990 Intelligent Integrated Instrument System

Measure • Monitor • Communicate • Control

PROCESS CONTROL FUNCTIONS
Linear PID
Batch Quantity
Dose Mixing
Manual Output Control
Monitor Measurements and Alarms

CONTROL FUNCTION SERVICES
Rate/Value Smoothing Filters
Quick-Tine Control Response
Control State Indicators
Manual or Computer Controlled

SYSTEM BASICS
Six Independent Input/Output Ports (Channels)
184 User Programmable Configuration Values
Mixed Quantity-Rate/Scaler Measurements
Universal Input and Output Scaling
Complete Keypad/Local/Remote Operation
High Precision Floating Point Arithmetic
Future Features Remotely Upgradable
Easy Private Label Customization

DISPLAYS AND INDICATORS
Large Backlit Liquid Crystal Display
Multi-Color State Lamps
Audio Annunciation

COMPUTER COMMUNICATION
Daisy Chainable RS232 Serial Repeater Interface
LAN and WAN Communications
Multiple-Unit Network Operation
Automatic Communication Port Routing
Error Corrected Compressed Information

INFORMATION REPORTING
Channel Programmable Report Selection
Real-Time Y2K Safe Clock-Calendar
Alarm or Clock Instigated Reports
Port Selectable Local/Remote Report Destination
Secondary WAN Disaster Recovery Number

ALARM SERVICES
Grand and Running Totals
Rate/Value High/Low Detection
Operation Service Time

ZERO FUNCTIONS
Zero Any Accumulated Value
Scaler Tare With Polarity
Zero Value Permanently Saved

SPECIAL FUNCTIONS
Selectable Rate Time Base
User Programmable Measure Units

DIAGNOSTICS
Six Frequency Counters, Voltmeters and Ammeters
Extensive Power-up and Operating Self Tests
WAN Installation Tests

CALIBRATIONS
Factory Set Digitally Stored
User Factory Default Configuration

EASY INSTALLATION
Plug-N-Play Wiring without Special Cables
Built-In Communicator Functions
Wall, Panel and Desk Mounting
Bottom or Rear Signal Access

THE MANUFACTURER
Designed and Built in the USA
Customer Service at 800 GET M2C2

The 990 is a full-featured precision multiport instrumentation system, supporting control and logging functions using six independent, full function rate-totalizer and scaler input measurement ports, advanced technology output ports, built-in data logging capability, multiplexed input port expansion, and extensive local and remote information communication. The 990 combines superior technology with operating simplicity, versatility, and ruggedness. Easy to install and easy to operate. Exclusive open architecture offers a wide range of special operating capabilities organized to meet the needs of any precision measurement and data reporting application.

The Technology

The 990 is microcomputer based, employing surface mount technology that supports powerful floating point digital signal processing arithmetic. It is capable of remote or local feature upgrade for easy future enhancements — eliminating product obsolescence. Special built-in test capabilities offer simple installation and enhanced operating reliability. The 990's ruggedized package is modularly architectured, comprising the ideal solution for use in demanding applications and tough environments. Options allow panel, wall, or desk mounting, with support for various signal access methods.

The **990** System is modular with independent ports to meet present and future instrumentation requirements. Ports are the measurement inputs and outputs for the system, which have modules installed that may be intermixed as desired. Inputs provide for value accumulation or value scaling of process frequency, voltage or current. Independent input smoothing and quick-tune filters compensate for erratic signals from sources such as metering pumps, or reject electrical noise when inputting low level signals over extended cable distances. Output ports provide voltage or current, relay or pulse support. Inputs provide programmable sensor excitation voltages or currents. Input port measurements may be user pro-

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THE 990 SYSTEM

grammed to drive output ports, detect alarm limit conditions, and provide information to be sent periodically to local or remote host computers.

