Established 1981

# Advanced Test Equipment Rentals

www.atecorp.com 800-404-ATEC (2832)

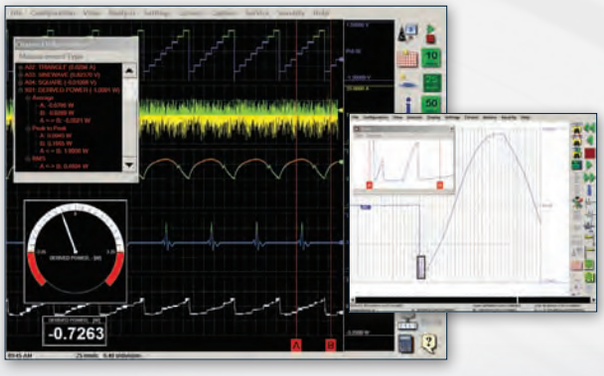
# TMX®

*High-Speed Testing. High-Speed Solutions.*

## *Introducing the TMX High-Speed Data Acquisition System*

### *Redefining High Speed*

- *17" LCD High-Resolution Touch Screen Display*
- *Up to 96 Channels*
- *Dedicated 1 TByte Removeable Hard Drive for Data Capture*
- *800 kHz Sample Rate/Channel*
- *100 kHz Bandwidth*



**That's High Speed Data Acquisition.**

Astro-Med,® Inc
TEST & MEASUREMENT PRODUCT GROUP

www.astro-med.com

## ASTRO-MED RECORDERS ARE THE EASIEST TO USE DATA ACQUISITION SYSTEMS ON THE MARKET

With the TMX, there's no need to fumble with those awkward buttons or knobs and complicated configurations! The TMX features a high resolution, 17" touch screen display, as well as pre-defined set up options, making test setup a breeze! With the TMX, you will be up and running in no time!

**See for Yourself! Check out our online video demo at: www.astro-med.com**

Whatever your test requirements are, the TMX offers a configuration to meet your needs. The TMX accepts a wide variety of inputs in one system.

Do multiple users in your group require different setups? No problem. With the TMX, you can easily create and switch among multiple setup configurations.

## SERVICE & SUPPORT

Astro-Med's world-class customer service and technical support teams are second to none. Available 24/7, no matter where you are in the world, you can be confident the Astro-Med team is behind you anytime, anywhere.

24/7

## Quick & Easy Setup With the Modular, Field-Configurable TMX

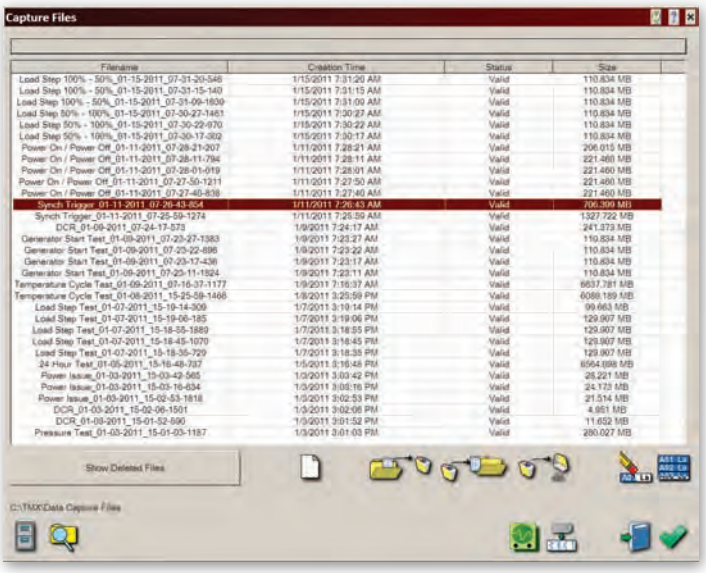
With the TMX's modular inputs, there's no need to purchase extra signal conditioners or struggle with unwieldy set-ups. The TMX accepts a variety of inputs and lets you mix and match different sensors within one test, so you can connect pressure sensors, strain gauges, thermocouples, high voltage and other signals to one system. Best of all, the TMX automatically converts data to Engineering units, giving you your data in units of pressure, strain, temperature, voltage, and more.

Should your requirements change later, the TMX allows for growth, allowing you to add more channels by simply installing input modules.

