

RealFLO

Multi-Run Gas Flow Computer Software

Overview

RealFLO is a SCADAPack software module that provides Custody Transfer natural gas flow measurement for one to ten gas flow runs. RealFLO converts the Control Microsystems' SCADAPack Series controllers into a full function gas flow computer, while retaining the controller's Relay Ladder Logic programmability, multiloop PID controllers and C user programmability. The result is a versatile flow computer that is well suited to a wide variety of oil and natural gas applications. Any application requiring gas flow measurement, a PLC for local controls and an RTU for communications is a candidate for automation with RealFLO.

RealFLO provides AGA-3 orifice plate, V-Cone, and AGA-7 turbine meter flow measurement with AGA-8 or NX-19 gas density calculations. Meeting the requirements of API 21.1, Custody Transfer RealFLO provides 35 days of hourly and daily averages, 700 user changes and events as well as 300 process alarms. No programming is required to use RealFLO. It is a complete flow computer, ready for configuration and use.

RealFLO configuration is provided by an intuitive Windows program that executes on the Windows 95/98/NT/XP/2000 operating systems. Users who wish to integrate RealFLO into existing SCADA systems will benefit from the fact that RealFLO uses Modbus or Enron Modbus as its native protocol. Custom protocols can also be added using the C and C++ toolkits. When using the SCADAPack32, 10baseT Ethernet can be used for remote configuration and data collection with wireless Ethernet radios. Any HMI software package, Distributed Control System, or SCADA master that has the Modbus protocol can be used as the front-end. Any host computer can read historical data logs, and reconfigure RealFLO through the SCADA communication system. RealFLO integrates seamlessly into existing SCADA systems.



Applications

- Gas well measurement and control
- Separator measurement and control
- Flow measurement
- Industrial energy consumption measurement
- Pipeline balancing
- Pipeline transmission station automation
- Coal Bed Methane
 - "POD" Automation
- Well Head Measurement and Automation



Features & Benefits

■ **Modbus Protocol Interface**

RealFLO is completely configurable and accessible using standard Modbus protocol commands. Use the RealFLO configuration software provided by Control Microsystems, or any other host computer equipped with Modbus. Configuration and historical data retrieval can be done locally, or through the SCADA network. Gas composition can be changed from the SCADA master. Field technicians don't need laptop computers or flow computer training when changing orifice plates.

■ **Standard EFM Modbus Interface**

Control Microsystems EFM Modbus interface is used with "Enron Modbus" SCADA systems. This standard EFM interface allows SCADAPacks with the REALFLO gas flow computer to be integrated into existing EFM SCADA networks. Control Microsystems' unique architecture provides two simultaneous methods of communication to one physical piece of electronic hardware even if only using one communication port. The first is access using the Standard EFM Modbus interface which has a unique address and the second is the usual RTU/PLC access using Modbus. Flow measurement data collection is obtained by addressing the EFM Modbus address while the other is used for monitoring and programming ladder logic programs on line, collecting logged data and downloading custom C programs.

■ **Programmable for Control**

RealFLO is a software extension in the SCADAPack. This means that the controller's Relay Ladder Logic, multitasking C/C++ programmability, or IEC 61131 programmability remains available for sequencing and feedback control applications. You can use the RealFLO software to measure gas flow, while Relay Ladder Logic, PID controllers, and C/C++ programs can be used to control the process, switch meter runs, etc. RealFLO combines the functions of a PLC, a multi-run flow computer and an RTU, in a compact, cost effective package.

■ **Universal Primary Variable Interface**

RealFLO is compatible with 4-20ma/1-5Vdc transmitters, plus single or multi-variable transmitters using HART, Modbus and Ethernet. If you choose to use the Rosemount 3095FB multi-variable transmitter, or other Modbus Multi-Variable Transmitters, RealFLO allows you to completely configure and calibrate the transmitter from within RealFLO.

■ **Versatile Communications**

The RealFLO gas flow computer, SCADAPack Series controllers, and the PC configuration and programming software, support radio, Ethernet, dial-up modem and dedicated modem communications. This versatility allows users to configure RealFLO, download new C programs, as well as monitor and change Relay Ladder Logic programs remotely over the communications network. Future upgrades to the firmware and AGA standards can be remotely upgraded.

■ **I/O Expandable to over 650 points**

RealFLO uses the powerful SCADAPack and SCADAPack32 SCADA controllers as its hardware platform. With standard I/O counts from as small as four points, these PLC/RTU controllers can be expanded to more than 650 I/O points, simply by plugging in more I/O modules. You can use the same hardware for all your oil and gas automation needs.



