CRT

ACCURATE MEASUREMENT

Technical Library

As a Service to the HydroCarbon Measurement Industry, CRT-SERVICES Curates this collection of Digital resources.

www.crt-services.com
www.crtsupply.com

11133 Interstate 45 S Suite O
Conroe, Texas 77302
(713) 242-1190

VOLUME 4B

Firmware Revisions 21.74/25.74

Modbus Database Addresses and Index Numbers

Omni 3000 / 6000 Flow Computer
User Manual

Liquid Orifice / Differential Pressure Meters

Effective June 2007

Omni®

Volume 4

MODBUS™ DATABASE ADDRESSES AND INDEX NUMBERS

Contents of Volume 4

For Your Information

Omni®

Measure the Difference!®

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.

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.

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 register" 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 Ste #100
Sugar Land Texas 77478

Phone: 281-240-6161

Fax: 281-240-6162

World-wide Web Site:

http://www.omniflow.com

E-mail Addresses:

helpdesk@omniflow.com

Getting User Support

Technical and sales support is available worldwide 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 Applications

OMNI 6000 and OMNI 3000 Flow Computers are integrable into the majority of liquid and gas flow measurement and control systems. The current firmware revisions of OMNI 6000/OMNI 3000 Flow Computers are:

- ❑ **20.74/24.74:** Turbine/Positive Displacement/Coriolis Liquid Flow Metering Systems with K Factor Linearization (US/metric units)
- ❑ **21.74/25.74:** Orifice/Differential Pressure Liquid Flow Metering Systems (US/metric units)
- ❑ **22.74/26.74:** Turbine/Positive Displacement Liquid Flow Metering Systems with Meter Factor Linearization (US/metric units)
- ❑ **23.74/27.74:** Orifice/Turbine Gas Flow Metering Systems (US/metric units)

About the User Manual

This manual applies to .74+ 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.

Volume 1. System 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

User Reference Documentation - The User Manual is structured into five volumes. Volumes 1 and 5 are generic to all flow computer application revisions. Volumes 2, 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 20/24.74:
Volume #s 2a, 3a, 4a

Revision 21/25.74:
Volume #s 2b, 3b, 4b

Revision 22/26.74:
Volume #s 2c, 3c, 4c

Revision 23/27.74:
Volume #s 2d, 3d, 4d

For example, if your flow computer application revision is 20/24.74, you will be supplied with Volumes 2a, 3a & 4a, along with Volumes 1 & 5.

This volume 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. Both US and metric units are considered.

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. They contain updates to the user manual. You can view and print updates 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. You can view and print these bulletins from our website.

Conventions Used in this Manual

Typographical Conventions - These are standard graphical/text elements used to denote types of information. For your convenience, a few conventions were established in the manual's layout design. These highlight important information of interest to the reader and are easily caught by the eye.

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
Sidebar Notes / InfoTips Example: **INFO -** Sidebar notes are used to highlight important information in a concise manner.	Sidebar notes or "InfoTips" consist of concise information of interest which is enclosed in a gray-shaded box placed on the left margin of a page. These refer to topics that are either next to them, or on the same or facing page. It is highly recommended that you read them.
Keys / Keypress Sequences Example: **[Prog] [Batch] [Meter] [*n*]**	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. Keypress 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).

Screen Displays
Example:
`Use Up/Down Arrows`
`To Adjust Contrast;`
`Left, Right Arrows`
`To Adjust Backlight`
	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.

CONVENTION USED	DESCRIPTION
Headings Example: **2. Chapter Heading** **2.3. Section Heading** **2.3.1. Subsection Heading**	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.
Figure Captions Example: **Fig. 2-3.** *Figure No. 3 of Chapter 2*	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.
Page Numbers Example: **2-8**	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.
Application Revision and Effective Publication Date Examples: **All.74 ◆ 06/07** **20/24.74 ◆ 06/07** **21/25.74 ◆ 06/07** **22/26.74 ◆ 06/07** **23/27.74 ◆ 06/07**	The contents of Volume 1 and Volume 5 are common to all application revisions and are denoted as **All.74**. Content of Volumes 2, 3 and 4 are application specific and are identified with the application number. These identifiers are included on every page in the inside margin of the footer, opposite the page number. The publication/effective date of the manual follows the application identification. The date is expressed as month/year (e.g.: June 2007 is 06/07).

Trademark References

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

- ❏ OMNI 3000
- ❏ OMNI 6000
- ❏ OmniCom®

Other brand, product and company names that appear in this manual are trademarks of their respective owners.

Copyright Information and Modifications Policy

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

Important!

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. Registered users will also receive important updates and information about their flow computer and metering system.

Chapter 1

Modbus™ Protocol Implementation

1.1. Introduction

OMNI Flow Computers implement a superset of the Gould Modbus™ Protocol on Serial Ports #1 (selectable), #2, #3 and #4 (selectable), thus allowing simultaneous communications with two 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	1.1 - 38.4 kbps	1.1 - 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	14Bits	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

Note: See **4.5** for descriptions and examples of these function codes. See **4.4** for a description of exception responses.

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.

FUNCTION CODE	ACTION
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 imbedded non ASCII hex characters are ignored in calculating the LRC (see page 1-7 of the **Gould Modbus™ Reference Guide** for more details).

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 (1100000000000101).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 (x16 + x15 + x2 + 1) at the receiver will give a zero remainder if no errors have occurred (see pages1-4 through 1-6 of the Gould Modbus™ Reference Guide for more details).

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.

EXCEPTION CODE	DESCRIPTION
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 Code 01 or 02 (Read Boolean Status)

This function allows 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 as from 1001; (Boolean number 1= 1001). 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. Data will be packed with one bit for each Boolean flag (1 = ON, 0 = OFF). The low order bit of the first character contains the addressed flag, and the remainder follow. 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 4 flags. The 4 left most bits are provided as zeros to fill the 8-bit format.

1.5.2. Function Code 03 0r 04 (Read 16-Bit Register Sets)

Function Code 03 allows the master to obtain the binary contents of holding registers in the addressed slave. The protocol allows for a maximum of 125 sixteen-bit registers to be obtained at each request. Broadcast mode is not allowed for function 03.

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

Register Groups for Long Integer Variable Type - Points 6XXX or 15XXX long integers apply only to Revision 23 for US customary units.

REGISTER 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 Register	2 Bytes	125
4XXX	8-Char. ASCII String	4 Registers	8 Bytes	31
6XXX or 15XXX	Long Integer	2 Registers	4 Bytes	62
17XXX or 18XXX	IEEE Floating Point	2 Registers	4 Bytes	62
14XXX	16-Char. ASCII String	8 Registers	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 above example 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 OD 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:

OMNI Port #	Bit 7	Bit 6	Bit 7
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 $0F_{HEX}$ 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 2 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 Register Sets)

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

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

Register Groups for Long Integer Variable Type - Points 6XXX or 15XXX long integers apply only to Revision 23 for US customary units.

REGISTER 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 Register	2 Bytes	125
4XXX	8-Char. ASCII String	4 Registers	8 Bytes	31
6XXX or 15XXX	Long Integer	2 Registers	4 Bytes	62
7XXX or 17XXX	IEEE Floating Point	2 Registers	4 Bytes	62
14XXX	16-Char. ASCII String	8 Registers	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} 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 BYTE 0	.....	Data BYTE 128	CRC CHECK	
		HI	LO	HI	LO					
05	41	23	29	00	01	30	.....	41	'nn'	'nn'

1.5.10. Function Code 66 (Write ASCII Text Buffer)

Function code 42_{HEX} 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 an 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 BYTE 0	....	DATA BYTE 128	CRC CHECK	
		HI	LO	HI	LO					
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 packets 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 (Modbus Port #1) 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 (see technical Bulletin **TB-980401** "**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.

Chapter 2

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

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

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.

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 registers which can be read or written independently, if the Modicon Compatible mode is selected when setting up the serial port.

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 but 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 though 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 **2.5.13 Vol.3**). 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**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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.

Points **1025** through **1088** are updated every 100 msec with the evaluated results of programmable Boolean statements (see **2.5.10 Vol.3**). 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**

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 **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 Alarm and Status Points

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

Note:
* Used to assign accumulator to the front panel counters or digital I/O 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.

* **1n01** **Pulses - Gross**
* **1n02** **Pulses - Net**
* **1n03** **Pulses - Mass**
* **1n04** **Pulses - Net Standard Volume (NSV)**

1n05 **Meter Run Active Flag**
Set when the differential pressure is greater than the cutoff value (**7n51**).

1n06 **Spare**

1n07 **Any New Alarm – Meter Run '*n*'**
Clears if acknowledged.

1n08 **Batch End Acknowledge Flag**
Toggles ON/OFF.

1n09 **Spare**

1n10 **Batch Preset Reached**
Batch total equasl 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**).

1n12 **Batch End Acknowledge Flag**
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 **Override In Use - Differential Pressure**

1n16 **Override In Use - Temperature**

1n17 **Override In Use - Pressure**

1n18 **Override In Use - Gravity/Density Transducer**

1n19 **Override In Use - Density Temperature**

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 - Transducer and flow rate alarms remain set while the alarm condition exists.

Alarms - All alarms indicated the current alarm condition at the time they are reset.

1n20 **Gross Flow Rate - Low Low Alarm**
1n21 **Gross Flow Rate - Low Alarm**
1n22 **Gross Flow Rate - High Alarm**
1n23 **Gross Flow Rate - 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 **Differential Pressure - Low Range - Transducer Failed Low Alarm**
1n41 **Differential Pressure - Low Range - Transducer Failed High Alarm**
1n42 **Differential Pressure - High Range - Transducer Failed Low Alarm**
1n43 **Differential Pressure - High Range - Transducer Failed High Alarm**

1n44 **Density Pressure - Transducer Failed Low Alarm**
1n45 **Density Pressure - Low Alarm**
1n46 **Density Pressure - High Alarm**
1n47 **Density Pressure - Transducer Failed High Alarm**

1n48 **Spare**
to
1n51 **Spare**

1n52 **Differential Pressure - Low Range Selected**
Refers to when stacked differential pressures are used.
1n53 **Differential Pressure - High Range Selected**

1n54 **Any Meter Run Specific Alarm This Meter**
Clears only if acknowledged and alarm condition is cleared.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - The second digit of the index number defines the number of the meter run.

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 to 1n69 **Spare**

1n70 **Day End Flag (500ms)**

1n71 to 1n76 **Spare**

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 **Differential Pressure in Use - Low Alarm**

1n80 **Differential Pressure in Use - High Alarm**

2.3.4. Fisher Rosemount 3095FB Multivariable Transmitter Alarm and Status Points

Notes:
* Signal 10% or more above upper range limit
# Signal 10% or more below the lower range limit

* **1n83** **Differential Pressure - Upper Range Limit Alarm**
\# **1n84** **Differential Pressure - Lower Range Limit Alarm**

* **1n85** **Pressure - Upper Range Limit Alarm**
\# **1n86** **Pressure - Lower Range Limit Alarm**
1n87 **Pressure - Sensor Failure Alarm**
1n88 **Pressure - Sensor Bridge - Open Circuit Flag**

* **1n89** **Temperature - Upper Range Limit Alarm**
\# **1n90** **Temperature - Lower Range Limit Alarm**

1n91 **Temperature RTD Disconnected Flag**

1n92 **Sensor Temperature - Upper Limit Alarm**
1n93 **Sensor Temperature - Lower Limit Alarm**
1n94 **Critical Failure of Sensor Electronics**

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

1n95 **Write Protect Enabled Flag**
1n96 **Communication Failure Alarm**
1n97 **Maintenance Mode** *(Revision 25)*

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.

1n98	**Spare**
to	
1n99	**Spare**
1500	**Spare**

2.3.5. 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 149**

2.3.6. 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**

2.3.7. Command Boolean Points/Variables

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - Unless indicated as being 'Level Sensitive', most commands are '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 I/O points as needed.

1701 **Spare**

1702 **End Batch - Station**
End batch on all meter runs defined in station. It is only used with common batch stack.

1703 **End Batch - Meter #1**
Points **1703**-**1706** individual end batch commands always work.

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**.

1708 to 1711 **Spare**

1712 **Station Alarm Acknowledge**
Acknowledges all flow computer alarms.

1713 **Reset Power Failed Flag**
See power fail Flag **1829**.

1714 to 1718 **Spare**

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**.

INFO - Unless indicated as being 'Level Sensitive', most commands are 'edge triggered'. To activate a command simply write a '1' or 'True' to that point. It is not necessary to write a '0' or 'False' after the command is given. The status of a command may also be read or used as input in a Boolean or variable statement.

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

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

 # 1722 1st PID Permissive - Loop #1
Points **1722**-**1725** enable PID startup and shutdown ramping for the respective meter (see **1752**-**1755**). Level sensitive.

