

ProductionManager™ Surface Controls



Product Overview

ProductionManager™ Surface Controls was designed with operations and engineering personnel in mind, allowing the user to perform control, logic, and mathematical functions. Using easy to configure pre-designed menus, Surface Controls handles your facility's operational requirements without the need for traditional programming skills. Surface Controls saves time during startup and commissioning, simplifying implementation and debugging of future changes as operational requirements mature.

Surface Controls can be utilized as an independent application or can be seamlessly integrated into the ProductionManager EDGE® suite of applications.

Features

■ 100 Action Blocks

Configurable control logic modules that include browsable parameters from the database, up to 4 logic statements per action block, use of Math and Boolean logic operators, chaining of blocks, before or after logic by-passes, individual logic results or group results.

■ 100 Effects

Configurable output events or actions that can be controlled by action block results. Effects can be tied to multiple action blocks as required by your cause-and-effect matrix.

■ 25 Calculation Blocks

Math calculations with up to 10 Inputs that each supports Arrays, up to 5 Outputs, 2 ASCII Messages and 25 Calc Functions each with a recorded result. A Calc Block can run every scan or be called from another Calc Block. There is a super set of supported functions available to meet any math need.

■ Utilities

Standard functions needed as part of facility controls and measurement for upstream production, including:

- 50 PID Control Loops
- 25 Ganged PIDs (ability to link up to 8 PID control loops together with HI/LO selector options)
- 25 Accumulators (rates and counters, either discrete or analog values)
- 25 Timers (on/off run timers providing output pulse configurations)
- 25 By-passes (API industry standard, class-based logic by-pass maintenance)
- 25 Permissives (ability to enable or disable action blocks or utilities).

User Interface

Surface Controls is accessed utilizing FBxConnect™ software, a Microsoft® Windows® based program created to configure, monitor and service Emerson's FB3000 RTU and applications. Surface Control's graphical user interface allows you to easily define, build, monitor, track and diagnose upstream production site equipment. Configurations are represented visually within the application. You can easily view data and reports, making changes and adjustments as required.

Connectivity/Requirements

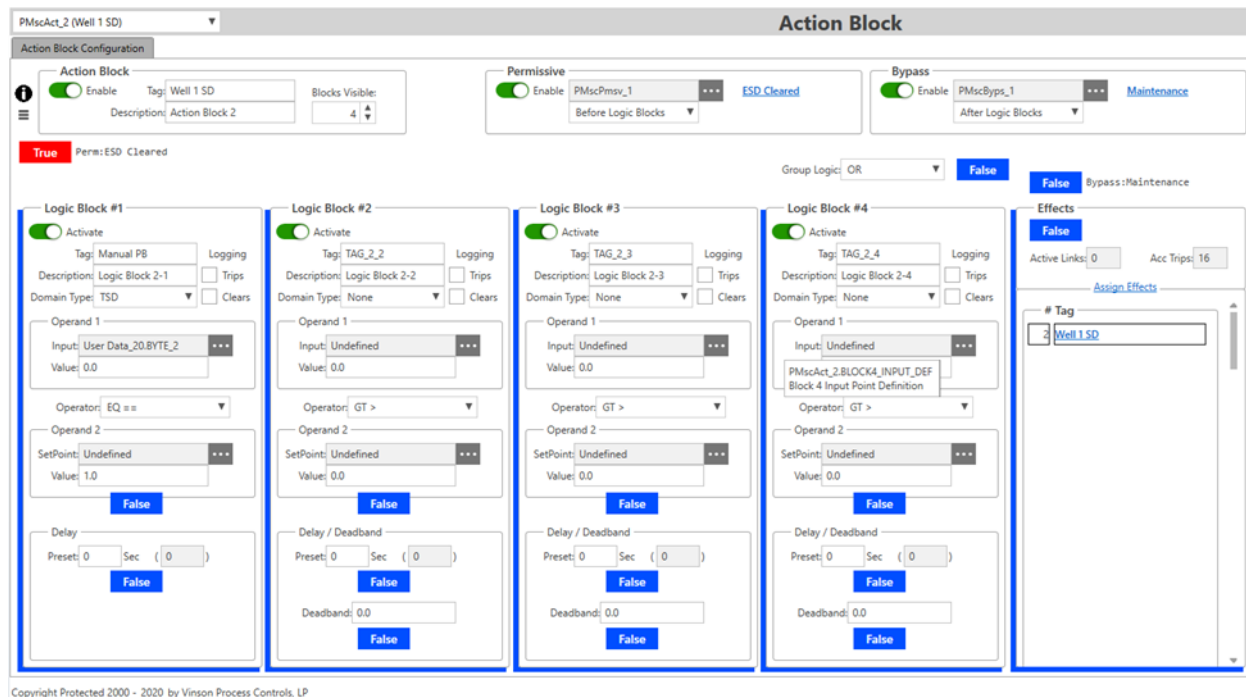
- FBxConnect™ access
- FB3000 RTU
- PMSC license
- Local connectivity via USB, serial or Ethernet**

*If you already have a method to connect to the FB3000 RTU remotely for SCADA access, you can use FBxConnect™ and that same remote link to connect to PMEQ and all other apps in the ProductionManager EDGE suite. Once connected, you can access all features, including editing objects, selecting auto adjustment parameters, setting alerts, reporting, diagnostics and more.

