

ProtEX+ and VantageView+ PD6938 Modbus® Register Tables



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⚠ WARNINGS

- As is typical with most instruments, the addition of serial communications carries an inherent risk; it allows a remote operator to change the operation and/or characteristics of the device being digitally communicated with. Inappropriate communication could have serious consequences in meter/controller or system operation.
- Ultimately, it is up to the system’s designer to provide for the safe operation of a process. But certainly, no single event should make the difference between a safe situation and a catastrophe. Please use the appropriate level of caution when implementing serial communication.

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Introduction

Communicate with the ProtEX+ and VantageView+ PD6938 with **firmware version 1.0 & greater**, using the Modbus® RTU Serial Communication Protocol. Users should be familiar with Modbus serial communication and the meters. Refer to the instruction manual and the serial communication adapters’ manual for setup and wiring instructions.

Get a copy of Modbus Specifications and Resources at <http://www.modbus.org/>

Note that although there are no specific 3x Registers, all 4x Registers are mirrored into 3x register space, and are therefore capable of being read by Modbus function 04 (Read Input Registers).

Register Overview

40001 – 40087	Rate, Total, Grand Total, Maximum Rate, Minimum Rate, Previous Total, Previous Grand Total, Frequency
40089 – 40103	Open Collector 1 and 2 Status, Relay 1 and 2 Status, Relay 1 and 2 Cycles, Relay 1 and 2 Runtime
40105 – 40117	Flow Time, Stopwatch, Open Collector 1 and 2 Timers, Relays 1 and 2 Timers,
40119 – 40124	Date and Time
40127 – 40128	Battery
40134 – 40159	Data Logging
40160 – 40163	Model String
40164 – 40167	System Tag
40168	Non-Resettable Grand Total (Permlck)
40169	Weights & Measures
40170 – 40171	Software Number and Version
40175 – 40177	Reset Total, Reset Grand Total
40179 – 40188	Unlock Main Password, Execute User Function, Default Meter, Restart Meter, Main Password, Total Password, Grand Total Password
40190 – 40219	Units, Decimal Point, K-Factor, Display Tag
40223 – 40224	Open Collector 1 Pulse Mode
40225 – 40243	Open Collector 1 Alarm Mode
40245 – 40247	Open Collector 1 Time Mode
40249 – 40250	Open Collector 2 Pulse Mode
40251 – 40269	Open Collector 2 Alarm Mode
40271 – 40273	Open Collector 2 Time Mode
40275 – 40293	Relay 1 Alarm Mode
40295 – 40297	Relay 1 Timer Mode
40299 – 40307	Relay 1 Sampling Mode
40309 – 40327	Relay 2 Alarm Mode
40329 – 40331	Relay 2 Timer Mode
40333 – 40341	Relay 2 Sampling Mode
40351 – 40388	Batch Control
40401 – 40416	Modbus Tag

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40001 - 40002	Rate	Float	03, 04	R	1001	3001	5001	7001	9001	
40003 - 40006	Total	Double	03, 04	R	1002	3002	5002	7002	9002	
40007 - 40010	G Total	Double	03, 04	R	1003	3003	5003	7003	9003	
40011 - 40012	Maximum Rate	Float	03, 04, 06, 16	R/W	1004	3004	5004	7004	9004	Write any value to reset
40013 - 40014	Minimum Rate	Float	03, 04, 06, 16	R/W	1005	3005	5005	7005	9005	Write any value to reset
40015 - 40018	Previous Total	Double	03, 04	R	1006	3006	5006	7006	9006	
40019 - 40022	Previous G Total	Double	03, 04	R	1007	3007	5007	7007	9007	
40023 - 40024	Frequency	Float	03, 04	R	1008	3008	5008	7008	9008	
40025 - 40026	Rate	Float	03, 04	R						
40027 - 40028	Total	Float	03, 04	R						
40029 - 40030	G Total	Float	03, 04	R						
40031 - 40032	Maximum Rate	Float	03, 04, 06, 16	R/W						Write any value to reset
40033 - 40034	Minimum Rate	Float	03, 04, 06, 16	R/W						Write any value to reset
40035 - 40036	Previous Total	Float	03, 04	R						
40037 - 40038	Previous G Total	Float	03, 04	R						
40039 - 40040	Frequency	Float	03, 04	R						
40041- 40044	Rate	Double	03, 04	R						
40045- 40048	Total	Double	03, 04	R						
40049 - 40052	G Total	Double	03, 04	R						
40053 - 40056	Maximum Rate	Double	03, 04, 06, 16	R/W						Write any value to reset