 # 1723 1st PID Permissive - Loop #2

 # 1724 1st PID Permissive - Loop #3

 # 1725 1st PID Permissive - Loop #4

1726 Spare

1727 Start Ramp-up PID - Loop #1
Initiates PID start up sequence by activating 1st and 2nd 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 Spare

1732 Alarm Acknowledge - Meter Run #1
Points **1732**-**1735** are meter run specific alarms only.

1733 Alarm Acknowledge - Meter Run #2

1734 Alarm Acknowledge - Meter Run #3

1735 Alarm Acknowledge - Meter Run #4

*** 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 Spare

1741 Remote Up Arrow Key
Duplicates the keypad function. Level sensitive.

1742 Remote Down Arrow Key
Duplicates the keypad function. Level sensitive.

1743 Product Select - Bit 0
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**).

1744 Product Select - Bit 1

1745 Product Select - Bit 2

1746 Product Select - Bit 3

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

1747 **'Change Product' Strobe - Meter #1**
For points **1747**-**1750**, rising edge triggers a batch end and a change to the product specified by points **1743**-**1746**.

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 ALL 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 **Orifice Plate Change - Meter #1**
Points **1756**-**1759** freeze all flow rates for the meter while changing orifice plates. Level sensitive.

1757 **Orifice Plate Change - Meter #2**

1758 **Orifice Plate Change - Meter #3**

1759 **Orifice Plate Change - Meter #4**

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 flow computers simultaneously.

1761 **Disable Flow Totalizing Station**
This command has no effect on individual meter run totalizing (see also points **1736**-**1739**). Level sensitive.

1762 **Remote Print - Previous Batch Report #1**
At local printer.

to

1769 **Remote Print - Previous Batch Report #8**

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

1770 **Remote Print - Previous Daily Report #1**
At local printer.

to

1777 **Remote Print - Previous Daily Report #8**

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

1778 **Spare**

to

1785 **Spare**

INFO - Unless indicated as being 'Level Sensitive', most commands are 'edge triggered'. To activate a command simply write a '1' or 'True' to that point. It is not necessary to write a '0' or 'False' after the command is given. The status of a command may also be read or used as input in a Boolean or variable statement.

1786 **Remote Print - Alarm Report**
At local printer.

1787 **Spare**

1788 **Shutdown PID - Loop #1**
Points **1788**-**1791** start ramp-down to 'top off' valve setting by deactivating the 1st 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 1st and 2nd 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 **Spare**
to
1800 **Spare**

2.3.8. Meter Station 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.

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:
* Used to assign accumulators to the front panel electromechanical counters and digital I/O points.

* **1801** **Positive - Gross Pulses**

* **1802** **Positive - Net Pulses**

* **1803** **Positive - Mass Pulses**

* **1804** **Positive - Net Standard Volume (NSV) Pulses**

* **1805** **Negative - Gross Pulses**
Points **1805**-**1808** are used to output pulses when station flow rate is negative. Negative flow rate is usually the result of a station definition such as, for example, '1-2', where Meter #2 flow exceeds Meter #1 flow.

* **1806** **Negative - Net Pulses**

* **1807** **Negative - Mass Pulses**

1808 **Negative - Net Standard Volume (NSV) Pulses**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

Alarms - All alarms indicated the current alarm condition at the time they are reset.

1809 **Gross Flow Rate - Low Low Alarm**

1810 **Gross Flow Rate - Low Alarm**

1811 **Gross Flow Rate - High Alarm**

1812 **Gross Flow Rate - High High Alarm**

1813 **Gravity Rate of Change Flag**
Product interface detected by station densitometer. 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 read only. These are the offset binary representation of the current running product for the station (0000=Product #1; 1111=Product #16).
Note: These are not command inputs (see points **1742-1746**).

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 (see points **7855-7860**).

1825 **Run Switching - Threshold Flag 2**

1826 **Run Switching - Threshold Flag 3**

1827 **Leak Detection Freeze Command was received**
See point **1760**.

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.

Notes:

~ The system limits the maximum number of statement evaluations to 100 to protect against possible lockups due to recursive loops. Any additional statement evaluations are ignored.

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 on power up after a power failure (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.
#	1835	**Batch End Acknowledge** Pulses at batch end (see **1817**).
#	1836	**Snapshot Printed** Indicates local 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	**Spare**
~	1840	**Boolean Statement Alarm** Tried to execute more than 100 Boolean statements.
~	1841	**Variable Statement Alarm** Tried to execute more than 100 variable statements.
	1842	**Peer-to-Peer - Transaction #1 - Communication Error** 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.
	to	
	1857	**Peer-to-Peer - Transaction #16 - Communication Error**
#	1858	**Calendar Day Start Flag** True at: 00:00:00.
#	1859	**Calendar Week Start Flag** True at: 00:00:00 Monday.
#	1860	**Calendar Month Start Flag** True at: 00:00:00 1st day of month.
#	1861	**Calendar Year Start Flag** True at: 00:00:00 Jan 1st.
	1862	**Station Density - Transducer Failed Low**
	1863	**Station Density - Low Alarm**
	1864	**Station Density - High Alarm**
	1865	**Station Density - Transducer Failed High**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

Note:

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

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

	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**
	1874	**Spare**
*	**1875**	**Net Standard Volumes (NSV) Appearing on Report Flag**
	1876	**Spare**
	1877	**Day End Flag (500ms)** *(Revision 25)*
*	**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 Day's - Station Totalizer Roll-over Flag** Set if any station totalizer rolled during the previous day.
	1881	**Liter is Selected Flag** *(Revision 25)*
	1882	**m3 Selected Flag** *(Revision 25)*
	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**
	1899	**Spare**
	to	
	2000	**Spare**

2.3.9. Meter Totalizer Roll-over Flags

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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.

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.

2n01 **Batch In Progress - Gross Totalizer Rollover Flag**
2n02 **Batch In Progress - Net Totalizer Rollover Flag**
2n03 **Batch In Progress - Mass Totalizer Rollover Flag**
2n04 **Batch In Progress - Net Standard Volume (NSV) Totalizer Rollover Flag**

2n05 **Batch In Progress - Cumulative - Gross Totalizer Rollover Flag**
2n06 **Batch In Progress - Cumulative - Net Totalizer Rollover Flag**
2n07 **Batch In Progress - Cumulative - Mass Totalizer Rollover Flag**
2n08 **Batch In Progress - Cumulative - Net Standard Volume (NSV) Totalizer Rollover Flag**

2n09 **Today's In Progress - Gross Totalizer Rollover Flag**
2n10 **Today's In Progress - Net Totalizer Rollover Flag**
2n11 **Today's In Progress - Mass Totalizer Rollover Flag**
2n12 **Today's In Progress - Net Standard Volume (NSV) Totalizer Rollover Flag**

2n13 **Today's In Progress - Cumulative - Gross Totalizer Rollover Flag**
2n14 **Today's In Progress - Cumulative - Net Totalizer Rollover Flag**
2n15 **Today's In Progress - Cumulative - Mass Totalizer Rollover Flag**
2n16 **Today's In Progress - Cumulative - Net Standard Volume (NSV) Totalizer Rollover Flag**

2n17 **Previous Batch '*n*' - Gross Totalizer Rollover Flag**
2n18 **Previous Batch '*n*' - Net Totalizer Rollover Flag**
2n19 **Previous Batch '*n*' - Mass Totalizer Rollover Flag**
2n20 **Previous Batch '*n*' - Net Standard Volume (NSV) Totalizer Rollover Flag**

2n21 **Previous Batch '*n*' - Cumulative - Gross Totalizer Rollover Flag**
2n22 **Previous Batch '*n*' - Cumulative - Net Totalizer Rollover Flag**
2n23 **Previous Batch '*n*' - Cumulative - Mass Totalizer Rollover Flag**
2n24 **Previous Batch '*n*' - Cumulative - Net Standard Volume (NSV) Totalizer Rollover Flag**

2n25 **Previous Day's - Gross Totalizer Rollover Flag**
2n26 **Previous Day's - Net Totalizer Rollover Flag**
2n27 **Previous Day's - Mass Totalizer Rollover Flag**
2n28 **Previous Day's - Net Standard Volume (NSV) Totalizer Rollover Flag**

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.

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

2n29 **Previous Day's - Cumulative - Gross Totalizer Rollover Flag**
2n30 **Previous Day's - Cumulative - Net Totalizer Rollover Flag**
2n31 **Previous Day's - Cumulative - Mass Totalizer Rollover Flag**
2n32 **Previous Day's - Cumulative - Net Standard Volume (NSV) Totalizer Rollover Flag**

2n33 **Spare**
to
2n36 **Spare**

2.3.10. Miscellaneous Meter Run Status Points

2n37 **Product in Use - Binary Coded Decimal Bit 0**
Points **2n37-2n40** are information only, read only, not commands (see **1743-1746**).
2n38 **Product in Use - Binary Coded Decimal Bit 1**
2n39 **Product in Use - Binary Coded Decimal Bit 2**
2n40 **Product in Use - Binary Coded Decimal Bit 3**

2n41 **Meter Hourly Archive Trigger Flag**
This flag is set high by the archive trigger commands (points **2733-2736**).

2.3.11. Miscellaneous Honeywell SMV3000 Multivariable Transmitter Alarm and Status Points

Notes:
* These are critical alarms that adversely affect the reliability of measurement. These alarms cause the flow computer to examine the override code strategy and apply an override, if so configured.

2n42 **Differential Pressure - Invalid Status**
Value is outside of acceptable limits.
* **2n43** **Differential Pressure - Input/Output Mode Status**
* **2n44** **Differential Pressure - Signal Alarm**

2n45 **Pressure - Invalid Status**
* **2n46** **Pressure - Input/Output Mode Status**
* **2n47** **Pressure - Signal Alarm**

2n48 **Temperature - Invalid Status**
* **2n49** **Temperature - Input/Output Mode Status**
* **2n50** **Temperature - Signal Alarm**

2n51 **Body Sensor Fault - Over Temperature Alarm**

* **2n52** **Critical Failure of SMV Electronics**

* **2n53** **Communication Failure Alarm**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

2n54 Spare
to
2n99 Spare

2500 Spare
to
2600 Spare

2.3.12. Miscellaneous Meter Station Alarm and Status Points

2601 Override in Use - Auxiliary Input #1
2602 Override in Use - Auxiliary Input #2
2603 Override in Use - Auxiliary Input #3
2604 Override in Use - Auxiliary Input #4

2605 Spare
to
2608 Spare

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.

2624 Spare
to
2700 Spare

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

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

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

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 Others - Watchdog Status
Assigned to a digital I/O point monitoring other flow computers watchdog (see **2863**).

2714 Others - 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.

2.3.15. Boolean Status Points Used for Meter Tube Switching

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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

How the MOV Limit Switches are Interpreted -

2717=On	2718=Off Open
2717=Off	2718=On Closed
2717=Off	2718=Off Travel
2717=On	2718=On Illegal

Status inputs and outputs are required to achieve the automatic meter tube switching function. The command input points below are used to interface to motor-operated valve (MOV) limit switch signals and allow the user to take an MOV 'out of service'. See 2877 to 2896 for points needed to send MOV open and close commands.

2717 **Meter #1- MOV - Open Status**
Must be activated when the MOV is fully open.

2718 **Meter #1 - MOV - Closed Status**
Must be activated when the MOV is fully closed.

2719 **Meter #1 - MOV - 'In Service' Command / Status**
Read/Write point used to remove an MOV from service. The flow computer also controls this point. Level sensitive.

2720 **Meter #2 - MOV - Open Status**

2721 **Meter #2 - MOV - Closed Status**

2722 **Meter #2 - MOV - 'In Service' Status**

2723 **Meter #3 - MOV - Open Status**

2724 **Meter #3 - MOV - Closed Status**

2725 **Meter #3 - MOV - 'In Service' Status**

2726 **Meter #4 - MOV - Open Status**

2727 **Meter #4 - MOV - Closed Status**

2728 **Meter #4 - MOV - 'In Service' Status**

2729 **Spare**
to
2732 **Spare**

2.3.16. Archive Trigger Commands

2733 **Archive Trigger Command - Meter #1**
Points **2733-2736** are set high to start archive. The archive trigger commands will trigger Point **2n41** 'Meter Hourly Archive Flag'.

2734 **Archive Trigger Command - Meter #2**

2735 **Archive Trigger Command - Meter #3**

2736 **Archive Trigger Command - Meter #4**

2737 **Toggle Maintenance Command Meter #1** *(Revision 25)*

2738 **Toggle Maintenance Command Meter #1** *(Revision 25)*

2739 **Toggle Maintenance Command Meter #1** *(Revision 25)*

2740 **Toggle Maintenance Command Meter #1** *(Revision 25)*

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 **Spare**
to
2799 **Spare**

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.

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

INFO - Remember that the station is defined as a group of individual meter runs.

In Progress Flags - The 'In Progress' flags are the flags that 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 an SCADA or MMI. This is necessary because the flow computer clears the 'In Progress' data immediately after it prints the local report.

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. See also points at **2n01** for meter run versions of flags.

