

High Isolation Measurement for Harsh Environments

MEASURpoint™ provides isolation to earth ground of up to ±3500V continuously or 5000V for transients, making it ideal for alternative energy applications including:

- Gas turbines
- Wind turbines
- Battery storage
- Power load distribution and management

MEASURpoint™ is an ultra-accurate instrument for any combination of thermocouple, RTD, and voltage inputs to be measured with a single software solution. MEASURpoint is available as a USB or Ethernet (LXI™ Class C compliant) instrument, and provides ±500V, ±1400V, or ±3500V isolation channel-to-channel and to earth ground.

MEASURpoint includes the MEASURpoint Framework application to configure and acquire temperature, resistance, and voltage channels, display, log, analyze, and export data to other formats including Excel. A ready-to-measure program for immediate productivity.

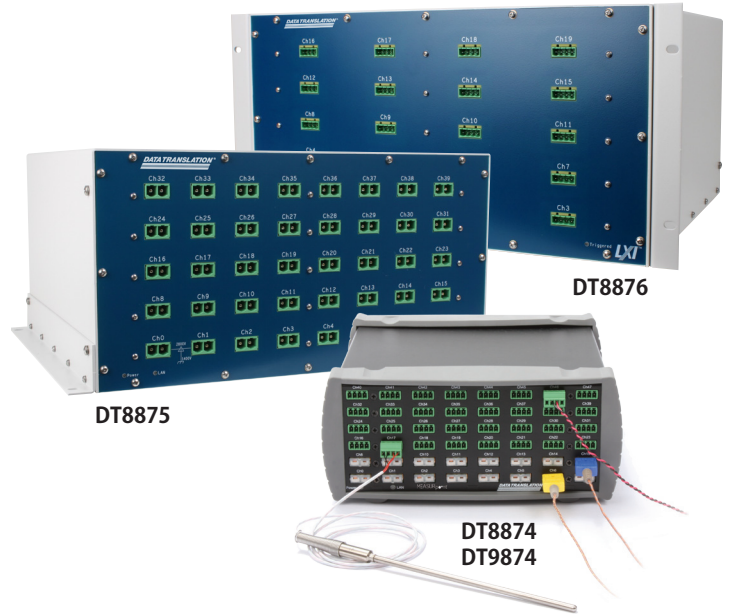


Figure 1. MEASURpoint incorporates proprietary ISO-Channel™ technology that makes measurements almost indestructible and eliminates any common mode noise and ground loop problems under all environmental conditions. In addition, up to forty-eight configurable input channels (depending on the model) offer ultimate flexibility to the user.

All systems have 10Hz/channel throughput rate and use a high stability 24-bit delta-sigma A/D per channel.

Features Summary			
	DT9874/DT8874	DT8875	DT8876
Isolation			
Working	±500V	±1400V	±3500V
Transient (peak)	500V	2500V	5000V
Ch-to-Ch	1000V	2800V	7000V
Channels			
# of Channels (max)	48	40	20
Sensor			
Thermocouple*	●	●	●
RTD**	●	●	●
Voltage	●	●	●
	±75mV, ±1.25V, ±10V, ±100V, ±400V	±75mV, ±1.25V, ±10V, ±100V, ±400V	±75mV, ±100mV, ±1.0V, ±1.25V, ±10V
Accuracy			
Thermocouple	±0.16°C	±0.24°C	±0.32°C
RTD	±0.03°C	±0.03°C	±0.03°C
Voltage (10V range)	±0.3mV	±0.3mV	±0.3mV
CJC Configuration	CJC per ch	CJC per 8 ch (embedded in block)	CJC per 4 ch (embedded in block)

*Type J, K, T, B, E, N, R, S, for all models.

