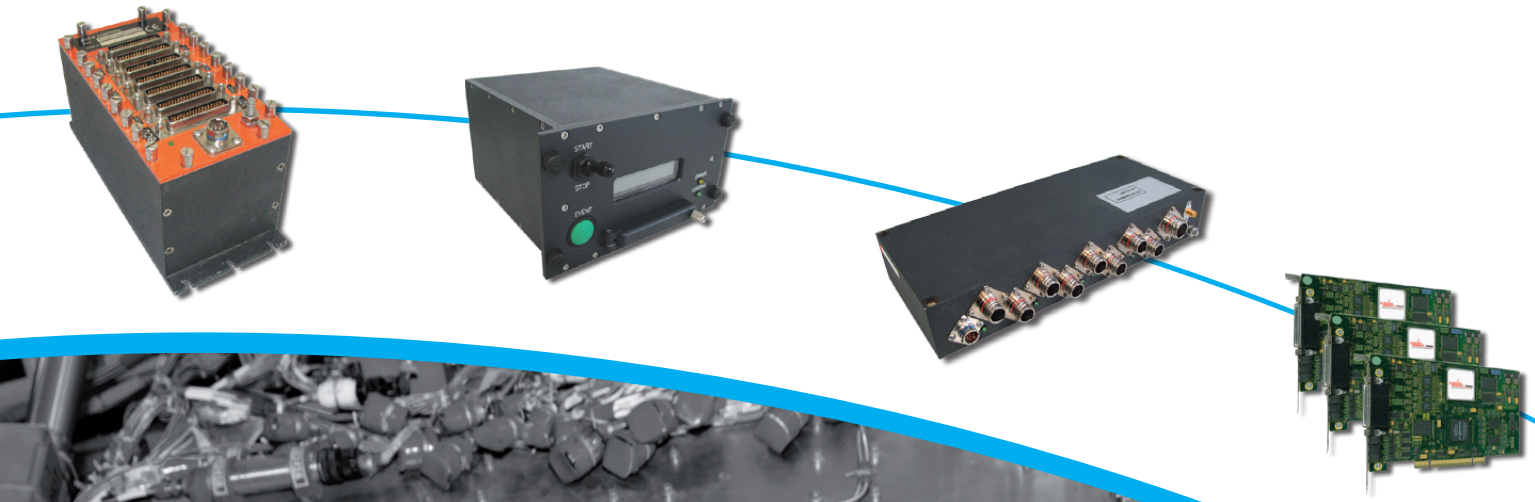
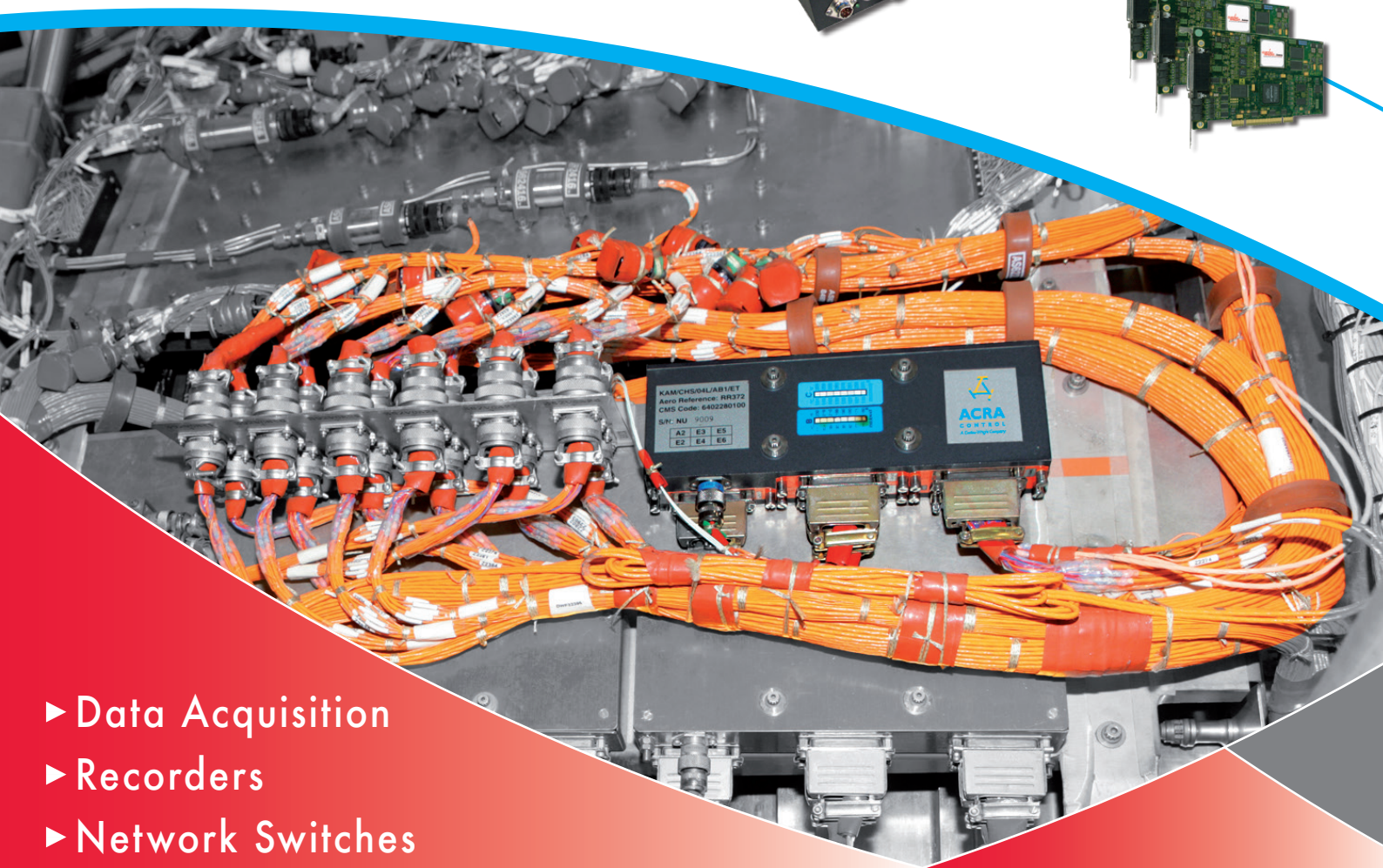
FLIGHT TEST INSTRUMENTATION
PRODUCT GUIDE

CURTISS WRIGHT Controls
Avionics & Electronics





- Data Acquisition
- Recorders
- Network Switches
- Ground Stations

INNOVATION DELIVERED

ABOUT CURTISS-WRIGHT CONTROLS AVIONICS & ELECTRONICS

Curtiss-Wright has a long history with its roots dating back to the Wright brothers' first flight in 1903 and continues that path of innovation and advanced engineering, applying that expertise to mission critical applications in aerospace, naval and land markets. The Avionics & Electronics division (CWC-AE) invests heavily in research and development to ensure it maintains the technology leadership required to deliver high performance COTS and custom engineered products to the aerospace market. The Acra Business Unit, within CWC-AE, has over two decades experience in developing Flight Test Instrumentation (FTI) solutions including data acquisition, Ethernet, recording and real-time ground stations. Our customers include all of the major aerospace prime contractors and test agencies with products supplied to over 300 platforms in 40 countries worldwide.


