

**DDP-UM-005**

**Val Controls Diagnostic Centre**

**User manual**

## Table of contents

<b>1</b>	<b>General.....</b>	<b>3</b>
1.1	System requirements.....	3
1.1.1	HART .....	3
<b>2</b>	<b>Application .....</b>	<b>4</b>
<b>3</b>	<b>Connection.....</b>	<b>5</b>
3.1	Offline mode.....	5
3.2	Modbus.....	5
3.3	Memory card .....	6
3.4	Pocket PC .....	6
3.5	HART .....	6
<b>4</b>	<b>Live.....</b>	<b>8</b>
<b>5</b>	<b>Graph.....</b>	<b>9</b>
5.1	Delete signatures .....	9
5.2	Graphs.....	10
5.3	Comparison.....	12
5.4	Report generation .....	12
<b>6</b>	<b>Setup.....</b>	<b>13</b>
6.1	Tag number.....	13
<b>7</b>	<b>Appendix A - Functionality.....</b>	<b>14</b>
<b>8</b>	<b>Appendix B - Typical transfer times.....</b>	<b>15</b>
<b>9</b>	<b>Appendix C – Report bookmarks .....</b>	<b>16</b>
9.1	Colour selection sequence .....	16
9.2	Identification.....	16
9.3	Partial stroke .....	17
9.4	Full stroke.....	18
9.5	Solenoid test .....	19
9.6	Graph.....	19

## 1 General

This manual covers the following software:

Software ID: DDP-SW-005

Software version: 2.02.00

### 1.1 System requirements

Operating system: Windows XP (SP3), Windows 7

Programs: Microsoft Word 2010

The user must be local administrator on the PC.

Minimum requirements for the hardware

Screen resolution: 1024 pixels times 768 pixels

Processor: Pentium 4 or equivalent

RAM: 256 MB

Disk space: 400 MB

#### 1.1.1 HART

For HART communication the following software is also required.

- DDP-SW-009 - ValControls-DTM (version 1.01.00)
- PACTware
- A HART communication DTM

## 2 Application

Val Controls Diagnostic Centre (VCDC) is a PC program designed to retrieve, view and analyze signatures from the Val Controls Intelligent Diagnostic Positioner (IDP).

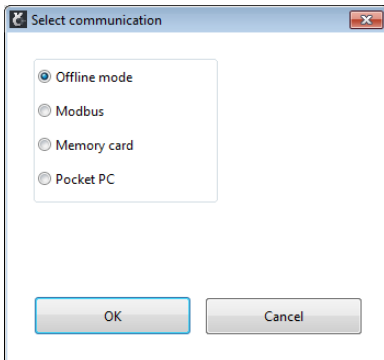
The signatures are recorded during the different diagnostic tests. There exist several methods to transfer the data from the IDP to VCDC e.g. through, HART, Modbus or using a Pocket PC.

VCDC can store signatures from several IDP's, and they can be viewed offline.

### 3 Connection

When Val Controls Diagnostic Centre (VCDC) is started the user must select the communication method. The following methods are available:

- Modbus
- Memory card
- Pocket PC



Further more an offline mode is available to show the signatures stored on the PC.

One IDP can be connected to Val Controls Diagnostic Centre at the time.

For communication with HART please see section 3.5.

#### 3.1 Offline mode

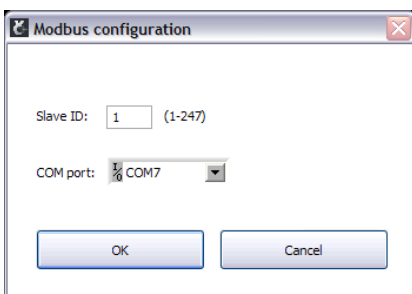
The offline mode allows access to the signatures stored on the PC.

All signatures are shown in the list to the left.

#### 3.2 Modbus

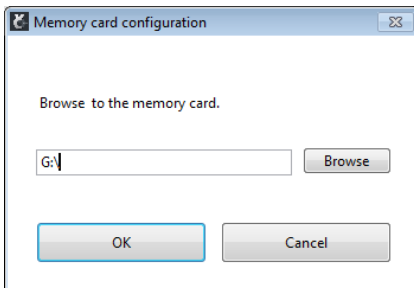
When Modbus is selected the user will be presented with the Modbus options. The correct slave ID and the COM port to which the Modbus network is connected must be entered. VCDC tries 3 times to connect to the IDP before an error is shown.

The options are automatically saved and presented as the default options at the next start.



