

VOLUME 4

Firmware Revisions 20.74/24.74

Modbus Database Addresses and Index Numbers

OMNI 3000 / 6000 Flow Computer
User Manual

Turbine/Positive Displacement/
Coriolis Liquid Flow Metering
Systems with K Factor
Linearization

Effective August 2009



Volume 4



MODBUS™ DATABASE ADDRESSES AND INDEX NUMBERS

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For Your Information



About Our Company

OMNI Flow Computers, Inc. is the world's leading manufacturer and supplier of panel-mount custody transfer flow computers and controllers. Our mission is to continue to achieve higher levels of customer and user satisfaction by applying the basic company values: our people, our products and productivity.

Omni flow computers – Our products are currently being used world-wide at:

- ✓ Offshore oil and gas production facilities
- ✓ Crude oil, refined products, LPG, NGL and gas transmission lines
- ✓ Storage, truck, and marine loading/offloading terminals
- ✓ Refineries; petrochemical and cogeneration plants

Our products have become the international flow computing standard. OMNI Flow Computers pursues a policy of product development and continuous improvement. As a result, our flow computers are considered the “brain” and “cash point” of liquid and gas flow metering systems.

Our staff is knowledgeable and professional. They represent the energy, intelligence and strength of our company, adding value to our products and services. With the customer and user in mind, we are committed to quality in everything we do, devoting our efforts to deliver workmanship of high caliber. Teamwork with uncompromising integrity is our lifestyle.

Contacting Our Corporate Headquarters

OMNI Flow Computers, Inc.
12620 West Airport, Suite 100
Sugar Land, Texas 77478 USA



Phone: 281-240-6161

Fax: 281-240-6162



World-wide Web Site:

<http://www.omniflow.com>



E-mail Address:

helpdesk@omniflow.com

Getting User Support

Technical and sales support is available world-wide through our corporate or authorized representative offices. If you require user support, please contact the location nearest you (see insert) or our corporate offices. Our staff and representatives will enthusiastically work with you to ensure the sound operation of your flow computer.

About the Flow Computer Application

OMNI 6000 and OMNI 3000 Flow Computers are integrated into the majority of liquid flow measurement and control systems. The current production firmware revision of OMNI 6000/OMNI 3000 Flow Computers are:

- **2075/2475:** Turbine/Positive Displacement/Coriolis Liquid Flow Metering Systems with K Factor Linearization (US/metric units)

About the User Manual

This manual applies to all .73, .74 and .75 firmware revisions of OMNI 6000 and OMNI 3000 Flow Computers. It is structured into 5 volumes and is the principal part of your flow computer documentation.

Target Audience

As a user's reference guide, this manual is intended for a sophisticated audience with knowledge of liquid and gas flow measurement technology. Different user levels of technical know-how are considered in this manual. You need not be an expert to operate the flow computer or use certain portions of this manual. However, some flow computer features require a certain degree of expertise and/or advanced knowledge of liquid and gas flow instrumentation and electronic measurement. In general, each volume is directed towards the following users:

- Volume 1. System Architecture and Installation
 - ♦ Installers
 - ♦ System/Project Managers
 - ♦ Engineers/Programmers
 - ♦ Advanced Operators
 - ♦ Operators
- Volume 2. Basic Operation
 - ♦ All Users
- Volume 3. Configuration and Advanced Operation
 - ♦ Engineers/Programmers
 - ♦ Advanced Operators
- Volume 4. Modbus™ Database Addresses and Index Numbers
 - ♦ Engineers/Programmers
 - ♦ Advanced Operators
- Volume 5. Technical Bulletins
 - ♦ Users with different levels of expertise.

Manual Structure

The User Manual comprises 5 volumes; each contained in separate binding for easy manipulation. You will find a detailed table of contents at the beginning of each volume.



User Reference Documentation – The User Manual is structured into five volumes. Volumes 1, 2, and 5 are generic to all flow computer application revisions. Volumes 3 and 4 are application specific. These have four versions each, published in separate documents; i.e., one per application revision per volume. You will receive the version that corresponds to your application revision.

The volumes respective to each application revision are:

Revision 2075/2475: Volume #s 3, 4

Volume 1. Architecture and Installation

Volume 1 is generic to all applications and considers both US and metric units. This volume describes:

- Basic hardware/software features
- Installation practices
- Calibration procedures
- Flow computer specifications

Volume 2. Basic Operation

Volume 2 is generic to all applications and considers both US and metric units. It covers the essential and routine tasks and procedures that may be performed by the flow computer operator.

General computer-related features are described, such as:

- Overview of keypad functions
- Adjusting the display
- Clearing and viewing alarms
- Computer totalizing
- Printing and customizing reports

The application-related topics may include:

- Batching operations
- Proving functions
- PID control functions
- Audit trail
- Other application specific functions

Depending on your application, some of these topics may not be included in your specific documentation. An index of display variables and corresponding key press sequences that are specific to your application are listed at the end of each version of this volume.

Volume 3. Configuration and Advanced Operation

Volume 3 is intended for the advanced user. It refers to application specific topics and is available in four separate versions (one for each application revision). This volume covers:

- Application overview
- Flow computer configuration data entry
- User-programmable functions
- Modbus™ Protocol implementation
- Flow equations and algorithms

Volume 4. Modbus™ Database Addresses and Index Numbers

- Volume 4 is intended for the system programmer (advanced user). It comprises a descriptive list of database point assignments in numerical order, within our firmware. This volume is application specific, for which there is one version per application revision.

Volume 5. Technical Bulletins




Manual Updates and Technical Bulletins – Volume 5 of the User Manual is a compendium of Technical bulletins. You can view and print technical bulletins from our website: <http://www.omniflow.com>

Volume 5 includes technical bulletins that contain important complementary information about your flow computer hardware and software. Each bulletin covers a topic that may be generic to all applications or specific to a particular revision. They include product updates, theoretical descriptions, technical specifications, procedures, and other information of interest.

This is the most dynamic and current volume. Technical bulletins may be added to this volume after its publication.

Conventions Used in this Manual

Several typographical conventions have been established as standard reference to highlight information that may be important to the reader. These will allow you to quickly identify distinct types of information.

CONVENTION USED	DESCRIPTION
	The light bulb icon indicates a tip, suggestion, or concise information of interest. It is highly recommended that you read them.
<p>Keys / Key Press Sequences</p> <p><u>Example:</u></p> <p>[Prog] [Batch] [Meter] [n]</p>	<p>Keys on the flow computer keypad are denoted with brackets and bold face characters (e.g. the 'up arrow' key is denoted as [↑]). The actual function of the key as it is labeled on the keypad is what appears between brackets. Key press sequences that are executed from the flow computer keypad are expressed in a series of keys separated by a space (as shown in the example).</p>
<p>Screen Displays</p> <p><u>Example:</u></p> <div><p>Use Up/Down Arrows To Adjust Contrast; Left, Right Arrows To Adjust Backlight</p></div>	<p>Sample screens that correspond to the flow computer display appear surrounded by a dark gray border with the text in bold face characters and mono-spaced font. The flow computer display is actually 4 lines by 20 characters. Screens that are more than 4 lines must be scrolled to reveal the text shown in the manual.</p>
<p>Headings</p> <p><u>Example:</u></p> <p>2. Chapter Heading</p> <p>2.3. Section Heading</p> <p>2.3.1. Subsection Heading</p>	<p>Sequential heading numbering is used to categorize topics within each volume of the User Manual. The highest heading level is a chapter, which is divided into sections, which are likewise subdivided into subsections. Among other benefits, this facilitates information organization and cross-referencing.</p>
<p>Figure Captions</p> <p><u>Example:</u></p> <p>Fig. 2-3. Figure No. 3 of Chapter 2</p>	<p>Figure captions are numbered in sequence as they appear in each chapter. The first number identifies the chapter, followed by the sequence number and title of the illustration.</p>
<p>Page Numbers</p> <p><u>Example:</u></p> <p>2-8</p>	<p>Page numbering restarts at the beginning of every chapter and technical bulletin. Page numbers are preceded by the chapter number followed by a hyphen. Technical bulletins only indicate the page number of that bulletin. Page numbers are located on the outside margin in the footer of each page.</p>

Trademark References

The following are trademarks of OMNI Flow Computers, Inc.:

- OMNI 3000
- OMNI 6000
- OmniCom®

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OMNI Flow Computers, Inc., in conformance with its policy of product development and improvement, may make any necessary changes to this document without notice.

Warranty, Licenses and Product Registration

Product warranty and licenses for use of OMNI Flow Computer Firmware and of OmniCom Configuration PC Software are included in the first pages of each Volume of this manual. We require that you read this information before using your OMNI Flow Computer and the supplied software and documentation.

If you have not done so already, please complete and return to us the product registration form included with your flow computer. We need this information for warranty purposes, to render you technical support and serve you in future upgrades. Pointed users will also receive important updates and information about their flow computer and metering system.



Important!

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Chapter 1

Modbus™ Protocol Implementation

1.1. Introduction

OMNI Flow Computers implement a superset of the Modbus™ Protocol on Serial Ports #1 (selectable), #2, #3, #4 (selectable), #5 and #6, thus allowing simultaneous communications with up to six totally independent Modbus systems. Maximum transmission baud rate is 38.4 kbps with an average answer response time of 70 msec plus any modem warm-up time.

The Modbus™ Protocol specifies one master and up to 247 slaves on a common communication line. Each slave is assigned a fixed unique device address in the range of 1 to 247. The Master always initiates the transaction. Transactions are either a query/response type (only one slave is accessed at a time) or a broadcast / no response type (all slaves are accessed at the same time). A transaction comprises a single query and single response frame or a single broadcast frame.

1.2. Modes of Transmission

Two basic modes of transmission are available: ASCII or Remote Terminal Unit (RTU). The mode selected depends on the equipment being used.

AVAILABLE TRANSMISSION MODES		
	TRANSMISSION MODE	
	ASCII	RTU
Coding System	Hexadecimal	8-bit binary
NUMBER OF BITS:		
Start Bits	1	1
Data Bits	7	8
Parity (Optional)	Odd, Even, None (1 or 0)	Odd, Even, None (1 or 0)
Stop Bits	1 or 2	1 or 2
Error Checking	LRC	CRC
Baud Rate	300 bps to 38.4 kbps	300 bps to 38.4 kbps

1.2.1. ASCII Framing and Message Format

Framing in ASCII Transmission Mode is accomplished by the use of the colon (:) character indicating the beginning of a frame and a carriage return (CR) line feed (LF) to delineate end of frame. The line feed character also serves as a synchronizing character which indicates that the transmitting station is ready to receive an immediate reply.

ASCII MESSAGE FORMAT						
BEGINNING OF FRAME	ADDRESS	FUNCTION CODE	DATA	ERROR CHECK	END OF FRAME	READY TO RECEIVE RESPONSE
:	2 Char	2 Char	N x 2 Char	2 Char	CR	LF
7 Bits	14 Bits	14 Bits	N x 14 Bits	14 Bits	7 Bits	7 Bits

Assuming 7 bits per transmitted character. →

1.2.2. Remote Terminal Unit (RTU) Framing and Message Format

Frame synchronization can be maintained in RTU Transmission Mode only by simulating a synchronous message. The 'OMNI' monitors the elapsed time between receipt of characters. If 3.5 character times elapse without a new character or completion of the frame, then the frame is reset and the next bytes will be processed looking for a valid address.

RTU MESSAGE FORMAT			
ADDRESS	FUNCTION	DATA	ERROR CHECK
8 Bits	8 Bits	N x 8 Bits	16 Bits

1.3. Message Fields

1.3.1. Address Field

The address field immediately follows the beginning of the frame and consists of 2 characters (ASCII) or 8 bits (RTU). These bits indicate the user assigned address of the slave device that is to receive the message sent by the master. Each slave must be assigned a unique address and only the addressed slave will respond to a query that contains its address. When the slave sends a response, the slave address informs the master which slave is communicating. In broadcast mode, an address of zero (0) is used. All slaves interpret this as an instruction to read and take action, but do not issue a response message.

1.3.2. Function Code Field

The function code field tells the addressed slave what function to perform. The high order bit of the function code field is set by the slave device to indicate that other than a normal response is being transmitted to the Master device. This bit remains 0 if the message is a query or a normal response message.



Note: See 1.5 for descriptions and examples of these function codes. See 1.4 for a description of exception responses.

<u>FUNCTION CODE</u>	<u>ACTION</u>
01 ———	READ MULTIPLE BOOLEAN POINTS
02 ———	READ MULTIPLE BOOLEAN POINTS
03 ———	READ STRINGS OR MULTIPLE 16 OR 32 BIT VARIABLES
04 ———	READ STRINGS OR MULTIPLE 16 OR 32 BIT VARIABLES
05 ———	WRITE SINGLE BOOLEAN POINT
06 ———	WRITE SINGLE 16 BIT INTEGER
07 ———	READ EXCEPTION STATUS
08 ———	LOOPBACK TEST
15 ———	WRITE MULTIPLE BOOLEAN POINTS
16 ———	WRITE STRINGS OR MULTIPLE 16 OR 32 BIT VARIABLES
65 ———	READ ASCII TEXT BUFFER
66 ———	WRITE ASCII TEXT BUFFER

1.3.3. Data Field

The data field contains the information needed by the slave to perform the specific function or it contains data collected by the slave in response to a query. This information may be text strings, values, exception code or text buffers.

1.3.4. Error Check Field

This field allows the master and slave devices to check a message for errors in transmission. A transmitted message may be altered slightly due to electrical noise or other interference while it is on its way from one unit to another. The error checking assures that the master and the slave do not react to messages that have been changed during transmission. The error check field uses a longitudinal redundancy check (LRC) in the ASCII Mode and a CRC-16 check in the RTU Mode. The bytes checked include the slave address and all bytes up to the error checking bytes. Checking is done with the data in the binary mode or RTU mode.

The LRC Mode

The error check is an 8-bit binary number represented and transmitted as two ASCII hexadecimal (hex) characters. The error check is produced by first stripping the Colon, CR and LF and then converting the hex ASCII characters to binary. Add the binary bytes (including slave address) discarding any carries, and then two's complement the result. At the received end the LRC is recalculated and compared to the LRC as sent. The colon, CR, LF, and any embedded non-ASCII hex characters are ignored in calculating the LRC.

The CRC Mode

The message is considered as one continuous binary number whose most significant bit (MSB) is transmitted first. The message is pre-multiplied by X^{16} (shifted left 16-bits), then divided by $(x^{16}+x^{15}+x^2+1)$ expressed as the binary number (11000000000000101).The integer quotient digits are ignored and the 16-bit remainder (initialized to all ones at the start to avoid the case of all zeros being an accepted message) is appended to the message (MSB first) as the two CRC check bytes. The resulting message including CRC, when divided by the same polynomial $(x^{16} + x^{15} + x^2 + 1)$ at the receiver will give a zero remainder if no errors have occurred.

1.4. Exception Response

Programming or operation errors are those involving illegal data in a message, no response or difficulty in communicating with a slave. These errors result in an exception response from the slave, depending on the type of error. When such a message is received from the master the slave sends a response to the master echoing the slave address, function code (with high bit set), exception code and error check fields. To indicate that the response is a notification of an error, the high order bit of the function code is set to 1.

<u>EXCEPTION CODE</u>	<u>DESCRIPTION</u>
01 ———	ILLEGAL FUNCTION
02 ———	ILLEGAL DATA ADDRESS
03 ———	ILLEGAL DATA VALUE
04 ———	DATA CANNOT BE WRITTEN
05 ———	PASSWORD NEEDED

1.5. Function Codes

1.5.1. Function Codes 01 and 02 (Read Boolean Status)



Note: Function Code 02 is identical to Function Code 01. It can be used by communication devices that do not support Function Code 01.

These functions allow the user to obtain the 'on/off' status of Booleans used to control discrete outputs from the addressed slaves only. Broadcast mode is not supported with this function code. In addition to the slave address and function field, the message requires that the information field contain the initial point number to be read (starting point) and the number of points that will be read to obtain the Boolean data.

Boolean points are numbered from 1001; (Boolean number 1 = 1001, 1 = on, 0 = off). The data is packed one bit for each Boolean flag variable. The response includes the slave address, function code, quantity of data characters, the data characters, and error checking. The low order bit of the first character contains the addressed flag and the remainder follows. For Boolean quantities that are not even multiples of eight, the last characters will be filled-in with zeros at high order end.

Example: Read Booleans 1120 to 1131 from Slave Device #01.

POLL MASTER-TO-SLAVE : ASCII TRANSMISSION MODE						
ADDRESS	FUNCTION CODE	DATA STARTING POINT #		NUMBER OF POINTS		LCR CHECK 8-BIT
		Hi	Lo	Hi	Lo	
: 3031	3031	3034	3630	3030	3043	3845 Cr Lf

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE						
ADDRESS	FUNCTION CODE	DATA STARTING POINT #		NUMBER OF POINTS		CRC CHECK 16-BIT
		Hi	Lo	Hi	Lo	
01	01	04	60	00	0C	'nn' 'nn'

SLAVE RESPONSE : ASCII Transmission Mode					
ADDRESS	FUNCTION CODE	BYTE COUNT	DATA		LCR CHECK 8-BIT
			Hi	Lo	
: 3031	3031	3032	3038	3030	4634 Cr Lf

SLAVE RESPONSE : RTU Transmission Mode					
ADDRESS	FUNCTION CODE	BYTE COUNT	DATA		LCR CHECK 8-BIT
			Hi	Lo	
01	01	02	08	00	'nn' 'nn'

The status of Booleans 1120 through 1127 is shown as 08 (hex) = 0000 1000 (binary). Reading right to left, this shows that status 1123 is 'on'. The other data flags are decoded similarly. Due to the quantity of Boolean status requested, the last data field, which is shown as 00 (hex) = 0000 0000 (binary), contains the status of only four flags. The four left most bits are provided as zeros to fill the 8-bit format.

1.5.2. Function Codes 03 and 04 (Read 16-Bit Point Sets)



Note: Function Code 04 is identical to Function Code 03. It can be used by communication devices that do not support Function Code 03.

Function Codes 03 and 04 allow the master to obtain the binary contents of holding points in the addressed slave. The protocol allows for a maximum of 125 16-bit points to be obtained at each request. Broadcast mode is not allowed for functions 03 and 04.

These 16-bit points are also grouped in sets of points and accessed as one variable. The numeric range of the point number defines the variable type and indicates how many 16-bit points make up that variable.



Note: Point Groups for Long Integer Variable Type – Points 6XXX or 15XXX long integers apply only to Revision 23 for US Customary units.

POINT GROUPS FOR TYPES OF VARIABLES				
POINT # RANGE	VARIABLE TYPE	16-BIT REGS. / POINT	NO OF BYTES / POINT	MAX POINTS / MESSAGE
3XXX or 13XXX	Short Integer	1 Point	2 Bytes	125
4XXX	8-Char. ASCII String	4 Points	8 Bytes	31
6XXX or 15XXX	Long Integer	2 Points	4 Bytes	62
17XXX or 18XXX	IEEE Floating Point	2 Points	4 Bytes	62
14XXX	16-Char. ASCII String	8 Points	16 Bytes	15

The addressed slave responds with its address and the function code, followed by the information field. The information field contains a single byte indicating the number of data bytes returned followed by the actual data bytes. The data is returned in multiples of two bytes, with the binary content right justified. The data is sent MS Byte first.

Example: Read Short Integer Message 3012 through 3013 from Slave #2.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE						
ADDRESS	FUNCTION CODE	DATA STARTING POINT #		QUANTITY OF POINTS		CRC CHECK 16-BIT
		Hi	Lo	Hi	Lo	
02	03	0B	C4	00	02	'nn' 'nn'

SLAVE RESPONSE : RTU Transmission Mode							
ADDRESS	FUNCTION CODE	BYTE COUNT	DATA		DATA		CRC CHECK 16-BIT
			Hi	Lo	Hi	Lo	
02	03	04	1F	40	1F	3E	'nn' 'nn'

The slave responds with its address and the function code, byte count of the data field followed by the actual data field. In the example above, the data field contains 4 bytes representing the value of the requested data.

1.5.3. Function Code 05 (Write Single Boolean)

This message forces a single Boolean variable either 'on' or 'off'. Boolean variables are points numbered 1XXX or 2XXX. Writing the 16-bit value 65,280 (FF00 HEX) will set the Boolean 'on'. Writing the value zero will turn it 'off'. All other values are illegal and will not effect the Boolean. Using a slave address '00' (Broadcast Mode) will force all slaves to modify the desired Boolean.

Example: Turn Single Boolean Point 1711 'on' - Slave #2.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE						
ADDRESS	FUNCTION CODE	BOOLEAN POINT #		DATA		CRC CHECK
		Hi	Lo	Hi	Lo	
02	05	06	AF	FF	00	'nn' 'nn'

SLAVE RESPONSE : RTU Transmission Mode						
ADDRESS	FUNCTION CODE	BOOLEAN POINT #		DATA		CRC CHECK
		Hi	Lo	Hi	Lo	
02	05	06	AF	FF	00	'nn' 'nn'

The normal response to the command request is to retransmit the message as received after the Boolean state has been altered.

1.5.4. Function Code 06 (Write Single 16-Bit Integer)

Any numeric variable that has been defined on the 16-bit integer index table can have its contents changed by this message. The 16-bit integer points are numbered from 3XXX or 13XXX.

When used with slave address zero (Broadcast Mode) all slaves will load the specified points with the contents specified. The following example sets one 16-bit integer at address 3106 (0C22 HEX) of Slave #2 (i.e., load address 3106 with data 0003).

Example: Set Single 16-Bit Integer Slave #2.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE						
ADDRESS	FUNCTION CODE	POINT #		DATA		CRC CHECK
		Hi	Lo	Hi	Lo	
02	06	0C	22	00	03	'nn' 'nn'

SLAVE RESPONSE : RTU Transmission Mode						
ADDRESS	FUNCTION CODE	POINT #		DATA		CRC CHECK
		Hi	Lo	Hi	Lo	
02	06	0C	22	00	03	'nn' 'nn'

The normal response to a Function 06 query is to retransmit the message as received after the 16-bit integer has been altered.

1.5.5. Function Code 07 (Read Exception Status)

This function allows the user to obtain the status of the five events and determine the communication port number (serial port number). These events are programmed and cannot be reconfigured. Following are the five events:

- ☐ EPROM Checksum error flag
- ☐ Program mode
- ☐ Diagnostic mode
- ☐ Master status
- ☐ Power failed flag

Example: Request to Modbus ID # 13 (Address HEX: 0D) to respond with event status and communication port number.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE			
ADDRESS	FUNCTION CODE		CRC CHECK 8-Bit
0D	07		'nn' 'nn'

SLAVE RESPONSE : RTU Transmission Mode			
ADDRESS	FUNCTION CODE	DATA	CRC CHECK 8-Bit
0D	07	4C	'nn' 'nn'

The slave responds with the Modbus 0D number (address), the function code, and the data, followed by the CRC check. In the above example, the data field contains 1 byte representing the value of the requested data. Following is the conversion of hexadecimal data to binary, to determine the event status and communication port number.

Hex 4C = 0100 1100 (Bit 7, Bit 6, Bit 5, Bit 4, Bit 3, Bit 2, Bit 1, Bit 0)

Bit 7, Bit 6, Bit 5 represent the communication port:

Port #	Bit 7	Bit 6	Bit 5
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0

Bit 4, Bit 3, Bit 2, Bit 1, Bit 0 represent the following event status:

- Bit 4 → Power failed flag (1=Yes, 0=No); Modbus database address = 1829
- Bit 3 → Master status (1=Yes, 0=No); Modbus database address = 2864
- Bit 2 → In diagnostic mode (1=Yes, 0=No)
- Bit 1 → In program mode (1=Yes, 0=No)
- Bit 0 → Invalid EPROM Checksum error flag (1=Yes, 0=No); Modbus database address = 1837

1.5.6. Function Code 08 (Loopback Test)

Function Code 08 sends diagnostics test message to slave, to evaluate communications processing. The purpose is to test the communication system only; it does not perform any write function. The system (slave) responds with an echo.

Example: *Loopback Test – Simple return of query message sent to Slave Address Identification # 13.*

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE						
ADDRESS	FUNCTION CODE	DATA DIAGNOSTICS CODE		DATA DIAGNOSTICS CODE		CRC CHECK
		Hi	Lo	Hi	Lo	
0D	08	00	00	A5	37	'nn' 'nn'

SLAVE RESPONSE : RTU Transmission Mode						
ADDRESS	FUNCTION CODE	DATA DIAGNOSTICS CODE		DATA DIAGNOSTICS CODE		CRC CHECK
		Hi	Lo	Hi	Lo	
0D	08	00	00	A5	37	'nn' 'nn'

The slave responds with an echo; i.e., identical Modbus ID (address), function code, and data.

1.5.7. Function Code 15 (Write Multiple Boolean)

Function Code 0F_{HEX} (15) writes to each Boolean variable in a consecutive block of Boolean variables to a desired 'on' or 'off' state. Each Boolean is packed in the data field, one bit for each Boolean flag (1 = on, 0 = off). The data field consists of increments of 2 bytes and can be up to 250 bytes (2000 points). Boolean points are packed right-to-left, 8 to a byte with unused bits set to '0'. The use of slave address '00' (Broadcast Mode) will force all slaves to modify the desired Boolean bits. The following example writes to 14 Boolean variables starting at address 1703. The data field value 05, 1703 through 1710, and data field value 20 represents the status of points 1711 through 1716. These data values are transmitted as 0000 0101 and 0010 0000, indicating that Booleans points 1703, 1705, 1716 are to be forced 'on' and 1704 and 1706 through 1715 are to be forced 'off' (the two most significant positions of the second byte are unused and set to '0').

Example: Turn on Boolean points 1703, 1705, 1716 ON Slave #3.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE									
ADDRESS	FUNCTION CODE	STARTING ADDRESS		QUANTITY OF POINTS		BYTE COUNT	DATA		CRC CHECK
							Hi	Lo	
03	0F	06	A7	00	0E	02	05	20	'nn' 'nn'

SLAVE RESPONSE : RTU Transmission Mode							
ADDRESS	FUNCTION CODE	STARTING ADDRESS		QUANTITY OF POINTS		CRC CHECK	
03	0F	06	A7	00	0E	'nn'	'nn'

The normal response to a Function 15 query is to echo the slave address, function code, starting address, and quantity of points written.

1.5.8. Function Code 16 (Write 16-Bit Point Sets)

Function Code 10_{HEX} (16) allows the master to change the binary contents of holding points in the addressed slave. The protocol allows for a maximum of 125 16-bit points to be changed at each download. Using a slave address of zero (00) allows the master to change points in all slaves simultaneously (Broadcast Mode).

These 16-bit points are also grouped as sets of points and accessed as one variable. The numeric range of the point number defines the variable type and indicates how many 16-bit points make up that variable.

POINT GROUPS FOR TYPES OF VARIABLES				
POINT # RANGE	VARIABLE TYPE	16-BIT REGS. / POINT	NO OF BYTES / POINT	MAX POINTS / MESSAGE
3XXX or 13XXX	Short Integer	1 Point	2 Bytes	125
4XXX	8-Char. ASCII String	4 Points	8 Bytes	31
5XXX or 15XXX	Long Integer	2 Points	4 Bytes	62
7XXX-8XXX or 17XXX	IEEE Floating Point	2 Points	4 Bytes	62
14XXX	16-Char. ASCII String	8 Points	16 Bytes	15

The addressed slave responds with its address and the function code, followed by the information field. The information field contains a single byte indicating the number of data bytes returned and the actual data bytes. The data is sent as multiples of two bytes, with the binary content right justified. The data is sent MS Byte first.

Example: Write Short Integers 3012 through 3013 to Slave #2.



Byte Count: The Byte Count will be increments of 2, 4, 8 or 16 bytes depending on the address range of the points downloaded.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE											
ADDR	FUNC CODE	STARTING POINT #		QUANTITY OF POINTS		BYTE COUNT	DATA		DATA		CRC CHECK
							Hi	Lo	Hi	Lo	
02	10	0B	C4	00	02	04	1F	40	1F	3E	'nn' 'nn'

SLAVE RESPONSE : RTU Transmission Mode							
ADDRESS	FUNCTION CODE	STARTING ADDRESS		QUANTITY OF POINTS		CRC CHECK	
02	10	0B	C4	00	02	'nn'	'nn'

The slave responds with its address and the function code, starting point number and quantity of points.

Example: Write a Long Integer 5101 to Slave #4

Poll Master-to-Slave : RTU Transmission Mode												
Addr	Func Code	Starting Point #		Quantity of Points		Byte Count	Data		Data		CRC Check	
							Hi	Lo	Hi	Lo		
04	10	13	ED	00	01	04	00	4F	20	4E	'nn'	'nn'

Slave Response : RTU Transmission Mode							
Address		Function Code	Starting Address		Quantity of Points		CRC Check
04		10	13	ED	00	01	'nn' 'nn'

The slave responds with its address and the function code, starting point number and quantity of points.

1.5.9. Function Code 65 (Read ASCII Text Buffer)

Function Code 41_{HEX} (65) allows the master to read the contents of an ASCII text buffer within an addressed slave. Data is always sent and received in packets containing 128 characters. Packets are numbered from 0 to 255. The size of the text buffer is always an exact multiple of 128 bytes. The last buffer will contain a HEX 1A (end of file character).

Example: Read 2nd packet of an ASCII Text Buffer Point 9001 from Slave # 5.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE							
ADDRESS	FUNCTION CODE	POINT #		PACKET #		CRC CHECK	
		Hi	Lo	Hi	Lo		
05	41	23	29	00	01	'nn'	'nn'

SLAVE RESPONSE : RTU Transmission Mode									
ADDR	FUNC CODE	POINT #		PACKET #		DATA	Data	CRC	CHECK
		Hi	Lo	Hi	Lo	BYTE 0			
05	41	23	29	00	01	30	41	'nn'	'nn'

1.5.10. Function Code 66 (Write ASCII Text Buffer)

Function Code 42_{HEX} (66) is used by the master to download an ASCII text buffer to an addressed slave. Data is always sent and received in packets containing 128 characters. Packets are numbered from 0 to 255. The size of the text buffer is always an exact multiple of 128 bytes. The last buffer will contain a HEX 1A (end of file character).

Example: Write 1st packet of an ASCII Text Buffer Point 9002 to Slave # 2.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE									
ADDR	FUNC CODE	POINT #		PACKET #		DATA	Data	CRC	CHECK
		Hi	Lo	Hi	Lo	BYTE 0			
02	42	23	2A	00	00	39	2F	'nn'	'nn'

SLAVE RESPONSE : RTU Transmission Mode							
ADDRESS	FUNCTION CODE	POINT #		PACKET #		CRC CHECK	
		Hi	Lo	Hi	Lo		
02	42	23	2A	00	00	'nn'	'nn'

1.6. Custom Data Packets

Many point numbers were left unused when numbering the variables within the database. This allows for future growth and different application data. Without custom data packets many polls would be required to retrieve data distributed throughout the database. The custom data packet allows you to concatenate or join different groups or sets of data in any order and of any data type into 1 message response. These custom packets are a type 03 read and are located at points 1, 201 and 401 in the database.

Example: Read Custom Data Packet #1 at Point 0001 from Slave #2.

POLL MASTER-TO-SLAVE : RTU TRANSMISSION MODE						
ADDRESS	FUNCTION CODE	STARTING POINT #		QUANTITY OF POINTS		CRC CHECK 16-BIT
		Hi	Lo	Hi	Lo	
02	03	00	01	00	00	'nn' 'nn'

Dummy number of points

SLAVE RESPONSE : RTU Transmission Mode								
ADDRESS	FUNCTION CODE	BYTE COUNT	DATA		DATA		CRC CHECK 16-BIT
			Hi	Lo		Hi	Lo	
02	03	??	??	??		??	??	'nn' 'nn'

Depends on the size of packet configured

Depends on the number and type of data points included

1.7. Peer-to-Peer on the Modbus™ Link

Serial Port #2 can be configured to allow peer-to-peer communications. In this mode any OMNI flow computer can act as a Modbus master and communicate with any other Modbus device on the communication link (Technical Bulletin 980401 (52-0001-0001) "Peer-to-Peer Basics").

1.8. Half Duplex Wiring Configuration Required

The physical wiring of a Modbus link is usually full duplex, although the Modbus communication protocol is a half duplex protocol (i.e., both devices **never** transmit at the same time). For peer-to-peer communications the physical link must be wired for half duplex operation with all transmit and receive terminals wired in parallel (see **7.4** in **Volume 1**). This allows all devices to hear all transmissions; even their own.

1.9. Active Master

Control of the communication link is passed from the current master to the next master in the sequence by broadcasting the ID number of the next master in sequence. When that flow computer has completed its transaction list (see **7.4** in **Volume 1**) it will in turn hand over control to the next master in the sequence.

1.10. Error Recovery

Should the next master in the sequence fail to take control of the link the current master will search for an active master. To ensure best performance and fastest recovery in the event of an error, always number Modbus masters consecutively starting from 01.

1.11. Trapil

Several Modbus Addresses in the following list are labeled with the word Trapil. These addresses are available with Revision 24 (French Version 24.XX Only) and the Trapil Function turned on.

Chapter 2

User-Defined, Status and Command Data (0001 - 2999)

2.1. Custom Data Packets or Modicon™ G51 Compatible Point Arrays

These three addresses specify reserved areas used to access user defined groups of data variables. Data can be accessed as read only blocks of data or the data is arranged as an array of adjacent 16-bit points which can be read or written independently, if the Modicon Compatible mode is selected when setting up the serial port.



Info: This data is accessed using Modbus function code 03 for reads and 16 for writes. Boolean data bits are packed 8 to a byte.