Configuration

Action Blocks

Allows defining logic, math or timer functions. The Block will change depending on the Operator selected for ease of configuration. (Pre-configuration and Configured). Multiple status indicators are available for use in logic or monitoring. Action Blocks can be chained together as required.



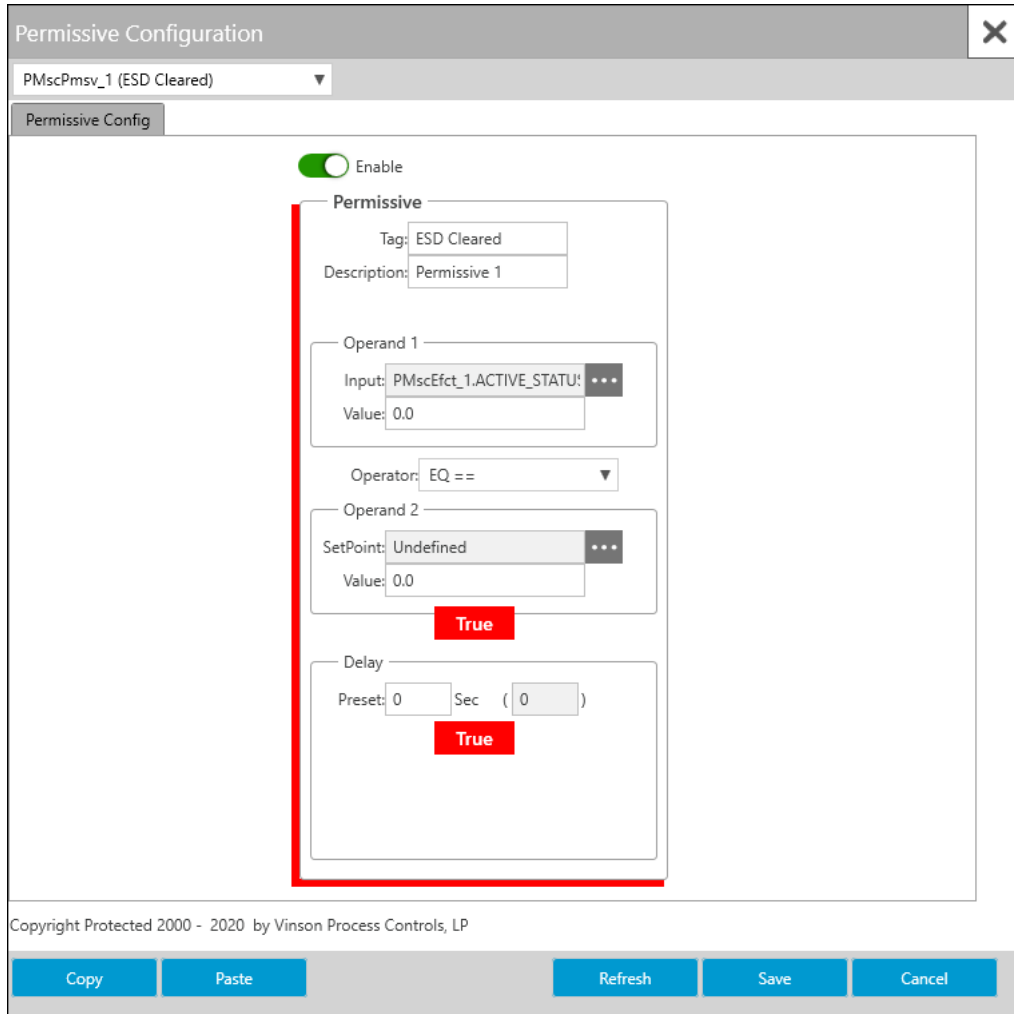
Copyright Protected 2000 - 2020 by Vinson Process Controls, LP

Action Block Supported Operators:

- GT > - Block is TRUE when Operand 1 is Greater Than Operand 2
- GE >= - Block is TRUE when Operand 1 is Greater Than or Equal To Operand 2
- LT < - Block is TRUE when Operand 1 is Less Than Operand 2
- LE <= - Block is TRUE when Operand 1 is Less Than or Equal To Operand 2
- EQ == - Block is TRUE when Operand 1 is Equal To Operand 2
- NE != - Block is TRUE when Operand 1 is Not Equal To Operand 2
- Watchdog – Block is TRUE when the Watchdog Input stops advancing for the amount of time in the Delay Preset.
- Trip on Change – Block is TRUE when Monitor Input changes
- pEdge – Block is TRUE for one scan when the Binary Input changes from 0 to 1
- nEdge – Block is TRUE for one scan when the Binary Input changes from 1 to 0
- Bitwise AND – Block is TRUE when the Byte and Comparator have the same weighted value
- Bitwise OR - Block is TRUE when either the Byte or Comparator have the same weighted value
- Add (+) – Adds Value 1 and Value 2
- Subtract (-) – Subtracts Value 2 from Value 1
- Multiply (*) – Multiplies Value 1 and Value 2
- Divide (/) – Divides Value 1 by Value 2
- Modulus (%) – Displays the Remainder after dividing Value 1 by Value 2
- Soft Input Reset Timer – Using a Soft Input from a User Data Value, the Block goes TRUE and the timer starts when the assigned User Data Value goes true. The Block will time down based on the Delay before Reset Preset time in seconds. Once the timer expires, the Block goes false and the User Data Value is set back to zero (0).
- Periodic Timer – Based on the selected clock parameter of seconds, minutes or hours, the Block will go TRUE when the Clock Parameter reaches a multiplier of the Periodic Time and will stay TRUE for the number of seconds defined in Duration Preset.

Permissives

Allows the creation of Permissives to enable or restrict a Logic Block or the Logic Block's results from executing. Permissives can be used by multiple Action Blocks. The Permissive must be TRUE to allow the logic to process or pass through, depending on if it is assigned before or after the Logic Blocks.