Airbus Military

"There has not been a lost flight or aircraft grounded on the program due to Acra equipment. It has worked flawlessly since the first flight."

Flight Test Instrumentation Acquisition System Team Leader
Airbus

THE CWC-AE ADVANTAGE

CWC-AE provides the most widely-installed FTI system in the world with more flight hours than any other. We lower risk by supplying COTS hardware that has been proven on every platform type in all environmental conditions and delivers data reliably every time thanks to its 'works once, works always' finite state machine construction. The COTS design results in short lead times ensuring the hardware is delivered quickly.

The design of the Acra KAM-500 means a reduced cost of ownership thanks to its modular construction. The common product line leads to acquisition cost savings by reducing the required inventory of spares. Lower installation and maintenance requirements help reduce operational costs while the simple plug-in module design yields extensive flexibility. This, coupled with continuous module development, yields lower life-cycle costs as the adaptable system is only ever one module away from supporting the next sensor or avionics bus technology.

The Acra KAM-500 was designed to be Flight Test Instrumentation from the very beginning. The physical characteristics, such as compact, low weight and high performance design, were coupled with architectural decisions to ensure low latency and coherent data flows. The finite state machine design of the Acra KAM-500 ensures that the hardware acts in a completely deterministic manner so the output data can always be related to the source. Coherency is maintained as all parameters are sampled simultaneously, and independently of transmission, across the complete system in every card in every chassis making it unnecessary to realign or interpolate samples during analysis.

"We looked at three other vendors but only Acra were prepared to do the system the way we wanted it - as opposed to taking what they had."

Flight Test Instrumentation Engineer
Embraer

FLIGHT TEST INSTRUMENTATION SOLUTION

LOWERS RISK

- Reliable: Proven on every platform type in all environmental conditions
- Robust: Works once, works always – the data is always valid
- Short lead times: COTS hardware with fast delivery

REDUCES COST OF OWNERSHIP

- Acquisition cost: Reduced inventory of spares due to common product line
- Operational cost: Lower installation, setup and maintenance requirements
- Life-cycle cost: Adaptable and upgradable modular design greatly extends system lifetime

FTI BY DESIGN

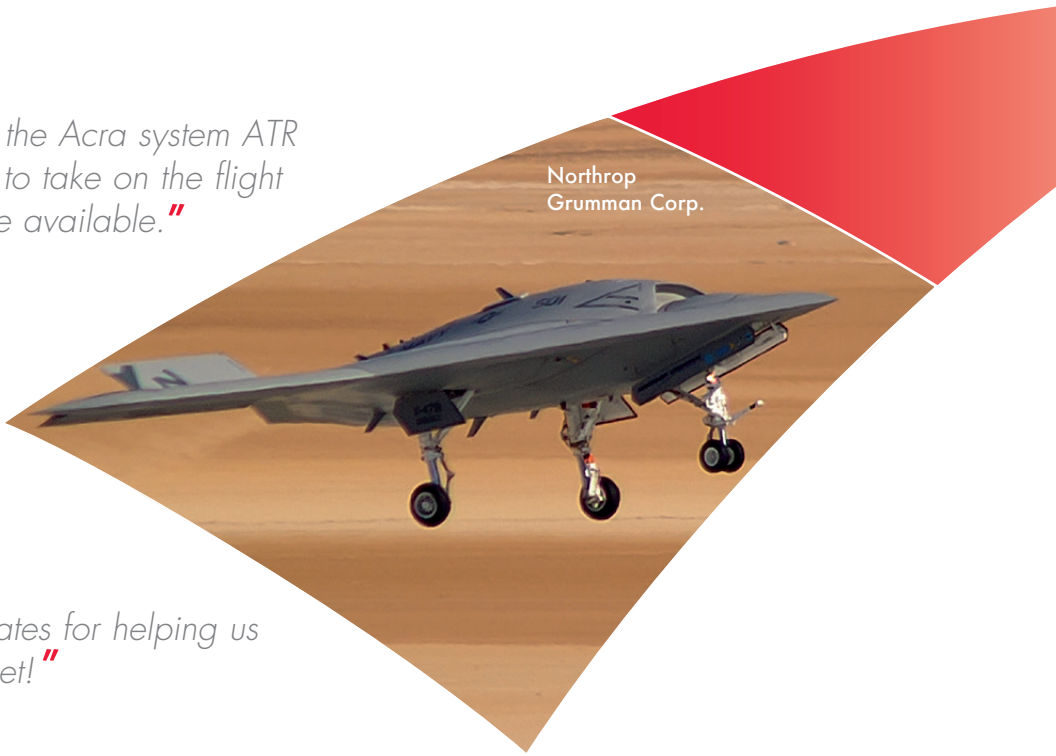
- Low latency: Designed to minimize the data transfer time from sensor to screen
- Deterministic: Guaranteed and predictable data - you get what you expect every time
- Coherency: Simultaneous sampling occurs across the complete system

FEATURE HIGHLIGHTS

- Reliable and rugged - Driven by hardwired finite state machines; operates in harsh environments
- Compact and low power - Ideal when space and power are limited
- High performance - High system throughput and data integrity
- COTS modular design - 100+ plug-in modules fit all chassis
- Powerful software - Intuitive, fast set-up and programming; tight integration with display/analysis

"Without the ease of use of the Acra system ATR would not have been able to take on the flight testing in the tight timeframe available."

