TechnipFMC

MANUAL

Liquid and Gas Ultrasonic Flowmeters

Smith Meter® Ultra™ 4c, 6c, 8c, and MPU 200c, 600c, 800c, and 1600c

External Data Communications Manual

Bulletin MN0A003 Issue/Rev 0.1 (1/18)

Important

All information and technical specifications in this documentation have been carefully checked and compiled by the author. However, we cannot completely exclude the possibility of errors. TechnipFMC is always grateful to be informed of any errors. Contact us on the website.

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1 – Introduction

1.1. General

This document contains a description of how to use the Ultra Series C and MPU Series C Modbus interfaces. Both the serial interface and the Ethernet interface are described.

1.2. Abbreviations

UMCB	Ultrasonic Meter Control Board

1.3. Downloads

Modpoll	www.modbusdriver.com/modpoll.html

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2 – Protocol Details

2.1 Summary

– All addresses refer to data in the 16-bit access holding registers, extended format, corresponding to registers 40001 to 105536.

– All data is formatted as a pair of addresses in 32-bit data format. The first address is always even.

– All floating point values are represented as 32-bit IEEE 754 single precision float format. Integer values are represented in 32-bit signed integer format.

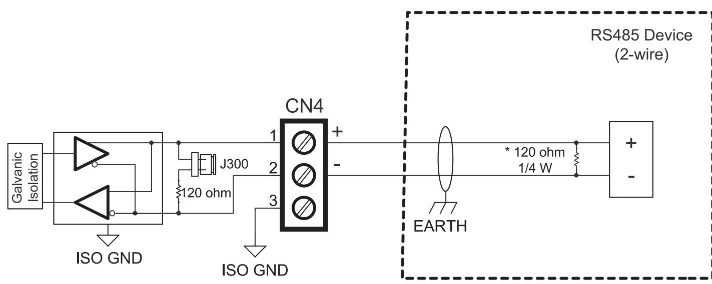
– The meter acts as a Modbus Slave.

2.2 Hardware Interface Details

2.2.1. Serial Interface

The meter features a 2-wire (Half Duplex) RS-485 serial communication port. The serial port terminals are accessed on connector CN4 on the UMCB board. The port supports Modbus-ASCII and Modbus-RTU communication protocols through software configuration.

RS485
(2-wire)



*Customer Supplied Resistor - Only necessary
if customer equipment does not have internal termination.

The serial port function and communication settings are configured through the Settings > Communications menu of the meter interface. Refer to section 5.3.2.4 of the Installation/Operation/Maintenance manual (MNKS025) for meter configuration details.

2.2.2. Timing Considerations for RS-485

Modbus data values are updated at a minimum of 1 second intervals. Polling at a faster rate will read duplicated values over one second intervals.

The software on the Modbus master will typically need to follow this pattern of communication:

1. Send a request message A to the meter
2. Read the reply message from the meter
3. **Wait for at least 1 second**
4. Send the next request message B to the meter

...etc.

2.2.3 Modbus Over Ethernet

The meter uses Modbus on TCP/IP for communication over Ethernet. Modbus data values are updated at a minimum of 1 second intervals. Polling at a faster rate will read duplicated values over one second intervals.

The following requirements apply to the Modbus Application Protocol (MBAP) header used for TCP/IP:

1. Send a request message A to the meter
2. Read the reply message from the meter
3. **Wait for at least 1 second**
4. Send the next request message B to the meter

...etc.

Fields	Length	Client
Transaction Identifier	2 bytes	Must be 0
Protocol Identifier	2 bytes	Must be 0
Length	2 bytes	Minimum 6
Unit Identifier	1 byte	Must be 1

2.3. Data Formatting

All Modbus information is provided in 32-bits data format. This is accomplished by using a pair of 16-bit Modbus words for each value. All integers use the 32-bit signed integer format and float point values use the IEEE 754 single precision float format.

The order in which the words are formatted can be configured through the meter's communication settings menu.

Setting	Value of Pi Test
Modbus Format Floats	0FDB 4049
Alternate Format Floats	4049 0FDB

2.4. Address Numbering Convention

All address blocks read/write requests should start at an even address and end at an odd one. If a block is started using an odd address, the meter will automatically subtract 1 from the start and end values and return that range instead. For example, block 12-33 will return values 12 thru 33. If block 13-34 is requested, data will be returned as if block 12-33 were requested.