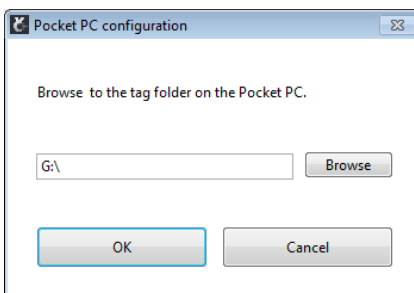
### 3.3 Memory card

Connect the memory card to the PC and navigate to root of the memory card



### 3.4 Pocket PC

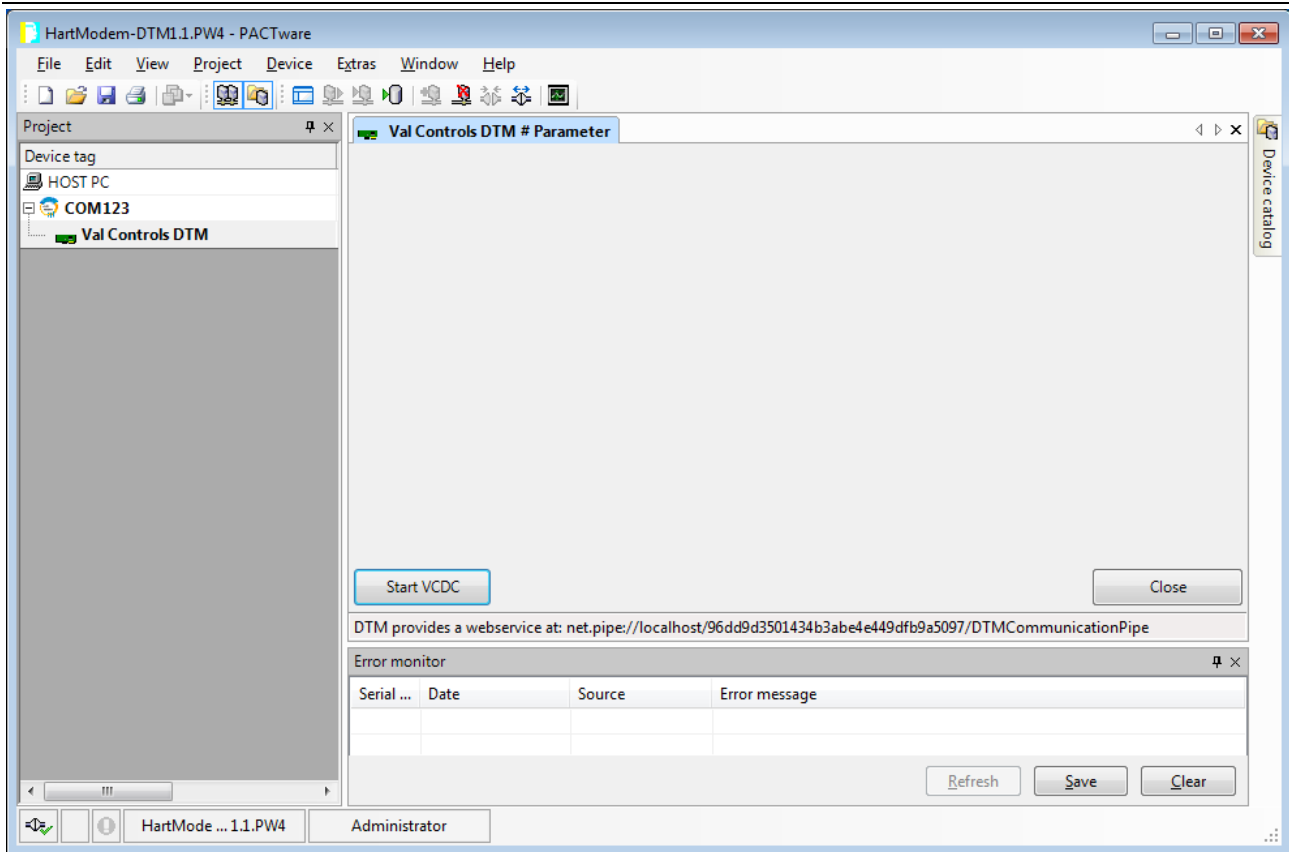
Connect the Pocket PC to the PC and navigate to the folder with the tag number of the desired unit.



### 3.5 HART

HART communication is established through an FDT and DTM.

