowered, boresight RF test source. It allows an operator to verify that the receive range telemetry system is properly configured and operating as expected prior to a mission, preventing costly test failures.



Integrated Transmit Assembly (TA) - L, S, and C bands are covered with the dual-output transmitter and the dual polarization (H and V) antenna.

2U Rackmount Chassis – The Controller Assembly (CA) resides on the user's network and supports a user interface via an embedded web server and the user's browser. A single cable connects the CA to the Transmit Assembly (TA).

Data Sources from Internal Data Generators and User-Supplied Data – With data rates from 24 kbps to 46 Mbps, the QSight provides standard PN generators from the internal transmitter, including user defined patterns, as well as PCM frame assembly with programmable frame header and size;

RS-422 or TTL data with clock-free operation; IRIG 218 (TMoIP) stream.

120 dB Output Power Range – Power and polarization calibrated from -40 to +40 dBm EIRP; operational down to -80 dBm EIRP.

Drives Both Ports in Phase or 90° Shifted or Drives One Port, H or V – Dual Transmitter drives Vertical and Horizontal antenna elements to produce any angle linear, or Left Hand or Right Hand circular polarization.

Optional Ethernet Accessories – Camera with Ethernet interface; positioner with Ethernet control.



2U Rackmount Controller Assembly





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Next-Generation Bit Error Rate Testing

Verify your system configuration and performance with the Quasonix QBERT. Its portability and simplicity make it an ideal replacement for aging test equipment. Its highperformance BERT core makes it the BERT of the future.

Advanced Bit Error Rate Tester – Built around the same BERT core used in the Quasonix Receiver Analyzer, QBERT is capable of obtaining pattern sync at extremely high bit error rates, up to 3.8e-1. More importantly, it can maintain pattern sync at equal or higher levels, exceeding 4.9e-1 with PN31 patterns. This remarkable performance permits accurate measurements in the harshest of channel conditions. At lower bit error rates, BERT pattern sync is essentially instantaneous, so you know all the errors counted are from your system, not your BERT.



Up to 8 simultaneous channels in one chassis.

Internal Pattern Generator – Includes all standard pseudonoise (PN) patterns and user patterns up to 32 bits. For test purposes, it can insert errors manually or at a userprogrammed error rate.

Simple User Interface – QBERT provides an intuitive touchscreen interface that places all functionality on-screen for simple one-touch operation. Measurements and indicators respond in real time, so there is instant correlation with system behavior.

Versatile Deployment – The QBERT chassis is sized to fit standard 19-inch rack-mounting (using provided adapter brackets). An optional portable case can be used to mount and transport the QBERT. The case can fully enclose the unit, while also allowing the front and back of the QBERT to be accessed in the field. The case itself is lightweight, rugged, and can be carried with an included shoulder strap.

QBERT is backed by lifetime software updates and Quasonix's legendary technical support.

BSS Analyzer

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"Do the best you can until you know better" — Maya Angelou Now You Can Know Better

Does your best-source selection (BSS) improve data accuracy as much as it should? Now you can know. The Quasonix BSS Analyzer (BSSA) emulates real-world channel conditions across all received signals in a range, allowing precise, repeatable BSS testing. Evaluate performance across BSS units and settings, and take the guesswork out of your mission-critical equipment.

Flexible Testing – The Quasonix BSSA has 12 independent data generators capable of emulating a multitude of best source selection challenges such as channel delay, Doppler effects, variable bit error probability, receiver sync loss, and more. Twelve PCM I/O and twelve TMoIP I/O are independently configurable as input or output, with the ability to monitor and report results for up to four simultaneous channel groups.

Rigorous, Repeatable Evaluation – Tests are precisely repeatable, so it's easy to make valid comparisons of any equipment across a wide variety of scenarios. Evaluate strengths and weaknesses, focusing on the signal impairments most likely to occur on your range. By including DQE framing with the exact DQM based on dynamic error probability, it's possible to know with certainty how your BSS is performing not only in the absolute but also relative to theory.



System Optimization – The BSSA can help you to test and optimize your own specific BSS parameters, such as those you may be using for receiver data correlation and realignment. Refine and improve your system with no actual data lost.

Cost Savings – Whether you already own Best Source Selectors or are preparing to purchase new gear, you can use the BSSA's results to select the best equipment for your particular needs, ensuring efficient deployment of existing hardware and cost-effective procurement of new.

The BSS Analyzer is supported by lifetime software updates and is easily field upgradeable.