To translate addresses into a register convention 40001 should be added to the address number. For example, address range 24-25 in the table below would translate to registers 40025-40026.

2.5. Factory Customizable Address Range

Modbus addresses in the customizable range can be modified upon request if the user has limited address flexibility or to maintain compatibility to an existing standard. Consult factory for further information on customized software options.

2.6. Units of Measure

All data is formatted in the metric units of measure as shown in the tables only. Adjusting the units of measure in the meter interface will not affect the Modbus values. The Modbus data is therefore impervious to a change in display settings.

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3 – Register Mappings

This section lists the specific Series C database register numbers and Modbus addresses.

1. **Note:** Data is read only except for the line temperature and line pressure in the Modbus Read/Write Data Segment.

Address Range Usage Overview:

Modbus Register Ranges –	Description
0 - 1023	Factory Customizable Range
1024 - 3083	Alarm Status
4096 - 5129	Accumulator Process Data (Volumes)
11264 - 12295	Computed Process Data
15360 - 16413	Flow Process Data
17408 - 18885	Flow Profile Path Data
19456 - 20971	Path Process Data
21504 - 22533	Pulse Process Data
23552 - 24583	System Status Data
25600 - 26633	Used Process Data (Temperature, Pressure)
28672 - 28679	Input Data

3.1. Commonly Used Read Only Registers

Factory Customizable Range

A factory customizable Modbus address range includes addresses between 0 – 1023. The default assignments shown in the table below will be configured as standard to duplicate commonly used Series B addresses.

Address	Description	Units	Function	Format
0 - 1	Measurement Round Counter (Note 1)	-	Read Only	IEEE single
2 - 3	Alarm Summary (Note 2)	-	Read Only	INT 32
4 - 5	Flow Velocity	m/s	Read Only	IEEE single
6 - 7	Flow Velocity of Sound	m/s	Read Only	IEEE single
8 - 9	Flow Rate	m^3/h	Read Only	IEEE single
10 - 11	Accumulator Forward	m^3	Read Only	INT 32
12 - 13	Accumulator Reverse	m^3	Read Only	INT 32
204 - 205	Reynold's Number	-	Read Only	IEEE single
206 - 207	Kinematic Viscosity	cSt	Read Only	IEEE single
208 - 209	Density	kg/m^3	Read Only	IEEE single
230 - 231	Meter Uncertainty Alarm (Note 2)	-	Read Only	INT 32
460 - 461	Hi Resolution Accumulator Forward - Integer (Note 3)	m^3	Read Only	INT 32
462 - 463	Hi Resolution Accumulator Forward - Fraction (Note 3)	m^3	Read Only	INT 32
464 - 465	Hi Resolution Accumulator Reverse - Integer (Note 3)	m^3	Read Only	INT 32
466 - 467	Hi Resolution Accumulator Reverse - Fraction (Note 3)	m^3	Read Only	INT 32
468 - 469	Hi Resolution Accumulator Error Forward - Integer (Note 3)	m^3	Read Only	INT 32
470 - 471	Hi Resolution Accumulator Error Forward - Fraction (Note 3)	m^3	Read Only	INT 32
472 - 473	Hi Resolution Accumulator Error Reverse - Integer (Note 3)	m^3	Read Only	INT 32
474 - 475	Hi Resolution Accumulator Error Reverse - Fraction (Note 3)	m^3	Read Only	INT 32

1. **Note:** This counter will now increment by one on the completion of each sonic signaling round. The value is primarily useful as a meter heartbeat monitor.
2. **Note:** See Section 4.2 for detailed description of how to interpret the Alarm Summary.
3. **Note:** To calculate the volumes using the high resolution accumulators in the customizable range, use the following formula: Volume = Integer part + Fractional part * 1.0E-9.

High Resolution Accumulators

For transfer of volumetric data it is recommended to use the high resolution accumulators. These use the IEEE 64 bit floating point standard for much higher resolution than the standard integer accumulators ensuring that no volume is lost because of rounding. The integer accumulators are recommended for information only due to the potential for rounding errors.

