

Modbus[®] Mapping Assignments for Micro Motion[®] Transmitters



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July 2002

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- In the U.S.A., phone 1-800-522-6277, 24 hours
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Using the Modbus Map

1.1 What this document tells you

This document lists Modbus® mapping assignments for Micro Motion® flowmeter components that support Modbus protocol.

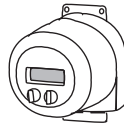
Micro Motion flowmeter components that support Modbus protocol include:



Series 1000 and 2000 transmitters, all versions



Core processor stand-alone (MVDSolo or MVD Direct Connect)



Field-mount Model RFT9739 transmitters, Version 2 and higher



Rack-mount Model RFT9739 transmitters, Version 2 and higher



Keys to using the Modbus map

Tables throughout the Modbus map contain checkmarks (✓) that identify the Micro Motion implementations for which each mapped address is available.

There are two Micro Motion implementations that do not include a Micro Motion transmitter:

- MVDSolo – includes only a sensor and core processor
- MVD Direct Connect – includes a sensor, core processor, and barrier

In this document, the term "MVDSolo" is used to refer to both.

What this document does not tell you

This document does *not* explain how individual mapped addresses are used. This document is a list of mapped addresses that are available for Micro Motion transmitters that support Modbus protocol.

For detailed information about using the mapped addresses that are listed in this document, see *Using Modbus Protocol with Micro Motion Transmitters*, available on the compact disk (CD) that is shipped with the transmitter, or from our website (www.micromotion.com).

This manual does *not* explain terminology and procedures for using Modbus protocol, or how to use a host controller to communicate with other devices in a Modbus-compatible multidrop network. For detailed information about using Modbus protocol, contact Modicon, Inc., North Andover, Massachusetts, U.S.A.

This manual does not explain transmitter installation or flowmeter wiring. For information about installation and wiring, see the appropriate sensor and transmitter manuals.

To order any of the manuals, see the phone numbers and website address that are listed below.

Tell us what you think

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Modbus Mapping Assignments

Table 2-1. Read/write coils

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
0 0002	Start/stop totalizers	√	√	√	√
0 0003	Reset totals	√	√	√	√
0 0004	Reset inventories	√	√	√	√
0 0005	Perform flowmeter zeroing	√	√	√	√
0 0006	Trim primary mA output at 0 or 4 mA		√	√ ¹	√
0 0007	Trim primary mA output at 20 mA		√	√	√
0 0008	Trim secondary mA output at 0 or 4 mA			√ ^{1,2}	√
0 0009	Trim secondary mA output at 20 mA			√ ²	√
0 0010	Fix current level from primary mA output		√	√	√
0 0011	Fix current level from secondary mA output			√ ²	√
0 0012	Fix frequency from frequency/pulse output		√	√	√
0 0013	Perform low-density calibration	√	√	√	√
0 0014	Perform high-density calibration	√	√	√	√
0 0014	Perform third-point density calibration				√
0 0015	Perform temperature offset calibration	√	√	√	
0 0016	Perform temperature slope calibration	√	√	√	
0 0018	Perform flowing density (FD) calibration	√	√	√	
0 0018	Save non-volatile data				√
0 0020	Perform transmitter test	√	√	√	√
0 0039	Reset configuration and calibration registers				√
0 0041	Perform reboot	√	√	√	√
0 0044	Perform T-Series sensor D3 calibration	√	√	√	
0 0045	Perform T-Series sensor D4 calibration	√	√	√	
0 0046	Fix discrete output 1		√	√	
0 0047	Fix discrete output 2			√ ³	
0 0056	Reset mass total	√	√	√	
0 0057	Reset line volume (gross volume) total	√	√	√	
0 0058	Reset API reference volume total (Standard volume total)	√	√	√	
0 0081	Enable/disable cryogenic modulus compensation	√	√	√	
0 0082	Enable/disable pressure compensation	√	√	√	
0 0083	Enable/disable HART burst mode		√	√	
0 0084	Enable/disable FOUNDATION Fieldbus simulation mode			√ ⁴	
0 0086	Enable/disable Use externally written temperature (20449/20450) for internal calculations	√	√	√	
0 0094	Enable/disable totalizer reset using display		√	√	
0 0095	Enable/disable automatic scrolling using display		√	√	
0 0096	Enable/disable display offline menu		√	√	
0 0097	Enable/disable offline password for display		√	√	
0 0098	Enable/disable display alarm menu		√	√	
0 0099	Enable/disable acknowledge all alarms using display		√	√	

¹Only the 4 mA trim value is supported.

²Transmitters with intrinsically safe output boards or configurable input/output boards only.

³Transmitters with configurable input/output boards only.

⁴Transmitters with FOUNDATION Fieldbus option board only.

Modbus Mapping Assignments *continued*

Table 2-2. RFT9739 security coils

Address	Description	RFT9739
0 0113	Read protect calibration factors	√
0 0114	Write protect output variables and units	√
0 0115	Write protect scaled integers	√
0 0116	Write protect sensor and transmitter information	√
0 0117	Write protect special units factors	√
0 0118	Write protect control output variable	√
0 0119	Write protect flow direction	√
0 0120	Write protect fault code	√
0 0121	Write protect fault limit	√
0 0122	Write protect output variables	√
0 0123	Write protect flowmeter zeroing and process variable limits	√
0 0124	Write protect pressure variables	√
0 0125	Write protect calibration factors	√
0 0126	Write protect coil 00002 (start/stop totalizer)	√
0 0127	Write protect coil 00003 (reset totals)	√
0 0128	Write protect coil 00004 (reset inventories)	√
0 0129	Write protect coil 00005 (perform flowmeter zeroing)	√
0 0130	Write protect coil 00006 (trim primary mA output at 4 mA or 0 mA)	√
0 0131	Write protect coil 00007 (trim primary mA output at 20 mA)	√
0 0132	Write protect coil 00008 (trim secondary mA output at 4 mA or 0 mA)	√
0 0133	Write protect coil 00009 (trim secondary mA output at 20 mA)	√
0 0134	Write protect coil 00010 (fix primary mA output)	√
0 0135	Write protect coil 00011 (fix secondary mA output)	√
0 0136	Write protect coil 00012 (fix frequency output)	√
0 0137	Write protect coil 00013 (perform low-density calibration)	√
0 0138	Write protect coil 00014 (perform high-density calibration)	√
0 0142	Write protect coil 00018 (save non-volatile data)	√
0 0143	Read/write protect master reset defaults	√
0 0144	Read/write protect coil 00020 (perform transmitter self-test)	√
0 0145	Read protect coil 10021 (EEPROM checksum failure)	√
0 0146	Read protect coil 10022 (RAM diagnostic failure)	√
0 0147	Read protect coil 10023 (real-time interrupt failure)	√
0 0148	Read protect coil 10024 (sensor failure)	√
0 0149	Read protect coil 10025 (temperature sensor failure)	√
0 0150	Read protect coil 10026 (flowmeter zeroing failure)	√
0 0151	Read protect coil 10027 (other failure occurred)	√
0 0152	Read protect coil 10028 (transmitter initializing/warming up)	√
0 0153	Read protect coil 10029 (primary variable out of range)	√
0 0154	Read protect coil 10030 (non-primary variable out of range)	√
0 0155	Read protect coil 10031 (milliamp output saturated)	√
0 0156	Read protect coil 10032 (milliamp output fixed)	√
0 0157	Read protect coil 10033 (watchdog timer error)	√
0 0158	Read protect coil 10034 (power reset occurred)	√
0 0159	Read protect coil 10035 (transmitter configuration changed)	√
0 0160	Read protect coil 10036 (transmitter electronics failure)	√

Modbus Mapping Assignments *continued*

Table 2-3. Read-only discrete inputs

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
1 0021	(E)EPROM checksum failure	√	√	√	√
1 0022	RAM diagnostic failure	√	√	√	√
1 0023	Real-time interrupt failure	√	√	√	√
1 0024	Sensor failure	√	√	√	√
1 0025	Temperature sensor failure	√	√	√	√
1 0026	Flowmeter zeroing failure	√	√	√	√
1 0027	Other failure occurred	√	√	√	√
1 0028	Transmitter initializing/warming up	√	√	√	√
1 0029	Primary variable out of range	√	√	√	√
1 0030	Secondary variable out of range	√	√	√	√
1 0031	Milliamp output(s) saturated		√	√	√
1 0032	Milliamp output(s) fixed		√	√	√
1 0033	Watchdog timer error	√	√	√	√
1 0034	Power reset occurred	√	√	√	√
1 0035	Transmitter configuration changed	√			√
1 0036	Transmitter electronics failure	√	√	√	√
1 0037	Event 1 status (ON/OFF)	√	√	√	√
1 0038	Event 2 status (ON/OFF)	√	√	√	√
1 0065	Event 1 or event 2 status (ON/OFF)		√	√	
1 0066	Flow direction switch status (ON/OFF)		√	√	
1 0067	Flow rate indicator status (ON/OFF)		√	√	
1 0068	Zero in progress status (ON/OFF)		√	√	
1 0069	Fault status (ON/OFF)		√	√	

