

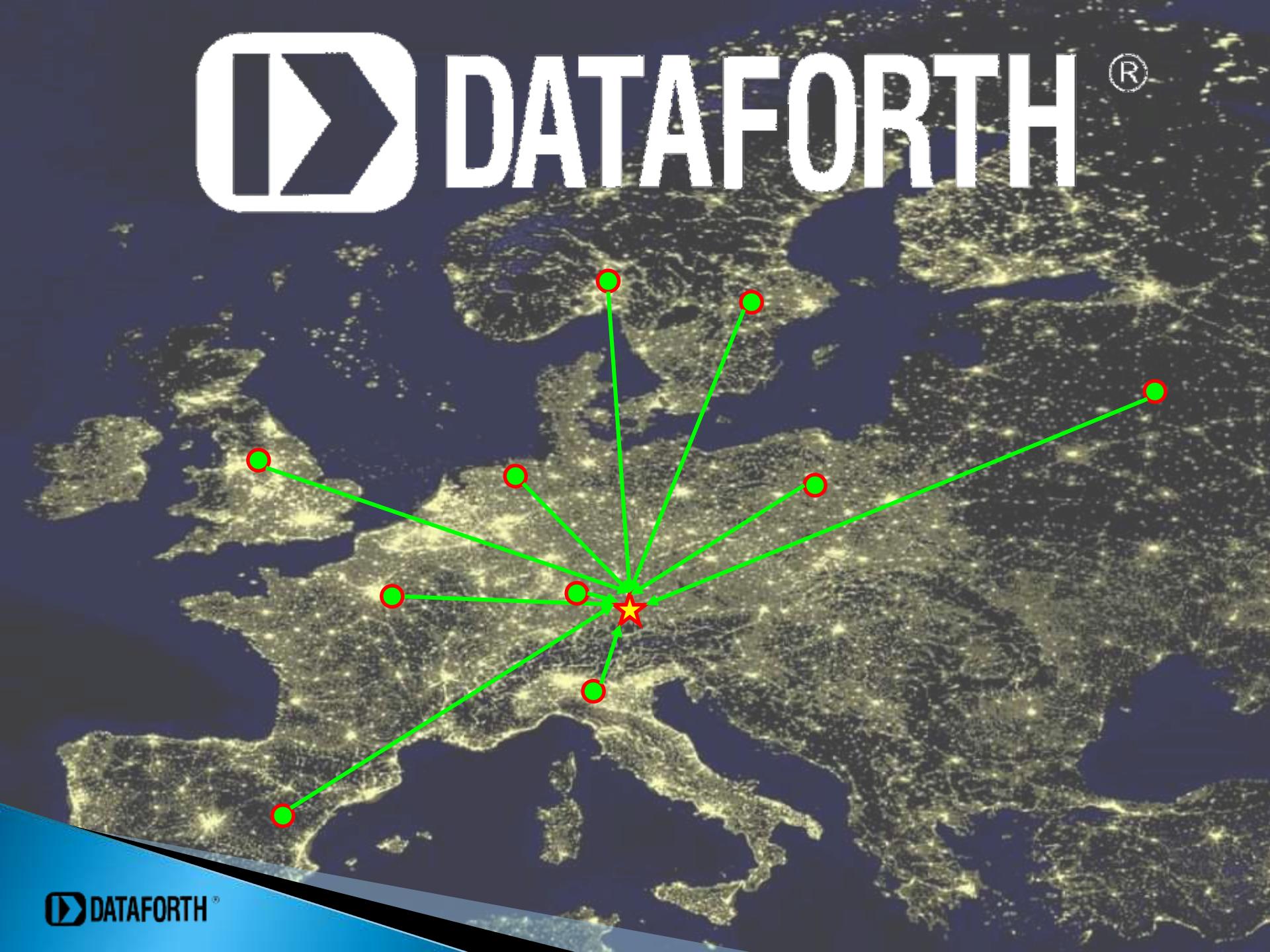


2018 European Sales Meeting





**DATAFORTH®**



# THURSDAY'S AGENDA

## 2018 EUROPEAN SALES MEETING

<u>Time</u>		<u>Topic</u>
12:00 PM	Georg	Introductions & Agenda & Lunch
12:30 PM	Georg	Dataforth Markets & Applications Overview
12:45 PM	Georg John	Signal Conditioning Overview – Some old stuff, but still very relevant for today's business Product Families / How to select / Datasheets
1:30 PM	John	MAQ20 Hardware Overview Modbus / Datalogging / Scaling
3:00 PM	Break	Coffee, tea, cookies, refreshments
3:15 PM	John	MAQ20 Modules Input: Analog / Strain / RTD / TC Digital Input / Output Output: Analog / Digital / Relay
	John	MAQ20 Software Overview ReDAQ Shape / IPE Motion Software Other Software (OPC/LabView/DasyLab/Custom Applications & Systems Building a MAQ20 System
5:00 PM	Adjourned	Free time until 5.45pm

Meet at 5.45pm in lobby

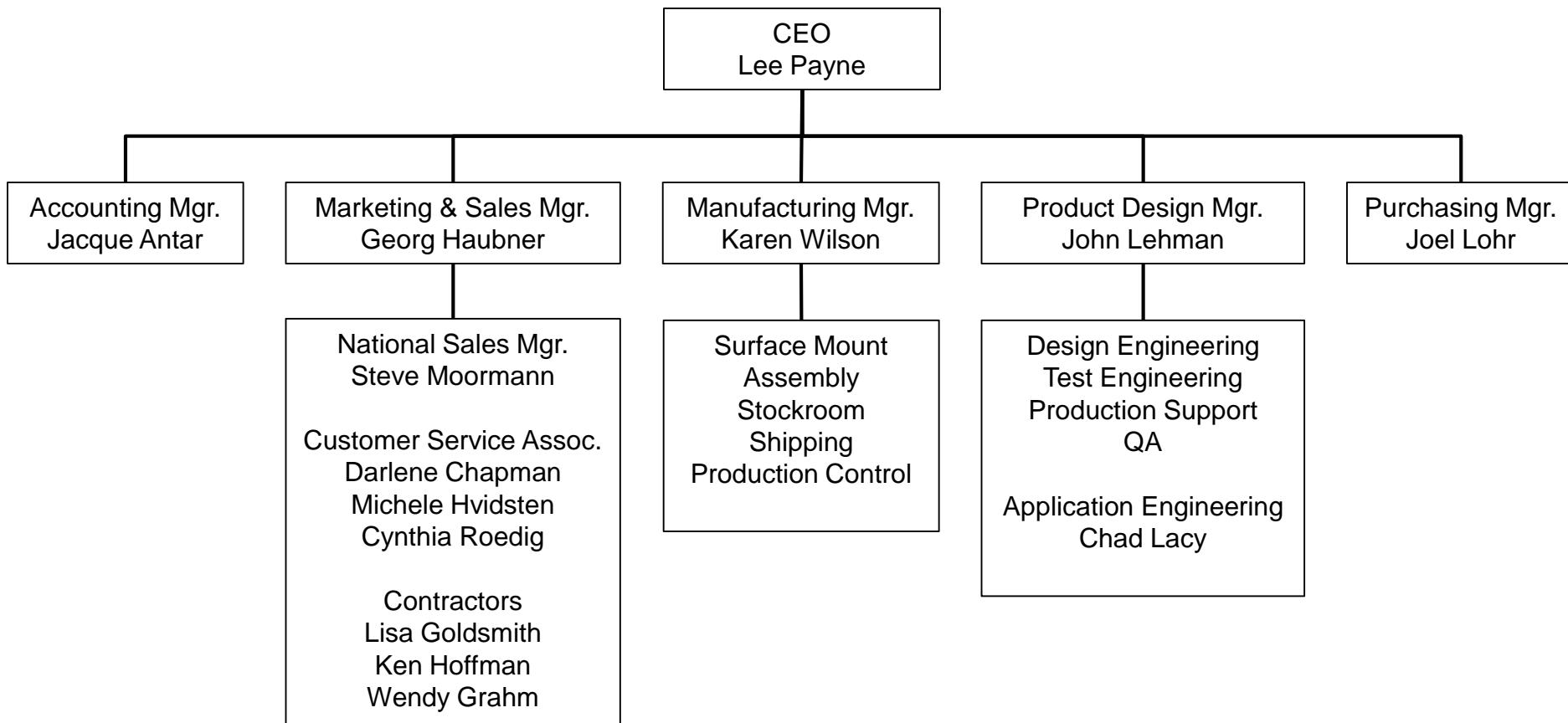
# FRIDAY'S AGENDA

## 2018 EUROPEAN SALES MEETING

<u>Mtg Time</u>		<u>Topic</u>
8:30 AM	Georg	Dataforth Marketing
9:00 AM	All	Application Examples
10:30 AM	Break	Coffee, tea, cookies, refreshments
10:45 AM	Georg & John	Future Products
11:15 AM	Georg	Projects in the pipeline
11:30 AM	All	Open discussions - Q&A
12:00 PM	Adjourned	Thank you for attending the 2018 European Sales Conference

Save travels!

# YOUR PARTNER TEAM





# DATAFORTH®

## YOUR CONTACTS

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Personal visits or online meetings



- **Established in 1984 – 35 years in 2019!**
- **Headquarter Tucson, Arizona, USA**
- **Serves customers world-wide**
- **ISO9001:2015 Registered**
- **Six-Sigma Reliability**



# Why Purchase Dataforth Products?

- In Business for 30+ Years, ISO9001:2015 Registered
- Products Manufactured in Tucson, Arizona USA
- Very High Quality and Reliability, Better than  $6\sigma$ 
  - below 3.4 defects per million opportunities (DPMO) (99.99966% Good)
- 1500VAC Continuous Isolation
- Up to 240VAC Input Protection
- 5000V Transient Input Protection
- Up to 6-Pole Low-Pass Filtering
- Vibration test our products to common industry standards
- $\pm 0.03\%$  Accuracy
- -40°C to +85°C Operating Temp
- Certifications: CSA/UL/ATEX/CE/EN

# Key Market Categories

Engine Testing and Monitoring Applications



# Key Market Categories

Aerospace and Aircraft Applications



# Key Market Categories

Mining, Earthmoving and Agriculture



JOHN DEERE



Kubota



NEW HOLLAND

# Key Market Categories

## Electric Power Generation & Support



# Key Market Categories

Pipeline & Process Monitoring



# Key Market Categories

Semiconductor & Process Equipment



Honeywell

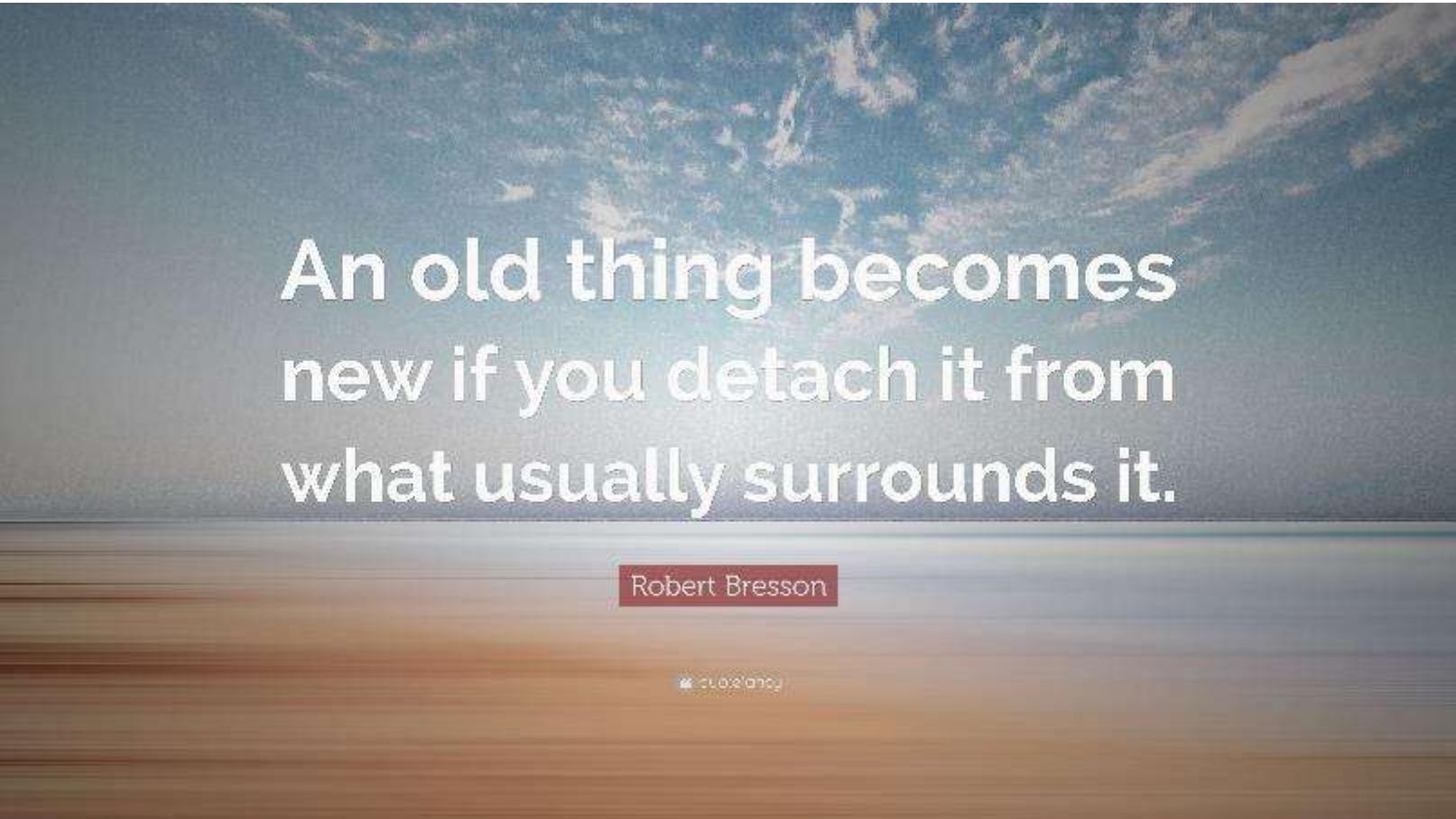




**Analog Isolation  
&  
Signal Conditioners**

**5B – 7B – 8B – DSCA**

# Why are we talking about old stuff?



An old thing becomes  
new if you detach it from  
what usually surrounds it.

Robert Bresson

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# EOL of ADI Modules

## Analog Devices (ADI) announces EOL (End of life) of their Signal Conditioning Modules

Analog Devices has announced a last time buy and EOL of their signal conditioning modules such as but not limited to 1B, 3B, 5B, and 7B.



AHEAD OF WHAT'S POSSIBLE™



### Important Dates:

Last Time Buy Date: 09-Oct-2018

Last Time Ship Date: 09-Oct-2019

# **COMPETITIVE ADVANTAGE**

Inventory of 1000's of Modules

Instrument Class® Performance

Broadest Analog I/O Options in the Market

Dataforth's Quality Reputation

Better than Six Sigma Reliability

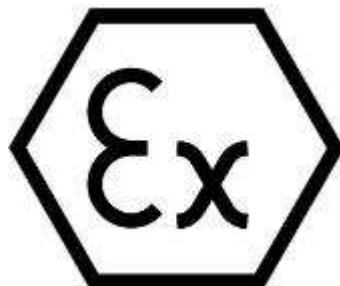
Design and Manufacturing in the USA

Competitively Priced

# INDUSTRY COMPARISONS

Parameter	Dataforth	Industry Typical
Accuracy	+/-0.03%	+/-0.1% to +/1.1%
Nonlinearity	+/-0.005% span	+/-0.03% to +/-0.1%
Conformity	+/-0.02%	+/-0.05% to +/-0.3%
Isolation	1500Vrms	100Vdc to 1000Vdc
CMR	160dB @ 50 or 60Hz	80 to 160dB @ 60Hz
NMR	95dB @ 60Hz	35dB to 60dB @ 60Hz
Price	100%	120% - 140%

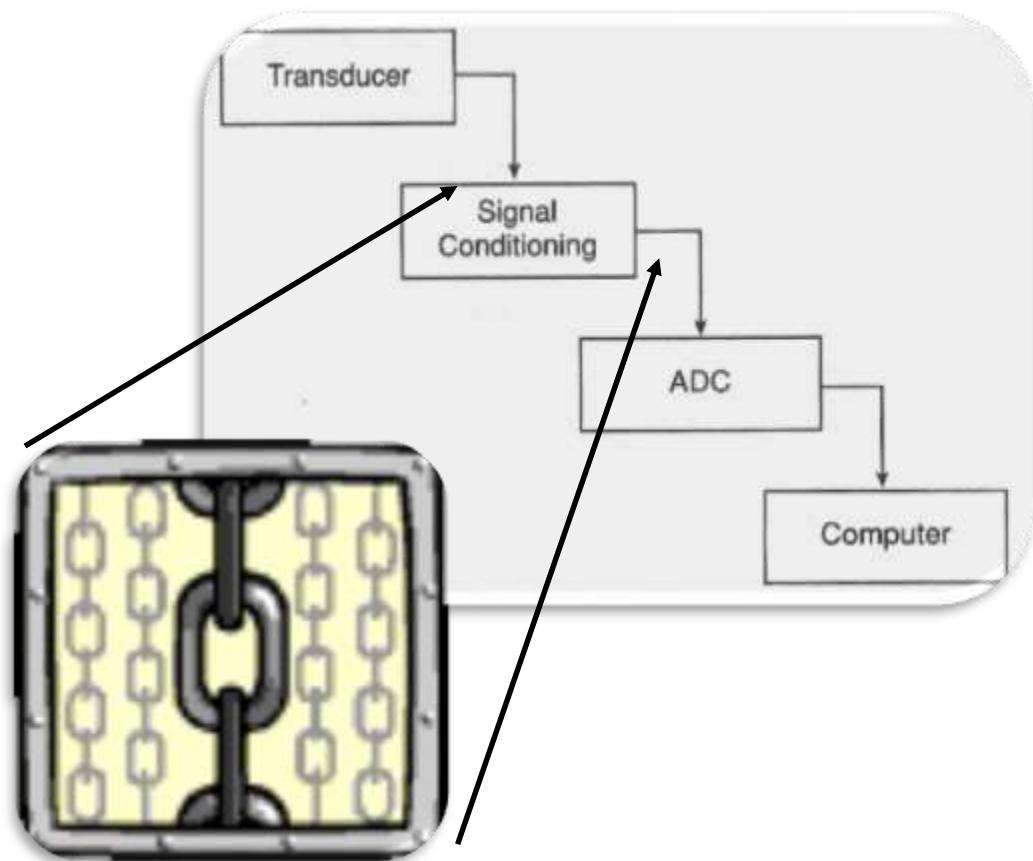
# CERTIFICATIONS



# DATAFORTH® PROTECTION

## Reinforces the Signal Path

- Protection
- Isolation
- Filtering
- Amplification
- Linearization



# **DATAFORTH® PROTECTION**

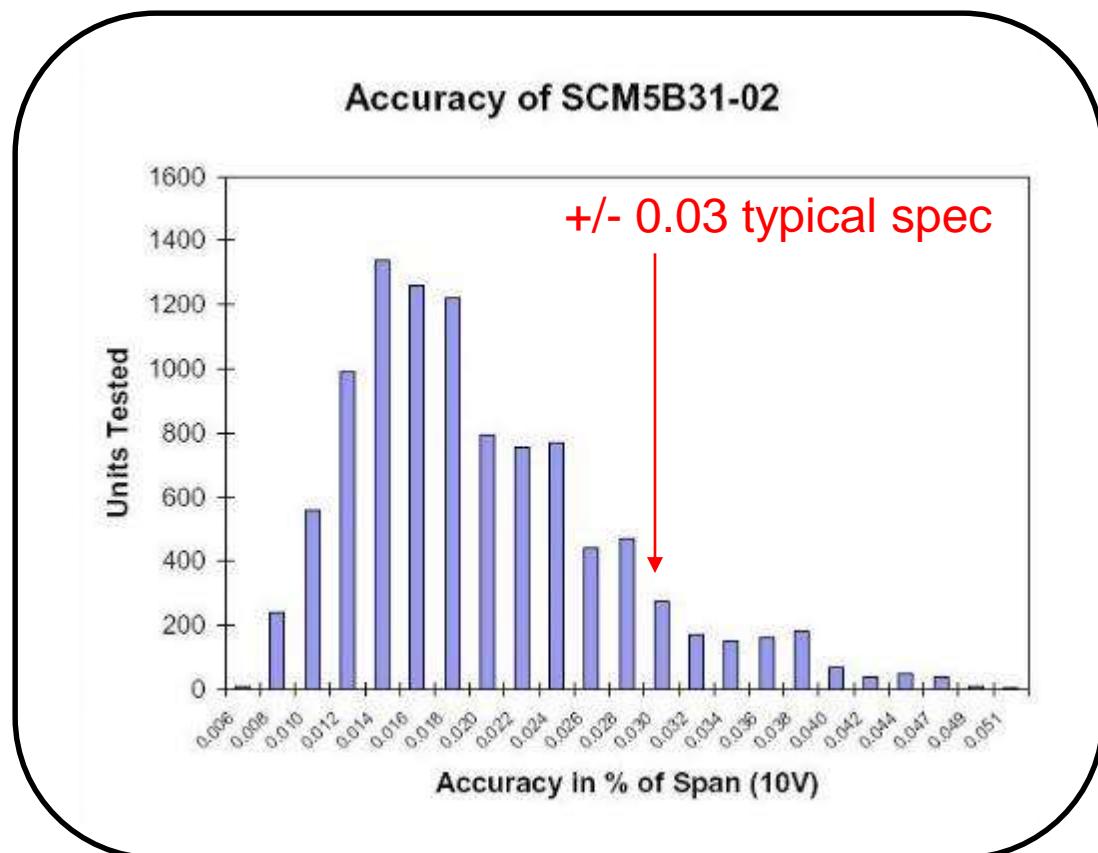
## **Typical Benefits**

- Protects Equipment from Power Surges and Voltage Transients
- Eliminates and Prevents Ground Loops
- Reduces Electrical Noise in Signal Data
- Ready to use in Industrial Environments
- System can be Easily Expanded
- Maintenance Free, MTBF > 500,000 Hrs

# Statistical Accuracy Distribution

## “INSTRUMENT CLASS®” Performance

Conservative Design  
Philosophy across all  
Modules



# **“INSTRUMENT CLASS®”**

## **Performance**

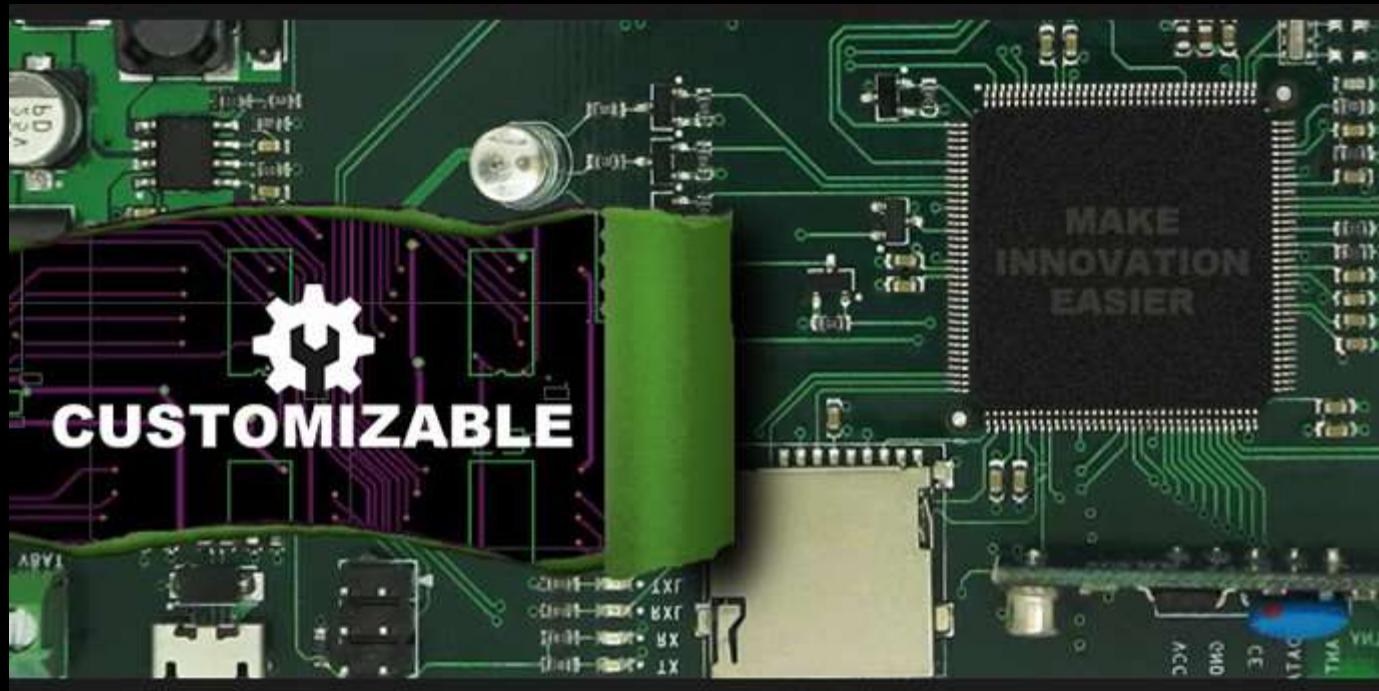
- Extremely Low Drift
- Highest accuracy
- Hazloc (Hazardous Locations) Certifications
- High Isolation



**CUSTOMIZED DESIGNS**

# CUSTOMIZED DESIGNS

Need more than our Standard Input & Outputs?



# **CUSTOMIZED DESIGNS**

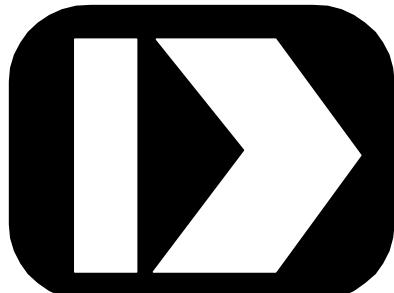
## **Financial Guidelines**

- Minimum Qty 10 on first Purchase
  - Any Qty on Subsequent Purchases
- NRE (Non-Recurring Expenses)
  - Upfront or covered by initial 10 units
- New Custom Model Added to Catalog
  - Over 400 Custom Designs (exclusivity available)

# **CUSTOMIZED DESIGNS**

## **Design Guidelines**

- Input Range Limits
  - Min +/-1mV up to +/-300V rms
- Output Range Limits
  - Max +/- 10V (8B: +/-5V)
- Bandwidth / Step Response Limits
  - 0.5Hz to 50kHz



**DATAFORTH®**

**How to choose**

**5B    7B    8B    DSCA**

# A Thousand Paths



# One Dataforth Solution

5B

DSCA

7B 8B



# **What do You need to know?**

How many channels?

Frequency response? And why?

What is the module connecting to?

Where does the output go?

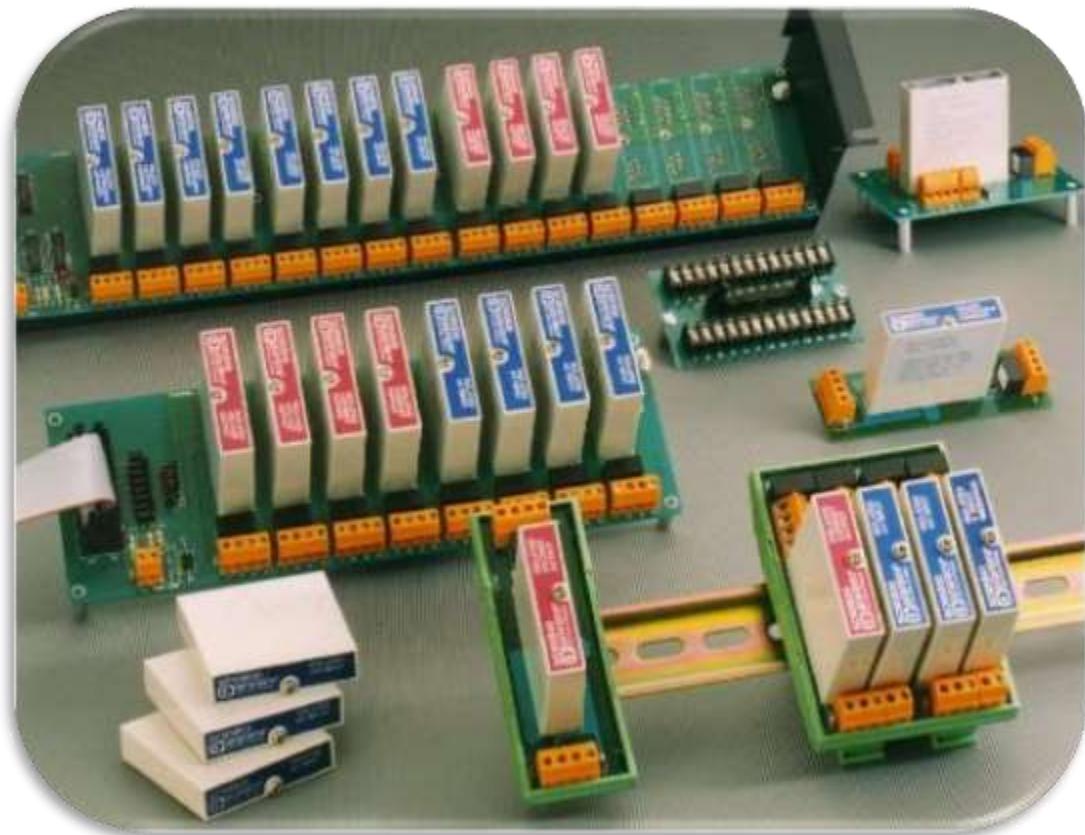
# SCM5B vs SCM7B vs 8B vs DSCA

<u>Feature</u>	<u>5B</u>	<u>7B</u>	<u>8B</u>	<u>DSCA</u>
Supply Voltage	+5Vdc +/-5%	14-35Vdc	+5Vdc +/-5%	15-30Vdc
Isolation	3 way Input-Output-Power	2 way Input - Ouput/Power	2 way Input - Ouput/Power	3 way Input-Output-Power
Input Withstand	240V rms	120V rms	240V rms	240V rms
Output Range	0-5Vdc, 0-10Vdc +/-5Vdc, +/-10Vdc 4-20mA, 0-20mA	1-5Vdc, 0-5Vdc 0-10Vdc, +/-10Vdc 4-20mA, 0-20mA	0-5Vdc +/-5Vdc 4-20mA, 0-20mA	0-5Vdc, 0-10Vdc +/-5Vdc, +/-10Vdc 4-20mA, 0-20mA
Accuracy	+/-0.03% Typical	+/-0.03% Typical	+/-0.10% Typical	+/-0.03% Typical
Nonlinearity	+/-0.005% Span	+/-0.01% Span	+/-0.02% Span	+/-0.005% Span
Output Noise	0.2uVrms	1.0mV	0.3uVrms	0.2uVrms
Output Control	Enable / Disable	Always Enabled	Always Enabled	Always Enabled
Supply Sensitivity	+/-2uV/% RTI	+/-0.0001%/%V	+/-0.0001%/%V	+/-0.0001%/%V
Dimensions (HxWxT)	2.28" x 2.26" x 0.6"	2.13" x 1.7" x 0.6"	1.00" x 1.65" x 0.41"	2.95" x 0.89" x 4.13"
Interface Pins	14	5 or 6	7	Screw Terminal
Relative Cost	***	**	*	****

# BUILD ON SUCCESS

## Existing 5B Modules Users

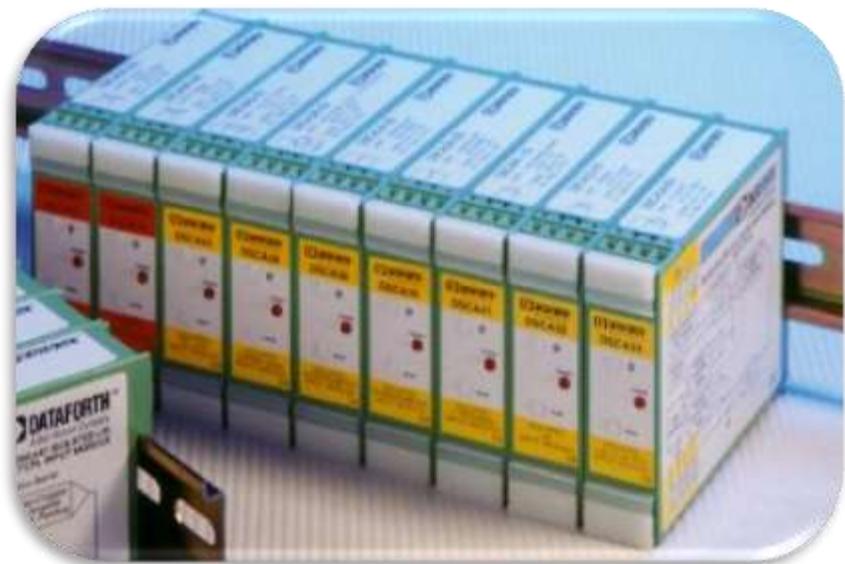
- Single
- Dual
- Quad
- 19" Rack



# **STANDALONE OPERATION**

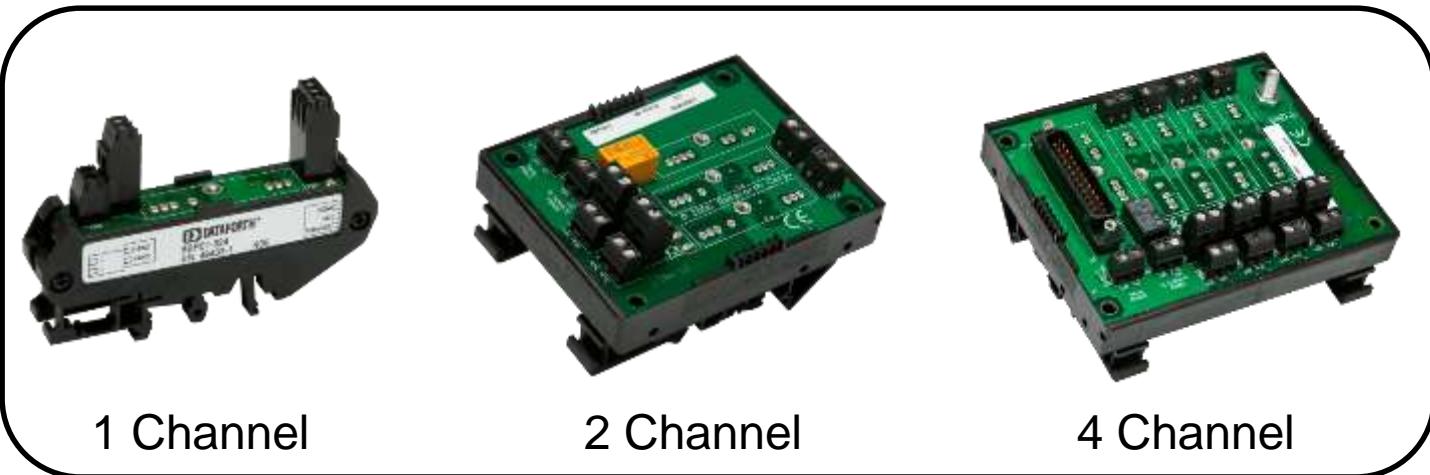
## **DSCA**

- **Available Power 15-30 vdc**
- **DIN Mounting**
- **Screw termination**



# STANDALONE OPERATION

- DIN Mounting Option
- Available Power 5 VDC
- Available Power 7-34 VDC
  - Built-in DC/DC converter





## Evolution of Data Acquisition



**MAQ®20**





**5B isoLynx<sup>®</sup>**  
**Data Acquisition System**  
**SLX200**

# 5B*iso*Lynx™ (SLX200)

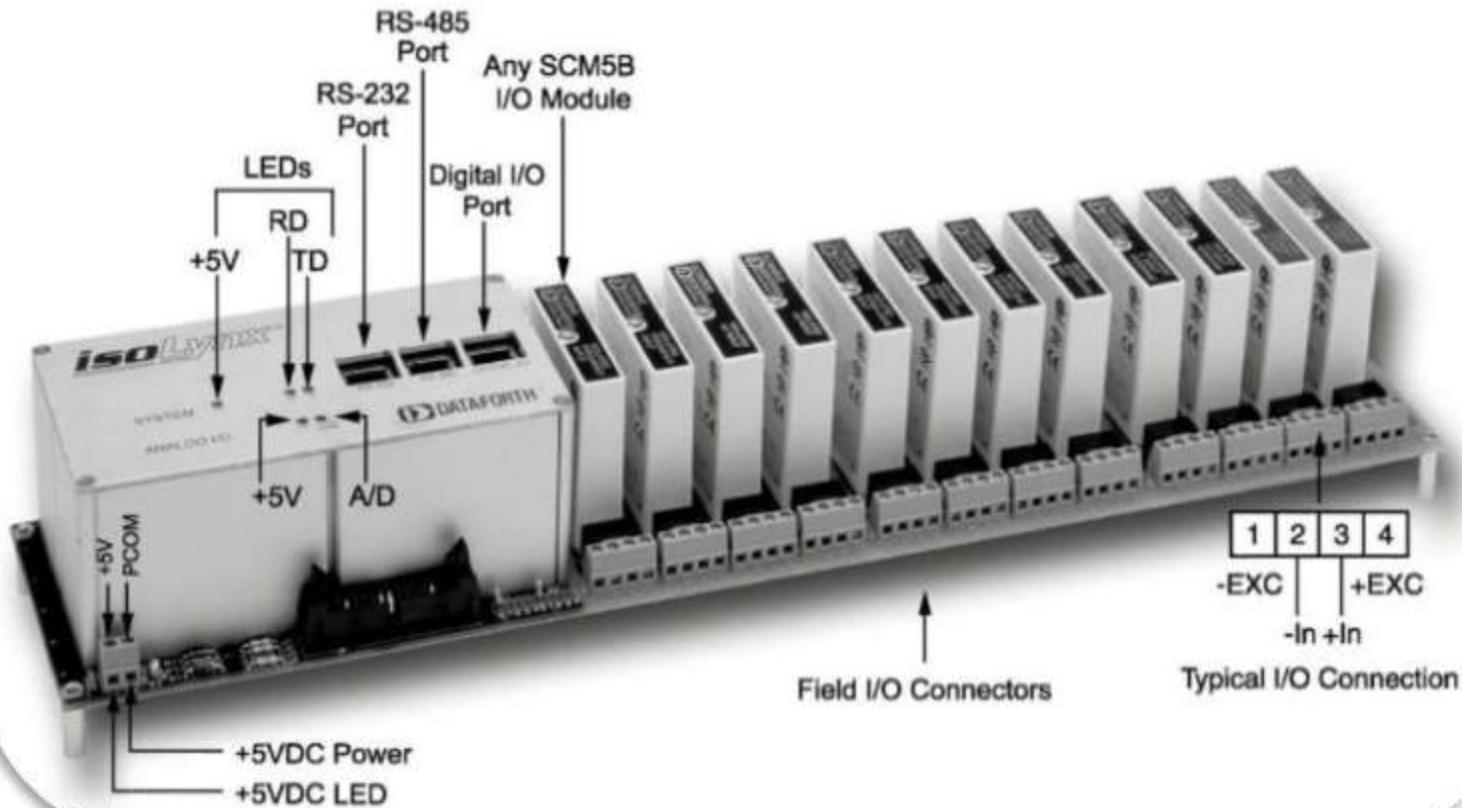


## Modular Design

- Microcontroller Module Runs in Background
- Analog I/O Subsystem
- Communications Subsystem

# 5B *isoLynx*<sup>TM</sup> (SLX200)

## *isoLynx*<sup>TM</sup> Analog I/O Base Unit



# **SLX200 Key Features**

- Individual Isolated Inputs
- Expandable
- -40°C to +85°C Operating Temp
- Modbus RTU and TCP/IP Protocol
- Uses +5VDC Power Supply

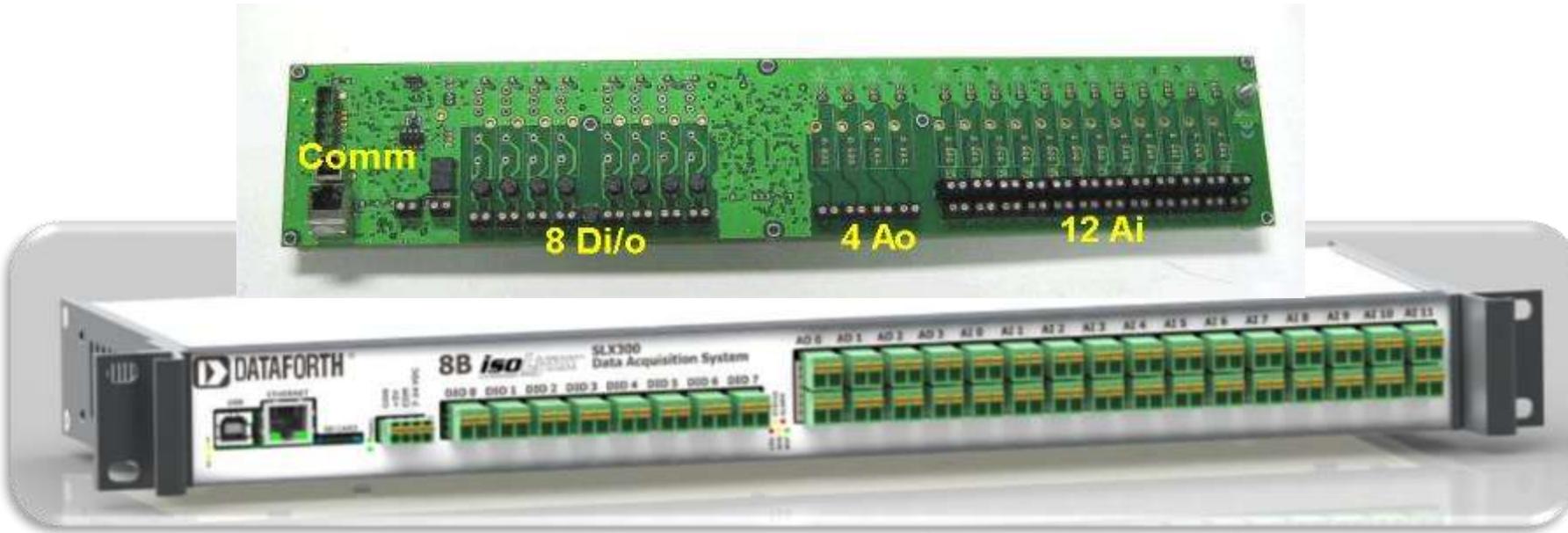


**8B isoLynx®**  
**Data Acquisition System**  
**SLX300**

# High Channel Density

## One PCB Base Board with Multifunction I/O

- 12 Channels of Analog Input Sockets
- 4 Channels of Analog Output Sockets
- 8 Channels Digital I/O Sockets
- 2 Counters / Timers (used by Di/o Sockets)
- 1 Comm Port / isoLynx Part Number