Address	Description	Units	Function	Format
1008 - 1011	High Resolution Accumulator Forward	m^3	Read Only	IEEE double
1012 - 1015	High Resolution Accumulator Reverse	m^3	Read Only	IEEE double
1016 - 1019	High Resolution Accumulator Error Forward	m^3	Read Only	IEEE double
1020 - 1023	High Resolution Accumulator Error Reverse	m^3	Read Only	IEEE double

Accumulator Process Date

Address	Description	Units	Function	Format
4098 - 4099	Accumulated Volume Forward	m^3	Read Only	IEEE single
4100 - 4101	Accumulated Volume Reverse	m^3	Read Only	IEEE single

Computed Process Data

Address	Description	Units	Function	Format
11266 - 11267	Kinematic Viscosity	cSt	Read Only	IEEE single
11268 - 11269	Density, Estimated	kg/m^3	Read Only	IEEE single
11270 - 11271	Reynolds Number, Estimated	--	Read Only	IEEE single
11272 - 11273	Dynamic Viscosity	cP	Read Only	IEEE single

Flow Process Data

Address	Description	Units	Function	Format
15362 - 15363	Flow Velocity	m/s	Read Only	IEEE single
15364 - 15365	Velocity of Sound	m/s	Read Only	IEEE single
15366 - 15367	Flow Rate	m^3/hr	Read Only	IEEE single
15368 - 15369	Profile Flatness	%	Read Only	IEEE single
15370 - 15371	Profile Symmetry	%	Read Only	IEEE single
15372 - 15373	Swirl Flow (6 and 8 path meters)	%	Read Only	IEEE single
15374 - 15375	Cross Flow (6 and 8 path meters)		Read Only	IEEE single
15386 - 15387	Measurement Round Count (See Note 1)	-	Read Only	IEEE single
15388 - 15389	Sonic Measurement Round Interval	Sec	Read Only	IEEE single

1. **Note:** This counter is incremented by one on the completion of each sonic signaling round This will vary depending on meter size and settings. This value is primarily useful as a meter heartbeat monitor.

Path Process Data

Address	Description	Units	Function	Format
19458 - 19459	Measured Flow Velocity path 1	m/s	Read Only	IEEE single
19522 - 19523	Measured Flow Velocity path 2	m/s	Read Only	IEEE single
19586 - 19587	Measured Flow Velocity path 3	m/s	Read Only	IEEE single
19650 - 19651	Measured Flow Velocity path 4	m/s	Read Only	IEEE single
19714 - 19715	Measured Flow Velocity path 5	m/s	Read Only	IEEE single
19778 - 19779	Measured Flow Velocity path 6	m/s	Read Only	IEEE single
19842 - 19843	Measured Flow Velocity path 7	m/s	Read Only	IEEE single
19906 - 19907	Measured Flow Velocity path 8	m/s	Read Only	IEEE single
19460 - 19461	Measured VOS path 1	m/s	Read Only	IEEE single
19524 - 19525	Measured VOS path 2	m/s	Read Only	IEEE single
19588 - 19589	Measured VOS path 3	m/s	Read Only	IEEE single
19652 - 19553	Measured VOS path 4	m/s	Read Only	IEEE single
19716 - 19717	Measured VOS path 5	m/s	Read Only	IEEE single
19780 - 19781	Measured VOS path 6	m/s	Read Only	IEEE single
19844 - 19845	Measured VOS path 7	m/s	Read Only	IEEE single
19908 - 19909	Measured VOS path 8	m/s	Read Only	IEEE single
19462 - 19463	Percentage of Signals Used 1A	%	Read Only	IEEE single
19464 - 19465	Percentage of Signals Used 1B	%	Read Only	IEEE single
19526 - 19527	Percentage of Signals Used 2A	%	Read Only	IEEE single
19528 - 19529	Percentage of Signals Used 2B	%	Read Only	IEEE single
19590 - 19591	Percentage of Signals Used 3A	%	Read Only	IEEE single
19592 - 19593	Percentage of Signals Used 3B	%	Read Only	IEEE single
19654 - 19655	Percentage of Signals Used 4A	%	Read Only	IEEE single
19656 - 19657	Percentage of Signals Used 4B	%	Read Only	IEEE single
19718 - 19719	Percentage of Signals Used 5A	%	Read Only	IEEE single
19720 - 19721	Percentage of Signals Used 5B	%	Read Only	IEEE single
19782 - 19783	Percentage of Signals Used 6A	%	Read Only	IEEE single
19784 - 19785	Percentage of Signals Used 6B	%	Read Only	IEEE single
19846 - 19847	Percentage of Signals Used 7A	%	Read Only	IEEE single
19848 - 19849	Percentage of Signals Used 7B	%	Read Only	IEEE single
19910 - 19911	Percentage of Signals Used 8A	%	Read Only	IEEE single
19912 - 19913	Percentage of Signals Used 8B	%	Read Only	IEEE single
19466 - 19467	Gain 1A	dB	Read Only	IEEE single
19468 - 19469	Gain 1B	dB	Read Only	IEEE single
19530 - 19531	Gain 2A	dB	Read Only	IEEE single
19532 - 19533	Gain 2B	dB	Read Only	IEEE single
19594 - 19595	Gain 3A	dB	Read Only	IEEE single
19596 - 19597	Gain 3B	dB	Read Only	IEEE single
19658 - 19659	Gain 4A	dB	Read Only	IEEE single
19660 - 19661	Gain 4B	dB	Read Only	IEEE single
19722 - 19723	Gain 5A	dB	Read Only	IEEE single
19724 - 19725	Gain 5B	dB	Read Only	IEEE single
19786 - 19787	Gain 6A	dB	Read Only	IEEE single
19788 - 19789	Gain 6B	dB	Read Only	IEEE single
19850 - 19851	Gain 7A	dB	Read Only	IEEE single