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40057 - 40060	Minimum Rate	Double	03, 04, 06, 16	R/W						Write any value to reset
40061 - 40064	Previous Total	Double	03, 04	R						
40065 - 40068	Previous G Total	Double	03, 04	R						
40069 - 40072	Frequency	Double	03, 04	R						
40073- 40074	Rate	Long	03, 04	R						
40075 - 40076	Total	Long	03, 04	R						
40077 - 40078	G Total	Long	03, 04	R						
40079- 40080	Maximum Rate	Long	03, 04, 06, 16	R/W						Write any value to reset
40081 - 40082	Minimum Rate	Long	03, 04, 06, 16	R/W						Write any value to reset
40083 - 40084	Previous Total	Long	03, 04	R						
40085 - 40086	Previous G Total	Long	03, 04	R						
40087 - 40088	Frequency	Long	03, 04	R						x0.1 Hz
40089	OC 1 Status	Byte, Bits	03, 04, 06, 16	R/W	1033	3033	5033			bit0: state of hardware output
40090	OC 2 Status	Byte, Bits	03, 04, 06, 16	R/W	1034	3034	5034			bit1: alarm active
40091	Rly 1 Status	Byte, Bits	03, 04, 06, 16	R/W	1035	3035	5035			bit2: alarm acknowledged
40092	Rly 2 Status	Byte, Bits	03, 04, 06, 16	R/W	1036	3036	5036			bit3: manual Write to acknowledge
40097 - 40098	Rly 1 Cycles	Ulong Integer	03, 04	R	1041	3041	5041			
40099 - 40100	Rly 1 Runtime (seconds)	Ulong Integer	03, 04	R	1042	3042	5042			
40101 - 40102	Rly 2 Cycles	Ulong Integer	03, 04	R	1043	3043	5043			

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40103 - 40104	Rly 2 Runtime (seconds)	Ulong Integer	03, 04	R	1044	3044	5044			
40105 - 40106	Flow Time (seconds)	Ulong Integer	03, 04, 16	R/W	1045	3045	5045			Write to set. Write zero to reset.
40109 - 40110	Stopwatch (seconds)	Ulong Integer	03, 04	R	1047	3047	5047			
40111 - 40112	Timer OC1 (seconds)	Ulong Integer	03, 04	R	1048	3048	5048			
40113 - 40114	Timer OC2 (seconds)	Ulong Integer	03, 04	R	1049	3049	5049			
40115 - 40116	Timer Rly1 (seconds)	Ulong Integer	03, 04	R	1050	3050	5050			
40117 - 40118	Timer Rly2 (seconds)	Ulong Integer	03, 04	R	1051	3051	5051			
	RTC Date and Time	Integer (x6)	03, 04, 16	R/W						Year, Month, Day, Hour, Minute, Second
40119	Year	Integer	03, 04, 16	R/W	1052	3052	5052			Write full RTC in single command.
40120	Month	Integer	03, 04, 16	R/W	1053	3053	5053			Individual write supported after read of RTC. Writes last read values.
40121	Day	Integer	03, 04, 16	R/W	1054	3054	5054			Main password may be required to set.
40122	Hour	Integer	03, 04, 16	R/W	1055	3055	5055			
40123	Minute	Integer	03, 04, 16	R/W	1056	3056	5056			
40124	Second	Integer	03, 04, 16	R/W	1057	3057	5057			
40127	Low Battery	Short (0 or 1)	03, 04	R	1059	3059	5059			
40128 - 40129	Battery Voltage	Float	03, 04	R	1060	3060	5060	7060	9060	Integer has 1 dp.
40134	Log Filter Flags	Short	06, 16	W	1062	3062	5062			0, FFFF = no filter