# **1U Enclosure**

Aluminum Tabletop or 19" Rack Mounting Enclosure  
Convenient Slide-off Top for Easy Module Access



# **SLX300 Key Features**

- **Competitive Multifunction I/O –**
  - Mixed Analog, Digital, Counters and Timers
- Trigger may be on any of Four-Point Alarms
- +5VDC or 7-34 VDC
- Panel or DIN Rail Mount

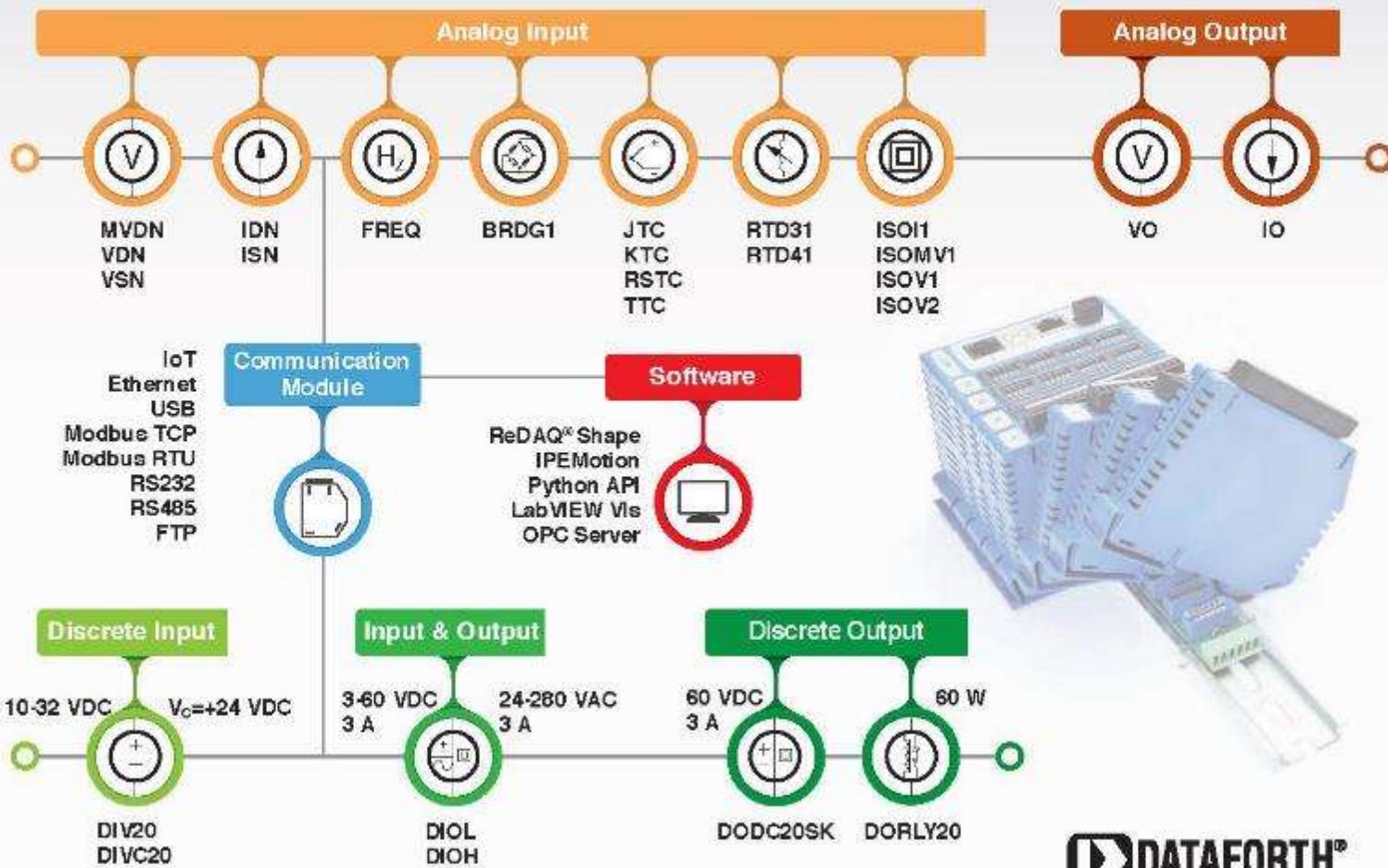


# MAQ®20

# Data Acquisition System



# The MAQ20 DAQ Eco-System

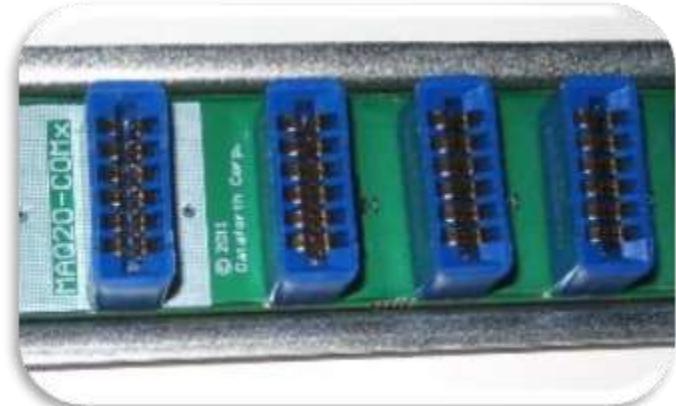


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# MAQ®20 Modular DAQ

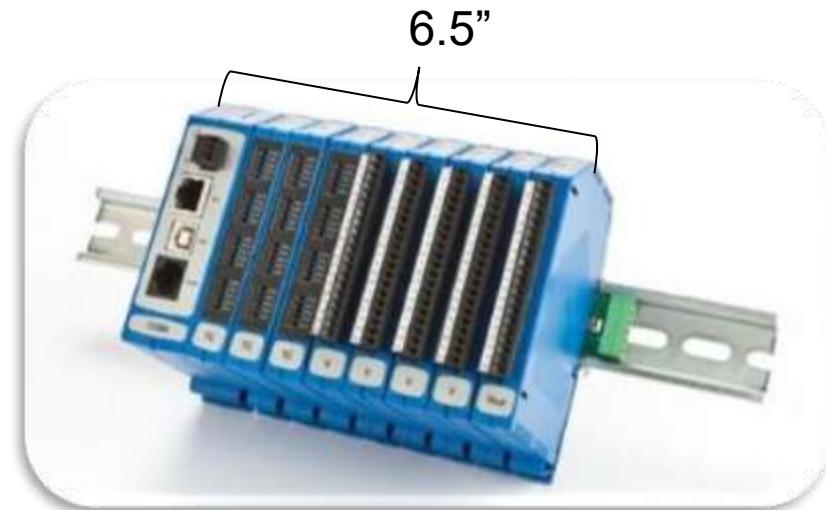
## Backbone

- Snaps into DIN Rail
- Provides Power & Comm
- Hot swappable
- Available in 4, 8, 16, and 24 sockets  
(24 sockets = 384/480 analog/digital channels)



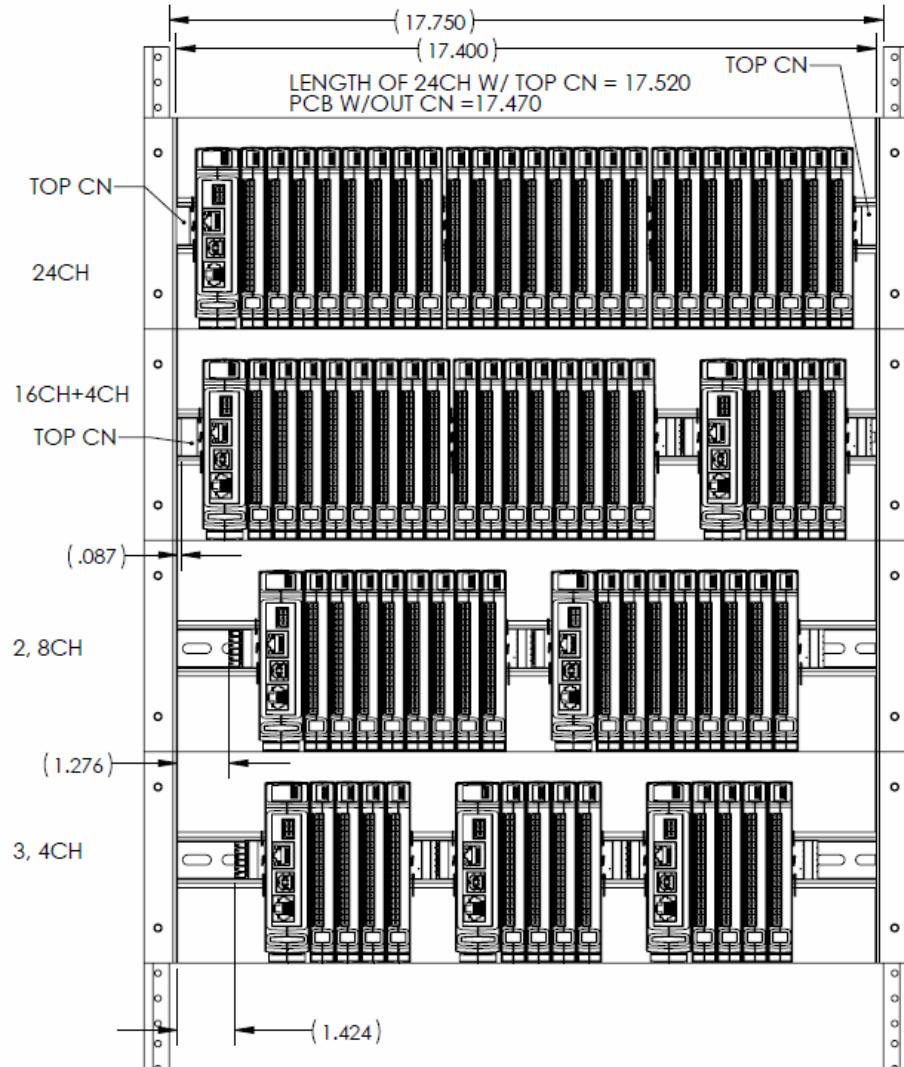
## High Density

- Up To 24 modules
- Up to 368 Analog Channels
- Up to 480 Digital Channels



# MAQ®20 Mounting Flexibility

- Many Configurations
- I/O is Distributable
- Firmware in each Module
- Watchdog timer protection
- Brownout Protection
- Reset to defined config!



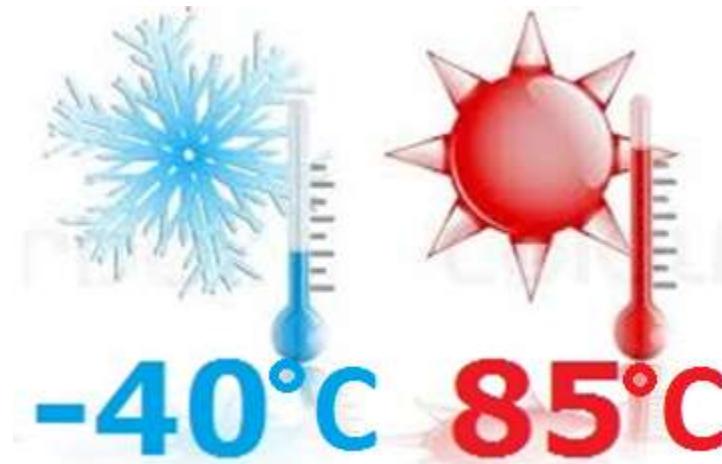
# MAQ®20 Modular DAQ

## 7 – 34 VDC Input Power

- 12VDC Battery
- Standard 24VDC



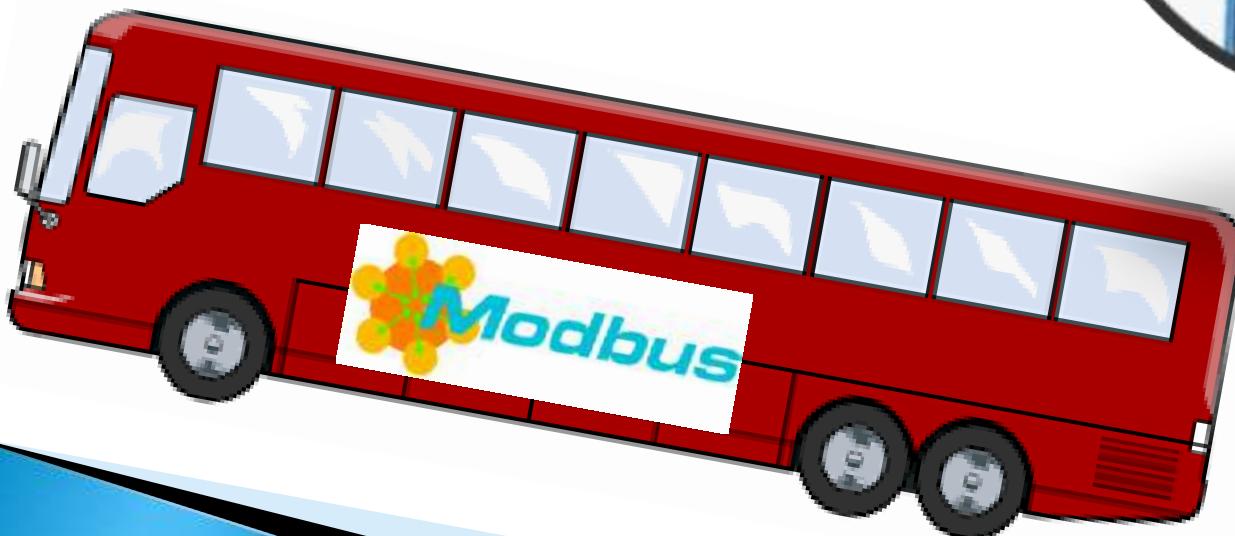
## Exceptional Operating Temperature

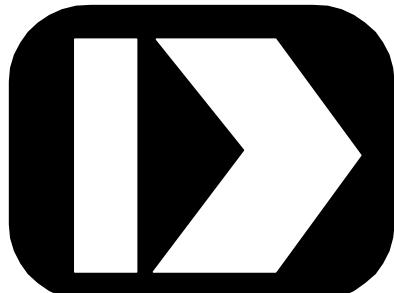


# MAQ®20 Modular DAQ

## Open Software Protocol

- Modbus TCP/IP – Ethernet based
- Modbus RTU – USB based

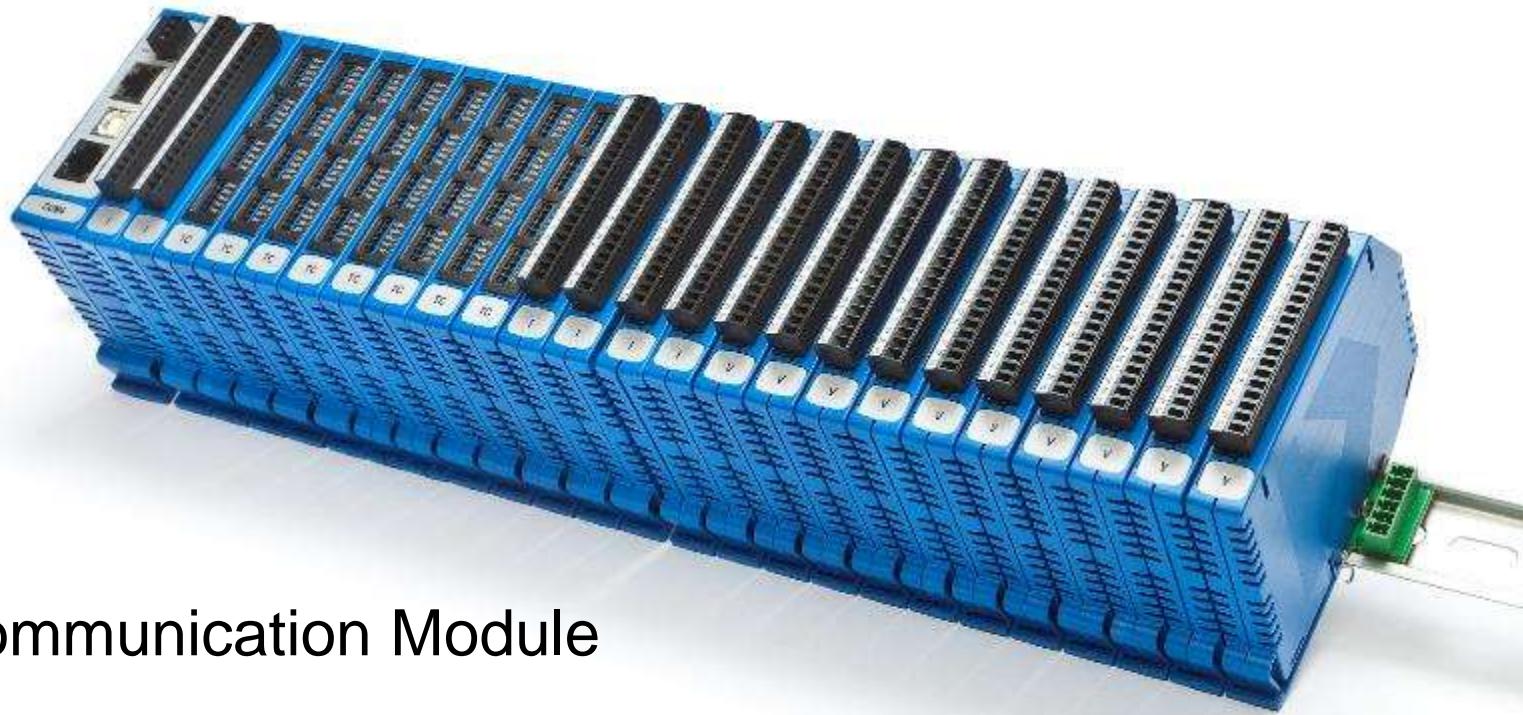




**DATAFORTH®**

**MAQ®20 Modules**

# MAQ®20 Module Overview

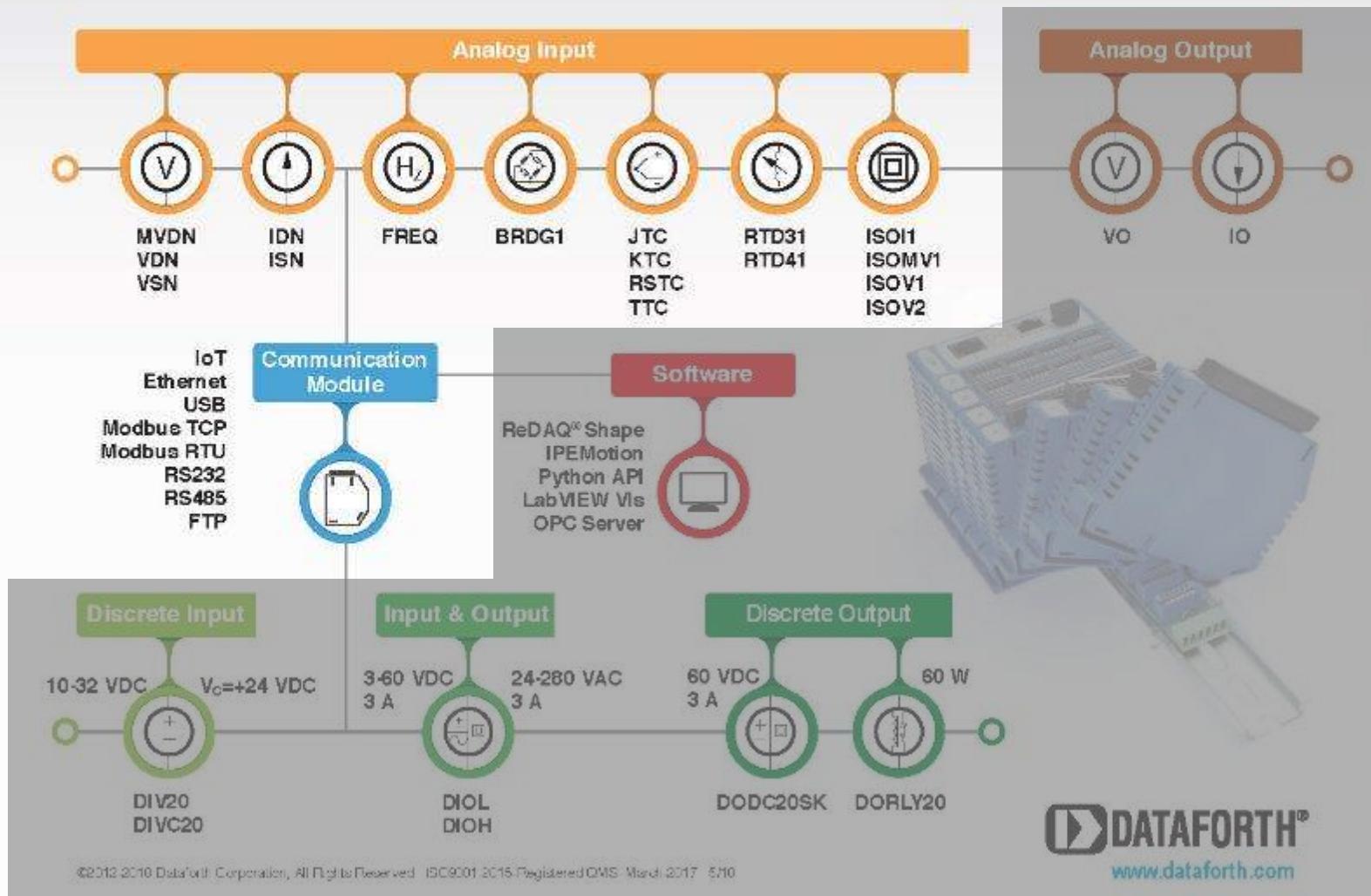


Communication Module

Analog Input / Output

Digital Input / Output

# The MAQ20 DAQ Eco-System



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# MAQ®20 Modbus Communications



- 7 to 34 VDC Power
- Ethernet – up to 4 sockets
- USB v2.0 Compatible
- RS-232 or RS-485
- 32 HW PID Control Loops
- Standard Micro SD card to 4GB storage for data-logging
- 50VDC isolation Comm-to-Bus
- 1500VAC isolation Field I/O-to-Bus

# MAQ®20 Analog Input Capabilities

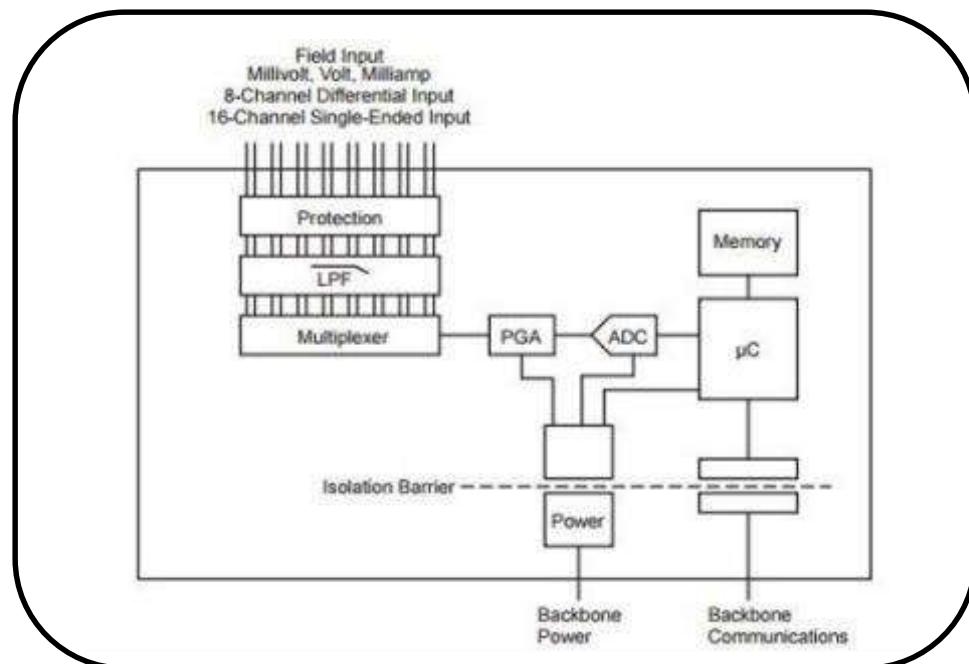


- Volt, mV, mA, TC, RTD, Pot, Strain, Frequency and more
- Narrow, high-density Modules
- Lowest Cost per Channel
- Selectable Ranges (Diff & SE)
- Each Channel is Configurable
- Alarms – Hi/Lo and Hi-Hi/Lo-Lo
- Low pass 50/60Hz Filtering

# MAQ®20 Analog Input Millivolt



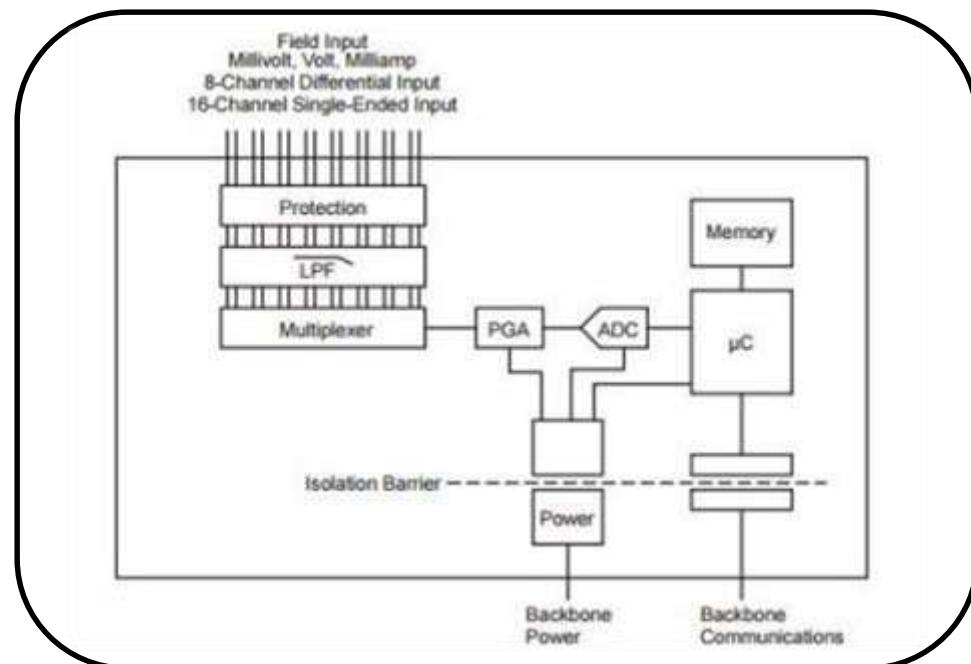
- **8 Channels, Differential Input**
  - $\pm 100\text{mV}$ ,  $\pm 250\text{mV}$ ,  $\pm 1.0\text{V}$  (Default),  $\pm 2.0\text{V}$
- **Each Channel is Configurable**
  - Input Range, Averaging & Alarms – hi/lo and hi-hi/lo-lo



# MAQ®20 Analog Input Voltage -Diff



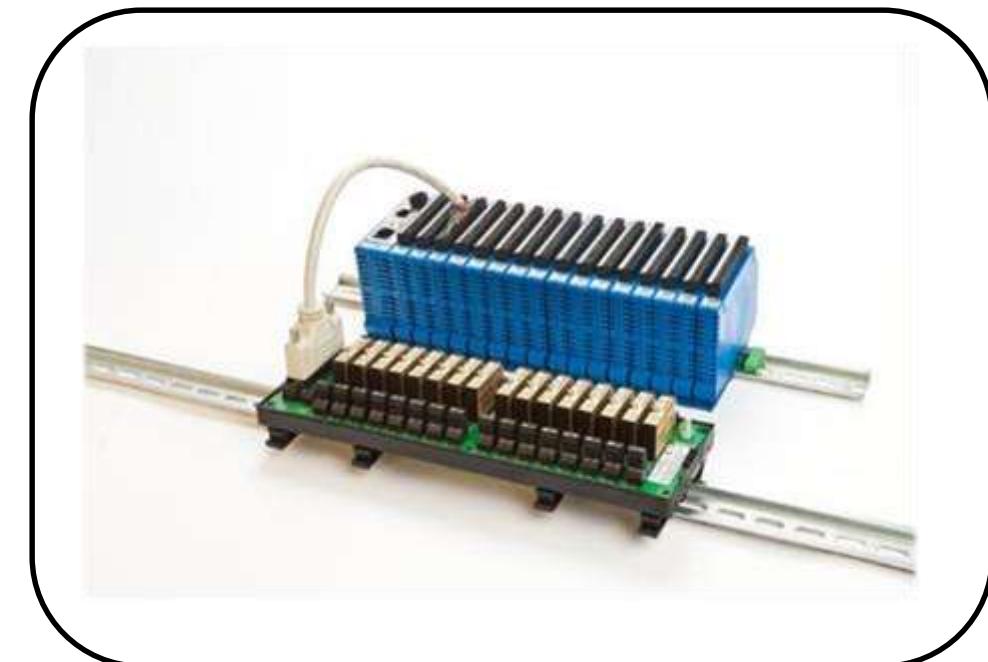
- **8 Channels, Differential Input**
  - ±5V (Default), ±10V, ±20V, ±40V, ±60V
- **Each Channel is Configurable**
  - Input Range, Averaging & Alarms – hi/lo and hi-hi/lo-lo



# MAQ®20 Analog Input Voltage -SE



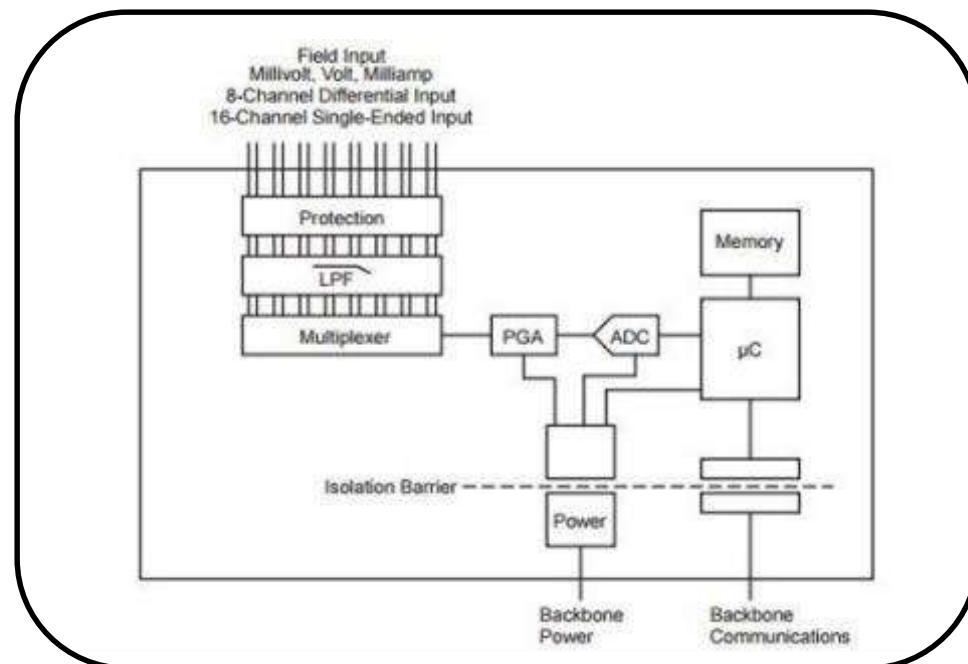
- **16 Channels, Single Ended Input**
  - $\pm 5V$  (Default),  $\pm 10V$ ,  $\pm 20V$ ,  $\pm 40V$ ,  $\pm 60V$
- **Each Channel is Configurable**
  - Input Range, Averaging & Alarms – hi/lo and hi-hi/lo-lo



# MAQ®20 Analog Input Current



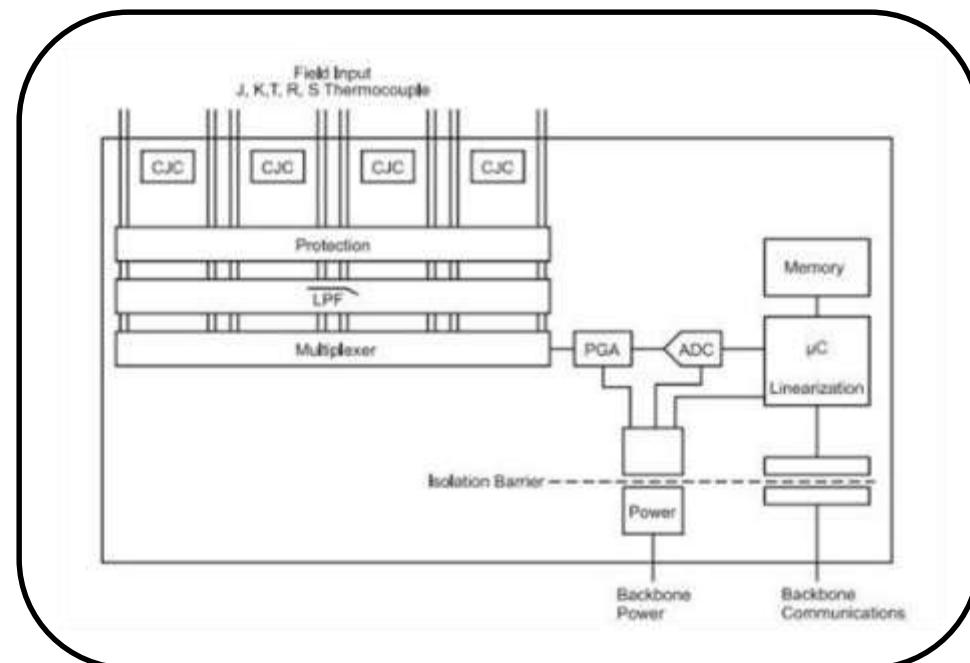
- **8 Channels, Differential Input**
  - 0-20mA, 4-20mA (Default 0-20mA)
- **16 Channels, Single Ended Input**
  - 0-20mA, 4-20mA (Default 0-20mA)



# MAQ®20 Analog Input Thermocouple



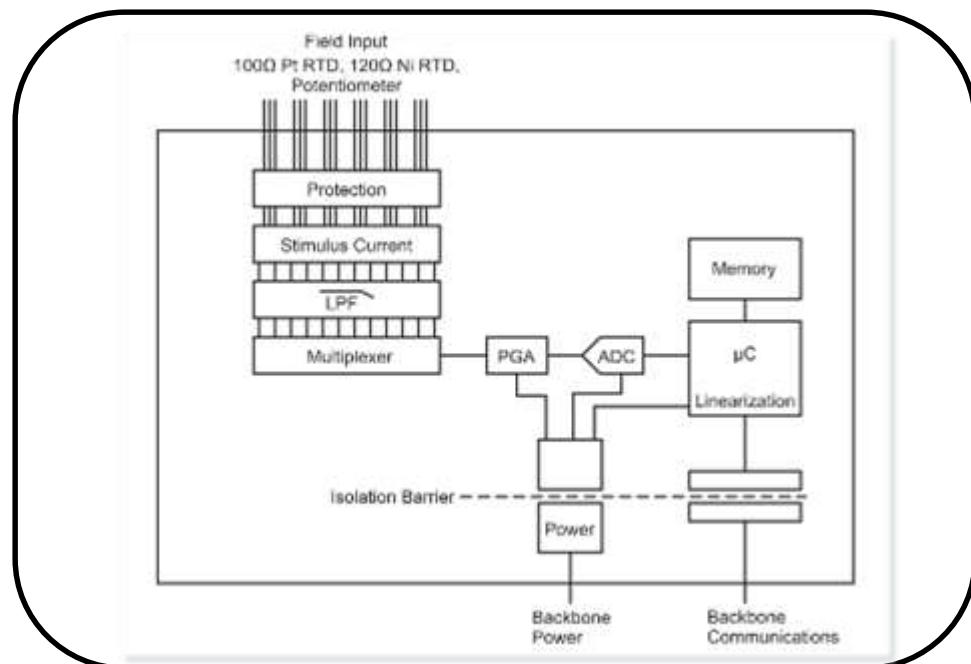
- 8 Channels, Differential Input
- Interface to Types J, K, T , R & S Thermocouples
- Each Channel is Configurable
- Selective Enabling of Module Channels for Scanning



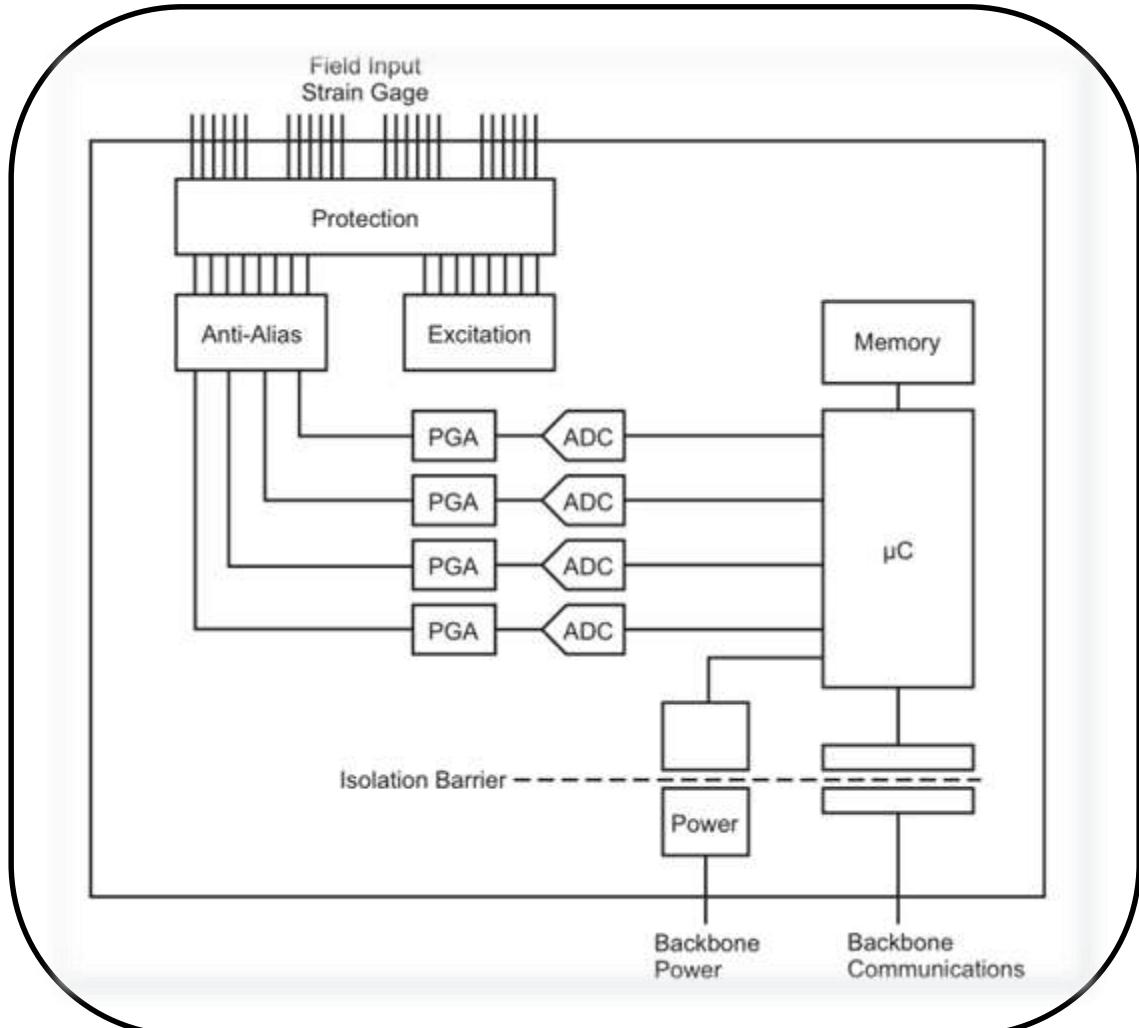
# MAQ®20 Analog RTD31



- 6 Channels, Pt100, Ni120, 3-wire
- Overvoltage to 240Vrms
- Each Channel is Configurable
- Open Input -Upscale or Downscale
- Interfaces to potentiometers and slidewires



