

NetAcquire® Telemetry-over-IP (TMoIP)

NetAcquire

Optimized Telemetry
Signal Distribution

Overview

NetAcquire TMoIP reliably distributes any type of telemetry signal across a wide range of IP-based networks with very low latency.

The NetAcquire TMoIP reads typical electrical input signals and converts the resulting data streams into Ethernet packets for network transmission. A second NetAcquire server reads the data from the network and reconstitutes the data back into the equivalent electrical output signals at remote locations.

Intelligent TMoIP

NetAcquire TMoIP has many advantages over fixed-mode serial-to-Ethernet devices. Now in its seventh generation, the NetAcquire product architecture is characterized as “Intelligent TMoIP”. See our technical note for a description of the many additional capabilities available as part of NetAcquire’s Intelligent TMoIP products—contact info@netacquire.com to get your copy today.

Easy-to-Use Web-Based System Management with Advanced Diagnostics

System configuration takes only a few simple steps from the NetAcquire browser-based user interface. The top level system management display shows a complete view of system status including network health. Simply click to drill-down and see additional helpful diagnostic information for rapid troubleshooting.

An innovative status display shows simultaneous information from both ends of the TMoIP connection, enabling more effective diagnostics.

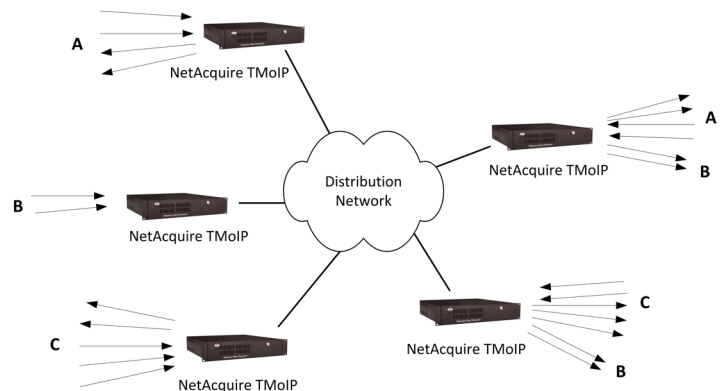
Operator drill-down capabilities include channel status, input/output counts, I/O parameters, error counts, network latency and jitter, and IRIG timing. Serial channel status includes detection and reporting of “no data” or “no clock signal” electrical conditions which are important for rapid diagnosis of external wiring/signal issues. In addition, actual telemetry data from any input channel can be viewed directly from the management interface.

Reliability and Time/Data Correlation

Data integrity and data timing are maintained throughout the telemetry distribution process. NetAcquire Intelligent TMoIP preserves the timing correlation of the signals from the source side to the destination side. Network transport of IRIG A/B/G timing signals and NTP/PTP timing is available on NetAcquire TMoIP systems. If an IRIG timing input signal is supplied, the IRIG output is accurately time correlated to serial data at each destination.

NetAcquire TMoIP uses agile frequency synthesis and tracking capability on all output channels to avoid serial bit slips and data padding that result from input-to-output timing mismatch conditions. Frequency resolution is better than .0001% (1 part-per-million) across telemetry data rates ranging from 100 bps to 100 Mbps, resulting in very low jitter.

Other high-reliability features include automatic reconnection following recovery from network failures, quality of service channel prioritization (ensuring that most important data goes through the network first), and a feature that allows users to reconfigure most system properties dynamically without the need for a system re-start.



Future-Proofing with “Universal” TMoIP

NetAcquire TMoIP simultaneously supports multiple configurable network protocol options to meet both current and future standards. Both UDP and TCP protocols are supported as well as IRIG 218 (RTP and non-RTP) and IRIG 106 Chapter 10 packet formats. The optional NetAcquire Data Flow Designer allows specification of arbitrary network packet formats for the ultimate in configurability and flexibility.

Network Mesh Flexibility

NetAcquire Intelligent TMoIP design overcomes the restrictions of traditional point-to-point communication products by supporting delivery of telemetry data to multiple endpoints simultaneously. It easily supports sophisticated one-to-many and fully dynamic “mesh” configurations.

Network Consumers and Data Processing Flexibility

In addition to serial data output, NetAcquire Intelligent TMoIP supports simultaneous delivery of telemetry data directly to PCs and other Ethernet devices.

Optional telemetry frame synchronization delivers telemetry data network packets that are frame-aligned for convenient software-based decommutation and display. NetAcquire offers an extensive suite of tools for network data archiving, decommutation, real-time processing and data display.

Local Channel Name	Status	Local Endpoint	Network	Remote Endpoint	Remote Channel Status	Remote Channel Name		
Serial 0	Locked	J-110	UDP Unicast 20000	J-56	Open	Serial 0		
Serial 1	Locked	J-110	UDP Unicast 20001	J-56	Open	Serial 1		
Serial 2	Locked	J-110	UDP Unicast 20002	J-56	Open	Serial 2		
Serial 3	Closed	J-110	Stopped	UDP Unicast 20003	J-56	Waiting	Suspended	Serial 3
Serial 0	Open	J-110	UDP Unicast 20000	J-56	Locked	Serial 0		
Serial 1	Open	J-110	UDP Unicast 20001	J-56	Locked	Serial 1		
Serial 2	Open	J-110	UDP Unicast 20002	J-56	Locked	Serial 2		
Serial 3	Open	J-110	UDP Unicast 20003	J-56	Suspended	Serial 3		

