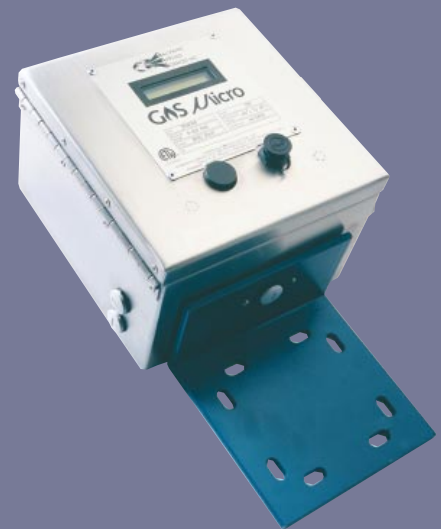# GAS μMicro

Electronic Volume Corrector (EVC)

Electronic Pressure Recorder (EPR)

3-Channel Electronic Recorder (ER)

GALVANIC
APPLIED
SCIENCES INC.

The *most advanced,*
versatile and economical
EVC, EPR, and ER available.
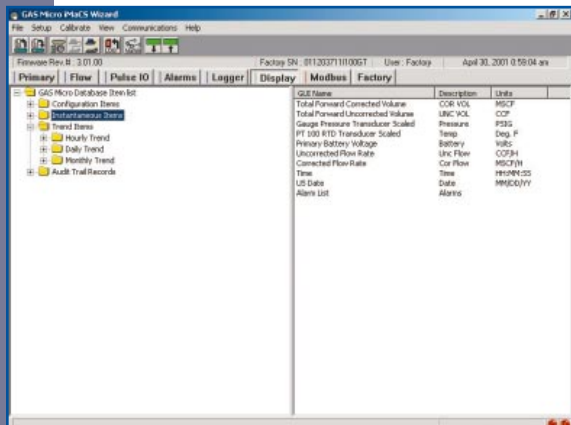
GAS Micro

Technical Specifications

GAS Micro is a universal electronic platform, software interface, and mechanical assembly designed to be configurable for application as an Electronic Volume Corrector (EVC) and/or Electronic Pressure Recorder (EPR), or 3-Channel Electronic Recorder (ER).
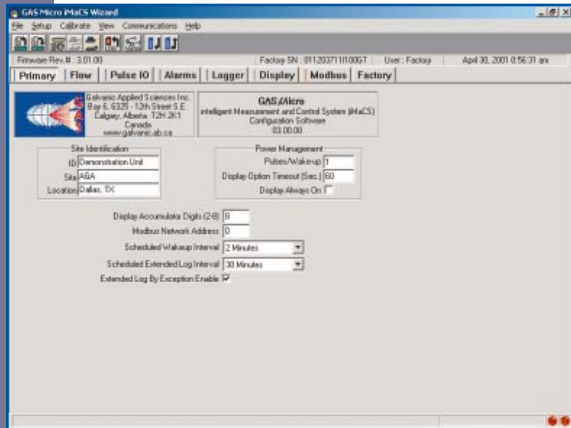
PRIMARY
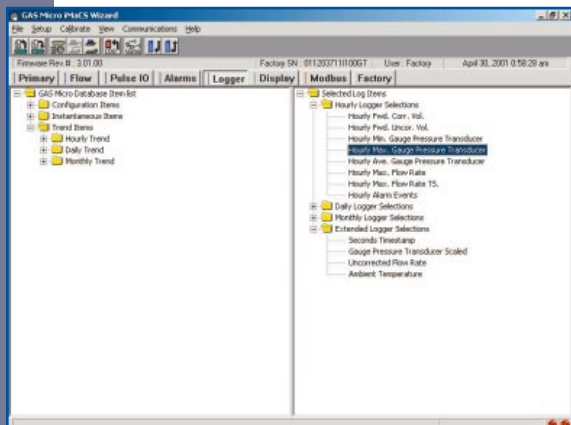
LOGGER

DISPLAY

CONFIGURABLE APPLICATIONS

EVC
- Correct volume flow for the effects of live/fixed pressure, temperature, and supercompressibility.
- Configurable for up to three (3) inputs for pressure and temperature.
- System calculates, records, and stores event, alarm, configuration and measurement history in nonvolatile memory.
- EVC can be configured to operate concurrently as an EPR.