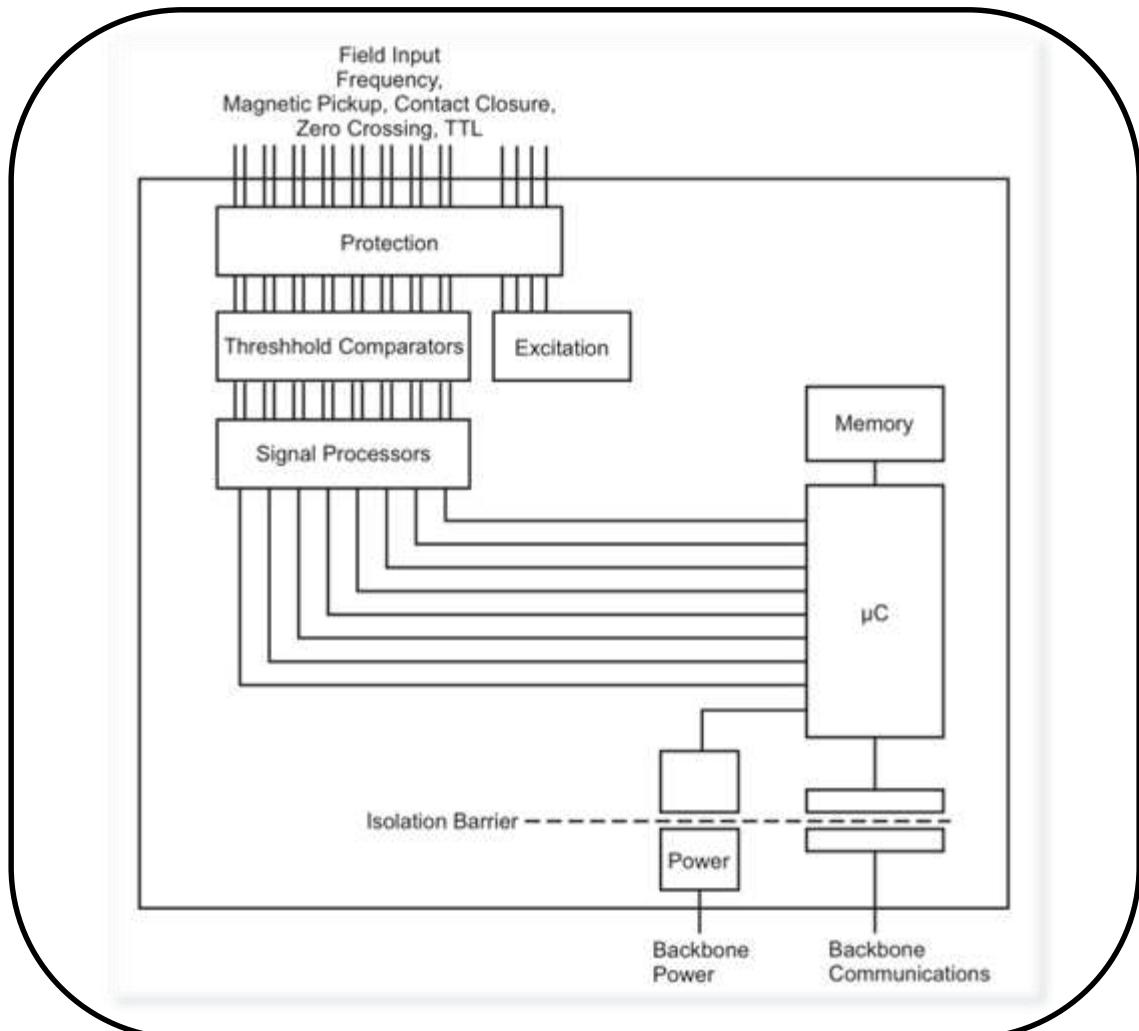
# MAQ®20 Analog BRDG1



# **MAQ®20 Analog BRDG1**

- **4 Input Channels for 4-Wire or 6-Wire Sensors**
- **Interface to Full and Half Bridge**
- **Quarter Bridge with external bridge completion**
- **Channels Individually Configurable for Range, Alarms, Averaging**
- **Programmable Sampling Rate & Resolution**
- **Simultaneous Sampling of Input Signals**
- **Burst Mode for Capturing Fast Events**
- **Programmable Bandwidth, Excitation, Shunt Calibration**
- **1500Vrms Input-to-Bus Isolation**
- **Channels Protected up to 30Vrms Continuous Overload**

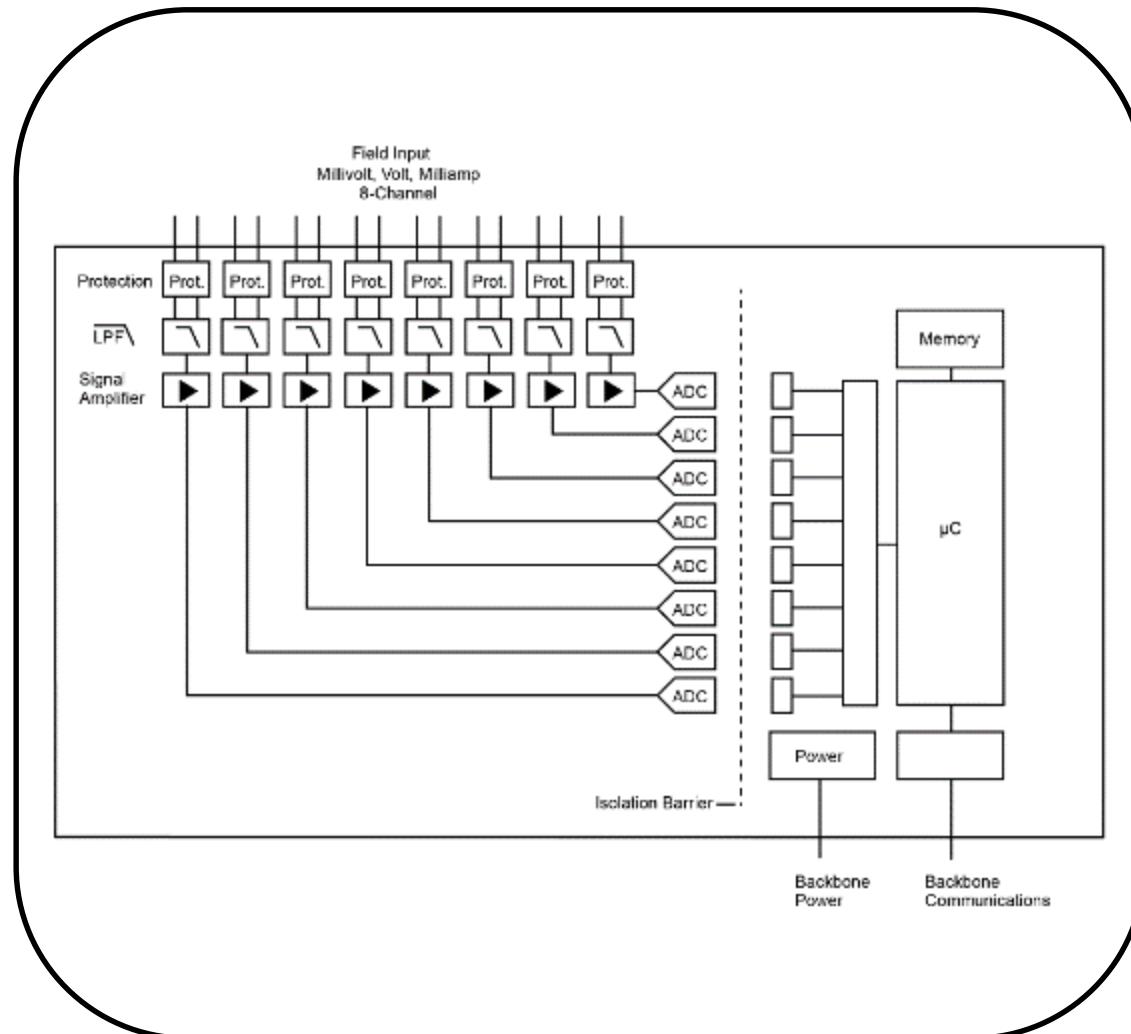
# MAQ®20 FREQUENCY INPUT



# **MAQ®20 FREQUENCY INPUT**

- **8 Input Channels**
- **50mV Sensitivity**
- **Frequency Range 1Hz to 1MHz plus State Change**
- **Operating Range DC + Signal ≤ 300Vrms**
- **Channels Individually Configurable for Range and Alarms**
- **4 Excitation Sources to Power Sensors or to Provide 5V Logic Compatible Output**
- **1500Vrms Input-to-Bus Isolation**
- **Each Channel Protected up to 240Vrms**
- **Selective Enabling of Module Channels for Scanning**

# MAQ®20 Analog Isolated Inputs ISOMV1 / ISOV1 / ISOV2 / ISOI1

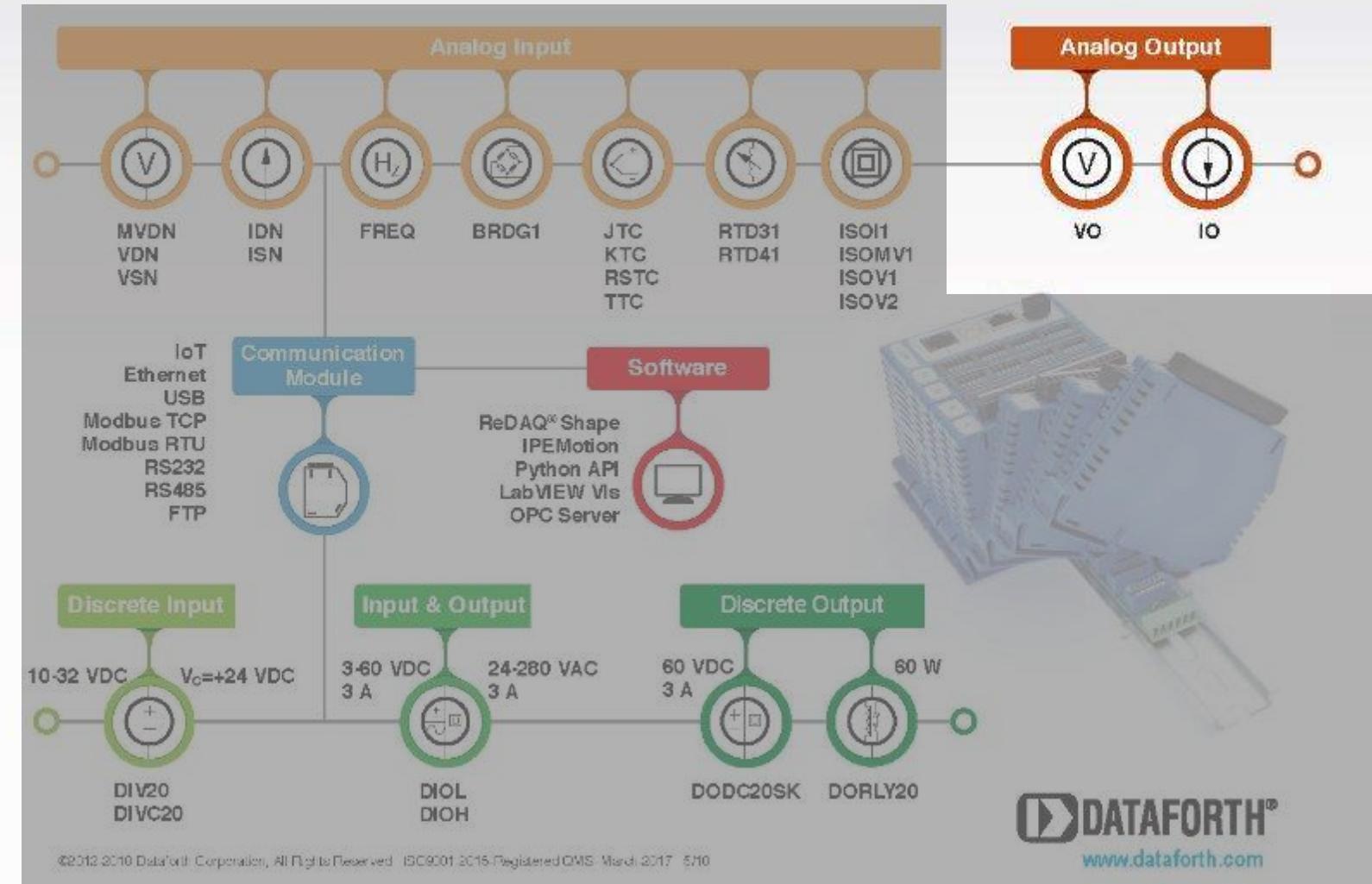


# **MAQ®20 Analog Isolated Inputs**

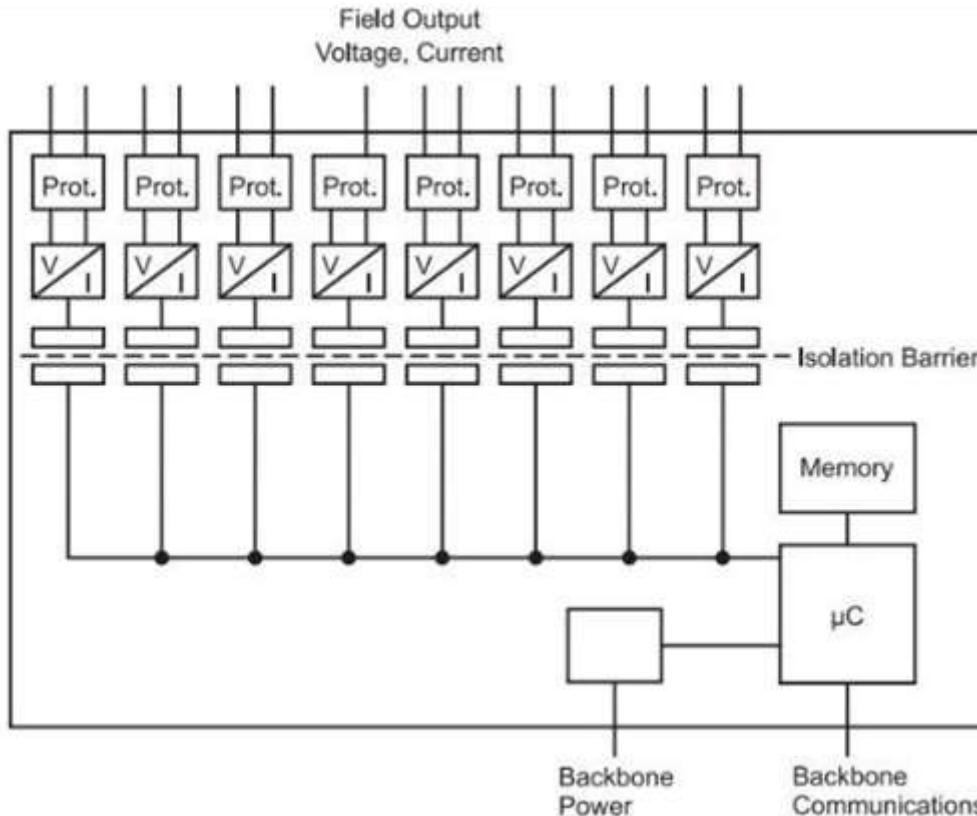
## **ISOMV1 / ISOV1 / ISOV2 / ISOI1**

- 8 Channel Millivolt, Volt, Milliamp Input**
- $\pm 50\text{mV}$  to  $\pm 60\text{V}$ , 0-20mA Input Capability**
- Up to 50kHz Bandwidth**
- 240VAC Withstand**
- 300VAC Ch-to-Ch Isolation**
- 1500 VAC Field to System Isolation**
- Open Circuit Detect**
- CJC Temp Sensors (Future Model)**

# The MAQ20 DAQ Eco-System



# MAQ®20 Analog Output



# MAQ®20 Analog Output Voltage

- **8 Isolated Channels**
- **0-2.5V, 0-5V, 0-10V, ±2.5V, ±5V, ±10V (Default)**
- **Isolated Field-Side Connections**
- **300Vrms Channel - Channel**
- **Selectable Ranges**
- **Can output wave shapes**
- **Power-on Delay**

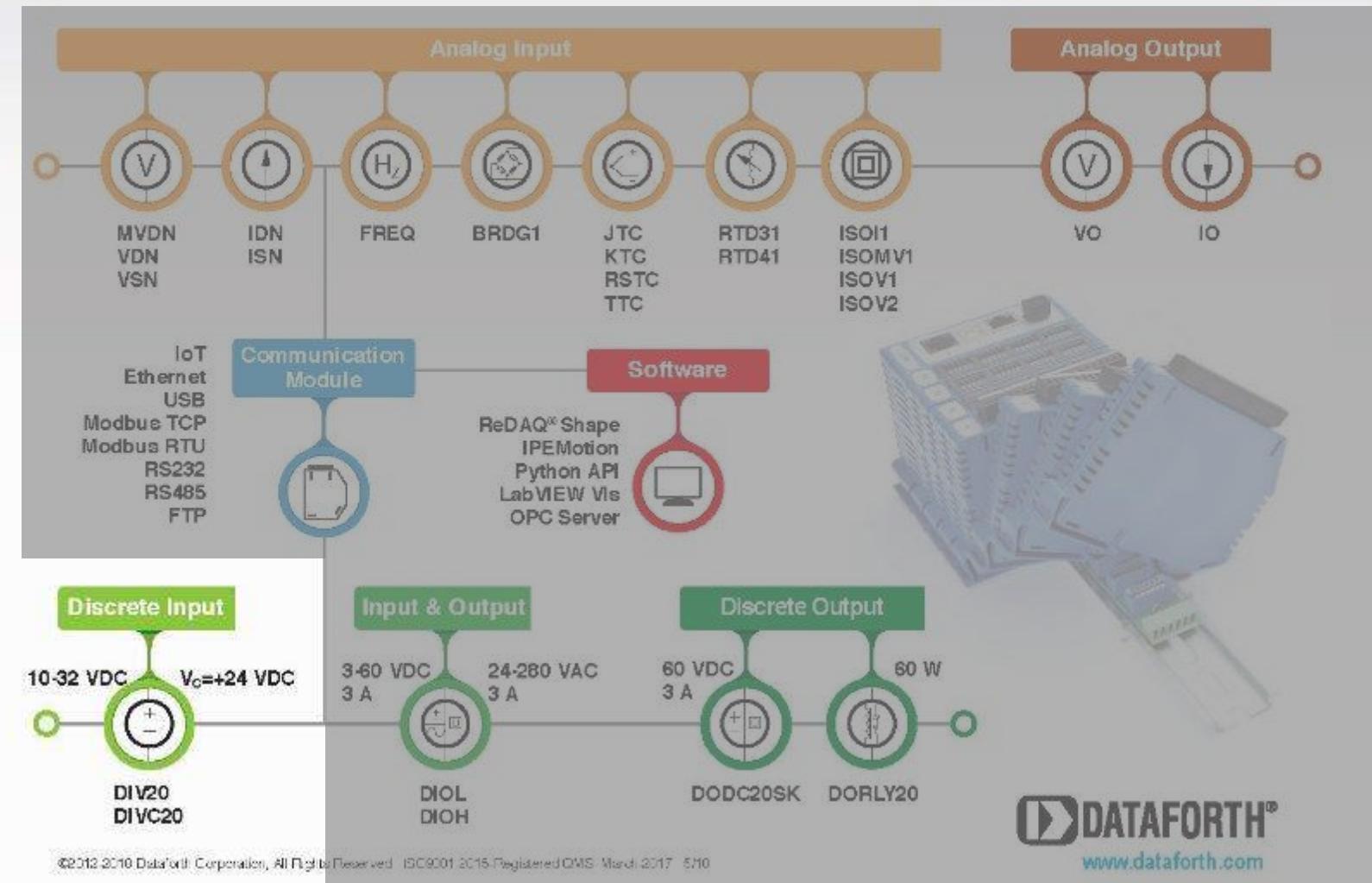


# MAQ®20 Analog Output Current

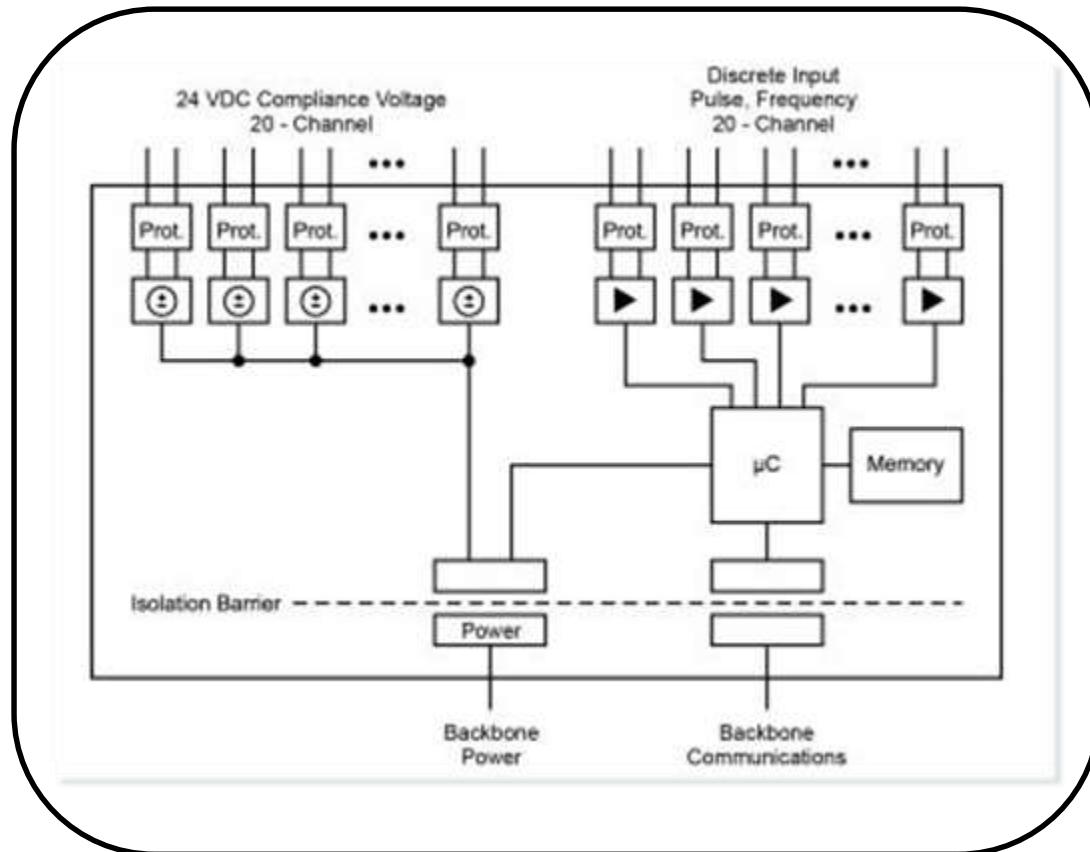
- 8 Isolated Channels
- 0-20mA (Default), 4-20mA
- Isolated Field-Side Connections
- 300Vrms Channel - Channel
- Selectable Ranges
- 40Vrms Overload protection



# The MAQ20 DAQ Eco-System



# MAQ®20 Discrete Input High Density 20 Channels



# **MAQ®20 Discrete Input High Density with or without Compliance Voltage**

**20 Discrete Input Channels**

**User-Defined Logic Polarity**

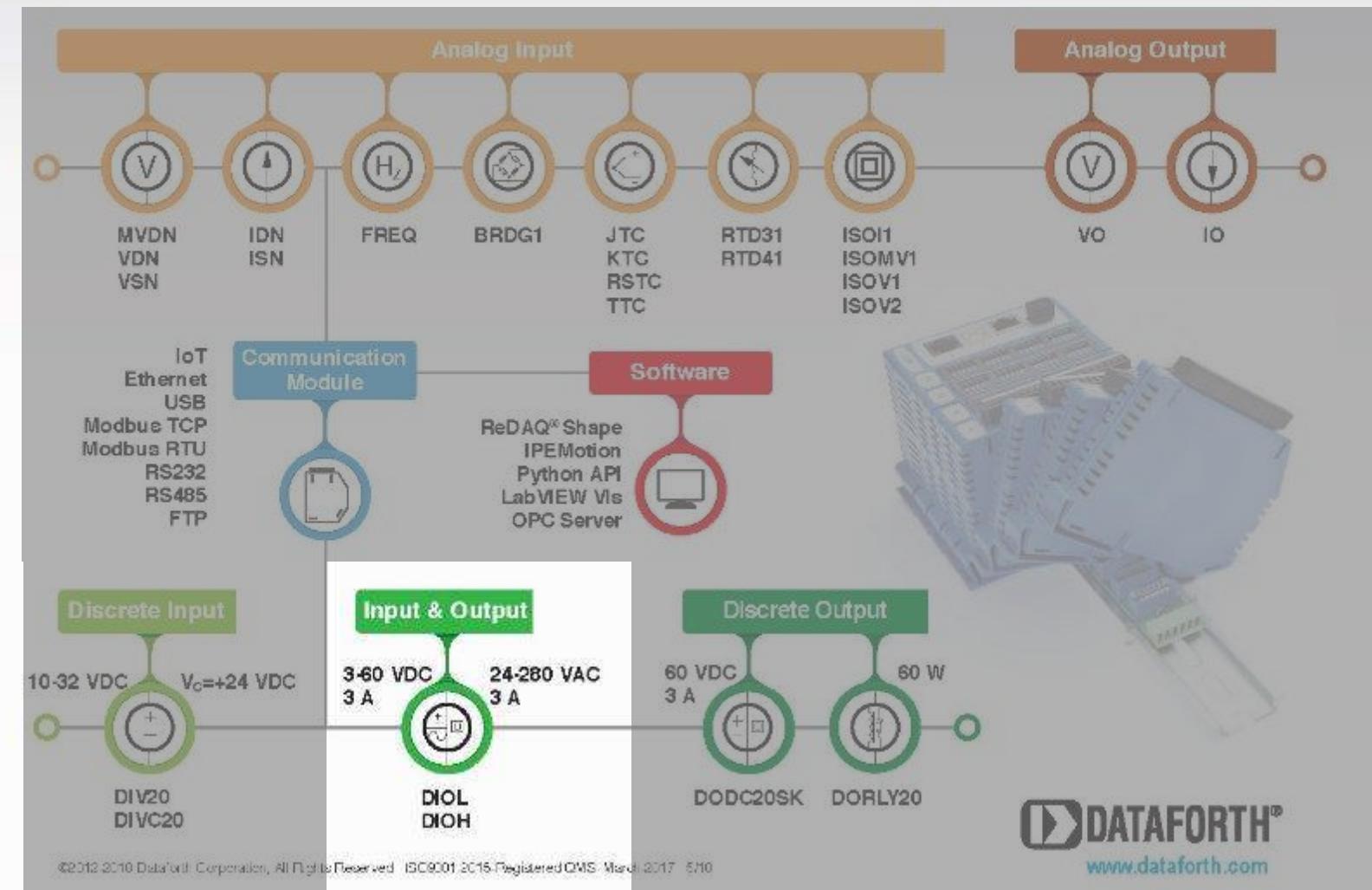
**Channels Switched Individually or in Blocks**

**1500Vrms Input-to-Bus Isolation**

**150Vrms Continuous Overload Protection**

**+24VDC Compliance Voltage (MAQ®20-DIV20C only)**

# The MAQ20 DAQ Eco-System



# MAQ®20 Discrete I/O Capabilities

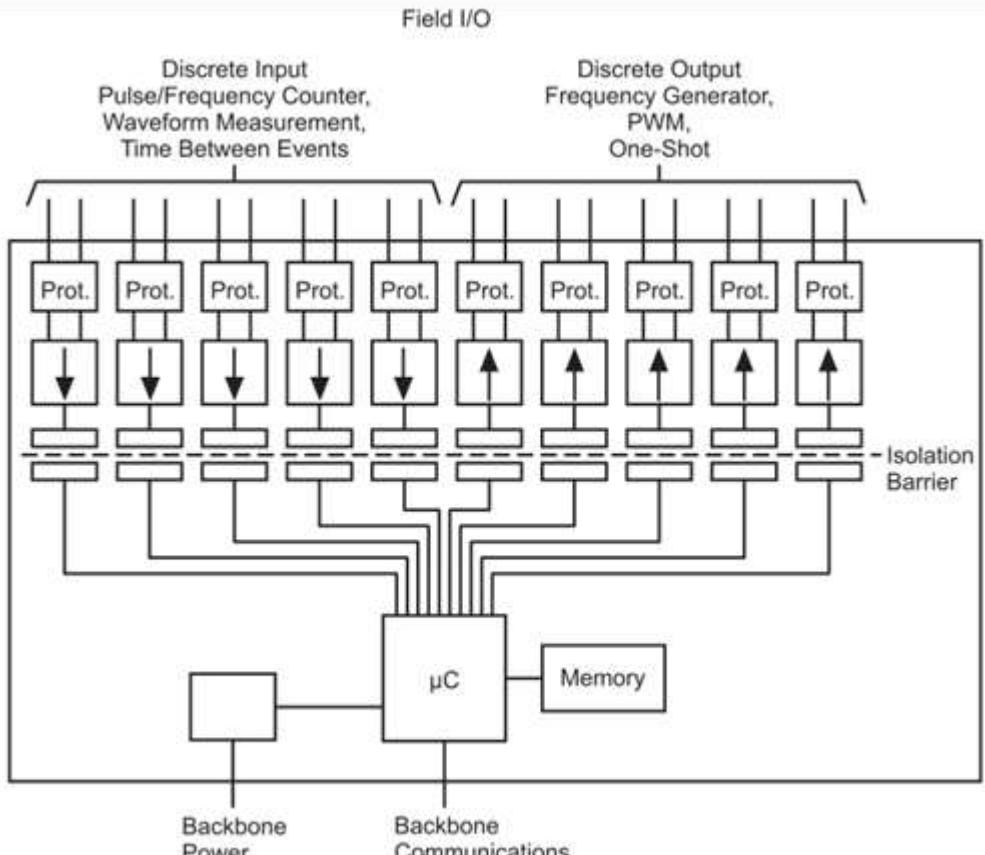
- LO and HI Voltage Models
  - DIOL (low voltage): 5 DI & 5 DO per Module
  - DIOH (high voltage): 4 DI & 4 DO per module
- Alarms Settable on each Input
- Special Functions (DIOL only) ...
  - *Pulse/Frequency Counter*
  - *Waveform Measurement*
  - *Time Between Events*
  - *Frequency Out Generator*
  - *PWM Generator*
  - *One-Shot Generator*



# **MAQ®20 Discrete I/O Capabilities**

- **Pulse/Frequency Ctr.** = Count to 10M, Freq to 10kHz, RPM to 65k
- **Waveform Measurement** = Up to 500Hz at 1% Accuracy
- **Time Between Events** = Min, Max, Avg, with selectable timebase
- **Frequency Generator** = Up to 700Hz at 1% Accuracy
- **PWM Generator** = Selectable timebase
- **One-Shot Pulse Gen.** = 100us min, programmable pre- and post-delay
- **Alarms** = High / High-High and Low / Low-Low
- **Scan Rate** = 3500 Ch/s

# MAQ®20 Discrete DIOH



# **MAQ®20 Discrete DIOH**

**Rugged Isolation and Protection for Industrial Control**

**User-Defined Default Output and Output Waveform**

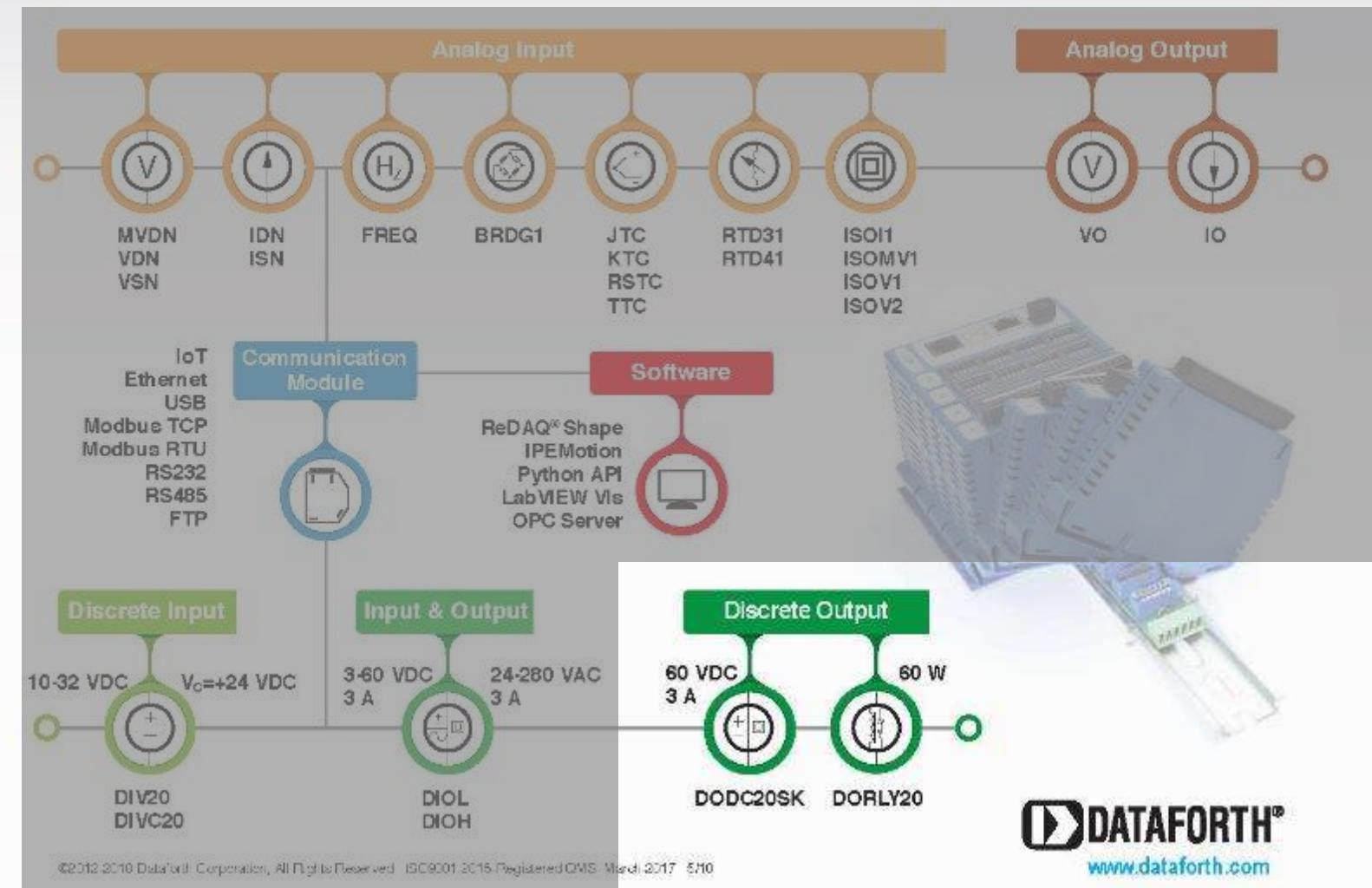
**3 High Performance Special Functions**

**1500Vrms Input-to-Bus Isolation**

**300Vrms Channel-to-Channel Isolation**

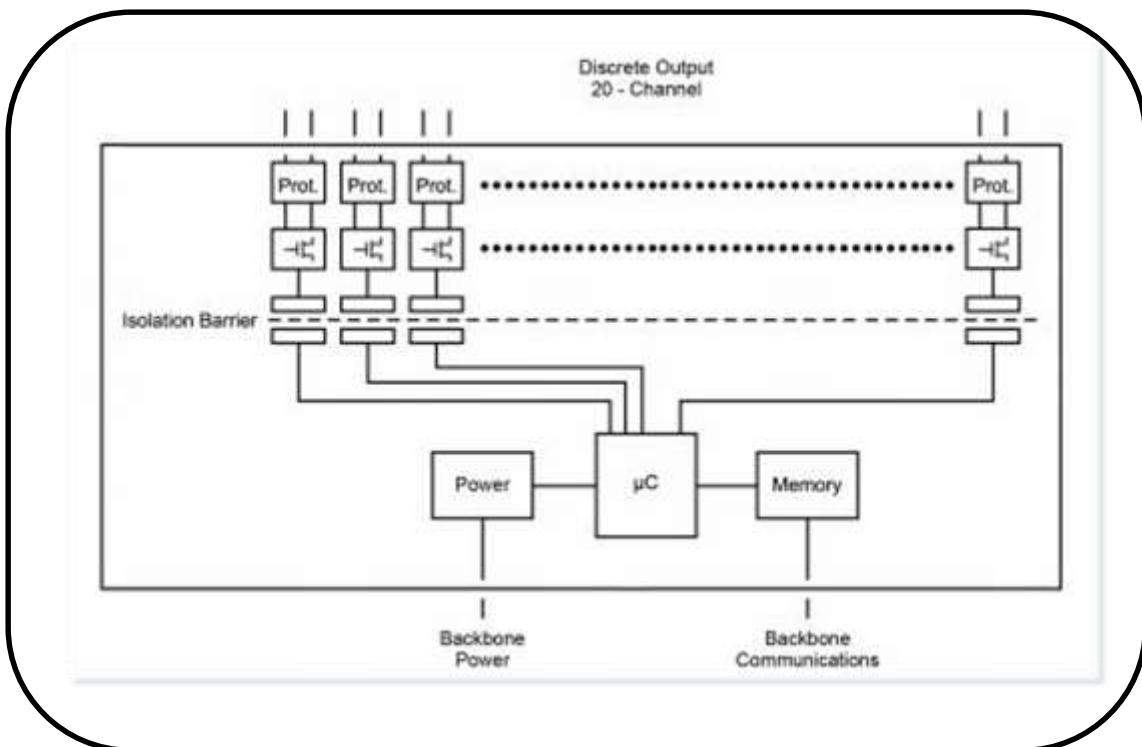
**Continuous Overload and Reverse Protection**

# The MAQ20 DAQ Eco-System



 **DATAFORTH®**  
[www.dataforth.com](http://www.dataforth.com)

# MAQ®20 Discrete Output High Density 20 Channels



# **MAQ®20 Discrete Output High Density 20 Channels**

**20 Isolated Channels @ 60VDC, sink up to 3A**

**User-Defined Logic Polarity Output**

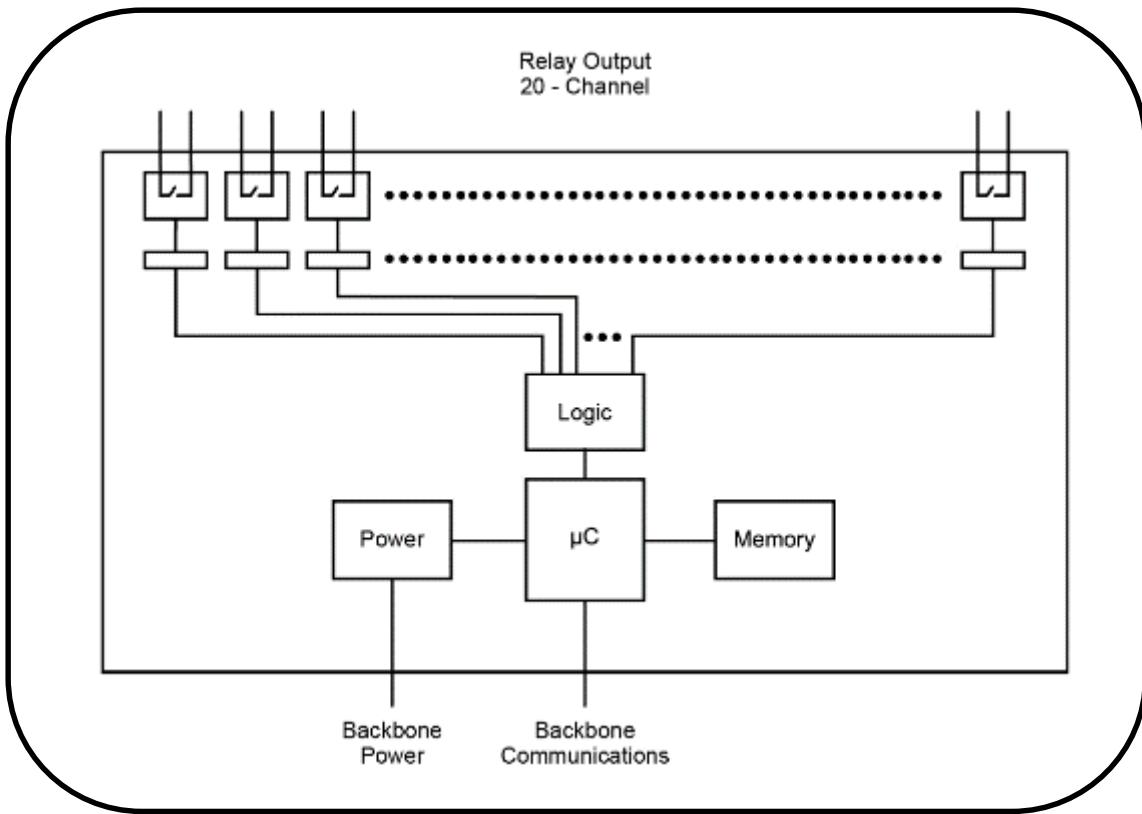
**Channels Switched Individually or in Blocks**

**1500Vrms Input-to-Bus Isolation**

**150Vrms Channel-to-Channel Isolation**

**Continuous Overload and Reverse Protection**

# MAQ®20 Relay Output High Density 20 Channels



# **MAQ®20 Relay Output High Density 20 Channels**

- **20 Isolated SPST Latching Relay Output Channels**
- **Switch Between 2A at 30V and 0.4A at 150V**
- **User-Defined Logic Polarity Output, Power Up, Power Down and Last Set States**
- **Channels Switched Individually or in Blocks**
- **1500Vrms Input-to-Bus Isolation**
- **150Vrms Channel-to-Channel Isolation**
- **Relays State Readback on Each Channel**
- **External Connection Allows Alternate Modes of Operation**

**SPDT, DPDT, Cross Point Matrix**

**Differential Multiplexer, 20:1 Multiplexer**

# MAQ®20 Certifications

- UL CL 1-Div 2 Groups A,B,C and D Pending
- ATEX Pending
- CE Certification Complete (Self-Certified)
- Emission EN61000-6-4 ISM Group 1 Class A
- Immunity EN61000-6-2 ISM Group 1 Perf A/B



# MAQ®20 ADVANCED CJC DESIGN

- Temp gradients...convective heating, air currents, local heat sources
- Typical system measures 8C gradient top to bottom of module
  - We use 4 embedded CJC sensors, one for every 2 channels
  - Our CJC accuracy  $\pm 0.25^\circ\text{C}$  at  $25^\circ\text{C}$  ambient,  $\pm 1.0^\circ\text{C}$  -40°C to +85°C
  - MAQ20-J/K/T/RS TC, \$270 U.S. list price
- Competition

	<b>NI</b>	<b>Advantech</b>	<b>Opto22</b>	<b>WAGO</b>	<b>Dataforth</b>
Model	9214 16 Ch	5018P-AE 7 Ch	SNAP-AITM 2 Ch	750-469 2 Ch	<b>MAQ20-xTC 8 Ch</b>
CJC at 25 °C	0.25C	No Spec	No Spec	No Spec	<b>0.25 °C</b>
CJC over range	0.9°C -40 to +70°C	No Spec	No Spec	No Spec	<b>1.0°C -40 to +85 °C</b>
Cost	\$1345 USD \$84/Ch	\$270 USD \$39/Ch	\$195 USD \$97/Ch	\$340 USD \$170/Ch	<b>\$270 USD \$34/Ch</b>