2801 Batch In Progress - Gross Totalizer Rollover Flag
2802 Batch In Progress - Net Totalizer Rollover Flag
2803 Batch In Progress - Mass Totalizer Rollover Flag
2804 Batch In Progress - Net Standard Volume (NSV) Totalizer Rollover Flag

2805 Batch In Progress - Cumulative - Gross Totalizer Rollover Flag
2806 Batch In Progress - Cumulative - Net Totalizer Rollover Flag
2807 Batch In Progress - Cumulative - Mass Totalizer Rollover Flag
2808 Batch In Progress - Cumulative - Net Standard Volume (NSV) Totalizer Rollover Flag

2809 Today's In Progress - Gross Totalizer Rollover Flag
2810 Today's In Progress - Net Totalizer Rollover Flag
2811 Today's In Progress - Mass Totalizer Rollover Flag
2812 Today's In Progress - Net Standard Volume (NSV) Totalizer Rollover Flag

2813 Today's In Progress - Cumulative - Gross Totalizer Rollover Flag
2814 Today's In Progress - Cumulative - Net Totalizer Rollover Flag
2815 Today's In Progress - Cumulative - Mass Totalizer Rollover Flag
2816 Today's In Progress - Cumulative - Net Standard Volume (NSV) Totalizer Rollover Flag

2817 Previous Batch '*n*' - Gross Totalizer Rollover Flag
2818 Previous Batch '*n*' - Net Totalizer Rollover Flag
2819 Previous Batch '*n*' - Mass Totalizer Rollover Flag
2820 Previous Batch '*n*' - Net Standard Volume (NSV) Totalizer Rollover Flag

2821 Previous Batch '*n*' - Cumulative - Gross Totalizer Rollover Flag
2822 Previous Batch '*n*' - Cumulative - Net Totalizer Rollover Flag
2823 Previous Batch '*n*' - Cumulative - Mass Totalizer Rollover Flag
2824 Previous Batch '*n*' - Cumulative - Net Standard Volume (NSV) Totalizer Rollover Flag

2825 Previous Day's - Gross Totalizer Rollover Flag
2826 Previous Day's - Net Totalizer Rollover Flag
2827 Previous Day's - Mass Totalizer Rollover Flag
2828 Previous Day's - Net Standard Volume (NSV) Totalizer Rollover Flag

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

2829 **Previous Day's - Cumulative - Gross Totalizer Rollover Flag**

2830 **Previous Day's - Cumulative - Net Totalizer Rollover Flag**

2831 **Previous Day's - Cumulative - Mass Totalizer Rollover Flag**

2832 **Previous Day's - Cumulative - Net Standard Volume (NSV) Totalizer Rollover Flag**

2833 **Current Batch 2nd Net Total Rollover Flag**

2834 **Current Daily 2nd Net Total Rollover Flag**

2835 **Previous Batch 'n' 2nd Net Rollover Flag**

2836 **Previous Day 2nd Net Rollover Total Flag**

2837 to 2845 **Spare**

2847 **DP Unit kPa Appearing On Report Flag** *(Revision 25)*

2848 **DP Unit millibar Appearing On Report Flag** *(Revision 25)*

2849 **Pressure Unit kPa Appearing On Report Flag** *(Revision 25)*

2850 **PressureP Unit bar Appearing On Report Flag** *(Revision 25)*

2851 **Pressure Unit kg/cm^2 Appearing On Report Flag** *(Revision 25)*

2.3.18. Station Totalizer Decimal Resolution Flags

INFO - Remember that the station is defined as a group of individual meter runs.

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**

Note: It is unlikely that the user would have any use for these variables.

2855 to 2857 **Spare**

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 **Spare**

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**).

2.3.20. More Station Totalizer Decimal Resolution 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.

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 **Spare**
to
2876 **Spare**

2.3.21. Boolean Command Outputs and Status Points Used For Meter Tube Switching

MOV Alarms: Any MOV alarm will cause the flow computer to take the MOV out of service (see 2719) and send a close MOV command.

Status inputs and outputs are required to achieve the automatic meter tube switching function. The command output points below are used to open and close the motor-operated valve (MOV). Alarm points are also provided which indicate MOV problems. See 2717 for points needed to interface to the MOV limit switches.

2877 **Meter #1 - Open MOV - Command Out**
Activates to open MOV.

2878 **Meter #1 - Close MOV - Command Out**
Activates to close MOV.

2879 **Meter #1 - MOV - Alarm Out**
MOV limit switches are indicating an illegal valve position.

2880 **Meter #1 - Time-out Alarm - Opening MOV**
MOV took too long opening.

2881 **Meter #1 - Time-out Alarm - Closing MOV**
MOV took too long closing.

2882 **Meter #2 - Open MOV - Command Out**
to
2886 **Meter #2 - Time-out Alarm - Closing MOV**

2887 **Meter #3 - Open MOV - Command Out**
to
2891 **Meter #3 - Time-out Alarm - Closing MOV**

2892 **Meter #4 - Open MOV - Command Out**
to
2896 **Meter #4 - Time-out Alarm - Closing MOV**

2897 **Spare**
to
3000 **Spare**

Chapter 3

16-Bit Integer Data (3001 - 3999)

3.1. Custom Data Packet Definition Variables

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple register writes.

INFO – These data packets may be transmitted automatically without being polled or requested (see points **2701-2712**).

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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

3097 **Select Units 0=m^3 1=Liter** *(Revision 25)*

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.

3100 **Spare**

3.3. Meter Run 16-Bit Integer Data

The second digit of the index number defines the number of the meter run. For example: **3101** is the 'Temperature Override Code' for Meter Run **#** 1. The same point for Meter Run # 4 would be **3401**.

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 **Spare**

3n07 **Spare**

3n08 **Transmitter Device Type Select**
0=Differential Pressure Sensor; 1=Rosemount 3095FB Multivariable Transmitter; 2=Honeywell SMV3000 Multivariable Transmitter

3n09 **Override Code - Differential Pressure**

3n10 **Static Pressure - Location Select**
0=Upstream; 1=Downstream.

3n11 **Spare**

3n12 **Orifice Taps**
For Revision 21 (US units): 0=Flange Taps; 1=Pipe Taps.
For Revision 25 (metric units): 0=Corner Taps; 1=D & D/2 Taps; 2=Flange Taps; 3=ISA 1932 Nozzle; 4=Long Radius Nozzle; 5=Venturi C=0.984; 6=Venturi C=0.995; 7=Venturi C=o.985; 8=Venturi Nozzle.

3n13 **Select Upstream Pressure 0=No, 1=Yes (***Revision 25)*

3114 to 3n15 **Spare**

INFO - These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple register writes.

3n16 **BS&W Source**
0=None; 1=Auxiliary Input #1; 2=Auxiliary Input #2; 3=Auxiliary Input #3; 4=Auxiliary Input #4; 5=Modbus.

3n17 **Hour in Progress - Flow Time**
500msec ticks (0-7200).

3n18 **Last Hour's - Flow Time**
500msec ticks (0-7200).

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 to 3n35 **Spare**

3n36 **Today's Flow - Hours**

3n37 **Today's Flow - Minutes**

3n38 **Previous Day's Flow - Hours**

3n39 **Previous Day's Flow - Minutes**

Notes:
- **#** 2s complement numbers based on span entries **17176** through **17189**. Values expressed as percentages of span in tenth percent increments;. i.e., 1000 represents 100.0%
- ***** Unsigned integer totalizers cumulative based. They roll at 65536.
- **~** 2s complement numbers based on the 4-20 mA spans. Values are expressed as percentages of span in tenth percent increments; i.e., 1000 equals 100.0 %.

**3n40** **Current Net Flow Rate**

***** **3n41** **Net Totalizer**

**3n42** **Current Gross Flow Rate**

***** **3n43** **Gross Totalizer**

**3n44** **Current Mass Flow Rate**

***** **3n45** **Mass Totalizer**

~ **3n46** **Current Meter Run Pressure**

~ **3n47** **Current Meter Run Temperature**

~ **3n48** **Current Transducer Density/Gravity**

**3n49** **Current Net Standard Volume (NSV) Flow Rate**

***** **3n50** **Net Standard Volume (NSV) Totalizer**

3n51 **Spare**

3n52 **Spare**

3n53 **Multivariable Serial Port Selection**

3n54 **Multivariable Address**

3n55 to 3n99 **Spare**

3500 **Spare**

3.4. Scratchpad 16-Bit Integer Data

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

Ninety-nine integer registers are provided for user scratch pad. These registers 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

3600 Spare

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
3610 Decimal Places for 1st Variable
3611 Database Index Number of 2nd Variable
3612 Decimal Places for 2nd Variable
3613 Database Index Number of 3rd Variable
3614 Decimal Places for 3rd Variable
3615 Database Index Number of 4th Variable
3616 Decimal Places for 4th Variable

INFO - These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple register writes.

3.5.3. User Display Number 3

3617 Database Index Number of 1st Variable
3618 Decimal Places for 1st Variable
3619 Database Index Number of 2nd Variable
3620 Decimal Places for 2nd Variable
3621 Database Index Number of 3rd Variable
3622 Decimal Places for 3rd Variable
3623 Database Index Number of 4th Variable
3624 Decimal Places for 4th Variable

3.5.4. User Display Number 4

3625 Database Index Number of 1st Variable
3626 Decimal Places for 1st Variable
3627 Database Index Number of 2nd Variable
3628 Decimal Places for 2nd Variable
3629 Database Index Number of 3rd Variable
3630 Decimal Places for 3rd Variable
3631 Database Index Number of 4th Variable
3632 Decimal Places for 4th Variable

3.5.5. User Display Number 5

3633 Database Index Number of 1st Variable
3634 Decimal Places for 1st Variable
3635 Database Index Number of 2nd Variable
3636 Decimal Places for 2nd Variable
3637 Database Index Number of 3rd Variable
3638 Decimal Places for 3rd Variable
3639 Database Index Number of 4th Variable
3640 Decimal Places for 4th Variable

3.5.6. User Display Number 6

3641 Database Index Number of 1st Variable
3642 Decimal Places for 1st Variable
3643 Database Index Number of 2nd Variable
3644 Decimal Places for 2nd Variable
3645 Database Index Number of 3rd Variable
3646 Decimal Places for 3rd Variable
3647 Database Index Number of 4th Variable
3648 Decimal Places for 4th Variable

INFO - These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple register writes.

3.5.7. User Display Number 7

3649 **Database Index Number of 1st Variable**
3650 **Decimal Places for 1st Variable**
3651 **Database Index Number of 2nd Variable**
3652 **Decimal Places for 2nd Variable**
3653 **Database Index Number of 3rd Variable**
3654 **Decimal Places for 3rd Variable**
3655 **Database Index Number of 4th Variable**
3656 **Decimal Places for 4th Variable**

3.5.8. User Display Number 8

3657 **Database Index Number of 1st Variable**
3658 **Decimal Places for 1st Variable**
3659 **Database Index Number of 2nd Variable**
3660 **Decimal Places for 2nd Variable**
3661 **Database Index Number of 3rd Variable**
3662 **Decimal Places for 3rd Variable**
3663 **Database Index Number of 4th Variable**
3664 **Decimal Places for 4th Variable**

3665 **Spare**
to
3700 **Spare**

3.6. Data Used to Access the Raw Data Archive Records

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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.

INFO - These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple register writes.

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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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 Added Flags**
A non-zero value indicates that a new record has been added; the user must clear after read. Bit 0 to Bit 9 for files 701 to 710.

3742 **Spare**
to
3746 **Spare**

3747 **Default Snapshot Report template (0=No, 1=Yes)**

3748 **Default Batch Report template (0=No, 1=Yes)**

3749 **Default Daily Report template (0=No, 1=Yes)**

3750 **Default Prove Report template (0=No, 1=Yes)** *(Revision 25)*

3751 **Run Switching in Auto Mode**
0=No; 1=Yes.

3752 **Run Switching Timer**
Seconds allowed for flow to settle during MOV operations.

3753 **Honeywell Multivariable Sensor #1 – Detailed Status Bytes 1 & 2**

3754 **Honeywell Multivariable Sensor #1 – Detailed Status Bytes 3 & 4**

3755 **Honeywell Multivariable Sensor #1 – Detailed Status Bytes 5 & 6**

3756 **Honeywell Multivariable Sensor #1 – Detailed Status Bytes 7 & 8**

3757 **Honeywell Multivariable Sensor #2 – Detailed Status Bytes 1 & 2**
to
3760 **Honeywell Multivariable Sensor #2 – Detailed Status Bytes 7 & 8**

3761 **Honeywell Multivariable Sensor #3 – Detailed Status Bytes 1 & 2**
to
3764 **Honeywell Multivariable Sensor #3 – Detailed Status Bytes 7 & 8**

3765 **Honeywell Multivariable Sensor #4 – Detailed Status Bytes 1 & 2**
to
3768 **Honeywell Multivariable Sensor #4 – Detailed Status Bytes 7 & 8**

3769 **Number of Historical Alarms to Modbus Buffer**
Used by OmniCom when reading the Historical Alarm Report. OmniCom first writes to this variable the number of historical alarm events to be included on the report.

3770 **Spare**
to
3799 **Spare**

3.8. Meter Station 16-Bit Integer Data

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

Notes:

~ 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. If pass-words are enabled, the target address is recorded for single point writes. 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):

000A = Audit S1
00A0 = Audit S2
0A00 = Audit S3
A000 = Audit S4

To monitor multiple ports; e.g.:
A0A0 = Audit S4 & S2

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

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

~	**3800**	**Special Diagnostic Function** Used to enable rigorous 'Audit Trail' reporting of all serial port transactions (see side bar note).
	3801	**Running Product Number** Common Batch Stack - Station.
#	**3802**	**Current Net Flow Rate**
*	**3803**	**Net Totalizer**
#	**3804**	**Current Gross Flow Rate**
*	**3805**	**Gross Totalizer**
#	**3806**	**Current Mass Flow Rate**
*	**3807**	**Mass Totalizer**
#	**3808**	**Current Pressure**
#	**3809**	**Current 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**

INFO - These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple register writes.

