



Project:

## **3059-08 – Beagle - Qinterra GUI Software**

Document Title:

### **User Manual**

Software:

### **Beagle 1.17**

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## 1 Introduction

### 1.1 Customer

Company name: Qinterra AS  
Contact person: Kenneth Grødeland  
Email: [kenneth.grodeland@qinterra.com](mailto:kenneth.grodeland@qinterra.com)  
Web: [www.qinterra.com](http://www.qinterra.com)  
Company address: Lagerveien 30, PO Box 281, 4066 Stavanger  
Country: Norway

### 1.2 Vendor

Company name: North Sea Electronics AS  
Email: [mail@nse.no](mailto:mail@nse.no)  
Web: [www.nse.no](http://www.nse.no)

### 1.3 Purpose of Document

This document shall describe the details use of the Beagle software, version 1.17.0. Beagle is the Qinterra downhole tool GUI Software.

### 1.4 Software version labeling

The complete version information for a Beagle release is:

Major.Minor.Fix (Release date. Build number)

Example: 1.2.03(120504.480)

Major version: 1.

Minor upgrade: 2.

Fix: (typically a bug fix): 03.

Release date: 2012, May, 04.

Build number: 480

For most purposes only Major and Minor version number are shown, but the complete version information is available in the About dialog window (4.5.2).

### 1.5 Compatibility

This document was written for Beagle 1.17.0. It will be compatible with all 1.17.## versions. When a new Major or Minor version update is released, a new version of this document will also be released.

### 1.6 Reference Documents

Doc Id	Document Title	Dated	Issued by
-			

### 1.7 HSE

All use of this software must be performed with regard to potential health, environmental and safety impact resulting from actions performed with it. The software will not identify or prevent such impact, hence this is the responsibility of the operator.

## 1.8 Abbreviations

AWS	<a href="#">Aker Well Service</a>
Beagle	Product name for the Qinterra GUI Software for downhole tool control
CANbus	<a href="#">Controller Area Network</a>
FTDI	<a href="#">Future Technology Devices International Ltd.</a>
GUI	<a href="#">Graphical User Interface</a>
H	High limit. A value above this level should be notable, but not critical.
HH	High-High limit. Should be higher than High Limit, and be a value that should not be exceeded.
HHmmSS	Time format with hour, minute and seconds. 142356 is hour 14, minute 23 and second 56
HV	<a href="#">High Voltage</a>
IO	Input / Output
L	Low limit. A value below this level should be notable, but not critical.
LL	Low-Low limit. Should be lower than Low Limit, and be a value that the measurement should not be below.
Mar-In	<a href="#">Marin-Innovasjon AS</a>
NSE	North Sea Electronics AS (former Marin-Innovasjon AS)
PCP	Powertrack Control Panel
TBD	To be determined
TPS	<a href="#">Topside Power supply</a>
VCP	<a href="#">Virtual Com Port</a>
VISA	<a href="#">Virtual Instrument Software Architecture</a>
YYYYMMDD	Date format with 4 digit year, two digit month, and two digit day. 20120519 is May 19, 2012

## 2 Beagle

Welcome as a user of Beagle, the user interface for the Qinterra range of downhole tools. Beagle will give you real time control of the downhole operations.



## **2.1 Supported downhole tools**

Stroker and Driller

## 2.2 Beagle Change history

### 2.2.1 V1.17

Released: 2015-09-11

- Changed Maximum limit of the “Maximum resistance” settings under Options>>PCP to 500 Ohm to allow cables with higher resistance when the Magna Power supply is used
- Added support for the 1250V, 8,3A Magna Power supply
- Renamed relay events in event log
- Changed name in from “Pressure OK limit” to “Anchor Enabled Pressure” in options.
- Removed previously configured COM ports from list if they are not available
- The depth offset is now preserved in the INI file. This will ensure that the depth is correct when Beagle is restarted.
- A restriction has been set on the Project selection dialog that prevents the operator from starting with an empty project. This will solve the problem that no logfiles are created if an empty project is started.
- GPIO feedback is used for relay status for 218 tool
- The channel list in the graph selection has been sorted into Basic, Advanced and Expert levels. Each group is separated with a horizontal line. All reserved channels have been removed from the list.
- A bug that causes all graph settings to be lost if the “Exit” button in the Welcome dialog, the Select Project dialog or the COM Port Configuration dialog is pressed has been fixed.
- Changed width of Version Indicator in Welcome window that was barring parts of the Exit command button.

### 2.2.2 V1.16

Released: 2015-06-23

- Removed buttons for controlling relays individually
- Removed Mono and Hepta relay status indicators and replaced them with one indicator which has the status for both
- Minor cosmetic changes to the Passenger and Motor relay control buttons
- The Relay status is always unknown until the operator has successfully set the tool in Motor or Passenger mode. It is set back to unknown when the HVPSU Voltage is below the “Relay Status Loss Voltage” limit
- Removed Solenoid position section from Main GUI
- Removed Lower Tension Sub value and status indicators when Stroker is selected. Stroker does not have a Lower Tension Sub
- Removed the words “Winch spool” and “Winch” under option – depth system
- Changed the Voltage slider confirmation message box to appear if the relay status is “Passenger” and “Unknown”
- Hardcoded Modem Status Baud Rate to 115.200

### 2.2.3 V1.15

- Fixed incorrect scaling in Stroke Force Monitoring when 338MRS was selected (V.1.15.2)
- Changed current limit and modulation table in Magna supply to 12Ampere (V1.15.1)
- Added setting for Slips type on Stroker tab in Options dialog
- Moved Winch settings to a new tab called “Depth System”
- Added Depth override function to “Depth System” tab
- Made the serial port selection more robust, to avoid user selecting the same port for multiple interfaces
- Fixed bug with “Turn HV OFF” on alarm condition
- Added “Stop Motor” as an action to alarm conditions
- “Relay Switch Voltage” is renamed “Maximum Relay Switch Voltage”
- Fixed bug which made it impossible to close the Telemetry splash screen
- Changed functionality of “Start Telemetry” button.

## **2.2.4 V1.14**

- Detail View dialog window – removed “Stop Controller” button, added “Close” button
- Added “Waiting for Telemetry to Start” screen when Tractor and Driller is selected
- Changed functionality of “Telemetry Timeout Disable GUI” to apply to measurements from the tool also. If telemetry fails, the measurements will maintain the last known value until the timeout has elapsed
- Changed numeric precision and size of the Tool Voltage Setpoint Numeric control
- Added selection of slips type to the Stroker Wizard
- Added “Close” button to the Stroker Wizard
- Added NA as a unit category for variables that has no engineering unit
- Changed name of all relay buttons to “Passenger” and “Motor”
- Added workshop mode selection to operate relays freely
- Added “pulses per revolution” and “spool circumference” options for calculation of Winch Depth and speed
- Added better control to the PC controlled Resistance calculations to avoid errors
- Increased width of Cable Resistance Control to allow 3 digits
- Increased size of Upper and Lower tension Sub indicators
- Added Beagle User Manual to “Help” button
- Added COM port selection to project creation wizard
- Added indicators for displaying the Modem Status

## **2.2.5 V1.13**

- Stroke Force variable is displayed in graph as a signed value, the indicator still shows absolute value
- Logging of Runs functionality has been disabled. Beagle has been reverted to use the original logging functionality
- PCP in PSU option has been renamed Unipower
- Relay Switch Voltage setting has been moved to PCP tab
- Stroke Extension slide indicator has been moved down a couple of pixels
- Added serial port information to “Create System Report”
- Added Tool Connected timeout configuration that will make it possible to select how long it should take before the main controls in the GUI times out
- Bug in Stroke Force Limit negating when Stroking In has been fixed

## **2.2.6 V1.12**

- Added support for Magna PSU

## **2.2.7 V1.11**

- Fixed bug that made binary logfiles corrupt.
- Merged the different tool analog variable lists into one
- Merged the different tool digital variable lists into one
- Added Runs controls to front panel
- Removed hardcoded limit of 350V for Voltage Setpoint sent to PCP

## **2.2.8 V1.10**

- Added m/min and ft/min as units for Winch Line Speed
- Accelerometer is now referenced to the tool when it is in operation
- Stroke force limit control has been given a minimum data entry of 0,5 tonne/long ton
- Added “Solenoid & Relay latching time” in ms to Options dialog.
- Added warning dialog if user increases Voltage setpoint while tool is in passenger mode.
- If telemetry is down or tool in motor mode, the Voltage setpoint can be operated freely
- Added ZERO button for tractor tension subs
- Removed “Stroker Wizard” when operating tractor
- Fixed bug in Beagle Panel status indicator

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- Changed the following names  
Tension Sub 1 -> Upper Tension Sub  
Tension Sub 2 -> Lower Tension Sub
- Fixed bug in “Stop Motor” button
- “Start Motor” button is now disabled when the tool is in passenger mode
- Enabled “Go to default pos” button in “Stroker Wizard”.
- Fixed bug in ZERO stroke force button.
- Added memory of chart configuration in different user modes and for different tools.
- Overhauled historical graph

### **2.2.9 V1.9**

- Added “Zero” button that equalizes the pressure and force
- Added “Zero” button that removes offset from tension subs
- Fixed some misspelled words
- Increased size of “plot line size” selector font
- Changed the following names  
Logging mode -> Passenger mode  
Tractor mode -> Motor mode
- Changed colors of Digital Status indicators to the following: Blue for “FALSE”, Green for “TRUE”, and Red for “UNKNOWN”. To avoid a “FALSE” value seem as an error.
- Default unit of “Stroke Extension” has been changed to millimeter
- Changed status indicator strings to ONLINE or OFFLINE, where it seems applicable
- “Stroke Force” is now presented as an absolute value
- Default value for “Tachometer pulses per mm” has been changed to 2
- Added status indicator for Beagle Panel aka Topside modem.
- The Stroke force is now multiplied with a constant of 2, which is a value that has been found during testing.
- The direction of the Stroke Force limit has been negated. A stroke out command will now stop when a positive limit has been reached. A stroke in command will now stop when a negative limit has been reached.

### **2.2.10 V1.8**

- Changed logic for blinking on “Start Telemetry” button. The button should now stop blinking when the telemetry has started.
- Added Telemetry timeout in Stroker Wizard
- The Calculate Resistance function is now averaged over two samples.
- PCP resistance is now updated automatically when communication between Beagle and PCP has been established.
- Added run-time menu which makes it possible to change active tool without restarting Beagle.
- Added COM port selection for Tractor “Setup>>Options>>Main>>Tractor Interface”
- Changed layout of display when running Tractor
- Longer timeout for greying out display when communication with tool is lost (4 seconds)
- Added dialog that appears if conditions for HV ON is not set
- Anchor enabled indicator is now Green
- Selectable units for variables (Metric and Imperial units)
- Changed order of logfiles so that data from the PCP comes first. This is to make it easier in future versions of Beagle to add new variables to the end of the logfile.
- Changed conversion of all analog nodes to 12 bit
- Added selectable line width of all plots
- Improved synchronization of graph
- “Start Motor” control will now change to “Stop Motor” when pressed

### **2.2.11 V1.7**

- Removed “1 On 2 Off” and “2 On 1 Off” relay buttons
- Changed digits of precision on Main GUI indicators
- Added interactive window for calibration of values

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- Added two analog nodes showing tension sub readings
- Automatic calculation of cable resistance
- Changed some variable names
- “Start telemetry” button is lit green when telemetry is active
- Data from PCP is now received 10 times per second
- Indicators are updated 10 times per second
- Tension, voltage downhole/topside and current indicators have an option to get variable averaging
- Graph is updated 5 times per second
- Winch Depth counter can now handle negative values
- Winch Speed is now calculated in GUI based on change in depth over time
- Disable force monitoring command is now sent before Enable force monitoring in order to get limits updated.
- Changed tension from ton to kg
- Changed appearance of digital indicators to show a Red indicator when not connected and False status.

### **2.2.12 V1.6**

- Added green color to the following buttons when pressed: “Set anchor, Release anchor, Stop Stroker, Stroker Go to, Stroker In, and Stroker out”.
- Added blinking to the following buttons when command is active: “Stroker Go to, Stroker In, and Stroker Out”.
- The relay buttons are disabled when the HV PSU Voltage is above a configurable threshold.
- Stroker force limit has been replaced with an absolute value, and the direction is decided automatically when running the Stroker.
- Force monitoring is always enabled
- New Aker Logo
- Removed High-G controls

### **2.2.13 V1.5**

- Added variables for “PSU Temp(deg C), PSU HV Voltage in(V), PSU Main Voltage out(V), PSU Main Current out(mA)”
- Removed North Sea Electronics logo from about dialog and splash screen
- Added Start Telemetry and Start Motor buttons
- Added Stroker default position dialog

### **2.2.14 V1.4**

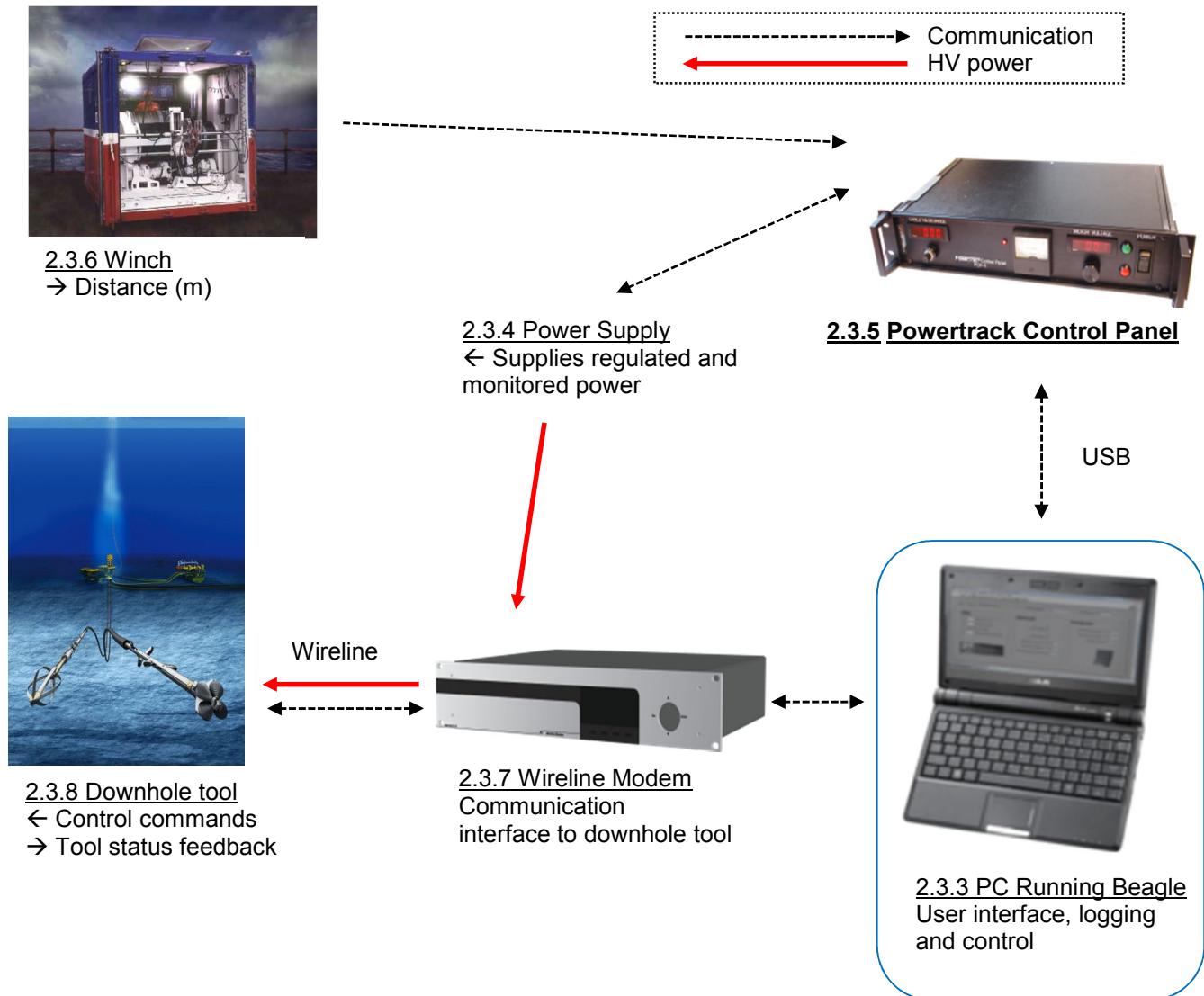
- Added buttons for Pressure Limit monitoring to GUI
- Added commands for Pressure Limit monitoring to sequencer
- Added command for overriding Solenoid status in detailed view
- Some minor name changes
- Added colors to HV ON and HV OFF buttons
- Enlarged fonts

Changes up to version 1.3.01 are not tracked in this document.

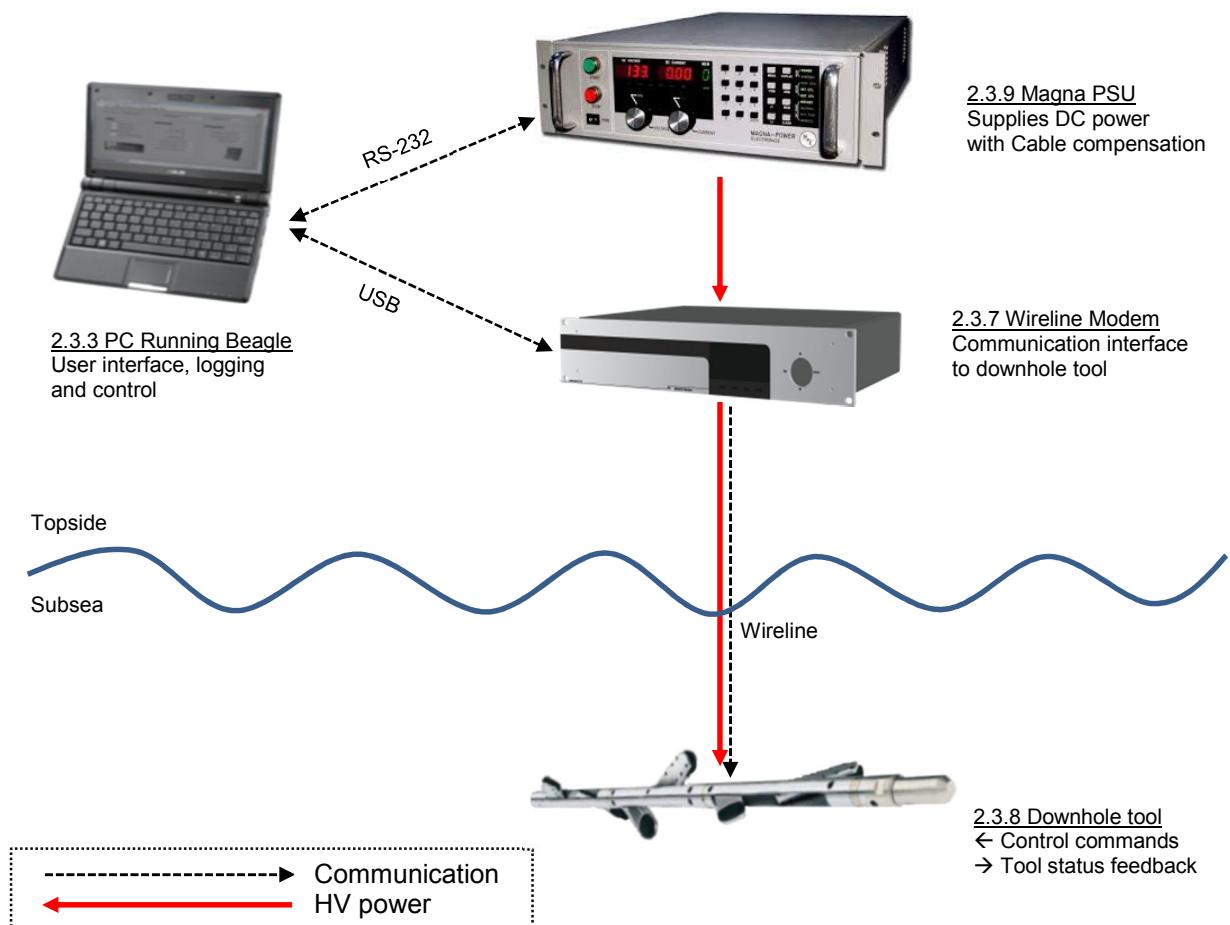
## 2.3 System Components

Detailed description of the different system components are not in the scope of this document. Beagle supports two different power supply options which are described in this chapter.

### 2.3.1 System Layout setup alternative 1 with Powertrack Control Panel



### 2.3.2 System Layout setup alternative 2 with Magna PSU



### **2.3.7 Wireline Modem (Beagle Panel)**

The topside Wireline Modem communicates with the downhole Wireline modem in the downhole tool, and acts like a full duplex transparent link.

