PROCESS MAINTENANCE PROGRAM

USER GUIDE

Bellingham + Stanley Ltd.

INSTRUCTION MANUAL: ISSUE 8.0 JANUARY 2004

SOFTWARE CODE: 27-310

This manual is applicable to Disk Set 27-310 version 8.0 and above

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Process Maintenance Program

Overview

The 'Process Maintenance Program', code number 27-310 has been designed to allow easy access to the Process Refractometer's calibration and configuration parameters. The program allows these settings to be viewed, archived and altered. The program is written for use with Windows 95, 98 or Windows NT 4.0

This manual covers Process Maintenance Program version 8.0 and above. When available, upgrade versions of this program are freely available on the B+S website at www.bs-ltd.com

Program Installation

The installation program will copy all the necessary files on to the computer. The installation program will also give the user a number of installation options, such as which directory the program is installed to. Before running the installation program make sure that no other programs are running.

Place the CD-ROM disk supplied in the CD drive

- Place the disk provided in the CD drive of the PC.
- The disk should after a few seconds auto-start the installation program.
- The installation program will now start copying some temporary files. From now on follow the on screen prompts.

The installation program will create two new short cuts in the Windows Start button, one for the program, and one for the user guide.

Hardware Installation

If the 'Process Maintenance Program' was installed onto a computer already connected to a Process Refractometer system then no further hardware installation will be necessary. Alternatively connect the computer to the Refractometer using a PC Interface 27-J21 or 27-J22. Refer to the Refractometer Manual for installation details.

Starting the Program

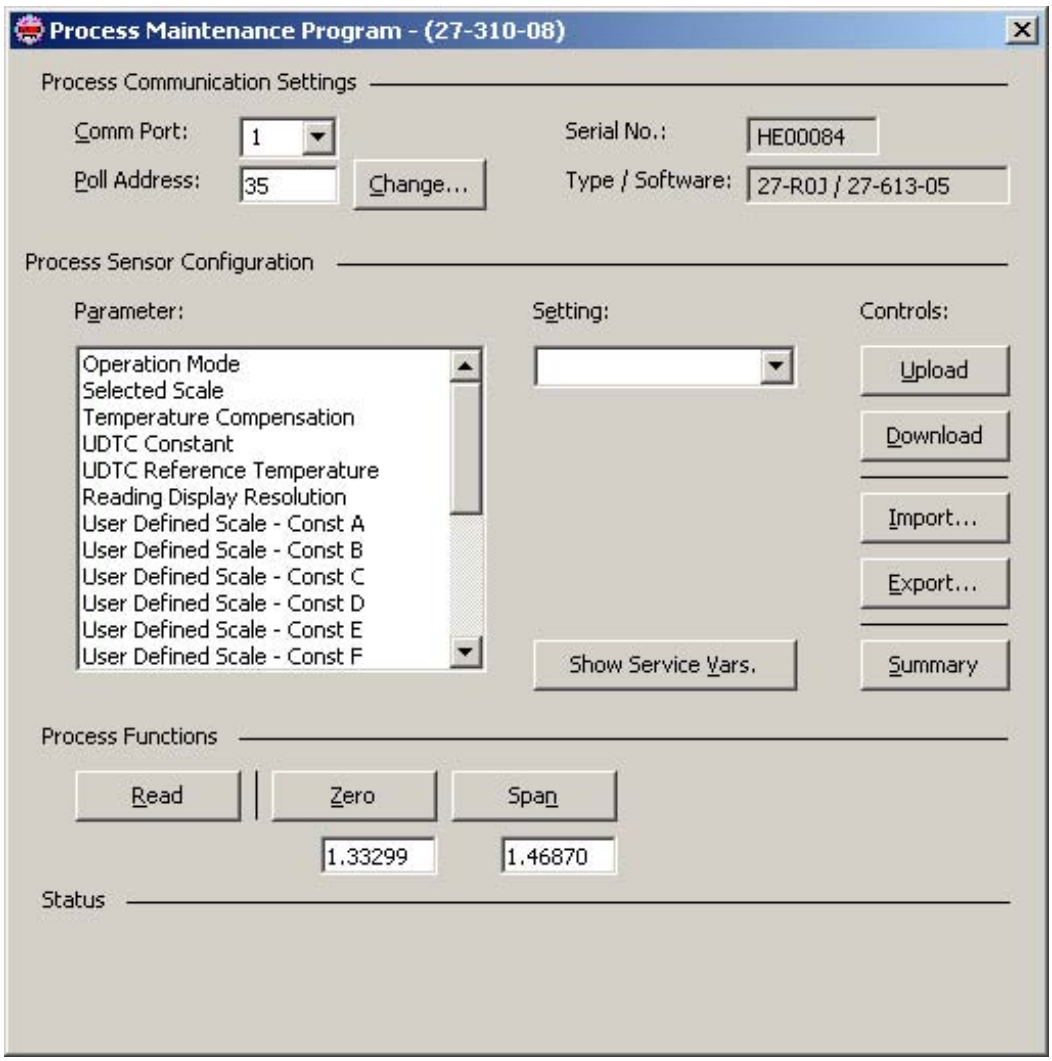
In order to use the program follow the instruction below. Note that if a version of the 'Process Data Capture Software' is running it should be closed prior to starting the 'Process Maintenance Program'. This is necessary because both programs cannot share the same serial port.