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 Carriage Return**
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=1st day of the month.

3835 **Automatic - Hourly Batch Select**
0=No; 1=Yes.

3836 **Default Report Templates**
0=Custom templates; 1=Default reports.

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 **Spare**

to

3841 **Spare**

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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

The following 24 registers are treated as either one 24-position shift stack or, 4 separate 6-position shift stacks depending upon register **3837**. ***Data in the stack(s) is shifted automatically at the beginning of a new batch***. A new batch starts after a either a 'station batch end' (**1702**) or '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**

INFO - These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple register writes.

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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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.

3875 **Julian Day (# of days since first day of January)**

3.11. More Miscellaneous 16-Bit Integer Data

3876 **Override Code - Density**

3877 **Override Code - Density Temperature**

3878 **Override Code - Density Pressure**

3879 **Spare**

3880 **Density Factor - Select A/B - Product #1**
to
3895 **Density Factor - Select A/B - Product #16**

3896 **Spare**

3897 **Alarm Timer (0 – 128 Seconds)** *(Revision 25)*

3897 **Spare**
to
4000 **Spare**

Chapter 4

8-Character ASCII String Data (4001 - 4999)

4.1. Meter Run ASCII String Data

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 registers. 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 registers. The starting address of the string still applies.

Note:
\# Last batch end for this meter run.

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 registers (see the side bar comments).

	4n01	**Running Batch - Start Date**
	4n02	**Running Batch - Start Time**
#	**4n03**	**Batch End - Date**
#	**4n04**	**Batch End - Time**
	4n05	**Running Product Name**
	4n06	**Current - Calculation Mode** Algorithm set used, in string format.
	4n07	**Current - Batch ID** Characters 1-8.
	4n08	**Current - Batch ID** Characters 9-16.
	4n09	**Spare**
	to	
	4n13	**Spare**
	4n14	**Meter - ID**
	4n15	**Flow Meter Tag / Low Range Tag - Differential Pressure**
	4n16	**Differential Pressure - High Range Tag**
	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	**Spare**
	to	
	4n25	**Spare**
	4n26	**Day Start Time**
	4n27	**Day Start Date**
	4n28	**Spare**
	to	
	4n39	**Spare**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

4n40 Previous Day Start Time
4n41 Previous Day Start Date
4n42 Previous Day End Time
4n43 Previous Day End Date

4n44 Spare
to
4n99 Spare

4.2. Scratch Pad ASCII String Data

Storage for ninety-nine ASCII strings is provided for user scratch pad. These registers 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.

INFO - See **3601** area for more data points needed to setup the user displays.

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 Spare
to
4706 Spare

4.4. String Variables Associated with the Station Auxiliary Inputs

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 registers. 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 registers. The starting address of the string still applies.

4707 **Auxiliary Tag - Input #1**
to
4710 **Auxiliary Tag - Input #4**

4711 **Spare**
to
4800 **Spare**

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.
4808 **Time of Last Database Change**

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 **Density/Gravity Tag**

4815 **Station - ID**

4816 **Station – Density Temperature Tag**
4817 **Station – Density Pressure Tag**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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 spares.)

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 spares.)

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: 21.72

4850 **Online Password / EPROM Checksum**
Dual function point. Write password. Read provides EPROM Checksum.

4851 **Spare**

4.6. Meter Run Batch Identification Data

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 registers. 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 registers. The starting address of the string still applies.

4.6.1. 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**

4.6.2. 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**

4.6.3. 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**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

4.6.4. 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	**Spare**
to	
5100	**Spare**

Chapter 5

32-Bit Integer Data (5001 - 6999)

5.1. Meter Run 32-Bit Integer Data

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 registers. The starting address of the 32-bit integer still applies.

Notes:

* The increment for all totalizers depends upon the 'totalizer resolution' settings shown in the 'Factor Setup' menu of OmniCom. They can only be changed via the keypad entries made in the 'Pass-word Maintenance' menu after 'Resetting all Totalizers'.

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**.

* **5n01** **Batch In Progress - Gross Totalizer**
Points **5n01**-**5n04** represent the total batch quantities measured so far for the batch in progress. Results are moved to **5n50** area at the end of the batch.

* **5n02** **Batch In Progress - Net Totalizer**

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

* **5n04** **Batch In Progress - Net Standard Volume (NSV) Totalizer**

* **5n05** **Cumulative In Progress - Gross Totalizer**
Points **5n05**-**5n08** are non-resetable totalizers which are snapshot for opening readings.

* **5n06** **Cumulative In Progress - Net Totalizer**

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

* **5n08** **Cumulative In Progress - Net Standard Volume (NSV) Totalizer**

* **5n09** **Today's In Progress - Gross Totalizer**
Points **5n09**-**5n12** are total daily quantities measured since the 'day start hour' today. These are moved to the **5n54** area at the start of a new day.

* **5n10** **Today's In Progress - Net Totalizer**

* **5n11** **Today's In Progress - Mass Totalizer**

* **5n12** **Today's In Progress - Net Standard Volume (NSV) Totalizer**

5n13 **Meter Factor**

5n14 **Batch FWA/TWA Meter Factor**

5n15 **Daily FWA/TWA Meter Factor**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

5n16 **Batch Preset Remaining**

5n17 **Running Product Number**

5n18 **Spare**

5n19 **In Progress - Batch Report Number**
Increments each batch start.

5n20 **Spare**
to
5n37 **Spare**

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

**5n38** **Batch Preset Warning**
Barrels.

**5n39** **Volume Correction Factor (VCF)**

**5n40** **Correction Factor for Effect of Pressure on Liquid (CPL)**

**5n41** **Batch – Flow/Time Weighted Average - VCF**

**5n42** **Batch - Flow/Time Weighted Average - CPL**

**5n43** **Today's - Flow/Time Weighted Average - VCF**

**5n44** **Today's - Flow/Time Weighted Average - CPL**

5n45 **Hour In Progress - Net Total for**
Points **5n45**-**5n48** represent the total quantities for the current hour in progress. These will be moved to 5n75 area at the start of the new hour.

5n46 **Hour In Progress - Mass Totalizer**

5n47 **Hour In Progress - Net Standard Volume (NSV) Totalizer**

5n48 **Hour In Progress - Gross Totalizer**

5n49 **Spare**

5n50 **Previous Batch '*n*' - Gross Totalizer**
Points **5n50**-**5n53** represent the total batch quantities for the previous batch.

5n51 **Previous Batch '*n*' - Net Totalizer**

5n52 **Previous Batch '*n*' - Mass Totalizer**

5n53 **Previous Batch '*n*' - Net Standard Volume (NSV) Totalizer**

5n54 **Previous Day's - Gross Totalizer**
Points **5n54**-**5n57** are the total quantities for the previous day; 'day start hour' to 'day start hour'.

5n55 **Previous Day's - Net Totalizer**

5n56 **Previous Day's - Mass Totalizer**

5n57 **Previous Day's - Net Standard Volume (NSV) Totalizer**

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 registers. The starting address of the 32-bit integer still applies.

5n58 **Batch In Progress - Opening Gross Totalizer**
Points **5n58**-**5n61** are cumulative totalizers snapshot at the start of the batch in progress. These variables are also the closing totalizers for the previous batch.

5n59 **Batch In Progress - Opening Net Totalizer**

5n60 **Batch In Progress - Opening Mass Totalizer**

5n61 **Batch In Progress - Opening Net Standard Volume (NSV) Totalizer**

5n62 **Today's - Opening Gross Totalizer**
Points **5n62**-**5n65** are cumulative totalizers snapshot at day start hour for today. These variables are also the closing totalizers for the previous day.

5n63 **Today's - Opening Net Totalizer**

5n64 **Today's - Opening Mass Totalizer**

5n65 **Today's - Opening Net Standard Volume (NSV) Totalizer**

5n66 **Cumulative - Gross 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 Total @ Leak Detection Freeze Command**

5n68 **Cumulative - Mass Total @ Leak Detection Freeze Command**

5n69 **Cumulative - Net Standard Volume (NSV) Total @ Leak Detection Freeze Command**

5n70 **Increment - Gross Totalizer**
Points **5n70**-**5n73** contains the incremental integer counts that were added to the totalizers for this current cycle (500msec).

5n71 **Increment - Net Totalizer**

5n72 **Increment - Mass Totalizer**

5n73 **Increment - Net Standard Volume (NSV) Totalizer**

5n74 **Previous Hour's - Gross Total**
Points **5n74**-**5n77** represent the total quantities measured for the last hour. These are moved here from **5n44** area at the end of hour.

5n75 **Previous Hour's - Net Total**

5n76 **Previous Hour's - Mass Total**

5n77 **Previous Hour's - Net Standard Volume (NSV) Total**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

5n78 **Previous Batch - Opening Gross**
Data from **5n58** area gets moved to **5n78**-**5n81** at the end of each batch.
5n79 **Previous Batch - Opening Net**
5n80 **Previous Batch - Opening Mass**
5n81 **Previous Batch - Opening Net Standard Volume (NSV)**

5n82 **Previous Day's - Opening Gross**
Data from **5n62** area gets moved to **5n82**-**5n85** at the end/beginning of each day.
5n83 **Previous Day's - Opening Net**
5n84 **Previous Day's - Opening Mass**
5n85 **Previous Day's - Opening Net Standard Volume (NSV)**

5n86 **Spare**
to
5n91 **Spare**

5n92 **Maintenance Mode Gross Total** *(Revision 25)*
5n93 **Maintenance Mode Net Total** *(Revision 25)*
5n94 **Maintenance Mode Mass Total** *(Revision 25)*
5n95 **Maintenance Mode Net Standard Volume** *(Revision 25)*
5n96 **Spare**
to
5500 **Spare**

5.2. Scratch Pad 32-Bit Integer Data

Ninety-nine 32-bit integer registers are provided for user scratch pad. These registers are 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 **Spare**
to
5800 **Spare**

5.3. Station 32-Bit Integer Data

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 registers. The starting address of the 32-bit integer still applies.

Note:

* The increment for all totalizers depends upon the 'totalizer resolution' settings shown in the 'Factor Setup' menu of OmniCom. They can only be changed via the keypad entries made in the 'Pass-word Maintenance' menu after 'Resetting all Totalizers'.

* **5801** **Batch In Progress - Gross 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 Totalizer**

* **5803** **Batch In Progress - Mass Totalizer**

* **5804** **Batch In Progress - Net Standard Volume (NSV) Totalizer**

* **5805** **Cumulative In Progress - Gross Totalizer**
Points **5805**-**5808** are non-resetable totalizers which are snapshot for opening readings.

* **5806** **Cumulative In Progress - Net Totalizer**

* **5807** **Cumulative In Progress - Mass Totalizer**

* **5808** **Cumulative In Progress - Net Standard Volume (NSV) Totalizer**

* **5809** **Today's In Progress - Gross Totalizer**
Points **5809**-**5812** are total daily quantities measured since the 'day start hour' today. These are moved to the **5854** area at the start of a new day.

* **5810** **Today's In Progress - Net Totalizer**

* **5811** **Today's In Progress - Mass Totalizer**

* **5812** **Today's In Progress - Net Standard Volume (NSV) Totalizer**

5813 **Spare**

5814 **Line Pack Remaining**

5815 **Batch Preset Warning**

5816 **Batch Preset Remaining**

5817 **Running Product ID**

5818 **Batch Number**

5.4. Meter Run Batch Size Data

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

5.4.1. 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

5.4.2. 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

5.4.3. 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

5.4.4. 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

5843 Spare

5.5. Miscellaneous 32-Bit Integer Data

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 registers. The starting address of the 32-bit integer still applies.

5844 **Station - In Progress - Gross Total for Hour**
Points **5844**-**5847** represent the total station quantities for the current hour in progress. These will be moved to 5n74 area at the start of the new hour.

5845 **Station - In Progress - Net Total for Hour**

5846 **Station - In Progress - Mass Total for Hour**

5847 **Station - In Progress - Net Standard Volume (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 **Previous Batch - Gross Totalizer**
Points **5850**-**5853** are total batch quantities for the previous batch. These are moved here from **5801** area at the end of a batch.

5851 **Previous Batch - Net Totalizer**

5852 **Previous Batch - Mass Totalizer**

5853 **Previous Batch - Net Standard Volume (NSV) Totalizer**

5854 **Previous Day's - Gross Totalizer**
Points **5854**-**5857** are total quantities for the previous day; 'day start hour' to 'day start hour'. These are moved here from **5809** area at the end of the day.

5855 **Previous Day's - Net Totalizer**

5856 **Previous Day's - Mass Totalizer**

5857 **Previous Day's - Net Standard Volume (NSV) Totalizer**

5858 **Current Batch - Opening Gross 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 **Current Batch - Opening Net Totalizer**

5860 **Current Batch - Opening Mass Totalizer**

5861 **Current Batch - Opening Net Standard Volume (NSV) Totalizer**

5862 **Today's - Opening Gross Totalizer**
Points **5862**-**5865** are cumulative totalizers snapshot at day start hour for today. These variables are also the closing totalizers for the previous day.