### **2.3.8 Downhole tool**

The downhole tool has a main controller node installed, which Beagle communicates with through the topside and downhole Wireline modems. This controller node reports tool status and can perform actions based on Beagle commands. It will also communicate on CANbus with the other control and sensor nodes in the tool.

### **2.3.9 Magna PSU**

The Magna PSU is a programmable DC powersupply with integrated cable compensation. The cable compensation is necessary because there is a substantial resistance in the power cable. When the Magna PSU is in use, it replaces both the PCP and the Topside PSU. No winch parameters will be possible to read in Beagle in this mode. Beagle is connected to the Magna PSU with a RS232 serial cable.

## 3 Installation

### 3.1 Requirements

Beagle is a resource intensive program, designed for industrial use.

#### 3.1.1 Minimum specification:

Windows XP, Windows 7  
Intel® Core™  
2 GB RAM  
100GB HD  
Single 1920 \* 1080 screen

#### 3.1.2 Recommended specification:

Windows 7 64 bit  
Second generation Intel® Core™ i7 or i5.  
8GB RAM  
100 GB SSD HD  
Dual 1920 \* 1080 screens

### 3.2 Installation pre requisites

Before installation of Beagle, all pre requisites should be installed. Check the README.txt file accompanying the Beagle installation files to find if any of these are included.

#### 3.2.1 NI LabVIEW runtime

Beagle is coded in LabVIEW 2011 by National Instruments. In order to run it, the LabVIEW runtime environment must be installed. The LabVIEW runtime environment may have been distributed along with Beagle as a separate executable, if not, download it from National Instruments at <http://joule.ni.com/nidu/cds/view/p/id/2534>. To install, double click the exe and follow the instruction. You may be asked to restart the computer.

#### 3.2.2 NI VISA driver

Beagle uses advanced serial interface VISA components, which requires VISA 5.2.0 or newer to be installed on the system. See the README.txt accompanying the Beagle installation files to see if this driver is included in the installation. If it is not included, download [visa520runtime.exe](http://joule.ni.com/nidu/cds/view/p/id/3342/lang/no) from <http://joule.ni.com/nidu/cds/view/p/id/3342/lang/no>. To install, double click the exe and follow the instruction. You may be asked to restart the computer.

#### 3.2.3 FTDI Driver

The PCP uses an FTDI chip as USB interface. The correct drivers must be installed on the system. The FTDI driver may have been distributed along with Beagle as a separate executable or zip file, or windows may install it automatically upon detection. If the driver is not included, nor automatically installed, download the appropriate (by OS) VCP driver from <http://www.ftdichip.com/Drivers/VCP.htm>, and installation instructions from <http://www.ftdichip.com/Support/Documents/InstallGuides.htm>. To install, follow the instructions.

### 3.3 Installing Beagle

Beagle is normally distributed as a self-installing exe file. Double click the exe and follow the instructions on screen. If a shortcut to Beagle.exe is not created, make this manually. Restart computer after installation. If Beagle has been distributed without an installer, copy the content of the Zip file to the system main drive (normally "C:").

## 3.4 Disk layout

### 3.4.1 Installation folder

The installation folder should be on the main disk, but can be freely placed in the system. Default location will be "C:\Program Files (x86)\Mar-In\Beagle\".

#### 3.4.1.1 Installation folder content

.. ./Beagle.aliases	<i>LabVIEW system file</i>
.. ./Beagle.exe	Main executable
.. ./Beagle.ini	<i>LabVIEW system file</i>
.. ./Config/Config.ini	User setup, as configured in the Options dialog (4.5.4).
.. ./Config/Variables.ini	Configuration of non-tool depended IOs in the system. These are accessed using the IO dialog (4.5.5).
.. ./Config/Tool Variables.ini	Configuration of all Tool IOs. These are accessed using the IO dialog (4.5.5).
.. ./Config/Modem Status Variables.ini	Configuration of Modem Status IOs. These are accessed using the IO dialog (4.5.5).
.. ./data/lvanlys.dll	<i>LabVIEW system file</i>
.. ./data/lvsound2.dll	<i>LabVIEW system file</i>
.. ./Promotional Material/	Available depending on distribution. Not required for correct functioning of software. PDFs with promotional material.
.. ./Data sheets/	Available depending on distribution. Not required for correct functioning of software. PDFs with specification and user information for material involved in the downhole operation.
.. ./Log/	Created by Beagle when needed. Used for system log files that does not belong to a project.
.. ./Help/	Contains the Beagle User Manual as a PDF file

### 3.4.2 Data repository

This is the windows folder where all project folders (3.4.3) are located. The location of the data repository is selected in the Options main tab (4.5.4.1). This should be on a local drive. Changing the location of the Data repository will not move any of the data in it.

### 3.4.3 Project folder

All log files generated while running Beagle is placed in the automatically created project folder, under the Beagle data repository. The project folder name is decided by the Project name.

If the data repository is at "C:/Data/Qinterra/" and the project is called "Test project", all log files will be located in C:/Data/Qinterra/Test project"

### 3.4.4 Data files

During normal operation, incoming data, user actions and alarms will be stored in files. These files will be placed in the project folder (3.4.3) of the Beagle data repository (3.4.2). For more information on the files, see chapter 4.12.

## 4 Using Beagle

### 4.1 Getting started

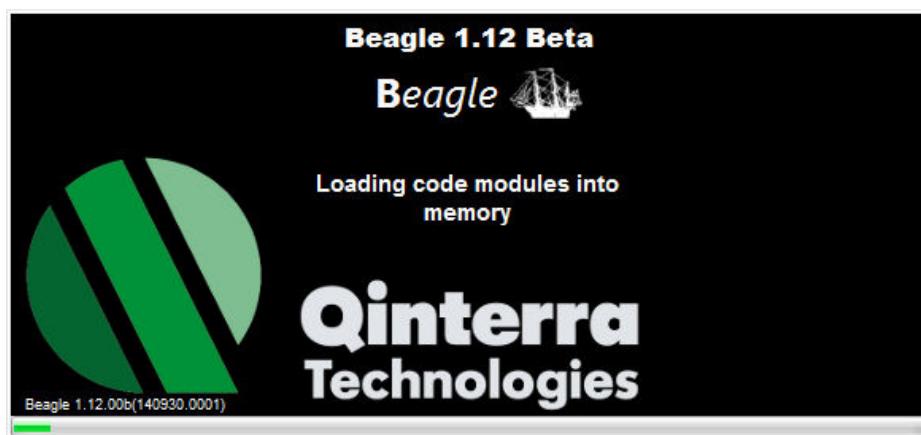
#### 4.1.1 Starting the program

The program is started by double clicking on the exe file or shortcut



Beagle may require up to a minute to start up.

During startup, a splash screen shows progress and detailed information about program version and build.



When the program is finished starting up, the welcome dialog (4.1.3) will be shown.

#### 4.1.2 User levels

Beagle has two user levels.

- User (Also referred to as standard user).
- Super User.

The level can be freely changed by the user (4.5.1).

A Super User has some access that standard users don't. The Super User can:

- View any analog channel in the charts.
- Make and change sequences.
- Change alarm levels and conditions.

### 4.1.3 Welcome

The welcome screen is the first stop in any Beagle session.



#### Tool Selection

Press one of the three tool graphics to select the tool to operate. The tool be changed during operation.

**User** Change user name and user access with the user dialog (4.5.1).

**Help(F1)** Opens the Beagle User Manual in the default pdf reader.

**Promotional** Opens a windows explorer window to folder ".../Beagle/Promotional material/".

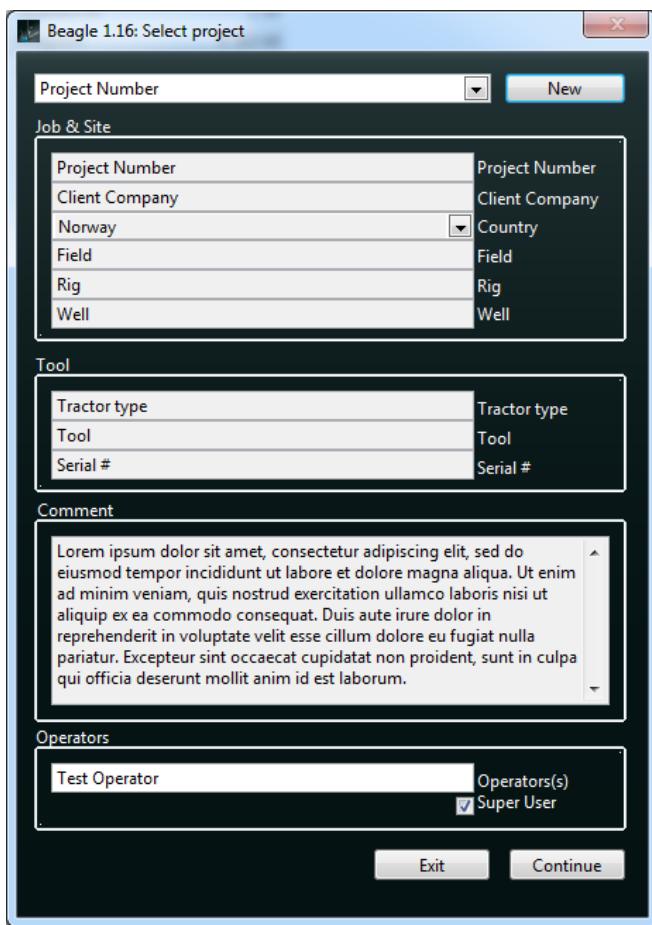
**Data sheets** Opens a windows explorer window to folder ".../Beagle/Data Sheets/".

**Exit** Closes Beagle, and exits to windows. (disabled)

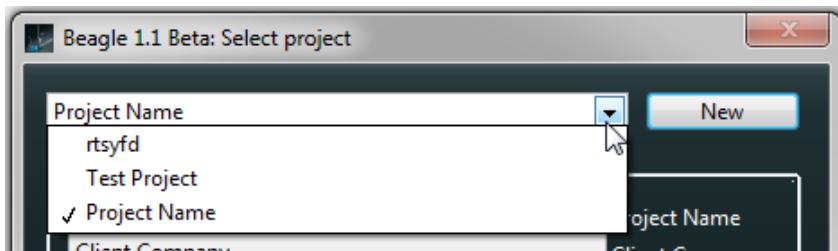
**Quick start** Closes the welcome window and opens the main window with the project setup used during the last session.

**Continue** Closes the welcome window and opens the Select Project dialog (4.1.4). This allows selection of project, and configuration of a new project.

#### 4.1.4 Select Project



Select a project number from the top drop down box.



All fields except “Operators” will be updated with the information registered for the project. This information is stored in the Project folder (3.4.3) of the same name. All data recorded while using Beagle will now be stored in this folder.

New

Brings up the New project dialog (4.1.4.2).

Continue

Closes the Select project dialog, and brings up the main window

Exit

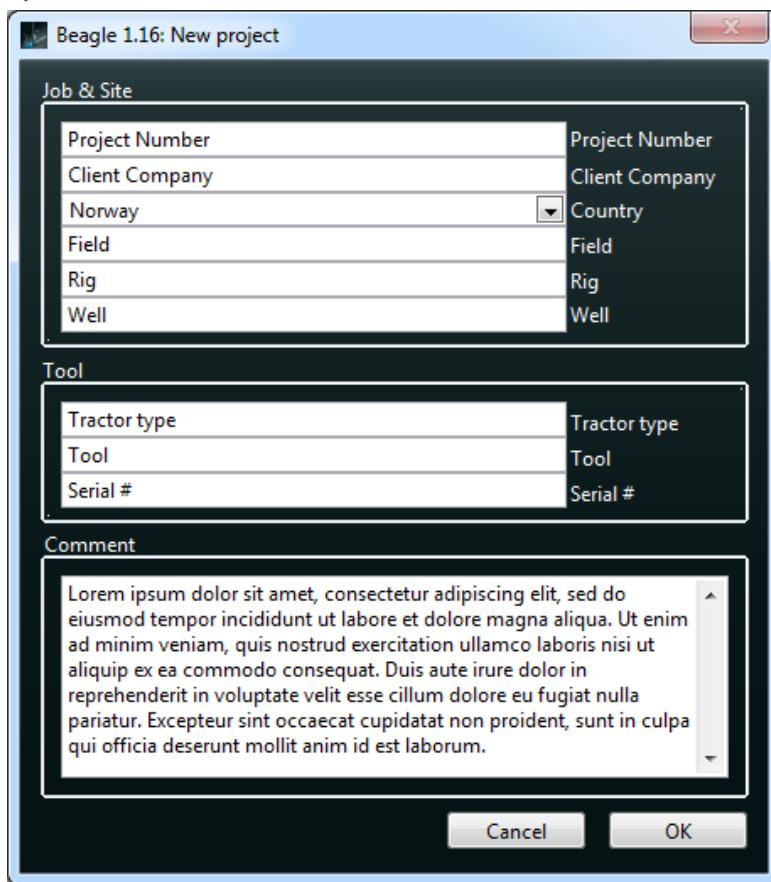
Closes Beagle.

##### 4.1.4.1 Operators

The name(s) typed into the Operator(s) text box will be visible in the main beagle window, and prepended to any annotations.

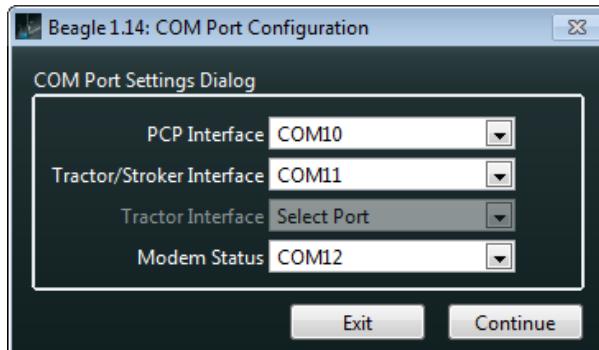
If Super User is selected, more options will be available to the user. See User levels (4.1.2) for more information.

#### 4.1.4.2 New project



When pressing OK, A new project folder will be created, and the project information stored. This project can now be selected from Select project (4.1.4).

#### 4.1.4.3 COM Port Selection



This dialog forces the operator to configure the COM ports used for hardware connectivity prior to starting Beagle. The available COM ports in the computer are automatically detected in this dialog, but the user has to determine which COM port is used for which interface. If a COM port is disabled in a drop down menu, it is because it is already selected in one of the other controls. In order to enable the COM port, it first has to be unselected in the control that is currently locking it. To unselect a COM port, press "Select Port" in the drop down menu. If a serial port was connected to the computer after this dialog was initiated, it is necessary to select "Refresh" in one of the drop down menus. The COM ports can later be changed in the Options dialog.

## 4.2 Main window



## 4.2.1 Indicators

### 4.2.1.1 Standard analog

Voltage Downhole(PCP)	X v	NaN
Voltage Downhole(PCP)	v	251.5
Voltage Downhole(PCP)	^ v	323.8
Voltage Downhole(PCP)	▼ v	129.4
Voltage Downhole(PCP)	▼ v	75.7

These indicators have three parts.

- IO state on the left side. See 4.5.6.2 regarding limits.

No issue	Blank
Technical issue	X
Above H limit	Single arrow pointing up.
Above HH limit	Double arrow pointing up.
Below L limit	Single arrow pointing down.
Below LL limit	Double arrow pointing down.

- To the right of the status is the unit.
- The right side of the indicator holds the measurement value.

When the IO triggers an alarm state, for instance if it goes below LL limit, and this limit has an alarm associated with it (4.5.6.2), the whole indicator will blink red.

### 4.2.1.2 Standard digital

Control	X	?	Red
Control	PC		Blue
Control	!	LOCAL	Green

These indicators have three parts.

- IO state on the left side. See 4.5.6.3 regarding state configuration.

No issue	Blank
Technical issue	X
Attention	!. Indicates that the value of the indicator warrants attention.

- In the middle is a text indicating the value. The text for True, False and Unknown is defined in the IO lists (4.6.1).
- To the right is the value. Green for “TRUE”, Blue for “FALSE”, Red for “UNKNOWN”. All digital indicators that are presenting connectivity status, are using a two colored version of this indicator. Where Red indicates “FALSE” and “UNKNOWN”.

When the IO triggers an alarm state, for instance if it goes High/True and this state has an alarm associated with it (4.5.6.3), the whole indicator will blink red.

### 4.2.1.3 Solenoid valve state

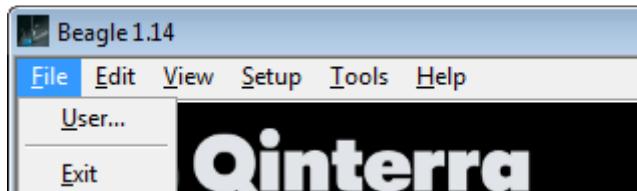
Solenoid state are indicated using glyphs

Unknown	{?}
Open	☒

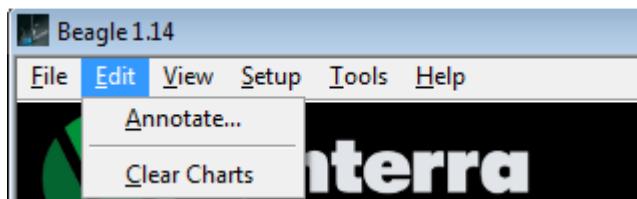
Closed



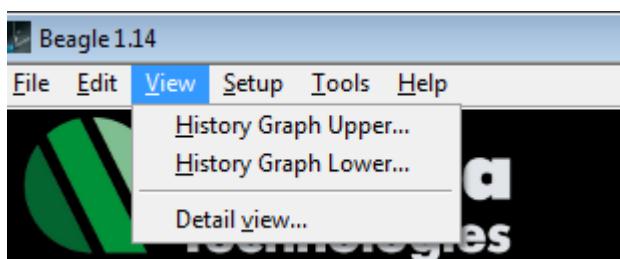
## **4.2.2 (A) Main menu**



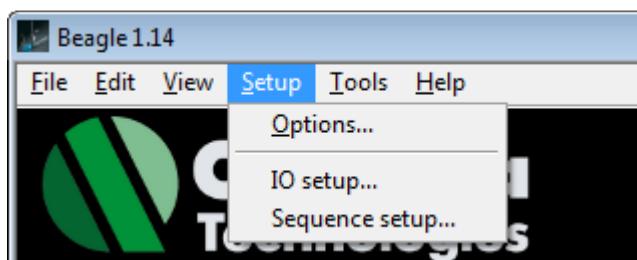
User	Opens dialog User (4.5.1). Allowing the current operator name and level to be changed.
Exit	Closes Beagle



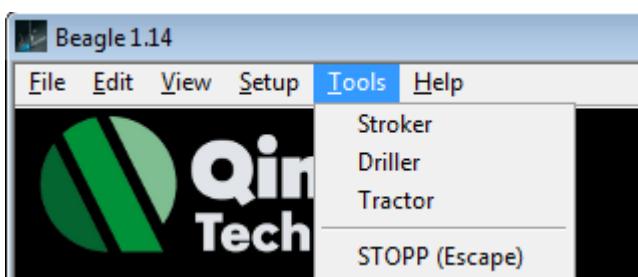
Annotate...	Opens the Annotate (4.5.3) dialog.
Clear Charts	Clears the two main charts (4.2.6) of data



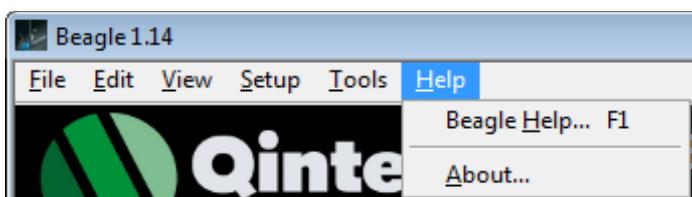
History Graph Upper...	Opens the History graph window with the current selection from the upper real-time graph (4.4.2).
History Graph Lower ...	Opens the History graph window with the current selection from the lower real-time graph (4.4.2).
Detail view...	Opens the Detail window (4.4.3).



Options	Opens the Options dialog (4.5.4).
IO setup	Opens the IO dialog (4.5.5).
Sequence setup	Opens the Sequence setup dialog (4.5.7).



