

Q-SMART MODBUS KIT

Modbus Protocol & Parameters

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Q-SMART Software Version AE17

Index

1	Modbus Protocol on Q-SMART	4
1.1	Broadcasting	4
1.2	Data Protection.....	4
1.3	Transmission Mode.....	4
1.4	Supported function Codes.....	5
1.5	Not supported Modbus function code	5
2	Connection and data handling	6
2.1	Unit Q-SMART connected to external device	6
3	Impostazioni Q-SMART	9
4	Q-SMART Register List – SW Version AE17	10

1 Modbus Protocol on Q-SMART



NOTE: The Modbus Protocol is an international standardized Bus Protocol!

The general information within this Manual is just a brief overview, for detailed information please use the Modbus Protocol reference guide, or any other source of information (e.g. Modbus.org. "MODBUS application protocol specification" available on the Internet).

This protocol defines a message structure that controllers will recognize and use, regardless of the type of networks over which they communicate. It describes the process a controller uses to request access to another device, how it will respond to requests from the other devices, and how errors will be detected and reported. It establishes a common format for the layout and contents of message fields.

During communications on a Modbus network, the protocol determines how each controller will know its device address, recognize a message addressed to it, determine the kind of action to be taken, and extract any data or other information contained in the message.

Communication

Q-SMART, through KIT MODBUS, uses the RS485 serial interface that defines connect pinouts, cabling, signal levels, transmission baud rates and parity checking.

Controllers communicate using a master-slave technique, in which only the master can start a transfer or polling. The other devices (Slaves) respond by supplying the requested data to the master, or by taking the action requested in the query.

1.1 Broadcasting

On Q-SMART, through KIT MODBUS, broadcast function is not supported.

1.2 Data Protection

Standard Modbus serial networks on Q-SMART use this kind of error checking:
Parity checking (even or odd) can be optionally applied to each character.

1.3 Transmission Mode

Transmission mode available is RTU type.

In addition to the desired transmission mode, the serial port communication parameters (baud rate, parity mode...) shall be selected.

! The mode and serial parameters must be the same for all devices on the Modbus network!

The following modes can be selected and are supported by Q-SMART:

RTU / 8, E, 1	1 start bit, 8 data bits, 1 stop bit, Even parity
RTU / 8, O, 1	1 start bit, 8 data bits, 1 stop bit, Odd parity
RTU / 8, N, 2	1 start bit, 8 data bits, 2 stop bits, No parity
RTU / 8, N, 1	1 start bit, 8 data bits, 1 stop bit, No parity

1.4 Supported function Codes

- **0x03 Read Holding Registers – READ COMMAND**

Read the binary contents of holding registers in the slave!

Note: The Modbus Registers are addressed starting at zero!
E.g. Holding Register indexed 0x33 has to be addressed as 0x32



NOTE: The management of exceptions / errors for incorrect messages sent to the panel and compliance with message response times as specified in the modbus protocol is not guaranteed

1.5 Not supported Modbus function code

Q-SMART only supports Function Codes described in par. 1.4; for the sake of clarity, other Modbus Function Codes not used/supported by Q-SMART are:

- 0x01 - Read Coils
- 0x02 - Read Discrete Inputs
- 0x04 - Read Input Registers
- 0x05 - Write Single Coil
- 0x07 - Read Exception Status
- 0x08 - Diagnostics
- 0x0B - Get Comm Event Counter
- 0x0C - Get Comm Event Log
- 0x0F - Write Multiple Coils
- 0x10 - Write Multiple Registers
- 0x11 - Report Slave ID
- 0x14 - Read File Record
- 0x15 - Write File Record
- 0x16 - Mask Write Register
- 0x17 - Read/Write Multiple registers
- 0x18 - Read FIFO Queue
- 0x2B - Encapsulated Interface Transport

2 Connection and data handling

2.1 Unit Q-SMART connected to external device



NOTE: For detailed information regarding installation, wiring and configuration of the Q-SMART e KIT MODBUS, please read and follow the relative Installation, Operation and Maintenance Manual.

WARNING: This product is intended to be operated by qualified personnel only.

Connection of KIT Modus on Q-SMART (see figure 1, 2).

1. Make sure that the control panel Q-SMART is isolated from the power supply and cannot be energised.
2. Open the front covers (1) and (3), and turn the main switch (2) OFF.
3. Unfasten the 4 screws M4x25 and open the REAR cover (see Figure 1).
4. Connect the MODBUS KIT to the TTL port in the Q-SMART and fix it in the appropriate housing (see Figure 2)
5. Check that all the cables are secured, close the REAR cover and fasten the screws if no other cables have been connected.

The +, -, S (RS485 port) terminals in the Modbus Kit (see Figure 2) are used for serial communication with an external control device (eg PLC, BMS or PC).



NOTE: Do not connect the ground of the control card to other voltage potentials. All ground terminals and ground of the RS485 connection are connected internally.