# **MAQ®20 COMPETITIVE ADVANTAGES**

**Advanced CJC Design Exceeds Competition Accuracy**

**Over Ranging V or I Input Ch Has No Effect on Other Chs**

**Backbone Does Not Use Multiple Pin and Socket Connectors**

**Auto-Load Sharing Power Boost Module Only One in Industry**

**PID Interface in Shape is One of Easiest to Use**



# Software

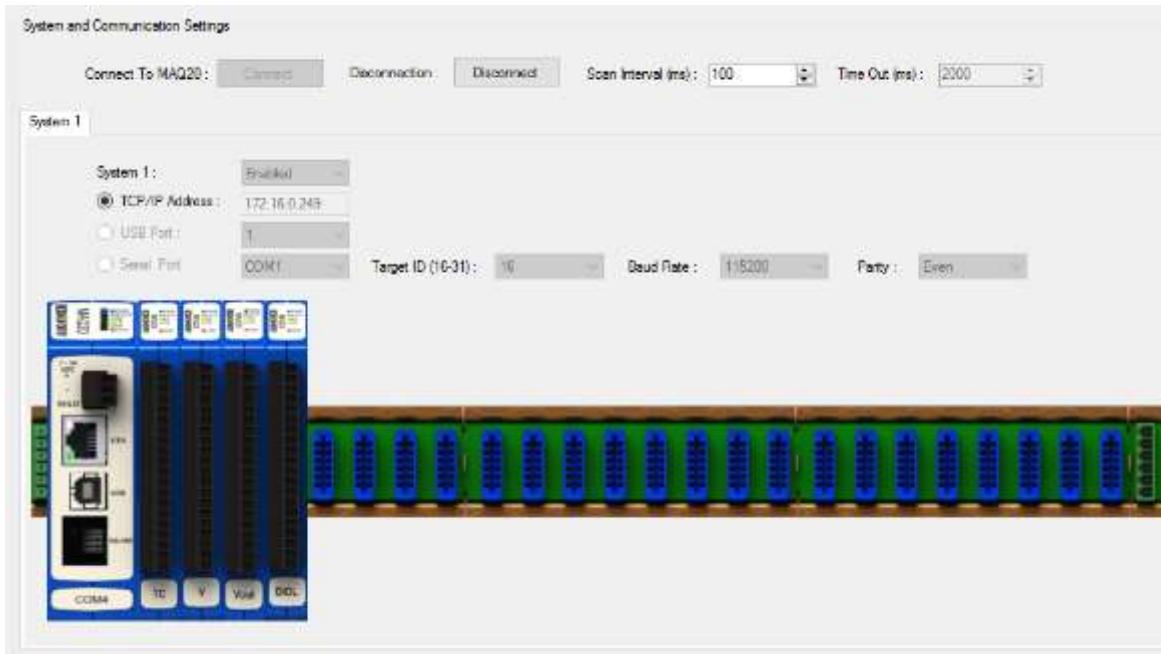
## ReDAQ® Shape

# ReDAQ® Shape Overview



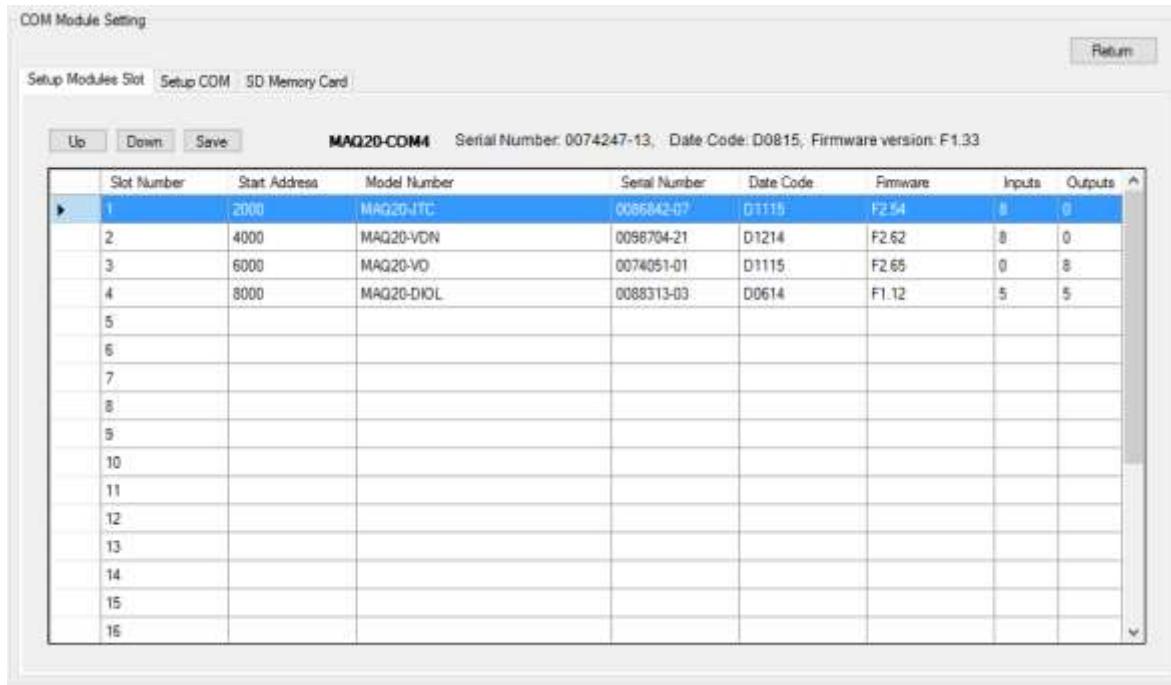
- Developed by Dataforth specifically for MAQ®20, designed with Microsoft's Visual Studio and National Instruments' Measurement Studio
- MAQ®20 Hardware Configuration
- Record Data
- Display via Graphical User Interface (GUI)

# ReDAQ® Shape Acquire



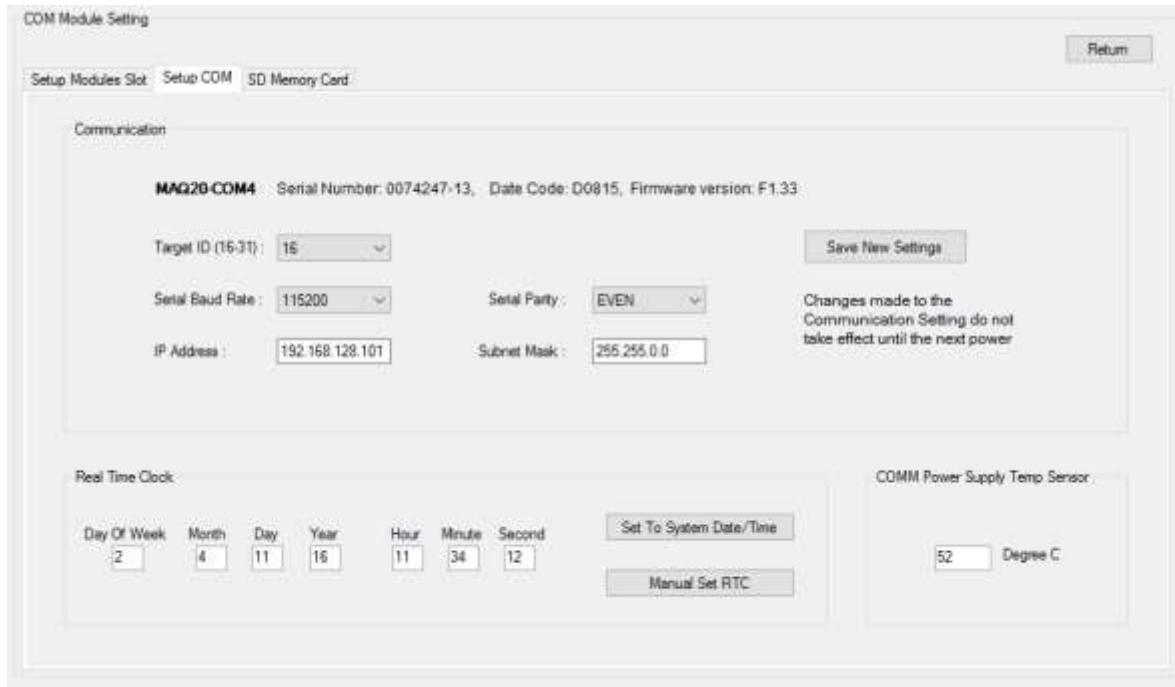
- Configure MAQ®20 Connection
- Connect Via TCP/IP, USB and Serial (RS232/485 COMx Dependant)
- Set Software Scan Interval

# ReDAQ® Shape Acquire



- MAQ®20 COMx Configuration
- IO Module Slots (Base Address)
- Network Settings
- SD Card Logging Options

# ReDAQ® Shape Acquire



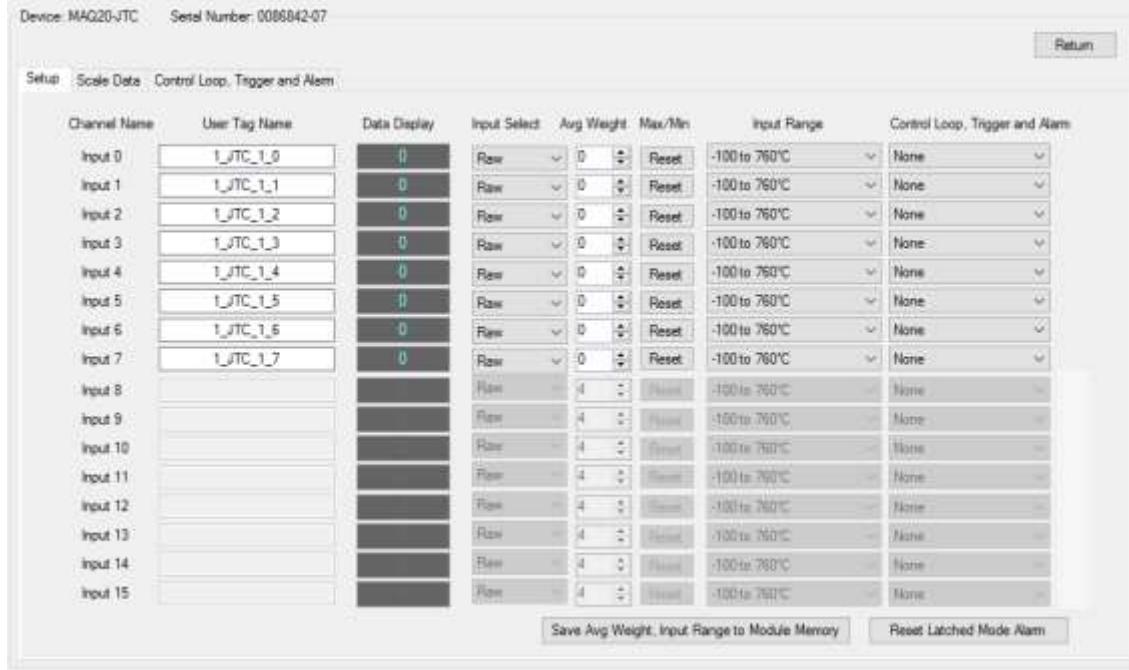
- MAQ®20 COMx Configuration
- IO Module Slots (Base Address)
- Network Settings
- SD Card Logging Options

# ReDAQ® Shape Acquire



- MAQ®20 COMx Configuration
- IO Module Slots (Base Address)
- Network Settings
- SD Card Logging Options

# ReDAQ® Shape Acquire



- IO Module Configuration
- Data Scaling
- IO Tag, Averaging, Input Range, Alarm Enable
- Alarm Configuration

# ReDAQ® Shape Acquire

Device: MAQ20-JTC    Serial Number: 0066642-07    [Return](#)

Setup   Scale Data   Control Loop, Trigger and Alarm

Channel Name	Full Scale	Scale To	Offset	Unit	
Input 0	-639 to 4095 Count	-100	760	0	°C
Input 1	-639 to 4095 Count	-100	760	0	°C
Input 2	-639 to 4095 Count	-100	760	0	°C
Input 3	-639 to 4095 Count	-100	760	0	°C
Input 4	-639 to 4095 Count	-100	760	0	°C
Input 5	-639 to 4095 Count	-100	760	0	°C
Input 6	-639 to 4095 Count	-100	760	0	°C
Input 7	-639 to 4095 Count	-100	760	0	°C
Input 8	-639 to 4095 Count	0	0	0	°C
Input 9	-639 to 4095 Count	0	0	0	°C
Input 10	-639 to 4095 Count	0	0	0	°C
Input 11	-639 to 4095 Count	0	0	0	°C
Input 12	-639 to 4095 Count	0	0	0	°C
Input 13	-639 to 4095 Count	0	0	0	°C
Input 14	-639 to 4095 Count	0	0	0	°C
Input 15	-639 to 4095 Count	0	0	0	°C

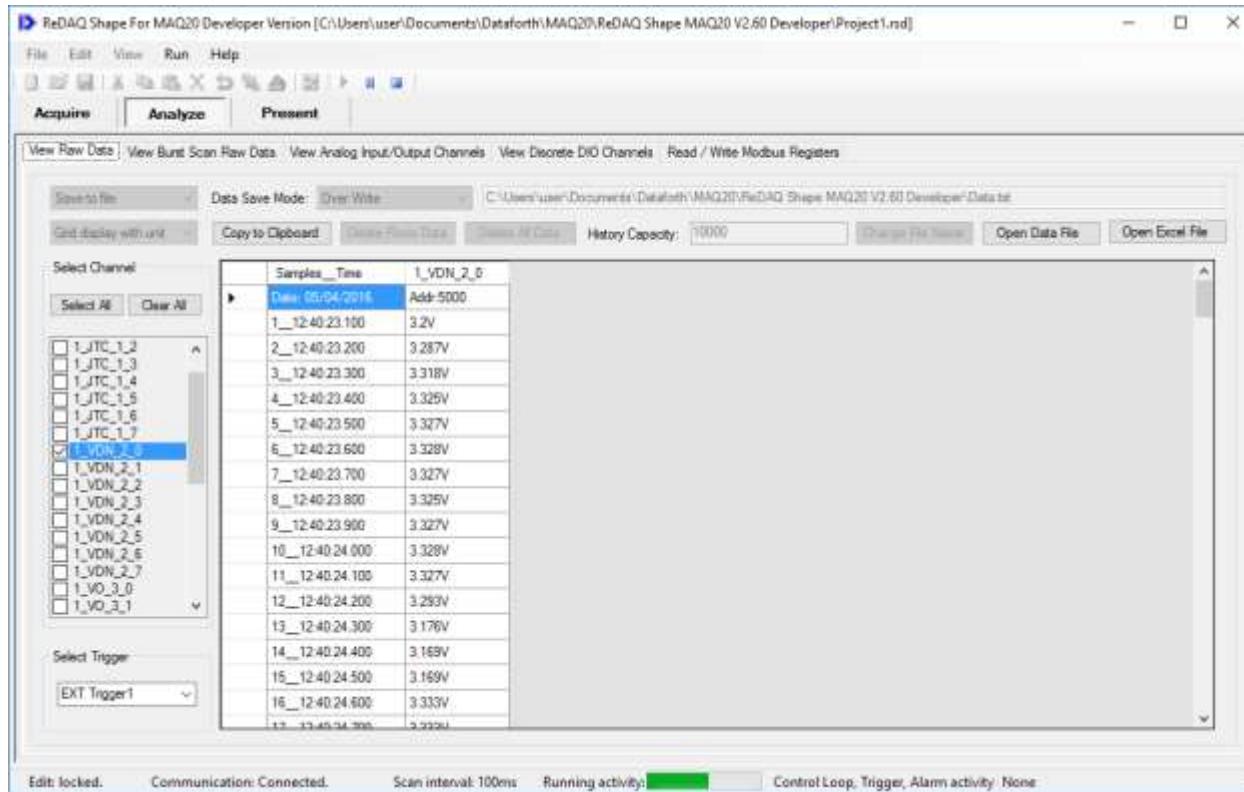
- IO Module Configuration
- Data Scaling
- IO Tag, Averaging, Input Range, Alarm Enable
- Alarm Configuration

# ReDAQ® Shape Acquire

Output To Channel											
Channel Name	Config / High Low Output	Config / High-High Low-Low Output	High Limit	Low Limit	HH Limit	LL Limit	High Deadband	Low Deadband	HH Deadband	LL Deadband	
Input 0	Active H	EXT Trigger 1	Active H	L_V0_1_0	760	-100	760	100	0	0	0
Input 1	Active H	EXT Trigger 1	Active H	L_V0_2_0	760	-100	760	100	0	0	0
Input 2	Active H	EXT Trigger 1	Active H	L_V0_3_0	760	-100	760	100	0	0	0
Input 3	Active H	EXT Trigger 1	Active H	L_V0_3_0	760	-100	760	100	0	0	0
Input 4	Active H	EXT Trigger 1	Active H	L_V0_3_0	760	-100	760	100	0	0	0
Input 5	Active H	EXT Trigger 1	Active H	L_V0_3_0	760	-100	760	100	0	0	0
Input 6	Active H	EXT Trigger 1	Active H	L_V0_3_0	760	-100	760	100	0	0	0
Input 7	Active H	EXT Trigger 1	Active H	L_V0_3_0	760	-100	760	100	0	0	0
Input 8	Active H	EXT Trigger 1	Active H	L_V0_3_0	0	0	0	0	0	0	0
Input 9	Active H	EXT Trigger 1	Active H	L_V0_3_0	0	0	0	0	0	0	0
Input 10	Active H	EXT Trigger 1	Active H	L_V0_3_0	0	0	0	0	0	0	0
Input 11	Active H	EXT Trigger 1	Active H	L_V0_3_0	0	0	0	0	0	0	0
Input 12	Active H	EXT Trigger 1	Active H	L_V0_3_0	0	0	0	0	0	0	0
Input 13	Active H	EXT Trigger 1	Active H	L_V0_3_0	0	0	0	0	0	0	0
Input 14	Active H	EXT Trigger 1	Active H	L_V0_3_0	0	0	0	0	0	0	0
Input 15	Active H	EXT Trigger 1	Active H	L_V0_3_0	0	0	0	0	0	0	0

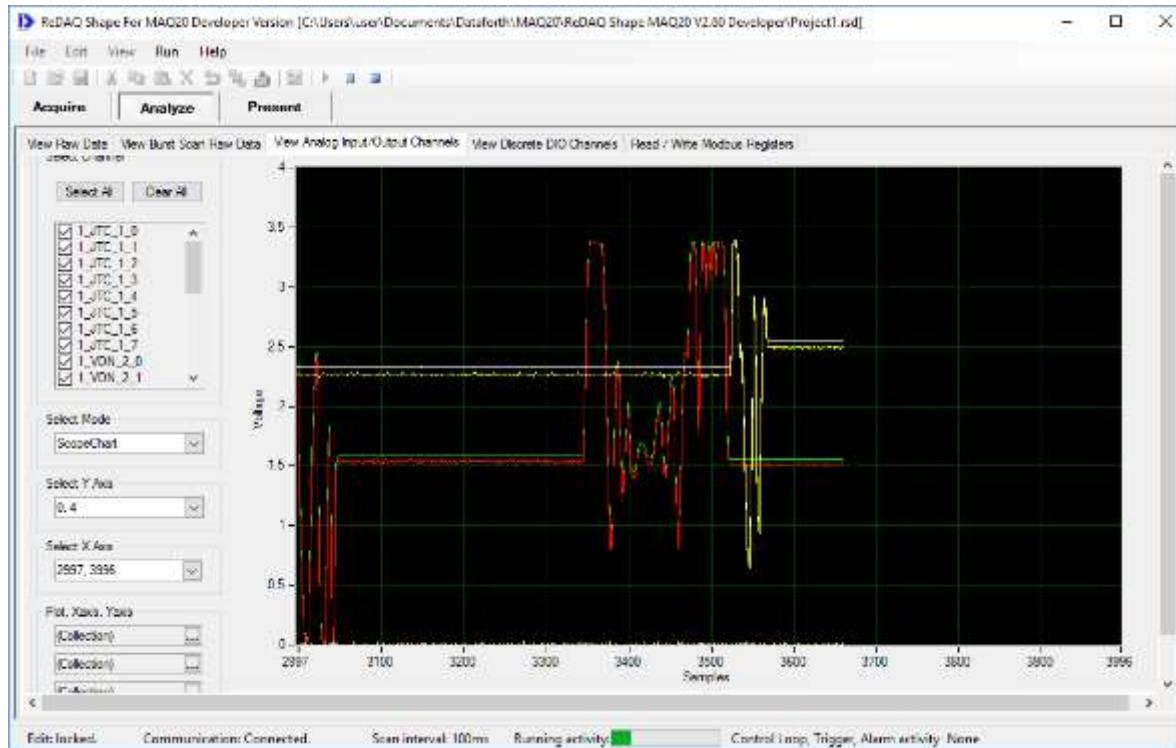
- IO Module Configuration
- Data Scaling
- IO Tag, Averaging, Input Range, Alarm Enable
- Alarm Configuration

# ReDAQ® Shape Analyze



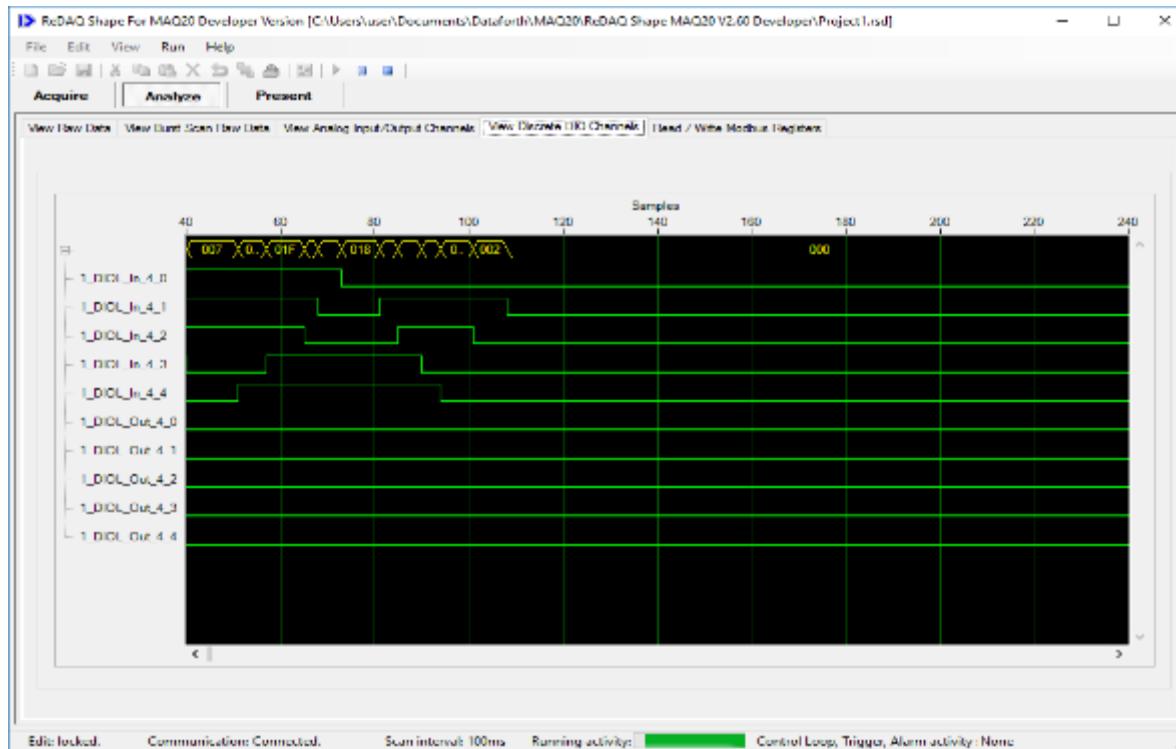
- Configure Data Logging
- View Burst Recorded Data
- Stored to Host PC
- Select Channels to Log
- Select Trigger Input

# ReDAQ® Shape Analyze



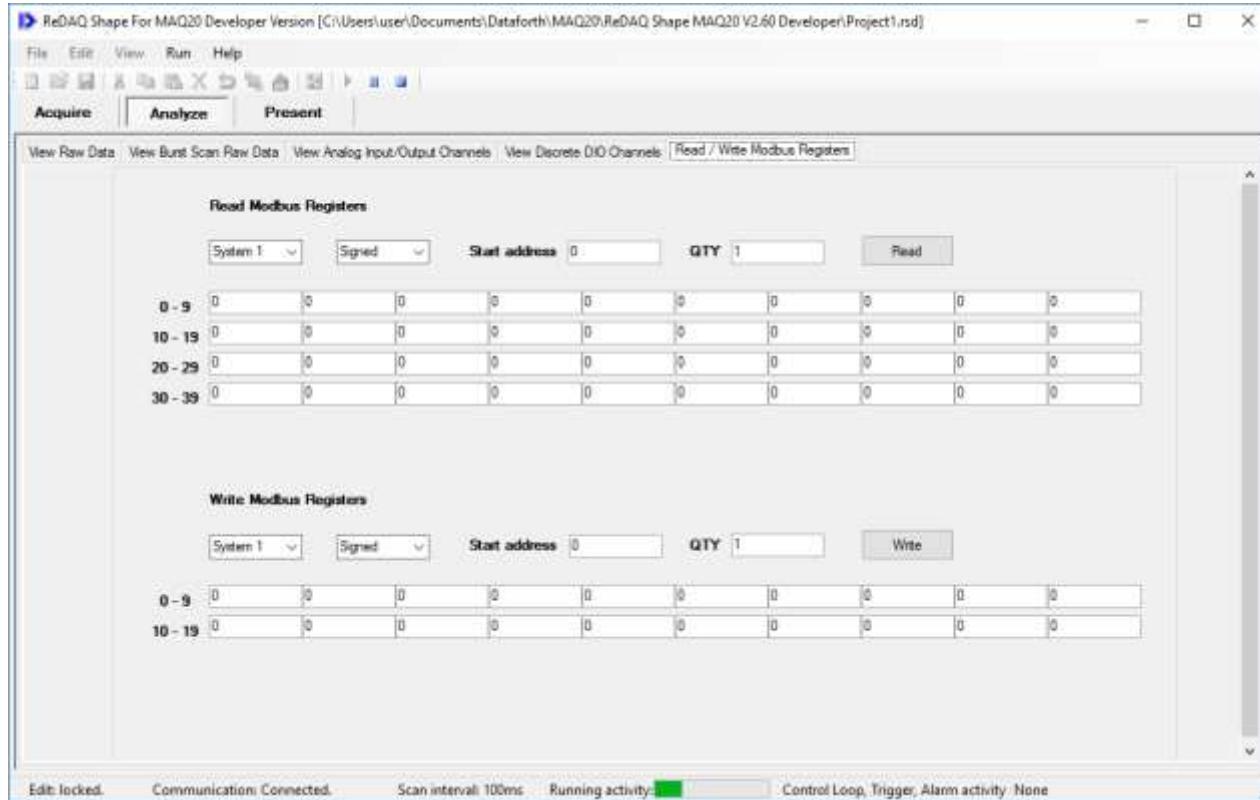
- Visualise Logged Data
- Real-Time Updates
- Analogue and Digital Signals

# ReDAQ® Shape Analyze



- Visualise Logged Data
- Real-Time Updates
- Analogue and Digital Signals

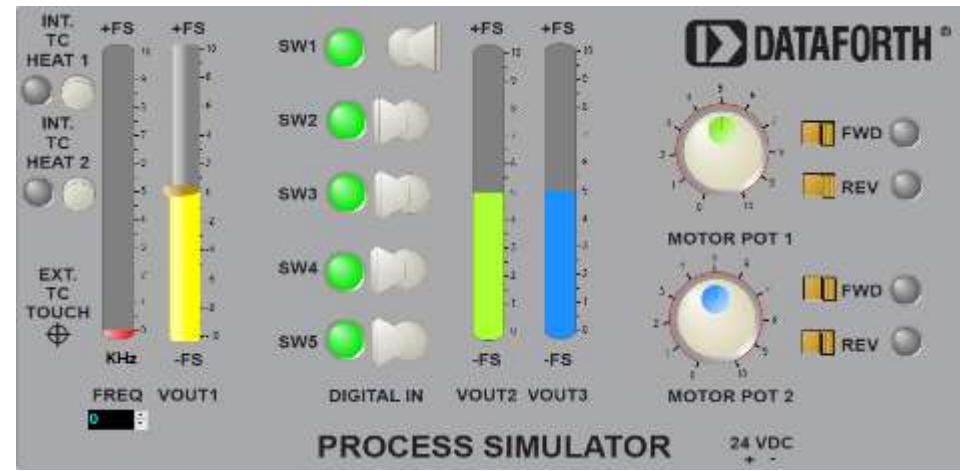
# ReDAQ® Shape Analyze



- Read and Write Modbus Registers
- Debug Module Configuration

# ReDAQ® Shape Present

- Create GUI to display data from MAQ®20
- Provide Control
- Simple
- Easy to learn
- Create Up to 20 Present Panels
- High Level Timer Functions
- Simple configuration for on screen controls
- It provides 18 high quality, license-free controls

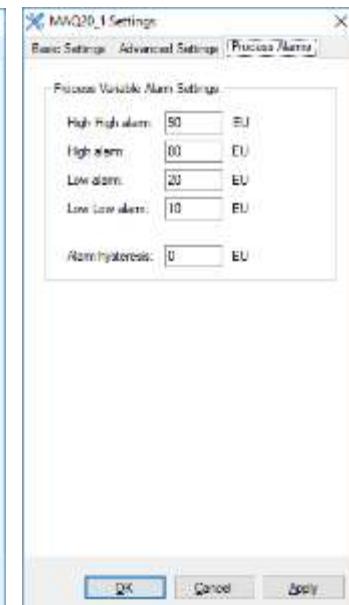
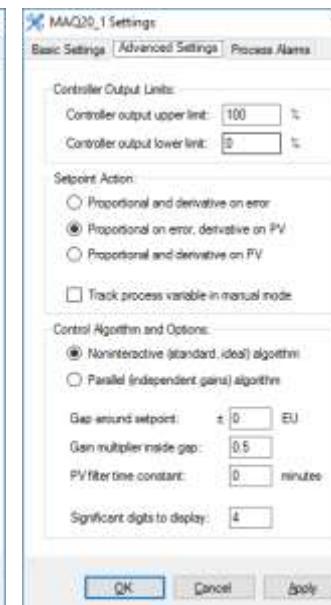
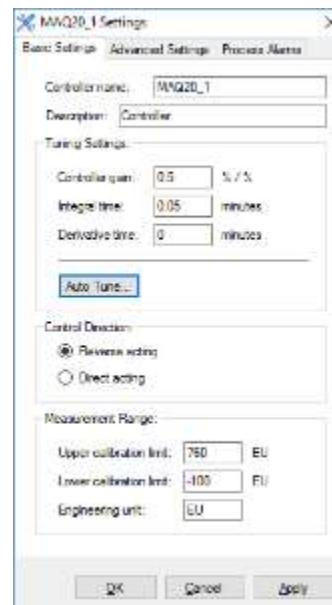
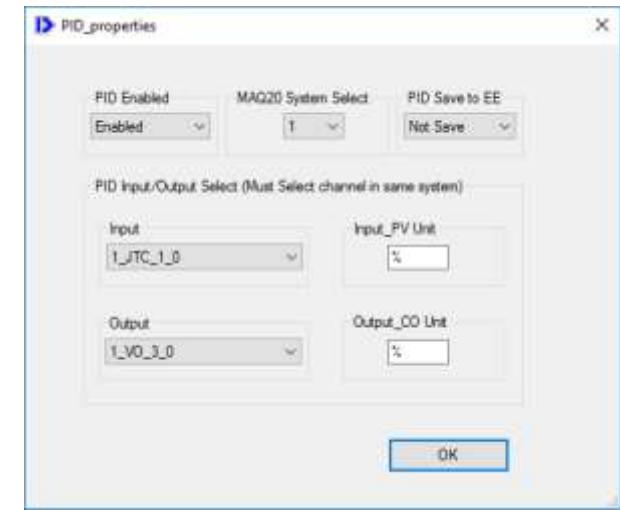
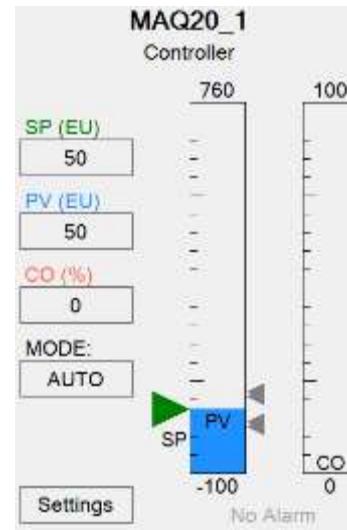


# ReDAQ® Shape Present Controls

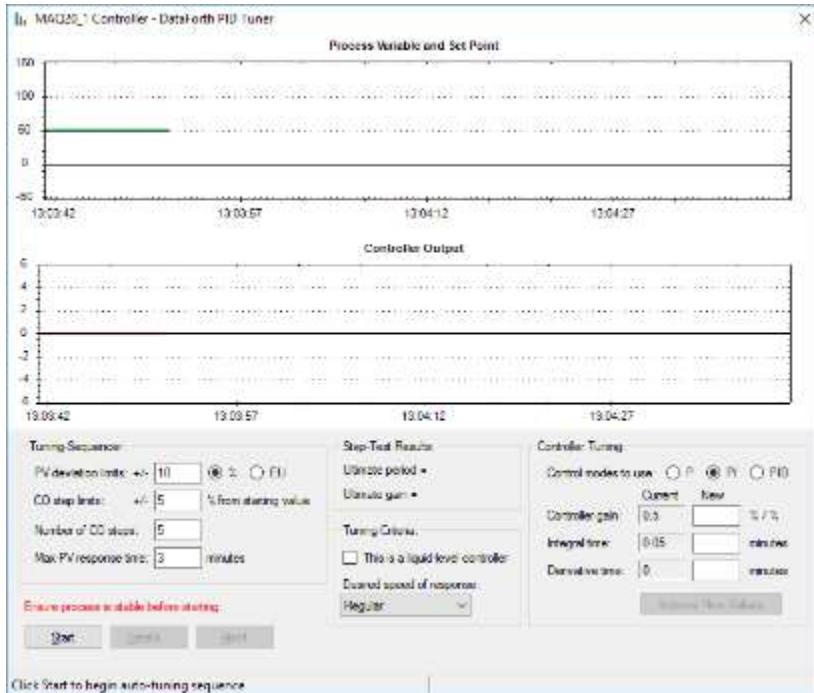
- Button
- Chart Recorder
- Discrete
- Waveform Graph
- Gauge
- Group box
- Knob
- Label
- Led
- Meter
- Numeric Edit
- Picture box
- Scope
- Slide
- Switch
- Tank
- Text box
- Thermometer
- XY plot

# ReDAQ® Shape PID

- Present Panel Control
- Simple Operator Interaction
- Auto Manual Mode
- PID Properties; Set IO Channels
- PID Settings; Configure PID variables and Control Action
- Limit Output Range
- Save Configuration to Module EEPROM



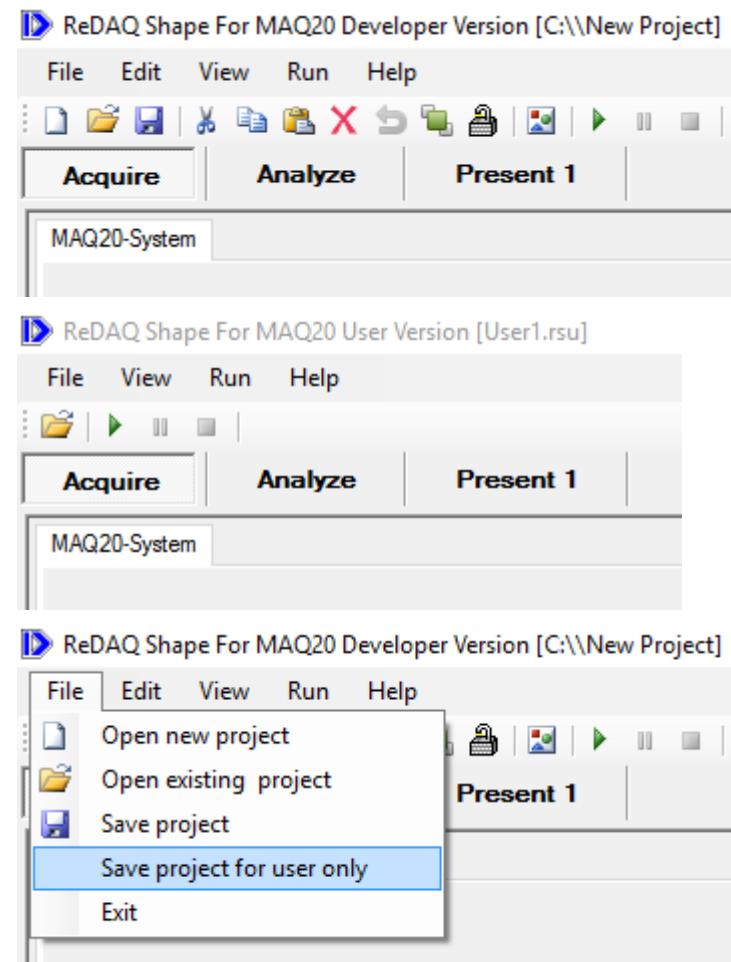
# ReDAQ® Shape PID Auto Tune



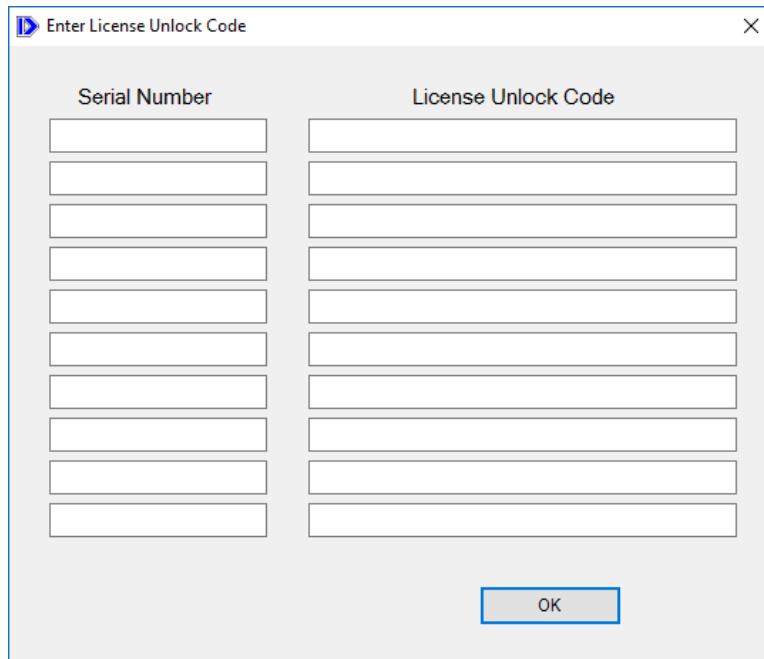
- Optimise Control Loops
- Software Characterises Control Loop and Calculates P, I and D Values To Run Process As Desired
- Response Speed Selections:
  - Slow and Stable
  - Regular
  - Fast Response

# ReDAQ® Shape Development and User

- Developer Version for Project Creation
- User Version For Runtime Only Projects
- Present Panel In Runtime is Locked to Prevent Edits
- Acquire and Analyse Panels can be Operated In User Mode
- Create Runtime Project: File >> Save project for user only



# ReDAQ® Shape Licensing



- License Separate For User and Developer Version
- One License Required Per COMx Module Used
- License Code is Related To COMx Module Serial Number
- Enter License Key:  
Help >> Enter License Unlock Code