Run the program

- Find the program's shortcut in the location specified when installing. By default this will be in a folder in the 'Programs' section of the Window Start button menu.
- Click on the 'Process Maintenance Program' shortcut.
- After a short wait the 'Process Maintenance Program' window will appear.

Process Maintenance Program Window

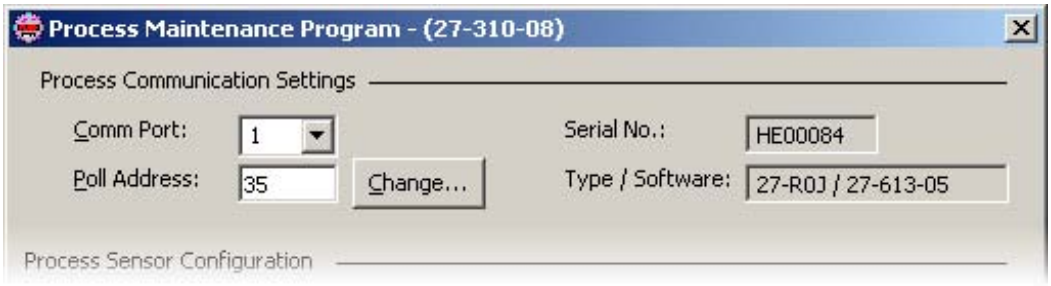
The window is split into three sections: Process Communication Settings, Process Sensor Configuration, Process Functions and Status. For more detail see Appendix A.



- **Process Communication Settings** covers Refractometer identity and the link between the program and the hardware
- **Process Sensor Configuration** deals with the operational set-up of the Refractometer. Parameters covering the mode, scale, range, etc of the instrument may altered and archived from here
- **Process Functions** and **Status** gives access to calibration controls and an area for displaying reading data/status information sent from the Refractometer

Process Communication Settings

When the program is running it must be set-up to operate the hardware installation. There are two aspects to this process: firstly, the program needs to know which serial port the PC Interface is connected to and secondly, the identity or 'poll address' of the Refractometer you wish to work with. The poll address is a number in the range of 32 to 127, and uniquely identifies a Refractometer in a system.



Set up the program

- Click on the 'Comm Port' selection arrow and pick from the serial port that the PC Interface is connected to. Alternatively delete the existing value in the box and type in the appropriate value. Serial ports on PC's are often referred to as 'Com ports' and are identified by a number, for example, Com1.
- Enter the instrument's poll address into the box labelled 'Poll Address'. The default poll address may be found in the back of the Refractometer Manual.

Note: All B+S Process Refractometers respond to a Poll Address of' '0' as shown in the figure above. Using an address of '0' is permissible if working with only one instrument. When working with two or more refractometers on a network the '0' address must not be used.

The 'Change…' button enables the user to change the poll address of a Refractometer to prevent addressing conflicts with other Refractometers in a system.

