AQUIONICS
UV That Works!

PureLine PQ

UVtronic
USER INTERFACE
MANUAL

C   USA

PureLine PQ models certified by WQA to NSF/ANSI 61 for materials safety only, as verified and substantiated by test data.

Models Covered

412 – PureLine PQ 0005
420 – PureLine PQ 0008
435 – PureLine PQ 0016
635 – PureLine PQ 0030
875 – PureLine PQ 0090

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Should any problems be encountered during the installation of your system, please do not hesitate to contact either our sales or service team using the details shown.

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190073-XXXX-01

1 Introduction

This manual describes the UVtronic control system and is intended to provide guidance on operation, maintenance and fault finding.

The parameters described here define the correct operation of the unit; these are Factory Set to suit the process requirements. Changing these parameters can lead to insufficient UV disinfection or dis-functioning of the entire system and could infringe the validation of the UV system.

Changing the configuration options of the system should be done by personnel fully aware of the implications of these changes. For help in configuring, training courses and any other information please refer to the contact section at the beginning of the manual.

2 Hardware (Version 0.7.01.09)

The UVtronic controller is installed within a cabinet fitted with a door isolator with wired connection at the bottom. All the connections to the cabinet are through compression glands on the bottom plate (gland plate).

All the wiring between the UVtronic control panel and UV chamber is pre-wired at the panel end. The only wiring required at the panel end is the mains supply (see Figure 2) and, if required, to the customer interface terminals (see Figure 3).

For connecting the wiring at the chamber end and mains supply wiring to the control panel, instructions are provided in the "Installation and Safety Manual".

The UVtronic controller has a backlight 4x20 character LCD display with user interface keys and a status indicator.

The UVtronic can be remotely controlled through a serial interface (MODBUS protocol over RS232 or RS485). The protocol is described further in this manual.

Some of the apertures of the gland plate at the bottom of the unit are already populated with cables to connect to the chamber. Other apertures are blanked off at the factory and are available for optional connections. If the optional connections are made these should use the aperture as per Figure 1 and suitable cable glands used.
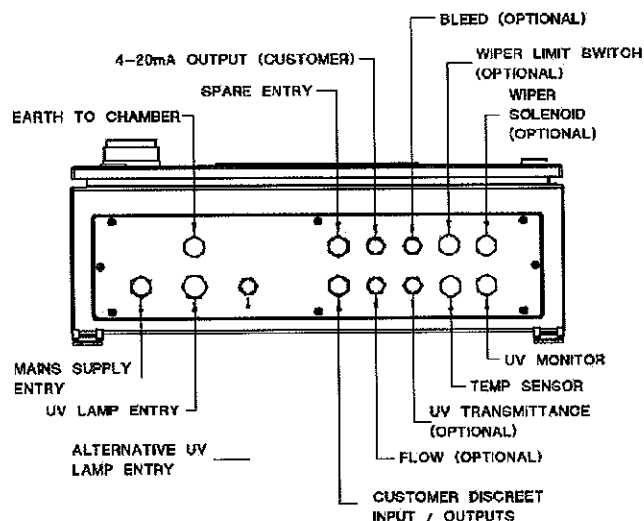
Figure 1 Gland Plate Details