Process Control

Process control functions have been built into your 990 Instrument System, including proportional-integral-differential (PID), batch, dose, manual and monitor, and are completely controlled either manually using the keypad and display or by using serial computer commands. Monitor allows the output of rescaled process measurements linked from an input port and relay contact states. Batch discountinuously controls delivery of programmed amounts. Dose controls continuous mixing of different constituents having a wide mixing ratio. PID operation provides continuously variable control for processes that required maintaining a programmed performance target.

Data Logging

Data logging may be optionally installed in the 990 Instrument System, and supports date-time stamped storage for 131,040 sequential records acquired from input ports at a programmed frequency rate. Operation is completely controlled from the keypad, or by local or remote serial computer commands. The logging controls include Start, Stop, Clear, or Send records.

Communication

Communications services provide for data acquisition, command and control functions, and support information reporting and alarm signaling. The standard **990** has a built-in RS-232 repeater interface, and is configurable for LAN RS-485 multidrop, Ethernet, DeviceNet, and remote WAN modem communications. The WAN facility supports collision avoidance and retry capabilities and may be user programmed with separate network access addresses for alternate host or disaster recovery. Communication is initiated by command, by scheduled reports based on the date-time clock, or by alarms. All communications are error corrected and networkable. Communication resources are shared by input ports, which are individually programmed to send information over a local or remote link to central host sites.

Reporting

A user programmable Y2K safe date-time clock initiates measurement reports based on the programmed date-time and frequency.

Multiple Alarms

Independent user programmable thresholds are available for every measurement variable for every input port including quantity, scaler value, process rate, process input, and service time. Alarms may be programmed to activate audio and lamp indicators and cause relay or analog outputs. Alarms are independently programmed for each input port to invoke local and remote communications.

Indicators

The **990** features a large backlit liquid crystal alphanumeric display, visible from a distance even in low light. The multi-colored lamps and audio indicator provide quick and easy status for quantities, rates, times and batch states, reporting, telcom and diagnostic status, and more. Key activation feedback is also provided by the audio indicator.

Operator Controls

The **990** has no power switch to be accidentally turned off. Operation can be completely controlled from the integral eight key pad when used to program and review values. Key inputs can be single-touch activated, or multiply-activated when continued to be depressed. The keypad features splash proofing and is resistant to heavy weather.

Diagnostics

Powerful automatic built-in tests support easy installation and ensure a long, trouble-free operating life. These tests include overall system operating status, memory conditions, communication adapter status, clock operation, lamp and audio indicators, and display-keypad operation.

Custom Services

Florite invites requests for private labeling or customized solutions to meet your specific system requirements. We offer system design, software and firmware development, electronic design, product packaging, and manufacturing.

Call Florite at 800 GET M2C2

…or just visit our web site at www.florite.com to discover how easily we can provide your next solution.

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990 Technical Specifications

Control Functions	PID, batch, dose, manual, monitor	Process Rate Range	0.00±9,999,999.99 units/time base
Service Time Range	0–65,535 hrs	Totalizer Ranges	0–99,999,999.99 units
Process Input	Hz, volts, mA	Measurement Type	Rate-Total or Scaler

Programmable Values

Quantity 1 and 2 Limits	0.00–99,999,999.99 units	Service Time Limit	0–65,535 hrs
High and Low Rate Limits	0.00±9,999,999.99 units	MeterConstant	0–999,999 (pulse/quantity ratio)
WAN Numbers	2 each, 16 Chars (0-9, *, #, A, B, C, D, T, P, ', ')	Measure Units	3 Chars, (a-z, 0–9, A-Z, other common)
Answer Rings	0–255	Quantity 1 and 2 Preset	0-99,999,999.99
Network Address	0–65,535	Ctrl Amount	0.00±9,999,999.99 units
Date–Time	Day/month/year, hrs/min/sec	Analog Input and Output	Low/High Value=0-10.000/20.00, Low/High=0.00±9,999,999.99 units
Comm Port Select	SIO (main)/WAN/LAN, Report/Alarm	Rate Time Base	Sec/min/hrs
Report/Log/Frequency	0–999 sec/min/hrs/days/months	Port Select	Input, output, off
Rate/Value Filter	0 to –20 dbHz, Smothing Ratio=4:1		