Table 2-4. Floating-point register pairs

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
2 0141 0142	Slug duration (seconds)	√	√	√	√
2 0143 0144	Fixed current for primary mA output test (milliamps)		√	√	√
2 0145 0146	Fixed current for secondary mA output test (milliamps)			√ ¹	√
2 0147 0148	Fixed frequency for frequency/output test (Hz)		√	√	√
2 0149 0150	Cutoff for density	√	√	√	
2 0151 0152	Temperature for temperature offset/slope calibrations	√	√	√	
2 0155 0156	Density for low-density calibration (g/cc)	√	√	√	√
2 0157 0158	Density for high-density calibration (g/cc)	√	√	√	√
2 0157 0158	Density for flowing-density calibration (g/cc)				√
2 0159 0160	Density calibration constant 1 (μsec)	√	√	√	√
2 0161 0162	Density calibration constant 2 (μsec)	√	√	√	√
2 0163 0164	Density temperature coefficient	√	√	√	√
2 0165 0166	High mass flow limit of sensor	√	√	√	√
2 0167 0168	High temperature limit of sensor	√	√	√	√
2 0169 0170	High density limit of sensor (g/cc)	√	√	√	√
2 0171 0172	High volume flow limit of sensor	√	√	√	√
2 0173 0174	Low mass flow limit of sensor	√	√	√	√
2 0175 0176	Low temperature limit of sensor	√	√	√	√
2 0177 0178	Low density limit of sensor (g/cc)	√	√	√	√
2 0179 0180	Low volume flow limit of sensor	√	√	√	√
2 0181 0182	Mass flow minimum range	√	√	√	√
2 0183 0184	Temperature minimum range	√	√	√	√
2 0185 0186	Density minimum range	√	√	√	√

Modbus Mapping Assignments *continued*

Table 2-4. Floating-point register pairs *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
2 0187 0188	Volume flow minimum range	√	√	√	√
2 0189 0190	Flow rate internal damping (seconds)	√	√	√	√
2 0191 0192	Temperature internal damping (seconds)	√	√	√	√
2 0193 0194	Density internal damping (seconds)	√	√	√	√
2 0195 0196	Mass flow cutoff for frequency/pulse output and totalizers	√	√	√	√
2 0197 0198	Volume flow cutoff for frequency/pulse output and totalizers	√	√	√	√
2 0199 0200	Slug flow high-density limit (g/cc)	√	√	√	√
2 0201 0202	Slug flow low-density limit (g/cc)	√	√	√	√
2 0203 0204	Primary mA output present current (milliamps)		√	√	√
2 0205 0206	Added damping on primary mA output (seconds)		√	√	√
2 0207 0208	Flow cutoff for primary mA output		√	√	√
2 0209 0210	Primary variable at 20 mA		√	√	√
2 0211 0212	Primary variable at 0 mA or 4 mA		√	√	√
2 0213 0214	Secondary mA output present current (milliamps) ¹			√	√
2 0215 0216	Added damping on secondary mA output (seconds) ¹			√	√
2 0217 0218	Flow cutoff for secondary mA output ¹			√	√
2 0219 0220	Secondary variable at 20 mA			√ ¹	√
2 0221 0222	Secondary variable at 0 mA or 4 mA			√ ¹	√
2 0223 0224	Frequency setpoint or number of pulses (Hz)		√	√	√
2 0225 0226	Flow rate or total represented by frequency or number of pulses		√	√	√
2 0227 0228	Frequency pulse width (seconds)		√	√	√
2 0229 0230	Frequency/pulse output present frequency (Hz)		√	√	√
2 0231 0232	Flowmeter zeroing standard deviation				√
2 0233 0234	Present flow signal offset at zero flow	√	√	√	√
2 0235 0236	Flowmeter zeroing standard deviation limit				√
2 0237 0238	Special mass unit conversion factor	√	√	√	√
2 0239 0240	Special volume unit conversion factor	√	√	√	√
2 0241 0242	Event 1 setpoint	√	√	√	√
2 0243 0244	Event 2 setpoint	√	√	√	√
2 0245 0246	1 (E)EPROM checksum failure	√	√	√	√
	2 RAM diagnostic failure	√	√	√	√
	4 Sensor failure	√	√	√	√
	8 Temperature sensor failure	√	√	√	√
	16 Input overrange	√	√	√	√
	32 Frequency/pulse output saturated	√	√	√	√
	64 Transmitter not configured	√	√	√	√
	128 Real-time interrupt failure	√	√	√	√
	256 Primary mA output saturated		√	√	√
	512 Secondary mA output saturated ¹			√	√
	1024 Primary mA output fixed		√	√	√
	2048 Secondary mA output fixed ¹			√	√
	4096 Density overrange	√	√	√	√
	8192 Flowmeter zeroing failure	√	√	√	√
	16384 Zero value too low	√	√	√	√
	32768 Zero value too high	√	√	√	√
	65536 Transmitter electronics failure	√	√	√	√
	131072 Flowmeter zeroing in progress	√	√	√	√
	262144 Slug flow	√	√	√	√
	524288 Power reset occurred	√	√	√	√
	1048576 Transmitter configuration changed	√	√	√	√
	2097152 Transmitter initializing/warming up	√	√	√	√

Modbus Mapping Assignments *continued*

Table 2-4. Floating-point register pairs *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
2 0247 0248	Mass flow rate	√	√	√	√
2 0249 0250	Density	√	√	√	√
2 0251 0252	Temperature	√	√	√	√
2 0253 0254	Volume flow rate	√	√	√	√
2 0257 0258	Pressure				√
2 0259 0260	Mass total	√	√	√	√
2 0261 0262	Volume total	√	√	√	√
2 0263 0264	Mass inventory	√	√	√	√
2 0265 0266	Volume inventory	√	√	√	√
2 0267 0268	Pressure correction factor for flow	√	√	√	√
2 0269 0270	Pressure correction factor for density	√	√	√	√
2 0271 0272	Flow calibration pressure	√	√	√	√
2 0273 0274	Pressure input at 4 mA				√
2 0275 0276	Pressure input at 20 mA				√
2 0277 0278	Density for flowing-density calibration	√	√	√	√ ⁴
2 0277 0278	Constant for third-point density calibration				√ ²
2 0279 0280	Mass flow rate meter factor	√	√	√	√ ³
2 0281 0282	Volume flow rate meter factor	√	√	√	√
2 0283 0284	Density meter factor	√	√	√	√
2 0285 0286	Raw tube frequency (Hz)	√	√	√	√ ³
2 0287 0288	Left pickoff voltage (millivolts)	√	√	√	√ ³
2 0289 0290	Right pickoff voltage (millivolts)	√	√	√	√ ³
2 0291 0292	Drive gain (% for MVDSolo, Series 1000, or Series 2000; volts for RFT9739)	√	√	√	√ ³
2 0293 0294	Mass flow live zero flow	√	√	√	√ ³
2 0303 0304	Flowing-density calibration constant	√	√	√	√ ⁴
2 0319 0320	API reference temperature	√	√	√	
2 0323 0324	API thermal expansion coefficient	√	√	√	
2 0325 0326	Temperature-corrected density	√	√	√	
2 0329 0330	CTL	√	√	√	
2 0331 0332	Temperature/pressure-corrected volumetric flow	√	√	√	
2 0333 0334	Temperature/pressure-corrected volumetric total	√	√	√	
2 0335 0336	Temperature/pressure-corrected volumetric inventory	√	√	√	
2 0337 0338	Weighted average batch observed density	√	√	√	
2 0339 0340	Weighted average batch observed temperature	√	√	√	
2 0407 0408	Flow calibration factor (FCF)	√	√	√	
2 0409 0410	Temperature coefficient for flow (FT)	√	√	√	
2 0411 0412	Tempcal slope	√	√	√	
2 0413 0414	Tempcal offset	√	√	√	
2 0435 0436	Sensor maximum recorded temperature	√	√	√	
2 0437 0438	Sensor minimum recorded temperature	√	√	√	
2 0439 0440	Sensor average recorded temperature	√	√	√	
2 0449 0450	External temperature input value	√	√	√	
2 0451 0452	External pressure input value	√	√	√	
2 0463 0464	Electronics maximum recorded temperature	√	√	√	
2 0465 0466	Electronics minimum recorded temperature	√	√	√	
2 0467 0468	Electronics average recorded temperature	√	√	√	
2 0503 0504	T-Series K3 density constant	√	√	√	
2 0505 0506	T-Series FTG value	√	√	√	
2 0507 0508	T-Series FTQ value	√	√	√	
2 0509 0510	Density for T-Series sensor D3 density calibration	√	√	√	
2 0511 0512	Density for T-Series sensor D4 density calibration	√	√	√	

