



MTS FlexDAC™ 20 Data Acquisition System

Reliable, accurate and flexible test data acquisition

- » Optimize test data accuracy
- » Maximize uptime
- » Support multiple test stations with a single DAC system
- » Achieve low cost of ownership
- » Simplify training and improve productivity
- » Get a single point of contact for your data acquisition, control and software support

The MTS FlexDAC™ 20 Data Acquisition System provides a high-performance solution for acquiring data through strain- and bridge-based devices during mechanical testing. Fast processing speeds and a high-channel-count capacity make the MTS FlexDAC 20 system ideal for evaluating the behavior of full-scale structures under load.

This standalone system is built on the same proven and reliable hardware platform as the MTS FlexTest® controller family, and is optimized specifically for use with industry-leading AeroPro™

Control and Data Acquisition software. It is also modular in design, with the capability to support up to eight data acquisition groups with a single unit. The end result is a completely integrated solution that delivers unsurpassed data acquisition speed, accuracy and flexibility.

With the addition of the MTS FlexDAC 20 system to the MTS solutions portfolio, you can meet all of your hardware, software and global support needs with a single supplier. This single point of contact will simplify system setup and support and help improve the overall efficiency of your test lab.

Precise, hardware-based clock synchronization

Most data acquisition systems employ software-based compensation to synchronize data between measurement and load at a specific moment in time. This can introduce measurable time variability between when data points are acquired and when a load is applied, resulting in potential inaccuracy. Because we engineer our control systems, DAC system and test software specifically for use with one another, the MTS solution employs hardware-based clock synchronization that produces extremely high data accuracy, helping you feel confident about your test results.

The MTS FlexDAC 20 system is also designed so that if one channel becomes unavailable, all of the other channels remain available for use. This feature helps to reduce unscheduled downtime and keep you at peak productivity. Other advanced functionality includes high data resolution, built-in bridge completion, advanced calculations within the hardware, and Transducer Electronic Data Sheets (TEDS) support.

Superior flexibility and ease-of-use

Traditional stand-alone data acquisition systems are limited to a single station, requiring test labs to purchase one box for every test rig in use. In contrast, the MTS FlexDAC 20 system can distribute channels in any proportion across up to eight data acquisition groups simultaneously. This allows you to support more lower-channel-count tests stations with fewer DAC systems, reducing both your initial and long-term hardware expenses. The MTS FlexDAC 20 system also features compatibility with most legacy and all future MTS control systems, as well as with data acquisition systems from HBM and VXI. A common RJ45 connector on each channel speeds and simplifies sensor connections and eliminates the need for patch panels.

Tightly integrated data acquisition and control

AeroPro software makes it possible to combine real-time data acquired with the MTS FlexDAC 20 system into your MTS FlexTest control system interface. This integration eliminates the need to switch

between interfaces and manually synthesize the data after testing is complete, improving productivity and simplifying training for new test engineers. It also offers more insight into tests in progress, making it easier to meet certification standards and verify designs.

A single point of contact for global service and support

Historically, test labs have been forced to work with multiple suppliers to create an integrated control and data acquisition solution. This situation has made it difficult to get issues resolved, especially compatibility issues between components. MTS resolves this less-than-ideal situation with the ability to supply, coordinate and integrate the entire solution from a single manufacturer. At last, you have a single and highly reputable point of contact for all of your test hardware and software support needs, giving you access to the industry-leading MTS network of global field support, service, and system integration expertise.

Seamlessly integrated MTS FlexDAC data acquisition systems, FlexTest controllers and AeroPro software: the only truly synchronized structural test solution in the industry.



MTS FlexDAC 20 family

The MTS FlexDAC™ 20 Data Acquisition System comprises a family of 64-, 48-, 32- and 24- channel units to make synchronized data acquisition and control a cost-effective reality for both large, full-scale structural tests and smaller component and materials tests. All units are compatible with AeroPro™ software and the MTS Data Display, which enables test engineers to display plots, charts, readings, view limits and more for all data acquisition channels – plus control channels – in a single convenient window.



B24 Units: 48- & 24-channel



A32 Units: 64- & 32-channel



AeroPro Software



MTS Data Display

Automated calibration

To affirm the measurement integrity of MTS FlexDAC 20 units, MTS has created an automated calibration method that can be performed by either an MTS Field Service Engineer (FSE), or by test lab personnel with the purchase of a Calibration Kit and annual software subscription. Developed to verify and document that a unit under test is performing to MTS engineering specifications, this automated method enables over 1,200 separate electrical measurements and calculations to be conducted in about ten minutes, greatly minimizing the disruption of test activities and removing the risk of manual errors.



More Testing Applications

The MTS FlexDAC 20 system is ideal for a wide variety of testing applications, and is especially well-suited for addressing the challenges of large channel-count structural applications. In addition to aerospace, this solution can be deployed for civil structural, wind turbine, rail, ground vehicles and materials testing.