Figure 2 Control Cabinet Internal View

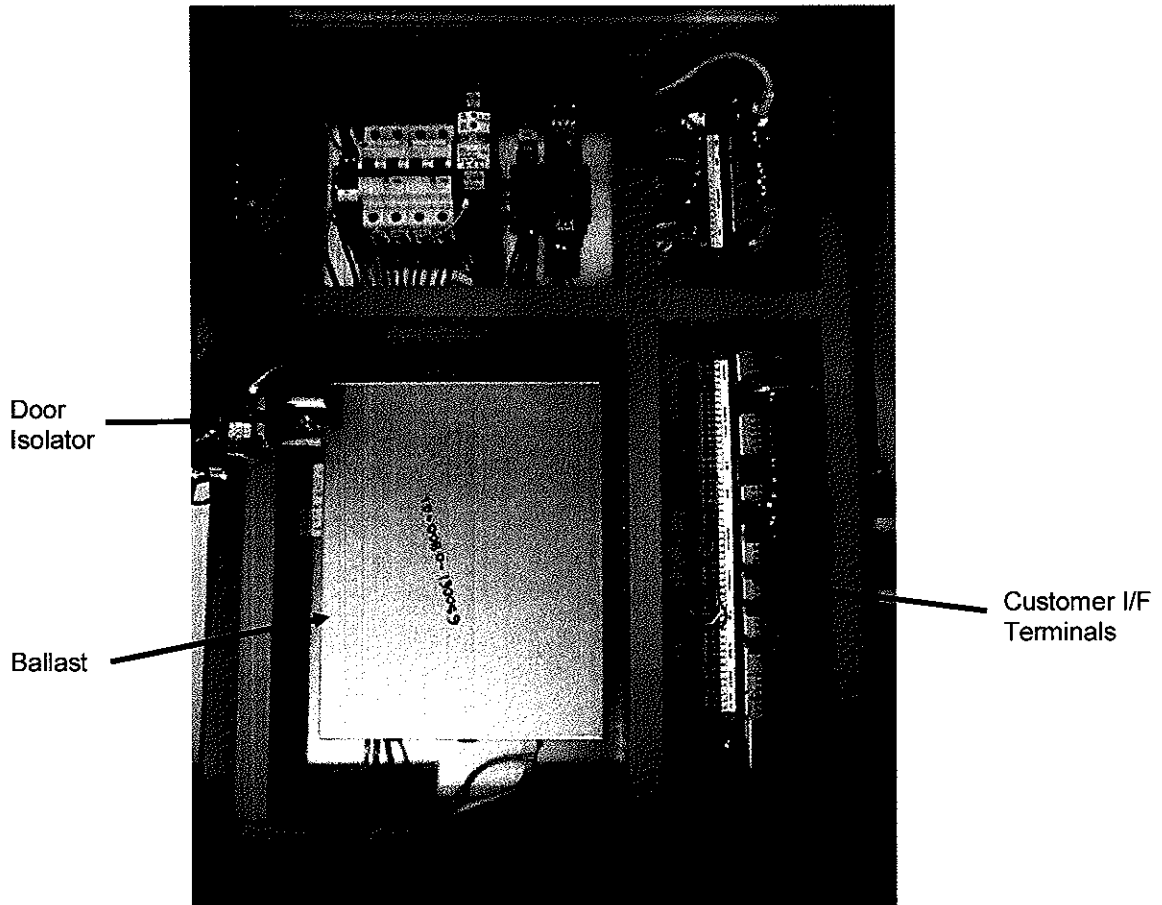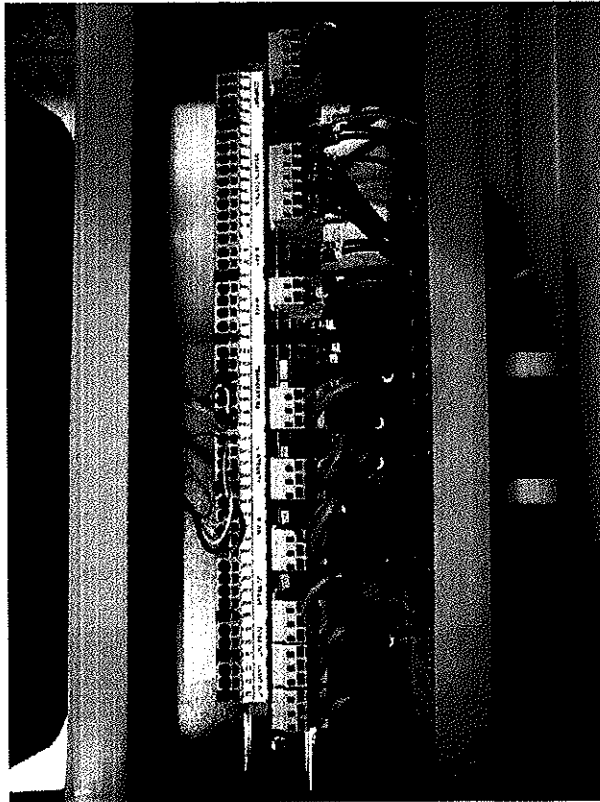The cabinet is not intended to be opened by the operator, only by qualified personnel.

Figure 3 Customer Interface Terminals

2.1 Customer Interface Terminals

The terminals in the customer interface area (Figure 3) are the only ones that need to be accessed when connecting optional devices. Table 1 lists the terminals from top to bottom.