5863 **Today's - Opening Net Totalizer**

5864 **Today's - Opening Mass Totalizer**

5865 **Today's - Opening Net Standard Volume (NSV) Totalizer**

5866 **Cumulative - Gross 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 **Cumulative - Net Total @ Freeze**

5868 **Cumulative - Mass Total @ Freeze**

5869 **Cumulative - Net Standard Volume (NSV) Total @ Freeze**

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 registers. The starting address of the 32-bit integer still applies.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

Note:

* The increment for all totalizers depends upon the 'totalizer resolution' settings shown in the 'Factor Setup' menu of OmniCom. They can only be changed via the keypad entries made in the 'Pass-word Maintenance' menu after 'Resetting all Totalizers'.

* **5870** **Increment - Gross Totalizer**
Points **5870**-**5873** contain the incremental integer counts that were added to the totalizers for this current cycle.

* **5871** **Increment - Net Totalizer**

* **5872** **Increment - Mass Totalizer**

* **5873** **Increment - Net Standard Volume (NSV) Totalizer**

5874 **Previous Hour's - Gross**
Points **5874**-**5877** represent the total quantities measured for the last hour. These are moved here from **5844** area at the end of hour.

5875 **Previous Hour's - Net**

5876 **Previous Hour's - Mass**

5877 **Previous Hour's - Net Standard Volume (NSV)**

5878 **Previous Batch - Opening Gross**
Data from **5858** area is moved to points **5878**-**5881** at the end of each batch.

5879 **Previous Batch - Opening Net**

5880 **Previous Batch - Opening Mass**

5881 **Previous Batch - Opening Net Standard Volume (NSV)**

5882 **Previous Day's - Opening Gross**
Data from **5862** area gets moved to points **5882**-**5885** at the end/beginning of each day.

5883 **Previous Day's - Opening Net**

5884 **Previous Day's - Opening Mass**

5885 **Previous Day's - Opening Net Standard Volume (NSV)**

5886 **Spare**
to
7000 **Spare**

Chapter 6

32-Bit IEEE Floating Point Data (7001 - 8999)

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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

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 -5.00 to 110.00.

7001	**Digital-to-Analog Output #1**
to	
7018	**Digital-to-Analog Output #18**
7019	**Spare**
to	
7024	**Spare**

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 the 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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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 **7089** is pulse out using **1089**.

to

7099 **Programmable Accumulator #11**
Data placed into **7099** is pulse out using **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.

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**.

INFO - Calculated averages can be either 'flow weighted' or 'time weighted depending upon point number.

Notes:
- **<** Current live values which are updated every 500msec.
- ***** Current values in use now.

< 7n01 **Flow Rate - Gross**
Barrels/hr or m^3/hr.

< 7n02 **Flow Rate - Net**
Barrels/hr or m^3/hr.

< 7n03 **Flow Rate - Mass**
Klbs/hr or ton/hr.

< 7n04 **Flow Rate - Net Standard Volume (NSV)**
Barrels/hr or m^3/hr.

*** 7n05** **Temperature**

*** 7n06** **Pressure**

*** 7n07** **Density in Use kg/m^3** *(Revision 25)*

*** 7n08** **Flowing Transducer Density Before Factoring**
Temperature and pressure corrected.

*** 7n09** **Flowing Transducer Density After Factoring**
7n09=**7n08** x **7n43**.

*** 7n10** **Density Transducer Temperature**
Corrects for transducer expansion effects.

*** 7n11** **Density Transducer Pressure**
Corrects for transducer expansion effects.

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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

Notes:

- ***** Current values in use now.
- **#** For orifice metering, these variables are the average of the square rooted value which is then squared before storing.

*	7n12	API Flowing
*	7n13	API @ 60 °F / API @ Reference Temperature
*	7n14	Specific Gravity Flowing
*	7n15	Specific Gravity @ 60 °F/Density @15 Degree C
*	7n16	Differential Pressure
*	7n17	Orifice Coefficient
	7n18	Batch In Progress - Average Meter Run Temperature
	7n19	Batch In Progress - Average Meter Run Pressure
#	7n20	Batch In Progress - Average of Density in Use
	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	Fluid Expansion Factor (Y)
	7n28	Velocity of Approach Factor (E_v)
	7n29	Day In Progress - Average Temperature
	7n30	Day In Progress - Average Pressure
#	7n31	Day In Progress - Average Density in Use
	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
	7n36	Day In Progress - Average Specific Gravity Flowing
	7n37	Day In Progress - Average Specific Gravity @ 60 °F / Density @ Reference Temperature
	7n38	Day in Progress - Average Differential Pressure
	7n39	Pipe Diameter
	7n40	Orifice Diameter
	7n41	Viscosity Override
	7n42	Isentropic Exponent Override

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - The second digit of the index number defines the number of the meter run number.

7n43 **Densitometer Factor in Use**

7n44 **Densitometer Factor B**

7n45 **Measured Orifice Diameter - @ Reference Temperature**

7n46 **Orifice Plate - Coefficient of Thermal Expansion**

7n47 **Orifice Plate - Reference Temperature**

7n48 **Measured Meter Tube Diameter - @ Reference Temperature**

7n49 **Meter Tube - Coefficient of Thermal Expansion**

7n50 **Meter Tube - Reference Temperature**

7n51 **Differential Pressure - Low Cutoff**
Inches of Water (kPa or millbar). **1n05** is set when DP above this.

7n52 **Differential Pressure - Low Limit**

7n53 **Differential Pressure - High Limit**

7n54 **Differential Pressure - Override Value**

7n55 **Low Range - Differential Pressure - @ 4mA**

7n56 **Low Range - Differential Pressure - @ 20mA**

7n57 **High Range - Differential Pressure - @ 4mA**
2nd DP when using stacked differential pressures.

7n58 **High Range - Differential Pressure - @ 20mA**

7n59 **Differential Pressure - High Switch Over %**
Use High DP if Low DP is greater than this %.

7n60 **Differential Pressure - Low Switch Over %**
Use Low DP if High DP is less than this %.

7n61 **Meter Run Gross Flow Rate - Low Limit**

7n62 **Meter Run Gross Flow Rate - 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**

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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

Note:

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

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 A**
Used to correct densitometer.

***** **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**
$K_{19}/P_{coef}/K_{t1}$.

***** **7n94** **Densitometer - Constant #6**
$K_{20A}/P_{cal}/K_{t2}$.

***** **7n95** **Densitometer - Constant #7**
K_{20B}/K_{t3}.

***** **7n96** **Densitometer - Constant #8**
K_{21A}/P_c.

***** **7n97** **Densitometer - Constant #9**
K_{21B}/K_{p1}.

***** **7n98** **Densitometer - Constant #10**
Kr/K_{P2}.

***** **7n99** **Densitometer - Constant #11**
K_j/K_{P3}.

7500 **Spare**

6.5. Scratch Pad 32-Bit IEEE Floating Point Data

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

Ninety-nine IEEE 32-bit floating point registers are provided for user scratch pad. These registers are 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 Spare

Notes:

- **+** Do not write to these variables. They are provided for read only information.
- **>** 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.
- **~** 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.
- **^** Only writes made while in the 'Manual' mode will be meaningful. These variables are overwritten by the flow computer in all other operating modes.
- **<** Writes to these variables are always accepted.

6.6. PID Control 32-Bit IEEE Floating Point Data

+ 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 Spare
to
7623 Spare

6.7. Miscellaneous Meter Run 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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

INFO - See **7n01** through **7n99** for more meter run related data.

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).

Flowing variables are snapshot and stored here when the Leak Detection Freeze command (**1760**) is received (also see points **5n66**).

	7624	**Equilibrium Pressure - Meter Run #1** Current live value, in PSIg or kPa.
	7625	**Equilibrium Pressure - Meter Run #2** Current live value, in PSIg or kPa.
	7626	**Equilibrium Pressure - Meter Run #3** Current live value, in PSIg or kPa.
	7627	**Equilibrium Pressure - Meter Run #4** Current live value, in PSIg or kPa.
	7628	**Spare**
	7629	**Vapor Pressure @ 100 °F - Meter Run #1** Current live value.
	7630	**Vapor Pressure @ 100 °F - Meter Run #2** Current live value.
	7631	**Vapor Pressure @ 100 °F - Meter Run #3** Current live value.
	7632	**Vapor Pressure @ 100 °F - Meter Run #4** Current live value.
	7633	**Spare**
#	**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	**Spare**
	to	
	7639	**Spare**
*	**7640**	**Meter Run #1 - Gross Volume Increment**
*	**7641**	**Meter Run #1 - Net Increment Volume**
*	**7642**	**Meter Run #1 - Mass Increment**
*	**7643**	**Meter Run #1 - Net Standard Volume (NSV) Increment**
#	**7644**	**Meter Run #2 - Temperature @ Freeze Command**
#	**7645**	**Meter Run #2 - Pressure @ Freeze Command**
#	**7646**	**Meter Run #2 - Density / Gravity @ Freeze Command**
	7647	**Spare**
	to	
	7649	**Spare**

*	7650	Meter Run #2 - Gross Volume Increment
*	7651	Meter Run #2 - Net Volume Increment
*	7652	Meter Run #2 - Mass Increment
*	7653	Meter Run #2 - Net Standard Volume (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 to 7659	Spare
*	7660	Meter Run #3 - Gross Volume Increment
*	7661	Meter Run #3 - Net Volume Increment
*	7662	Meter Run #3 - Mass Increment
*	7663	Meter Run #3 - Net Standard Volume (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 to 7669	Spare
*	7670	Meter Run #4 - Gross Volume Increment
*	7671	Meter Run #4 - Net Volume Increment
*	7672	Meter Run #4 - Mass Increment
*	7673	Meter Run #4 - Net Standard Volume (NSV) Increment
#	7674	Station - Temperature @ Freeze Command
#	7675	Station - Pressure @ Freeze Command
#	7676	Station - Density / Gravity @ Freeze Command
	7677 to 7679	Spare
*	7680	Station - Gross Volume Increment
*	7681	Station - Net Volume Increment
*	7682	Station - Mass Volume Increment
*	7683	Station - Net Standard Volume (NSV) Volume Increment
	7684 to 7699	Spare

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - See **7n01** through **7n99** for more meter run related data.

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).

\# Flowing variables are snapshot and stored here when the Leak Detection Freeze command (**1760**) is received (also see points **5n66**).

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - See **7n01** through **7n99** for more meter run related data.

6.8. Miscellaneous Variables 32-Bit IEEE Floating Point Data

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

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

7701	**Process Input - Channel # 1**
to	
7724	**Process Input - Channel # 24**

7725	**Spare**
to	
7782	**Spare**

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	**Spare**
to	
7800	**Spare**

6.9. Meter Station 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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

7801 **Station - Gross Flow Rate**
Barrels/hr or m^3/hr.

7802 **Station - Net Flow Rate**
Barrels/hr or m^3/hr.

7803 **Station - Mass Flow Rate**
Klbs/hr or ton/hr.

7804 **Station – Net Standard Flow Rate**

7805 **Gravity/Density**

7806 **Density Temperature**

7807 **Density Pressure**

7808 **Spare**

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 **Spare**
to
7820 **Spare**

7821 **Product #1 - API Override / Thermal Expansion Coefficient**

7822 **Product #1 - Specific Gravity Override / Reference Density**

7823 **Product #2 - API Override / Thermal Expansion Coefficient**

7824 **Product #2 - Specific Gravity Override / Reference Density**

7825 **Product #3 - API Override / Thermal Expansion Coefficient**

7826 **Product #3 - Specific Gravity Override / Reference Density**

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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

7827 **Product #4 - API Override / Thermal Expansion Coefficient**
7828 **Product #4 - Specific Gravity Override / Reference Density**

7829 **Product #5 - API Override / Thermal Expansion Coefficient**
7830 **Product #5 - Specific Gravity Override / Reference Density**

7831 **Product #6 - API Override / Thermal Expansion Coefficient**
7832 **Product #6 - Specific Gravity Override / Reference Density**

7833 **Product #7 - API Override / Thermal Expansion Coefficient**
7834 **Product #7 - Specific Gravity Override / Reference Density**

7835 **Product #8 - API Override / Thermal Expansion Coefficient**
7836 **Product #8 - Specific Gravity Override / Reference Density**

7837 **Product #9 - API Override / Thermal Expansion Coefficient**
7838 **Product #9 - Specific Gravity Override / Reference Density**

7839 **Product #10 - API Override / Thermal Expansion Coefficient**
7840 **Product #10 - Specific Gravity Override / Reference Density**

7841 **Product #11 - API Override / Thermal Expansion Coefficient**
7842 **Product #11 - Specific Gravity Override / Reference Density**

7843 **Product #12 - API Override / Thermal Expansion Coefficient**
7844 **Product #12 - Specific Gravity Override / Reference Density**

7845 **Product #13 - API Override / Thermal Expansion Coefficient**
7846 **Product #13 - Specific Gravity Override / Reference Density**

7847 **Product #14 - API Override / Thermal Expansion Coefficient**
7848 **Product #14 - Specific Gravity Override / Reference Density**

7849 **Product #15 - API Override / Thermal Expansion Coefficient**
7850 **Product #15 - Specific Gravity Override / Reference Density**

7851 **Product #16 - API Override / Thermal Expansion Coefficient**
7852 **Product #16 - Specific Gravity Override / Reference Density**

7853 **Gross Flow Rate - Low Limit**
Indicates flow rate low limit in mass units.