- | | |
|-------------|--|
| 0001 | Custom Data Packet / Array #1
Maximum 250 bytes using Modbus RTU mode (for Packet/Array definition see Index 3001-3040). |
| 0201 | Custom Data Packet / Array #2
Maximum 250 bytes using Modbus RTU mode (for Packet/Array definition see Index 3041-3056). |
| 0401 | Custom Data Packet / Array #3
Maximum 250 bytes using Modbus RTU mode (for Packet/Array definition see Indices 3057-3096). |

2.2. Archive Control Flags

Data to be added into the Text Archive RAM is flagged by embedding Boolean Point **1000** or **2000** within the appropriate custom report immediately preceding the data to be archived. You may enable or disable the archiving of data by resetting or setting this variable.

- | | |
|-------------|---|
| 1000 | Archive Control Flag
Report data following flag will be archived not printed. |
| 2000 | Archive Control Flag
Report data following flag is printed and archived. |

2.3. Status / Command Data

2.3.1. Reading and Writing the Physical Digital I/O



IMPORTANT: Never set a physical I/O point which has been assigned as an input as this could cause a DC voltage to appear on the input terminals of that point which may conflict with any voltage already present on those terminals

The current status of physical Digital I/O Points 01 through 12 (OMNI 3000) or 01 through 24 (OMNI 6000) can be accessed by reading Modbus Indexes **1001** through **1024**.

All points which are to be written to exclusively via the Modbus must first have the point assigned to Modbus control by entering zero (0) for 'Digital Point Assign' (see **Chapter 9**). Assigning to '0' prevents the OMNI application software from overwriting the Modbus write.

1001 **Digital I/O Point #1**
to
1024 **Digital I/O Point # 24**

2.3.2. Programmable Booleans



Info: Boolean data is accessed using Modbus function codes 01 for reads, 05 for single point writes, and 15 for multiple bit writes. Boolean data is packed 8 points to a byte when reading.



Info: Boolean data points 1057-1088 are available for User Alarms.

Example: 1030:1088=1002

1088: High Filter DP

Make 1088 follow status of Digital Point #2. When true, 1088 Alarm message will be placed in Alarm log and on Alarm screen.

Points **1025** through **1088** are updated every 100 msec with the current value of the programmable Boolean statements (see **Chapter 10**). You may read from or write to these variables, but anything that you write may be overwritten by the flow computer depending upon the logic functions programmed into the logic statement.



1025 **Boolean Point #25**
to
1088 **Boolean Point #88**

Points **1089** through **1099** are paired with Floating Point Variables **7089** through **7099**. For example, numeric data placed in **7089** can be output as pulses by assigning a Digital I/O Point to **1089**.

1089 **Programmable Accumulator #1**
Used to pulse out data placed into **7089**.
to
1099 **Programmable Accumulator #11**
Used to pulse out data placed into **7099**.

2.3.3. Meter Run Status and Alarm Points

The second digit of the index number defines the number of the meter run. For example: Point **1105** is the Meter Active Flag for Meter Run #1. Point **1405** would be the Meter Active Flag for Meter Run #4.

1n00	Reserved
	<i>* Note: is used to assign accumulators to the front panel counters or digital I/O points.</i>
* 1n01	Pulses - Gross Indicated Volume (IV)
* 1n02	Pulses - Net Volume (GSV)
* 1n03	Pulses - Mass
* 1n04	Pulses - Net Standard Volume (NSV) S&W corrected GSV.
1n05	Meter Run Active Flag Flow pulses above threshold frequency.
1n06	Meter Being Proved Activates during proving of this meter.
1n07	Any Meter Run Specific Alarm This Meter Clears if acknowledged.
1n08	Batch End Acknowledge Toggle ON/OFF.
1n09	Auto Prove Problem Ten consecutive attempts to auto-prove have failed.
1n10	Batch Preset Reached Batch total equal or exceeds the batch preset.
1n11	Batch Preset Warning Flag Batch total is within 'X' volume or mass units of the batch preset ('X' is stored at 5n38).
	<i>* Info: The following 500mS pulse flag are treated as level for archive trigger.</i>
* 1n12	Batch End Acknowledge 500 msec pulse.
1n13	Calculation Alarm Usually temperature, pressure or density is outside of the range of the algorithm selected.
1n14	Override In Use - Density Pressure Override in use for any reason.
1n15	Auto Prove Flag Indicates that flowmeter 'n' will be automatically proved based on changes in flow rate or meter run time, etc. It is cleared if prove sequence is completed or prove is aborted.
1n16	Override In Use - Temperature
1n17	Override In Use - Pressure
1n18	Override In Use - Gravity/Density Transducer
	<i>Info: Transducer and flow rate alarms remain set while the alarm condition exists.</i>
1n19	
1n20	Flowrate – Low Low Alarm For point's 1n20-1n23 , flow rate units are either gross volume or mass units (depending on which unit is selected) for all products.
1n21	Flowrate - Low Alarm
1n22	Flowrate - High Alarm
1n23	Flowrate - High High Alarm

1n24	Meter Temperature - Transducer Failed Low Alarm
1n25	Meter Temperature - Low Alarm
1n26	Meter Temperature - High Alarm
1n27	Meter Temperature - Transducer Failed High Alarm
1n28	Meter Pressure - Transducer Failed Low Alarm
1n29	Meter Pressure - Low Alarm
1n30	Meter Pressure - High Alarm
1n31	Meter Pressure - Transducer Failed High Alarm
1n32	Gravity/Density - Transducer Failed Low Alarm
1n33	Gravity/Density - Low alarm
1n34	Gravity/Density - High Alarm
1n35	Gravity/Density - Transducer Failed High Alarm
1n36	Density Temperature - Transducer Failed Low Alarm
1n37	Density Temperature - Low Alarm
1n38	Density Temperature - High Alarm
1n39	Density Temperature - Transducer Failed High Alarm
1n40	Reserved
to	
1n43	Reserved
1n44	Density Pressure - Transducer Failed Low
1n45	Density Pressure - Low Alarm
1n46	Density Pressure - High Alarm
1n47	Density Pressure - Transducer Failed High
1n48	Turbine - Meter Comparator Alarm Only when dual pulse fidelity check enabled.
1n49	Turbine - Channel A Failed Total absence of pulses on Channel A.
1n50	Turbine - Channel B Failed Total absence of pulses on Channel B.
1n51	Turbine - Difference Detected Between A & B Channel Missing or added pulses.
1n52	Reserved
1n53	Reserved
1n54	Any Meter Run Specific Alarm This Meter Clears only if acknowledged and alarm condition is cleared.



*** Info:** The following 500mS pulse flags are treated as level for archive trigger.

-
- | | |
|---|--|
| * | 1n55 Meter Off-line Flag
Pulses for 500 msec when Meter Active (1n05) goes false. |
| | 1n56 Batch in Progress Flag
Set when flow occurs at start of batch. Reset at batch end command. |
| | 1n57 Batch Start Acknowledge
Pulses for 500 msec when 1727-1730 command is received. |
| | 1n58 Meter Not Active / Batch Suspended
True when batch is in progress but Meter Active (1n05) is false. |
| * | 1n59 Day End Flag (500ms) Meter 'n' (Revision 20, Reserved 24) |

2.3.4. Micro Motion™ Alarm Status Points

The following Micro Motion Alarm points can be accessed from the RFT via Modbus and placed in the 'Micro Motion Alarm Word' as the destination address **3n18** in the flow computer, to log the alarm points. The alarms will be logged into the computer alarm log and will be displayed on the LCD when they occur.



Micro Motion™: Data obtained via RS-485 link with Micro Motion Device

1n60	Micro Motion – EPROM Checksum Fail
1n61	Micro Motion - Transmitter Configuration Change Made
1n62	Micro Motion - Sensor Failure
1n63	Micro Motion - Temperature Sensor Failure
1n64	Micro Motion - Input Over-ranged
1n65	Micro Motion - Frequency Output Over-ranged
1n66	Micro Motion - Transmitter Not Configured
1n67	Micro Motion - Real Time Interrupt Failure
1n68	Micro Motion - mA Output Saturated
1n69	Micro Motion - mA Output Fixed
1n70	Micro Motion - Density Out of Limits
1n71	Micro Motion - Zeroing Operation Failure
1n72	Micro Motion - Transmitter Electronics Failure
1n73	Micro Motion - Slug Flow Detected
1n74	Micro Motion - Self-calibration In Progress
1n75	Micro Motion - Power Reset Occurred

2.3.5. More Meter Run Status and Alarm Points



Note : See **2n00** area for even more meter run alarms and status points.

1n76	Batch Re-calculation Acknowledge Flag Pulses for 500 msec when 1756 command received.
1n77	Correctable Totalizer Error Occurred Primary totalizer checksum error secondary totalizer checksum OK.
1n78	Non-correctable Totalizer Error Primary and secondary totalizers reset to zero because both checksums incorrect.
1n79	Meter # Day End Flag (500ms) (Revision 24, Reserved 20)
1n80	Reserved
1n81	Meter #1 Meter Factor Changed
1n82	Meter #1 Retroactive Adjustment Occurred
1n83	Reserved to
1n96	Reserved
1n97	Maintenance Mode - Meter Status (Revision 24, Reserved 20)
1n98	Meter #1 Batch End Flag – No Batch Stack Operation
1n99	Reserved
1500	Reserved

2.3.6. User Scratch Pad Boolean Points

There are two groups of user scratchpad flags which can be used to store the results of Boolean statements or to group data to be transmitted or received over a Modbus data link.

1501 Scratchpad - Point 01
to
1649 Scratchpad - Point 148

2.3.7. User Scratch Pad One-Shot Boolean Points

Many times it is necessary to send a command which momentarily turns on a Boolean point. The following one-shot Boolean points simplify this action. They remain activated for exactly 2 seconds after they have been written to.

1650 Scratchpad One-Shot - Point 01
to
1699 Scratchpad One-Shot - Point 50

2.3.8. Command Boolean Points/Variables



Info: Unless indicated as being 'Level Sensitive', most commands are leading 'edge triggered'.



Hardware Interaction : Unreliable operation will result if a command which has been assigned to a digital I/O point directly also needs to be activated via a Modbus write. This is because the On/Off state of the digital I/O point overwrites the command point every 100 msec and most command point actions are only triggered every 500 msec.



Info: Notice that all write commands have indexes / point addresses with a '7' in the 3rd digit from the right.

To activate a command simply write a '1' (1 = True) to that point. It is not necessary to write a '0' (0 = False) after the command. The status of a command may also be read or used as input in a Boolean or variable statement.

1700 Dummy

Used only to reserve a digital I/O point to be used as an input. Point **1700** can be assigned to as many Digital I/O points as needed.

1701 Prover Seal is OK

Must be true when sphere is between detectors.

1702 End Batch - Station

End batch on all meter runs defined in station.

1703 End Batch - Meter #1

1704 End Batch - Meter #2

1705 End Batch - Meter #3

1706 End Batch - Meter #4

1707 Station - 'Change Product' Strobe

Rising edge triggers batch end and change to product selected by **1743-1746**. Used with Station Product ID Bit 0-3 (**1820-1823**).

1708 Prove - Meter #1 Request

Edge triggered.

1709 Prove - Meter #2 Request

1710 Prove - Meter #3 Request

1711 Prove - Meter #4 Request

1712 Station Alarm Acknowledge

Acknowledges all alarms.

1713 Reset Power Failed Flag

See power fail Flag **1829**.

1714 Trial Prove - Meter #1 Request

Edge triggered.

1715 Trial Prove - Meter #2 Request

1716 Trial Prove - Meter #3 Request

1717 Trial Prove - Meter #4 Request

1718 Abort the Prove in Progress

1719 Request Local Snapshot Report

Printed on local printer connected to flow computer.

1720 Snapshot Report to Modbus Buffer

Move Snapshot Report to buffer located at **9402**.

1721 Alarm Report to Modbus Buffer

Move Alarm Report to buffer located at **9402**.



Note: These points are defaulted to 'active' and need not be manipulated unless the application requires it.

	Points 1722-1725 enable PID startup and shutdown ramping for the respective meter (see 1752-1755). Level sensitive.
# 1722	1st PID Permissive - Loop #1
# 1723	1st PID Permissive - Loop #2
# 1724	1st PID Permissive - Loop #3
# 1725	1st PID Permissive - Loop #4
# 1726	Prover Start Permissive Checked after temperature and flow are stable. Indicates that the meter divert valves are lined up. Enables prover sequencing when set.
1727	Start Ramp-up PID - Loop #1 Initiates PID start up sequence by activating 1 st and 2 nd PID Permissive (see 1n57 for acknowledge pulse). These commands are edge triggered, simply turn on.
1728	Start Ramp-up PID - Loop #2
1729	Start Ramp-up PID - Loop #3
1730	Start Ramp-up PID - Loop #4
1731	Compact Prover Piston Downstream Applies only to Brooks SVP, must be false before the piston can be re-launched.
	Points 1732-1735 are meter run specific alarms only.
1732	Alarm Acknowledge - Meter Run #1
1733	Alarm Acknowledge - Meter Run #2
1734	Alarm Acknowledge - Meter Run #3
1735	Alarm Acknowledge - Meter Run #4



*** Note:** These points also affect station totalizing (see also point **1761**).
Level sensitive

* 1736	Disable Flow Totalizing - Meter Run #1
* 1737	Disable Flow Totalizing - Meter Run #2
* 1738	Disable Flow Totalizing - Meter Run #3
* 1739	Disable Flow Totalizing - Meter Run #4
1740	Reserved
1741	Remote Up Arrow Key Duplicates the keypad function. Level sensitive.
1742	Remote Down Arrow Key Duplicates the keypad function. Level sensitive.
	Points 1743-1746 represent the product number to change to as offset binary; i.e., 0000 = product #1. 1111=product #16 (see 1707 , 1747-1750).
1743	Product Select - Bit 0
1744	Product Select - Bit 1
1745	Product Select - Bit 2
1746	Product Select - Bit 3
	For points 1747-1750, rising edge triggers a batch end and a change to the product specified by points 1743-1746.
1747	'Change Product' Strobe - Meter #1
1748	'Change Product' Strobe - Meter #2
1749	'Change Product' Strobe - Meter #3
1750	'Change Product' Strobe - Meter #4
1751	Freeze Analog Inputs Used when calibrating analog inputs. Freezes <u>ALL</u> analogs. Level sensitive.
1752	2nd PID Permissive - Meter #1

Points **1752-1755** limit the PID ramp-down to the minimum output % setting (see **1722-1725**). Level sensitive.

1753	2nd PID Permissive - Meter #2
1754	2nd PID Permissive - Meter #3
1755	2nd PID Permissive - Meter #4
1756	Reserved
to	
1759	Reserved
1760	Leak Detection Freeze Command Stores totalizers, temperatures, pressures and density variables to temporary storage (see 5n66 and 7634). This command is usually broadcast to all RTUs simultaneously.
1761	Disable Flow Totalizing Station This command has no effect in individual meter run totalizing (see also points 1736-1739). Level sensitive
1762	Remote Print - Previous Batch Report #1
to	At local printer.
1769	Remote Print - Previous Batch Report #8
1770	Remote Print - Previous Daily Report #1
to	At local printer.
1777	Remote Print - Previous Daily Report #8
1778	Remote Print - Previous Prove Report #1
to	At local printer.
1785	Remote Print - Previous Prove Report #8
1786	Remote Print - Alarm Report At local printer.



Info: More 'Command Boolean Points' are located at address 2701.

1787	Implement Last Prove Meter Factor Causes the meter factor determined at the last complete prove to be implemented and saved. Edge triggered.
1788	Shutdown PID - Loop #1 Points 1788-1791 start ramp-down to 'top off' valve setting by deactivating the 1 st PID permissive. These commands are edge triggered; simply turn on.
1789	Shutdown PID - Loop #2
1790	Shutdown PID - Loop #3
1791	Shutdown PID - Loop #4
1792	Stop Flow PID - Loop #1 Points 1792-1795 deactivate the 1 st and 2 nd PID permissive, causing the valve to ramp to the 'top off' setting, and then immediately closes the valve. If the valve is already at the 'top off' setting, the valve immediately closes.
1793	Stop Flow PID - Loop #2
1794	Stop Flow PID - Loop #3
1795	Stop Flow PID - Loop #4



Caution: Stored archive data may be lost! See chapter on 'Raw Data Archive' before manipulating these data points. These functions are duplicated using integers at **13920** and **13921**.

1796	Raw Data Archive 'Run' Level sensitive.
1797	Reconfigure Archive Level sensitive.
1798	Recalculate and Print Selected Batch - Station The previous batch selected by pointed 3879 is recalculated. Edge triggered.

1799 Reserved

1800 Reserved

2.3.9. Meter Station Alarm and Status Points

Data points not specifically connected to a particular meter run are grouped here. These include flow computer general system alarms and metering group alarms and status points.



* **Note:** These points are used to assign accumulators to the front panel electromechanical counters and digital I/O points.

* 1801	Positive - Gross Volume Pulses (IV)
* 1802	Positive - Net Volume Pulses (GSV)
* 1803	Positive - Mass Pulses
* 1804	Positive - S&W Corrected Net Volume Pulses (NSV)
* 1805	Negative - Gross Volume Pulses (IV) Points 1805-1808 refer to flow which occurs in the reverse direction.
* 1806	Negative - Net Volume Pulses (GSV)
* 1807	Negative - Mass Pulses
* 1808	Negative - S&W Corrected Net Volume Pulses (NSV)
1809	Flowrate - Low Low Alarm For points 1809-1812, flow rate units are gross volume or mass units (depending on which unit is selected) for all products.
1810	Flowrate - Low Alarm
1811	Flowrate - High Alarm
1812	Flowrate - High High Alarm
1813	Gravity Rate of Change Flag Set when rate of change of flowing SG exceeds the setting in 7889.
1814	Delayed Gravity Rate of Change Point 1813 delayed by volume specified in 7890.
1815	Any System Alarm Includes acknowledged alarms also.
1816	Any New System Alarm Does not include acknowledged alarms.
1817	Batch End Acknowledge Toggle state at batch end (see 1835).
1818	Batch Preset Warning Flag Station batch total is within 'X' volume or mass units of the batch preset ('X' is stored at 5815).
1819	Batch Preset Reached Flag Station batch total equal or exceeds the batch preset
1820	Station - Current Product ID Bit 0 Points 1820-1823 are the offset binary representation of the current running product for the station (0000=Product #1; 1111=Product #16).
1821	Station - Current Product ID Bit 1
1822	Station - Current Product ID Bit 2
1823	Station - Current Product ID Bit 3
1824	Run Switching - Threshold Flag 1 Flags 1824-1826 activate/deactivate depending on the run switching threshold settings and are based on current station flow rates.
1825	Run Switching - Threshold Flag 2
1826	Run Switching - Threshold Flag 3
1827	Leak Detection Freeze Command was received

See point 1760.



Note: These points pulse high for one 500 msec cycle time.

-
- | | |
|---------------|---|
| # 1828 | Day Start Flag
True at specified day start hour (e.g. 07:00:00). |
| 1829 | Power Fail Flag
True after power up (see 1713 for reset). |
| 1830 | Print Buffer Full Flag
Reports may be lost if 32K spooling buffer overflows due to the printer being 'off-line' or jammed with paper. |
| # 1831 | Hour Start Flag |
| # 1832 | Week Start Flag
True at specified 'day start' hour Monday. |
| # 1833 | Month Start Flag
True at specified 'day start' hour on 1st day of month. |
| # 1834 | Year Start Flag
True at specified 'day start' hour on 1st January. |
-



*** Note:** The following 500mS pulse flags are treated as level for archive trigger.

-
- | | |
|----------------|--|
| # *1835 | Batch End Acknowledge
Pulses at batch end (see 1817). |
| # *1836 | Snapshot Printed
Indicates snapshot report printed. |
| 1837 | EPROM error Flag
Invalid checksum detected in EPROM memory. |
| 1838 | Peer-to-Peer Master Flag
Momentarily true when this computer is peer-to-peer master. |
| *1839 | No stack operation
Station Batch End Flag. |
-



~ Note: The system limits the maximum number of statement evaluations to 100 to protect against possible lock-ups due to recursive loops. Any additional statement evaluations are ignored.

-
- | | |
|---------------|--|
| ~ 1840 | Boolean Statement Alarm
Tried to execute more than 100 Boolean statements. |
| ~ 1841 | Variable Statement Alarm
Tried to execute more than 100 variable statements. |

Points 1842-1857 refer to an error occurred while communicating with the slave in the appropriate transaction. If a slave is involved in multiple transactions which fail, only the first will be flagged.

- | | |
|-------------|---|
| 1842 | Peer-to-Peer - Transaction #1 - Communication Error |
| to | |
| 1857 | Peer-to-Peer - Transaction #16 - Communication Error |
-



Note: These points pulse high for one 500 msec. cycle time

-
- | | |
|---------------|---|
| # 1858 | Calendar Day Start Flag
Format: 00:00:00. |
| # 1859 | Calendar Week Start Flag
Format: 00:00:00 Monday. |
| # 1860 | Calendar Month Start Flag
Format: 00:00:00 1st day of month. |
| # 1861 | Calendar Year Start Flag
Format: 00:00:00 Jan 1 st . |
-

- 1862 Station Density - Transducer Failed Low
- 1863 Station Density - Low Alarm
- 1864 Station Density - High Alarm
- 1865 Station Density - Transducer Failed High-
- 1866 Density Temperature - Transducer Failed Low
to
- 1869 Density Temperature - Transducer Failed High
- 1870 Density Pressure - Transducer Failed Low
to
- 1873 Density Pressure - Transducer Failed High



* **Note:** These flags are usually used to conditionally print appropriate information messages on the batch and daily reports.

- * 1874 Viscosity Appearing on Report Flag
- * 1875 Net Standard Volumes (NSV) Appearing on Report Flag
- 1876 Batch Recalculation Acknowledge Flag
Pulses for 500 msec when the 1798 command is received.
- 1877 Day End Flag (500mS) (Revision 24, Reserved 20)



* **Note:** The following 500mS pulse flags are treated as level for archive trigger.

- 1878 Previous Batch - Station Alarm Flag
Set if any station alarm during the previous batch.
- * 1879 Previous Batch - Station Totalizer Roll-over Flag
Set if any station totalizer rolled during the previous batch.
- * 1880 Previous Daily - Station Totalizer Roll-over Flag
Set if any station totalizer rolled during the previous day.
- * 1881 Liter Units Selected Flag (Revision 24, Reserved 20)
Set when Liter is the selected volume unit.
- * 1882 Cubic Meter Units Selected Flag (Revision 24, Reserved 20)
Set when m³ is the selected volume unit.
- * 1882 Day End Flag (500ms) Station (Revision 20, Reserved 24)
- 1883 Auxiliary Input #1 - Transducer Failed Low
- 1884 Auxiliary Input #1 - Low Alarm
- 1885 Auxiliary Input #1 - High Alarm
- 1886 Auxiliary Input #1 - Transducer Failed High
- 1887 Auxiliary Input #2 - Transducer Failed Low
to
- 1890 Auxiliary Input #2 - Transducer Failed High
- 1891 Auxiliary Input #3 - Transducer Failed Low
to
- 1894 Auxiliary Input #3 - Transducer Failed High
- 1895 Auxiliary Input #4 - Transducer Failed Low
to
- 1898 Auxiliary Input #4 - Transducer Failed High



Note: See 2600 area and 2800 area for more station alarms and status points.

- 1899 Net Volume @ 2nd Reference Temperature Appears on Reports Flag
Set when 7699 is assigned a non-zero value. Prints on reports.
- 1900 Reserved

2.3.10. Prover Alarm and Status Points



Info: Boolean data is accessed using Modbus function codes 01 for reads, 05 for single point writes and 15 for multiple bit writes. Boolean data is packed 8 points to a byte when reading.

Alarm and Status points connected with the meter proving system are grouped here. The second digit '9' defines a prover. See the **1700** area for command points associated with the prover.

1901	Inlet (Left) Pressure - Transducer Low Alarm
1902	Inlet (Left) Pressure - Transducer High Alarm
1903	Outlet (Right) Pressure - Transducer Low Alarm
1904	Outlet (Right) Pressure - Transducer High Alarm
1905	Inlet (Left) Temperature - Transducer Low Alarm
1906	Inlet (Left) Temperature - Transducer High Alarm
1907	Outlet (Right) Temperature - Transducer Low Alarm
1908	Outlet (Right) Temperature - Transducer High Alarm



Note: These alarms are active until the next prove sequence is started.

# 1909	Prove Aborted - Temperature Unstable
# 1910	Prove Aborted - Meter-to-Prover Temperature Deviation Exceeded
# 1911	Prove Sequence - Successfully Completed
# 1912	Prove Sequence Aborted - Did Not Complete
1913	1st Detector Sensed - Sphere in Flight Forward Direction
1914	3rd Detector Sensed - Sphere in Flight Reverse Direction
1915	2nd Detector Sensed - In Over-travel Forward Direction
1916	4th Detector Sensed - In Over-travel Reverse Direction
1917	Launch Sphere - Forward Direction Two second pulse.
1918	Launch Sphere - Reverse Direction Two second pulse.
# 1919	Prove Aborted - Run Repeatability Deviation Limit Exceeded
# 1920	Prove Aborted - Prover Seal Not OK - Sphere Between Detectors See 1701.
# 1921	Prove Aborted - Flowrate was Unstable
# 1922	Prove Aborted - No Prover Permissive Received See 1726.
# 1923	Meter Factor Obtained was Not Implemented
# 1924	Prove Aborted - Meter Selected was not Flowing See 1n05.
1925	Plenum - Charge Required Points 1925 and 1926 refer to Brooks small volume provers only. Plenum pressure can be automatically adjusted by adding or venting nitrogen.
1926	Plenum - Vent Required
1927	Brooks Small Volume Prover - Run Command Output Active low output to launch piston.
1928	Prove Sequence - Successfully Completed Flag 500 msec pulse at end of prove.
1929	Using Fixed Override - Prover Inlet (Left) Temperature
1930	Using Fixed Override - Prover Outlet (Right) temperature

- 1931 Using Fixed Override - Prover Inlet (Left) Pressure
 1932 Using Fixed Override - Prover Outlet (Right) Pressure



* **Note:** These flags are used to cause data to be conditionally printed on the prover report.

- * 1933 Mass Prove Flag
- * 1934 Net Prove Flag
- * 1935 Mass Prove Report Flag
- * 1936 Net Prove Report Flag
- * 1937 Prover Inactivity – Prove Abort
- * 1938 Meter Factor Repeatability in Use Flag
Set when run deviation is based on meter factor.
- * 1939 Count Repeatability in Use Flag
Set when run deviation is based on meter counts.
- 1940 Prover Density - Transducer Failed Low Alarm
- 1941 Prover Density - Low Alarm
- 1942 Prover Density - High Alarm
- 1943 Prover Density - Transducer Failed High Alarm
- 1944 Prover Density Temperature - Transducer Failed Low Alarm
to
- 1947 Prover Density Temperature - Transducer Failed High Alarm
- 1948 Prover Density Pressure - Transducer Failed Low Alarm
to
- 1951 Prover Density Pressure - Transducer Failed High Alarm
- 1952 Print Density on Mass Prove Report Flag
- 1953 Print Cplp, Cplm on Volumetric Prove Report Flag
- 1954 Run Complete Flag (500ms) (see Points 18901-18918)
(added to Rev 20.74.30 & Rev 24.74.30)
- * 1955 Viscosity Linearization - Proving Mode Selected
- * 1956 Viscosity Linearization - Mode NOT Selected
- 1957 Print Abandoned 4th Run Flag (Revision 24, Reserved 20)
- 1958 Print Abandoned 3rd Run Flag (Revision 24, Reserved 20)
- * 1959 Prove Report - Print 4 Decimal Places for Correction Factors
- * 1960 Prove Report - Print 5 Decimal Places for Correction Factors
- * 1961 Prove Report - Print 6 Decimal Places for Correction Factors
- * 1962 Prove Report - Print 4 Decimal Places for Meter Factors
- * 1963 Prove Report - Print 5 Decimal Places for Meter Factors
- * 1964 Prove Report - Print 6 Decimal Places for Meter Factors



* **Note:** These flags are used to cause data to be conditionally printed on the prover report.

- * 1965 Prove Report - Print 5 Decimal Places for Intermediate Meter Factors
- * 1966 Prove Report - Print 6 Decimal Places for Intermediate Meter Factors
- * 1967 Prove Report - Print 7 Decimal Places for Intermediate Meter Factors
- 1967 Print Run #1 on Prove Report Flag (Revision 24, Reserved 20)
- 1968 Print Run #2 on Prove Report Flag (Revision 24, Reserved 20)

1969	Print Run #3 on Prove Report Flag <i>(Revision 24, Reserved 20)</i>
1970	Print Run #4 on Prove Report Flag <i>(Revision 24, Reserved 20)</i>
1971	Print Run #5 on Prove Report Flag <i>(Revision 24, Reserved 20)</i>
1972	Print Run #6 on Prove Report Flag <i>(Revision 24, Reserved 20)</i>
1973	Print Run #7 on Prove Report Flag <i>(Revision 24, Reserved 20)</i>
1974	Print Run #8 on Prove Report Flag <i>(Revision 24, Reserved 20)</i>
1975	Print Run #9 on Prove Report Flag <i>(Revision 24, Reserved 20)</i>
1976	Print Run #10 on Prove Report Flag <i>(Revision 24, Reserved 20)</i>
1977	Reserved
to	
1979	Reserved
1980	Inlet Pressure - Fail to Low
1981	Inlet Pressure - Low Alarm
1982	Inlet Pressure - High Alarm
1983	Inlet Pressure - Fail to High
1984	Outlet Pressure - Fail to Low
1985	Outlet Pressure - Low Alarm
1986	Outlet Pressure - High Alarm
1987	Outlet Pressure - Fail to High
1988	Inlet Temperature - Fail to Low
1989	Inlet Temperature - Low Alarm
1990	Inlet Temperature - High Alarm
1991	Inlet Temperature - Fail to High
1992	Outlet Temperature - Fail to Low
1993	Outlet Temperature - Low Alarm
1994	Outlet Temperature - High Alarm
1995	Outlet Temperature - Fail to High
1996	Reserved
to	
1999	Reserved
2n00	Reserved

2.3.11. Meter Totalizer Roll-over Flags

The following Boolean points are flags indicating that a totalizer has rolled-over (i.e., reached maximum count and restarted from zero). These flags are used to conditionally print characters (usually '**') in front of the totalizer which has rolled on the appropriate report. Examination of an OMNI 'Custom Report Template' will show how this is accomplished. The second digit of the index number defines the number of the meter run. See also points at **2801** for station versions of these flags.



Note: The 'In Progress' flags are those which the flow computer uses when printing the reports on the connected printer. Use the 'Previous' flags if the report is being printed by another device such as a SCADA or MMI. This is necessary because the flow computer clears the 'In Progress' data immediately after it prints the local report.

2n01	Batch In Progress - Gross (IV) Totalizer Rollover Flag
2n02	Batch In Progress - Net (GSV) Totalizer Rollover Flag
2n03	Batch In Progress - Mass Totalizer Rollover Flag
2n04	Batch In Progress - NSV Totalizer Rollover Flag
2n05	Batch In Progress - Cumulative - Gross (IV) Totalizer Rollover Flag
2n06	Batch In Progress - Cumulative - Net (GSV) Totalizer Rollover Flag
2n07	Batch In Progress - Cumulative - Mass Totalizer Rollover Flag
2n08	Batch In Progress - Cumulative - NSV Totalizer Rollover Flag
2n09	Daily In Progress - Gross (IV) Totalizer Rollover Flag
2n10	Daily In Progress - Net (GSV) Totalizer Rollover Flag
2n11	Daily In Progress - Mass Totalizer Rollover Flag
2n12	Daily In Progress - NSV Totalizer Rollover Flag
2n13	Daily In Progress - Cumulative - Gross (IV) Totalizer Rollover Flag
2n14	Daily In Progress - Cumulative - Net (GSV) Totalizer Rollover Flag
2n15	Daily In Progress - Cumulative - Mass Totalizer Rollover Flag
2n16	Daily In Progress - Cumulative - NSV Totalizer Rollover Flag
2n17	Previous Batch 'n' - Gross (IV) Totalizer Rollover Flag
2n18	Previous Batch 'n' - Net GSV) Totalizer Rollover Flag
2n19	Previous Batch 'n' - Mass Totalizer Rollover Flag
2n20	Previous Batch 'n' - NSV Totalizer Rollover Flag
2n21	Previous Batch 'n' - Cumulative - Gross (IV) Totalizer Rollover Flag
2n22	Previous Batch 'n' - Cumulative - Net (GSV) Totalizer Rollover Flag
2n23	Previous Batch 'n' - Cumulative - Mass Totalizer Rollover Flag
2n24	Previous Batch 'n' - Cumulative - NSV Totalizer Rollover Flag
2n25	Previous Daily - Gross (IV) Totalizer Rollover Flag
2n26	Previous Daily - Net (GSV) Totalizer Rollover Flag
2n27	Previous Daily - Mass Totalizer Rollover Flag
2n28	Previous Daily - NSV Totalizer Rollover Flag
2n29	Previous Daily - Cumulative - Gross (IV) Totalizer Rollover Flag
2n30	Previous Daily - Cumulative - Net (GSV) Totalizer Rollover Flag
2n31	Previous Daily - Cumulative - Mass Totalizer Rollover Flag
2n32	Previous Daily - Cumulative - NSV Totalizer Rollover Flag
2n33	Batch In Progress - 2 nd Net Totalizer Rollover Flag
2n34	Daily In Progress - 2 nd Net Totalizer Rollover Flag
2n35	Previous Batch 'n' - 2 nd Net Totalizer Rollover Flag
2n36	Previous Daily - 2 nd Net Totalizer Rollover Flag



Note: Notice that all write commands have indexes/ point addresses with a '7' in the 3rd digit from the right.

2n37	Meter 'n' - Product in Use - Binary Code Decimal Bit 0
2n38	Meter 'n' - Product in Use - Binary Code Decimal Bit 1
2n39	Meter 'n' - Product in Use - Binary Code Decimal Bit 2
2n40	Meter 'n' - Product in Use - Binary Code Decimal Bit 3
2n41	Meter 'n' - Non Ammonia Flag (Revision 20, Reserved 24)

2n42 **Meter 'n' – Ammonia Flag** (Revision 20, Reserved 24)



Note: See 1800 area and 2800 area for more station alarms and status points.

