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Management System
ISO 9001:2015

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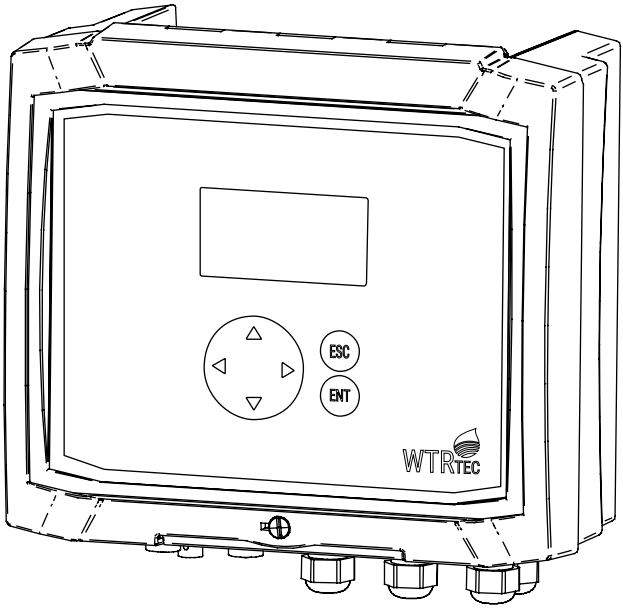
ITC
DOSING PUMPS



WTRTEC
MODBUS

ENGLISH

CONTENTS

SAFETY RULES

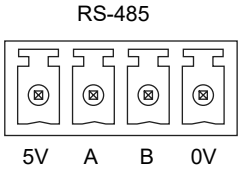
In order to avoid personal injury risks and environmental damage, and to ensure that the device works correctly, the personnel in charge of installing, operating and maintaining the device must follow the instructions given in this manual, paying particular attention to the recommendations and warning detailed in it. In addition, they must follow the specific instructions of use for the chemical products that they wish to dose.

This device must not be used by people (including children) with reduced physical, sensory or mental capacities or a lack of experience and knowledge, unless they do so under supervision or they are informed of the correct procedures. Children must not play with the device unsupervised.

1. WIRING AND CONFIGURATION

Connections

Bus	RS-485
Communication/Wiring	Half-Duplex A, B
Protocol	Modbus RTU



Serial communication

	Default value	Value range
Modbus slave address	1	1-99
Bits per second (baud rate)	9600	1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200
Number of bits	8	8
Parity	None	Even / Odd / Neither
Stop bits	1	1.2
Hardware control	No	--
Software control	No	--
Character timeout	20 ms	--
End of message timeout	100 ms	--

NB: If a RS232/RS485 converter or similar is required, make sure that the signal emitted does not produce an echo.

Supported modbus functions:

Read Holding Registers	0x03
Write Single Register	0x06
Write Multiple Registers	0x10

NB: This version of the manual refers to controller firmware version **WTRtec v1.21.** For other versions, please contact **sat@itc.es.**

2. IDENTIFICATION BENCH

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40000(0x9C40)	Device identification		Read Only	ALL
40001(0x9C41)	Device serial number		Read Only	ALL
40002(0x9C42)	Firmware version		Read Only	ALL
40003(0x9C43)	Hardware version		Read Only	ALL
40004(0x9C44)	Device model	1: GREY 2: BLUE 3: WHITE 4: RED 5: GREEN	Read Only	ALL