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40135	Log Reader Seek	Short	06, 16	W	1063	3063	5063			0 = Oldest in Time, 1 = Newest
40136	Log Reader Direction	Short	06, 16	W	1064	3064	5064			0 = Forward, 1 = Backward
40137	Log Load Next	Short (0 or 1)	03, 04	R	1065	3065	5065			0 = Previous not found 1 = Previous record loaded
40138	Log Entry: Flags	Short	03, 04	R	1066	3066	5066			
40139	Log Entry: Year	Integer	03, 04	R	1067	3067	5067			
40140	Log Entry: Month	Integer	03, 04	R	1068	3068	5068			
40141	Log Entry: Day	Integer	03, 04	R	1069	3069	5069			
40142	Log Entry: Hour	Integer	03, 04	R	1070	3070	5070			
40143	Log Entry: Minute	Integer	03, 04	R	1071	3071	5071			
40144	Log Entry: Second	Integer	03, 04	R	1072	3072	5072			
40145 - 40146	Log Entry: Rate	Float	03, 04	R	1073	3073	5073	7073	9073	
40147 - 40150	Log Entry: Total	Double	03, 04	R	1074	3074	5074	7074	9074	
40151 - 40154	Log Entry: G Total	Double	03, 04	R	1075	3075	5075	7075	9075	
40155	Log Entry: OC 1 Status	Short	03, 04	R	1076	3076	5076			bit0: state of hardware output.
40156	Log Entry: OC 2 Status	Short	03, 04	R	1077	3077	5077			bit1: alarm active.
40157	Log Entry: Rly 1 Status	Short	03, 04	R	1078	3078	5078			bit2: alarm acknowledged.
40158	Log Entry: Rly 2 Status	Short	03, 04	R	1079	3079	5079			
40159	Log Load Next	Short (0 or 1)	03, 04	R	1080	3080	5080			0 = Next not found, 1 = Next record loaded.
40160 - 40163	Model String	String (8 char)	03, 04	R	1081	3081	5081			
40164 - 40167	System Tag	String (8 char)	03, 04, 06, 16	R/W	1089	3089	5089			
40168	Permlock	Short (0 or 1)	03, 04	R	1097	3097	5097			Sets grand total as non-resettable
40169	W&M	Short (0 or 1)	03, 04	R	1098	3098	5098			

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40170	SFT No.	Unsign Integer	03, 04	R		3099	5099			SFT133 (133)
40171	SFT Version	Unsign Integer	03, 04	R		3100	5100			3 decimal (e.g. 1.000)
40175 - 40176	Reset Total	Ulong Integer	06, 16	W	1103	3103	5103			Write to reset Total. If password enabled, write password, otherwise write zero.
40177 - 40178	Reset G Total	Ulong Integer	06, 16	W	1104	3104	5104			Write to reset GTotal. If password enabled, write password, otherwise write zero.
40179 - 40180	Unlock Main Password	Ulong Integer	06, 16	W	1105	3105	5105			Write Main Password to unlock Writes. Locked on any Read.
										Note: Momentarily unlocks Modbus only.
40181	Execute User Function	Short	06, 16	W	1106	3106	5106			See User Functions Table on page 13.
40182	Default Meter	Word	06, 16	W	1107	3107	5107			Write to default meter.
40183	Restart Meter	Word	06, 16	W	1108	3108	5108			Write to restart meter.
40184 - 40185	Main Password	Ulong Integer	06, 16	W	1109	3109	5109			Set password, write to reg. 179 to unlock temporarily.
40186 - 40187	Total Password	Ulong Integer	03, 04, 06, 16	R/W	1110	3110	5110			
40188 - 40189	G Total Password	Ulong Integer	03, 04, 06, 16	R/W	1111	3111	5111			
40190	Rate Units	Integer	03, 04, 06, 16	R/W	1112	3112	5112			Units, 0 = GAL, see Units sheet
40191	Time Units	Integer	03, 04, 06, 16	R/W	1113	3113	5113			Time Units, 0 = sec
40192	Total Units	Integer	03, 04, 06, 16	R/W	1114	3114	5114			Units
40193	Total Unit Multiplier	Integer	03, 04, 06, 16	R/W	1115	3115	5115			Enum
40194	G Total Units	Integer	03, 04, 06, 16	R/W	1116	3116	5116			Units