Table 1 – Customer Interface terminal connections

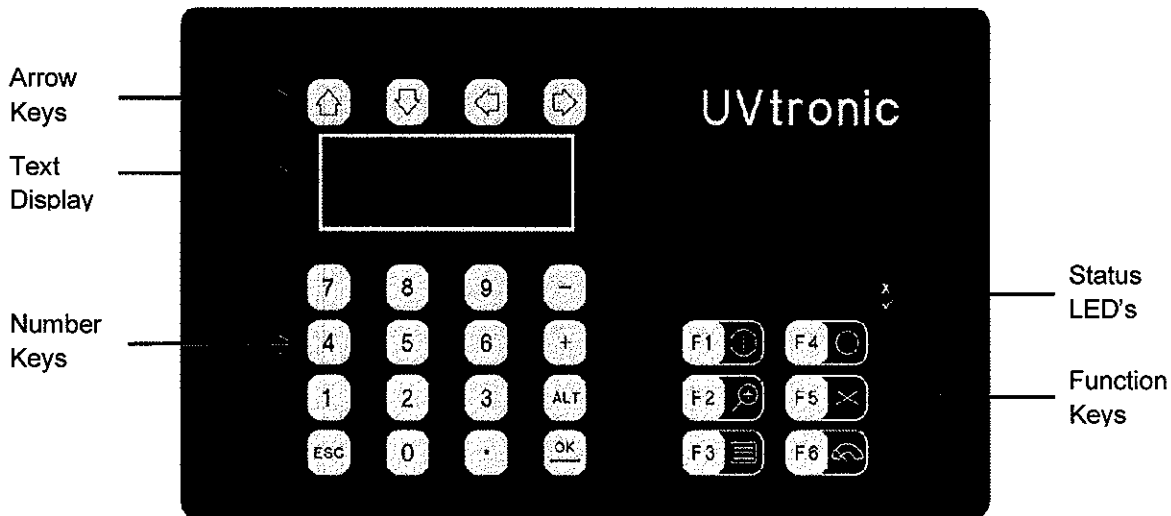| N	Terminal Ident.	Port name	Signal Name	Direction	Type	Use
1	A01	COMPORT	A (TX RS232)	BI (OUT)	COM	Customer
2	A02	COMPORT	B (RX RS232)	BI (IN)	COM	Customer
3	A03	COMPORT	GND	OUT	POWER	Customer
4	A04	COMPORT	SCREEN	-	SCREEN	Customer
5	B01	DISCRETE CONTROL	SCREEN	-	SCREEN	Customer
6	B02	DISCRETE CONTROL	24VDC	OUT	POWER	Customer
7	B03	DISCRETE CONTROL	GND	OUT	POWER	Customer
8	B04	DISCRETE CONTROL	SPARE	-	-	Customer
9	B05	DISCRETE CONTROL	REPLACE LAMP	OUT	Digital (24V-10mA)	Customer
10	B06	DISCRETE CONTROL	ANY TRIP	OUT	Digital (24V-10mA)	Customer
11	B07	DISCRETE CONTROL	ANY WARNING	OUT	Digital (24V-10mA)	Customer
12	B08	DISCRETE CONTROL	SYSTEM AVAILABLE	OUT	Digital (24V-10mA)	Customer
13	B09	DISCRETE CONTROL	SYSTEM IN REMOTE	OUT	Digital (24V-10mA)	Customer
14	B10	DISCRETE CONTROL	LAMP RUNNING	OUT	Digital (24V-10mA)	Customer
15	B11	DISCRETE CONTROL	SYSTEM START	IN	Digital (24V)	Customer
16	C01	BLEED	COMMAND	OUT	Digital (24V-10mA)	Customer
17	C02	BLEED	GND	OUT	POWER	Customer
18	D01	WIPER	SCREEN	-	SCREEN	Factory
19	D02	WIPER	24VDC	OUT	POWER	Factory
20	D03	WIPER	LIMIT SWITCH	IN	Digital (24V)	Factory
21	D04	WIPER	COMMAND	OUT		Factory
22	D05	WIPER	GND	OUT	POWER	Factory
23	D06	WIPER	SCREEN	-	SCREEN	Factory
24	F01	TEMPERATURE	OVERTEMP	IN	Digital (24V)	Factory
25	F02	TEMPERATURE	24VDC	OUT	POWER	Factory
26	F03	TEMPERATURE	24VDC	OUT	POWER	Factory
27	F04	TEMPERATURE	GND	NA	POWER	No
28	F05	TEMPERATURE	RETURN	NA	-	No
29	F06	TEMPERATURE	SIGNAL	IN	4-20mA	Factory
30	F07	TEMPERATURE	SCREEN	-	SCREEN	Factory
31	G01	UV INTENSITY	24VDC	OUT	POWER	Factory
32	G02	UV INTENSITY	GND	NA	POWER	No
33	G03	UV INTENSITY	RETURN	NA	-	No
34	G04	UV INTENSITY	SIGNAL	IN	4-20mA	Factory
35	G05	UV INTENSITY	SCREEN	-	SCREEN	Factory
36	H01	FLOW	24VDC	OUT	POWER	Customer
37	H02	FLOW	GND	NA	POWER	No
38	H03	FLOW	RETURN	NA	-	No
39	H04	FLOW	SIGNAL	IN	4-20mA	Customer
40	H05	FLOW	SCREEN	-	SCREEN	Customer
41	J01	UV TRANS	24VDC	OUT	POWER	Customer
42	J02	UV TRANS	GND	NA	POWER	No
43	J03	UV TRANS	RETURN	NA	-	No
44	J04	UV TRANS	SIGNAL	IN	4-20mA	Customer
45	J05	UV TRANS	SCREEN	-	SCREEN	Customer
46	K01	DOSE OUT	NEGATIVE	OUT	4-20mA	Customer
47	K02	DOSE OUT	POSITIVE	OUT	4-20mA	Customer
48	K03	DOSE OUT	SCREEN	-	SCREEN	Customer
49	L01	UVINT OUT	NEGATIVE	OUT	4-20mA	Customer
50	L02	UVINT OUT	POSITIVE	OUT	4-20mA	Customer
51	L03	UVINT OUT	SCREEN	-	SCREEN	Customer

2.2 Specifications (electrical)

Table 2 gives an overview of all inputs and outputs that might be used by the customer. Please refer to the circuit diagrams for the relevant connections, drawing 210080-XXXX and 210081-XXXX in the Installation and Safety manual.
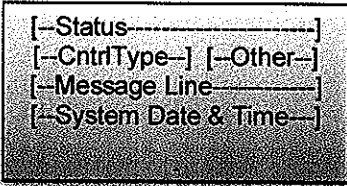
Table 2 - Electrical specifications

Use	Specification	Explanation
Comms. port	RS485 signal	Full system control by SCADA
Lamp change (If bleed Not installed)		Output when suggested time to change lamp
Any trip		Output if there is an active alarm (trip)
Any warning	Relay output	Output if there is an active warning
System available	24V DC 10mA max	Output when system ready to start (healthy)
System in remote		Output when system set for remote operation
Lamp running		Output after warm up and flow is stable
Bleed		Output when chamber over temp
Remote start input	24V DC 10mA max	Input starts lamp
Flow	Analogue input 24V	Signal of the liquid flow sensor
Transmittance	0mA-20mA DC	Signal of the transmittance sensor
UV dose	Analogue output 24V DC	System dose level 20 mA level to be specified, 4 mA = zero dose
UV Intensity		System intensity level 20 mA level to be specified, 4 mA = zero intensity

3 Local User Interface

Figure 4 UV tronic User Interface

The display comprises the following items:

Arrow Keys	These allow various option menus to be scrolled through in two directions and to move through the menus and active messages.
Text Display	The text display consists of four lines. The first line of the display shows the systems status. The second line shows the control type of the unit (remote or local) and additional information if required, such as power level, dose or intensity. The third line shows active message (warning and alarms if present). The bottom line shows the date and time. If alarms are active this will be the alarm date and time. [--Status-----------------] [--CntrlType--] [--Other--] [--Message Line-----------] [--System Date & Time--]
Number Keypad	These keys are used for entering numeric values. They cannot be used in the operator menu.
Status-LEDs	When the UVtronic software is running, the ✓ (Run) LED will be lit. This is not related to the UV lamps being "ON" or "OFF". The × (Stop) LED will only be lit when the software is being reloaded and should therefore be off during normal operation.
Function Keys	These have the following functions: F1: Start system: Switch ON UV lamp. F2: Clear trip. F3: Activates the menu. Use arrow keys to scroll through menu. F4: Stop system: switch off UV Lamp. F5: Clear Alarm on the display. F6: Execute wipe action.