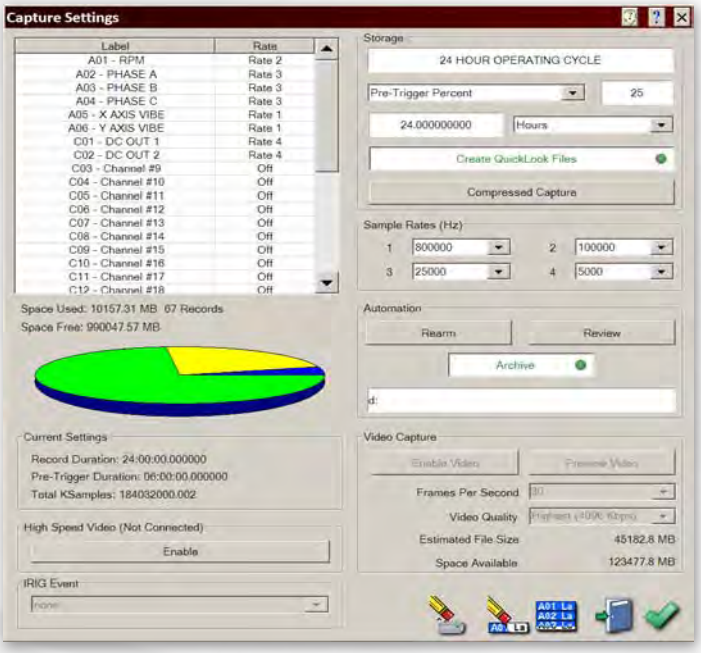
## PRECISELY SYNCHRONIZED DATA CAPTURE

## Don't Miss a Glitch!

Whether your test runs for 100 milliseconds or 100 hours, the TMX won't miss a glitch. With its dedicated, 1 TByte hard drive for data capture, the TMX is ideal for long-term trending and high-speed event detection. Powerful Embedded Scope Capture and intelligent triggering provide low speed trending while simultaneously monitoring and storing highly sampled, time-synchronized events.




*The TMX enables you to stack thousands of data captures on the hard drive.*




Astro-Med's powerful BackChannel technology ensures precise synchronization of analog, audio, video and data bus inputs. We do not rely on Windows® to synchronize your data.

## *Embedded Scope Captures*

Using the powerful embedded scope capture and intelligent triggering, the TMX provides low speed trending while simultaneously monitoring and storing highly sampled time synchronized transients or events.
The TMX will time stamp and embed that important data into the trend recording, assuring that you capture details of critical data.

## *Multiple Sample Rates*

Up to four sample rates can be used per TMX data capture. This allows you to manage file size by assigning higher sample rates to critical signals and lower sample rates to trending signals.

## *Triggering*

The TMX contains advanced triggering capabilities that allow you to start and/or stop a recording based on changes in your input signals. The circular data buffer of the TMX allows you to set and record large amounts of pre-trigger data. Window, level and slew triggering allow you to set up trigger conditions precisely for your application, while logical AND and OR triggering ensure that you trigger only on events that are important to you.

## *Dedicated Hard Drive*

Unlike Windows-based systems, the TMX features a 1 TByte hard drive dedicated solely for capturing data. Removable drives allow your data to be easily transferred and stored securely, leaving no proprietary data on the machine.

## FLEXIBLE INPUTS & DATA PROCESSING

The modular, field-configurable TMX accepts all of your inputs, including analog, video, audio, IRIG, GPS, CAN bus, MIL-1553 and more, all in one system!

The TMX uses modular analog inputs allowing you to easily configure the system for any testing application. The TMX has many optional analog input modules including Voltage, High-Voltage, Thermocouple, Bridge, and others.

### IRIG/GPS

The TMX-IR IRIG/GPS time option provides precise time-synchronization of data, video, and all TMX inputs with other devices.

### Video

Why waste time and money on a video recording system for a video record of your important test? The TMX can record 30 frames per second video perfectly synchronized with your analog data. Each frame is linked to a sample point giving you amazing detail of any test.

### Audio Notes

Save audio annotation into your data capture giving you a verbal account of your test. Why write notes down when you can speak them and save them with the data capture?

### Bus Inputs

The TMX CAN bus and MIL-1553 input options allow your critical bus data to be displayed and recorded with great precision along with your analog signals.

