Bellingham + Stanley
Longfield Road, Tunbridge Wells, Kent, TN2 3EY, UK
Tel +44 (0) 1892 500400 Fax +44 (0) 1892 543115

Bellingham + Stanley
a xylem brand

Service & Repair Department

Internal Repair Instruction

Instruction Number: RI015 Version 1.0

Title: Process Refractometer (PRH) calibration check (AdBlue)

Date: 23 Dec 2014

Compiled By: PJW

Related Instruments: Process refractometers (PRH)

Description:

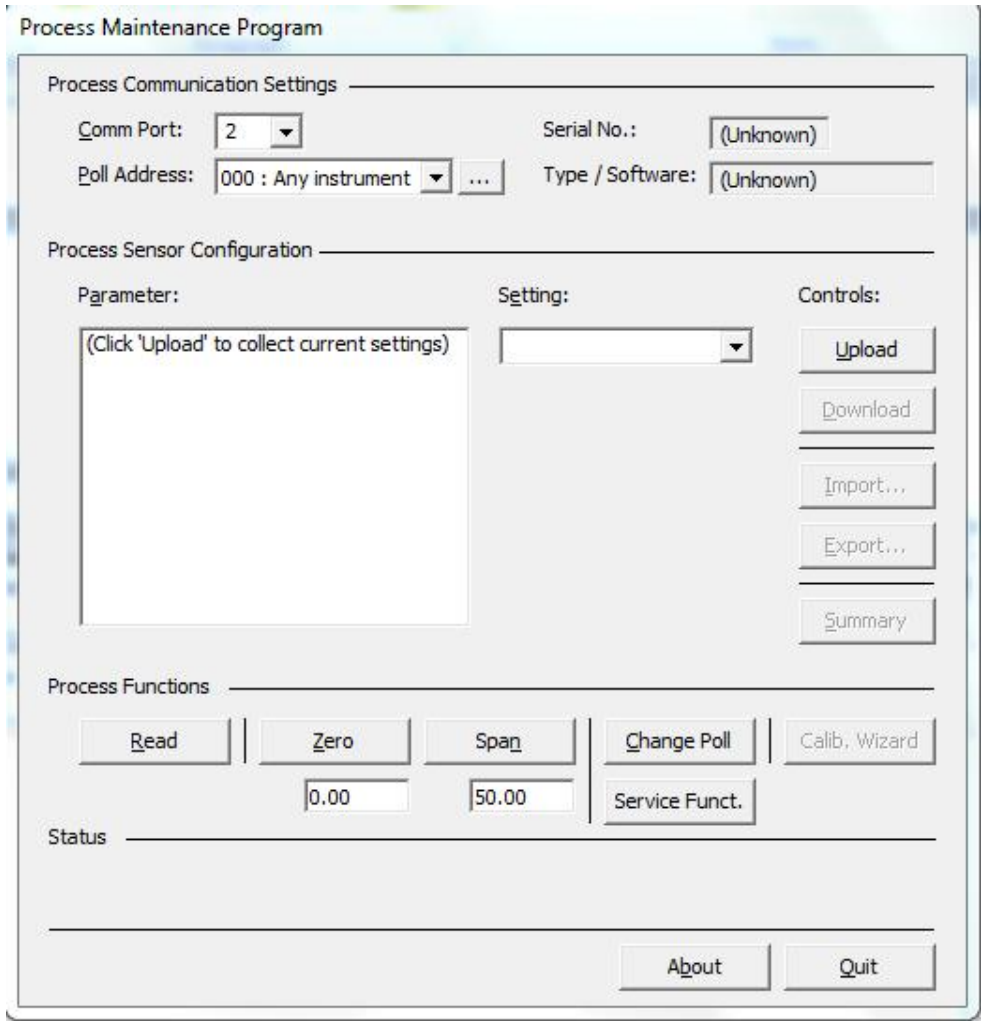
Simple test procedure to check the calibration of PRH process refractometer using AdBlue UDS (27-843).