3. STATUS BENCH

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40050(0x9C72)	Output status	Bit 0: RELAY 1 Bit 1: RELAY 2 Bit 2: RELAY 3 Bit 3: RELAY 4 Bit 4: RELAY 5 Bit 5: DISPLAY LIGHT	Read Only	ALL
40051(0x9C73)	Input status	Bit 0: REMOTE Bit 1: INP 01 Bit 2: INP 02 Bit 3: INP 03 - FREQ	Read Only	ALL
40052(0x9C74)	Device status	Bit 0: OPERATIONAL Bit 1: ALARM Bit 2: REMOTE OFF Bit 3: UPDATING	Read Only	ALL
40053(0x9C75)	Alarms Active	Bit 0: Q = 0 Bit 1: Q DET = 0 Bit 2: EC MIN Bit 3: EC MAX Bit 4: N.C. Bit 5: CL MIN Bit 6: CL MAX Bit 7: N.C. Bit 8: PH MIN Bit 9: PH MAX Bit 10: N.C. Bit 11: RD MIN Bit 12: RD MAX Bit 13: N.C.	Read Only	ALL
40054(0x9C76)	CHANNEL 1 4-20mA (mA x 103) output value		Read Only	ALL
40055(0x9C77)	Status 4-20 CHANNEL 1	Bit 0: OUTPUT DISCONNECTED	Read Only	ALL
40056(0x9C78)	CHANNEL 2 4-20mA (mA x 103) output value		Read Only	ALL
40057(0x9C79)	Status 4-20 CHANNEL 2	Bit 0: OUTPUT DISCONNECTED	Read Only	ALL
40058(0x9C7A)	Flow meter frequency (Hz x 103)	MSB	Read Only	ALL
40059(0x9C7B)	Flow meter frequency (Hz x 103)	LSB	Read Only	ALL
40060(0x9C7C)	Flow rate (m^3/h or gpm x 100)	MSB	Read Only	ALL
40061(0x9C7D)	Flow rate (m^3/h or gpm x 100)	LSB	Read Only	ALL
40062(0x9C7E)	pH sensor value (mV)		Read Only	ALL
40063(0x9C7F)	pH value		Read Only	ALL
40064(0x9C80)	Temperature value (ºC or ºF x 10)	If it is not installed, it returns -600.	Read Only	ALL

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40065(0x9C81)	Temperature sensor value (Ohms x 10)		Read Only	ALL
40066(0x9C82)	Redox value (mV)		Read Only	BLUE, WHITE
40067(0x9C83)	EC temperature value (ºC or ºF x 10)	If it is not installed, it returns -600.	Read Only	GREY, GREEN
40068(0x9C84)	EC temperature sensor value (ohms)		Read Only	GREY, GREEN
40069(0x9C85)	EC conductivity sensor value (ohms)		Read Only	GREY, GREEN
40070(0x9C86)	EC conductivity value (mS x 100)		Read Only	GREY, GREEN
40071(0x9C87)	Chlorine sensor value (NA)		Read Only	GREY, BLUE, WHITE
40072(0x9C88)	Chlorine value (ppm x 100)		Read Only	GREY, BLUE, WHITE
40073(0x9C89)	Chlorine functions status	Bit 0: Functioning Bit 1: Clean Bit 2: Post-Clean Bit 2: Over-Chlorinated Bit 3: Purge	Read Only	GREY, BLUE, WHITE
40074(0x9C8A)	RESERVED	RESERVED	RESERVED	RESERVED
40075(0x9C8B)	Output flow rate regulation (% x 10)		Read Only	GREEN
40076(0x9C8C)	Output EC regulation (% x 10)		Read Only	GREY, GREEN
40077(0x9C8D)	Output chlorine regulation (% x 10)		Read Only	GREY, BLUE, WHITE
40078(0x9C8E)	Output PH regulation (% x 10)		Read Only	ALL
40079(0x9C8F)	RESERVED	RESERVED	RESERVED	RESERVED
40080(0x9C90)	Output PH2 regulation (% x 10)		Read Only	RED
40081(0x9C91)	WTRTec GREEN Conductivity or Flow Rate Control.	0: EC control 1: Q control	Read Only	GREEN
40082(0x9C92)	Device time in operation (seconds)	MSB	Read Only	ALL
40083(0x9C93)	Device time in operation (seconds)	LSB	Read Only	ALL