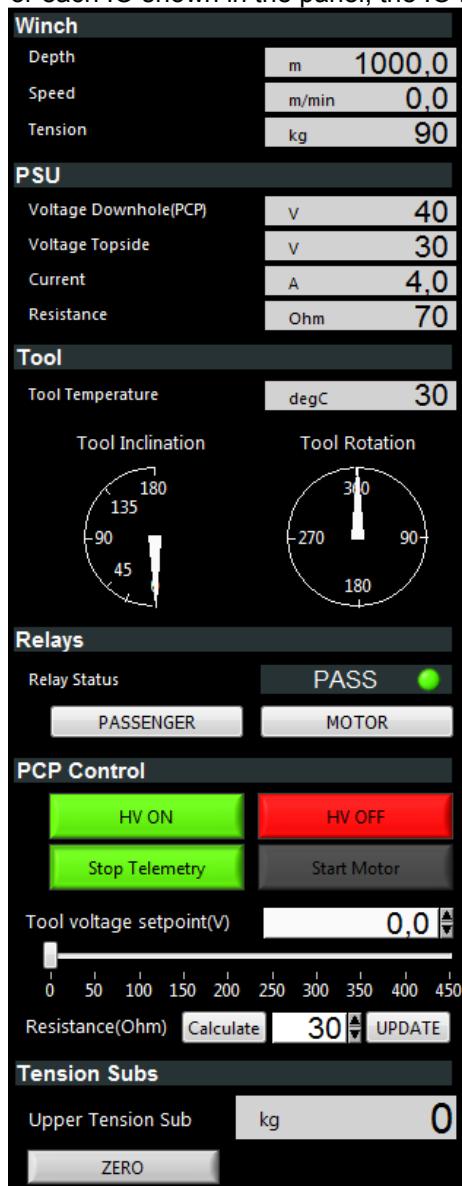
Stroker	Sets the Stroker as the active tool
Driller	Sets the Driller as the active tool
Tractor	Sets the Tractor as the active tool
STOPP (Escape)	Sends the HV Off command to the PCP. Note that the Escape shortcut does not work correctly in 1.5.01



Beagle Help	Opens Beagle User Manual in the default pdf reader.
About	Shows the About dialog (4.5.2).

### 4.2.3 (B) Left panel

For each IO shown in the panel, the IO name according to the IO table (4.6.2).



#### Indicators

Name	Variable	Digits
Depth	4.6.2. Winch Depth	1
Speed	4.6.2. Winch Line Speed	1
Tension	4.6.2. Winch Wire Tension	0
Voltage	4.6.2. HVPSU Head Voltage	0
Downhole(PCP)		
Voltage Topside	4.6.2. HVPSU TS Voltage	0
Current	4.6.2. HVPSU Current	1
Resistance	4.6.2. PCP Cable Resistance	0
Tool	4.6.2. Tool max Temperature	0
Temperature		
Relay Status	4.6.1. Tool Both Relays	NA
Tool Inclination	4.6.2. Tool Inclination	NA
Tool Rotation	4.6.2. Tool Rotation	NA
Upper Tension Sub	4.6.2. Tool Upper Tension Sub	0
Lower Tension Sub	4.6.2. Tool Lower Tension Sub	0

#### Controls

For detection of activation, current limits for relay 1 and 2 are implemented, see 4.5.4.3.

Name	Variable
PASSENGER	Puts the Tool in Passenger mode by turning the controller Relay 1 and 2 ON.
MOTOR	Puts the Tool in Motor mode by turning the controller Relay 1 and 2 OFF.
<b>Note</b> To prevent any damage on equipment the relay controls are disabled when the 4.6.2. HVPSU Head Voltage is above the 4.5.4.3 Relay Voltage Limit.	

HV ON

Send a High Voltage ON command to the PCP.

Enabled when:

- PCP is connected.
- PCP mode is PC control.

Gives an error when:

- Tool voltage setpoint(V) = 0.
- The PCP IO (4.6.2.HVPSU Head Voltage) is below 10V.

Control colors when:

- |  |                                 |
|--|---------------------------------|
|  | 4.6.1.HV PSU HV Active is TRUE  |
|  | 4.6.1.HV PSU HV Active is FALSE |

HV OFF	Send a High Voltage OFF command to the PCP. Is always available as long as the PCP is connected. This control is always colored red.
Start Telemetry/Stop Telemetry	Starts telemetry by setting the value of Tool voltage setpoint to 4.5.4.2 Start Telemetry Voltage. The button will also open the 4.5.8 Stroker Default Dialog when operating the Stroker.  When pressed once the text of the button will change to "Stop Telemetry". If pressed again the Tool Voltage setpoint is set to 0V.
	Enabled when: <ul style="list-style-type: none"><li>• PCP is connected.</li><li>• PCP mode is PC control.</li></ul> Control colors when:  4.6.1.Tool Connected is FALSE  4.6.1.Tool Connected is TRUE
Start Motor/Stop Motor	Starts motor by setting the value of Tool Voltage setpoint to 4.5.4.2 Start Motor Voltage.  When pressed once the text of the button will change to "Stop Motor". If pressed again the Tool Voltage setpoint is set to 4.5.4.2 Stop Motor Voltage.
	Enabled when: <ul style="list-style-type: none"><li>• PCP is connected.</li><li>• PCP mode is PC control.</li><li>• Telemetry Started</li><li>• Tool in Motor mode</li></ul>
Tool voltage setpoint(V)	Changing this value sends a new setpoint to the PCP. Beagle will not try to change the setpoint quickly, but will divide the change into several steps. See 4.5.4.3. 0 digits of precision.  If the voltage setpoint is increased when the tool is in passenger mode or an unknown mode, a commit dialog will appear. If OK is pressed on the dialog, the dialog will be disabled until the next time the tool is set to passenger mode.
Resistance(Ohm).Calculate	This control button will calculate the cable resistance based on the voltage drop over the cable and the current that runs through it. It will average the inputs over two samples.
	$\text{Resistance} = \frac{\text{4.6.2 HVPSU TS Voltage} - \text{4.6.2 Head Voltage}}{\text{4.6.2 HVPSU Current}}$
Resistance(Ohm)	Value for the PCP to use as Wireline resistance when calculating the topside voltage that will give a certain head voltage. The PCP is updated with a default value when communication is established and PCP is in PC mode. A new value is not sent to the PCP until UPDATE is clicked. 0 digits of precision.

Resistance(Ohm).UPDATE

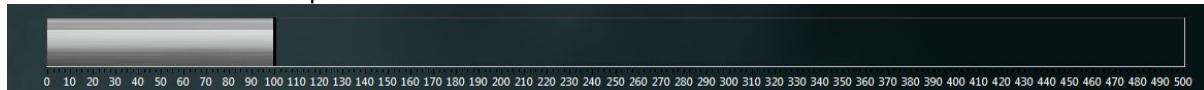
Send the resistance to use to the PCP. Beagle will not try to change the setpoint quickly, but will divide the change into several steps. See 4.5.4.3.

ZERO

Sets the measurements from the Tension Subs to zero by removing the current offset

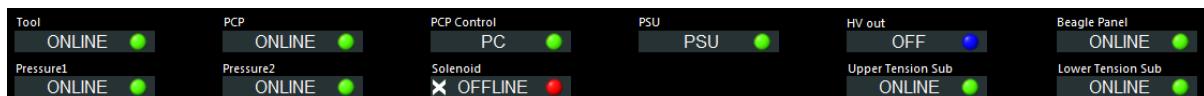
#### **4.2.4 (C) Stroke indicator.**

Shows the current stroke position.



This is available in numerical form on the right side panel (4.2.7).

#### **4.2.5 (D) Bottom status panel**



All the indicators here are standard digital (4.2.1.2).

Tool	4.6.1.Tool Connected	Beagle has contact with the Tool controller.
PCP	4.6.1.PCP Connected	Beagle has contact with PCP.
PCP Control	4.6.1.PCP Control	PCP is under PC control. If off, the local switch is on.
PSU	4.6.1.HV PSU Connected	The PSU is connected to the PCP.
HV out	4.6.1.HV PSU HV Active	The PSU is outputting a voltage.
Beagle Panel	4.6.1. Modem Connected	A valid COM port has been configured for the Beagle Panel aka the Wireline modem.
Pressure 1	4.6.1.Tool node pressure 1	Beagle has contact with the Tool pressure node 1 (via the controller).
Pressure 2	4.6.1.Tool node pressure 2	Beagle has contact with the Tool pressure node 2 (via the controller).
Solenoid	4.6.1.Tool node solenoid	Beagle has contact with the Tool solenoid node (via the controller).
Upper Tension Sub	4.7.1. Stroke tension sub	Beagle has contact with the Tool upper Tension Sub node (via the controller).
Lower Tension Sub	4.7.1.Stroke tension sub	Beagle has contact with the Tool lower Tension Sub node (via the controller).

#### 4.2.6 (E) Chart panel



- (a) Two Channel, line width and line color selectors (0) to associate up to two IO channels with the left Y-scale of the top chart(c).
- (b) Two Channel, line width and line color selectors (0) to associate up to two IO channels with the right Y-scale of the top chart(c).
- (c) Top chart will show up to 4 channels of data simultaneously. It will always show the most recent data if there is new data coming in.
- (d) Bottom chart will show up to 4 channels of data simultaneously. It will always show the most recent data if there is new data coming in.
- (e) Two Channel, line width and line color selectors (0) to associate up to two IO channels with the left scale of the bottom chart (d).
- (f) Control panel with 3 controls.

Inspect

Opens up the Graph history window (4.4.2) with the channels from the bottom chart (e, g) selected. This can be used to inspect static data, so that previously recorded data can be viewed. Can only be used on data recorded since the program was started or since tool or user was changed.

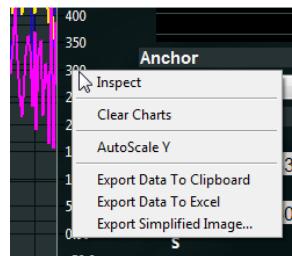
Annotate

Opens the Annotate dialog, to make an annotation that is saved to file. The time an annotation was made is shown as a white dot between (c) and (d).

## minutes

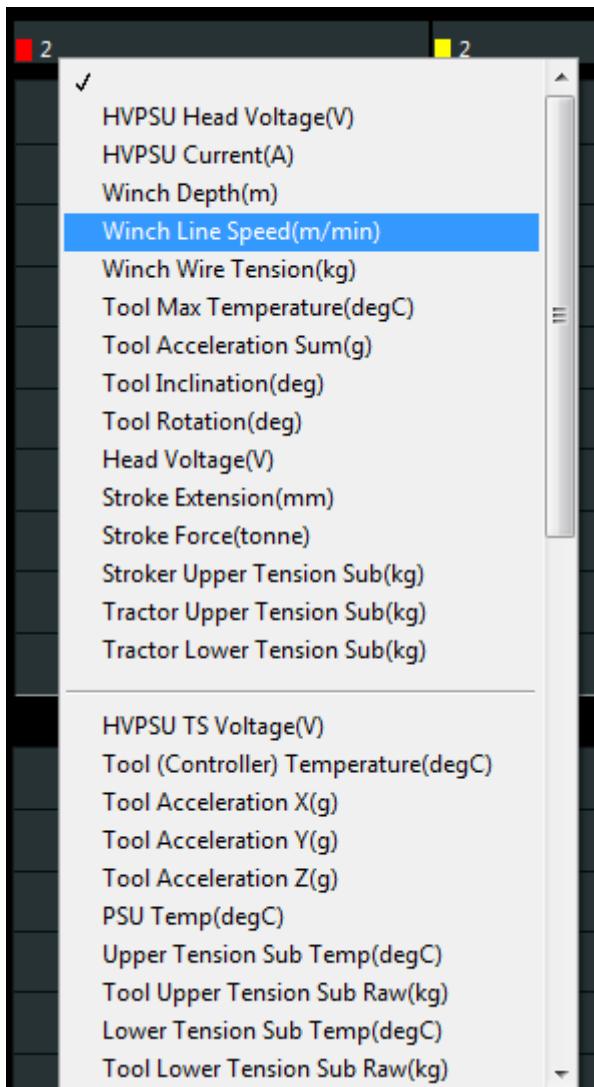
How far back chart (c) and (d) should extend. Available options are 10 seconds, 1 minute, 5 minutes, 10 minutes, 30 minutes and 1 hour.

*Inspection is also available with the graph right click menu, this will open the history graph window with the same channels as the chart that was right clicked.*

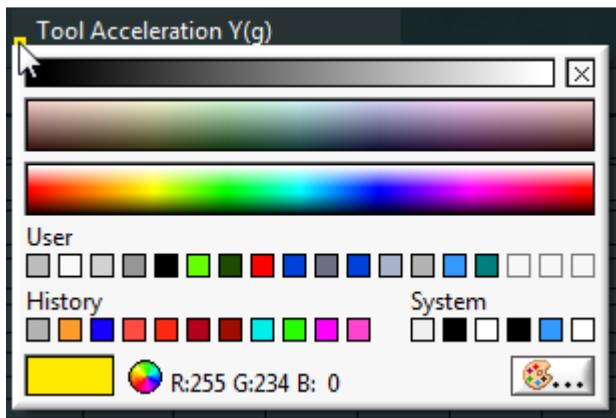


- (g) Two Channel, line width and line color selectors (0) to associate up to two IO channels with the right scale of the bottom chart (d).
- (h) Opens up the Graph history window (4.4.2) with the channels from the upper chart (a, b) selected. This can be used to inspect static data, so that previously recorded data can be viewed. Can only be used on data recorded since the program was started or since tool or user was changed.

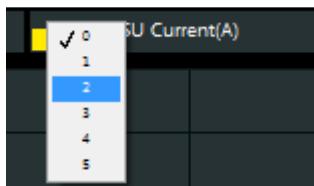
#### 4.2.6.1 Channel and color selector



The channel selector contains all available channels and a blank item (no channel selected). A Super User (4.1.2) will have every single channel to choose from, while a standard user will only have access to the channels marked as "User graph selection" (4.5.6.2). The channels are grouped into basic, advanced and expert levels. The basic group is in the top section of the list. (Changed v1.17)



The color to use for the channel on the graph can be selected by clicking the small colored squares.



The line width to use for the channel on the graph can be selected by clicking the small number.

#### 4.2.7 (F) Right panel when operating Stroker

##### Anchor STROKE PRESSURE FALLING

<b>Anchor</b>	<b>Set Anchor</b>	<b>Release Anchor</b>	
<b>Stroke</b>			
"Stroke in" Pressure bar	3	"Stroke out" Pressure bar	8
Stroke force tonne	4,5	ZERO	
<b>Anchor Disabled</b>			
Stroke extension mm	0	mm	0
<input type="range" value="112"/> mm		Stop	Go to
		In	Out
<b>Stroker force limit</b>			
tonne	6		
<b>Sequence automation</b>			
<input type="text"/> Start		End	
		Operator approve	

##### Indicators

Name	Variable	Digits
Anchor/ Anchor. Stroke pressure falling	4.6.2. Stroke Force change not correct	NA
"Stroke in" Pressure	4.6.2. Tool Pressure 1/2. See 4.5.4.3 regarding which node is used.	0
"Stroke out" Pressure	4.6.2. Tool Pressure 1/2. See 4.5.4.3 regarding which node is used.	0
Stroke force.	4.6.2. Stroke Force.	1
Left "S"	4.6.1. Stroke SLIPS established P1/2 See 4.5.4.3 regarding which node is used.	NA
Anchor	4.6.1. Anchor Enabled/Disabled. Text turns green when it displays Anchor Enabled	NA
Right "S"	4.6.1. Stroke SLIPS established P1/2 See 4.5.4.3 regarding which node is used.	NA
-	4.6.2. Tool Stroke position.	0
Indicator without label, unit "mm".		
Anchor	4.6.1. Tool Anchor Valve	NA
Stroker Enabled	4.6.1. Tool Stroke enable valve	NA
Direction	4.6.1. Tool Stroke direction valve	NA

##### Controls

Set Anchor

Open Anchor solenoid.

Release Anchor Close Anchor solenoid.

**Note!** The button that was pressed most recently of “Set Anchor” and “Release Anchor” will be colored green. The other control will be colored grey.

ZERO

Equalizes the measured stroke force by removing the offset in the pressure

Slide below stroke indicator  
Stop  
In  
Out  
Go to

Setpoint to use with the “Go to” command.  
Close stroke enable solenoid valve.  
Set stroke direction solenoid to in, and open stroke enable solenoid.  
Set stroke direction solenoid to out, and open stroke enable solenoid.  
Send Go to setpoint to solenoid. The solenoid will set the stroke  
direction solenoid valve, and open the Stroke enable valve. Once the  
Go to position is reached, it will close the stroke enable valve.

**Note!** The button that was pressed most recently of "Stop", "In", "Out", and "Go to" will be colored green. The other controls will be colored grey.

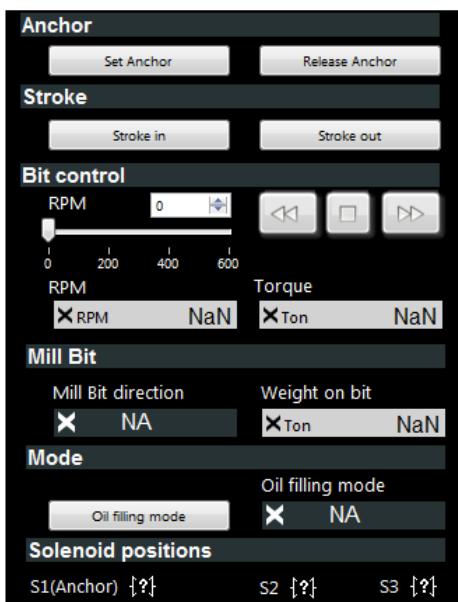
### Stroker force limit

### Limit for force monitoring

### Sequence automation

See chapter 4.3.1

#### **4.2.8 (F) Right panel when operating Driller**



## Indicators

RPM	4.6.2.
Torque	4.6.2.
Mill Bit direction	4.6.1.
Weight on bit	4.6.2.
Oil filling mode	4.6.1.
S1(Anchor)	4.6.1.
S2	4.6.1.
S3	4.6.1.

## Controls

Set Anchor	Open Anchor solenoid.
Release Anchor	Close Anchor solenoid.
RPM	RPM for Bit control
Direction A	Run Driller in direction A
Stop	Stop Driller
Direction B	Run Driller in direction B
Oil filling mode	Sets tool in oil filling mode (not implemented)

#### **4.2.9 (G) Alarm Panel**



#### 4.2.9.1 Categories

All channels in the system (4.5.9) belong to one of four categories.

- Temperature
- Pressure
- Electrical power
- General

Above the alarm list there is one indicator for each category. If there is an alarm belonging to the category, it will flash red. It will also display the most significant channel state of any channel in its category. From most to least significant status:

- Technical
- HH
- LL
- H
- L

#### 4.2.9.2 Alarm list

All active alarms will be displayed in this list, with the following columns.

Category (Alarm)	Type of alarm (Tech, HH, H, LL, L)	Channel	Current value
------------------	------------------------------------	---------	---------------

#### 4.2.9.3 Example

In the above picture, there is a general technical alarm because the winch depth is not available. One or more channels in the electrical power category have a technical issue (although alarm for these channels has not been turned on in IO setup (4.5.5)). One or more temperature readings are above their HH limits, although the channel/channels in question do not have alarm enabled for HH. There are no temperature channels with technical errors, because that would be prioritized above the HH.

### 4.2.10 (H) Modem Status Indicators



These indicators provide status data for the Topside and Subsea modems. The section on the left hand side is the status of the topside modem whereas the right hand section is the status of the subsea modem. The green numeric value is the Signal Quality. The orange numeric value represents the gain.

## 4.3 Actions and operations

### 4.3.1 Sequences

To allow for more advanced operations, Beagle incorporates a way to sequence commands. These sequences are stored in text files called [name].sequence, in folder.../Beagle/Sequences/. One sequence is stored per file.

For instructions on how to configure sequences, see chapter 4.5.7.

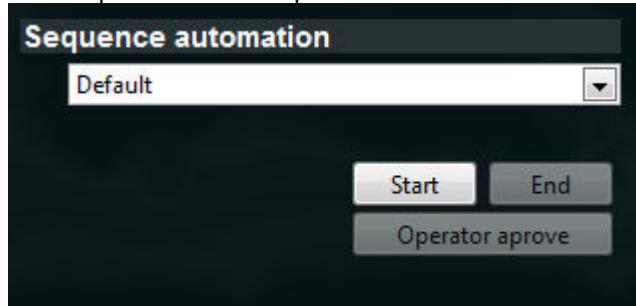
A sequence is a series of actions, with criteria for going to the next step in the sequence. Each step can have two criteria from which a boolean result is calculated.