EPR
- Measures and store pressure and temperature values and is configurable for up to three (3) inputs including: pressure transducer, pressure transmitter, differential pressure transducer, differential pressure transmitter, PT 100 temperature RTD, and temperature transmitter.
- Individually configurable scheduled wakeup intervals: continuous, 15 sec., 30 sec., 1, 2, 3, 4, 5, 6, 10, 12, 15, and 30 minutes.
- Individually configurable scheduled extended log interval: 1, 2, 3, 4, 5, 6, 10, 12, 15, 30, and 60 minutes.

ER
- Configurable for application as a Stand-alone Electronic Readout (SER) or ER for application with most pressure and temperature transducers/transmitters.
- Capable of receiving a pulse input from a turbine, rotary, diaphragm or ultrasonic meter and displaying and storing associated corrected/uncorrected volume data.
- Local display (LCD) is configurable for any 8-character value description, measurement unit, scale and resolution.

SYSTEM INPUTS

PRESSURE TRANSDUCER
- Configurable for 1 to 3 pressure transducers. Each transducer Individually compensated for effects of pressure and temperature.
- Pressure ranges: 15, 30, 60, 100, 200, 300, 500, 1000, and 2000 psi Gauge or Absolute (standard). Differential and metric transducers are optional.

PRESSURE TRANSMITTER
- Compatible with standard, differential, or linear pressure transmitter.

TEMPERATURE RTD OR TRANSMITTER
- Configurable for 2, 3, or 4 wire PT 100 RTD (Platinum Tip 100 OHM resistance)
- Standard RTD dimensions: 6" ss probe x 60" armored cable. Optional 9" probe or 72" armored cable. Custom dimensions available. RTD is compensated over operating range.
- Compatible with standard temperature transmitter.

ACCURACY

PRESSURE TRANSDUCER
- +/- 0.2% of reading (atmospheric to full scale pressure).
- Economical EPR option: +/- 1% of reading.

TEMPERATURE RTD
- +/- 0.3° F. over full operating temperature range (-40° - 150° F.).

CALCULATED CORRECTED VOLUME (EVC)
- +/- 0.25% of reading (atmospheric to full scale pressure).

CALIBRATION AND VERIFICATION
- Graphical User Interface (GUI) software provides features for pressure (P) and temperature (T) verification and calibration.
- Verification feature allows user to manually input reference value (P/T) and to capture and record measured value. Reference and actual values are stored in configuration log (database) and include date/time stamp.
- Calibration feature provides optional single point or two-point calibration.
- Calibration/verification routines are easily accomplished in the field.

VOLUME CORRECTION (EVC) - AGA 7 AND AGA 8
- Corrected volume is calculated using AGA 7 method.
- Supercompressibility is calculated using user-selectable AGA 8 Gross Method 1 or Gross Method 2.

VOLUME INPUT (EVC)
MECHANICAL INDEX WITH PULSE GENERATOR
- Index designed for mounting integrally or remotely from the GAS Micro enclosure.
- Pulse generator is integral in mechanical index.
- The index is configurable for clockwise (cw) or counter clockwise (ccw) flow.
- Index incorporates a mechanical test (clocking) wheel and a seven digit mechanical counter.
- Standard index supports meter drive rates for 10', 100', and 1000'. 5' drive and metric meter drive units are optional.

ROCKING DETECTION
- Multiple reed switch design and pulse input validation eliminates the occurrence of false uncorrected pulses.

DIRECTION DETECTION
- Multiple reed switch design allows the system to differentiate between forward and reverse flow
- The system is capable of measuring and storing uncorrected and corrected reverse flow.

SINGLE PULSE
- Compatible with single pulse generators with Form A type output.
- Compatible of processing up to 500Hz pulse input frequency.

OUTPUT
PULSE OUTPUT
- Two optically coupled, open-collector pulse outputs (consistent with form A pulse output)
- Configurable for corrected, uncorrected, and alarm output. Output is scalable using pre-configured units or by user-configurable factor
- Output frequency is user selectable and supports 0.5Hz - 8Hz
- Additional mechanical uncorrected pulse output (Form A type).

LCD DISPLAY
- 8 character alphanumeric LCD display. Pixel type with automatic update (refresh) supports display of real-time data in plain language (English alphabet) text.
- A Piezo switch mounted externally on the enclosure door activates display and scrolling feature.
- Standard LCD supports the display of 31 user-selectable values.
- LCD has a self-adjusting contrast to compensate for the effects of ambient temperatures.