**Type PT100, PT500, PT1000. 2, 3, or 4-wire.

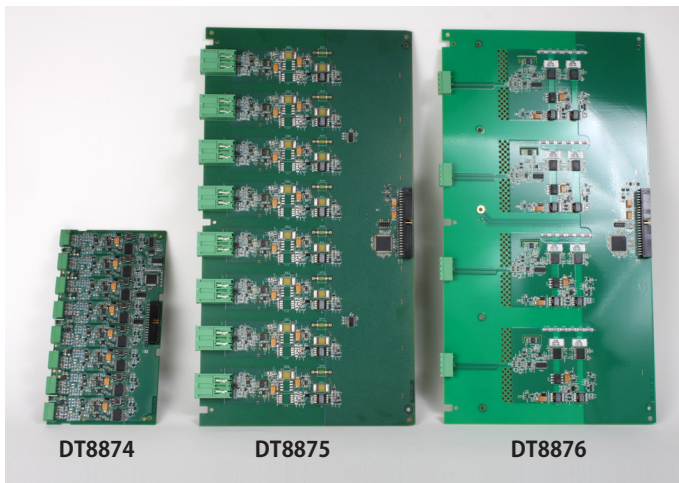


Figure 2. MEASURpoint offers 3 different levels of isolation. The DT8874 input channel board offers the smallest size and easily accommodates $\pm 500V$ isolation. The DT8875 offers wide spacing between channel elements to accommodate $\pm 1400V$ isolation. The DT8876 offers the widest spacing to accommodate $\pm 3500V$ isolation.

Key Design Features

- High isolation protects signal integrity
- ISO-Channel™ technology provides galvanic isolation channel-to-channel and to earth ground:
 - $\pm 500V$ on the DT9874 and DT8874
 - $\pm 1400V$ on the DT8875
 - $\pm 3500V$ on the DT8876
- Ethernet (LXI™ Class C compliant) or USB
- Configure up to 48 channels for the DT9874 and DT8874, up to 40 channels for the DT8875, and up to 20 channels for the DT8876.
- Dedicated 24-bit, Delta-Sigma A/D converter for each thermocouple, RTD, or voltage channel operating in parallel
- Up to 10Hz throughput rate on each channel simultaneously
- DC/DC converter per channel maximizes isolation
- Easy-access jacks or screw terminals for quick wiring thermocouple inputs, RTDs, and voltage inputs
- Measurement Instrument Field Calibration Utility... Comprehensive procedure assures accurate measurements at all times
- MEASURpoint Framework application included... configure, acquire, and display data immediately

Thermocouple Board:

- Typical $0.0004^{\circ}C$ resolution
- Up to $\pm 0.15^{\circ}C$ accuracy including all errors
- B, E, J, K, N, R, S, and T thermocouple types supported
- +10 nA break-detection circuitry to detect open thermocouple inputs
- Dedicated CJC (cold junction compensation) input for each thermocouple channel for the DT9874 and DT8874, CJC per 8 channels on DT8875, or CJC per 4 channels on DT8876

RTD Board:

- Precision reference current source for each RTD channel
- Supports Platinum RTD types: Pt 100 ($\pm 0.07^{\circ}C$ accuracy), Pt500 ($\pm 0.01^{\circ}C$ accuracy), Pt1000 ($\pm 0.01^{\circ}C$ accuracy)

Voltage Board:

- 3 software selectable input ranges on the DT9874, DT8874, and DT8875: $\pm 10V$, $\pm 100V$, $\pm 400V$ on a per channel basis for the DT9874, DT8874, and DT8875
- 3 software selectable input ranges on the DT8876: $\pm 0.1V$, $\pm 1V$, and $\pm 10V$ on a per channel basis

Analog Input Flexibility

The standard MEASURpoint instrument provides up to 48 configurable channels (depending on the model), allowing for ultimate flexibility with thermocouple, RTD, and voltage inputs. Because MEASURpoint architecture uses an A/D per channel, sampling rates of up to 10Hz per channel simultaneously can be achieved.

On the thermocouple channels, a voltage or thermocouple input can be attached to any channel in a mix or match fashion. The analog input range is $\pm 75mV$.

