



icFEP | FRONT-END PROCESSORS

IngeniComm's icFEP front-end processors represent the next generation of low-cost, high-performance multi-mission data decoding and processing solutions. The icFEP product line combines IngeniComm's proven Configurable Ground Systems (CGS) software framework with robust enterprise hardware platforms to provide multi-channel telemetry and command processing capabilities at rates of up to 1.5 Gbps per channel.

Turn-Key Data Processing

The icFEP front-end processor provides full support for CCSDS and non-CCSDS telemetry protocol decoding and processing. The icFEP supports CCSDS Conventional (version 1) and AOS (version 2) Transfer Frame, VCA, and Bitstream services, Space Packets, and IP encapsulation, as well as legacy TDM major/minor frame telemetry formats. The icFEP is capable of decoding most commonly used forward error correction codes, including Reed-Solomon, Convolutional/Viterbi, TPC, and LDPC.

Integrated Simulation and Analysis

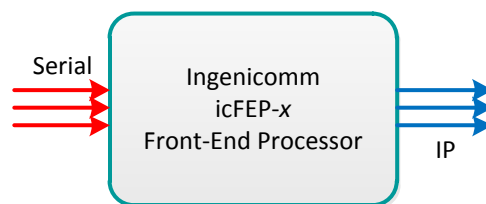
The capabilities of the icFEP go beyond data processing. By integrating IngeniComm's full CGS software processing suite, the icFEP enables users to take advantage of a full range of secondary capabilities, including data quality metric generation, test pattern verification, link performance analysis, and file management and distribution capabilities. When deployed in prototyping and test environments, the CGS framework allows seamless integration of user-written software components, allowing custom data processing and archive manipulation capabilities to be easily added to the standard system.

Easy Local and Remote Configuration

The icFEP front-end processor can be controlled either locally or remotely via a highly flexible web-based graphical user interface. A full-featured command-line interface is also provided to allow easy scripting and automation, and service-oriented cluster management components are available to allow single-point control of multiple icFEP systems simultaneously.

Robust Platform Architecture

The icFEP product line is based on a robust enterprise-grade server architecture to provide component-level redundancy and high resiliency against failure. The systems are highly scalable, and can be expanded to include additional interfaces and increased storage capacity as required.



Key Features

- Industry-leading high-performance front-end processing solution for link data rates up to 1.5 Gbps
- CCSDS Conventional and AOS protocol processing
- TDM major/minor frame protocol processing
- Database-driven telemetry processing and extraction
- Reed-Solomon, Viterbi, TPC, and LDPC decoding and correction
- Integrated multi-channel archiving and playback
- Test pattern and user data simulation and verification
- Robust enterprise-grade hardware platform with up to 24 TB of integrated storage

IngeniComm, Inc. is a leading provider of ground and range equipment and enterprise engineering services for civil and commercial aerospace programs, as well as the defense and intelligence communities. To learn more about IngeniComm's service and product offerings, visit <http://www.ingeniComm.net> or contact IngeniComm at info@ingeniComm.net or +1-703-943-7236.



System Capabilities

Input and Output Interfaces

- Gigabit Ethernet at rates up to 800 Mbps per channel
- 10-Gigabit Ethernet at rates up to 1.5 Gbps per channel
- TTL/RS-422 at rates up to 30 Mbps per channel
- ECL/LVDS at rates up to 800 Mbps per channel

Telemetry Processing and Simulation

- CCSDS Conventional (version 1) and AOS (version 2) Transfer Frames
- CCSDS VCA and Bitstream service
- CCSDS Space Packets
- Fully configurable VCID and APID filtering and routing

Data Archiving and Playback

- Heuristic data presence detection and automated recording
- Segmented and multi-file recording and playback
- Automatic time-tagging and aging of recorded files
- Data search and playback via session names, timestamps, or data/metadata characteristics
- Real-time and scheduled distribution of files via FTP/SFTP or SMB

Network Encapsulation

- NASCOM
- LEO-T CDH/TFDH
- SFDU/AXAF/ACE
- VRT

Encoding and Decoding

- Pseudo-randomization and de-randomization
- Reed-Solomon (255,223) or (10,6) decoding
- Convolutional/Viterbi decoding
- TPC and LDPC decoding
- CRC checksum verification

Test Data Generation

- Fully configurable PRBS generation and verification
- Fixed and user-provided pattern generation and verification
- Single- and multi-bit burst error simulation
- Bit and packet error rate calculation

Monitoring and Control

- Local and remote command-line interface
- Web-accessible graphical user interface
- Fully integrated documentation and user help features
- Integrated scripting and automation

Platform Specifications

Data Rate	1 bps – 30 Mbps	30 Mbps – 800 Mbps	800 Mbps – 1.5 Gbps
Models	icFEP-30	icFEP-100 icFEP-400 icFEP-800	icFEP-1200 icFEP-1500
Chassis	3U 19" rack-mount chassis (5.2" x 17.7" x 25.5")		
Processor	Intel® Xeon® 3.1 GHz quad-core CPU	Dual Intel® Xeon® 1.8 GHz quad-core CPUs	Dual Intel® Xeon® 2.5 GHz six-core CPU
Memory	8 GB DDR3 1600 MHz ECC-registered RAM	16 GB DDR3 1600 MHz ECC-registered RAM	32 GB DDR3 1600 MHz ECC-registered RAM
Interfaces	4 Gigabit (10/100/1000) Ethernet ports 4 bi-directional TTL/RS-422 ports	2-6 Gigabit (10/100/1000) Ethernet ports 2 bi-directional ECL/LVDS ports	2-6 Gigabit (10/100/1000) Ethernet ports 2 10-Gigabit Ethernet ports
Drives	250 GB hot-swap RAID-1 system drive array 1–24 TB hot-swap RAID-0/1/5/6/10 archive drive array 22x DVD-RW optical drive		
Power	760 W triple-redundant (2+1) power supplies		
Operating System	Red Hat® Enterprise Linux 6.2 or Windows® 7 Professional		
Remote Management	IPMI 2.0 remote management with dedicated NIC		

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