A sequence consisting of three steps will do the following:

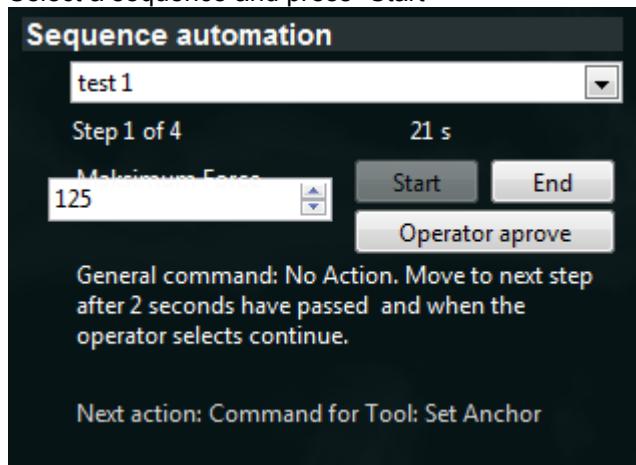
1. Perform action 1.
2. If (Criteria 1.a [Boolean operation (4.3.1.4)] Criteria 1.b) is True, go to 3. Else, repeat 2.
3. Perform action 2.
4. If (Criteria 2.a [Boolean operation (4.3.1.4)] Criteria 2.b) is True, go to 5. Else, repeat 4.
5. Perform action 3.
6. If (Criteria 3.a [Boolean operation (4.3.1.4)] Criteria 3.b) is True, go to 7. Else, repeat 6.
7. End

#### 4.3.1.1 Using sequences in the main window

The sequence interface panel is located in the bottom of the main window's right side panel.



Select a sequence and press "Start"



The GUI will show the status of the sequence.

- Which step the sequence is currently on.
- How long the step has been active.
- The user input (if enabled for the sequence) and its name (partially hidden in V1.1.07).
- If one of the criteria for the step is "operator approve", this button will be available.
- "End". Pressing this will abort the sequence. Note that if an operation like "Stroker out" is in progress, this will not be stopped.
- The next action to perform.

#### 4.3.1.2 User input.

During a sequence, the user has three input possibilities.

End	A sequence can be stopped by pressing the “End” button. The sequence will send no further commands, but any ongoing operations, like “Stroke Out”, will continue and must be stopped manually.
Operator approve.	A sequence step can have “Operator approval” as one of its criteria (4.3.1.5). Then the user has to press the “Operator approve” button before the next step is performed.
User input	A sequence can be set up to have a numeric input box in the sequence part of the main window. This is used with analog criteria. It is recommended to combine this with “Operator approve”, so that the user can think about it, put in the new criteria value, and then press approve to go to the next step that needs the criteria.

#### 4.3.1.3 Available actions

No Action	Do not perform any action.
Set HV level	Send a new setpoint (Value) to the PCP. Beagle will not try to change the setpoint quickly, but will divide the change into several steps.
Value	The setpoint to use.
HV On	Send a High Voltage ON command to the PCP. Does not check that the PCP is off. This should be incorporated in the sequence.
HV Off	Send a High Voltage OFF command to the PCP.
Send stop command	Send stop command to controller.
Monitor High G	Send start High -G monitoring command to tool.
Stop stroke	Close stroke enable solenoid valve.
Stroke In	Set stroke direction solenoid to in, and open stroke enable solenoid.
Stroke Out	Set stroke direction solenoid to out, and open stroke enable solenoid.
Value	Send Go to setpoint to solenoid. The solenoid will set the stroke direction solenoid valve, and open the Stroke enable valve. Once the Go to position (Value) is reached, it will close the stroke enable valve.
Stroke to position	The stroke position setpoint to use.
Set Anchor	Open Anchor solenoid
Release Anchor	Close Anchor solenoid
Relay 1 On	Turn the controller Relay 1 on.
Relay 2 On	Turn the controller Relay 2 on.
Relay 1 Off	Turn the controller Relay 1 off.
Relay 2 Off	Turn the controller Relay 2 off.
Relay 1 and 2 on	Turn the controller Relay 1 and 2 on.
Relay 1 and 2 off	Turn the controller Relay 1 and 2 off.
Relay 1 on, 2 off	Turn Relay 1 on, and 2 off.
Relay 1 off, 2 on	Turn Relay 1 off and 2 on.
Start Pressure Monitoring	Enables monitoring of pressure when running stroker. If the pressure exceeds the specified level, the stroker will be disabled. The input value is given in ton. The pressure is calculated by Pressure node 1- Pressure node 2.
Stop Pressure Monitoring	Disables pressure monitoring.

#### 4.3.1.4 Boolean relationships between criteria

And

Criteria 1	0	0	1	1
Criteria 2	0	1	0	1
<b>Result</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>

Or

Criteria 1	0	0	1	1
Criteria 2	0	1	0	1
<b>Result</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>

Xor

Criteria 1	0	0	1	1
Criteria 2	0	1	0	1
<b>Result</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>

Nand

Criteria 1	0	0	1	1
Criteria 2	0	1	0	1
<b>Result</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>

Nor

Criteria 1	0	0	1	1
Criteria 2	0	1	0	1
<b>Result</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

Nxor

Criteria 1	0	0	1	1
Criteria 2	0	1	0	1
<b>Result</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>

Implies

Logical implication.  $C1 \Rightarrow C2$ . If C1 if true, C2 must also be true.

Criteria 1	0	0	1	1
Criteria 2	0	1	0	1
<b>Result</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>

#### 4.3.1.5 Available next step criteria

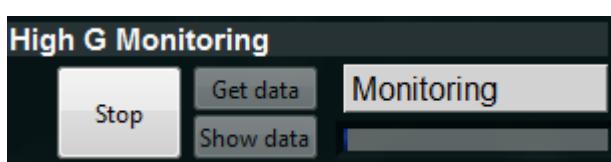
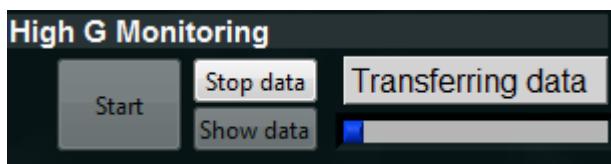
No criteria(True)	Always true. Ready for next step.		
Time(s)	Will be true after input time(s).		
Time(s)	Time to delay in seconds.		
Analog IO over	Continues when an analog IO (4.6.2) is over input "Limit"		
Analog IO	Analog IO to compare with Limit.		
Limit	Limit to use if "User limit" is not set.		
User limit	If "User limit" is set, a user input available while the sequence is running, will be used instead of "Limit"		
Analog IO over or equal	Continues when an analog IO (4.6.2) is over or equal to limit. Has the same extra inputs as "Analog IO over"		
Analog IO under	Continues when an analog IO (4.6.2) is under limit. Has the same extra inputs as "Analog IO over"		
Analog IO under or equal	Continues when an analog IO (4.6.2) is under or equal to limit. Has the same extra inputs as "Analog IO over"		
Analog IO 1 minus Analog IO 2 over	Continue if the difference between the analog IOs is above "Limit" Note that this cannot be used with "User input"		
Analog IO 1	Analog IO to subtract from before comparison.		
Analog IO 2	Analog IO to subtract before comparison.		
Limit	Limit to compare the difference to.		
Digital IO True	Continue when this channel is true.		

Digital IO	Digital IO channel (4.6.1) to use.
Digital IO False	Continue when this channel is false.
Digital IO	Digital IO channel (4.6.1) to use.
Operator approval	Continue when operator presses the “Operator approve” button

### **4.3.2 High G monitoring (has been removed from GUI)**

High G data is sampled at 1 kHz for 4.5 seconds at a time. This data is not continually streamed, but needs to be buffered up and then collected from the Tool.

- The user sends a start High G monitoring command.
- The tool starts monitoring and buffering the High G data in addition to its other jobs.
- When the tool detects acceleration above 50G, it will continue buffering data for 3.5 seconds.
- When this time has passed, the tools high G buffer will contain High G data from 1 second before the first sample above 50G, to 3.5 seconds high G data after this sample.
- The data will remain in this buffer until the node loses power, or monitoring is restarted.
- When there is data in the buffer, this can be retrieved by clicking “Get data”.



#### **Possible states**

Unknown	Beagle has no information about the current state. Usually when tool is not connected
Not active	The tool has not received a start command since it started up, or monitoring was stopped before data was recorded.
Monitoring	The tool has received a start command, it is monitoring and buffering the data, but there has been no shock over 50G, so recording has not started.
Recording	The 3.5 s of post shock/trigger data is being recorded.
Data ready	The tool has a High G buffer ready for upload.
Transferring data	High G data is being transferred from the tool to Beagle. Progress should be displayed directly below the state indication.

#### **Commands**

Start/Stop	Start: Command the tool to start monitoring High G data. Stop: Command the tool to stop monitoring High G data. Button is only enabled when either is a valid command.
Get data/Stop data	Get data: Start transferring 4.5s of High G data from the tool Stop data: Abort an ongoing data transfer.

Show data

Display the retrieved buffer. This opens the High G window(4.4.1)

## 4.4 Sub windows

Sub windows can be open and available without blocking the Beagle main window. These windows will only be visible when Beagle is the active foreground application.

### 4.4.1 High G window



The High G window is used to display High G data. Any previous High G buffer retrieved that is available on the machine can be viewed using the “Load High-G file” button.

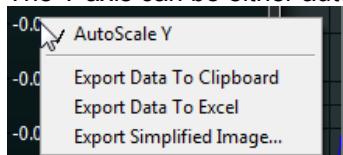
If this window is opened using the show data button (4.2.9), it will open with the last retrieved data visible. The Graph palette in the bottom right can be used to adjust the axis. This window can be resized.

#### 4.4.2 History Graph



The History graph window can be accessed from the “View” menu in the main window. All analog data recorded since program restart, up to “History buffer size(s)” (4.5.4.4) can be viewed.

- The channels are selected using the channel and color selectors (A), in the same way as in the main window (0), two channels per Y axis.
- To select the period to view, either the date and time in the graph X axis can be manually changed, or the span controls (B) can be updated (edit like a text string).
- The yellow vertical line (E) in the graph window is a Cursor, which can be dragged back and forth using the mouse. The center date and time indicator (D) shows the time selected with the cursor. The numeric indicators (C) show the value for each channel at the cursor.
- The graph palette (F) can also be used to navigate in the window using panning and zooming.
- All annotations made during the session are listed at the bottom (G).
- The Y axis can be either auto scale, or manual scale, use the right click menu to select which.



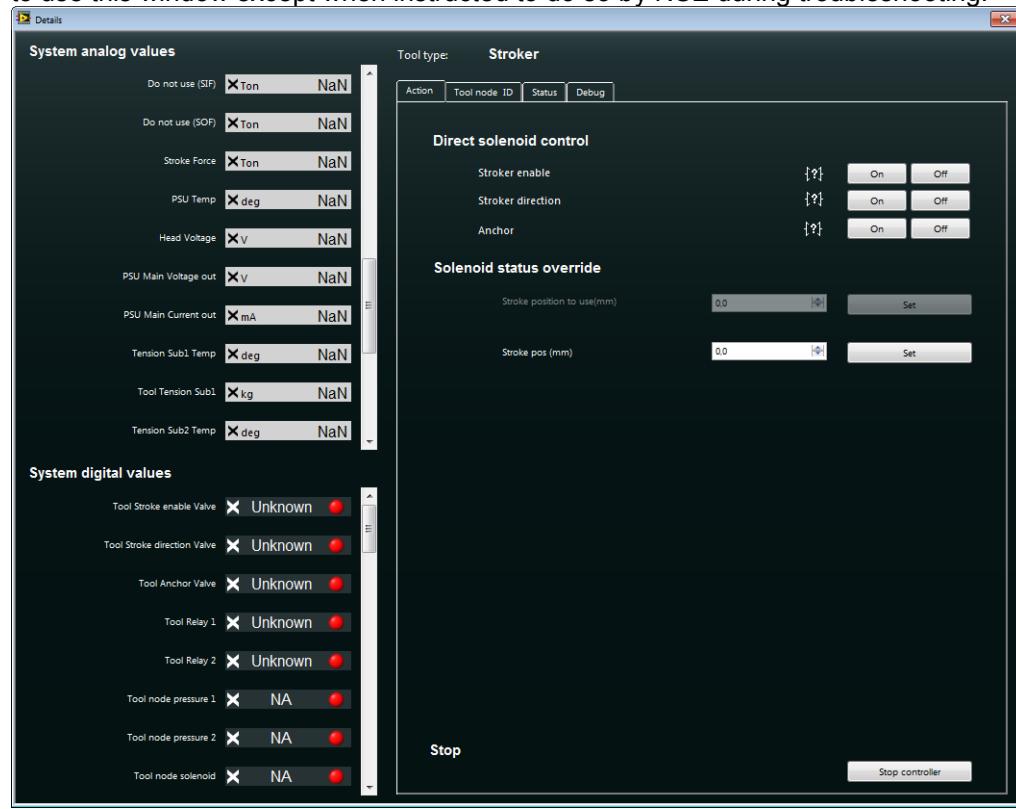
When using manual scaling, simply alter the numbers directly on the scales.



This window can be resized.

#### 4.4.3 Detail view window

This window is not intended for normal use, it is for debugging and diagnosis. It is not recommended to use this window except when instructed to do so by NSE during troubleshooting.



All IO channels in the system (4.5.9) can be viewed on the left side of the window. The indicators used are standard indicators (4.2.1.1, 4.2.1.2) except that they will not blink red to indicate an associated alarm.

##### 4.4.3.1 Detail pane: Action

Commands that can be sent to the tool.

###### Direct solenoid control

The solenoid commands in the main window operate one or more solenoids to achieve a goal. These controls allow the user to directly operate each individual solenoid. These should not be used during normal operation.

The state of each solenoid is shown using the solenoid indicators (4.2.1.3) left of the buttons.

###### Stroke position - Obsolete

Clicking "Set" will send "Stroke position to use(mm)" to the solenoid. This will not cause stroke movement, but change what the solenoid node reports the current stroke position as. This should only be used if the solenoid node has incorrect information about the stroke position.

###### Stroke pos (mm)

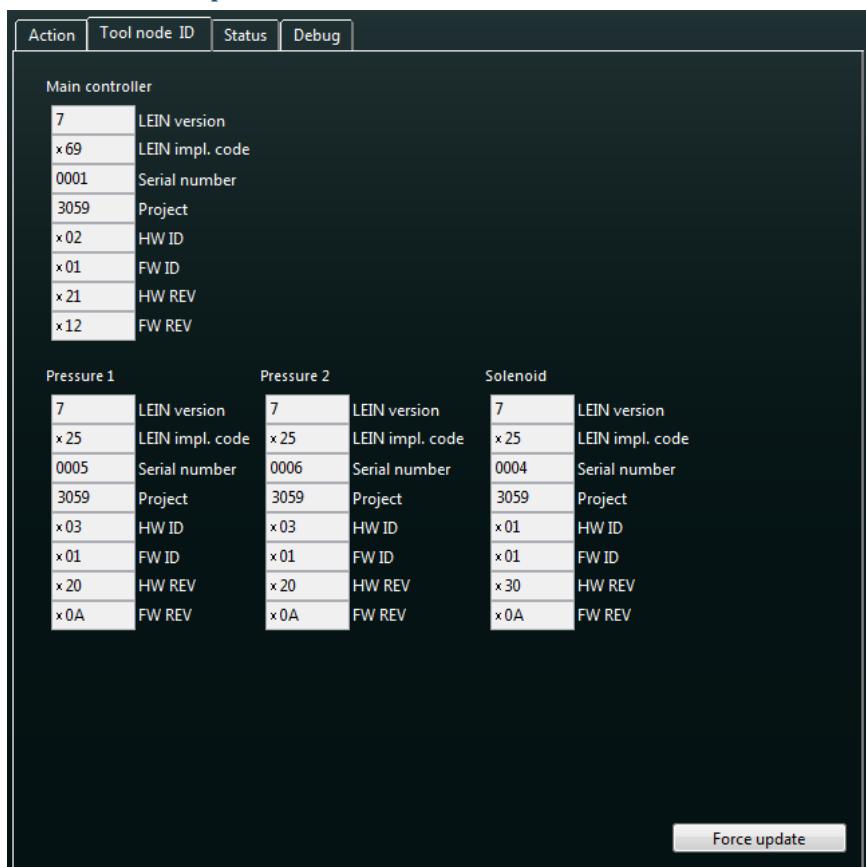
This command makes it possible to override the value of the stroke position. It will not perform any action on the tool. It will only change the value of the variable. To change the stroke position, enter a value in the "Stroke pos (mm)" control, enable "Pos Change" and press "Set". This should only be necessary if the solenoid node has incorrect information about the stroke position. This situation may occur after loss of power.

###### Stop

A stop command is sent to every node in the tool. The actions caused by the stop command, are the same that a nodes does on its own, if it loses communication.

Note that if a sequence (4.3.1) is active, this will not stop it.

#### 4.4.3.2 Detail pane: Tool node ID



Identification information for each node in the tool.

Clicking “Force update” retrieves the information from the tool, this is normally done automatically during startup. Only use the button if any of the nodes have all zeros in the text fields.

The information shown for each node is static information that serves to identify the node and its firmware. The ID information may be asked for during debugging/trouble shooting.

#### 4.4.3.3 Detail pane: Status

Action	Tool node ID	Status	Debug
<b>Controller</b>			
Con			
Stopp			
<b>Error</b>			
Error			
Has had error			
Com. issue			
<b>Task &amp; job</b>			
Task			
Task error			
0 Task cnt.			
Job 0			
User			
<b>Raw values</b>			
x0000 sys register	x0000 sys register	x0000 sys register	x0008 sys register
3959 temperature	3919 temperature	3911 temperature	3983 temperature
14 Input voltage	291 Pressure	100 Pressure	0 Position
123 Input Current	63 osctun	63 osctun	63 osctun
2024 Accelerometer ch0			x00 valve status
2006 Accelerometer ch1			
0 Accelerometer ch2			
x00 Relay status			
x00 GPIO values			
7181 Sensor 1			
31691 Sensor 2			
x00 Sequence monitor			
x00 High G monitoring			
Raw values, for calculated values, see System analog values, and System digital values on the right.			
To find more information about error or task status, See Debug pane.			
Sol. pos has been overridden			

The current status of each node, and the raw data they are reporting.

This will not be used during normal operation, but is available for trouble shooting. All information seen here is used by the system, and does not require manual interpretation.

- “Con” Connection status of each node. Lit if connected.
- “Stop” If the node has performed a Stop action since startup or an “Error clear” command has been executed (4.4.3.4). A Stop action can be performed as the result of a command (4.4.3.1), or the node loosing communication. A part of the controllers Stop Action is to send a Stop command to each of the sub nodes. A node that indicates “Stop” will still function normally.

#### Error

- “Error” The node has an error. This may be caused by communication issues, or some other cause. An error should be investigated, although in most cases the node will perform commands as intended.
- “has had error” There has been an error since the node received an “Error clear” command (4.4.3.4). This may be caused by intermittent communication errors.

#### Task & Job

- “Task” The node is performing a task (4.4.3.5). This will be active when the controller or solenoid node is operating solenoids/relays. Will not necessarily be detectable if the task takes less than a second.
- “Task error”. The last task performed did not succeed, for instance the solenoid did not pull enough current, so its state is unknown.
- “Task cnt.” This is a one bit counter of how many tasks that have been performed. It can be used to see if a task was performed (toggles after each task).
- “Job0”. This will indicate on the solenoid node when a Stroke “Go To” operation is in progress. Not used on the other nodes.
- “User”. This will indicate on the solenoid node when it has received an override position for the stroke from Beagle. This should always be lit, since this is done by Beagle any time it connects/reconnects with the solenoid node.

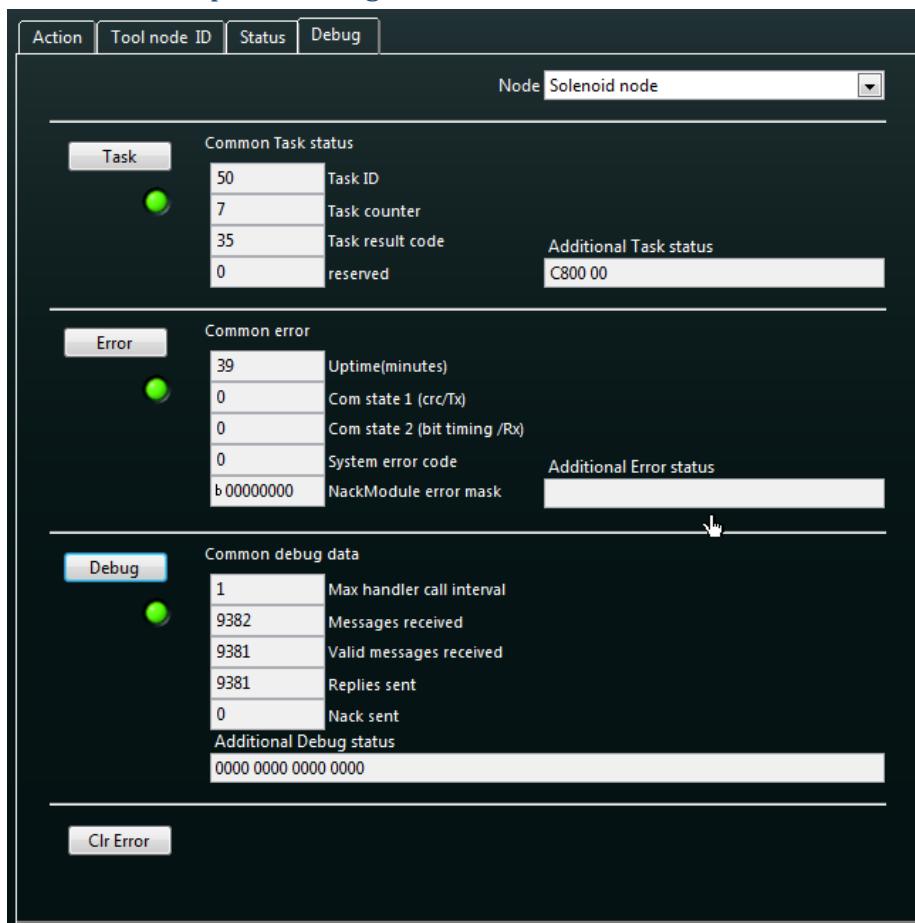
### Raw values

Status information from the nodes in machine friendly form.