RealFLO Components

A RealFLO gas flow computer consists of the following components:

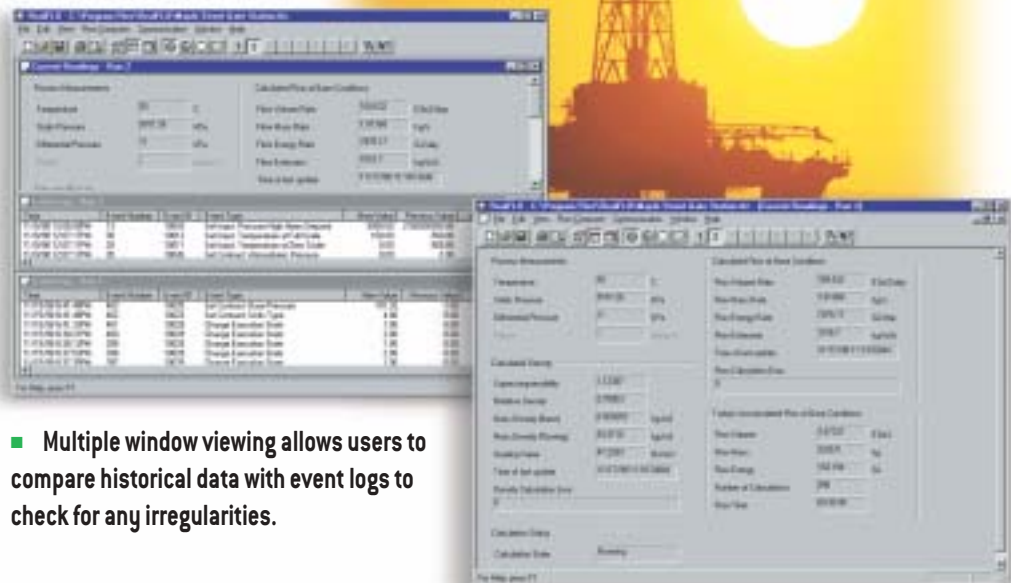
- SCADAPack, or SCADAPack 32 SCADA controller
- RealFLO Configuration Software

SCADAPack Hardware Platform

While the RealFLO flow computer software executes in most SCADAPack controllers, three controllers below are ideally suited to support EFM applications.

- The SCADAPack LP is a low power version which is ideal for solar powered wellhead applications that involve EFM as well as production optimization and control. A single LP may measure up to two gas flow runs, two liquid flow runs using turbine meters and multiple I/O for well optimization techniques such as plunger lift and pump off control.
- The SCADAPack 32 or SCADAPack 32P is a high powered 10 run flow computer where wells are either close together, or where many runs are measured together such as at headers, gas plants, transmission stations or coal bed methane pods. With Ethernet capability, the SCADAPack 32 and 32P are ideal candidates for LAN applications and are currently installed in several production fields which utilize wireless Ethernet.

- **Export to .csv, .cfx and printing options allow configuration data, historical data and event logs to be archived digitally or on paper for future reference.**



- **Multiple window viewing allows users to compare historical data with event logs to check for any irregularities.**

SCADAPack controllers running RealFLO may be expanded to over 650 I/O points. Please refer to the SCADAPack Series PLC/RTU Technical Overview data sheet for detailed descriptions or consult your Control Microsystems sales representative.

RealFLO Configuration Program

The RealFLO Configuration Software operates on a PC running Windows, and is used to configure the RealFLO EFM. The RealFLO Configuration Software was designed in consultation with end users and consulting engineers to make commissioning a flow computer as intuitive and as efficient as possible. It allows on-line or off-line configuration of the gas flow run operating parameters. History and event data may be downloaded into CSV files or exported in CFX format for import into Flow-Cal's EGM Software* for further use and analysis with any spreadsheet or database gas measurement software. This package offers a user-friendly environment which is intuitive for any user familiar with Windows. It also provides all the tools necessary to confirm correct operation of the SCADA system interface to the flow computations during system startup and configuration.

Modbus Multi-Variable Transmitter Integration

The RealFLO Configuration Software allows users to completely configure and calibrate the Rosemount 3095 (or any similarly mapped) multi-variable transmitter† from within the gas flow computer. This feature greatly simplifies installation and maintenance when multiple transmitters are connected to one SCADAPack. It also allows for remote re-spanning of ranges for optimal measurement without a site visit.

Automatic Audit Trail and Log Retrieval

RealFLO's unique scripting capability allows users to automatically retrieve all the data required by API 21.1 audit trail requirements. Scripts may be launched from an HMI or Window's scheduler with data being saved in RealFLO's binary format as well as standard CSV or CFX files.