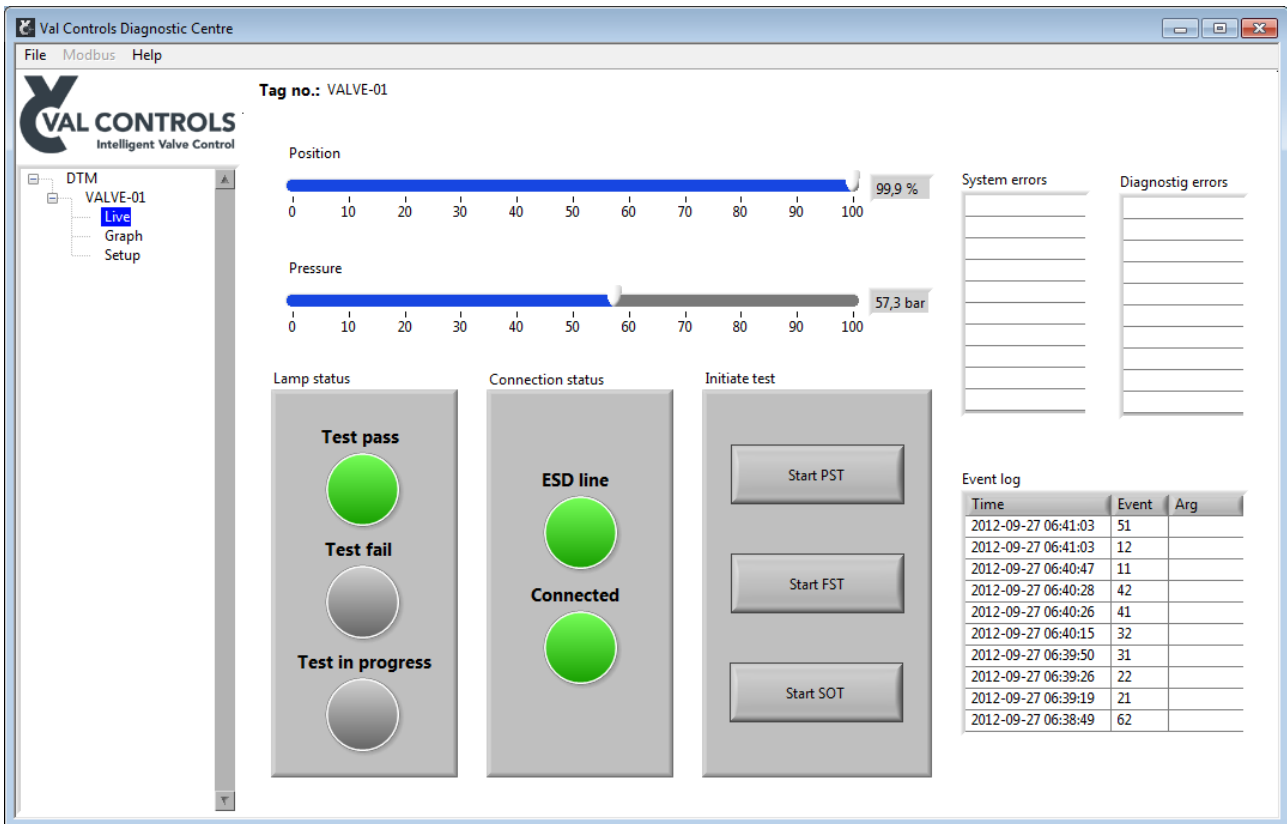
The topology of the network must be set up and the Val Controls DTM must be added.



Above is shown a simple example with only a HART modem and one IDP. The “Start VCDC” button starts VCDC and connects through the DTM to the device.

## 4 Live

The Live page shows the current status of the IDP. The different test can be initiated.



Val Controls Diagnostic Centre

File Modbus Help

Tag no.: VALVE-01

VAL CONTROLS Intelligent Valve Control

DTM  
VALVE-01  
Live  
Graph  
Setup

Position: 99,9 %

Pressure: 57,3 bar

Lamp status

- Test pass (Green)
- Test fail (Grey)
- Test in progress (Grey)

Connection status

- ESD line (Green)
- Connected (Green)