Flight Test Engineer
ATR



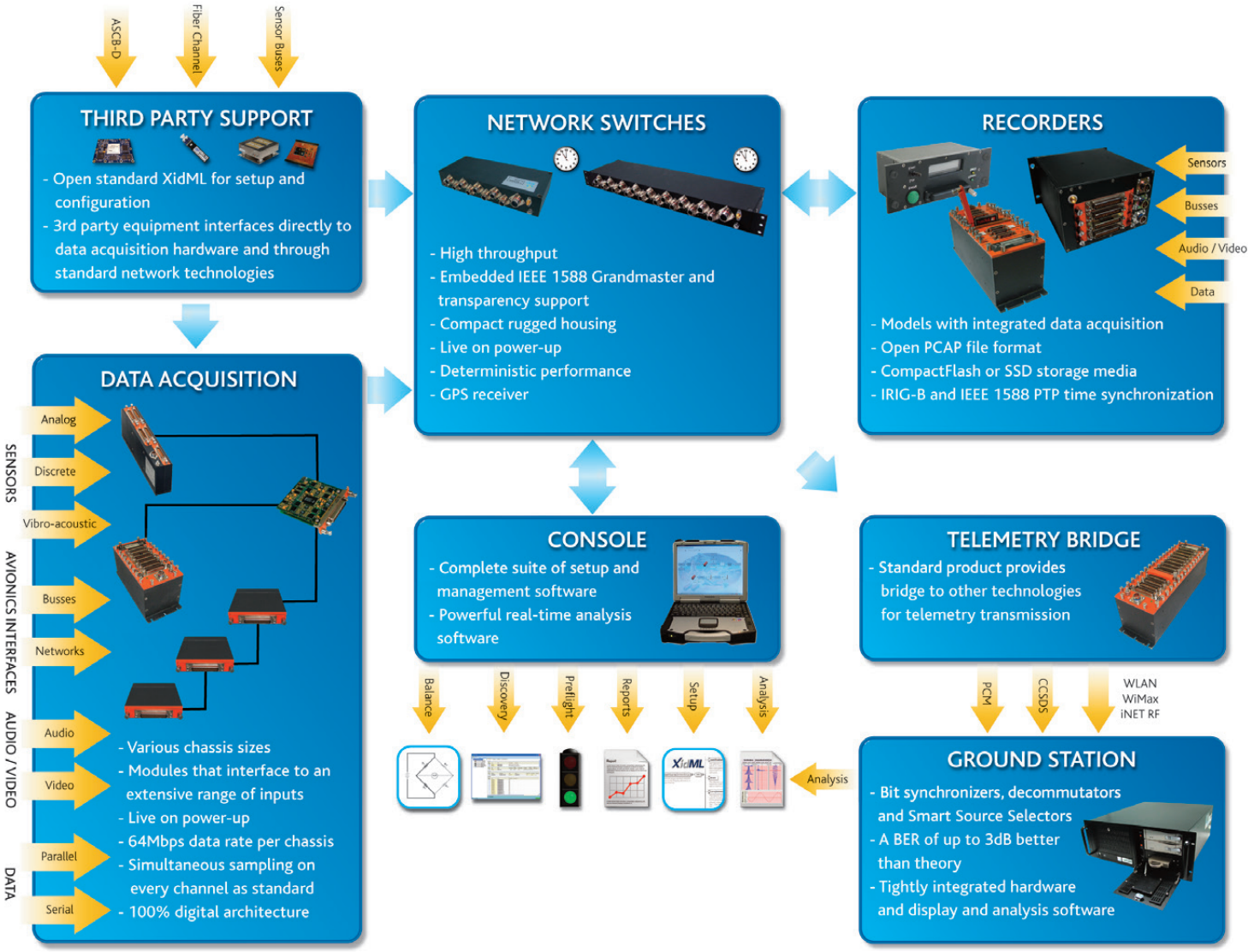
"Thanks to our Acra team-mates for helping us launch AV-1 into the Ethernet!"

Flight Test IPT Lead
Northrop Grumman

COMPLETE SOLUTION

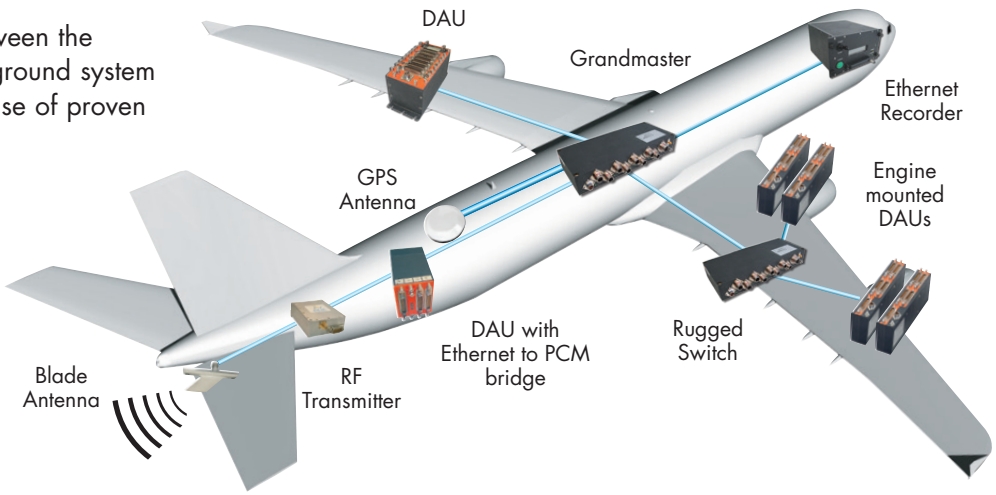
CWC-AE provides a seamless end to end solution from setup, data acquisition and transmission to analysis. The same modular products are used to build both single chassis and large distributed systems in PCM, Ethernet or hybrid topologies.

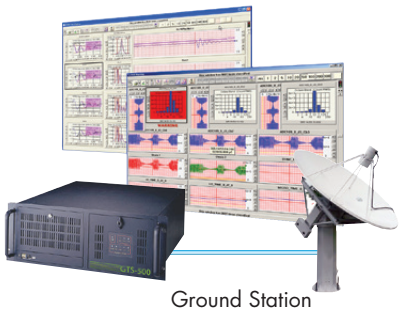
For Ethernet systems, switches provide interconnections across the system offering data transmission, programming and precision time synchronization over a single cable using standard technologies resulting in a system that is easy to setup and maintain.



RELIABLE FROM AIR TO GROUND

Reliable data delivery is ensured between the airborne system, the RF link and the ground system through system engineering and the use of proven and validated products.




Ground Station

NETWORK NATIVE

CWC-AE develops reliable high performance Ethernet interface modules that build real packets instead of simply wrapping PCM into a packet structure.

> *True network native hardware means the power of Ethernet can be exploited, such as allowing software to talk to every chassis in parallel for far faster setup and diagnosis.*

In such a network, setup, data acquisition and synchronization occur over a single Ethernet connection, leading to significant savings in wiring complexity and weight. Ethernet data from an Acra KAM-500 is optimally packetized for Ethernet transmission and recording but can also be converted to many other industry standard protocols. This facilitates hybrid system e.g. PCM DAUs can be integrated into an Ethernet system or Ethernet data can be converted to PCM for telemetering.