- An intuitive Windows-based program steps the user through the calibration process. User information, before and after values and calibration readings are recorded in the event log for future reference

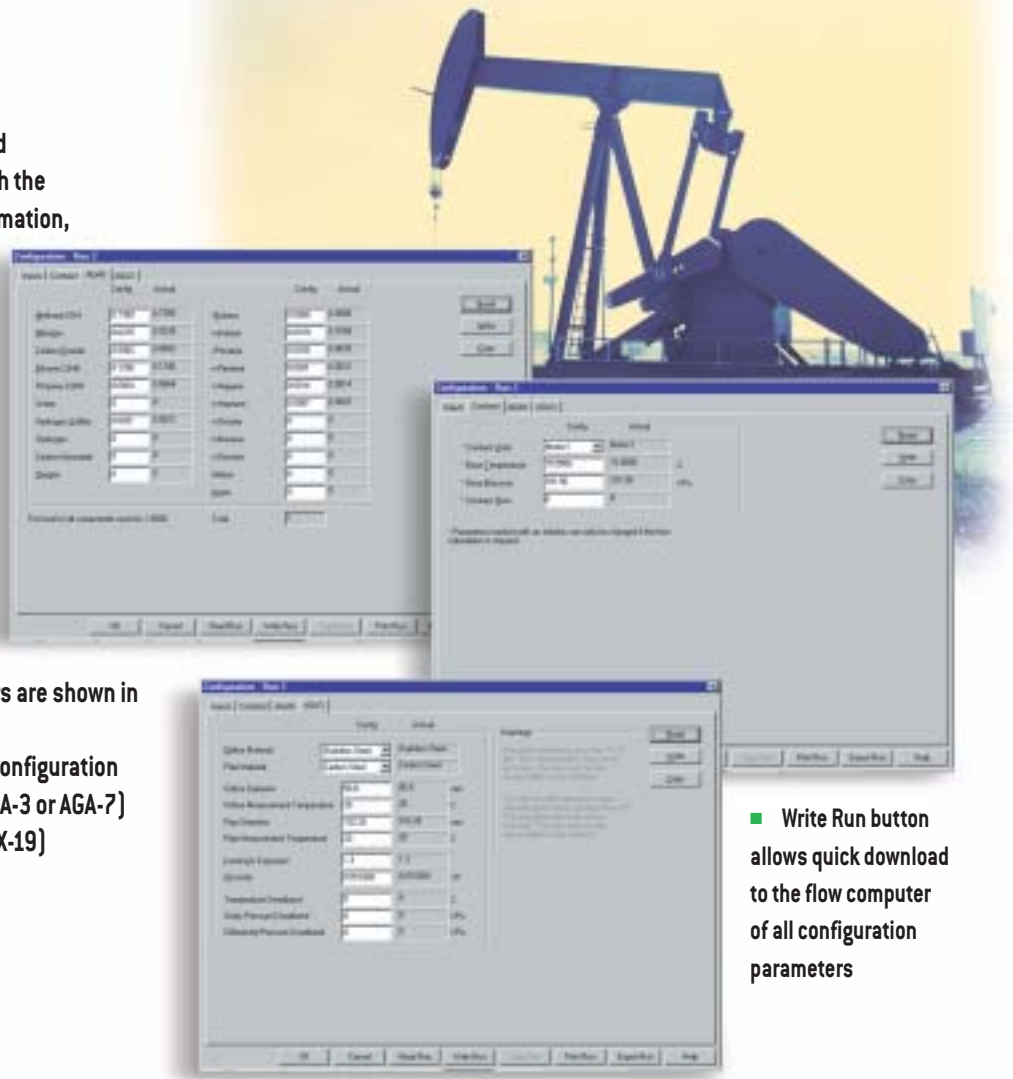
- All configuration parameters are shown in one tabbed dialog:

- process variable input configuration
- gas flow calculation (AGA-3 or AGA-7)
- gas density (AGA-8 or NX-19)
- contract configuration

Custom C Enhancements and User Defined Events

C Function libraries are provided to allow users to extend the RealFLO application for custom protocol drivers, enhanced data acquisition for pilot projects, or automatic configuration of flow computer parameters on power up. With the versatility provided by C/C++, virtually any function can be added by the user.

Relay Ladder Logic and C/C++ programs can store custom events in the event log, along with previous and new values. This capability is particularly valuable to record special events that are not normally part of the gas flow computer operations. Examples could include communication error events and process alarm conditions. User-defined events are allocated to a specific numeric range to prevent tampering of flow computer events.