3.1 Menu operations

The menus available are:

Operator menu	This menu is available to the operator and provides operational data, both actual and historical. The menu allows the user to view additional information and to reset the system following a TRIP condition (provided the condition has been cleared).
Secured User menu	This menu allows access to parameters that can be modified by the user. This menu is password protected.
Maintenance menu	This menu contains settings that are made when preparing the equipment for shipment. It is not available to the operator and is password protected with a different code from the Secure User menu.

1. To enter the menus press [F3]. The Text Display shows:

MENU SELECTION
> Operator menu
Secured User menu
Maintenance menu
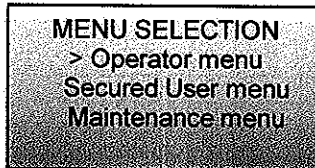
The > character is the placeholder for the arrow key (cursor) indicating the selected item of the menu. To enter the operator menu press [OK] with the cursor in position as shown above.

2. Use the arrow keys [⇩] and [⇧] to scroll to the desired menu line, and then press [OK] to select.

3. If there are sub options: scroll through them with up/down buttons [⇩] and [⇧] then select the displayed sub options by pressing [OK].

4. To move up one menu level press [ESC].

5. The structure and content of the Operator menu can vary depending on the options that are selected in the Secure User and Maintenance menus.

Local mode has priority over Remote mode.

Remote mode can only be set in Local mode.

Local mode can only be set in Remote mode.

When in Local mode the system can supply information but will not execute any remote command.

3.2 Menu structure

The menu shown here is the complete menu. Depending on which options are selected some menu items may not be shown. For example if wiper is declared as "not installed" the menu items related to the wiper are not shown. Refer to table 4 for details of configuration options.

1   **Operator menu**
    1.1   Measurements
         1.1.1   UV intensity
         1.1.2   Chamber temperature
         1.1.3   Flow
         1.1.4   UV Transmittance
         1.1.5   Dose (RED NOT shown and not calculated if the system is not running or mode is not UVT or NOUVT)
         1.1.6   Bleed Status (NOT shown if BLEED is declared not installed)
    1.2   Usage data
         1.2.1   Lamp on time
         1.2.2   Nr of lamp starts
         1.2.3   Nr of wipes
         1.2.4   Total on time
    1.3   Information (No heading)
         1.3.1   Manufacturer (if not NONE)
         1.3.2   Model name (if not NONE)
         1.3.3   Model number (if not NONE)
         1.3.4   Web address (if manufacturer not NONE)
         1.3.5   Phone number (if manufacturer not NONE)
         1.3.6   Fax number (if manufacturer not NONE)
         1.3.7   Firmware version
         1.3.8   Serial number + (SYSMODEL if not NONE)
    1.4   Maintenance info
         1.4.1   System installation date
         1.4.2   Last service
         1.4.3   Next service
         1.4.4   Lamp last changed
         1.4.5   Last wipe service
         1.4.6   Next wipe service
    1.5   InOut values
         1.5.1   Analogue inputs
                1.5.1.1   TMPSNS Temp Sensor Reading
                1.5.1.2   FLWSNS Flow Sensor Reading
                1.5.1.3   UVSENS UV Sensor Reading
                1.5.1.4   TRSSNS UV TX Sensor Reading
         1.5.2   Digital inputs
                1.5.2.1   RSTART Remote Start Stop
                1.5.2.2   WIPLIM Wiper Limit Switch
                1.5.2.3   CHOVTP Chamber Over Temp
                1.5.2.4   LAMPFAIL Lamp Failure
         1.5.3   Analogue outputs
                1.5.3.1   CCRED Calculated Credited Dose
                1.5.3.2   UVINT UV Intensity
         1.5.4   Digital outputs
                1.5.4.1   ANYTRIP Any Trip
                1.5.4.2   ANYWNG Any Warning
                1.5.4.3   SYSAVA System Available
                1.5.4.4   SYSREM System in Remote Mode
                1.5.4.5   DRVWIP Wiper Active
                1.5.4.6   LMPRNG Lamp Running
                1.5.4.7   SWTLMP Switch Lamp On/Off
                1.5.4.8   RPLBLD Replace Lamp
    1.6   Reset system From TRIP
         1.6.1   Confirmation

2   **Secure user Menu**
    2.1   System options
         2.1.1   Control Mode
         2.1.2   Auto lamp start
         2.1.3   Wiping

3.5.1 Manufacturer (factory only)
3.5.2 Model Name (factory only)
3.5.3 Model Number (factory only)
3.5.4 System model parameters (factory only)
3.5.5 Serial Number
3.5.6 Wiper Installed
3.5.7 Bleeding system installed
3.5.8 Install date
3.5.9 Last service date
3.5.10 Next service date
3.5.11 Last wiping service date
3.5.12 Next wiping service date
3.5.13 Last lamp change
3.5.14 Service code
3.5.15 Temp sensor average period
3.5.16 UV sensor average period
3.5.17 Flow sensor average period
3.5.18 UVT sensor average period

4 Alarms

The UVtronic is controlling a number of conditions against malfunctions. These are related to safety, process and the system. Alarms are raised if certain conditions are met. Depending on the operating mode and on the configuration of the system some alarms will not be active.