Modbus Mapping Assignments *continued*

Table 2-4. Floating-point register pairs *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
2 0513 0514	T-Series DTG value	√	√	√	
2 0515 0516	T-Series DFQ1 value	√	√	√	
2 0517 0518	T-Series DFQ2 value	√	√	√	
2 0519 0520	T-Series K4 density constant	√	√	√	
2 0687 0688	Slot 0 configuration variable	√	√	√	
2 0689 0690	Slot 1 configuration variable	√	√	√	
2 0691 0692	Slot 2 configuration variable	√	√	√	
2 0693 0694	Slot 3 configuration variable	√	√	√	
2 0695 0696	Slot 4 configuration variable	√	√	√	
2 0697 0698	Slot 5 configuration variable	√	√	√	
2 0699 0700	Slot 6 configuration variable	√	√	√	
2 0701 0702	Slot 7 configuration variable	√	√	√	
2 0703 0704	Slot 8 configuration variable	√	√	√	
2 0705 0706	Slot 9 configuration variable	√	√	√	
2 0707 0708	Slot 10 configuration variable	√	√	√	
2 0709 0710	Slot 11 configuration variable	√	√	√	
2 0711 0712	Slot 12 configuration variable	√	√	√	
2 0713 0714	Slot 13 configuration variable	√	√	√	
2 0715 0716	Slot 14 configuration variable	√	√	√	
2 0717 0718	Slot 15 configuration variable	√	√	√	
2 0719 0720	Slot 16 configuration variable	√	√	√	
2 0721 0722	Slot 17 configuration variable	√	√	√	
2 0723 0724	Slot 18 configuration variable	√	√	√	
2 0725 0726	Slot 19 configuration variable	√	√	√	
2 0727 0728	Slot 20 configuration variable	√	√	√	
2 0729 0730	Slot 21 configuration variable	√	√	√	
2 0731 0732	Slot 22 configuration variable	√	√	√	
2 0733 0734	Slot 23 configuration variable	√	√	√	
2 0735 0736	Slot 24 configuration variable	√	√	√	
2 0737 0738	Slot 25 configuration variable	√	√	√	
2 0739 0740	Slot 26 configuration variable	√	√	√	
2 0741 0742	Slot 27 configuration variable	√	√	√	
2 0743 0744	Slot 28 configuration variable	√	√	√	
2 0745 0746	Slot 29 configuration variable	√	√	√	
2 0747 0748	Slot 30 configuration variable	√	√	√	
2 0749 0750	Slot 31 configuration variable	√	√	√	
2 0783 0784	Slot 0 process variable	√	√	√	
2 0785 0786	Slot 1 process variable	√	√	√	
2 0787 0788	Slot 2 process variable	√	√	√	
2 0789 0790	Slot 3 process variable	√	√	√	
2 0791 0792	Slot 4 process variable	√	√	√	
2 0793 0794	Slot 5 process variable	√	√	√	
2 0795 0796	Slot 6 process variable	√	√	√	
2 0797 0798	Slot 7 process variable	√	√	√	
2 0799 0800	Slot 8 process variable	√	√	√	
2 0801 0802	Slot 9 process variable	√	√	√	
2 0803 0804	Slot 10 process variable	√	√	√	
2 0805 0806	Slot 11 process variable	√	√	√	
2 0807 0808	Slot 12 process variable	√	√	√	
2 0809 0810	Slot 13 process variable	√	√	√	
2 0811 0812	Slot 14 process variable	√	√	√	
2 0813 0814	Slot 15 process variable	√	√	√	

Modbus Mapping Assignments *continued*

Table 2-4. Floating-point register pairs *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
2 0815 0816	Slot 16 process variable	√	√	√	
2 0817 0818	Slot 17 process variable	√	√	√	
2 0819 0820	Slot 18 process variable	√	√	√	
2 0821 0822	Slot 19 process variable	√	√	√	
2 0823 0824	Slot 20 process variable	√	√	√	
2 0825 0826	Slot 21 process variable	√	√	√	
2 0827 0828	Slot 22 process variable	√	√	√	
2 0829 0830	Slot 23 process variable	√	√	√	
2 0831 0832	Slot 24 process variable	√	√	√	
2 0833 0834	Slot 25 process variable	√	√	√	
2 0835 0836	Slot 26 process variable	√	√	√	
2 0837 0838	Slot 27 process variable	√	√	√	
2 0839 0840	Slot 28 process variable	√	√	√	
2 0841 0842	Slot 29 process variable	√	√	√	
2 0843 0844	Slot 30 process variable	√	√	√	
2 0845 0846	Slot 31 process variable	√	√	√	
2 1101 1102	Frequency output pulses per unit		√	√	
2 1103 1104	Frequency output units per pulse		√	√	
2 1105 1106	Frequency output fault setting		√	√	
2 1109 1110	Primary mA output fault setting		√	√	
2 1111 1112	Secondary mA output fault setting ¹			√	
2 1159 1160	Flow rate switch setpoint		√	√	

¹Transmitters with intrinsically safe output boards or configurable input/output boards only.

²Version 3.5 or lower revision RFT9739 transmitter.

³Version 3 or higher revision RFT9739 transmitter.

⁴Version 3.6 or higher revision RFT9739 transmitter.

Table 2-5. Input registers

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
3 0001	Bit #0 (E)EPROM checksum failure	√	√	√	√
	Bit #1 Transmitter configuration changed	√			√
	Bit #2 Sensor failure	√	√	√	√
	Bit #3 Temperature sensor failure	√	√	√	√
	Bit #4 Input overrange	√	√	√	√
	Bit #5 Frequency/pulse output saturated		√	√	√
	Bit #6 Transmitter not configured	√	√	√	√
	Bit #7 Real-time interrupt failure	√	√	√	√
	Bit #8 Milliamp output(s) saturated		√	√	√
	Bit #9 Milliamp output(s) fixed		√	√	√
	Bit #10 Density overrange	√	√	√	√
	Bit #11 Flowmeter zeroing failure	√	√	√	√
	Bit #12 Transmitter electronics failure	√	√	√	√
	Bit #13 Slug flow	√	√	√	√
	Bit #14 Transmitter initializing/warming up	√	√	√	√
	Bit #15 Power reset occurred	√	√	√	√
3 0002	Mass flow rate scaled integer	√	√	√	√
3 0003	Density scaled integer	√	√	√	√
3 0004	Temperature scaled integer	√	√	√	√