OPEN STANDARDS

CWC-AE embraces open standards and protocols for file storage and for system synchronization, management and configuration. The use of SATA, CF and PCAP, IRIG 106 Ch 4/10, ensures immediate open access to data with a huge user-base for support and services. CWC-AE also uses standard networking protocols such as the Simple Network Management Protocol (SNMP), IEEE 1588 PTP, Unicast Datagram Protocol (UDP) and the Trivial File Transfer Protocol (TFTP). XidML, an open XML metadata standard for the aerospace community, provides a vendor-neutral hardware configuration platform that describes how data is acquired, processed and packaged for transmission, storage or reproduction.

CWC-AE's FTI product design is based on the iNET-X framework which has been developed around the core recommendations and technologies outlined in the CTEIP Integrated Network Enhanced Telemetry (iNET) standard. CWC-AE's open standards philosophy facilitates device interoperability, iNET compliance and frees the end user from proprietary hardware and software products.

XidML

iNET

DATA ACQUISITION

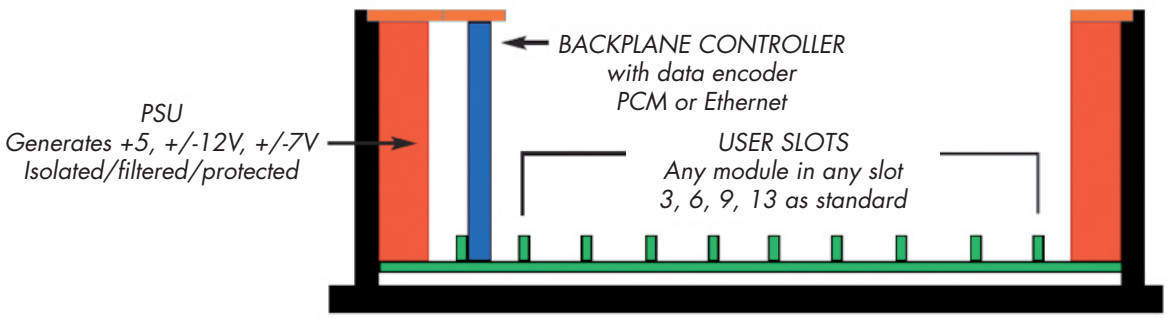
ACRA KAM-500 DAU

The Acra KAM-500 Data Acquisition Unit (DAU) is an airborne acquisition and transmission system that consists of a chassis, a backplane controller and user selected modules. This highly configurable system enables fully customized systems to be built using Commercial Off-The-Shelf (COTS) products. From its inception, the Acra KAM-500 was designed specifically to optimally balance small size with high performance to be the perfect fit for the majority of FTI applications.

> *The Acra KAM-500 is driven by hardwired finite state machines with a 'works once, works always' operation to make it extremely reliable. This low power design results in less heat and, coupled with its compact size and MIL-SPEC ruggedness, makes it ideal for installing in locations that have limited space and are subject to harsh environments.*

The Acra KAM-500 DAU achieves high performance by utilizing a 100% digital architecture to support a throughput of up to 64Mbps per unit, aggregating up to a gigabit per second throughput for a network distributed system. This mature architecture has remained stable for over a decade thanks to the future proof design philosophy. This eliminates the need to refresh a product line every few years, offers unequaled backwards compatibility and means there is a vast selection of modules available.

A key concept behind the Acra KAM-500 is "any module, any chassis, in any combination". Modules or chassis can be added to the system or individually replaced. There are over a hundred modules and variants available and chassis can be built with any mixture of modules to meet the specific needs of a program. The high number of modules and ongoing development means the Acra KAM-500 is only one module away from any application. This modularity means inventory requirements are minimized and the proven, easy migration path to new networking and sensor technologies, such as smart and wireless sensor networks, greatly extends system life time and reduces life-cycle costs.



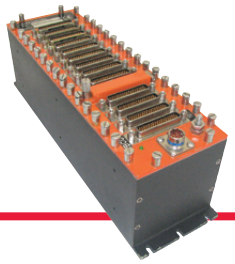
DIGITAL BACKPLANE
Synchronous Clock , at 8MHz, Address and Data Lines, Read/Write Strobes

STANDARD CHASSIS


3U


6U


9U


13U

The Acra KAM-500 standard chassis are the most popular DAU and ideal for most applications.

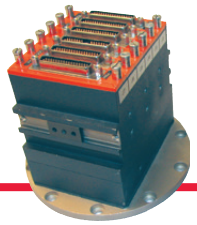
Chassis	User Slots	Height	Length	Width	Mass*
CHS/03U	3	3.88" (98.5mm)	5.51" (140mm)	3.15" (80mm)	2.87lb (1.3Kg)
CHS/06U	6	3.88" (98.5mm)	7.17" (182mm)	3.15" (80mm)	2.75lb (1.7Kg)
CHS/09U	9	3.88" (98.5mm)	8.82" (224mm)	3.15" (80mm)	4.74lb (2.2Kg)
CHS/13U	13	3.88" (98.5mm)	11.02" (280mm)	3.15" (80mm)	5.95lb (2.7Kg)

*Fully populated with typical modules

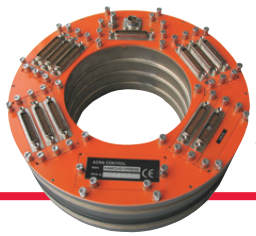
ALTERNATIVE CHASSIS


2F


3F


5F


4L


12R


microKAM

The alternative Acra KAM-500 DAUs use the same stable, well proven and mature backplane technology as the standard chassis and utilize the same standard modules✧. A wide range of module-level core logic, combined with a stable backplane design ensures that no challenge is too great where the program merits the customization of COTS technology and the schedule can accommodate the corresponding lead-times.

Chassis	User Slots	Height	Length	Width	Mass*
CHS/02F	2	3.31" (84.2mm)	5.37" (136.5mm)	2.05" (50.2mm)	1.79lb (0.81Kg)
CHS/03F	3	3.31" (84.2mm)	4.78" (121.5mm)	2.51" (64mm)	1.97lb (0.89Kg)
CHS/05F	5	4.62" (117.5mm)	5.51" (140mm)	3.92" (92mm)	3.43lb (1.56Kg)
CHS/04L	4	3.88" (98.5mm)	9.52" (242mm)	1.6" (40mm)	3.27lb (1.48Kg)
CHS/012R	12	3.88" (98.5mm)	Annular	9.84" (250mm)	8.28lb (3.75Kg)
microKAM✧	2	1.86" (47.3mm)	4.92" (125mm)	1.99" (50.8mm)	0.58lb (0.26kg)

* Fully populated with typical modules

✧ The microKAM is an ultra-compact unit and does not use the standard modules. Please contact sales for further details.