4. FLOW RATE BENCH

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40100(0x9CA4)	Regulation set-point (% or ppm x 100)		Read & Write	GREEN
40101(0x9CA5)	Control activation	0: Deactivated/ Deactivate 1: Active/Activate	Read & Write	GREEN
40102(0x9CA6)	Output control	0: None 1: 4-20 CHANNEL 1 2: 4-20 CHANNEL 2 3: RELAY 4 4: RELAY 5	Read & Write	GREEN
40103(0x9CA7)	Maximum control output flow rate (%)		Read & Write	GREEN
40104(0x9CA8)	Pump flow rate (m^3/h or gph x 100)	MSB	Read & Write	GREEN
40105(0x9CA9)	Pump flow rate (m^3/h or gph x 100)	LSB	Read & Write	GREEN
40106(0x9CAA)	Time to activate alarm Q=0 with flow meter or counter (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	ALL
40107(0x9CAB)	Control stoppage with alarm Q=0 on flow meter or counter	0: NO 1: CONTROL STOP	Read & Write	ALL
40108(0x9CAC)	Automatically rearm alarm Q=0	0: Do not rearm 1: Rearm automatically	Read & Write	ALL
40109(0x9CAD)	Time to activate alarm with flow sensor	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	ALL
40110(0x9CAE)	Flow sensor alarm stoppage	0: NO 1: CONTROL STOP	Read & Write	ALL
40111(0x9CAF)	Automatically rearm flow sensor alarm	0: Do not rearm 1: Rearm automatically	Read & Write	ALL
40112(0x9CB0)	Sensor type			ALL
40113(0x9CB1)	Time without pulses to establish Q=0 with counter/LOW (seconds)	MSB	Read & Write	ALL
40114(0x9CB2)	Counter-flow meter K factor (l/pulse or g/pulse - pulses/l or pulses/g x 100)	LSB	Read & Write	ALL

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40115(0x9CB3)	Counter-flow meter K factor (l/pulse or g/pulse - pulses/l or pulses/g x 100)		Read & Write	ALL
40116(0x9CB4)	Refresh time for regulation calculations		Read & Write	ALL

5. CONDUCTIVITY (EC) BENCH

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40150(0x9CD6)	Regulation set-point (mS x 100)		Read & Write	GREY/GREEN
40151(0x9CD7)	Control activation	0: Deactivated/ Deactivate 1: Active/Activate	Read & Write	GREY/GREEN
40152(0x9CD8)	Output control			GREY/GREEN
40153(0x9CD9)	Maximum control output flow rate (%)	MSB	Read & Write	GREEN
40154(0x9CDA)	Pump flow rate (m^3/h or gph x 100)	LSB	Read & Write	GREEN
40155(0x9CDB)	Pump flow rate (m^3/h or gph x 100)	0: Disabled	Read & Write	GREEN
40156(0x9CDC)	Enable PIQ flow control	1: Enabled	Read & Write	GREEN
40157(0x9CDD)	PEC conductivity parameter (mS x 100)		Read & Write	GREEN
40158(0x9CDE)	KP proportional control constant		Read & Write	GREEN
40159(0x9CDF)	KI integral control constant		Read & Write	GREEN
40160(0x9CE0)	Injection/sensor delay time TDelay (seconds)		Read & Write	GREEN
40161(0x9CE1)	Flow test for calculating TDelay (m^3/h or gpm x 100)	MSB	Read & Write	GREEN
40162(0x9CE2)	Flow test for calculating TDelay (m^3/h or gpm x 100)	LSB	Read & Write	GREEN
40163(0x9CE3)	Towers EC hysteresis (mS x 100)		Read & Write	GREY
40164(0x9CE4)	Residual dose (%)		Read & Write	BLUE
40165(0x9CE5)	Maximum time to activate EC alarm (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	GREY/GREEN

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40166(0x9CE6)	Differential with respect to the set-point to activate maximum EC alarm (mS x 100)		Read & Write	GREY/GREEN
40167(0x9CE7)	Minimum time to activate EC alarm (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	GREY/GREEN
40168(0x9CE8)	Differential with respect to the set-point to activate minimum EC alarm (mS x 100)		Read & Write	GREY/GREEN
40169(0x9CE9)	Conductivity alarms stoppage	0: NO 1: CONTROL STOP 2: EC/Q CONTROL STOP	Read & Write	GREEN
40170(0x9CEA)	Automatically rearm flow sensor alarm	0: Do not rearm 1: Rearm automatically	Read & Write	GREY/GREEN
40171(0x9CEB)	Conductivity sensor type	0: ITC sensor 1: Standard K=1 sensor	Read & Write	GREY/GREEN