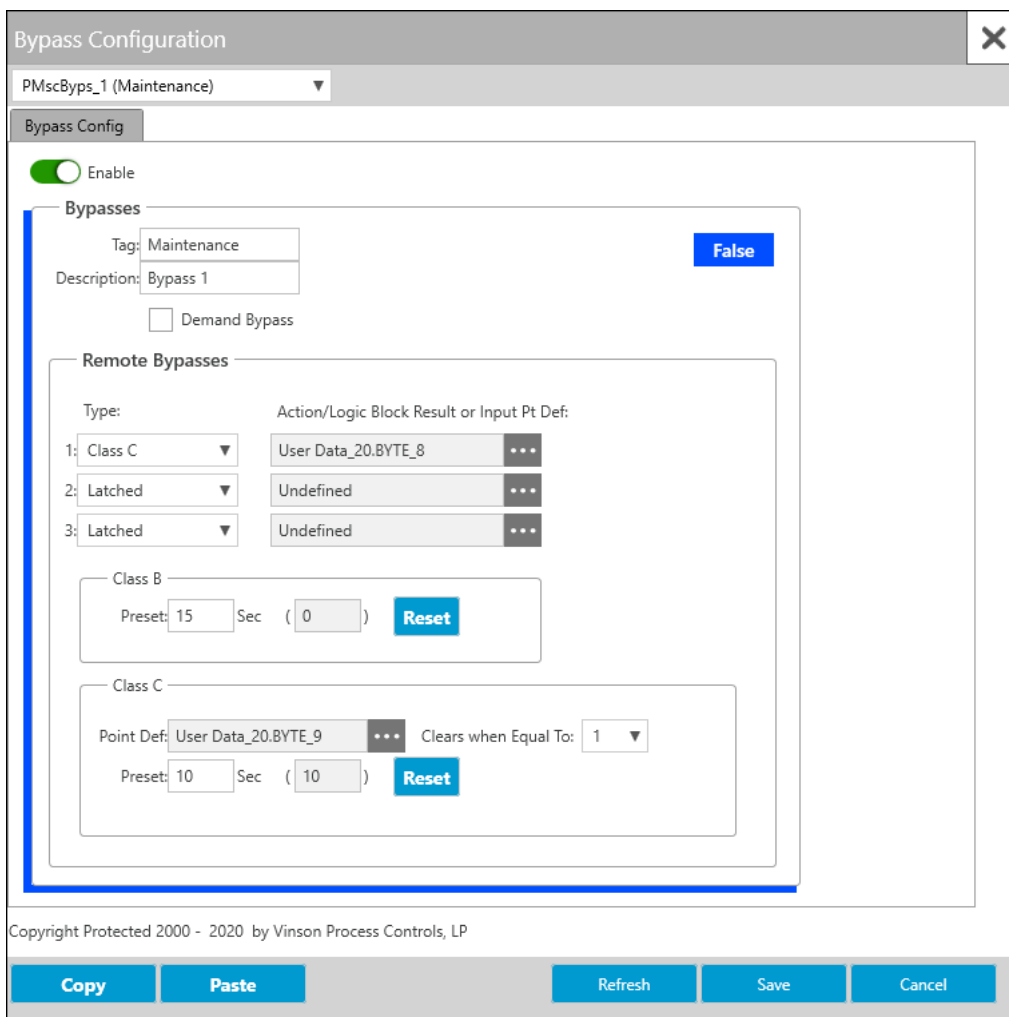


Bypasses

Allows the creation of industry standard class-based Bypasses, including Latched Bypasses. Bypasses can be used by multiple Action Blocks. The Bypass must be FALSE to allow the logic to process or pass through, depending on if it is assigned before or after the Logic Blocks. If a Bypass is assigned before the Logic Blocks, none of the Logic Blocks will process until the Bypass is false. If a Bypass is assigned after the Logic Blocks, the Logic Blocks will process, but the output will be held false until the Bypass is false.

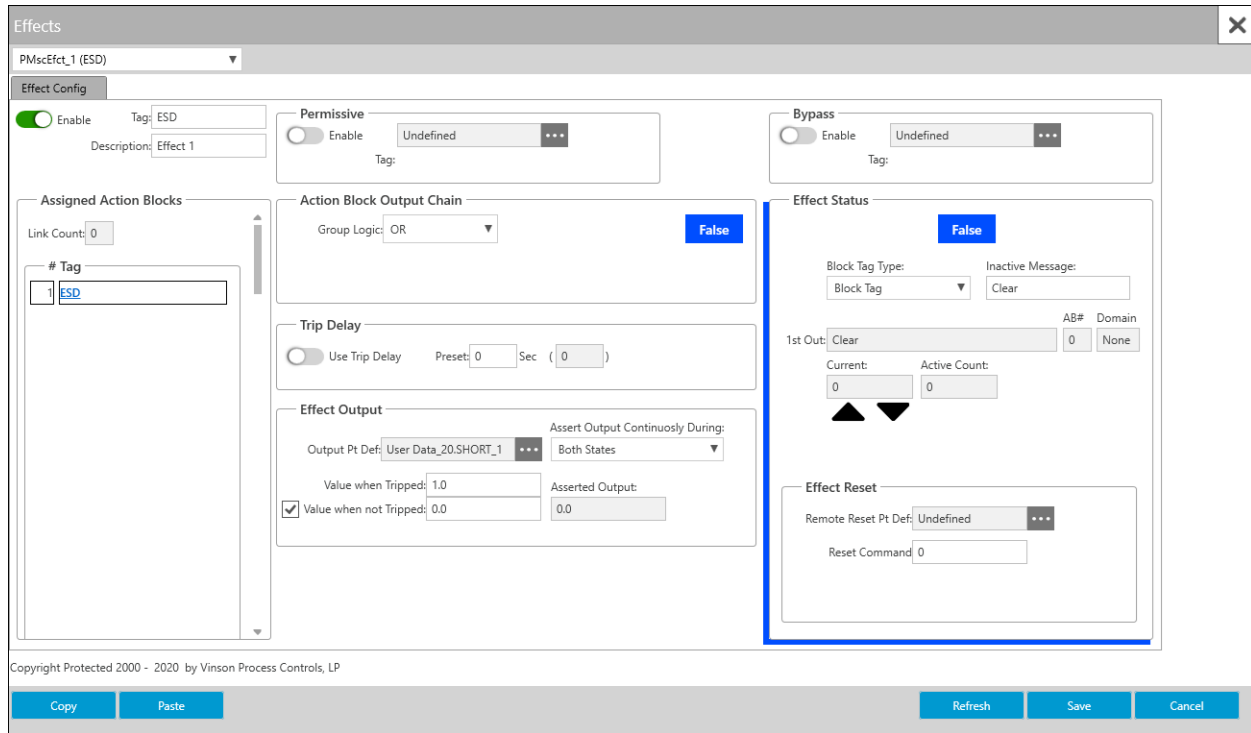
Supported Bypasses:

- a. Latched – Bypass is true while the associated Input Point Definition is true. The Bypass Status follows the status of the assigned Input. The assigned Input can come from an Action or Logic Block, User Data Integer or Discrete I/O.
- b. Class B – Timed Bypass based on the Status of the associated Input.
- c. Class C – Bypass based on the status of a remote input.
- d. Class B & C – Timed Bypass with a remote input override.