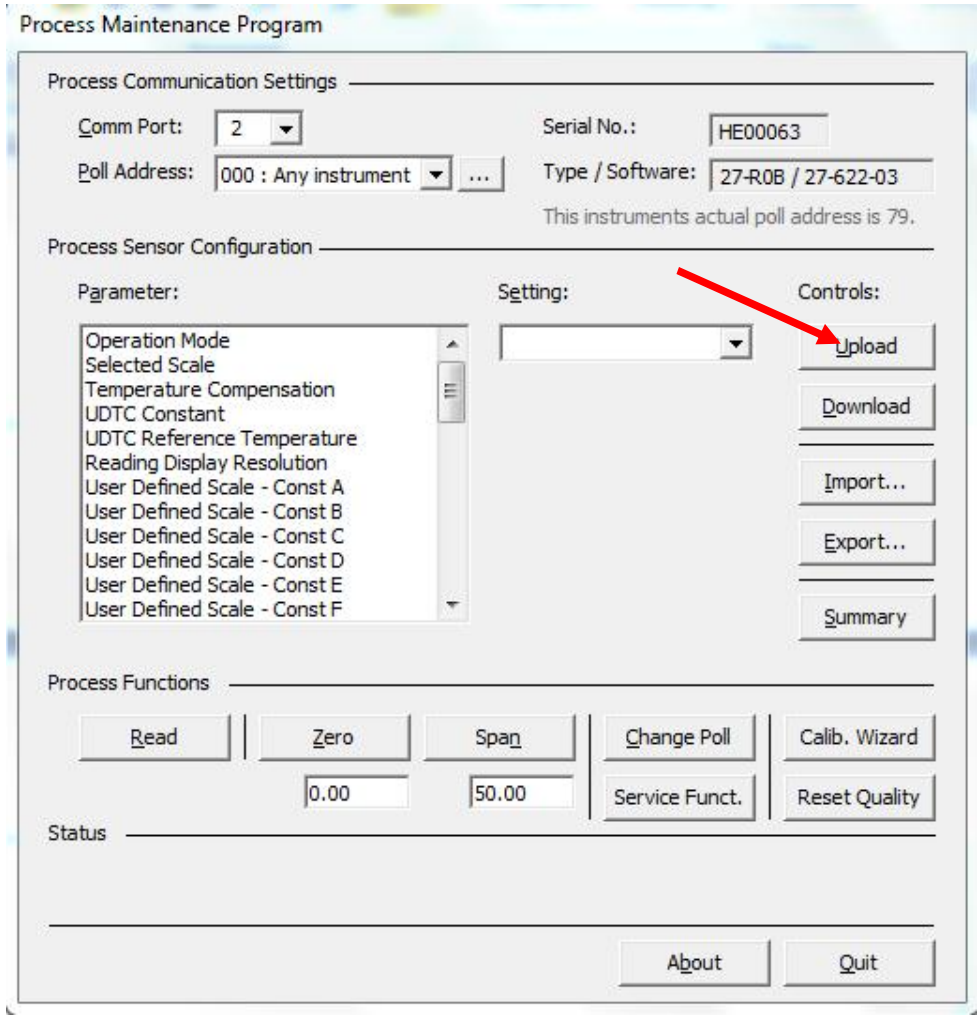
Document modification record			
Issue	Date	Details of change	Modified by.
1.0	23/12/2014	First issue	