### Hardware Counters

The TMX analog input modules all contain hardware counters that provide Frequency to Voltage (time and cycle based), Pulse Counter, Duty Cycle, Pulse Width, Quadrature and Period Detector measurements.

### Filtering

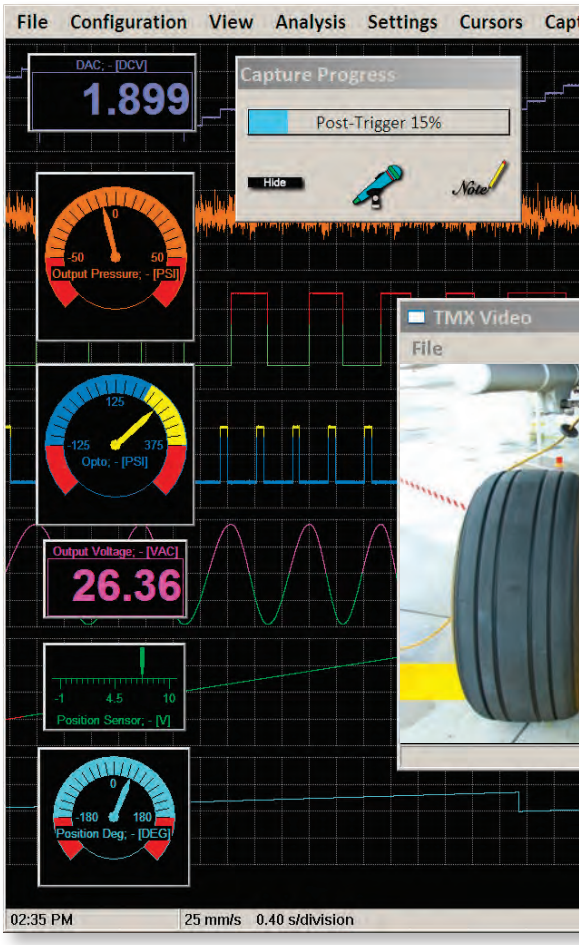
The TMX provides the most flexible data filtering options available. The raw unfiltered data is stored to the hard drive, allowing you the choice of pre- or post- data acquisition, low pass, high pass, band pass, and band stop filtering using Bessel, Butterworth or Chebyshev topologies.

Advanced DSP filtering allows you to see the real-time analog data as an RMS measurement, which is ideal for power monitoring applications. The integration and differentiation filter functions provide useful tools for acceleration and deceleration measurement applications.

## DISPLAY

### Real-time Viewing & Setup

The TMX has a large 17" color display for viewing the data in real-time and post capture. Operation of the TMX is quick and easy with the intuitive touch-screen display. Interface icons and menus provide for straightforward setup and operation. There are no switches, push-buttons or other



controls — complete operation is from the touch-screen. It can easily be customized to fit your exact needs. This means less setup time and more time for gathering data.

## Meters/Gauges/Bar Graphs

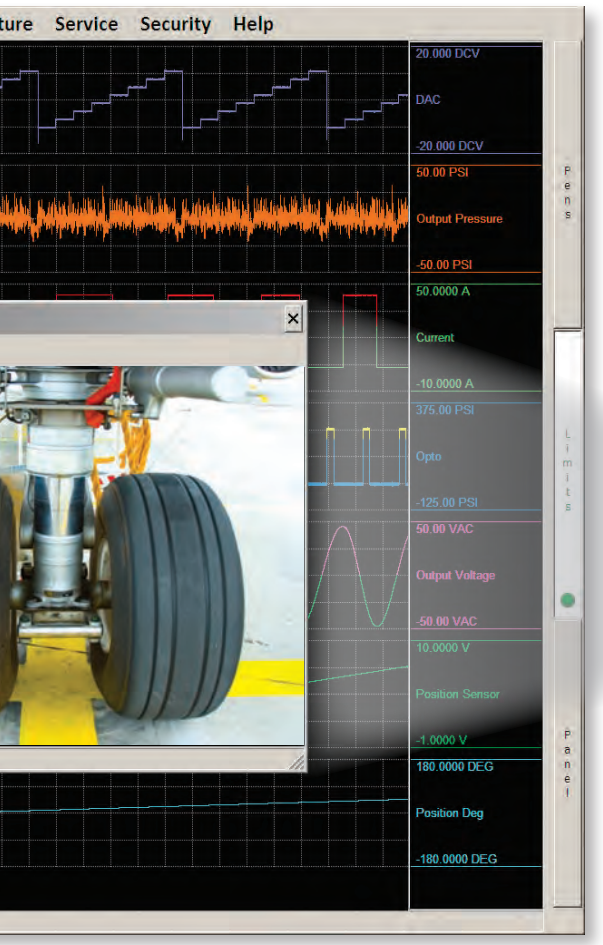
The advanced channel meters provide a variety of ways to visually indicate channel activity. View your data numerically or in other visual representations such as a gauge or horizontal/vertical bar, needle and LED readouts.

