MOD 30ML™ Multiloop Controllers

- **Multiple PID loops, math, logic and sequence control**
- **Highly visible, configurable operator display**
- **Flexible built-in and expansion I/O**
- **Dual independent communications networks: Modbus serial, peer-to-peer, or Ethernet**
- **Redundant, removable NOVRAM backs up configuration and current process parameters**
- **Multiple processors for maximum power & protection**
- **FM & CSA Class 1, Div. 2, Groups A,B,C,D**
- **Graphic-driven, function block configuration**

MOD 30ML combines the continuous control power of a DCS with the discrete I/O handling and easy sequence configuration of a PLC, in one compact package.

POWERFUL

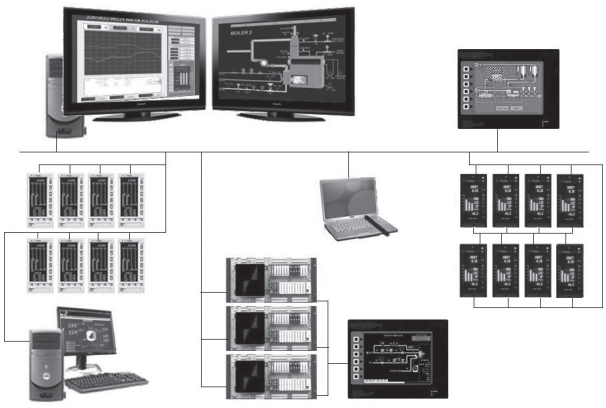
With up to six PID loops and hundreds of math, sequence, logic, timer and totalizer blocks, the MOD 30ML controller offers unprecedented control power for its size. The built-in vacuum fluorescent faceplate provides a high level of process and alarm information, and multiple screens can be configured for display and operation of discrete, batch and other functions not usually associated with loop controller products.

SECURE

MOD 30ML provides unparalleled security and integrity at a fraction of the cost of other systems. A portable memory module backs up the tuning parameters, calculated values, timer & totalizer values, and output states as well as the controller configuration. I/O points are individually isolated and can be configured to assume specific values or states after a power failure. The controller also detects and alarms on open circuit or loss of field signal. Multiple processors ensure maximum performance and operations security.

FLEXIBLE

MOD 30ML has more on-board I/O than any other controller of its type. Current, voltage, RTD, thermocouple, and digital signals can be mixed and matched on the same board, so you fit the I/O to your application. Two on-board ports provide independent Modbus, Ethernet and/or and peer-to-peer networks, allowing flexible, independent communication to PCs, panels and other controllers to allow you to build a complete distributed system. A choice of architectures provides flexibility in panel design and easy installation and service.



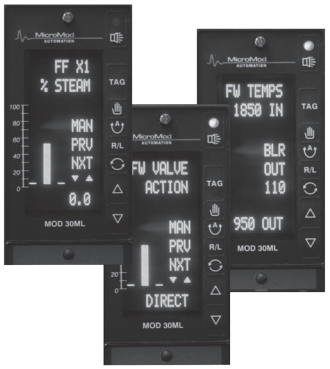
HIGH RELIABILITY, HIGH VISIBILITY DISPLAY

The new, pixel-based vacuum fluorescent display is highly visible and extremely robust. It provides a choice of up to six fonts and seven levels of brightness for ease of operation.

Standard Loop Display
Provides familiarity and reduces operator retraining

Alarm Displays
Any number of alarms can be configured for any signal. The alarm displays make it easy to identify, review and acknowledge process and diagnostic alarms.

Tuning Displays
Password-protected entry of tuning parameters, XY table values, recipe data and other information

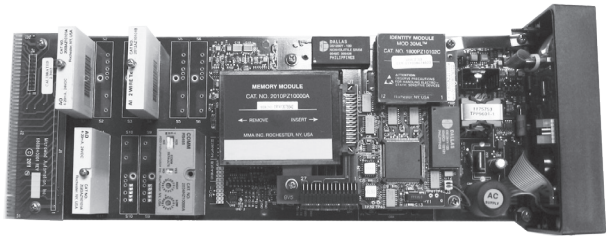


Application-Specific Displays
User screens can be configured for sequence and batch operations, discrete device operation, recipe selection, and more. All keys are user programmable.