6. CHLORINE BENCH (PPM)

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40200(0x9D08)	Regulation set-point (ppm x 100)		Read & Write	GREY/BLUE/ WHITE
40201(0x9D09)	Control activation	0: Deactivated/ Deactivate 1: Active/Activate	Read & Write	GREY/BLUE/ WHITE
40202(0x9D0A)	Output control	0: None 1: 4-20 CHANNEL 1 2: 4-20 CHANNEL 2 3: RELAY 4 4: RELAY 5	Read & Write	GREY/BLUE/ WHITE
40203(0x9D0B)	Maximum control output flow rate (%)			GREY/BLUE/ WHITE
40204(0x9D0C)	Pump flow rate (m^3/h or gph x 100)	MSB	Read & Write	GREY/BLUE/ WHITE
40205(0x9D0D)	Pump flow rate (m^3/h or gph x 100)	LSB	Read & Write	GREY/BLUE/ WHITE
40206(0x9D0E)	Enable PIQ flow control	0: Disabled 1: Enabled	Read & Write	GREY/BLUE/ WHITE
40207(0x9D0F)	KP proportional control constant			GREY/BLUE/ WHITE
40208(0x9D10)	KI integral control constant		Read & Write	GREY/BLUE/ WHITE
40209(0x9D11)	Injection/sensor delay time TDelay (seconds)		Read & Write	GREY/BLUE/ WHITE
40210(0x9D12)	Flow test for calculating TDelay (m^3/h or gpm x 100)	MSB	Read & Write	GREY/BLUE/ WHITE
40211(0x9D13)	Flow test for calculating TDelay (m^3/h or gpm x 100)	LSB	Read & Write	GREY/BLUE/ WHITE
40212(0x9D14)	Over-chlorination set-point (ppm x 100)		Read & Write	GREY
40213(0x9D15)	Over-chlorination time (minutes)		Read & Write	GREY
40214(0x9D16)	Purge time (minutes)		Read & Write	GREY
40215(0x9D17)	Maximum time to activate chlorine alarm (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	GREY/BLUE/ WHITE

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40216(0x9D18)	Differential with respect to the set-point to activate maximum chlorine alarm (ppm x 100)		Read & Write	GREY/BLUE/ WHITE
40217(0x9D19)	Minimum time to activate chlorine alarm (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	GREY/BLUE/ WHITE
40218(0x9D1A)	Differential with respect to the set-point to activate minimum chlorine alarm (ppm x 100)		Read & Write	GREY/BLUE/ WHITE
40219(0x9D1B)	Chlorine alarms stoppage	0: NO 1: CONTROL STOP 2: PPM CONTROL STOP	Read & Write	GREY/BLUE/ WHITE
40220(0x9D1C)	Automatically rearm chlorine alarms.	0: Do not rearm 1: Rearm automatically	Read & Write	GREY/BLUE/ WHITE
40221(0x9D1D)	Cleaning interval of chlorine sensor (hours)		Read & Write	GREY/BLUE/ WHITE
40222(0x9D1E)	Cleaning interval of chlorine sensor (seconds)		Read & Write	GREY/BLUE/ WHITE
40223(0x9D1F)	Maintain control during cleaning	0: Control OFF 1: Control ON	Read & Write	GREY/BLUE/ WHITE

7. pH BENCH

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40250(0x9D3A)	Regulation set-point (pH x 100)		Read & Write	ALL
40251(0x9D3B)	Control activation	0: Deactivated/ Deactivate 1: Active/Activate	Read & Write	ALL
40252(0x9D3C)	Output control	0: None 1: 4-20 CHANNEL 1 2: 4-20 CHANNEL 2 3: RELAY 4 4: RELAY 5	Read & Write	ALL
40253(0x9D3D)	Maximum control output flow rate (%)			ALL
40254(0x9D3E)	Pump flow rate (m^3/h or gph x 100)	MSB	Read & Write	ALL
40255(0x9D3F)	Pump flow rate (m^3/h or gph x 100)	LSB	Read & Write	ALL
40256(0x9D40)	Enable PIQ flow control	0: Disabled 1: Enabled	Read & Write	ALL
40257(0x9D41)	pH - PPH parameter			
40258(0x9D42)	KP proportional control constant		Read & Write	ALL
40259(0x9D43)	KI integral control constant		Read & Write	ALL
40260(0x9D44)	Injection/sensor delay time TDelay (seconds)		Read & Write	ALL
40261(0x9D45)	Flow test for calculating TDelay (m^3/h or gpm x 100)	MSB	Read & Write	ALL
40262(0x9D46)	Flow test for calculating TDelay (m^3/h or gpm x 100)	LSB	Read & Write	ALL
40263(0x9D47)	Output control 2	0: None 1: 4-20 CHANNEL 1 2: 4-20 CHANNEL 2 3: RELAY 4 4: RELAY 5	Read & Write	RED
40264(0x9D48)	Maximum control 2 output flow rate (%)			RED
40265(0x9D49)	Pump 2 flow rate (l/h or gph x 100)	MSB	Read & Write	RED