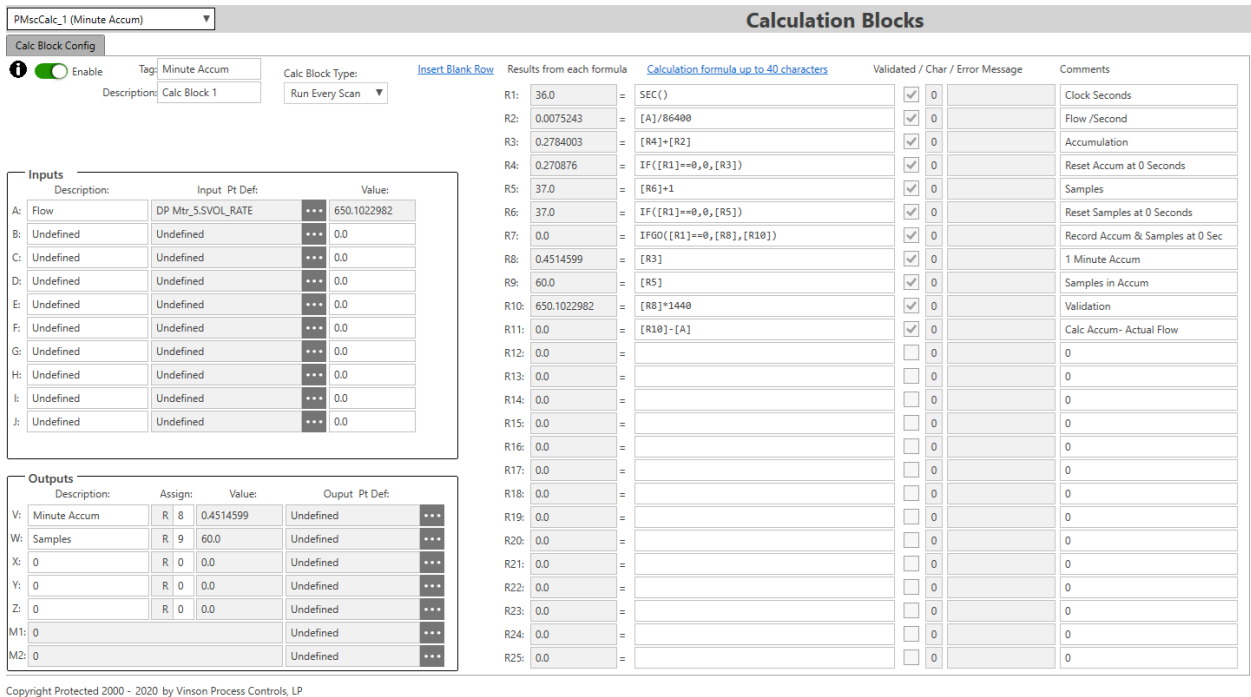
Effects

Allows the user to control a defined database point. The value sent to the assigned database point can be Discrete or Analog and can be configured for assertion in several ways. Permissives and Bypasses can be assigned to the Effect. First Out indication and viewing is available along with a Reset Option for Permanent Shut Down (PSD) type trips versus Temporary Shut Down (TSD) trip types. Multiple Action Blocks can be assigned to a single Effect.



Calculation Blocks

Allows the user to execute spreadsheet type formulas and logic to be entered into a table of 25 lines that executes from the top to the bottom every second. Inputs and Outputs can be defined along with two messages.



Calculation Formula Supported Operators and Functions:

Data Entry			
Brackets	[]	[A]	Brackets define variables
Paranthesis	()	([A]/[B])*3.14	Precedence
Other Calc Blk	\$	\$3[A]	R=A from 3rd Calc Block
Specific Bit	#	[A#3]	R=3rd Bit from A

Basic Math			
Addition	+	[A]+[B]	R=Math Result
Subtraction	-	[A]-[B]	R=Math Result
Multiply	*	[A]*[B]	R=Math Result
Divide	/	[A]/[B]	R=Math Result
Square Root	SQRT	SQRT([A])	R=Math Result

Comparison			
Greater Than	>	[A]>[B]	R= True(1) or False(0)
Greater or Equal	>=	[A]>=[B]	R= True(1) or False(0)
Less Than	<	[A]<[B]	R= True(1) or False(0)
Less or Equal	<=	[A]<=[B]	R= True(1) or False(0)
Equal To	==	[A]==[B]	R= True(1) or False(0)
Not Equal To	!=	[A]!= [B]	R= True(1) or False(0)

Time			
Seconds	SEC	SEC()	R= Clock Seconds
Minutes	MNT	MNT()	R= Clock Minutes
Hour	HR	HR()	R= Clock Hour
Date	DAY	DAY()	R= Current Date
Month	MTH	MTH()	R= Current Month (1-12)
Year	YR	YR()	R= Current Year
Since Midnight	SMD	SMD()	R= Seconds since Midnight
Day of the Week	DWK	DWK()	R= Weekday (1-7)