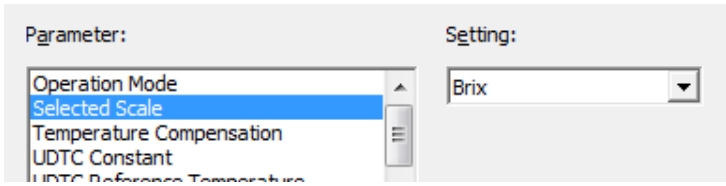
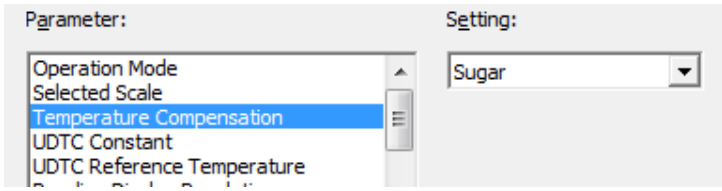
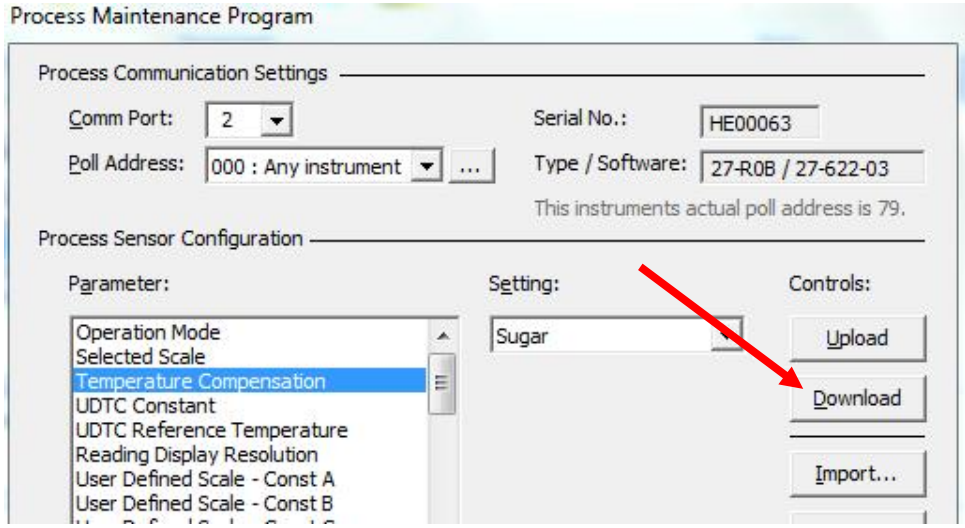
Caution:

1. This procedure is only to be carried out by Bellingham + Stanley technicians or suitably trained third party agents where specifically authorised.
2. These instructions assume electronic engineering competence of the operator, and should be familiar with Bellingham + Stanley instruments and procedures.
3. Correct ESD precautions should be observed to prevent damage to sensitive electronic components if the instrument is to be opened.

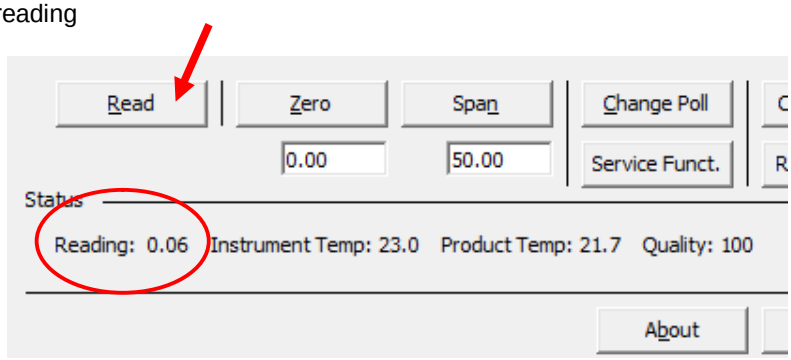
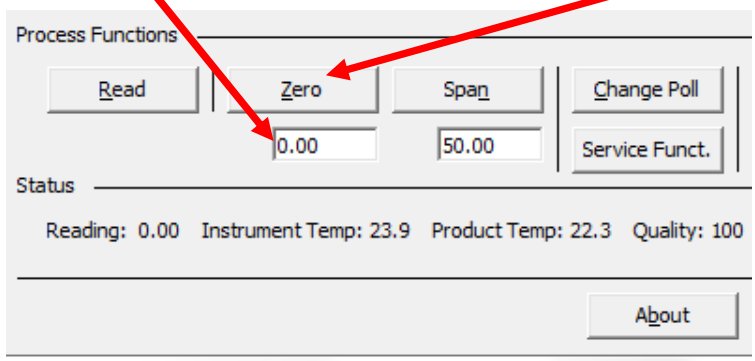
Procedure