#### Sol. Pos has been overridden.

Same as solenoid nodes “User” indicator.

#### 4.4.3.4 Detail pane: Debug



All the nodes hold internal status and troubleshooting registers. These are available from the Debug pane. These codes are for now intended to be communicated to Mar-In during trouble shooting.

It is only possible to communicate with one node at a time. Node is selected in the “Node” drop down box. Once the node is selected, the different status messages can be collected.

#### Task

Click “Task” to get Common and Additional task status.

- Task ID identifies the last task attempted performed. Will display 255 if no task has been performed.
- Task Counter holds how many tasks that have been attempted. (Roll over at 255).
- Task result code. If other then 0, the last task did not complete successfully.
- Additional Task status. Content depends on the task.

#### Error

Click “error” to get Common and Additional error status.

- Uptime (minutes). The number of minutes the node has been active since last restart. 16 bit.
- Com state 1. This is a CRC error counter for the Controller, and a CANbus TX error counter for the other nodes.
- Com stat2 2. This is a combination of different bit timing counters for the controller, and a CANbus RX error counter for the nodes.
- System error code. An error code for the node. Should be 0.
- Module error mask. Sub modules in the code for each node can flag errors. Each bit in this 8 bit value is a different module.

- Additional Error status. Each node may have different data here. The controller has additional communication status information.

### **Debug**

Click “Debug” to get Common and Additional debug status.

- Max handler call interval. Number of milliseconds between each time a certain code is executed. Should be below 5.
- Messages received. Number of messages received since startup. This is a 16 bit counter that rolls over at 0xFFFF.
- Valid messages received. Number of valid messages received since startup. Often one less than Messages received due to when the numbers are calculated. This is a 16 bit counter that rolls over at 0xFFFF.
- Replies sent. Number of replies the node has sent. This is a 16 bit counter that rolls over at 0xFFFF.
- Nack sent. Number of times the node has replied that it could not do as commanded, or that it did not understand the command.

### **Clr error**

Send an “Error clear” command to the selected node. This will set status and error counters to zero.

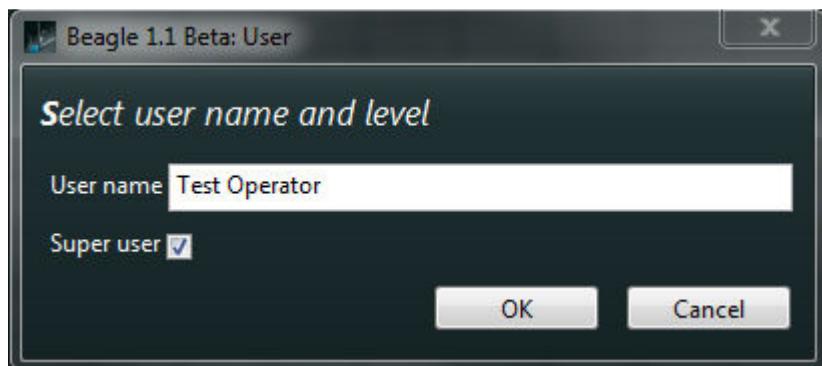
#### **4.4.3.5 Tasks**

A task is a command that is sent to a node that cannot be carried through before the node has to answer. Solenoid and relay switching takes time, so the node needs to answer the command before it knows the result of the operation. The details of the result are available in the Detail pane: Debug (4.4.3.4). Some data about the latest task is transmitted with the periodical data.

## 4.5 Dialog windows

A dialog window is a window that blocks access to the main Beagle interface until closed.

### 4.5.1 User



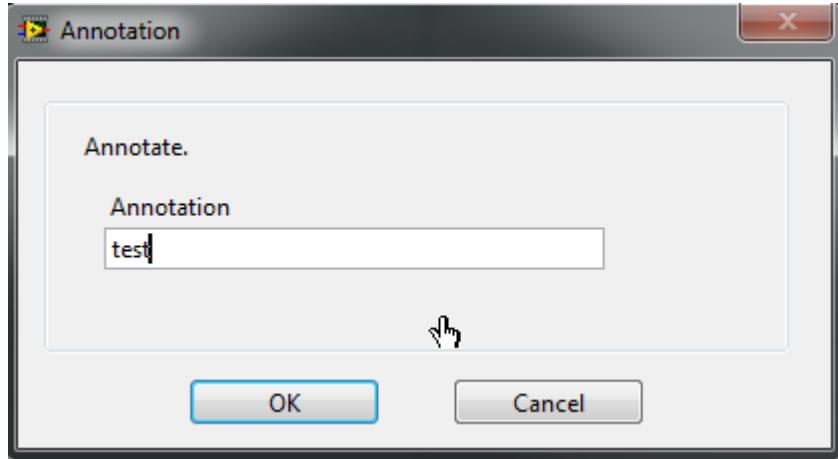
Allows the user to change user name and user level during a session. See 4.1.4.1.

### 4.5.2 About



The About box is used to identify the version and build (see 1.4 regarding version labeling). Press anywhere inside the dialog to close it.

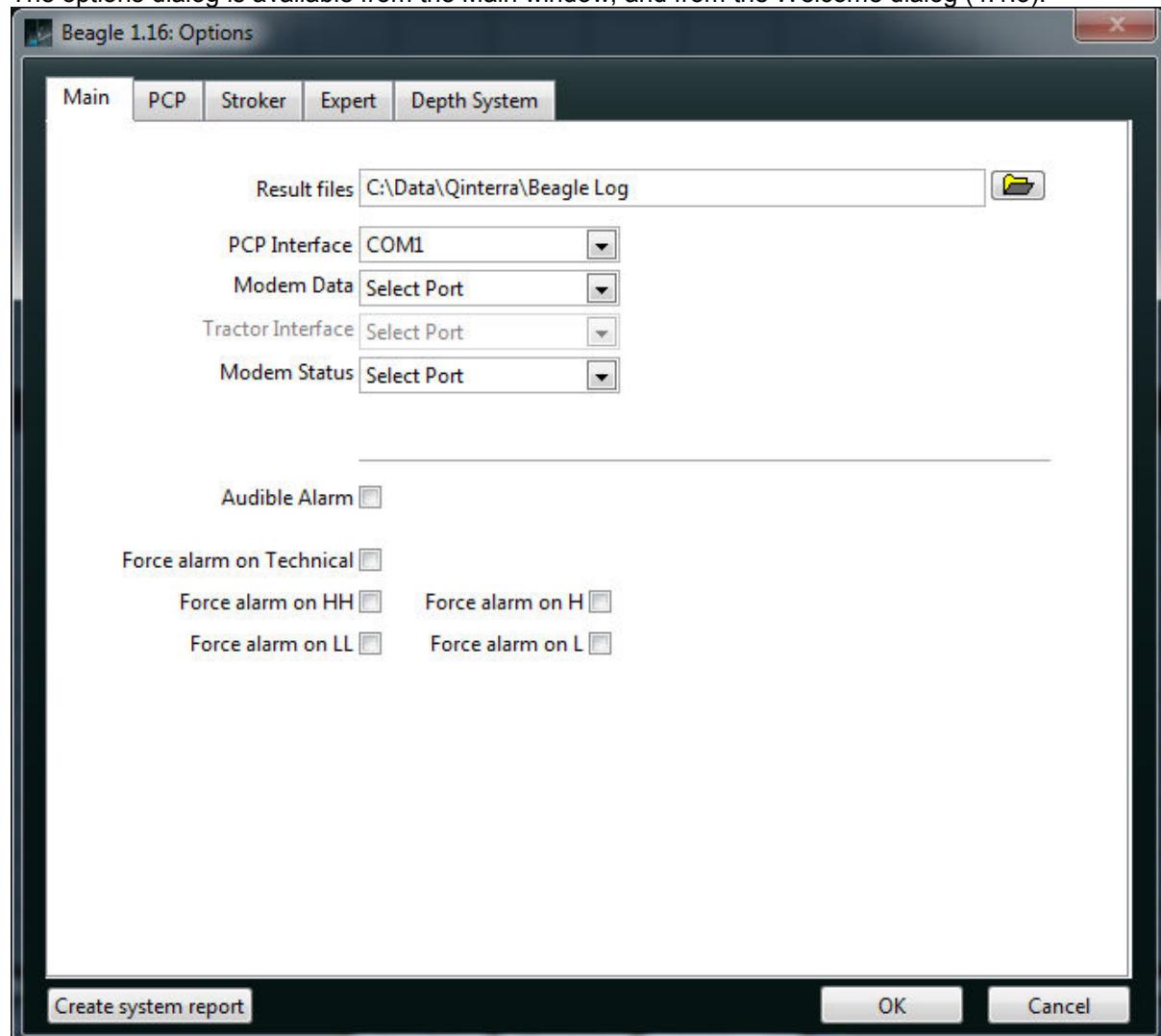
### 4.5.3 Annotate



Make user annotations in the text box. These are available to read in the history graph window (4.4.2), and in the project folder (.stat file (4.12.9)).

#### 4.5.4 Options

The options dialog is available from the Main window, and from the Welcome dialog (4.1.3).



Create system report	Creates a detailed report about the system Beagle is running on. See 4.12.3.
OK	All changed options are stored and activated. Note that Beagle may lose contact with the tool for a short time after this.
Cancel	Closes the options dialog, discarding any changes made.

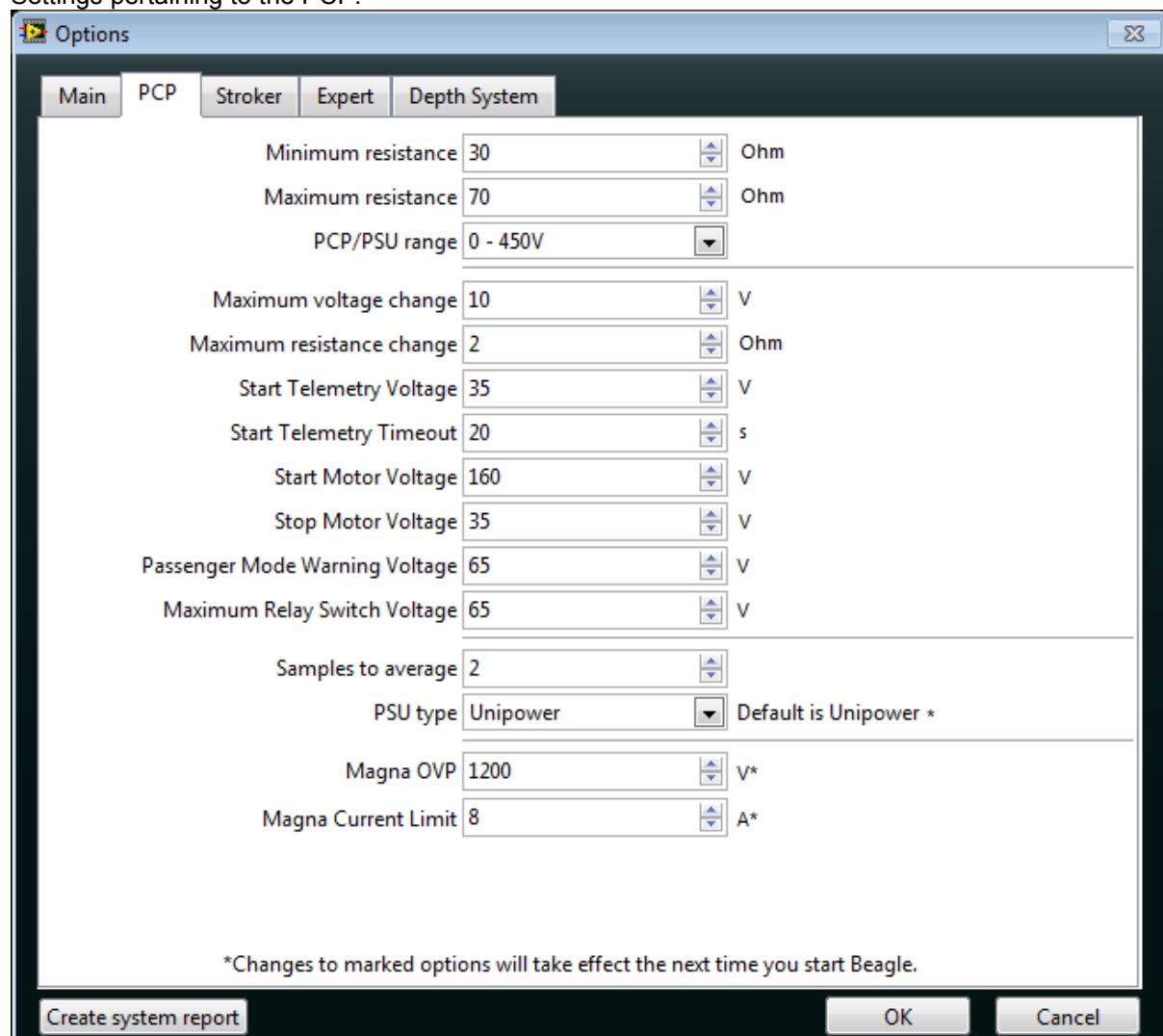
##### 4.5.4.1 Options Pane: Main

Result files	The location on disk where log data is to be stored. The data repository (3.4.2).
PCP Interface	Select which COM-port that is connected to the PCP from the drop down list. If unsure which comport to use, disconnect the PCP, wait 5 seconds, press "Refresh" bring up the drop down list again and see which COM-port that is missing.
Modem Data	Select the COM-port used for the Wireline modem connected to the Stroker or Tractor tool. (Changed v1.16)
Tractor Interface (disabled)	Select the COM-port used for the Wireline modem connected to the Tractor tool.

Modem Status	Select the COM-port used for the Modem Status communication. This interface is not required for operation, but is useful if the Modem is equipped with a status port. (Changed v1.16)
Audible Alarm	Beagle will use the PC speaker to Indicate when there is an alarm. It uses an intermittent beep of 1khz.
Force alarm on Technical	Forces an alarm indication when any IO channel has a Technical issue. See IO state and alarm (4.5.6.2).
Force alarm on HH	Forces an alarm indication when any analog IO channel is above its HH limit. See IO state and alarm (4.5.6.2).
Force alarm on H	Forces an alarm indication when any analog IO channel is above its H limit. See IO state and alarm (4.5.6.2).
Force alarm on LL	Forces an alarm indication when any analog IO channel is below its LL limit. See IO state and alarm (4.5.6.2).
Force alarm on L	Forces an alarm indication when any analog IO channel is below its L limit. See IO state and alarm (4.5.6.2).

#### 4.5.4.2 Options Pane: PCP

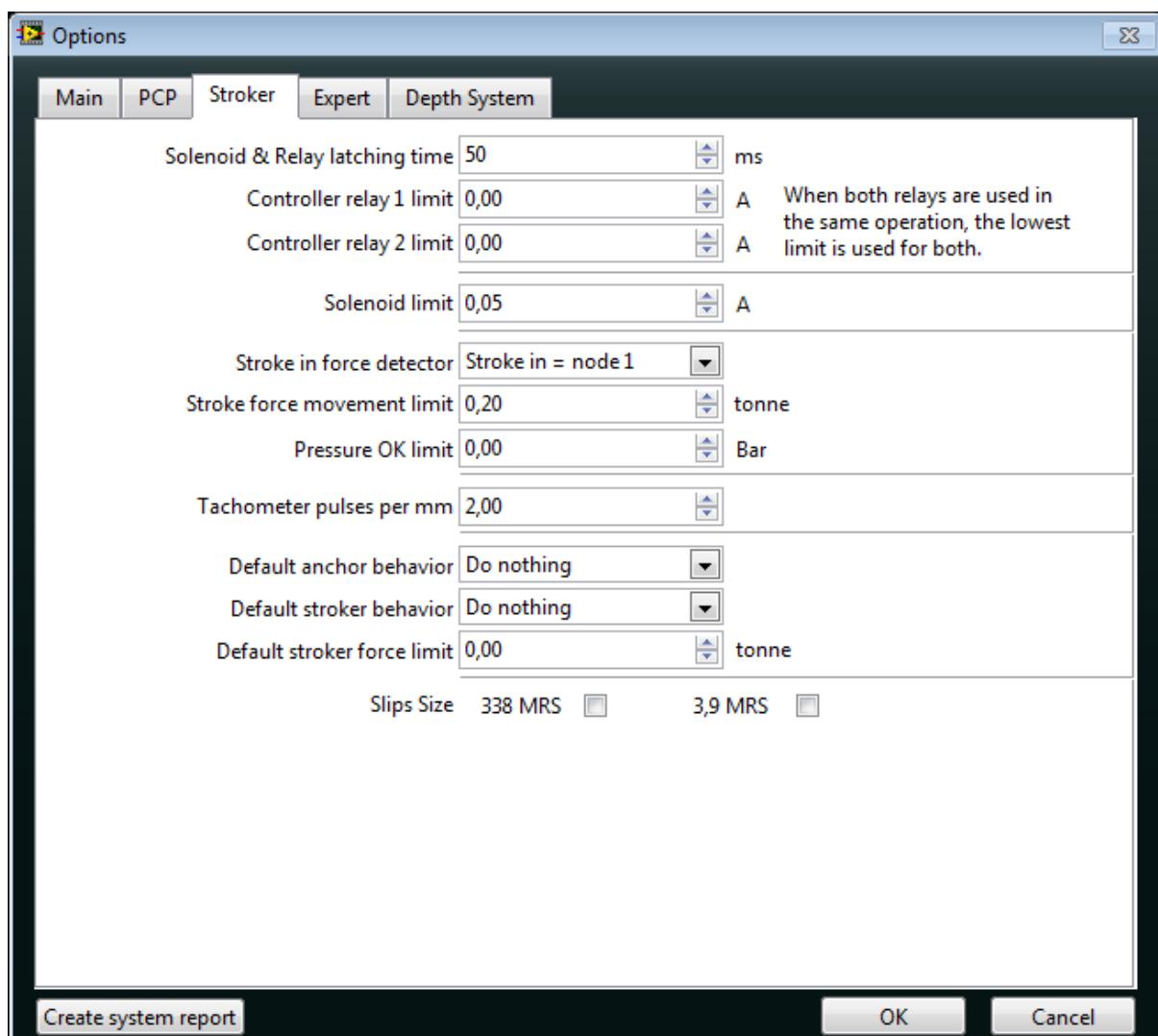
Settings pertaining to the PCP.