Maintenance & Troubleshooting
View raw input values for commissioning and startup, detailed diagnostic information before and during normal operation and Event Queue of up to 1024 entries.

FIELD-FLEXIBLE I/O

MOD 30ML controllers include two universal analog inputs and two current outputs with two independent



transmitter power supplies for loop power.

Up to 11 additional expansion I/O points can be added in the field at any time using plug-in, single-point analog and digital modules. These modules are individually isolated channel-to-channel and channel-to-ground for maximum protection against noise and power spikes. Modules can be added in any position to suit the application.

- Current input with or without transmitter power
- RTD - 3 wire 100 ohm or 2-wire 1000 ohm
- Thermocouple with upscale burnout detection and automatic linearization
- Volt/millivolt
- Isolated and non-isolated digital inputs and outputs
- Mechanical relay outputs

FLEXIBLE FUNCTIONALITY

MOD 30ML controllers include all the functionality as standard. Function blocks are re-usable over 1000 times, and can be grouped and saved into a library in the configuration software. Calculations are easy with engineering units and floating point.

Standard Function Block Library

- P,I,D control with adaptive gain & reset, feedforward, external feedback, setpoint & output tracking and limiting, setpoint selection,
- Math/Logic with arithmetic, logical, comparator, exponential, absolute and log operators
- Sequence with 128 inputs, 64 outputs and 512 steps per block
- Linearization with 60-segment characterizer, square root with low signal cutoff, piecewise & inverse piecewise
- Setpoint Ramp/Hold with up to 100 individually guaranteed ramp or hold segments
- Timer and totalizer configurable for up or down with reset and wrap
- Input conditioning with filtering, action, normalization, linearization, action and scaling

FLEXIBLE ARCHITECTURE

Available in traditional panel mount with integral front display or in a split-architecture version with flushmount chassis and a remote faceplate, MOD 30ML allows flexibility in your panel design. The flushmount style allows selection of smaller, less expensive panels and provides easy access to I/O modules and the Portable Memory Module for servicing. Removable termination blocks on both versions provide for easy wiring and installation.

FLEXIBLE COMMUNICATIONS

MOD 30ML is equipped with one communication network as standard, jumper-configurable for peer-to-peer or Modbus RTU.

The peer-to-peer Instrument Communication Network provides communication with other MOD 30ML controllers, MODCELL Multiloop Processors and Taylor MOD 30 instruments. The ICN supports up to 15 devices and any MOD 30ML controller can transmit up to 32 and receive up to 32 parameters of any supported data type.

The Modbus RTU protocol supports floating point and can be set for either RS-232 or RS-485. MOD 30ML can act as either a master or slave on the bus.

A second, independent communication network can be added using a plug-in module for RS-232 Modbus, RS-485 Modbus, Ethernet, or ICN. The protocol for the second network is independent of that selected for the built-in network.

The Ethernet option includes a rear connector for a standard RJ45 Ethernet cable and a factory-installed 2040NZ communication module. The protocol is Modbus TCP. This option uses the second communication network. Setup is done through a simple utility included with the XModbus OPC Server and the configuration software. Host communication is supported by MicroMod's XModbus OPC Server.

HIGH SECURITY, MAXIMUM AVAILABILITY

MOD 30ML is unique in providing features for protection of process, personnel and plant equipment.

- Power recovery and warm/cold-start settings for every parameter with data retention independent of external power
- Failsafe output settings stored in I/O modules
- Backup of database and tuning parameters in NOVRAM and in Portable Memory Module
- Portable Memory Module updated every 50ms, with continuous checksum
- Single-point I/O isolation - galvanic and optical
- Short-circuit and cut-wire detection and alarm
- Out-of-range and quality diagnostics for each point
- Multiple processors: display, main CPU, communication and analog modules

FUNCTION-BLOCK CONFIGURATION

The Visual Application Designer software provides a Windows-based environment for creating, editing, downloading, documenting and debugging control strategies. Automatic, on-screen documentation and online context-sensitive help along with live debug and runtime features simplify strategy building and verification. Automatic report generation makes system documentation easy.