The RTD input channels provide a 4-wire RTD input with Kelvin sensing for maximum accuracy by eliminating errors due to wire resistance. You can attach a voltage input or any of the following RTD types to these channels in a mix and match fashion: Platinum 100 Ω (Pt100), Platinum 500 Ω (Pt500), or Platinum 1000 Ω (Pt1000) RTD using an European alpha curve of 0.00385 or an American alpha curve of 0.00392. The supported temperature measurement range for these RTD types is $-200^{\circ}C$ ($-328^{\circ}F$) to $850^{\circ}C$ ($1562^{\circ}F$). You can also measure a resistance value, in Ohms, if desired. The analog input range is $\pm 1.25V$ is.

The precision high voltage analog input channels allow direct connection of voltages with three software selectable input ranges: $\pm 10V$, $\pm 100V$, and $\pm 400V$ for the DT9874, DT8874, and DT8875 and $\pm 0.1V$, $\pm 1V$, and $\pm 10V$ for the DT8876

CJC Circuit

Thermocouples are “relative” not “absolute” temperature measuring devices that generate voltage as a function of the temperature difference between both ends. To measure absolute temperature, you need to know the temperature of one end of the thermocouple to find the temperature of the other end. This is where the CJC circuit comes in. The CJC measures the temperature of the end of the thermocouple that plugs into the instrument. The DT9874 and DT8874 incorporate an independent CJC circuit for every channel. The DT8875 and DT8876 incorporate a CJC per 4 or 8 channel board. The board level CJC is embedded in a metal bar for excellent thermal conductivity and optimum consistency.

Galvanic Isolation with ISO-Channel™

ISO-Channel™ uses galvanic isolation methods to guarantee up to $\pm 3500\text{V}$ isolation (depending on the model) between any input channel to any other input channel and earth ground. Common mode noise and ground loop problems are eliminated with ISO-Channel since sensors that are at different ground reference levels are easily accommodated, even if they are at widely differing voltages of hundreds of volts or transients to thousands of volts.

ISO-Channel vastly increases reliability by implementing a high stability 24-bit A/D converter per channel on each of the channels, all operating in parallel. Older system designs with relay front ends are prone to system failure through “sticking channels” or magnetic field influence. The all solid-state ISO-Channel provides digital transfer of valuable sensor data with optical or transformer isolation.

The result is that accuracy is preserved for all sensor inputs. This is especially useful when conditions change in the electrical environment due to motor current surges, electromagnetic radiation, or noisy industrial equipment turning on/off. A vast majority of thermocouple applications reside in industrial environments. ISO-Channel™ technology makes measurements almost indestructible.