ANALOG MODULES SELECTION GUIDE

Module	Channels	Accuracy (+/-) % FSR	Max rate (sps/ channel)	Bandwidth (Hz)	Analog Gain (vs. +/- 10V FSR)	Digital Gain	Excitation	Voltage	Current	Temperature	Strain	Vibration	Position	Pressure	3 Phase Power	Examples of Signal Sources and Notes
ADC/008	3+3	0.3	20	1k	Variable 1, 10	1	n/a								•	Three phase power supplies.
ADC/010	2	0.25	100k	20k	Fixed 1,10,100	1	n/a	•								Differential voltage sources.
ADC/105	8	1.2 [1]	24k	6k	Variable 1,10,100, 1000	1-16	n/a	•								Differential voltage sources.
ADC/106	6 ICP 2x D/E	1.2 [1]	24k	6k	Variable 1,10	1-16	Fixed 3.6mA/ ch	•				•				ICP type accelerometers. Inputs: 6 accelerometer + 2 differential voltage.
ADC/109/QB	8	1.2 [1]	24k	6k	Variable 1,10,100, 1000	1-16	0 - 14.5mA/ ch				•					Quarter-bridge strain gages (120 or 350 Ohm). Individual excitation buffer per channel.
ADC/109/S1	8	1.2 [1]	24k	6k	Variable 1,10,100, 1000	1-16	±5.1V, 30mA/ ch	•			•	•	•	•		S1: Full or half-bridge strain gages. S2: pressure sensors, DC accelerometers, potentiometers.
ADC/111	48	0.1	4k	1k	Fixed 0.25, 1	1-16	n/a	•								Single ended voltage sources.
ADC/112	24	0.01	12k	3k	Fixed 0.25,1,10 or 100	1-16	n/a	•								Differential voltage sources.
ADC/113	16	0.35	12k	3k	Fixed	1-16	1 - 2mA/ch			•						PT100 temp sensors. Analog gain set to maximize PT100 range.
ADC/114	16	0.01	12k	3k	Fixed 1,10 or 100	1-16	±5.1V, 15mA/ ch	•			•	•	•	•		Full or half -bridge strain gages. Excitation buffer shared between two channels.
ADC/116	12	0.4	12k	3k	Fixed 1 or 10	1-16	Fixed 3.6mA/ ch					•				ICP©, Isotron©, Piezotron© and Deltatron© accelerometers.
ADC/117	8	1.2 [1]	24k	6k	Variable 1,10,100, 1000	1-4	0 - 20mA/ch	•			•					Full-bridge strain gages. Excitation buffer per channel.
ADC/118	12	0.42 [2]	12k	3k	Fixed 1,10 or 100	1-4	±5.1V, 30mA/ ch	•			•					Full or half-bridge strain gages. Individual excitation buffer and balance adjust per channel.
ADC/120	12	0.42 [2]	12k	3k	Fixed 1,10 or 100	1-16	±5.1V, 30mA/ ch	•			•	•	•	•		Full or half -bridge strain gages, pressure sensors, DC accelerometers, potentiometers.
ADC/126	4	0.1	100k	25k	Variable 1, 10	1-16	3.6mA, 24V					•				ICP©, Isotron©, Piezotron© and Deltatron© accelerometers.
ADC/129	4	0.02	100k	25k	Variable 1, 10, 100, 1000	1-16	±5.1V, 30mA/ ch	•			•	•				Full or half -bridge strain gages. Excitation buffer per channel.
ADC/130	4	0.1	12k	3k	Fixed 0.05	1-16	n/a	•								Differential high voltage sources (±200V).
ADC/132	24	0.02	12k	3k	Fixed	1-16	n/a	•								Voltage ladder analog channels (250V common mode).
ADC/135	12	0.03	25k	6.25k	Variable on ±2.5V 1,2 4, 8, 16, 32, 64, 128	1-16	1- ±5.1V, 30mA/ch	•			•		•	•		Full or half bridge strain gages. Differential voltage measurements. High impredance bridge sensors.
CDC/002	24	1 [3]	17.5k	1.1k	Fixed	1	n/a		•							Differential-ended current channels.
CDC/101	4	0.4	24k	300	Variable 1,10	1-16	n/a					•				Piezoelectric accelerometers. 300Hz and 6kHz variants available.
LDC/101	4	1.25	24k	6k	n/a	1	3Vrms 25mA/ ch						•			LVDT and RVDT sensors. Excitation frequency options available: 2.5KHz, 5KHz and 10KHz.
MDC/001	8x64	0.25	300	n/a	Variable 1, 2, 4	1	n/a							•		Interfacing to analogue pressure scanners. Gain is fixed for each of the 8 input channels.
MDC/002	2x64 +2	0.25	195	n/a	Variable 1, 2, 4	1	0.5 or 2.5mA							•		Interfacing to Scanivalve analogue pressure scanners with temperature compensation sensor. Gain is fixed for the 2 mux input channels and 2 PT100/PT500 inputs.
MDC/103	2x64 +2	0.25	312.5	n/a	Variable 1, 2, 4, 8	1	5V (50mA)							•		Interfacing to Esterline analog pressure scanners with temperature compensation sensor.
SDC/001	2	5 min of arc	24k	n/a	n/a	1	n/a						•			Synchro sensors. Measures angle.
TDC/102	15 +1 ref	0.04	1k	250	Fixed	1-16	n/a			•						Thermocouples (K, B, J, E, N,R, S, T, T99).
TDC/107	12	0.55°C	8	4Hz	Fixed	1-256	n/a			•						Thermocouples (k-type). High accuracy with reference compensation. (K, B, J, E, N,R, S, T, T99)

[1] Combined analog and digital gain = 4000. Very small temperature drift of the resistors on the module cause additional constant error of ±90µe. [2] Combined DC & excitation error. [3] 4-20mA range.

ACRA KAM-500 MODULE SELECTION GUIDE

BUS MONITORS

KAD/ABM/101	ARINC 429 bus monitor snarfer/parser - 8ch
KAD/ABM/102	ARINC 429 bus monitor parser/packetizer - 8ch
KAD/ARI/002	ARINC 429 transmitter - 1ch
KAD/ARI/103	ARINC 573 bus monitor parser - 1ch
KAD/ARR/101	AFDX redundancy remover - 1ch
KAD/CBM/101	CCDL bus monitor parser - 4ch
KAD/CBM/102	CAN bus monitor parser - 4ch
KAD/CBM/103	CCDL/MCDL bus monitor parser - 4ch
KAD/CBM/104	CSDB bus monitor parser - 4ch
KAD/CBM/105	CAN bus monitor packetizer - 4ch
KAD/EBM/101	Ethernet bus monitor parser - 1ch
KAD/EBM/102	Gigabit Ethernet bus monitor parser - 1ch
KAD/EBM/103	ARINC 429 on AFDX bus monitor parser -1ch
KAD/FBM/102	Firewire bus monitor parser - 1ch
KAD/FBM/103	Firewire S200b bus monitor parser - 1ch
KAD/HBM/102	G1000 HSDB bus monitor parser - 1ch
KAD/MBI/001	MIL-STD-1553 remote terminal - 1ch
KAD/MBM/101	Dual redundant MIL-STD-1553 bus monitor with PARSER-packetizer – 1ch
KAD/MSB/103	MIL-STD-1553 bus monitor parser - 1ch dual redundant
KAD/PBM/001	Panavia bus monitor parser - 8ch
KAD/PBM/002	MC/ENMC bus monitor snarfer/parser - 1ch
KAD/SDI/103	Serial data bus monitor parser - 1ch
KAD/TBM/101	TTP bus monitor parser/packetizer - 1ch dual redundant
KAD/UAR/102	RS-232/422/485 bus monitor snarfer/parser - 4ch
KAD/UAT/101	RS-232/422 asynchronous transmitter - 8ch
KAD/UBM/101	RS-422/485 serial bus packetizer - 8ch
KAM/SBM/101	EFAbus Express/STANAG 3910 bus monitor parser - 1ch dual redundant