7854 **Gross Flow Rate - High Limit**
Indicates flow rate high limit in mass units.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

7855 **Flow Threshold - Run Switch Flag #1 - Decreasing Flow**
See **1824**.

7856 **Flow Threshold - Run Switch Flag #1 - Increasing Flow**

7857 **Flow Threshold - Run Switch Flag #2 - Decreasing Flow**
See **1825**.

7858 **Flow Threshold - Run Switch Flag #2 - Increasing Flow**

7859 **Flow Threshold - Run Switch Flag #3 - Decreasing Flow**
See **1826**.

7860 **Flow Threshold - Run Switch Flag #3 - Increasing Flow**

7861 **Station - Density Pressure - Low Limit**
Points **7861**-**7865** are configuration settings used when the pressure is a live 4-20 mA.

7862 **Station - Density Pressure - High Limit**

7863 **Station - Density Pressure - Override**

7864 **Station - Density Pressure - @ 4mA**

7865 **Station - Density 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.

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.

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**

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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

Notes:
- ***** Various factors used by various vendors of digital densitometers.
- **#** Miscellaneous conversion factors and constants.

*	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** $K_{19}/P_{coef}/K_{t1}$.
*	7882	**Station - Densitometer - Constant #6** $K_{20A}/P_{cal}/K_{t2}$.
*	7883	**Station - Densitometer - Constant #7** K_{20B}/K_{t3}.
*	7884	**Station - Densitometer - Constant #8** K_{21A}/P_c.
*	7885	**Station - Densitometer - Constant #9** K_{21B}/K_{P1}.
*	7886	**Station - Densitometer - Constant #10** K_{rr}/K_{P2}.
*	7887	**Station - Densitometer - Constant #11** K_j/K_{P3}.
#	7888	**Cubic Feet to Barrel - Conversion Factor**
#	7889	**Gravity Rate of Change**
#	7890	**Line Pack Delay**
#	7891	**Local Atmospheric Pressure**
#	7892	**Contract Base - Temperature**
#	7893	**Gram/cc to lb/ft^3 - Conversion Factor**
#	7894	**Contract Base - Pressure**
#	7895	**Weight of Water @ 15°C** Applies only to Revision 25 (metric units). Also known as absolute density of water, it is used to convert relative density (specific gravity) or API gravity units to density in Kg/m^3. Gravity units are assumed to be based on water at 15°C and 101.325 kPaa.
	7896 to 8500	**Spare**

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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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.

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

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

6.10.1. Previous Batch Average

8501 **Meter #1 - Previous Batch - Average Temperature**

8502 **Meter #1 - Previous Batch - Average Pressure**

8503 **Meter #1 - Previous Batch - Average Density**

8504 **Meter #1 - Previous Batch - Average Volume Correction Factor (VCF)**

8505 **Meter #1 - Previous Batch - Average Correction Factor for Pressure on Liquid (CPL)**

8506 **Meter #1 - Previous Batch - Average Differential Pressure**

8507 **Meter #1 - Previous Batch - Average Specific Gravity**

8508 **Meter #1 - Previous Batch - Average SG @ 60 °F / Density @ Reference Temperature**

8509 **Meter #1 - Previous Batch - Average Density Temperature**

8510 **Meter #1 - Previous Batch - Average Density Pressure**

8511 **Meter #1 - Previous Batch - Average Density**

8512 **Meter #1 - Previous Batch - Average Orifice Diameter**

8513 **Meter #1 - Previous Batch - Average Pipe Diameter**

8514 **Meter #1 - Previous Batch - Average Orifice Discharge Coefficient (C_d)**

8515 **Meter #1 - Previous Batch - Average Velocity of Approach Factor**

8516 **Meter #1 - Previous Batch - Average Fluid Expansion Factor (Y)**

8517 **Meter #1 - Previous Batch - Average Density Correction Factor**

8518 **Meter #1 - Previous Batch - Average Unfactored Density**

8519 **Meter #1 – Previous Batch 'n' Average Meter Factor**

6.10.2. Previous Hour's Average

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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

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.

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

8520 **Meter #1 - Previous Hour's - Average Temperature**

8521 **Meter #1 - Previous Hour's - Average Pressure**

8522 **Meter #1 - Previous Hour's - Average Density**

8523 **Meter #1 - Previous Hour's - Average Specific Gravity @ 60°F / Density @ Reference Temperature**

8524 **Meter #1 - Previous Hour's - Average Differential Pressure**

8525 **Meter #1 - Previous Hour's - Average Density**

8526 **Meter #1 - Previous Hour's - Average BS&W Percent**

8527 **Meter #1 - Previous Batch - Average Extension Factor**

8528 **Meter #1 - Previous Hour's - Average Extension Factor**

8529 **Meter #1 - Previous Hour's - Average Combined Factor**

8530 **Meter #1 - Previous Batch - Average Combined Factor**

6.10.3. Previous Day's Average

8531 **Meter #1 - Previous Day's - Average Temperature**

8532 **Meter #1 - Previous Day's - Average Pressure**

8533 **Meter #1 - Previous Day's - Average Density**

8534 **Meter #1 - Previous Day's - Average Volume Correction Factor (VCF)**

8535 **Meter #1 - Previous Day's - Average Correction Factor for Pressure on Liquid (CPL)**

8536 **Meter #1 - Previous Day's - Average Differential Pressure**
Depends on setup.

8537 **Meter #1 - Previous Day's - Average Specific Gravity**

8538 **Meter #1 - Previous Day's - Average Specific Gravity @ 60°F / Density @ Reference Temperature**

8539 **Meter #1 - Previous Day's - Average Density Temperature**

8540 **Meter #1 - Previous Day's - Average Density Pressure**

8541 **Meter #1 - Previous Day's - Average Density**

8542 **Meter #1 - Previous Day's - Average Orifice Bore Diameter**

8543 **Meter #1 - Previous Day's - Average Pipe Diameter**

8544 **Meter #1 - Previous Day's - Average Orifice Coefficient of Discharge (C_d)**

8545 **Meter #1 - Previous Day's - Average Velocity of Approach Factor**

8546 **Meter #1 - Previous Day's - Average Fluid Expansion Factor (Y)**

8547 **Meter #1 - Previous Day's - Average Density Correction Factor**

8548 **Meter #1 - Previous Day's - Average Unfactored Density**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - The indicated data (**8501-8599**) refers to Meter Run #1. The same data is available for all meter runs at the following addresses:

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

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

8549 **Meter #1 - Previous Day's - Gross in Float Format**
Barrels or m^3 or Liter

8550 **Meter #1 - Previous Day's - Net in Float Format**
Barrels or m^3 or Liter.

8551 **Meter #1 - Previous Day's - Mass in Float Format**
Mass Klb or Ton or kg

8552 **Meter #1 - Previous Day's - Net Standard Volume (NSV) in Float Format**
Barrels or m^3 or Liter

8553 **Meter #1 – Previous Daily Average Meter Factor** *(Revision 21)*

8553 **Meter #1 – Previous Daily Net @ 2nd Ref Temp in Float** *(Revision 25)*

6.10.4. Statistical Moving Window Averages of Transducer Inputs

8554 **Meter #1 - Moving Hour - Transducer Input - Differential Pressure Low Range**

8555 **Meter #1 - Moving Hour - Transducer Input - Differential Pressure High Range**

8556 **Meter #1 - Moving Hour - Transducer Input - Average Temperature**

8557 **Meter #1 - Moving Hour - Transducer Input - Average Pressure**

8558 **Meter #1 - Moving Hour - Transducer Input - Average Density**

8559 **Meter #1 - Moving Hour - Transducer Input - Average Density Temperature**

8560 **Meter #1 - Moving Hour - Transducer Input - Average Density Pressure**

6.10.5. Miscellaneous In Progress Averages

8561 **Meter #1 - Batch In Progress - Average Density Correction Factor**

8562 **Meter #1 - Day In Progress - Average Density Correction Factor**

8563 **Meter #1 - Batch In Progress - Average Unfactored Density**

8564 **Meter #1 - Day In Progress - Average Unfactored Density**

8565 **Meter #1 - Viscosity in Use**

8566 **Meter #1 - Isentropic Exponent in Use**

8567 **Meter #1 - Previous Day's - Average Extension Factor**

8568 **Meter #1 - Previous Day's - Average Combined Factor**

8569 **Meter #1 Density @ Reference Temperature** *(Revision 25)*

6.10.6. More Miscellaneous In Progress Averages

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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

8570 **Meter #1 - Hour In Progress - Average Temperature**
8571 **Meter #1 - Hour In Progress - Average Pressure**
8572 **Meter #1 - Hour In Progress - Average Density**
8573 **Meter #1 - Hour In Progress - Average Specific Gravity @ 60°F / Density**

8574 **Meter #1 - Hour In Progress - Average Differential Pressure**
8575 **Meter #1 - Hour In Progress - Average Density**
8576 **Meter #1 - Hour In Progress – Average BS&W Percent**

8577 **Meter #1 VCF@15 Degree C** *(Revision 25)*
8578 **Meter #1 VCF@ Reference Temperature** *(Revision 25)*
8578 **Meter #1 Reynolds Number** *(Revision 21)*

8579 to 8582 **Spare**

8583 **Meter #1 – Current Daily - Average BS&W Percent**
8584 **Meter #1 – Current Batch - Average BS&W Percent**

8585 **Meter #1 Previous Daily Average Meter Factor** *(Revision 25)*

6.10.7. 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 **Meter #1 - Previous Batch '*n*' - Gross in Float Format**
Barrels or m^3 or Liter.
8587 **Meter #1 - Previous Batch '*n*' - Net in Float Format**
Barrels or m^3 or Liter.
8588 **Meter #1 - Previous Batch '*n*' - Mass in Float Format**
Klbs or tons or kgs
8589 **Meter #1 - Previous Batch '*n*' - Net Standard Volume (NSV) in Float Format**
Barrels or m^3 or Liter.
8590 **Meter #1 – Previous Batch Net @ 2nd Reference Temperature** *(Revision 25)*
Barrels or m^3 or Liter.
8591 **Meter #1 Meter Density** *(Revision 25)*
8592 **Meter #1 Calculated Density @15 Deg C if Using Table 54C***(Revision 25)*
8593 **Meter #1 Current Upstream Temperature** *(Revision 25)*
8594 **Meter #1 - Current - Upstream Pressure**
8595 **Meter #1 - Differential Pressure - Low Range**
8596 **Meter #1 - Differential Pressure - High Range**
8597 **Meter #1 - Current - S&W Percent**
8598 **Meter #1 - Current - CSW**

8599 **Spare**
8600 **Spare**

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - The indicated data (**8501-8599**) refers to Meter Run #1. The same data is available for all meter runs at the following addresses:

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

Weighted Averages - 'Time Weighted' or 'Flow Weighted' averages can be selected on a global basis (see point **13394**).

8601 **Meter 2 - Miscellaneous 32-Bit IEEE Floating Point Data**
to
8698 **Meter 2 - Miscellaneous 32-Bit IEEE Floating Point Data**

8699 **Spare**
8700 **Spare**

8701 **Meter 3 - Miscellaneous 32-Bit IEEE Floating Point Data**
to
8798 **Meter 3 - Miscellaneous 32-Bit IEEE Floating Point Data**

8799 **Spare**
8800 **Spare**

8801 **Meter 4 - Miscellaneous 32-Bit IEEE Floating Point Data**
to
8898 **Meter 4 - Miscellaneous 32-Bit IEEE Floating Point Data**

8899 **Spare**
to
8948 **Spare**

6.10.8. Station Previous Average Data

8949 **Station - Previous Day's - Gross in Float Format**
8950 **Station - Previous Day's - Net in Float Format**
8951 **Station - Previous Day's - Mass in Float Format**
8952 **Station - Previous Day's - Net Standard Volume (NSV) in Float Format**

8953 **Station Previous Daily 2nd Net in Float Format**
to
8985 **Spare**

8986 **Station - Previous Batch - Gross in Float Format**
8987 **Station - Previous Batch - Net in Float Format**
8988 **Station - Previous Batch - Mass in Float Format**
8989 **Station - Previous Batch - Net Standard Volume (NSV) in Float Format**

8990 **Station Previous Batch Net Total @ 2nd Reference Temperature**

8991 **Spare**
to
9000 **Spare**

Chapter 7

ASCII Text Data Buffers (9001 - 9499)

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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 **Chapter 6**)

7.1. Custom Report Templates

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 to 9100	**Spare**

7.2. Previous Batch Reports

Copies of the last 8 Batch Reports are stored.

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 to 9300	**Spare**

7.3. Previous Daily Reports

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.