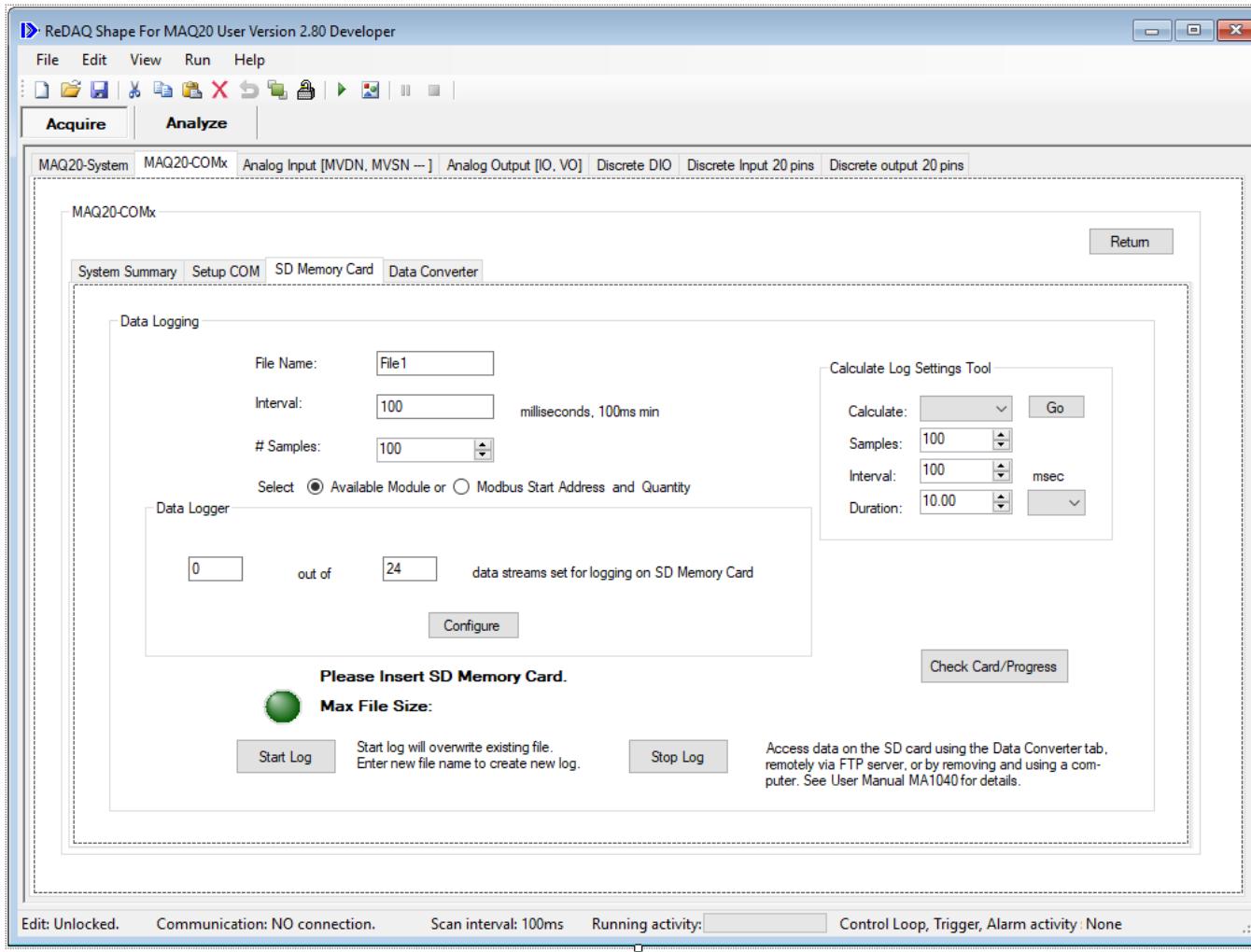
# ReDAQ®



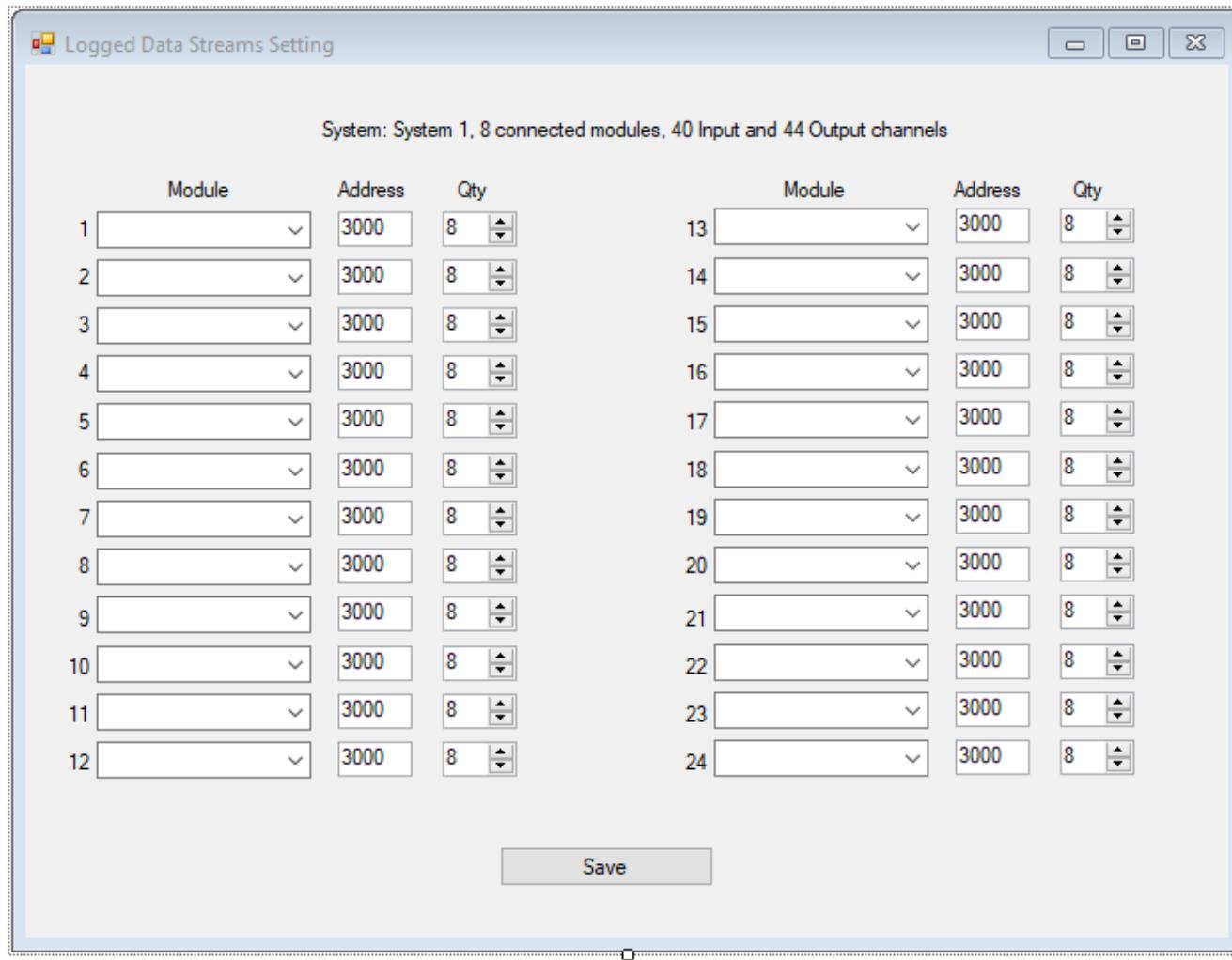
# **ReDAQ® Whats New**

- 24 start addresses for data logging, 40 addresses from each start
- Connectivity to 10 systems and over 1200 channels
- More FTP functionality, stability. File transfer recovery and restart on comms break.
- SD card data transfer record by record to prevent lost data or files.
- Improved file system interface to SD card
- Panels for all new modules
- Tab naming for systems 1-10
- Check system configuration in project file vs. configuration stored in system memory. Prompt if differences found and give user choice of action.
- Many stability and speed improvements.
- .....and many more

# ReDAQ® Whats New: Expanded Datalogging up to 24 start addresses



# ReDAQ® Whats New: Expanded Datalogging up to 24 start addresses



# ReDAQ® Whats New: DIV20 panel

System and Communication Settings

Connect To MAQ20 :  Disconnection :  Scan Interval (ms) : 100  Time Out (ms) : 2000  Reconnect Time Out (s) : 10

System2

Device: MAG20-DIV20 Serial Number: 0101471-03

Return

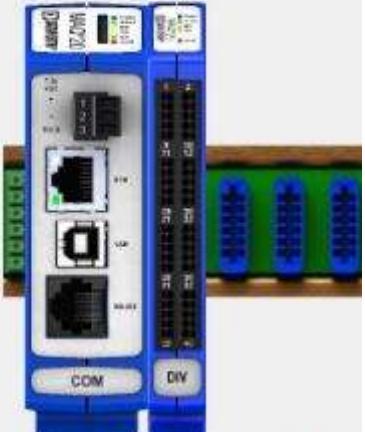
Setup

Channel Name	User Tag Name	DIO Status	Channel Name	User Tag Name	DIO Status
DI0	2_DI20_1_0	0	DI10	2_DI20_1_10	0
DI1	2_DI20_1_1	0	DI11	2_DI20_1_11	0
DI2	2_DI20_1_2	0	DI12	2_DI20_1_12	0
DI3	2_DI20_1_3	0	DI13	2_DI20_1_13	0
DI4	2_DI20_1_4	0	DI14	2_DI20_1_14	0
DI5	2_DI20_1_5	0	DI15	2_DI20_1_15	0
DI6	2_DI20_1_6	0	DI16	2_DI20_1_16	0
DI7	2_DI20_1_7	0	DI17	2_DI20_1_17	0
DI8	2_DI20_1_8	0	DI18	2_DI20_1_18	0
DI9	2_DI20_1_9	0	DI19	2_DI20_1_19	0

I/O Mod

Logic Style

Inverted  Standard



# ReDAQ® Whats New: DIVC20 panel

System and Communication Settings

Connect To MAQ20 :

Disconnection :

Scan Interval (ms) :

Time Out (ms) :

Reconnect Time Out (s) :

System2

System 2 :

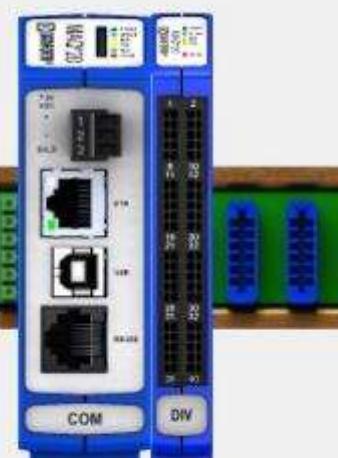
TCP/IP Address :

USB Port :

Serial Port :

COM

Device: MAQ20-DIVC20 Serial Number: 0101474-06



Channel Name	User Tag Name	DIO Status	Channel Name	User Tag Name	DIO Status
DI0	<input type="text" value="2_DI20_1_0"/>	<input type="button" value="0"/>	DI10	<input type="text" value="2_DI20_1_10"/>	<input type="button" value="0"/>
DI1	<input type="text" value="2_DI20_1_11"/>	<input type="button" value="0"/>	DI11	<input type="text" value="2_DI20_1_11"/>	<input type="button" value="0"/>
DI2	<input type="text" value="2_DI20_1_12"/>	<input type="button" value="0"/>	DI12	<input type="text" value="2_DI20_1_12"/>	<input type="button" value="0"/>
DI3	<input type="text" value="2_DI20_1_13"/>	<input type="button" value="0"/>	DI13	<input type="text" value="2_DI20_1_13"/>	<input type="button" value="0"/>
DI4	<input type="text" value="2_DI20_1_14"/>	<input type="button" value="0"/>	DI14	<input type="text" value="2_DI20_1_14"/>	<input type="button" value="0"/>
DI5	<input type="text" value="2_DI20_1_15"/>	<input type="button" value="0"/>	DI15	<input type="text" value="2_DI20_1_15"/>	<input type="button" value="0"/>
DI6	<input type="text" value="2_DI20_1_16"/>	<input type="button" value="0"/>	DI16	<input type="text" value="2_DI20_1_16"/>	<input type="button" value="0"/>
DI7	<input type="text" value="2_DI20_1_17"/>	<input type="button" value="0"/>	DI17	<input type="text" value="2_DI20_1_17"/>	<input type="button" value="0"/>
DI8	<input type="text" value="2_DI20_1_18"/>	<input type="button" value="0"/>	DI18	<input type="text" value="2_DI20_1_18"/>	<input type="button" value="0"/>
DI9	<input type="text" value="2_DI20_1_19"/>	<input type="button" value="0"/>	DI19	<input type="text" value="2_DI20_1_19"/>	<input type="button" value="0"/>

Logic Style

Inverted

Standard

# ReDAQ® Whats New: DODC20 panel

## System and Communication Settings

Connect To MAQ20 :

Disconnection :

Scan Interval (ms) : 100

Time Out (ms) : 2000

Reconnect Time Out (s) : 10

System2

System 2 :

Enabled

TCP/IP Address :

192.168

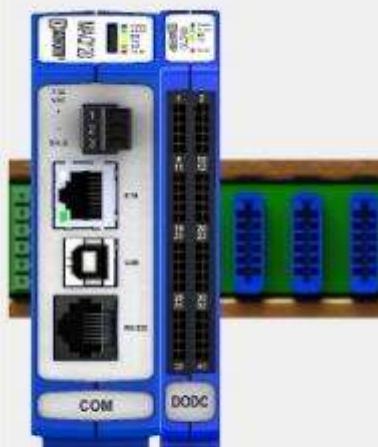
USB Port :

Serial Port :

COM3

Device: MAQ20-DODC20SK Serial Number: 0104672-05

Setup



I/O Mod

Channel	User Tag Name	State	Output Data	Power On
D00	2_D020_2_0	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D01	2_D020_2_1	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D02	2_D020_2_2	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D03	2_D020_2_3	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D04	2_D020_2_4	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>

Channel	User Tag Name	State	Output Data	Power On
D05	2_D020_2_5	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D06	2_D020_2_6	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D07	2_D020_2_7	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D08	2_D020_2_8	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D09	2_D020_2_9	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>

Defaults

Channel	User Tag Name	State	Output Data	Power On
D010	2_D020_2_10	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D011	2_D020_2_11	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D012	2_D020_2_12	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D013	2_D020_2_13	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D014	2_D020_2_14	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>

Defaults

Channel	User Tag Name	State	Output Data	Power On
D015	2_D020_2_15	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D016	2_D020_2_16	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D017	2_D020_2_17	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D018	2_D020_2_18	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>
D019	2_D020_2_19	0	0 <input type="button" value="Up"/> <input type="button" value="Down"/>	1 <input type="button" value="Up"/> <input type="button" value="Down"/>

Logic Style

Standard Logic

Inverted Logic

# ReDAQ® Whats New: DORLY20 panel

System and Communication Settings

Connect To MAQ20 :  Disconnection :  Scan Interval (ms) : 100  Time Out (ms) : 2000  Reconnect Time Out (s) : 10

System2

System 2 : Device: MAQ20-DORLY20 Serial Number: 0126373-01

TCP/IP Address :  USB Port :  Serial Port :



**Setup**

Channel	User Tag Name	State	Output Data	Power On	Power Off
DORLY0	2_DORLY20_1_0	0	0	1	1
DORLY1	2_DORLY20_1_1	0	0	1	1
DORLY2	2_DORLY20_1_2	0	0	1	1
DORLY3	2_DORLY20_1_3	0	0	1	1
DORLY4	2_DORLY20_1_4	0	0	1	1
DORLY5	2_DORLY20_1_5	0	0	1	1
DORLY6	2_DORLY20_1_6	0	0	1	1
DORLY7	2_DORLY20_1_7	0	0	1	1
DORLY8	2_DORLY20_1_8	0	0	1	1
DORLY9	2_DORLY20_1_9	0	0	1	1

Channel	User Tag Name	State	Output Data	Power On	Power Off
DORLY10	2_DORLY20_1_1	0	0	1	1
DORLY11	2_DORLY20_1_1	0	0	1	1
DORLY12	2_DORLY20_1_1	0	0	1	1
DORLY13	2_DORLY20_1_1	0	0	1	1
DORLY14	2_DORLY20_1_1	0	0	1	1
DORLY15	2_DORLY20_1_1	0	0	1	1
DORLY16	2_DORLY20_1_1	0	0	1	1
DORLY17	2_DORLY20_1_1	0	0	1	1
DORLY18	2_DORLY20_1_1	0	0	1	1
DORLY19	2_DORLY20_1_1	0	0	1	1

Logic Style  Standard Logic  Inverted Logic

# ReDAQ® Whats New: ISOV1 panel

System and Communication Settings

Connect To MAQ20:

Disconnection:

Scan Interval (ms): 100

Time Out (ms): 2000

Reconnected Time Out (s): 10

System2

System 2:

En

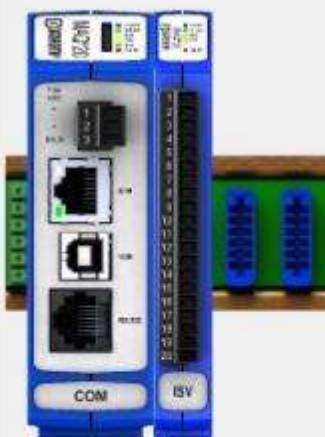
TCP/IP Address :

192

USB Port:

Serial Port:

CO



Device: MAQ20-ISOV1 Serial Number: 0126970-02

Setup | Scale Data | Control Loop, Trigger and Alarm

Channel Name	User Tag Name	Data Display	Input Select	Avg Weight	Max/Min	Input Range	Control Loop, Trigger and Alarm
Input 0	2_ISOV1_1_0	0	Raw	3	Reset	-1V to +1V	None
Input 1	2_ISOV1_1_1	0	Raw	3	Reset	-1V to +1V	None
Input 2	2_ISOV1_1_2	0	Raw	3	Reset	-1V to +1V	None
Input 3	2_ISOV1_1_3	0	Raw	3	Reset	-1V to +1V	None
Input 4	2_ISOV1_1_4	0	Raw	3	Reset	-1V to +1V	None
Input 5	2_ISOV1_1_5	0	Raw	3	Reset	-1V to +1V	None
Input 6	2_ISOV1_1_6	0	Raw	3	Reset	-1V to +1V	None
Input 7	2_ISOV1_1_7	0	Raw	3	Reset	-1V to +1V	None
Input 8			Raw	4	Reset	-1V to +1V	None
Input 9			Raw	4	Reset	-1V to +1V	None
Input 10			Raw	4	Reset	-1V to +1V	None
Input 11			Raw	4	Reset	-1V to +1V	None
Input 12			Raw	4	Reset	-1V to +1V	None
Input 13			Raw	4	Reset	-1V to +1V	None
Input 14			Raw	4	Reset	-1V to +1V	None
Input 15			Raw	4	Reset	-1V to +1V	None

# ReDAQ® Whats New: ISOI1 panel

System and Communication Settings

Connect To MAQ20 :  Disconnection :  Scan Interval (ms) : 100  Time Out (ms) : 2000  Reconnect Time Out (s) : 10

System2

Device: MAQ20-ISOI1 Serial Number: 0126741-02

Return

Channel Name	User Tag Name	Data Display	Input Select	Avg Weight	Max/Min	Input Range	Control Loop, Trigger and Alarm
Input 0	2_ISOI1_2_0	0	Raw	3	Reset	0mA to +20mA	None
Input 1	2_ISOI1_2_1	0	Raw	3	Reset	0mA to +20mA	None
Input 2	2_ISOI1_2_2	0	Raw	3	Reset	0mA to +20mA	None
Input 3	2_ISOI1_2_3	0	Raw	3	Reset	0mA to +20mA	None
Input 4	2_ISOI1_2_4	0	Raw	3	Reset	0mA to +20mA	None
Input 5	2_ISOI1_2_5	0	Raw	3	Reset	0mA to +20mA	None
Input 6	2_ISOI1_2_6	0	Raw	3	Reset	0mA to +20mA	None
Input 7	2_ISOI1_2_7	0	Raw	3	Reset	0mA to +20mA	None
Input 8			Raw	4	Reset	0mA to +20mA	None
Input 9			Raw	4	Reset	0mA to +20mA	None
Input 10			Raw	4	Reset	0mA to +20mA	None
Input 11			Raw	4	Reset	0mA to +20mA	None
Input 12			Raw	4	Reset	0mA to +20mA	None
Input 13			Raw	4	Reset	0mA to +20mA	None
Input 14			Raw	4	Reset	0mA to +20mA	None
Input 15			Raw	4	Reset	0mA to +20mA	None

I/O

Load Avg Weight, Input Range to Module

Save Avg Weight, Input Range to Module Memory

Reset Latched Mode

# ReDAQ® Whats New: ISOMV1 panel

System and Communication Settings

Connect To MAQ20 : Connect Disconnection : Disconnect Scan Interval (ms) : 100 Time Out (ms) : 2000 Reconnect Time Out (s) : 10

System2

Device: MAQ20-ISOMV1 Serial Number: 0125799-02

Return

Setup Scale Data Control Loop, Trigger and Alarm

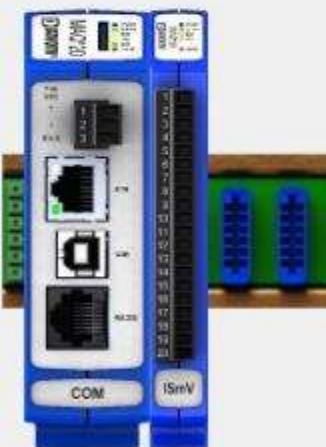
Channel Name	User Tag Name	Data Display	Input Select	Avg Weight	Max/Mn	Input Range	Control Loop, Trigger and Alarm
Input 0	2_IS0mV1_1_0	0	Raw	3	Reset	-100mV to +100mV	None
Input 1	2_IS0mV1_1_1	0	Raw	3	Reset	-100mV to +100mV	None
Input 2	2_IS0mV1_1_2	0	Raw	3	Reset	-100mV to +100mV	None
Input 3	2_IS0mV1_1_3	0	Raw	3	Reset	-100mV to +100mV	None
Input 4	2_IS0mV1_1_4	0	Raw	3	Reset	-100mV to +100mV	None
Input 5	2_IS0mV1_1_5	0	Raw	3	Reset	-100mV to +100mV	None
Input 6	2_IS0mV1_1_6	0	Raw	3	Reset	-100mV to +100mV	None
Input 7	2_IS0mV1_1_7	0	Raw	3	Reset	-100mV to +100mV	None
Input 8			Raw	4	Reset	-100mV to +100mV	None
Input 9			Raw	4	Reset	-100mV to +100mV	None
Input 10			Raw	4	Reset	-100mV to +100mV	None
Input 11			Raw	4	Reset	-100mV to +100mV	None
Input 12			Raw	4	Reset	-100mV to +100mV	None
Input 13			Raw	4	Reset	-100mV to +100mV	None
Input 14			Raw	4	Reset	-100mV to +100mV	None
Input 15			Raw	4	Reset	-100mV to +100mV	None

I/O 1

Load Avg Weight, Input Range to Module

Save Avg Weight, Input Range to Module Memory

Reset Latched Mode



# ReDAQ® Whats New: ISOV2 panel

System and Communication Settings

Connect To MAQ20 :  Disconnection :  Scan Interval (ms) : 100  Time Out (ms) : 2000  Reconnect Time Out (s) : 10

System2

System 2 : Device: MAQ20-ISOV2 Serial Number: 0125483-12

TCP/IP Address :  USB Port :  Serial Port :

Channel Name	User Tag Name	Data Display	Input Select	Avg Weight	Max/Min	Input Range	Control Loop, Trigger and Alarm	
Input 0	2_ISOV2_1_0	0	Raw	3	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 1	2_ISOV2_1_1	0	Raw	3	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 2	2_ISOV2_1_2	0	Raw	3	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 3	2_ISOV2_1_3	0	Raw	3	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 4	2_ISOV2_1_4	0	Raw	3	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 5	2_ISOV2_1_5	0	Raw	3	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 6	2_ISOV2_1_6	0	Raw	3	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 7	2_ISOV2_1_7	0	Raw	3	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 8			Raw	4	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 9			Raw	4	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 10			Raw	4	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 11			Raw	4	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 12			Raw	4	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 13			Raw	4	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 14			Raw	4	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	
Input 15			Raw	4	<input type="button"/> Reset	-10V to +10V	<input type="button"/> None	

# ReDAQ® Whats New: All new panels

System and Communication Settings

Connect To MAQ20 :  Disconnection :  Scan Interval (ms) : 100  Time Out (ms) : 2000  Reconnect Time Out (s) : 10

System2

System 2 : Enabled System Name:

TCP/IP Address : 192.168.128.100

USB Port :

Serial Port : COM3 Target ID (16-31) : 16 Baud Rate : 115200 Parity : Even

I/O Module position in this system graphic represents module Registration Number, not physical location.

Click on [ Connect ] button to start 



**Software**

**IPEmotion**

# About IPETRONIK

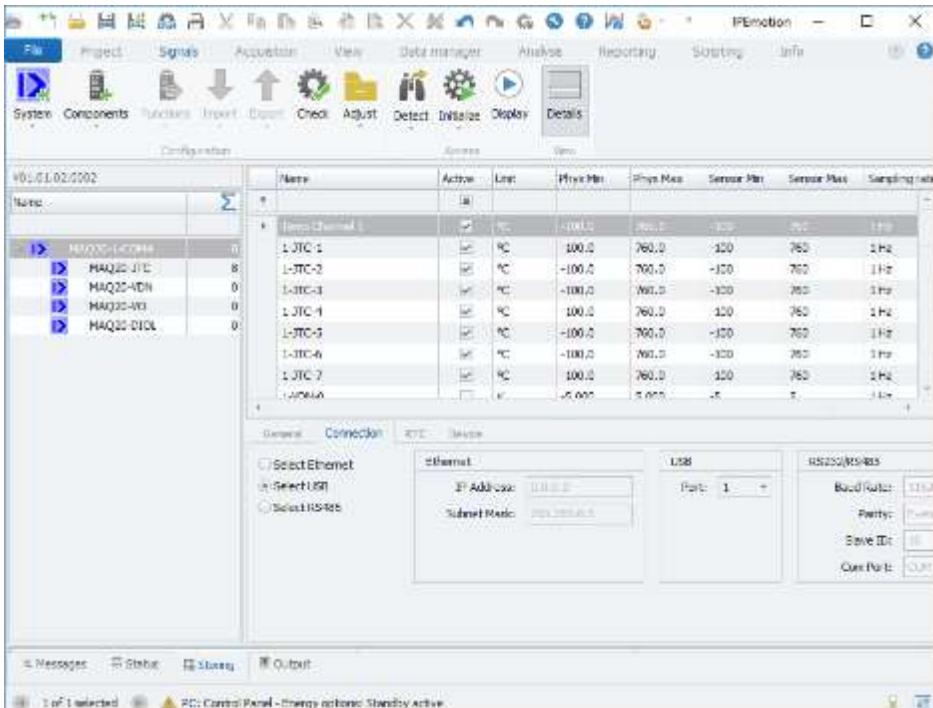
- **Founded 1989**
- **> 160 employees**
- **Global presence**
- **Owned by INDUS Holding AG**
- **Leading manufacturer of in vehicle DAQ systems**



**Germany:**  
Baden-Baden  
Duesseldorf  
Hamburg  
Ingolstadt

**Globally:**  
France  
UK  
Italy  
Austria  
USA  
Sweden  
Brazil  
India  
China  
South Korea  
Japan  
Australia

# IPEmotion Overview

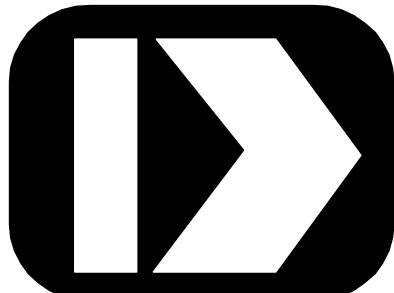


- Developed by IPETRONIK based in Germany
- Designed for German Automotive market
- Plug-In Architecture for Hardware Support
- Math and Logic functions
- Create Graphical User Interface (GUI)
- Data Storage, Analysis, and Post Processing
- Control Package Provides:
  - Software PID
  - Sequencing
  - Function Generator
  - Output Routing

**IPE**MOTION

# Unique Features of IPEmotion

Unique Features	Feature Description
Hardware independent	Plugin support for any DAQ hardware
One-Click Acquisition	Direct hardware detection, data display & recording
Live Adjustment	GUI adaption during display & recording
Customizing	Adapt IPEmotion to personal preferences
System Integration	COM Automation and .VBS / Python Scripting interface
Multilanguage	Choose from 7 languages
Reporting	Data post processing and report generation



**DATAFORTH®**

**ReDAQ® Shape**

**vs.**

**IPEmotion**

# ReDAQ Shape vs. IPEmotion

ReDAQ Shape	IPEmotion
One-Step Connect to Hardware	same
Graphical display of modules in system	Auto configure SW based on connected HW
USB, Ethernet, RS-232, RS-485 interface	USB, Ethernet, RS-232 interface
Easy to Configure Hardware Channels	same
Configure Chns / Scaling / Alarms	same
Displays alarm status from modules	Implements alarms in host SW
Build HMI Presentation Pages	same
Configure SD Mem Card Storage	Configure PC Mem Storage
Output 100 point Buffered Data File	Output Arbitrary Data File
Seven Special Di/o Functions	Two Timers, supports MAQ®20-DIOL PWM
View Raw Data Spreadsheet	View Raw Data Table
View Real-time Ai/o Data Chart	View Real-time Ai/o Charts per Module
Faceplate monitors PID running in HW	PID runs in IPEmotion Software
PID with Auto Tuner Built-in	No Built-in PID Auto Tuner
Supports all modules and functions	Supports Module Family: COM2, COM4, xTC, -VDN, -VSN, -VO, -IO, -DIOL, -DIOH

# ReDAQ Shape vs. IPEmotion

<b>Additional Functionality</b>	
	Create Calculated Formula Channels Variable (num, test, status) Channels Define Storage Groups to HDD / SSD Message on Data Limits and Ranges Create Function Generator Channels Channel (Data) Routing to New Channel Configure Test Step(s) Sequencing Works with other hardware (PlugIns) Works with Eight Languages
<b>ReDAQ Shape</b>	
\$250 Developer License \$50 User (Runtime) License	\$420 License (COM + 4 Modules) +\$760 License (4 additional Modules) +\$760 License (4 additional Modules)
One-time license fee	Annual fee for updated versions

# ReDAQ Shape

\$250 Developer License

Develop Applications with your  
“Golden” Developer System

SAVE this COM Module...  
Keep s/n for “Golden” Module  
(Don’t Ship the Developer!)



Purchase \$50 User  
License for Each New  
COM Module

One-Time License Fee

Then...  
Distribute Applications  
that you developed  
with the “Golden” COM  
Module !

# IPEmotion

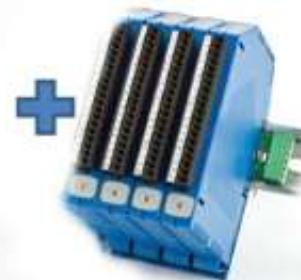
\$420 License (COM + 4 Modules)



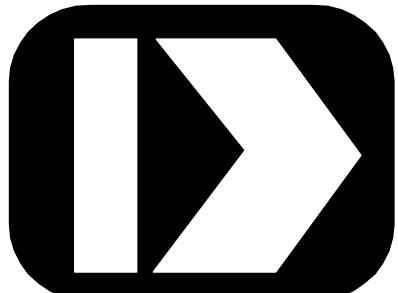
Add \$760 License (4 Additional Modules)



Add \$760 License (4 Additional Modules)



Etc. Up to 24 Modules !  
Annual fee for Updated Versions.

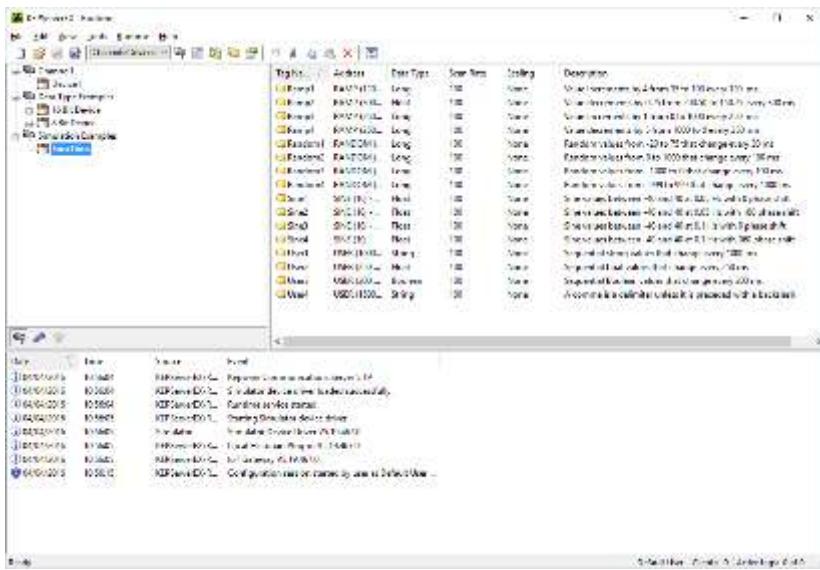


**DATAFORTH®**

**Compatible Software**

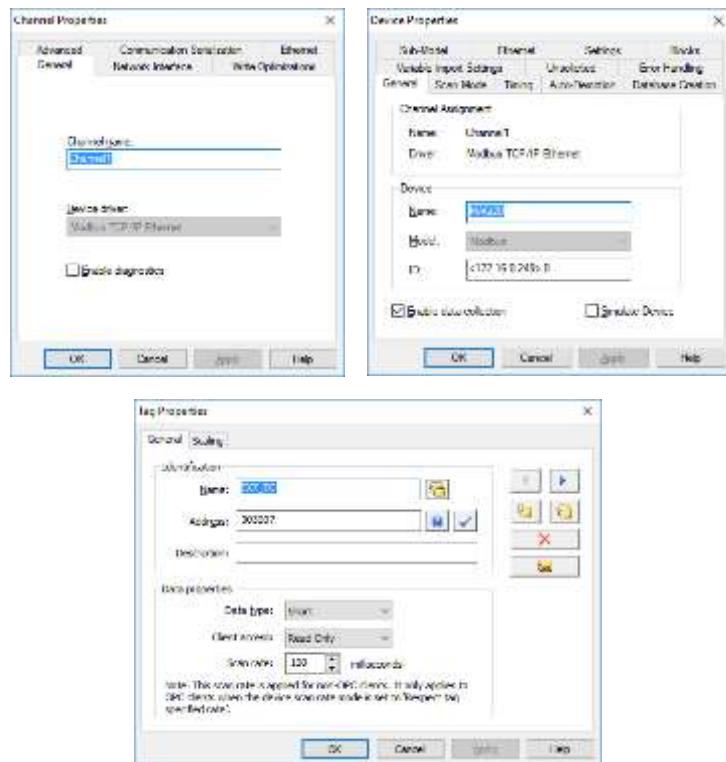
**OPC**

# OPC Overview



- Original Standard 1996, “OLE for Process Control”. “Object Linking and Embedding”
- 2011 Changed to “Open Platform Communications”
- Platform Independent, Multiple Devices Multiple Vendors
- Provides Software ‘Bridge’ via Modbus
- Interface to SCADA and HMI software
- Integrate MAQ®20 with existing System Architecture

# OPC Structure

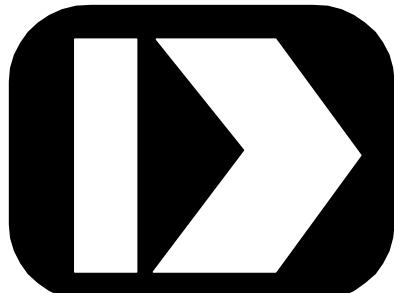


- Three Basic Parts:
- *Channel* - Define the medium of communication, in MAQ®20 case Ethernet or Serial
- *Device* - Hardware the server communicates with, MAQ®20 in this case
- *Tag* - Represents an address within the device where data is stored. Scaling is Applied to Retrieve Tag Values
- Additional Diagnostic Information Also Available

# OPC IOT Gateway



Stream real-time  
industrial control data

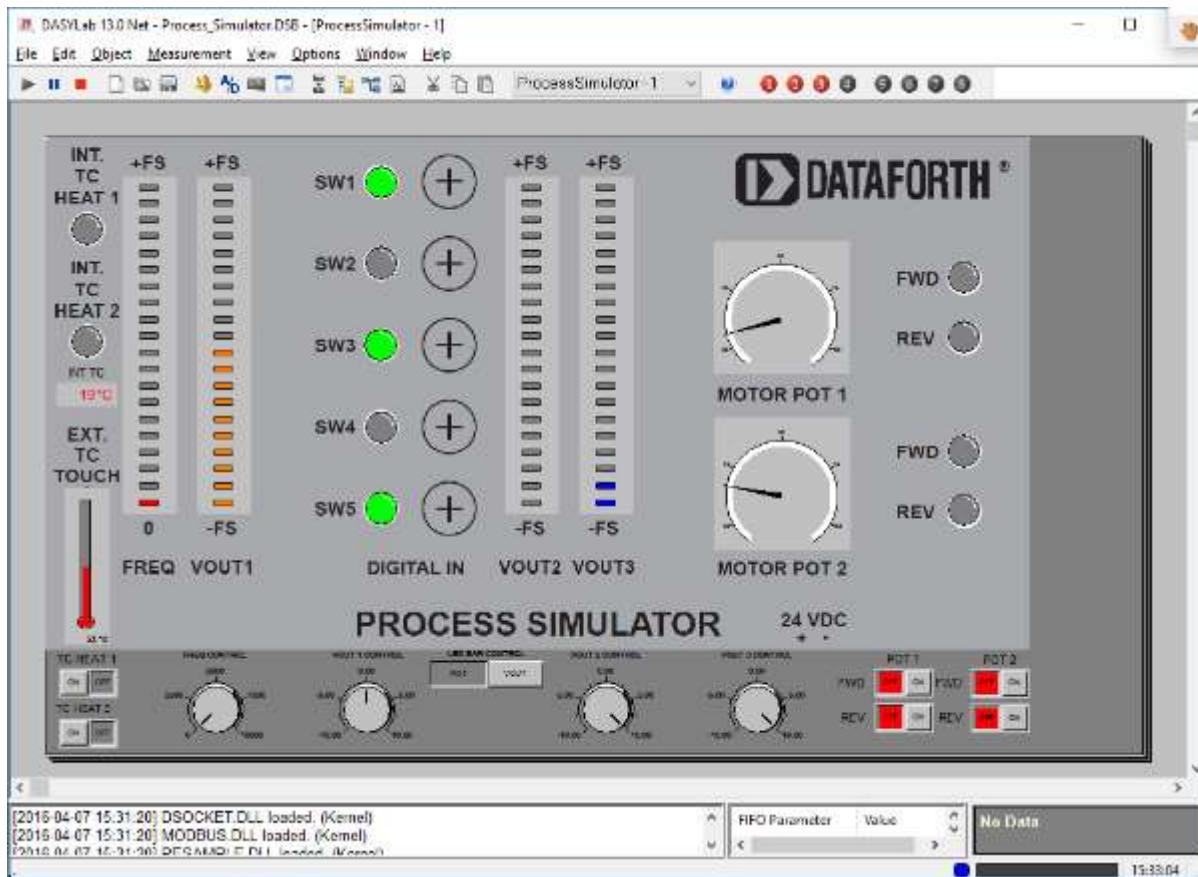


**DATAFORTH®**

**Compatible Software**

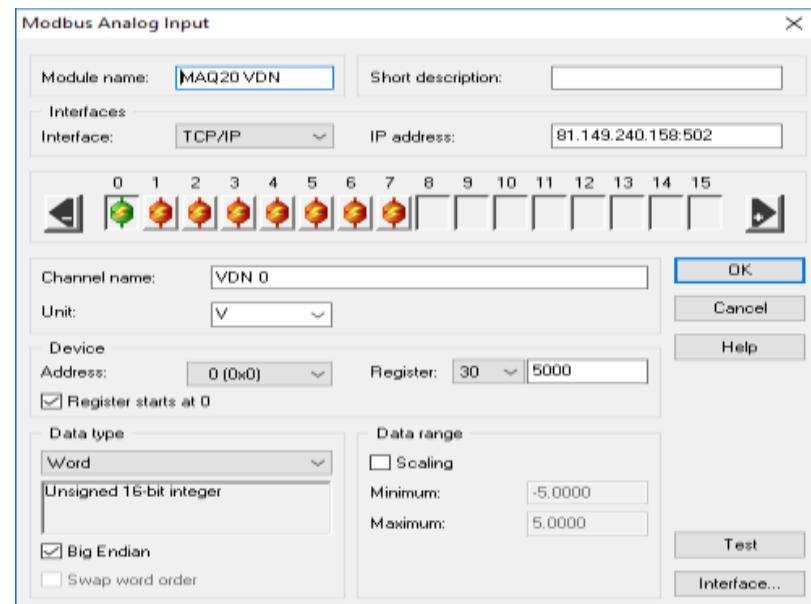
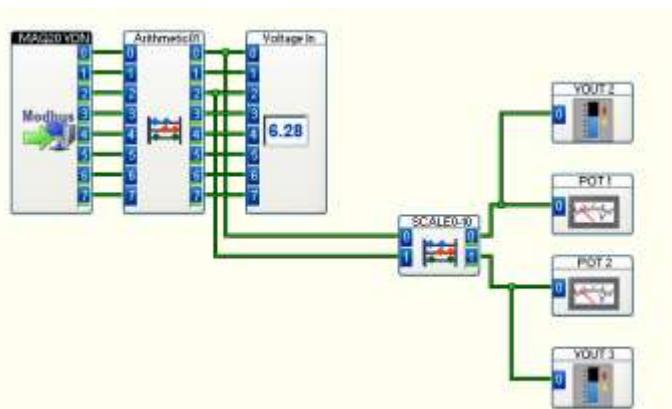
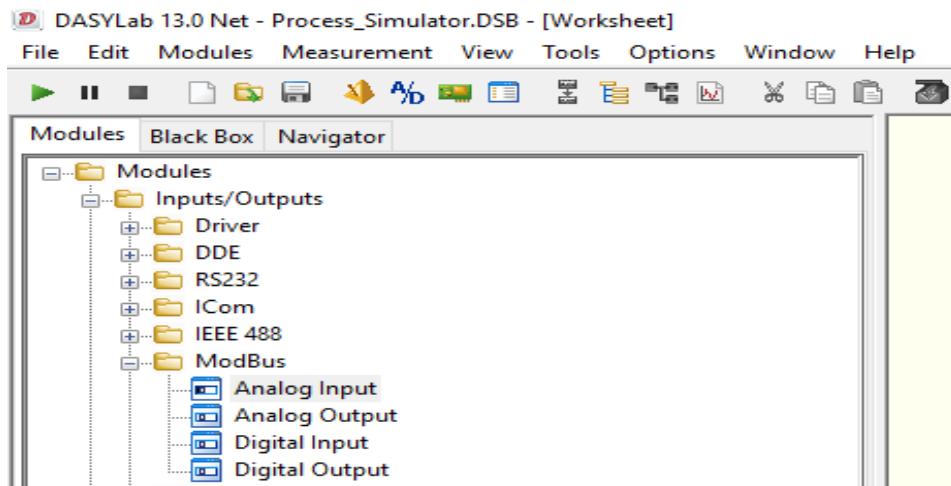
**DASYLab®**

# DASYLab® Overview



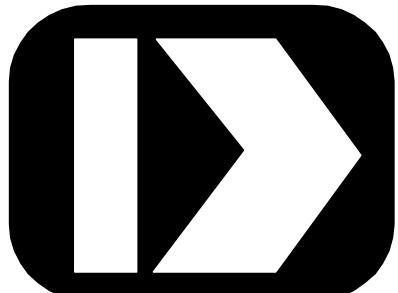
- Graphical Programming
- Test bench and Process Control
- Uses Modbus
- Math and Logic Functions
- Mimic screen creation
- Owned by NI