Path Process Data

Address	Description	Units	Function	Format
19852 - 19853	Gain 7B	dB	Read Only	IEEE single
19914 - 19915	Gain 8A	dB	Read Only	IEEE single
19916 - 19917	Gain 8B	dB	Read Only	IEEE single
19470 - 19471	S/N Raw 1A	dB	Read Only	IEEE single
19472 - 19473	S/N Raw 1B	dB	Read Only	IEEE single
19534 - 19535	S/N Raw 2A	dB	Read Only	IEEE single
19536 - 19537	S/N Raw 2B	dB	Read Only	IEEE single
19598 - 19599	S/N Raw 3A	dB	Read Only	IEEE single
19600 - 19601	S/N Raw 3B	dB	Read Only	IEEE single
19662 - 19663	S/N Raw 4A	dB	Read Only	IEEE single
19664 - 19665	S/N Raw 4B	dB	Read Only	IEEE single
19726 - 19727	S/N Raw 5A	dB	Read Only	IEEE single
19728 - 19729	S/N Raw 5B	dB	Read Only	IEEE single
19790 - 19791	S/N Raw 6A	dB	Read Only	IEEE single
19792 - 19793	S/N Raw 6B	dB	Read Only	IEEE single
19854 - 19855	S/N Raw 7A	dB	Read Only	IEEE single
19856 - 19857	S/N Raw 7B	dB	Read Only	IEEE single
19918 - 19919	S/N Raw 8A	dB	Read Only	IEEE single
19920 - 19921	S/N Raw 8B	dB	Read Only	IEEE single
19474 - 19475	S/N Used 1A	dB	Read Only	IEEE single
19476 - 19477	S/N Used 1B	dB	Read Only	IEEE single
19538 - 19539	S/N Used 2A	dB	Read Only	IEEE single
19540 - 19541	S/N Used 2B	dB	Read Only	IEEE single
19602 - 19603	S/N Used 3A	dB	Read Only	IEEE single
19604 - 19605	S/N Used 3B	dB	Read Only	IEEE single
19666 - 19667	S/N Used 4A	dB	Read Only	IEEE single
19668 - 19669	S/N Used 4B	dB	Read Only	IEEE single
19730 - 19731	S/N Used 5A	dB	Read Only	IEEE single
19732 - 19733	S/N Used 5B	dB	Read Only	IEEE single
19794 - 19795	S/N Used 6A	dB	Read Only	IEEE single
19796 - 19797	S/N Used 6B	dB	Read Only	IEEE single
19858 - 19859	S/N Used 7A	dB	Read Only	IEEE single
19860 - 19861	S/N Used 7B	dB	Read Only	IEEE single
19922 - 19923	S/N Used 8A	dB	Read Only	IEEE single
19924 - 19925	S/N Used 8B	dB	Read Only	IEEE single
19478 - 19479	Turbulence level 1	%	Read Only	IEEE single
19542 - 19543	Turbulence level 2	%	Read Only	IEEE single
19606 - 19607	Turbulence level 3	%	Read Only	IEEE single
19670 - 19671	Turbulence level 4	%	Read Only	IEEE single
19734 - 19735	Turbulence level 5	%	Read Only	IEEE single
19798 - 19799	Turbulence level 6	%	Read Only	IEEE single
19862 - 19863	Turbulence level 7	%	Read Only	IEEE single
19926 - 19927	Turbulence level 8	%	Read Only	IEEE single