Modbus Mapping Assignments *continued*

Table 2-5. Input registers *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
3 0005	Volume flow rate scaled integer	√	√	√	√
3 0008	Mass total scaled integer	√	√	√	√
3 0009	Volume total scaled integer	√	√	√	√
3 0010	Mass inventory scaled integer	√	√	√	√
3 0011	Volume inventory scaled integer	√	√	√	√
3 0016	Transmitter software revision (xxxx.x format; 141 = rev14.1)	√	√	√	√
3 0045	Standard or special mass total or inventory unit ¹	√	√	√	√
3 0046	Standard or special volume total or inventory unit ²	√	√	√	√
3 0120	Device type code	√	√	√	√
3 0121	Electronics manufacturer's code identification number	√	√	√	√
3 0122	HART device I.D. number – high order register of 3-byte integer	√	√	√	√
3 0123	HART device I.D. number – low order register of 3-byte integer	√	√	√	√
3 0125	Bit #0 Primary mA output saturated		√	√	√
	Bit #1 Secondary mA output saturated ³			√	√
	Bit #2 Primary mA output fixed		√	√	√
	Bit #3 Secondary mA output fixed ¹			√	√
	Bit #4 Density overrange	√	√	√	√
	Bit #5 Drive gain overrange	√	√	√	√
	Bit #6 Not used				
	Bit #7 External input error				√
	Bit #8 (E)EPROM checksum failure, core processor or RFT9739	√	√	√	√
	Bit #9 RAM diagnostic failure, core processor or RFT9739	√	√	√	√
	Bit #10 Sensor failure	√	√	√	√
	Bit #11 Temperature sensor failure	√	√	√	√
	Bit #12 Input overrange	√	√	√	√
	Bit #13 Frequency/pulse output saturated		√	√	√
	Bit #14 Transmitter not configured	√	√	√	√
	Bit #15 Real-time interrupt failure	√	√	√	√
3 0126	Bit #0 Burst mode enabled		√	√	√
	Bit #1 Power reset occurred	√	√	√	√
	Bit #2 Transmitter initializing/warming up	√	√	√	√
	Bit #3 Security breach				√
	Bit #4 Display readback error				√
	Bit #5 Event 2 ON	√	√	√	√
	Bit #6 Event 1 ON	√	√	√	√
	Bit #7 Not used				
	Bit #8 Flowmeter zeroing failure	√	√	√	√
	Bit #9 Zero value too low	√	√	√	√
	Bit #10 Zero value too high	√	√	√	√
	Bit #11 Zero too noisy	√	√	√	√
	Bit #12 Transmitter electronics failure	√	√	√	√
	Bit #13 Data loss possible	√	√	√	√
	Bit #14 Calibration in progress	√	√	√	√
	Bit #15 Slug flow	√	√	√	√
3 0295	Security event configuration register				√
3 0296	Security event calibration register				√
3 0297	Mass flow live zero flow				√ ⁴
3 0305	Most significant word for binary mass total				√ ⁵
3 0306	High-order word for binary mass total				√ ³
3 0307	Low-order word for binary mass total				√ ³
3 0308	Least significant word for binary mass total				√ ³
3 0309	Most significant word for binary volume total				√ ³

Modbus Mapping Assignments *continued*

Table 2-5. Input registers *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
3 0310	High-order word for binary volume total				√ ³
3 0311	Low-order word for binary volume total				√ ³
3 0312	Least significant word for binary volume total				√ ³
3 0419	Bit #0 (E)EPROM checksum error, core processor	√	√	√	
	Bit #1 RAM test error, core processor	√	√	√	
	Bit #2 Real-time interrupt failure	√	√	√	
	Bit #3 Sensor not vibrating	√	√	√	
	Bit #4 Temperature sensor out of range	√	√	√	
	Bit #5 Calibration failure	√	√	√	
	Bit #6 Other failure occurred	√	√	√	
	Bit #7 Transmitter initializing/warming up	√	√	√	
	Bit #8 Primary variable out of limits	√			
	Bit #9 Secondary variable out of limits	√			
	Bit #10 Not used				
	Bit #11 Not used				
	Bit #12 Watchdog error	√			
	Bit #13 Cold start occurred	√			
	Bit #14 Transmitter configuration changed	√			
	Bit #15 Transmitter fault	√	√	√	
3 0420	Bit #0 Primary mA output saturated		√	√	
	Bit #1 Secondary mA output saturated ¹			√	
	Bit #2 Primary mA output fixed		√	√	
	Bit #3 Secondary mA output fixed ¹			√	
	Bit #4 Density overrange	√	√	√	
	Bit #5 Drive overrange	√	√	√	
	Bit #6 Not used				
	Bit #7 External input failure		√	√	
	Bit #8 (E)EPROM checksum failure, core processor	√	√	√	
	Bit #9 RAM diagnostic failure, core processor	√	√	√	
	Bit #10 Sensor not vibrating	√	√	√	
	Bit #11 Temperature sensor failure	√	√	√	
	Bit #12 Input overrange	√	√	√	
	Bit #13 Frequency/pulse output saturated		√	√	
	Bit #14 Transmitter not configured	√	√	√	
	Bit #15 Real-time interrupt failure	√	√	√	
3 0421	Bit #0 Burst mode enabled		√	√	
	Bit #1 Power reset occurred	√	√	√	
	Bit #2 Transmitter initializing/warming up	√	√	√	
	Bit #3 Not used				
	Bit #4 Not used				
	Bit #5 Event 2 ON	√	√	√	
	Bit #6 Event 1 ON	√	√	√	
	Bit #7 Sensor/transmitter communication failure		√	√	
	Bit #8 Calibration failure	√	√	√	
	Bit #9 Zero value too low	√	√	√	
	Bit #10 Zero value too high	√	√	√	
	Bit #11 Zero too noisy	√	√	√	
	Bit #12 Transmitter electronics failure	√	√	√	
	Bit #13 Data loss possible	√	√	√	
	Bit #14 Calibration in progress	√	√	√	
	Bit #15 Slug flow	√	√	√	

Modbus Mapping Assignments *continued*

Table 2-5. Input registers *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
3 0422	Bit #0	API: Temperature outside standard range	√	√	√
	Bit #1	API: Density outside standard range	√	√	√
	Bit #2	Line temperature sensor out of range	√	√	√
	Bit #3	Meter temperature sensor out of range	√	√	√
	Bit #4	Flow direction (1 = reverse, 0 = forward or zero flow)	√	√	√
	Bit #5	Not used			
	Bit #6	Not used			
	Bit #7	Not used			
	Bit #8	Not used			
	Bit #9	Transmitter not configured	√	√	√
	Bit #10	(E)EPROM checksum error		√	√
	Bit #11	RAM test error in transmitter		√	√
	Bit #12	Invalid/unrecognized sensor type	√	√	√
	Bit #13	(E)EPROM database corrupt	√	√	√
	Bit #14	(E)EPROM powerdown totals corrupt	√	√	√
Bit #15	(E)EPROM program corrupt	√	√	√	
3 0423	Bit #0	Boot sector fault	√	√	√
	Bit #1	Software upgrade needed		√	√
	Bit #2	Frequency output fixed		√	√
	Bit #3	Not used			
	Bit #4	DO1 status (0=OFF, 1=ON)		√	√
	Bit #5	DO2 status (0=OFF, 1=ON) ⁶			√
	Bit #6	T-Series D3 calibration in progress	√	√	√
	Bit #7	T-Series D4 calibration in progress	√	√	√
	Bit #8	Not used			
	Bit #9	Not used			
	Bit #10	Temperature slope calibration in progress	√	√	√
	Bit #11	Temperature offset calibration in progress	√	√	√
	Bit #12	Flowing density calibration in progress	√	√	√
	Bit #13	High-density calibration in progress	√	√	√
	Bit #14	Low-density calibration in progress	√	√	√
Bit #15	Flowmeter zeroing in progress	√	√	√	
3 0424	Bit #0	Discrete input 1 status (0=OFF, 1=ON) ⁴			√
	Bit #1	Not used			
	Bit #2	Discrete output 1 fixed		√	√
	Bit #3	Discrete output 2 fixed ⁴			√
	Bit #4	Not used			
	Bit #5	Not used			
	Bit #6	Security breach			√
	Bit #7	Not used			
	Bit #8	Not used			
	Bit #9	Not used			
	Bit #10	Not used			
	Bit #11	Not used			
	Bit #12	Not used			
	Bit #13	Not used			
	Bit #14	Not used			
Bit #15	Not used				

Modbus Mapping Assignments *continued*

Table 2-5. Input registers *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
3 1137	Core processor software revision		√	√	
3 1138	Output option board		√	√	
3 1187 ⁸	Core processor HART device I.D. number – high order register of 3-byte integer		√	√	
3 1188	Core processor HART device I.D. number – low order register of 3-byte integer		√	√	

¹Automatically derived from holding register 40039.

²Automatically derived from holding register 40042.

³Transmitters with intrinsically safe output boards or configurable input/output boards only.

⁴Version 3 RFT9739 transmitter.

⁵Version 3.7 or higher revision RFT9739 transmitter.

⁶Transmitters with configurable input/output boards only.

⁷Must be queried through transmitter. If wiring is direct to core processor, registers 31187 and 31188 do not exist.

⁸Same as registers 41187-41188. If these registers contain a non-zero value, they are read-only. If they contain 0, they can be written to.