Each alarm can be associated to a specific response to the system as per table 3. Alarms can be associated to no response (N), warning (W) and trip (T).

Parameters of the alarms can be found in the menu.

Table 3 – Table of Alarms.

N	Short name	Description	N	W	T	Message on display	Where Modified in Menu
1	AL_NOTEMPSNSDTC	No Temp sensor detected. Only if temp sensor is installed.	o	o	o		2.5.1.1
2	AL_NOUVSNSDTC	No UV sensor detected. Only if UV sensor is installed.	o	o	o		2.5.1.2
3	AL_NOFLOWSNSDTC	No flow sensor detected. Only if flow sensor is installed.	o	o	o		2.5.1.3
4	AL_NOTRSMSNSDTC	No Transmittance sensor detected. Only if UVT sensor is installed.	o	o	o		2.5.1.4
5	AL_WIPOUTFAIL	Wiper out failure. Only if wiper is installed.	-	o	o	Wiper time out	2.5.1.5
6	AL_WIPRETFAIL	Wiper returns failure. Only if wiper is installed.		o	o	Wiper return time out	2.5.1.6
7	AL_LAMPFAIL	Lamp fail.	-	o	o	Lamp failure	2.5.1.7
8	AL_TEMPWARN	Water temperature over warning level.	-	o	-	Water getting hot (no input for this)	2.5.2.1
9	AL_TEMPFAIL	Water temperature over alarm level.	-	-	o	Water too hot (no input for this)	2.5.2.2
10	AL_THSTOPEN	Bimetal for chamber temperature check off.	-	-	o	Chamber too hot	2.5.2.3
11	AL_LAMPHOURS	Lamp hours over maximum value	-	o	o	Replace lamps	2.5.2.4
12	AL_LAMPSWON	Lamp starts over maximum value	-	o	o	Replace lamps	2.5.2.5
13	AL_UVINTLOW	Intensity is below warning level	-	o	o	Intensity low	2.5.3.2
14	AL_UVINTFAIL	Intensity is below fail level	-	o	o	Intensity fail	2.5.3.1
15	AL_CREDWARN	Dose lower than warning level	-	o	o	UV dose low	2.5.3.3
16	AL_CREDFAIL	Dose lower than dose fail level	-	o	o	UV dose failure	2.5.3.4
17	AL_ESKEWHIGH	S/Q over maximum level	-	o	o	S/Q too high	2.5.3.5

N	Short name	Description	N	W	T	Message on display	Where Modified in Menu
18	AL_ESKEWLOW	S/Q under minimum level	-	o	o	S/Q too low	2.5.3.6
19	AL_OFFSCOFLOW	Operating flow conditions out of validated range but conservative	o	o	o	FLOW < min	2.5.3.8
20	AL_OFFSCOUVT	Operating UVT conditions out of validated range but conservative	o	o	o	UVT > MAX	2.5.3.9
21	AL_OFFSCODOSE	Operating dose conditions out of validated range but conservative	o	o	o	DOSE > MAX	2.5.3.10
22	AL_OFFSNCFLOW	Operating flow conditions out of validated range but NOT conservative	o	o	o	FLOW > MAX	2.5.3.11
23	AL_OFFSNCUVT	Operating UVT conditions out of validated range but NOT conservative	o	o	o	UVT < min	2.5.3.12
24	AL_OFFSNCDOSE	Operating dose conditions out of validated range but NOT conservative	o	o	o	DOSE < min	2.5.3.13
25	AL_FLOWHIGH	Flow too high	o	o	o	Flow too high	2.5.2.6
26	AL_UVTLOW	UVT under minimum level	o	o	o	UVT too low	2.5.3.7
27	AL_LOGNRYFUL	Log nearly full	o	o	-		2.5.1.8
28	AL_LOGFUL	Log full	o	o	-		2.5.1.9

O allowed, - not allowed

5   Event log

The system has a means of recording events. The events logged are:

1	power on (mains)
2	power off (mains)
3	lamp on
4	lamp off
5	alarms
6	log cleared
7	wipe start

The log can be accessed through the Menu.
The log can be cleared activating the related option in the menu.
When the log is full it is possible to set the system not to accept new messages or to discard the older messages.

6   Communication

6.1   Hardware

The communication port is connected to the customer interface terminals directly from the control unit. The control unit is capable of using serial RS232 full duplex or RS485 half-duplex communication methods. The standard connection is RS485. For normal operations the connection should be made to the customer interface terminals. For programming the unit a special programming cable should be used and connected directly to the control unit on the C8 connector port temporarily removing the one present. (Refer to section 10)

The programming cable and RS232 conversion module are available on request.

6.1.1   Communication interface

The serial interface has a dual purpose:
- communicate with the external world using a RS232 or RS485 link.
- install the software in the unit when connected to a PC using a programming cable and the appropriate PC software;

The connector does not have a standard RS232 pin out, so a standard RS232 cable cannot be used.

6.2 Communication protocol

The unit can communicate over a half-duplex serial protocol. It can be used with RS232 or RS485 physical layers. MODBUS logic level protocol is used to manage data packets. The format of the data packets is proprietary. Communication is made through port C8.

6.2.1 Physical connections

It is possible to use RS232 or RS485 physical protocol to communicate with the unit. The connecting cables are different.