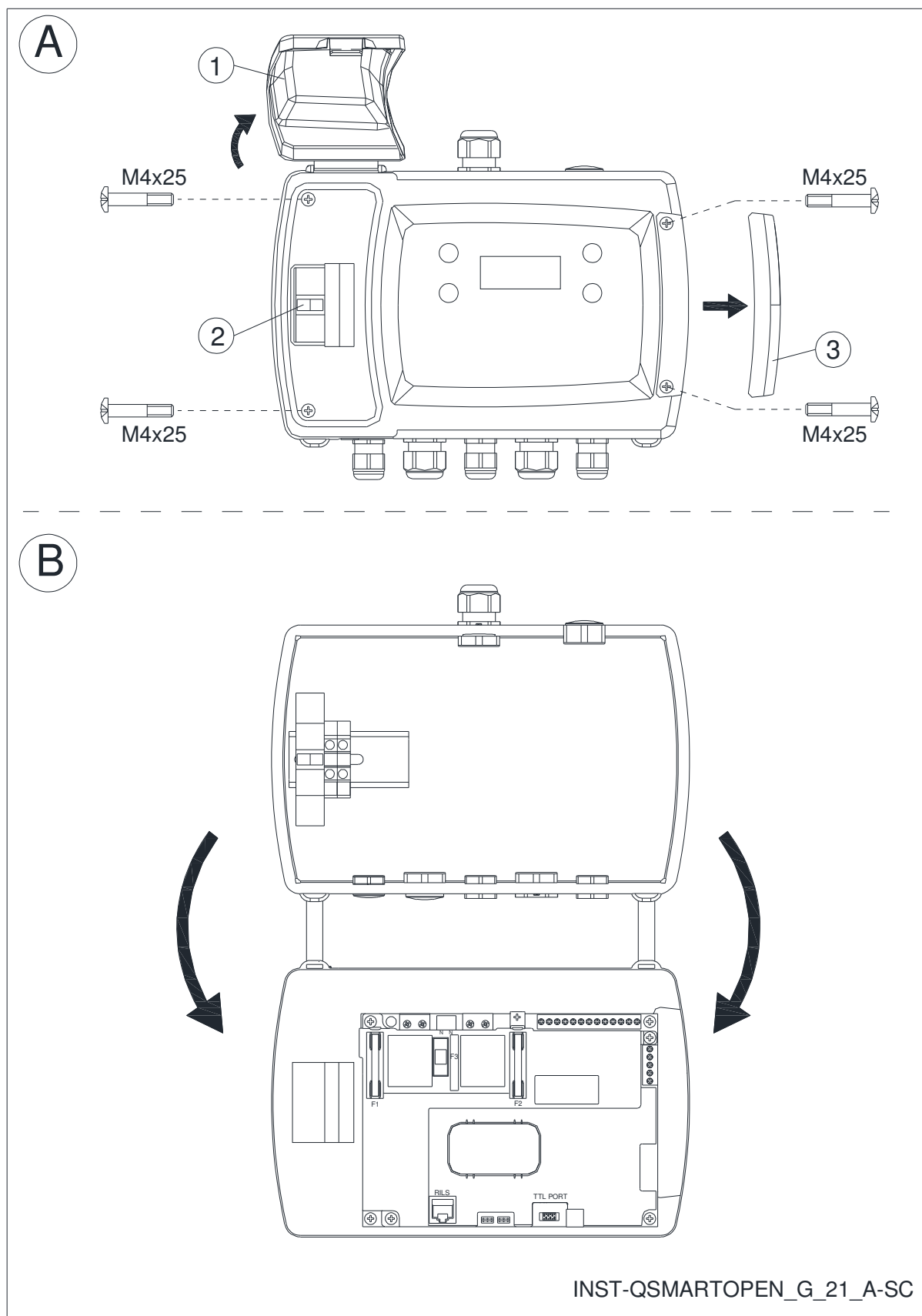


Figura 1

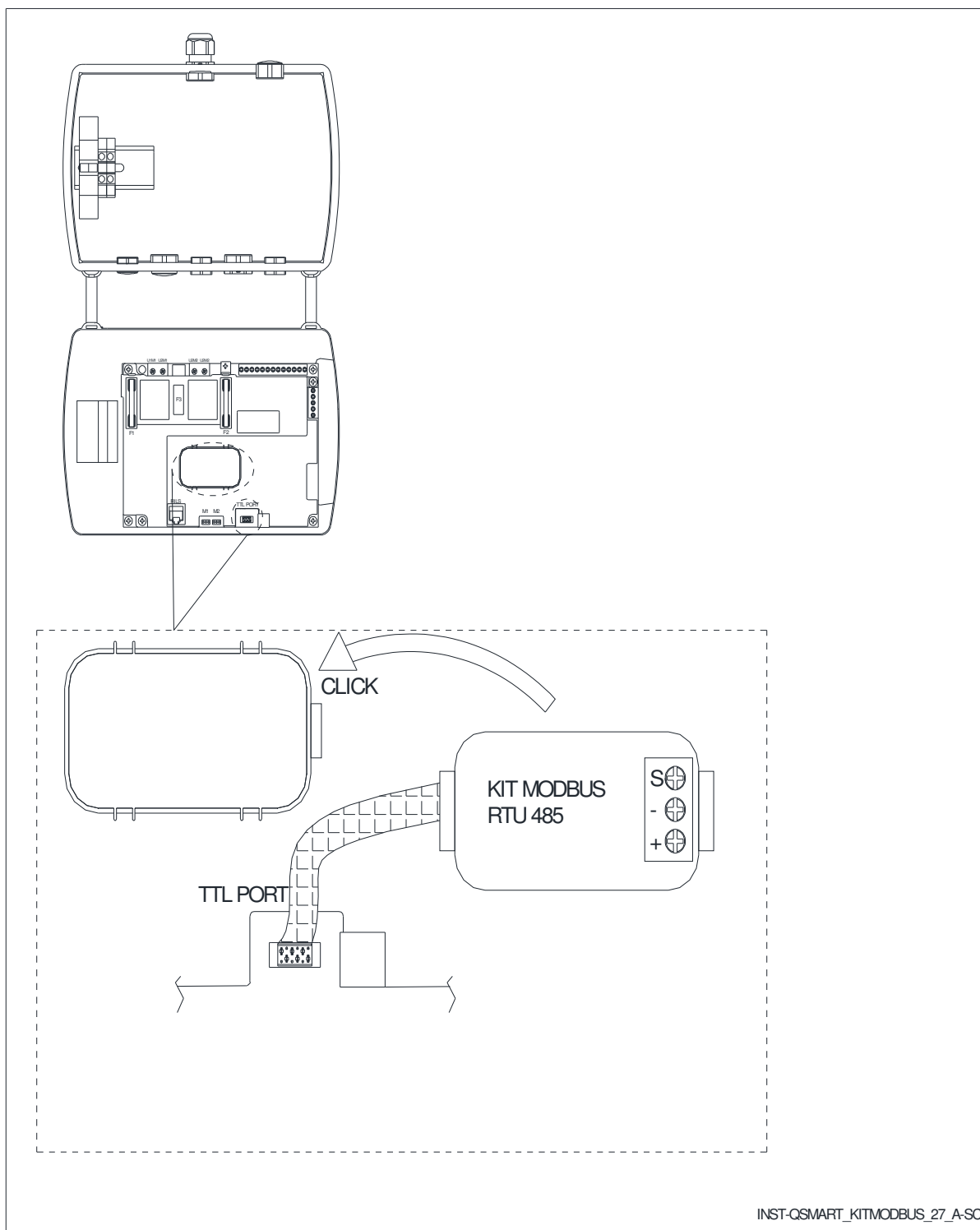


Figura 2

3 Settings Q-SMART

The following 4 parameters, on Q-SMART menu , have to be set to guarantee correct Modbus communication. Q-SMART is a SLAVE type device.

Parameter Q-SMART	Description	Range	Default
c46	Enable ModBus port communication	0= Disabilitato 1= Abilitato	0
r46	Setting the address	da 1 a 255	247
c47	Parity	0= Nessuna 1= Pari 2= Dispari	2
r47	BAUDRATE	0= 9600 1= 19200 2= 38400 3= 57600	1



NOTA: : With Even or Odd parity there is a one stop bit, with no parity there are two stop bits. Switch the Q-SMART control panel off and back on after changing the r46-c47-r47 parameters.

4 Q-SMART Register List – SW Version AE17

4.1 Register list for SEWAGE application

DESCRIZIONE DESCRIPTION		MODBUS ADDR (BASE 0)	MODBUS ADDR (BASE 1)	MODBUS ACCESS	UNITA' MISURA UNIT	MIN	MAX
Sensor		0201h	514	R	(0.1 resolution)	-3276.7	3276.8
Output relè							