PCM Serial Interface

- Maximum PCM Data Rate: 20, 30, 40, or 100 Mbps[†]
- Minimum PCM Data Rate: 100 bps
- Channels per Chassis: 2 to 32[†], in groups of 2
- Bidirectionality: All channels bidirectional, with different rate rates supported for transmit and receive
- Electrical Signaling: TTL, RS-422, RS-232, ECL, or LVDS[†]
- PCM Codes: NRZ-L/M/S, R-NRZ-L/M/S, and Biphas-L/M/S
- PCM Code Conversion: Output code can be configured to be different from input code
- Data and Clock Polarity: Normal or Inverted, configurable
- Automatic Baud Rate Detection: Yes
- PCM Input Clocking: External clock input or internal clock recovery
- PCM Output Clocking: Auto-tracking clock output or external clock input
- Output Clock Frequency Resolution: 0.0001%
- Noise Rejection: Configurable noise and signal ringing filtering on input signal
- Analog Bit Synchronization: Any group of channels can have full-function bit synchronization (http://www.netacquire.com/bit_sync.htm)[†]
- Site Specific Signals: Field programmable gate array (FPGA) support with remote upgrade

Network

- Number of Network Ports: Two standard, up to four available[†]
- Interface Type: Gigabit Ethernet twisted pair (1000BASE-T), with fiber optic media option
- 10 Gbps Ethernet Upgrade Available: Yes
- Negotiation: Automatic or manual link speed and duplex negotiation
- Network Latency/Jitter Removal: Automatic tuning to support networks with latency/jitter from 1 ms to 1000 ms
- Quality of Service: User-selectable using DSCP (Differentiated Services Codepoint)
- Channel Priorities: 100 levels
- Network Output Protocol: TCP (reliable delivery), UDP (best effort delivery), or both protocols simultaneously
- UDP Packet Format Options: IRIG 218 (RTP and non-RTP) and IRIG 106 Chapter 10
- Simultaneous Network Output Destinations: No restriction on number of destinations with either TCP or UDP
- Network Recovery: Automatic network fault detection and recovery
- Data Quality Reporting: Network data includes header with signal quality and time stamp information
- Load Sharing/Network Path Diversity: Yes
- Bandwidth Saving Mode: Automatic suspend/resume of flat-line PCM channels after configurable number of seconds
- Space Links: Integrated SCPS-TP and Reed-Solomon forward error correction support for high bit error networks
- Ethernet MTU: Configurable
- IPv6 Support: Yes

Timing

- IRIG Timing: IRIG A, B, G (amplitude modulated)
- Other Time Sources: SNTP and IEEE 1588
- Stream-to-Stream Data Skew: Less than 0.1 ms

Operating System and Processor

- Operating System: Hard real-time with latency guarantees
- Main Processor: Intel® Core™ i7-3770 3.4 GHz
- RAM: 2 GB with expansion
- Nonvolatile Storage: 8 GB, swappable/removable for device sanitization[†]
- Open Architecture: Supports additional data processing (encoding, compression, encryption) with optional programming Toolkit

Security

- Security-Hardened Operating System: Yes
- Password Protection: Unlimited number of accounts with password-controlled permission levels
- Strong Authentication: Support for centralized authentication (ActiveDirectory and LDAP) available Q4/2014[†]
- Auditing: Audit logging of all system configuration changes

User Interface and Diagnostics

- Operator Interface: Web-based HTTP and HTTPS
- Simultaneous Display of Multiple Systems: Yes
- SNMP: Both v1 and v3 supported
- Self Test: Selectable power-up, continuous, and remotely initiated
- Loopback: Configurable loopback and loopout options
- Signal Status Display: "No Data" and "No Clock" indications
- PCM Quick Look Display: Configurable display of PCM data in hex, decimal, binary, etc.
- Bit Error Rate tester: Supported on any/all PCM channels
- Backup: One-step configuration save/restore
- Open Architecture: Create custom user interfaces with LabVIEW™, .NET, C++, or Java with optional programming Toolkit

Frame Synchronization[†]

- Pattern Length: 0 to 32 bits
- Frame Length: 16 bits to 4 Mbits, configurable
- Pattern Mask Bits: Yes
- Sync Strategy: Configurable Verify/Check and Flywheel count
- Variable Frame Length Support: Yes
- Alternating Frame Sync: Yes
- Automatic Polarity Inversion: Yes
- Burst support: Yes
- Sync Error Tolerance: 0 to 3 bits, configurable
- Sync Slip Window: 0, ±1, and ±2 bits, configurable

Decommutator[†]

- Common Word Width: 1 to 64 bits, configurable
- Word Width: 1 to 64 bits, configurable for each measurand
- Bit order: MSB or LSB, configurable
- Data Types: Signed/unsigned integer, float, and byte array
- Sub/super commutation: All variants supported
- Embedded streams: Supported, with arbitrary level of nesting

Other

- Data recording/playback[†]: 2 TB capacity
- CCSDS[†]: Yes
- Best Source Selection[†]: Yes

Physical

- Frame: Heavy-duty steel
- Rack-Mount: 1U, 2U, or 4U available
- Redundancy: Redundant, swappable power supplies and fans
- Operating temperature: 32 to 122°F (0 to 50°C)
- Power Requirements: 90-132 VAC or 180-264 VAC with automatic range switching, 250 watts (DC power optional)

[†]Ordering options



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