Copies of the last 8 Daily Reports are stores

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

7.4. Last Snapshot Report

9401	**Last Local Snapshot / Interval Report**

7.5. 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**. Reports which are retrieved using this buffer are:

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

Text Archive Data defined by integers **15127** and **15128** is also retrieved using this buffer.

9402	**Miscellaneous Report Buffer**
9403	**Spare**
to	
13000	**Spare**

Chapter 8

Flow Computer Configuration Data (13001 - 18999)

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 register writes.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

The following data is especially 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 before manipulating configuration data directly via a serial port or programmable variable statements.

8.1. Flow Computer Configuration 16-Bit Integer Data

8.1.1. Meter Run Configuration Data

13001 **Spare**

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**
0=None; 1=4-20mA API linear; 2=4-20mA SG linear; 3=4-20mA density linear; 4=Solartron pulse; 5=Sarasota pulse; 6=UGC pulse.

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 **Meter Run #1 - Differential Pressure Low Range I/O Point**

13012 **Meter Run #1 - Differential Pressure High Range I/O Point**

13013 **Spare**

13014 **Spare**

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 register writes.

13015 Meter Run #2 - Temperature I/O Point
to
13025 Meter Run #2 - Differential Pressure High Range I/O Point

13026 Spare
13027 Spare

13028 Meter Run #3 - Temperature I/O Point
to
13038 Meter Run #3 - Differential Pressure High Range I/O Point

13039 Spare
13040 Spare

13041 Meter Run #4 - Temperature I/O Point
to
13051 Meter Run #4 - Differential Pressure High Range I/O Point

13052 Spare
to
13062 Spare

13063 Gravity Sample Time
Seconds.

13064 Station - Pressure - I/O Point

13065 Station - Density - I/O Point

13066 Station - Density - Type
0=None; 1=4-20mA API linear; 2=4-20mA SG linear; 3=4-20mA density linear; 4=Solartron pulse; 5=Sarasota pulse; 6=UGC pulse.

13067 Station - Density Temperature - I/O Point

13068 Station - Density Temperature - Type
0=DIN RTD; 1=Amer RTD; 2=4-20mA/Honeywell.

13069 Spare
13070 Spare

13071 Select Pressure Unit 0=kPa, 1=bar, 2=kg/cm^2 *(Revision 25)*

13072 Select DP Unit 0=kPa, 1=millibar *(Revision 25)*

13073 Spare

8.1.2. General Flow Computer Configuration 16-Bit Integer Data

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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
Combination module used with Honeywell® smart transmitters.

13082 Number of ED Combo Modules Installed

13083 Number of SV Combo Modules Installed
Serial multivariable combination module used with Rosemount® 3095FB and other multivariable transmitters.

13084 Number of HV Combo Modules Installed
Multivariable combination module used with Honeywell® SMV3000 multivariable transmitters.

8.1.3. Serial Port Configuration 16-Bit Integer Data

13085 Serial Port #1 - Port Type
0=Printer; 1=Modbus.

13086 Serial Port - ID
Read only point which reports back the number of the port you are connected to.

13087 Serial Port #1 - Baud Rate
300-38400 bps.

13088 Serial Port #1 - Data Bits
7 or 8.

13089 Serial Port #1 - Stop Bits
1 bit or 2 bits.

13090 Serial Port #1 - Parity
0=None; 1=Odd; 2=Even.

13091 Serial Port #1 - Transmit Key Delay
0=0hms; 1=50 msec; 2=100 msec; 3=150 msec.

13092 Serial Port #1 - Modbus ID
If the port type selected above is Modbus: 0-247.

13093 Serial Port #1 - Protocol Type
If the port type selected above is Modbus: 0=Modbus RTU; 1= Modbus ASCII; 2= Modbus RTU Modem.

13094 Serial Port #1 - Enable CRC Checking
If the port type selected above is Modbus: 0=No (CRC check disabled), 1=Yes (CRC check enabled).

13095 Serial Port #1 - Modicon Compatible
If the port type selected above is Modbus: 0=No (OMNI Mode); 1=Yes (Modicon 984 Mode).

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 register writes.

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 - Protocol Type
0=Modbus RTU; 1=Modbus ASCII; 2=Modbus RTU Modem (Relaxed Timing).
13103 Serial Port #2 - Enable CRC Checking
13104 Serial Port #2 - Modicon Compatible
0=OMNI; 1=Modicon 984 compatible.

13105 Spare
to
13107 Spare

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

13117 Spare
to
13119 Spare

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 is selected as the protocol type, then: 0=CRC; 1=BCC error checking.

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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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**

8.1.5. Programmable Logic Controller Configuration 16-Bit Integer Data

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 register writes.

13161 PLC Group #1 - Starting Address
Allen-Bradley PLC-2 Translation Tables.
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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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 Meter #1 ISO5167 Selection *(Revision 25)*
13287 Meter #2 ISO5167 Selection *(Revision 25)*
13288 Meter #3 ISO5167 Selection *(Revision 25)*
13289 Meter #4 ISO5167 Selection *(Revision 25)*

13290 Spare
to
13292 Spare

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 Spare
to
13299 Spare

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

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 register writes.

13300 Current Master ID
Real-time. Shows current peer-to-peer master.

13301 Reserved Register
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 Index

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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 Index

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 register writes.

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 or Net Totalizer

13387 Spare

13388 Number of Decimal Places for Mass Totalizer

13389 Spare

13390 Number of Decimal Places for Factors on Batch Report

13391 Spare
to
13393 Spare

13394 Select Averaging Method
0=Time weighted; 1=Flow weighted.

13395 Spare

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 Meter Run #1 - Differential Pressure Low Range Damping Factor
13401 Meter Run #1 - Differential Pressure High Range Damping Factor
13402 Meter Run #1 - Temperature Damping Factor
13403 Meter Run #1 - Pressure Damping Factor
13404 Meter Run #1 - Density Temperature Damping Factor
13405 Meter Run #1 - Density Pressure Damping Factor

13406 Meter Run #2 - Differential Pressure Low Range Damping Factor
to
13411 Meter Run #2 - Density Pressure Damping Factor

13412 Meter Run #3 - Differential Pressure Low Range Damping Factor
to
13417 Meter Run #3 - Density Pressure Damping Factor

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

13418 Meter Run #4 - Differential Pressure Low Range Damping Factor
to
13423 Meter Run #4 - Density Pressure Damping Factor

13424 Station - Density Temperature Damping Factor
13425 Station - Density Pressure Damping Factor

13426 Spare
to
13432 Spare

13433 Auxiliary Input #1 - Damping Factor
13434 Auxiliary Input #2 - Damping Factor
13435 Auxiliary Input #3 - Damping Factor
13436 Auxiliary Input #4 - Damping Factor

13437 Spare
to
13449 Spare

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

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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**

8.1.6. Serial Port 5 and 6 Configuration 16-Bit Integer Data

13478 **Serial Port #5 - Baud Rate**
13479 **Serial Port #5 - Data Bits**
13480 **Serial Port #5 - Stop Bits**
13481 **Serial Port #5 - Parity**
13482 **Serial Port #5 - Transmit Delay**
13483 **Serial Port #5 - Modbus or Node ID**
13484 **Serial Port #5 - Protocol Type**
0=Modbus RTU; 1=Modbus ASCII; 2=Modbus RTU Modem (Relaxed Timing).
13485 **Serial Port #5 - Enable CRC Checking**
13486 **Serial Port #5 - Modicon™ Compatible**

13487 **Spare**
13488 **Spare**

13489 **Serial Port #5 - Baud Rate**
13490 **Serial Port #5 - Data Bits**
13491 **Serial Port #5 - Stop Bits**
13492 **Serial Port #5 - Parity**
13493 **Serial Port #5 - Transmit Delay**
13494 **Serial Port #5 - Modbus or Node ID**
13495 **Serial Port #5 - Protocol Type**
0=Modbus RTU; 1=Modbus ASCII; 2=Modbus RTU Modem (Relaxed Timing).
13496 **Serial Port #5 - Enable CRC Checking**
13497 **Serial Port #5 - Modicon™ Compatible**

13498 **Reserved**
13499 **Reserved**

8.1.7. 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 Spare
to
13539 Spare

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 Spare
to
13579 Spare

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

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 register writes.

13612 Spare
to
13619 Spare

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

13652 Spare
to
13659 Spare

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 Spare
to
13699 Spare

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 Spare
to
13739 Spare

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 Spare
to
13779 Spare

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - These short integers are accessed using Modbus function code 03 for reads, 06 for single writes and 16 for multiple register writes.

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 Spare
to
13819 Spare

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 Spare
to
13859 Spare

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 Spare
to
13899 Spare

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 Spare

to

13919 Spare

⚠*13920 Archive Run ?
0=Stops archiving; 1=Starts archiving.

⚠*13921 Reconfigure Archive?
0=No configuration allowed; 1=Configuration changes allowed.

13922 Spare

to

13929 Spare

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 Spare

to

14000 Spare

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 register writes.

⚠* CAUTION! ⚠*

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

8.2. Flow Computer Configuration 16-Character ASCII String Data

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

INFO - These ASCII string variables are accessed using Modbus function codes 03 for reads, and 16 for writes.

Note that the index number for each string refers to the complete string which occupies the space of eight 16-bit registers. It must be accessed as a complete unit. You cannot read or write a partial string. Each string counts as one point in the normal OMNI Modbus mode.

Modicon™ Compatible Mode - For the purposes of point count only, each string counts as 8 registers. The starting address of the string still applies.

14001 Boolean Statement #1025
to
14048 Boolean Statement #1072

14049 OmniCom - Download Serial Number & File Name
14050 OmniCom - Download PC ID

14051 Variable Statement #7025
to
14098 Variable Statement #7072

14099 Spare

14100 Station Total and Flow Rate Definition

14101 Comment String (Remarks) - Boolean Statement #1025
to
14148 Comment 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 String - Variable Statement #7025
to
14198 Comment String - Variable Statement #7072

14199 Spare
to
14200 Spare

14201 Boolean Statement #1073
to
14216 Boolean Statement #1088

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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 ASCII string variables are accessed using Modbus function codes 03 for reads, and 16 for writes.

Note that the index number for each string refers to the complete string which occupies the space of eight 16-bit registers. It must be accessed as a complete unit. You cannot read or write a partial string. Each string counts as one point in the normal OMNI Modbus mode.

Modicon™ Compatible Mode - For the purposes of point count only, each string counts as 8 registers. The starting address of the string still applies.

14217 Spare
to
14220 Spare

14221 Variable Statement #7073
to
14236 Variable Statement #7088

14237 Spare
to
14240 Spare

14241 Comment String - Boolean Statement #1073
to
14256 Comment String - Boolean Statement #1088

14257 Spare
to
14260 Spare

14261 Comment String - Variable Statement #7073
to
14276 Comment String - Variable Statement #7088

14277 Spare
to
14300 Spare

14301 Comment String - Assign - Digital-to-Analog Output #1
to
14312 Comment String - Assign - Digital-to-Analog Output #12

14321 Comment String - Assign - Digital I/O Point #1
to
14344 Comment String - Assign - Digital I/O Point #24

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

14345 Spare
to
14359 Spare

14360 Comment String - Assign - PID #1 - Primary Variable
14361 Comment String - Assign - PID #1 - Secondary Variable

14362 Comment String - Assign - PID #2 - Primary Variable
14363 Comment String - Assign - PID #2 - Secondary Variable

14364 Comment String - Assign - PID #3 - Primary Variable
14365 Comment String - Assign - PID #3 - Secondary Variable

14366 Comment String - Assign - PID #4 - Primary Variable
14367 Comment String - Assign - PID #4 - Secondary Variable

14368 Spare
to
14379 Spare

14380 Comment String - Assign - Front Panel Counter A
14381 Comment String - Assign - Front Panel Counter B
14382 Comment String - Assign - Front Panel Counter C

14383 Spare

14384 Comment String - Assign - Digital-to-Analog Output #13
14385 Comment String - Assign - Digital-to-Analog Output #14
14386 Comment String - Assign - Digital-to-Analog Output #15
14387 Comment String - Assign - Digital-to-Analog Output #16
14388 Comment String - Assign - Digital-to-Analog Output #17
14389 Comment String - Assign - Digital-to-Analog Output #18

14390 Spare
to
15000 Spare

8.3. Flow Computer Configuration 32-Bit Long Integer Data

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 registers. The starting address of the 32-bit integer still applies.

15001 Assign - Digital-to-Analog Output #1

to

15012 Assign - Digital-to-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

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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

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 registers. The starting address of the 32-bit integer still applies.

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

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

15097 Digital Point #22 - Assignment
to
15100 Digital Point #22 - Timer - Pulse Width

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 Spare
to
15119 Spare

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 Spare

15122 On/Off Status of Digital Points
Real-time, read-only! #1=Bit 0; #24=Bit 23: 0 =Off, 1=On.

15123 Spare
to
15125 Spare

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 registers. The starting address of the 32-bit integer still applies.

15126 32-Bit Packed Status Word

Exclusively for OmniCom use (see Bit Layout below).