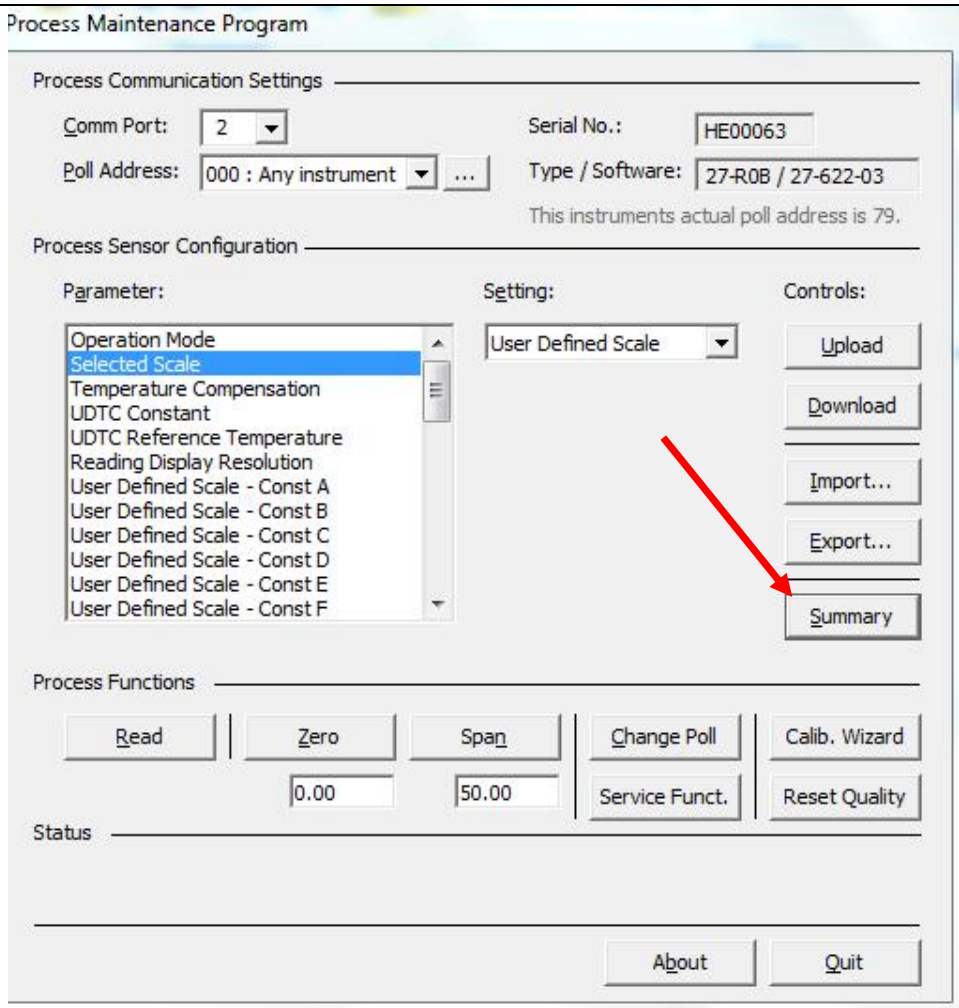
Step	Description
1	**Switch the instrument on** Refer to the appropriate user manual for information about switching the instrument on.
1.1	Connect a suitable computer to the Process (PRH) refractometer junction box (27-J01) as detailed in the Process Maintenance Program User Guide (Vn 15C) using the correct communication cables.
1.2	Start the Process Maintenance program (27-310). This should already be installed on the computer. 

