1. WELCOME

Thank you for using VaDia Suite; BioControl's fully integrated VaDia software for Milking Time Testing and Pulsator Testing.
BioControl (www.biocontrol.no) provides technology for biology with focus on hi-tech products for the livestock industry. We already do this for more than 20 years now and have gained great competence and skills in this specialized area.
The name VaDia is short for 'Vacuum Diagnostics' and illustrates the value of this hi-tech instrument for technicians, advisors and other professionals in the dairy industry that want to understand and manage udder health and milk quality problems.
VaDia and the VaDia software have been developed by BioControl in close cooperation with the International Dairy Federation (www.fil-idf.org) and Tine, the Norwegian dairy farmers cooperative (www.tine.no).
We hope that VaDia and its software will enable you to get better understanding of the basic milking, give better milking advice and achieve better udder health and milk quality results.

This document is part of the following document family:

1. *'VaDia Startup Guide'*
2. *'VaDia Suite User Manual'*

Latest versions of these documents can be found on our website www.biocontrol.no

Manual to start-up and use VaDia hardware
This manual explains how to work with the VaDia Suite software which is designed for viewing, analyzing and report making of the VaDia loggings.
Please refer to the VaDia Startup Guide that is supplied with your VaDia for instructions how to work with the VaDia hardware.

Contents

! This manual is for VaDia Suite version 1.0 and higher

Due to continuous improvements, screenshots in this manual may differ from the screens that are actually displayed on your PC. Visit the section 'Community' on www.biocontrol.no for the latest documentation.

2. PRODUCT DESCRIPTION

VaDia Suite is a complete PC-software package designed for viewing, analyzing and report making of the VaDia logs for Milking Time Testing and for Pulsator Testing acc. to ISO 6690 ('dry test').
Testing can be done both online (Bluetooth streaming for immediate result during the test) and offline (analyzing all data after the test).
VaDia Suite also offers Falloff and Attachment testing acc. to ISO 6690.
VaDia Suite reports are based on XML. This enables integrators to define and manage the contents of their own reports. Please contact support@biocontrol.pl for details if this feature is interesting.

2.1. User license

VaDia Suite is copy protected by a license key. You can work with VaDia Suite within a 30 day free evaluation period after installing it on your computer. VaDia Suite will stop working if it is not activated within this 30 day period. To activate VaDia Suite your PC has to be connected to the internet.
Part of the activation procedure is that your contact details are registered. This is necessary for BioControl to inform you about important updates and relevant upgrades.
BioControl will only use this email address to send information related to VaDia and will not share this information with others.

! Your user license and password are printed on the invoice with your VaDia. This is a personal user license for runtime use of VaDia Suite on one PC only. Make sure you store this license information somewhere safe so that you can find it again, also make a copy of this license data and store it in a safe place. You need this license key and password again when re-installing VaDia Suite onto another PC (e.g. in case you get a new PC).
Please contact support@biocontrol.pl if the activation doesn't work or to enquire about getting a LicenseID if you have downloaded the VaDia Suite software for evaluation from our website.

2.2. Modules

The VaDia Suite functionality is divided into modules. Currently the following modules are available:

- MTT: Milking Time Test
- PT: Pulsator Test acc. to ISO 6690
- FT: Falloff and attachment Test acc. to ISO 6690
- AM: Advanced Module

VaDia Suite is the successor of the software packages 'VaDia Viewer' and 'VPT-software'. If these software packages are installed and activated on your PC when installing VaDia Suite, the corresponding modules are automatically enabled in VaDia Suite.
The BioControl license server contains the modules that you are enabled within your license. These module enablings can be purchased and enabled separately. When the 30 days evaluation period has expired you can decide if you want to purchase (other) modules.

2.3. Updater License

When you purchase VaDia Suite you will have access to new VaDia Suite version updates for 1 year included in your license. Every time you open VaDia Suite the program will look for new versions on the BioControl server, and inform you of new versions you can download. After the 1 year has passed your license will no longer have the updater activated, unless you purchase the updater for your license. Contact orders@biocontrol.pl for more information on how to update your license. You will always have access to bug fixes for your latest version.

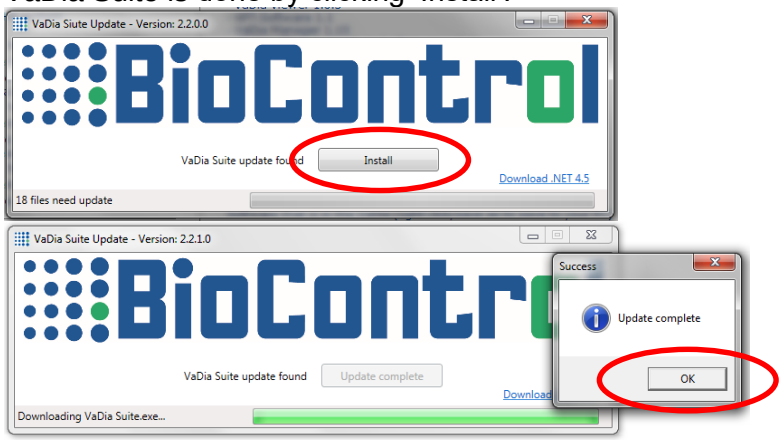
2.4. Operating System requirements

VaDia Suite is designed for PC's with MS Windows 7 to 10 with .NET Framework 4.5.
It is not suited for Windows XP (this is not supported by Microsoft anymore).

3. INSTALL AND SETUP VADIA SUITE

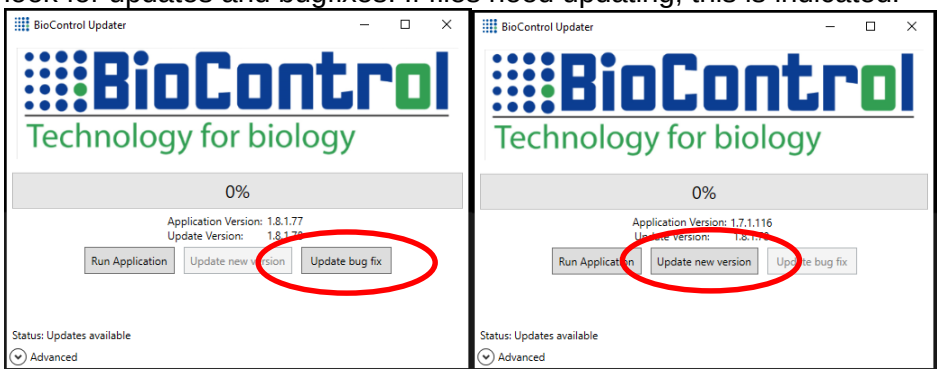
3.1. Install

To install VaDia Suite your PC must be connected to the internet.
Run *VaDiaSuiteUpdater.exe* on the VaDia Suite CD. This program can also be downloaded from the BioControl website www.biocontrol.no/vadia.
VaDiaSuiteUpdater automatically makes contact with the BioControl server. Installation of VaDia Suite is done by clicking 'Install'.



When VaDiaSuiteUpdater runs for the first time it will create all necessary VaDia Suite directories and files and place a shortcut 'VaDia Suite' on the desktop.
Click 'OK', VaDia Suite will then startup.
Next time, double-click the VaDia Suite icon on the desktop to run VaDia Suite.

VaDiaSuiteUpdater will automatically start and make contact with the BioControl server to look for updates and bugfixes. If files need updating, this is indicated:



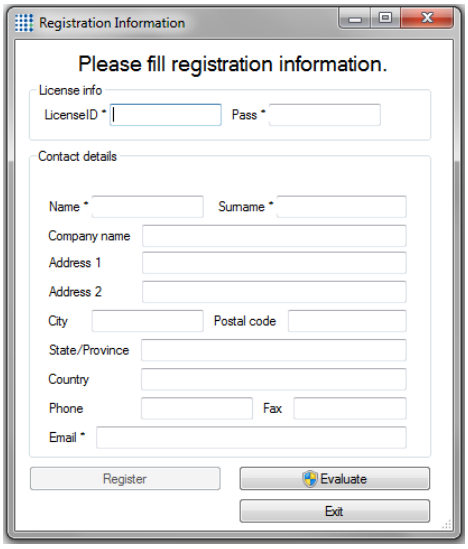
Click 'Update bug fix' to install a bug fix to your already installed version. Bug fixes for your VaDia Suite version are always available for download with your VaDia Suite license and normally have small bug fix changes compared to your old version.

Click 'Update new version' to install a new version of the VaDia Suite program. New VaDia Suite versions can have bigger changes and new functionality to your VaDia Suite program. The new VaDia Suite versions are only available if your license is up to date (you have the updater license). When you install VaDia Suite you have free access to new VaDia Suite versions for 12 months. After this time you must pay a yearly fee if you want to continue to download new VaDia Suite versions from the BioControl server. Contact orders@biocontrol.pl for more information.

If no updates are available or if the PC is not connected to the internet, VaDia Suite will start in the last installed version.

3.2. **Activate**

When you run the program for the first time, the following screen will show. The ‘Register’ button will become active when all fields marked with * are filled.



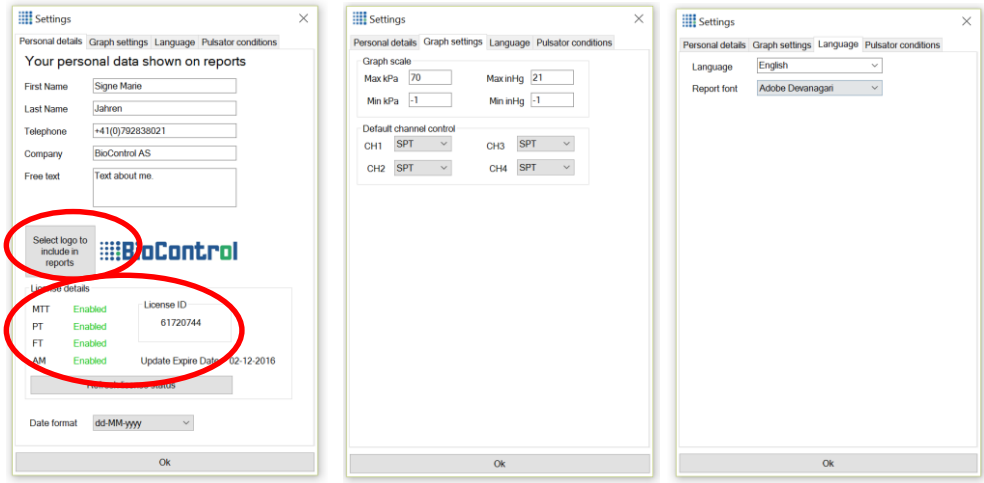
! Make sure you activate within 30 days, otherwise VaDia Suite will stop working!