Pulse Process Data

Address	Description	Units	Function	Format
21508 - 21509	Pulse Counter	-	Read Only	INT 32

System Status Data

Address	Description	Units	Function	Format
23558 - 23559	Alarm Status (Note 2)	-	Read Only	INT 32
25602 - 25603	Used Line Temperature	°C	Read Only	IEEE single
25604 - 25605	Used Line Pressure	barA	Read Only	IEEE single

2. **Note:** See Section 4.1 for interpretation of the Alarm Summary.

3.2. Fluid Correction Data

Address	Description	Units	Function	Format
29698 - 29699	Temperature Used	°C	Read Only	IEEE single
29700 - 29701	Pressure Used	bar (abs)	Read Only	IEEE single
29702 - 29703	Density Used (API correction only)	kg/m³	Read Only	IEEE single
29704 - 29705	Correction Factor		Read Only	IEEE single
29706 - 29707	Density at Ref Conditions (GOST)	kg/m³	Read Only	IEEE single
29708 - 29709	Density at Line Conditions (API)	kg/m³	Read Only	IEEE single
29710 - 29711	Standard Flow Rate	Sm³/hr	Read Only	IEEE single
29712 - 29713	CTL Correction Factor (API)		Read Only	IEEE single
29714 - 29715	CPL Correction Factor (API)		Read Only	IEEE single
29716 - 29717	Nitrogen Mole Fraction (Gas)	%	Read Only	IEEE single
29718 - 29719	Carbon Dioxide Mole Fraction (Gas)	%	Read Only	IEEE single
29720 - 29721	Reference density input (GOST)	kg/m³	Read Only	IEEE single

3.3. GOST Fluid Correction Outputs

Address	Description	Units	Function	Format
30722 - 30723	Mass Flow Rate	kg/hr	Read Only	IEEE single
30724 - 30725	Compressibility at Ref. Cond		Read Only	IEEE single
30726 - 30727	Compressibility at Line Cond		Read Only	IEEE single
30728 - 30729	Adiabatic Exponent		Read Only	IEEE single
30730 - 30731	Speed of Sound	m/s	Read Only	IEEE single
30732 - 30733	Isobaric Heat Value (superior)	MJ/m³	Read Only	IEEE single
30734 - 30735	Isobaric Heat Value (inferior)	MJ/m³	Read Only	IEEE single
30736 - 30737	Viscosity, Dynamic	cP	Read Only	IEEE single
30738 - 30739	Compressibility Ratio		Read Only	IEEE single
30740 - 30741	Viscosity, Kinematic	cSt	Read Only	IEEE single
30742 - 30743	density at Line Conditions	kg/m³	Read Only	IEEE single

3.4. Read/Write Registers

The following addresses can be updated by the external device. It is recommended that the register write area be configured in two different scans, each with a different update interval.

1. **Scan 1:**
   a. Addresses 28674-28689
   b. Recommended write interval: between 10 and 25 seconds.
2. **Scan 2:**
   a. Addresses 28690-28695 (note: this address range may be extended in the future to accommodate new algorithms, but suggest the range be kept as short as possible to maintain efficiency).
   b. Recommended write interval: between 2 and 4 minutes. If new data is not available within an interval, it is recommended the old values be rewritten to prevent the ultrasonic meter from issuing an alarm.