# DASYLab® Configuration



- Worksheet Used to Route Signals and Perform Functions
- Layout is Used to Create GUI
- Modbus Read/Write Digital/Analog uses Built in Block

Left blank on purpose

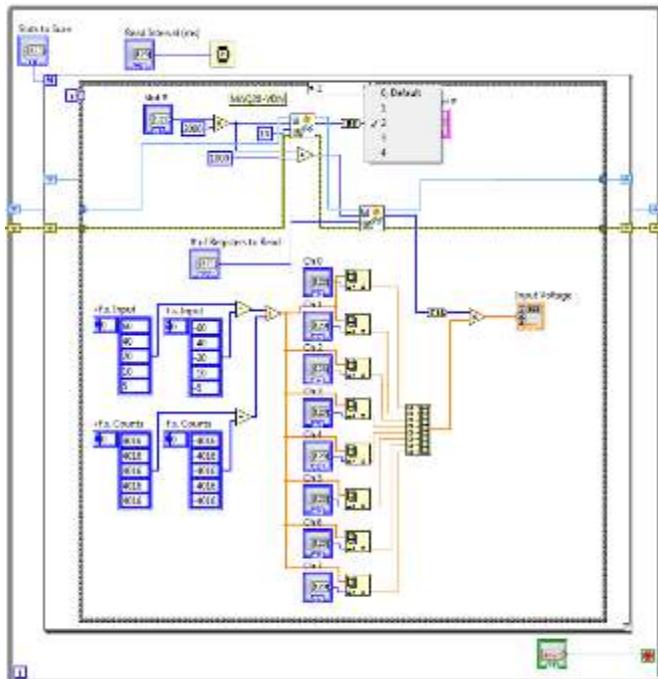


**DATAFORTH®**

**Compatible Software**

**LabVIEW™**

# LabVIEW™ Overview



- Graphical Programming
  - Popular in Test and Measurement Applications
  - Math and Logic Functions
  - Create Graphical User Interface (GUI)
  - DSC Module can Provide IO server functionality and support for Modbus (Additional Cost)
  - Unofficial Modbus Library Available
  - Dataforth Examples Available with Documentation

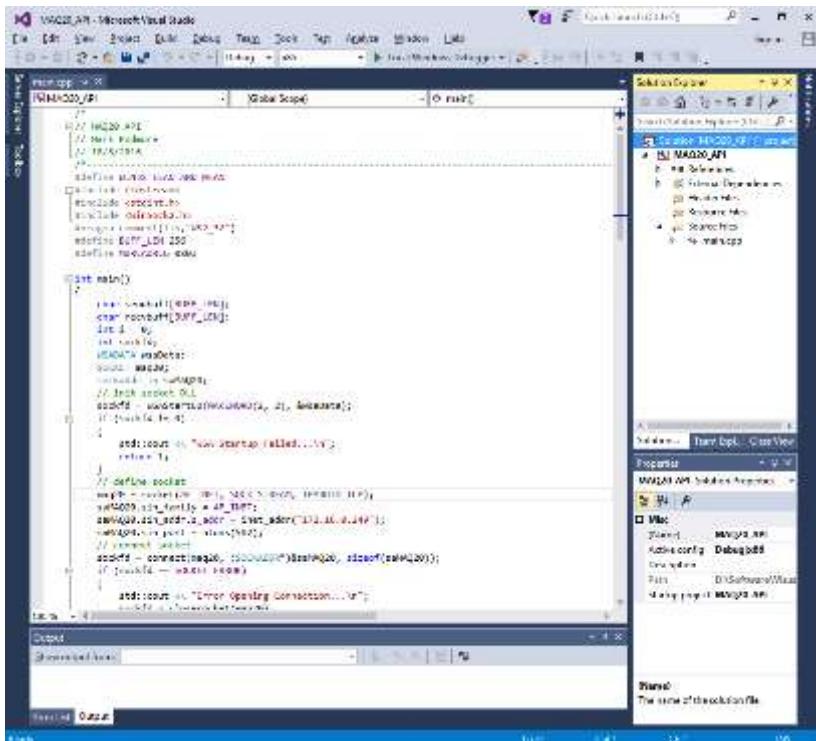


## Compatible Software

## Custom User Applications

## 3<sup>rd</sup> Party Dashboards

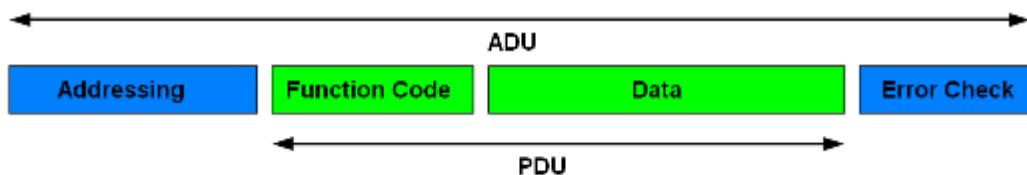
# Custom User Applications



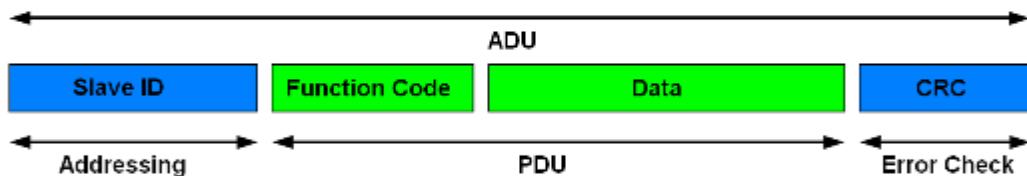
- Any Language supporting TCP sockets
- USB, Serial or Ethernet
- Modbus Library (not essential)
- Function Codes
- C/C++/C#/Python/VB

# Custom User Applications Modbus

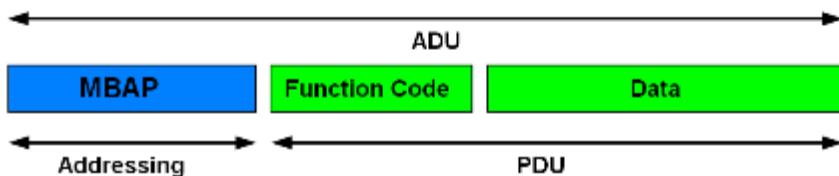
General MODBUS Frame



MODBUS/RTU Serial Frame



MODBUS/TCP Frame



- Support for RTU and TCP
- Four Functions Implemented:  
Read Holding/Input Registers  
Write Single/Multiple Registers
- Offset Addressing System
- TCP includes MBAP header and no CRC check, Error check performed by IP layer

# Custom User Applications Python API



- Provides libraries to access data and special functions of the MAQ®20
- Simple Command Line programs to full featured GUI Applications

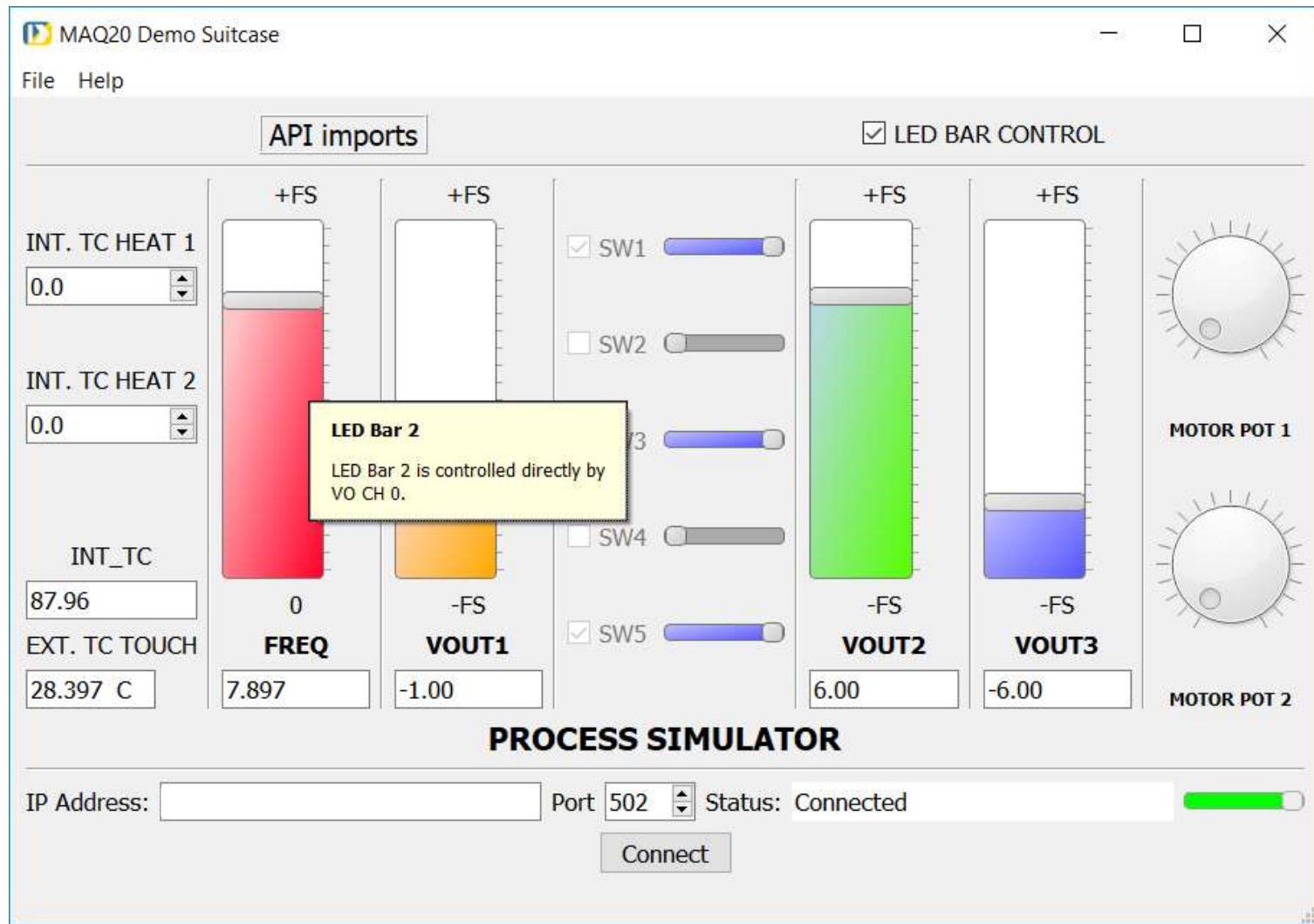
# Python API connect to Weather Station



# Python API connect to Demo Suitcase



# Python API connect to Demo Suitcase



# MAQ®20 3<sup>rd</sup> party dashboard: Eagle.io

① https://dataforth.eagle.io

... Search

## DATAFORTH®

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# **MAQ®20 3<sup>rd</sup> party dashboard: Eagle.io**

**ARKANSAS RIVER**

**Level**  
3.31 ft  
NORMAL  
↓ 1%  
2018-06-10 11:45:00

**Discharge**  
1030 cu ft/s  
NORMAL  
↓ 2%  
2018-06-10 11:45:00

**0 Alarms**  
In 7 days  
2018-06-10 12:30:20 - 2018-06-10 11:45:00

**pH**  
8.2 NORMAL  
2018-06-10 11:45:00

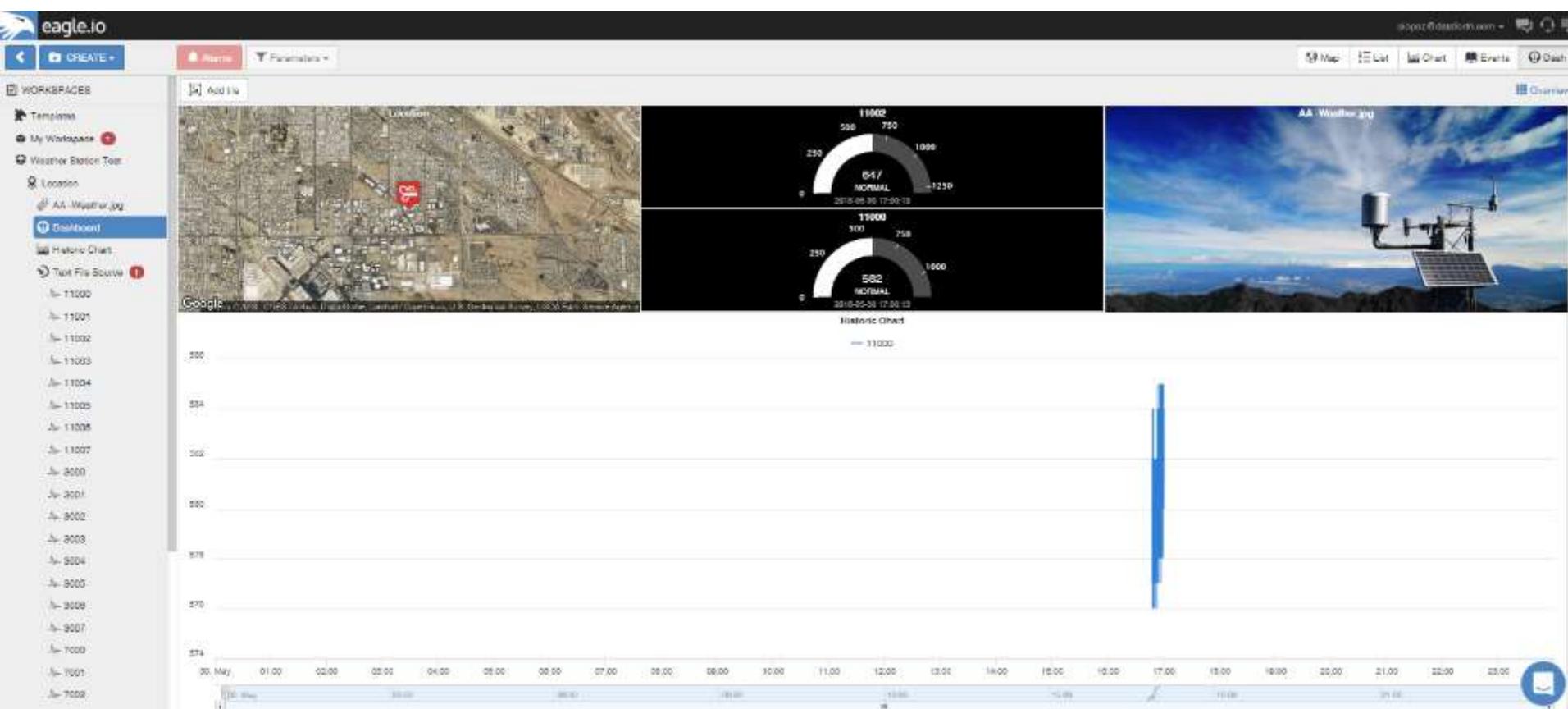
**Historic Chart**  
Temperature (°C) vs. pH  
Legend: Temperature (blue line), pH (red line)  
X-axis: 28. May to 4. Jun  
Y-axis: 10, 15, 20, 25

Time	pH	Conductivity [µS]
2018-06-10 11:45:00	8.2	579
2018-06-10 11:30:00	8.2	580
2018-06-10 11:15:00	8.2	579
2018-06-10 11:00:00	8.2	578
2018-06-10 10:45:00	8.2	579
2018-06-10 10:30:00	8.2	578
2018-06-10 10:15:00	8.2	578

Parameter	Value	Status	Last Update
Dissolved Oxygen	8.2 mg/l	NORMAL	2018-06-10 10:00:00
pH	8.2	NORMAL	2018-06-10 11:45:00
Conductivity	579 µS	NORMAL	2018-06-10 11:45:00
Temperature	16.2 °C	NORMAL	2018-06-10 11:45:00
Level	3.31 ft	NORMAL	2018-06-10 11:45:00
Discharge	1030 cu ft/s	NORMAL	2018-06-10 11:45:00

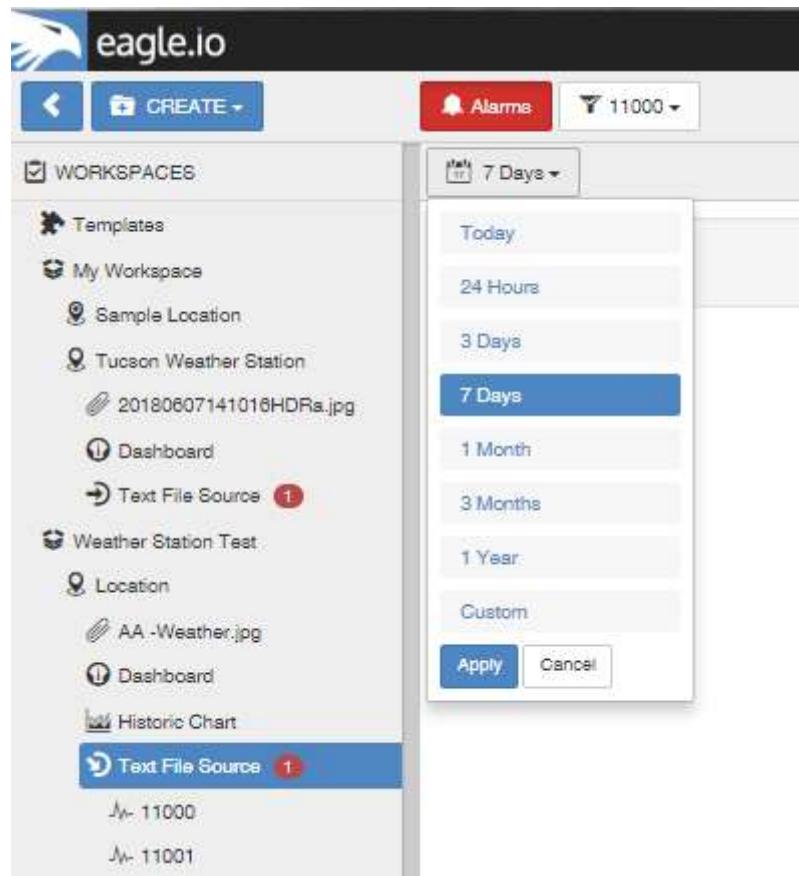
# Example of Monitoring Dashboard

# MAQ®20 3<sup>rd</sup> party dashboard: Eagle.io



Dataforth Weather Station Dashboard

# MAQ®20 3<sup>rd</sup> party dashboard: Eagle.io



Accessing Historic Data

# MAQ®20 3<sup>rd</sup> party dashboard: Eagle.io

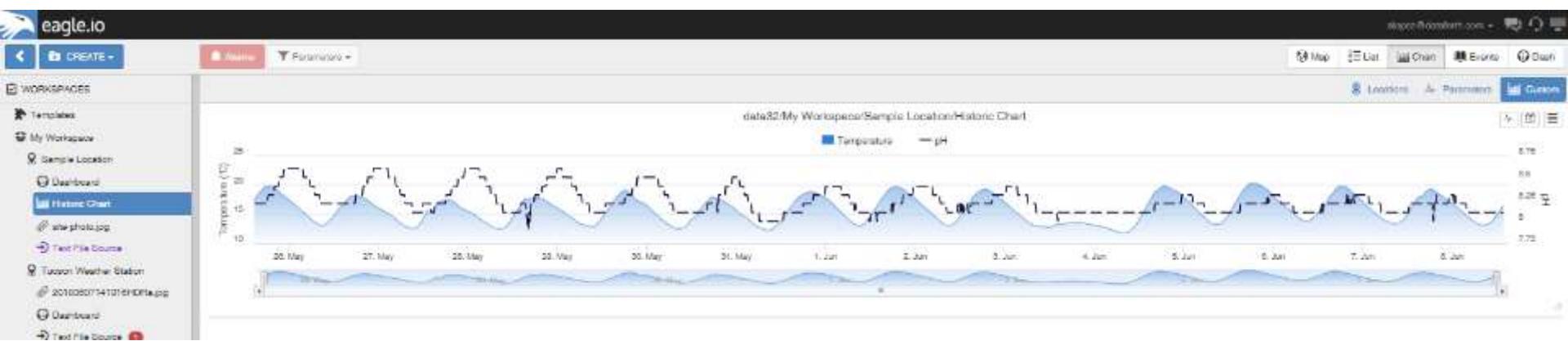


Chart of Historic Data

# **MAQ®20 3<sup>rd</sup> party dashboard: Eagle.io**

**Q: Is Eagle.io available through Dataforth?**

A: Not at this time

**Q: Will Eagle.io be available through Dataforth?**

A: Most likely not, but we are in the process of evaluating two possible scenarios: Marketing Partnership and Dashboard offering.

**Q: If Dataforth does not offer Eagle.io, how can customers use it?**

A: Customers can sign up with Eagle.io directly and use their dashboard and Dataforth MAQ20. We believe, other 3<sup>rd</sup> party dashboards can also be used.

# Resources

≡ Products    Functional Search    Sales & Support

Literature & Downloads

Literature

- > Corporate Brochure
- > Product Catalog

Downloads

- > User Manuals / Configuration Guides
- > CAD Models
- > Software

Application Notes

Featured Application Notes ...

Cross Point Switch using MAQ20-DORLY20 Module  
The MAQ20 relay module, MAQ20-DORLY20, contains 20 relays that may be wired as a 4x5 cross point switch and find valuable use in many applications.

Harmonics and Utility Costs

The objective of this Application Note is to briefly show how these types of harmonics in a customer's facility affect utility measured quantities and costs.

RMS Revisited

This Application Note will revisit the definition of RMS, show RMS values for various sine functions, and compare them.

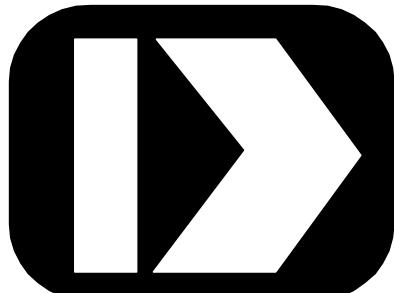
Tech Notes

Recent Tech Notes

- > Faraday's Law of Induction
- > Power Supply Issues
- > When to Use Closed Loop Instead of Open-Loop
- > Aliasing, Anti-aliasing, Anyway?
- > Made in the USA
- > MAQ20 Data Acquisition

- Dataforth Manuals found here:
  - [http://www.dataforth.com/maq20\\_download.aspx](http://www.dataforth.com/maq20_download.aspx)
- ReDAQ® Shape
  - MA1038 ReDAQ® Shape for MAQ®20 User Manual
- IPEmotion
  - MAQ®20 IPEmotion Software Manual
  - MAQ®20 IPEmotion Dataforth Plug-In Manual
- OPC
  - MA1057 OPC Server User Manual
  - OPC Server Demonstration
- LabVIEW™
  - MA1039 LabVIEW™ VI for MAQ®20 User Manual
  - LabVIEW™ VI
- Python API examples
- Software Downloads
- IO Module Hardware User Manuals





**DATAFORTH®**

**MAQ®20 Components**

**Building a System**

# **MAQ®20 Components building a System**

## **REMINDER**

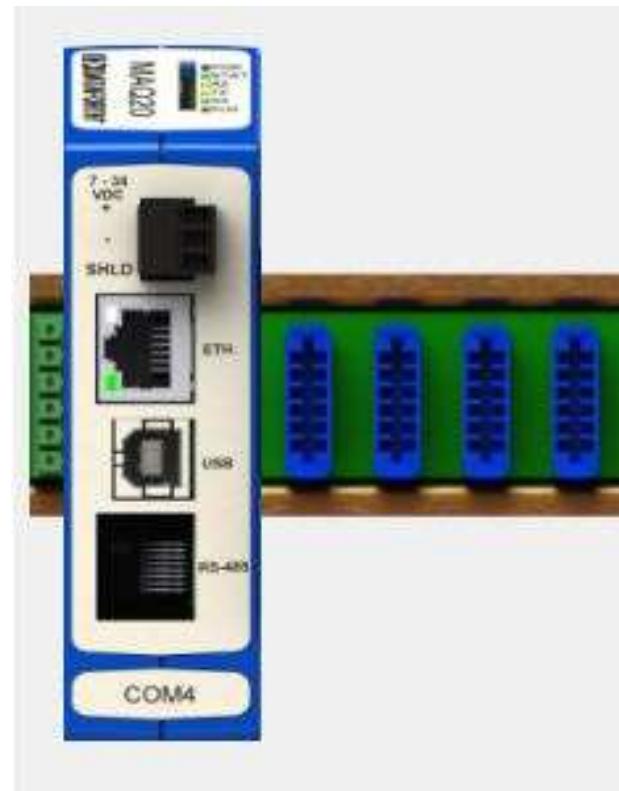
**Communication Module Alone is  
NOT a system**

**RS232/RS485/USB/Ethernet  
Communication only**



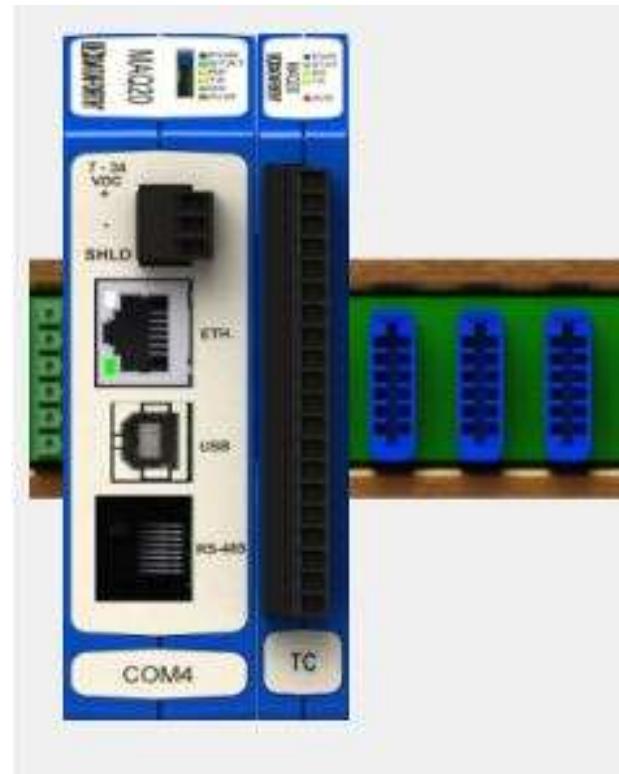
# MAQ®20 Components building a System

## Communication



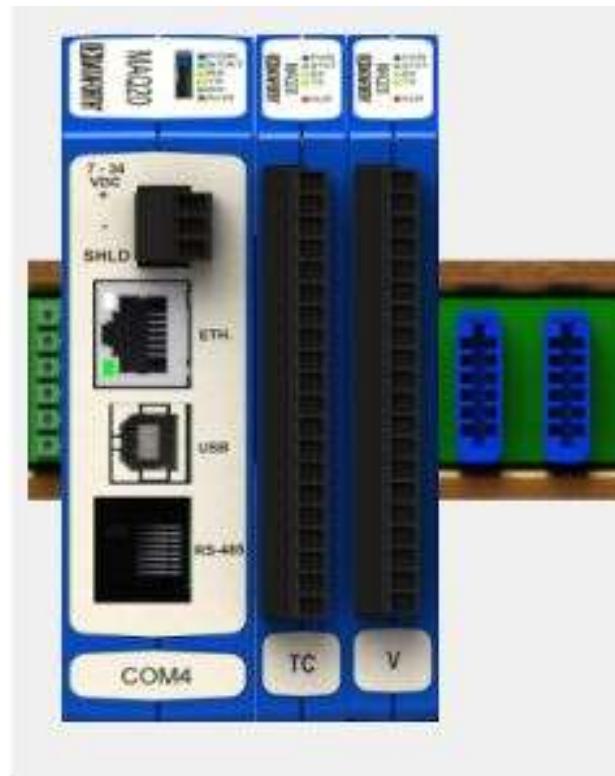
# MAQ®20 Components building a System

## Communication Analog Module



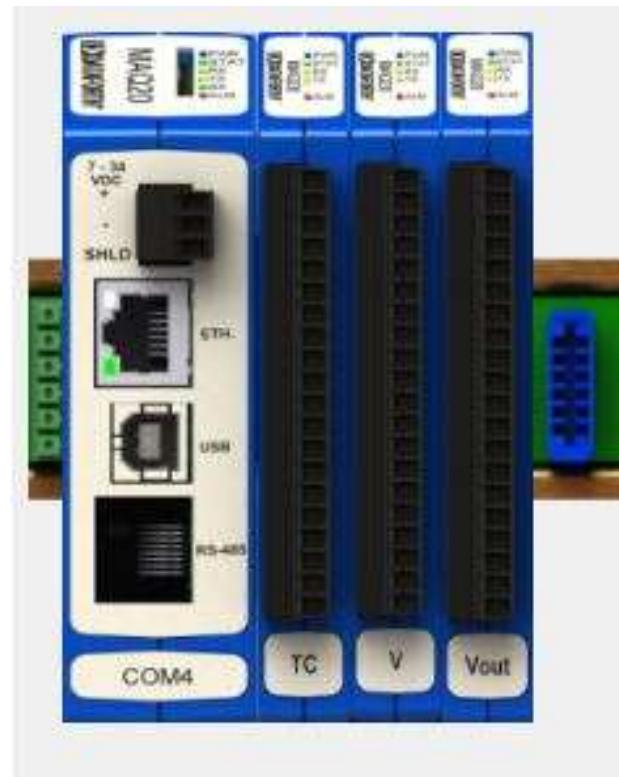
# MAQ®20 Components building a System

## Communication Analog Module



# MAQ®20 Components building a System

## Communication Analog Module

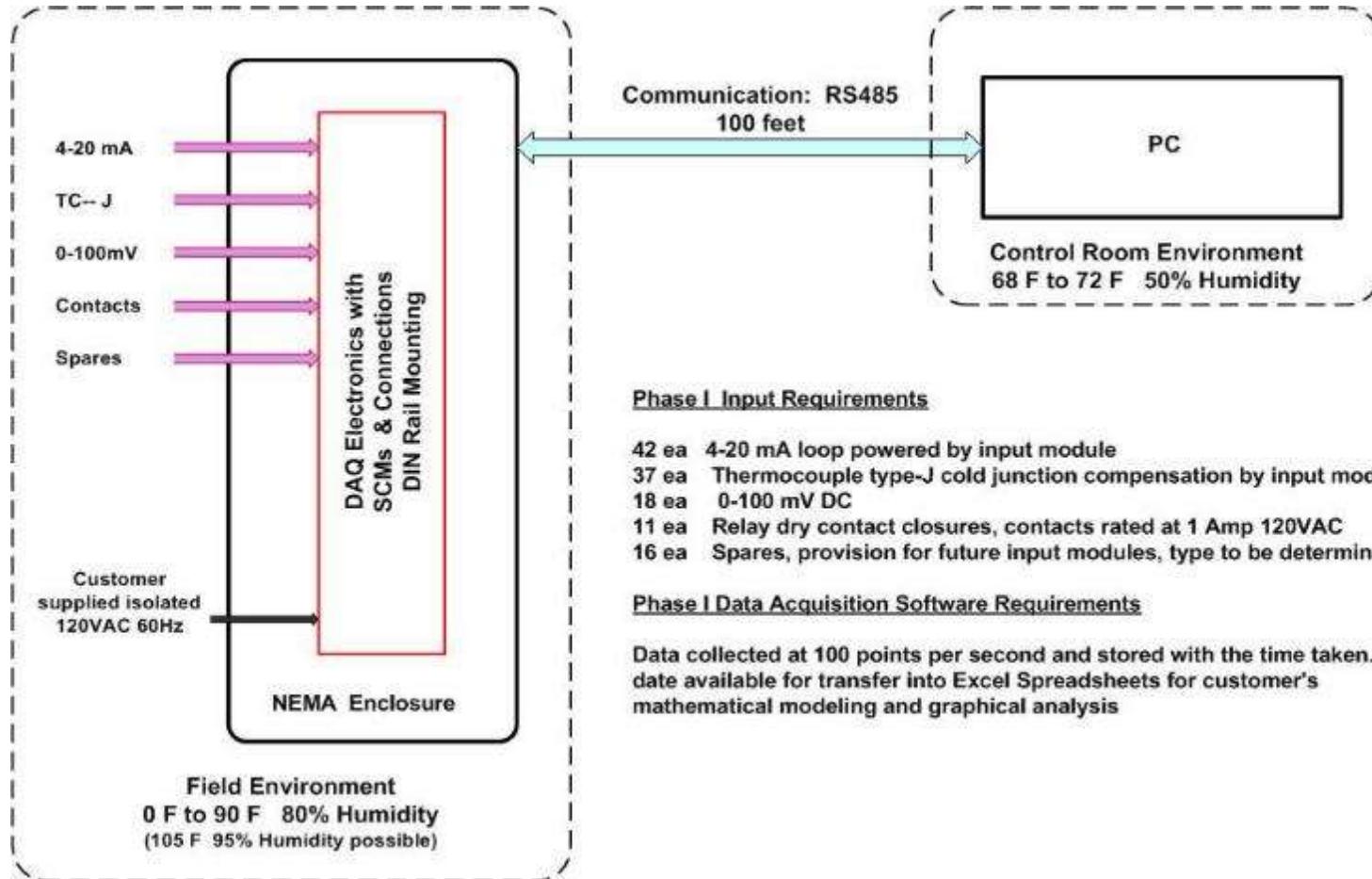


# MAQ®20 Components building a System

Communication  
Analog Module  
and / or  
Digital Module



# MAQ®20 Competitive Landscape



#### Phase I Input Requirements

- 42 ea 4-20 mA loop powered by input module
- 37 ea Thermocouple type-J cold junction compensation by input module
- 18 ea 0-100 mV DC
- 11 ea Relay dry contact closures, contacts rated at 1 Amp 120VAC
- 16 ea Spares, provision for future input modules, type to be determined.

#### Phase I Data Acquisition Software Requirements

Data collected at 100 points per second and stored with the time taken. Stored data available for transfer into Excel Spreadsheets for customer's mathematical modeling and graphical analysis

REQUEST for QUOTATION

# MAQ®20 Competitive Landscape

Company	National Instruments	Opto 22	Red Lion	WAGO	Advantech	Beckhoff	Dataforth
Model Quoted	CompactDAQ	SNAP-PAC-R2	CSM/CSIN	750-xxx	Adam 5000		MAQ20
Quoted System Price	\$11,989	\$14,015	\$8,042	\$6,911	\$3,885	Never Responded	\$3,910
Warranty	Hdw 1 yr, Soft 90 days, extended option	Lifetime on I/O mods, 2.5 yrs on other	2 yrs	2 yrs	2 yrs		Hdw 1 yr, Soft 30 days
Delivery ARO	2 to 4 weeks	2 weeks	5 weeks	16 weeks	not quoted		stock to 4 weeks
Operating Temp	-20 to 55C (chassis) up to -40 to 70C modules	0 to 60C	0 to 50C	0 to 55C	-10 to 70C		-40 to +85C
Burn-In	Yes, but proprietary	None, full test at 25C	Yes, room temp. See Note 1	No Response	-15 to 75C Time ?		48 hrs at +85C
Certifications	Heavy CE, IEC, EN, UL, FCC class A	UL, CSA, FM	CE, IEC, EN, UL, CSA FCC class A	UL, ATEX, Marine	CE, FCC class A		CE, EN, UL Class I, Div 2, Groups A, B, C, D
Input Transient Protection	2300Vrms for 5s	No	4kV contact discharge 8kV air discharge	Not specified	Yes, but no details avail		ANSI/IEEE C37.90.1
Isolation	Note 2	Note 3	500Vrms 1 min ch-to-ch and ch-to-power supply	500V ch-to-system	3000VDC ch-to-bus 15VDC max ch-to-ch		1500Vrms ch-to-bus, ch-to-ch module dependent
Accuracy	0.2% or better	0.05% to 1.0%	0.1%, 0.3% temp	0.1% to 0.2%	0.1% to 0.2%		0.03% to 0.06%
Power Supply	9 to 30VDC	5.0 to 5.2VDC	24VDC +/-10%	24VDC (-15 +20%)	10 to 30VDC		7 to 34VDC
Software	LabVIEW SignalExpress \$749	Basic sftw free	Config sftw free	Modbus DLL, \$88	Windows utility free		ReDAQ Shape \$200 IPEmotion \$420
Cost per Channel: 108 Chs	\$111/ch	\$130/ch	\$74/ch	\$64/ch	\$36/ch		\$36/ch

# **Homework for tomorrow**

**2-3 minutes, answering following questions:**

- Opportunities: won (why? Sharing success) and lost (why?)
- What separates Dataforth from other principals?
- What is your territory / regional main/prime industry?
- What is our customers' first thought about Dataforth?
- What have you learned about one other rep?
- What is your take-away from this conference?



**Marketing  
&  
Sales**

# **Corporate Overview & Direction**

**Industrial Electronics Research**

**Design and Development**

**In-house Manufacturing**

**Expand into New Markets**

**We are always looking for product ideas**



# **DATAFORTH COMMITMENT**

**ISO9001:2015 Registered**

Better than Six Sigma Reliability

## **Continuous Improvements**

**Design:** Better Accuracy, Filtering, Packaging

**Manufacturing:** New Equipment

**Final Test:** Higher First-Pass Yields



## **Continuous Product Introduction**

**MAQ®20 Modules**

**Standalone Modules**

**New AOI**

## **Value-added Quality**



# Product vs. Solution

# **Capture Customer Requirements**

## **Key Questions:**

The Customer Knows What They Want?

Customer is aware of all Product Features?

Are Requirements Likely to Change?

# Capture Customer Requirements



How the customer  
explained it



How the Project Leader  
understood it



How the Programmer  
wrote it



How the Business  
Consultant described it



What the customer  
really needed

# **Requirements Capture Key Words**

- **IO Types & Counts**
- **Rate at Which Data Needs to Be Acquired**
- **Resolution**
- **Spare IO**
- **Redundant IO**
- **Special Functions**
- **Physical Environment**
  - Layout of System Elements
  - Signal Conditioning Required to Protect Equipment
  - Noise (Transients, EMI, RFI)
- **Cost (Per Channel)**
- **Lifetime**



# Your Resources

# New Web page

**DATAFORTH®**  
Specialists in data acquisition, signal conditioning and data communication

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## The MAQ20 DAQ Eco-System

Diagram illustrating the MAQ20 DAQ Eco-System architecture. It shows a central **Communication Module** connected to various **Analog Input** and **Analog Output** modules. The **Analog Input** modules include MWDN/VDN/VSN, IDN/ISN, FREQ, BRDG1, JTG/KTC/RBTIC/TTC, RTD21/RTD41, ISOMT/ISOMVI/ISOMV, and VC/IO. The **Analog Output** modules include ISOMT/ISOMVI/ISOMV. Below the communication module, there are **Discrete Inputs** (10-32 VDC, Voh/V24 VDC, DIV20, DIVC20) and **Input & Output** modules (3-40 VDC, 3 A, DIOL/DIOH). On the right, there are **Discrete Output** modules (24-320 VAC, 3 A, DODC205K, DORLY20). The system is connected to **Software** via ReConfigurable I/O EMotion Python API LabVIEW Via OPC Server.

**SIGNAL CONDITIONING**  
Isolated Analog Products for Data Acquisition and Control  
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**4-20mA Transmitters**  
Industrial Loop-Powered Transmitters.  
[SEE MORE +](#)

**DATA ACQUISITION**  
Hardware and Software for fast, flexible, reliable & intelligent data acquisition systems  
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- Global Presence
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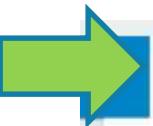
Dataforth - USA  
Phone: 800-444-7644

[EMAIL](#) [WEBSITE](#)

Conformance & Compliance

CE Declaration of Conformity  RoHS Compliance  ISO9001:2015 Certificate  Declaration of Conformity to REACH - All Products

# Product Information Available Online



Products     Functional Search    Sales & Support    Literature & Downloads    Admin    Georg Haubner    Cart

<input type="checkbox"/> Signal Conditioning 5B Series 3-Way Isolated Modules  7B Series 2-Way Isolated Modules  SensorLex® 8B Series Analog to Serial Isolated Modules  DSCA Series DIN Rail Mount Isolators  SCM9B Series Analog to Serial Isolated Modules  SCMD Series Isolated Digital I/O Modules	<input type="checkbox"/> 4-20mA Transmitters Loop Powered Two-Wire Transmitters DSCT Series  User-Programmable Transmitters DSCP/SCTP Series  DIN Rail Mount Loop Isolators DSCL Series	<input type="checkbox"/> Data Acquisition & Control Modular Data Acquisition System MAQ®20  8B isoLynx® System SLX300  5B isoLynx® System SLX200	<input type="checkbox"/> Software Complete software solutions and programming tools:  ReDAQ® Shape Graphical Software for MAQ®20  ReDAQ® Shape Graphical Software for 8B SLX300  Python API for MAQ®20  IPEmotion Graphical Software for MAQ®20  DSCP20/SCTP20/DSCP81 Configuration Software  9B Data Acquisition and Control Utility Software
<input type="checkbox"/> Data Communications  <input type="checkbox"/> Isolated DIN Mount RS-232/RS-485 converters / line drivers  <input type="checkbox"/> Isolated Modular Modular converters / line drivers	<input type="checkbox"/> Data Acquisition System Builder Configure, price, and purchase your data acquisition system online.	<input type="checkbox"/> Power Supplies  <input type="checkbox"/> Custom Products	

# Product Information Available Online



Functional Search

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Signal Conditioning - Input Sensors

- > Accelerometer
- > Frequency
- > True RMS
- > Matched Pair
- > Digital
- > Thermistor
- > User Programmable
- > Thermocouple
- > RTD
- > Strain Gage
- > Voltage
- > Current
- > Potentiometer

Data Acquisition

- > MAQ®20
- > SLX200
- > SLX300
- > System Builder

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Contact us for a wide range of technical support and assistance regarding your application.

- > Toll Free: 800-444-7644
- > Online Technical Support
- > sales@dataforth.com

Signal Conditioning - Output Sensors

- > Voltage
- > Current
- > Digital

Data Communications

- > Line Drivers
- > Converters

Power Supplies

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# Literature

≡ Products

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## Literature

- > Corporate Brochure
- > Product Catalog

## Downloads

- > User Manuals / Configuration Guides
- > CAD Models
- > Software

## Videos

- Dataforth Video Library  
Browse our library of video tutorials.