Contact orders@biocontrol.pl to purchase a license ID and password for VaDia Suite.

3.3. Settings

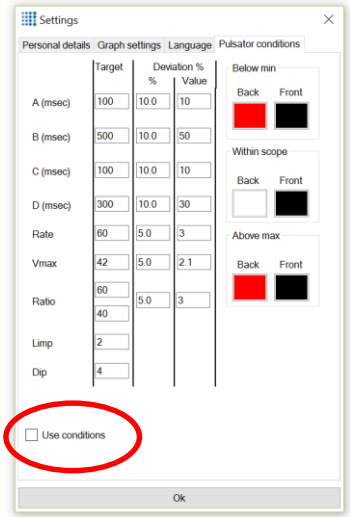
1= Navigation keys
2= VaDia's that are currently connected via Bluetooth (explained later in this manual)

Click 'Settings' to enter your personal details (and logo!) that will be shown on all reports. This screen also lists the license details and modules that are enabled within your license. Scale and language can also be selected here.



3.4. Default Pulsator Test Conditions

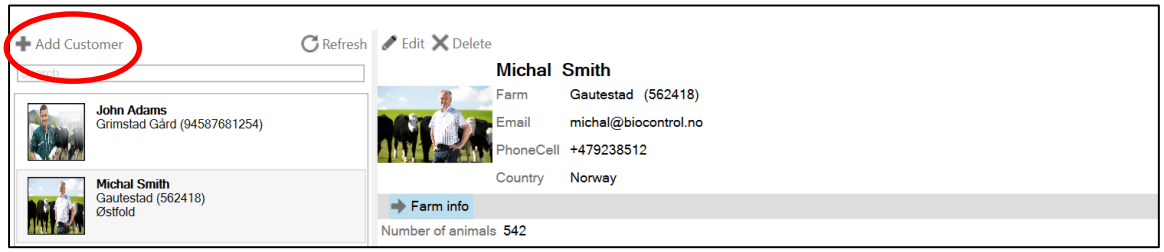
The screen 'Pulsator conditions' lists the default targets and deviation tolerances for Pulsator Testing. Values that deviate from these targets will automatically highlight on the Pulsator Testing reports. The highlighting can be user defined (default background is red, font is black).



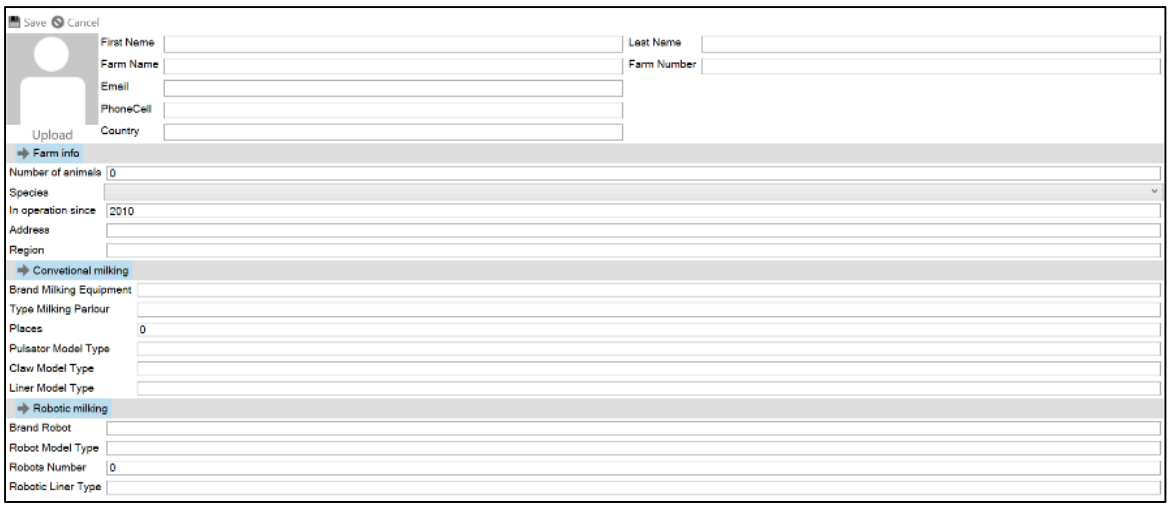
Click 'Use Conditions' to enable this function.

4. CUSTOMER MANAGEMENT

Click 'Customer' to enter and manage customer data. Create a new customer by clicking 'Add Customer'.



The customer database contains general customer data and details of the milking equipment, both for conventional and milking robot customers. Fill in the information for your customer and click 'Save'.



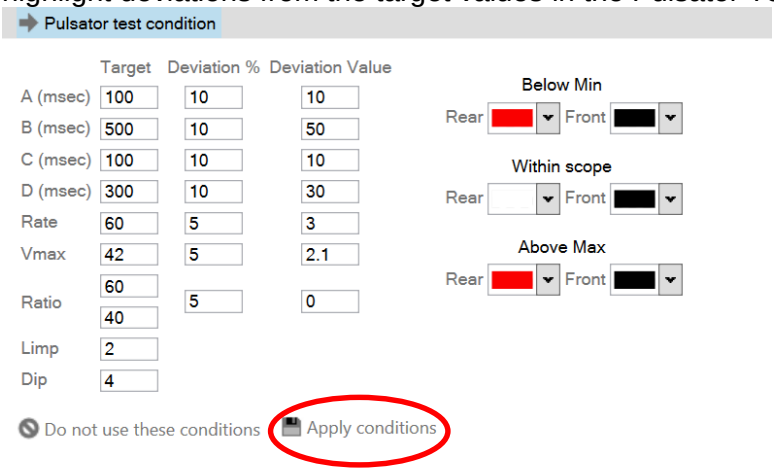
Select a customer by clicking on the customer name, or search in the search field. This customer is now 'active'. The active customer is also displayed in the left column of the screen (red circle above screenshot). All data and reports that are made will be added to this active customer until another customer is selected.

Click a customer and 'Delete' to delete a customer.

! **Careful**: all reports and historic data of this customer will then be deleted!

4.1. Customer Pulsator Test Conditions

Clicking on a customer and the tab “Pulsator test condition” will open the customer specific pulsator test conditions. The default values can be set to values that are specific for this customer/installation. Clicking ‘Apply Conditions’ makes that these conditions will be used to highlight deviations from the target values in the Pulsator Test Reports.

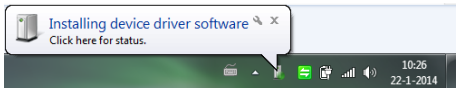


5. VADIA MANAGER

VaDia Suite uses the program 'VaDia Manager' to put the VaDia in logging mode and to retrieve the logs from the VaDia.

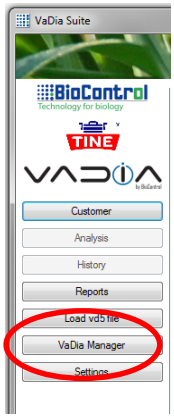
5.1. Connect your VaDia

- Connect the VaDia to the PC with the USB cable. The following will be displayed when a new VaDia is connected to the PC for the first time:

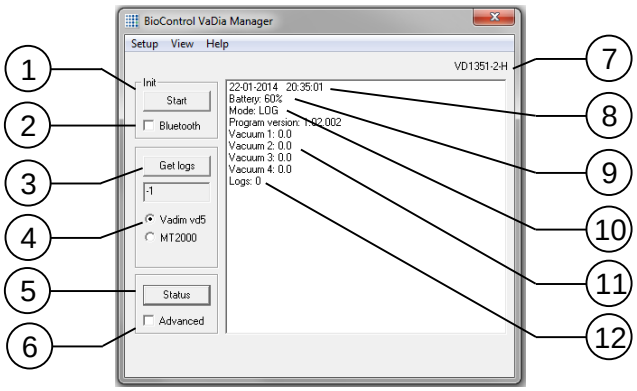


Wait a while, after some time (< 1 minute), the drivers will have installed, the following will be displayed:

- After this click 'VaDia Manager' in VaDia Suite to connect to your VaDia.



The VaDia status information will show:



The following functions and information is relevant, the other menus in 'VaDia Manager' should be ignored:

1. To start logging (explanation below)
2. Select this for Bluetooth streaming data (explanation below)
3. Retrieve logs from VaDia, save to PC (explanation below)
4. Select 'Vadim vd5', do not select 'MT2000'!!
5. To refresh the displayed status information. Repeat clicking 'Status' if VaDia Manager displays 'USB not found' until the VaDia status information is displayed.
   Refer to chapter troubleshooting if the status information is not displayed within a minute.
6. Select this for calibration. Careful!! (explanation in the VaDia Startup Guide)
7. VaDia unique serial nr.
8. VaDia clock (is set to PC-clock when 'Start' is pressed)
9. Battery capacity (explanation in the VaDia Startup Guide)
10. VaDia mode (explanation below)
11. The actual vacuum on the sensor
12. A log is one second of recorded data

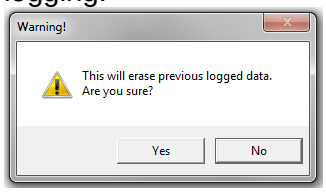
5.2. Start logging

Click 'Start' (1) to start a new logging session. By doing so, the VaDia memory will be erased and the VaDia clock will be set equal to the PC clock.
To use the Bluetooth streaming function: select the 'Bluetooth' box (2), then click 'Start'.
Click 'Status' (5) to verify that:

- The VaDia is in logging mode (10)
  LOG = 'normal' log mode. All data is stored in the VaDia memory.
  LOG BT = Bluetooth log mode. All data is stored in the VaDia memory AND sent streaming via Bluetooth.
- The battery is full (chapter below)
- The clock is set to the PC-clock

Note that the Bluetooth streaming mode consumes quite some more power than the normal mode. So VaDia operational time in Bluetooth mode will be significantly less

! Note this message when you click ‘Start’: the previous logs will be erased when you start logging!