MTS FlexDAC 20 Data Acquisition System

General Functionality	64-channel Unit	48-channel Unit	32-channel Unit	24-channel Unit
Total inputs per chassis	64	48	32	24
Maximum number of channels per system	20480	15360	10240	7680
Input connector	RJ-45			
Synchronization with control system	Hardware synchronized A/D conversion between all channels in all chassis and FlexTest 40/60/100/200 controllers or timestamp			
A/D converters	24-bits per channel			
Independent stations	Up to 4, any channel in any chassis			
Independent acquisition rate groups	2 per station (up to 8 total)			
Supported sensors	1/4 bridge, 1/2 bridge and full bridge strain gages, load cells, analog temposonics, string potentiometers and voltage input +/- 11mV, +/-110mV, +/-1.1V, +/- 11V			
Integration with other vendors	Yes			
Network connection	10/100 Base-T Ethernet			
Size	48.26 cm W x 13.21 cm H x 55.5 cm L (19" x 5.2" x 21.85")			
Weight	7.76 kg (17.1 lb)			
Power and Environmental Specifications	64-channel Unit	48-channel Unit	32-channel Unit	24-channel Unit
A/D converters	100 - 240 V AC, 50/60 Hz @ 250 VA max			
Ambient temperature	0° - 55° C (32 - 131° F)			
Relative humidity	0 - 85%, non-condensing			
Altitude	Up to 3,048 m (10,000 ft)			
Certifications	CE, EN 61326, EN 61010			
Electrical Specifications	64-channel Unit	48-channel Unit	32-channel Unit	24-channel Unit
Excitation	0.5 V, 1 V, 2 V, 5 V, 7.5 V, 10 V			
Maximum current	50 mA, over current protected	70 mA, over current protected	50 mA, over current protected	70 mA, over current protected
Gains	x1, x10, x100, x1000, set on a per-channel basis			
Temperature shift	± 0.1% over temperature range			
Sampling rate	1 Hz to 6 kHz, user selectable on a per channel basis in up to 8 acquisition groups			
Shunt resistors	One per channel, externally installed on front of chassis, value specified at time of order			
Resistor connection	Software activated per channel, shunts across local bridge completion resistor for 1/4 bridge or remote for 1/2, full bridge			
Back half resistor network	1k/1k (0.05% ratio matching, 2 ppm/°C)			
Synchronization cable maximum lengths	300 m between MTS FlexDAC chassis and FlexTest controller, 100 m between MTS FlexDAC chassis			
Synchronization chain restrictions	160 FlexDAC chassis (10,240 channels) per chain, 2 chains per FlexTest controller	160 FlexDAC chassis (7,680 channels) per chain, 2 chains per FlexTest controller	160 FlexDAC chassis (5,120 channels) per chain, 2 chains per FlexTest controller	160 FlexDAC chassis (3,840 channels) per chain, 2 chains per FlexTest controller
Synchronization chain media	Cat5e Ethernet cable			
Synchronization limitations	Hot plugging allowed, auto master/slave detect, no cabling restrictions for acquisition groups			
Performance	64-channel Unit	48-channel Unit	32-channel Unit	24-channel Unit
FIFO data buffering	75 MB			
Tare	Available for all channels			
Event/action	Through AeroPro software			
Limit detection	Through AeroPro software			
Conditioning	64-channel Unit	48-channel Unit	32-channel Unit	24-channel Unit
1/4 bridge completion	Standard 3-wire			
1/4 bridge completion resistance	120 Ω, 350 Ω, optional user-specified (0.05%), set on a per-channel basis			
1/2 bridge completion	4-wire configuration	6-wire configuration	4-wire configuration	6-wire configuration
Full bridge completion	5-wire configuration	7-wire configuration	5-wire configuration	7-wire configuration
Bridge type and completion restrictions	No restrictions, each channel individually configurable			
Excitation restrictions	No restrictions, the excitation voltage is uniquely programmed for each channel			
Filters	Bessel, Butterworth, Elliptical, Adjustable pass band (1 kHz max), no filter			
Filtering	Analog anti-aliasing filter with digital low-pass filter set on a per-channel basis			
Filter frequencies	Customer definable through AeroPro software to 1 kHz			
Filtering restrictions	No restrictions			
Lead wire resistance	Lead wire compensation is available for 3 wire ¼	Lead wire compensation is available for 3 wire ¼ bridge sensors. Remote excitation sensing for ½ and full bridge sensors.	Lead wire compensation is available for 3 wire ¼ bridge sensors.	Lead wire compensation is available for 3 wire ¼ bridge sensors. Remote excitation sensing for ½ and full bridge sensors.
High strain nonlinearity	Yes			
Features	64-channel Unit	48-channel Unit	32-channel Unit	24-channel Unit
Modularity	All units can stand alone or be combined with other units, from the same or different manufacturers			
LEDs	Green LED for software controlled connection identification, yellow LED for excitation over current indication			
Transducer Electronic Data Sheets (TEDS)	Supports IEEE 1451 class 2 interface			
Digital I/O	"SMART DIO" enables any analog channel to be configured as a digital IO channel			



MTS Systems Corporation
 14000 Technology Drive
 Eden Prairie, MN 55344-2290 USA
 www.mts.com

Telephone: 1.952.937.4000
 Toll Free: 1.800.328.2255
 E-mail: info@mts.com
 ISO 9001 Certified QMS

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