## Application Notes

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This Application Note will revisit the definition of RMS, show RMS values for various time functions, and explore some interesting RMS measurement issues.

[see all application notes](#)

## Tech Notes

Recent Tech Notes ...

### Faraday's Law of Induction

> Power Supply Isolation

> When to Use Closed-loop Control Instead of Open-loop Control

> Aliasing, Anti-aliasing – What is that anyway?

> Made in the USA

> MAQ20 Data Acquisition System Features

[see all Tech Notes](#)

## Press & Product Releases

> MAQ20 Module Receives Honorable Mention in 2018 Engineers' Choice Awards

> MAQ®20 Discrete Relay Output Module

> MAQ®20-DODC20SK Award Finalist

> Dataforth Announces ISO9001:2015 Quality Management Certification

> Dataforth MAQ20 System Offers Intuitive Interface with Python API

[see all Press & Product Releases](#)

43 Application Notes  
82 Tech Notes  
69 Press & Product Releases  
Sales & Training Presentations

# Final Test Data Sheets Available Online

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### FAQ

View/Search our repository of frequently asked questions.

### Obtain an RMA

Request returns, repairs, exchanges and credits with our online RMA form.

## Online Services

### Test Data Sheets

Locate factory test data for a specific Dataforth module using a serial number lookup.

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Online application to request a line of credit with Dataforth.

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# Final Test Data Sheets Available Online

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Dataforth Home > Test Data Reports

## Test Data Reports

Search for Test Report Datasheets by Serial Number

Use this tool to locate the factory test data for a specific Dataforth module. The test data report will be similar to [this example](#).

\* Enter the Serial Number of the module to retrieve the test report data sheet.

SEARCH

### Availability:

Test Data Reports for the following product families are available online.

- SCM5Bxx-xx
- 8Bxx-xx
- DSCAx-xx

Datasheets for products more than 5 years old may not be online. Contact the factory to obtain datasheet reprints.

Please contact the factory to obtain Test Data Reports for the following product families:

- SCM7B
- DSCT
- SCMVAS

### Related Topics

- ❑ [Online RMA Procedure](#)
- ❑ [Technical Support Services](#)
- ❑ [User Manuals and Configuration Guides](#)

# Final Test Data Sheets Available Online

## TEST DATA SHEET

Date: 08-30-2012  
Model: SCM5B31-02  
SN: 81974-1

### ACCURACY TEST

Vin (V)	Calculated Vout (V)	Measured Vout (V)*	Error (%)	Status
-5.000	-5.000	-5.000	+0.000	PASS
-2.499	-2.499	-2.500	-0.005	PASS
-0.000	-0.000	+0.000	+0.002	PASS
+2.500	+2.500	+2.501	+0.006	PASS
+5.000	+5.000	+5.002	+0.012	PASS

### FINAL TEST RESULTS

Parameter	Measured Value	Specification	Status
Supply Current, Nom	15.1 mA	< 30 mA	PASS
Output Resistance	19 ohms	< 55 ohms	PASS
Linearity	0.004 %	+/- .03 %	PASS
Accuracy	0.012 %	+/- .08 %	PASS
Supply Sensitivity	155 uV/%	+/- 600 uV/%	PASS
Frequency Response	52.2 dB	61+/-16 dB	PASS
Step Response	99.9 %	85 to 110 %	PASS
Output Noise	103 uVrms	< 400 uVrms	PASS
240 VAC Withstand			PASS
Hi-Pot			PASS

Check List

# System Builder

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## Signal Conditioning

5B Series  
3-Way Isolated Modules

7B Series  
2-Way Isolated Modules

SensorLex® 8B Series  
Analog to Serial Isolated Modules

DSCA Series  
DIN Rail Mount Isolators

SCM9B Series  
Analog to Serial Isolated Modules

SCMD Series  
Isolated Digital I/O Modules

## 4-20mA Transmitters

Loop Powered Two-Wire Transmitters  
DSCT Series

User-Programmable Transmitters  
DSCP/SCTP Series

DIN Rail Mount Loop Isolators  
DSCL Series

## Data C

Isolated DIN Mount  
RS-232/RS-485 converters / line drivers

Isolated Modular  
Modular converters / line drivers

## Data Acquisition & Control

Modular Data Acquisition System  
MAQ®20

8B isoLynx® System  
SLX300

5B isoLynx® System  
SLX200

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ReDAQ® Shape Graphical Software for 8B SLX300

Python API for MAQ®20

IPEmotion Graphical Software for MAQ®20

DSCP20/SCTP20/DSCP81 Configuration Software

9B Data Acquisition and Control Utility Software

# Software Downloads

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## Signal Conditioning

5B Series  
3-Way Isolated Modules

7B Series  
2-Way Isolated Modules

SensorLex® 8B Series  
Analog to Serial Isolated Modules

DSCA Series  
DIN Rail Mount Isolators

SCM9B Series  
Analog to Serial Isolated Modules

SCMD Series  
Isolated Digital I/O Modules

## 4-20mA Transmitters

Loop Powered Two-Wire Transmitters  
DSCT Series

User-Programmable Transmitters  
DSCP/SCTP Series

DIN Rail Mount Loop Isolators  
DSCL Series

## Data Communications

Isolated DIN Mount  
RS-232/RS-485 converters / line drivers

Isolated Modular  
Modular converters / line drivers

## Data Acquisition

Modular Data Acquisition System  
MAQ®20

8B IsoLynx® System  
SLX300

5B IsoLynx® System  
SLX200

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Dataforth Home > Data Acquisition > Data Acquisition Software

## Data Acquisition Software

- [ReDAQ® Shape for MAQ®20](#)
- [ReDAQ® Shape for BB](#)
- [Python API for MAQ20](#)
- [IPEmotion for MAQ20](#)
- [DSCP20/SCTP20 & DSCP81](#)
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ReDAQ® Shape

Programmable DIN Rail and Head Mount Modules

Utility Software

IPEmotion, ReDAQ® Shape, OPC Server,  
LabVIEW™ VIs, DASYLab\*

# Online User Account

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**User Account Profile**  
Your dataforth.com site registration profile.



Please enter your information and click Submit Information below.

\* Required fields are in bold.

## Personal Info

\* First Name

Grainger

## Contact

\* Email

grauber@dataforth.com

\* Last Name

Hautner

\* Phone

520-917-2246

Fax

520-741-0762

\* Company

Dataforth

Job Classification

GM Corp. Management

Industry & Business Classification

Other

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- Necessary for your order
- We call to verify
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## GNAL CONDITIONING

Integrated Analog Products for Data Acquisition and Control

## 20mA Transmitters

External Loop Powered Transmitters

## DATA ACQUISITION

Hardware and Software for Fast, Flexible, Variable & Intelligent data acquisition systems

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### Alliance Partner Network Resources



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# New: 3D CAD Model Library

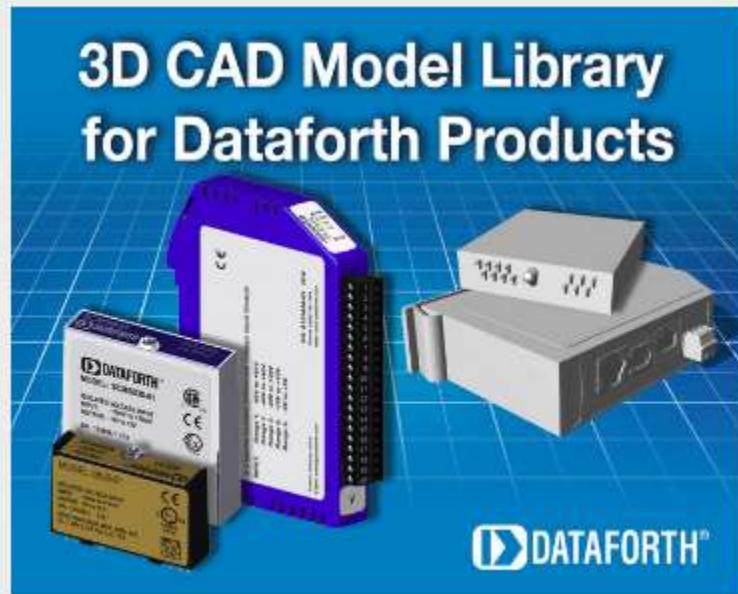
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Dataforth Home > 3D CAD Models

## 3D CAD Model Library

Utilize our library of 3D CAD models of Dataforth modules and accessories.

Dataforth has made available 3D CAD models, in STEP and STL format, for many of our product families. Follow the links on this page to find the download link for the model(s) you are interested in.



### Families with CAD Models Available:

#### Signal Conditioning

- **SCM5B** 3-Way Isolated Signal Conditioning
- **SCM7B** 2-Way Isolated Process Control Signal Conditioning
- **SensorLex® BB** Miniature Isolated Analog Signal Conditioning
- **DSCA** High Performance DIN Isolated Signal Conditioners
- **SCMD** Isolated Digital I/O Modules
- **SCMVAS** Voltage Attenuator System for Analog Signal Conditioning

#### Data Acquisition

- **MAQ®20** Modular Data Acquisition and Control System
- **5B isoLynx® SLX200** Data Acquisition System
- **8B isoLynx® SLX300** Data Acquisition System

#### 4-20mA Transmitters

- **DSCT** Loop Powered Two-Wire Transmitters

#### Data Communications

- **DCP** DIN Rail Converters and Line Drivers
- **LDM** Isolated Modular Converters and Line Drivers

# New Tech & Application Notes

## Faraday's Law of Induction

Faraday's law of induction is a basic law of electromagnetism. When an electric circuit is moved in the neighborhood of a magnet, a current is induced in the circuit during the movement.

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## TECH NOTE

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### Faraday's Law of Induction

Michael Faraday in 1831 and Joseph Henry in 1832 independently discovered electromagnetism.(3) Faraday published first and gets the honor of his name on the phenomenon.

## Cross Point Switch using MAQ20-DORLY20 Module

The MAQ20 relay module, MAQ20-DORLY20, contains 20 relays that may be wired as a 4x5 cross point switch and find valuable use in many applications.

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an901

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## APPLICATION NOTE

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### Cross Point Switch using MAQ20-DORLY20 Module

The MAQ20 relay module, MAQ20-DORLY20, contains 20 relays that may be wired as a 4x5 cross point switch as shown in the figure 1 below. The numbers 1-40 represent the 40 spring terminals of the module. The labeled

1<sup>st</sup> and 3<sup>rd</sup> week of the month

2<sup>nd</sup> (and 4<sup>th</sup>) week of the month

# New Newsletter

The newsletter features a blue header with the Dataforth logo and navigation links for 'Visit Us', 'About Us', 'Email Us', and 'Your Account'. The main content area has a blue background with white text. It starts with a welcome message: 'Welcome to Our Monthly Newsletter' and 'Data On Demand Available To Connect With Dataforth'. Below this, it says: 'We continue to work hard to provide the best solutions for your problems.' and 'Share your challenge with us, we might just have the solution for you.' A red button labeled 'Share It Now!' is present. The word 'NEWS' is prominently displayed in large, metallic letters. A section titled 'Dataforth launches online demo for MAQ20' is highlighted with a red circle. At the bottom, there's a sidebar for 'Application and Product Support' and a note about 'Be one of our newest application engineers'.

The newsletter features a blue header with the Dataforth logo and navigation links for 'Visit Us', 'About Us', 'Email Us', and 'Your Account'. The main content area has a blue background with white text. It starts with a welcome message: 'Welcome to Our Monthly Newsletter' and 'Data On Demand Available To Connect With Dataforth'. Below this, it says: 'We continue to work hard to provide the best solutions for your problems.' and 'Share your challenge with us, we might just have the solution for you.' A red button labeled 'Share It Now!' is present. The word 'NEWS' is prominently displayed in large, metallic letters. A section titled 'Dataforth launches online demo for MAQ20' is highlighted with a red circle. Another section titled 'INTRO Enterprise' is also highlighted with a red circle. At the bottom, there's a sidebar for 'Application and Product Support' and a note about 'Be one of our newest application engineers'.



Last week of the month

## Product of the Month

### **MAQ20-ISOV2**

The MAQ20-ISOMV and MAQ20-ISOI voltage input modules and MAQ20-ISOI current input module offer 8 isolated input



## Channel Partner of the month

**HG Associates - Serving New England for Sensors, Data Acquisition & Test Instrumentation**

HG Associates has provided the best in test and measurement products to customers located within the New England states for over 3 decades. Providing application support in the Mil/Aero, Medical, Industrial, and R&D markets. The technical sales team at HGA is strategically located within their

The newsletter features a blue header with the Dataforth logo and navigation links for 'Visit Us', 'About Us', 'Email Us', and 'Your Account'. The main content area has a blue background with white text. It starts with a welcome message: 'Welcome to Our Monthly Newsletter' and 'Data On Demand Available To Connect With Dataforth'. Below this, it says: 'We continue to work hard to provide the best solutions for your problems.' and 'Share your challenge with us, we might just have the solution for you.' A red button labeled 'Share It Now!' is present. The word 'NEWS' is prominently displayed in large, metallic letters. A section titled 'TRITEK' is visible. At the bottom, there's a sidebar for 'Application and Product Support' and a note about 'Be one of our newest application engineers'.

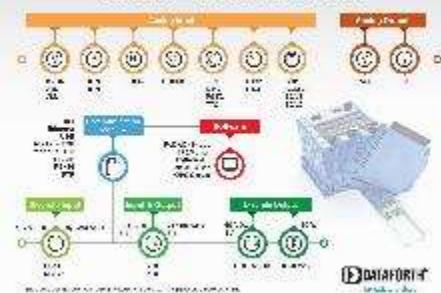
# Advertisements & Images

Spend the Least ... Get the Most

MAQ®20 Industrial Data Acquisition & Control System



The MAQ20 DAQ Eco-System



**MAQ®20**

Industrial Data Acquisition & Control System

- Environmental Monitoring
- Oil and Gas
- Factory and Process Automation
- Power and Energy
- Machine Automation

**DATAFORTH®**

ETHERNET



**8B**

World's  
Smallest  
Isolated  
Analog  
Signal  
Conditioner



**DATAFORTH®**



**DSCA**

1500V Isolation  
0.03%  
Accuracy  
DIN Mount



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Data Acquisition

When accuracy and reliability  
are your top priorities



**DATAFORTH®**



# DATAFORTH®

## YOUR CONTACTS

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Technical Support

[support@dataforth.com](mailto:support@dataforth.com)

US Toll Free: +1-800-444-7644

Phone: +1-520-741-1404

Personal visits or online meetings



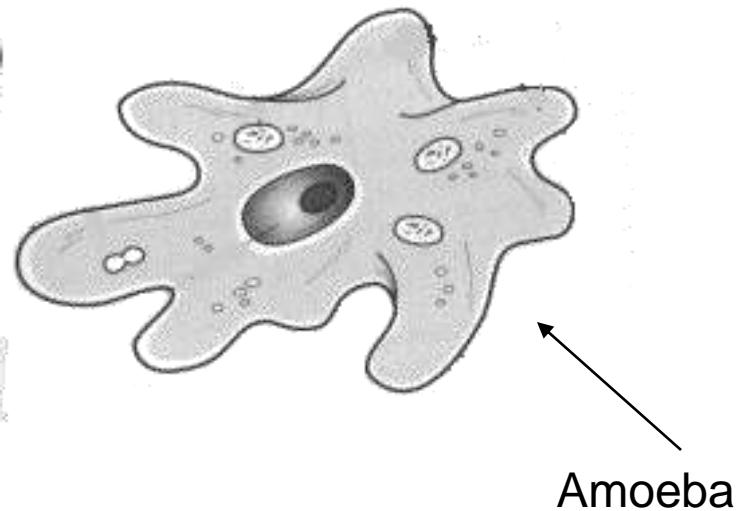
# MAQ<sup>®</sup>20 Applications

## Simple → Complex

# MAQ®20 Simple Applications

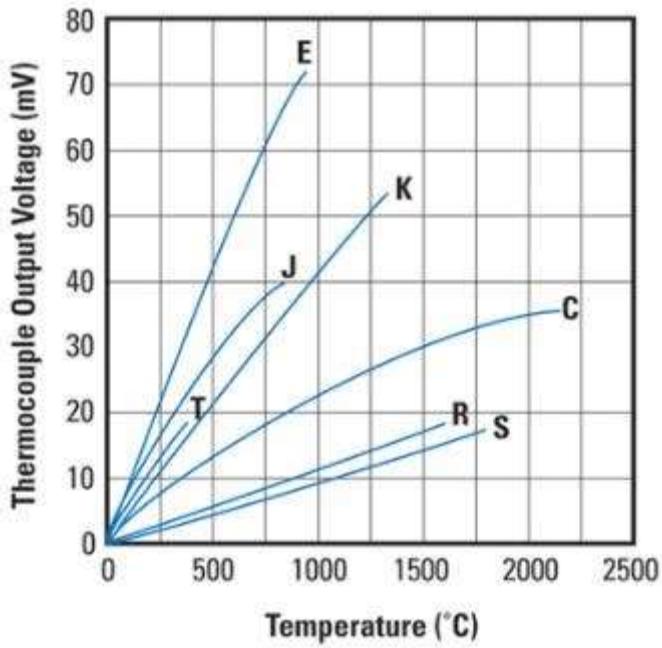
## Monitor

- Display
- Record
- Scale



# MAQ®20 Monitor -Temperature

- Thermocouple
- RTD



# MAQ®20 Record - Datalogging

- Hard Drive
- Solid State Drive
- Micro SD



# MAQ®20 Scaling – Engineering Units



# MAQ®20 Complex Control?



# MAQ®20 Control

## Setpoint

- ON/OFF
- Threshold



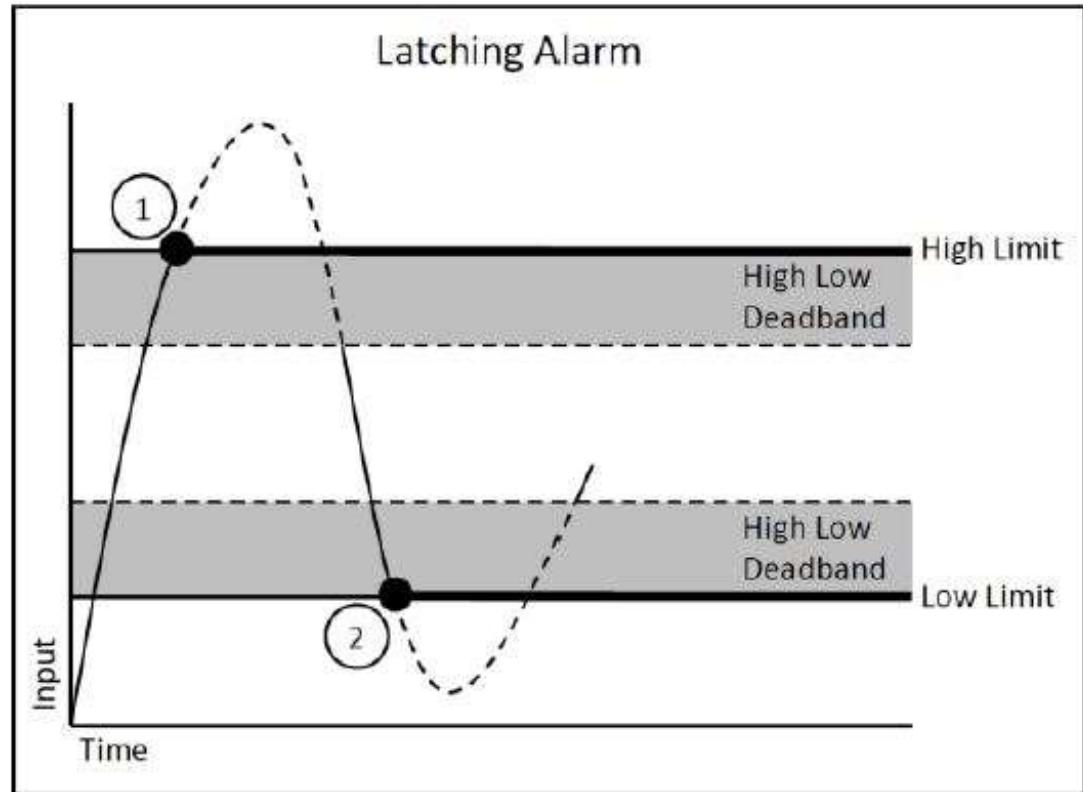
# **MAQ®20 Alarms**

- **High / Low**
- **Deadband**
- **Latched**
- **Tracking**



# MAQ®20 Alarms

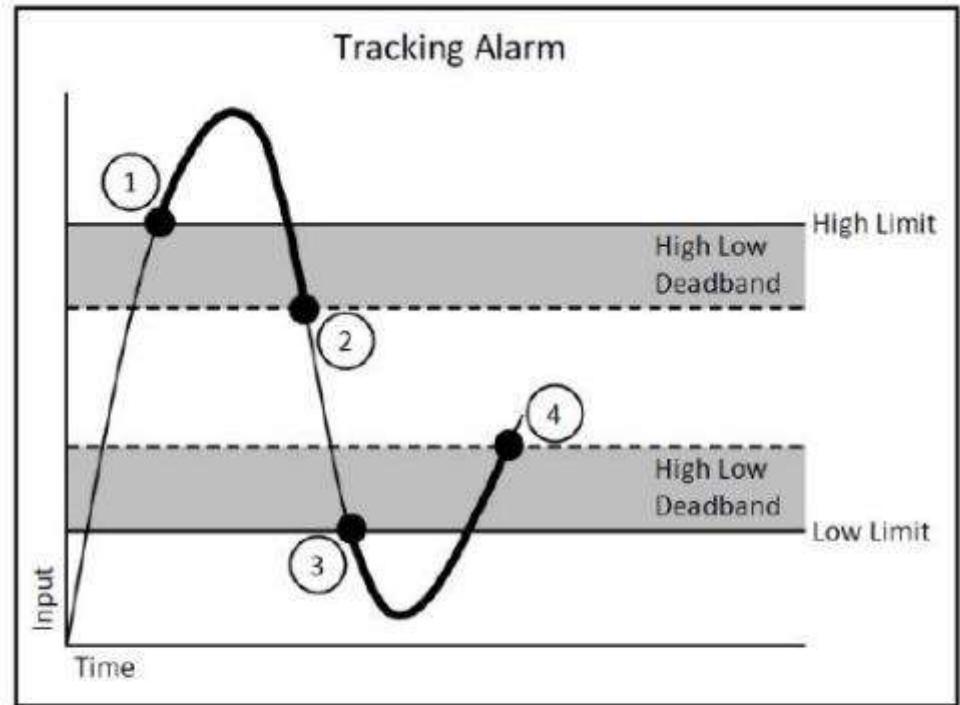
- **High/ Low**
- **Latched**



1. High Alarm Tripped
2. Low Alarm Tripped

# MAQ®20 Alarms

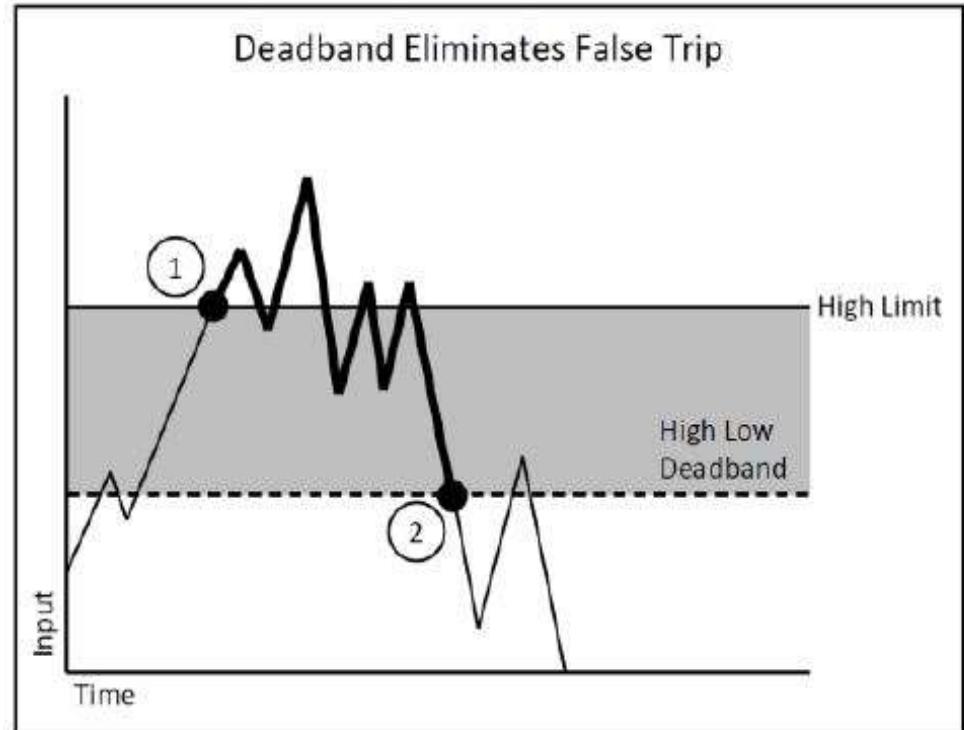
- High/ Low
- Tracking



1. High Alarm Tripped
2. High Alarm Reset
3. Low Alarm Tripped
4. Low Alarm Reset

# MAQ®20 Alarms

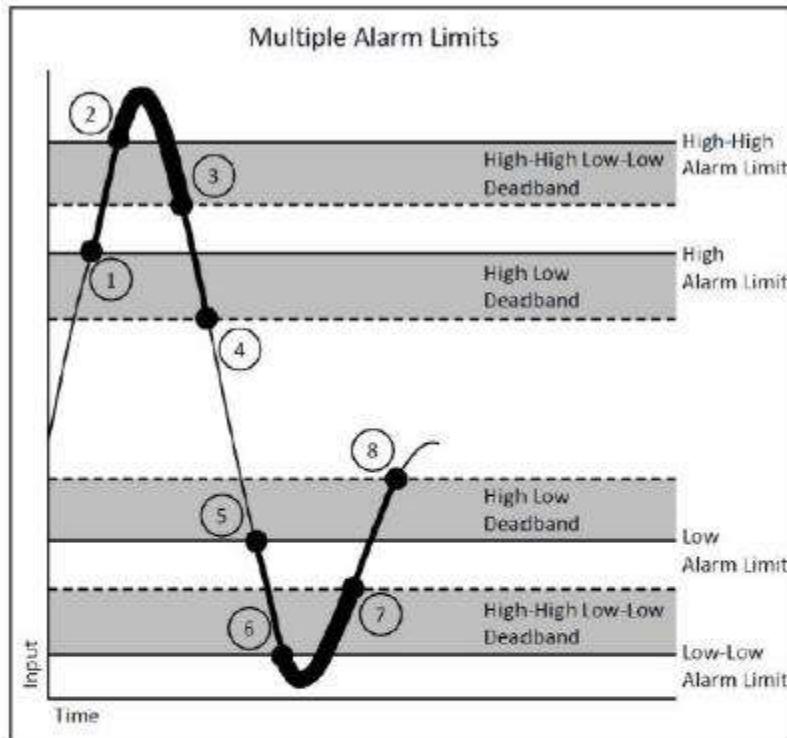
- **Deadband**



1. High Alarm Trip
2. High Alarm Reset

# MAQ®20 Alarms

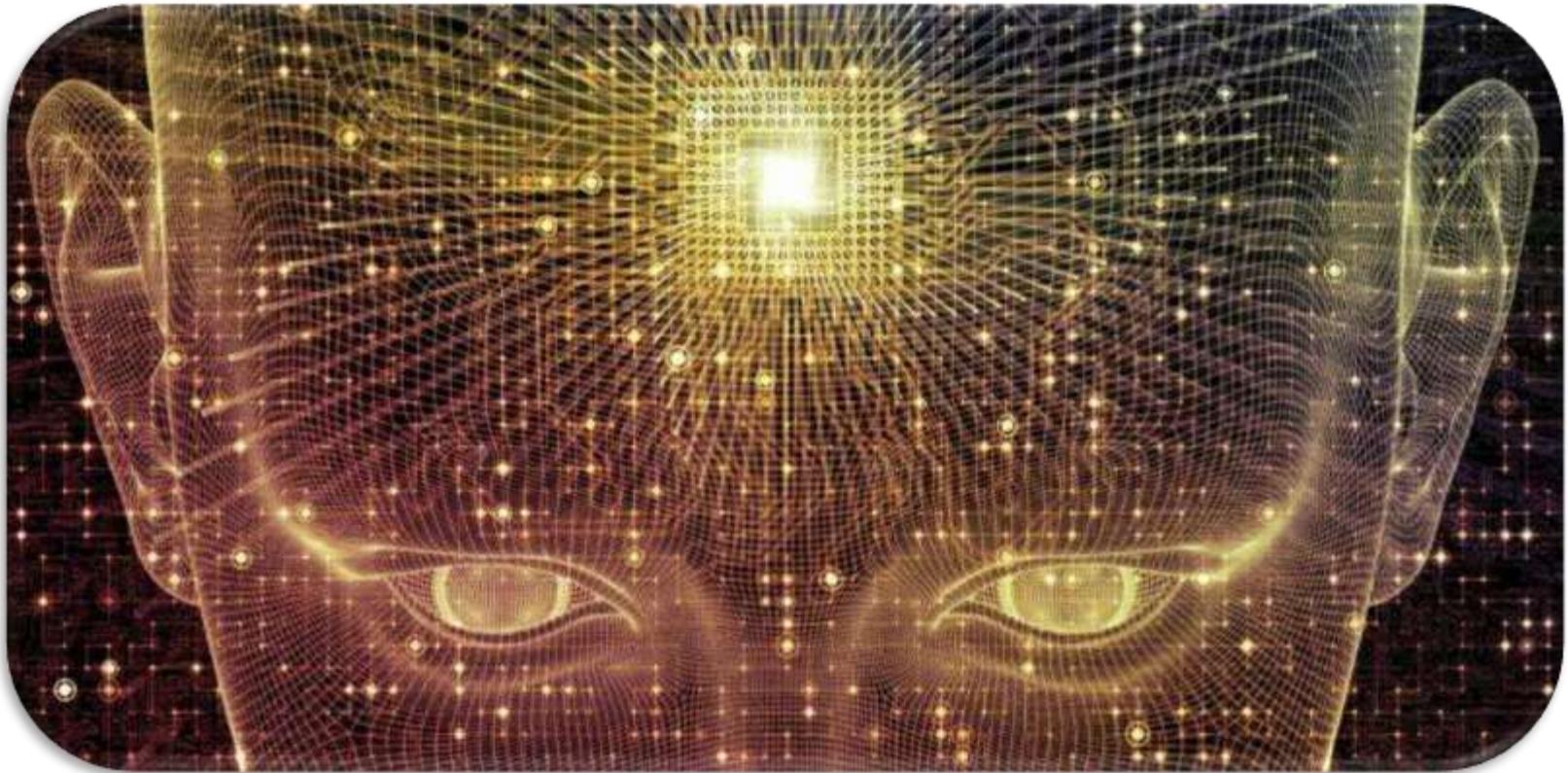
- **High**
- **Low**
- **High/High**
- **Low/Low**



1. High Alarm Trip
2. High-High Alarm Trip
3. High-High Alarm Reset
4. High Alarm Reset
5. Low Alarm trip
6. Low-Low Alarm Trip
7. Low-Low Alarm Reset
8. Low Alarm Reset

# **MAQ®20 Complex Applications**

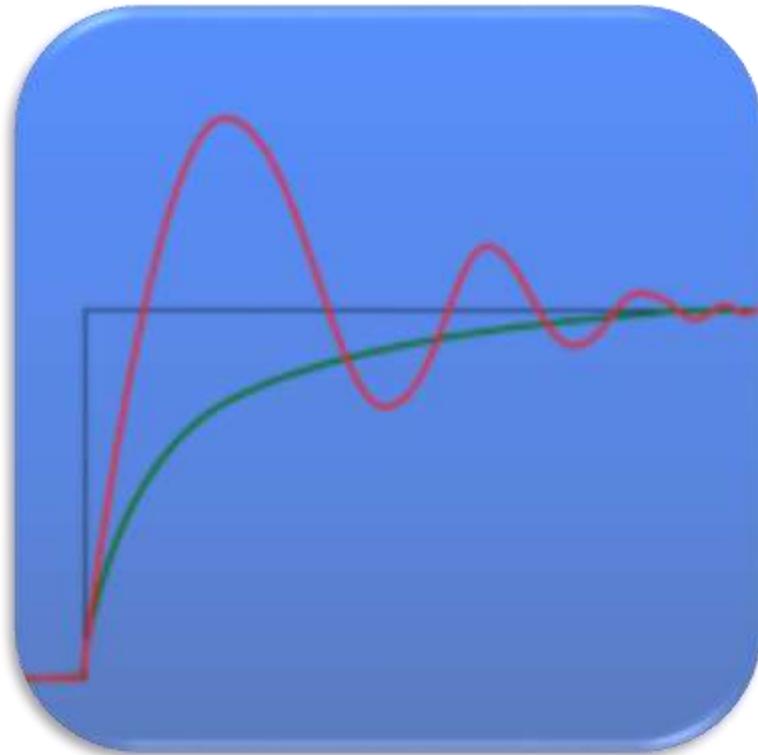
## **Output Control – Sequence – PID**



# MAQ®20 Complex Application

## PID Control

- Proportional
- Integral
- Derivative

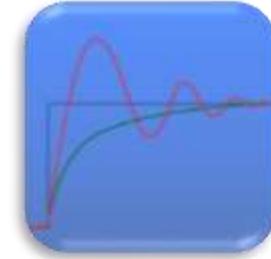


# **MAQ®20 Complex Application - PID**

**Communication Module**

**Input & Output Module**

**ReDAQ® Shape**



# **MAQ®20 Complex Application - PID**

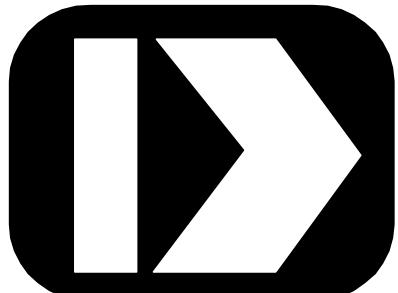
**32 PID Loops**



**Auto Restart on Power Up**

**Automatic Control (Tuning)**

**Anti-reset windup Alarms**



**DATAFORTH®**

**MAQ®20**

# **Application Examples**

# MAQ®20 Application: Remote Windfarm control



Mobile network

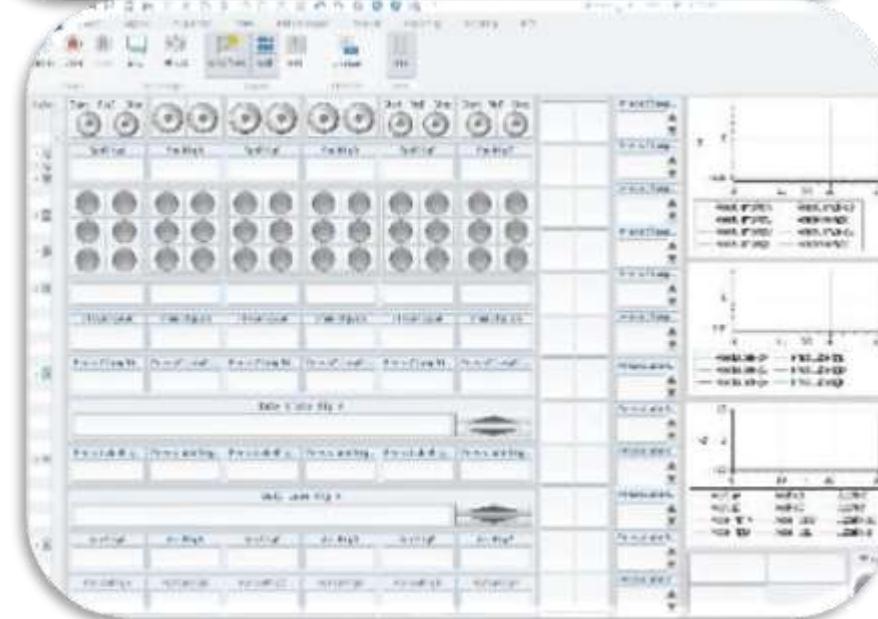


Control and system monitoring  
of e.g. temperature, pressure  
and current draw

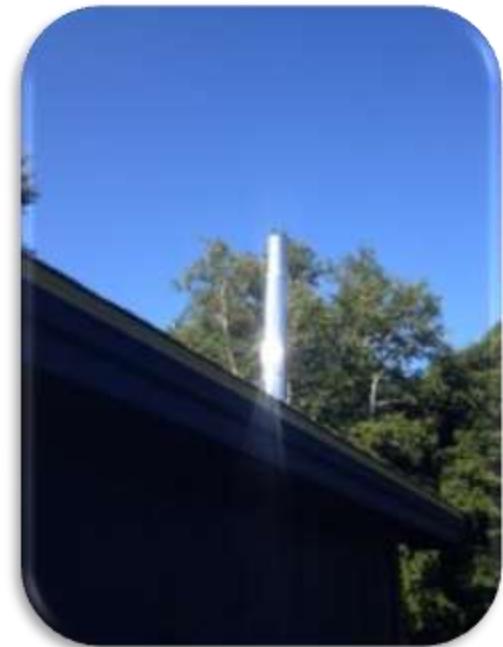
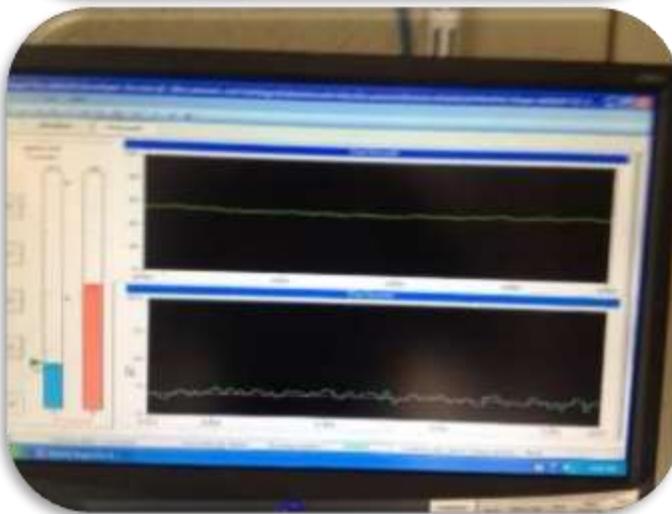
Note: SCM7B34 modules is  
also a solution



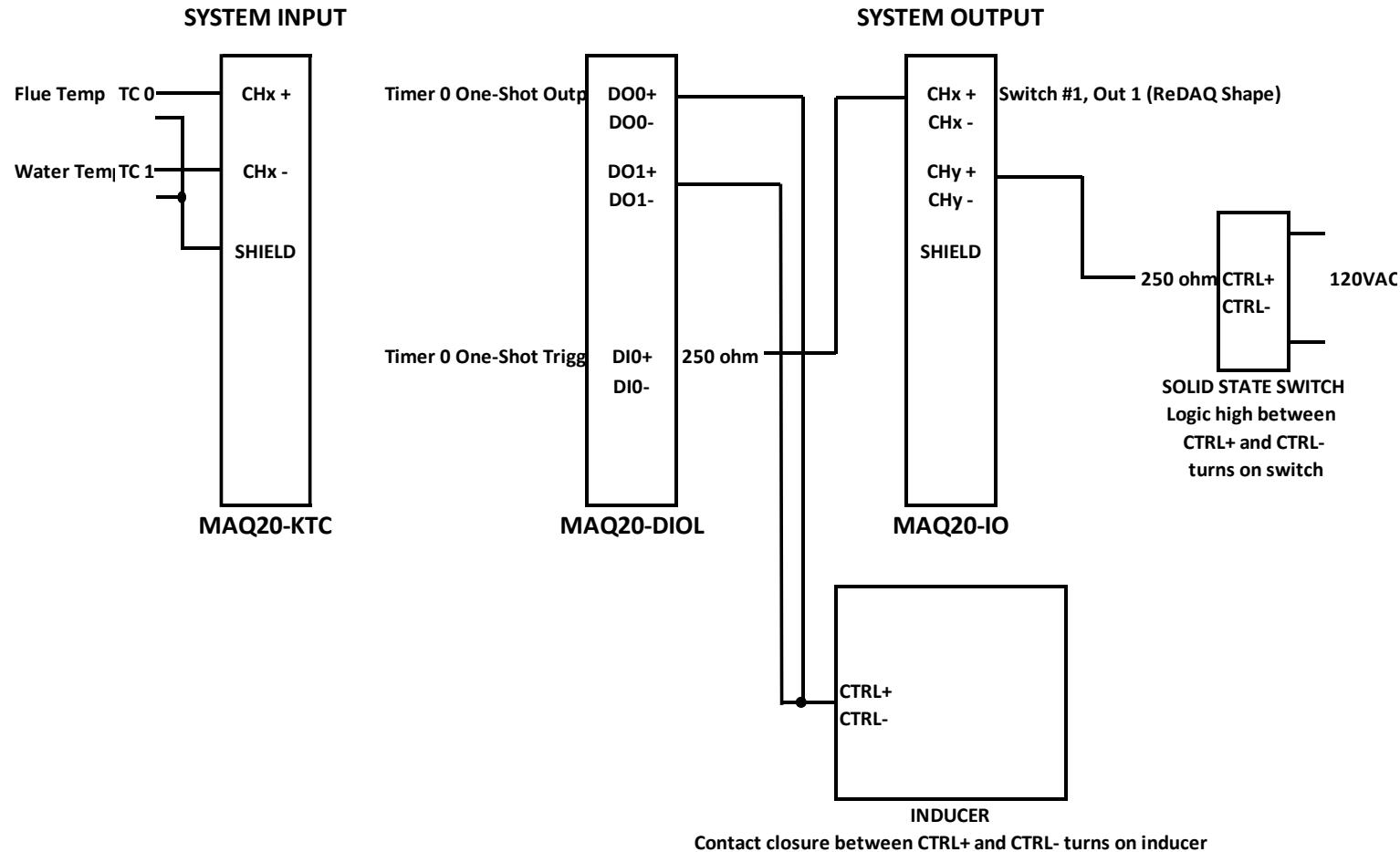
# MAQ®20 Application: Torotrak



# MAQ®20 Application: Furnace control - PID Loop



# MAQ®20 Application: Furnace control - PID Loop



# MAQ®20 Application: Telescope tube experiments Measurement errors

**SOFTWARE:** REDAQ SHAPE for MAQ20 Version 2.5 2012 with full license

**DAQ type:** MAQ20 RTD-31 Modules on MAQ20 COM4

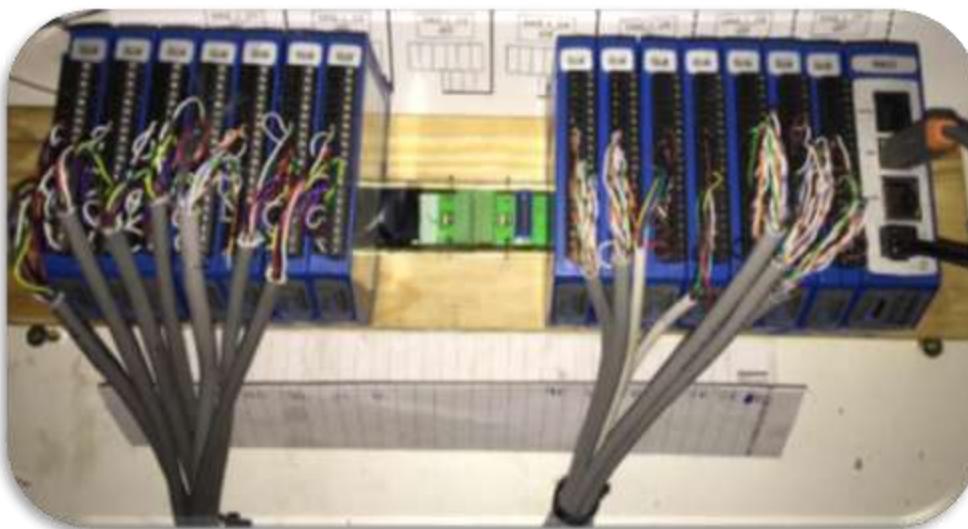
**Interface:** USB CABLE

**RTD TYPE:** OMEGA F2020, 100 Ω, Class 'A'

**Operating System:** Microsoft Windows 7

**Comparison Temperature:** DS18B20

**Wiring type:** 3 wire on a shielded 12 core communication cable.



Showing the data from **14 RTD-31 modules**,(left) the wiring and the 64 sensors placed on the tube(right). The wire used is a shielded 12 core communication cable.