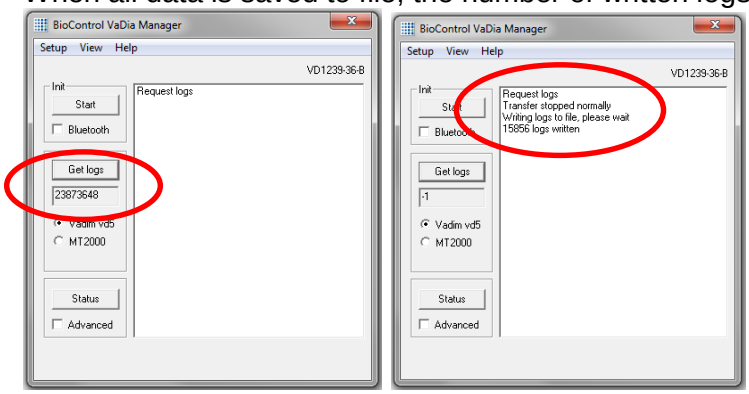


Now disconnect the VaDia from the PC and follow the instructions in the chapter ‘logging’ in the VaDia Startup Guide.

5.3. Save logs

- Connect the VaDia-USB to the PC, wait for the driver to be ready (PC makes a sound)
- Click ‘VaDia Manager’ in VaDia Suite, the VaDia status information is displayed (12) shows the amount of recorded logs (i.e. recorded seconds)
- Verify that file-format vd5 is selected (4)
- Click ‘Get logs’ (3), give it a filename.

The transfer between PC and VaDia will now start, a counter increments to indicate that data is transferred. The end value of the counter depends on the size of the logged data.
When data transfer is finished, the message ‘Transfer stopped normally’ will show.
Then the logs will be written to the file, the message ‘Writing logs to file, please wait’ will show. This may take a while, be patient!
When all data is saved to file, the number of written logs is shown.



6. DEMO-FILES FOR ONLINE AND OFFLINE TESTING

VaDia Suite offers both offline and online data viewing modes.

- Offline means that an existing vd5-file is loaded into VaDia Suite
- Online means that the VaDia is connected to the PC via Bluetooth and that the data is continuously streamed into VaDia Suite for real time presentation and online analysis.

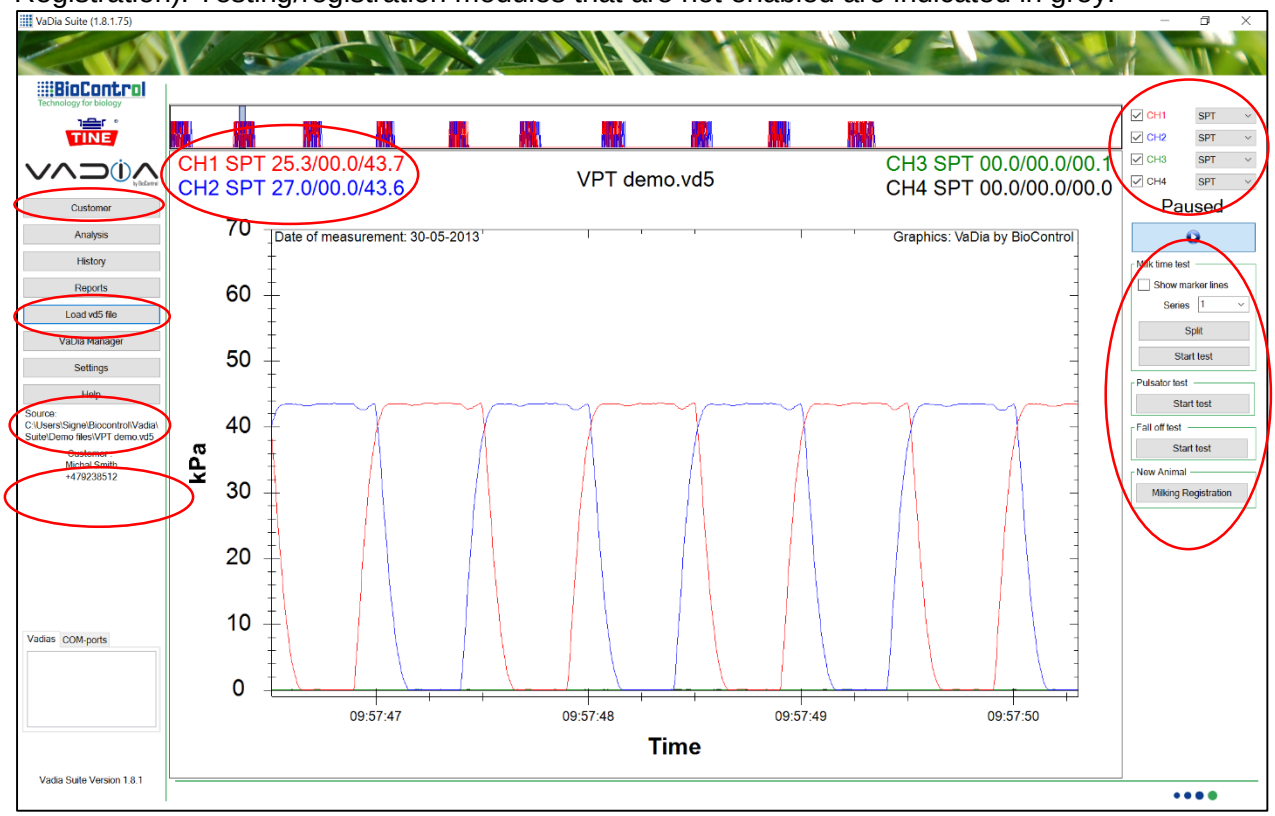
To explain the working of the VaDia Suite the following vd5 demo files are used in this manual:

- Milking Time Test: ‘Leppink 4A MTT demo’ and ‘Leppink 5A MTT demo’
- Pulsator test: ‘VPT demo’
- Falloff Test: ‘VPT fall-off demo’

These files can be found in the directory ‘VaDia demo files’ on the VaDia Suite CD and can also be downloaded from the Community Section on our website http://www.biocontrol.no/index.php?root=comm&branch=vadia&leaf=soft.
The explanations in the following chapters are valid for both the online and the offline mode; the only difference is the data entry method (vd5-file or Bluetooth streaming).
To fully understand the functionality and potential of the VaDia Suite software we recommend you follow this manual step by step (and not read loose chunks) and work with the demo files as explained in this manual.

7. PULSATOR TEST (OFFLINE)

Click ‘Customer’ and create a new customer (or select existing from the list).
Click ‘Load vd5 file’ and select the file ‘VPT demo’.
All data is now loaded and displayed in the active window, notice the content of ‘Source’ in the left side of the screen. The right side of the screen lists the channel selection and definition boxes and the various testing/registration modules (MTT, PT, FT, Milking Registration). Testing/registration modules that are not enabled are indicated in grey.



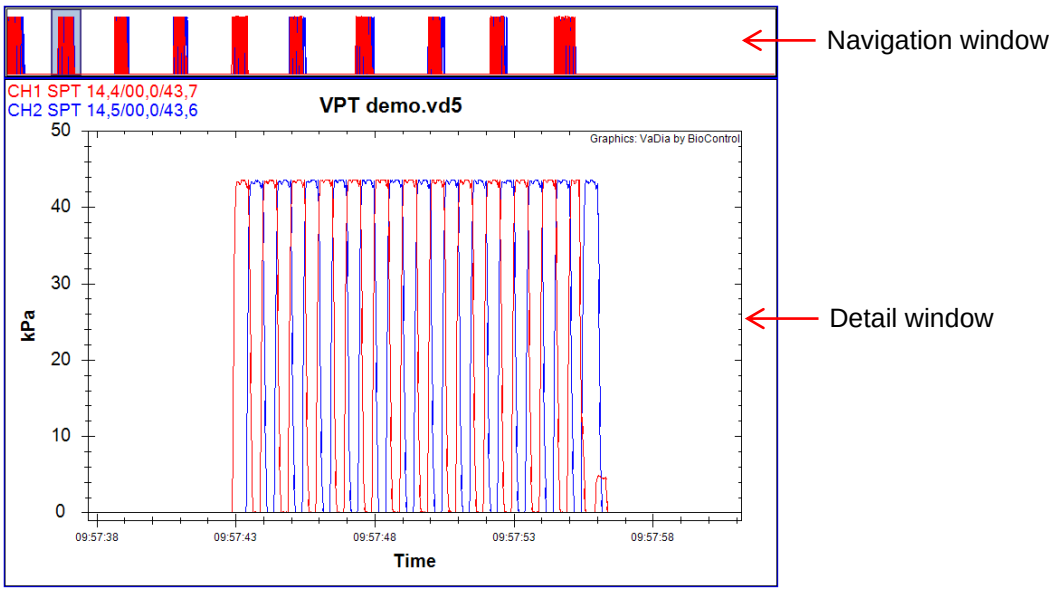
When all data is loaded, the program status in the right navigation pane indicates ‘Paused’.

! Note that the data can only be analyzed in the ‘Paused’ mode.

Activate the channel selectors to only display the relevant channels. The average/minimum/ maximum value of each channel is displayed in the top of the frame. These values are calculated from the data as displayed in the current window.

7.1. Graph navigation

VaDia Suite has two graph windows: a smaller ‘navigation’ window (top) and a larger ‘detail’ window (bottom). The navigation window shows which part of the logs is currently zoomed and displayed in the detail window. This helps to keep the overview of your logs.
Zoom in the navigation window is with mouse ‘left click, hold and drag’.



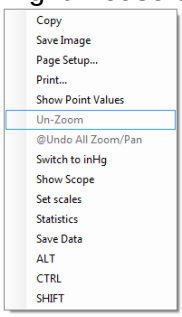
Click on the 'detail' window to activate it; a blue frame around the window indicates that it is active and that zoom/navigation is possible.