Initiate test

- Start PST
- Start FST
- Start SOT

System errors


Diagnostig errors

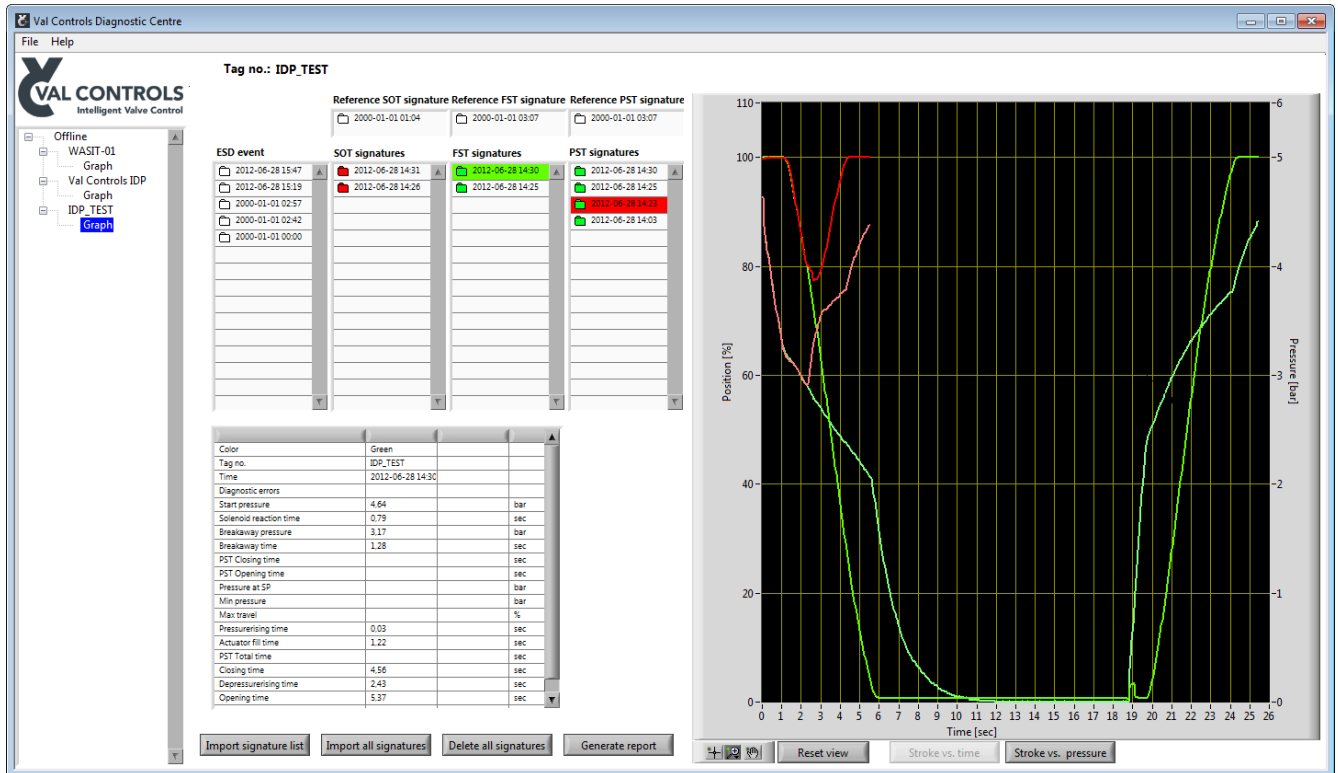
Event log

Time	Event	Arg
2012-09-27 06:41:03	51	
2012-09-27 06:41:03	12	
2012-09-27 06:40:47	11	
2012-09-27 06:40:28	42	
2012-09-27 06:40:26	41	
2012-09-27 06:40:15	32	
2012-09-27 06:39:50	31	
2012-09-27 06:39:26	22	
2012-09-27 06:39:19	21	
2012-09-27 06:38:49	62	



## 5 Graph

Val Controls Diagnostic Centre stores the signatures after they have been transferred to the PC. The signatures which are stored on the PC under the tag number are automatically loaded into the program. The icon  shows that the signatures are stored on the PC.



The list can be updated with all the signatures which are on the unit by going to

*Graph → Import signature list*

Typical transfer times for the different communication methods can be seen in Appendix B - Typical transfer times. The signatures which are not stored on the PC are automatically downloaded when they are marked. The download may take some time depending on the communication method. See Appendix B - Typical transfer times. All the curves which are not currently on the PC can be downloaded by going to the menu

*Graph → Import all signatures*

### 5.1 Delete signatures

A signature can be deleted by right clicking on it in the list and select delete signature. This will remove the signature from the PC and from the IDP. All signatures except the reference signatures can be deleted by going to

*Graph → Delete all signatures*




This will remove all the signatures from the PC and the IDP except the reference signatures.

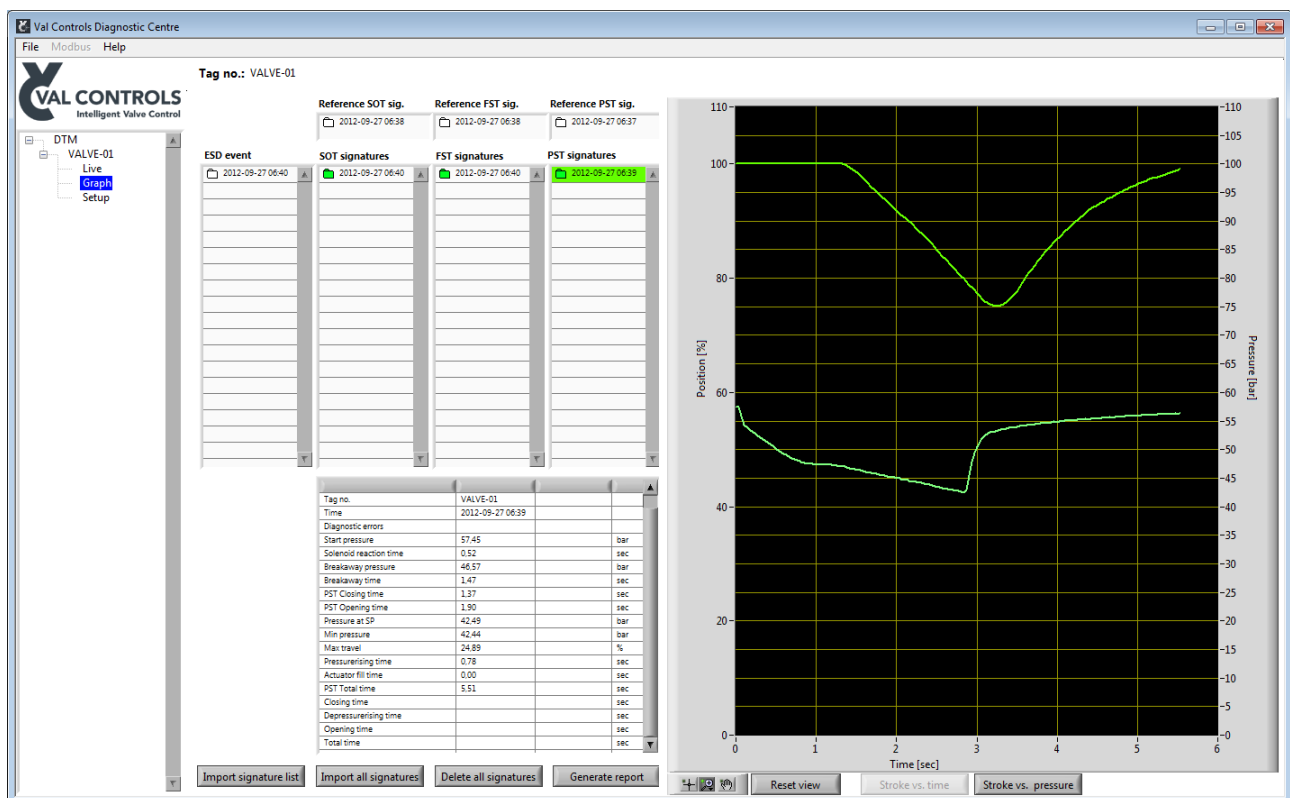
Remark: These functions cannot be undone!