Writing into these registers might be omitted if the function is not needed, or if obtained via analog. If “reserved” values are included in the scan range, it is recommended that 0xffff be written these to maintain future compatibility. If writing to gas mole fractions, all applicable fractions must be written in the same scan or none of them will be accepted.

Address	Description	Units	Function	Format
28674 - 28675	Spool Temperature, used for spool dimension compensation	°C	Read/Write	IEEE single
28676 - 28677	Spool Pressure, used for spool dimension compensation	barA	Read/Write	IEEE single
28678 - 28679	Fluid Temperature (fluid volume correction)	°C	Read/Write	IEEE single
28680 - 28681	Fluid Pressure (fluid volume correction)	barA	Read/Write	IEEE single
28682 - 28683	Fluid Density (actual conditions), (fluid volume correction)	kg/m3	Read/Write	IEEE single
28684 - 28685	Fluid Density (reference conditions), (fluid volume correction)	kg/m3	Read/Write	IEEE single
28686	(reserved; write 0xffff if necessary)	-	Read/Write	INT16
28687	(reserved; write 0xffff if necessary)	-	Read/Write	INT16
28688	(reserved; write 0xffff if necessary)	-	Read/Write	INT16
28689	(reserved; write 0xffff if necessary)	-	Read/Write	INT16
28690	(reserved; write 0xffff if necessary)	-	Read/Write	INT16
28691	(reserved; write 0xffff if necessary)	-	Read/Write	INT16
28692 - 28693	Nitrogen mole fraction (gas meter only)	%	Read/Write	IEEE single
28694 - 28695	Carbon dioxide mole fraction (gas meter only)	%	Read/Write	IEEE single

4 – Register Usage

Figure 1 below describes the most common way to implement a master application that is synchronized with the meter.

In this example, the master application running on an external flow computer is responsible for writing the correct pressure and temperature to the meter.

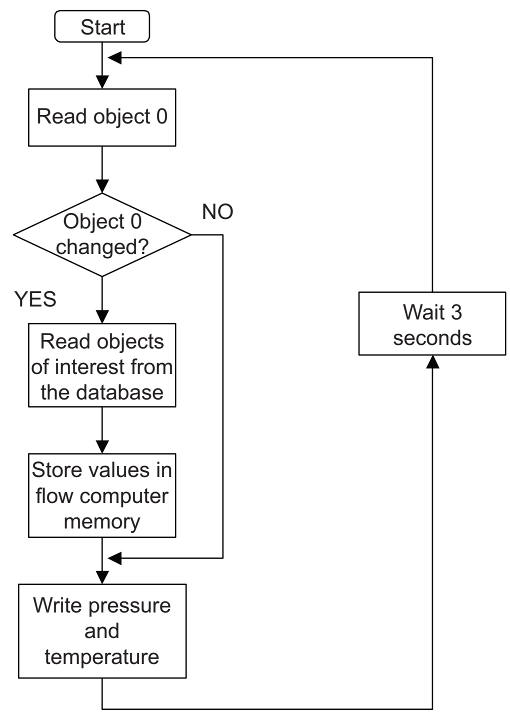

Figure 1 - Flow Computer Application Example

Alternatively, the master can read a whole block of data from object 0 to simplify and reduce the number of Modbus operations.

Whenever object 0 changes values, there are updated values in the block.

4.1. Alarm Status: Address 23558-23559

The Alarm Status is a bit coded value indicating the state of the meter alarms. The address value is read as a 32-bit signed integer. The integer is interpreted as a binary value with bits set for each alarm according to the place holding value. The table below shows the alarm bits used and their interpretation. Multiple alarms will set multiple bits with a corresponding integer output of the binary numerical value.