"Test Lab" Configuration Example





Meet Your Sales Rep

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Quasonix works with select sales representatives and distributors. The result? You get premium, local sales support. Whether you know exactly what you need or require some guidance, you're in good hands. Contact your representative today to learn more about how Quasonix's end-to-end solutions can meet your needs – and exceed your expectations.



1. Western United States

Elotek Systems, Inc.

elotek.com sales@elotek.com +1949-366-4404

Covering: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Texas (El Paso), Utah, Washington, and Wyoming



2. Southern and Eastern United States

AeroGear Telemetry

aerogear.us sales@AeroGear.us

+1 561-223-2590

Covering: Alabama, Arkansas, Connecticut, Florida, Georgia, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas (except El Paso), Vermont, Virginia, and West Virginia, Western United States



3. Italy, Slovenia

Instrumentation Devices

instrumentation.it/it/partners/quasonix info@instrumentation.it +39 031.525.391



4. United Kingdom

Nprime

nprime.co.uk +44 114.2727868



Other Countries

BDSI

abdsi.com tfte@abdsi.com +33 2.33.54.06.60

Covering:

5. EUROPE

Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and Turkey

6. MIDDLE EAST

Egypt, Israel, Qatar, and UAE

7. ASIA

Australia, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, Singapore, South Korea, Taiwan, and Thailand

Our Tradition

Innovation Defined

Quasonix was founded in 2002 with the purpose of filling a void in the flight-test telemetry market for a company dedicated to the development and deployment of advanced telemetry products. As founder and president of Quasonix as well as the inventor of the SOQPSK waveform, Terry Hill set out to leverage key design experience and market knowledge to build a company with a focus on delivering inventive, revolutionary telemetry solutions.

More than two decades later, Quasonix has evolved and grown to reflect an expanding and enthusiastic customer base. Quasonix's core tenet of exceeding customer expectations continues today with the development of products that push the envelope of spectral efficiency, power efficiency, size, packaging, and user-friendliness. Quasonix continually breaks new ground and stands apart as the market's key innovator. Quasonix is... Reinventing Telemetry[™] Here are some of our milestones, including a number of industry firsts:

- 2002 Quasonix opens for business
- 2004 First TIMTER™ transmitter ships
- 2007 First RDMS[™] receiver ships
- 2013 LDPC Coding introduced
- 2014 STC introduced
 First Receiver Analyzer ships
- 2015 DQE/DQM introduced EVTM introduced LDPC Coding added to IRIG 106-15 STC added to IRIG 106-15
- 2017 DQE/DQM added to IRIG 106-17 First Status Logger ships
- 2018 BCS introduced First QTrack™ antenna ships
- 2019 All-digital antenna control protocol introduced
- 2021 First HyperTrack[™] system installed
- 2023 First TMoIP Processor ships
- 2024 First Maximum Likelihood Stream Combiner™
- 2025 First QBERT[™] bit error rate tester

Meet the Team

Support? Yeah, we've got that.

When you call Quasonix, you talk with an actual person. Customers are sometimes surprised by that – but they shouldn't be. Experts helping experts is the way questions get answered and problems get solved, especially in a technical field like telemetry. It's one of the things that sets us apart. Meet some of the people on the front lines of our customer support.



Terry Hill Founder, President, and Chief Scientist



Pam Hill Human Resources, Accounting, and Customer Support



Bob Schumacher Status Logger and Network Assistant design and support



Dave Harris Antenna and transmitter software



David Williams Engineering technician passionate about design/technology



Don Fox

Transmitter support and transmitter production coordinator



Frank Eichenberger

Swiss Army Knife of customer support



Greg Wells Product development leader on RDMS



Gregg Wood RDMS, Receiver Analyzer, and QBERT



Jeff Muntel RDMS, TMoIP, and MLSC software and support



Jim Kemp Antenna production schedule



Jim McCurdy Design and support of RDMS receivers and all antenna

products



Jim Uetrecht

Digital signal processing across all product lines



KJ Yi Antenna system design and customer support



Matt Schultz Product support



Paul Radcliffe CTO, Antenna Systems



Ryan Salyers Engineering Technician, RDMS support



Sean Wilson

Development and support of Receiver Analyzer and EVTM

Reinventing Telemetry™

With a razor-sharp focus on the aeronautical telemetry market and a team rich in talent, experience, and sheer determination, Quasonix is able to consistently design, develop, and manufacture what our customers regard as market-leading telemetry products.

Quasonix

Quasonix.com

Galactic Headquarters

6025 Schumacher Park Drive West Chester, OH 45069 1-513-942-1287 sales@quasonix.com

Antenna Division

353 Science Drive Moorpark, CA 93021 1-805-530-0933 sales@quasonix.com

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