## 5.2 Graphs

Multiple signatures can be compared. Click on a date/time in the list box and the curve is shown with the same colour as the background colour. The reference curves are shown separately in the top of the lists. The graphs scales will auto adjust after the green signature.

The position is shown as the dark colour and corresponds to the scale on the left. The pressure is a brighter version of the same colour.

- : The signature is downloaded to the PC
- : The signature is downloaded to the PC, and the test result was Fail
- : The signature is downloaded to the PC, and the test result was Pass

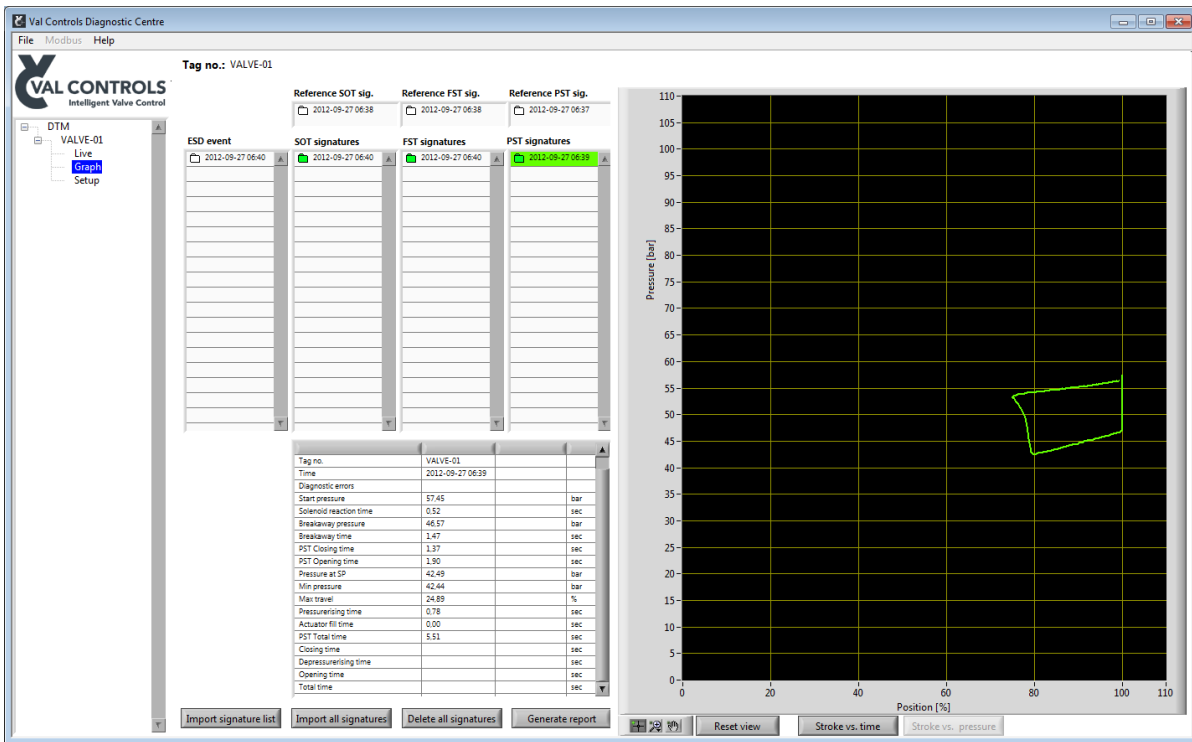


The scales can be changed by editing the numbers by the end of each scale or by using the tools at the bottom.