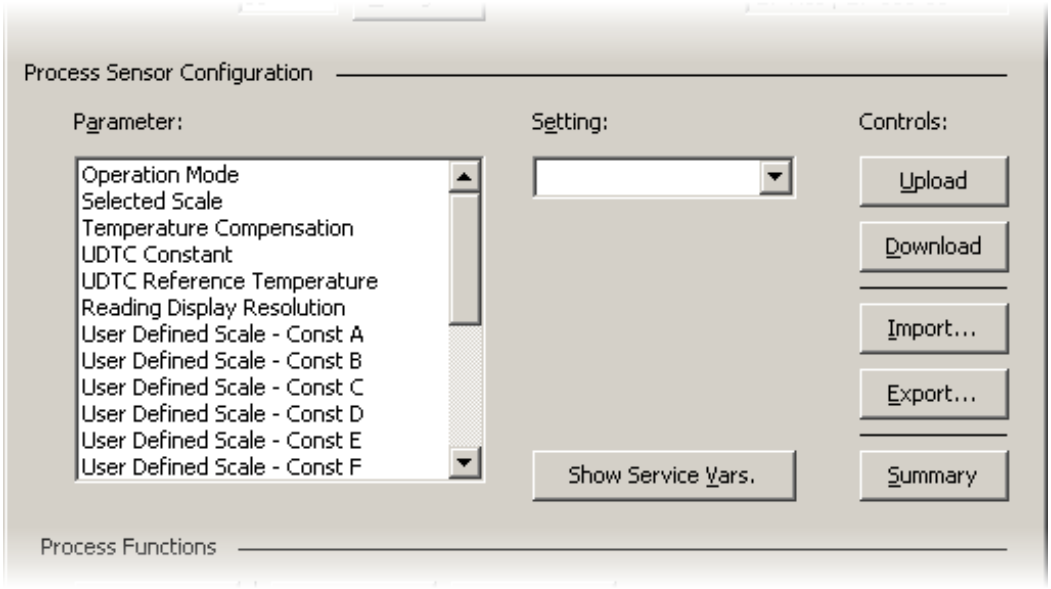
Change the poll address

- Enter the instrument's current poll address into the box labelled 'Poll Address'
- Click on 'Change'
- Enter the new address as prompted and click on 'OK'
- For future reference note the change of address in the back of the Refractometer Manual

Note also that at this stage the boxes labelled as 'Serial No.' and 'Type / Software' will remain blank. Their use is described in the following section.

Process Sensor Configuration

The method of changing the operational configuration of the Refractometer is a simple procedure of three steps: Upload the current parameters, alter the parameters and Download the updated parameters.



Upload current Refractometer parameters

- Click on the 'Upload' button. The 'Serial No.' and 'Type / Software' boxes (shown under in the previous section) will now indicate the Refractometer's serial number and software code.

Alter the parameters

- Click on the parameter within the list that is to be altered, for example 'Reading Limits – Lower'.
- The current setting for that parameter will now be displayed in the 'Setting' box.
- Alter the setting value in the 'Setting' box. (See Appendix B)

Download altered Refractometer parameters

- Click on the 'Download' button
- Confirm the action when prompted

Functions are also available that enable the user to keep and manage backup copies of Refractometer configurations on disk. The 'Export' button saves the currently uploaded data to a PCF file (process configuration file). The 'Import' button allows the user to read data from disk for reference or to download to a Refractometer. Using the import function presents the user with a choice of either a PCF file (as exported) or a USC (user scale constants) file. Note that the import/export functions only work when a Refractometer is connected to the system and has had its data 'uploaded'. Clicking on the 'Summary' button provides a detailed list of the current configuration from where it may be printed.

Exporting configuration data

- Click on 'Upload' to read the current Refractometer configuration.
- Now click on 'Export'. The program will then display a window allowing the location and the file's name to be changed. By default the file will be placed in the working directory, with the Refractometer serial number as the filename.
- When the file location and name are set click on 'Save'. The program will finally display a window to indicate that the export has been completed.
- Click on 'OK'.

Importing configuration data

- Click on the 'Import' button. The program will now display a window verifying that you want to overwrite the current parameters.