2n43 **Reserved**

to

2n89 **Reserved**

2n90 **Meter # NIST14 Vapor Flag.** (Revision 24, Reserved 20)

2n91 **Meter # NIST 14 Liquid Flag.** (Revision 24, Reserved 20)

2n92 **Meter #1 Gross Increment Exceed Limits**

2n93 **Meter #1 Net Increment Exceed Limits**

2n94 **Meter #1 Mass Increment Exceed Limits**

2n95 **Meter #1 NSV Increment Exceed Limits**

2196 **Reserved**

to

2199 **Reserved**

2500 **Reserved**

to

2600 **Reserved**



Info: To differentiate between normal message responses and unsolicited transmissions, Modbus function code 67 appears in the transmitted message rather than function code 03.

2.3.12. Miscellaneous Meter Station Alarm and Status Points

2601 **Auxiliary Input #1 - Override in Use**

to

2604 **Auxiliary Input #4 - Override in Use**

2605 **Inlet Temperature - Override in Use**

2606 **Outlet Temperature - Override in Use**

2607 **Inlet Pressure - Override in Use**

2608 **Outlet Pressure - Override in Use**

2609 **Switch Bar Temperature Override in Use Flag**

2610 **Switch Bar Temperature Fail Low**

2611 **Switch Bar Temperature Low Alarm**

2612 **Switch Bar Temperature High Alarm**

2613 **Switch Bar Temperature Fail High**

2614 **Reserved**

to

2619 **Reserved**

2620 **Calibration Data Checksum Error**

Correctable as secondary copy was OK.

2621 **System Initialized Flag**

True after power up or system reset, clears when reset power fail command is set (1713).

- 2622 Day Light Savings Time**
 'On' means that spring adjustment was made. 'Off' means autumn adjustment was made.
- 2623 Archive Memory Alarm**
 0 = Ok; 1 = Fail.



Info: The following Booleans (2624-2629) are only available with Revision 24 (French 24.XX Only) when the Trapail Function is turned on.

- 2624 Partial Status (0=Partial A, 1=Partial B)**
2625 Hydraulics Alarm Status (0=OK, 1=Alarm)
2626 Heavy Hydraulic Alarm Status (0=OK, 1=Alarm)
2627 Training Mode Status (0=Not in Progress, 1=Training in Progress)
2628 Training Mode Aborted Status (1=Last Training was Aborted)
2629 Training Mode Completed Status (1=Last Training was Completed)
- 2631 Serial #1 as Ethernet Port (0=No, 1=Yes)**
2632 Serial #2 as Ethernet Port (0=No, 1=Yes)
2633 Serial #3 as Ethernet Port (0=No, 1=Yes)
2634 Serial #4 as Ethernet Port (0=No, 1=Yes)
2635 Serial #5 as Ethernet Port (0=No, 1=Yes)
2636 Serial #6 as Ethernet Port (0=No, 1=Yes)
2637 SE-1 Ethernet Mode (0=VO, 1=V2)
2638 SE-2 Ethernet Mode (0=VO, 1=V2)
2639 SE-3 Ethernet Mode (0=VO, 1=V2)
2640 SE-1 Ethernet Printer #1 Error
2641 SE-1 Ethernet Printer #2 Error
2642 Reserved
 to
2645 Reserved
2646 SE-2 Ethernet Printer #1 Error
2647 SE-2 Ethernet Printer #2 Error
2648 Reserved
 to
2651 Reserved
2652 SE-3 Ethernet Printer #1 Error
2653 SE-3 Ethernet Printer #1 Error
2654 Reserved
 to
2657 Reserved
2658 SE-1 Ethernet Link Down
2659 SE-2 Ethernet Link Down
2660 SE-3 Ethernet Link Down
2661 Reserved
 to
2700 Reserved

2.3.13. Commands Which Cause Custom Data Packets to be Transmitted Without a Poll

Activating any of the 'edge triggered' command points below causes the appropriate 'Custom Data Packet' to be transmitted out of the selected serial

port without the serial port being polled for data. This function can be useful when communicating via VSAT satellite systems where operating cost is directly proportional to RF bandwidth used.

2701	Data Packet #1 to Serial Port #1
2702	Data Packet #2 to Serial Port #1
2703	Data Packet #3 to Serial Port #1
2704	Data Packet #1 to Serial Port #2
2705	Data Packet #2 to Serial Port #2
2706	Data Packet #3 to Serial Port #2
2707	Data Packet #1 to Serial Port #3
2708	Data Packet #2 to Serial Port #3
2709	Data Packet #3 to Serial Port #3
2710	Data Packet #1 to Serial Port #4
2711	Data Packet #2 to Serial Port #4
2712	Data Packet #3 to Serial Port #4

2.3.14. Commands Needed To Accomplish a Redundant Flow Computer System

Accomplishing a redundant flow computer system requires two identically configured flow computers to share input and output signals. In addition four digital I/O points are cross connected to enable each flow computer to monitor the other.

2713	Other - Watchdog Status Assigned to a digital I/O point monitoring other flow computers watchdog (see 2863).
2714	Other - Master Status Assigned to a digital I/O point monitoring other flow computers master status (see 2864).
2715	Assume Master Status Command Set to take mastership. Edge triggered.
2716	Assume Slave Status Command Set to relinquish mastership. Edge triggered.
2717	Toggle Partial (TRAPIL) (<i>Revision 24, Reserved 20</i>)
2718	RAZ Command (TRAPIL) (<i>Revision 24, Reserved 20</i>)
2719	Start Training Command (TRAPIL) (<i>Revision 24, Reserved 20</i>)
2720	Abort Training Command (TRAPIL) (<i>Revision 24, Reserved 20</i>)
2721	Reserved
	to
2736	Reserved
2737	Meter #1 - Toggle Maintenance Mode (<i>Revision 24, Reserved 20</i>)
2738	Meter #2 - Toggle Maintenance Mode (<i>Revision 24, Reserved 20</i>)
2739	Meter #3 - Toggle Maintenance Mode (<i>Revision 24, Reserved 20</i>)
2740	Meter #4 - Toggle Maintenance Mode (<i>Revision 24, Reserved 20</i>)
2741	Force Day End Meter #1
2742	Force Day End Meter #2
2743	Force Day End Meter #3
2744	Force Day End Meter #4
2745	Force Day End Station
2746	Remote Print Audit Report
2747	Reserved
	to
2750	Reserved
2751	End Batch Meter #1 No Batch Stack Operation
2752	End Batch Meter #2 No Batch Stack Operation
2753	End Batch Meter #3 No Batch Stack Operation
2754	End Batch Meter #4 No Batch Stack Operation
2755	End Batch Station - No Stack Operation

2.3.15. Commands to Recalculate and Print Selected Batch

- 2756 Recalculate and Print Selected Batch - Meter #1**
When one of the commands **2756-2759** is given, the previous batch selected by **3n51** is recalculated. Edge triggered.
- 2757 Recalculate and Print Selected Batch - Meter #2**
- 2758 Recalculate and Print Selected Batch - Meter #3**
- 2759 Recalculate and Print Selected Batch - Meter #4**

2.3.16. Commands to Send Reports/Alarms thru the Ethernet ports

- 2760 Serial #1 has Ethernet Printers (0=No, 1=Yes)**
- 2761 Reserved**
- 2762 Serial #2 has Ethernet Printers (0=No,1=Yes)**
- 2763 Reserved**
- 2764 Serial #3 has Ethernet Printers (0=No,1=Yes)**
- 2765 Reserved**
- 2766 Serial #4 has Ethernet Printers (0=No,1=Yes)**
- 2767 Reserved**
- 2768 Serial #5 has Ethernet Printers (0=No,1=Yes)**
- 2769 Reserved**
- 2770 Serial #6 has Ethernet printers (0=No,1=Yes)**
- 2771 Reserved**
- to**
- 2774 Reserved**
-
- 2775 SE-1 Ethernet Set Configuration Status Command**
- 2776 SE-2 Ethernet Set Configuration Status Command**
- 2777 SE-3 Ethernet Set Configuration Status Command**
-
- 2778 Reserved**
- to**
- 2799 Reserved**



Info: Remember that the station is defined as a group of individual meter runs.

2.3.17. Station Totalizer Roll-over Flags



Info: Boolean data is accessed using Modbus function codes 01 for reads, 05 for single point writes and 15 for multiple bit writes. Boolean data is packed 8 points to a byte when reading.

The following Boolean points are flags indicating that a totalizer has rolled-over (i.e. reached maximum count and restarted from zero). These flags are used to conditionally print characters (usually ‘**’) in front of the totalizer which has rolled over on the appropriate report. Examination of an OMNI ‘Custom Report Template’ will show how this is accomplished. See also points at **2n01** for meter run versions of flags.

2801	Batch In Progress - Gross (IV) Totalizer Rollover Flag
2802	Batch In Progress - Net (GSV) Totalizer Rollover Flag
2803	Batch In Progress - Mass Totalizer Rollover Flag
2804	Batch In Progress - NSV Totalizer Rollover Flag
2805	Batch In Progress - Cumulative - Gross (IV) Totalizer Rollover Flag
2806	Batch In Progress - Cumulative - Net (GSV) Totalizer Rollover Flag
2807	Batch In Progress - Cumulative - Mass Totalizer Rollover Flag
2808	Batch In Progress - Cumulative - NSV Totalizer Rollover Flag
2809	Daily In Progress - Gross (IV) Totalizer Rollover Flag
2810	Daily In Progress - Net (GSV) Totalizer Rollover Flag
2811	Daily In Progress - Mass Totalizer Rollover Flag
2812	Daily In Progress - NSV Totalizer Rollover Flag
2813	Daily In Progress - Cumulative - Gross (IV) Totalizer Rollover Flag
2814	Daily In Progress - Cumulative - Net (GSV) Totalizer Rollover Flag
2815	Daily In Progress - Cumulative - Mass Totalizer Rollover Flag
2816	Daily In Progress - Cumulative - NSV Totalizer Rollover Flag
2817	Previous Batch ‘n’ - Gross (IV) Totalizer Rollover Flag
2818	Previous Batch ‘n’ - Net (GSV) Totalizer Rollover Flag
2819	Previous Batch ‘n’ - Mass Totalizer Rollover Flag
2820	Previous Batch ‘n’ - NSV Totalizer Rollover Flag
2821	Previous - Cumulative - Gross (IV) Totalizer Rollover Flag
2822	Previous - Cumulative - Net (GSV) Totalizer Rollover Flag
2823	Previous - Cumulative - Mass Totalizer Rollover Flag
2824	Previous - Cumulative - NSV Totalizer Rollover Flag
2825	Previous Daily - Gross (IV) Totalizer Rollover Flag
2826	Previous Daily - Net (GSV) Totalizer Rollover Flag
2827	Previous Daily - Mass Totalizer Rollover Flag
2828	Previous Daily - NSV Totalizer Rollover Flag
2829	Previous Daily - Cumulative - Gross (IV) Totalizer Rollover Flag
2830	Previous Daily - Cumulative - Net (GSV) Totalizer Rollover Flag
2831	Previous Daily - Cumulative - Mass Totalizer Rollover Flag
2832	Previous Daily - Cumulative - NSV Totalizer Rollover Flag
2833	Batch In Progress - 2 nd Ref. Temperature - Net Total Rollover Flag
2834	Daily In Progress - 2 nd Ref. Temperature - Net Total Rollover Flag

2835	Previous Batch 'n' - 2 nd Ref. Temperature - Net Total Rollover Flag
2836	Previous Daily - 2 nd Ref. Temperature - Net Total Rollover Flag
2837	Reserved
to	
2839	Reserved
2840	Flash Jumper enabled on 68-6201 CPU
2841	Reserved
to	
2848	Reserved
2849	Pressure Units Selected in kPa (<i>Revision 24, Reserved 20</i>)
2850	Pressure Units Selected in Bar (<i>Revision 24, Reserved 20</i>)
2851	Pressure Units Selected in kg/cm ² (<i>Revision 24, Reserved 20</i>)

2.3.18. Station Totalizer Decimal Resolution Flags

All totalizers within the flow computer are 'long integer types'. This data type uses an 'implied' decimal position. The computer uses these flags internally to determine how to format all totalizers of the same type for printing purposes.

2852	Batch Report - Print 4 Decimal Places for Correction Factors
2853	Batch Report - Print 5 Decimal Places for Correction Factors
2854	Batch Report - Print 6 Decimal Places for Correction Factors
2855	Batch Report - Print 4 Decimal Places for Meter Factors
2856	Batch Report - Print 5 Decimal Places for Meter Factors
2857	Batch Report - Print 6 Decimal Places for Meter Factors
2858	Print 0 Decimal Place for Gross & Net Totalizer
2859	Print 1 Decimal Place for Gross & Net Totalizer
2860	Print 2 Decimal Places for Gross & Net Totalizer
2861	Print 3 Decimal Places for Gross & Net Totalizer
2862	Reserved

2.3.19. Status Booleans Relating to Redundant Flow Computer Systems

2863	Watchdog Status Out Normally High Watchdog. Monitored by other flow computer in a redundant system (see 2713).
2864	Master Status Indicates mastership. Monitored by other flow computer in a redundant system (see 2714).
2865	Print 0 Decimal Place for Mass Totalizer
2866	Print 1 Decimal Place for Mass Totalizer
2867	Print 2 Decimal Places for Mass Totalizer
2868	Print 3 Decimal Places for Mass Totalizer
2869	Print NIST14 Components on Snapshot and Daily Report Flag. (<i>Revision 24, Reserved 20</i>)
2870	Print NIST14 Components on Batch Report Flag. (<i>Revision 24, Reserved 20</i>)
2871	Reserved
to	
3000	Reserved

Chapter 3

16-Bit Integer Data (3001 - 3999)

3.1. Custom Data Packet Definition Variables



Info: These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple point writes.

3.1.1. Custom Data Packet #1

The 16-bit integers needed to define the 20 groups of data that make up **Custom Data Packet #1** which is accessed at database Index **0001** are listed below.

3001	Group 1 - Starting Index Point Number
3002	Group 1 - Number of Index Points
to	
3039	Group 20 - Starting Index Point Number
3040	Group 20 - Number of Index Points

3.1.2. Custom Data Packet #2

The 16-bit integers needed to define the 8 groups of data that make up **Custom Data Packet #2** which is accessed at database Index **0201** are listed below.

3041	Group 1 - Starting Index Point Number
3042	Group 1 - Number of Index Points
to	
3055	Group 8 - Starting Index Point Number
3056	Group 8 - Number of Index Points

3.1.3. Custom Data Packet #3

The 16-bit integers needed to define the 20 groups of data that make up **Custom Data Packet #3** which is accessed at database Index **0401** are listed below.

3057	Group 1 - Starting Index Point Number
3058	Group 1 - Number of Index Points
to	
3095	Group 20 - Starting Index Point Number
3096	Group 20 - Number of Index Points

3.2. Miscellaneous 16-Bit Integer Data

- 3097 Select Units** (*Revision 24, Reserved 20*)
0=m3; 1=Liter.
- 3097 Alarm Timer** (*Revision 20, Reserved 24*)
1-127 Seconds for delaying the alarm to be logged onto the alarm log
- 3098 Number of Totalizer Digits**
Totalizers roll at: 0=9 digits; 1=8 digits.
- 3099 Select Batch Preset Unit**
0=Net; 1= Gross; 2=Mass.

3.3. Meter Run 16-Bit Integer Data

The second digit of the index number defines the number of the meter run. For example: **3106** is the 'Meter Active Frequency' for Meter Run # 1. The same point for Meter Run # 4 would be **3406**.

- 3n00 Reserved**
- 3n01 Override Code - Temperature**
For points **3n01-3n05**: 0=Never use; 1=Always use; 2=Use if transmitter fails; 3=If transmitter fails use last hours average.
- 3n02 Override Code - Pressure**
- 3n03 Override Code - Gravity/Density**
- 3n04 Override Code - Density Temperature**
- 3n05 Override Code - Density Pressure**
- 3n06 Active Threshold Hz**
Point **1n05** is set when flow pulses exceed this frequency.
- 3n07 Prover Volume Select**
Brooks SVP: 0=Use downstream; 1=Use upstream.
- 3n08 Auto Prove Enable**
0=No auto-prove; 1=Enable auto-prove.
- 3n09 Use Live Density (0=No, 1=Yes)** (*Revision 24, Reserved 20*)
- 3n10 Viscosity Linearized Gross (IV) Volume**
0=No; 1=Apply Liquid Correction Factor (LCF).
- 3n11 Reserved**
- 3n12 Reserved**
- 3n13 Meter Factor Used in Net and Mass**
0=No; 1=Yes.
- 3n14 Is Meter Already Temperature Compensated?**
0=No; 1=Yes.
- 3n15 Viscosity Correction Polynomial**
0=Positive Displacement Meter; 1=Helical Turbine Meter.
- 3n16 BS&W Source**
0=None; 1=Auxiliary #1; 2=Auxiliary #2; 3=Auxiliary #3; 4=Auxiliary #4; 5=Modbus.
- 3n17 Viscosity Source**
0=None; 1=Auxiliary #1; 2=Auxiliary #2; 3=Auxiliary #3; 4=Auxiliary #4; 5=Modbus.
- 3n18 Micro Motion - Alarm Word**
Via RS-485 from device (see also **1n60 -1n75**).
- 3n19 PID Control Mode**
Do not write if **3n20** is '1'. 1=Manual; 0=Auto.
- 3n20 Setpoint Mode**
1=Local; 0=Remote.
- 3n21 PID Loop Status**

Read only. 1=Secondary; 0=Primary.

3n22	Frequency Point - K Factor #1 For points 3n22-3n33, see the 17500 area for matching K-Factors.
3n23	Frequency Point - K Factor #2
3n24	Frequency Point - K Factor #3
3n25	Frequency Point - K Factor #4
3n26	Frequency Point - K Factor #5
3n27	Frequency Point - K Factor #6
3n28	Frequency Point - K Factor #7
3n29	Frequency Point - K Factor #8
3n30	Frequency Point - K Factor #9
3n31	Frequency Point - K Factor #10
3n32	Frequency Point - K Factor #11
3n33	Frequency Point - K Factor #12
3n34	Comparator Error Threshold When 'dual pulse' error checking enabled only.
3n35	Reserved
to	
3n39	Reserved



Notes: 2s complement numbers based on span entries 17176 through 17189. Values are expressed as percentages of span in tenth percent increments; i.e., 1000 represents 100.0%



*** Notes:** Unsigned integer totalizers cumulative based. They roll at 65536.



~ Notes: 2s complement numbers based on the 4-20mA spans. Values are expressed as percentages of span in tenth percent increments; i.e., 1000 represents 100.0%

#	3n40	Current Net (GSV) Flowrate
*	3n41	Net (GSV) Totalizer
#	3n42	Current Gross (IV) Flowrate
*	3n43	Gross (IV) Total
#	3n44	Current Mass Flowrate
*	3n45	Mass Total
~	3n46	Current Meter Run Pressure
~	3n47	Current Meter Run Temperature
~	3n48	Current Transducer Density/Gravity
#	3n49	Current S&W Corrected Net (NSV) Flowrate
*	3n50	S&W Corrected Net (NSV) Total
	3n51	Move Previous Batch Number to Print Area
	3n52	Number of Calculation Times of Batch Report
	3n53	Reserved
	to	
	3n99	Reserved

3.4. Scratchpad 16-Bit Integer Data

Ninety-nine integer points are provided for user scratch pad. These points are typically used to store and group data that will be moved via peer-to-peer operations or similar operations.

3501 Scratchpad - Short Integer #1
to
3599 Scratchpad - Short Integer #99

3.5. User Display Definition Variables

The 16-bit integers needed to define the variables that appear in the eight User Displays are listed below. Look in the **4601** area for string associated with setting up User Displays.

3.5.1. User Display Number 1

3601 Database Index Number of 1st Variable
3602 Decimal Places for 1st Variable
3603 Database Index Number of 2nd Variable
3604 Decimal Places for 2nd Variable
3605 Database Index Number of 3rd Variable
3606 Decimal Places for 3rd Variable
3607 Database Index Number of 4th Variable
3608 Decimal Places for 4th Variable

3.5.2. User Display Number 2

3609 Database Index Number of 1st Variable
to
3616 Decimal Places for 4th Variable

3.5.3. User Display Number 3

3617 Database Index Number of 1st Variable
to
3624 Decimal Places for 4th Variable

3.5.4. User Display Number 4

3625 Database Index Number of 1st Variable
to
3632 Decimal Places for 4th Variable

3.5.5. User Display Number 5

3633 Database Index Number of 1st Variable
to
3640 Decimal Places for 4th Variable

3.5.6. User Display Number 6

3641 Database Index Number of 1st Variable
to
3648 Decimal Places for 4th Variable

3.5.7. User Display Number 7

3649 Database Index Number of 1st Variable
to
3656 Decimal Places for 4th Variable

3.5.8. User Display Number 8

3657 Database Index Number of 1st Variable
to
3664 Decimal Places for 4th Variable
3665 Reserved
to
3670 Reserved

The following variables 3671 – 3696 are only available with Revision 24 and the Trapil Function turned on

3671 Alarm Point LSB =B0 (Trapil)

Exclusively for French Version Revision 24 Only (see Bit Layout below).

B0	Station Gross Flowrate Low Limit Alarm
B1	Station Gross Flowrate High Limit Alarm
B2	Trapil Flowmeter 1 Comparator Alarm
B3	Trapil Flowmeter 2 Comparator Alarm
B4	Hydraulic Alarm
B5	Heavy Hydraulic Alarm
B6	Active Partial 0=A,1=B
B7	EPROM Error Detected (1837)
B8	Calibration Data Checksum Error (2620)
B9	System Initialized Flag (2621)
B10	**Watchdog Status written at Command Point B5
B11	Training in Progress Flag
B12	Training Complete Flag
B13	Training Aborted Flag

3672 Command Point -LSB=B0 (Trapil)

B0	Toggle Partial
B1	RAZ (Reset inactive partial)
B2	Start Training Function
B3	Abort Training Function
B4	Reset system Initialize Flag 1713
B5	Watchdog Write

3673	Number of Hydraulics Alarms
3674	Current Sample Delta
3675	Partial A Counter (High Word)
3676	Partial A Counter (Low Word)
3677	Partial B Counter (High Word)
3678	Partial B Counter (Low Word)
3679	Meter #1 Cumulative Total (High Word)
3680	Meter #1 Cumulative Total (Low Word)
3681	Meter #2 Cumulative Total (High Word)
3682	Meter #2 Cumulative Total (Low Word)
3683	Meter #1+2 Cumulative Total (High Word)
3684	Meter #1+2 Cumulative Total (Low Word)
3685	Meter #1 Flowrate
3686	Meter #2 Flowrate
3687	Meter #1+2 Flowrate
3688	Training Sample Delta Average
3689	Training Sample Delta Standard Deviation
3690	Recommended Threshold 'S'
3691	Training Interval Countdown Seconds
3692	Current Training Sample Completed
3693	Meter #1 Electronic Alarms (High Word)
3694	Meter #2 Electronic Alarms (Low Word)
3695	Meter #3 Electronic Alarms (High Word)
3696	Meter #4 Electronic Alarms (Low Word)
3697	Reserved
to	
3699	Reserved

3.6. Archive Records

See the chapter describing how to use the raw data archiving features of the flow computer including how to manipulate the 'pointers' below.

3701	Archive 701 - Maximum Records Number of data records in archive file.
3702	Archive 701 - Current Record Number Number of the last record updated.
3703	Archive 701 - Request Record Number Write the number of the record you wish to read.
3704	Archive 702 - Maximum Records Number of data records in archive file.
3705	Archive 702 - Current Record Number Number of the last record updated.
3706	Archive 702 - Request Record Number Write the number of the record you wish to read.
3707	Archive 703 - Maximum Records Number of data records in archive file.
3708	Archive 703 - Current Record Number Number of the last record updated.
3709	Archive 703 - Request Record Number Write the number of the record you wish to read.
3710	Archive 704 - Maximum Records Number of data records in archive file.
3711	Archive 704 - Current Record Number Number of the last record updated.
3712	Archive 704 - Request Record Number Write the number of the record you wish to read.
3713	Archive 705 - Maximum Records Number of data records in archive file.
3714	Archive 705 - Current Record Number Number of the last record updated.
3715	Archive 705 - Request Record Number Write the number of the record you wish to read.
3716	Archive 706 - Maximum Records Number of data records in archive file.
3717	Archive 706 - Current Record Number Number of the last record updated.
3718	Archive 706 - Request Record Number Write the number of the record you wish to read.
3719	Archive 707 - Maximum Records Number of data records in archive file.
3720	Archive 707 - Current Record Number Number of the last record updated.
3721	Archive 707 - Request Record Number Write the number of the record you wish to read.
3722	Archive 708 - Maximum Records Number of data records in archive file.
3723	Archive 708 - Current Record Number Number of the last record updated.
3724	Archive 708 - Request Record Number Write the number of the record you wish to read.
3725	Archive 709 - Maximum Records Number of data records in archive file.
3726	Archive 709 - Current Record Number Number of the last record updated.

- 3727 Archive 709 - Request Record Number**
Write the number of the record you wish to read.
- 3728 Archive 710 - Maximum Records**
Number of data records in archive file.
- 3729 Archive 710 - Current Record Number**
Number of the last record updated.
- 3730 Archive 710 - Request Record Number**
Write the number of the record you wish to read.
- 3731 Archive 711 - Maximum Records**
Number of data records in archive file.
- 3732 Archive 711 - Current Record Number**
Number of the last record updated.
- 3733 Archive 711 - Request Record Number**
Write the number of the record you wish to read.
- 3734 Archive 712 - Maximum Records**
Number of data records in archive file.
- 3735 Archive 712 - Current Record Number**
Number of the last record updated.
- 3736 Archive 712 - Request Record Number**
Write the number of the record you wish to read.

3.7. More Miscellaneous 16-Bit Integer Data

3737	Archive File System - Memory Allocation Status 0=OK; 1=Allocation Error.
3738	Time Tag MM/DD or DD/MM format.
3739	Time Tag YY/HH format
3740	Time Tag MM/SS format.
3741	New Archive Bit 0-Bit 9 for files 701-710
3742	Reserved
to	
3744	Reserved
3745	Batch End – No Batch Stack Operation (0=No,1=Yes)
3746	Starting Index of Displayed Database Points
3747	Use default Snapshot report template (0=No, 1=Yes)
3748	Use default Batch report template (0=No, 1=Yes)
3749	Use default Daily report template (0=No, 1=Yes)
3750	Use default snapshot report template (0=No, 1=Yes)
3751	Reserved
to	
3768	Reserved
3769	Number of Historical Alarms to Send to Modbus Buffer The number of historical alarms indicated are written to the Modbus buffer (9402)
3770	Reserved
to	
3780	Reserved

The following points 3781 Product #1 thru 3796 Product #16 will either refer to Observed Density or Pressure Correction selected on each product. Not both selections.

3781	Product #1 Observed Density in Use (0=No, 1=Yes) API 11.01 2004. Observed Density selection is required when Product table is: Table 28 = API 11.1 Crude Oil. Table 29 = API 11.01 Refined Products, Table 30 = API 11.01 Lubricating Oil, Table 31 = API 11.01 Specialized Liquid.
to	
3796	Product #16 observed Density in Use (0=No, 1=Yes)
or	
3781	Product #1 Use API 11.1 Pressure Correction (Y/N)
to	
3796	Product #16 Use API 11.1 Pressure Correction (Y/N)
3797	Reserved
to	
3799	Reserved

3.8. Meter Station 16-Bit Integer Data

~ 3800	Special Diagnostic Function
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Used to enable rigorous 'Audit Trail' reporting of all serial port transactions.



~ **Note:** To avoid flushing the audit trail, audit events other than complete 'downloads' to the flow computer are usually not documented in the 'audit trail' unless serial port passwords have been enabled. Rigorous auditing of a serial port or group of serial ports can be activated by placing the appropriate hexadecimal code in **3800** (S = Serial Port): *00 0A = Audit S1 (Dec = 10), 00 A0 = Audit S2 (Dec = 160), 0A 00 = Audit S3 (Dec = 2560), A0 00 = Audit S4 (Dec = 40960), 00 05 = Audit S5 (Dec=5), 00 50 = Audit S6 (Dec = 80).* To monitor multiple ports; e.g. *Audit S2 (Dec = 160) + S4 (Dec = 40960) = Total for both ports: 00 A0 A0 00 (Dec = 41120).* See Technical Bulletin TB-981101.



Note: 2s complement numbers based on span entries 17176 through 17189. Values are expressed as percentages of span in tenth percent increments; i.e., 1000 equals 100.0%. No over range or under range checking is done.



* **Note:** Unsigned integer totalizers are cumulative based. They roll at 65536.

3801	Running Product Number Common Batch Stack - Station.
# 3802	Current Net (GSV) Flowrate
* 3803	Net (GSV) Totalizer
# 3804	Current Gross (IV)Flowrate
* 3805	Gross (IV) Totalizer
# 3806	Current Mass Flowrate
* 3807	Mass Totalizer
# 3808	Current Density Pressure
# 3809	Current Density Temperature
# 3810	Current Gravity/Density
3811	Allen Bradley - CRC Error Counter
3812	Allen Bradley - Message 'Type' Error Counter
3813	Algorithm Select - Product #1 Points 3813-3828 select the API, ASTM, NIST calculations that will be used when selecting these products.
3814	Algorithm Select - Product #2
3815	Algorithm Select - Product #3
3816	Algorithm Select - Product #4
3817	Algorithm Select - Product #5
3818	Algorithm Select - Product #6
3819	Algorithm Select - Product #7
3820	Algorithm Select - Product #8
3821	Algorithm Select - Product #9
3822	Algorithm Select - Product #10
3823	Algorithm Select - Product #11
3824	Algorithm Select - Product #12
3825	Algorithm Select - Product #13
3826	Algorithm Select - Product #14
3827	Algorithm Select - Product #15
3828	Algorithm Select - Product #16
3829	Flow Average Factor Number of 500 msec calculation cycles to average.
3830	Print Priority 0=Not sharing a printer; 1=Master; n=slaves 2-12.

3831	Number of Nulls After CR Used to slow data to a printer if no hardware handshake.
3832	Print Interval in Minutes Time interval between automatic snapshot reports.
3833	Automatic - Weekly Batch Select 0=None; 1=Monday; 7=Sunday.
3834	Automatic - Monthly Batch Select 0=None; 1=1 st day of the month.
3835	Automatic - Hourly Batch Select 0=No; 1=Yes.
3836	Default Report Template (Y/N) 0=Custom templates; 1=Default Report.
3837	Batch Stack Mode Select 0=Independent stacks; 1=Common stack.
3838	Clear Daily @ Batch End Select 0=24hr Totals; 1=Cleared at batch end.
3839	Trapil Function (Y/N) (<i>Revision 24, Reserved 20</i>)
3840	Dual Pulse Fidelity Delay Cycle
3841	Trapil Consecutive Heavy Count 'n' (<i>Revision 24, Reserved 20</i>)
3842	Select Date Type Selects date format: 0=dd/mm/yy; 1=mm/dd/yy.

3.9. Batch Stack Storage of Product Numbers to Run

The following 24 points are treated as either one 24-position shift stack or, 4 separate 6-position shift stacks depending upon point **3837**. ***Data in the stack(s) is shifted automatically at the beginning of a new batch.*** A new batch starts after either a 'station batch end' (**1702**) or a 'meter batch end' (**1703** to **1706**) command is received **and** meter pulses occur. Data on the top of a stack is the 'current running product' for the batch in progress. This entry is discarded (popped off) and replaced with the entry below on receipt of a 'batch end'. A 'batch stack' may be stopped from shifting by leaving the second entry '0'. Note that these entries are only part of the 'batch stack'. Matching entries for other data types such as long integers and strings can be found at **5819** and **4852**. All three 'data type' stacks act as a single unit, they all synchronize and shift together.

3.9.1. Meter #1 Batch Sequence

- 3843 Sequence #1 - Individual Batch Stack or Common Batch Stack - Sequence #1
- 3844 Sequence #2 - Individual Batch Stack or Common Batch Stack - Sequence #2
- 3845 Sequence #3 - Individual Batch Stack or Common Batch Stack - Sequence #3
- 3846 Sequence #4 - Individual Batch Stack or Common Batch Stack - Sequence #4
- 3847 Sequence #5 - Individual Batch Stack or Common Batch Stack - Sequence #5
- 3848 Sequence #6 - Individual Batch Stack or Common Batch Stack - Sequence #6

3.9.2. Meter #2 Batch Sequence

- 3849 Sequence #1 - Individual Batch Stack or Common Batch Stack - Sequence #7
- 3850 Sequence #2 - Individual Batch Stack or Common Batch Stack - Sequence #8
- 3851 Sequence #3 - Individual Batch Stack or Common Batch Stack - Sequence #9
- 3852 Sequence #4 - Individual Batch Stack or Common Batch Stack - Sequence #10
- 3853 Sequence #5 - Individual Batch Stack or Common Batch Stack - Sequence #11
- 3854 Sequence #6 - Individual Batch Stack or Common Batch Stack - Sequence #12

3.9.3. Meter #3 Batch Sequence

3855	Sequence #1 - Individual Batch Stack or Common Batch Stack - Sequence #13
3856	Sequence #2 - Individual Batch Stack or Common Batch Stack - Sequence #14
3857	Sequence #3 - Individual Batch Stack or Common Batch Stack - Sequence #15
3858	Sequence #4 - Individual Batch Stack or Common Batch Stack - Sequence #16
3859	Sequence #5 - Individual Batch Stack or Common Batch Stack - Sequence #17
3860	Sequence #6 - Individual Batch Stack or Common Batch Stack - Sequence #18

3.9.4. Meter #4 Batch Sequence

3861	Sequence #1 - Individual Batch Stack or Common Batch Stack - Sequence #19
3862	Sequence #2 - Individual Batch Stack or Common Batch Stack - Product #20
3863	Sequence #3 - Individual Batch Stack or Common Batch Stack - Sequence #21
3864	Sequence #4 - Individual Batch Stack or Common Batch Stack - Sequence #22
3865	Sequence #5 - Individual Batch Stack or Common Batch Stack - Sequence #23
3866	Sequence #6 - Individual Batch Stack or Common Batch Stack - Sequence #24

3.10. Flow Computer Time and Date Variables

Time and date can be read and written here. See also **4847** and **4848**.