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40195	G Total Unit Multiplier	Integer	03, 04, 06, 16	R/W	1117	3117	5117			Enum
40196	Rate DP	Integer	03, 04, 06, 16	R/W	1118	3118	5118			Decimal Position: 0 - 7
40197	Total DP	Integer	03, 04, 06, 16	R/W	1119	3119	5119			
40198	G Total DP	Integer	03, 04, 06, 16	R/W	1120	3120	5120			
40199 - 40200	Custom Units Factor - Rate	Float	03, 04, 06, 16	R/W	1121	3121	5121	7121	9121	Integer has 1 dp.
40201 - 40202	Custom Units Factor - Total	Float	03, 04, 06, 16	R/W	1122	3122	5122	7122	9122	Integer has 1 dp.
40203 - 40204	Custom Units Factor - G Total	Float	03, 04, 06, 16	R/W	1123	3123	5123	7123	9123	Integer has 1 dp.
40205 - 40208	Custom Units String - Rate	String (8 char)	03, 04, 06, 16	R/W	1124	3124	5124			
40209 - 40212	Custom Units String - Total	String (8 char)	03, 04, 06, 16	R/W	1132	3132	5132			
40213 - 40216	Custom Units String - G Total	String (8 char)	03, 04, 06, 16	R/W	1140	3140	5140			
40217 - 40218	K-Factor	Float	03, 04, 06, 16	R/W	1148	3148	5148	7148	9148	
40219 - 40222	Display Tag	String (8 char)	03, 04, 06, 16	R/W	1149	3149	5149			
OC1 Pulse Mode										Pulse output must be set to read values
40223 - 40224	OC1 - Factor - Rate	Float	03, 04, 06, 16	R/W	1157	3157	5157	7157	9157	Integer has 3 dp.
40223 - 40224	OC1 - KFactor - Total	Float	03, 04, 06, 16	R/W	1157	3157	5157	7157	9157	Integer has 4 dp.
40223 - 40224	OC1 - KFactor - G Total	Float	03, 04, 06, 16	R/W	1157	3157	5157	7157	9157	Integer has 4 dp.
40223 - 40224	OC1 - Freq - Test	Float	03, 04, 06, 16	R/W	1157	3157	5157	7157	9157	Integer has 1 dp.
OC1 Alarm Mode										
40225 - 40226	OC1 - Alarm Setpoint	Float	03, 04, 06, 16	R/W	1158	3158	5158	7158	9158	Alarm mode must be set to read corresponding alarm registers.
40227 - 40228	OC1 - Alarm Reset Point	Float	03, 04, 06, 16	R/W	1159	3159	5159	7159	9159	
40229 - 40230	OC1 - Delay Off Seconds	Ulong Integer	03, 04, 06, 16	R/W	1160	3160	5160	7160	9160	
40231 - 40232	OC1 - Delay On Seconds	Ulong Integer	03, 04, 06, 16	R/W	1161	3161	5161	7161	9161	