Hot-keys:

'+' and '-', mouse-wheel	zoom time in and out
'Ctrl' with mouse drag	zoom-in on section (x and y)
'Shift' with mouse drag	set time marker line, mouse drag shows second marker line with delta
'Alt' with mouse drag	set vacuum marker line, mouse drag shows second marker line and delta

Pan the graph with left mouse click, hold and then drag.

Right mouse click brings-up settings and other navigation possibilities.



All navigation possibilities explain itself. We recommend you use some time to understand each feature. 'Save Image' is an easy and fast method to make images of a recording for your reports.

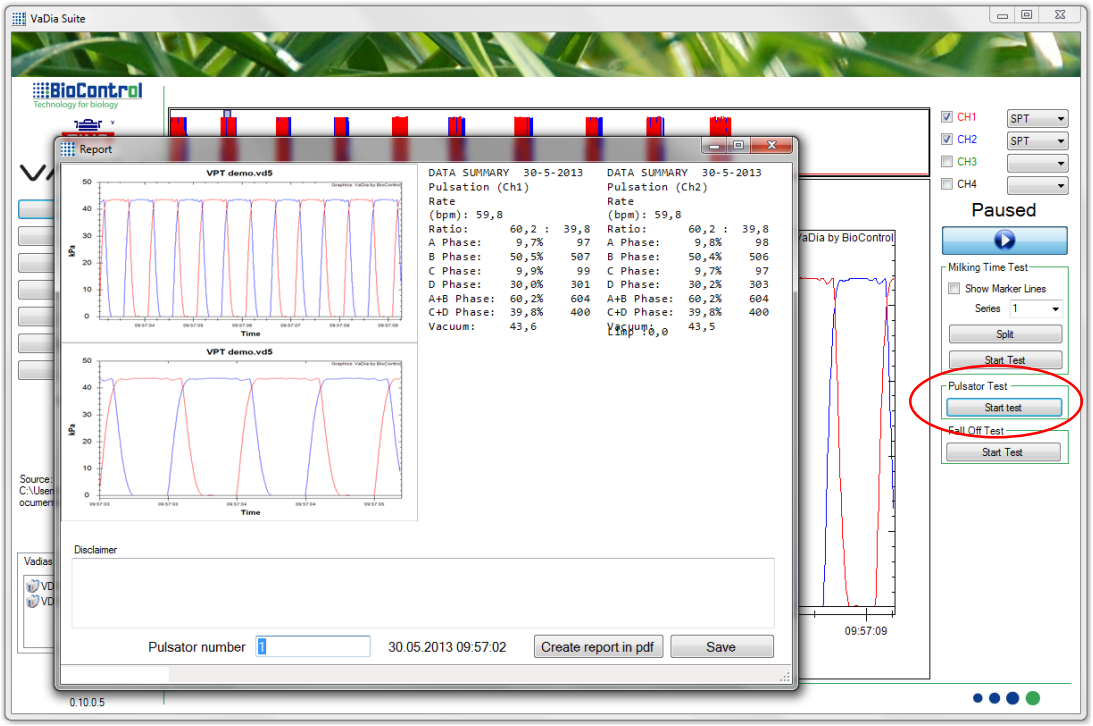
ALT, CTRL and SHIFT are listed here to enable VaDia Suite to work on a tablet-PC without a keyboard.

7.2. Switch to inHg

Right mouse click, select 'Switch to inHg'. From now all graphs and reports are in inHg.

7.3. Analyzing the pulsation data

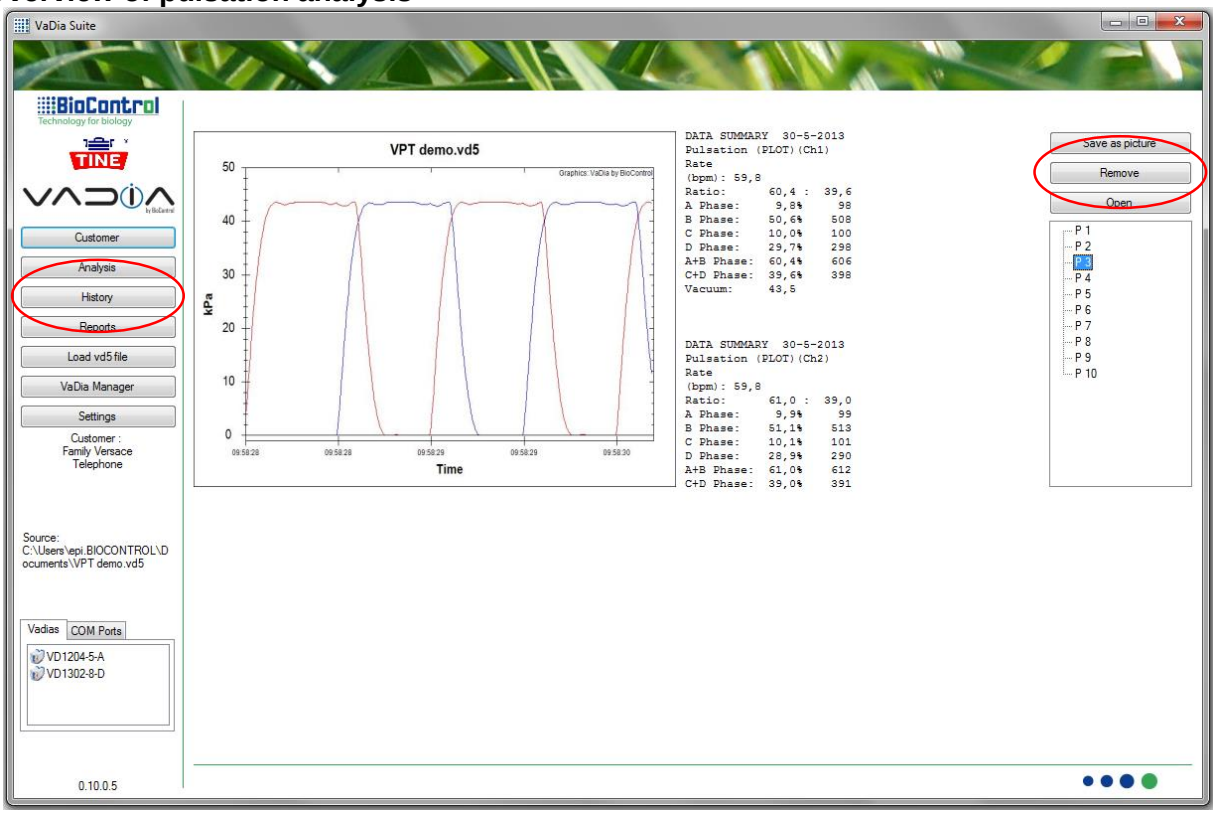
1. Select with the mouse a representative part of the pulsator data you want to analyze (approx. 10-20 pulsation cycles in the detail window).
2. Press 'Start Test' in the right navigation column to analyze the pulsation data according to ISO 6690.



Data Summary lists the values of the analysis according to ISO 6690. The top graph displays the analyzed cycles, the lower graph only a few to make details visible.
Data that is entered in the field ‘disclaimer’ is displayed in the pulsator detail report.

3. Enter the pulsator nr. and press ‘Save’. The data is now stored in the customer database and can be found in ‘History’. A report pdf can be made from this screen also.
4. With the top navigation window you can now select the next pulsation data, press ‘Start test’, etc. The pulsator number is automatically incremented for fast recording.
5. Fast-keys: F2 = Start Test, Enter = Save, TAB = jump to middle of next pulsator data, Space = toggle Paused/Running.
6. So with consecutive TAB, F2 and Enter your pulsator test report can be finished in no time.

7.4. Overview of pulsation analysis



History lists all saved test results of this customer, so you can also compare this test with previous tests.
An individual analysis is displayed by clicking on the recording in the list. An analysis can also be removed by selecting and 'Del' key.
Be careful with 'Remove' since it will remove the entire recording.
Use 'Open' to add more data to the list of this analysis, e.g. pulsator data from another VaDia, or to create a report.

7.5. PDF-report of pulsation analysis

'Report' generates a pdf-report of the active analysis. Page 1 of the report lists a total overview of all pulsators, the following pages lists details of each pulsator.
Most information in the report is self-explanatory. 'Limping' and 'dip' are calculated as defined in ISO 3918.

- Limping is the difference in pulsator ratio between the two halves of a milking cluster with alternating pulsation. Limping checks if the two sides of the pulsator are equal.
  ISO 5707 recommends that limping shall be < 5%. Limping can also be intentionally when the rear half of the udder is milked with a different pulsator ratio than the front half.
- Dip is about the shape of the vacuum curve. A dip is when, during the B-phase, the vacuum for a short period drops more than 4 kPa below the maximum B-phase vacuum.

The VPT-demo dataset with customer Versace individual pulsator settings highlights in red the values that deviate from the Versace targets.