DIGITAL

KAD/DPI/002	Data input (RAM reader) - dual-port
KAD/DSI/102	Discrete input (counters, time tagging) - 24ch
KAD/DSI/104	Bi-level optically isolated input (counters, time tagging) - 24ch
KAD/SDI/001	Serial data input (clock out) - 8ch

BACKPLANE CONTROLLERS

KAD/BCU/101	IRIG-106 backplane controller and encoder
KAD/BCU/140	Ethernet backplane controller - iNET-X compatible

OTHER MODULES

KAD/BIT/101	Built-in self test module
KAD/BIT/102	Built-in self test for networked FTI
KAD/DAC/001	Analog and discrete outputs – 24ch
KAD/ENC/106	IRIG-106 PCM encoder with PMF output
KAD/ENC/111	CCSDS encoder with Ethernet interface and internal 64MB memory buffer
KAD/ETH/101	DA and programming over Ethernet
KAD/ETH/102	iNET-X, 2.5Msample/sec, DA and programming over Ethernet
KAD/MBC/001	MIL-STD-1553 bus controller
KAM/MEM/004	CompactFlash, data extraction via Ethernet
KAM/MEM/103	CompactFlash memory
KAD/RTC/002	Real-time clock (RTC) generator
KAD/RTC/003	RTC generator with memory status outputs
KAD/SWI/101	3 to 1 aggregator Ethernet switch
KAD/SWI/102	2 to 2 aggregator with console port
KAM/TCG/102	Combined GPS and IRIG input
KAD/UTL/102	Format select line sequencing
KAD/VDC/001	CVSD voice to digital converter – 2ch
KAD/VID/106	H.264 video encoder – 1ch

SETUP SOFTWARE

DAS STUDIO 3

DAS Studio 3 is an FTI hardware setup and management software that has been developed using feedback from decades of support experience in the data acquisition community. It has been designed to save time in entering, reviewing and validating setup information and to ensure that instrumentation is correctly configured. DAS Studio 3 provides hardware discovery, setup, programming and validation in a single integrated environment.

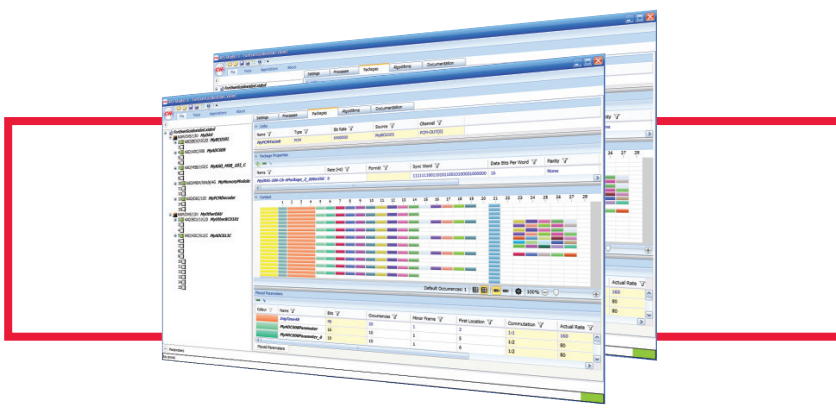
The software is optimized for multi-core platforms with a multi-threaded architecture and parallel processing. This high performance means that system validation and programming is performed in minutes or even seconds. The integrated environment allows status, discovery, programming and other tools to be accessed without having to exit and launch another application. The user interface is simple and easy to learn with data rich tables and a consistent look that cuts through the complexity of configuring a data acquisition system.

DAS Studio 3 has been designed to allow easy integration of new applications. This facilitates the rapid development of a wide range of tools to help engineers save time setting up, testing and managing their systems. Examples include Bridge Balancer 3 which automatically balances bridge outputs and PCM Frame Builder 3 which automatically construct PCM frames while optimizing the placement of parameters.

FEATURES

- System automatically discovers interconnected devices and manages inter-chassis communication
- Seamlessly integrate 3rd party equipment
- View how the system is configured at a glance
- Change thousands of settings simultaneously
- Re-use of proven configurations
- Rapid system programming via XidML task file
- Edit frames using a visual editor with custom parameter color coding and zoom and pan functions
- Dynamically check for errors
- Generate an HTML report from XidML files

"Acra support of XidML has allowed us to improve the efficiency of our flight test programs."



NETWORK SWITCHES

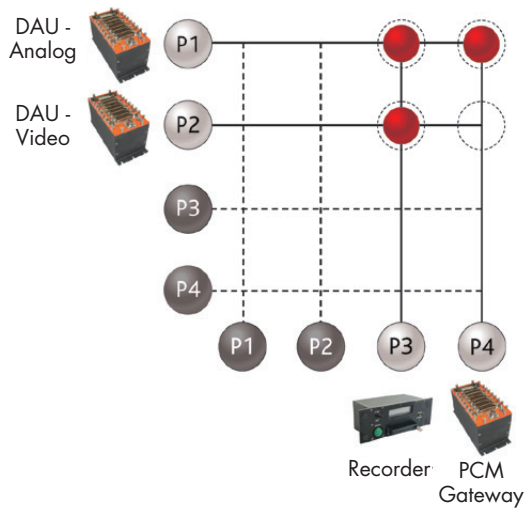
The Acra network switch products are specifically designed for the unique requirements of FTI networks. They are deterministic, reliable and fast due to their hardwired switching design which eliminates packet loss in properly designed networks. There is no adaptive or dynamic switch behavior as the Ethernet data output of the DAU is predictable and known in advance. This deterministic acquisition and transmission facilitates coherency.