ALARMS
- Low/High alarming available for three analogue input channels (i.e. pressure and temperature) and corrected flow rate.
- Low alarming available for three battery options (primary, secondary, and modem), high nomination (corrected volume), and reed switch fail.
- Alarms are configurable for report-by-exception (callout).
- Configurable for discrete alarm input from auxiliary devices.

AUDIT TRAIL AND DATA STORAGE
- GAS Micro maintains 64 days of hourly data, 188 days of daily data, and 3 years of monthly records in non-volatile memory.
- GAS Micro Configuration Event log stores 128 records and the Alarm log stores 512 records.
- Data logs are compatible for simple copy/paste into other Microsoft(tm) applications.
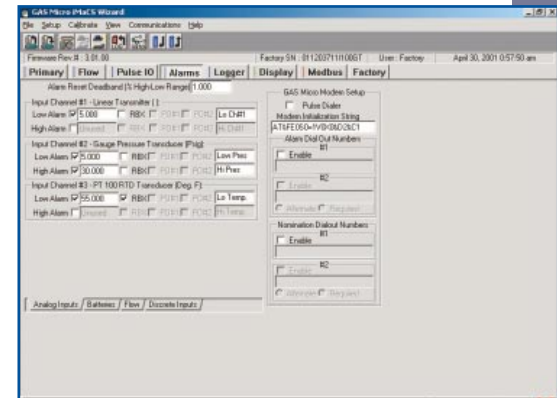
SOFTWARE
- System software is compatible with Microsoft Windows(tm) 98, 2000, ME, and NT Operating Systems.
- Interface uses standard Windows format and design elements. Majority of instructions/interaction are point-and-click and drag-and-drop.
- Measurement units and scaling are fully configurable for display in software interface.
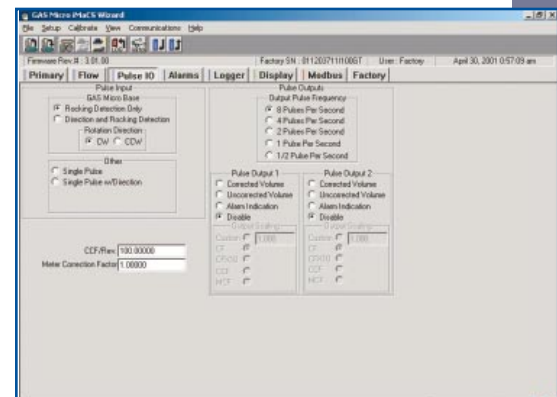
COMMUNICATIONS
MODBUS
- GAS Micro incorporates MODBUS (ENRON RTU) protocol.
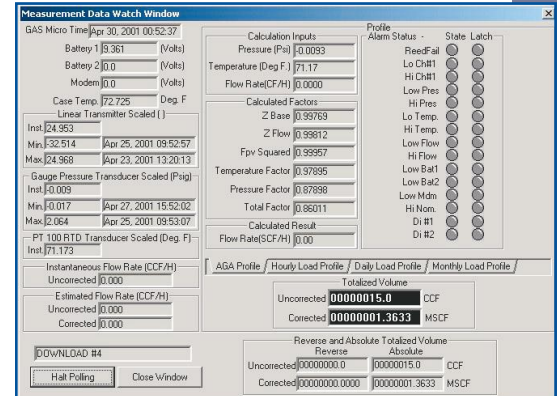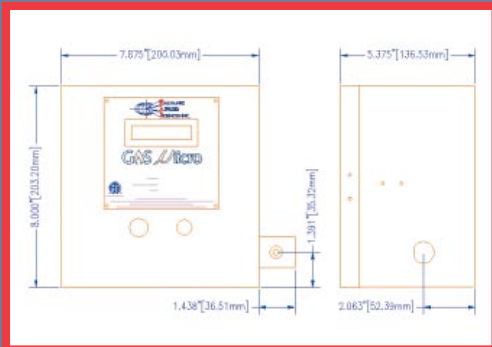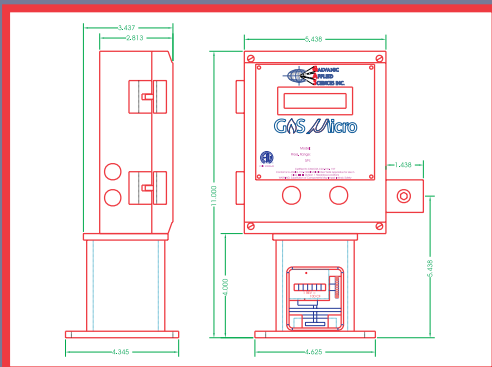

WATCH WINDOW

ALARM

PULSE

GAS μMicro

Galvanic Applied Sciences Inc. (GASI) designs, develops, manufactures, and markets microprocessor based instrumentation and software products for application in sulfur and H_2S (hydrogen sulfide) measurement, sulfur and gas chromatography, and energy, flow, and pressure measurement.