# MAQ®20 Application: Position & Movement Monitoring

## Objective

Monitoring the position and movement of 2 columns on the front and rear of the Providence House in Charlottetown PEI during a restoration of the foundation.

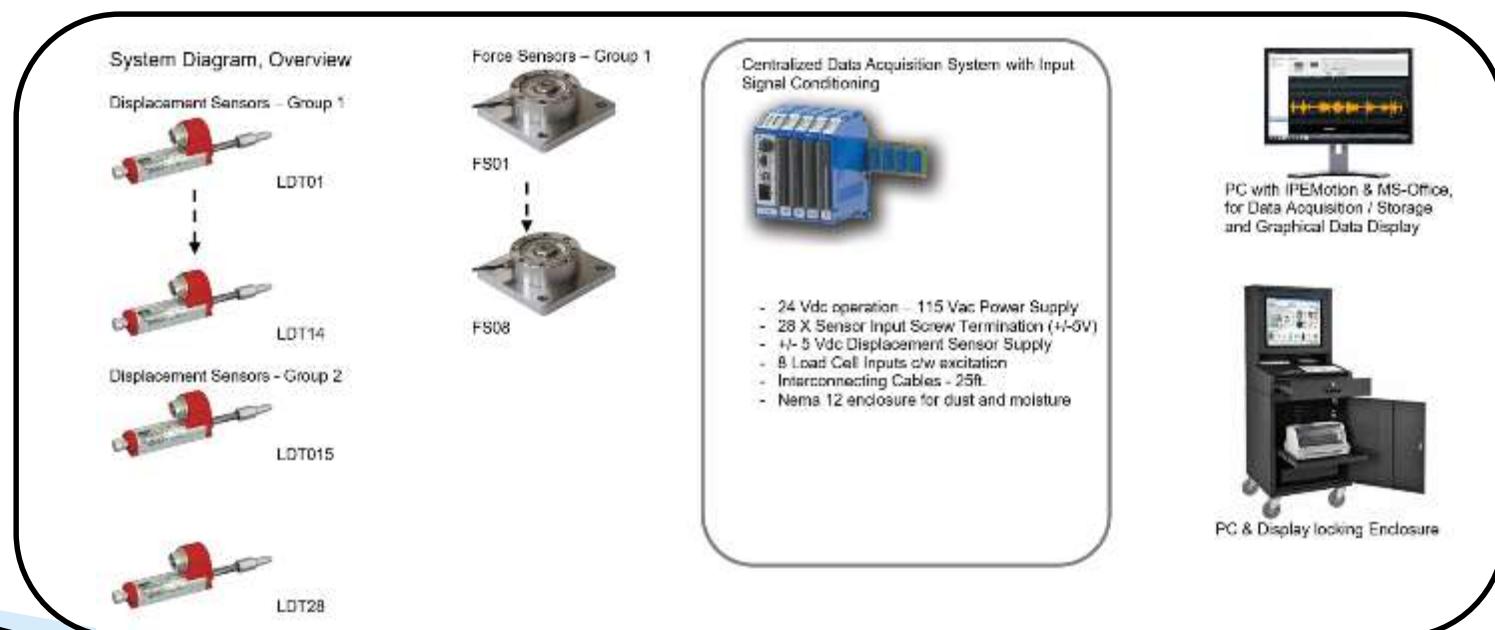
In addition the Compression Forces will be monitored during a loading sequence using 8 Force Sensors mounted on Hydraulic actuators.



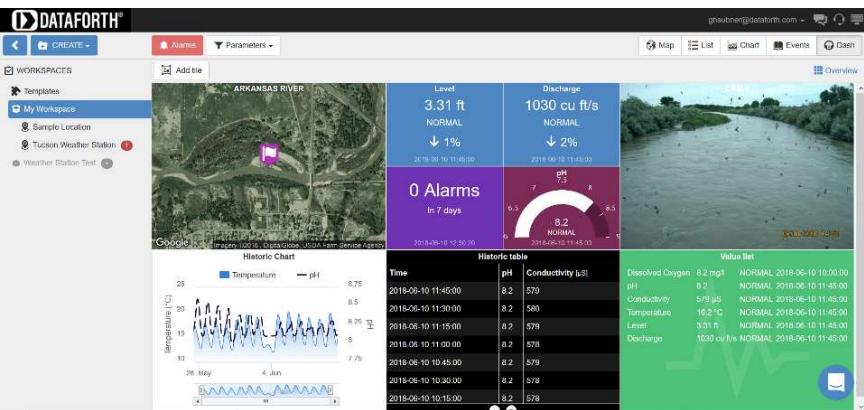
# MAQ®20 Application: Position & Movement Monitoring

## System Component Details

- 2 sets of 14 Displacement Sensors
- 1 set of 8 Force Sensors
- 1 Data Acquisition System (DAS) Input Signal Conditioning
- Sensor Power Supply with distribution terminals
- 1 PC with the DAS software installed
- MS-Office with Excel and Word for Data Display and Reporting
- 1 Initial Configuration consisting of Gauges for Force indication and Bargraphs for Displacement indication
- Optional Locking Computer Workstation



# MAQ®20 Example Application: Remote monitoring of liquid levels



Dashboard



MAQ20

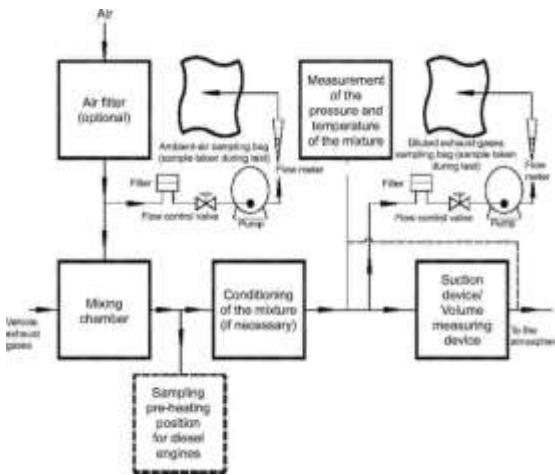
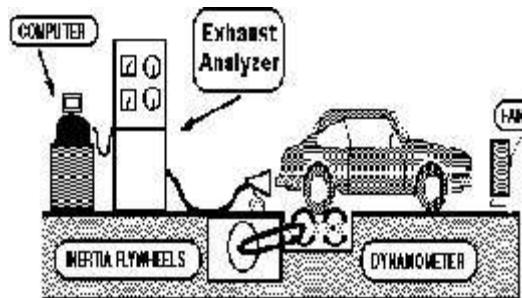


Water tower



Storage tanks

# MAQ®20 Example Application: Valve control to mix exhaust



Basic operation is to controls valves to mix the exhaust of a vehicle with makeup air for later analysis.

Big US automaker uses MAQ20-DORLY20, -VO, -VDN, 20+ systems

# MAQ®20 Example Application: Remote load bank boxes

Remote connect via FTP

ReDAQ® Shape user

High Channel count

Simultaneous 10 systems,  
each with 16 MAQ20-DIOH  
modules

Purchased 22 system so far

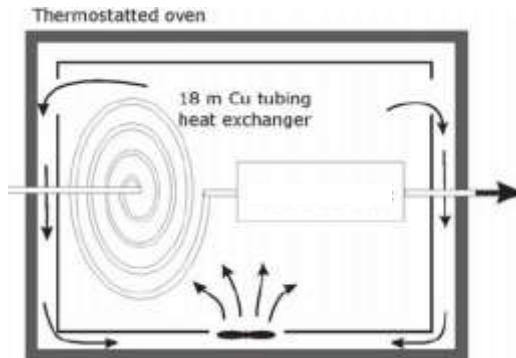


# MAQ®20 Example Application: Monitor heat exchangers in test ovens

## Company:

Engineers, manufactures, tests and qualifies mission critical thermal and fluid management products, and provides aftermarket services, utilized on aircraft, jet engines, advance weapons pods, cruise missiles, avionics & electronic systems.

They have used the MAQ20 in a system to monitor heat exchangers in test ovens for periods of hours or up to a week.



# MAQ®20 Example Application: Aircraft black box testers

## Company:

Builds Universal ATE 'aircraft black box testers'

This is an aircraft simulator that mimics a variety of aircraft status signals to prove the hardware is functional.

They have a working and functional system but have a new requirement to monitor remotely monitor 10-20 signals, T/C, V, RTD, 120v @ 400hz. This would be the case when a box needs to be tested in a temp chamber.

Distance is about 50 feet, so there a variety of solutions possible from 5B392 pairs to SLX300 to MAQ20. A successful solution would be rolled out as needed. There is a 50+ potential for this type of solution over the next few years.



Products: 5B, SLX300, MAQ20

# MAQ®20 Example Application: Catalyst Characterization Instrumentation

## Company

Manufacturer of catalyst characterization instrumentation and bench-scale micro-reactor systems for industrial and research use.

Their instruments have been installed at more than 300 locations around the world.

They have had a difficult time with NI in the recent past that has caused them to be in a redesign of their hardware.

## Product

The MAQ20 has a high potential to replace the Compact RIO  
Software VIs for LabView support.



# MAQ®20 Example Application: Test Cell Control

## Customer

They are the #1 supplier for this type of traction engine test and calibration to the UK rail industry.

MAQ20 / IPEmotion

Challenge: rotary encoder interfacing to standard MAQ20 modules.

Option 1: The MAQ20-FREQ frequency input module can measure the frequency of signals A and B, which would indicate rotational speed. This module does not have relative edge detection per channel, so direction could not be determined.

Option 2: The MAQ20-DIOL module has 5 discrete input channels and 5 discrete output channels. Aside from basic DIO function, this module can perform seven 'Special Functions'.



# MAQ®20 Example Application: Temperature Monitoring

## Customer

Electronic manufacturing services (EMS) and Contract Manufacturer who brings innovation to the electronics market with engineering, production

MAQ20 system to monitor temperature a Caterpillar component

MAQ20-RTD31  
ReDAQ® Shape

Investigating IP EMotion



Large scale pick and place machines

# **MAQ®20 Example Applications**

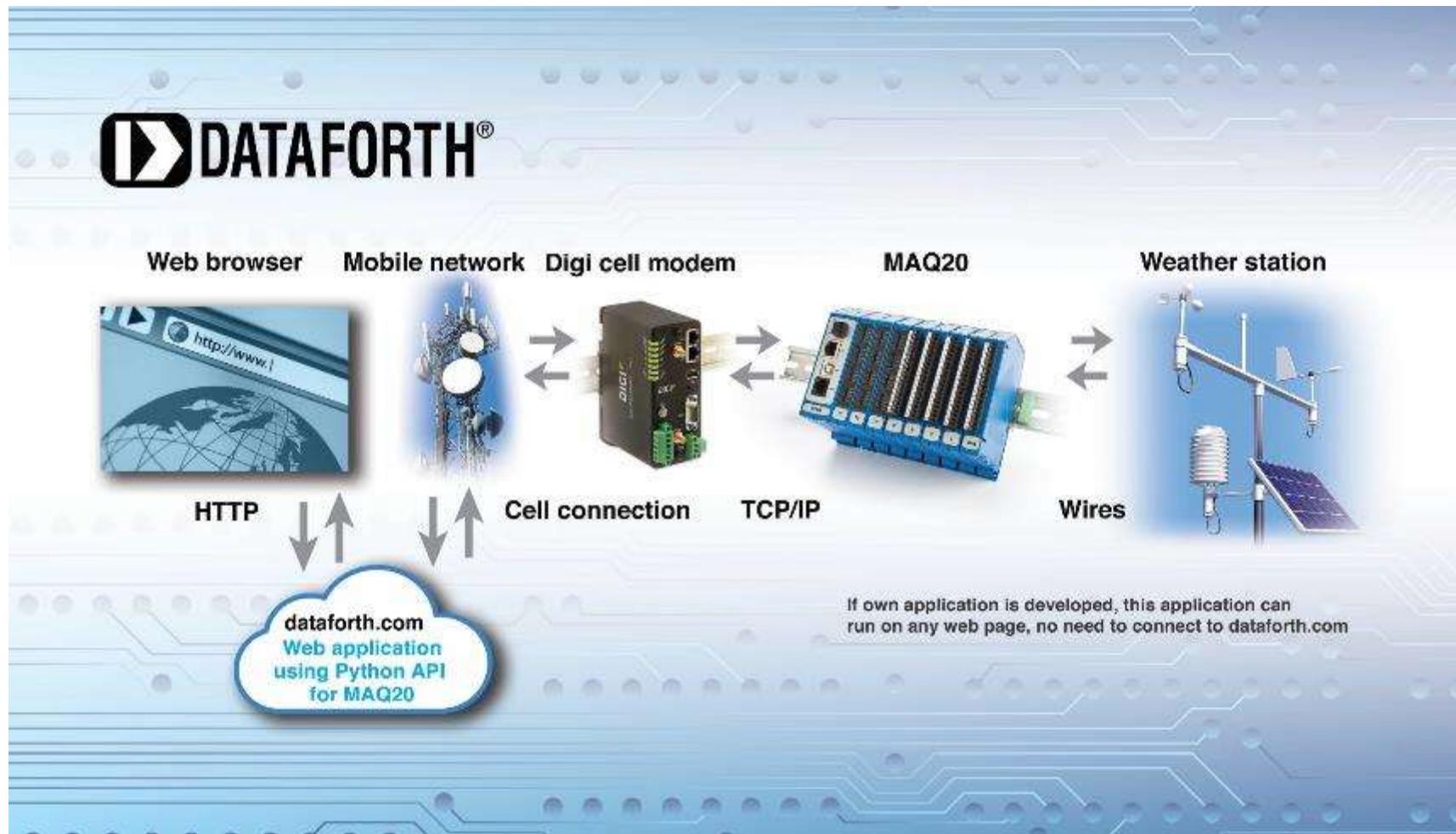
- London Underground, SCM5B41-1794
- Vibration Monitoring of antennas on military vehicles, MAQ20-ISOV2 + MAQ20-IO
- Nutricia Food processing, MAQ20-FREQ + IPEMotion
- .....

# MAQ®20 and IIOT Possibilities

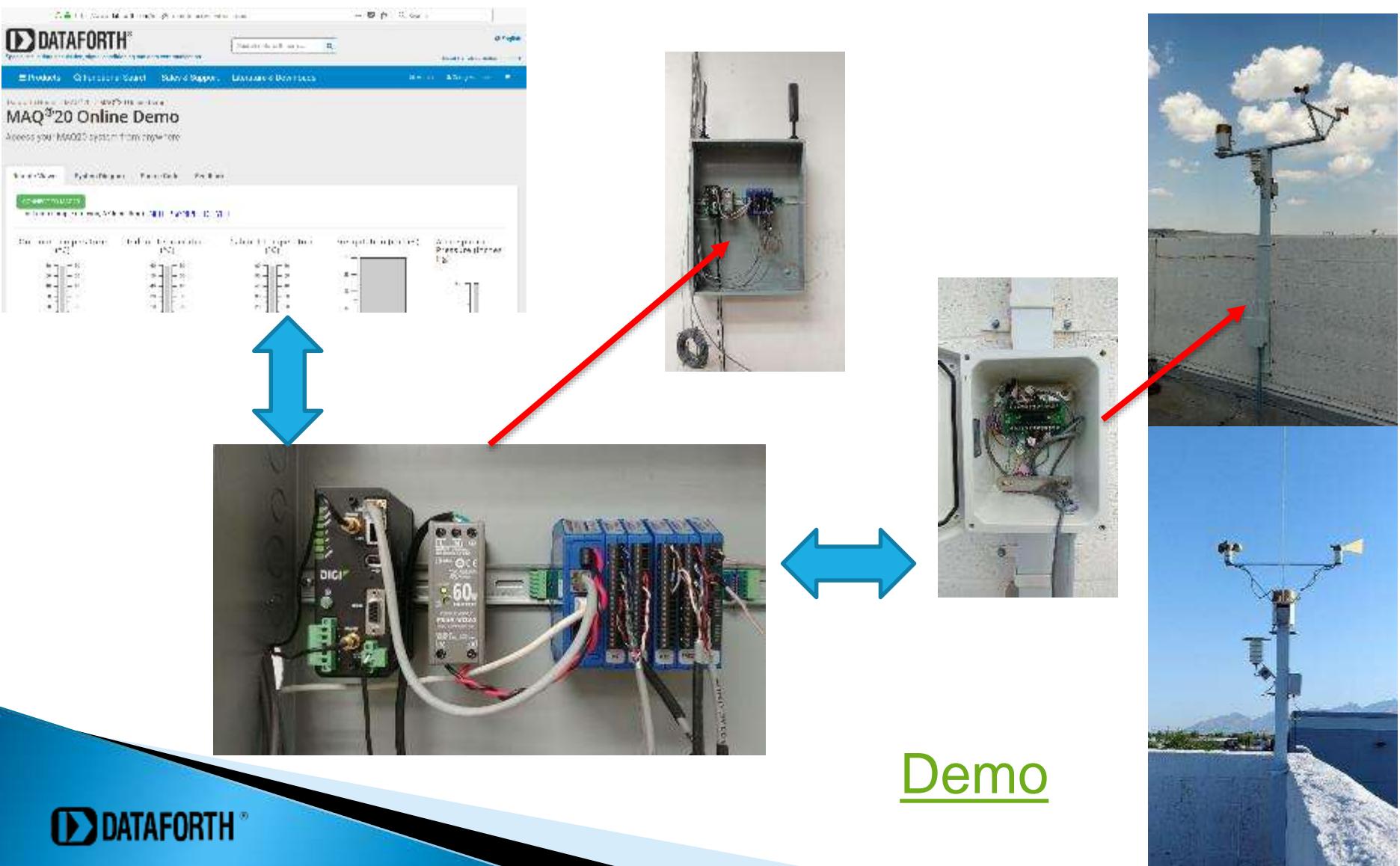


- Modbus is an Internet Routable Protocol (Port 502)
- GSM/3G/4G Routers
- Embedded PC
- Connect legacy machinery to acquire data
- System monitoring
- Pre-emptive Maintenance
- Remote Telemetry

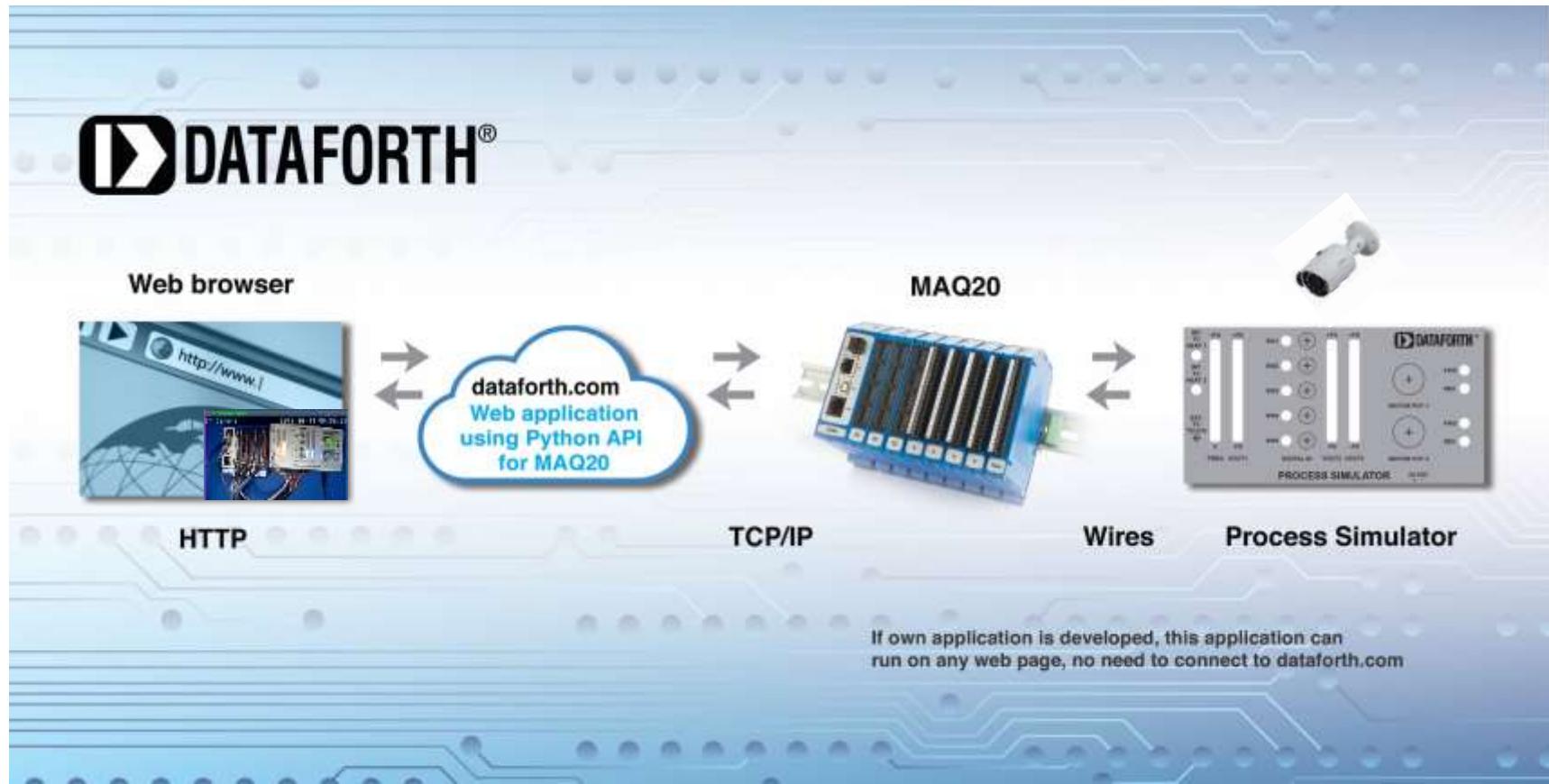
# MAQ®20 and IOT Demo Application



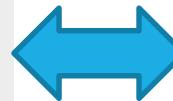
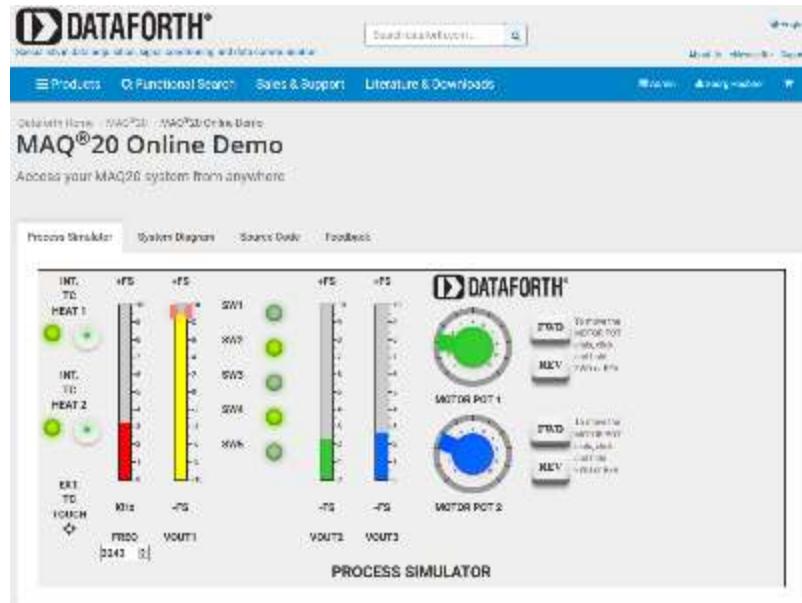
# MAQ®20 Demo Application: Remote Monitoring of a Weather Station



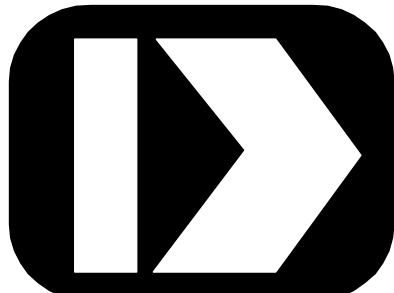
# MAQ®20 and IOT Demo Application



# MAQ®20 Demo Application: Remote Control of a Process Simulator



Demo



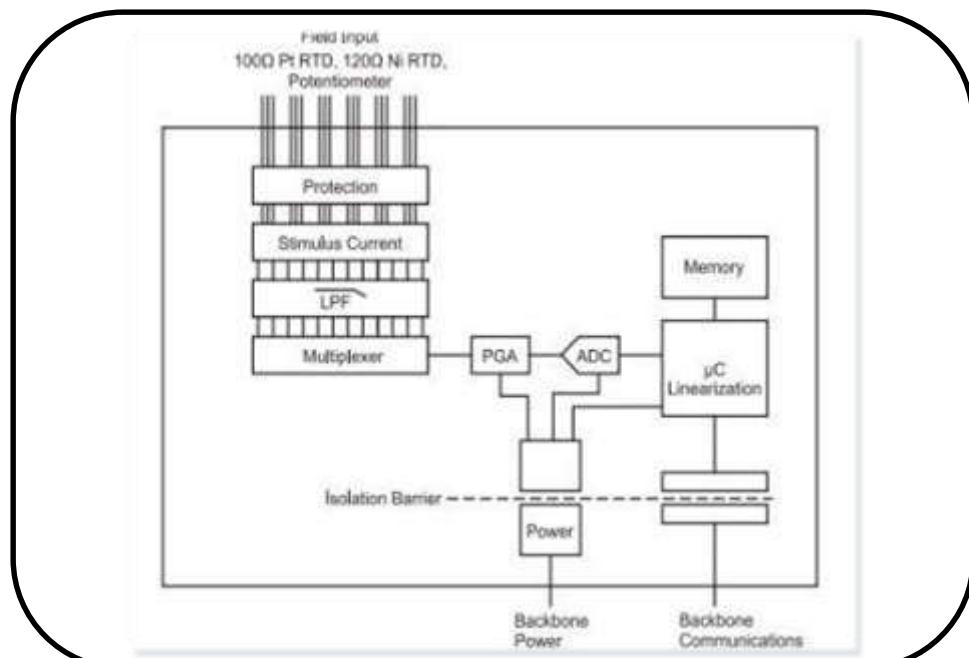
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**New Products  
&  
Software Features  
Preview**

# MAQ®20 Analog RTD41



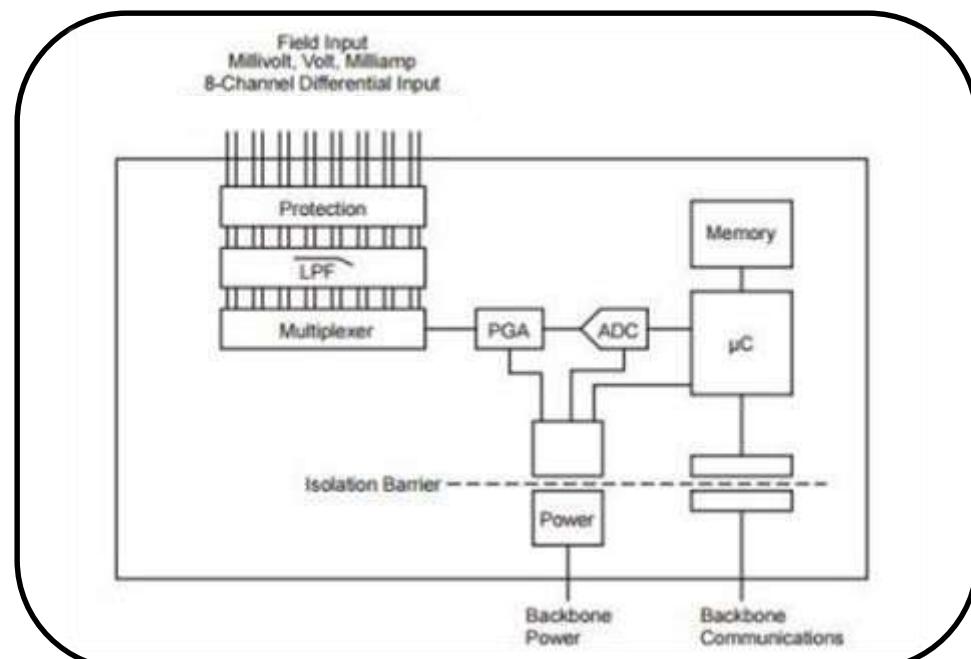
- 5 Channels, Pt100, Ni120, 4-wire
- Overvoltage to 240Vrms
- Each Channel is Configurable
- Open Input -Upscale or Downscale



# MAQ®20 High Resolution 24bit

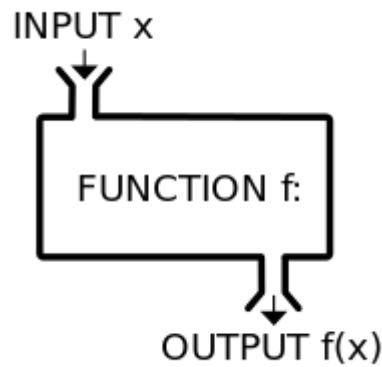


- **24 bit ADC**
- **8 Channels, Differential Input**
  - $\pm 1\text{mV}$ ,  $\pm 1\text{V}$ ,  $\pm 60\text{V}$ ,  $\pm 20\text{mA}$ ,
- **Each Channel is Configurable**
  - Input Range, Averaging & Alarms – hi/lo and hi-hi/lo-lo

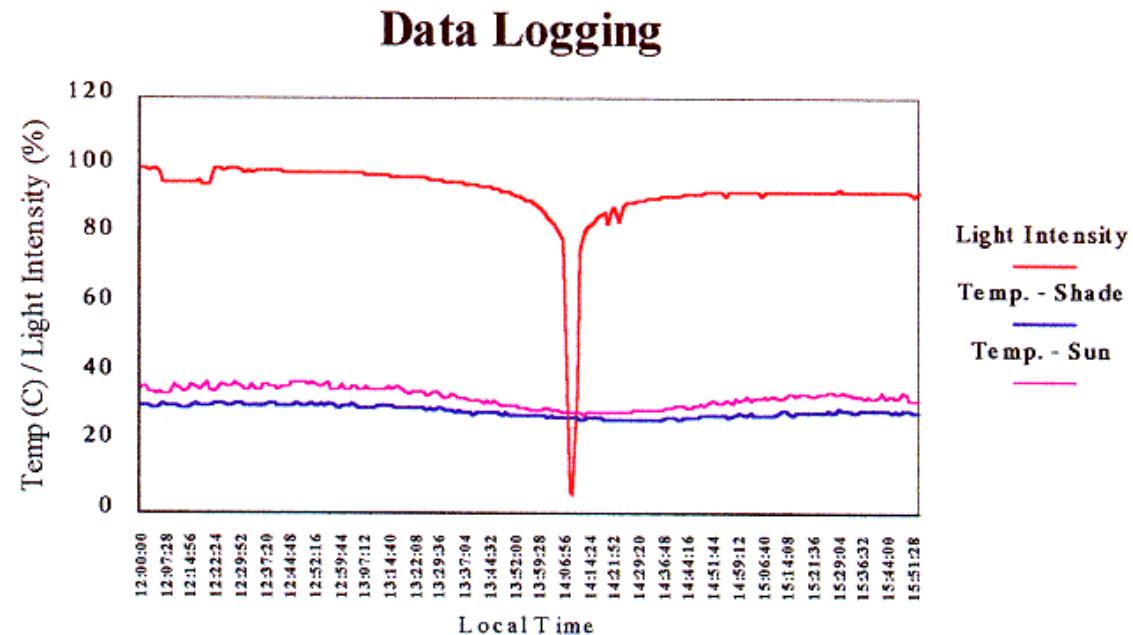


# Software Enhancements

- Math Functions in ReDAQ® Shape



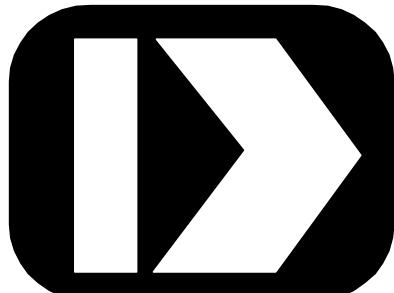
- True Standalone Data Logging



# PWRM10-xx: IoT Energy Monitoring



- Fundamental Active and Reactive Energies
  - Apparent Energy
  - Voltage and Current RMS values
  - Harmonic Information
  - And many other valuable information
- 
- Energy Metering Systems
  - Power Quality Monitoring
  - Solar Monitoring
  - Process Monitoring
  - Health of Machine
  - Predictive Maintenance
  - Retrofit applications in energy distribution and industry



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## Projects In The Pipeline

# **Marketing Projects In The Pipeline**

**Localized Pages (Demo)**

**Application Notes**

**Tech Notes**

**New Customer Engagements**

**Case Studies**

# Localized Web Pages

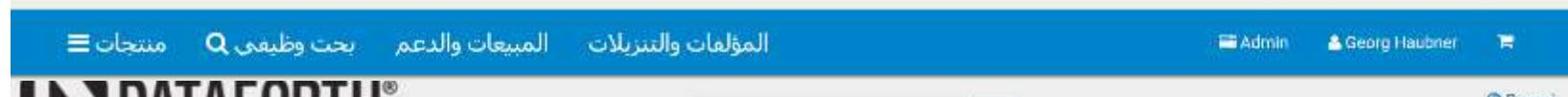
The screenshot shows the Dataforth website's homepage. At the top left is the Dataforth logo with the tagline "Specialists in data acquisition, signal conditioning and data communication". A search bar and a language selection dropdown are also at the top. Below the header is a navigation bar with links for "Products", "Functional Search", and "Sales". The main content area features a large image of the MAQ20 DAQ module with various connection points labeled. Below the image is a detailed technical diagram of the module's internal components and connectivity options, including Analog Input, Digital Input, and Communication modules.

This screenshot shows the Dataforth website after selecting "English" from the language dropdown. A modal window titled "Select Language Preference" informs the user that some content is not yet available in the selected language and encourages them to send translated content to sales@dataforth.com. The main content area now displays localized content for the English language, including a "4-20mA Transmitters" section and a "DATA ACQUISITION" section. A large green arrow points from the original screenshot to this localized view, indicating the result of the language selection.

# Localized Web Pages



The screenshot shows a localized web page for Arabic users. At the top right is a link to "العربية" (Arabic). Below it, a message in Arabic reads "الدعم - نشرة إخبارية إلكترونية بمنصة من الشركة". The main navigation bar includes links for "Admin", "Georg Haubner", and a shopping cart icon. The search bar contains the Arabic placeholder "البحث في موقع dataforth.com" and a magnifying glass icon.



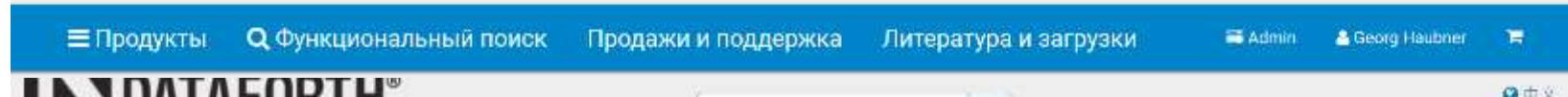
The screenshot shows a localized web page for Finnish users. At the top right is a link to "Suomi" (Finnish). Below it, a message in Finnish reads "Tietoja meistä - eNewsletter - Tuki". The main navigation bar includes links for "Admin", "Georg Haubner", and a shopping cart icon. The search bar contains the Finnish placeholder "Etsi dataforth.com-sivuilta ..." and a magnifying glass icon.



The screenshot shows a localized web page for French users. At the top right is a link to "Français" (French). Below it, a message in French reads "A propos de - Lettre d'information électronique - Support". The main navigation bar includes links for "Admin", "Georg Haubner", and a shopping cart icon. The search bar contains the French placeholder "Rechercher dataforth.com" and a magnifying glass icon.



The screenshot shows a localized web page for Russian users. At the top right is a link to "Русский язык" (Russian). Below it, a message in Russian reads "О нас - Электронная новостная рассылка - Поддержка". The main navigation bar includes links for "Admin", "Georg Haubner", and a shopping cart icon. The search bar contains the Russian placeholder "Поиск по dataforth.com..." and a magnifying glass icon.



The screenshot shows a localized web page for Chinese users. At the top right is a link to "中文" (Chinese). Below it, a message in Chinese reads "关于我们 - 电子新闻 - 支持". The main navigation bar includes links for "Admin", "Georg Haubner", and a shopping cart icon. The search bar contains the Chinese placeholder "查找dataforth.com" and a magnifying glass icon.



The screenshot shows a localized web page for Chinese users. At the top right is a link to "中文" (Chinese). Below it, a message in Chinese reads "关于我们 - 电子新闻 - 支持". The main navigation bar includes links for "Admin", "Georg Haubner", and a shopping cart icon. The search bar contains the Chinese placeholder "查找dataforth.com" and a magnifying glass icon.



# Localized Web Pages

Log in now  
and test it  
and check  
the  
translations!

☰ Produkte    ⚡ Funktionale Suche    Verkauf & Unterstützung    Literatur & Downloads

### The MAQ20 DAQ Eco-System

The diagram illustrates the MAQ20 DAQ Eco-System. At the top, there are eight analog input modules: MVDN, VDN, VGN, IDN, ISN, FREQ, BRDG1, JTC, KTC, RSTC, TTC, RTD31, RTD41, ISO11, ISO1M1, ISOV1, ISOV2, VO, and IO. Below these are two discrete input modules: DI010 and DI020. In the center, a blue box labeled 'Communication Module' contains a list of connectivity options: IoT (Ethernet, USB), Modbus TCP, Modbus RTU, RS232, RS485, and FTP. To the right of the communication module is a red box labeled 'Software' containing ReDAQ-Suite, IPEMotion, Python API, LabVIEW VI, and OPC Server. Below the communication module are three input/output modules: DIOL, DI0H, 3-60 VDC, 24-280 VAC, 3 A, 60 VDC, 3 A, DODC20SK, and DORLY20. The bottom right corner features the DATAFORTH logo and website address: [www.dataforth.com](http://www.dataforth.com).

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[EMAIL](#)   [WEBSITE](#)

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Isolierte analoge Produksteuerung  
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**4-20mA Transm**  
Industrielle schleifenges  
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**DATENERFASSU**  
Hardware und Software intelligente Datenerfassu  
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**DATAFORTH CO**

- Über Dataforth
- Weltweite Präsenz
- Treten Sie unserm bei

[WEITER ▶](#)



**Where Do You Come In?**

# **Do You Like Success?**



**GO  
HOME**

# **How Do We Achieve Success?**

Promote existing and new products

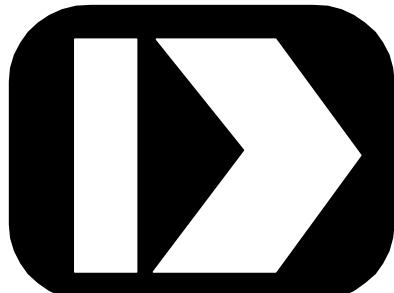
Share ideas for targeting new customers

Get closer to existing customers

Propose new product ideas

Suggest advertising and trade show opportunities

Request help and support from us – **we are on your team!**



**DATAFORTH®**

# **Roundtable Discussion**

# **Homework follow up**

**2-3 minutes, answering following questions:**

- Opportunities: won (why? Sharing success) and lost (why?)
- What separates Dataforth from other principals?
- What is your territory / regional main/prime industry?
- What is our customers' first thought about Dataforth?
- What have you learned about one other rep?
- What is your take-away from this conference?

# **Three Main Things to Remember**

- 1) Dataforth **made many improvements** and will continue to address market needs
- 2) Dataforth is **fun to sell** because we provide Instrument Class performance, quality, and outstanding support
- 3) We are **one team**: if the customer wins, you win, Dataforth wins

**Save travels!**  
**Happy Selling!**