Minimum resistance	The lowest resistance value that may be sent to the PCP/Magna PSU in ohms.
Maximum resistance	The highest resistance value that may be sent to the PCP/Magna PSU in ohms. The maximum value allowed in this setting is 500 ohm. The maximum resistance supported by the PCP is 400 ohm. Do not set this value higher than 400 ohm when using the PCP.
PCP/PSU range	The output range of the PCP/TPS combination. Can select between "0 - 350V", "0 - 450V" and "0 - 650V".
Maximum voltage change	When the user sets a new voltage setpoint for the PSU in the GUI, Beagle will prevent sudden changes, it will send up to 5 new setpoints per second, using this setting as the maximum value. For example: The voltage is 250V, user selects 325V, and this setting is 10V. Beagle will send new setpoints to the PCP/Magna PSU as follows: 260V, 270V, 280V, 290V, 300V, 310V, 320V, 325V over approximately 1.5 seconds.
Maximum resistance change	Acts in the same way as "Maximum voltage change" above, but limits the step side of the resistance setpoint instead of voltage.
Start Telemetry Voltage	Voltage setpoint for Start Telemetry control
Start Telemetry Timeout	If the Telemetry did not start within this limit after the "Start Telemetry" button was pressed. The operator will get a
Start Motor Voltage	Voltage setpoint for Start Motor control
Stop Motor Voltage	Voltage setpoint for Stop Motor control
Maximum Relay Switch Voltage	HVPSU Head Voltage limit for disabling the Relay control buttons in the Main window. This will prevent users from accidentally changing the relays when the voltage is high.
Relay Status Loss Voltage	If the HVPSU Head Voltage drops below this limit, the relay status is set to Unknown
Samples to average	Size of the averaging window that is used for the Tension, Voltage Downhole(PCP), Voltage Topside, and Current indicators in the Main Window. Value range: 1-10.
PSU type (Changed v1.17)	Selects which PSU interface Beagle should use. Beagle has to be restarted before any of the changes are applied. To get an accurate cable compensation when using a Magna supply it is important to set the correct supply type.
Magna OCP	Over Voltage Protection Level for the Magna PSU only. The default level of 1250V is the maximum voltage output of the Magna PSU.
Magna Current Limit (Changed v1.17)	Maximum Current Limit for the Magna PSU only. This setting can be used to reduce the maximum output current of the supply. It is not the same as the current rating. This value should never be set higher than the current rating of the supply. To use the maximum available current output of the supply, set this value to match the rated value of the supply. Make sure that this limit is always updated when the PSU type has been changed.

#### 4.5.4.3 Options pane: Stroker

These options are for the 218 stroke tool.

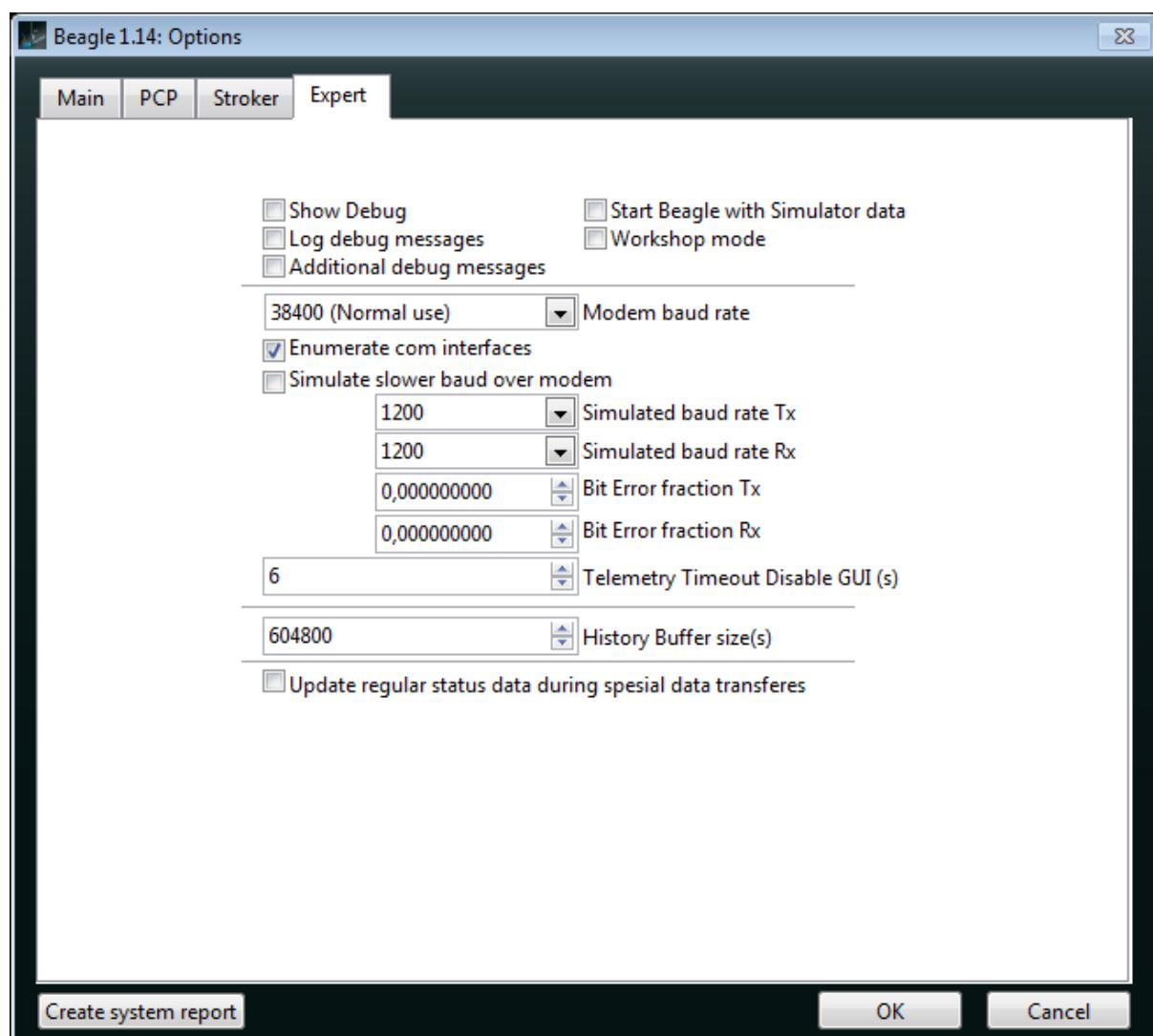


Solenoid & Relay Latching Time	Duration in milliseconds of pulse used for latching solenoids and relays
Controller relay 1 limit	The current used to detect whether a relay operation on relay 1 has been successful. See Solenoid limit below for details. If a single command involves both relays, the lowest of relay 1 and relay 2 limit is used for both relays.
Controller relay 2 limit	The current used to detect whether a relay operation on relay 2 has been successful. See Solenoid limit below for details. If a single command involves both relays, the lowest of relay 1 and relay 2 limit is used for both relays.
Solenoid limit	The current used to detect whether a solenoid operation has been successful. If the solenoid pulls more current than this during activation, it is considered a success, and the valve is considered open or closed based on the operation. If it pulls less, the state of the valve is considered unknown.
Stroke in force detector	Decides which node is used as "Stroke in" pressure, and which is used for "Stroke out" pressure. Options are: "Stroke in = node 1" "Stroke out = node 1"
Stroke force movement limit	When the stroke force is above this limit, it indicates that the Stroke is moving out. When it is below the negative of this limit, it indicates that stroke is moving in.

Pressure OK limit	When pressure is above this limit, SLIPS will be indicated on the front panel.
Tachometer pulses per mm	Number of tachometer pulses per mm of stroke travel.
Default anchor behavior	Anchor behavior when pressing the “Go to default pos” in the Stroker Default dialog.
Default stroker behavior	Stroker behavior when pressing the “Go to default pos” in the Stroker Default dialog.
Default stroker force limit	Force monitoring limit for stroker movements when pressing the “Go to default pos” in the Stroker Default dialog.
<b>Slips Size (New v1.15)</b>	Slips type used in current configuration.

#### 4.5.4.4 Options pane: Expert

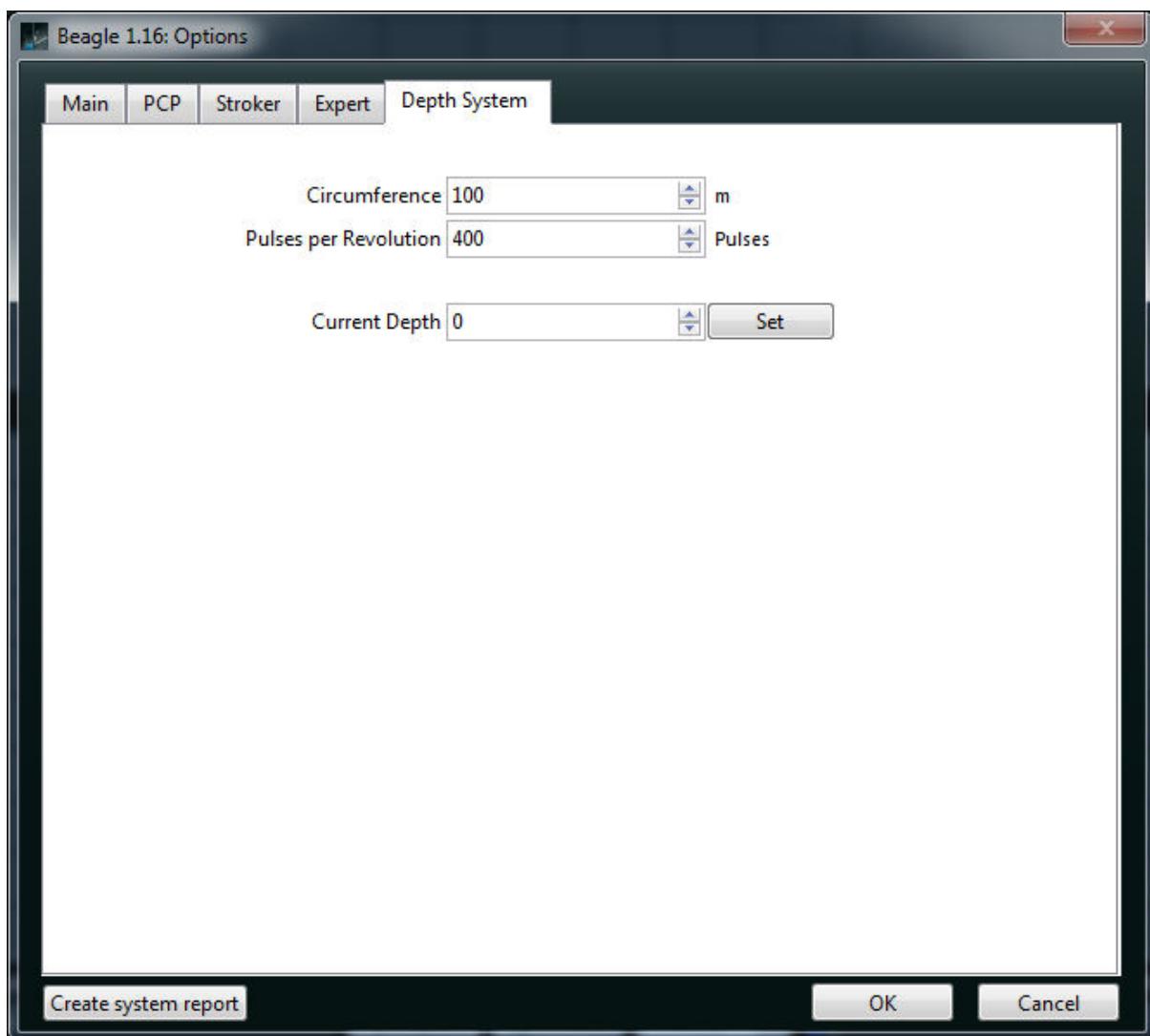
These options should not be changed from the default (as seen below) unless during remote debugging with NSE personnel.



Show debug	Displays a separate window for debugging. This window is designed for development work, and will not be documented for the user. Do not use.
Log debug messages.	Not in use.
Additional debug messages.	Not in use.
Show Simulator	Displays a separate window for simulating data when hardware is not available. This window is designed for development work, and will not be documented for the user. Do not use.
Workshop Mode	Enables the Relays to be operated freely. Only to be used when testing the system in a lab. This setting will be reset every time Beagle is restarted.
Modem baud rate	Baud rate used when communicating with the modem. Should always be 38400.
Enumerate com interfaces	When this is on, Beagle tries to populate the COM-port drop down lists with the names of available COM-ports. Should be enabled unless problems are encountered.
Simulate slower baud over modem	Along with sub options, this is only used during development. Do not enable.
History Buffer size(s)	Seconds of data available to inspect (4.4.2). Can be reduced to make Beagle use less memory.
Update regular status data during data transfers	Gathering logged high G data from the tool is very communication intensive. As default the normal data transfer and status updates are disabled when this data is retrieved. If this option is enabled the program attempts to do both at the same time. The transfer will then take much longer.
Telemetry Timeout Disable GUI	This setting lets the operator decide how long it should take before the “Tool Connected” variable is set to false after a communication failure. This variable is used for disabling/greying out most of the controls on the user interface. All measurements that originates from the Tool will maintain their last known value until this value has elapsed. The value has to be set to a multiple of two.

#### **4.5.5 Depth System**

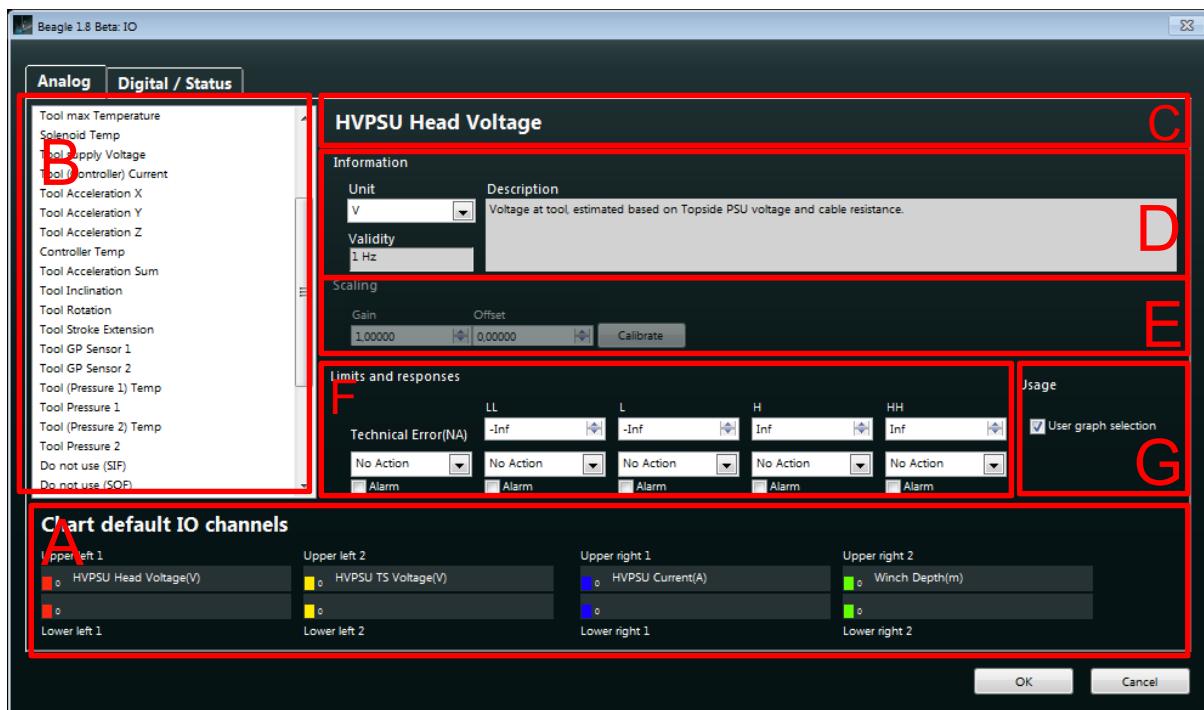
These options are used when Beagle is calculating the current depth of the tool, based on encoder values received from the PCP.



Circumference	Circumference of winch spool used to calculating the Winch Speed and Depth.
Pulses per Revolution	Number of encoder pulses per revolution of the winch spool used to calculate the Winch Speed and Depth.
Current Depth	Overrides the depth that is currently displayed in Beagle. It is necessary to press the "Set" button to apply this setting.

#### 4.5.6 IO

Beagle treats each measurement and status as an IO channel that it continually monitors. See 4.5.6.2 for available IOs.



#### 4.5.6.1 Chart default IO channels

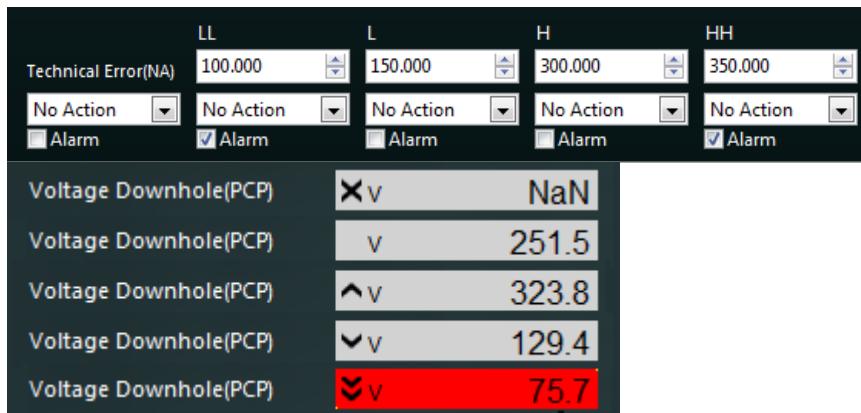
The default color and channel selected for the two main graphs in the GUI at the bottom of the dialog (A). These are the settings that a standard user will start a session with. The Super User that is setting up these defaults, must make sure that each selected channel has “User graph selection” enabled, or the channel will not show up in the drop down list.

#### 4.5.6.2 IO Pane: Analog

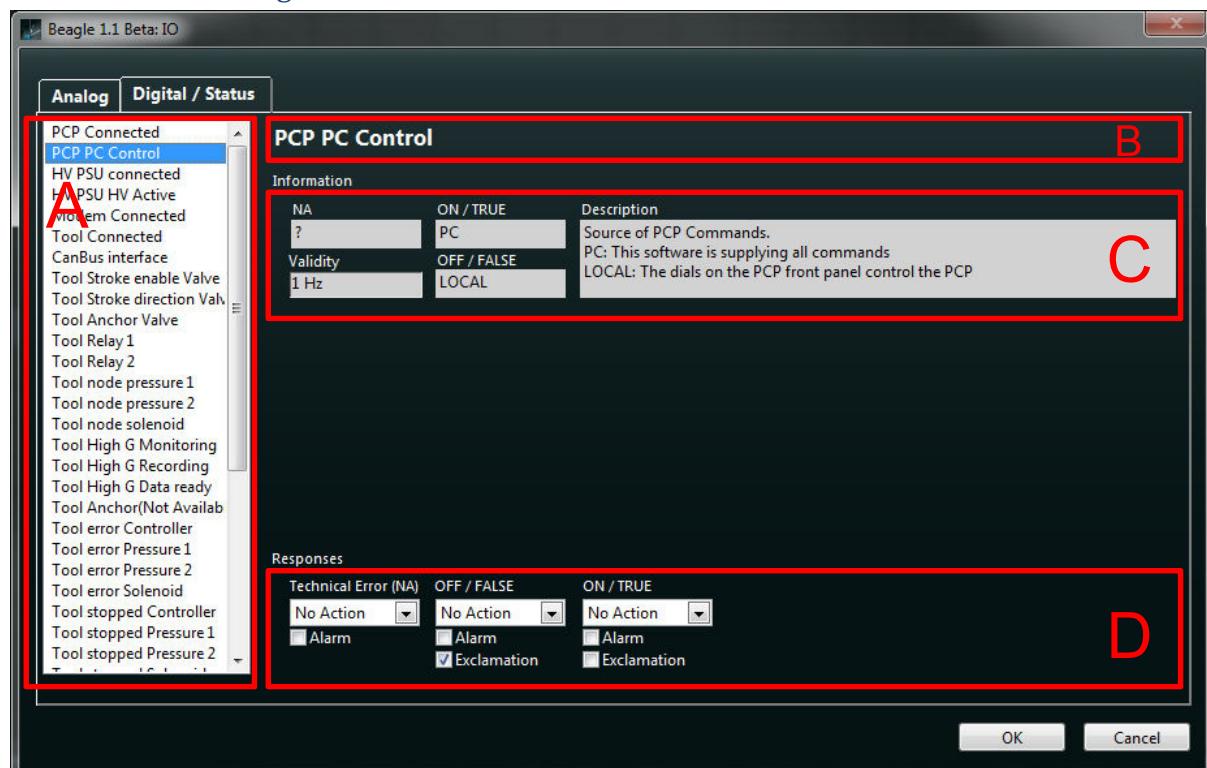
The analog channels in the system may be configured here.

- (B) List of all analog IO channels.
- (C) Name of the selected channel. Cannot be changed.
- (D) Channel information
  - Unit. The engineering unit for the channel. This drop down menu lets the operator change between all the unit representations that is available for that channel. When changing units, the unit conversion factors will be incorporated into the channel scaling. This is also true for channels that have a custom scaling.
  - Validity. How long a value for this channel remains valid without a new value replacing it (1Hz = 1 second)
  - Description. Description of the behavior of the channel.
- (E) Scaling. For some channels it is possible to change the scaling. Default scaling for all channels is Gain =1 and offset =0. Note that additional conversion factors are applied to the incoming raw data that is retrieved from the PCP and tool. The default should always give the correct value according to the channels unit unless otherwise stated in the description (D) or the IO channel list (4.6.2). The “Calibrate” button will open a dialog that makes it possible to calculate new scaling values interactively
- (F) An analog channel can have alarms and actions associated with different conditions:
  - Technical Error (NA). Any situation causing the value to show as NA or NaN. Typically that the value is no longer available. Node disconnected for instance. Some GUI indicators have a built in status display. A technical error will always show as an X, regardless of alarm or action setting.
  - LL. Value is below the value listed under LL. Some GUI indicators have a built in status display. A LL situation will display as two down facing arrows, regardless of alarm or action setting.