Flow, Pressure and Energy Measurement product lines include the PL – GC Gas Chromatograph/ BTU Analyzers and the GAS MICRO Electronic Volume Correctors.

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OPTIONS
iMaCS (INTELLIGENT MEASUREMENT AND CONTROL SYSTEM)
- Option package includes comprehensive configuration capabilities for LCD Display, Data Logs, Extended Logs, and Modbus.

DISPLAY
- Fully configurable display for up to 31 user-selectable items. Display items are selectable from the following: 71 configuration values; 51 instantaneous (calculated/measured) values; 28 hourly trend values; 32 daily trend values; 32 monthly trend values; 1344 hourly audit values (168 hours historical x 8 items); 1504 daily audit values, and; 288 monthly audit values.
- Option provides configurable display text, units, scale and decimal place resolution (up to four decimal places).
- Configurable display text supports 8 character alphanumeric values based on English alphabet characters.

DATA LOGS AND EXTENDED LOGS
- Option provides fully configurable Hourly, Daily, Monthly and Extended Logs.
- Hourly, Daily, and Monthly Logs are configurable for up to 8 user-selectable log items.
- Extended Logs are configurable for up to 4 user-selectable items. Extended Log is assigned to store values every time the system wakes up and measures/calculates values based on scheduled wakeup time versus system wakeup based on a configurable pulse/wakeup event.
- Log items are selected from the following: 29 Configuration items; 31 instantaneous items ("real-time" values); 27 hourly, 31 daily, and 31 monthly measurement values. 8192 valves for each log.

MODBUS
- MODBUS register list is fully mapable and configurable.
- Modbus items are configurable for Read/Write where applicable.
- Modifications to Modbus register items via Modbus host are logged in the GAS Micro Configuration Event Logs.
- Register list is configured using drag-and-drop method from the following user-selectable items: 123 Configuration items; 78 Instantaneous items; 28 Hourly, 32 Daily, and 32 Monthly measurement values, and; 3136 hourly, daily and monthly audit items.

EPR EXTENDED LOGS
- Extended Logs are configurable for up to 4 user-selectable items.
- Extended Log is used to store values based on scheduled interval wakeup (time). This option is required for all EPR applications and is available as a part of the iMaCS option package or separately.
- Extended Log by exception feature writes to the log only when an item changes by a user-selectable amount.

HIGH FREQUENCY INPUT
- Capable of processing up to 4KHz pulse input frequency when powered by battery.
- Capable of processing up to 8KHz pulse input frequency when AC powered.

POWER SUPPLY
- Power supply options include: Alkaline/Lithium battery packs; battery receptacle(s); Solar, and; AC power with internally mounted Class I, Division II approved converter.
- Theoretical battery life for standard EVC configuration is expected to exceed four years.
- System is capable of using up to three battery power supplies.

ENCLOSURE
- Stainless steel enclosure is configurable for EVC/EPR/ER applications and supports internal mounting of modems and Internet communications hardware and multiple power supply options and combinations.
- White epoxy coated cast aluminum enclosure is suitable for single pressure EVC or EPR applications only. Will accept internal dial-up modem only. Power supply is limited to single battery pack/receptacle or AC. Small enclosure is ideal for application where space is limited.

COMMUNICATIONS
DIAL-UP/LEASED LINE MODEM
- Optional internal 2400-baud dial-up/leased line modem is designed for low power and extended temperature range operation.
- Modem can be powered from primary (shared) power supply or dedicated modem power supply.

CDPD MODEM
- Internal Airlink Raven II CDPD Modem or external Airlink Raven CDPD Modem. 9 -24 VDC input voltage.
- Designed for low power extended temperature range operation.

INTERNET COMMUNICATIONS
- Optional IP Anywhere™ service with internally mounted Processor Assisted Connector™ (PAC) hardware provides remote enterprise wide access to GAS Micro data from anywhere via a standard web browser interface.
- IP Anywhere™ service supports sophisticated alarm callout and scheduling and seamless data transfer to users internal systems.
- System supports solicited/unsolicited communications.