3867	Current - Hour 0-23.
3868	Current - Minute 0-59.
3869	Current - Second 0-59.
3870	Current - Month 1-12.
3871	Current - Day of Month 1-31.
3872	Current - Year 0-99; Year 2000=00.
3873	Current - Day of Week Read only. 1=Monday; 7=Sunday.
3874	Disable Daily Report 0=print daily report; 1=no daily report.

3.11. More Miscellaneous 16-Bit Integer Data

3875	Julian Day. <i>(Read Only)</i>
3876	Override Code – Station Density
3877	Override Code – Station Density Temperature
3878	Override Code – Station Density Pressure
3879	Station Move Previous 'n' Batch to Print Area
3880	Density Factor - Select A/B - Product #1 to
3895	Density Factor - Select A/B - Product #16
3896	Trapil – Sample Interval <i>(Revision 24, Reserved 20)</i>
3897	Alarm Timer (0-128 Seconds) <i>(Revision 24, Reserved 20)</i>
3898	Trapil – Training Sample Period <i>(Revision 24, Reserved 20)</i>
3899	Trapil – Training Sample Number <i>(Revision 24, Reserved 20)</i>

3.12. Prover 16-Bit Integer Data

3901	Prove Run
3902	Proving Meter Number
3903	Outlet (Right) - Pressure % 0-999.
3904	Outlet (Right) - Temperature % 0-999.
3905	Inlet (Left) - Pressure % 0-999.
3906	Inlet (Left) - Temperature % 0-999.
3907	Prove Counts <i>(Revision 20)</i> Archive all prove report, 0=No, 1=Yes. <i>(Revision 24)</i>
3908	Override Code - Prover Density/Gravity
3909	Override Code - Prover Density Temperature
3910	Override Code - Prover Density Pressure
3911	Enable Trial Prove Report 0=No; 1=Yes.
3912	Number of Passes/Run
3913	Number of Prover Runs to Average Maximum is 10.
3914	Number of Total Prove Runs
3915	Inactivity Timer Seconds.
3916	Temperature Stability Sample Time
3917	Override Code - Inlet (Left) Temperature
3918	Override Code - Outlet (Right) Temperature
3919	Override Code - Inlet (Left) Pressure
3920	Override Code - Outlet (Right) Pressure
3921	Uni- or Bi-directional Prover 0=Uni, 1=Bi; 2=Uni-Compact; 3=Bi-SVP; 4=Master Meter Prove; 5=2 Series Bi.
3922	Automatic Implement Prove Meter Factor
3923	Apply Meter Factor Retroactively 0=No; 1=Yes.

3924	Prover Density Stability Timer
3925	Flow Stable Period Minutes.
3926	Meter Down Period Hours.
3927	Print Run Passes (Compact Prove) 0=No; 1=Yes.
3928	Run Repeatability on Meter Factor 0=No; 1=Yes.
3929	Archive all prove report, 0=No, 1=Yes. <i>(Revision 20, Reserved 24)</i>
3930	Proved Meter Temperature Compensated <i>(Revision 20, Reserved 24)</i>
3931	Run # - 4 th Last
3932	Run # - 3 rd Last
3933	Run # - 2 nd Last
3934	Run # - Last
3935	Proving Run # - 1 st Run
3936	Proving Run # - 2 nd Run
3937	Proving Run # - 3 rd Run
3938	Proving Run # - 4 th Run
3939	Proving Run # - 5 th Run
3940	Proving Run # - 6 th Run
3941	Proving Run # - 7 th Run
3942	Proving Run # - 8 th Run
3943	Proving Run # - 9 th Run
3944	Proving Run # - 10 th Run
3945	Current Prove Passes
3946	Reserved
3947	Switch Bar Temperature Override Code (Added to Rev 20.74.30 & Rev 24.70.30)
3948	Reserved
	to
3999	Reserved
4n00	Reserved

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Chapter 4

8-Character ASCII String Data (4001 - 4999)



Info: These ASCII string variables are accessed using Modbus function codes 03 for all reads and 16 for all writes.



Note: The index number of each string refers to the complete string which occupies the space of 4 points. It must be accessed as a complete unit. You cannot read or write a partial string. Each point counts as one point in the normal OMNI Modbus mode.



Modicon Compatible Mode: For the purpose of point count only, each string counts as 4 points. The starting address of the string still applies.

4.1. Meter Run ASCII String Data

The second digit of the index number defines the number of the meter run. For example: **4114** is the 'Meter ID' for Meter Run #1. The same point for Meter Run #4 would be **4414**. Each ASCII string is 8 characters occupying the equivalent of 4 short integer points.

4n00	Reserved
4n01	Running Batch - Start Date
4n02	Running Batch - Start Time



Note: Last batch end for this meter run.

# 4n03	Batch End - Date
# 4n04	Batch End - Time
4n05	Running Product Name Data from 4n05-06 area gets moved to 4n45-4n46 at the end/beginning of each day [Firmware Revision 24.74.30] (use 4n45 point for Previous Daily Report)
4n06	Current - Calculation Mode Algorithm set used, in string format. [Firmware Revision 24.74.30] (use 4n46 point for Previous Daily Report)
4n07	Current - Batch ID Characters 1-8.
4n08	Current - Batch ID Characters 9-16.
4n09	Meter Factor Used in Net / Mass Used on reports. It contains 'Yes' or 'No'. Characters 1-8. Data from 4n09-4n10 area gets moved to 4n49-4n50 at the end/beginning of each day [Firmware Revision 20.74.30] (use 4n49 point for Previous Daily Report)
4n10	Linear Correction Factor (LCF) Used in Gross Characters 1-8

[Firmware Revision 20.74.30]
 (use 4n50 point for Previous Daily Report)

4n11	Meter - Serial Number
4n12	Meter - Size
4n13	Meter - Model
4n14	Meter - ID
4n15	Flow Meter Tag
4n16	Reserved
4n17	Transmitter Tag - Temperature
4n18	Transmitter Tag - Pressure
4n19	Transmitter Tag - Densitometer
4n20	Transmitter Tag - Density Temperature
4n21	Transmitter Tag - Density Pressure
4n22	Output Tag - PID Control
4n23	Reserved
	to
4n25	Reserved
4n26	Day Start Time Meter 'n'
4n27	Day Start Date Meter 'n'
4n28	Reserved
	to
4n30	Reserved
4n31	Previous Batch 'n' - Batch Start Date
4n32	Previous Batch 'n' - Batch Start Time
4n33	Previous Batch 'n' - Batch End date
4n34	Previous Batch 'n' - Batch End Time
4n35	Previous Batch 'n' - Product Name
4n36	Previous Batch 'n' - API Table
4n37	Previous Batch 'n' - Batch ID
	Characters 1-8.
4n38	Previous Batch 'n' - Batch ID
	Characters 9-16.
4n39	Previous Batch 'n' - Meter Factor Used in Net
4n40	Previous Day Start Time Meter 'n'
4n41	Previous Day Start Date Meter 'n'
4n42	Previous Day End Time Meter 'n'
4n43	Previous Day End Date Meter 'n'
4n44	Reserved
4n45	Previous Day Product Name <i>(Daily Report template should use this)</i>
4n46	Previous Day - Calculation Mode <i>(Daily Report template should use this)</i>
4n47	Reserved
4n48	Reserved
4n49	Meter Factor Used in Net / Mass <i>(Daily Report template should use this)</i>
4n50	Linear Correction Factor (LCF) Used in Gross <i>(Daily Report template should use this)</i>
4n51	
	to

4n99 Reserved
4500 Reserved

4.2. Scratch Pad ASCII String Data

Storage for ninety-nine ASCII strings is provided for user scratch pad. These points are typically used to store and group data that will be moved via peer-to-peer operations or similar operations.

4501 Scratchpad - ASCII String #1
to
4599 Scratchpad - ASCII String #99

4.3. User Display Definition String Variables

The string variables which define the descriptor tags that appear in the eight User Displays and the key press combinations which recall the displays are listed below.

4601 User Display #1 - Descriptor Tag - Line #1
4602 User Display #1 - Descriptor Tag - Line #2
4603 User Display #1 - Descriptor Tag - Line #3
4604 User Display #1 - Descriptor Tag - Line #4
4605 User Display #2 - Descriptor Tag - Line #1
to
4632 User Display #8 - Descriptor Tag - Line #4
4633 User Display #1 - Key Press Sequence
to
4640 User Display #8 - Key Press Sequence
4641 Reserved
to
4706 Reserved

4.4. String Variables Associated with the Station Auxiliary Inputs

4707 Auxiliary Tag - Input #1
to
4710 Auxiliary Tag - Input #4
4711 Previous Batch Start Date - Station
4712 Previous Batch Start Time - Station
4713 Previous Batch End Date - Station
4714 Previous Batch End Time - Station
Added to Rev 20.74.30 & 24.70.30.74.30
4715 Reserved
to
4800 Reserved

4.5. Meter Station 8-Character ASCII String Data

4801	Station - Batch Start Date
4802	Station - Batch Start Time
4803	Station - Batch End Date
4804	Station - Batch End Time
4805	Station - Running Product Name
4806	Station - Current Calculation Mode
4807	Date of Last Database Change Updated each time the Audit Trail is updated. (Via Keypad Only)
4808	Time of Last Database Change (Via Keypad Only)
4809	Reserved
4810	Esc Sequence to Print Condensed Raw ASCII characters sent to printer (see 14149 for Hex ASCII setup).
4811	Esc Sequence to Print Normal Raw ASCII characters sent to printer (see 14150 for Hex ASCII setup).
4812	Daylight Savings Starts Date format field (**/**/**).
4813	Daylight Savings Ends Date format field (**/**/**).
4814	Station Density/Gravity Tag
4815	Station - ID
4816	Station - Density Temperature Tag
4817	Station - Density Pressure Tag
4818	Print Interval Timer Start Time Time format field (**:**:**).
4819	Time to Print Daily Report Time format field (**:**:**).
4820	Product #1 - Name
	to
4835	Product #16 - Name
4836	Flow Computer ID
4837	Company Name Characters 1-8.
4838	Company Name Characters 9-16.
4839	Company Name Characters 17-24.
4840	Company Name Characters 25-32.
4841	Company Name Characters 33-38. (Note: Last two characters are Reserved.)
4842	Station Location Characters 1-8.
4843	Station Location Characters 9-16.
4844	Station Location Characters 17-24.
4845	Station Location Characters 25-32.
4846	Station Location Characters 33-38. (Note: Last two characters are Reserved.)



* **Note:** The flow computer time and date can be set by writing to these ASCII variables. Be sure to include the colons (:) in the time string and the slashes (/) in the date string.

* 4847	Current Date Point 3842 selects date format (see also 3870-3872).
* 4848	Current Time See also 3867-3869.
4849	Software Version Number Example: 20.74
4850	Online Password / EPROM Checksum Dual function point. Write password. Read provides EPROM Checksum.
4851	Reserved

4.5.1. Meter #1 Batch ID

4852	Sequence #1 - Individual Batch Stack or Common Batch Stack - Sequence #1
4853	Batch ID
4854	Sequence #2 - Individual Batch Stack or Common Batch Stack - Sequence #2
4855	Batch ID
4856	Sequence #3 - Individual Batch Stack or Common Batch Stack - Sequence #3
4857	Batch ID
4858	Sequence #4 - Individual Batch Stack or Common Batch Stack - Sequence #4
4859	Batch ID
4860	Sequence #5 - Individual Batch Stack or Common Batch Stack - Sequence #5
4861	Batch ID
4862	Sequence #6 - Individual Batch Stack or Common Batch Stack - Sequence #6
4863	Batch ID

4.5.2. Meter #2 Batch ID

4864	Sequence #1 - Individual Batch Stack or Common Batch Stack - Sequence #7
4865	Batch ID
to	
4874	Sequence #6 - Individual Batch Stack or Common Batch Stack - Sequence #12
4875	Batch ID

4.5.3. Meter #3 Batch ID

4876	Sequence #1 - Individual Batch Stack or Common Batch Stack - Sequence #13
4877	Batch ID
to	
4886	Sequence #6 - Individual Batch Stack or Common Batch Stack - Sequence #18
4887	Batch ID

4.5.4. Meter #4 Batch ID

4888	Sequence #1 - Individual Batch Stack or Common Batch Stack - Sequence #19
4889	Batch ID
to	
4898	Sequence #6 - Individual Batch Stack or Common Batch Stack - Sequence #24
4899	Batch ID
4900	Reserved

4.6. Prover ASCII String Data

4901	Prove Meter - Product Name
4902	Prove Meter - Calculation Mode Text
4903	Prove Meter - Batch ID Characters 1-8.
4904	Prove Meter - Batch ID Characters 9-16.
4905	Prove Meter - Serial Number Manufacturer's Number.
4906	Prove Meter - Size
4907	Prove Meter - Model Manufacturer Model Number.
4908	Prove Meter - ID
4909	Prove Meter - Tag
4910	Reserved
4911	Prover - Inlet (Left) Temperature Tag
4912	Prover - Outlet (Right) Temperature Tag
4913	Prover - Inlet (Left) Pressure Tag
4914	Prover - Outlet (Right) Pressure Tag
4915	Plenum Pressure Tag
4916	Prover - Density/Gravity Tag
4917	Prover - Density Temperature Tag
4918	Prover - Density Pressure Tag
4919	Reserved
4920	Reserved
4921	Prove Complete/abort time/ Date

4922	Prove Complete/abort time/ Time
4923	Selected Table Text
4924	Prove - Meter Product Name
4925	Prove - Meter ID
4926	Prove - Meter Serial #
4927	Prove - Meter Size
4928	Prove - Meter Model
4929	Previous Prove - Meter Factor Date
4930	Previous Prove - Meter Factor Time
4931	Prove - Result String Characters 1-8. Printed on Prove Report.
4932	Prove - Result String Characters 9-16.
4933	Prove - Result String Characters 17-24.
4934	Prove - Result String Characters 25-32.
4935	Prove - Reason String Characters 1-8. Printed on Prove Report.
4936	Prove - Reason String Characters 9-16.
4937	Prove - Reason String Characters 17-24.
4938	Prove - Reason String Characters 25-32.
4939	Master Meter - ID
4940	Master Meter - Serial Number
4941	Master Meter - Size
4942	Master Meter - Model
4943	Reserved
4944	Switch Bar Temperature (added to Rev 20.74.30 & Rev 24.70.30)
4945	Reserved
to	
5100	Reserved

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Chapter 5

32-Bit Integer Data (5001 - 5999)



Info: These 32-bit long integer variables are accessed using Modbus function code 03 for reads, 06 for single writes, and 16 for multiple writes. Note that the index number for each variable refers to one complete long integer which occupies the space of two 16-bit registers. It must be accessed as a complete unit. You cannot read or write a partial 32-bit integer. Each 32-bit long integer counts as one point in the normal OMNI Modbus mode.



Modicon™ Compatible Mode: For the purpose of point count only, each 32-bit integer counts as two points. The starting address of the 32-bit integer still applies.

5.1. Meter Run 32-Bit Integer Data

The second digit of the index number defines the number of the meter run. For example: **5105** is the 'Cumulative Gross Totalizer' for Meter Run # 1. The same point for Meter Run # 4 would be **5405**.

5n00 Reserved

5n01 Batch in Progress - Gross (IV) Totalizer

Points **5n01-5n04** represent the total batch quantities measured so far for the batch in



Notes: * The increment for all totalizers depends upon the 'totalizer resolution' settings shown on the 'Configure/General Setup/Totalizers' property page within OmniCom. They can only be changed via the keypad entries made in the 'Password Maintenance' menu after 'Resetting all Totalizers'.

progress. Results are moved to the **5n50** point area at the end of the batch.

* **5n02** Batch in Progress - Net (GSV) Totalizer

* **5n03** Batch in Progress - Mass Totalizer

* **5n04** Batch in Progress - NSV Totalizer

* **5n05** Cumulative In Progress - Gross (IV) Totalizer

Points 5n05-5n08 are non-resettable totalizers which are snapshots for opening readings.

Data from the 5n05-06 point area is moved to the 5n94-95 point area at the end/beginning of each day.

[Firmware Revision 20.74.30]

(use 5n74 point for Previous Daily Report)

* **5n06** Cumulative In Progress - Net (GSV) Totalizer

[Firmware Revision 20.74.30]

(use 5n75 point for Previous Daily Report)

* **5n07** Cumulative In Progress - Mass Totalizer

Data from the 5n07 point area is moved to the 5n39 point area at the end/beginning of each day.

[Firmware Revision 20.74.30]

(use 5n76 point for Previous Daily Report)

* **5n08** Cumulative In Progress - NSV

Data from the 5n08 point area is moved to the 5n40 point area at the end/beginning of each day.

[Firmware Revision 20.74.30]

(use 5n77 point for Previous Daily Report)

- * **5n09 Today's In Progress - Gross (IV) Totalizer**
Points **5n09-5n12** are total daily quantities measured since the 'day start hour' of the current day.
Data from the 5n09 -5n12 point area is moved to the 5n54-5n57 point area at the end/beginning of each day.
[Firmware Revision 20.74.30]
(use 5n54 point for Previous Daily Report)
- * **5n10 Today's In Progress - Net (GSV) Totalizer**
[Firmware Revision 20.74.30]
(use 5n55 point for Previous Daily Report)
- * **5n11 Today's In Progress - Mass Totalizer**
[Firmware Revision 20.74.30]
(use 5n56 point for Previous Daily Report)
- * **5n12 Today's In Progress – NSV**
[Firmware Revision 20.74.30]



Notes: These variables are stored with 4 places after the implied decimal point; i.e., 10000 is interpreted as 1.0000.

(use 5n57 point for Previous Daily Report)

- # **5n13 Meter Factor in Use Now**
- # **5n14 Average Meter Factor - Batch in Progress**
- # **5n15 Average Meter Factor - Today's In Progress**
- 5n16 Batch Preset Remaining**
- 5n17 Running Product**
Data from the 5n17 point area is moved to the 15n17 point area (5,6,7,8) at the end/beginning of each day.
[Firmware Revision 20.74.30]
(use 15n17 point for Previous Daily Report)
- 5n18 'Dual Pulse' (Comparator) Error Counts for Batch**
Applicable Only when pulse fidelity checking is enabled.
- 5n19 In Progress Batch Report Number**
Incremented upon each batch start.
- 5n20 Raw Input Counts (500 msec)**
Turbine pulse count during the current 500 msec cycle period.
- # **5n21 Meter Factor - Product #1**
- # **5n22 Meter Factor - Product #2**
- # **5n23 Meter Factor - Product #3**
- # **5n24 Meter Factor - Product #4**
- # **5n25 Meter Factor - Product #5**
- # **5n26 Meter Factor - Product #6**
- # **5n27 Meter Factor - Product #7**
- # **5n28 Meter Factor - Product #8**
- # **5n29 Meter Factor - Product # 9**
- # **5n30 Meter Factor - Product #10**
- # **5n31 Meter Factor - Product #11**
- # **5n32 Meter Factor - Product #12**
- # **5n33 Meter Factor - Product #13**
- # **5n34 Meter Factor - Product #14**
- # **5n35 Meter Factor - Product #15**
- # **5n36 Meter Factor - Product #16**
- # **5n37 Meter Factor - Change Retroactive Barrels/m³**

5n38 **Batch Preset Warning**
Bbl/m³.



+ **Note:** Applies to Rev 20.74.24 and prior.

-
- + 5n39 **Previous Day Closing Mass Cumulative Total (n=Meter 1-4)**
[Firmware Revision 24 All]
Reserved
[Firmware Revision 2074.74.25 or later]
(Today's Closing Mass Totalizer)
Points 5n39-5n40 are cumulative totalizers snapshot at the end/beginning of each day.
- + 5n40 **Previous Day Closing NSV Cumulative Total (n=Meter 1-4)**
[Firmware Revision 24 All]
Reserved
[Firmware Revision 2074.74.25 or later]
(Today's Closing NSV Totalizer)
- 5n41 **Micro Motion - Frequency**
- 5n42 **Micro Motion - Mass Total**
- 5n43 **In Progress - Raw Input Counts for Hour**
Raw flowmeter counts for the current hour in progress.
- 5n44 **In Progress - Gross (IV) Total for Hour**
Points 5n44-5n47 represent the total quantities for the current hour in progress. These will be moved to the 5n74 point area at the start of the new hour.
- 5n45 **In Progress - Net (GSV) Total for Hour**
- 5n46 **In Progress - Mass Total for Hour**
- 5n47 **In Progress - NSV Total for Hour**
- 5n48 **In Progress - Raw Input Counts for Batch**
Raw turbine counts for the current batch in progress.
- 5n49 **In Progress - Raw Input Counts for Day**
Raw turbine counts for the current day in progress.
- 5n50 **Previous Batch 'n' - Gross (IV) Totalizer**
Points 5n50-5n53 represent the total batch quantities for the previous batch.
- 5n51 **Previous Batch 'n' - Net (GSV) Totalizer**
- 5n52 **Previous Batch 'n' - Mass Totalizer**
- 5n53 **Previous Batch 'n' - NSV Totalizer**
- 5n54 **Previous Day's - Gross (IV) Totalizer**
Points 5n54-5n57 are the total quantities for the previous day; 'day start hour' to 'day start hour'. (Changed Default Daily Report Template)
- 5n55 **Previous Day's - Net (GSV) Totalizer** (Changed Default Daily Report Template)
- 5n56 **Previous Day's - Mass Totalizer** (Changed Default Daily Report Template)
- 5n57 **Previous Day's - NSV Totalizer** (Changed Default Daily Report Template)
- 5n58 **Current Batch - Opening Gross (IV) Totalizer**
Points 5n58-5n61 are the cumulative totalizers snapshot at the start of the batch in progress. These variables are also the closing totalizers for the previous batch.
- 5n59 **Current Batch - Opening Net (GSV) Totalizer**
- 5n60 **Current Batch - Opening Mass Totalizer**
- 5n61 **Current Batch - Opening NSV Totalizer**
- 5n62 **Today's - Opening Gross (IV) Totalizer**
Points 5n62-5n65 are cumulative totalizers snapshot at the day start hour for the current day. These points are also the closing totalizers for the previous day. Data from the 5n62-5n65 point area is moved to the 5n82-5n85 point area at the end/beginning of each day.
[Firmware Revision 20.74.30]
(use 5n82 point for Previous Daily Report)
-

- 5n63 Today's - Opening Net (GSV) Totalizer**
[Firmware Revision 20.74.30]
(use 5n83 point for Previous Daily Report)
- 5n64 Today's - Opening Mass Totalizer**
[Firmware Revision 20.74.30]
(use 5n84 point for Previous Daily Report)
- 5n65 Today's - Opening NSV Totalizer**
[Firmware Revision 20.74.30]
(use 5n85 point for Previous Daily Report)
- 5n66 Cumulative - Gross (IV) Total @ Leak Detection Freeze Command**
Points 5n66-5n69 are cumulative totalizers snapshot when the Leak Detection Freeze Command (1760) is received (see also points 7634, 7644, 7654 & 7664).
- 5n67 Cumulative - Net (GSV) Total @ Leak Detection Freeze Command**
- 5n68 Cumulative - Mass Total @ Leak Detection Freeze Command**
- 5n69 Cumulative - NSV Total @ Leak Detection Freeze Command**
- 5n70 Increment - Gross (IV) Totalizer**
Points 5n70-5n73 contains the incremental integer counts that were added to the totalizers for this current cycle (500msec).
- 5n71 Increment - Net (GSV) Totalizer**
- 5n72 Increment - Mass Totalizer**
- 5n73 Increment - NSV Totalizer**
- 5n74 Previous Hourly - Gross (IV) Total (Changed Default Daily Report Template)**
[All app 20 revisions and firmware revision 24.74.21 or earlier]
Points 5n74-5n77 represent the total quantities measured for the last hour. These are moved here from the 5n44 point area at the end of the hour.
[Firmware Revision 20.74.30 or later]
(use 15574 point for Previous Daily Report)
[Firmware Revision 24.74.30 or later]
(Today's Closing Gross (IV) Totalizer)
Points 5n74 – 5n77 are cumulative totalizers snapshot at the end/beginning of each day.
- 5n75 Previous Hourly - Net (GSV) Total (Changed Default Daily Report Template)**
[Firmware Revision 20.74.30 or later]
(use 15575 point for Previous Daily Report)
[Firmware Revision 24.74.30 or later]
(Today's Closing Net Totalizer)
- 5n76 Previous Hourly - Mass Total (Changed Default Daily Report Template)**
[Firmware Revision 20.74.30 or later]
(use 15576 point for Previous Daily Report)
[Firmware Revision 24.74.30 or later]
(Today's Closing Mass Totalizer)
- 5n77 Previous Hourly - NSV Total (Changed Default Daily Report Template)**
[Firmware Revision 20.74.30 or later]
(use 15577 point for Previous Daily Report)
[Firmware Revision 24.74.30 or later]
(Today's Closing NSV Totalizer)
- 5n78 Previous Batch 'n' - Opening Gross (IV)**
Data from 5n58 area gets moved to 5n78-5n81 at the end of each batch.
- 5n79 Previous Batch 'n' - Opening Net (GSV)**
- 5n80 Previous Batch 'n' - Opening Mass**
- 5n81 Previous Batch 'n' - Opening NSV**
- 5n82 Previous Day's - Opening Gross (IV) (Changed Default Daily Report Template)**
Data from 5n62 area gets moved to 5n82-5n85 at the end/beginning of each day.
- 5n83 Previous Day's - Opening Net (GSV) (Changed Default Daily Report Template)**
- 5n84 Previous Day's - Opening Mass (Changed Default Daily Report Template)**

5n85	Previous Day's - Opening NSV (Changed Default Daily Report Template)
5n86	Previous Batch 'n' - Closing Gross (IV) Total
5n87	Previous Batch 'n' - Closing Net (GSV) Total
5n88	Previous Batch 'n' - Closing Mass Total
5n89	Previous Batch 'n' - Closing NSV Total
5n90	Previous Batch 'n' - Batch Report Number
	Use this value on Batch Report.
5n91	Previous Batch 'n' - Batch Product Number



* **Note:** The increment for all totalizers depends upon the 'totalizer resolution' settings shown on the 'Configure/General Setup/Totalizers' property page within OmniCom. They can only be changed via the keypad entries made in the 'Password Maintenance' menu after 'Resetting all Totalizers'.

*	5n92	Maintenance Mode - Meter Gross (IV) Total (Revision 24)
*	5n93	Maintenance Mode - Meter Net (GSV) Total (Revision 24)
*	5n94	Maintenance Mode - Meter Mass Total (Revision 24)
*	5n95	Maintenance Mode - Meter NSV Total (Revision 24)



+ **Note:** Applies to 20.74.24 and prior.

*	5n92	Meter #1 Current Gross Opening (IV) Total
*	5n93	Meter #1 Current Net Opening (GSV) Total
+	5n94	Previous Day Closing Gross Cumulative Total (n=Meter 1-4) Data from the 5n05-06 point area is moved to the 5n94-5n95 point area at the end/beginning of each day. [Firmware Revision 20.74.25 or later] (Today's Closing Gross (IV) Totalizer) Points 5n94-95 are cumulative totalizers snapshot at the end/beginning of each day.
+	5n95	Previous Day Closing Net Cumulative Total (n=Meter 1-4) [Firmware Revision 20.74.25 or later] (Today's Closing Net Totalizer)
	5n97	Daily Net @ 2nd Reference Temperature Data from 5n97 area gets moved to 5n99 at the end/beginning of each day [Firmware Revision 20.74.30] (use 5n99 point for Previous Daily Report)
	5n98	Previous Batch 'n' Net @ 2nd Reference Temperature
	5n99	Previous Daily Net @ 2nd Reference temperature
	5500	Reserved

5.2. Scratch Pad 32-Bit Integer Data

Ninety-nine 32-bit integer points are provided for use as a user scratch pad. This point area is typically used to store the results of variable statement calculations, to group data that will be moved via peer-to-peer operations or similar types of operations.

5501	Scratchpad - 32-Bit Integer #1
	to
5599	Scratchpad - 32-Bit Integer #99
5600	Reserved

5.3. Product 32-Bit Integer Data (Revision 20 only)

For each available product, 32 Bit integers representing non resettable gross totalizers and gross opening points are allocated for each meter run and the station. The gross Totalizers will reflect accumulations only when that product/meter or station is flowing. End of Batch operations will trigger updates of the product gross opening points (the opening total of the current running product will be updated after printing batch end report and storing archive data, if archive is requested.)

5601	Product #1 Meter #1 Gross Opening
5602	Product #1 Meter #1 Gross Total
5603	Product #1 Meter #2 Gross Opening
5604	Product #1 Meter #2 Gross Total
5605	Product #1 Meter #3 Gross Opening
5606	Product #1 Meter #3 Gross Total
5607	Product #1 Meter #4 Gross Opening
5608	Product #1 Meter #4 Gross Total
5609	Product #1 Station Gross Opening
5610	Product #1 Station Gross Total
5611 to 5620	Product #2
5621 to 5630	Product #3
5631 to 5640	Product #4
5641 to 5650	Product #5
5651 to 5660	Product #6
5661 to 5670	Product #7
5671 to 5680	Product #8
5681 to 5690	Product #9
5691 to 5700	Product #10
5701 to 5710	Product #11
5711 to 5720	Product #12
5721 to 5730	Product #13
5731 to 5740	Product #14
5741 to 5750	Product #15
5751 to 5760	Product #16
5761 to 5800	Reserved

5.4. Station 32-Bit Integer Data



* **Notes:** The increment for all totalizers depends upon the 'totalizer resolution' settings shown on the 'Configure/General Setup/Totalizers' property page within OmniCom. They can only be changed via the keypad entries made in the 'Password Maintenance' menu after 'Resetting all Totalizers'.

- * **5801 Batch in Progress - Gross (IV) Totalizer**
Points **5801-5804** are total batch quantities measured so far for the batch in progress. These are moved to **5850** area at the end of the batch.

* 5802	Batch in Progress - Net (GSV) Totalizer
* 5803	Batch in Progress - Mass Totalizer
* 5804	Batch in Progress - NSV Totalizer
* 5805	Cumulative in Progress - Gross (IV) Totalizer Points 5805-5808 are non-resettable totalizers which are snapshot for opening readings.
* 5806	Cumulative in Progress - Net (GSV) Totalizer
* 5807	Cumulative in Progress - Mass Totalizer Data from the 5807 and 5808 point areas is moved to the 5813 and 5843 point areas at the end/beginning of each day.
* 5808	Cumulative in Progress - NSV Totalizer
* 5809	Today's in Progress - Gross (IV) Totalizer Points 5809-5812 are total daily quantities measured since the 'day start hour' of the current day. These are moved to the 5854 point area at the start of a new day.
* 5810	Today's in Progress - Net (GSV) Totalizer
* 5811	Today's in Progress - Mass Totalizer
* 5812	Today's in Progress - NSV Totalizer
5813	Daily Closing - Mass Totalizer (<i>Revision 20, Reserved 24</i>)
5814	Line Pack Remaining
5815	Batch Preset Warning
5816	Batch Preset Remaining
5817	Running Product ID
5818	Batch Number

5.5. More Meter Run 32-Bit Integer Data

5.5.1. Meter #1 Batch Size

5819	Current Batch Size or Common Batch Stack Sequence #1 - Batch Size
5820	Batch Sequence #2 - Batch Size or Common Batch Stack Sequence #2 - Batch Size
5821	Batch Sequence #3 - Batch Size or Common Batch Stack Sequence #3 - Batch Size
5822	Batch Sequence #4 - Batch Size or Common Batch Stack Sequence #4 - Batch Size
5823	Batch Sequence #5 - Batch Size or Common Batch Stack Sequence #5 - Batch Size
5824	Batch Sequence #6 - Batch Size or Common Batch Stack Sequence #6 - Batch Size

5.5.2. Meter #2 Batch Size

5825	Current Batch Size or Common Batch Stack Sequence #7 - Batch Size
to	
5830	Batch Sequence #6 - Batch Size or Common Batch Stack Sequence #12 - Batch Size

5.5.3. Meter #3 Batch Size

- 5831 Current Batch Size or Common Batch Stack Sequence #13 - Batch Size
to
5836 Batch Sequence #6 - Batch Size or Common Batch Stack Sequence #18
- Batch Size

5.5.4. Meter #4 Batch Size

- 5837 Current Batch Size or Common Batch Stack Sequence #19 - Batch Size
to
5842 Batch Sequence #6 - Batch Size or Common Batch Stack Sequence #24
- Batch Size

5.5.5. Station 32-Bit Integer Data

- 5843 Station - Previous Daily Closing NSV
5844 Station - In Progress - Gross (IV)
Total for Hour
Points 5844-5847 represent the total station quantities for the current hour in progress. These will be moved to the 5n74 point area at the start of the new hour.
- 5845 Station - In Progress - Net (GSV) Total for Hour
5846 Station - In Progress - Mass Total for Hour
5847 Station - In Progress - NSV Total for Hour
5848 Time in hhmmss format
Read (e.g. the number 103125 represents 10:31:25).
- 5849 Date in yymmdd format
Read (e.g. the number 970527 represents May 27, 1997). The date format used here does not follow the US/European format selection.
- 5850 Station - Previous Batch 'n' - Gross (IV) Totalizer
Points 5850-5853 are total batch quantities for the previous batch. These are moved here from the 5801 point area at the end of a batch.
- 5851 Station - Previous Batch 'n' - Net (GSV) Totalizer
5852 Station - Previous Batch 'n' - Mass Totalizer
5853 Station - Previous Batch 'n' - NSV Totalizer
5854 Station - Previous Day's - Gross (IV) Totalizer
Points 5854-5857 are total quantities for the previous day; 'day start hour' to 'day start hour'. These are moved here from the 5809 point area at the end of the day.
- 5855 Station - Previous Day's - Net (GSV) Totalizer
5856 Station - Previous Day's - Mass Totalizer
5857 Station - Previous Day's - NSV Totalizer
5858 Station - Current Batch - Opening Gross (IV) Totalizer
Points 5858-5861 are cumulative totalizers snapshot at the start of the batch in progress. These variables are also the closing totalizers for the previous batch.
- 5859 Station - Current Batch - Opening Net (GSV) Totalizer
5860 Station - Current Batch - Opening Mass Totalizer
5861 Station - Current Batch - Opening NSV Totalizer
5862 Station - Today's - Opening Gross (IV) Totalizer
Points 5862-5865 are cumulative totalizers snapshot at day start hour of the current day. These variables are also the closing totalizers for the previous day.
- 5863 Station - Today's - Opening Net (GSV) Totalizer
5864 Station - Today's - Opening Mass Totalizer

5865	Station - Today's - Opening NSV Totalizer
5866	Station - Cumulative - Gross (IV) Total @ Freeze Points 5866-5869 are cumulative totalizers snapshot when the Leak Detection Freeze Command (1760) is received (see also points 7634, 7644, 7654 & 7664).
5867	Station - Cumulative - Net (GSV) Total @ Freeze
5868	Station - Cumulative - Mass Total @ Freeze
5869	Station - Cumulative - NSV Total @ Freeze



* **Note:** Points 5870 -.5874 are in 500ms


5870	Station - Increment - Gross (IV) Totalizer Points 5870-5873 contain the incremental integer counts that were added to the totalizers for this current cycle.
* 5871	Station - Increment - Net (GSV) Totalizer
* 5872	Station - Increment - Mass Totalizer
* 5873	Station - Increment - NSV Totalizer
5874	Station - Previous Hourly - Gross (IV) Points 5874-5877 represent the total quantities measured for the last hour. These are copied here from the 5844 point area at the end of hour.
5875	Station - Previous Hourly - Net (GSV)
5876	Station - Previous Hourly - Mass
5877	Station - Previous Hourly - NSV
5878	Station - Previous Batch 'n' - Opening Gross (IV) Data from the 5858 point area is copied to points 5878-5881 at the end of each batch.
5879	Station - Previous Batch 'n' - Opening Net (GSV)
5880	Station - Previous Batch 'n' - Opening Mass
5881	Station - Previous Batch 'n' - Opening NSV
5882	Station - Previous Day's - Opening Gross (IV) Data from the 5862 point area is copied to points 5882-5885 at the end/beginning of each day.
5883	Station - Previous Day's - Opening Net (GSV)
5884	Station - Previous Day's - Opening Mass
5885	Station - Previous Day's - Opening NSV
5886	Station - Previous Batch 'n' - Closing Gross (IV) Total
5887	Station - Previous Batch 'n' - Closing Net (GSV) Total
5888	Station - Previous Batch 'n' - Closing Mass Total
5889	Station - Previous Batch 'n' - Closing NSV Total
5890	Station - Previous Batch 'n' - Batch Number
5891	Station - Previous Batch 'n' - Product Number



+ **Note:** Applies to Revision 20, Reserved 24.