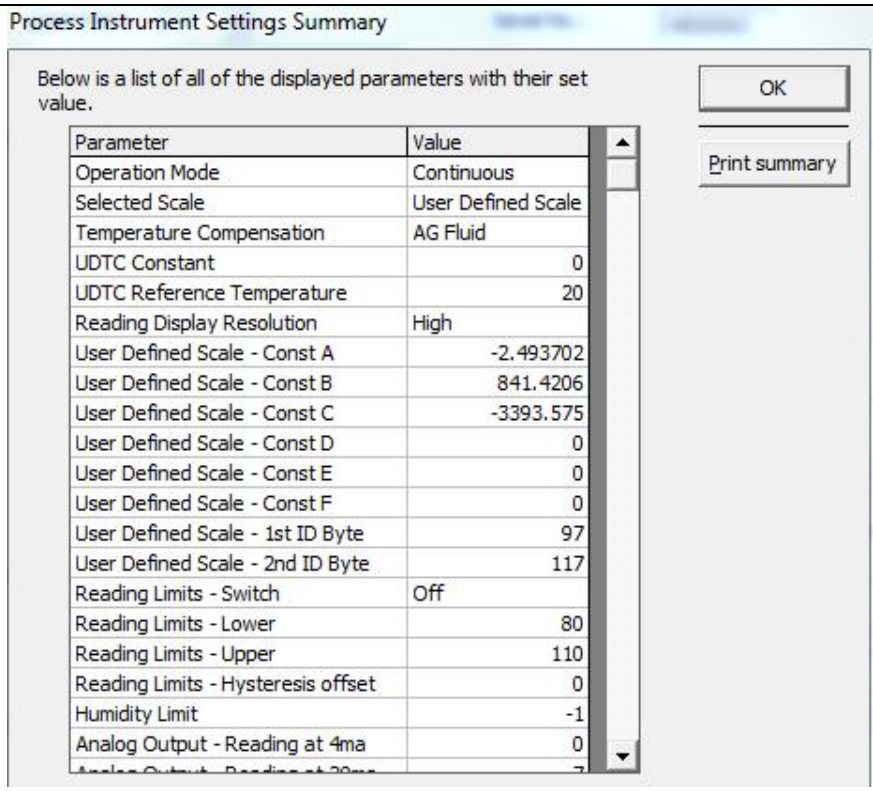
1.3	Upload the instrument details: 

1.4	**Check Zero** To check the zero calibration of the instrument it is necessary to configure the instrument to a suitable measurement scale. The best configuration is to set the instrument to read in %Brix scale with sucrose temperature compensation (SUTC) NOTE: Even with temperature compensation correctly set, the readings can be affected by high or low ambient temperature conditions. Allowance should be made for any such conditions.  
1.5	Once these have been selected the parameters need to be downloaded to the refractometer. 

1.6	The refractometer needs to be removed from the manifold and placed on a work surface with the prism at the top. 
1.7	Clean the prism surface..
1.8	**Zero Check** Check the calibration at zero by placing a sample of distilled / de-ionised water on to the prism surface. 

1.9	Take a reading 
1.10	If the reading is not correct:- • Rmove the water sample, clean and dry the prism surface, apply another sample and take another reading. If this is still incorrect then carry out Zero Calibration the instrument.
1.11	**Carry out Zero Calibration** Clean the prism surface and apply a sample of distilled / de-ionised water. Set the Zero value on the Maintenance Program and then Zero the instrument.  Take a reading and check that it now reads 0.00 Note the 'Quality' number – This should read a value around 100
1.12	**Span Check (AdBlue)** To check the span calibration using a user defined scale (UDS) we must first ensure that the corect scale is installed in the instrment. Select the 'Summary' button on the Process Maintenance program.