LEGACY CONTROLLER COMPATIBILITY

For easy hardware retrofit of ABB Taylor MOD 30 instruments a special cable adapter is available that connects directly to the 1750F series cables connected to the 1720N MOD 30 Standard Termination Panel so that field wiring can remain in place. The MOD 30 replacement version of MOD 30ML can be ordered factory-installed with the same I/O complement as the MOD 30 Controller XL (1701R), or you can choose the I/O that best matches the installation. Refer to specification sheet S-RETROPAK-M30 for more detail and ordering information.

GENERAL SPECIFICATIONS

PID Loops
Six single or four cascade

Execution Time
Using built-in I/O: 100mSec.
Module I/O: 150mSec. or greater
(depends on strategy size)

Operating Range
AC option: 85-250V rms, 50-400Hz
DC option: 20-50V dc
MOD 30 termination style: 24V dc

Fuse
2 Amps (ac), 3.15 Amps (dc)

Power Consumption (120V rms, 60Hz, Full load)
50W maximum

Data Retention
Typically 10 years with instrument unpowered

Operating temperature
0 to +50°C

Storage Temperature
-40 to +75°C

Humidity
5 to 95% RH, non-condensing

Open Input Fault Detection
User configurable for all inputs

Fault Output
Built-in outputs - last value or 0%
Module outputs - user defined between 0 and 100%

PHYSICAL SPECIFICATIONS

Height
Bezel - 5.69" (144.5 mm)
Panel cutout - 5.47" (138.9 mm)

Width
Bezel - 2.87" (72.9 mm)
Panel Cutout - 2.69" (68.3mm)

Safety Approvals
General Purpose
FM Approved and CSA Certified Class I, Division 2, Groups A, B, C, D (standard version only)
CE

Depth
Standard version :
Behind the panel - 15.75" (400 mm)
Front of panel - 1.13" (28.7 mm)

Split Architecture (flushmount):
Behind the panel - 4.125" (150 mm)*
Front of panel - 1.13" (28.7 mm)
*includes mounting bracket

Weight
Base instrument with identity module: 4.7 lbs.
Fully module loaded: 6.0 lbs.

Mounting
Standard version instrument mounts directly in a panel. Split Architecture faceplate mounts directly in a panel, and instrument chassis mounts on a flat surface using bracket provided.

Maximum distance between Split Architecture face-plate and instrument chassis is 8 feet (244mm)

PERFORMANCE SPECIFICATIONS

Built-In Analog Inputs & Outputs

Analog Inputs (2)

Transmitter Power: 24V dc, isolated (each input)

Range / Span

Configured as:	Min	Max.	Span Min.	Impedance
Millivolts	-10	120	10	10MΩ min.
Volts	0	6,0	0,1	10MΩ min.
Milliamps	0	22	1,0	100Ω nominal
Resistance	500 ohms (20 Ω min. con resistor de 3,9KΩ cum.)			

Input Temperature Linearization
Thermocouple – per standard NBS 125 y IEC 584
RTD – per standard IEC751 y DIN43760

Measurement Range Limits – Thermocouple or RTD	°F Low	°F High	°C Low	°C High
Type B	392	3308	200	1820
Type E	-328	1832	-200	1000
Type J	-346	1400	-210	760
Type K	-328	2501	-200	1372
Type N	32	2372	0	1300
Type R&S	32	3214	0	1768
Type T	-430	752	-257	400
RTD	-328	1562	-200	850

Note: performance accuracy of Type B thermocouple cannot be guaranteed below 752^{0}F (400^{0}C).