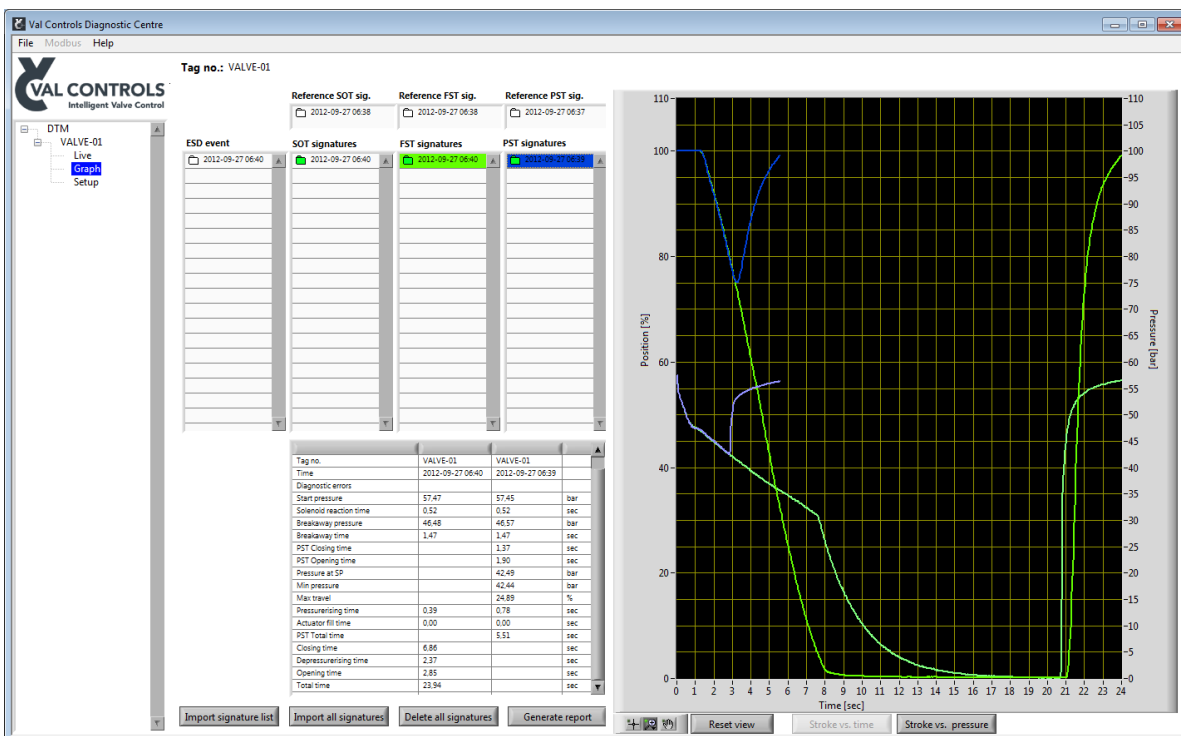


- Cursor tool
- Zoom tools
- Move tool

The default shown graph is position and pressure vs. time. This can be changed in to position vs. pressure.



Different signature types can be compared. Up till six different signatures can be shown at the same time, they will have different colours.



### 5.3 Comparison

In the comparison table can measured values from two selected signatures be compared.

Tag no.	VALVE-01	VALVE-01	
Time	2012-09-27 06:39	2012-09-27 06:37	
Diagnostic errors			
Start pressure	57,45	57,42	bar
Solenoid reaction time	0,52	0,52	sec
Breakaway pressure	46,57	46,69	bar
Breakaway time	1,47	1,44	sec
PST Closing time	1,37	1,37	sec
PST Opening time	1,90	2,04	sec
Pressure at SP	42,49	42,53	bar
Min pressure	42,44	42,46	bar
Max travel	24,89	24,66	%
Pressurerising time	0,78	0,77	sec
Actuator fill time	0,00	0,00	sec
PST Total time	5,51	5,62	sec
Closing time			sec
Depressurerising time			sec
Opening time			sec
Total time			sec