	
1.13	A summary of the instrument parameters will be displayed. Ensure that the User Defined Constants A to F have the same data as defined in the relevant AdBlue UDS document (27-843). If this data is incorrect or missing then the UDS scale will need to be installed. Refer to the Process Maintenance Program User Guide (Vn 15C) for instruction to carry out this procedure.

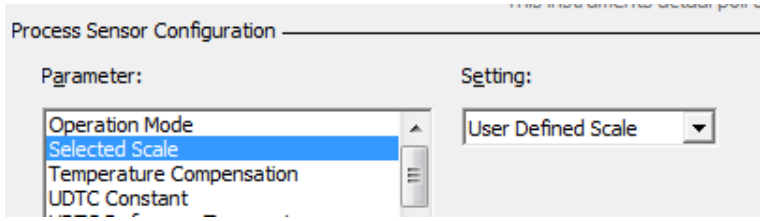


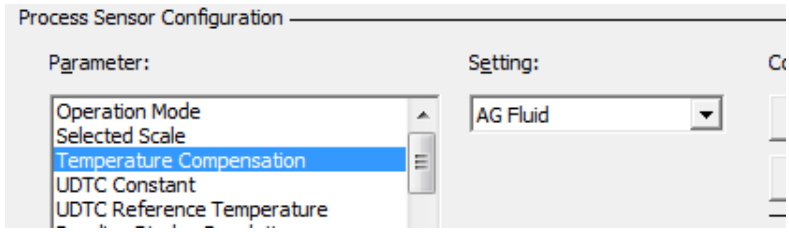
Parameter	Value
Operation Mode	Continuous
Selected Scale	User Defined Scale
Temperature Compensation	AG Fluid
UDTC Constant	0
UDTC Reference Temperature	20
Reading Display Resolution	High
User Defined Scale - Const A	-2.493702
User Defined Scale - Const B	841.4206
User Defined Scale - Const C	-3393.575
User Defined Scale - Const D	0
User Defined Scale - Const E	0
User Defined Scale - Const F	0
User Defined Scale - 1st ID Byte	97
User Defined Scale - 2nd ID Byte	117
Reading Limits - Switch	Off
Reading Limits - Lower	80
Reading Limits - Upper	110
Reading Limits - Hysteresis offset	0
Humidity Limit	-1
Analog Output - Reading at 4ma	0

NOTE: This can be viewed at any time to check the current configuration of the instrument.

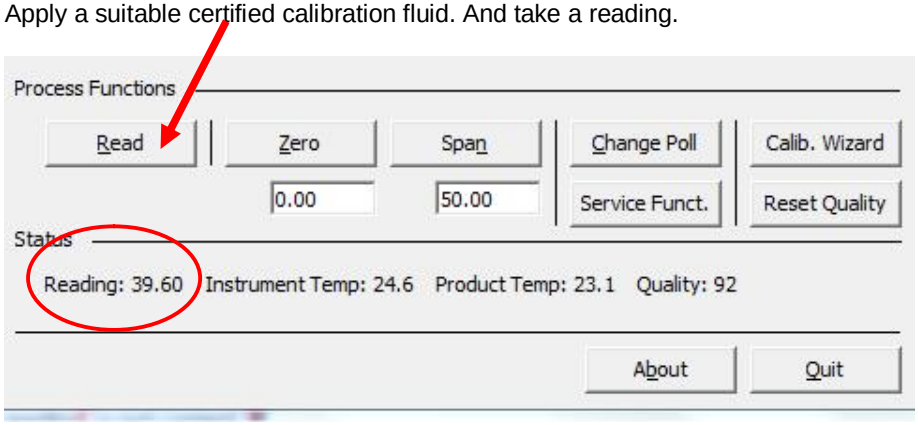
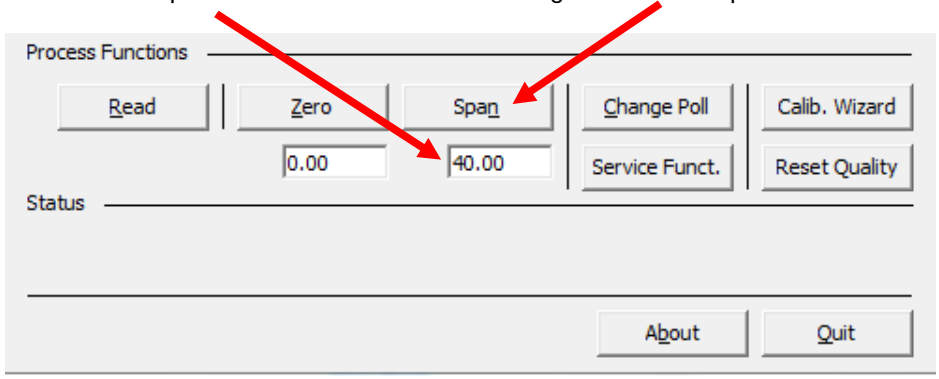
1.14 **Select scale & temperature compensation**