RTD – 3-wire platinum, 100 ohms per DIN 43760 (IEC751), range 0-430 ohms (normal) or 0-55 ohms (low)

Common mode rejection 45Vdc
Isolation Complete galvanic isolation using transformers and opto-isolators

Analog Outputs (2)
Range 0 to 22mA, non-isolated, with user-adjustable span (1 mA mín.)
Load 22mA at 1000 ohms maximum

PERFORMANCE SPECIFICATIONS

Modular Inputs & Outputs *Refer to Specification Sheet S-MOD-MODULES for complete specifications*

Voltage Input 2001A

Range	(0-100%) ±10V dc, ±100 mV dc
Low limit	-11V, -110mV
High limit	+11V, +110 mV

Current Input 2002A

Range	(0-100%) 4 a 20mA
Low limit	0 mA
High limit	24 MA

Current with 2-wire transmitter power 2012A

Range	4 a 20mA
Low limit	0 mA
High limit	27.5 mA

Thermocouple 2013A

Types	B,E,J,K,N,R,S,T
Range	±100 mVd dc
Low limit	-110 mV
High limit	+110 mV

RTD Input 2009A

Type	Range	Low Limit	High Limit
2 wire	0-4000 ohms (1000 ohms nominal)	0 ohms	4200 ohms
3 wire	0-400 ohms (100 ohms nominal)	0 ohms	400 ohms

Current Output 2003A

Range	(0-100%) 4 a 20 mA
Low Limit	0 mA
High Limit	25 mA

Isolated Digital Inputs 2004A

2004AP10…	…100A	…110A	…120A	…130A	…140A	…150A
Input Voltage Range	2.5-28V dc	4-16V dc	10-32V dc 12-32V ac	35-60V ac/dc	90-140V ac/dc	180-280V ac/dc
Low logic input	1V	1V	3V	9V	45V	80V
Maximum input current	30mA	45mA	25mA	6mA	11mA	6.5mA

Non-isolated Digital Inputs 2006A

Contact sense	5V/ 0.5 mA dc typical
Low logic input	0 to 0.65V dc to 50K ohms minimum
High logic input	2.2 to 24V dc to 50 ohms maximum

Isolated Digital Output 2005A

2005AP21…	…100A	…110A	…120A	…130A/140A
Output voltage range	5-60V dc	5-200V dc	12-140V ac	24-280V ac
Maximum output current	1A	0.55A	1A	1A

Non-isolated Digital Output 2007A

Output Voltage Range	+5 a +24V dc
Maximum output current	100 mA dc

Mechanical Relay Output 2011A

Types	Two independent relays (NO/NO, NC/NC, NO/NC)
Contact Load	3A a 250V ca o 30V dc per relay

COMMUNICATION SPECIFICATIONS

ICN Peer-to-Peer

BAUD Rate	31.25K BAUD

Modbus

Protocol	Modbus RTU
Electrical	RS-232 or RS-485
BAUD Rate	150 to 38.4K BAUD

2040N Ethernet Interface Module

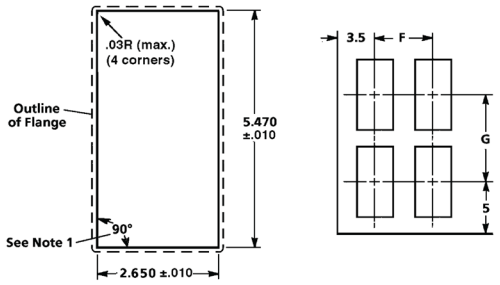
Protocol	Serial MODBUS RTU Slave
Modbus Address	1
BAUD Rate	up to 38.4K BAUD

Ethernet Port

Protocols	
Configuration	HTTP Web Interface
Operation	Modbus TCP
Standard	IEEE 802.3
Physical Layer	10/100Base-T
Data Rate	10/100Mbps (auto-sensing)
Mode	Half and Full duplex support (auto-sensing)
Connector	RJ45