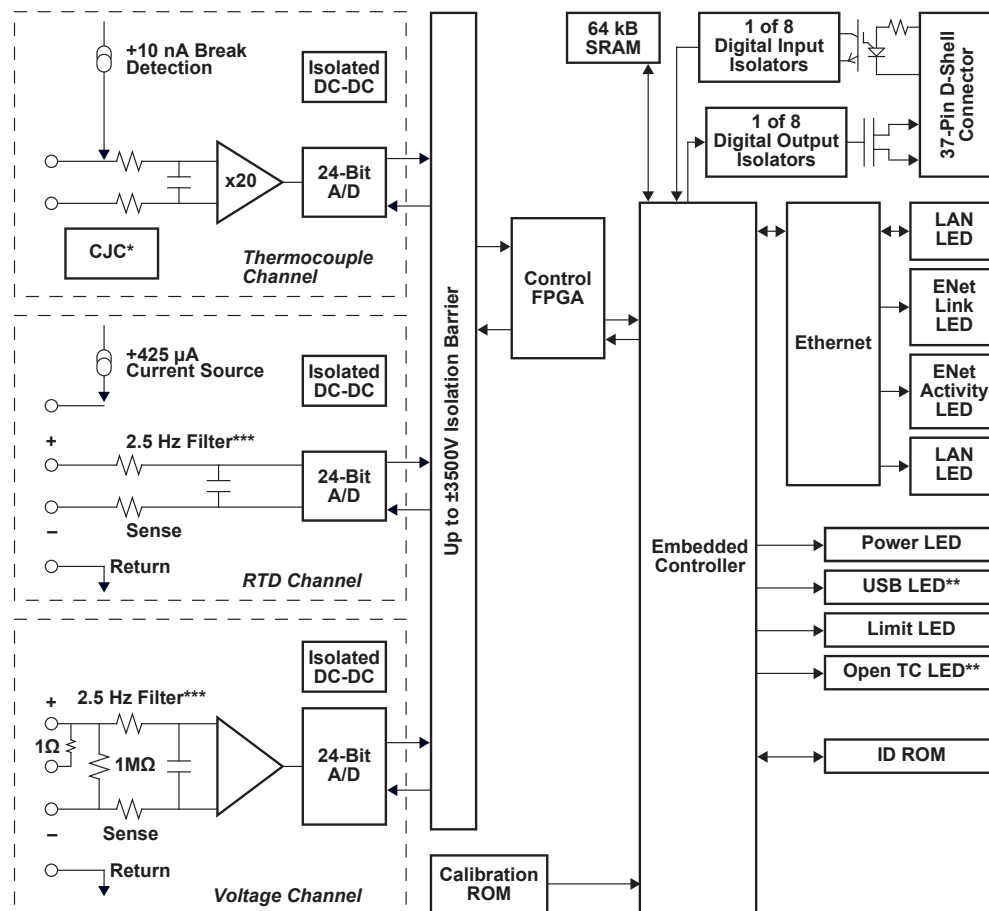
Triggers

A trigger is an event that occurs based on a specified set of conditions. Acquisition starts when the instrument detects the initial trigger event and stops when the buffer has been filled or you stop the operation. MEASURpoint instruments support a software trigger and an external trigger on digital input line 0.

Digital Input/Output Lines

MEASURpoint instruments feature eight, isolated, digital input lines. The digital input lines operate from +3 to +28V DC, with a switching time of 2ms maximum.

MEASURpoint instruments are perfect for driving relays directly, featuring eight, isolated, digital output lines. The outputs are solid-state relays that operate at $\pm 30\text{V}$ and 400mA peak (AC or DC) with a switching time of 2ms maximum.



*CJC per channel on DT9874 and DT8874. CJC every 8 channels on DT8875 and every 4 channels for DT8876.
 **Not used on LXI instruments.
 ***DT8875 and DT8876 use 4.5 Hz filter.

Figure 3. Block diagram.