+ 5892	Station Current Product Gross Opening Total
+ 5893	Station Current Product Gross Total
+ 5894	Previous Day Closing Gross Station Cumulative Total
+ 5895	Previous Day Closing Net Station Cumulative Total
5896	Batch Net @ 2 nd Reference Temperature
5897	Daily Net @ 2 nd Reference Temperature
5898	Previous Batch 'n' Net @ 2 nd Reference Temperature
5899	Previous Daily Net @ 2 nd Reference Temperature
5900	Reserved

5.6. Prover 32-Bit Integer Data

5901	Prove Counts
5902	TDVOL Timer Pulses Timer Pulses accumulated between detectors switches (microseconds).
5903	TDFMP Timer Pulses Timer Pulses accumulated between the first flow pulse after each detector switch event (microseconds).
5904	Reserved
to	
5919	Reserved
5920	Pulses - Total Linear Correction Factor - 1st Run
to	
5929	Pulses - Total Linear Correction Factor - 10th Run
5930	Net Total since Last Prove (<i>Revision 20 Reserved 24</i>)
5931	Prove Report Number
5932	Previous Prove Totalizer
5933	Totalizer Reading This Prove
<hr/>	
	<i>Info: Points 5934-5961 – When using a compact or bi-compact prover, these data points have an implied 3 decimal places. On conventional pipe provers, these points have 0 decimal places.</i>
5934	Pulses - Forward - 4th Last
5935	Pulses - Total - 4th Last
5936	Pulses - Forward - 3rd Last
5937	Pulses - Total - 3rd Last
5938	Pulses - Forward - 2nd Last
5939	Pulses - Total - 2nd Last
5940	Pulses – Forward - Last
5941	Pulses - Total - Last
5942	Pulses - Forward - 1st Good Run
5943	Pulses - Total - 1st Good Run
to	
5960	Pulses - Forward - 10th Good Run
5961	Pulses - Total - 10th Good Run
5962	Actual Meter Factor - from Last Prove (<i>May not have been implemented</i>)
5963	Actual Meter Factor - Current Run
5964	Flowmeter Frequency - 1st Good Run
to	
5973	Flowmeter Frequency - 10th Good Run

5.6.1. Compact Prover TDVOL and TDFMP Pulses

5974	Compact Prover - TDVOL Timer Pulses - 1 st Run
5975	Compact Prover - TDFMP Timer Pulses 1st Run
to	
5992	Compact Prover - TDVOL Timer Pulses - 10th Run
5993	Compact Prover - TDFMP Timer Pulses - 10th Run

5.6.2. Prover Meter Factor Data

5994	Meter Factor - Trial Prove
5995	Meter Factor - Linear
5996	Meter Factor - GSVp/GSVm <i>(Updated when "Count Repeatability" is selected)</i>
5997	Reserved
to	
6000	Reserved

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Chapter 6

32-Bit IEEE Floating Point Data (6001 - 8999)

6.1.

Digital-to-Analog Outputs 32-Bit IEEE Floating Point Data



Info: These 32 bit IEEE Floating Point variables are accessed using Modbus function code 03 for all reads, 06 for single writes or 16 for multiple writes. Note that the index number of each variable refers to the complete floating point variable which occupies the space of two 16-bit points. It must be accessed as a complete unit. You cannot read or write a partial variable. Each floating point variable counts as one point in the normal OMNI Modbus mode.



Modicon™ Compatible Mode: For the purpose of point count only, each IEEE float point counts as two points. The starting address of the variable still applies.

6001 Reserved
to
6999 Reserved

Any analog output point which physically exists can be read via these point numbers. Data returned is expressed as a percentage of the output value.

Only those points which physically exist and have been assigned to Modbus control by assigning zero (0) at 'D/A Out Assign' (see **Volume 3**) should be written to. Outputs which are not assigned to Modbus control will be overwritten every 500 msec by the flow computer. Data written should be within the range of 0.00 to 100.0.

7000 Reserved
7001 Analog Output #1
to
7012 Analog Output #12
7013 Reserved
to
7024 Reserved

6.2. User Variables 32-Bit IEEE Floating Point Data

Database points 7025 through 7088 have been assigned as user variables (see **Volume 3**). The value contained in each variable depends on the associated program statement which is evaluated every 500 msec. You may read these variables at any time. You may also write to these variables but anything you write may be overwritten by the flow computer depending on the evaluation of the statement. Leave the statement blank or simply put a comment or prompt into it to avoid having the flow computer overwrite it.

7025 User-Programmable Variable #1
to
7088 User-Programmable Variable #64

6.3. Programmable Accumulator 32-Bit IEEE Floating Point Variables

Points 7089 through 7099 are paired with Boolean Point Variables 1089 through 1099. Numeric data placed in 7089, for example, can be output as pulses by assigning a digital I/O point to 1089.

7089 Programmable Accumulator #1
Data placed into point 7089 is utilized to generate pulses through a digital I/O assignment to point 1089.
to
7099 Programmable Accumulator #11
Data placed into point 7099 is utilized to generate pulses through a digital I/O assignment to point 1099.

6.4. Meter Run 32-Bit IEEE Floating Point Data



Info: The second digit of the index number defines the number of the meter run number.



Info: Calculated averages are 'flow weighted'.

The second digit of the index number defines the meter run number. For example: 7105 is the 'Temperature' variable for Meter Run #1. The same point for Meter Run #4 would be 7405.

7n00 Reserved



< **Notes:** Current live values which are updated ever 500 msec.

- < 7n01 Flowrate - Gross (IV)
Bbl (Revision 20, Reserved 24); m³/hr or liter/hr (Revision 24, Reserved 20).
- < 7n02 Flowrate - Net (GSV)
Bbl (Revision 20, Reserved 24); m³/hr or liter/hr (Revision 24, Reserved 20).
- < 7n03 Flowrate - Mass
Klb (Revision 20, Reserved 24); ton/hr or kg/hr (Revision 24, Reserved 20).
- < 7n04 Flowrate - NSV
Bbl (Revision 20, Reserved 24); m³/hr or liter/hr (Revision 24, Reserved 20).



* **Notes:** Current values in use now.

- * **7n05** **Temperature**
- * **7n06** **Pressure**
- * **7n07** **Density**
Lb/ft³ (Revision 20) or kg/m³. (Revision 24) Indicates calculated propylene/ethylene density.
- * **7n08** **Flowing Transducer Density Before Applying DCF**



* **Notes:** Current values in use now.

- Temperature and pressure corrected for the steel of the Density Meter.
- * **7n09** **Flowing Transducer Density After Applying DCF**
 $7n09 = 7n08 \times 7n43$.
- * **7n10** **Density Transducer Temperature**
Corrects for transducer temperature expansion effects.
- * **7n11** **Density Transducer Pressure**
Corrects for transducer pressure expansion effects.
- * **7n12** **API Flowing**
- * **7n13** **API @ 60 °F / API @ Reference Temperature**
- * **7n14** **Specific Gravity Flowing**
- * **7n15** **Specific Gravity @ 60 °F** (Revision 20, Reserved 24); **Density @ 15 °C**
(Revision 24, Reserved 20)
- * **7n16** **VCF**
Volume Correction Factor (CTL).
- * **7n17** **CPL**
Correction Factor for Pressure on Liquids.
- 7n18** **Batch In Progress – Average Meter Run Temperature**
- 7n19** **Batch In Progress - Average Meter Run Pressure**
- 7n20** **Batch In Progress - Average of Density Flowing**
- 7n21** **Batch In Progress - Average Density Transducer Temperature**
- 7n22** **Batch In Progress - Average Density Transducer Pressure**
- 7n23** **Batch In Progress - Average API Flowing**
- 7n24** **Batch In Progress - Average API @ 60 °F / API @ Reference Temperature**
- 7n25** **Batch In Progress - Average Flowing Specific Gravity**
- 7n26** **Batch In Progress - Average Specific Gravity @ 60 °F / Density @ Reference Temperature**
- 7n27** **Batch In Progress - Average VCF**
- 7n28** **Batch In Progress - Average CPL**
- 7n29** **Day In Progress - Average Temperature**
- 7n30** **Day In Progress - Average Pressure**
- 7n31** **Day In Progress - Average Density Flowing**
- 7n32** **Day In Progress - Average Density Transducer Temperature**
- 7n33** **Day In Progress - Average Density Transducer Pressure**
- 7n34** **Day In Progress - Average API Flowing**
- 7n35** **Day In Progress - Average API @ 60 °F / API @ Reference Temperature**
Data from the 7n35 point area is copied to 8n30 (n=5,6,7,8) at the end/beginning of each day.
- 7n36** **Day In Progress - Average Specific Gravity Flowing**

7n37 Day In Progress - Average Specific Gravity @ 60 °F / Density @ Reference Temperature



~ Notes: The data in these points may or may not be updated in real time or is the same data as entered elsewhere depending on the fluid type selected or the equation of state selected.

* ~ 7n38 Day In Progress - Average VCF
 * ~ 7n39 Day In Progress - Average CPL
 * ~ 7n40 Current K Factor
 7n41 Weighted Average K Factor - Batch Flow
 7n42 Weighted Average K Factor - Daily Flow
 7n43 Density - Factor in Use
 7n44 Density - Factor B
 7n45 Z Factor of Carbon Dioxide
 7n46 Current Viscosity CST

 7n47 **Coefficient b**
 Viscosity coefficients used with helical or turbine meters.
 7n48 **Coefficient a**
 7n49 **LCF**
 Linear Correction Factor.
 7n50 **Coefficient c**
 7n51 **Coefficient d**
 7n52 **Coefficient e**
 7n53 **Coefficient f**
 7n54 **Coefficient g**
 7n55 **Reserved**
 to
 7n60 **Reserved**



Notes: Indicates meter run gross or mass flow rate depending on which unit is selected.

7n61 **Meter Run Gross/Mass Flowrate - Low Limit**
 # 7n62 **Meter Run Gross/Mass Flowrate - High Limit**
 7n63 **Meter Temperature - Low Limit**
 7n64 **Meter Temperature - High Limit**
 7n65 **Meter Temperature - Override**
 7n66 **Meter Temperature - @ 4mA**
 7n67 **Meter Temperature - @ 20mA**
 7n68 **Meter Pressure - Low Limit**
 to
 7n72 **Meter Pressure - @ 20mA**
 7n73 **Gravity / Density Transducer - Low Limit**
 Indicated at either flowing or reference conditions, depending on which is selected.
 to
 7n77 **Gravity / Density Transducer - @ 20mA**
 7n78 **Density Transducer Temperature - Low Limit**
 to

7n82	Density Transducer Temperature - @ 20mA
7n83	Density Transducer Pressure - Low Limit
to	
7n87	Density Transducer Pressure - @ 20mA
7n88	Density Transducer - Correction Factor
	Used to correct densitometer.



* **Notes:** Various factors used by various vendors of digital densitometers.

* 7n89	Densitometer – Constant #1
	K_0/D_0 .
* 7n90	Densitometer - Constant #2
	K_1/T_0 .
* 7n91	Densitometer - Constant #3
	K_2/T_{coef} .
* 7n92	Densitometer - Constant #4
	$K_{18}/T_{cal}/T_c$.
* 7n93	Densitometer - Constant #5
	$K_{19}/P_{coef}/K_{11}$.
* 7n94	Densitometer - Constant #6
	$K_{20A}/P_{cal}/K_{12}$.
* 7n95	Densitometer - Constant #7
	K_{20B}/K_{13} .
* 7n96	Densitometer - Constant #8
	K_{21A}/P_c .
* 7n97	Densitometer - Constant #9
	K_{21B}/K_{p1} .
* 7n98	Densitometer - Constant #10
	K_r . (For UGC densitometers: K_r/K_{p2} .)
* 7n99	Densitometer - Constant #11
	K_j . (For UGC densitometers: K_j/K_{p3} .)
7500	Reserved

6.5. Scratch Pad 32-Bit IEEE Floating Point Data

Ninety-nine IEEE 32-bit floating data points are provided for use as a user scratch pad. This data point area is typically used to store and group data that will be moved via peer-to-peer operations or similar uses.

7501	Scratchpad - IEEE Float #1
to	
7599	Scratchpad - IEEE Float #99
7600	Reserved

6.6. PID Control 32-Bit IEEE Floating Point Data



Notes: Do not write to these variables. They are provided for read only information.



*** Notes:** Writing to these variables will have no effect as the flow computer overwrites these values with either the remote or local primary Setpoint value depending on the operating mode of the control loop.



~ Notes: Only writes made while in the 'Remote' mode will be meaningful. These variables are overwritten with the current value of the primary controlled variable when in all other modes.



^ Notes: Only writes made while in the 'Manual' mode will be meaningful. These variables are overwritten by the flow computer in all other operating modes.



< Notes: Writes to these variables are always accepted.

#	7601	PID Control #1 - Local Primary Variable Setpoint Value
*	7602	PID Control #1 - Primary Setpoint Value in Use
~	7603	PID Control #1 - Remote Primary Setpoint Value
^	7604	PID Control #1 - Control Output Percent
<	7605	PID Control #1 - Secondary Variable Setpoint
#	7606	PID Control #2 - Local Primary Variable Setpoint Value
*	7607	PID Control #2 - Primary Setpoint Value in Use
~	7608	PID Control #2 - Remote Primary Setpoint Value
^	7609	PID Control #2 - Control Output Percent
<	7610	PID Control #2 - Secondary Variable Setpoint
#	7611	PID Control #3 - Local Primary Variable Setpoint Value
*	7612	PID Control #3 - Primary Setpoint Value in Use
~	7613	PID Control #3 - Remote Primary Setpoint Value
^	7614	PID Control #3 - Control Output Percent
<	7615	PID Control #3 - Secondary Variable Setpoint
#	7616	PID Control #4 - Local Primary Variable Setpoint Value
*	7617	PID Control #4 - Primary Setpoint Value in Use
~	7618	PID Control #4 - Remote Primary Setpoint Value
^	7619	PID Control #4 - Control Output Percent
<	7620	PID Control #4 - Secondary Variable Setpoint
	7621	Reserved
	to	
	7623	Reserved

6.7. Miscellaneous Meter Run 32-Bit IEEE Floating Point Data



Info: See points 7n01 through 7n99 for more meter run related data.

7624	Equilibrium Pressure - Meter Run #1 Psig (Revision 20) or kPa/ Bar/ kg/cm ² (Revision 24,) (current live values).
7625	Equilibrium Pressure - Meter Run #2 Psig (Revision 20) or kPa/ Bar/ kg/cm ² (Revision 24,) (current live values).
7626	Equilibrium Pressure - Meter Run #3 Psig (Revision 20) or kPa/ Bar/ kg/cm ² (Revision 24,) (current live values).
7627	Equilibrium Pressure - Meter Run #4 Psig (Revision 20) or kPa/ Bar/ kg/cm ² (Revision 24,) (current live values).
7628	Equilibrium Pressure - Prover Psig (Revision 20) or kPa/ Bar/ kg/cm ² (Revision 24,) (current live values).
7629	Vapor Pressure @ 100 °F/37.8 °C - Meter Run #1 Configuration Constants
7630	Vapor Pressure @ 100 °F/37.8 °C - Meter Run #2
7631	Vapor Pressure @ 100 °F/37.8 °C - Meter Run #3
7632	Vapor Pressure @ 100 °F/37.8 °C - Meter Run #4
7633	Vapor Pressure @ 100 °F/37.8 °C – Prover



Notes: These variables represent the freezed values when 1760 is true

#	7634	Meter Run #1 - Temperature @ Leak Detect Freeze Command See 1760 command.
#	7635	Meter Run #1 - Pressure @ Leak Detection Freeze Command
#	7636	Meter Run #1 - Density / Gravity @ Leak Detect Freeze Command
	7637	Reserved
	to	
	7639	Reserved



*** Notes:** These variables represent the incremental flow which is accumulated each 500 msec. calculation cycle in float format (also see points 5n70 for integer format)..

*	7640	Meter Run #1 - Gross (IV) Volume Increment
*	7641	Meter Run #1 - Net (GSV) Volume Increment
*	7642	Meter Run #1 - Mass Increment
*	7643	Meter Run #1 - NSV Increment



Notes: Flowing variables are snapshot and stored here when the Leak Detection Freeze command (1760) is received (Also see point 5n66).

#	7644	Meter Run #2 - Temperature @ Freeze Command
#	7645	Meter Run #2 - Pressure @ Freeze Command
#	7646	Meter Run #2 - Density / Gravity @ Freeze Command
	7647	Reserved
	to	
	7649	Reserved

* 7650	Meter Run #2 - Gross (IV) Volume Increment
* 7651	Meter Run #2 - Net (GSV) Volume Increment
* 7652	Meter Run #2 - Mass Increment
* 7653	Meter Run #2 - NSV Increment
# 7654	Meter Run #3 - Temperature @ Freeze Command
# 7655	Meter Run #3 - Pressure @ Freeze Command
# 7656	Meter Run #3 - Density / Gravity @ Freeze Command
7657	Reserved
to	
7659	Reserved
* 7660	Meter Run #3 - Gross (IV) Volume Increment
* 7661	Meter Run #3 - Net (GSV) Volume Increment
* 7662	Meter Run #3 - Mass Increment
* 7663	Meter Run #3 - NSV Increment
# 7664	Meter Run #4 - Temperature @ Freeze Command
# 7665	Meter Run #4 - Pressure @ Freeze Command
# 7666	Meter Run #4 - Density / Gravity @ Freeze Command
7667	Reserved
to	
7669	Reserved
* 7670	Meter Run #4 - Gross (IV) Volume Increment
* 7671	Meter Run #4 - Net (GSV) Volume Increment
* 7672	Meter Run #4 - Mass Increment
* 7673	Meter Run #4 - NSV Increment
# 7674	Station - Temperature @ Freeze Command
# 7675	Station - Pressure @ Freeze Command
# 7676	Station - Density / Gravity @ Freeze Command
7677	Reserved
to	
7679	Reserved
* 7680	Station - Gross (IV) Volume Increment
* 7681	Station - Net (GSV) Volume Increment
* 7682	Station - Mass Volume Increment
* 7683	Station - NSV Volume Increment
7684	Reserved
to	
7698	Reserved
7699	2 nd Reference Temperature Other than 60°F or 15°C.
7700	Reserved

6.8. Miscellaneous Variables 32-Bit IEEE Floating

Point Data

The percentage of span for each of the 24 process input channels is available as a floating point variable point.



Info: The data is only meaningful when the input channel is used as an analog input or as a digital transducer input. For pulse type input channels, see data points located at 15131 through 15154.

7701	Process Input - Channel # 1
to	
7724	Process Input - Channel # 24
7725	Reserved
to	
7782	Reserved
7783	Sequence #2 Batch Size - Meter #1
7784	Sequence #2 Batch Size - Meter #2
7785	Sequence #2 Batch Size - Meter #3
7786	Sequence #2 Batch Size - Meter #4
7787	Sequence #1 Batch Size - Meter #1
7788	Sequence #1 Batch Size - Meter #2
7789	Sequence #1 Batch Size - Meter #3
7790	Sequence #1 Batch Size - Meter #4
7791	Batch Preset Warning – Meter #1
7792	Batch Preset Warning - Meter #2
7793	Batch Preset Warning - Meter #3
7794	Batch Preset Warning - Meter #4
7795	Batch Preset Warning - Station
7796	Meter Factor - Meter #1
7797	Meter Factor - Meter #2
7798	Meter Factor - Meter #3
7799	Meter Factor - Meter #4
7800	Reserved

6.9. Meter Station 32-Bit IEEE Floating Point Data

7801	Station - Gross (IV) Flowrate Bbl/hr (Revision 20); m ³ /hr or liter/hr (Revision 24).
7802	Station - Net (GSV) Flowrate Bbl/hr (Revision 20); m ³ /hr or liter/hr (Revision 24).
7803	Station - Mass Flowrate Klbs/hr (Revision 20); ton/hr or kg/hr (Revision 24).
7804	Station - NSV Flowrate Bbl/hr (Revision 20); m ³ /hr or liter/hr (Revision 24).
7805	Gravity/Density
7806	Density Temperature
7807	Density Pressure
7808	Switch Bar Temperature (Valid for Revision 20.74.30 & Rev 24.74.30 or later only. This point is reserved for all previous revisions.)
7809	Auxiliary Input #1 Points 7809-7812 represent miscellaneous live input signals provided for user-defined functions.

7810	Auxiliary Input #2
7811	Auxiliary Input #3
7812	Auxiliary Input #4
7813	Time - hhmmss Read only (e.g. the number 103125 represents 10:31:25).
7814	Date - yymmdd Read only (e.g. the number 970527 represents May 27/ 97; the date format used here does not follow the US/European format selection).
7815	Reserved
7816	Reserved



+ **Notes:** Applies to Revision 24.74.19 or later only; Reserved in Revision 20.

+	7817	Trapil - Sample Volume
+	7818	Trapil - Hydraulic Alarm Threshold
+	7819	Trapil - Heavy Hydraulic Threshold
+	7820	Trapil - Training Mode Constant 'n'
	7821	Product #1 - API Override / Thermal Expansion Coefficient
	7821	Product #1 – Equilibrium Pressure (Table 40 Selected)
	7822	Product #1 - Specific Gravity / Reference Density Override
	7823	Product #2 - API Override / Thermal Expansion Coefficient
	7823	Product #2 – Equilibrium Pressure (Table 40 Selected)
	7824	Product #2 - Specific Gravity / Reference Density Override
	7825	Product #3 - API Override / Thermal Expansion Coefficient
	7826	Product #3 - Specific Gravity / Reference Density Override
	7827	Product #4 - API Override / Thermal Expansion Coefficient
	7828	Product #4 - Specific Gravity / Reference Density Override
	7829	Product #5 - API Override / Thermal Expansion Coefficient
	7830	Product #5 - Specific Gravity / Reference Density Override
	7831	Product #6 - API Override / Thermal Expansion Coefficient
	7832	Product #6 - Specific Gravity / Reference Density Override
	7833	Product #7 - API Override / Thermal Expansion Coefficient
	7834	Product #7 - Specific Gravity / Reference Density Override
	7835	Product #8 - API Override / Thermal Expansion Coefficient
	7836	Product #8 - Specific Gravity / Reference Density Override
	7837	Product #9 - API Override / Thermal Expansion Coefficient
	7838	Product #9 - Specific Gravity / Reference Density Override
	7839	Product #10 - API Override / Thermal Expansion Coefficient
	7840	Product #10 - Specific Gravity / Reference Density Override
	7841	Product #11 - API Override / Thermal Expansion Coefficient
	7842	Product #11 - Specific Gravity / Reference Density Override
	7843	Product #12 - API Override / Thermal Expansion Coefficient
	7844	Product #12 - Specific Gravity / Reference Density Override
	7845	Product #13 - API Override / Thermal Expansion Coefficient
	7846	Product #13 - Specific Gravity / Reference Density Override
	7847	Product #14 - API Override / Thermal Expansion Coefficient
	7848	Product #14 - Specific Gravity / Reference Density Override
	7849	Product #15 - API Override / Thermal Expansion Coefficient
	7850	Product #15 - Specific Gravity / Reference Density Override

7851	Product #16 - API Override / Thermal Expansion Coefficient
7852	Product #16 - Specific Gravity / Reference Density Override
7853	Gross/Mass Flowrate - Low Limit Indicates flow rate low limit in gross or mass units, depending on which unit is selected.
7854	Gross/Mass Flowrate - High Limit Indicates flow rate high limit in gross or mass units, depending on which unit is selected.
7855	Flow Threshold - Run Switch Flag #1 - Decreasing Flow See Station Flowrates below this set 1824 low
7856	Flow Threshold - Run Switch Flag #1 - Increasing Flow See Station Flowrates below above this set 1824 High
7857	Flow Threshold - Run Switch Flag #2 - Decreasing Flow See Station Flowrates above this set 1825 Low
7858	Flow Threshold - Run Switch Flag #2 - Increasing Flow See Station Flowrates above this set 1825 High
7859	Flow Threshold - Run Switch Flag #3 - Decreasing Flow See Station Flowrates below this set 1826 low
7860	Flow Threshold - Run Switch Flag #3 - Increasing Flow See Station Flowrates below above this set 1826 High
7861	Station - Pressure - Low Limit Points 7861-7865 are configuration settings used when the pressure is a live 4-20 mA input.
7862	Station - Pressure - High Limit
7863	Station - Pressure - Override
7864	Station - Pressure - @ 4mA
7865	Station - Pressure - @ 20mA
7866	Station - Gravity/Density - Low Limit Points 7866-7870 are configuration settings used when the gravity/density is a live 4-20 mA input.
7867	Station - Gravity/Density - High Limit
7868	Station - Gravity/Density - Override
7869	Station - Gravity/Density - @ 4mA
7870	Station - Gravity/Density - @ 20mA
7871	Station - Density Temperature - Low Limit Points 7871-7875 are configuration settings used when the gravity/density is a live 4-20 mA input.
7872	Station - Density Temperature - High Limit
7873	Station - Density Temperature - Override
7874	Station - Density Temperature - @ 4mA
7875	Station - Density Temperature - @ 20mA
7876	Station - Density Correction Factor



*** Notes:** Various factors used by various vendors of digital densitometers.

*	7877	Station - Densitometer - Constant #1 K_0/D_0 .
*	7878	Station - Densitometer - Constant #2 K_1/T_0 .
*	7879	Station - Densitometer - Constant #3 K_2/T_{coef} .
*	7880	Station - Densitometer - Constant #4 $K_{18}/T_{cal}/T_c$.

- * 7881 **Station - Densitometer - Constant #5**
 $K_{19}/P_{\text{coel}}/K_{11}$.
- * 7882 **Station - Densitometer - Constant #6**
 $K_{20A}/P_{\text{cal}}/K_{12}$.
- * 7883 **Station - Densitometer - Constant #7**
 K_{20B}/K_{13} .
- * 7884 **Station - Densitometer - Constant #8**
 K_{21A}/P_c .
- * 7885 **Station - Densitometer - Constant #9**
 K_{21B}/K_{P1} .
- * 7886 **Station - Densitometer - Constant #10**
 K_r . (For UGC densitometers: K_r/K_{P2} .)
- * 7887 **Station - Densitometer - Constant #11**
 K_j . (For UGC densitometers: K_j/K_{P3} .)



Notes: Miscellaneous conversion factors and constants.