Output 8 (on 6CP card)		0181h.Bit0	386.Bit0	R		0=OFF	1=ON
Output 7 (on 6CP card)		0181h.Bit1	386.Bit1	R		0=OFF	1=ON
Output 6 (on 6CP card)		0181h.Bit2	386.Bit2	R		0=OFF	1=ON
Output 5 (on 6CP card)		0181h.Bit3	386.Bit3	R		0=OFF	1=ON
Output 4 (on 6CP card)		0181h.Bit4	386.Bit4	R		0=OFF	1=ON
Output 3 (on 6CP card)		0181h.Bit5	386.Bit5	R		0=OFF	1=ON
Output 2 (Pump 2)		0181h.Bit6	386.Bit6	R		0=OFF	1=ON
Output 1 (Pump 1)		0181h.Bit7	386.Bit7	R		0=OFF	1=ON
Inputs level control by probes							
Input probe SB		0102h.Bit0	259.Bit0	R		0=OFF	1=ON
Input probe S1		0102h.Bit1	259.Bit1	R		0=OFF	1=ON
Input probe S2		0102h.Bit2	259.Bit2	R		0=OFF	1=ON
Input probe SA		0102h.Bit3	259.Bit3	R		0=OFF	1=ON
Digital inputs float switches							
G1		0101h.Bit0	258.Bit0	R		0=OFF	1=ON
G2		0101h.Bit1	258.Bit1	R		0=OFF	1=ON
GA		0101h.Bit2	258.Bit2	R		0=OFF	1=ON
GB		0101h.Bit3	258.Bit3	R		0=OFF	1=ON
SelfTest/OnOff/Alarm		0101h.Bit4	258.Bit4	R		0=OFF	1=ON
Fuse1		0101h.Bit6	258.Bit6	R		0=OFF	1=ON