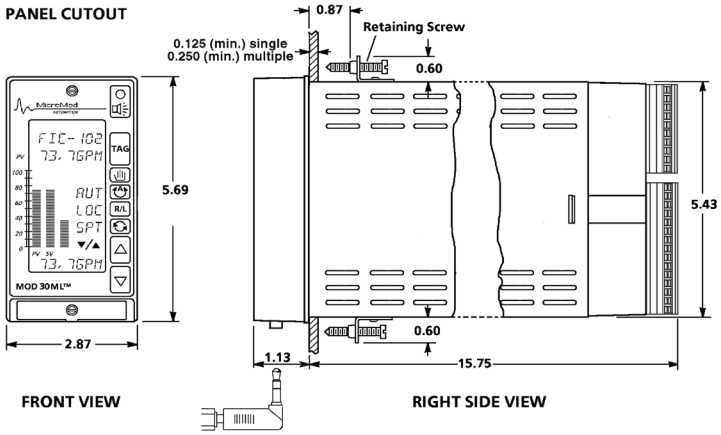
MOUNTING DIMENSIONS

Standard version (1800R)



Center-to-Center Distance	F	G
Recommended	4	8
Minimum	3.5	7

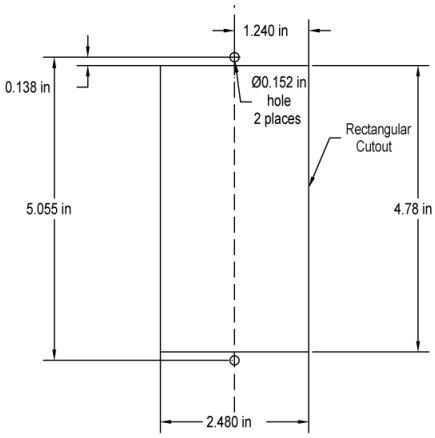
Inches	mm	Inches	mm
0.60	15.2	5.43	137.9
0.87	22.1	5.47	138.9
1.13	28.7	5.69	144.5
2.69	68.3	7.00	177.8
2.87	72.9	8.00	203.2
3.50	88.9	15.75	400.0
4.00	101.6		



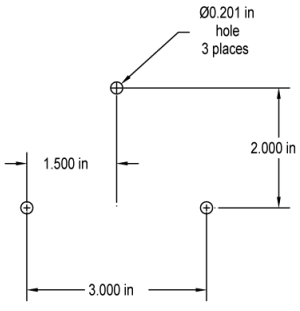
Notes:

1. *When mounting housing in panel cutout or rack and panel mounted bezel, turn retaining screws until point of screw touches rear of panel or bezel. Overtightening of retaining screws will distort housing. Housing must be square after retaining screws are tightened.*
2. *NEMA 4 option contains a gasket and lower front panel screw. Also, communication jack and service manual switch not present.*
3. *1801R bezel width is 2.735in (69.47mm). Panel cutout is the same.*

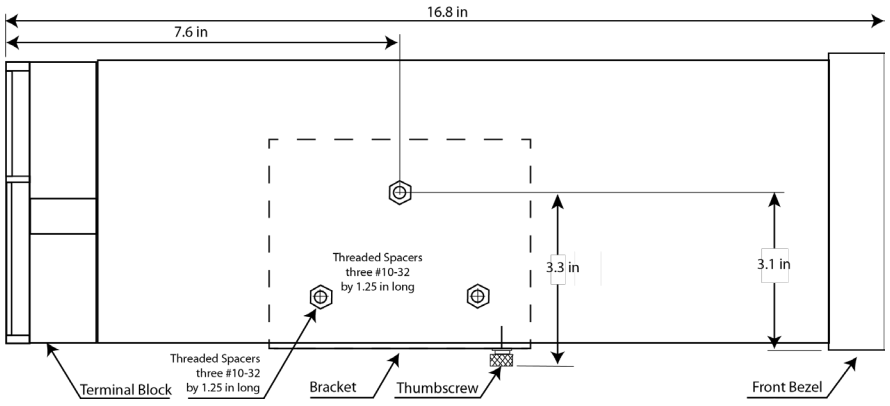
Split Architecture (1803R)



