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KGT-777 CERTIFIED DATA-ENCRYPTION UNIT

UNIT	
Encryption	
Algorithm	Photoplay
Key	Up to 128 distinct red keys per channel, selectable via command interface
Key Storage	Fixed-key PROM per channel, removable assemblies
PN-23 Mode	PN-23 pseudorandom data sequence output active prior to first crypto frame sync, continuous PN-23 output selectable via command input
Data Interface	
Channels	2 channels, independent
Cross-strapping	A-side/B-side per channel both input and output
PT Data Input	Byte-wide (8-bit), LVDS
Input Data Rate	4 Gbps max (2 Gbps per channel), data valid on falling edge of input clock
PT Input Clock	Synchronous to input data, 250 MHz, duty cycle 50% (nominal)
CT Data Output	Byte-wide (8-bit), LVDS
Output Data Rate	4 Gbps max (2 Gbps per channel), data valid on rising edge of output clock
CT Output Clock	Synchronous to output data and equal frequency to PT input clock, 250 MHz max, duty cycle 50% nominal
Data Format	NRZ-L input and output
Power/Construction	
Input Power	≤ 32 W @ 4 Gbps
Operating Voltage	22 to 36 VDC
Mass	7.75 lb
Dimensions	8.25" L x 7.25" W x 4.0" H
Connectors	Data/clock in: high-density-DB26 male x 2 (A-side/B-side) per channel Data/clock out: high-density-DB26 female (A-side/B-side) per channel
Cmd/Status	High-density-DB15 male (A/B-sides) per channel
Power	Std-DB9 male x 2 (primary/redundant)



The KGT-777 data-encryption unit provides a comprehensive, integrated, high-speed, type 1 data-encryption solution that meets increasing demands for spacecraft downlink mission data throughput. It features dual-channel capability for data encryption in the range of 10 Mbps-to-2 Gbps per channel, up to 4 Gbps and both channels are fully independent. In addition, each channel provides A-side/B-side inputs and outputs to facilitate external cross-strapping to multiple data sources and mission-data transmitters.

The KGT-777 uses a byte-wide (8-bit) data interface for both plain text input and cipher text output data streams. A byte-clock input synchronous with the plain text byte-data input is required. The unit produces cipher text data and synchronous byte-clock output at the same rate as the plain text input.

The KGT-777 provides an independent serial command and status interface for each channel. System configuration and mode changes are command-selectable by the host spacecraft. System health and status are output automatically during power-up and on command. The KGT-777 incorporates non-volatile memory to preserve its current configuration settings allowing the unit to return to the previous operational state on power-up. This unit uses an integrated +28 V prime-power supply, providing all required secondary voltages to the unit with both primary and redundant input ports to provide interconnect flexibility to the spacecraft prime power bus. Total primary-power consumption for the unit is less than 32 W at 4 Gbps data throughput.

UNIT	
Environmental	
Radiation	≥ 1 MRad environment (GEO orbit w/100 mil Al shielding; ≥ 300 kRad total dose parts)
EMI/EMC	MIL-STD-461C
Temperature	Operational: -34 °C to +71 °C (qual) Non-operating (storage): -55 °C to +85 °C
Altitude	Unlimited
Humidity	Operational: 0 to 70% Non-operating (storage): 0 to 100% non-condensing
Parts (PMP)	Microcircuits: MIL-STD-883E level "S" (QML-V) Semiconductors level: MIL-S-19500 quality assurance JANS Passive parts: military-established reliability level "T"
Service Life	> 10 years
Reliability	> 0.9 w/65% confidence at 10 years; based on MIL-HDBK-217
MTTF	> 500,000 hours

RADIATION-HARDENED, TWO-CHANNEL, HIGH-SPEED, NSA TYPE 1 CERTIFIED DATA-ENCRYPTION UNIT

The KGT-777 incorporates a separate removable key assembly for each of the two channels. Each key assembly contains a one-time programmable read-only memory device which can be programmed with up to 128 mission keys. Keys are independently selectable per channel via the command interface, allowing flexibility in encryption of channel 1 and channel 2 data streams. The removable key assembly architecture of the KGT-777 allows for installation or changing of the mission keys following manufacture of the unit.

KGT-777 Certified Data Encryption Unit

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