Table 2-6. Holding registers

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
4 0007	Pressure scaled integer				√
4 0012	Process variable assigned to primary variable	√ ¹	√	√	√
4 0013	Process variable assigned to secondary variable	√ ¹	√ ¹	√ ^{1,2}	√
4 0014	Process variable assigned to tertiary variable	√ ¹	√	√ ¹	√
4 0015	Process variable assigned to RFT9739 control output variable				√
4 0015	Process variable assigned to quaternary variable	√ ¹	√	√	
4 0017	Flow direction	√	√	√	√
4 0018	Maximum integer	√	√	√	√
4 0019	Mass flow offset	√	√	√	√
4 0020	Density offset	√	√	√	√
4 0021	Temperature offset	√	√	√	√
4 0022	Volume flow offset	√	√	√	√
4 0024	Pressure offset				√
4 0025	Mass total offset	√	√	√	√
4 0026	Volume total offset	√	√	√	√
4 0027	Mass inventory offset	√	√	√	√
4 0028	Volume inventory offset	√	√	√	√
4 0029	Mass flow scale factor	√	√	√	√
4 0030	Density scale factor	√	√	√	√
4 0031	Temperature scale factor	√	√	√	√
4 0032	Volume flow scale factor	√	√	√	√
4 0034	Pressure scale factor				√
4 0035	Mass total scale factor	√	√	√	√
4 0036	Volume total scale factor	√	√	√	√
4 0037	Mass inventory scale factor	√	√	√	√
4 0038	Volume inventory scale factor	√	√	√	√
4 0039	Standard or special mass flow rate unit	√	√	√	√
4 0040	Density unit	√	√	√	√
4 0041	Temperature unit	√	√	√	√
4 0042	Standard or special volume flow rate unit	√	√	√	√
4 0044	Pressure unit				√
4 0047	Polling address ³		√	√	√
4 0048	Final assembly number – high order register of 3-byte integer	√	√	√	√

Modbus Mapping Assignments *continued*

Table 2-6. Holding registers *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
4 0049	Final assembly number – low order register of 3-byte integer	√	√	√	√
4 0050	Date low order byte: day	√	√	√	√
4 0051	Date high order byte: month Date low order byte: year (1900 + x assumed)	√	√	√	√
4 0124	RFT9739 fault code				√
4 0124	MVD digital output fault code	√	√	√	
4 0127	Sensor serial number	√	√	√	√
4 0128	Sensor serial number	√	√	√	√
4 0129	Sensor flange type	√	√	√	√
4 0130	Sensor flow tube construction material	√	√	√	√
4 0131	Sensor flow tube liner material	√	√	√	√
4 0132	Base mass unit	√	√	√	√
4 0133	Base time unit for special mass unit	√	√	√	√
4 0134	Base volume unit	√	√	√	√
4 0135	Base time unit for special volume unit	√	√	√	√
4 0136	Maximum zeroing time	√	√	√	√
4 0137	Event 1 variable assignment	√	√	√	√
4 0138	Event 2 variable assignment	√	√	√	√
4 0139	Event 1 type (high=1/low=2)	√	√	√	√
4 0140	Event 2 type (high=1/low=2)	√	√	√	√
4 0302	Polling control code #1		√	√	√
4 0313	Modbus polling address	√	√	√	√ ⁴
4 0314	Last measured value fault timeout	√	√	√	
4 0351	API 2540 CTL table type (see CTL Code Table)	√	√	√	
4 0366	DSP calculation update rate (20 Hz or 100 Hz)	√	√	√	
4 0521	Floating-point byte order	√	√	√	
4 0522	Additional delay to Modbus response	√	√	√	
4 0655	Slot 0 configuration index	√	√	√	
4 0656	Slot 1 configuration index	√	√	√	
4 0657	Slot 2 configuration index	√	√	√	
4 0658	Slot 3 configuration index	√	√	√	
4 0659	Slot 4 configuration index	√	√	√	
4 0660	Slot 5 configuration index	√	√	√	
4 0661	Slot 6 configuration index	√	√	√	
4 0662	Slot 7 configuration index	√	√	√	
4 0663	Slot 8 configuration index	√	√	√	
4 0664	Slot 9 configuration index	√	√	√	
4 0665	Slot 10 configuration index	√	√	√	
4 0666	Slot 11 configuration index	√	√	√	
4 0667	Slot 12 configuration index	√	√	√	
4 0668	Slot 13 configuration index	√	√	√	
4 0669	Slot 14 configuration index	√	√	√	
4 0670	Slot 15 configuration index	√	√	√	
4 0671	Slot 16 configuration index	√	√	√	
4 0672	Slot 17 configuration index	√	√	√	
4 0673	Slot 18 configuration index	√	√	√	
4 0674	Slot 19 configuration index	√	√	√	
4 0675	Slot 20 configuration index	√	√	√	
4 0676	Slot 21 configuration index	√	√	√	
4 0677	Slot 22 configuration index	√	√	√	
4 0678	Slot 23 configuration index	√	√	√	
4 0679	Slot 24 configuration index	√	√	√	

Modbus Mapping Assignments *continued*

Table 2-6. Holding registers *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
4 0680	Slot 25 configuration index	√	√	√	
4 0681	Slot 26 configuration index	√	√	√	
4 0682	Slot 27 configuration index	√	√	√	
4 0683	Slot 28 configuration index	√	√	√	
4 0684	Slot 29 configuration index	√	√	√	
4 0685	Slot 30 configuration index	√	√	√	
4 0686	Slot 31 configuration index	√	√	√	
4 0751	Slot 0 process variable index	√	√	√	
4 0752	Slot 1 process variable index	√	√	√	
4 0753	Slot 2 process variable index	√	√	√	
4 0754	Slot 3 process variable index	√	√	√	
4 0755	Slot 4 process variable index	√	√	√	
4 0756	Slot 5 process variable index	√	√	√	
4 0757	Slot 6 process variable index	√	√	√	
4 0758	Slot 7 process variable index	√	√	√	
4 0759	Slot 8 process variable index	√	√	√	
4 0760	Slot 9 process variable index	√	√	√	
4 0761	Slot 10 process variable index	√	√	√	
4 0762	Slot 11 process variable index	√	√	√	
4 0763	Slot 12 process variable index	√	√	√	
4 0764	Slot 13 process variable index	√	√	√	
4 0765	Slot 14 process variable index	√	√	√	
4 0766	Slot 15 process variable index	√	√	√	
4 0767	Slot 16 process variable index	√	√	√	
4 0768	Slot 17 process variable index	√	√	√	
4 0769	Slot 18 process variable index	√	√	√	
4 0770	Slot 19 process variable index	√	√	√	
4 0771	Slot 20 process variable index	√	√	√	
4 0772	Slot 21 process variable index	√	√	√	
4 0773	Slot 22 process variable index	√	√	√	
4 0774	Slot 23 process variable index	√	√	√	
4 0775	Slot 24 process variable index	√	√	√	
4 0776	Slot 25 process variable index	√	√	√	
4 0777	Slot 26 process variable index	√	√	√	
4 0778	Slot 27 process variable index	√	√	√	
4 0779	Slot 28 process variable index	√	√	√	
4 0780	Slot 29 process variable index	√	√	√	
4 0781	Slot 30 process variable index	√	√	√	
4 0782	Slot 31 process variable index	√	√	√	
4 1107	Frequency/pulse output fault code		√	√	
4 1108	Frequency/pulse output scaling method		√	√	
4 1113	Primary milliamp output fault code		√	√	
4 1114	Secondary milliamp output fault code			√ ²	
4 1115	Display offline password (0000 to 9999)		√	√	
4 1116	Display scroll rate (1 to 10 seconds)		√	√	
4 1117	Display variable #1		√	√	
4 1118	Display variable #2		√	√	
4 1119	Display variable #3		√	√	
4 1120	Display variable #4		√	√	
4 1121	Display variable #5		√	√	
4 1122	Display variable #6		√	√	
4 1123	Display variable #7		√	√	