Factory Functions	Keypad Security (on/off), Report Message Response Retry (on/off), analog cal, default set
Runtime Operations	Clock and LAN/WAN installation status
Scaler TARE Function	[RST/TARE] key saves immediate input value as a zero reference, applied as offset to subsequent measured values, permanently saved

Indicators

Display	Backlit, liquid crystal super-twist nematic 2x16 alphanumeric dot matrix, ±20 degree view, yel-grn, 122x44 mm
Audio	2.0 KHz, 85 db @ 10 cm
Lamps	LED, Quantity/Rate/Time, each red/green/orange
Keypad	8-key, metal dome tactile — Chan, qty, prog, view, start, stop, zero/tare, rate/value

Input Port

Interchannel Isolation	>85 dbv (nom.)
Interface	3.5mm plug, sleeve=gnd, ring=signal, tip=+excitation or wire terminal plugs
Digital Pulse	0–24 V, 2.4 V threshold (typical), Z-in=8.7K tied to excitation voltage, excitation=5 or 12 VDC regulated, 24.570 KHz, ±0.01%, Hall effect open collector TTL/CMOS switch contacts
Analog Voltage	Levels=0/1–10.000 volts, Z-in=10.0K, ±0.024% (12 bits), Excitation=5 or 12 VDC regulated, 2.300 mA constant
Analog Current	Levels=0/4–20.00 mA, Z-in=100 ohms, ±0.024% (12 bits), Excitation=unregulated supply voltage

Output Port

Interface	3.5mm plug or wire terminal plugs
Analog Current	0/4–20.00 mA, Z-out=60.4 ohms, ±0.024%, source or sink (sleeve=neg, ring=n/c, tip=pos.)
Analog Voltage	0/1–10.000 Volts, Z-out=1.0 ohm, ±0.024%, (sleeve=neg., ring=n/c, tip=pos.)
Relay Rating	Form "C," 28 VAC, 5 A., ISO=1,000 V, (sleeve=N.O., ring=N.C., tip=common)

WAN Port	RJ-11, tip/ring, FCC Subpart "H," modem, V.22 bis full duplex
Local Serial Ports	EIA/TIA 232D (RS-232C), full duplex, 3.5 mm audio stereo plug
DTE	Sleeve=gnd, ring=TXD, input tip=RXD
DCE	Sleeve=gnd, ring=RXD, input tip=TXD
LAN Port	EIA/TIA485 multidrop master/salve dual jack plug-on card (option), Ethernet or DeviceNet
Value Memory	Non-volatile EEROM 100 year retention without power, Capacity=64x8 (external)/512x8 (internal), Write=1.0 ms/10^6 writes, Error detect algorithm
Diagnostics	Memory checksums, installation, local serial, telecommunication
Power Required	12–24 VDC, 65–33 mA (no options), 110–130 VAC, 50–60 Hz, U.S. standard wall adapter, 2.0 mm (center post positive) DC power jack, UL/CSA (VDE 220) VAC, 50 Hz Europe option
Consumption	0.78 watts (no options)
Clock-Calendar Battery	3.0 VDC, 35 mA/hr lithium, 9 years
Operating Environment	0–55° C (30–132° F) 0–95% RH non-condensing, Shipping/Storage: –20° to +85° C (warm up to rated accuracy = 30 min.)
Enclosure	NEMA 4X panel, wall, or desk mount, aluminum anodized, 8.25 inches x 4.05 inches x 2.125 inches (210 x 103 x 54 mm)
Weight	1.865 lbs. (847 gm.) weight
Publications	Installation and Operation Manual, Warranty Registration
Regulatory Qualifications	FCC Part 15 Class A verified, FCC Part 68 5TUUSA-23969-DT-E, UL and CSA: Power Adapter, Foreign: CSA and CE mark (as required)

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