QEL - DEDESCO

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Q5 TRANSMITTER
Software Specification Document

ModBus Protocol

85940-001-000

	Name	Signature	Date
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Reviewed:			
Checked:			
Approved:			

Revision:	**1**	**2**	**A**		
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1. MODBUS Protocol Supported By Q5

1.1 Serial Transmission Mode

- Modbus RTU Slave Mode
- Baud rate: 1200 to 57.6K, selectable from Baud Rate Setting in System Setting Menu.
- Byte parity: Odd, Even or None parity, selectable in Menu (**Default is Even Parity**)
- Data format: One start bit, 8 data bit, (one parity bit), one stop bit, LSB first.
- Frame Check: CRC check.

1.2 Function Code Supported by M-Controller

- **#03 Read Holding Registers**

Function in Q5: Read inputs and outputs statuses and readings, such as

- Sensor readings and statuses
- Analog output current (mA x 10)
- Relay Statuses and Settings
- Buzzer Statuses and Settings
- Alarm Statuses and Settings
- Real Time Clock
- Events Records

Attribute: Read Only.
Broadcast is not supported.
Q5 only suports the reading that number points is not more than 100 in one query.

Query:

Slave Address:	xx (Default 0x01, check Address in Q5)
Function code:	03
Starting addr. Hi:	000
Starting addr. Lo:	xxx
No. of points Hi:	000
No. of points Lo:	xxx
CRC check:	xxxxH

Example: to read all holding registers in Q5 (Address: 0x01)

Query: [001] [003] [000] [000] [000] [004] [068] [009] in unsigned decimal.

Holding Register for Running Data Address Table

Modbus	Name	Description
40001	Instantaneous Gas_Concentration Without Decimal	The concentration is 16 bits signed integer. The actual value is the value divided by Decimal Position Decimal Position see 40010
40002	STEL	16 bits signed integer. 15 minutes averaging concentration without decimal The actual value is the value divided by Decimal Position Decimal Position see 40010
40003	TWA	16 bits signed integer 8 Hours Averaging Concentration without decimal The actual value is the value divided by Decimal Position Decimal Position see 40010
40004	Daily Peak	16 bits signed integer Peak reading during a day The actual value is the value divided by Decimal Position Decimal Position see 40010
40005	100 x mA Output	16 bits unsigned integer 4-20mA analog output, 100X mA value. The actual value is the value divided by 100. Unit is mA
40006	mV Output	16 bits unsigned integer 1-5VDC or 2-10VDC analog output, Unit is mV
40007	Board Tempearture	16 bits signed integer Q5 Sensor Board Temperature, 10X value. The actual value is the value divided by 10. Unit is °C
40008	Working Status Register and Error Register	Working status register in high 8 bits. 0x00: Monitoring_Mode 0x10: Zeroing_Cal_Mode 0x20: Span_Cal_Mode 0x30: T0_Cal_Mode 0x40: T1_Cal_Mode 0x50: Warmup_Mode 0x60: Restore_Factory_Mode 0x70: Programming_Mode 0x80: Menu_Mode Error Register is in low 8 bits. Bit0 = 1 : Thermistor Error Bit1 = 1 : 3.3VDC Low Bit2 = 1 : Sensor Board is offline Bit3 = 1 : Signal Low or Error Bit4 = 1 : Battery Low Bit5 = 1 : Calibration Error Bit6 = 1 : Concentration Overflow

		Bit7 = 1 : Others errors
40009	Alarm Status Register and Relay Status Register	Alarm status register in high 8 bits. 0: OFF, 1: ON Bit0 : Alarm 1 status Bit1 : Alarm 2 status Bit2 : Alarm 3 status Bit3 : Alarm 4 status Bit4 : Alarm 5 status Bit5 : Alarm 6 status Bit6 : Alarm 7 status Bit7 : Alarm 8 status Relay stauts register is in low 8 bits. 0: OFF, 1: ON Bit0 : Relay1 status Bit1 : Relay2 status Bit2 : Relay3 status
40010	Buzzer Status Register and Decimal Position	Buzzer status register in high 8 bits. 0: OFF, 1: ON Bit0 : Buzzer1 status Bit1 : Buzzer2 status Bit2 : Buzzer3 status Decimal Position in low 8 bits. If the byte = 0: The actual reading is Reading / 1 If the byte = 1: The actual reading is Reading / 10 If the byte = 2: The actual reading is Reading / 100 If the byte = 3: The actual reading is Reading / 1000 Others: N/A
40011	Q5 Real Time Clock in Seconds,	Real Time Clock Seconds is a 32bit Long Integer. The register contains high 16 bits Q5 Real Time Clock is based on the number of seconds elapsed since 00:00:00 on Jan. 1, 2000.
40012	Q5 Real Time Clock in Seconds,	Real Time Clock Seconds is a 32bit Long Integer. The register contains low 16 bits

Holding Register for Tranmsitter Settings Address Table

40013	Transmitter Software Version	Software version major Number register in high 8 bits Software version minur number register in low 8 bits
40014	Transmitter Measure Span	16 bits unsigned integer The actual value is the value divided by Decimal Position Decimal Position see 40010
40015	Last Time CAL	Last Time Calibration is a 32bit Long Integer. The time in seconds when the last calibration was performed. The register contains high 16 bits Last Time CAL is based on the number of seconds elapsed since 00:00:00 on Jan. 1, 2000.
40016	Last Time CAL	Last Time Calibration is a 32bit Long Integer. The time in seconds when the last calibration was performed. The register contains low 16 bits
40017	Digital Pot Position	Zeroing CAL Pot Position is in high 8 bits Span CAL Pot Position is in low 8 bits
40018	D/A Value at 4mA	16 bits unsigned integer D/A data output register value at 4mA output
40019	D/A Value at 20mA	16 bits unsigned integer D/A data output register value at 20mA output
40020	D/A Value at 1V	16 bits unsigned integer D/A data output register value at 1VDC output
40021	D/A Value at 5V	16 bits unsigned integer D/A data output register value at 5VDC output
40022	D/A Value at 2V	16 bits unsigned integer D/A data output register value at 2VDC output
40023	D/A Value at 10V	16 bits unsigned integer D/A data output register value at 10VDC output
40024	Detected Gas Name Max. 6 Characters	First Character in high 8 bits Second Character in low 8 bits

40025	Detected Gas Name	Third Character in high 8 bits Fourth Character in low 8 bits
40026	Detected Gas Name	Fifth Character in high 8 bits Sixth Character in low 8 bits
40027	Gas Unit Name Max. 6 Characters	First Character in high 8 bits Second Character in low 8 bits
40028	Gas Unit Name	Third Character in high 8 bits Fourth Character in low 8 bits
40029	Gas Unit Name	Fifth Character in high 8 bits Sixth Character in low 8 bits