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40233 - 40236	OC1 - Alarm Setpoint	Double	03, 04, 06, 16	R/W	1162	3162	5162	7162	9162	
40237 - 40240	OC1 - Alarm Reset Point	Double	03, 04, 06, 16	R/W	1163	3163	5163	7163	9163	
40241 - 40242	OC1 - Alarm Setpoint	Long Integer	03, 04, 06, 16	R/W						
40243 - 40244	OC1 - Alarm Reset Point	Long Integer	03, 04, 06, 16	R/W						
OC1 Timer Mode										
40245 - 40246	OC1 - Timer Off Seconds	Ulong Integer	03, 04, 06, 16	R/W	1166	3166	5166	7166	9166	
40247 - 40248	OC1 - Timer On Seconds	Ulong Integer	03, 04, 06, 16	R/W	1167	3167	5167	7167	9167	
OC2 Pulse Mode										
40249 - 40250	OC2 - Factor - Rate	Float	03, 04, 06, 16	R/W	1168	3168	5168	7168	9168	Integer has 3 dp.
40249 - 40250	OC2 - KFactor - Total	Float	03, 04, 06, 16	R/W	1168	3168	5168	7168	9168	Integer has 4 dp.
40249 - 40250	OC2 - KFactor - G Total	Float	03, 04, 06, 16	R/W	1168	3168	5168	7168	9168	Integer has 4 dp.
40249 - 40250	OC2 - Freq - Test	Float	03, 04, 06, 16	R/W	1168	3168	5168	7168	9168	Integer has 1 dp.
OC2 Alarm Mode										
40251 - 40252	OC2 - Alarm Setpoint	Float	03, 04, 06, 16	R/W	1169	3169	5169	7169	9169	
40253 - 40254	OC2 - Alarm Reset Point	Float	03, 04, 06, 16	R/W	1170	3170	5170	7170	9170	
40255 - 40256	OC2 - Delay Off Seconds	Ulong Integer	03, 04, 06, 16	R/W	1171	3171	5171	7171	9171	
40257 - 40258	OC2 - Delay On Seconds	Ulong Integer	03, 04, 06, 16	R/W	1172	3172	5172	7172	9172	
40259 - 40262	OC2 - Alarm Setpoint	Double	03, 04, 06, 16	R/W	1173	3173	5173	7173	9173	
40263 - 40266	OC2 - Alarm Reset Point	Double	03, 04, 06, 16	R/W	1174	3174	5174	7174	9174	
40267 - 40268	OC2 - Alarm Setpoint	Long Integer	03, 04, 06, 16	R/W						
40269 - 40270	OC2 - Alarm Reset Point	Long Integer	03, 04, 06, 16	R/W						

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
OC2 Timer Mode										
40271 - 40272	OC2 - Timer Off Seconds	Ulong Integer	03, 04, 06, 16	R/W	1177	3177	5177	7177	9177	
40273 - 40274	OC2 - Timer On Seconds	Ulong Integer	03, 04, 06, 16	R/W	1178	3178	5178	7178	9178	
RLY1 Alarm Mode										
40275 - 40276	RLY1 - Alarm Setpoint	Float	03, 04, 06, 16	R/W	1179	3179	5179	7179	9179	
40277 - 40278	RLY1 - Alarm Reset Point	Float	03, 04, 06, 16	R/W	1180	3180	5180	7180	9180	
40279 - 40280	RLY1 - Delay Off Seconds	Ulong Integer	03, 04, 06, 16	R/W	1181	3181	5181	7181	9181	
40281 - 40282	RLY1 - Delay On Seconds	Ulong Integer	03, 04, 06, 16	R/W	1182	3182	5182	7182	9182	
40283 - 40286	RLY1 - Alarm Setpoint	Double	03, 04, 06, 16	R/W	1183	3183	5183	7183	9183	
40287 - 40290	RLY1 - Alarm Reset Point	Double	03, 04, 06, 16	R/W	1184	3184	5184	7184	9184	
40291 - 40292	RLY1 - Alarm Setpoint	Long Integer	03, 04, 06, 16	R/W						
40293 - 40294	RLY1 - Alarm Reset Point	Long Integer	03, 04, 06, 16	R/W						
RLY1 Timer Mode										
40295 - 40296	RLY1 - Timer Off Seconds	Ulong Integer	03, 04, 06, 16	R/W	1187	3187	5187	7187	9187	
40297 - 40298	RLY1 - Timer On Seconds	Ulong Integer	03, 04, 06, 16	R/W	1188	3188	5188	7188	9188	
RLY1 Sampling Mode										
40299 - 40300	RLY1 - Sampling Count	Float	03, 04, 06, 16	R/W	1189	3189	5189	7189	9189	
40301 - 40302	RLY1 - Sample Time Seconds	Ulong Integer	03, 04, 06, 16	R/W	1190	3190	5190	7190	9190	
40303 - 40306	RLY1 - Sampling Count	Double	03, 04, 06, 16	R/W	1191	3191	5191	7191	9191	
40307 - 40308	RLY1 - Sampling Count	Long Integer	03, 04, 06, 16	R/W	1192	3192	5192	7192	9192	
RLY2 Alarm Mode										
40309 - 40310	RLY2 - Alarm Setpoint	Float	03, 04, 06, 16	R/W	1193	3193	5193	7193	9193	