Functions			
Absolute	ABS	ABS([A])	R= Absolute value of A
Average	AVG	AVG([A],[B],[C])	R= Average of A, B and C
Average If	AVGIF	AVGIF([A],[B],[>1])	R= Average A, B if > 1
Value of a Bit	BIT	BIT([A],3)	R= 3rd Bit in A
Ceiling	CEIL	CEIL([A])	R= A Rounded Up
Count	CNT	CNT([A],[B],[C])	R= Qty containing numbers
Count If	CNTIF	CNTIF([A],[B],[>1])	R= Qty greater than 1
Floor	FLR	FLR([A])	R= A Rounded Down
IF Statement	IF	IF([A]>[B],1000,0)	R= 1000 if True or 0 if False
Integer	INT	INT([A])	R= Rounds Down to Int
Natural Log	LN	LN([A])	R= Natural Log of A
Base 10 Log	LOG	LOG([A])	R= Base 10 Log of A
Base 2 Log	LOG2	LOG2([A])	R= Base 2 Log of A
Maximum	MAX	MAX([A],[B],[C])	R= Maximum Value
Max Instance	MAXI	MAXI([A],[B],[C])	R= Instance with Max Value
Minimum	MIN	MIN([A],[B],[C])	R= Minimum Value
Min Instance	MINI	MINI([A],[B],[C])	R= Instance with Min Value
Modulus	MOD	MOD([A]/3.14)	R= Remainder
Power	POW	POW([A],3)	R= A raised to 3rd Power
Round	RND	RND([A])	R= Round A to Whole #
Summation	SUM	SUM([A],[B],[C])	R= Sum A, B and C
Sum If	SUMIF	SUMIF([A],[B],[>1])	R= Sum if values are > 1

Logical			
AND	&&	[A]==1&&[B]==1	R= True(1) or False(0)
OR		[A]==1 [B]==1	R= True(1) or False(0)
NOT	!	!([A]==1&&[B]==1)	R= True(1) or False(0)
XOR	^^	[A]==1^^[B]==1	R= True(1) or False(0)

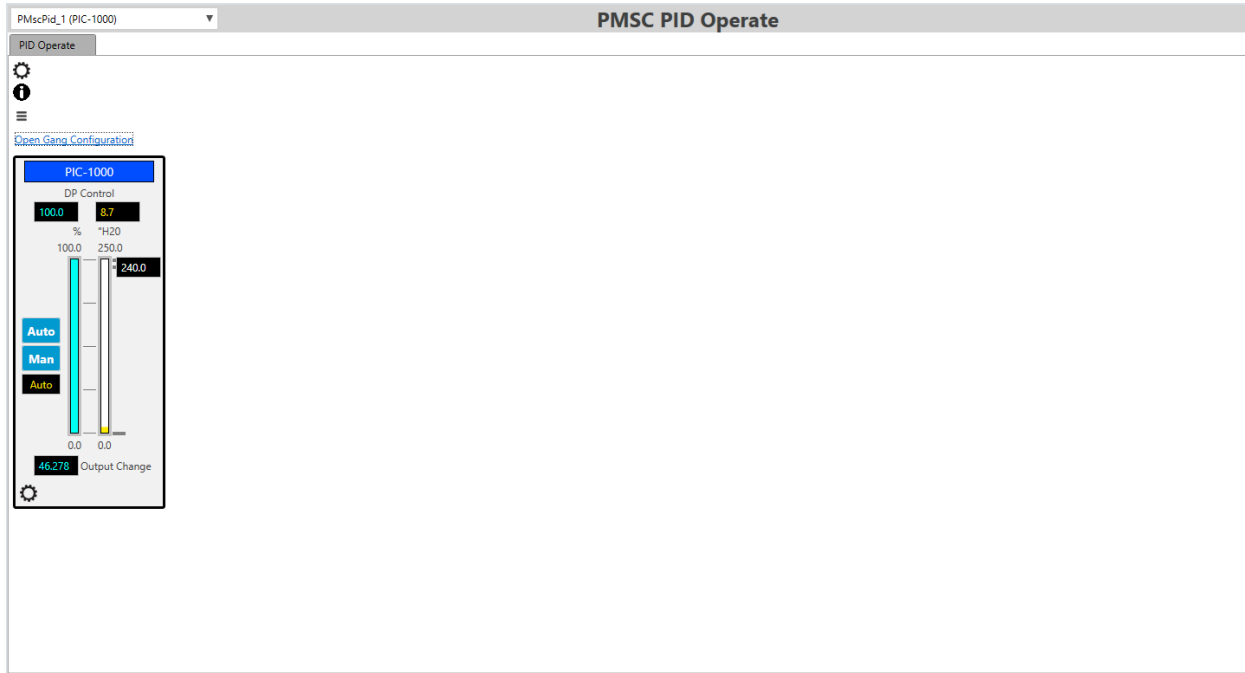
Logging			
Alarm Log	ALR	ALR("text",Value)	Log Alarm Text and Value
Event Log	EVN	EVN("text")	Log Event Text
Message 1	M1	M1("text")	Write Text to Message 1
Message 2	M2	M2("text")	Write Text to Message 2