Integer Value	Binary Format Bit Setting	Alarm Interpretation
1	1	High Flow Alarm
2	10	Electronics Failure Bad Hardware
4	100	Transducer Failure
8	1000	Calculation Error (ex: division by zero)
16	10000	Signal percent too low
32	100000	Signal gain too high
64	1000000	Velocity-of-sound difference between paths too high
128	10000000	Path substitution has taken place (path failure)
256	100000000	Parameter error
512	1000000000	S/N ratio low
1024	10000000000	Turbulence level too high
2048	100000000000	Profile deviation high

4.2. Measurement Uncertainty Alarm: Address 230-231

The Confidence Alarms indicate that certain values might not be within specification. These are determined by looking at a combination of meter alarms and operating conditions. The integer is interpreted as a binary value with bits set for each alarm according to the place holding value. The table below shows the alarm bits used and their interpretation. Multiple alarms will set multiple bits with a corresponding integer output of the binary numerical value.

Integer Value	Binary Format Bit Setting	Alarm Interpretation
1	1	High Flow Alarm One or more of: 1. Linear velocity is above 0.1m/s AND path substitution is active on two or more paths 2. Turbulence on any path is above 12% 3. Gain is equal to or greater than 42dB on any path 4. Electronics Failure Alarm 5. Calculation error
2	10	Velocity of Sound Uncertain Cannot be calculated due to prerequisites being unknown
4	100	Estimated Density Uncertain Cannot be calculated due to prerequisites being unknown
8	1000	Estimated Viscosity Uncertain Cannot be calculated due to prerequisites being unknown
16	10000	Estimated ReNo Uncertain Cannot be calculated due to prerequisites being unknown
32	100000	Analog Output Range Error Analog output engineering range exceeded
64	1000000	Computed Dynamic Viscosity Uncertain Cannot be calculated due to prerequisites being unknown

4.3. The Modbus Protocol – Message Exchange Example

This chapter describes the exchange of messages taking place in a typical Flow computer - meter communication.

4.3.1. Modbus Read Message Example

In the following example the flow computer performs the following task:

- Read VOS and flow rate from the meter

The database objects used for VOS and flow rate and these have the Modbus addresses VOS 15364 (3C04 hex) and 15366 (3C06 hex). These registers are read with ONE message using function code 3. Figure 2 below shows (VOS) the contents of this message.

Node no.	Function code	1st register address		Number of 16-bit values	
01	03	3C	04	00	04

Figure 2 - Modbus Read Message Example

Note: All bytes are shown in hexadecimal format.

The reply from the Series C will be on the format described in Figure 3 below:

Node no.	Function code	Byte count	VOS - 344 m/s				Flow rate - 3456.5 m^3/h			
01	03	3C	43	AC	00	00	45	58	08	00

Figure 3 - Modbus Read Reply Message Example

The message contains the content of database represented as two 32-bit real values (least significant byte first).

4.3.2. Modbus Write Message Example

In the following example the flow computer performs the following task:

- Write temperature and pressure from the meter

These have the Modbus addresses 28674 (7002 hex) and 28676 (7004 hex). These registers are written with ONE message using function code 16 (10 hex). Figure 4 below shows the contents of this message.

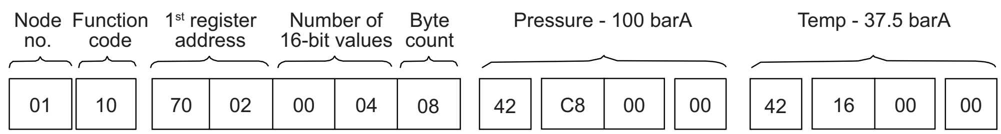

Figure 4 - Modbus Write Message Example

The reply from the meter will be on the format described in the figure below:

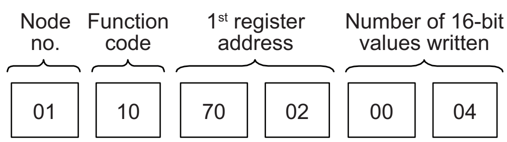

Figure 5 - Modbus Write Reply Message Example

The message contains a copy of the first 6 bytes of the request message.

Technical Support

Contact Information:
Field Service Response Center
24/7 Technical Support/Schedule a Technician: 1-844-798-3819
System Installation Supervision, Start-Up, Training, and Commissioning Services Available

Revisions included in MN0A003 Issue/Rev. 0.1 (1/18):
Section 3.2 and 3.3 added - Fluid Correction Data and GOST Fluid Connection Outputs. Section 3.4 added/revised - Read/Write Registers.
The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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