- Write Run button allows quick download to the flow computer of all configuration parameters

RealFLO Specifications

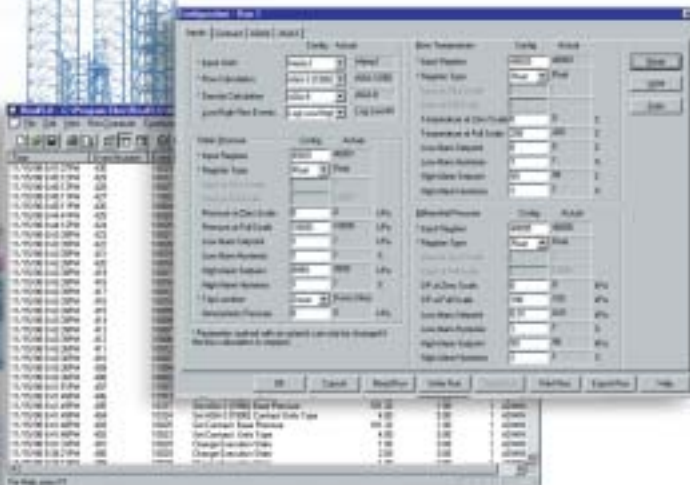
Flow Calculations	<ul style="list-style-type: none">■ AGA-3, 1992/2000 and V-Cone■ AGA-7
Density Calculations	<ul style="list-style-type: none">■ AGA-8, 1992■ NX-19
Measurement Update	<ul style="list-style-type: none">■ Once per second; up to 10 Gas Flow Runs
AGA 3, 7 Calculation Update	<ul style="list-style-type: none">■ Once per second
Alarm and Event Log	<ul style="list-style-type: none">■ 300/700 (per API 21.1 and Measurement Canada)
Hourly History	<ul style="list-style-type: none">■ 35 days
Daily History	<ul style="list-style-type: none">■ 35 days
Passwords	<ul style="list-style-type: none">■ Four levels with log of user ID during access
Hardware	<ul style="list-style-type: none">■ SCADAPack Series and SCADAPack 32 Series Controllers with 380 kBytes free memory
Maximum I/O	<ul style="list-style-type: none">■ Expandable to more than 650 I/O points
PID Controller Blocks	<ul style="list-style-type: none">■ 32, single or cascadable
Communications	<ul style="list-style-type: none">■ Radio, leased line, phone, cellular, microwave, Ethernet or Satellite
Protocols	<ul style="list-style-type: none">■ Modbus RTU/ASCII standard, ModbusTCP with SCADAPack32 DNP-3, Enron Modbus■ Allen-Bradley DF1 optional■ Custom protocols possible

For controller hardware detailed specifications, please refer to the "SCADAPack Series PLC/RTU – Technical Overview" Part Number M06001-03

Multivariable Transmitter:	<ul style="list-style-type: none">■ Seamless integration of Rosemount 3095MVT or any similarly mapped Modbus Multi-Variable Transmitter†■ Configuration■ Calibration
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PC Requirements to run RealFLO Configuration Software

- Windows 95/98/NT/XP/2000 operating systems
- Minimum 8 MB of memory
- 2.5 Mbytes hard disk space
- Mouse or compatible pointing device



- Multiple window viewing allows users to compare historical data with event logs to check for any irregularities
- Export and printing options allow configuration data, historical data and event logs to be archived digitally or on paper for future reference

RealFLO Ordering Guide

Model Number	RealFLO Utility Description	Order Part Number
RealFLO	RealFLO configuration and diagnostic utility provides an easy to use interface to flow computation configuration as well as facility for collection of historical flow. Windows 95, 98 or NT on a PC. User manual is included in PDF format on CD	327023
RealFLO-IC	RealFLO configuration and diagnostic utility with Industry Canada Approval. Windows 95, 98 or NT on a PC. User manual is included in PDF format on CD	327048
RealFLO-U	RealFLO upgrade for existing users of RealFLO configuration and diagnostic package running on PC. Provides latest version of RealFLO utility	327024
Gas Flow Run-Time Target Options for SCADAPack Series		
RFSP-3	Three Run Gas Flow run-time target (no additional RAM required)	327043
Gas Flow Run-Time Target Options for SCADAPack 32 Series		
RF32-10	Ten Run Gas Flow run-time target (no additional RAM required)	327053
Gas Flow Run-Time Target Option for SCADAPack LP		
RFLP-2	One/Two Run Gas Flow run-time target (no additional RAM required)	327064

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Windows is a trademark of Microsoft.

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† Contact Control Microsystems for details on other modbus multi-variable transmitters.

* Flow-Cal, Inc.: Provider of natural gas (EGM/EFM) software solutions. Visit: www.flowcal.com for more information.

**CONTROL
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To discuss how Control Microsystems can help solve your telemetry, SCADA and remote monitoring and control applications, please contact your local oil & gas sales representative or call our toll free sales number shown below.

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