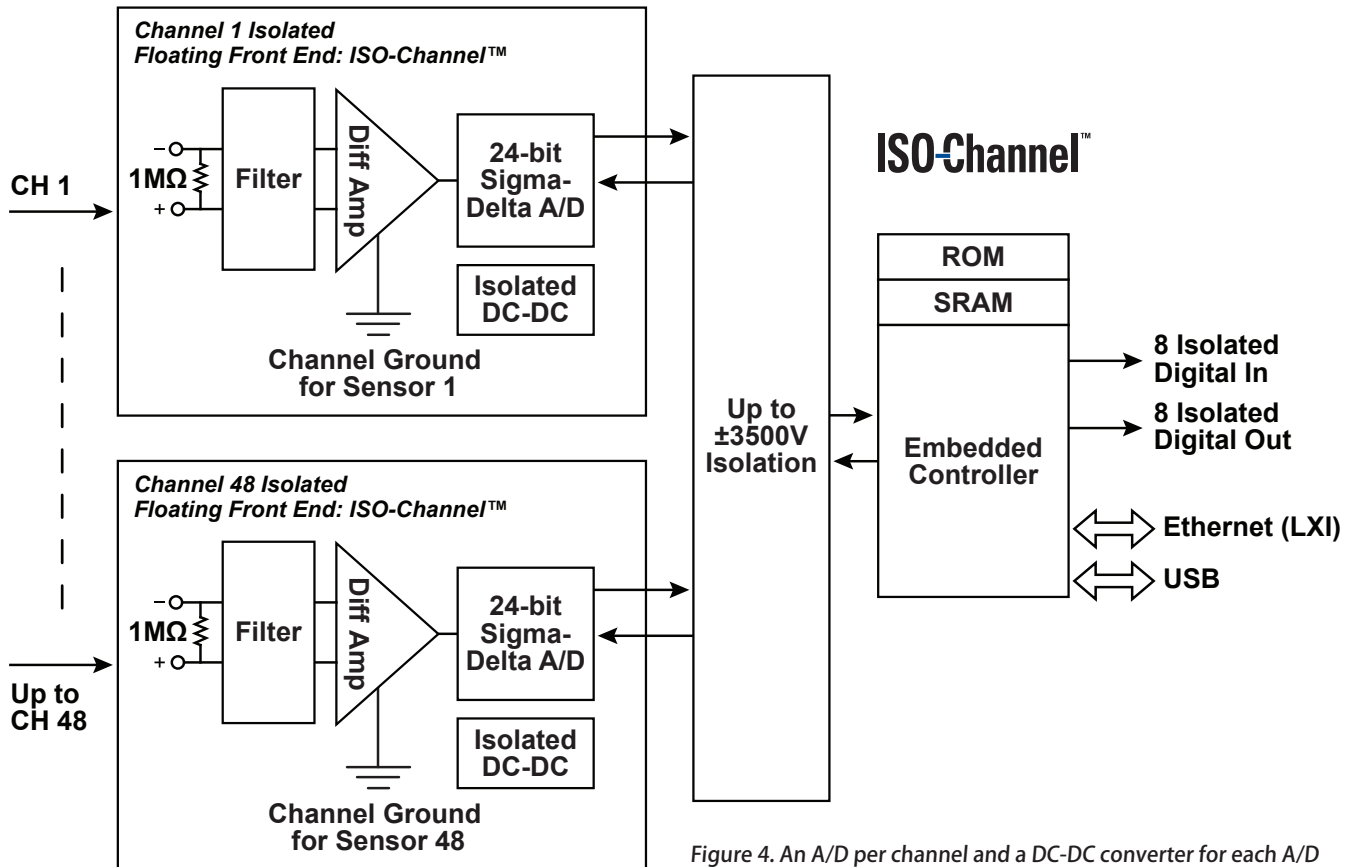


Figure 4. An A/D per channel and a DC-DC converter for each A/D provides channel-to-channel isolation, where each signal can float to its own ground reference.

MEASURpoint instruments include channel-to-channel isolation of up to 250V between digital I/O lines. If the application requires greater channel-to-channel isolation, every other digital line may be used. This reduces the number of digital I/O lines, but provides channel-to-channel isolation of 500V (one channel can be +250V while the adjacent channel can be -250V).

High-Stability, Low Drift Voltage References

Temperature measurement systems compare the voltages produced by a thermocouple or RTD with a known voltage before the data can be properly digitized and stored. This is where voltage references come in.

MEASURpoint uses high-precision, high-stability, low-drift voltage references rated at 4 PPM per degree and 100 PPM drift per year. This means MEASURpoint is accurate now and will remain that way over time.

Custom Designed DC-DC Converters

Our custom DC-DC converters circuits have a unique power distribution system that supplies power to only 2 of the 6 boards at any one time. Cycling non-adjacent boards in this manner creates less power surges, reduces noise, and improves the overall system performance.

Field Calibration

Users can calibrate any MEASURpoint instrument in the field using precise calibration equipment and the Measurement Instrument Calibration Utility. Since each MEASURpoint instrument consists of up to 48 individual instruments, great care must be taken to ensure that proper warm-up times are followed and precise calibration equipment is used. The Measurement Instrument Calibration Utility ships with a comprehensive help file that describes the required equipment and calibration procedure, including warm-up times, for each MEASURpoint model.