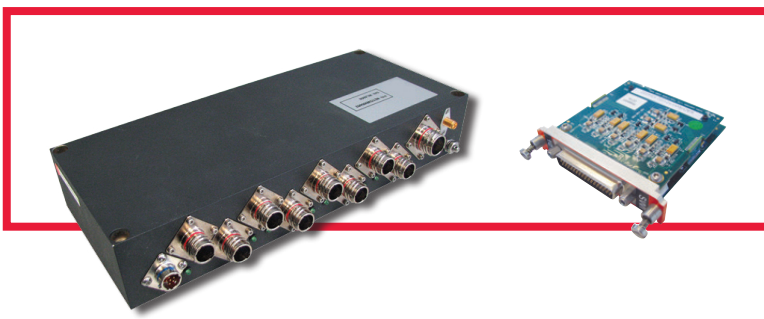
The switches have a rugged compact form to survive the extreme conditions of the aerospace environment and feature live at power-up functionality that eliminates boot-up delays and minimizes data loss from power outages. An Xbar architecture facilitates flexible forwarding and filtering configurations (e.g. to send data to multiple destinations for real-time monitoring, recording and transmission). All managed switches include an embedded IEEE 1588 grandmaster that distributes Precision Time Protocol (PTP) packets to ensure system wide data coherency. Support for the Simple Network Management Protocol (SNMP) allows users to configure the switch and query for health and status information.

FEATURES

- Eliminate packet losses
- Guaranteed throughput
- Compact and rugged housing
- Live at power-up
- Hardwired or configurable routing
- Based on open standards and protocols
- IEEE 1588 PTP transparency
- Rugged MightyMouse connectors
- Store and forward switching architecture
- Integrated GPS and digital IRIG-B (Grandmasters only)
- SNMP support
- LRU or KAM-500 module variants available

Switch	Ports	Gigabit	DAUs	Aggregators	Tap	Filtering	Grandmaster	Form Factor
NET/SWI/001	8	_	7	1	_	_	_	LRU
NET/SWI/003	8	Y	1 – 7	1 – 7	Y	Y	Y	LRU
NET/SWI/005	16	Y	1 – 15	1 – 15	Y	Y	Y	LRU
KAD/SWI/101	4	_	3	1	_	_	_	Module
KAD/SWI/102	4	_	2	2	_	_	_	Module
KAD/SWI/108	4	_	1 – 4	1 – 4	1 – 2	_	_	Module





RECORDERS

Acra FTI recorders are rugged, compact and utilize removable COTS solid state media. The range features dedicated data recorders and recorders with integrated data acquisition capabilities. Designed for reliability, they are live on power-up and ensure minimal data loss during power outages. A PC identifies the media as a FAT32 drive so that the data is instantly accessible with no need for proprietary hardware or software. Data files are recorded in the popular open PCAP (packet capture) format and are readable by GS Works 7 display and analysis package, as well as many other third party software products.

DATA RECORDERS

The Acra NET-500 recorder range consists of stand-alone Ethernet recorders that store data to COTS removable CompactFlash or Solid State Drive (SSD) media. They support 100/1000BaseT recording, utilize IRIG/GPS/IEEE 1588 PTP time synchronization and are live on power-up. Combined with Acra KAM-500 DAUs, these form a powerful distributed recording system.

FEATURES

- Integrated Ethernet recording
- Streamlined data buffering techniques protect data from power outages
- Discrete I/O and Ethernet remote control
- Display panel indicates the memory and recording status

Chassis	DZUS Rails	Storage	Dimensions (HxLxW)	Ethernet Speed
NET/REC/001	2	CF	2.24 x 2.75 x 4.9" 57 x 70 x 127mm	100BaseT
NET/REC/002	3	SSD	2.8 x 6.4 4.9" 71 x 163 x 127mm	100BaseT
NET/REC/003	3	SSD	2.8 x 6.4 x 4.9" 71 x 163 x 127mm	1000BaseT

DATA ACQUISITION RECORDERS

The Acra SSR-500 family is a rugged range of multi-role recorders with integrated data acquisition to cater for diverse application requirements. Based on open standards, these network native recorders allow immediate access to your data. They leverage the investment in the Acra KAM-500 modules by utilizing the same technology to provide a wide range of interface support. Aperiodic data is recorded only when there is activity on an asynchronous bus, resulting in efficient file storage.

FEATURES

- Proven, extensive range of data acquisition modules
- Integrated Ethernet recording
- Built-in audio encoding and GPS receiver
- Ethernet output for real-time data monitoring

SSR-500 CHASSIS

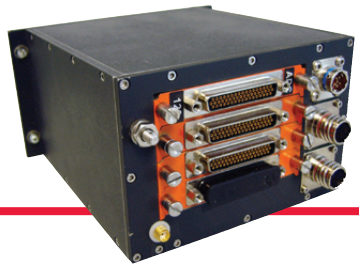
Chassis	User Slots	DZUS Rails	Storage	Dimensions (HxLxW)	Ethernet Speed
SSR/CHS/001	4	4	CF	3.34 x 5.67 x 4.9" 85 x 144 x 127mm	100BaseT
SSR/CHS/002	4	5	SSD	4.45 x 6.39 x 4.9" 113 x 162.4 x 127mm	100BaseT
SSR/CHS/003	4	5	SSD	4.45 x 6.39 x 4.9" 113 x 162.4 x 127mm	1000BaseT

SSR-500 PCM RECORDER

Chassis	Mounting	Storage	Dimensions (HxLxW)	Ethernet Speed
SSR/REC/001	Lugs	CF	1.5 x 2.75 x 4.57" 38.1 x 69.85 x 116.3mm	100BaseT

CRASH PROTECTED RECORDER FAMILY

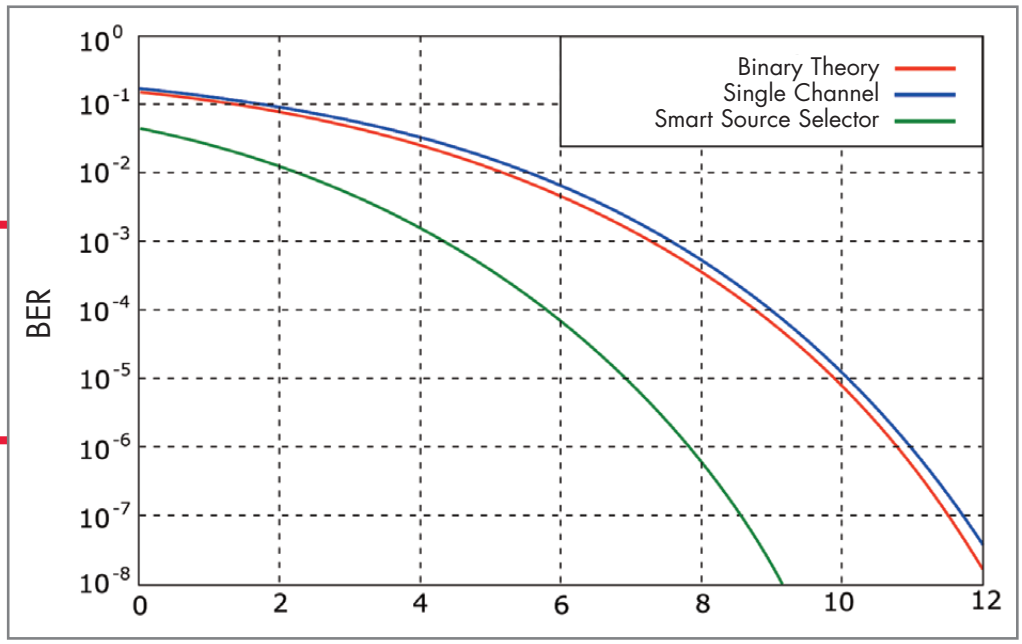
CWC-AE manufactures compact and light crash protected recorders that have the capability to acquire and store data from a number of sources. These multi-purpose flight data recorders are ideal for applications requiring a combined fully qualified and approved flight data recorder, cockpit voice recorder and data acquisition system.