Modbus Mapping Assignments *continued*

Table 2-6. Holding registers *continued*

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739
4 1124	Display variable #8		√	√	
4 1125	Display variable #9		√	√	
4 1126	Display variable #10		√	√	
4 1127	Display variable #11		√	√	
4 1128	Display variable #12		√	√	
4 1129	Display variable #13		√	√	
4 1130	Display variable #14		√	√	
4 1131	Display variable #15		√	√	
4 1132	RS-485 digital communication protocol setting AIO		√	√	
4 1133	RS-485 digital communication baud rate AIO		√	√	
4 1134	RS-485 digital communication parity setting AIO		√	√	
4 1135	RS-485 digital communication stop bits setting AIO		√	√	
4 1139	Sensor type code		√	√	
4 1144	Polling control code #2		√	√	
4 1145	Polled variable #1 code		√	√	
4 1146	Polled variable #2 code		√	√	
4 1147	Polling type code ⁵		√	√	
4 1151	Discrete output 1 assignment		√	√	
4 1153	Discrete output 2 assignment ⁶			√	
4 1164	100 Hz update rate variable assignment		√	√	
4 1165	Burst command		√	√	
4 1166	Output channel A type assignment		√	√	
4 1167	Output channel B type assignment		√	√	
4 1168	Output channel C type assignment		√	√	
4 1169	Burst variable 1		√	√	
4 1170	Burst variable 2		√	√	
4 1171	Burst variable 3		√	√	
4 1172	Burst variable 4		√	√	
4 1174	Channel B power ³			√	
4 1175	Channel C power ⁵			√	
4 1176	Discrete input 1 assignment ⁸			√	
4 1181	Frequency output mode ⁵			√	
4 1182	Discrete output 1 fixed value		√	√	
4 1183	Discrete output 2 fixed value ⁵			√	
4 1186	Profibus station address (0-126) ⁷			√	
4 1187 ⁸	Core processor HART device I.D. number – high order register of 3-byte integer		√	√	
4 1188	Core processor HART device I.D. number – low order register of 3-byte integer		√	√	
4 1197	Frequency output polarity (0=active low, 1=active high)		√	√	

¹Supported in software even if associated output is not available.

²Transmitters with intrinsically safe output boards or configurable input/output boards only.

³Modbus or HART polling address (Version 3.6 or lower RFT9739 transmitter); HART polling address (Version 3.7 or higher RFT9739 transmitter and Series 1000 and 2000 transmitters).

⁴Version 3.7 or higher revision RFT9739 transmitter.

⁵Release 2.x or lower only.

⁶Transmitters with configurable input/output boards only.

⁷Transmitters with Profibus-PA software only.

⁸Must be queried through transmitter. Same as registers 31187-31188. If these registers contain a non-zero value, they are read-only. If they contain 0, they can be written to.

Modbus Mapping Assignments *continued*

Table 2-7. ASCII character strings

Note

Always write character strings as single-write multiples.

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739	
5 0052	Special mass flow unit					Single-write multiple
5 0053	Special mass flow unit					
5 0054	Special mass flow unit ¹ or space character ²	√	√	√	√	
5 0055	Special mass flow unit ¹ or space character ²					
5 0056	Special mass total or mass inventory unit					Single-write multiple
5 0057	Special mass total or mass inventory unit					
5 0058	Special mass total or mass inventory unit ¹ or space character ²	√	√	√	√	
5 0059	Special mass total or mass inventory unit ¹ or space character ²					
5 0060	Special volume flow unit					Single-write multiple
5 0061	Special volume flow unit					
5 0062	Special volume flow unit ¹ or space character ²	√	√	√	√	
5 0063	Special volume flow unit ¹ or space character ²					
5 0064	Special volume total or volume inventory unit					Single-write multiple
5 0065	Special volume total or volume inventory unit					
5 0066	Special volume total or volume inventory unit ¹ or space character ²	√	√	√	√	
5 0067	Special volume total or volume inventory unit ¹ or space character ²					
5 0068	Device tag					Single-write multiple
5 0069	Device tag					
5 0070	Device tag	√	√	√	√	
5 0071	Device tag					
5 0072	Flow calibration factor					Single-write multiple
5 0073	Flow calibration factor					
5 0074	Flow calibration factor					
5 0075	Flow temperature coefficient	√	√	√	√	
5 0076	Flow temperature coefficient					
5 0077	Space character					
5 0078	Space character					
5 0079	Space character					
5 0080	Temperature calibration slope					Single-write multiple
5 0081	Temperature calibration slope					
5 0082	Temperature calibration slope					
5 0083	Temperature calibration slope	√	√	√	√	
5 0084	Temperature calibration offset					
5 0085	Temperature calibration offset					
5 0086	Temperature calibration offset					
5 0087	Space character					
5 0096	Description					Single-write multiple
5 0097	Description					
5 0098	Description					
5 0099	Description					
5 0100	Description	√	√	√	√	
5 0101	Description					
5 0102	Description					
5 0103	Description					

Modbus Mapping Assignments *continued*

Table 2-7. ASCII character strings *continued*

Note

Always write character strings as single-write multiples.

Address	Description	MVDSolo	Series 1000	Series 2000	RFT9739	
5 0104	User message					Single-write multiple
5 0105	User message					
5 0106	User message					
5 0107	User message					
5 0108	User message					
5 0109	User message					
5 0110	User message					
5 0111	User message					
5 0112	User message	√	√	√	√	
5 0113	User message					
5 0114	User message					
5 0115	User message					
5 0116	User message					
5 0117	User message					
5 0118	User message					
5 0119	User message					
5 0298	Polling tag name for external device #1					Single-write multiple
5 0299	Polling tag name for external device #1					
5 0300	Polling tag name for external device #1		√	√	√	
5 0301	Polling tag name for external device #1					
5 0425	Sensor type					Single-write multiple
5 0426	Sensor type					
5 0427	Sensor type					
5 0428	Sensor type					
5 0429	Sensor type	√	√	√		
5 0430	Sensor type					
5 0431	Sensor type					
5 0432	Sensor type					
5 1140	Polling tag name for external device #2					Single-write multiple
5 1141	Polling tag name for external device #2					
5 1142	Polling tag name for external device #2		√	√		
5 1143	Polling tag name for external device #2					

¹MVDSolo or Series 1000 or 2000 transmitter.

²RFT9739 transmitter.

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes

		MVDSolo	Series 1000	Series 2000	RFT9739
Mass flow unit codes (holding register 40039)					
70	Grams/second	√	√	√	√
71	Grams/minute	√	√	√	√
72	Grams/hour	√	√	√	√
73	Kilograms/second	√	√	√	√
74	Kilograms/minute	√	√	√	√
75	Kilograms/hour	√	√	√	√
76	Kilograms/day	√	√	√	√
77	Metric tons/minute	√	√	√	√
78	Metric tons/hour	√	√	√	√
79	Metric tons/day	√	√	√	√
80	Pounds/second	√	√	√	√
81	Pounds/minute	√	√	√	√
82	Pounds/hour	√	√	√	√
83	Pounds/day	√	√	√	√
84	Short tons (2000 pounds)/minute	√	√	√	√
85	Short tons (2000 pounds)/hour	√	√	√	√
86	Short tons (2000 pounds)/day	√	√	√	√
87	Long tons (2240 pounds)/hour	√	√	√	
88	Long tons (2240 pounds)/day	√	√	√	
253	Special	√	√	√	√
Mass totalizer unit codes (holding register 40045)					
60	Grams	√	√	√	√
61	Kilograms	√	√	√	√
62	Metric tons	√	√	√	√
63	Pounds	√	√	√	√
64	Short tons (2000 pounds)	√	√	√	√
65	Long tons (2240 pounds)	√	√	√	
253	Special	√	√	√	√
Mass inventory unit codes (holding register 40045)					
60	Grams	√	√	√	√
61	Kilograms	√	√	√	√
62	Metric tons	√	√	√	√
63	Pounds	√	√	√	√
64	Short tons (2000 pounds)	√	√	√	√
65	Long tons (2240 pounds)	√	√	√	
253	Special	√	√	√	√
Base mass unit codes for special mass units (holding register 40132)					
60	Grams	√	√	√	√
61	Kilograms	√	√	√	√
62	Metric tons	√	√	√	√
63	Pounds	√	√	√	√
64	Short tons (2000 pounds)	√	√	√	√
65	Long tons (2240 pounds)	√	√	√	