The Measurement Instrument Calibration Utility allows you to revert to the factory calibration for any or all channels, or revert back to the last user calibration values, if desired. In addition, this utility generates a report that lists the starting and ending calibration values for each channel, allowing traceability.

Remote Measurements

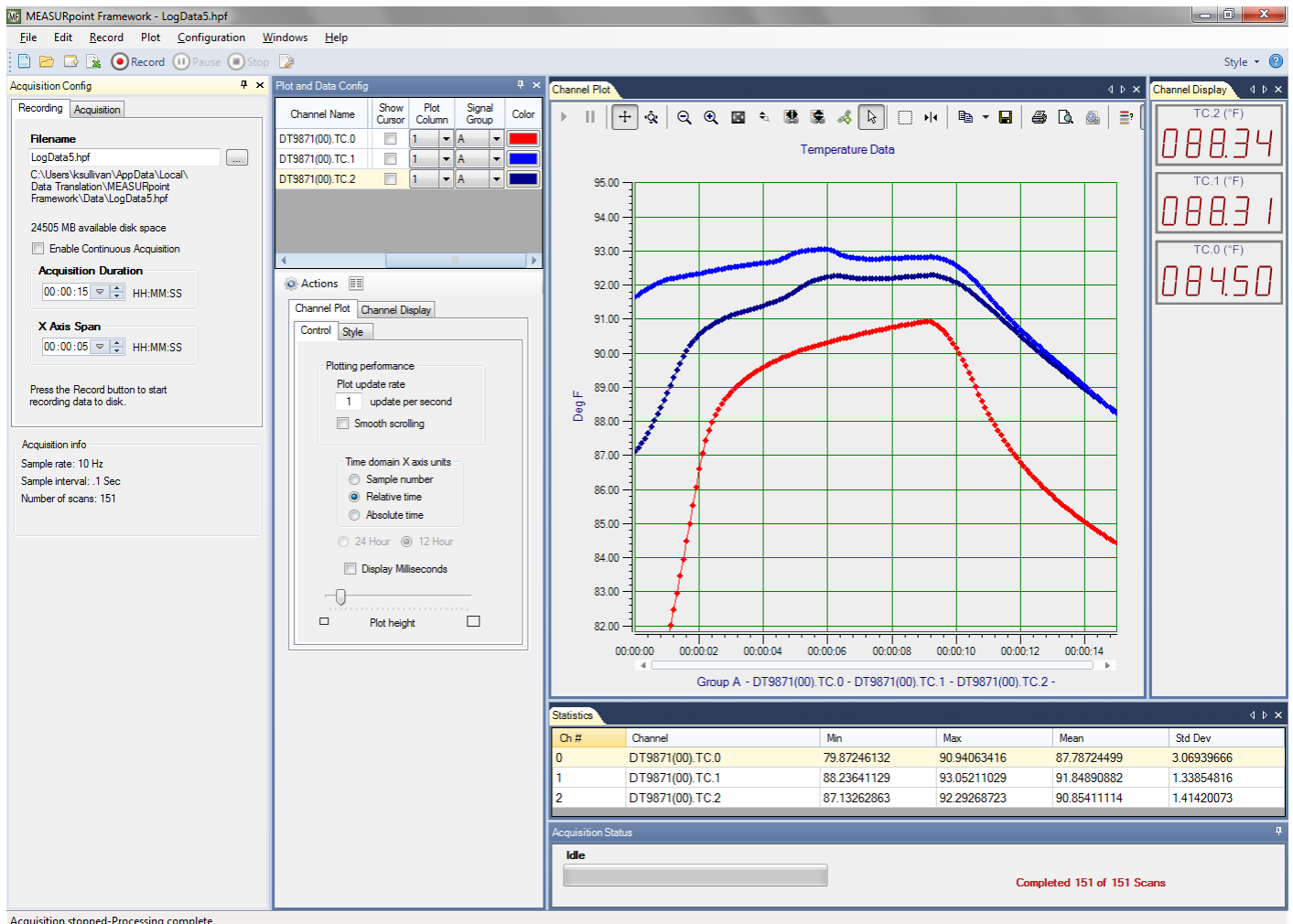
The network-ready versions of MEASURpoint are LXI™ Class C compliant and provide a standard Ethernet connection to support remote monitoring and control from the field or on the factory floor. Channels can be expanded by simply adding more instruments to the network.