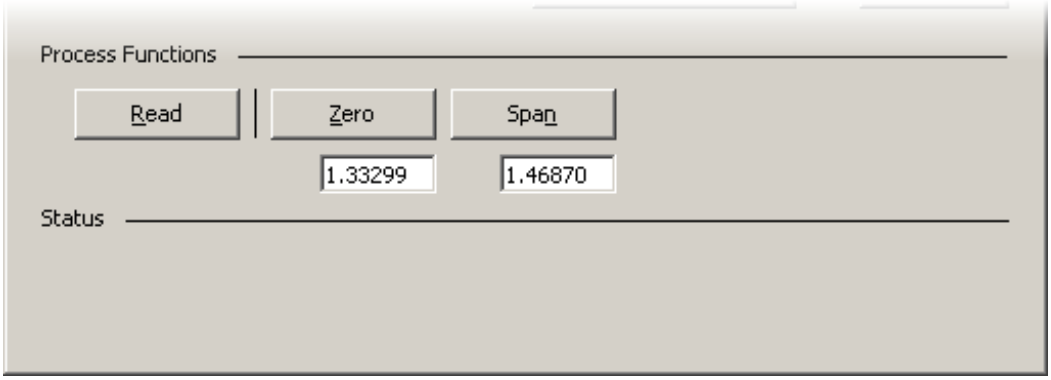
- Click on the button labelled ‘Yes’. The program will then display a window allowing you to select a PCF or USC file. Make sure the ‘File of Type’ box is set correctly.
- Click on the file and then on ‘Open’. The program will then show a window to indicate that the import has been completed.
- Click on ‘OK’. The new configuration will now be set in the program. To transfer the data from the program to the Refractometer click on ‘Download’.

Configuration summary
- Click on ‘Summary’
- Click on ‘Print’ if a paper copy is required
- Click on ‘OK’ to exit

The program also provides access, via password security, to an extended parameter list that includes ‘service variables’ via the ‘Show Service Vars.’ button. The use of these additional parameters is to configure a Refractometer from new and their function is not described in this manual. Altering any of these service variables on an unauthorised basis could result in unpredictable performance or complete failure of the Refractometer and should only be altered by a qualified B+S Engineer or an approved service agent.

Process Functions and Status

This area enables the user to calibrate the Refractometer and get reading data.



Get a reading
- Click on ‘Read’, after a brief period reading data will be displayed in the ‘Status’ area.

Zero the Refractometer
- Place the zero sample on the prism and allow approximately 20 seconds for the temperature to stabilise.
- Make sure that the aim value for the zero function is correct. The aim value should be in the units that the Refractometer measurements are displayed. For example, if set to display brix readings, a distilled water sample would have an aim value of 0, should it be set to refractive index the value will be 1.33299.
- Click on the ‘Zero’ button. The program will then display a window to verify that you want to zero the instrument. To confirm the operation click on the ‘Yes’ button. The program will now inform the Refractometer to carry out a zero operation. After a few seconds the zero calibration will be complete.

Span the Refractometer
- Place the span sample on the prism and allow approximately 20 seconds for the temperature to stabilise.
- Verify that the aim value for the span function is correct. The aim value should be in the units that the Refractometer measurements are displayed. For example, if set to display brix readings, a 50% sucrose sample would have an aim value of 50, should it be set to refractive index the value would be 1.42006.
- Click on the ‘Span’ button. The program will then display a window to verify that you want to span the instrument. Click on ‘Yes’ to initiate the span. The program will now inform the Refractometer to carry out a span operation. After a few seconds the span calibration will be complete.

