MAQ®20

Industrial Data Acquisition & Control System

- ✔ Test and Measurement
- ✔ Factory and Process Automation
- ✔ Machine Automation
- ✔ Military and Aerospace
- ✔ Power and Energy
- ✔ Environmental Monitoring
- ✔ Oil and Gas

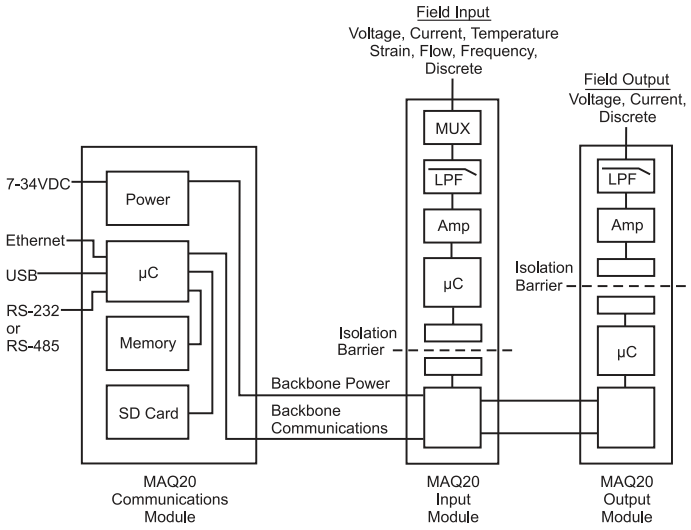
DATAFORTH®

MAQ®20 Industrial Data Acquisition & Control System

Encompassing more than 30 years of design excellence in the test and measurement and control industry, the MAQ20 family consists of high performance, DIN rail mounted, programmable, multi-channel, industrially rugged signal conditioning I/O and communications modules.

The modules mount on industry standard 35x7.5mm gull-wing DIN rails. A backbone within the rail provides power and communication interconnections between the communications modules and each I/O module.

The MAQ20 interfaces directly to industrial sensors and transducers. It provides input protection, noise filtering, amplification, CJC and linearization, shunt calibration, and data logging.



MAQ®20 System Block Diagram

Instrument Class® Performance

- Industry's Lowest Cost per Channel
- ±0.035% Accuracy
- Industry Leading ±0.3°C CJC Accuracy Over Full Operating Temperature Range
- 1500Vrms Channel-to-Bus Isolation
- Up to 240Vrms Continuous Field I/O Protection
- 4000V Input Transient Protection
- Wide Range 7-34VDC Power
- –40°C to +85°C Industrial Operating Temperature
- CE Compliant, UL/CUL Listing and ATEX Compliance Pending

Industry Leading Functionality

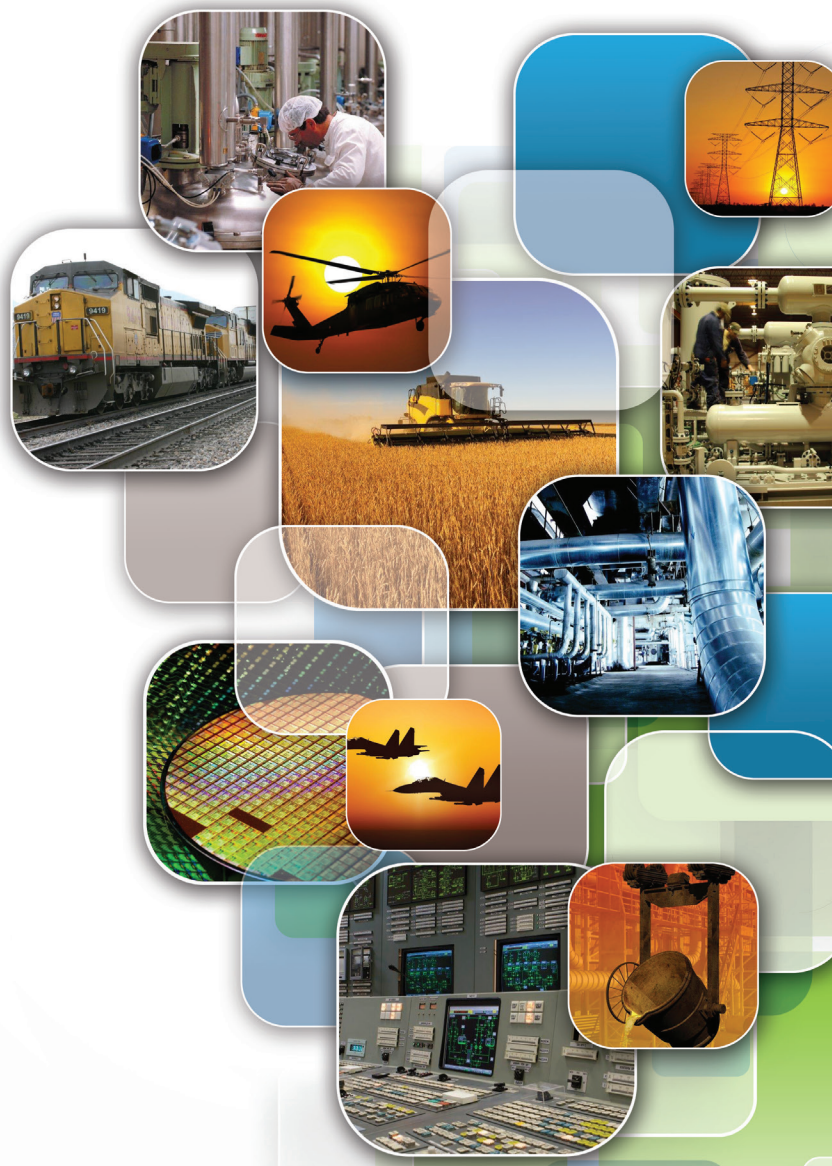
- Up to 24 I/O Modules – 384 Channels – per System, per 19" Rack Width
- Per-Channel Configurable for Range and Alarms
- Load Share Power Supply Modules for Expansion, Standby and Redundant Power
- System Can Operate Remotely Without Host PC Intervention
- System Can Operate as Standalone Data Logger