- # 7888 **Weight of Water**
Lbm/Bbl (Revision 20) or Kg/m^3 . (Revision 24)
- # 7889 **Gravity Rate of Change**
Relative Density/BBL (Revision 20) or M3 or LTR (Revision 24)
- # 7890 **Line Pack Delay**
Net Bbl or m^3 .
- # 7891 **Local Atmospheric Pressure**
- # 7892 **Contract Base Temperature**
- # 7893 **gr/cc to lb/ft^3 Conversion Factor**
(Valid for Revision 20.74.22 or later only. This point is reserved for all previous Revision 20 Revisions and all Revision 24 Revisions.)
- # 7894 **Contract Base Pressure**
Check ABS or Gauge & State.
- 7895 **Reserved**
- 7896 **Auto Prove Mode - Startup Flow**
- 7897 **Auto Prove Mode - Maximum Flow between Proves**
- 7898 **Auto Prove Mode - Minimum Flow Rate Change**
- 7899 **Auto Prove Mode - Delta Flow Rate**
Flow rate unstable check.
- 7900 **Reserved**

6.10. Prover Data - IEEE Floating Point

7901	Prover - Inlet (Left) Temperature
7902	Prover - Outlet (Right) Temperature
7903	Prover - Temperature in Use
7904	Prover - Inlet (Left) Pressure
7905	Prover - Outlet (Right) Pressure
7906	Prover - Pressure in Use
7907	Prover - Plenum Pressure Compact Prover Only.
7908	Prover - Run Time
7909	Volume - Master Prove
7910	Volume - Test Meter
7911	Calculated Plenum Pressure
7912	Prover - Density/Gravity (API, SG,Kg/m3 and Gm/cc Type Densitometers)
7913	Prover - Density Temperature
7914	Prover - Density Pressure
7915	Prover - Uncorrected Density
7916	Prover – Density (Gm/cc or Kg/m3 Type Densitometers Only)
7917	Invar Rod/Switch Bar Temperature Small Volume Prover.
7918	Overtravel Bbls (Revision 20) and m3 (Revision 24)

6.10.1. Configuration Data for Prover

7919	Prover - Volume Bbls (Revision 20), m3 (Revision 24)
7920	Prover - Diameter Inches (Revision 20), mm (Revision 24).
7921	Prover - Wall Thickness Inches (Revision 20), mm (Revision 24).
7922	Prover - Modulus of Elasticity
7923	Prover - Coefficient of Cubic Expansion
7924	Prover - Base Pressure Check if ABS or Gauge & State it.
7925	Prover - Temperature Stability Limits
7926	Prove & Meter - Temperature Deviation °F (Revision 20) °C (Revision 24)
7927	Prover – Run Count or Meter Factor Deviation % [(Maximum Deviation - Minimum Deviation) / Minimum Deviation] x 100%.
7928	Prover - Acceptable Meter Factor Deviation % [(New Meter Factor - Previous Meter Factor) / Previous Meter Factor] x 100%.
7929	Prover – Temperature Inlet (Left) – Low
7930	Prover - Temperature Inlet (Left) - High Limit
7931	Prover - Temperature Inlet (Left) - Override
7932	Prover - Temperature Inlet (Left) - @ 4mA
7933	Prover - Temperature Inlet (Left) - @ 20mA
7934	Prover - Temperature Outlet (Right) - Low Limit to

7938	Prover - Temperature Outlet (Right) - @ 20mA
7939	Prover - Pressure Inlet (Left) - Low Limit
to	
7943	Prover - Pressure Inlet (Left) - @ 20mA
7944	Prover - Pressure Outlet (Right) - Low Limit
to	
7948	Prover - Pressure Outlet (Right) - @ 20mA
7949	Flow Rate % Change Threshold
7950	Linear Thermal Coefficient
7951	Plenum Pressure - Constant
7952	Plenum - Deadband %
7953	Plenum Pressure - @ 4mA
7954	Plenum Pressure - @ 20mA
7955	Prover - Volume Upstream
7956	Prover - Specific Gravity @ 60 °F / Density @ Meter Factor
7957	Prover - Temperature @ Meter Factor
7958	Prover - Pressure @ Meter Factor

6.10.2. Last Prove Data

7959	Prover - Volume
7960	Prover - Diameter
	Inches (Revision 20), mm (Revision 24).
7961	Prover - Wall Thickness
	Inches (Revision 20), mm (Revision 24).
7962	Prover - Modulus of Elasticity
7963	Prover - Coefficient of Cubic Expansion
7964	Prover - K Factor
7965	Prover - Master Meter K Factor
7966	Prover - Previous Flow Rate @ Meter Factor

6.10.3. Data Rejected During Prove

The following refers to the data rejected during Prove Run #3. The same data is available for the Last, 1st and 2nd Prove Runs at the following points:

7967	3 rd Run - Meter Temperature
7968	3 rd Run - Meter Pressure
7969	3 rd Run - Prover Temperature
7970	3 rd Run - Prover Pressure
7971	3 rd Run - Reference Gravity
7972	3 rd Run - Flowrate
7973	2 nd Run - Meter Temperature
to	
7978	2 nd Run - Flowrate
7979	1 st Run - Meter Temperature
to	
7984	1 st Run - Flowrate
7985	Last Run - Meter Temperature

to 7990 Last Run – Flowrate

6.10.4. Prove Run Data

The following data refers to Prove Run #1. The same data is available for all 10 prove runs at the following points:

7991	1 st Run - Meter Temperature
7992	1 st Run - Meter Pressure
7993	1 st Run - Prover Temperature
7994	1 st Run - Prover Pressure
7995	1 st Run - Specific Gravity @ 60 °F (Revision 20)/ Density @ Reference Temperature (Revision 24)
7996	1 st Run - Flowrate
7997	2 nd Run - Meter Temperature
to	
8002	2 nd Run - Flowrate
8003	3 rd Run - Meter Temperature
to	
8008	3 rd Run - Flowrate
8009	4 th Run - Meter Temperature
to	
8014	4 th Run - Flowrate
8015	5 th Run - Meter Temperature
to	
8020	5 th Run - Flowrate
8021	6 th Run - Meter Temperature
to	
8026	6 th Run - Flowrate
8027	7 th Run - Meter Temperature
to	
8032	7 th Run - Flowrate
8033	8 th Run - Meter Temperature
to	
8038	8th Run – Flowrate
8039	9th Run – Meter Temperature
to	
8044	9 th Run - Flowrate
8045	10 th Run - Meter Temperature
to	
8050	10 th Run – Flowrate

6.10.5. Prove Average Data

8051	Prove - Average Counts
8052	Prove - Average Meter Temperature
8053	Prove - Average Meter Pressure
8054	Prove - Average Prover Temperature
8055	Prove - Average Prover Pressure
8056	Prove - Average SG @ 60°F (Revision 20)/ Density @ Reference Temperature (Revision 24)
8057	Prove - Average Flowrate
8058	Prove - % Deviation Between Runs
8059	Prove - CTSP Prover Correction Factor for the Effect of Temperature on Steel.
8060	Prove - CPSP Prover Correction Factor for the Effect of Pressure on Steel.
8061	Prove - CTLP Prover Correction Factor for the Effect of Temperature on a Liquid.
8062	Prove - CPLP Prover Correction Factor for the Effect of Pressure on a Liquid.
8063	Prove - CCFP Prover Combined Correction Factor.
8064	Prove - Corrected Prover Volume Base Volume of Prover x [8063].
8065	Prove - Metered Volume
8066	Prove - CTLM Meter Correction Factor for the Effect of Temperature on a Liquid.
8067	Prove - CPLM Meter Correction Factor for the Effect of Pressure on a Liquid.
8068	Prove - CCFM Meter Combined Correction Factor.
8069	Prove - Corrected Meter Volume Meter Volume [8065] x [8068].
8070	Prove - Average Counts multiplied by Linear Correction Factor
8071	Prove - Meter Factor Deviation % from Previous Meter Factor
8072	Prove - Actual K Factor
8073	Prove - Average Flowmeter Hertz
8074	Prove - Prover Compressibility F Factor
8075	Prove - Meter Compressibility F Factor
8076	Prove - Average Observed Density
8077	Prove - Average SG @ 60°F (Revision 20)/ Density @ Reference Temperature (Revision 24)
8078	Prove - Average Linear Correction Factor
8079	Prove - Average Viscosity

6.10.6. Prove Run - Master Meter Data

The following detailed data refers to Master Meter Prove Run #1. The same data is available in the same order for all 10 prove runs at the following addresses:

8080	1 st Run - Master Meter - Volume -
8081	1 st Run - Master Meter - Meter Factor
8082	1 st Run - Master Meter - CTL
8083	1 st Run - Master Meter - CPL
8084	1 st Run - Master meter - CCF
8085	1 st Run - Master Meter - Corrected Volume
8086	1 st Run - Proved Meter - Volume
8087	1 st Run - Proved Meter - CTL
8088	1 st Run - Proved Meter - CPL
8089	1 st Run - Proved Meter - CCF Tester Meter CCF Run 1
8090	1 st Run - Corrected Meter Volume
8091	1 st Run - Meter Factor
8092	2 nd Run - Master Meter - Volume
	to
8103	2 nd Run - Meter Factor
8104	3 rd Run - Master Meter - Volume
	to
8115	3 rd Run - Meter Factor
8116	4 th Run - Master Meter - Volume
	to
8127	4 th Run - Meter Factor
8128	5 th Run - Master Meter - Volume
	to
8139	5th Run - Meter Factor
8140	6 th Run - Master Meter - Volume
	to
8151	6 th Run - Meter Factor
8152	7 th Run - Master Meter - Volume
	to
8163	7 th Run - Meter Factor
8164	8 th Run - Master Meter - Volume
	to
8175	8 th Run - Meter Factor
8176	9 th Run - Master Meter - Volume
	to
8187	9 th Run - Meter Factor
8188	10 th Run - Master Meter - Volume
	to
8199	10 th Run - Meter Factor

6.10.7. Proving Series Data



> **Notes:** Applies only to Revision 20 for US customary units. Reserved for Revision 24

-
- > 8200 Series #1 - Average Counts
 - > 8201 Series #1 - Average Meter Temperature
 - > 8202 Series #1 - Average Meter Pressure
 - > 8203 Series #1 - Average Prover Temperature
 - > 8204 Series #1 - Average Prover pressure
 - > 8205 Series #1 - Average Gravity @ 60 °F or Reference Temperature
 - > 8206 Series #1 - Average Flowrate
 - > 8207 Series #1 - CTSP
 - > 8208 Series #1 - CPSP
 - > 8209 Series #1 - CTLP
 - > 8210 Series #1 - CPLP
 - > 8211 Series #1 - Average Net Prover Volume
 - > 8212 Series #1 - CTLM
 - > 8213 Series #1 - CPLM
 - > 8214 Series #1 - Average Gross Meter Volume
 - > 8215 Series #1 - Net Meter Volume
 - > 8216 Series #1 - Prover Volume @ Prover Pressure
 - > 8217 Series #2 - Prover Volume @ Prover Pressure
 - > 8218 Series #1 - Meter Factor
 - > 8219 Series #2 - Meter Factor
 - >* 8220 Proving Meter - Gravity
 - >* 8221 Proving Meter - Density Temperature
 - >* 8222 Proving Meter - API @ 60 °F
 - >* 8223 Proving meter - Specific Gravity @ 60 °F

6.10.8. Data of Meter Being Proved

- 8224 Temperature
- 8225 Pressure
- 8226 Flowrate
- 8227 Transducer Density
- 8228 Specific Gravity @ 60 °F (Revision 20)/ Density @ Reference Temperature (Revision 24)
- 8229 API @ 60 °F(Revision 20) / API @ 15 °C Reference Temperature (Revision 24)
- 8230 Gross Flowrate

6.10.9. Mass Prove Data

The following data refers to Mass Prove Run #1. The same data is available for all 10 prove runs at the following addresses:

- 8231 1st Run - Prover Temperature
- 8232 1st Run - Prover Pressure
- 8233 1st Run - Prover Density or Linear Viscosity
- 8234 1st Run - Meter Temperature

8235	1 st Run - Meter Pressure
8236	1 st Run - Meter Density
8237	1 st Run - Meter Density @ Reference Temperature
8238	1 st Run - CTLP Prover Correction Factor for the Effect of Temperature on a Liquid.
8239	1 st Run - CPLP Prover Correction Factor for the Effect of Pressure on a Liquid.
8240	1 st Run - CTLM Meter Correction Factor for the Effect of Temperature on a Liquid.
8241	1 st Run - CPLM Meter Correction Factor for the Effect of Pressure on a Liquid.
8242	1 st Run - CTSP or LCF Correction Factor for the Effect of Temperature on Steel.
8243	1 st Run - CPSP Correction factor for the Effect of Pressure on Steel.
8244	1 st Run – Prove Volume
8245	1 st Run - Prove Mass
8246	1 st Run - Meter Mass
8247	1 st Run - Meter Factor
8248	2 nd Run - Prover Temperature
to	
8264	2 nd Run - Meter Factor
8265	3 rd Run - Prover Temperature
to	
8281	3 rd Run - Meter Factor
8282	4 th Run - Prover Temperature
to	
8298	4 th Run - Meter Factor
8299	5 th Run - Prover Temperature
to	
8315	5 th Run - Meter Factor
8316	6 th Run - Prover Temperature
to	
8332	6 th Run - Meter Factor
8333	7 th Run - Prover Temperature
to	
8349	7 th Run - Meter Factor
8350	8 th Run - Prover Temperature
to	
8366	8 th Run - Meter Factor
8367	9 th Run - Prover Temperature
to	
8383	9 th Run - Meter Factor
8384	10 th Run - Prover Temperature
to	
8400	10 th Run - Meter Factor
8401	Linear Meter Volume
8402	Linear Corrected Meter Volume
8403	Average Prover Density of Runs

8404 Reserved
to
8410 Reserved



Notes: See 5n50 and 5850 for matching totalizer data.

8411 Master Meter Linear Correction Factor 1st Run
8412 Master Meter Viscosity 1st Run
8413 Master Meter Lineared Volume 1st Run
8414 Test Meter Linearizing Correction Factor 1st Run
8415 Test Meter Viscosity 1st Run
8416 Test Meter Linearizing Volume 1st Run
8517 Linearizing Meter Factor 1st Run
8418 Master Meter Linear Correction Factor 2nd Run
to
8524 Lineared Meter Factor 2nd Run
8425 Master Meter Linear Correction Factor 3rd Run
to
8431 Lineared Meter Factor 3rd Run
8432 Master Meter Linear Correction Factor 4th Run
to
8438 Lineared Meter Factor 4th Run
8439 Master Meter Linear Correction Factor 5th Run
to
8445 Lineared Meter Factor 5th Run
8446 Master Meter Linear Correction Factor 6th Run
to
8452 Lineared Meter Factor 6th Run
8453 Master Meter Linear Correction Factor 7th Run
to
8459 Lineared Meter Factor 7th Run
8460 Master Meter Linear Correction Factor 8th Run
to
8466 Lineared Meter Factor 8th Run
8467 Master Meter Linear Correction Factor 9th Run
to
8473 Lineared Meter Factor 9th Run

8474 Master Meter Linear Correction Factor 10th Run
to
8480 Lineared Meter Factor 10th Run

8481 Reserved
to
8499 Reserved

6.11. Miscellaneous Meter Run 32-Bit IEEE Floating

Point Data

The following data refers to Meter Run #1. The same data is available for all meter runs at the following addresses:

- o **Meter Run #1 @ 8501 through 8599**
- o **Meter Run #2 @ 8601 through 8699**
- o **Meter Run #3 @ 8701 through 8799**
- o **Meter Run #4 @ 8801 through 8899**

6.11.1. Previous Batch Average



Previous Batch Average: Refers to data stored at the time of the last Batch End command. It will remain valid until the next batch end. This is the data that should be used by SCADA or MMIs to build Monthly or Batch reports.



Note: See 5n50 and 5850 for matching totalizer data.

8501	Previous Batch 'n' - Average Temperature
8502	Previous Batch 'n' - Average Pressure
8503	Previous Batch 'n' - Average Density
8504	Previous Batch 'n' - Average VCF
8505	Previous Batch 'n' - Average CPL
8506	Previous Batch 'n' - Average Meter factor
8507	Previous Batch 'n' - Average Specific Gravity
8508	Previous Batch 'n' - Average SG @ 60 °F (Revision 20) / Density @ Reference Temperature (Revision 24)
8509	Previous Batch 'n' - Average Density Temperature
8510	Previous Batch 'n' - Average Density Pressure
8511	Previous Batch 'n' - Average Density Correction Factor
8512	Previous Batch 'n' - Average Unfactored Density
8513	Previous Batch 'n' - Average K Factor
8514	Previous Batch 'n' - Average Viscosity
8515	Previous Batch 'n' - Average Linear Correction Factor
8516	Previous Batch 'n' - Average Gross Flowrate
8517	Previous Batch 'n' - Average %S&W
8518	Previous Batch 'n' - Average Equilibrium Pressure
8519	Previous Batch 'n' - Average API @ 60 °F (Revision 20) / Density @ Reference Temperature (Revision 24)

6.11.2. Previous Hour's Average



Previous Hour's Average: Refers to data stored at the end of the last hour. It is valid for one hour and is then overwritten. This is the data that should be used by SCADA or MMIs which need hourly averages.

8520	Previous Hours - Average Temperature
8521	Previous Hours - Average Pressure
8522	Previous Hours - Average Density

8523	Previous Hours - Average Specific Gravity @ 60°F (Revision 20) / Density @ Reference Temperature (Revision 24)
8524	Previous Hours - Average K Factor
8525	Previous Hours - Average Meter Factor
8526	Previous Hours - Average %S&W
8527	Meter #1 previous batch 'n' CTPL
8528	Meter #1 batch in progress average CTPL
8529	Reserved
8530	Meter #1 Previous Day Avg API@60 (Revision 20, Reserved 24)

6.11.3. Previous Day's Average



Previous Day's Average: Refers to data stored at the end of the contract day. It is valid for 24 hours and is then overwritten at the 'day start hour'. This is the data that should be used by SCADA or MMLs to build daily reports.

8531	Previous Day's - Average Temperature
8532	Previous Day's - Average Pressure
8533	Previous Day's - Average Density
8534	Previous Day's - Average VCF
8535	Previous Day's - Average CPL
8536	Previous Day's - Average Meter Factor
8537	Previous Day's - Average Specific Gravity
8538	Previous Day's - Average SG 60 °F / Density @ Reference Temperature
8539	Previous Day's - Average Density Temperature
8540	Previous Day's - Average Density Pressures
8541	Previous Day's - Average Density Correction Factor
8542	Previous Day's - Average Unfactored density
8543	Previous Day's - Average K Factor
8544	Previous Day's - Average Viscosity
8545	Previous Day's - Average Linear Correction Factor
8546	Previous Day's - Average Gross Flowrate
8547	Previous Day's - Average %S&W
8548	Previous Day's - Average Equilibrium Pressure
8549	Previous Day's - Gross (IV) in Float Format Bbl/m ³ .
8550	Previous Day's - Net (GSV) in Float Format Bbl/m ³ .
8551	Previous Day's - Mass in Float Format Klb/ton.
8552	Previous Day's - NSV in Float Format Bbl/m ³ .
8553	Previous Day's - Net @ 2 nd Reference Temperature in Float Format
8554	Meter #1 previous day CTPL
8555	Meter #1 daily in progress average CTPL

6.11.4. Statistical Moving Window Averages of Transducer Inputs

8556	Moving Hour - Transducer Input - Average Temperature
8557	Moving Hour - Transducer Input - Average Pressure
8558	Moving Hour - Transducer Input - Average Density
8559	Moving Hour - Transducer Input - Average Density Temperature
8560	Moving Hour - Transducer Input - Average Density Pressure

6.11.5. Miscellaneous In Progress Averages

8561	In Progress - Density Correction Factor - Batch Average
8562	In Progress - Density Correction Factor - Daily Average
8563	In Progress - Unfactored Density - Batch Average
8564	In Progress - Unfactored Density - Daily Average



> **Notes:** Applies only to Revision 24 for metric units

-
- > **8565** Meter #1 Density @ 2nd Reference Temperature (*Revision 24, Reserved 20*)
 - > **8566** Meter #1 VCF of Flowing Temperature to 2nd Reference Temp (*Revision 24, Reserved 20*)

6.11.6. Previous Batch and Daily Average Data

- > **8567** VCF @ 15 °C
- > **8568** VCF @ Reference Temperature
- > **8569** Density @ Reference Temperature

6.11.7. More Miscellaneous In Progress Averages

8570	In Progress - Hourly Average - Temperature
8571	In Progress - Hourly Average - Pressure
8572	In Progress - Hourly Average - Density
8573	In Progress - Hourly Average - Specific Gravity @ 60°F (Revision 20)/ Density @ Reference Temperature (Revision 24)
8574	In Progress - Hourly Average - K Factor
8575	In Progress - Hourly Average - Meter Factor
8576	In Progress - Hourly Average - %S&W
8577	In Progress - Batch Average - Viscosity
8578	In Progress - Batch Average - Linear Correction Factor
8579	In Progress - Batch Average - Gross Flowrate
8580	In Progress - Daily Average - Viscosity
8581	In Progress - Daily Average - Linear Correction Factor
8582	In Progress - Daily Average - Gross Flowrate
8583	In Progress - Daily Average - %S&W
8584	In Progress - Batch Average - %S&W
8585	Meter #1 Ctpl (API 11.1 2004) (Revision 20, and Revision 24)

6.11.8. Previous Batch Quantities



Previous Batch Quantities: Refers to data stored at the time of the last 'Batch End' command. It will remain valid until the next batch end. These variables are floating point duplicates of integer data at 5n50 area. These points are for MMI or SCADA retrieval, not for Batch recalculation.



Note: See 8501 area for other Previous Batch data

8586	Previous Batch - Gross (IV) in Float Format
8587	Previous Batch - Net (GSV) in Float Format
8588	Previous Batch - Mass in Float Format
8589	Previous Batch - NSV in Float Format
8590	Previous Batch - Net @ 2 nd Reference Temperature

6.11.9. Miscellaneous Live or Calculated Data

- > 8591 **Specific Gravity @ 60°F**
Calculated Specific Gravity @ 60°F using Table 23B when Table 24C is selected.
Density @15°C
Calculated Density @ 15°C using Table 53B when Table 54C is selected.
- 8592 **Meter #1 Density kg/m3 at reference condition (API 11.1 2004)**
- 8593 **Meter #1 Density kg/m3 at alternative condition (API 11.1 2004)**
- 8594 **Meter Density in Use**
- 8595 **Meter #1 Meter Sg**
- 8595 **Meter #1 Calculated Alpha60 if Table Selected 40**
- 8596 **Water Density kg/m3 (Table Select 27)**
- 8597 **Meter Current - %S&W**
- 8598 **Meter Current - CSW**
- 8599 **Meter Current - VCF @ 2nd Reference Temperature**
- 8600 **Reserved**
- 8601 **Meter 2 - Miscellaneous 32-Bit IEEE Floating Point Data**
to
- 8699 **Meter 2 - Miscellaneous 32-Bit IEEE Floating Point Data**
- 8700 **Reserved**
- 8701 **Meter 3 - Miscellaneous 32-Bit IEEE Floating Point Data**
to
- 8799 **Meter 3 - Miscellaneous 32-Bit IEEE Floating Point Data**
- 8800 **Reserved**
- 8801 **Meter 4 - Miscellaneous 32-Bit IEEE Floating Point Data**
to
- 8899 **Meter 4 - Miscellaneous 32-Bit IEEE Floating Point Data**
- 8900 **Reserved**

6.11.10. Station - Previous Batch Average Data

8901	Station - Previous Batch 'n' - Average Temperature
8902	Station - Previous Batch 'n' - Average Pressure
8903	Station - Previous Batch 'n' - Average Density
8904	Station - Previous Batch 'n' - Average VCF
8905	Station - Previous Batch 'n' - Average CPL
8906	Station - Previous Batch 'n' - Average Meter Factor
8907	Station - Previous Batch 'n' - Average Specific Gravity
8908	Station - Previous Batch 'n' - Average Specific Gravity @ 60 °F (Revision 20)/ Density @ Reference Temperature (Revision 24)
8909	Station - Previous Batch 'n' - Average Density Temperature
8910	Station - Previous Batch 'n' - Average Density Pressure
8911	Station - Previous Batch 'n' - Average Density Correction Factor
8912	Station - Previous Batch 'n' - Average Unfactored Density
8913	Station - Previous Batch 'n' - Average K Factor
8914	Station - Previous Batch 'n' - Average Viscosity
8915	Station - Previous Batch 'n' - Average Linear Correction Factor
8916	Station - Previous Batch 'n' - Average Gross Flowrate
8917	Station - Previous Batch 'n' - Average %S&W
8918	Station - Previous Batch 'n' - Average Equilibrium Pressure
8919	Station - Previous Batch 'n' - Average API @ 60 °F(Revision 20)/ Density @ Reference Temperature (Revision 24)
8920	Station - Previous Batch 'n' - Average API (Revision 20)/ Density @ Reference Temperature (Revision 24)
8921	Reserved
to	
8926	Reserved
8927	Station batch average CTPL (When API 11.01 is selected)
8921	Reserved
to	
8926	Reserved
8931	Station - Previous Daily - Average Temperature
8932	Station - Previous Daily - Average Pressure
8933	Station - Previous Daily - Average Density
8934	Station - Previous Daily - Average VCF
8935	Station - Previous Daily - Average CPL
8936	Station - Previous Daily - Average Meter Factor
8937	Station - Previous Daily - Average Specific Gravity
8938	Station - Previous Daily - Average Specific Gravity @ 60 °F (Revision 20)/ Density @ Reference Temperature (Revision 24)
8939	Station - Previous Daily - Average Density Temperature
8940	Station - Previous Daily - Average Density Pressure
8941	Station - Previous Daily - Average Density Correction factor
8942	Station - Previous Daily - Average Unfactored Density
8943	Station - Previous Daily - Average K Factor

8944	Station - Previous Daily - Average Viscosity
8945	Station - Previous Daily - Average Linearizing Correction Factor
8946	Station - Previous Daily - Average Gross Flowrate
8947	Station - Previous Daily - Average %S&W
8948	Station - Previous Daily - Average Equilibrium Pressure
8949	Station - Previous Daily - Gross (IV) in Float Format
8950	Station - Previous Daily - Net (GSV) in Float Format
8951	Station - Previous Daily - Mass in Float Format
8952	Station - Previous Daily - NSV in Float Format
8953	Station - Previous Daily - 2 nd Net @ Reference Temperature in Float Format
8954	Station - Previous Daily Average – API
8955	Station - Previous Daily Average - API @ 60 °F
8956	Station daily average CTPL (API 11.01 is selected)
8957	Reserved
to	
8960	Reserved
8961	Station - Current Batch - Flow Weighted Average - Temperature
8962	Station - Current Batch - Flow Weighted Average - Pressure
8963	Station - Current Batch - Flow Weighted Average - Density
8964	Station - Current Batch - Flow Weighted Average - VCF
8965	Station - Current Batch - Flow Weighted Average - CPL
8966	Station - Current Batch - Flow Weighted Average - Meter Factor
8967	Station - Current Batch - Flow Weighted Average - Specific Gravity
8968	Station - Current Batch - Flow Weighted Average - SG60 (Revision 20) / Dens @ Ref (Revision 24)
8969	Station - Current Batch - Flow Weighted Average - Density Temp
8970	Station - Current Batch - Flow Weighted Average - Density Pressure
8971	Station - Current Batch - Flow Weighted Average - Dens Corr Factor
8972	Station - Current Batch - Flow Weighted Average - Unfactored Density
8973	Station - Current Batch - Flow Weighted Average - K Factor
8974	Station - Current Batch - Flow Weighted Average - Viscosity
8975	Station - Current Batch - Flow Weighted Average - LCF
8976	Station - Current Batch - Flow Weighted Average - Gross Flowrate
8977	Station - Current Batch - Flow Weighted Average - %S&W
8978	Station - Current Batch - Flow Weighted Average - Equilibrium Pressure
8979	Station - Current Batch - Flow Weighted Average - API60
8980	Station - Current Batch - Flow Weighted Average - API
8981	Reserved
to	
8985	Reserved
8986	Station - Previous Batch - Gross (IV) in Float Format
8987	Station - Previous Batch - Net (GSV) in Float Format
8988	Station - Previous Batch - Mass in Float Format
8989	Station - Previous Batch - NSV in Float Format
8990	Station - Previous Batch - Net @ 2 nd Reference Temperature

8991 Reserved
to
9000 Reserved

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Chapter 7

ASCII Text Data Buffers (9001 - 9499)

7.1. Custom Report Templates



Info: These ASCII text buffers are accessed using Modbus function codes 65 for reads and 66 for writes. The index number for each **9000** type variable refers to the complete text buffer which may be as big as 8192 bytes. Data is transmitted or received as multiple transmissions of 128 byte packets. See 1.5.9 & 1.5.10

These are ASCII text files which serve as a format template for certain printed reports.

- 9001 Report Template - Snapshot / Interval
- 9002 Report Template - Batch
- 9003 Report Template - Daily
- 9004 Report Template - Prove
- 9005 Reserved
- to
- 9100 Reserved

7.2. Previous Batch Reports

Copies of the last 8 Batch Reports are stored.(See Also Buffer Status Points 15221 – 15268 & 15351 – 15358)

- 9101 Batch Report - Last
- 9102 Batch Report - 2nd Last
- 9103 Batch Report - 3rd Last
- 9104 Batch Report - 4th Last
- 9105 Batch Report - 5th Last
- 9106 Batch Report - 6th Last
- 9107 Batch Report - 7th Last
- 9108 Batch Report - 8th Last
- 9109 Reserved
- to
- 9200 Reserved

7.3. Previous Prove Reports

Copies of the last 8 Prove Reports are stored. (See Buffer Status Points 15271 – 15308)

9201	Prove Report - Last
9202	Prove Report - 2 nd Last
9203	Prove Report - 3 rd Last
9204	Prove Report - 4 th Last
9205	Prove Report - 5 th Last
9206	Prove Report - 6 th Last
9207	Prove Report - 7 th Last
9208	Prove Report - 8 th Last
9209	Reserved
to	
9300	Reserved

7.4. Previous Daily Reports

Copies of the last 8 Daily Reports are stored. (See Buffer Status Points 15311 – 15348)

9301	Previous Day's Report - Last
9302	Previous Day's Report - 2 nd Last
9303	Previous Day's Report - 3 rd Last
9304	Previous Day's Report - 4 th Last
9305	Previous Day's Report - 5 th Last
9306	Previous Day's Report - 6 th Last
9307	Previous Day's Report - 7 th Last
9308	Previous Day's Report - 8 th Last
9309	Reserved
to	
9400	Reserved

7.5. Last Snapshot Report

9401	Last Local Snapshot / Interval Report
------	---------------------------------------

7.6. Miscellaneous Report Buffer

The following buffer is used to retrieve miscellaneous reports. Report data is loaded into this buffer depending on which bit is written to integer point **15129**. (See Chapter 8 for details.) Reports which are retrieved using this buffer are:

- o Current Snapshot Report
- o Alarm Report
- o Audit Trail Report
- o Status Report
- o Product File Report

Text Archive Data defined by integers **15127** and **15128** is also retrieved using this buffer. (See Chapter 8 for details.)

9402	Miscellaneous Report Buffer
9403	Reserved
to	
9900	Reserved
9901	SE1- Ethernet Configuration Data
9902	SE2- Ethernet Configuration Data
9903	SE3- Ethernet Configuration Data
9904	Reserved
to	
13000	Reserved

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Chapter 8

Flow Computer Configuration Data (13001 - 18999)

8.1. Flow Computer Configuration 16-Bit Integer Data



Caution: Flow computer configuration data is critical to the correct operation of the flow computer. Any modifications to this data while operating the flow computer could cause unpredictable results which could cause measurement or control errors. Users are encouraged to consult with OMNI Flow Computers, Inc. before manipulating configuration data directly via a serial port or programmable variable statements.



Info: These short integers are accessed using Modbus function code 03 for reads, 06 for single writes, and 16 for multiple point writes.

8.1.1. Meter Run Configuration Data

13001	Meter Run #1 - Flow I/O Point
13002	Meter Run #1 - Temperature I/O Point
13003	Meter Run #1 - Temperature Type 0=DIN RTD; 1=Amer RTD; 2=4-20mA/Honeywell.
13004	Meter Run #1 - Pressure I/O Point
13005	Meter Run #1 - Density I/O Point
13006	Meter Run #1 - Density Type 1=API; 2=SG; 3=gr/cc; 4=Solartron; 5=Sarasota; 6=UGC.
13007	Meter Run #1 - Density Temperature I/O Point
13008	Meter Run #1 - Density Temperature Type 0=DIN RTD; 1=Amer RTD; 2=4-20mA/Honeywell.
13009	Meter Run #1 - Density Press I/O Point
13010	Meter Run #1 - Density @ Reference Conditions 0=Flowing; 1=Reference.
13011	Reserved
13012	Reserved
13013	Meter Run #1 - Flowmeter Dual Pulse Fidelity 0=No; 1=Yes.
13014	Meter Run #2 - Flow I/O Point
to	
13023	Meter Run #2 - Density @ Reference Conditions
13024	Reserved
13025	Reserved
13026	Meter Run #2 - Flowmeter Dual Pulse Fidelity
13027	Meter Run #3 - Flow I/O Point
to	
13036	Meter Run #3 - Density @ Reference Conditions

13037	Reserved
13038	Reserved
13039	Meter Run #3 - Flowmeter Dual Pulse Fidelity
13040	Meter Run #4 - Flow I/O Point
to	
13049	Meter Run #4 - Density @ Reference Conditions
13050	Reserved
13051	Reserved
13052	Meter Run #4 - Flowmeter Dual Pulse Fidelity

8.1.2. Prover Configuration 16-Bit Integer Data

13053	Prover - Temperature Inlet (Left) - I/O Point
13054	Prover - Temperature Inlet (Left) - Type 0=DIN RTD; 1=Amer RTD; 2=4-20mA/Honeywell.
13055	Prover - Temperature Outlet (Right) - I/O Point
13056	Prover - Temperature Outlet (Right) - Type 0=DIN RTD; 1=Amer RTD; 2=4-20mA/Honeywell.
13057	Prover - Pressure Inlet (Left) - I/O Point
13058	Prover - Pressure Outlet (Right) - I/O Point
13059	Prover - Plenum Pressure - I/O Point
13060	Prover - Density Temperature - I/O Point
13061	Prover - Density Temperature - Type 0=DIN RTD; 1=Amer RTD; 2=4-20mA/Honeywell.
13062	Prover - Density Pressure - I/O Point
13063	Gravity Sample Time Seconds.
13064	Station - Pressure - I/O Point
13065	Station - Density - I/O Point
13066	Station - Density - Type 1=API; 2=SG; 3=gr/cc; 4=Solartron; 5=Sarasota; 6=UGC.
13067	Station - Density Temperature - I/O Point
13068	Station - Density Temperature - Type 0=DIN RTD; 1=Amer RTD; 2=4-20mA/Honeywell.
13069	Prover - Density - I/O Point
13070	Prover - Density - Type 1=API; 2=SG; 3=gr/cc; 4=Solartron; 5=Sarasota; 6=UGC.
13071	Select Pressure Unit (<i>Revision 24, Reserved 20</i>) 0=kpa; 1=Bar; 2= kg/cm ² .
13072	Reserved
13073	# of SE Cards Installed

8.1.3. General Flow Computer Configuration 16-Bit Integer Data

13074	Flow Computer Type 0=3000; 1=6000.
13075	Number of A Combo Modules Installed
13076	Number of B Combo Modules Installed
13077	Number of C Combo Modules Installed
13078	Number of Digital Modules Installed
13079	Number of Serial Modules Installed
13080	Number of E Combo Modules Installed
13081	Number of H Combo Modules Installed
13082	Number of ED Combo Modules Installed
13083	Reserved
13084	Reserved

8.1.4. Serial Port Configuration 16-Bit Integer Data

13085	Serial Port #1 - Port Type 0=Printer; 1=Modbus.
13086	Serial Port #1 - ID Read only point which reports back the number of the port you are connected to.
13087	Serial Port #1 - Baud Rate 1200-38400 bps.
13088	Serial Port #1 - Data Bits 7 or 8.
13089	Serial Port #1 - Stop Bits 0, 1 or 2.
13090	Serial Port #1 - Parity O, E, N.
13091	Serial Port #1 - Transmit Key Delay 0=0hms; 1=50 msec; 2=100 msec; 3=150 msec.
13092	Serial Port #1 - Modbus ID 0-247.
13093	Serial Port #1 - Protocol Type 0=RTU; 1=ASCII; 2=RTU Modem.
13094	Serial Port #1 - Enable CRC Checking 0=No CRC, 1=CRC check.
13095	Serial Port #1 - Modicon Compatible 0=Omni Mode; 1=Modicon 984 Mode.
13096	Serial Port #2 - Baud Rate
13097	Serial Port #2 - Data Bits
13098	Serial Port #2 - Stop Bits
13099	Serial Port #2 - Parity
13100	Serial Port #2 - Transmit Key Delay
13101	Serial Port #2 - Modbus ID
13102	Serial Port #2 - Modbus Mode RTU / ASCII
13103	Serial Port #2 - Enable CRC Checking
13104	Serial Port #2 - Modicon Compatible 0=Omni; 1=Modicon 984 compatible.

13105	Reserved
to	
13107	Reserved
13108	Serial Port #3 - Baud Rate
13109	Serial Port #3 - Data Bits
13110	Serial Port #3 - Stop Bits
13111	Serial Port #3 - Parity
13112	Serial Port #3 - Transmit Delay
13113	Serial Port #3 - Modbus or Node ID
13114	Serial Port #3 - Protocol Type 0=Modbus RTU; 1=Modbus ASCII; 2=Modbus RTU Modem (Relaxed Timing).
13115	Serial Port #3 - Enable CRC Checking
13116	Serial Port #3 - Modicon™ Compatible 0=Omni; 1=984 compatible.
13117	Reserved
13118	Switch Bar Temperature I/O Point
13119	Switch Bar Temperature I/O Type Added to Rev 20.74.30 & Rev 24.70.30
13120	Serial Port #4 - Baud Rate
13121	Serial Port #4 - Data Bits
13122	Serial Port #4 - Stop Bits
13123	Serial Port #4 - Parity
13124	Serial Port #4 - Transmit Delay
13125	Serial Port #4 - Enable CRC Checking
13126	Serial Port #4 - Modbus or Node ID
13127	Serial Port #4 - Protocol Type 0=Modbus RTU; 1=Modbus ASCII; 2=Modbus RTU Modem (Relaxed Timing); 3=Allen-Bradley Full Duplex DF1; 4=Allen-Bradley Half Duplex.
13128	Serial Port #4 - Modicon Compatible 0=Omni, 1=984 compatible. If Allen-Bradley Protocol selected above: 0=CRC; 1=BCC error checking.