Fuse2		0101h.Bit5	258.Bit5	R		0=OFF	1=ON
PARAMETRI/PARAMETERS							
DESCRIZIONE DESCRIPTION	PARAMETRO PARAMETER	MODBUS ADDR (BASE 0)	MODBUS ADDR (BASE 1)	MODBUS ACCESS	UNITA' MISURA UNIT	MIN	MAX
Parameters							
Number of pumps	c01	0601h	1538	RW		1	2
Filling function	c02	0602h	1539	RW		0=Disabled	1=Enabled
Type of sensor that is used	c03	0603h	1540	RW		1	5
					1	Float switches	
					2	Sensor level	
					3	Probes	
					4	Level sensor with automatic switching to float if sensor is faulty	
					5	Level sensor with automatic switching to probes if sensor is faulty	
Sensor signal type	c04	0604h	1541	RW		1=4_20mA	2=0_20mA
					1	4_20mA	
					2	0_20mA	
Initial scale value of the sensor. Only if sensor is used.	c05	0605h	1542	RW	(0.1 resolution)	0.0	50.0
Calibration of the initial scale in mA.	r05	0606h	1543	RW		-1	1
Software filter for analogue input	t05	0607h	1544	RW		0	5
Full scale value of the selected sensor. Only if sensor is used.	c06	0608h	1545	RW	(0.1 resolution)	0.0	50.0
Unique level set point	c07	0609h	1546	RW		0=Disabled	1=Enabled
Set point level value	r07	060Ah	1547	RW	(0.1 resolution)	0.0	50.0
Upper threshold delta	r08	060Bh	1548	RW	(0.1 resolution)	0.0	10.0
Lower threshold delta	r09	060Ch	1549	RW	(0.1 resolution)	0.0	10.0
Threshold Start Pump 1	r10	060Dh	1550	RW	(0.1 resolution)	0.0	50.0

Delay time start Pump 1	t10	060Eh	1551	RW		0	100
Threshold Stop Pump 1	r11	060Fh	1552	RW	(0.1 resolution)	0.0	50.0
Delay time stop Pump 1	t11	0610h	1553	RW		0	100
Threshold Start Pump 2	r12	0611h	1554	RW	(0.1 resolution)	0.0	50.0
Delay time start Pump 2	t12	0612h	1555	RW		0	100
Threshold Stop Pump 2	r13	0613h	1556	RW	(0.1 resolution)	0.0	50.0
Delay time stop Pump 2	t13	0614h	1557	RW		0	100
Enable combinations of stopping and/or starting the pumps by the float switches (G) and probes (S).	c14	0615h	1558	RW		0=G1_G2	3
					0	G1_G2	
					1	GB_SB	
					2	GA_SA	
					3	GB_SB_GA_SA	
Enable pump rotation	c15	0616h	1559	RW		0=Disabled	1=Enabled
Insert the duty pump that you want to start first after powering up or after reset.	c16	0617h	1560	RW		1=P1	2=P2
					1	P1	
					2	P2	
Exchange Timetable	c17	0618h	1561	RW		0	12
Settable only in the case of sys-tems with sensor. Halves the timing (t10, t11, t12, t13) in the case of excessive variation of the feed-back (pres-sure, levels, tempera-ture).	c18	0619h	1562	RW		0=Disabled	1=Enabled
Setting the date	h19	061Ah	1563	RW		0	50
Setting the month	h20	061Bh	1564	RW		1	12
Setting the day	h21	061Ch	1565	RW		1	31
Setting the hour	h22	061Dh	1566	RW		0	23
Setting the minute	h23	061Eh	1567	RW		0	59
Enabling periodic Auto-test	c24	061Fh	1568	RW		0=Disabled	3
					0	disabilitato	

					1	Weekly	
					2	Time of inactivity	
Setting the inactivity period of pump 1 (c24=2)	t24	0620h	1569	RW		1	30
Setting the inactivity period of pump 2 (c24=2)	t25	0621h	1570	RW		1	30
Setting the day of weekly auto-test (c24=1)	h26	0622h	1571	RW		1=Monday	7=Sunday
					1	Monday	
					2	Tuesday	
					3	Wednesday	
					4	Thursday	
					5	Friday	
					6	Saturday	
					7	Sunday	
Setting the hour of weekly auto-test (c24=1)	h27	0623h	1572	RW		0	23
Setting the minutes of weekly auto-test (c24=1)	h28	0624h	1573	RW		0	59
Setting the operating time of the pump during the weekly auto-test (c24=1)	h29	0625h	1574	RW		2	20
Setting the mode to change the set point	c30	0626h	1575	RW		0=Disabled	2
					0	disabilitato	
					1	orologio interno	
					2	ingresso digitali DI5	
Setting the change value of the set point.	r30	0627h	1576	RW	(0.1 resolution)	0.0	50.0
Setting the start hour for changing the set point (c30=1)	h30	0628h	1577	RW		0	23
Setting the start minutes for changing the set point (c30=1)	h31	0629h	1578	RW		0	59
Setting the stop hour for changing the set point (c30=1)	h32	062Ah	1579	RW		0	23

Setting the stop minutes for changing the set point (c30=1)	h33	062Bh	1580	RW		0	59
Setting the logic of the digital input float switch G1	r34	062Ch	1581	RW		1=NC	2=NO
					1	NC	
					2	NO	
Setting the logic of the digital input float switch G2	r35	062Dh	1582	RW		1=NC	2=NO
					1	NC	
					2	NO	
Setting the logic of the digital input float switch GMAX	r36	062Eh	1583	RW		1=NC	2=NO
					1	NC	
					2	NO	
Delay time until activation of digital input float switch G MAX (r36)	t36	062Fh	1584	RW		0	200
Setting the logic of the digital input float switch GMIN	r37	0630h	1585	RW		1=NC	2=NO
					1	NC	
					2	NO	
Delay time until activation of digital input float switch G MIN (r37)	t37	0631h	1586	RW		0	200
Configuration of programmable digital input D IN_PROG	c38	0632h	1587	RW		0=Not used	4
					0	Not used	
					1	External command and the pumps are switched on one at a time	
					2	External alarm	
					3	External ON/OFF	
					4	Change set point	
Setting the logic of programmable digital input D IN_PROG	r38	0633h	1588	RW		1=NC	2=NO
					1	NC	
					2	NO	