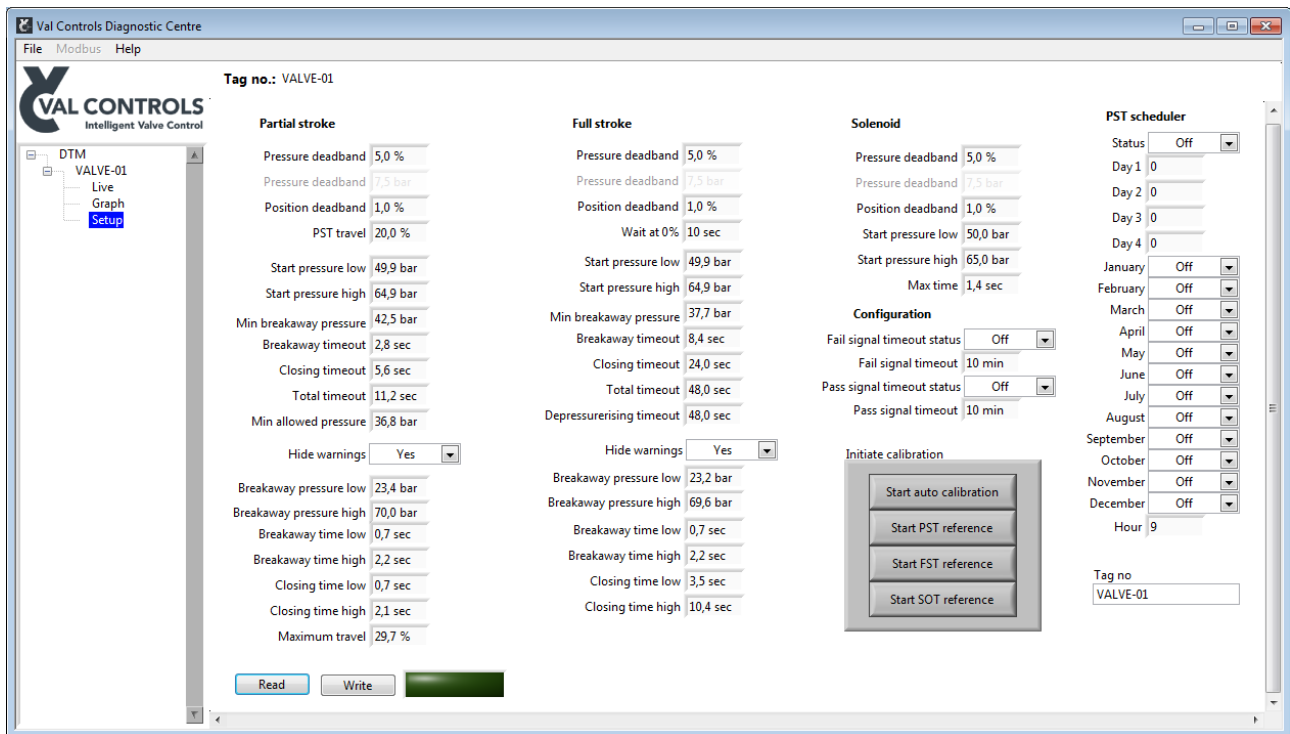
### 5.4 Report generation

VCDC can generate reports for documentation the performance of the actuator and valve. Going to

*Graph → Generate report*

will open a file dialog which must be used to select a Word template. The bookmarks in the templates are described in Appendix C – Report bookmarks.

## 6 Setup



The settings for the tests can be changed on the setup page

### 6.1 Tag number

The tag number is automatically retrieved from the unit when VCDC starts. If VCDC is connected using Memory card or Pocket PC is the tag number the name of the folder selected during connection.

The tag number can for some of the connection methods be changed from the setup page

The tag number cannot be changed for all connection methods. See Appendix A - Functionality for a table of available functionality under the different connection methods.

When analysing data from multiple IDP24-A's they must all have a unique tag number.

## 7 Appendix A - Functionality

The table shows what functions are available in VDCD when using the different connection modes.

	Offline	HART	Modbus	Memory card	Pocket PC
<b>Live</b>		•	•		
<b>Setup</b>		•	•		
<b>Change tag number</b>		•	•		
<b>Download signature from device</b>		•	•	•	•
<b>Delete one signature</b>		•	•	•	•
<b>Delete all signatures</b>		•	•	•	•
<b>View signatures</b>	•	•	•	•	•
<b>Generate report</b>	•	•	•	•	•

## 8 Appendix B - Typical transfer times

The following table shows the typical transfer timers for signatures and for retrieving list of signatures on the IDP.

	HART	Modbus	Memory card	Pocket PC
<b>Dir (1 line)</b>	0:15 min	< 1 sec	< 1 sec	< 1 sec
<b>Dir (10 line)</b>	2:20 min	1.5 sec	< 1 sec	< 1 sec
<b>Dir (100 line)</b>	22 min	15 sec	< 1 sec	< 1 sec
<b>Dir (500 line)</b>	114 min	70 sec	1.5 sec	1.5 sec
<b>Dir (1000 line)</b>	228 min	140 sec	3 sec	3 sec
<b>Fil (0 sec)</b>	3 min	2 sec	< 1 sec	< 1 sec
<b>Fil (10 sec)</b>	21 min	68 sec	< 1 sec	< 1 sec
<b>Fil (30 sec)</b>	57 min	165 sec	< 1 sec	< 1 sec
<b>Fil (60 sec)</b>	114 min	329 sec	1 sec	1 sec

## 9 Appendix C – Report bookmarks

The bookmarks in this appendix are available when generating reports from Val Controls Diagnostic Centre. VCDC support word 97-2003 templates (.dot) and Word 2007-2010 templates (.dotx)

### 9.1 Colour selection sequence

Colour	Abbreviation
Green	gre
Blue	blu
Red	red
Turquoise Blue	tur
Pink	pin
Yellow	yel

In the following bookmark names replace “col” in the beginning of the bookmark with the abbreviation from the table above.