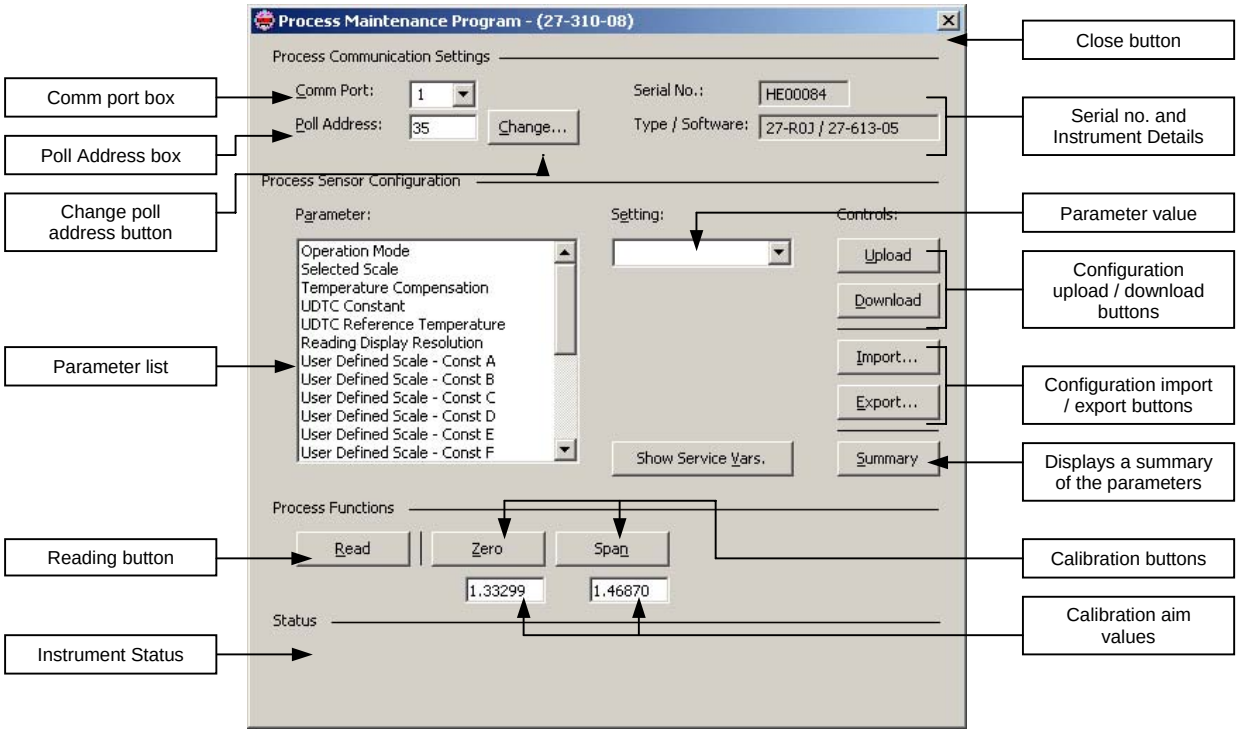
Closing the Program

When use of the Process Maintenance Program is complete it must be closed.

Close the program
- Click on the window close button (labelled with a small ‘**x**’) at the very top right hand corner of the window.

Appendix A

Process Maintenance Program Window



Appendix B

Configuration Parameter Description

The 'Process Maintenance Program' permits configuration parameters to be altered. Below is a table showing all the available parameters and their use. Note that 'Service variables' are excluded.

Name	*Setting*	*Description*
Alternate Reading Display	Number	Value that determines whether an alternate value will be displayed on the 7 Segment display, as well as the measurement. 0 = Concentration only 5 = Concentration and product temperature 9 = Concentration and quality figure
Analogue Output – Concentration to give 4ma (scale dependent)	Number	The reading at which the analogue output will be 4ma.
Analogue Output – Concentration to give 20ma(scale dependent)	Number	The reading at which the analogue output will be 20ma.
Communication Delay Period *1	Number	Specifies the number of milliseconds the refractometer waits between receiving data and responding.
Humidity Limit		Not implemented in this version
Operation Mode	Options	The reading mode of the instrument. Selectable as either Continuous or Polled. Polled is primarily used for service diagnostic work. 'Continuous' should always be selected for operational use.
Reading Display Resolution	Options	Set the resolution mode for the measurement output. Selectable as High, medium or low. Higher resolutions are inhibited on low accuracy Refractometers
Reading Limits – Hysteresis *1 / 2	Number	An additional limit offset added to the low limit and subtracted from the high limit, used to stop alarm chattering when the reading fluctuates about a limit.
Reading Limits – Lower	Number	Value that will activate the low alarm.
Reading Limits – Switch	Options	Enables or disables the limits alarm facility. Also selects whether concentration, quality or temperature drives the alarm.
Reading Limits – Upper	Number	Value that will activate the high alarm.
Selected Scale	Options	Select the measurement scale units, Refractive Index, Brix or User Defined Scale
Temperature Compensation	Options	Specifies which temperature compensation equation is used to calculate the measurement. The user may select Off, Sugar Compensation or User Compensation.
UDTC Constant	Number	The constant used when the User Compensation is selected. Expressed in RI/ºC
UDTC Reference Temperature *2 / 3	Number	The reference temperature used when User Compensation is selected, in ºC.
User Defined Scale - 1st ID Byte		Not implemented in this version
User Defined Scale – 2nd ID Byte		
User Defined Scale - Const A	Number	The 6 user defined scale polynomial constants.
User Defined Scale - Const B		
User Defined Scale - Const C		
User Defined Scale - Const D		
User Defined Scale - Const E		
User Defined Scale - Const F		

Notes
*1 – only instruments fitted with 27-612-04 and 27-613-04 or greater
*2 – only instruments fitted with 27-602-09 and 27-603-09 or greater
*3 – only instruments fitted with 27-612-03 and 27-613-03 or greater