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40266(0x9D4A)	Pump 2 flow rate (l/h or gph x 100)	LSB	Read & Write	RED
40267(0x9D4B)	pH hysteresis with double pH regulation (pH x 100)		Read & Write	RED
40268(0x9D4C)	Maximum time to activate pH alarm (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	ALL
40269(0x9D4D)	Differential with respect to the set-point to activate maximum pH alarm (pH x 100)		Read & Write	ALL
40270(0x9D4E)	Minimum time to activate pH alarm (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	ALL
40271(0x9D4F)	Differential with respect to the set-point to activate minimum pH alarm (pH x 100)		Read & Write	ALL
40272(0x9D50)	pH alarms stoppage	0: NO 1: CONTROL STOP 2: pH CONTROL STOP	Read & Write	ALL
40273(0x9D51)	Automatically rearm pH alarms	0: Do not rearm 1: Rearm automatically	Read & Write	ALL
40274(0x9D52)	pH reading mode	0: Reading deactivated 1: Reading from sensor 2: pH assigned manually	Read & Write	ALL
40275(0x9D53)	pH value assigned manually (pH x 100)		Read & Write	ALL
40276(0x9D54)	Acid/base control type	1: acid 2: base	Read & Write	ALL
40277(0x9D55)	Control type	0: No control 1: acid 2: base	Read & Write	RED

8. REDOX (ORP) BENCH

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40312(0x9D78)	Maximum time to activate ORP alarm (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	BLUE/WHITE
40313(0x9D79)	Differential with respect to the set-point to activate maximum ORP alarm (mV)		Read & Write	BLUE/WHITE
40314(0x9D7A)	Minimum time to activate ORP alarm (seconds)	0: Alarm deactivated X: Alarm time in seconds.	Read & Write	BLUE/WHITE
40315(0x9D7B)	Differential with respect to the set-point to activate the minimum pH alarm (mV)		Read & Write	BLUE/WHITE
40316(0x9D7C)	ORP alarms stoppage	0: NO 1: CONTROL STOP 2: PPM CONTROL STOP	Read & Write	BLUE/WHITE
40317(0x9D7D)	Automatically rearm ORP alarms	0: Do not rearm 1: Rearm automatically	Read & Write	BLUE/WHITE
40318(0x9D7E)	Oxidant/reductant control type	0: oxidant 1: reductant	Read & Write	BLUE/WHITE

9. CONFIGURATION BENCH

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40350(0x9D9E)	Flow rate unit	0: Litres 1: Gallons	Read & Write	ALL
40351(0x9D9F)	Temperature unit	0: ºC 1: ºF	Read & Write	ALL
40352(0x9DA0)	Flow rate control unit	0: ppm 1: %	Read & Write	GREEN
40353(0x9DA1)	Diameter unit	0: mm 1: inches	Read & Write	WHITE
40354(0x9DA2)	Parameter value for 4mA in OUTPUT 1 REGISTER (units depending on parameter)	MSB	Read & Write	ALL
40355(0x9DA3)	Parameter value for 4mA in OUTPUT 1 REGISTER (units depending on parameter)	LSB	Read & Write	ALL
40356(0x9DA4)	Parameter value for 20mA in OUTPUT 1 REGISTER (units depending on parameter)	MSB	Read & Write	ALL
40357(0x9DA5)	Parameter value for 20mA in OUTPUT 1 REGISTER (units depending on parameter)	LSB	Read & Write	ALL
40358(0x9DA6)	Parameter value for 4mA in OUTPUT 2 REGISTER (units depending on parameter)	MSB	Read & Write	ALL
40359(0x9DA7)	Parameter value for 4mA in OUTPUT 2 REGISTER (units depending on parameter)	LSB	Read & Write	ALL
40360(0x9DA8)	Parameter value for 20mA in OUTPUT 2 REGISTER (units depending on parameter)	MSB	Read & Write	ALL