Distributed Processing

- Output Modules Programmable for User-Defined Waveforms
- Discrete I/O Modules Offer 7 High Level Functions:
  - Pulse Counter
  - Frequency Counter
  - Waveform Measurement
  - Time Between Events
  - Frequency Generator
  - PWM Generator
  - One-Shot Pulse Generator

Intuitive Graphical Control Software, Integral PID Control

- ReDAQ Shape Graphical HMI Design & Runtime Solution
  - Up to 32 PID Loops With Auto-Tune
- IPEmotion Advanced Features & Multi-Language Solution
  - Formulas, Data Logger, TEDS, PID, Scripting



The Modules: Compact, Flexible, Powerful

Communications Modules

- Manage System I/O and Run PID Control
- Communicate to Host Using Ethernet, USB, RS-485, RS-232
- Follow Modbus TCP or RTU Protocols
- Interface to Up to 24 I/O Modules to Create a 384-Channel System
- Automatically Register I/O Modules

Analog Input Modules

Voltage, Current & Thermocouple Input Modules

- Voltage & Current Input Interface to Volt, Millivolt, Milliamp Sensors and Equipment
- Thermocouple Input Interfaces to Types J, K, T, R and S Sensors
- 8-Channel Differential or 16-Channel Single-Ended Input
- All Channels Individually Configurable for Range, Alarms, Averaging

RTD and Potentiometer Input Modules

- Interface to 3-Wire and 4-Wire Sensors
  - 6 Input Channels for 3-Wire Sensors
  - 5 Input Channels for 4-Wire Sensors
- Interface to 100ΩPt, 120Ω Ni RTDs, and 5kΩ Potentiometer
- All Channels Individually Configurable for Sensor, Range, Alarms, Averaging

Strain Gage Input Module

- Interface to Full, Half, and Quarter Bridge Sensors
- 4 Input Channels for 4-Wire or 6-Wire Sensors
- All Channels Individually Configurable for Range, Alarms, Averaging
- Burst Mode for Fast Event Capture
- Programmable Bandwidth, Excitation, Shunt Calibration

Frequency Input Module

- 8 Input Channels
- 50mV Sensitivity
- Input Range 0.5Hz to 1MHz
- All Channels Individually Configurable for Range and Alarms

Communications Module with I/O Modules

Analog Output Voltage & Current Modules

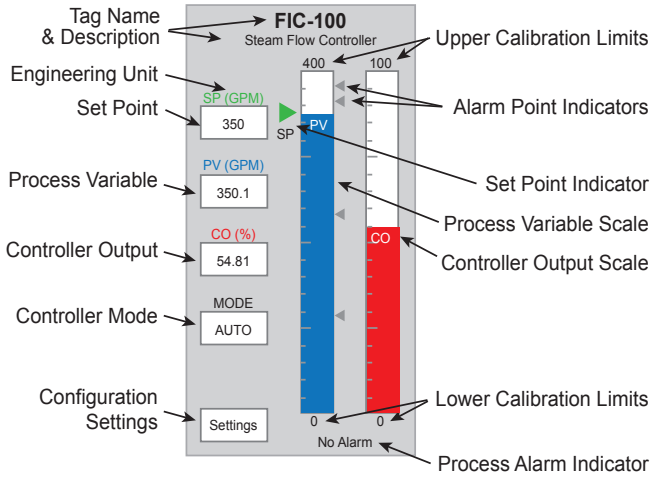
- 8 Isolated Voltage or Current Output Channels
- All Channels Individually Configurable for Range and Programmable Output
- User-Defined Default Output and Output Waveform
- 300Vrms Channel-to-Channel Isolation