## Cursor Measurements

Placing cursors on the touch screen allows quick measurements of Time, Sample Point, Average, Min/Max & Peak-Peak Slope, RMS, Sum, Sum of Squares, Variance, Standard Deviation & Area.

## Scope Mode

Scope mode acts like a digital storage oscilloscope, providing high time-base resolution for viewing high-frequency signals. Scope mode is useful for timing and synchronization analysis, transient capture, and high-speed testing. It can be used while continuously capturing data and monitoring signals on the display.




## Compressed Capture

Compressed Capture is for long-term recording of data using a min/max method which keeps the file size small. It fully records the input signal amplitude at the full bandwidth of the system (glitch capture). Compressed Capture has real-time digitizing sample rates up to 800 kHz (input module dependent) and selectable capture rates for a wide variety of applications. It can be combined with Scope captures for capturing transient signals. Glitches are clearly seen when reviewing the data.

## Alarms

Alarms provide a visual indicator when signals extend below or above specified boundaries. These boundaries are defined by setting up low and high alarm levels. The utility / DIO port provides an alarm output pin that can be used to trigger an external process when alarm conditions for selected signals occur.

## Automation & Stimulation

StimulationTest stimulation and automation is possible with the analog outputs, digital outputs, relays and counters found on the DIOC-16 when coupled with a background program running on the TMX. Quick creation of temporary or unique test cells and even report files is possible with programs as simple as script files and as large as third party graphical programming packages.

## REVIEW & POST PROCESSING WITHOUT THE DOWN TIME...

### QuickLook

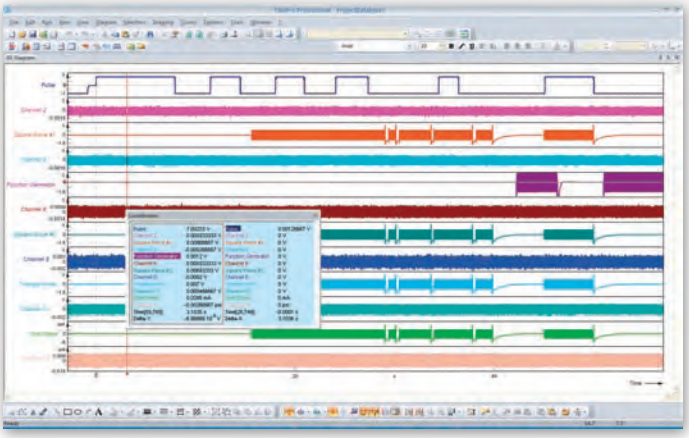
The innovative QuickLook feature calculates compression and expansion factors while recording data allowing you to review GB of data in seconds and scan through large data files quickly and easily.

### LookBack

The TMX's unique LookBack feature allows you to review data during a capture and also allows the user to transfer previously recorded data without interruption to the active trend capture – truly a time saving benefit.

### Exporting Data

The TMX offers a number of ways to archive and export captured data. Data can be exported in our packed binary format – minimizing file size – or a generic ASCII format, which is compatible with most analysis packages. For applications requiring transportable media, the TMX provides eight USB 2.0 ports that open up a world of possibilities. Connect an external hard drive or USB flash drive, and archive GBytes of data at once. You can also connect a USB 2.0 Windows printer for printing screen shots from the recorder.