GROUND STATION PRODUCTS

CWC-AE provides sophisticated ground station boards and systems based on cutting edge bit synchronizer, Smart Source Selector (SSS) and decommutator technology. The resulting systems significantly improve signal reception, reduce the number of dropped frames and increase data throughput. These systems are specifically tailored to meet the demanding needs of real-time applications, leveraging decades of experience designing flight test solutions.

Leading edge bit synchronizers coupled with SSS technology yield best in class bit error rates. The 100% digital design reduces the effects of temperature and noise that are normally inherent to analog systems and produces the same performance at all rates and for all codes. Combined with SSS technology, a dual-channel ground station system using diverse receivers can achieve a possible BER of 3dB better than theory for a single receiver. Three or more channel SSS are ideal for adding coverage to blind spots found, for example, around buildings or on runways. These can also be used to further enhance the reception when combined with other channels. Eight diverse channels working together can achieve a possible BER of 9dB better than theory.



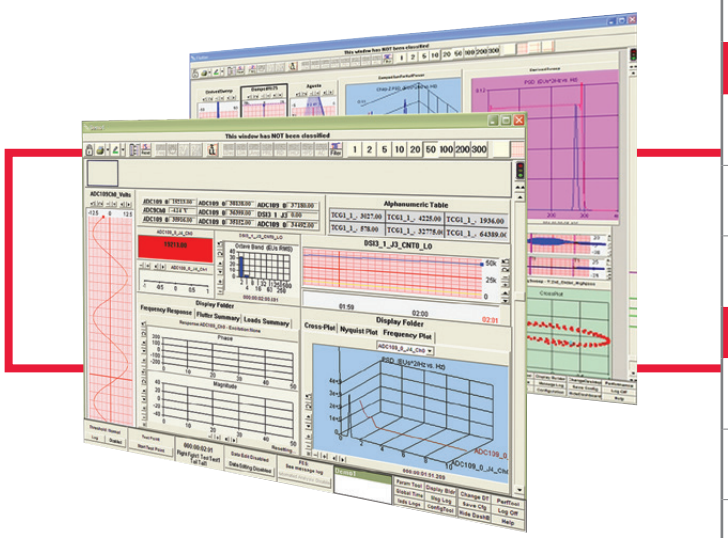
This innovative SSS technology also supports the use of encrypted data. Reconstructed data is decommutated into minor frames which are time tagged using an IRIG-B source. The telemetry ground stations offer an end to end solution from receiver to processed data with tightly integrated hardware and software that has a host of features that allow displays, data and analysis techniques to be built, tested and saved with little effort at any time before or during the mission.

GROUND STATION SOFTWARE

Analysis software products have been specifically designed for flight test applications to provide a powerful integrated solution that saves time and money. GS Studio 3 is used to configure and manage Acra GTS-500 ground stations. Its intuitive user interface ensures any required configuration changes are quick and easy to implement.

GS WORKS 7

GS Works 7 is the real-time and post-test display and analysis software suite (powered by Symvionics IADS® technology) that has been designed from the ground up to meet the needs of the flight test community. Customers are assured of quality data as it is tightly integrated with GTS-500 ground station systems. It utilizes multi core capabilities with a multi-threaded architecture for maximum efficiency and is scalable from a laptop to a large workgroup through its Client/Server software architecture. Every data point is cached to disk allowing immediate scroll back through the time history – no data is ever lost, it continues to be stored in real-time and can be instantly transferred to another analysis workstation. An interactive interface lets users create customized displays in seconds that can contain multiple windows arranged into different desktop groups and sent to multiple monitors via multi-port graphics processors or Ethernet.



System	
GTS/SYS/005	GTS-500 telemetry ground station system with receivers, dual channel Smart Source Selector, PCM decommutator, GPS/IRIG time reference, GS Studio 3 and GS Works 7
GTS-500 PCI Boards	
GTS/BSC/003	20Mbps bit synchronizer PCI card
GTS/BSC/004	Dual channel 20Mbps Smart Source Selector PCI card
GTS/BSC/005	Dual channel 20Mbps bit synchronizer PCI card
GTS/BSC/006	Tri channel 20Mbps bit synchronizer PCI card
GTS/DEC/003	20Mbps bit synchronizer and PCM decommutator PCI card
GTS/DEC/004	Dual channel 20Mbps Smart Source Selector and PCM Decommutator PCI card
GTS/DEC/005	Dual channel 20Mbps bit synchronizer and PCM decommutator PCI card
GTS/DEC/006	Tri channel 20Mbps bit synchronizer and PCM decommutator PCI card
GTS/FSC/003	20Mbps PCM decommutator PCI card
GTS/FSC/005	Dual channel 20Mbps PCM decommutator PCI card
Other Boards	
GTS/RCV/001/PBE	14 Mbps E-band receiver PCI card with 12 IF filters
GTS/RCV/001/PBL	14 Mbps L-band receiver PCI card with 12 IF filters
GTS/GPS/002	PCI card with GPS and IRIG-A/B inputs and IRIG-B output
Software & Accessories	
SWP/GTS/003	GS Studio 3 setup and management software for ground stations
SWP/GSW/007	GS Works 7 visualization and analysis software package
GTS/BAY/001	Desktop PC 5.25 inch DRE/SSD/001 harness
SAM/DEC/007	Type II IRIG-106 compatible PCM decommutator
GTS/IFC/003	PCMCIA to PCI board for use with the SAM/DEC/007 PCM decommutator

Curtiss-Wright Controls Avionics & Electronics
www.cwc-ae.com

665 North Baldwin Park Boulevard
City of Industry
CA 91746
USA
Phone: 626-851-3100

Landscape House
Landscape Road
Dublin 14
Ireland
Phone: +353-1295-1264

P09-0513