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
Base time unit codes for special mass units (holding register 40133)					
50	Minutes	√	√	√	√
51	Seconds	√	√	√	√
52	Hours	√	√	√	√
53	Days	√	√	√	√
Volume flow unit codes (holding register 40042)					
15	Cubic feet/minute	√	√	√	√
16	Gallons/minute	√	√	√	√
17	Liters/minute	√	√	√	√
18	Imperial gallons/minute	√	√	√	√
19	Cubic meters/hour	√	√	√	√
22	Gallons/second	√	√	√	√
23	Million U.S. gallons/day	√	√	√	
24	Liters/second	√	√	√	√
25	Million liters/day	√	√	√	
26	Cubic feet/second	√	√	√	√
27	Cubic feet/day	√	√	√	
28	Cubic meters/second	√	√	√	√
29	Cubic meters/day	√	√	√	√
30	Imperial gallons/hour	√	√	√	√
31	Imperial gallons/day	√	√	√	√
130	Cubic feet/hour	√	√	√	√
131	Cubic meters/minute	√	√	√	√
132	Barrels/second	√	√	√	√
133	Barrels/minute	√	√	√	√
134	Barrels/hour	√	√	√	√
135	Barrels/day	√	√	√	√
136	U.S. gallons/hour	√	√	√	√ ¹
137	Imperial gallons/second	√	√	√	√ ¹
138	Liters/hour	√	√	√	√ ¹
235	U.S. gallons/day	√	√	√	
253	Special	√	√	√	√
Volume totalizer unit codes (holding register 40046)					
40	U.S. gallons	√	√	√	√
41	Liters	√	√	√	√
42	Imperial gallons	√	√	√	√
43	Cubic meters	√	√	√	√
46	Barrels (42 U.S. gallons)	√	√	√	√
112	Cubic feet	√	√	√	√
253	Special	√	√	√	√
Volume inventory unit codes (holding register 40046)					
40	U.S. gallons	√	√	√	√
41	Liters	√	√	√	√
42	Imperial gallons	√	√	√	√
43	Cubic meters	√	√	√	√
46	Barrels (42 U.S. gallons)	√	√	√	√
112	Cubic feet	√	√	√	√
253	Special	√	√	√	√

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
Base volume units for special volume units (holding register 40134)					
40	U.S. gallons	√	√	√	√
41	Liters	√	√	√	√
42	Imperial gallons	√	√	√	√
43	Cubic meters	√	√	√	√
46	Barrels (42 U.S. gallons)	√	√	√	√
112	Cubic feet	√	√	√	√
Base time units for special volume units (holding register 40135)					
50	Minutes	√	√	√	√
51	Seconds	√	√	√	√
52	Hours	√	√	√	√
53	Days	√	√	√	√
Temperature unit codes (holding register 40041)					
32	Degrees Celsius	√	√	√	√
33	Degrees Fahrenheit	√	√	√	√
34	Degrees Rankine	√	√	√	√
35	Kelvin	√	√	√	√
Density unit codes (holding register 40040)					
90	Specific gravity units	√	√	√	√
91	Grams/cubic centimeter	√	√	√	√
92	Kilograms/cubic meter	√	√	√	√
93	Pounds/gallon	√	√	√	√
94	Pounds/cubic foot	√	√	√	√
95	Grams/milliliter	√	√	√	
96	Kilograms/liter	√	√	√	
97	Grams/liter	√	√	√	
98	Pounds/cubic inch	√	√	√	
99	Short tons (2000 pounds)/cubic yard	√	√	√	
104	Degrees API	√	√	√	√
Pressure unit codes (holding register 40044)					
1	Inches water at 68° Fahrenheit	√	√	√	√
2	Inches mercury at 0° Celsius	√	√	√	√
3	Feet water at 68° Fahrenheit	√	√	√	√
4	Millimeters water at 68° Fahrenheit	√	√	√	√
5	Millimeters mercury at 0° Celsius	√	√	√	√
6	Pounds/square inch	√	√	√	√
7	Bar	√	√	√	√
8	Millibar	√	√	√	√
9	Grams/square centimeter	√	√	√	√
10	Kilograms/square centimeter	√	√	√	√
11	Pascals	√	√	√	√
12	Kilopascals	√	√	√	√
13	Torr at 0° Celsius	√	√	√	√
14	Atmospheres	√	√	√	√

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
Milliamp output variable codes (holding register 40012 or 40013)					
0	Mass flow rate		√	√	√
1	Temperature		√	√	√
3	Density		√	√	√
5	Volume flow rate		√	√	√
9	Pressure				√
10	Event 1				√
11	Event 2				√
15	API: Temperature-corrected density		√	√	
16	API: Temperature-corrected (standard) volume flow		√	√	
19	API: Batch-weighted average corrected density		√	√	
20	API: Batch-weighted average temperature		√	√	
47	Drive gain		√	√	
Display variable codes (holding registers 41117-41131)					
0	Mass flow rate		√	√	
1	Temperature		√	√	
2	Mass totalizer		√	√	
3	Density		√	√	
4	Mass inventory		√	√	
5	Volume flow rate		√	√	
6	Volume totalizer		√	√	
7	Volume inventory		√	√	
15	API: Temperature-corrected density		√	√	
16	API: Temperature-corrected (standard) volume flow		√	√	
17	API: Temperature-corrected (standard) volume total		√	√	
18	API: Temperature-corrected (standard) volume inventory		√	√	
19	API: Batch-weighted average corrected density		√	√	
20	API: Batch-weighted average temperature		√	√	
33	API: CTL		√	√	
46	Raw tube frequency		√	√	
47	Drive gain		√	√	
48	Meter temperature (T-Series)				
49	Left pickoff amplitude		√	√	
50	Right pickoff amplitude		√	√	
51	Board temperature		√	√	
52	Input voltage		√	√	
53	Externally read pressure		√	√	
55	Externally read temperature		√	√	
Event output variable codes (holding register 40137 or 40138)					
0	Mass flow rate	√	√	√	√
1	Temperature	√	√	√	√
2	Mass totalizer	√	√	√	√
3	Density	√	√	√	√
4	Mass inventory	√	√	√	√
5	Volume flow rate	√	√	√	√
6	Volume totalizer	√	√	√	√
7	Volume inventory	√	√	√	√

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
Quaternary variable codes (holding register 40015)					
0	Mass flow rate	√	√	√	
1	Temperature	√	√	√	
2	Mass total	√	√	√	
3	Density	√	√	√	
4	Mass inventory	√	√	√	
5	Volume flow rate	√	√	√	
6	Volume total	√	√	√	
7	Volume inventory	√	√	√	
15	API: Temperature-corrected density	√	√	√	
16	API: Temperature-corrected (standard) volume flow	√	√	√	
17	API: Temperature-corrected (standard) volume total	√	√	√	
18	API: Temperature-corrected (standard) volume inventory	√	√	√	
19	API: Batch-weighted average corrected density	√	√	√	
20	API: Batch-weighted average temperature	√	√	√	
33	API: CTL	√	√	√	
47	Drive gain	√	√	√	
53	Externally read pressure	√	√	√	
55	Externally read temperature	√	√	√	
Event alarm type codes (holding register 40139 or 40140)					
1	High alarm	√	√	√	√
2	Low alarm	√	√	√	√
Flow direction codes (holding register 40017)					
0	Forward flow only	√	√	√	√
1	Reverse flow only	√	√	√	√
2	Bidirectional flow	√	√	√	√
3	Absolute forward/reverse	√	√	√	
4	Negate - forward only	√			
5	Negate - bidirectional	√			
Process variable and diagnostic codes for slot addresses (holding registers 40751-40782)					
0	Mass flow rate	√	√	√	
1	Temperature	√	√	√	
2	Mass totalizer	√	√	√	
3	Density	√	√	√	
4	Mass inventory	√	√	√	
5	Volume flow rate	√	√	√	
6	Volume totalizer	√	√	√	
7	Volume inventory	√	√	√	
10	Event 1	√	√	√	
11	Event 2	√	√	√	
12	Status word 1 (419/420)	√	√	√	
13	Status word 2 (421/422)	√	√	√	
14	Status word 3 (423/424)	√	√	√	
15	API: Temperature-corrected density	√	√	√	
16	API: Temperature-corrected (standard) volume flow	√	√	√	
17	API: Temperature-corrected (standard) volume total	√	√	√	
18	API: Temperature-corrected (standard) volume inventory	√	√	√	
19	API: Batch-weighted average corrected density	√	√	√	
20	API: Batch-weighted average temperature	√	√	√	