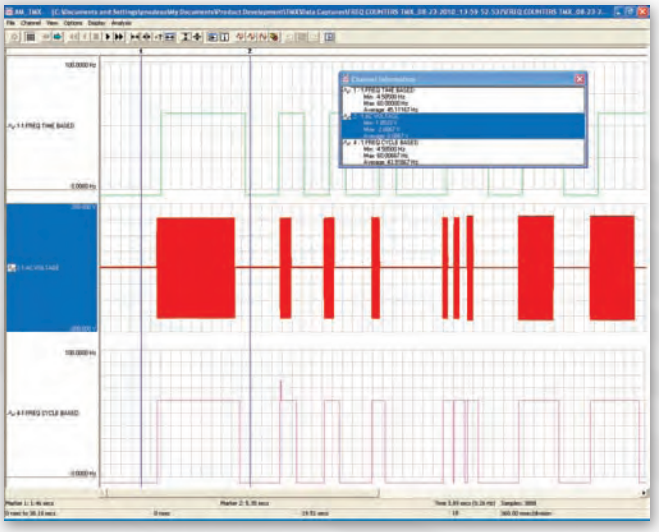


The TMX has an integral 1000BaseT Ethernet port to make exporting data to your PC or network as easy as ever. Simply connect your TMX to a network and upload only the data of interest. The Ethernet connection also provides the capability to control a TMX from a remote location using a suite of host commands.

## SOFTWARE

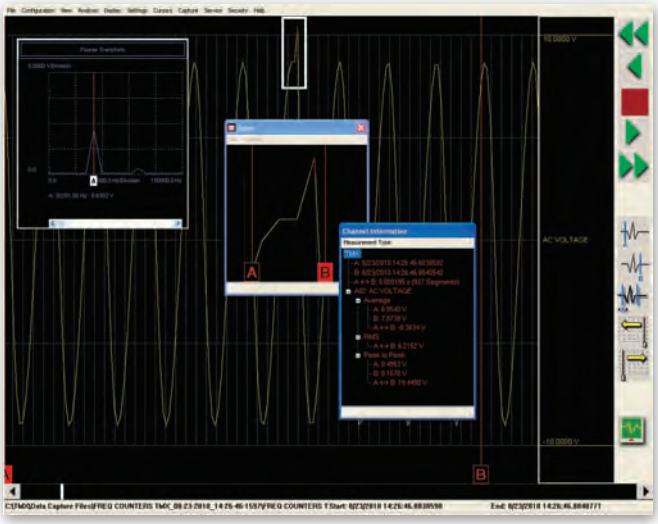
### AstroVIEW® X

Each TMX includes free AstroVIEW X PC based data review and analysis program. AstroVIEW X runs on any Windows PC and lets you upload and review data captured on your recorder. AstroVIEW X has built-in analysis and easily converts data into ASCII, Excel®, Mathcad®, DADiSP® and other popular formats.



### TMX Offline

With the TMX Offline software, working with the TMX has never been easier! This powerful software gives you the ability to create setups as well as review data on your PC. Running under Windows XP, Windows Vista or Windows 7, the TMX Offline software gives you all the tools necessary to quickly configure the system, transfer files, review and analyze your data.



## HARDWARE CONFIGURATIONS

### TMX Portable Data Acquisition System

The TMX is designed to go anywhere your testing sends you. The tough, MIL-STD-810 tested industrial grade package gives you the freedom to bring it onto the production floor or out to a remote site.

### AstroDock® PC Docking Station

The AstroDock is a two-drive docking station that accepts the removable hard drives from any TMX recorder. The AstroDock connects to your PC via USB 2.0 and provides immediate review capability as well as direct transfer of data capture files to your computer. Simply remove the 1 TByte capture drive from your TMX recorder, plug it into the AstroDock TMX and begin reviewing the data on your PC... all in seconds. Insert a new capture drive in your TMX recorder and continue to record data while you review and archive on your PC. Working with large data files has never been this fast and easy!

### TMX-E Expansion Box

The TMX-E Expansion box for the TMX adds up to three additional modules for increased channel count.

*The TMX-E Expansion Box requires the TMX base system for operation.*

### TMX-R Rackmount

If you're looking for a high speed data acquisition system to integrate into your test stand, take a look at the TMX-R. The TMX-R is a rackmount version of the TMX data acquisition recorder with all the same features and capabilities. The TMX-R is configured for installation in a standard nineteen-inch rack, and features six module slots.