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40311 - 40312	RLY2 - Alarm Reset Point	Float	03, 04, 06, 16	R/W	1194	3194	5194	7194	9194	
40313 - 40314	RLY2 - Delay Off Seconds	Ulong Integer	03, 04, 06, 16	R/W	1195	3195	5195	7195	9195	
40315 - 40316	RLY2 - Delay On Seconds	Ulong Integer	03, 04, 06, 16	R/W	1196	3196	5196	7196	9196	
40317 - 40320	RLY2 - Alarm Setpoint	Double	03, 04, 06, 16	R/W	1197	3197	5197	7197	9197	
40321 - 40324	RLY2 - Alarm Reset Point	Double	03, 04, 06, 16	R/W	1198	3198	5198	7198	9198	
40325 - 40326	RLY2 - Alarm Setpoint	Long Integer	03, 04, 06, 16	R/W						
40327 - 40328	RLY2 - Alarm Reset Point	Long Integer	03, 04, 06, 16	R/W						
RLY2 Timer Mode										
40329 - 40330	RLY2 - Timer Off Seconds	Ulong Integer	03, 04, 06, 16	R/W	1201	3201	5201	7201	9201	
40331 - 40332	RLY2 - Timer On Seconds	Ulong Integer	03, 04, 06, 16	R/W	1202	3202	5202	7202	9202	
RLY2 Sampling Mode										
40333 - 40334	RLY2 - Sampling Count	Float	03, 04, 06, 16	R/W	1203	3203	5203	7203	9203	
40335 - 40336	RLY2 - Sample Time Seconds	Ulong Integer	03, 04, 06, 16	R/W	1204	3204	5204	7204	9204	
40337 - 40340	RLY2 - Sampling Count	Double	03, 04, 06, 16	R/W	1205	3205	5205	7205	9205	
40341 - 40342	RLY2 - Sampling Count	Long Integer	03, 04, 06, 16	R/W						
Batch Control Settings										
40351	Batch Mode Auto	Short (0 or 1)	03, 04, 06, 16	R/W	1210	3210	5210			0 = MANUAL, 1 = AUTO
40352	Batch Mode Count Down	Short (0 or 1)	03, 04, 06, 16	R/W	1211	3211	5211			0 = COUNT UP, 1 = DOWN
40353	Batch Mode Rly2 Preclose	Short (0 or 1)	03, 04, 06, 16	R/W	1212	3212	5212			0 = PRESET, 1 = PRECLOSE
40354 - 40355	Batch Auto Delay (seconds)	Ulong Integer	03, 04, 06, 16	R/W	1213	3213	5213			
40356 - 40357	Batch - Delay Off Seconds - Rly1	Ulong Integer	03, 04, 06, 16	R/W	1214	3214	5214			
40358 - 40359	Batch - Delay On Seconds - Rly1	Ulong Integer	03, 04, 06, 16	R/W	1215	3215	5215			