Delay time until activation of programmable digital input D IN_PROG (r38)	t38	0634h	1589	RW		0	200
Configuration of OUT_1 relay (6CP card)	c40	0635h	1590	RW		0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	
					3	F1 fuse faulty	
					4	F2 fuse faulty	
					5	High level alarm	
					6	Alarm Max level threshold	
					7	Alarm Min level threshold	
					8	External alarm	
					9	Auto-test in progress.	
					10	Alarm sensor fault	
					11	Power ON	
					12	Aut/Man mode	
Configuration of OUT_2 relay (6CP card)	c41	0636h	1591	RW		0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	
					3	F1 fuse faulty	
					4	F2 fuse faulty	
					5	High level alarm	
					6	Alarm Max level threshold	
					7	Alarm Min level threshold	
					8	External alarm	
					9	Auto-test in progress.	
					10	Alarm sensor fault	
					11	Power ON	
					12	Aut/Man mode	
Configuration of OUT_3 relay (6CP card)	c42	0637h	1592	RW		0=Disabled	12

					0	Disabled	
					1	P1 running	
					2	P2 running	
					3	F1 fuse faulty	
					4	F2 fuse faulty	
					5	High level alarm	
					6	Alarm Max level threshold	
					7	Alarm Min level threshold	
					8	External alarm	
					9	Auto-test in progress.	
					10	Alarm sensor fault	
					11	Power ON	
					12	Aut/Man mode	
Configuration of OUT_4 relay (6CP card)						0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	
					3	F1 fuse faulty	
					4	F2 fuse faulty	
					5	High level alarm	
					6	Alarm Max level threshold	
					7	Alarm Min level threshold	
					8	External alarm	
					9	Auto-test in progress.	
					10	Alarm sensor fault	
					11	Power ON	
					12	Aut/Man mode	
Configuration of OUT_5 relay (6CP card)						0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	

					3	F1 fuse faulty	
					4	F2 fuse faulty	
					5	High level alarm	
					6	Alarm Max level threshold	
					7	Alarm Min level threshold	
					8	External alarm	
					9	Auto-test in progress.	
					10	Alarm sensor fault	
					11	Power ON	
					12	Aut/Man mode	
Configuration of OUT_6 relay (6CP card)						0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	
					3	F1 fuse faulty	
					4	F2 fuse faulty	
					5	High level alarm	
					6	Alarm Max level threshold	
					7	Alarm Min level threshold	
					8	External alarm	
					9	Auto-test in progress.	
					10	Alarm sensor fault	
					11	Power ON	
					12	Aut/Man mode	
Enable ModBus port communication						0=Disabled	1=Enabled
Setting the address						1	31
Parity						0=none	2=odd
					0	none	
					1	even	
					2	odd	

Baudrate	r47	063Eh	1599	RW		0=9600	3=57600
					0	9600	
					1	19200	
					2	38400	
					3	57600	
Loads all the default parameters	c48	063Fh	1600	RW		0	1
Reads pump 1 operating hours	h49	0640h	1601	RW		0	65536
Reads pump 2 operating hours	h50	0641h	1602	RW		0	65536
Reads total hours of running of Q-SMART control panel	h51	0642h	1603	RW		0	65536
Resets memory of all pump hour counters	c52	0643h	1604	RW		0	1
control level (parameter available if se c02=1)	c53	0644h	1605	RW		0=Disabled	1=Enabled
Setting probe sensitivity according to water conductivity.	r53	0645h	1606	RW		0	10
Delay time until activation of probes (r53)	t53	0646h	1607	RW		0	200
Enable alarm for minimum level threshold (only with system with sensor)	c54	0647h	1608	RW		0=Disabled	1=Enabled
Setting the minimum level threshold alarm	r54	0648h	1609	RW	(0.1 resolution)	0.0	50.0
Delay time until activation of minimum level alarm threshold (c54=1)	t54	0649h	1610	RW		0	200
Enable alarm for high level threshold (only with system with sensor)	c55	064Ah	1611	RW		0=Disabled	1=Enabled
Setting the high level threshold alarm. All pumps are activated in case of alarm	r55	064Bh	1612	RW	(0.1 resolution)	0.0	50.0
Delay time until activation of high level alarm threshold (c55=1)	t55	064Ch	1613	RW		0	200
Enables system block if the same alarm occurs five times in 30 min.	c56	064Dh	1614	RW		0=Disabled	1=Enabled
Reset the alarm log	c57	064Eh	1615	RW		0=NO	1=YES