# TMX

Astro-Med, Inc
TEST & MEASUREMENT PRODUCT GROUP

## TMX MAINFRAME

### MAINFRAME CHASSIS

| | |
|---|---|
| **Maximum Analog Modules** | 3 (6 with optional expansion unit) |
| **Maximum Analog Waveforms** | 48 (96 with optional expansion unit) |
| **Event Inputs (TTL)** | 16 |
| **Derived Channels** | +, -, x, ÷, Exponential, Sin, Cos, Tan, Asin, Acos, Atan, Exp √, Absolute Value |

### DATA ACQUISITION RECORDING

| | |
|---|---|
| **Operational Modes** | Scope, Review, Real-time (strip-chart) |
| **Recording Method** | Internal removable 1 TByte SATA disk drive |
| **Time Stamp** | Time and date automatically saved with data |
| **Trigger Point** | Amount of pre and post trigger is user adjustable |
| **Filtering** | Low pass, high pass, band pass, band stop, RMS, integration & differentiation |

### COLOR DISPLAY

| | |
|---|---|
| **Type** | Active matrix color LCD (TFT) |
| **Viewing Area** | 17" (43.2 cm) diagonal |
| **Resolution** | 1280 x 1024 |
| **Touch** | Full screen, resistive |

### COMPLIANCE/ENVIRONMENTAL

| | |
|---|---|
| **Operating Temp** | 32 to 104 °F (0 to 40 °C) |
| **Operating Humidity** | 10 % to 90 % non condensing |
| **Shock** | MIL-STD-810F Method 516.5, Procedure I |
| **Vibration** | MIL-STD-810F Method 514.5, Procedure I |

### PHYSICAL

| | |
|---|---|
| **Enclosure** | Aluminum, with armored end caps |
| **Dimensions** | 14.5" (36.8 cm) H x 19" (48.3 cm) W x 7.5" (19.1 cm) D (without handle) |
| **Weight (including 3 modules)** | 37 lbs (15.78 kg) |

### INTERFACE

| | |
|---|---|
| **Ethernet** | 1000BaseT |
| **VGA** | For displaying data on an external monitor |
| **USB 2.0 (8 ports/unit)** | For external peripherals and file export |
| **Expansion Port** | For connection of optional TMX-E |

### SYSTEM POWER

| | |
|---|---|
| **Input Voltage Range** | 100 to 264 VAC or 24 VDC at 11 A |
| **Frequency Range** | 47 Hz to 63 Hz |

## TMX OPTIONS—INPUT MODULE SPECIFICATIONS

### UNIV-6 UNIVERSAL ISOLATED VOLTAGE MODULE WITH DC BRIDGE

*UNIV-6 GENERAL SPECIFICATIONS*

| | |
|---|---|
| **Channels (per module)** | 6 |
| **Maximum Sample Rate/Ch** | 800 kHz (400 kHz with TMX-E) |
| **Isolation** | 250 Vrms or DC, Cat II |

*UNIV-6 SINGLE-ENDED VOLTAGE INPUT*

| | |
|---|---|
| **Maximum Bandwidth** | Up to 100 kHz |
| **Input Type** | Isolated, AC/DC coupled |
| **Specified Ranges** | 200 mVFS to 800 VFS |

*UNIV-6 DIFFERENTIAL VOLTAGE INPUT/BRIDGE MEASUREMENTS*

| | |
|---|---|
| **Maximum Bandwidth** | 50 kHz |
| **Input Type** | Differential, DC coupled |
| **Specified Ranges** | 5 mVFS to 2 VFS |
| **Excitation** | Isolated 10 V at 30 mA |

### IHVM-6 ISOLATED HIGH VOLTAGE MODULE

| | |
|---|---|
| **Channels (per module)** | 6 |
| **Maximum Sample Rate/Ch** | 800 kHz (400 kHz with TMX-E) |
| **Maximum Bandwidth** | 60 kHz |
| **Input Type** | Isolated Differential |
| **Isolation** | 600 Vrms or 1000 VDC, Cat IV |

### IBRM-6 ISOLATED BRIDGE MODULE

| | |
|---|---|
| **Channels (per module)** | 6 |
| **Maximum Sample Rate/Ch** | 800 kHz (400 kHz with TMX-E) |
| **Maximum Bandwidth** | 70 kHz |
| **Input Type** | Isolated Differential |
| **Isolation** | 250 Vrms or DC, Cat II |
| **TEDS Capability** | Yes |