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40361(0x9DA9)	Parameter value for 20mA in OUTPUT 2 REGISTER (units depending on parameter)	LSB	Read & Write	ALL
40362(0x9DAA)	Associated parameter CHANNEL 1	0: NONE 1: PH 2: ORP 3: EC 4: PPM 5: Q	Read & Write	ALL
40363(0x9DAB)	Associated parameter CHANNEL 2	0: NONE 1: PH 2: ORP 3: EC 4: PPM 5: Q	Read & Write	ALL
40364(0x9DAC)	The temperature measurement is taken by the temperature sensor or by the conductivity probe	0: Temperature sensor 1: EC sensor	Read & Write	ALL
40365(0x9DAD)	Temperature reading mode	0: Reading deactivated 1: Reading from sensor 2: Temperature assigned manually	Read & Write	ALL
40366(0x9DAE)	Manual temperature value (ºC/ºF x 10)		Read & Write	ALL
40367(0x9DAF)	Pipe inner diameter (mm/inches x 10)		Read & Write	WHITE
40368(0x9DB0)	Flow rate compensation when calculating chlorine concentration	0: With compensation 1: With compensation	Read & Write	WHITE
40369(0x9DB1)	RESERVED	RESERVED	RESERVED	RESERVED
40370(0x9DB2)	RESERVED	RESERVED	RESERVED	RESERVED
40371(0x9DB3)	RESERVED	RESERVED	RESERVED	RESERVED
40372(0x9DB4)	RESERVED	RESERVED	RESERVED	RESERVED
40373(0x9DB5)	Biocide (% x 100)		Read & Write	GREY/BLUE
40374(0x9DB6)	Cooling tower flow rate (m^3/h or gpm x 100)	MSB	Read & Write	GREY
40375(0x9DB7)	Cooling tower flow rate (m^3/h or gpm x 100)	LSB	Read & Write	GREY
40376(0x9DB8)	Cooling tower volume (m^3 or gallons x 100)	MSB	Read & Write	GREY

MODBUS ADDRESS	DESCRIPTION	NOTES	READING/ WRITING	AVAILABLE IN MODEL
40377(0x9DB9)	Cooling tower volume (m^3 or gallons x 100)	LSB	Read & Write	GREY
40378(0x9DBA)	Display automatic turn-off	0: Deactivated 1: Activated	Read & Write	ALL

NB: We recommend reading and modifying variables that occupy two registers at the same time (reading/writing of two registers).

NB: Each time a parameter is modified, the pump configuration is written on the non-volatile memory. These must not be continuous as the memory can only be written on a limited number of times (between 1 and 2 million).

10. EXAMPLES

Reading one register READ HOLDING REGISTERS (0x03)

Request

Slave ID	Function	Reg ADDR HI	Reg ADDR LO	Num Reg HI	Num Reg LO	CRC HI	CRC LO
0x01	0x03	0x9C	0x42	0x00	0x01	0x0A	0x4E

Response

Slave ID	Function	Byte Count	Value HI	Value LO	CRC HI	CRC LO
0x01	0x03	0x02	0x00	0x79	0x79	0xA6

Query results:

Software version	0x0079 → 121 → Version 1.21

Reading multiple registers (mV pH, pH, Temperature) READ HOLDING REGISTERS (0x03)

Request

Slave ID	Function	Reg ADDR HI	Reg ADDR LO	Num Reg HI	Num Reg LO	CRC HI	CRC LO
0x01	0x03	0x9C	0x7E	0x00	0x03	0x4B	0x83

Response

Slave ID	Function	Byte Count	Value1 HI	Value1 LO	Value2 HI	Value2 LO	Value3 HI	Value3 LO
0x01	0x03	0x06	0x00	0x01	0x02	0xBB	0x00	0x00

Value3 HI	Value3 LO	CRC HI	CRC LO
0x00	0xBB	0x2D	0x5B

Query results:

mV pH	0x0001 → 1 * 10-1 → 0.1 mV
pH	0x02BB → 699 * 10-2 → 6.99 pH
Temperature	0x00BB → 187 * 10-1 → 18.7 ºC