- L. Value is below the value listed under L. Some GUI indicators have a built in status display. A L situation will display as one down facing arrow, regardless of alarm or action setting.
- HH. Value is above the value listed under HH. Some GUI indicators have a built in status display. A HH situation will display as two up facing arrows, regardless of alarm or action setting.
- H. Value is above the value listed under H. Some GUI indicators have a built in status display. A H situation will display as one up facing arrow, regardless of alarm or action setting.
- (G) Check if a standard user should have this channel available for viewing in the graph.



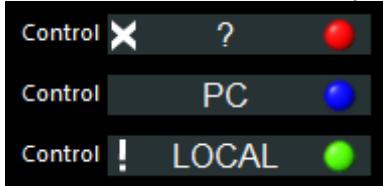
#### 4.5.6.3 IO Pane: Digital



The digital channels in the system may be configured here.

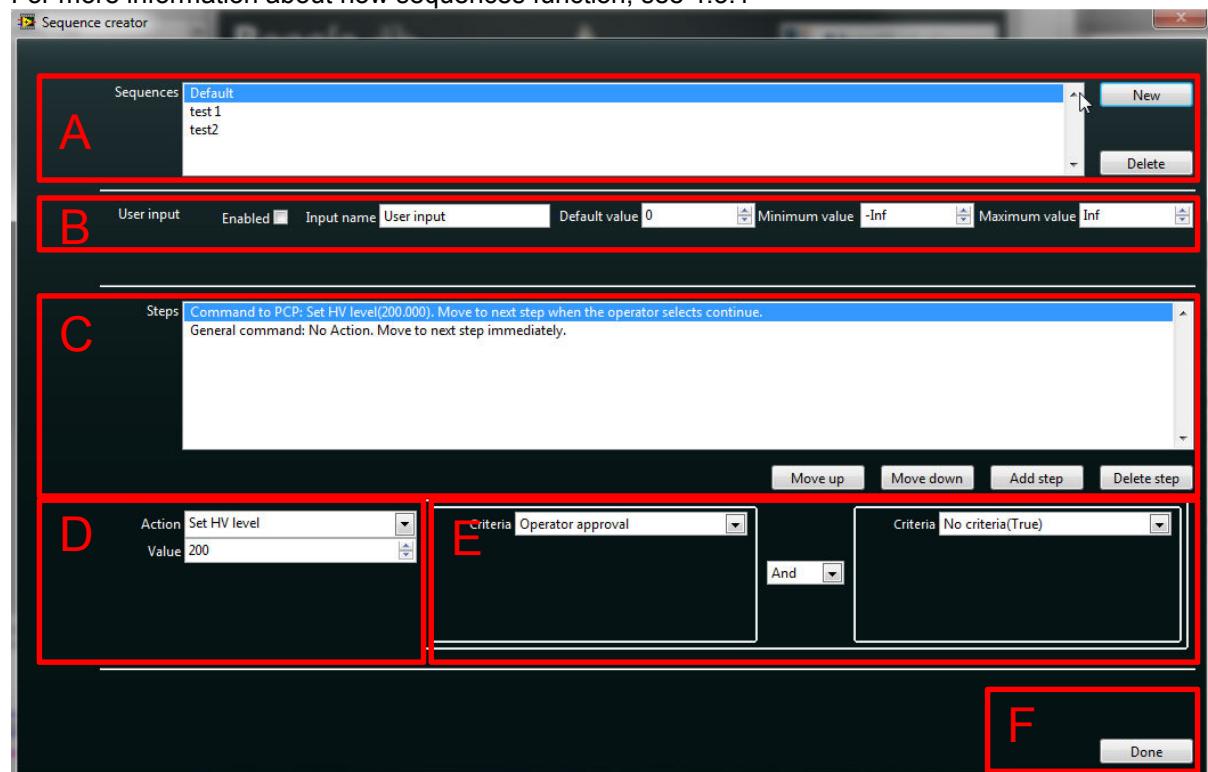
- (A) List of all analog IO channels.
- (B) Name of the selected channel. Cannot be changed.
- (C) Channel information that cannot be changed.
  - NA. The text that will be used in indicators when the status is unavailable.

- ON/TRUE. The text that will be used in indicators when the value is true.
- OFF/FALSE. The text that will be used in indicators when the value is False.
- Validity. How long a value for this channel remains valid without a new value replacing it (1Hz = 1 second)
- Description. Description of the behavior of the channel.
- (D) How the channel reacts to different situations.
  - Technical Error (NA). Any situation causing the value to be unknown. Typically that the value is no longer available. Node disconnected for instance. Some GUI indicators have a built in status display. A technical error will always show as an X, regardless of alarm or action setting.
  - OFF / FALSE. Any action or alarm to perform if value is false. Select exclamation to show this is same spot as the unavailable indicating X.
  - ON / TRUE. Any action or alarm to perform if value is true. Select exclamation to show this is same spot as the unavailable indicating X.

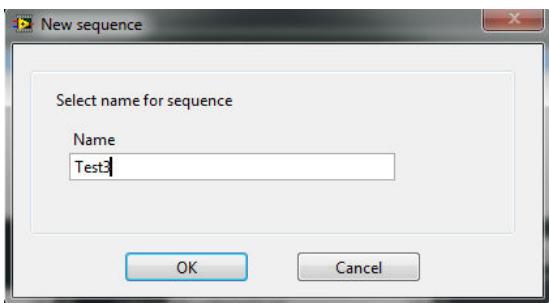


#### 4.5.7 Sequence creator

For more information about how sequences function, see 4.3.1



- (A) List of available sequences along with the possibility of creating new ones, and deleting any sequence selected in the list.



The sequence selected in list (A) is the one being worked on in all other parts of the dialog.

- (B) Some criteria may have a “User input” Boolean option (4.3.1.5). For this to work the User input must be configured.
  - Enabled
  - Given a name (“Input name”). This will be shown on the main window during the sequence.
  - A default value (“Default value”). This will be the initial value for the input box.
  - A maximum and minimum allowed value.
- (C) The steps of the sequence in a human readable form. The configuration for the step can be seen in section D and E below. The text will normally be:

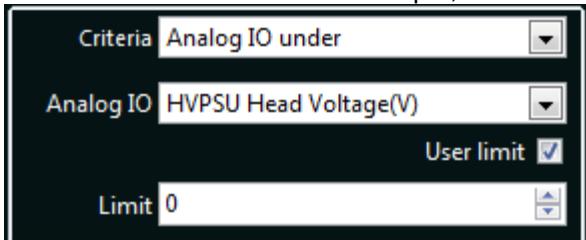
*[Type of command (PCP, Tool, General)] [Name of action with any additional value in parenthesis] “Move to next step” [Criteria 1 description] [Boolean operation] [Criteria 2 description].*

When the step configuration in D and E changes, so will the text of the selected line.

Steps can be added, deleted, and given new positions in the sequence using the buttons.

- (D) List of available actions (4.3.1.3). If an action has additional specifications needed, like HV level, this will become available below the Action drop down box.
- (E) Two criteria (4.3.1.5) can be setup along with their Boolean relationship. The sequence will not go to the next step until the result of the selected Boolean operation (4.3.1.4) between the two criteria is True.  
If only one criteria is needed, the other should be left to “No criteria (True)” and the Boolean operation to “And”.

When a criteria needs additional input, these will show up under the criteria type.

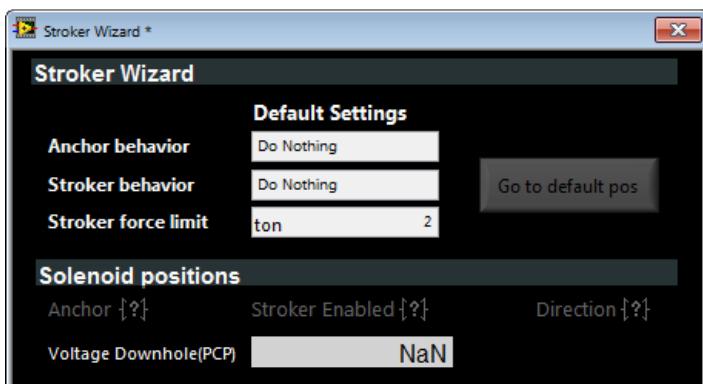


When “User limit” is selected, User input will be used instead of “Limit”.

- (F) “Done” saves all changes and closes the dialog window.

#### 4.5.8 Stroker Default Dialog

This dialog will launch when the Telemetry is started and is used for setting the tool in default position. All default settings are configurable in the Options dialog (4.5.4.3). If the Telemetry has not started within a specified time limit, this dialog will display a Error Message.



#### Indicators

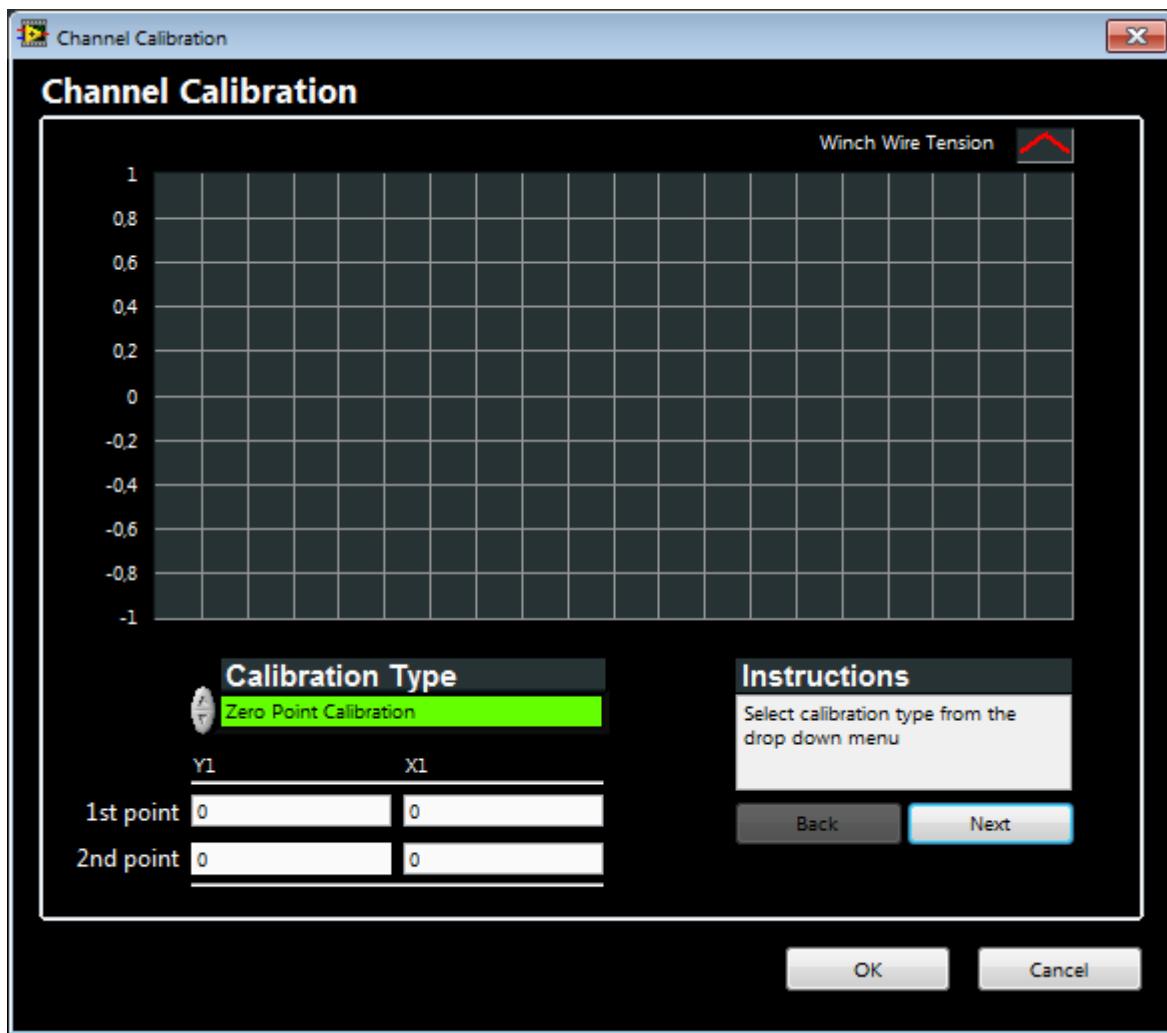
Anchor behavior	Displays the default anchor behavior configured in (4.5.4.3).
Stroker behavior	Displays the default stroker behavior configured in (4.5.4.3).
Stroke force limit (ton)	Displays the default stroker force limit configured in (4.5.4.3).
Voltage Downhole(PCP)	4.6.2. HVPSU Head Voltage
Anchor	4.6.1. Tool Anchor Valve
Stroker Enabled	4.6.1. Tool Stroke enable valve
Direction	4.6.1. Tool Stroke direction valve

#### Controls

Go to default pos	Control button that sets the tool in the default state.
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### 4.5.9 Channel Calibration

The channel calibration dialog can be opened by pressing the “Calibrate” button for an analog channel in the 4.5.6.2 IO dialog. Follow the on-screen instructions to perform a calibration. When a calibration procedure has been completed, new scaling factors will be calculated for that channel. The subsequent chapters will describe the two types of calibration which are possible.



#### 4.5.9.1 Zero Point Calibration

When using the Zero Point Calibration the input signal has to be set to zero. A new value for the scaling offset will be calculated by negating the measured value.

#### 4.5.9.2 Two Point Calibration

When performing a two point calibration, the input signal has to be set to two known values. When both values have been measured, new values for scaling gain and offset are calculated by comparing the measured values to the theoretical values.

## 4.6 PCP IO channels

List of available IO channels from the PCP. These channels are stored to file, displayed in the main window and the analog ones can be displayed in the graphs. For more on how to configure the channels see 4.5.5

### 4.6.1 Digital IO

Name	Source	On text	Off text	NA text	Category	Comment
PCP Connected	General	ONLINE	OFFLINE	?	No Category	PowerTrack Control Panel (PCP) or Magna connection status.
PCP PC Control	PCP	PC	LOCAL	?	No Category	Source of PCP Commands. PC: This software is supplying all commands LOCAL: The dials on the PCP front panel control the PCP Always set to PC when using Magna PSU
HV PSU connected	PCP	ONLINE	OFFLINE	?	No Category	Connection status of the topside Power supply that supplies the HV power. This is connected via the PCP Always online when Magna PSU connected
HV PSU HV Active	PCP	ON	OFF	?	Power	High voltage power output from the PSU is active.
Modem Connected	PCP	ONLINE	OFFLINE	?	No Category	Connection status between the PC and the topside part of the Downhole modem. NB! Since the wireline modem is transparent, it is not possible to know that a connection has been established without the tool connected. This variable only tells if the COM port selected for the tool communication is valid.
Tool Connected	General	ONLINE	OFFLINE	?	No Category	Connection status between PC and Tool.

### 4.6.2 Analog IO

Name	Source	Quantity	Category	User adjustable scaling	Comment
HVPSU Head Voltage	PCP	Voltage	Power	No	Voltage at tool, estimated based on Topside PSU voltage and cable resistance.
HVPSU TS Voltage	PCP	Voltage	Power	No	Voltage supplied by the Topside PSU.
HVPSU Current	PCP	Current	Power	No	Current delivered by the Topside PSU.
PCP Cable Resistance	PCP	Resistance	Power	No	Resistance used for calculations, may have been supplied manually, or calculated based on Topside voltage, and voltage measured at the tool.
Winch Depth	PCP	Distance	No Category	No	Length of winch cable.
Winch Line Speed	PCP	Speed	No Category	No	Speed of winch cable.
Winch Wire Tension	PCP	Tension	No Category	Yes	Cable tension measured by the winch. Must be calibrated using gain and offset.

## 4.7 Tool IO channels

List of available IO channels from the Tool. These channels are stored to file, displayed in the main window and the analog ones can be displayed in the graphs. For more on how to configure the channels see 4.5.5

### 4.7.1 Digital IO

Name	Source	On text	Off text	NA text	Category	Comment
Tool Error Controller	Tool	ERROR	OK	Unknown	No Category	Controller node has an error. To clear an error, or gather more details when an error occurs, see "Detail view" in main menu.
Tool Stopped Controller	Tool	STOPPED	RUNNING	Unknown	No Category	Controller node has been stopped by stop command, or connection timeout.

Name	Source	On text	Off text	NA text	Category	Comment
Tool Relay 1	Tool	PASS	MOTOR	Unknown	No Category	Controller relay 1 is in MOTOR mode(F) or PASSENGER mode(T)
Tool Relay 2	Tool	PASS	MOTOR	Unknown	No Category	Controller relay 2 is in MOTOR mode(F) or PASSENGER mode(T)
Tool Both Relays (New v1.16)	Tool	PASS	MOTOR	Unknown	No Category	Both controller relays are in MOTOR mode(F) or PASSENGER mode(T)
Tool node Pressure 1	Tool	ONLINE	OFFLINE	Unknown	No Category	Is the software communicating with pressure 1 node?
Tool Error Pressure 1	Tool	ERROR	OK	Unknown	No Category	Pressure node 1 has an error. To clear an error, or gather more details when an error occurs, see "Detail view" in main menu.
Tool Stopped Pressure 1	Tool	STOPPED	RUNNING	Unknown	No Category	Pressure node 1 has been stopped by stop command, or connection timeout.
Tool node Pressure 2	Tool	ONLINE	OFFLINE	Unknown	No Category	Is the software communicating with pressure 2 node?
Tool Error Pressure 2	Tool	ERROR	OK	Unknown	No Category	Pressure node 2 has an error. To clear an error, or gather more details when an error occurs, see "Detail view" in main menu.
Tool Stopped Pressure 2	Tool	STOPPED	RUNNING	Unknown	No Category	Pressure node 2 has been stopped by stop command, or connection timeout.
Tool node Solenoid	Tool	ONLINE	OFFLINE	Unknown	No Category	Is the software communicating with the solenoid node?
Tool Error Solenoid	Tool	ERROR	OK	Unknown	No Category	Solenoid node has an error. To clear an error, or gather more details when an error occurs, see "Detail view" in main menu.
Tool Stopped Solenoid	Tool	STOPPED	RUNNING	Unknown	No Category	Solenoid node has been stopped by stop command, or connection timeout.
Tool Solenoid 1	Tool	OPEN	CLOSED	Unknown	No Category	-
Tool Solenoid 2	Tool	OPEN	CLOSED	Unknown	No Category	-
Tool Solenoid 3	Tool	OPEN	CLOSED	Unknown	No Category	-
Tool node PSU	Tool	ONLINE	OFFLINE	Unknown	No Category	Is the software communicating with the PSU node?
Tool Error PSU	Tool	ERROR	OK	Unknown	No Category	PSU node has an error. To clear an error, or gather more details when an error occurs, see "Detail view" in main menu.
Tool Stopped PSU	Tool	STOPPED	RUNNING	Unknown	No Category	PSU node has been stopped by stop command, or connection timeout.
Upper Tension Sub	Tool	ONLINE	OFFLINE	Unknown	No Category	Is the software communicating with the upper tension sub node?
Tool Error Upper Tension Sub	Tool	ERROR	OK	Unknown	No Category	Upper Tension Sub node has an error. To clear an error, or gather more details when an error occurs, see "Detail view" in main menu.
Tool Stopped Upper Tension Sub	Tool	STOPPED	RUNNING	Unknown	No Category	Upper Tension Sub node has been stopped by stop command, or connection timeout.
Lower Tension Sub	Tool	ONLINE	OFFLINE	Unknown	No Category	Is the software communicating with the lower tension sub node?
Tool Error Lower Tension Sub	Tool	ERROR	OK	Unknown	No Category	Lower Tension Sub node has an error. To clear an error, or gather more details when an error occurs, see "Detail view" in main menu.
Tool Stopped Lower Tension Sub	Tool	STOPPED	RUNNING	Unknown	No Category	Lower Tension Sub node has been stopped by stop command, or connection timeout.
Stroke Target seeking	Tool	HOMING	IDLE	Unknown	No Category	Tool stroke is moving to a preset mm target. This should be the result of a "Go to" command.
Stroke Moving Out	Tool	MOVING	STILL	Unknown	No Category	Stroke has been detected as moving out based on position data over time
Stroke Moving Inn	Tool	MOVING	STILL	Unknown	No Category	Stroke has been detected as moving in based on position data over time
Stroke valves set for Out	Tool	ACTIVE	OFF	Unknown	No Category	Stroke hydraulic valves are positioned to move the stroke out.
Stroke valves set for In	Tool	ACTIVE	OFF	Unknown	No Category	Stroke hydraulic valves are positioned to move the stroke in.
Stroke In (force)	Tool	IN	OFF	Unknown	No Category	Pressure readings are indicating that the stroke is moving in