ALLARMI ALARMS							
DESCRIZIONE DESCRIPTION	PARAMETRO PARAMETER	MODBUS ADDR (BASE 0)	MODBUS ADDR (BASE 1)	MODBUS ACCESS	UNITA' MISURA UNIT	MIN	MAX
word allarms		0301h	770	RW		0	65535
Single alarm							
Sensor alarm	A05	0301h.Bit0	770.Bit0	RW		0	1
External fault alarm Configuration of the indication of an external alarm connected to digital input D IN PROG	A39	0301h.Bit1	770.Bit1	RW		0	1
Minimum threshold alarm	A54	0301h.Bit3	770.Bit3	RW		0	1
Max threshold alarm	A55	0301h.Bit4	770.Bit4	RW		0	1
Fuse F1 pump 1 burned.	A01	0301h.Bit5	770.Bit5	RW		0	1
Fuse F2 pump 2 burned	A02	0301h.Bit6	770.Bit6	RW		0	1
Alarm Lower limit sensor signal	A05	0301h.Bit7	770.Bit7	RW		0	1
High Level Alarm	A36	0301h.Bit10	770.Bit10	RW		0	1
Minimum Level Alarm of the water intake tank	A37	0301h.Bit11	770.Bit11	RW		0	1
The same alarm is detected 5 times in the last 30 minutes	A56	0301h.Bit13	770.Bit13	RW		0	1

4.2 Register list for PRESSURIZATION/BOOSTER application

DESCRIZIONE DESCRIPTION		MODBUS ADDR (BASE 0)	MODBUS ADDR (BASE 1)	MODBUS ACCESS	UNITA' MISURA UNIT	MIN	MAX
Sensor		0201h	514	R	(0.1 resolution)	-3276.7	3276.8
Output relè							
Output 8 (on 6CP card)		0181h.Bit0	386.Bit0	R		0=OFF	1=ON
Output 7 (on 6CP card)		0181h.Bit1	386.Bit1	R		0=OFF	1=ON
Output 6 (on 6CP card)		0181h.Bit2	386.Bit2	R		0=OFF	1=ON
Output 5 (on 6CP card)		0181h.Bit3	386.Bit3	R		0=OFF	1=ON
Output 4 (on 6CP card)		0181h.Bit4	386.Bit4	R		0=OFF	1=ON
Output 3 (on 6CP card)		0181h.Bit5	386.Bit5	R		0=OFF	1=ON
Output 2 (Pump 2)		0181h.Bit6	386.Bit6	R		0=OFF	1=ON
Output 1 (Pump 1)		0181h.Bit7	386.Bit7	R		0=OFF	1=ON
Inputs level control by probes							
Input probe SB		0102h.Bit0	259.Bit0	R		0=OFF	1=ON
Input probe S1		0102h.Bit1	259.Bit1	R		0=OFF	1=ON
Input probe S2		0102h.Bit2	259.Bit2	R		0=OFF	1=ON
Input probe SA		0102h.Bit3	259.Bit3	R		0=OFF	1=ON
Digital inputs Pressure switches							
P1		0101h.Bit0	258.Bit0	R		0=OFF	1=ON
P2		0101h.Bit1	258.Bit1	R		0=OFF	1=ON
PMax		0101h.Bit2	258.Bit2	R		0=OFF	1=ON
PMin		0101h.Bit3	258.Bit3	R		0=OFF	1=ON
SelfTest/OnOff/Alarm		0101h.Bit4	258.Bit4	R		0=OFF	1=ON
Fuse1		0101h.Bit6	258.Bit6	R		0=OFF	1=ON
Fuse2		0101h.Bit5	258.Bit5	R		0=OFF	1=ON
PARAMETRI/PARAMETERS							

DESCRIZIONE DESCRIPTION	PARAMETRO PARAMETER	MODBUS ADDR (BASE 0)	MODBUS ADDR (BASE 1)	MODBUS ACCESS	UNITA' MISURA UNIT	MIN	MAX
Parameter							
Number of pumps	c01	0601h	1538	RW		1	2
Jockey pump.	c02	0602h	1539	RW		0=Disabled	1=Enabled
Type of sensor or control de-vice.	c03	0603h	1540	RW		1	6
					1	Pressure sensor	
					2	Temperature sensor	
					3	Level sensor	
					4	Pressure switch	
					5	Probes	
					6	Pressure sensor with automatic activation of the pressure switches if sensor is faulty.	
Sensor signal type	c04	0604h	1541	RW		1=4_20mA	2=0_20mA
					1	4_20mA	
					2	0_20mA	
Initial scale value of the sensor. Only if sensor is used.	c05	0605h	1542	RW	(0.1 resolution)	0.0	100.0
Calibration of the initial scale in mA.	r05	0606h	1543	RW		0	1
Software filter for analogue input	t05	0607h	1544	RW		0	5
Full scale value of the selected sensor. Only if sensor is used.	c06	0608h	1545	RW	(0.1 resolution)	0.0	100.0
Unique level set point	c07	0609h	1546	RW		0=Disabled	1=Enabled
Set point level value	r07	060Ah	1547	RW	(0.1 resolution)	0.0	100.0
Upper threshold delta	r08	060Bh	1548	RW	(0.1 resolution)	0.0	10.0
Lower threshold delta	r09	060Ch	1549	RW	(0.1 resolution)	0.0	10.0
Threshold Start Pump 1	r10	060Dh	1550	RW	(0.1 resolution)	0.0	100.0
Delay time start Pump 1	t10	060Eh	1551	RW		0	100
Threshold Stop Pump 1	r11	060Fh	1552	RW	(0.1 resolution)	0.0	100.0
Delay time stop Pump 1	t11	0610h	1553	RW		0	100
Threshold Start Pump 2	r12	0611h	1554	RW	(0.1 resolution)	0.0	100.0