MEASURpoint Framework application

The MEASURpoint Framework application is included with all MEASURpoint instruments. This ready-to-measure application allows you to acquire thermocouple, RTD, and/or voltage data from multiple instruments, record data to disk, display the results in both a plot and a digital display, and read a recorded data file.

Key Software Features

- Discover and select instruments
- Configure all input channel settings for the attached sensors
- Load/save multiple hardware configurations
- On each device, acquire temperature and voltage data from all enabled channels simultaneously at up to 10Hz per channel
- Log acquired data to disk
- Display acquired data during acquisition in a digital display using the Channel Display window and/or as a waveform in the Channel Plot window
- View statistics about the acquired data, including the minimum, maximum, and mean values and the standard deviation in the Statistics window
- Open recorded data in Microsoft Excel® for further analysis
- Customize many aspects of the acquisition, display, and recording functions, including the acquisition duration, sampling frequency, trigger settings, filter type, and temperature units to use
- Fully configurable graphical user interface



Acquisition stopped-Processing complete

Additional Software Support

The following software support is available for all MEASURpoint instruments:

- **Eureka Discovery Utility** – This utility helps you locate or “discover” all LXI (Ethernet) instruments that are connected to your system and provides the following information about your instrument: the IP address, manufacturer, model number, serial number, and version of the firmware that is running on your instrument. In addition, you can use this utility to configure Windows firewall settings and update the firmware for your Data Translation LXI instrument.
- **Instrument Web Interface** – This built-in interface allows you to verify the operation of your instrument and perform basic functions with Internet Explorer and no additional software. Using it, you can configure your instrument, control output signals, measure input signals, and save results to disk.
- **IVI-COM Driver** – This driver is provided to write application programs for MEASURpoint using an IVI-COM instrument interface. It can be used with programs written in Visual C#®, Visual Basic® for .NET, or C++ under Visual Studio® 2003/2005/2008. You can also use the IVI-COM driver with LabVIEW® from National Instruments® or MATLAB® and the Instrument Control Toolbox from the MathWorks™ to program MEASURpoint instruments.
- **SCPI Commands** – Use VISA or network sockets to program and control MEASURpoint LXI instruments by sending SCPI commands. Comprehensive user manual and example programs provided.

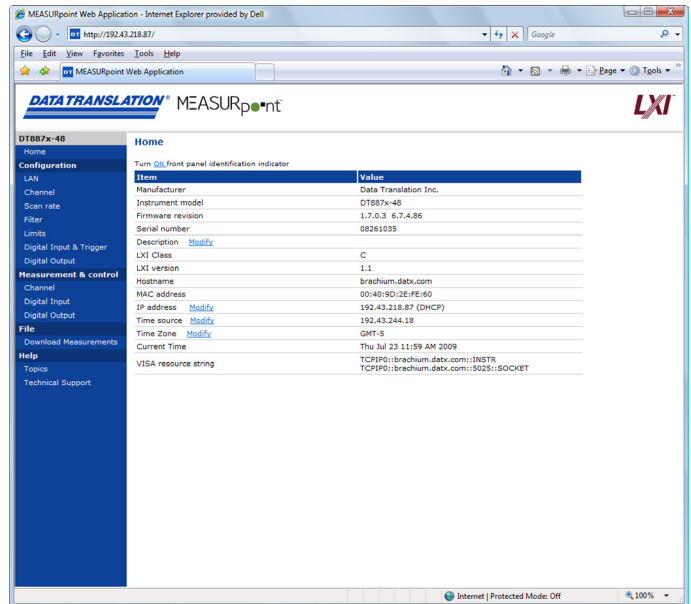


Figure 6. The main web page displays information about your instrument on the network.