RTU Address	Name	Type	Function Codes	R/W	Enron Address					Comments
					Byte	Short	Long	Float	Double	
40360 - 40361	Batch - Delay Off Seconds - Rly2	Ulong Integer	03, 04, 06, 16	R/W	1216	3216	5216			
40362 - 40363	Batch - Delay On Seconds - Rly2	Ulong Integer	03, 04, 06, 16	R/W	1217	3217	5217			
40364 - 40365	Batch Preset Maximum	Float	03, 04, 06, 16	R/W	1218	3218	5218	7218	9218	Total Units. Integers use Total DP.
40366 - 40369	Batch Preset Maximum	Double	03, 04, 06, 16	R/W	1219	3219	5219	7219	9219	
40370 - 40371	Batch Preset Maximum	Long Integer	03, 04, 06, 16	R/W						
40372 - 40373	Batch Preset - Rly1	Float	03, 04, 06, 16	R/W	1221	3221	5221	7221	9221	
40374 - 40375	Batch Setpoint - Rly2	Float	03, 04, 06, 16	R/W	1222	3222	5222	7222	9222	
40376 - 40379	Batch Preset - Rly1	Double	03, 04, 06, 16	R/W	1223	3223	5223	7223	9223	
40380 - 40383	Batch Setpoint - Rly2	Double	03, 04, 06, 16	R/W	1224	3224	5224	7224	9224	
40384 - 40385	Batch Preset - Rly1	Long Integer	03, 04, 06, 16	R/W						
40386 - 40387	Batch Setpoint - Rly2	Long Integer	03, 04, 06, 16	R/W						
40388	Batch Status	Short	03, 04	R	1227	3227	5227			
40388	Batch Control	Short	06, 16	W	1227	3227	5227			0 = Run, 1 = Stop, 2 = Pause
40401 - 40416	Modbus Tag	String (32 characters)	03, 04, 06, 16	R/W	1231 (231-262)	3231	5231			

User Functions Table

To execute any user function, write the index value to register 40181.

Index	Description	Index	Description
1	Reset min & max	33-34	Spare
2-3	Spare	35	Automatic control (All outputs)
4	Acknowledge alarm (All)	36	Automatic control OC1
5	Acknowledge alarm OC1	37	Manual control OC1 = On
6	Acknowledge alarm OC2	38	Manual control OC1 = Off
7	Acknowledge alarm relay 1	39	Manual control OC1 = Toggle On/Off
8	Acknowledge alarm relay 2	40	Automatic control OC2
9-10	Spare	41	Manual control OC2 = On
11	Start timer (All)	42	Manual control OC2 = Off
12	Stop timer (All)	43	Manual control OC2 = Toggle On/Off
13	Start timer OC1	44	Automatic control OC1 & OC2
14	Stop timer OC1	45	Manual control OC1 & OC2 = On
15	Start timer OC2	46	Manual control OC1 & OC2 = Off
16	Stop timer OC2	47	Manual control OC1 & OC2 = Toggle On/Off
17	Start timer relay 1	48	Manual control OC1 & OC2 = Alternate
18	Stop timer relay 1	49	Automatic control relay 1
19	Start timer relay 2	50	Manual control relay 1 = On
20	Stop timer relay 2	51	Manual control relay 1 = Off
21-22	Spare	52	Manual control relay 1 = Toggle On/Off
23	Start stopwatch	53	Automatic control relay 2
24	Stop stopwatch	54	Manual control relay 2 = On
25-26	Spare	55	Manual control relay 2 = Off
27	Manual data log	56	Manual control relay 2 = Toggle On/Off
28	Start interval data log	57	Automatic control relay 1 & 2
29	Stop interval data log	58	Manual control relay 1 & 2 = On
30	Erase data log	59	Manual control relay 1 & 2 = Off
31	Spare	60	Manual control relay 1 & 2 = Toggle On/Off
32	On/Off RS-485 Modbus (Battery power)	61	Manual control relay 1 & 2 = Alternate