6.2.2 RS232

If using RS232 only one unit can be connected to the cable point to point.

6.2.3 RS485

If using RS485 it is possible to connect more units on the bus. The connection to the control panel is terminated.

6.3 Logical Protocol

The logic protocol is MODBUS either over RS232 or RS485. Built on top of MODBUS there is the proprietary protocol defined in the following paragraphs.

It is possible to configure BAUD rate, parity type, number of STOP bits and data bits (CO_BAUDRATE, CO_PARITY and CO_STOPBITS respectively).

The address of the device can be selected from the maintenance menu (CO_MODBUSADDR). The address can be chosen between 1 and 99.

The master writes requests (data) to the system in the "master MODBUS buffer memory" (64 16 bits words, with addresses from 200 to 263). The system writes replies (data) to the master using the "system MODBUS buffer memory" (64 16 bits words with addresses from 400 to 463).

The system only replies to the MODBUS master's requests. The system cannot initiate any data transmission and only replies to the master requests within the MODBUS allowed time.

If a master command is not recognised the system replies with the appropriate error message.

7 Interface

7.1 Local

In LOCAL mode, the system can be switched on and off via the user I/F panel by pressing the KEY_F1 and KEY_F4 respectively. To prevent unintentional switch-offs the user is prompted to confirm the intention to switch-off the system by pressing the PLUS KEY and KEY_OK. If confirmation is not received within a pre-defined period (CO_OFFCONFTOUT) the system will remove the confirmation message and return to the normal operation menu. If confirmation is received the system goes into the AVAILABLE state.

7.2 Remote

In REMOTE mode the system is switched on and off through the remote start/stop digital input DI_RSTART (B11).

Depending on the state of the unit the outputs of the signals that are available to the user are

Name	B06 ANY TRP	B08 SYSAVA	B10 LMPRNG
ST_AVAILAB	NOT ACTIVE	ACTIVE	NOT ACTIVE
ST_WARMUP	NOT ACTIVE	NOT ACTIVE	NOT ACTIVE

ST_FLOWST	NOT ACTIVE	NOT ACTIVE	ACTIVE
ST_RUNNING	NOT ACTIVE	NOT ACTIVE	ACTIVE
ST_TRIP	ACTIVE	NOT ACTIVE	NOT ACTIVE
ST_SENSVER	NOT ACTIVE	NOT ACTIVE	ACTIVE

7.3 COMBUS

The master communicates to the device using three different request forms:
- Poll pages request
- Command request
- Data input update

The system always replies to requests from the master with an appropriate reply. If a request is not recognized or is incorrectly formatted an error message is returned instead.

In COMBUS mode the system is switched on and off using the remote start/stop command through the communication interface.

7.3.1 Specifications

The format of the commands is specified in the following parameters:

The requests specify the format the UVtronic is expecting to receive to perform certain operations. The format of the replies is what the UVtronic is returning when a meaningful and correctly formatted request is received.

7.3.1.1 Poll pages request

This message format instructs the system to provide information about its status. The system does not perform any action other than copying the data to the output buffer accordingly to the format specified in the Poll Pages reply section.

N	ADDRESS	Description	Values
1	200		Must be 107
2	201	Poll data	0: No poll 1: Poll page 1 2: Poll page 2 3: Poll page 3
3	202	Password to access pages containing data from protected menus	Unsigned integer
4	203		

7.3.1.1.1 Page 1
Data obtained from the Operator menu.
No password is required.

N	ADDRESS	Description	Values
1	400		Must be 107
	401	Reply Status	0: fail 1: ok
2	402	Poll page	Must be 1 Poll page 1
3	403	UV intensity	Range 0 – 65000, unit hundredths of W/m2
4	404	Flow rate	Thousandths of current flow units
5	405	UV Transmission 10mm T10	T10 multiplied by 1000: range 0-1000 1000: 1 (100%)

6	406	Chamber Temperature	Hundredths in current temperature units x 100. 2615 means 26.15K
7	407	Dose	Tenths of mJ/cm2 124 : 12.4 mJ/cm2
8	408	Lamp on time	Time lamp has been on since last start up in minutes
	409	All lamp time	Overall time lamp has been on
9	410	Nr switch on	N, Unsigned short
10	411	Nr of wipes	N, Unsigned short
11	412	Total on time	In hours
	413	Supplier info [0]	One ASCII character per 16 bits word in LSB position values 32-127
		[...]	
	432	Supplier info [19]	20 characters
	433	Software version [0]	
		[...]	
	442	Software version [9]	10 characters
	443	Digital inputs	Only the relevant bits represented If not present set zero. Number follows bit position (LSB is 1)
	444	Digital outputs	Only the relevant bits represented If not present set zero. Number follows bit position (LSB is 1)
	445	Analogue input [1]	Raw data (12 bits) in LSB position
	446	Analogue input [2]	Raw data (12 bits) in LSB position
	447	Analogue input [3]	Raw data (12 bits) in LSB position
	448	Analogue input [4]	Raw data (12 bits) in LSB position
	449	Analogue input [1]	Raw data (12 bits) in LSB position
	450	Analogue input [2]	Raw data (12 bits) in LSB position

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7.3.1.1.2 Page 2

Data obtained from the Secured user menu

This data is password protected with the Secured user password.