Timers			
Wait	WT	WT(5)	Wait 5 seconds, continue
Start Timer	STM	STM(30)	Start timer at 30 seconds
Check Timer	CTM	CTM([R5],[R15])	If timer has expired go to R5, else go to R15

Miscellaneous			
Run a Calc Block	CAL	CAL(\$8,[R5],2,3,4)	Pass 4 variables into K-N of called Calc Block (8) and set to run once
End Calc Block	END	END()	End, continue at beginning
IF Go To	IFGO	IFGO([A]>[B],[R5],[R9])	IF True, jump down to R5, IF False, jump down to R9
Go To	GOTO	GOTO(R15)	Jump down to R15

PID Loop

Allows control of an Analog Signal using Proportional, Integral and Derivative Gain factors applied to the error between a Process Variable and a Setpoint. The PID can be standalone or support up to 7 overrides (see Ganged PID Loops).



Copyright Protected 2000 - 2020 by Vinson Process Controls, LP



Copyright Protected 2000 - 2020 by Vinson Process Controls, LP

Ganged PID Loops

Allows user to assign up to 7 overrides to a PID Loop including Hi/Lo selection criteria for each override.

The screenshot shows the 'PMSC PID Operate' interface for a ganged PID loop. At the top, it displays 'PMscPid_10 (FIC-5000)' and 'PID Operate'. Below this, there are fields for 'Gang Tag: Isabella Prod' and 'Description: PID Gang 5'. A link for 'Open Gang Configuration' is visible. The main area contains six individual PID loop cards:

- FIC-5000:** Isabella Flow. Variable: 1640.9. Control Mode: Auto. Output Change: 0.131. Selector: S2 Low.
- PIC-5001:** DP Control. Variable: 88.0. Control Mode: Auto. Output Change: 0.4. Selector: S2 Low.
- PIC-5002:** Upstream OV. Variable: 682.0. Control Mode: Auto. Output Change: 1.133. Selector: S2 Low.
- PIC-5003:** DownStream OV. Variable: 598.7. Control Mode: Auto. Output Change: 1.505. Selector: S2 Low.
- FIC-5005:** Critical vs Prod. Variable: 1640.9. Control Mode: Auto. Output Change: -182.136. Selector: S1 High.
- PIC-5004:** Tubing Decline. Variable: 710.0. Control Mode: Auto. Output Change: 0.0. Selector: S1 High.

At the bottom, it shows 'Assigned to Gang # 5 in Position: 1'.

Copyright Protected 2000 - 2020 by Vinson Process Controls, LP

The screenshot shows the 'Ganged PID Config' interface. It has an 'Enable' toggle (checked) and fields for 'Tag: Theodore' and 'Description: PID Gang 1'. The 'PID Assignment' section contains two selector columns:

- Selector 1:**
 - Low Select:
 - High Select:
- Selector 2:**
 - Low Select:
 - High Select:

Below the selectors is a table for PID assignments:

PID	Include (S1)	Include (S2)
Primary PID: PMscPid_1	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1st Override PID: PMscPid_2	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2nd Override PID: PMscPid_3	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3rd Override PID: PMscPid_4	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4th Override PID: PMscPid_5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5th Override PID: PMscPid_6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6th Override PID: Undefined	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7th Override PID: Undefined	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Copyright Protected 2000 - 2020 by Vinson Process Controls, LP

Accumulators

Allows the user to accumulate any value, typically flow, by accumulating a Rate (e.g. analog signal) or by accumulating an Accumulator (e.g. Modbus Accumulator)

Accumulations

Tag: Accumulator 1

Description: Accumulator 1

Accounting Code: 0

Flow Rate: 12.3999996 Bbl/Hr

Tuesday, October 20, 2020 9:46:54 AM

Contract Hour: 0

	Time		Accumulations	
Current Hour	46.9	Minutes	9.6926664	Bbl
Previous Hour	60.0	Minutes	12.3999996	Bbl
Today	1109.37	Minutes	229.2691041	Bbl
Yesterday	1440.0	Minutes	297.5999908	Bbl
Current Month	24363.33	Minutes	5035.088734	Bbl
Previous Month	27230.97	Minutes	5627.7329379	Bbl
Running Accum	51594.3	Minutes	10662.821672	Bbl

Copyright Protected 2000 - 2020 by Vinson Process Controls, LP

Refresh
Save

Timers

Allows the user to configure a quick logic statement and will calculate time when the statement is both True and False along with the percentage of time it is true.