PANEL CUTOUT FOR DISPLAY ASSEMBLY



BRACKET HOLE PATTERN FOR MOUTING HOUSING



Information:

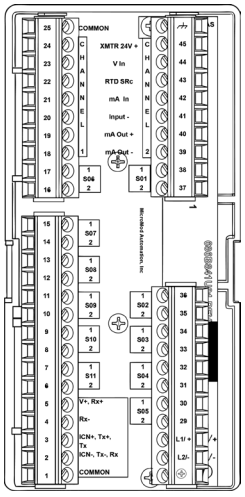
1 Available as standard Panel Mount or Split Architecture with remote faceplate (up to 8 feet)
2 All 1800R series controllers include two built-in universal analog inputs, two built-in current outputs and one built-in communications channel. All controllers are expansion-ready for additional plug-in modules
3 Select additional I/O and communication modules as required. Number of modules per instrument depends on:
- number of active analog input modules (powering transmitters); blank position required between
- position requirements of each module, e.g. 3-wire RTD requires 2 positions
- whether 2nd communications channel is used

4 Select Visual Application Designer configuraton software from S-MOD-VIZAPP

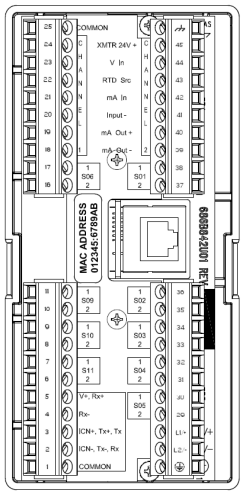
MOD 30ML PANEL-MOUNT	____ 01-06	__ 07-08	__ 09	__ 10	_0_ 11	_C_ 12
Base Controller						
Standard bezel	1800RZ					
Narrow bezel (Foxboro replacement version)	1801RZ					
Approvals						
General Purpose		10				
CE (European Community destinations only)		12				
FM/CSA Class 1 Division 2 A,B,C,D		21				
Power Supply						
24V dc			0			
85 to 250V ac			1			
Enclosure						
Standard terminations				0		
Standard terminations, NEMA 4 display (see Note 2)				3		
Standard terminations, NEMA 4 display, conformal coating (see Note 2)				4		
Ethernet termination (see Note 1)				6		
Ethernet termination, NEMA 4 display (see Notes 1 & 2)				7		
Ethernet termination, NEMA 4 display, conformal coating (see Notes 1 & 2)				8		
Not Used					0	
Design Model						C

Note 1: Available with General Purpose approval only. Not currently available with FM, CSA or CE. The Ethernet termination option includes a factory-installed 2040NZ communication module and a rear connector for a standard RJ45 cable. If adding an Ethernet-ready controller to an existing installation, an update to Visual Application Designer configuration software and/or the XMobuus OPC server may be required.

Note 2: NEMA 4 not available with 1801R Narrow Bezel version



Standard Terminations



Ethernet Terminations

For Remote Faceplate version and Accessories see following page

MOD 30ML SPLIT ARCHITECTURE	1803RZ 01-06	07-08	09	0 10	0 11	C 12
Base Controller Split Architecture with remote faceplate	1803RZ					
Approvals General Purpose (does not provide FM, CSA or CE) General Purpose, CE Marked		10 12				
Power Supply 24V dc 85 to 250V ac			0 1			
Enclosure Standard terminations				0		
Mounting Flushmount (includes mounting bracket)					0	
Design Model						C

Split Architecture version with remote faceplate

ACCESSORIES

MOD 30ML Users Guide - printed	98280-418
Extra downloading cable - for use with built-in RS-232 front port	109S1854
Extra USB-to-serial port adaptor (one included with ViZapp software)	179H001U01
ICN Termination Assembly (1 per ICN network)	2030FZ00001A
Portable Memory Module (optional)	2010PZ10000A
Upgrade to Version 2 Identity Module	1800PZ10102C

The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.

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