8.1.5. Proportional Integral Derivative (PID) Configuration 16-Bit Integer Data

13129	PID Loop #1 - I/O Point Assignment - Remote Setpoint
13130	PID Loop #1 - Primary Variable
13131	PID Loop #1 - Secondary Variable
13132	PID Loop #1 - Primary Action 0=Forward; 1=Reverse.
13133	PID Loop #1 - Secondary Action 0=Forward; 1=Reverse.
13134	PID Loop #1 - Error Select 0=Low; 1=High.
13135	PID Loop #1 - Startup Mode 0=Last state; 1=Manual.
13136	PID Loop #2 - I/O Point Assignment - Remote Setpoint
to	
13142	PID Loop #2 - Startup Mode

13143	PID Loop #3 - I/O Point Assignment - Remote Setpoint to
13149	PID Loop #3 - Startup Mode
13150	PID Loop #4 - I/O Point Assignment - Remote Setpoint to
13156	PID Loop #4 - Startup Mode
13157	I/O Point Assignment - Auxiliary Input #1
13158	I/O Point Assignment - Auxiliary Input #2
13159	I/O Point Assignment - Auxiliary Input #3
13160	I/O Point Assignment - Auxiliary Input #4

8.1.6. Programmable Logic Controller Configuration 16-Bit Integer Data

13161	PLC Group #1 - Starting Address <small>Allen-Bradley PLC-2 Translation Tables.</small>
13162	PLC Group #1 - Index 1
13163	PLC Group #1 - Number of Points 1
13164	PLC Group #1 - Index 2
13165	PLC Group #1 - Number of Points 2
13166	PLC Group #1 - Index 3
13167	PLC Group #1 - Number of Points 3
13168	PLC Group #1 - Index 4
13169	PLC Group #1 - Number of Points 4
13170	PLC Group #1 - Index 5
13171	PLC Group #1 - Number of Points 5
13172	PLC Group #1 - Index 6
13173	PLC Group #1 - Number of Points 6
13174	PLC Group #1 - Index 7
13175	PLC Group #1 - Number of Points 7
13176	PLC Group #1 - Index 8
13177	PLC Group #1 - Number of Points 8
13178	PLC Group #1 - Index 9
13179	PLC Group #1 - Number of Points 9
13180	PLC Group #1 - Index 10
13181	PLC Group #1 - Number of Points 10
13182	PLC Group #1 - Index 11
13183	PLC Group #1 - Number of Points 11
13184	PLC Group #1 - Index 12
13185	PLC Group #1 - Number of Points 12
13186	PLC Group #1 - Index 13
13187	PLC Group #1 - Number of Points 13
13188	PLC Group #1 - Index 14
13189	PLC Group #1 - Number of Points 14
13190	PLC Group #1 - Index 15
13191	PLC Group #1 - Number of Points 15
13192	PLC Group #1 - Index 16

13193	PLC Group #1 - Number of Points 16
13194	PLC Group #2 - Starting Address
13195	PLC Group #2 - Index 1
	to
13225	PLC Group #2 - Index 16
13226	PLC Group #2 - Number of Points 16
13227	PLC Group #3 - Starting Address
13228	PLC Group #3 - Index 1
	to
13258	PLC Group #3 - Index 16
13259	PLC Group #3 - Number of Points 16
13260	PLC Group #4 - Starting Address
13261	PLC Group #4 - Index 1
	to
13271	PLC Group #4 - Index 6
13272	PLC Group #4 - Number of Points 6
13273	PLC Group #5 - Starting Address
13274	PLC Group #5 - Index 1
	to
13284	PLC Group #5 - Index 6
13285	PLC Group #5 - Number of Points 6
13286	Reserved
	to
13288	Reserved
13289	Mass Pulses - Meter #1
	For points 13289-13292: 0=No; 1=Yes.
13290	Mass Pulses - Meter #2
13291	Mass Pulses - Meter #3
13292	Mass Pulses - Meter #4
13293	Input Type - Auxiliary Input #1
	For points 13293-13296: 0=DIN; 1=Amer; 2=4-20mA.
13294	Input Type - Auxiliary Input #2
13295	Input Type - Auxiliary Input #3
13296	Input Type - Auxiliary Input #4
13297	Start batch with current time/date if meter is not active
	(0=No, 1=Yes, default is No) added to Rev 20.74.30 & Rev 24.70.30
13298	Reserved
	to
13299	Reserved

8.1.7. Peer-to-Peer Setup Entries 16-Bit Integer Data

13300	Current Master ID Real-time. Shows current peer-to-peer master.
13301	Reserved Point Debug only.
13302	Transaction #1 - Slave ID
13303	Transaction #1 - Read / Write
13304	Transaction #1 - Source Index
13305	Transaction #1 - Number of Points
13306	Transaction #1 - Destination Index
13307	Transaction #2 - Slave ID
to	
13311	Transaction #2 - Destination Index
13312	Transaction #3 - Slave ID
to	
13316	Transaction #3 - Destination Index
13317	Transaction #4 - Slave ID
to	
13321	Transaction #4 - Destination Index
13322	Transaction #5 - Slave ID
to	
13326	Transaction #5 - Destination Index
13327	Transaction #6 - Slave ID
to	
13331	Transaction #6 - Destination Index
13332	Transaction #7 - Slave ID
to	
13336	Transaction #7 - Destination
13337	Transaction #8 - Slave ID
to	
13341	Transaction #8 - Destination Index
13342	Transaction #9 - Slave ID
to	
13346	Transaction #9 - Destination Index
13347	Transaction #10 - Slave ID
to	
13351	Transaction #10 - Destination Index
13352	Transaction #11 - Slave ID
to	
13356	Transaction #11 - Destination Index
13357	Transaction #12 - Slave ID
to	
13361	Transaction #12 - Destination Index
13362	Transaction #13 - Slave ID
to	
13366	Transaction #13 - Destination Index

13367	Transaction #14 - Slave ID
	to
13371	Transaction #14 - Destination Index
13372	Transaction #15 - Slave ID
	to
13376	Transaction #15 - Destination Index
13377	Transaction #16 - Slave ID
	to
13381	Transaction #16 – Destination
13382	Next Master ID
	A non zero entry here turns on peer-to-peer mode.
13383	Last Master ID In Sequence
13384	Retry Timer
	Number of 50 msec ticks between retries; default=3.
13385	Activate Redundancy Mode
	0=single unit; 1=dual flow computer system.
13386	Number of Decimal Places for Gross Totalizer
13387	Number of Decimal Places for Net Totalizer
13388	Number of Decimal Places for Mass Totalizer
13389	Number of Decimal Places for Energy
13390	Number of Decimal Places for Factors on Batch Report
13391	Number of Decimal Places for Meter Factor on Batch Report
13392	Number of Decimal Places for Factors on Prove Report
13393	Number of Decimal Places for Meter Factor on Prove Report
13394	Reserved
13395	Peer to Peer Default Mastership on Power UP
	0=No; 1=Yes
13396	Override Code - Auxiliary Input #1
13397	Override Code - Auxiliary Input #2
13398	Override Code - Auxiliary Input #3
13399	Override Code - Auxiliary Input #4
13400	Reserved
13401	Reserved
13402	Meter Run #1 - Temperature Damping Factor
13403	Meter Run #1 - Pressure Damping Factor
13404	Meter Run #1 - Density Temp Damping Factor
13405	Meter Run #1 - Density Press Damping Factor
13406	Reserved
13407	Reserved
13408	Meter Run #2 - Temperature Damping Factor
	to
13411	Meter Run #2 - Density Press Damping Factor
13412	Reserved
13413	Reserved
13414	Meter Run #3 - Temperature Damping Factor
	to
13417	Meter Run #3 - Density Press Damping Factor

13418	Reserved
13419	Reserved
13420	Meter Run #4 - Temperature Damping Factor
to	
13423	Meter Run #4 - Density Press Damping Factor
13424	Damping Factor - Station - Density Temperature
13425	Damping Factor - Station - Density Pressure
13426	Damping Factor - Prover - Inlet (Left) Temperature
13427	Damping Factor - Prover - Outlet (Right) Temperature
13428	Damping Factor - Prover - Inlet (Left) Pressure
13429	Damping Factor - Prover - Outlet (Right) Pressure
13430	Damping Factor - Plenum Pressure
13431	Damping Factor - Prover - Density Temperature
13432	Damping Factor - Prover - Density Pressure
13433	Damping Factor - Auxiliary Input #1
13434	Damping Factor - Auxiliary Input #2
13435	Damping Factor - Auxiliary Input #3
13436	Damping Factor - Auxiliary Input #4
13437	Enable Alarm Checking when Meter #1 is Inactive
13438	Enable Alarm Checking when Meter #1 is Inactive
13439	Enable Alarm Checking when Meter #1 is Inactive
13440	Enable Alarm Checking when Meter #1 is Inactive
13441	Switch Bar Temperature Damping Code
	Added to Rev 20.74.30 & Rev 24.70.30
13442	Reserved
to	
13448	Reserved
13449	Default Status Screen (0=No,1=Yes)
	Added to Rev 20.74.30 & Rev 24.70.30
13450	Insert Batch Stack - Meter #1
13451	Insert Batch Stack - Meter #2
13452	Insert Batch Stack - Meter #3
13453	Insert Batch Stack - Meter #4
13454	Insert Batch Stack - Station
13455	Delete Batch Stack - Meter #1
13456	Delete Batch Stack - Meter #2
13457	Delete Batch Stack - Meter #3
13458	Delete Batch Stack - Meter #4
13459	Delete Batch Stack - Station
13460	Remote Key Press
13461	Beep Counts
13462	Redundancy - Master PID #1 - Valve Mode
	Slave keeps copy of primary unit's settings in points 13462-13469 in case it becomes master.
13463	Redundancy - Master PID #1 - Setpoint Mode
13464	Redundancy - Master PID #2 - Valve Mode
13465	Redundancy - Master PID #2 - Setpoint Mode
13466	Redundancy - Master PID #3 - Valve Mode

13467	Redundancy - Master PID #3 - Setpoint Mode
13468	Redundancy - Master PID #4 - Valve Mode
13469	Redundancy - Master PID #4 - Setpoint Mode
13470	Redundancy - Slave PID #1 - Valve Mode
13471	Redundancy - Slave PID #1 - Setpoint Mode
13472	Redundancy - Slave PID #2 - Valve Mode
13473	Redundancy - Slave PID #2 - Setpoint Mode
13474	Redundancy - Slave PID #3 - Valve Mode
13475	Redundancy - Slave PID #3 - Setpoint Mode
13476	Redundancy - Slave PID #4 - Valve Mode
13477	Redundancy - Slave PID #4 - Setpoint Mode
13478	Serial Port #5 Baud rate
13479	Serial Port #5 Number of Data Bits
13480	Serial Port #5 Number of Stop Bits
13481	Serial Port #5 Parity
13482	Serial Port #5 Transmit Key Delay
13483	Serial Port #5 Modbus ID
13484	Serial Port #5 Modbus Type
13485	Serial Port #5 Modbus CRC Enabled
13486	Serial Port #5 Modicom 984 Compatible
13487	Reserved
to	
13488	Reserved
13489	Serial Port #6 Baud rate
to	
13497	Serial Port #6 Modicom 984 Compatible

8.1.8. Raw Data Archive Files 16-Bit Integer Data

The following entries are used to define the record structure of each **Raw Data Archive** file:

13500	Archive 701 #1 - Starting Index
13501	Archive 701 #1 - Number of Points
to	
13530	Archive 701 #16 - Starting Index
13531	Archive 701 #16 - Number of points
13532	Product #1 API 11.1 Use CTL x CPL (Y=1, N= 0)
to	
13539	Product #8 API 11.1 Use CTL x CPL (Y=1, N= 0)
13540	Archive 702 #1 - Starting Index
13541	Archive 702 #1 - Number of Points
to	
13570	Archive 702 #16 - Starting Index
13571	Archive 702 #16 - Number of Points
13572	Product #9 API 11.1 Use CTL x CPL (Y=1, N= 0)
to	
13579	Product #16 API 11.1 Use CTL x CPL (Y=1, N= 0)
13580	Archive 703 #1 - Starting Index
13581	Archive 703 #1 - Number of Points
to	
13610	Archive 703 #16 - Starting Index
13611	Archive 703 #16 - Number of Points
13612	Maintenance Mode Decimal Places for Gross Total (<i>Revision 24, Reserved 20</i>)
13613	Reserved
13614	Maintenance Mode Decimal Places for Mass Total (<i>Revision 24, Reserved 20</i>)
13615	Reserved
13616	Maintenance Mode Decimal Places for Gross Flowrate (<i>Revision 24, Reserved 20</i>)
13617	Reserved
13618	Maintenance Mode Decimal Places for Mass Flowrate (<i>Revision 24, Reserved 20</i>)
13619	Reserved
13620	Archive 704 #1 - Starting Index
13621	Archive 704 #1 - Number of Points
to	
13650	Archive 704 #16 - Starting Index
13651	Archive 704 #16 - Number of Points



Application Revision 20.74.30 & Rev 24.70.30.74: Modbus addresses 13652 – 13739 added to database corresponds to Application Revision 20.74.30 & Rev 24.70.30 for Turbine/Positive Displacement/Coriolis Liquid Flow Metering Systems, with K Factor Linearization. Both US and metric unit versions are considered.

- 13652 Meter #1 Sequence #1 Gravity Adjust Selection**
(0=No Gravity Adjustment Required, 1= Adjust Gravity at batch stack shift, 2= Adjust API at batch stack shift)
- 13653 Meter #1 Sequence#2 Gravity Adjust Selection**
- 13654 Meter #1 Sequence #3 Gravity Adjust Selection**
- 13655 Meter #1 Sequence#4 Gravity Adjust Selection**
- 13656 Meter #1 Sequence #5 Gravity Adjust Selection**
- 13657 Meter #1 Sequence#6 Gravity Adjust Selection**
- 13658 Meter #2 Sequence #1 Gravity Adjust Selection**
- 13659 Meter #2 Sequence#2 Gravity Adjust Selection**
- 13660 Archive 705 #1 - Starting Index**
- 13661 Archive 705 #1 - Number of Points**
to
- 13690 Archive 705 #16 - Starting Index**
- 13691 Archive 705 #16 - Number of Points**
- 13692 Meter #2 Sequence#3 Gravity Adjust Selection**
- 13693 Meter #2 Sequence #4 Gravity Adjust Selection**
- 13694 Meter #2 Sequence#5 Gravity Adjust Selection**
- 13695 Meter #2 Sequence #6 Gravity Adjust Selection**
- 13696 Meter #3 Sequence#1 Gravity Adjust Selection**
- 13697 Meter #3 Sequence#2 Gravity Adjust Selection**
- 13698 Meter #3 Sequence #3 Gravity Adjust Selection**
- 13699 Meter #3 Sequence#4 Gravity Adjust Selection**
- 13700 Archive 706 #1 - Starting Index**
- 13701 Archive 706 #1 - Number of Points**
to
- 13730 Archive 706 #16 - Starting Index**
- 13731 Archive 706 #16 - Number of Points**
- 13732 Meter #3 Sequence#5 Gravity Adjust Selection**
- 13733 Meter #3 Sequence#6 Gravity Adjust Selection**
- 13734 Meter #4 Sequence#1 Gravity Adjust Selection**
- 13735 Meter #4 Sequence#2 Gravity Adjust Selection**
- 13736 Meter #4 Sequence#3 Gravity Adjust Selection**
- 13737 Meter #4 Sequence#4 Gravity Adjust Selection**
- 13738 Meter #4 Sequence#5 Gravity Adjust Selection**
- 13739 Meter #4 Sequence#6 Gravity Adjust Selection**
- 13740 Archive 707 #1 - Starting Index**
- 13741 Archive 707 #1 - Number of Points**
to
- 13770 Archive 707 #16 - Starting Index**
- 13771 Archive 707 #16 - Number of Points**
- 13772 Reserved**
to
- 13779 Reserved**
- 13780 Archive 708 #1 - Starting Index**

13781	Archive 708 #1 - Number of Points
to	
13810	Archive 708 #16 - Starting Index
13811	Archive 708 #16 - Number of Points
13812	Reserved
to	
13819	Reserved
13820	Archive 709 #1 - Starting Index
13821	Archive 709 #1 - Number of Points
to	
13850	Archive 709 #16 - Starting Index
13851	Archive 709 #16 - Number of Points
13852	Reserved
to	
13859	Reserved
13860	Archive 710 #1 - Starting Index
13861	Archive 710 #1 - Number of Points
to	
13890	Archive 710 #16 - Starting Index
13891	Archive 710 #16 - Number of Points
13892	Reserved
to	
13899	Reserved
13900	Trigger Boolean - Archive 701
	Points 13900-13909 contain the point numbers of the trigger points which cause the data to be stored when the trigger goes from low to high.
13901	Trigger Boolean - Archive 702
13902	Trigger Boolean - Archive 703
13903	Trigger Boolean - Archive 704
13904	Trigger Boolean - Archive 705
13905	Trigger Boolean - Archive 706
13906	Trigger Boolean - Archive 707
13907	Trigger Boolean - Archive 708
13908	Trigger Boolean - Archive 709
13909	Trigger Boolean - Archive 710
13910	Reserved
to	
13919	Reserved



*** Caution: POTENTIAL FOR DATA LOSS! Read Archive documentation before manipulating points 13920 and 13921.**



***13920 Archive Run?**

0=Stops archiving; 1=Starts archiving.



***13921 Reconfigure Archive?**

0=No configuration allowed; 1=Configuration changes allowed.

13922 Product #1 NIST14 Input Selection (Configuration Data) (0=Mole %, 1=Mole Fraction, 2=Mass %, 3= Mass Fraction) (Revision 24, Reserved 20)

13923	Product #2 NIST14 Input Selection. (Configuration Data) <i>(Revision 24, Reserved 20)</i>
13924	Product #3 NIST14 Input Selection. (Configuration Data) <i>(Revision 24, Reserved 20)</i>
13925	Product #4 NIST14 Input Selection. (Configuration Data) <i>(Revision 24, Reserved 20)</i>
13926	Meter #1 Turn Off NIST14 Density @ Flowing Temp and Pressure
13927	Meter #2 Turn Off NIST14 Density @ Flowing Temp and Pressure
13928	Meter #3 Turn Off NIST14 Density @ Flowing Temp and Pressure
13929	Meter #4 Turn Off NIST14 Density @ Flowing Temp and Pressure
13930	Archive 711 #1 Starting Index Points 13930-13961 are dummy read-only points which show the structure of the Alarm Archive.
13931	Archive 711 #1 Number of Points
	to
13960	Archive 711 #16 Starting Index
13961	Archive 711 #16 Number of Points
13962	Archive 712 #1 Starting Index Points 13962-13993 are dummy read-only points which show the structure of the Audit Trail.
13963	Archive 712 #1 Number of Points
	to
13992	Archive 712 #16 Starting Index
13993	Archive 712 #16 Number of Points
13994	Reserved
	to
14000	Reserved

8.2. Flow Computer Configuration 16-Character ASCII String Data

14001	Boolean Statement #1025 Text String
	to
14048	Boolean Statement #1072 Text String
14049	OmniCom - Download Serial Number & File Name
14050	OmniCom - Download PC ID
14051	Variable Statement #7025 Text String
	to
14098	Variable Statement #7072 Text String
14099	68-6201 CPU Serial Number <i>(Reserved if 68-6001)</i>
14100	Station Total and Flowrate Definition
14101	Comment String (Remarks) - Boolean Statement #1025
	to
14148	Comment Text String (Remarks) - Boolean Statement #1072
14149	Printer Condense Mode String Points 14149 & 14150 represent the hexadecimal ASCII version of what is actually sent to the printer.
14150	Printer Uncondensed Mode String
14151	Comment Text String - Variable Statement #7025

	to
14198	Comment String - Variable Statement #7072
14199	Reserved
	to
14200	Reserved
14201	Boolean Statement #1073 Text String
	to
14216	Boolean Statement #1088 Text String
14217	Reserved
	to
14220	Reserved
14221	Variable Statement #7073 Text String
	to
14236	Variable Statement #7088 Text String
14237	Reserved
	to
14240	Reserved
14241	Comment Text String - Boolean Statement #1073
	to
14256	Comment Text String - Boolean Statement #1088
14257	Reserved
	to
14260	Reserved
14261	Comment Text String - Variable Statement #7073
	to
14276	Comment Text String - Variable Statement #7088
14277	Reserved
	to
14300	Reserved
14301	Comment Text String - Assign - Digital to Analog Output #1
	to
14312	Comment Text String - Assign - Digital to Analog Output #12
14313	Reserved
	to
14320	Reserved
14321	Comment Text String - Assign - Digital I/O Point #1
	to
14344	Comment Text String - Assign - Digital I/O Point #24
14345	Reserved
	to
14359	Reserved
14360	Comment Text String - Assign - PID #1 - Primary Variable
14361	Comment Text String - Assign - PID #1 - Secondary Variable
14362	Comment Text String - Assign - PID #2 - Primary Variable
14363	Comment Text String - Assign - PID #2 - Secondary Variable
14364	Comment Text String - Assign - PID #3 - Primary Variable

14365	Comment Text String - Assign - PID #3 - Secondary Variable
14366	Comment Text String - Assign - PID #4 - Primary Variable
14367	Comment Text String - Assign - PID #4 - Secondary Variable
14368	Reserved
to	
14379	Reserved
14380	Comment Text String - Assign - Front Panel Counter A
14381	Comment Text String - Assign - Front Panel Counter B
14382	Comment Text String - Assign - Front Panel Counter C
14383	Reserved
to	
15000	Reserved

8.3. Flow Computer Configuration 32-Bit Long Integer Data

15001	Assign - Analog Output #1
to	
15012	Assign - Analog Output #12
15013	Digital Point #1 - Assignment
15014	Digital Point #1 - Timer - Delay On 100 msec ticks.
15015	Digital Point #1 - Timer - Delay Off 100 msec ticks.
15016	Digital Point #1 - Timer - Pulse Width 10 msec ticks.
15017	Digital Point #2 - Assignment
to	
15020	Digital Point #2 - Timer - Pulse Width
15021	Digital Point #3 - Assignment
to	
15024	Digital Point #3 - Timer - Pulse Width
15025	Digital Point #4 - Assignment
to	
15028	Digital Point #4 - Timer - Pulse Width
15029	Digital Point #5 - Assignment
to	
15032	Digital Point #5 - Timer - Pulse Width
15033	Digital Point #6 - Assignment
to	
15036	Digital Point #6 - Timer - Pulse Width
15037	Digital Point #7 - Assignment
to	
15040	Digital Point #7 - Timer - Pulse Width
15041	Digital Point #8 - Assignment
to	

15044	Digital Point #8 - Timer - Pulse Width
15045	Digital Point #9 - Assignment
to	
15048	Digital Point #9 - Timer - Pulse Width
15049	Digital Point #10 - Assignment
to	
15052	Digital Point #10 - Timer - Pulse Width
15053	Digital Point #11 - Assignment
to	
15056	Digital Point #11 - Timer - Pulse Width
15057	Digital Point #12 - Assignment
to	
15060	Digital Point #12 - Timer - Pulse Width
15061	Digital Point #13 - Assignment
to	
15064	Digital Point #13 - Timer - Pulse Width
15065	Digital Point #14 - Assignment
to	
15068	Digital Point #14 - Timer - Pulse Width
15069	Digital Point #15 - Assignment
to	
15072	Digital Point #15 - Timer - Pulse Width
15073	Digital Point #16 - Assignment
to	
15076	Digital Point #16 - Timer - Pulse Width
15077	Digital Point #17 - Assignment
to	
15080	Digital Point #17 - Timer - Pulse Width
15081	Digital Point #18 - Assignment
to	
15084	Digital Point #18 - Timer - Pulse Width
15085	Digital Point #19 - Assignment
to	
15088	Digital Point #19 - Timer - Pulse Width
15089	Digital Point #20 - Assignment
to	
15092	Digital Point #20 - Timer - Pulse Width
15093	Digital Point #21 - Assignment
to	
15096	Digital Point #21 - Timer - Pulse Width
15097	Digital Point #22 - Assignment
to	
15100	Digital Point #22 - Timer - Pulse Width (10msec Ticks)
15101	Digital Point #23 - Assignment
to	
15104	Digital Point #23 - Timer - Pulse Width
15105	Digital Point #24 - Assignment

to

- 15108 **Digital Point #24 - Timer - Pulse Width**
- 15109 **Assign - Front Panel Counter A**
- 15110 **Assign - Front Panel Counter B**
- 15111 **Assign - Front Panel Counter C**
- 15112 **Max Comparator - Error Counts per Batch - Meter #1**
Points 15112-15115 represent dual pulse error checks.
- 15113 **Max Comparator - Error Counts per Batch - Meter #2**
- 15114 **Max Comparator - Error Counts per Batch - Meter #3**
- 15115 **Max Comparator - Error Counts per Batch - Meter #4**
- 15116 **Meter #1 Maximum Good Pulses**
- 15117 **Meter #2 Maximum Good Pulses**
- 15118 **Meter #3 Maximum Good Pulses**
- 15119 **Meter #4 Maximum Good Pulses**
Modbus Points 15116 -15119 added to Rev 20.74.30 & Rev 24.70.30
- 15120 **Input / Output Status of Digital Points**
Real-time, read-only! Indicates which points are inputs (1) and which are outputs (0).
#1=Bit 0; #24=Bit 23.
- 15121 **Reserved**
- 15122 **On/Off Status of Digital Points**
Real-time, read-only! #1=Bit 0; #24=Bit 23: 0 =Off, 1=On.
- 15123 **Prove Run Number**
- 15124 **Proving Meter Number**
- 15125 **Prove Counts**
- 15126 **32-Bit Packed Status Word (Read Only)**

15126 (see Bit Layout below).

LSB			
B0	Not Proving	B16	Flow Rate Unstable
B1	Overtravel Forward	B17	No Prove Permissive
B2	Launch Forward	B18	Prover Seal Not OK
B3	1 st Detector	B19	Meter Not Active
B4	In Flight Forward	B20	Piston Downstream
B5	2 nd Detector	B21	Checking Plenum
B6	Overtravel Reverse	B22	Master Meter Proving
B7	Launch Reverse	B23	Check Stability Master Meter
B8	In Flight Reverse	B24	Reserved
B9	Prove Aborted	B25	Reserved
B10	Prove Complete	B26	Power Fail Flag
B11	Checking/Temperature Stability	B27	End Batch #4
B12	Prover/Meter Temp Limits	B28	End Batch #3
B13	Prover Inactivity	B29	End Batch #2
B14	Bad Repeatability	B30	End Batch #1
B15	Prove Temperature Unstable	B31	End Batch Station
		MSB	

- 15127 **Text Archive Data - Number of Days to Retrieve**
- 15128 **Text Archive Data - Starting Date of Requested**
Fix date format (YYDDMM).

15129 32-Bit Command Word #1 Write Double Word with bit(s) on will cause following ,Action Command
(see Bit Layout below).

LSB			
B0	Prove Seal OK	B16	Trial Prove Meter #4
B1	End Batch Station	B17	Abort Prove in Progress
B2	End Batch Meter #1	B18	Send Snapshot to Printer
B3	End Batch Meter #2	B19	Load Snapshot to 9402
B4	End Batch Meter #3	B20	Load Alarms to 9402
B5	End Batch Meter #4	B21	Load Prod File to 9402
B6	Reserved	B22	Load Status to 9402
B7	Request Prove Meter #1	B23	Load Audit Trail to 9402
B8	Request Prove Meter #2	B24	End Batch Station No Batch Stk
B9	Request Prove Meter #3	B25	End Batch Mtr#1 No Batch Stk
B10	Request Prove Meter #4	B26	End Batch Mtr#2 No Batch Stk
B11	Alarm Acknowledge	B27	End Batch Mtr#3 No Batch Stk
B12	Reset Power Fail Flag	B28	End Batch Mtr#4 No Batch Stk
B13	Trial Prove Meter #1	B29	Reserved
B14	Trial Prove Meter #2	B30	Reserved
B15	Trial Prove Meter #3	B31	Reserved
		MSB	

15130 32-Bit Command Word #2 Write Double Word with bit(s) on will cause following ,Action Command
(see Bit Layout below).

LSB			
B0	Decrease PID #1 Setpoint @ 1% Rate	B16	Decrease PID #1 Valve @ 1% Rate
B1	Increase PID #1 Setpoint @ 1% Rate	B17	Increase PID #1 Valve @ 1% Rate
B2	Decrease PID #1 Setpoint @ 0.1% Rate	B18	Decrease PID #1 Valve @ 0.1% Rate
B3	Increase PID #1 Setpoint @ 0.1% Rate	B19	Increase PID #1 Valve @ 0.1% Rate
B4	Decrease PID #2 Setpoint @ 1% Rate	B20	Decrease PID #2 Valve @ 1% Rate
B5	Increase PID #2 Setpoint @ 1% Rate	B21	Increase PID #2 Valve @ 1% Rate
B6	Decrease PID #2 Setpoint @ 0.1% Rate	B22	Decrease PID #2 Valve @ 0.1% Rate
B7	Increase PID #2 Setpoint @ 0.1% Rate	B23	Increase PID #2 Valve @ 0.1% Rate
B8	Decrease PID #3 Setpoint @ 1% Rate	B24	Decrease PID #3 Valve @ 1% Rate
B9	Increase PID #3 Setpoint @ 1% Rate	B25	Increase PID #3 Valve @ 1% Rate
B10	Decrease PID #3 Setpoint @ 0.1% Rate	B26	Decrease PID #3 Valve @ 0.1% Rate
B11	Increase PID #3 Setpoint @ 0.1% Rate	B27	Increase PID #3 Valve @ 0.1% Rate
B12	Decrease PID #4 Setpoint @ 1% Rate	B28	Decrease PID #4 Valve @ 1% Rate
B13	Increase PID #4 Setpoint @ 1% Rate	B29	Increase PID #4 Valve @ 1% Rate
B14	Decrease PID #4 Setpoint @ 0.1% Rate	B30	Decrease PID #4 Valve @ 0.1% Rate

B15	Increase PID #4 Setpoint @ 0.1% Rate	B31	Increase PID #4 Valve @ 0.1% Rate
		MSB	

- 15131 Raw Process Input - Input #1
Real-time, read-only! 1kHz~1mA.
- to
- 15154 Raw Process Input - Input #24
- 15155 Reserved
- to
- 15175 Reserved
- 15176 Ethernet Port #1 IP Address
- 15177 Ethernet Port #1 Netmask
- 15178 Ethernet Port #1 Gateway
- 15179 Ethernet Port #2 IP Address
- 15180 Ethernet Port #2 Netmask
- 15181 Ethernet Port #2 Gateway
- 15182 Ethernet Port #3 IP Address
- 15183 Ethernet Port #3 Netmask
- 15184 Ethernet Port #3 Gateway
- 15185 Ethernet Port #4 IP Address
- 15186 Ethernet Port #4 Netmask
- 15187 Ethernet Port #4 Gateway
- 15188 Ethernet Port #5 IP Address
- 15189 Ethernet Port #5 Netmask
- 15190 Ethernet Port #5 Gateway
- 15191 Ethernet Port #6 IP Address
- 15192 Ethernet Port #6 Netmask
- 15193 Ethernet Port #6 Gateway
- 15194 Wincom Scratch Pad #1
- 15195 Wincom Scratch Pad #2
- 15196 Wincom Scratch Pad #3
- 15197 Reserved
- to
- 15199 Reserved

8.3.1.

Archive Data File Data

Information Only Data!