Discrete Input/Output Modules

- 4 or 5 Isolated Input and Output Channels
- User-Defined Default Output and Output Waveform
- 7 High Performance Special Functions
- 300Vrms Channel-to-Channel Isolation

All MAQ20 I/O Modules

- 1500Vrms Field-to-Bus Isolation
- Each Channel Protected Up to 240Vrms Continuous Overload
- Continuous Overload and Reverse Protection



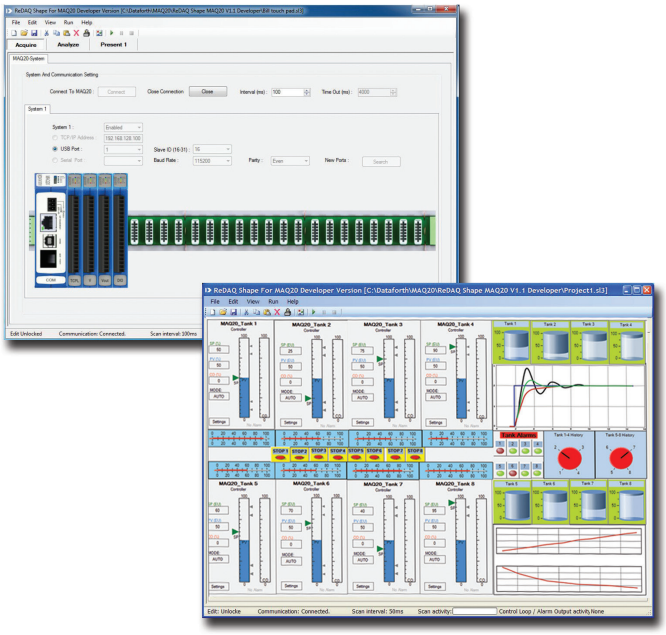
PID Faceplate in ReDAQ Shape Software

Leading-Edge PID Loop Control

- Integral in Both ReDAQ Shape for MAQ20 and IPEmotion Software
- Up to 32 PID Control Loops with ReDAQ Shape for MAQ20
  - Faceplates Enable Engineer or Operator to Configure Loop Control Features and Monitor Processes
  - Auto-Tuner Simplifies Control Loop Optimization
- Typical PID Applications
  - Steam, Water, and Chemical Flow Control
  - Tank Level Control
  - Heat-Exchanger / Reactor Temperature Control
  - Pressure Control

ReDAQ® Shape Software for MAQ®20

- One-Time Low-Cost License Fee
- Ideal for Data Acquisition, Monitoring and Control Applications
- No Setup Required in Acquire and Analyze Panels
- Create, Save, Open GUI Projects for Test, Process, Data Collection, Data Analysis
- 3 Easy Steps to Create Customized Presentation Panels
- Main Screen Shows Communications Module + Installed I/O Modules
  - Graphic Updates as I/O Modules are Added or Removed
- Automatic Registration of I/O Modules
- Faceplates for PID Loop Control – Up to 32 Loops Possible
- 18 Toolbox Tools Simplify Project Creation
- Supports Any Graphical File Format
- Most Efficient Way to Set Up & Configure MAQ20 Functions



IPEmotion Software for MAQ®20

- Advanced, Intuitive Data Acquisition / Test & Measurement Software
- Synchronized Data Acquisition
- Automatic Recognition of Connected Devices
- Automatic Configuration of All Channels
- Automatic Start of Measuring
- Instant Visualization of All Measurement Values
- Live Data Display, Recording, Online and Offline Math and Logic Functions
- One-Click Acquisition
  - Direct Hardware Detection, Data Display and Recording
- Live Adjustment
  - Analyze and Verify Measurements During Active Data Acquisition
  - GUI Adaptation During Active Measurement and Storage
- PID Loop Control – Unlimited Loops Possible
  - Limited Only by Processing Power of PC
- Post Processing and Report Generation
- Easy Drag and Drop HMI Creation
- High Speed Recording to 1000 Samples/s
- Communication with MAQ20 via Plug-In Driver
- Import and Export Recorded Data Using Standard File Formats
- Scripting Option with VB or Python Software
- Configurable Gauges for Wide Ranging Applications
- Available in 8 Languages
  - English, German, French, Italian, Chinese, Korean, Japanese, Russian

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