Run Times

Tag: Timer 1

Description: Timer 1

Accounting Code: 0

Status: True

Tuesday, October 20, 2020 1:25:35 PM

Contract Hour: 0

	TRUE Time	FALSE Time	Percent TRUE
Current Hour	12.6	12.98	Minutes 49.25 %
Previous Hour	30.0	30.0	Minutes 50 %
Today	663.82	664.23	Minutes 49.98 %
Yesterday	720.0	720.0	Minutes 50 %
Current Month	12561.48	12560.68	Minutes 50 %
Previous Month	11187.48	11187.02	Minutes 50 %
Running Accum	23748.97	23747.7	Minutes 50 %

Copyright Protected 2000 - 2020 by Vinson Process Controls, LP

Refresh
Save

How Will Surface Controls Benefit Your Operation?

If optimizing well production in the field or behind a desk is important to you, Surface Controls can be of great benefit.

- **Field Operations**
Ease-of-use and configuration, measurement, current operating status, production optimization
- **Facility Engineers**
Standardized deployment of equipment and facilities
- **Production/Reservoir Engineers**
Better reservoir management through captured data and well analytics
- **Management/HSE/Accounting**
Safety controls, standardization, custody transfer measurement and log retrieval
- **SCADA/IT Administration**
Standardized data model provides consistent access to optimization, analytics and operational parameters

Support

- Help desk support is available 24/7.
- Training classes are offered year-round.
- Onsite configuration assistance is available upon request via your local Emerson Impact Partner.

ProductionManager EDGE® Suite

The ProductionManager EDGE® suite of applications is designed to provide standardized yet flexible solutions to common processes in the Oil & Gas production field. The suite is designed to assist with managing the lifecycle of the well (from flowback to abandonment), managing well testing for allocation purposes, and complete fluids management from well-to-sell. This comprehensive suite of applications has been enhanced by input from Major and Independent E&P companies alike, and utilized in North America for over 20 years with tremendous success.

ProductionManager™ Equipment Module (PMEQ)

The ProductionManager Equipment Module (PMEQ) gives you the ability to define, build, monitor, track and diagnose the equipment installed on your upstream production site. PMEQ allows for operational analysis and diagnostics of onsite equipment.

ProductionManager™ Well Optimization (PMWO)

ProductionManager™ Well Optimization (PMWO) allows you to optimize production based on industry standard methods. This application provides your operation with continuous, real-time optimization of production, as well as surface and downhole analytics. PMWO records optimization statistics needed to identify key trends, allowing you to better manage your decline curves.

ProductionManager™ Well Test (PMWT)

ProductionManager™ Well Test (PMWT) allows you to maintain accurate allocation measurement while achieving facility cost reduction goals. Now you can rest easy knowing that potential issues with allocation, scheduling, multiple testers and optimal test results are a thing of the past.

ProductionManager™ Surface Controls (PMSC)

ProductionManager™ Surface Controls allows the user to perform control, logic, and mathematical functions using easy to configure pre-designed menus. Surface Controls facilitates configuration of your complete cause and effect narrative, handling temporary or permanent shutdowns, permissives, bypasses, alarming and other utility functions.

Coming Soon

- **ProductionManager EDGE™ Fluid Logistics (PMFL)**
- **ProductionManager EDGE™ Interface (PMEI)**
- **ProductionManager EDGE™ Chemical Manager (PMCM)**

Dallas Headquarters
Vinson Process Controls
2747 Highpoint Oaks Drive
Lewisville, TX 75067
T: 800-420-6571
T: 972-459-8200
Fax: 972-459-8299

Odessa
Vinson Process Controls
320 Interstate 20 Service Rd, #C
Odessa, TX 79766
T: 800-420-6571
T: 972-459-8200
Fax: 972-459-8299

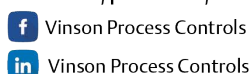
Farmington
Vinson Process Controls
2030 Cortland Dr.
Farmington, NM 87401
T: 800-420-6571
T: 972-459-8200
Fax: 972-459-8299

Carrollton
Vinson Process Controls
2933 Eisenhower
Carrollton, TX 75007
T: 800-420-6571
T: 972-459-8200
Fax: 972-459-8299

OKC
Vinson Process Controls
2545 S. Kelly Pointe Suite #C
Edmond, OK 73013
T: 800-420-6571
T: 972-459-8200
Fax: 972-459-8299

Tulsa
Vinson Process Controls
12211 E. 51st ST.
Tulsa, OK 74146
T: 800-420-6571
T: 972-459-8200
Fax: 972-459-8299

vinsonprocess.com/products/remote-automation-solutions/



www.vinsonprocess.com/products/remote-automation-solutions