N	ADDRESS	Description	Values
1	400		Must be 107
2	401	Reply status	0: fail 1: ok
3	402	Poll data	Must be 3 Poll page 3
4	403	Warming up time	Seconds
5	404	Wiping time	Seconds
6	405	Wiper time out	
7	406	Value delay flow stabilisation	
8	407	Chamber type	0: 4 inches 1: 6 inches 2: 8 inches
9	408	System type	0: fail 1: ok
10	409	Pathogen	0: None 1: Dose 2: Cryptosporidium 3: Giardia 4: Adenovirus
11	410	S/Q min	
	411	S/Q max	
	412	T10 min	
	413	Max flow	
	414	CRED	
	415	Max hours	
	416	Max starts	

7.3.1.2 Command request

The system executes the command specified in the request depending on the system status and returns an appropriate reply:

N	ADDRESS	Description	Values
1	200		Must be 132
2	201	Command	0: No remote command 1: Switch on 2: Switch off 3: Reset

7.3.1.3 Command request reply

The system replies to a command request with the following message:

N	ADDRESS	Description	Values
1	400		Must be 154
2	401	Command number	
	402	Command status	0: Fail 1: OK
	403	Fail reason	0: No error 1: Local mode
3	404	Specific command fail reason	Table to be defined

7.3.1.4 Data input update

The system replies to a command request with the following message:

N	ADDRESS	Description	Values
1	400		Must be 154
2	401	Reply status	0: fail 1: OK
3	402	Reason for falling flow	0: no fail 1: out of range
4	403	Reason for failing UVT	0: no fail 1: out of range

7.3.1.5 Data input update

In certain occasions the system relies on external data to validate the operating conditions and calculate dose.

The data that can be provided to the system is:
- UV intensity W/m2 multiplied by 100 (284 is 2.84W/m2)
- Flow rate in m3/h multiplied by 1000 (1430 is 1.43m3/h)
- UV transmittance over 10mm T10 multiplied by 1000 (976 is 0.976 = 97.6%)
- Chamber temperature in K multiplied by 100 (29315 is 293.15K = 20°C)

These values are stored in the system and if required copied to the relevant working parameter.
The format of the data input update is as per following table:

N	ADDRESS	Description	Values
1	200		Must be 154
2	201	Thousandths of current flow units	Least significant word of flow rate, Unsigned integer
3	202	Thousandths of current flow units	Most significant word of flow rate, Unsigned integer
4	203	Thousandths of transmittance value	Thousandths, Unsigned integer 0-1000
5	204	Hundredths of W/m2	Least significant word of UV intensity, Unsigned integer
6	205	Hundredths of W/m2	Most significant word of UV intensity, Unsigned integer
7	206	Hundredths of current temperature unit	Unsigned integer

N	Short name	CO	Passwo rd level	Name	Default value	Unit	Data Type	Range	Where modified in menu
121	CO_WIPRETTIMOUT	121	3	Wiper return time out	30	s	INTEGER	1-120	3.1.5
122	CO_WIPTIME	122	3	Wiping time	30	s	INTEGER	1-120	3.1.3

Table 5 contains a brief description of how the Configuration Option affects the behaviour of the system.

Table 5 - Explanation of Configuration Options

N	Short name max 15 chars	Description
1	CO_ALCREDFAIL	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
2	CO_ALCREDWARN	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
3	CO_ALESKEWHIGH	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
4	CO_ALESKEWLOW	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
5	CO_ALFLOWHIGH	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
6	CO_ALLAMPFAIL	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
7	CO_ALLAMPHOURS	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
8	CO_ALLAMPSWON	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
9	CO_ALLOGFULL	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
10	CO_ALLOGNRYFUL	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
11	CO_ALNOFLOWSENS	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
12	CO_ALNOTEMPSENS	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
13	CO_ALNOTRSMSENS	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
14	CO_ALNOUVSENS	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
15	CO_ALOFFSCODOSE	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
16	CO_ALOFFSCOFLOW	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
17	CO_ALOFFSCOUVT	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
18	CO_ALOFFSNCDOSE	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
19	CO_ALOFFSNCFLOW	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
20	CO_ALOFFSNCUVT	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
21	CO_ALTEMPFAIL	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
22	CO_ALTEMPWARN	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
23	CO_ALTHSTOPEN	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
24	CO_ALTRSMLOW	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
25	CO_ALUVINTFAIL	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
26	CO_ALUVINTLOW	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
27	CO_ALWIPOUTFAIL	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
28	CO_ALWIPRETFAIL	Define what type of action is done after the raise of the alarm (Table 3 – Table of Alarms.Table 3) Action can be None, Warning or Trip (N, W, T) or a subset depending on range.
29	CO_AUTORUNNING	Define if the system is starting up automatically on power up.
30	CO_BAUDRATE	Define the baud rate for the communication bus.
31	CO_BLDHISTERES	Define the hysteresis temperature for the bleed functionality.
32	CO_BLDINSTALLED	Declare bleeding as installed (lamp warning wire in is disabled).
33	CO_CMPASSWORD	Defines the maintenance user password.
34	CO_CREDOUT04REF	Define the value of CRED (Credited RED) when 4-20mA output is 4mA. Value is linearly interpolated between 4mA and 20mA values.
35	CO_CREDOUT20REF	Define the value of CRED (Credited RED) when 4-20mA output is 20mA. Value is linearly interpolated between 4mA and 20mA values.
36	CO_CTRLMODE	Defines the control mode of the system.
37	CO_DATABITS	Defines the data bits of the Combus.
38	CO_DATEINSTALL	Contains the date of installation of the system.
39	CO_DATELSTLMPCH	Contains the date of the last lamp change of the system.
40	CO_DATELASTSERV	Contains the date of the last service of the system.
41	CO_DATELASTWIPS	Contains the date of the last service of the wiper.
42	CO_DATENEXTSERV	Contains the date of the next service of the system.
43	CO_DATENEXTWIPS	Contains the date of the next service of the wiper.
44	CO_FLOWFIXVALUE	Defines the value of FLOW input when CO_FLOWSOURCE is fixed.
45	CO_FLOWRATEMAXD	Defines the delay before raising an alarm when flow is above threshold.
46	CO_FLOWSEN04MAV	Define the value of FLOW when 4-20mA output is 4mA. Value is linearly interpolated between 4mA and 20mA values.
47	CO_FLOWSEN20MAV	Define the value of FLOW when 4-20mA output is 4mA. Value is linearly interpolated between 4mA and 20mA values.
48	CO_FLOWSENSPRES	Declares the local (4-20mA) flow sensor present.
49	CO_FLOWSNSAVE	Defines the time of the low pass average filter for temperature.
50	CO_FLOWSOURCE	Determines the source of the flow input.
51	CO_FLOWSTTIME	Defines the duration of the flow stabilisation period.
52	CO_FLOWUNITS	Defines the unit of measure for flow.
53	CO_GENVALIDFACT	Defines the generic validation factor to reduce the value of dose.
54	CO_LAMPFAILDEL	Defines the time to ignore the lamp fail signal on start-up (Fixed at factory).
55	CO_LAMPONTIMTHS	Defines the time above which raise the alarm.
56	CO_LAMPSWON	Defines the threshold above which raising the alarm.
57	CO_LAMPSWONIGNH	Defines the number of hours to ignore the alarm of average switch on is higher than threshold (CO_LAMPSWON).
58	CO_LANGUAGE	Defines the language to be used.