Allowable ASCII Character Set (40164 – 40167, 40219 – 40222, 40401 – 40416)

Display	HEX	Char
0	30	0
1	31	1
2	32	2
3	33	3
4	34	4
5	35	5
6	36	6
7	37	7
8	38	8
9	39	9

Display	HEX	Char
A	41	A
B	42	B
C	43	C
D	44	D
E	45	E
F	46	F
G	47	G
H	48	H
I	49	I
J	4A	J
K	4B	K
L	4C	L
M	4D	M
N	4E	N
O	4F	O
P	50	P
Q	51	Q
R	52	R
S	53	S
T	54	T
U	55	U
V	56	V
W	57	W
X	58	X
Y	59	Y
Z	5A	Z

Display	HEX	Char
a	61	a
b	62	b
c	63	c
d	64	d
e	65	e
f	66	f
g	67	g
h	68	h
i	69	i
j	6A	j
k	6B	k
l	6C	l
m	6D	m
n	6E	n
o	6F	o
p	70	p
q	71	q
r	72	r
s	73	s
t	74	t
u	75	u
v	76	v
w	77	w
x	78	x
y	79	y
z	7A	z

Display	HEX	Char
	20	Space
*	2A	*
+	05B	+
-	2D	-
/	2F	/
^	5E	^
_	5F	_
°	F8	°

Notes

Note 1. The Register numbers and addresses follow the Modbus format:

- 3xxxx are for Input Registers and are read – only.
- 4xxxx are for Holding Registers and are read/write.

Although there are no specific 3x registers, all 4x registers are mirrored into 3x register space, and are therefore capable of being read by Modbus function 04 (Read Input Registers). All register addresses are referenced to one (1). For example, register 40101 is sent in the Modbus message as 0x0064 (101 - 1 = 100 ≡ 64 hex). If two addresses are shown separated by a “–”, they form a register pair to make the parameter into a 4-byte (32 bit) value.

Note 2. Limits or Range: Writing a value that is outside the parameters range will force it to be limited to the closest value within the range. For example, if the range is -1.99 to +1.99 and the value sent is 3.21, the value used is 1.99. Likewise for the lower side of the range.

Note 3. Data Types:

Data format is highest byte first (Byte order: 1234).

Bit = 1 bit; write a 1 to the first bit of the register

Word = 16 bit

Integer 16 (Short, 2 bytes): -32768 to 32767

Unsigned integer 16 (Short, 2 bytes): 0 to 65535

Long 32 (Long, 4 bytes): -2,147,483,648 to 2,147,483,647

Float 32 (4 bytes): IEEE floating point format.

For the complete floating point standard, see IEEE 754-1985 Standard for Binary Floating-Point Arithmetic.

Float 64 (Double, 8 bytes)

Integer's data: The values represent the number without regard to the decimal point. The decimal point setting can be found in Holding Register 40196 for rate, 40197 for total, and 40198 for grand total.

For example, if the total value is 1234.56, a read of both 40075 – 40076 together will return 1 – 23456 (0x0001 – 0xE240). Register 40197 will contain 2 (0x0002) to indicate a decimal point setting of two places to the right of the decimal point. A floating point version of the total value, with the decimal point included, is also available by accessing register 40027 - 40028.

Note 4. A read of the main password registers 40184-40185 will return 00000 and a device failure error, this is a write-only register.

To lock a meter via Modbus:

- 1) Write a password (lock number) to register 40184-40185.
An unlocked meter can be locked by writing any non – zero value up to 99999.
- 2) Read any register to complete the lock sequence.
Known Issue: The lock symbol on the display is not turned on until an off/on cycle (Press & hold Menu key to turn off/on).

To unlock the meter via Modbus:

- 1) Write the correct password to registers 40179-40180 to enable Modbus write.
- 2) Write 0 to the main password registers 40184-40185 to unlock the meter permanently; otherwise, the meter will lock itself after any read command.

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