Select the installed UDS and AG temperature compensation.

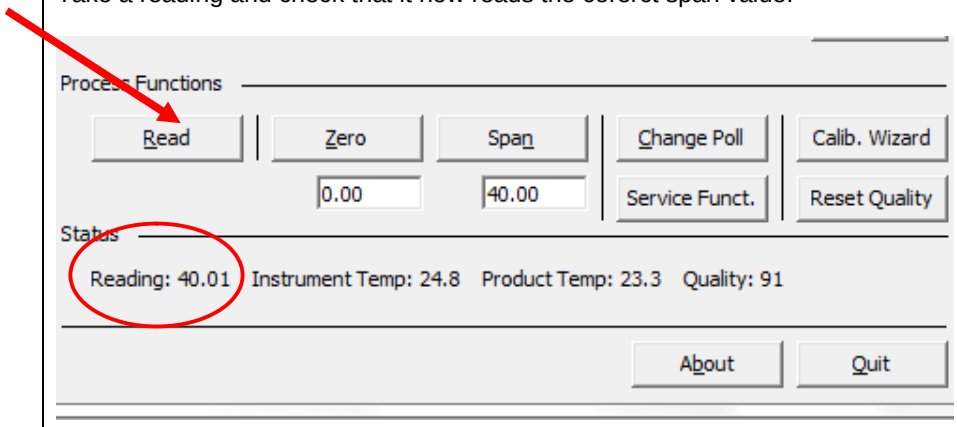




Down load these selections (as carried out in step 1.5).

1.15	**Take a reading** NOTE: Measurements at this stage are taken in the selected User Defined Scale with AG fluid temperature compensation. Apply a suitable certified calibration fluid. And take a reading. 
1.16	If the reading is not correct:- • Rmove the sample, clean and dry the prism surface, apply another sample and take another reading. If this is still incorrect then carry out Span Calibration the instrument.
1.17	**Carry out Span Calibration** Clean the prism surface and apply a sample certified calibration solution. Set the correct Span value on the Maintenance Program and then span the instrument. 

Please note! Us the value provided with the certificate of the AG-Liquids. (32.5AUS)

	Take a reading and check that it now reads the corerct span value. 
1.18	**Calibration Check** Carry out further calibration checks as required using additional certified calibration standards. NOTE: Ensure that a suitable scale and temperature compensation is selected for the certified calibration materials used. Record results:

		Scale:	
		Temperature Compensation:	
		Zero Point:	
		Span Point:	
Test Standard	Value	Measured Result	Deviation

	All measurements should read within the published tolerances for the instrument type. If any measurements fall outside the expected tolerance then repeat the Zero & Span process and check the calibration again.
1.19	Once all calibration checks are complete, return the instrument to the original configuration. Download this configuration. Exit the Process Maintenance program by selecting ‘Quit’. Re-connect the Process refractometer to the manifold and ensure that all bolts are secure.