Name	Source	On text	Off text	NA text	Category	Comment
Stroke Out (force)	Tool	OUT	OFF	Unknown	No Category	Pressure readings are indicating that the stroke is moving out
Stroke Force decreasing(in)	Tool	DECREASE	OFF	Unknown	No Category	Pressure readings are indicating that the inward stroke force is decreasing.
Stroke Force decreasing(out)	Tool	DECREASE	OFF	Unknown	No Category	Pressure readings are indicating that the outward stroke force is decreasing.
Stroke Force change not correct	Tool	PROBLEM	OK	Unknown	No Category	Stroke force is decreasing when it should be increasing. Expected: When pressure is over limit to indicate movement, and valves are set for movement, the pressure on the stroking side is not expected to decrease.
Stroke SLIPS established P1	Tool	P1 "SLIPS"	-	Unknown	No Category	Pressure node 1 indicates that SLIPS has been established.
Stroke SLIPS established P2	Tool	P2 "SLIPS"	-	Unknown	No Category	Pressure node 2 indicates that SLIPS has been established.
Stroke SLIPS established	Tool	SLIPS	-	Unknown	No Category	Both pressure nodes indicate that SLIPS has been established.
Stroke Pressure Monitor Ongoing	Tool	ONGOING	-	Unknown	No Category	Pressure monitoring state.
Stroke Pressure Monitor Ending	Tool	ENDING	-	Unknown	No Category	Pressure monitoring shutting down. Should never be active for long periods.
Tool Stroke enable Valve	Tool	DISABLED	ENABLED	Unknown	No Category	Stroke enable solenoid open(F) or closed(T)
Tool Stroke direction Valve	Tool	IN	OUT	Unknown	No Category	Stroke direction solenoid open(F) or closed(T)
Tool Anchor Valve	Tool	IN	OUT	Unknown	No Category	Anchor solenoid open(F) or closed(T)
Stroker Var19 - Reserved	Tool	-	-	Unknown	No Category	-
Stroker Var20 - Reserved	Tool	-	-	Unknown	No Category	-
Stroker Var21 - Reserved	Tool	-	-	Unknown	No Category	-
Stroker Var22 - Reserved	Tool	-	-	Unknown	No Category	-
Stroker Var23 - Reserved	Tool	-	-	Unknown	No Category	-
Stroker Var24 - Reserved	Tool	-	-	Unknown	No Category	-
Tractor Var1 - Reserved	Tool	-	-	Unknown	No Category	-
Tractor Var2 - Reserved	Tool	-	-	Unknown	No Category	-
Tractor Var3 - Reserved	Tool	-	-	Unknown	No Category	-
Tractor Var4 - Reserved	Tool	-	-	Unknown	No Category	-
Tractor Var5 - Reserved	Tool	-	-	Unknown	No Category	-
Tractor Var6 - Reserved	Tool	-	-	Unknown	No Category	-
Tractor Var7 - Reserved	Tool	-	-	Unknown	No Category	-
Tractor Var8 - Reserved	Tool	-	-	Unknown	No Category	-
Oil filling mode	Tool	-	-	Unknown	No Category	-
Mill Bit Direction	Tool	-	-	Unknown	No Category	-
Position control	Tool	-	-	Unknown	No Category	-
Anchor	Tool	-	-	Unknown	No Category	-
Driller Var5 - Reserved	Tool	-	-	Unknown	No Category	-
Driller Var6 - Reserved	Tool	-	-	Unknown	No Category	-
Driller Var7 - Reserved	Tool	-	-	Unknown	No Category	-
Driller Var8 - Reserved	Tool	-	-	Unknown	No Category	-

#### 4.7.2 Analog IO

Name	Source	Quantity	Category	User adjustable scaling	Comment
Tool max Temperature	Tool	Temperature	Temperature	No	The highest temperature currently being measured in the tool. If data from any of the tool temperature sensors is not available, this is reported as "Not Available".
Tool (Solenoid) Temperature	Tool	Temperature	Temperature	No	Temperature of the Solenoid electronics
Tool supply Voltage	Tool	Voltage	Power	No	The tool controller board supply voltage.
Tool (Controller) Current	Tool	Current	Power	No	The tool controller board supply current.
Tool Acceleration X	Tool	Acceleration	No Category	No	The tool controller board accelerometer X axis. Used to determine the tool inclination and rotation.
Tool Acceleration Y	Tool	Acceleration	No Category	No	The tool controller board accelerometer Y axis. Used to determine the tool inclination and rotation.
Tool Acceleration Z	Tool	Acceleration	No Category	No	The tool controller board accelerometer Z axis. Used to determine the tool inclination and rotation.
Tool (Controller) Temperature	Tool	Temperature	Temperature	No	The tool controller board temperature.
Tool Acceleration Sum	Tool	Acceleration	No Category	No	The vector sum of the accelerations(X, Y and Z) measured on the tool controller board.
Tool Inclination	Tool	Angle	No Category	No	The tool inclination, as calculated by the accelerations (X, Y and Z) measured in reference to the tool in operation. 0deg indicates straight down, 180deg indicates straight up, 90deg is level.
Tool Rotation	Tool	Angle	No Category	No	The tool rotation, as calculated by the accelerations (X, Y and Z) measured on the tool controller board. This is not calculated if the inclination is within 10 deg of 0 deg or 180 deg.
Tool Stroke Extension	Tool	Distance	No Category	No	How far the tool's stroke is protruding from its retracted position.
Tool GP Sensor 1	Tool	Voltage	No Category	No	Tool controller board 24bit analog input bridge sensor no 1.
Tool GP Sensor 2	Tool	Voltage	No Category	No	Tool controller board 24bit analog input bridge sensor no 2.
Tool (Pressure 1) Temperature	Tool	Temperature	Temperature	No	Temperature measured at pressure node 1 in the tool.
Tool Pressure 1	Tool	Pressure	Pressure	Yes	Pressure measured by pressure node 1 in the tool. Please note that currently this is indicated as a voltage between 0 and 6.7 mv.
Tool (Pressure 2) Temperature	Tool	Temperature	Temperature	No	Temperature measured by pressure node 2 in the tool.
Tool Pressure 2	Tool	Pressure	Pressure	Yes	Pressure measured by pressure node 2 in the tool.
Do not use (SIF)	Tool	Force	No Category	Yes	Pending removal. Replaced by "Stroke Force". (The stroke in force as measured by the pressure transmitter. Pressure(Bar) * 0.0197)
Do not use (SOF)	Tool	Force	No Category	Yes	Pending removal. Replaced by "Stroke Force". (The stroke out force as measured by the pressure transmitter. Pressure(Bar) * 0.0197)
Stroke Force	Tool	Force	No Category	Yes	Total stroke force. The difference between the pressures measured at the two pressure nodes, is multiplied by 0.0197 tonnes. The pressure of Node 2 is subtracted from the pressure of Node 1.
PSU Temp	PSU	Temperature	No Category	No	Temperature measured in PSU
Head Voltage	PSU	Voltage	No Category	No	Input voltage of PSU
PSU Main Voltage out	PSU	Voltage	No Category	No	Output voltage of PSU

Name	Source	Quantity	Category	User adjustable scaling	Comment
PSU Main Current out	PSU	Current	No Category	No	Output current of PSU
Upper Tension Sub Temp	Tension s Sub Node	Temperature	Temperature	No	Temperature measured at the upper tension sub node in the tool.
Tool Upper Tension Sub	Tension s Sub Node	Tension	No Category	Yes	Tension measured by the upper tension sub node in the tool.
Lower Tension Sub Temp	Tension s Sub Node	Temperature	Temperature	No	Temperature measured at the lower tension sub node in the tool.
Tool Lower Tension Sub	Tension s Sub Node	Tension	No Category	Yes	Tension measured by the lower tension sub node in the tool.

## 4.8 Tractor IO channels

List of available IO channels from the Tractor. These channels are stored to file, displayed in the main window and the analog ones can be displayed in the graphs. For more on how to configure the channels see 4.5.5

### 4.8.1 Analog IO

Name	Source	Quantity	Category	User adjustable scaling	Comment
Tool max Temperature	Tool	Temperature	Temperature	No	The highest temperature currently being measured in the tool. If data from any of the tool temperature sensors is not available, this is reported as "Not Available".
Tool supply Voltage	Tool	Voltage	Power	No	The tool controller board supply voltage.
Tool (Controller) Current	Tool	Current	Power	No	The tool controller board supply current.
Tool Acceleration X	Tool	Acceleration	No Category	No	The tool controller board accelerometer X axis. Used to determine the tool inclination and rotation.
Tool Acceleration Y	Tool	Acceleration	No Category	No	The tool controller board accelerometer Y axis. Used to determine the tool inclination and rotation.
Tool Acceleration Z	Tool	Acceleration	No Category	No	The tool controller board accelerometer Z axis. Used to determine the tool inclination and rotation.
Tool (Controller) Temperature	Tool	Temperature	Temperature	No	The tool controller board temperature.
Tool Acceleration Sum	Tool	Acceleration	No Category	No	The vector sum of the accelerations(X, Y and Z) measured on the tool controller board.
Tool Inclination	Tool	Angle	No Category	No	The tool inclination, as calculated by the accelerations (X, Y and Z) measured on the tool controller board. 0deg indicates straight down, 180deg indicates straight up, 90deg is level.
Tool Rotation	Tool	Angle	No Category	No	The tool rotation, as calculated by the accelerations (X, Y and Z) measured on the tool controller board. This is not calculated if the inclination is within 10 deg of 0 deg or 180 deg.
Tool Stroke Extension	Tool	Distance	No Category	No	How far the tool's stroke is protruding from its retracted position.
Tool GP Sensor 1	Tool	Voltage	No Category	No	Tool controller board 24bit analog input bridge sensor no 1.

Name	Source	Quantity	Category	User adjustable scaling	Comment
Tool GP Sensor 2	Tool	Voltage	No Category	No	Tool controller board 24bit analog input bridge sensor no 2.
PSU Temp	PSU	Temperature	No Category	No	Temperature measured in PSU
Head Voltage	PSU	Voltage	No Category	No	Input voltage of PSU
PSU Main Voltage out	PSU	Voltage	No Category	No	Output voltage of PSU
PSU Main Current out	PSU	Current	No Category	No	Output current of PSU
Upper Tension Sub Temp	Tension s Sub Node	Temperature	Temperature	No	Temperature measured at the upper tension sub node in the tool.
Tool Upper Tension Sub	Tension s Sub Node	Tension	No Category	Yes	Tension measured by the lower tension sub node in the tool.
Lower Tension Sub Temp	Tension s Sub Node	Temperature	Temperature	No	Temperature measured at the upper tension sub node in the tool.
Tool Lower Tension Sub	Tension s Sub Node	Tension	No Category	Yes	Tension measured by the lower tension sub node in the tool.

## 4.9 Modem Status IO channels (new v1.14)

List of available IO channels from the Modem Status. These channels are stored to file, displayed in the main window and the analog ones can be displayed in the graphs. For more on how to configure the channels see 4.5.5

### 4.9.1 Digital IO

Name	Source	On text	Off text	NA text	Category	Comment
TS-DH_LINK_STATUS	General	OK	NOT OK	?	No Category	Topside - Downhole Link status retrieved from topside modem status port

### 4.9.2 Analog IO

Name	Source	Quantity	Category	User adjustable scaling	Comment
TS_Signal_Quality		NA	No Category	No	Signal quality of topside modem
TS_PCB_Temp		Temperature	Temperature	No	Topside modem PCB temperature
TS_Gain		NA	No Category	No	Topside modem gain
DH_Signal_Quality		NA	No Category	No	Signal quality of downhole modem
DH_PCB_Temp		Temperature	Temperature	No	Downhole modem PCB temperature
DH_Gain		NA	No Category	No	Downhole modem gain
Link_Status		NA	No Category	No	Numerical Representation of link status

## 4.10 Quantity

In version 1.8 of Beagle it is possible to select which unit each variable should be given in. Each variable is assigned a quantity which dictates which units are available for that variable. The following table shows the units and conversion factors that are relevant for each quantity.

Quantity	Unit	Gain	Offset	Comment
NA	NA	1	0	Used for variables that has no engineering unit (New v1.14)
Acceleration	g	1	0	The default unit of this quantity
Angle	deg	1	0	The default unit of this quantity
Current	A	1	0	Current given in ampere. The default unit of this quantity.
Current	mA	1000	0	Current given in millampere
Force	tonne	1	0	Force given as metric tonne. The default unit of this quantity.
Force	long ton	0,9842	0	Force given as imperial ton.
Force	lb	2204,62	0	Force given as pound force.
Distance	m	1	0	Distance given in meter. The default unit for this quantity.
Distance	mm	1000	0	Distance given in millimeter.
Distance	in	39,3701	0	Distance given in inches.
Distance	ft	3,2808	0	Distance given in feet
Pressure	bar	1	0	Pressure given in bar. The default unit for this quantity.
Pressure	psi	14,5038	0	Pressure given in pounds per square inch
Resistance	Ohm	1	0	Resistance given in Ohm. The default unit for this quantity.
Rotational Speed	RPM	1	0	Rounds per minute. The default unit for this quantity.
Speed	m/s	1	0	Speed given in meters per second. The default unit for this quantity.
Speed	m/min	60	0	Speed given in meters per minute.
Speed	ft/s	3,28084	0	Speed given in feet per second.
Speed	ft/min	196,8504	0	Speed given in feet per minute.
Temperature	deg C	1	0	Temperature given in degrees Celsius. The default unit for this quantity.
Temperature	deg F	1,8	32	Temperature given in degrees Fahrenheit.
Tension	kg	1	0	Tension given in kg. The default unit for this quantity.
Tension	lb	2,2046	0	Tension given in pound.
Torque	tonne	1	0	Torque given in metric tonne. The default unit for this quantity.
Voltage	V	1	0	Voltage given in Volts. The default unit for this quantity.
Voltage	mV	1000	0	Voltage given in millivolts.
Weight	Tonne	1	0	Weight given in metric tonne. The default unit for this quantity.
Weight	Long ton	0,9842	0	Weight given in imperial ton.

## 4.12 File types

### 4.12.1 .sequence files

Sequence files hold automation sequences (4.3.1), and can be transferred between different copies of Beagle. The files are both created and read by Beagle, and they should not be manually edited. These files must be located in the “.../Beagle/sequences/” folder for Beagle to be able to use them.

### 4.12.2 .ini files

Beagle uses several ini files. These are not intended for manual use. All relevant parameters can be accessed from inside Beagle, so no further information will be given regarding contents for most of these.

### 4.12.3 System report

The system report is a text file stored in “.../Beagle/Log/”, and can be created in the Options dialog (4.5.1).

“YYYYMMDD hhmmss.sysrep.txt”. The file includes details about:

- PC
- OS
- Network adapters. Including IP and MAC Address.
- Disk drives
- System items with issues. This is any component marked as not OK in the windows Device manager.

In addition it includes System Name, Domain and User. The file is intended for trouble shooting by Mar-In when a problem is discovered with Beagle.

### 4.12.4 Project.ini file

Each project folder will have a project.ini file. This contains the information given in the new project dialog (4.1.4.2), except for “Comment”.

```
[Project information]
Project information.Job and Site.Project Name = "test"
Project information.Job and Site.Client Company = ""
Project information.Job and Site.Field = ""
Project information.Job and Site.Rig = ""
Project information.Job and Site.Country = ""
Project information.Tool.Tractor type = ""
Project information.Tool.Tool = ""
Project information.Tool.Serial # = ""
```

The project.ini file will also contain the AWS ID of all NSE electronics nodes that are in the system. This is read automatically by Beagle. There will be one section for Stroker information and a similar section for Tractor information.

```
[Stroker information]
Project information.Stroker.Controller.AWS # = ""
Project information.Stroker.Pressure1.AWS # = ""
Project information.Stroker.Pressure2.AWS # = ""
Project information.Stroker.PSU.AWS # = ""
Project information.Stroker.Solenoid.AWS # = ""
Project information.Stroker.TensionSub1.AWS # = ""
Project information.Stroker.TensionSub2.AWS # = ""
```

### 4.12.5 Project.comment file

In addition to project.ini, each project folder has a “project.comment” file, which contains the comment from the new project dialog in unformatted ASCII.

#### **4.12.6 .High-G**

Whenever high-G data (4.3.2) is retrieved by Beagle, it is stored in the project folder in these files with names [YYYYMMDD HHmmSS].High-G. The date and time is the time of retrieval, not time of shock. These are tab delimited ASCII files where the first row is a header, the first column is time since start of buffer in seconds, and the other columns are per axis.

Time	X axis (g)	Y axis (g)	z axis (g)
0.000	-500.000	-500.000	-500.000
0.001	-500.000	-500.000	-500.000
0.002	-500.000	-500.000	-500.000
0.003	-500.000	-500.000	-500.000
0.004	-500.000	-500.000	-500.000
0.005	-500.000	-500.000	-500.000
0.006	-500.000	-500.000	-500.000
0.007	-500.000	-500.000	-500.000
0.008	-500.000	-500.000	-500.000
0.009	-500.000	-500.000	-500.000

#### **4.12.7 .log**

Project folders will have .log files with name [YYYYMMDD HHmmSS].log. These contain the log data for the project. Each time the program starts it will make a new file.

Data is written to the file once per second. If no new data is available, it will use “NaN”. All analog channels (4.6.2) are included in the file; future version will hold all digital channels also.

This is a tab delimited ASCII file, with Line break/carriage return between each second of data. The first line is the channel names, second line is units, the rest of the lines start with a time (YYYY.MM.DD HH:mm:SS)

A	B	C
1 Time	Tool max Temperature	Tool (Soler)
2 HH:MM:SS	degC	degC
3 23.05.2012 16:55	NaN	NaN
4 23.05.2012 16:55	NaN	NaN
5 23.05.2012 16:55	33.710937	33.24218
6 23.05.2012 16:55	33.679687	33.24218
7 23.05.2012 16:55	33.710937	33.24218
8 23.05.2012 16:55	33.648437	33.24218

#### **4.12.8 .logb**

This is a binary version of the .log files. Same data, but channel values are stored as 8 byte floating point values. This file is currently not in use.

#### **4.12.9 .stat**

Issues have been found with the .stat files, which will lead to changes in this functionality. Data relevant to the user tend to drown in internal messages that do not require action.

The .stat file is stored in the project folder, and is named “Beagle “[YYYYMMDD HHmmSS]”.stat”. It contains internal error states, user events, information packages, alarms and annotations. This is a semicolon delimited ASCII file, where each line represents an occurrence.

Time;Source system;Source thread;Sub ID;Elevated priority;Type;Detail
13:09:17.158 23.04.2012;0 Host;0;FALSE;Event;App_Program Started-;
13:09:27.260 23.04.2012;0 Host;7 Main-SE Handler;0;FALSE;Error State;Error 1 (Open/Create/Replace File in Create E&S Text file.vi->Main.vi<APPEND>

A	B	C	D	E	F	G
Time	Source	Source thread	S	Elevated priorit	Type	Detail
1 13:09:17.158 23.04.2012	0 Host	0	FALSE	Event	App. Program Started-	
2 13:09:27.260 23.04.2012	0 Host	7 Main-SE Handler	0	FALSE	Error State	Error 1 (Open/Create/Replace File in Create E&S Text file.vi->Main.vi<APPEND>)
<b>Time</b>		Time stamp of occurrence. HH:mm:SS.sss DD.MM.YYYY				
<b>Source system</b>		0 Host. Identifies the system causing the occurrence. Currently always 0 Host.				
<b>Source thread</b>		Source thread. Identifies originating thread in software. For use by Mar-In.				
<b>Sub ID</b>		Additional Thread location identification. Identifies originating thread in software. For use by Mar-In.				
<b>Type</b>		Type of occurrence.				
		<ul style="list-style-type: none"> <li>• Event Button presses and similar</li> <li>• Error State Errors and error cleared.</li> <li>• Alarm State Alarms and alarm cleared.</li> <li>• User annotation User input messages</li> <li>• Info Information about activities in the program.</li> <li>• Debug Message Additional Info, normally not recorded.</li> </ul>				
<b>Detail</b>		A text string further describing the occurrence.				

#### **4.12.10 .statb**

This is a binary version of the .stat files. Same data, but binary coded for machine reading. This file is currently not in use.