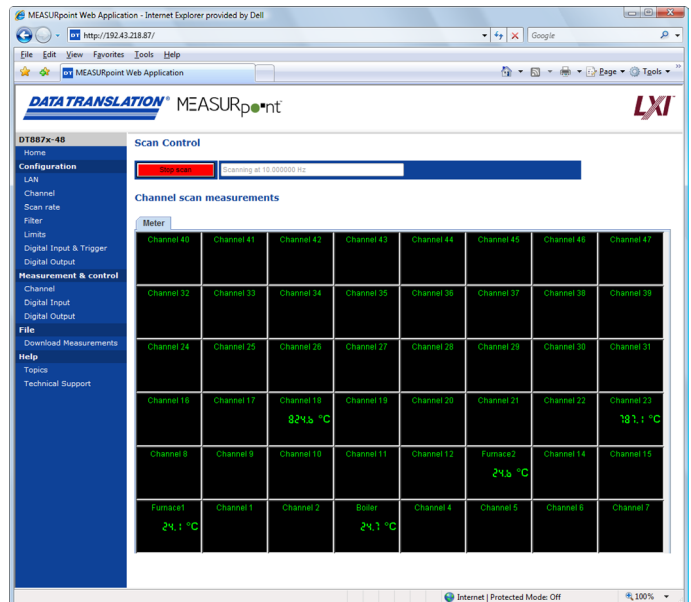
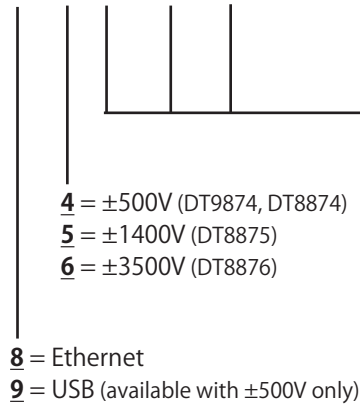


Figure 7. The Measurement and Control web pages are used to start or stop data acquisition and display live data in a numerical channel overview.

Ordering Summary

MEASURpoint Instruments

DTx87x-xxT-xxR-xxV



T = Thermocouple Channels
R = RTD Channels
V = Voltage Channels

DT9874, DT8874, DT8875

00 = No Channels
08 = 8 Channels
16 = 16 Channels
24 = 24 Channels
32 = 32 Channels
40 = 40 Channels
48 = 48 Channels (DT9874 and DT8874 only)

DT8876

00 = No Channels
04 = 4 Channels
08 = 8 Channels
12 = 12 Channels
16 = 16 Channels
20 = 20 Channels

Ordering Example

DT9874-16T-16R-16V

MEASURpoint USB instrument configured with 16 thermocouple channels, 16 RTD channels, and 16 voltage channels.

For additional channel configurations, please call 1-800-525-8528 or email info@datatranslation.com to discuss your requirements.

Options

- STP37 – Digital I/O screw terminal panel
- EP333 – Cable for attaching the STP37 to the MEASURpoint instrument
- EP373 – Single Rack-Mount Kit for DT9874/DT8874
- EP374 – Dual Rack-Mount Kit for DT9874/DT8874
- EP395 – Surface mount Kit for DT8875/DT8876 (mounts DT8875/DT8876 to a surface, such as a table).
- EP396 – Rack-Mount Kit for DT8875/DT8876

Enclosure Options



MEASURpoint
Instruments with
Rack Mount Kit



Rugged NEMA enclosures.



For more information about MEASURpoint, please visit:
<http://www.datatranslation.com/MEASURpoint/>

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