Note: These variables contain the number of bytes each archive file uses within memory. They are updated when the archiving process is started and memory is allocated. The maximum memory that can be allocated to this group of variables is a total of 229359 bytes for Revision 20.74.30 & 24.74.30. 1.5 Megabytes for Revision 20.75 and Rev 24.75

- * 15200 Size of Text - Archive File
- * 15201 Size of Archive - File 701
- * 15202 Size of Archive - File 702
- * 15203 Size of Archive - File 703
- * 15204 Size of Archive - File 704
- * 15205 Size of Archive - File 705

*	15206	Size of Archive - File 706
*	15207	Size of Archive - File 707
*	15208	Size of Archive - File 708
*	15209	Size of Archive - File 709
*	15210	Size of Archive - File 710
	15211	Reserved
	15212	Reserved
	15213	Archive File 'n' Memory Allocation Failed Indicates which archive file failed; e.g. if archive files 1-4 occupy allocated memory, this point will read 5 (n=1-10). (See points 2623, 15200-15210, and 15214.)
	15214	Total Number of Archive Files Allocated
	15215	Reserved
	to	
	15220	Reserved
	15221	Meter #1 Batch Size Adjustment
	15222	Meter #2 Batch Size Adjustment
	15223	Meter #3 Batch Size Adjustment
	15224	Meter #4 Batch Size Adjustment
	15225	Station Batch Size Adjustment
	15226	Meter #1 Number of New Alarms
	15227	Meter #2 Number of New Alarms
	15228	Meter #3 Number of New Alarms
	15229	Meter #4 Number of New Alarms
	15230	Station Number of New Alarms



Info: Text Report Buffer status points. The data stored in Points 15231 – 15358 can be read to determine if these are reports of interest that may have been added to the historical report storage buffers located in points 9101 -9308

15231	Date YYMMDD of the Most Recent Batch Report
15232	Date YYMMDD of the 2 nd Historical Batch Report
15233	Date YYMMDD of the 3 rd Historical Batch Report
15234	Date YYMMDD of the 4 th Historical Batch Report
15235	Date YYMMDD of the 5 th Historical Batch Report
15236	Date YYMMDD of the 6 th Historical Batch Report
15237	Date YYMMDD of the 7 th Historical Batch Report
15238	Date YYMMDD of the 8 th Historical Batch Report
15239	Reserved
15240	Reserved
15241	Time HHMMSS of the Most Recent Batch Report
15242	Time HHMMSS of the 2 nd Historical Batch Report
15243	Time HHMMSS of the 3 rd Historical Batch Report
15244	Time HHMMSS of the 4 th Historical Batch Report
15245	Time HHMMSS of the 5 th Historical Batch Report
15246	Time HHMMSS of the 6 th Historical Batch Report
15247	Time HHMMSS of the 7 th Historical Batch Report
15248	Time HHMMSS of the 8 th Historical Batch Report
15249	Reserved
15250	Reserved

15251	Running Meter of the Most Recent Batch Report (Bit 0=Meter # 1, Bit 1=Meter #2, Bit 2=Meter #3, Bit 3=Meter #4, Bit 4=Station)
15252	Running Meter of the 2 nd Historical Batch Report
15253	Running Meter of the 3 rd Historical Batch Report
15254	Running Meter of the 4 th Historical Batch Report
15255	Running Meter of the 5 th Historical Batch Report
15256	Running Meter of the 6 th Historical Batch Report
15257	Running Meter of the 7 th Historical Batch Report
15258	Running Meter of the 8 th Historical Batch Report
15259	Reserved
15260	Reserved
15261	Batch Number of the Most Recent Batch Report
15262	Batch Number of the 2 nd Historical Batch Report
15263	Batch Number of the 3 rd Historical Batch Report
15264	Batch Number of the 4 th Historical Batch Report
15265	Batch Number of the 5 th Historical Batch Report
15266	Batch Number of the 6 th Historical Batch Report
15267	Batch Number of the 7 th Historical Batch Report
15268	Batch Number of the 8 th Historical Batch Report
15269	Reserved
15270	Reserved
15271	Date YYMMDD of the Most Recent Prove Report
15272	Date YYMMDD of the 2 nd Historical Prove Report
15273	Date YYMMDD of the 3 rd Historical Prove Report
15274	Date YYMMDD of the 4 th Historical Prove Report
15275	Date YYMMDD of the 5 th Historical Prove Report
15276	Date YYMMDD of the 6 th Historical Prove Report
15277	Date YYMMDD of the 7 th Historical Prove Report
15278	Date YYMMDD of the 8 th Historical Prove Report
15279	Reserved
15280	Reserved
15281	Time HHMMSS of the Most Recent Prove Report
15282	Time HHMMSS of the 2 nd Historical Prove Report
15283	Time HHMMSS of the 3 rd Historical Prove Report
15284	Time HHMMSS of the 4 th Historical Prove Report
15285	Time HHMMSS of the 5 th Historical Prove Report
15286	Time HHMMSS of the 6 th Historical Prove Report
15287	Time HHMMSS of the 7 th Historical Prove Report
15288	Time HHMMSS of the 8 th Historical Prove Report
15289	Reserved
15290	Reserved
15291	Proving Meter of the Most Recent Prove Report
15292	Proving Meter of the 2 nd Historical Prove Report
15293	Proving Meter of the 3 rd Historical Prove Report
15294	Proving Meter of the 4 th Historical Prove Report
15295	Proving Meter of the 5 th Historical Prove Report
15296	Proving Meter of the 6 th Historical Prove Report

15297	Proving Meter of the 7 th Historical Prove Report
15298	Proving Meter of the 8 th Historical Prove Report
15299	Reserved
15300	Reserved
15301	Prove Status of the Most Recent Prove Report
15302	Prove Status of the 2 nd Historical Prove Report
15303	Prove Status of the 3 rd Historical Prove Report
15304	Prove Status of the 4 th Historical Prove Report
15305	Prove Status of the 5 th Historical Prove Report
15306	Prove Status of the 6 th Historical Prove Report
15307	Prove Status of the 7 th Historical Prove Report
15308	Prove Status of the 8 th Historical Prove Report
15309	Reserved
15310	Reserved
15311	Date YYMMDD of the Most Recent Daily Report
15312	Date YYMMDD of the 2 nd Historical Daily Report
15313	Date YYMMDD of the 3 rd Historical Daily Report
15314	Date YYMMDD of the 4 th Historical Daily Report
15315	Date YYMMDD of the 5 th Historical Daily Report
15316	Date YYMMDD of the 6 th Historical Daily Report
15317	Date YYMMDD of the 7 th Historical Daily Report
15318	Date YYMMDD of the 8 th Historical Daily Report
15319	Reserved
15320	Reserved
15321	Time HHMMSS of the Most Recent Daily Report
15322	Time HHMMSS of the 2 nd Historical Daily Report
15323	Time HHMMSS of the 3 rd Historical Daily Report
15324	Time HHMMSS of the 4 th Historical Daily Report
15325	Time HHMMSS of the 5 th Historical Daily Report
15326	Time HHMMSS of the 6 th Historical Daily Report
15327	Time HHMMSS of the 7 th Historical Daily Report
15328	Time HHMMSS of the 8 th Historical Daily Report
15329	Reserved
15330	Reserved
15331	Running Meter of the Most Recent Daily Report (Bit 0=Meter # 1, Bit 1=Meter #2, Bit 2=Meter #3, Bit 3=Meter #4, Bit 4=Station)
15332	Running Meter of the 2 nd Historical Daily Report
15333	Running Meter of the 3 rd Historical Daily Report
15334	Running Meter of the 4 th Historical Daily Report
15335	Running Meter of the 5 th Historical Daily Report
15336	Running Meter of the 6 th Historical Daily Report
15337	Running Meter of the 7 th Historical Daily Report
15338	Running Meter of the 8 th Historical Daily Report
15339	Reserved
15340	Reserved
15341	Day End Status of the Most Recent Daily Report (0=Auto Day End, 1=Force Day End)

15342	Day End Status of the 2 nd Historical Daily Report
15343	Day End Status of the 3 rd Historical Daily Report
15344	Day End Status of the 4 th Historical Daily Report
15345	Day End Status of the 5 th Historical Daily Report
15346	Day End Status of the 6 th Historical Daily Report
15347	Day End Status of the 7 th Historical Daily Report
15348	Day End Status of the 8 th Historical Daily Report
15349	Reserved
15350	Reserved
15351	Batch End Status of the Most Recent Batch
	to (0=Normal Batch End, 1=No Stack Operation Batch End)
15358	Batch End Status of the 8 th Most Recent Batch
15359	Reserved
	to
15508	Reserved
15509	Meter #1 Previous Day Closing Gross Cumulative Total
15510	Meter #1 Previous Day Closing Net Cumulative Total
15511	Meter #1 Previous Day Closing Mass Cumulative Total
15512	Meter #1 Previous Day Closing NSV Cumulative Total
15513	Meter #1 Daily Closing Gross Cumulative Total
15514	Meter #1 Daily Closing Net Cumulative Total
15515	Meter #1 Daily Closing Mass Cumulative Total
15516	Meter #1 Daily Closing NSV Cumulative Total
15517	Meter #1 Previous Day Product Number
15518	Reserved
	to
15543	Reserved
15544	Meter #1 resetable error counts
15545	Meter #1 good Pulse counts
15546	Reserved
	to
15573	Reserved
15574	Meter #1 Previous Hour – Gross Total <i>(Revision 24 Reserved 20))</i>
15575	Meter #1 Previous Hour – Net Total <i>(Revision 24,Reserved 20)</i>
15576	Meter #1 Previous Hour – Mass Total <i>(Revision 24,Reserved 20)</i>
15577	Meter #1 Previous Hour – NSV Total <i>(Revision 24,Reserved 20)</i>
15578	Reserved
	to
15600	Reserved
15601 – 15699	Meter #2 Data
15701 – 15799	Meter #3 Data
15801 – 15899	Meter #4 Data

8.4. Flow Computer Configuration 32-Bit IEEE Floating Point Data

17001	Digital-to-Analog - Output #1 - @ 4mA Engineering units which equal to 0%.
17002	Digital-to-Analog - Output #1 - @ 20mA Engineering units which equal to 100%.
to	
17023	Digital-to-Analog - Output #12 - @ 4mA
17024	Digital-to-Analog - Output #12 - @ 20mA
17025	Pulses per Unit - Digital I/O #1
to	
17048	Pulses per Unit - Digital I/O #24
17049	Pulses per Unit - Counter A
17050	Pulses per Unit - Counter B
17051	Pulses per Unit - Counter C



Note: Input expected is engineering units

#	17052	PID #1 - Remote Setpoint - Low Limit The primary setpoint will not be allowed to drop below this value.
#	17053	PID #1 - Remote Setpoint - High Limit The primary setpoint will not be allowed to raise above this value.
#	17054	PID #1 - Remote Setpoint - @ 4mA Sets the zero of the controller.
#	17055	PID #1 - Remote Setpoint - @ 20mA Sets the maximum span of the controller.
	17056	PID #1 - Primary Gain
	17057	PID #1 - Primary Repeats/Minute
#	17058	PID #1 - Secondary Value - @ Zero
#	17059	PID #1 - Secondary Value - @ Full Scale
	17060	PID #1 - Secondary Gain
	17061	PID #1 - Secondary Repeats/Minute
	17062	PID #1 - Maximum Ramp Up Rate % - p/500 msec Limits rate of valve movement at startup only.
#	17063	PID #1 - Secondary Setpoint
	17064	PID #1 - Maximum Ramp Down Rate % - p/500msec Limits the rate of valve movement at shutdown only.
	17065	PID #1 - Min Output % - To Ramp To The minimum % that the control output will be allowed to ramp down to.
	17066	PID #1 - Deadband % No change in output if the % error is less than this
	17067	PID #2 - Remote Setpoint - Low Limit
	to	
	17081	PID #2 - Deadband %
	17082	PID #3 - Remote Setpoint - Low Limit
	to	
	17096	PID #3 - Deadband %
	17097	PID #4 - Remote Setpoint - Low Limit

to	
17111	PID #4 - Deadband %
17112	Output in Percent - Digital to Analog #1 Read-only, Live Value.
to	
17123	Output in Percent - Digital to Analog #12 Read-only, Live Value.
17124	Reserved
to	
17135	Reserved
17136	PID #1 - Primary Controlled Variable Value
17137	PID #1 - Secondary Controlled Variable Value
17138	PID #1 - Control Output %
17139	PID #1 - Primary Setpoint Value
17140	PID #1 - Secondary Setpoint Value
17141	Reserved
to	
17145	Reserved
17146	PID #2 - Primary Controlled Variable Value
to	
17150	PID #2 - Secondary Setpoint Value
17151	Reserved
to	
17155	Reserved
17156	PID #3 - Primary Controlled Variable Value
to	
17160	PID #3 - Secondary Setpoint Value
17161	Reserved
to	
17165	Reserved
17166	PID #4 - Primary Controlled Variable Value
to	
17170	PID #4 - Secondary Setpoint Value
17171	Reserved
to	
17175	Reserved
17176	Meter #1 - Full Scale - Gross Flowrate Used to scale integer volume flow rate variables 3140 & 3142.
17177	Meter #1 - Full Scale - Mass Flowrate Used to scale integer mass flow rate variable 3144.
17178	Reserved
17179	Reserved
17180	Meter #2 - Full Scale - Gross Flowrate
17181	Meter #2 - Full Scale - Mass Flowrate
17182	Reserved
17183	Reserved
17184	Meter #3 - Full Scale - Gross Flowrate
17185	Meter #3 - Full Scale - Mass Flowrate

17186	Reserved
17187	Reserved
17188	Meter #4 - Full Scale - Gross Flowrate
17189	Meter #4 - Full Scale - Mass Flowrate
17190	Reserved
17191	Reserved
17192	Station - Full Scale - Gross (Used to scale integer volume flow rate variables 3802 & 3804.
17193	Station - Full Scale - Mass Used to scale integer mass flow rate variable 3806.
17194	Product #1 K0 When NGL product type is selected, allows the user to substitute an empirically derived value for coefficient K0.
17195	Product #1 K1 When NGL product type is selected, allows the user to substitute an empirically derived value for coefficient K1.
17196	Product #2 K0 When NGL product type is selected, allows the user to substitute an empirically derived value for coefficient K0.
17197	Product #2 K1 When NGL product type is selected, allows the user to substitute an empirically derived value for coefficient K1.
17198	Alarm Deadband % 0-5%. Global dead-band applied to all analog alarms. Variable must return this % out of alarm for alarm to cancel. This entry sets a % limit based on the 'high alarm' entry. A variable must return within the high/low alarm limits by more than this amount before the alarm is cleared.
17199	Reserved
to	
17202	Reserved
17203	F Factor - Product #1
to	
17218	F Factor - Product #16
17219	Reference Temperature - Product #1 (Revision 24, Reserved 20)
to	
17234	Reference Temperature - Product #16 (Revision 24, Reserved 20)
17235	Product #1 - Mole Fraction of Propylene A value of 1.0 means the mixture is 100% pure propylene. A propylene fraction of 0.93 means the mixture is 93% propylene and 7% propane.
to	
17250	Product #16 - Mole Fraction of Propylene
17235	Product #1 – Dissolved Air Correction (0.0 = No, 1.0 = Yes) This point applies only when measuring water.
to	
17250	Product #16 – Dissolved Air Correction (0.0 = No, 1.0 = Yes)
17251	Product #1 Reference Pressure (Configuration Data) (Revision 24, Reserved 20) Absolute pressure in user selected unit used to calculate NIST14 density at reference condition.
17252	Product #2 Reference Pressure (Configuration Data) (Revision 24, Reserved 20)
17253	Product #3 Reference Pressure (Configuration Data) (Revision 24, Reserved 20)

- 17254 **Product #4 Reference Pressure (Configuration Data)** (*Revision 24, Reserved 20*)
- 17255 **Switch Bar Temperature Low Limit**
- 17256 **Switch Bar Temperature High Limit**
- 17257 **Switch Bar Temperature Override**
- 17258 **Switch Bar Temperature @4mA**
- 17259 **Switch Bar Temperature @20mA**
(Added to Rev 20.74.30 & Rev 24.70.30)
- 17260 **Prover - Density/Gravity - Low Limit**
- 17261 **Prover - Density/Gravity - High Limit**
- 17262 **Prover - Density/Gravity - Override**
- 17263 **Prover - Density/Gravity - @ 4mA**
- 17264 **Prover - Density/Gravity - @ 20mA**
- 17265 **Prover - Density Temperature - Low Limit**
to
- 17269 **Prover - Density Temperature - @ 20mA**
- 17270 **Prover - Density Pressure - Low Limit**
to
- 17274 **Prover - Density Pressure - @ 20mA**
- 17275 **Prover - Density Correction Factor A**
- * 17276 **Prover - Densitometer - Constant #1**
 K_0/D_0 .
- * 17277 **Prover - Densitometer - Constant #2**
 K_1/T_0 .
- * 17278 **Prover - Densitometer - Constant #3**
 K_2/T_{coef} .
- * 17279 **Prover - Densitometer - Constant #4**
 $K_{18}/T_{cal}/T_c$.
- * 17280 **Prover - Densitometer - Constant #5**
 $K_{19}/P_{coef}/K_{t1}$.
- * 17281 **Prover - Densitometer - Constant #6**
 $K_{20A}/P_{cal}/K_{t2}$.
- * 17282 **Prover - Densitometer - Constant #7**
 K_{20B}/K_{t3} .
- * 17283 **Prover - Densitometer - Constant #8**
 K_{21A}/P_c .
- * 17284 **Prover - Densitometer - Constant #9**
 K_{21B}/K_{p1} .
- * 17285 **Prover - Densitometer - Constant #10**
 K_r . (For UGC densitometers: K_{p2} .)
- * 17286 **Prover - Densitometer - Constant #11**
 K_j . (For UGC densitometers: K_{p3} .)
- * 17287 **Reserved**
- 17288 **Product #1 Base Pressure (Pe)**
The use of Base Pressure (Pe) at a value other than 0 was introduced by ADI in the spring 2007 Addendum to the API Mpm 11.1 (2004) standard.
to
- 17303 **Product #16 Base Pressure (Pe)**
(Modbus addresses 17304 -17327 added to Rev 20.74.30 & Rev 24.70.30)
- 17304 **Meter #1 Batch Sequence #1 Product Gravity Adjust**
- 17305 **Meter #1 Batch Sequence #2 Product Gravity Adjust**
- 17306 **Meter #1 Batch Sequence #3 Product Gravity Adjust**

17307	Meter #1 Batch Sequence #4 Product Gravity Adjust
17308	Meter #1 Batch Sequence #5 Product Gravity Adjust
17309	Meter #1 Batch Sequence #6 Product Gravity Adjust
17310	Meter #2 Batch Sequence #1 / Common Batch Stack Sequence #7 / Product Gravity Adjust
17311	Meter #2 Batch Sequence #2 / Common Batch Stack Sequence #8 / Product Gravity Adjust
17312	Meter #2 Batch Sequence #3 / Common Batch Stack Sequence #9 / Product Gravity Adjust
17313	Meter #2 Batch Sequence #4 / Common Batch Stack Sequence #10 / Product Gravity Adjust
17314	Meter #1 Batch Sequence #5 / Common Batch Stack Sequence #11 / Product Gravity Adjust
17315	Meter #2 Batch Sequence #6 / Common Batch Stack Sequence #12 / Product Gravity Adjust
17316	Meter #3 Batch Sequence #1 / Common Batch Stack Sequence #13 / Product Gravity Adjust
17317	Meter #3 Batch Sequence #2 / Common Batch Stack Sequence #14 / Product Gravity Adjust
17318	Meter #3 Batch Sequence #3 / Common Batch Stack Sequence #15 / Product Gravity Adjust
17319	Meter #3 Batch Sequence #4 / Common Batch Stack Sequence #16 / Product Gravity Adjust
17320	Meter #3 Batch Sequence #5 / Common Batch Stack Sequence #17 / Product Gravity Adjust
17321	Meter #3 Batch Sequence #6 / Common Batch Stack Sequence #18 / Product Gravity Adjust
17322	Meter #4 Batch Sequence #1 / Common Batch Stack Sequence #19 / Product Gravity Adjust
17323	Meter #4 Batch Sequence #2 / Common Batch Stack Sequence #20 / Product Gravity Adjust
17324	Meter #4 Batch Sequence #3 / Common Batch Stack Sequence #21 / Product Gravity Adjust
17325	Meter #4 Batch Sequence #4 / Common Batch Stack Sequence #22 / Product Gravity Adjust
17326	Meter #4 Batch Sequence #5 / Common Batch Stack Sequence #23 / Product Gravity Adjust
17327	Meter #4 Batch Sequence #6 / Common Batch Stack Sequence #24 / Product Gravity Adjust
17328	Reserved
	to
17379	Reserved
17380	Auxiliary Input #1 - Low limit
17381	Auxiliary Input #1 - High Limit
17382	Auxiliary Input #1 - Override Value
17383	Auxiliary Input #1 - @ 4mA
17384	Auxiliary Input #1 - @ 20mA
17385	Auxiliary Input #2 - Low limit
	to
17389	Auxiliary Input #2 - @ 20mA

17390 Auxiliary Input #3 - Low limit
 to
17394 Auxiliary Input #3 - @ 20mA
17395 Auxiliary Input #4 - Low limit
 to
17399 Auxiliary Input #4 - @ 20mA
17400 Reserved

8.4.1. Product 1 thru 16 Meter 'n' and Station, Density Correction Factors.

17401	Product #1 Meter #1 Density Correction Factor
17402	Product #1 Meter #2 Density Correction Factor
17403	Product #1 Meter #3 Density Correction Factor
17404	Product #1 Meter #4 Density Correction Factor
17405	Product #1 Station Density Correction Factor
17406	Product #2 Meter #1 Density Correction Factor
17407	Product #2 Meter #2 Density Correction Factor
17408	Product #2 Meter #3 Density Correction Factor
17409	Product #2 Meter #4 Density Correction Factor
17410	Product #2 Station Density Correction Factor
17411	Product #3 Meter #1 Density Correction Factor
17412	Product #3 Meter #2 Density Correction Factor
17413	Product #3 Meter #3 Density Correction Factor
17414	Product #3 Meter #4 Density Correction Factor
17415	Product #3 Station Density Correction Factor
17416	Product #4 Meter #1 Density Correction Factor
17417	Product #4 Meter #2 Density Correction Factor
17418	Product #4 Meter #3 Density Correction Factor
17419	Product #4 Meter #4 Density Correction Factor
17420	Product #4 Station Density Correction Factor
17421	Product #5 Meter #1 Density Correction Factor
17422	Product #5 Meter #2 Density Correction Factor
17423	Product #5 Meter #3 Density Correction Factor
17424	Product #5 Meter #4 Density Correction Factor
17425	Product #5 Station Density Correction Factor
17426	Product #6 Meter #1 Density Correction Factor
17427	Product #6 Meter #2 Density Correction Factor
17428	Product #6 Meter #3 Density Correction Factor
17429	Product #6 Meter #4 Density Correction Factor
17430	Product #6 Station Density Correction Factor
17431	Product #7 Meter #1 Density Correction Factor
17432	Product #7 Meter #2 Density Correction Factor
17433	Product #7 Meter #3 Density Correction Factor
17434	Product #7 Meter #4 Density Correction Factor
17435	Product #7 Station Density Correction Factor
17436	Product #8 Meter #1 Density Correction Factor
17437	Product #8 Meter #2 Density Correction Factor
17438	Product #8 Meter #3 Density Correction Factor
17439	Product #8 Meter #4 Density Correction Factor
17440	Product #8 Station Density Correction Factor
17441	Product #9 Meter #1 Density Correction Factor
17442	Product #9 Meter #2 Density Correction Factor
17443	Product #9 Meter #3 Density Correction Factor
17444	Product #9 Meter #4 Density Correction Factor

17445	Product #9 Station Density Correction Factor
17446	Product #10 Meter #1 Density Correction Factor
17447	Product #10 Meter #2 Density Correction Factor
17448	Product #10 Meter #3 Density Correction Factor
17449	Product #10 Meter #4 Density Correction Factor
17450	Product #10 Station Density Correction Factor
17451	Product #11 Meter #1 Density Correction Factor
17452	Product #11 Meter #2 Density Correction Factor
17453	Product #11 Meter #3 Density Correction Factor
17454	Product #11 Meter #4 Density Correction Factor
17455	Product #11 Station Density Correction Factor
17456	Product #12 Meter #1 Density Correction Factor
17457	Product #12 Meter #2 Density Correction Factor
17458	Product #12 Meter #3 Density Correction Factor
17459	Product #12 Meter #4 Density Correction Factor
17460	Product #12 Station Density Correction Factor
17461	Product #13 Meter #1 Density Correction Factor
17462	Product #13 Meter #2 Density Correction Factor
17463	Product #13 Meter #3 Density Correction Factor
17464	Product #13 Meter #4 Density Correction Factor
17465	Product #13 Station Density Correction Factor
17466	Product #14 Meter #1 Density Correction Factor
17467	Product #14 Meter #2 Density Correction Factor
17468	Product #14 Meter #3 Density Correction Factor
17469	Product #14 Meter #4 Density Correction Factor
17470	Product #14 Station Density Correction Factor
17471	Product #15 Meter #1 Density Correction Factor
17472	Product #15 Meter #2 Density Correction Factor
17473	Product #15 Meter #3 Density Correction Factor
17474	Product #15 Meter #4 Density Correction Factor
17475	Product #15 Station Density Correction Factor
17476	Product #16 Meter #1 Density Correction Factor
17477	Product #16 Meter #2 Density Correction Factor
17478	Product #16 Meter #3 Density Correction Factor
17479	Product #16 Meter #4 Density Correction Factor
17480	Product #16 Station Density Correction Factor
17481	Reserved
	to
17500	Reserved
17501	Meter #1 - K Factor #1 See 3122 for matching flow frequency entry.
17502	Meter #1 - K Factor #2
17503	Meter #1 - K Factor #3
17504	Meter #1 - K Factor #4
17505	Meter #1 - K Factor #5
17506	Meter #1 - K Factor #6
17507	Meter #1 - K Factor #7

17508	Meter #1 - K Factor #8
17509	Meter #1 - K Factor #9
17510	Meter #1 - K Factor #10
17511	Meter #1 - K Factor #11
17512	Meter #1 - K Factor #12
17513	Reserved
	to
17530	Reserved

8.4.2. Meter #1 Mole % Fraction Component Data (Revision 24, Reserved 20)

17531	Meter #1 Mol % / Fraction Methane
17532	Meter #1 Mol % / Fraction Nitrogen
17533	Meter #1 Mol % / Fraction Carbon Dioxide
17534	Meter #1 Mol % / Fraction Ethane
17535	Meter #1 Mol % / Fraction Propane
17536	Meter #1 Mol % / Fraction Water
17537	Meter #1 Mol % / Fraction Hydrogen Sulfide
17538	Meter #1 Mol % / Fraction Ethylene
17539	Meter #1 Mol % / Fraction Carbon Monoxide
17540	Meter #1 Mol % / Fraction Oxygen
17541	Meter #1 Mol % / Fraction i-Butane
17542	Meter #1 Mol % / Fraction n-Butane
17543	Meter #1 Mol % / Fraction i-Pentane
17544	Meter #1 Mol % / Fraction n-Pentane
17545	Meter #1 Mol % / Fraction n-Hexane
17546	Meter #1 Mol % / Fraction n-Heptane
17547	Meter #1 Mol % / Fraction i-Hexane
17548	Meter #1 Mol % / Fraction n-Nonane
17549	Meter #1 Mol % / Fraction n-Decane
17550	Meter #1 Mol % / Fraction i-Helium
17551	Meter #1 Mol % / Fraction Argon
17552	Meter #1 Previous Batch Average Methane
17553	Meter #1 Previous Batch Average Ethane
17554	Meter #1 Previous Batch Average Propane
17555	Meter #1 Previous Batch Average i-Butane
17556	Meter #1 Previous Batch Average n-Butane
17557	Meter #1 Previous Batch Average CO2
17558	Meter #1 Previous Batch Average Argon
17559	Meter #1 Previous Batch Average Ethylene
17560	Meter #1 Previous Batch Average Nitrogen
17561	Meter #1 Previous Batch Average Oxygen
17562	Meter #1 Previous Batch Average Carbon Monoxide
17563	Meter #1 Previous Batch Average Hydrogen Sulfide
17564	Meter #1 Previous Batch Average n-Pentane
17565	Meter #1 Previous Batch Average i-Pentane
17566	Meter #1 Previous Batch Average n-Hexane
17567	Meter #1 Previous Batch Average i-Hexane
17568	Meter #1 Previous Batch Average n-Heptane
17569	Meter #1 Previous Day Flow Weighted Average Methane
17570	Meter #1 Previous Day Flow Weighted Average Ethane
17571	Meter #1 Previous Day Flow Weighted Average Propane
17572	Meter #1 Previous Day Flow Weighted Average i-Butane
17573	Meter #1 Previous Day Flow Weighted Average n-Butane
17574	Meter #1 Previous Day Flow Weighted Average CO2

17575	Meter #1 Previous Day Flow Weighted Average Argon
17576	Meter #1 Previous Day Flow Weighted Average Ethylene
17577	Meter #1 Previous Day Flow Weighted Average Nitrogen
17578	Meter #1 Previous Day Flow Weighted Average Oxygen
17579	Meter #1 Previous Day Flow Weighted Average Carbon Monoxide
17580	Meter #1 Previous Day Flow Weighted Average Hydrogen Sulfide
17581	Meter #1 Previous Day Flow Weighted Average n-Pentane
17582	Meter #1 Previous Day Flow Weighted Average i-Pentane
17583	Meter #1 Previous Day Flow Weighted Average n-Hexane
17584	Meter #1 Previous Day Flow Weighted Average i-Hexane
17585	Meter #1 Previous Day Flow Weighted Average n-Heptane
17586	Meter #1 Maintenance Mode Gross Flowrate
17587	Meter #1 Maintenance Mode Net Flowrate
17588	Meter #1 Maintenance Mode Mass Flowrate
17589	Meter #1 Maintenance Mode NSV Flowrate
17590	Reserved
to	
17599	Reserved

8.4.3. Meter #2 Mole% Fraction Component Data (Revision 24, Reserved 20)

17601	Meter #2
to	
17689	Meter #2
17690	Reserved
to	
17699	Reserved

8.4.4. Meter #3 Mole% Fraction Component Data (Revision 24, Reserved 20)

17701	Meter #3
to	
17789	Meter #3
17790	Reserved
to	
17799	Reserved

8.4.5. Meter #4 Mole% Fraction Component Data (Revision 24, Reserved 20)

17801	Meter #4
to	
17889	Meter #4
17890	Reserved
to	
17899	Reserved

**8.4.6. Product #1 Mol % Fraction Configuration Data
(Revision 24, Reserved 20)**

17901	Product #1 Methane
17902	Product #1 Nitrogen
17903	Product #1 Carbon Dioxide
17904	Product #1 Ethane
17905	Product #1 Propane
17906	Product #1 Water
17907	Product #1 Hydrogen Sulfide
17908	Product #1 Ethylene
17909	Product #1 Carbon Monoxide
17910	Product #1 Oxygen
17911	Product #1 i-Butane
17912	Product #1 n-Butane
17913	Product #1 i-Pentane
17914	Product #1 n-Pentane
17915	Product #1 n-Hexane
17916	Product #1 n-Heptane
17917	Product #1 i-Hexane
17918	Product #1 n-Nonane
17919	Product #1 n-Decane
17920	Product #1 Helium
17921	Product #1 Argon

**8.4.7. Product #2 Mol % Fraction Configuration Data
(Revision 24, Reserved 20)**

17922	Product #2 Methane
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17923	Product #2 Nitrogen
17924	Product #2 Carbon Dioxide
17925	Product #2 Ethane
17926	Product #2 Propane
17927	Product #2 Water
17928	Product #2 Hydrogen Sulfide
17929	Product #2 Ethylene
17930	Product #2 Carbon Monoxide
17931	Product #2 Oxygen
17932	Product #2 i-Butane
17933	Product #2 n-Butane
17934	Product #2 i-Pentane
17935	Product #2 n-Pentane
17936	Product #2 n-Hexane
17937	Product #2 n-Heptane
17938	Product #2 i-Hexane
17939	Product #2 n-Nonane
17940	Product #2 n-Decane
17941	Product #2 Helium
17942	Product #2 Argon

8.4.8. Product #3 Mol % Fraction Configuration Data (Revision 24, Reserved 20)

17943	Product #3 Methane
17944	Product #3 Nitrogen
17945	Product #3 Carbon Dioxide
17946	Product #3 Ethane

17947	Product #3 Propane
17948	Product #3 Water
17949	Product #3 Hydrogen Sulfide
17950	Product #3 Ethylene
17951	Product #3 Carbon Monoxide
17952	Product #3 Oxygen
17953	Product #3 i-Butane
17954	Product #3 n-Butane
17955	Product #3 i-Pentane
17956	Product #3 n-Pentane
17957	Product #3 n-Hexane
17958	Product #3 n-Heptane
17959	Product #3 i-Hexane
17960	Product #3 n-Nonane
17961	Product #3 n-Decane
17962	Product #3 Helium
17963	Product #3 Argon

8.4.9. Product #4 Mol % Fraction Configuration Data (Revision 24, Reserved 20)

17964	Product #4 Methane
17965	Product #4 Nitrogen
17966	Product #4 Carbon Dioxide
17967	Product #4 Ethane
17968	Product #4 Propane
17969	Product #4 Water
17970	Product #4 Hydrogen Sulfide

17971	Product #4 Ethylene
17972	Product #4 Carbon Monoxide
17973	Product #4 Oxygen
17974	Product #4 i-Butane
17975	Product #4 n-Butane
17976	Product #4 i-Pentane
17977	Product #4 n-Pentane
17978	Product #4 n-Hexane
17979	Product #4 n-Heptane
17980	Product #4 i-Hexane
17981	Product #4 n-Nonane
17982	Product #4 n-Decane
17983	Product #4 Helium
17984	Product #4 Argon

8.4.10. Prove Run Data for the Last Prove Run Completed.



Info: This Data is updated at the end of each Prove Run or round trip. See "Run Complete" Flag 1954.

18901	Run Number of the complete run
18902	Forward Pulses of the Volumetric run Prover Density of Mass Proving Corrected Pv Volume (Master Meter Proving)
18903	Reverse Pulse of Volumetric Prover Prover Volume of Mass Proving

	Master Meter Volume of Master Meter Proving
18904	Total Pulse of Volumetric Prover
	Prover Mass Total of Mass Proving
	Test Meter Volume of Master Meter Proving
18905	Frequency Hertz of Volumetric Prover
	Mater Mass Total of Mass Proving
	Corrected Meter Volume of Master Meter Proving
18906	Proving Meter Temperature of the current Complete Run
18907	Proving Meter Pressure of the Current Complete Run
18908	Prover temperature of the Current Complete Run
18909	Prover Pressure of the Current Complete Run
18910	Density/SG60/API60 of the Current Complete Run
18911	Meter Factor of the Current Complete Run
18912	Meter Flowrate of Volumetric Proving
	CTSP of Mass Proving
	Master Meter CCF of Master Meter Proving
18913	Run Time in Seconds of Volumetric Proving
	CPSP of Mass Proving
	Test Meter CCF of Master Meter Proving
18914	CTLP of Mass Proving
	Master Meter CTL/CTPL of Master Meter Proving
18915	CPLP of Mass Proving
	Master Meter CPL of Master Meter Proving
18916	CTLM of Mass Proving
	Test Meter CTL/CTPL of Master Meter Proving
18917	CPLM of Mass Proving
	Test Meter CPL of Master Meter Proving
18918	Master Meter MF of Master Meter Proving
	(Modbus address 18901-18918 added to Rev 20.74.30 & Rev 24.70.30)