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
33	API: CTL	√	√	√	
34	High-order doubleword of binary mass total in grams	√	√	√	
35	Low-order doubleword of binary mass total in grams	√	√	√	
36	High-order doubleword of binary volume total in cubic centimeters	√	√	√	
37	Low-order doubleword of binary volume total in cubic centimeters	√	√	√	
38	Raw API: Temperature/pressure-corrected volume total, high-order doubleword	√	√	√	
39	Raw API: Temperature/pressure-corrected volume total, low-order doubleword	√	√	√	
46	Raw tube frequency	√	√	√	
47	Drive gain	√	√	√	
49	Left pickoff amplitude	√	√	√	
50	Right pickoff amplitude	√	√	√	
51	Board temperature	√	√	√	
52	Input voltage	√	√	√	
53	Externally read pressure	√	√	√	
55	Externally read temperature	√	√	√	
100	Event 1 or event 2 ²		√	√	
101	Flow switch indicator ²		√	√	
102	Forward/reverse indication ²		√	√	
103	Calibration in progress ²		√	√	
104	Fault condition indication ²		√	√	
Frequency/pulse output variable codes (holding register 40014)					
0	Mass flow rate			√	√
2	Mass totalizer				√
5	Volume flow rate			√	√
6	Volume totalizer				√
16	API: Temperature-corrected (standard) volume flow			√	
Frequency/pulse output scaling method codes (holding register 41108)					
0	Frequency=flow		√	√	
1	Pulses/unit		√	√	
2	Units/pulse		√	√	
Control output variable codes (holding register 40015)					
0	Forward/reverse flow				√
1	Zero in progress				√
2	Faults				√
3	Event 1				√
4	Event 2				√
100 Hz variable codes (holding register 41164)					
0	Mass flow rate	√	√	√	
1	Temperature	√	√	√	
2	Mass totalizer	√	√	√	
3	Density	√	√	√	
4	Mass inventory	√	√	√	
5	Volume flow rate	√	√	√	
6	Volume totalizer	√	√	√	
7	Volume inventory	√	√	√	
10	Event 1	√	√	√	
11	Event 2	√	√	√	

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
Flow tube liner material codes (holding register 40131)					
10	PTFE (Teflon)	√	√	√	√
11	Halar	√	√	√	√
16	Tefzel	√	√	√	√
251	None	√	√	√	√
252	Unknown	√	√	√	√
253	Special	√	√	√	√
Sensor type codes (holding register 41139)					
0	Curved-tube sensor (D, DL, DT, CMF, F-Series, R-Series)		√	√	
1	Straight-tube sensor (T-Series)		√	√	
Pressure value receiving method codes (holding register 40302)					
0	None				√
3	HART primary				√
4	HART secondary				√
6	Analog input				√
8	Modbus				√
Version 2 RFT9739 fault output codes (holding register 40124)					
0	Upscale				√
1	Downscale				√
2	Last measured value				√
3	Internal zero				√
Analog fault output codes (holding registers 41107 and 41113)					
0	Upscale		√	√	
1	Downscale		√	√	
3	Internal zero		√	√	
4	None		√	√	
Digital fault output codes (holding register 40124)					
0	Hold at value greater than upper sensor limit, stop totalizing	√	√	√	
1	Hold at value less than lower sensor limit, stop totalizing	√	√	√	
2	Drive outputs to zero values of process variables, stop totalizing	√	√	√	
3	Report not-a-number or maximum scaled integer, stop totalizing	√	√	√	
4	Drive flow rate to zero value, other process variables remain unaffected	√	√	√	
5	None (default; use status bits for fault detection)	√	√	√	
Floating-point byte ordering codes (holding register 40521)					
0	0-1-2-3	√	√	√	
1	2-3-0-1 (Default)	√	√	√	
2	1-0-3-2	√	√	√	
3	3-2-1-0	√	√	√	
Sensor flange type codes (holding register 40129)					
0	ANSI 150	√	√	√	√
1	ANSI 300	√	√	√	√
2	ANSI 600	√	√	√	√
5	PN 40	√	√	√	√
7	JIS 10K	√	√	√	√
8	JIS 20K	√	√	√	√

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
9	ANSI 900	√	√	√	√
10	Sanitary clamp	√	√	√	√
11	Union	√	√	√	√
12	PN 100	√	√	√	
250	Reserved				√
251	None	√	√	√	√
252	Unknown	√	√	√	√
253	Special	√	√	√	√
254	Reserved				√
255	Reserved				√
Flow tube construction material codes (holding register 40130)					
3	Hastelloy C-22	√	√	√	√
4	Monel	√	√	√	√
5	Tantalum	√	√	√	√
6	Titanium	√	√	√	
19	316L stainless steel	√	√	√	√
23	Inconel	√	√	√	
252	Unknown	√	√	√	√
253	Special	√	√	√	√
Digital communication protocol codes (holding register 41132)					
0	None		√	√	
1	HART only		√	√	
2	Modbus RTU only		√	√	
3	Modbus ASCII only		√	√	
Digital communication baud rate codes (holding register 41133)					
0	1200 baud		√	√	
1	2400 baud		√	√	
2	4800 baud		√	√	
3	9600 baud		√	√	
4	19,200 baud		√	√	
5	38,400 baud		√	√	
Digital communication parity codes (holding register 41134)					
0	None		√	√	
1	Odd parity		√	√	
2	Even parity		√	√	
Digital communication stop bits codes (holding register 41135)					
1	1 stop bit		√	√	
2	2 stop bits		√	√	
Read-only output board codes (input register 31138)					
0	None		√	√	
1	Analog I/O (mA/Frequency/RS-485)		√	√	
2	Foundation Fieldbus (H1) or Profibus-PA			√	
3	Intrinsically safe output		√	√	
4	Configurable input/output			√	

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
Polling control option codes (holding register 40302 or 41144)					
0	Do not poll		√	√	
1	Poll transmitter: HART primary		√	√	
2	Poll transmitter: HART secondary		√	√	
Polling type option codes (holding register 41147)					
0	None				
1	Pressure compensation only		√	√	
3	API only (temperature)		√	√	
6	Pressure compensation and API (temperature)		√	√	
Polled variable codes (holding registers 41145-41146)					
53	Externally read pressure		√	√	
55	Externally read temperature		√	√	
Output type codes (holding registers 41166-41168)					
0	Milliamp (primary) output		√	√	
1	Frequency output		√	√	
2	Digital communications ³		√	√	
3	Milliamp (secondary) output ⁴			√	
4	Discrete output		√	√	
5	Discrete input ⁵			√	
Discrete input assignment codes (holding register 41176)⁵					
0	None			√	
1	Start sensor zero			√	
2	Reset mass total			√	
3	Reset volume total			√	
4	Reset corrected volume total			√	
Discrete output assignment codes (holding registers 41151 and 41153)					
10	Event 1 active		√	√	
11	Event 2 active		√	√	
100	Event 1 or event 2 active		√	√	
101	Flow switch indication		√	√	
102	Forward/reverse indication		√	√	
103	Calibration in progress		√	√	
104	Fault condition indication		√	√	
Power source codes (holding registers 41174-41175)					
0	External		√	√	
1	Internal		√	√	
Burst command option codes (holding register 41165)					
1	Read primary variable		√	√	
2	Read PV current and percent of range		√	√	
3	Read dynamic variables and PV current		√	√	
33	Read transmitter variables		√	√	

Modbus Mapping Assignments *continued*

Table 2-8. Integer codes *continued*

		MVDSolo	Series 1000	Series 2000	RFT9739
Burst variable codes for command 33 (holding registers 41169-41172)					
0	Mass flow rate	√	√	√	
1	Temperature	√	√	√	
2	Mass totalizer	√	√	√	
3	Density	√	√	√	
4	Mass inventory	√	√	√	
5	Volume flow rate	√	√	√	
6	Volume totalizer	√	√	√	
7	Volume inventory	√	√	√	
Frequency output mode codes (holding register 41181)⁵					
0	Single			√	
1	Quadrature			√	
2	Dual with 0° phase shift			√	
3	Dual with 180° phase shift			√	
4	Dual with +90° phase shift			√	
5	Dual with -90° phase shift			√	
CTL code table codes (holding register 40351)					
17	Table 5A	√	√	√	
18	Table 5B	√	√	√	
19	Table 5D	√	√	√	
36	Table 6C	√	√	√	
49	Table 23A	√	√	√	
50	Table 23B	√	√	√	
51	Table 23D	√	√	√	
68	Table 24C	√	√	√	
81	Table 53A	√	√	√	
82	Table 53B	√	√	√	
83	Table 53D	√	√	√	
100	Table 54C	√	√	√	
Discrete output state codes (holding registers 41182-41183)					
0	Off		√	√	
1	On		√	√	
255	Unfix discrete output		√	√	

¹Version 3 RFT9739 transmitter.

²Available only when mapped to a discrete output.

³Transmitters with analog output boards only.

⁴Transmitters with intrinsically safe output boards and configurable input/output boards only.

⁵Transmitters with configurable input/output boards only.

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