LSB			
B0	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B16	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B1	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B17	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B2	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B18	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B3	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B19	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B4	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B20	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B5	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B21	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B6	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B22	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B7	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B23	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B8	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B24	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B9	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B25	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B10	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B26	Power Fail Flag
B11	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B27	End Batch #4
B12	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B28	End Batch #3
B13	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B29	End Batch #2
B14	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B30	End Batch #1
B15	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B31	End Batch Station
		MSB	

15127 Text Archive Data - Number of Days to Retrieve

Exclusively for OmniCom use.

15128 Text Archive Data - Starting Date of Requested

Fix date format (YYDDMM).

15129 32-Bit Command Word #1

Exclusively for OmniCom use (see Bit Layout below).

LSB			
B0	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B16	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B1	End Batch Station	B17	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B2	End Batch Meter #1	B18	Send Snapshot to Printer
B3	End Batch Meter #2	B19	Load Snapshot to Report Buffer (9402)
B4	End Batch Meter #3	B20	Load Alarms to Miscellaneous Report Buffer (9402)
B5	End Batch Meter #4	B21	Load Prod File to Miscellaneous Report Buffer (9402)
B6	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B22	Load Status to Miscellaneous Report Buffer (9402)
B7	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B23	Load Audit Trail to Miscellaneous Report Buffer (9402)
B8	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B24	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B9	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B25	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B10	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B26	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B11	Alarm Acknowledge	B27	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B12	Reset Power Fail Flag	B28	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B13	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B29	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B14	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B30	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
B15	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨	B31	⇦⇦⇦⇦⇦⇦ N/A ⇨⇨⇨⇨⇨⇨
		MSB	

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

15130 32-Bit Command Word #2
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 Spare

to

15169 Spare

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 registers. The starting address of the 32-bit integer still applies.

Note:

* **Archive Data File Size -** 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.

15170 Assign - Digital-to-Analog Output #13
15171 Assign - Digital-to-Analog Output #14
15172 Assign - Digital-to-Analog Output #15
15173 Assign - Digital-to-Analog Output #16
15174 Assign - Digital-to-Analog Output #17
15175 Assign - Digital-to-Analog Output #18

15176 Spare
to
15193 Spare

15194 WinCom Scratch Pad #1
15195 WinCom Scratch Pad #2
15196 WinCom Scratch Pad #3

Archive Data File Size

Information Only Data!

* **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 Spare
15212 Spare

15213 Archive File '*n*' 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 Spare
to
15225 Spare

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

15231	Date YYMMDD of the Most Recent Batch
15232	Date YYMMDD of the 2nd Historical Batch Report
15233	Date YYMMDD of the 3rd Historical Batch Report
15234	Date YYMMDD of the 4th Historical Batch Report
15235	Date YYMMDD of the 5th Historical Batch Report
15236	Date YYMMDD of the 6th Historical Batch Report
15237	Date YYMMDD of the 7th Historical Batch Report
15238	Date YYMMDD of the 8th Historical Batch Report
15239 to 15240	Spare
15241	Time HHMMSS of the Most Recent Batch
15242	Time HHMMSS of the 2nd Historical Batch Report
15243	Time HHMMSS of the 3rd Historical Batch Report
15244	Time HHMMSS of the 4th Historical Batch Report
15245	Time HHMMSS of the 5th Historical Batch Report
15246	Time HHMMSS of the 6th Historical Batch Report
15247	Time HHMMSS of the 7th Historical Batch Report
15248	Time HHMMSS of the 8th Historical Batch Report
15249 to 15250	Spare
15251	Running Meter of the Most Recent Batch
15252	Running Meter of the 2nd Historical Batch Report
15253	Running Meter of the 3rd Historical Batch Report
15254	Running Meter of the 4th Historical Batch Report
15255	Running Meter of the 5th Historical Batch Report
15256	Running Meter of the 6th Historical Batch Report
15257	Running Meter of the 7th Historical Batch Report
15258	Running Meter of the 8th Historical Batch Report
15259 to 15260	Spare
15261	Batch Number of the Most Recent Batch
15262	Batch Number of the 2nd Historical Batch Report
15263	Batch Number of the 3rd Historical Batch Report
15264	Batch Number of the 4th Historical Batch Report
15265	Batch Number of the 5th Historical Batch Report
15266	Batch Number of the 6th Historical Batch Report
15267	Batch Number of the 7th Historical Batch Report
15268	Batch Number of the 8th Historical Batch Report
15269 to 15310	Spare

15311	Date YYMMDD of the Most Recent Day
15312	Date YYMMDD of the 2nd Historical Daily Report
15313	Date YYMMDD of the 3rd Historical Daily Report
15314	Date YYMMDD of the 4th Historical Daily Report
15315	Date YYMMDD of the 5th Historical Daily Report
15316	Date YYMMDD of the 6th Historical Daily Report
15317	Date YYMMDD of the 7th Historical Daily Report
15318	Date YYMMDD of the 8th Historical Daily Report
15319 to 15320	Spare
15321	Time HHMMSS of the Most Recent Day
15322	Time HHMMSS of the 2nd Historical Daily Report
15323	Time HHMMSS of the 3rd Historical Daily Report
15324	Time HHMMSS of the 4th Historical Daily Report
15325	Time HHMMSS of the 5th Historical Daily Report
15326	Time HHMMSS of the 6th Historical Daily Report
15327	Time HHMMSS of the 7th Historical Daily Report
15328	Time HHMMSS of the 8th Historical Daily Report
15329 to 15330	Spare
15331	Running Meter of the Most Recent Day
15332	Running Meter of the 2nd Historical Daily Report
15333	Running Meter of the 3rd Historical Daily Report
15334	Running Meter of the 4th Historical Daily Report
15335	Running Meter of the 5th Historical Daily Report
15336	Running Meter of the 6th Historical Daily Report
15337	Running Meter of the 7th Historical Daily Report
15338	Running Meter of the 8th Historical Daily Report
15339 to 15340	Spare
15341	Day End Status of the Most Recent Day
15342	Day End Status of the 2nd Historical Daily Report
15343	Day End Status of the 3rd Historical Daily Report
15344	Day End Status of the 4th Historical Daily Report
15345	Day End Status of the 5th Historical Daily Report
15346	Day End Status of the 6th Historical Daily Report
15347	Day End Status of the 7th Historical Daily Report
15348	Day End Status of the 8th Historical Daily Report
15349 to 15350	Spare

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 Energy/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 Energy/NSV Cumulative Total
15517	Meter #1 Flow Ticks (500ms) Daily
15518	Meter #1 Previous Day Flwo Ticks(500ms)
15519	Spare
to	
17000	Spare

8.4. Flow Computer Configuration 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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

Note:
Input expected is engineering units.

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

 # 17052 PID #1 - Remote Setpoint - Low Limit
Setpoint download will be limited to this setting.

 # 17053 PID #1 - Remote Setpoint - High Limit
Setpoint download will be limited to this setting.

 # 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
This valve open % is used to slow the flow rate and complete the delivery (i.e., top-off).

17066 PID #1 - Deadband %
No change in output if the % error is less than this

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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
17129 Output in Percent - Digital to Analog #18
Read-only, Live Value.

17130 Spare
to
17135 Spare

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 Spare
to
17145 Spare

17146 PID #2 - Primary Controlled Variable Value
to
17150 PID #2 - Secondary Setpoint Value

17151 Spare
to
17155 Spare

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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

17156 PID #3 - Primary Controlled Variable Value
to
17160 PID #3 - Secondary Setpoint Value

17161 Spare
to
17165 Spare

17166 PID #4 - Primary Controlled Variable Value
to
17170 PID #4 - Secondary Setpoint Value

17171 Spare
to
17175 Spare

17176 Meter #1 - Full Scale - Gross Flow Rate
Used to scale integer volume flow rate variables **3140** & **3142**.

17177 Meter #1 - Full Scale - Mass Flow Rate
Used to scale integer mass flow rate variable **3144**.

17178 Spare
17179 Spare

17180 Meter #2 - Full Scale - Gross Flow Rate
17181 Meter #2 - Full Scale - Mass Flow Rate

17182 Spare
17183 Spare

17184 Meter #3 - Full Scale - Gross Flow Rate
17185 Meter #3 - Full Scale - Mass Flow Rate

17186 Spare
17187 Spare

17188 Meter #4 - Full Scale - Gross Flow Rate
17189 Meter #4 - Full Scale - Mass Flow Rate

17190 Spare
17191 Spare

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

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 Spare
to
17197 Spare

17198 Alarm Deadband %
0-5%. Global dead-band applied to all analog alarms. Variable must return this % out of alarm for alarm to cancel.

17199 Spare
to
17202 Spare

17203 F Factor - Product #1
to
17218 F Factor - Product #16

17219 Product #1 Reference Temperature *(Revision 25)*
17220 Product #2 Reference Temperature *(Revision 25)*
17221 Product #3 Reference Temperature *(Revision 25)*
17222 Product #4 Reference Temperature *(Revision 25)*
17223 Product #5 Reference Temperature *(Revision 25)*
17224 Product #6 Reference Temperature *(Revision 25)*
17225 Product #7 Reference Temperature *(Revision 25)*
17226 Product #8 Reference Temperature *(Revision 25)*
17227 Product #9 Reference Temperature *(Revision 25)*
17228 Product #10 Reference Temperature *(Revision 25)*
17229 Product #11 Reference Temperature *(Revision 25)*
17230 Product #12 Reference Temperature *(Revision 25)*
17231 Product #13 Reference Temperature *(Revision 25)*
17232 Product #14 Reference Temperature *(Revision 25)*
17233 Product #15 Reference Temperature *(Revision 25)*
17234 Product #16 Reference Temperature *(Revision 25)*

17235	Product #1 Mole Fraction of Propylene
17236	Product #2 Mole Fraction of Propylene
17237	Product #3 Mole Fraction of Propylene
17238	Product #4 Mole Fraction of Propylene
17239	Product #5 Mole Fraction of Propylene
17240	Product #6 Mole Fraction of Propylene
17241	Product #7 Mole Fraction of Propylene
17242	Product #8 Mole Fraction of Propylene
17243	Product #9 Mole Fraction of Propylene
17244	Product #10 Mole Fraction of Propylene
17245	Product #10 Mole Fraction of Propylene
17246	Product #12 Mole Fraction of Propylene
17247	Product #13 Mole Fraction of Propylene
17248	Product #14 Mole Fraction of Propylene
17249	Product #15 Mole Fraction of Propylene
17250	Product #16 Mole Fraction of Propylene
17251	Spare
to	
17379	Spare

8.5. More Flow Computer Configuration 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 single or multiple writes. Note that the index number for each variable refers to the complete floating point variable which occupies the space of two 16- bit registers. 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 2 registers. The starting address of the variable still applies.

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 Spare
to
17410 Spare

17411 Meter #1 Gross Flowrate while changing Orifice Plate
17412 Meter #1 Net Flowrate while changing Orifice Plate
17413 Meter #1 Mass Flowrate while changing Orifice Plate
17414 Meter #1 NSV Flowrate while changing Orifice Plate

17415 Spare
to
17420 Spare

17421 Meter #2 Gross Flowrate while changing Orifice Plate
17422 Meter #2 Net Flowrate while changing Orifice Plate
17423 Meter #2 Mass Flowrate while changing Orifice Plate
17424 Meter #2 NSV Flowrate while changing Orifice Plate

17425 Spare
to
17430 Spare

17431 **Meter #3 Gross Flowrate while changing Orifice Plate**
17432 **Meter #3 Net Flowrate while changing Orifice Plate**
17433 **Meter #3 Mass Flowrate while changing Orifice Plate**
17434 **Meter #3 NSV Flowrate while changing Orifice Plate**

17435 **Spare**
to
17440 **Spare**

17441 **Meter #4 Gross Flowrate while changing Orifice Plate**
17442 **Meter #4 Net Flowrate while changing Orifice Plate**
17443 **Meter #4 Mass Flowrate while changing Orifice Plate**
17444 **Meter #4 NSV Flowrate while changing Orifice Plate**

17445 **Spare**
to
17479 **Spare**

17480 **Run Switch - Threshold Low %**
Differential pressure input percent less then this flags that a meter run should be closed.

17481 **Run Switch - Threshold High %**
Differential pressure input percent greater then this flags that a meter run should be opened.

17482 **Spare**
to
17487 **Spare**

⚠ CAUTION! ⚠

Flow computer configuration data is especially 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.

Application Revision 21/25.73+ - This database corresponds to Application Revision 21/25.73+ for Orifice/Differential Pressure Liquid Flow Metering Systems.

Note:

⇨ These addresses are reserved for product development.

17488 Digital-to-Analog Output #13 - @ 4mA
Engineering units which equal to 0%.

17489 Digital-to-Analog Output #13 - @ 20mA
Engineering units which equal to 100%.

to

17498 Digital-to-Analog Output #18 - @ 4mA

17499 Digital-to-Analog Output #18 - @ 20mA

17500 Spare

to

18499 Spare

⇨ **18500 Reserved**

to

⇨ **18999 Reserved**

⇨ **19000 Reserved**

to

⇨ **19999 Reserved**

⇨ **20000 Reserved**

to

⇨ **29999 Reserved**

⇨ **30000 Reserved**

to

⇨ **39999 Reserved**

⇨ **40000 Reserved**

to

⇨ **49999 Reserved**