### IEPE-6 ISOLATED PIEZO ELECTRIC SENSOR MODULE

| | |
|---|---|
| **Channels (per module)** | 6 |
| **Maximum Sample Rate/Ch** | 800 kHz (400 kHz with TMX-E) |
| **Maximum Bandwidth** | Up to 65 kHz |
| **Input Type** | Isolated with constant current |
| **Isolation** | 250 Vrms or DC, Cat II |
| **TEDS Capability** | Yes |

### DIOC-16 DIGITAL I/O, ANALOG OUTPUT, COUNTER AND RELAY MODULE

| | |
|---|---|
| **Channels (per module)** | 16 (Counters or digital inputs) |
| Analog Outputs | 4, up to ±10 V, function & arbitrary waveform generation |
| Digital Outputs | 16 (TTL) |
| Counters | Up to 16, 32 bit |

### NIDV-16 NON-ISOLATED DIFFERENTIAL VOLTAGE MODULE

| | |
|---|---|
| **Channels (per module)** | 16 |
| **Maximum Sample Rate/Ch** | 200 kHz (100 kHz with TMX-E) |
| **Maximum Bandwidth** | 40 kHz |
| **Input Type** | Differential, non-isolated DC coupled |
| **Maximum Rated Input** | ±50 VDC (35 Vrms) |
| **Specified Ranges** | 80 mVFS to 100 VFS |

### ITCU-12 ISOLATED THERMOCOUPLE MODULE

| | |
|---|---|
| **Channels (per module)** | 12 |
| **Input Type** | Type U miniature thermocouple (12 connectors) |
| **Isolation** | 250 Vrms or DC, Cat II |
| **Maximum Bandwidth** | 6 Hz update rate (TC sampled at 3 Hz) |
| **Thermocouple Types** | J, K, E, T, N, B, R, S, C |

### IRTD-12 ISOLATED PRT TEMPERATURE/RESISTANCE MODULE

| | |
|---|---|
| **Channels (per module)** | 12 |
| **Isolation** | 150 Vrms or DC, Cat II |
| **Input Types** | Pt100(385), Pt100(3916), Pt100(3926), resistance up to 450Ω |

## TMX OPTIONS—ADVANCED

### TMX-R RACKMOUNT VERSION (FITS STANDARD 19" RACKS)

| | |
|---|---|
| **Maximum Analog Modules** | 6 |
| **Maximum Analog Waveforms** | 96 |
| **Dimensions** | 15.75" (40 cm) H x 18.97" (48.2 cm) W x 17.15" (43.6 cm) D |

### TMX-VA VIDEO/AUDIO ACQUISITION

| | |
|---|---|
| **Analog Input Type/Connector** | Composite/BNC |
| **Supported Video Formats** | NTSC, PAL |
| **NTSC Capture Rate** | 30 fps (frames per second) |
| **PAL Capture Rate** | 25 fps (frames per second) |
| **Audio Capture Rate** | Up to 44.1 kHz |

### TMX-E EXPANSION CHASSIS (REQUIRES MAINFRAME CHASSIS FOR OPERATION)

| | |
|---|---|
| **Maximum Analog Modules** | 3 |
| **Maximum Analog Waveforms** | 48 |
| **Dimensions** | 14.5" (36.8 cm) H x 19" (48.3 cm) W x 5" (12.8 cm) D |
| **Weight (including 3 modules)** | 15 lbs (6.8 kg) |

### TMX-HSV HIGH SPEED VIDEO

| | |
|---|---|
| **Maximum Frame Rate** | 1000 fps |
| **Maximum Storage** | 2 GBytes |

***TO READ FULL SPECIFICATIONS, PLEASE VISIT***
**www.astro-med.com**

***OR CALL US AT***
**401-828-4000**

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### CONTACT INFORMATION


Astro-Med Industrial Park
600 East Greenwich Avenue
West Warwick, RI 02893 U.S.A.
031412

**Phone:** 401-828-4000
**Toll-free:** 877-867-9783 (U.S.A. and Canada only)
**Fax:** 401-822-2430
**Sales e-mail:** mtgroup@astromed.com