Writing one register WRITE SINGLE REGISTER (0x10)

Activate pH control	(0x9D3B) = 1 (0x0001)

Request:

Slave ID	Function	Reg ADDR HI	Reg ADDR LO	Value HI	Value LO	CRC HI	CRC LO
0x01	0x06	0x9D	0x3B	0x00	0x01	0x16	0x6B

Response:

Slave ID	Function	Reg ADDR HI	Reg ADDR LO	Value HI	Value LO	CRC HI	CRC LO
0x01	0x06	0x9D	0x3B	0x00	0x01	0x16	0x6B

Writing multiple registers WRITE MULTIPLE REGISTERS (0x10)

Output chlorine control (0x9D0A)	0x0001 = 4-20 CHANNEL 1
Output limit (%)	0x005F = 95 %
Pump chlorine control nominal flow rate	0x000003B6 = 9.50 l/h

Request:

Slave ID	Function	Reg ADDR HI	Reg ADDR LO	Num Reg HI	Num Reg LO	Byte Count	Value1 HI	Value1 LO
0x01	0x10	0x9D	0x0A	0x00	0x04	0x08	0x00	0x01

Value2 HI	Value2 LO	Value3 HI	Value3 LO	Value4 HI	Value4 LO	CRC HI	CRC LO
0x00	0x5F	0x00	0x00	0x03	0xB6	0x79	0xF5

Response:

Slave ID	Function	Reg ADDR HI	Reg ADDR LO	Num Reg HI	Num Reg LO	CRC HI	CRC LO
0x01	0x10	0x9D	0x0A	0x00	0x04	0xCE	0x64

11. ERROR RESPONSE CODES

Error response frames	Error description
Slave ID / **Error** / **Exception** / **CRC HI** / **CRC LO** 0x01 / 0x83 / 0x02 / 0xC0 / 0xF1	Reading error. One of the registers is not permitted.
Slave ID / **Error** / **Exception** / **CRC HI** / **CRC LO** 0x01 / 0x83 / 0x03 / 0x03 / 0x01	Reading error. The number of registers to read is invalid.
Slave ID / **Error** / **Exception** / **CRC HI** / **CRC LO** 0x01 / 0x86 / 0x02 / 0xC3 / 0xA1	Error writing single register. Register not permitted.
Slave ID / **Error** / **Exception** / **CRC HI** / **CRC LO** 0x01 / 0x86 / 0x04 / 0x43 / 0xA3	Error writing single register. The variable value is out of range.
Slave ID / **Error** / **Exception** / **CRC HI** / **CRC LO** 0x01 / 0x90 / 0x03 / 0xC0 / 0x01	Error writing multiple registers. The number of registers to write is invalid.
Slave ID / **Error** / **Exception** / **CRC HI** / **CRC LO** 0x01 / 0x90 / 0x04 / 0x4D / 0xC3	Error writing multiple registers. One of the variable values is out of range.

EU DECLARATION OF CONFORMITY

CE

I.T.C S.L.
Vallès, 26
Polígono Industrial Can Bernades-Subirà
08130 Santa Perpètua de Mogoda, Spain

Declares that the **WTR$_{TEC}$** products identified by serial number and manufacture year comply with the Low Voltage Directive 2014/35/EU and the Electromagnetic Compatibility Directive 2014/30/EU, provided that the installation, use and maintenance are performed in accordance with current legislation and the indications given in the instruction manual.

Xavier Corbella
Manager

ITC GUARANTEE
DOSING PUMPS

I.T.C. S.L. guarantees the product specified in this document against all manufacturer or material faults for 1 year, provided that the device has been installed, used and maintained correctly.

The device must be sent free of charge to an accredited workshop or to I.T.C. S.L.'s technical service, and it will be returned to you, cash on delivery.

The warranty document bearing the purchase date and the stamp of the establishment where the device was purchased, or a photocopy of the purchase invoice, must be sent alongside the device.

MODEL _____

SERIAL NO. _____

Purchase date and stamp of the establishment where the device was purchased

DATE: _____

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ITC
DOSING PUMPS

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