### 9.2 Identification

#### Val Controls Diagnostic Centre

Description	Bookmark
VCDC Version	VCDC_Version

#### Unit

Description	Bookmark
Tag no.	col_2266_03
Type	col_1008_00
Software ID	col_1018_05
Software version	col_1018_03
PCB no.	col_1018_04



### 9.3 Partial stroke

#### Partial stroke test information

Description	Bookmark	
Time of test	col_TimeStamp	
Type	col_2502_04	
Status	col_2500_02	
System error log	col_1003	
Diagnostic error log	col_2500_07	

#### Partial stroke test data

Start pressure	col_2506_09	
Solenoid reaction time	col_2506_18	
Breakaway pressure	col_2506_02	col_2506_02_a
Breakaway time	col_2506_01	col_2506_01_a
Closing time	col_2506_03	col_2506_03_a
Opening time	col_2506_11	
Minimum pressure	col_2506_10	
Maximum travel	col_2506_07	
Pressure at SP	col_2506_08	
Pressurerising time	col_2506_20	
Actuator fill time	col_2506_21	
Total time	col_2506_04	

#### Partial stroke settings

Description	Bookmark	
Deadband pressure (bar)	col_2505_10	
Deadband pressure (%)	col_2505_15	
Deadband position	col_2505_01	
PST travel	col_2505_02	

#### Partial stroke error limits

Description	Bookmark	
Start pressure low	col_2505_09	
Start pressure high	col_2505_14	
Min. breakaway pressure	col_2505_03	
Breakaway timeout	col_2505_04	
Closing timeout	col_2505_12	
Total timeout	col_2505_13	
Min. allowed pressure	col_2505_11	

#### Partial stroke warning limits

Description	Bookmark	
Hide warnings	col_2505_23	
Breakaway pressure low	col_2503_03	
Breakaway pressure high	col_2503_04	
Breakaway time low	col_2503_01	

Breakaway time high	col_2503_02	
Closing time low	col_2503_05	
Closing time high	col_2503_06	
Maximum travel	col_2503_09	

## 9.4 Full stroke

### Test information

Description	Bookmark	
Time of test	col_TimeStamp	
Type	col_Type	
Status	col_Status / col_2500_04	
System error log	col_1003	
Diagnostic error log	col_2500_07	

### Test data

Start pressure	col_2506_15	
Solenoid reaction time	col_2506_19	
Breakaway pressure	col_2506_14	
Breakaway time	col_2506_13	
Closing time	col_2506_05	
Depressurising time	col_2506_17	
Opening time	col_2506_12	
Total time	col_2506_06	
Pressurerising time	col_2506_22	
Actuator fill time	col_2506_23	

### Full stroke settings

Description	Bookmark	
Deadband pressure (bar)	col_2505_19	
Deadband pressure (%)	col_2505_20	
Deadband position	col_2505_18	
Wait at fail pos time	col_2505_27	
SOV activate time	col_2505_28	

### Full stroke error limits

Description	Bookmark	
Start pressure low	col_2505_05	
Start pressure high	col_2505_21	
Min. breakaway pressure	col_2505_22	
Breakaway timeout	col_2505_17	
Closing timeout	col_2505_07	
Depressurising timeout	col_2505_16	
Total timeout	col_2505_08	

### Full stroke warning limits

Description	Bookmark	
Hide warnings	col_2505_24	
Breakaway pressure low	col_2503_10	
Breakaway pressure high	col_2503_11	
Breakaway time low	col_2503_12	
Breakaway time high	col_2503_13	
Closing time low	col_2503_07	
Closing time high	col_2503_08	

## 9.5 Solenoid test

### Test information

Description	Bookmark	
Time of test	col_TimeStamp	
Type	col_Type	
Status		
System error log	col_1003	
Diagnostic error log	col_2500_07	

### Solenoid test data

Start pressure	col_2512_01	
Pressure drop	col_2512_02	
Solenoid reaction time	col_2512_03	

### Solenoid test settings

Description	Bookmark	
Deadband pressure (bar)	col_2511_06	
Deadband pressure (%)	col_2511_07	
Deadband position	col_2511_05	

### Solenoid test error limits

Description	Bookmark	
Start pressure low	col_2511_01	
Start pressure high	col_2511_02	
Max time	col_2511_04	

## 9.6 Graph

Description	Bookmark	
Position vs. time graph	ref_Graph1	