Delay time start Pump 2	t12	0612h	1555	RW		0	100
Threshold Stop Pump 2	r13	0613h	1556	RW	(0.1 resolution)	0.0	100.0
Delay time stop Pump 2	t13	0614h	1557	RW		0	100
Enable load loss compensation with increase of the start and stop thresholds, in bar, for the pumps after the first one.	r14	0615h	1558	RW	(0.1 resolution)	0.0	100.0
Enable pump rotation	c15	0616h	1559	RW		0=Disabled	1=Enabled
Insert the duty pump that you want to start first after powering up or after reset.	c16	0617h	1560	RW		1=P1	2=P2
					1	P1	
					2	P2	
Exchange Timetable	c17	0618h	1561	RW		0	12
Settable only in the case of systems with sensor. Halves the timing (t10, t11, t12, t13) in the case of excessive variation of the feed-back (pressure, levels, temperature).	c18	0619h	1562	RW		0=Disabled	1=Enabled
Setting the date	h19	061Ah	1563	RW		0	50
Setting the month	h20	061Bh	1564	RW		1	12
Setting the day	h21	061Ch	1565	RW		1	31
Setting the hour	h22	061Dh	1566	RW		0	23
Setting the minute	h23	061Eh	1567	RW		0	59
Enabling periodic Auto-test	c24	061Fh	1568	RW		0=Disabled	1=Enabled
Setting the day of weekly auto-test (c24=1)	h26	0620h	1569	RW		1=Monday	7=Sunday
					1	Monday	
					2	Tuesday	
					3	Wednesday	
					4	Thursday	
					5	Friday	
					6	Saturday	
					7	Sunday	
Setting the hour of weekly auto-test (c24=1)	h27	0621h	1570	RW		0	23
Setting the minutes of weekly auto-test (c24=1)	h28	0622h	1571	RW		0	59

Setting the operating time of the pump during the weekly auto-test (c24=1)	h29	0623h	1572	RW		0	300
Setting the mode to change the set point	c30	0624h	1573	RW		0=Disabled	2
					0	Disabled	
					1	Internal clock	
					2	With program-mable digital input D IN_PROG	
Setting the change value of the set point.	r30	0625h	1574	RW	(0.1 resolution)	0.0	100.0
Setting the start hour for changing the set point (c30=1)	h30	0626h	1575	RW		0	23
Setting the start minutes for changing the set point (c30=1)	h31	0627h	1576	RW		0	59
Setting the stop hour for changing the set point (c30=1)	h32	0628h	1577	RW		0	23
Setting the stop minutes for changing the set point (c30=1)	h33	0629h	1578	RW		0	59
Setting the logic of the digital input pressure switch P1	r34	062Ah	1579	RW		1=NC	2=NO
					1	NC	
					2	NO	
Setting the logic of the digital input of pressure switch P2	r35	062Bh	1580	RW		1=NC	2=NO
					1	NC	
					2	NO	
Setting the logic of the digital input high pressure switch P MAX	r36	062Ch	1581	RW		1=NC	2=NO
					1	NC	
					2	NO	
Delay time until activation of the digital input high pressure switch P MAX (r36)	t36	062Dh	1582	RW		0	200
Setting the logic of the digital input minimum pressure switch P MIN	r37	062Eh	1583	RW		1=NC	2=NO
					1	NC	
					2	NO	
Delay time until activation of the digital input minimum pressure switch P MIN (r37)	t37	062Fh	1584	RW		0	200

Configuration of the programmable digital input D IN_PROG	c38	0630h	1585	RW		0=Non usato	4
					0	Not used.	
					1	Membrane pressure switch.	
					2	External alarm	
					3	External ON/OFF.	
					4	Change set point	
Setting the logic of programmable digital input D IN_PROG	r38	0631h	1586	RW		1=NC	2=NO
					1	NC	
					2	NO	
Delay time until activation of the programmable digital input D IN_PROG (r38)	t38	0632h	1587	RW		0	200
Configuration of OUT_1 relay (6CP card)	c40	0633h	1588	RW		0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	
					3	Fuse 1 burned	
					4	Fuse 2 burned	
					5	Lack of water alarm	
					6	Maximum pressure threshold	
					7	Minimum pressure threshold alarm.	
					8	External alarm	
					9	Command for Auto-test	
					10	Auto-test faulty	
					11	Power ON	
					12	Aut/Man mode	
Configuration of OUT_2 relay (6CP card)	c41	0634h	1589	RW		0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	

					3	Fuse 1 burned		
					4	Fuse 2 burned		
					5	Lack of water alarm		
					6	Maximum pressure threshold		
					7	Minimum pressure threshold alarm.		
					8	External alarm		
					9	Command for Auto-test		
					10	Auto-test faulty		
					11	Power ON		
					12	Aut/Man mode		
Configuration of OUT_3 relay (6CP card)		c42	0635h	1590	RW		0=Disabled	12
					0	Disabled		
					1	P1 running		
					2	P2 running		
					3	Fuse 1 burned		
					4	Fuse 2 burned		
					5	Lack of water alarm		
					6	Maximum pressure threshold		
					7	Minimum pressure threshold alarm.		
					8	External alarm		
					9	Command for Auto-test		
					10	Auto-test faulty		
					11	Power ON		
					12	Aut/Man mode		
Configuration of OUT_4 relay (6CP card)		c43	0636h	1591	RW		0=Disabled	12
					0	Disabled		
					1	P1 running		
					2	P2 running		
					3	Fuse 1 burned		
					4	Fuse 2 burned		
					5	Lack of water alarm		