10 Firmware updating

The software running on the UVtronic can be updated without the need to open the controller enclosure, using the appropriate customer I/F terminals.

This can be done connecting the controller to a PC with a serial port (an USB adaptor is available) through a programming cable and using the PC software HPCLoad to updated the software.

The following parts are required:
- Programming cable Part number: 160387-2002
- Programming Software PC: HPCLoad
- Program to be loaded: Desired version

10.1 Instructions

In HPCLoad select the Network Interface related to the serial port to which the UVtronic is connected and click "Open".

Under Status the following message appears:

Nif 01 successfully opened and the HPC-Mode.

or
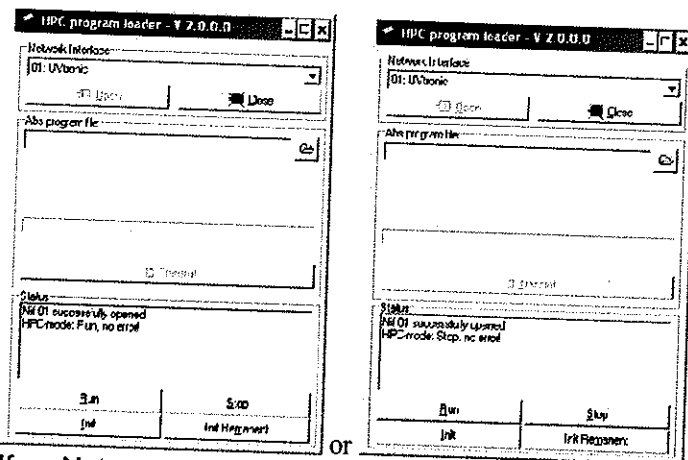
If no Network interfaces present or error messages check the configuration of Network Interface is correct as per section 10.2.

Select the executable code to install by pressing the folder icon on the right side of the section Abs program file and locating the desired file as per specifications {#}.

Press the Transmit button to write the executable to the UVtronic.
Depending on the size of the executable it could take up to 3 minutes to transmit the executable.
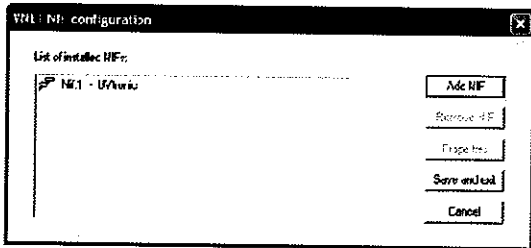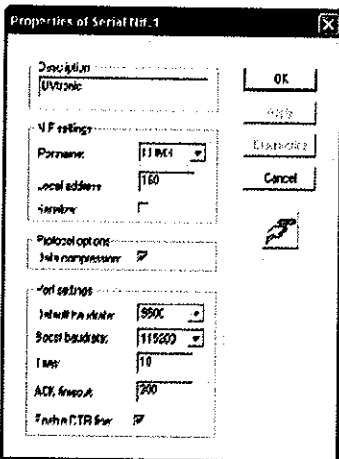An indicator will show the progress.
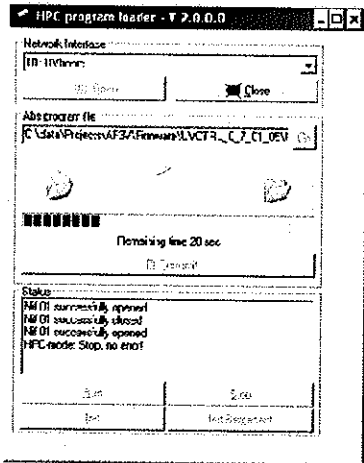
10.2 Network Interface configuration

To configure the network interface it is necessary to go to the operating system control panel and open the VNET NIF configuration program.

Please ensure that HPCLoad is closed to allow the configuration to be changed at next HPCLoad start-up.

Select the item Nif. 1 and click on Properties.

Ensure the "Portname" matches the one to which the UVtronic is connected as well as the other numbers.

Confirm OK twice to exit the configuration.