					6	Maximum pressure threshold	
					7	Minimum pressure threshold alarm.	
					8	External alarm	
					9	Command for Auto-test	
					10	Auto-test faulty	
					11	Power ON	
					12	Aut/Man mode	
Configuration of OUT_5 relay (6CP card)		c44	0637h	1592	RW	0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	
					3	Fuse 1 burned	
					4	Fuse 2 burned	
					5	Lack of water alarm	
					6	Maximum pressure threshold	
					7	Minimum pressure threshold alarm.	
					8	External alarm	
					9	Command for Auto-test	
					10	Auto-test faulty	
					11	Power ON	
					12	Aut/Man mode	
Configuration of OUT6 relay (6CP card)		c45	0638h	1593	RW	0=Disabled	12
					0	Disabled	
					1	P1 running	
					2	P2 running	
					3	Fuse 1 burned	
					4	Fuse 2 burned	
					5	Lack of water alarm	
					6	Maximum pressure threshold	
					7	Minimum pressure threshold alarm.	
					8	External alarm	

					9	Command for Auto-test	
					10	Auto-test faulty	
					11	Power ON	
					12	Aut/Man mode	
Enable ModBus port communication	c46	0639h	1594	RW		0=Disabled	1=Enabled
Setting the address	r46	063Ah	1595	RW		1	31
Parity	c47	063Bh	1596	RW		0=none	2=odd
					0	none	
					1	even	
					2	odd	
Baudrate	c48	063Ch	1597	RW		0=9600	3=57600
					0	9600	
					1	19200	
					2	38400	
					3	57600	
Loads all the default pa-rameters	c48	063Dh	1598	RW		0	1
Reads pump 1 operating hours	h49	063Eh	1599	RW		0	65536
Reads pump 2 operating hours	h50	063Fh	1600	RW		0	65536
Reads total hours of running of Q-SMART control panel	h51	0640h	1601	RW		0	65536
Resets memory of all pump hour counters	c52	0641h	1602	RW		0	3
Lack of water alarm. Protection against dry running of the pump	c53	0642h	1603	RW		0=Disabled	1=Enabled
Setting probe sensitivity according to water conductivity.	r53	0643h	1604	RW		0	10
Delay time until activation of lack of water alarm (c53)	t53	0644h	1605	RW		0	200
Enable alarm for minimum pressure threshold (only for system with sensor)	c54	0645h	1606	RW		0=Disabled	1=Enabled
Setting the minimum pressure threshold	r54	0646h	1607	RW	(0.1 resolution)	0.0	100.0
Delay time until activation of minimum pressure alarm threshold (c54=1)	t54	0647h	1608	RW		0	200

Enable alarm for maximum pressure threshold alarm (only for system with sensor)	c55	0648h	1609	RW		0=Disabled	1=Enabled
Setting the maximum pressure threshold alarm. All pumps are stopped in case of alarm	r55	0649h	1610	RW	(0.1 resolution)	0.0	100.0
Delay time until activation of maximum pressure alarm threshold (c55=1)	t55	064Ah	1611	RW		0	200
Enables system block if the same alarm occurs five times in 30 min.	c56	064Bh	1612	RW		0=Disabled	1=Enabled
Reset the alarm log	c57	064Ch	1613	RW		0	1
ALLARMI/ALARMS							
DESCRIZIONE DESCRIPTION	PARAMETRO PARAMETER	MODBUS ADDR (BASE 0)	MODBUS ADDR (BASE 1)	MODBUS ACCESS	UNITA' MISURA UNIT	MIN	MAX
word allarms		0301h	770	RW		0	65535
Single alarm							
Sensor alarm	A05	0301h.Bit0	770.Bit0	RW		0	1
External fault alarm Configuration of the indication of an external alarm connected to digital input D IN PROG	A39	0301h.Bit1	770.Bit1	RW		0	1
Lack of water alarm. Protection against dry running of the pump	A53	0301h.Bit2	770.Bit2	RW		0	1
Minimum threshold alarm	A54	0301h.Bit3	770.Bit3	RW		0	1
Max threshold alarm	A55	0301h.Bit4	770.Bit4	RW		0	1
Fuse F1 pump 1 burned.	A01	0301h.Bit5	770.Bit5	RW		0	1
Fuse F2 pump 2 burned	A02	0301h.Bit6	770.Bit6	RW		0	1
Alarm Lower limit sensor signal	A05	0301h.Bit7	770.Bit7	RW		0	1
Auto-test pump 1 failed	A24	0301h.Bit8	770.Bit8	RW		0	1
Auto-test pump 2 failed	A25	0301h.Bit9	770.Bit9	RW		0	1
High pressure alarm, PMAX	A36	0301h.Bit10	770.Bit10	RW		0	1
Minimum pressure alarm, PMIN	A37	0301h.Bit11	770.Bit11	RW		0	1
Minimum pressure out of op-eration range.	A38	0301h.Bit12	770.Bit12	RW		0	1
The same alarm is detected 5 times in the last 30 minutes	A56	0301h.Bit13	770.Bit13	RW		0	1

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