BioControl

Pulsator Test report

Customer
Family Versace
Telephone
Test date: 2013-05-30

Advisor
BioControl

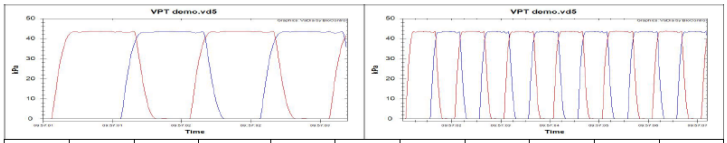
Pulsator Nr.	Chan	Rate (bpm)	Ratio	A	B	C	D	Vmax	Limp	Dip
1	1	59,8	60,1 : 39,9	9,6 96	50,5 507	9,9 99	30,0 301	43,7	0,0	
1	2	59,8	60,2 : 39,8	9,8 98	50,4 506	9,8 98	30,1 302	43,6	0,0	
2	1	59,8	60,1 : 39,9	9,6 96	50,5 507	10,0 100	29,9 300	43,6	0,1	
2	2	59,8	60,3 : 39,7	10,0 100	50,3 505	10,1 101	29,7 298	43,5	0,1	
3	1	59,8	60,4 : 39,6	9,8 98	50,6 508	10,0 100	29,7 298	43,5	0,7	
3	2	59,8	61,0 : 39,0	9,9 99	51,1 513	10,1 101	28,9 290	43,5	0,7	
4	1	59,8	60,4 : 39,6	10,0 100	50,4 506	9,9 99	29,8 299	43,6	0,1	
4	2	59,8	60,2 : 39,8	9,6 96	50,6 508	10,0 100	29,8 299	43,5	0,1	
5	1	59,8	60,1 : 39,9	9,9 99	50,2 504	10,0 100	30,0 301	43,7	0,0	
5	2	59,8	60,0 : 40,0	10,4 104	49,7 498	9,8 98	30,2 303	43,5	0,0	
6	1	59,8	60,6 : 39,4	10,1 101	50,5 507	10,6 106	28,8 289	43,6	0,4	
6	2	59,8	60,3 : 39,7	10,2 102	50,1 503	10,5 105	29,3 294	43,5	0,4	
7	1	59,8	60,4 : 39,6	9,7 97	50,7 509	9,9 99	29,8 299	43,6	0,0	
7	2	59,8	60,4 : 39,6	9,7 97	50,7 509	10,0 100	29,7 298	43,6	0,0	
8	1	59,8	60,0 : 40,0	9,7 97	50,3 505	9,9 99	30,2 303	43,5	0,3	
8	2	59,8	60,2 : 39,8	9,8 98	50,4 506	10,2 102	29,6 297	43,5	0,3	
9	1	59,8	60,1 : 39,9	9,5 95	50,6 508	9,7 97	30,2 303	43,6	0,1	
9	2	59,8	60,3 : 39,7	9,9 99	50,4 506	10,0 100	29,8 299	43,5	0,1	
10	1	59,8	59,9 : 40,1	9,6 96	50,3 505	9,8 98	30,3 304	43,7	0,2	

BioControl

Pulsator Test report

Customer
Family Versace
Telephone
Test date: 2013-05-30

Advisor
BioControl

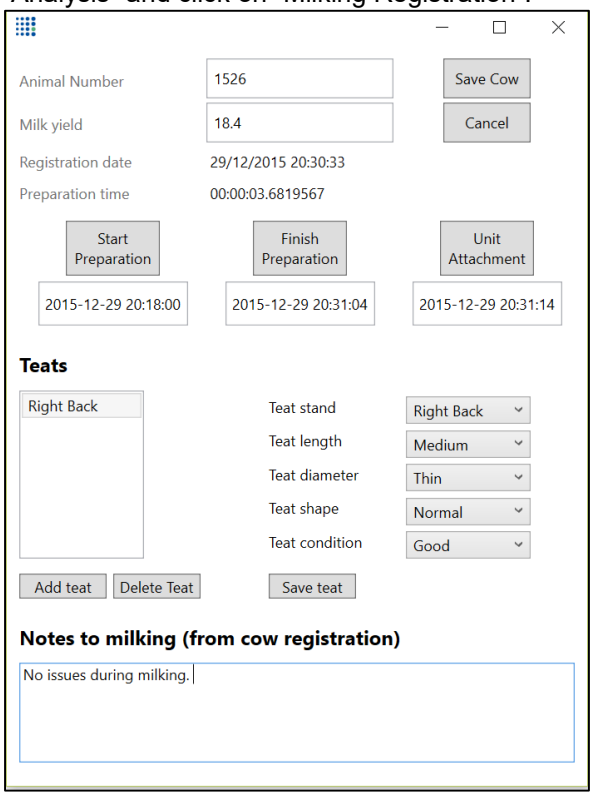


Pulsator Nr.	Chan	Rate (bpm)	Ratio	A	B	C	D	Vmax	Limp	Dip
1	1	59,8	60,1 : 39,9	9,6 96	50,5 507	9,9 99	30,0 301	43,7	0,0	
1	2	59,8	60,2 : 39,8	9,8 98	50,4 506	9,8 98	30,1 302	43,6	0,0	

8. MILKING REGISTRATION

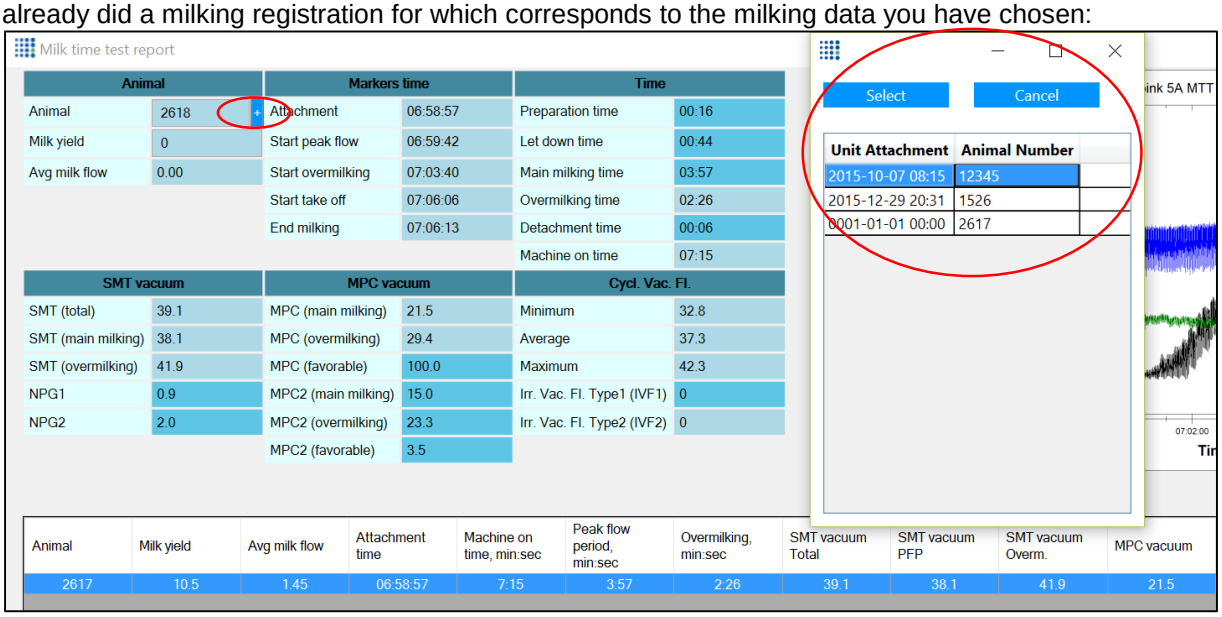
! Milking Registration is only available if you have “Advanced Module” activated.

A milking registration can be made during milking to register information about the milking, and to record preparation time, teat analysis, and notes to the milking. While the VaDia is registering, go to “Analysis” and click on “Milking Registration”:



Click on the buttons “Start Preparation” and “Finish Preparation” to record the preparation time before milking. Then click on “Unit Attachment” when the unit with the VaDia is attached to the teat.
Insert the animal number, and if wanted click “Add teat” to register teat information.
You can write any notes to the milking, and then add Milk Yield before clicking “Save”.

When you want to analyze the data recorded during milking, select the milking area, place markers, and click “Start Test” (see chapter 9 for more information on how to perform Milking Time Test). When the analysis window appear for the Milking Time Test, you can click on the “+” next to the animal number to see a list of registered animals (milking registrations) and then choose the animal that you already did a milking registration for which corresponds to the milking data you have chosen:

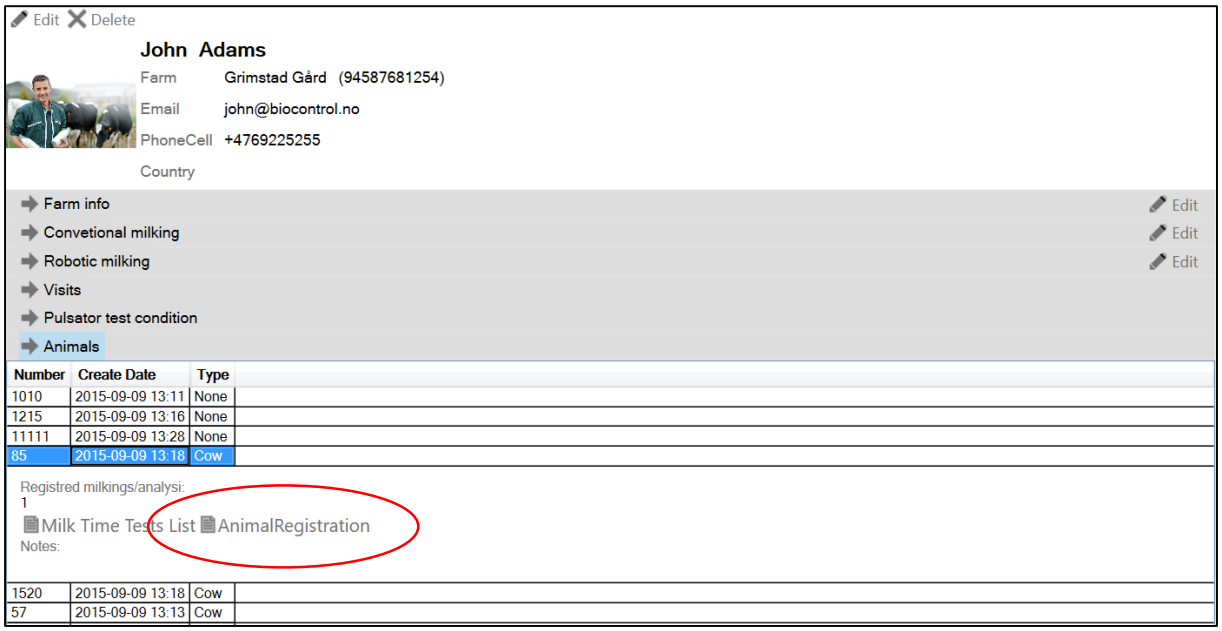


After you choose an animal, data will automatically be filled in from the milking registration with:

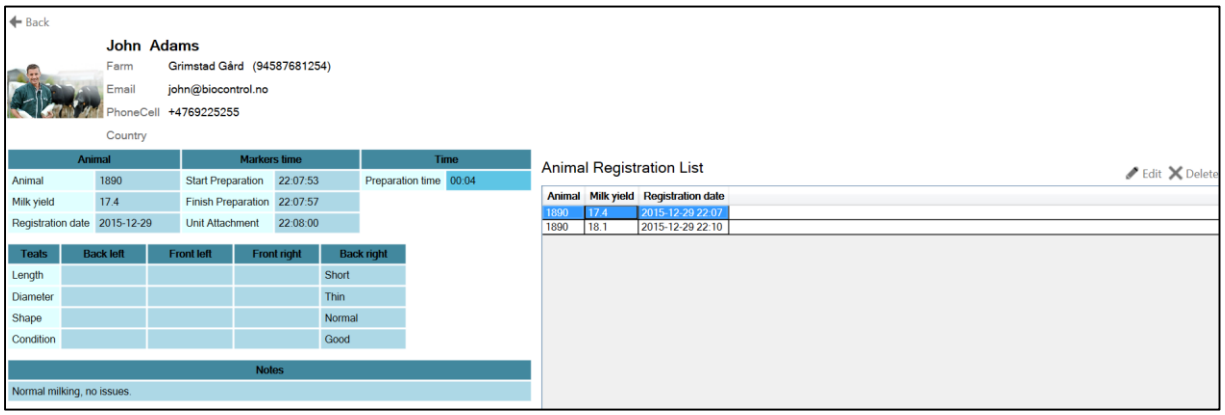
- Animal Number
- Milk yield
- Preparation time

For more information about the other Milking Time Test data, see chapter 10.

Information recorded under “Milking Registration” can be found under the menu “Customer” and the tab “Animals”:



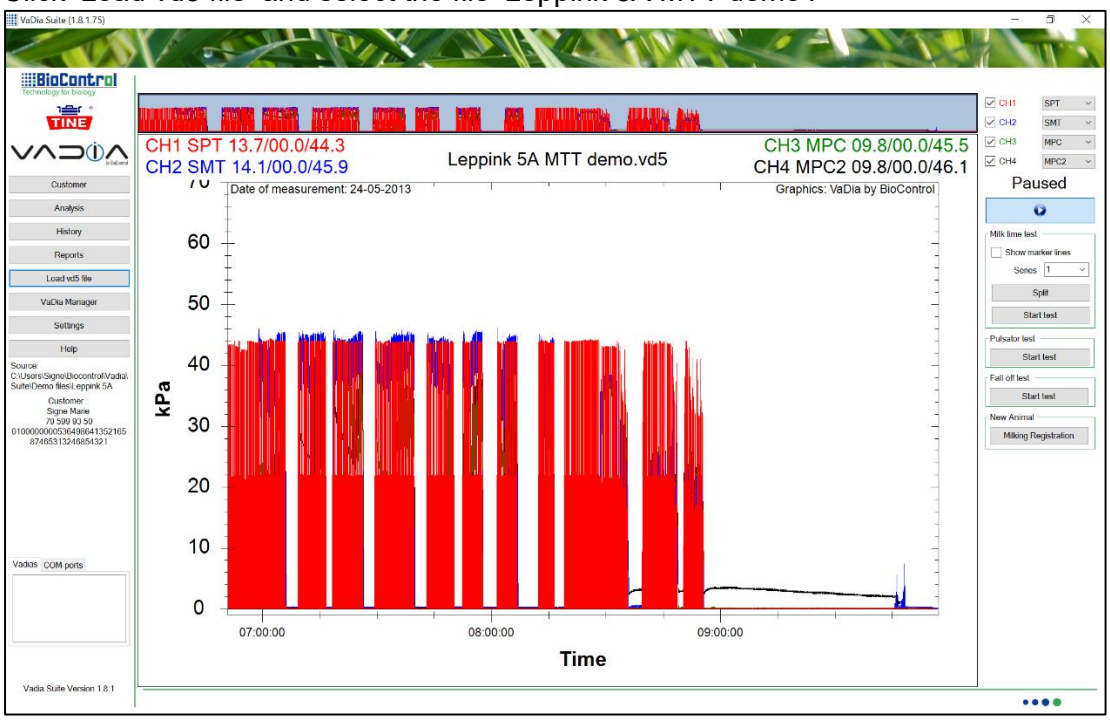
Click on “AnimalRegistrations” to see detailed information of milking registration(s) registered to the animal:



9. MILKING TIME TEST (OFFLINE)

! This explanation of Milking Time Test analysis assumes that the chapter on Pulsator Test has been read and understood since navigation, history and report functions are identical.

Click 'Load vd5 file' and select the file 'Leppink 5A MTT demo'.

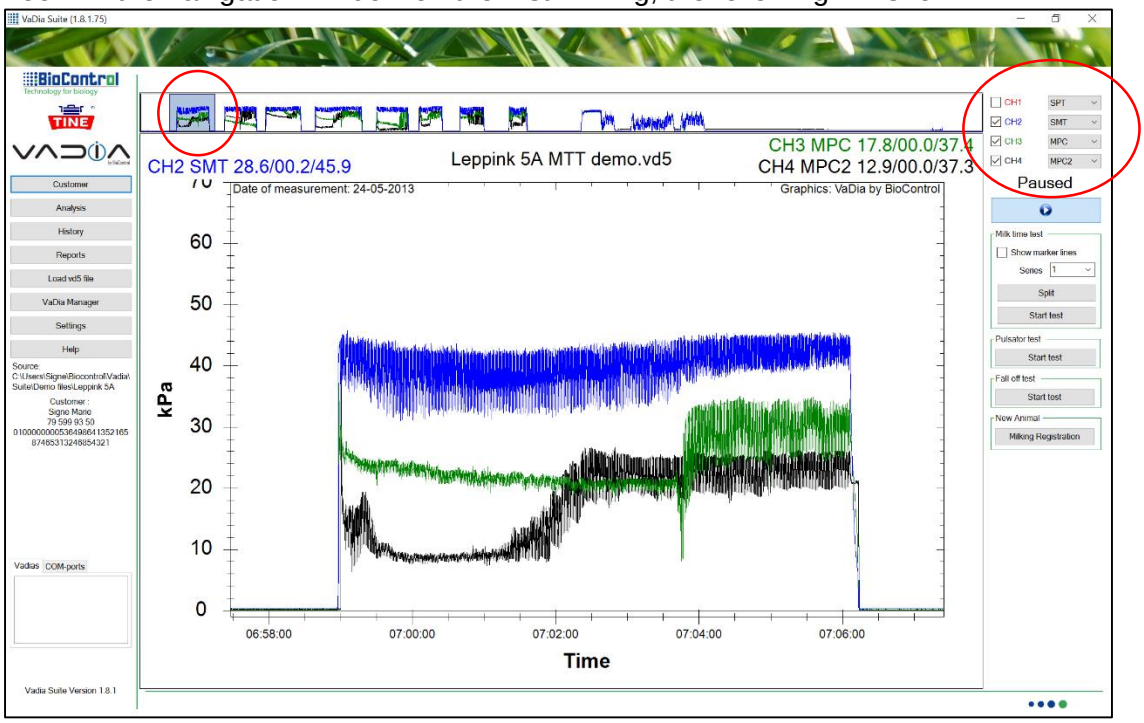


CH1 is the pulsator recording. Define the Channels as follows:

CH1 = SPT (Short Pulsation Tube)
CH2 = SMT (Short Milk Tube)
CH3 = MPC (MouthPiece Chamber rear teat)
CH4 = MPC2 (MouthPiece Chamber front teat)

In this zoom CH1 overlaps the relevant channels, therefore deselect CH1.

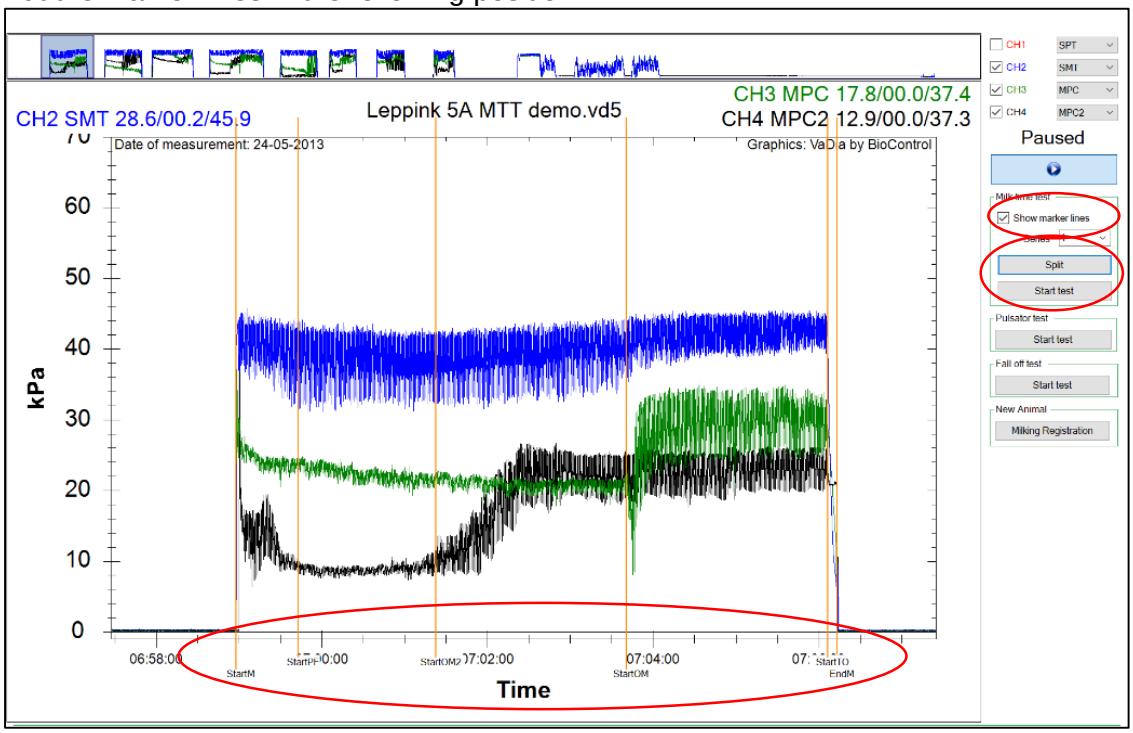
Zoom in the navigation window on the first milking, the following will show:



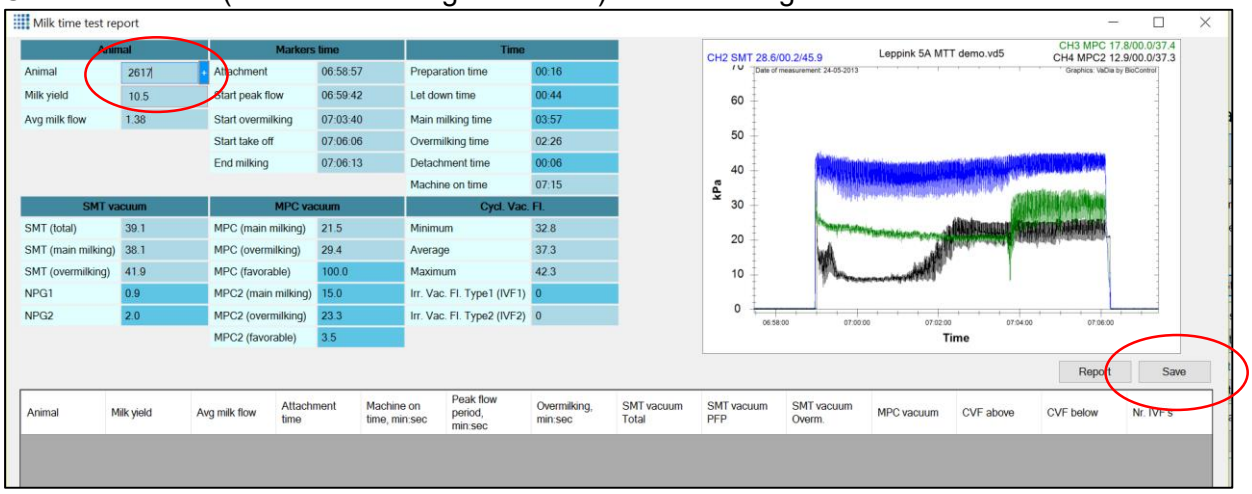
Tick the box ‘Show Marker Lines’. This will display 5 marker lines that split-up the milking into 4 milking phases:

StartM = Start Of Milking
StartP = Start Peakflow
StartOM = Start Overmilking MPC
StartOM2 = Start Overmilking MPC2
StartT = Start Takeoff
EndM = End of Milking

Refer to chapter 10 for details about the calculation and milking phases.
Analysis of the individual cow milking is done by clicking ‘Split’. The marker lines are now automatically set, manual correction is done by dragging the marker line to the right position.
Put the marker lines in the following position:

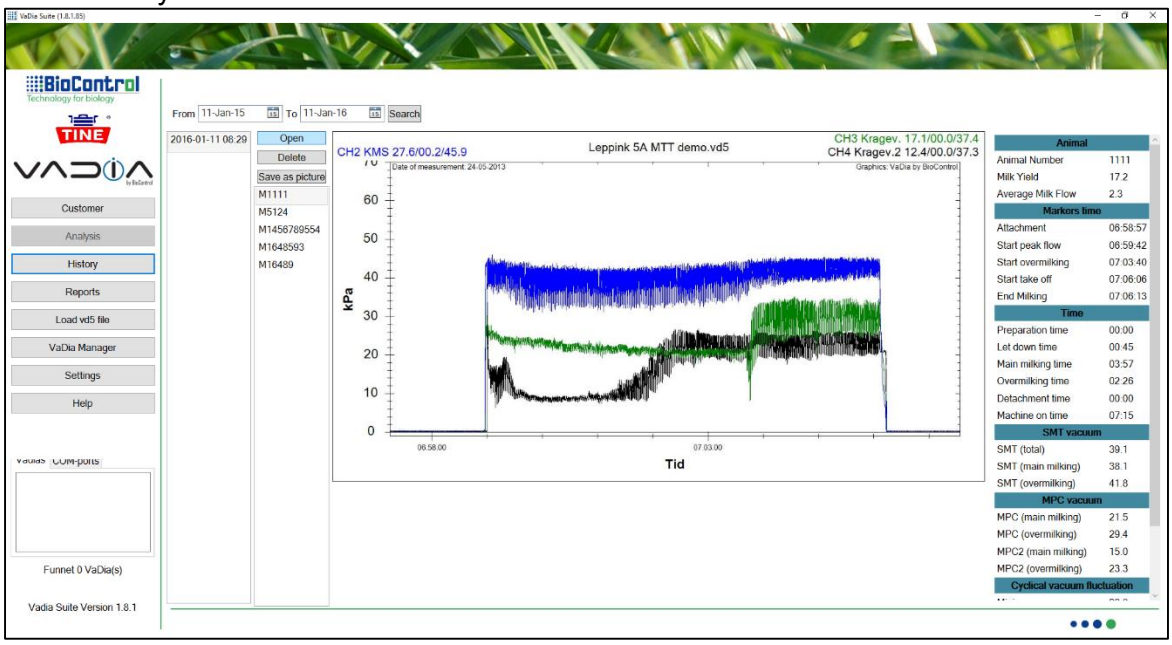


Click ‘Start Test’ (in the box Milking Time Test). The following information will show:

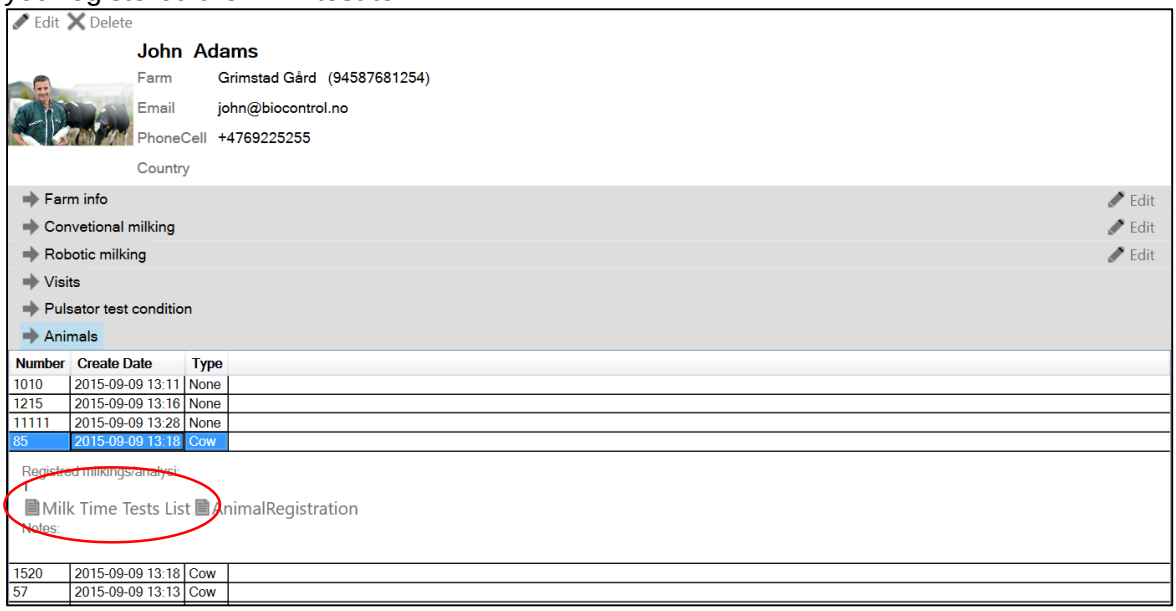


Enter cow ID (here 2617) and Milk Yield (not necessary), click ‘Save’. If you have advanced module you can select a registered cow by clicking the “+” next to the box for animal number (see chapter 8 for information about milking registration).
Refer to chapter 10 for details about the displayed values and calculation methods.
Select the next milking in the navigation window (or use the TAB-key) and use the same method to do the tests.

Click ‘History’ to view the saved MTT results:



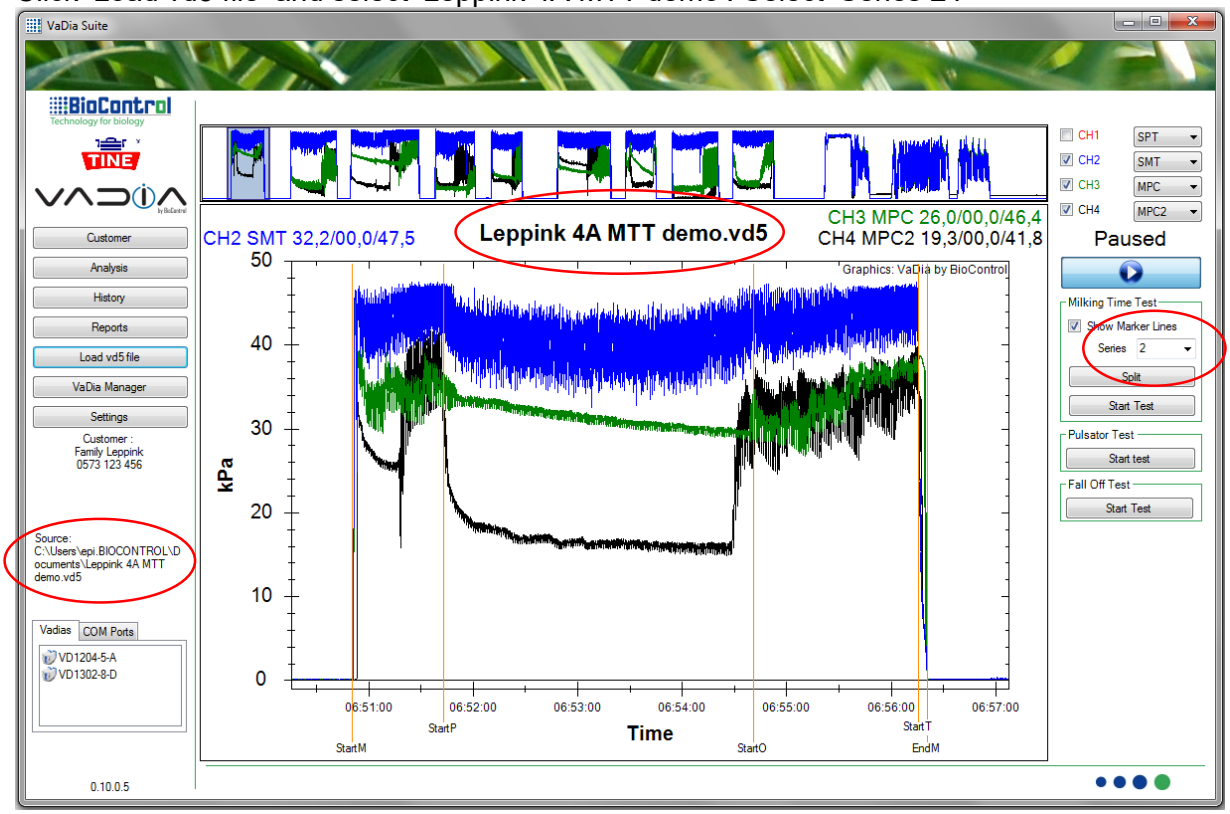
You can also see saved MTT tests under “Customer” and “Animals” and select the animal you registered the MTT test to:



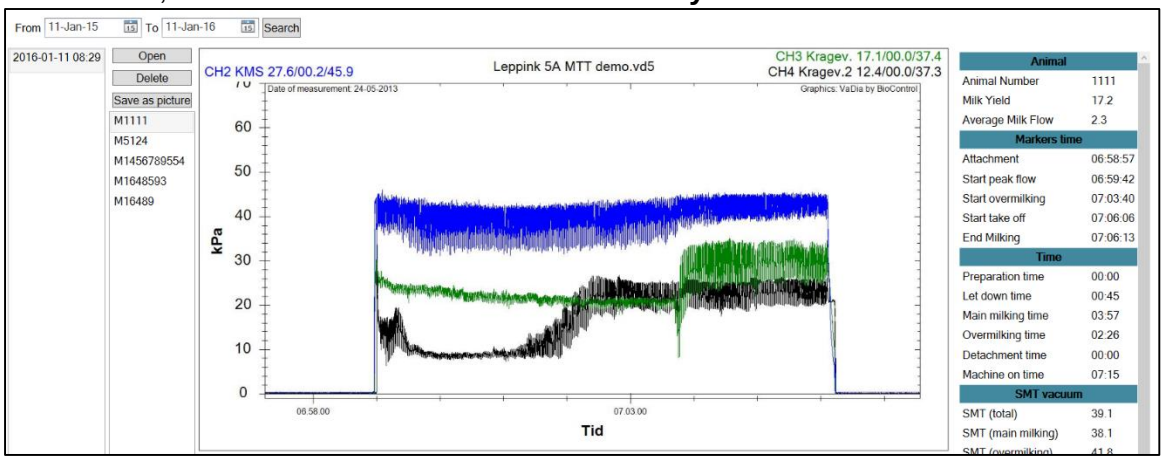
9.1. Add another VaDia series

Another series from another VaDia can be added so that it is included in the same report. This can be convenient for recordings where e.g. different cluster/liner combinations are tested.

Click ‘Load vd5 file’ and select ‘Leppink 4A MTT demo’. Select ‘Series 2’.



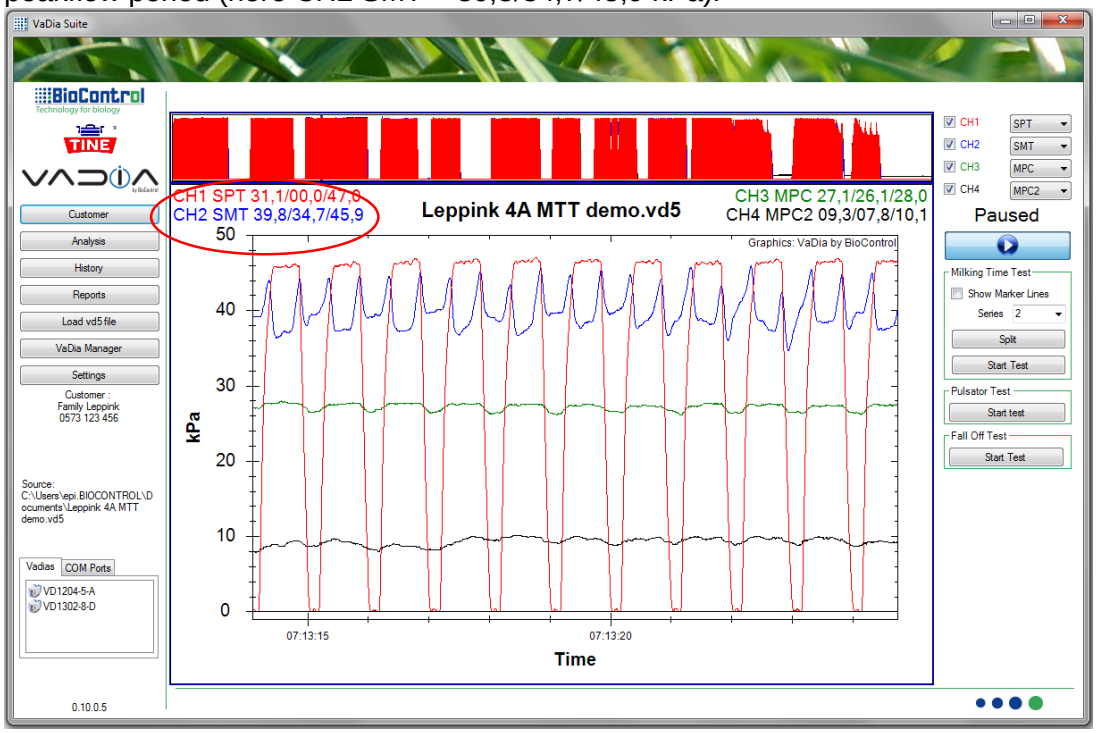
Do the tests, after this the results are listed in ‘**History**’.



Click ‘**Report**’ to create pdf reports for the MTT tests. See more in chapter 13.

9.2. Teat-end vacuum during Peakflow (average/min/max)

The Channel information displays average/minimum/maximum of the data that is displayed in the detail window. This is very convenient for fast recording of teat-end vacuum in the peakflow period (here CH2 SMT = 39,8/34,7/45,9 kPa).

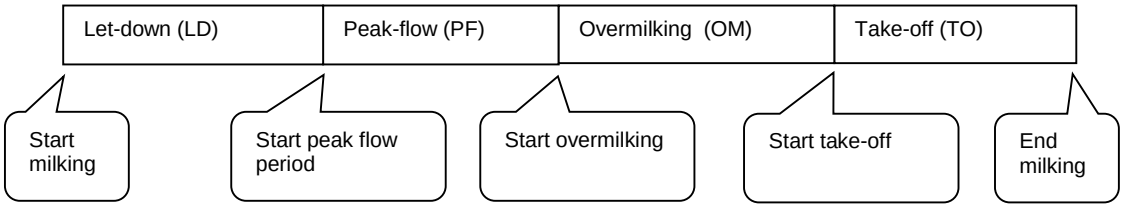


10. MTT CALCULATION METHODS AND ALGORITHMS

This content may change because of new theories and calculations. The latest version of this document can be found on our website. Please click:
http://www.biocontrol.no/index.php?root=comm&branch=vadia&leaf=manuals

10.1. General

To analyse the vacuum in the milking unit, individual milkings have to be split into various phases. For the purpose of this program four phases are used, see figure 1. The peak-flow period includes the period with gradually decreasing milk flow (if present), contrary to some other systems for analysing milkings.
VaDia Suite offers manual selection of the boundaries (marker lines), there is also an automatic function to “split” the milking into phases. The automatic function must be regarded to be of assistance for the manual adjustment. Results from the automatic splitting must always be checked before assessing vacuum conditions.



Phases and boundaries indicating the phases.

10.2. Determining boundaries

- ***Start Milking***
  This is the moment when the teatcup is attached to the teat.

  Automatic detection (Split)
  The moment when SMT vacuum rises above 25 kPa.

- ***Start peak flow period***
  This is the end of the period when the teatcup is establishing a stationary position on the teat, and milk flow is established. It is also the start of a period with relatively stable conditions and a relatively stable milk flow.

  Automatic detection (Split)
  Is based on the common mechanism that vacuum level declines when milk flow increase. The average SMT vacuum in 10 seconds periods after attachment is monitored. When the average vacuum from one period to the next declines less than 0,15 kPa, the midpoint of the first (of the two) periods is indicated as start of peak flow period. The first 20 seconds period is excluded from the calculations, so there will be a minimum value of 25 seconds.

- ***Start overmilking***
  Overmilking of the relevant teat can be detected by means of MPC vacuum. When the teat gets empty, there will ordinarily be a shift in the MPC vacuum level, or a marked change in the MPC vacuum fluctuations, or both. There are two markers for overmilking, one for each MPC channel.

  Automatic detection (Split)
  is based on an increase in MPC vacuum variation. When the current variation is equal to or above 1,3 times the preceding running average variation, start of overmilking is denoted. Current and running average variation is calculated every two seconds. Variation is the difference between maximum and minimum per two seconds. New running average is 0,7 times the old running average plus 0,3 times the current variation.

- ***Start take-off***
  is the moment when teatcup detachment is initiated. It can be seen on the SMT vacuum as the start of a rapid decline towards zero, or it may be a shift in vacuum in some types of equipment.

  Automatic detection (Split)
  The program loops through all datapoints after start peak flow period and finds maximum vacuum. Then the program loops through backwards from the end of milking until the SMT vacuum is less than 5 kPa below maximum vacuum. This datapoint denotes the start of take-off.

- ***End of milking***
  Is when the SMT vacuum falls below a set value.

  Automatic detection (Split)
  The program loops through all datapoints after start of peak flow period. The first datapoint with SMT vacuum below 5 kPa denotes the End milking.

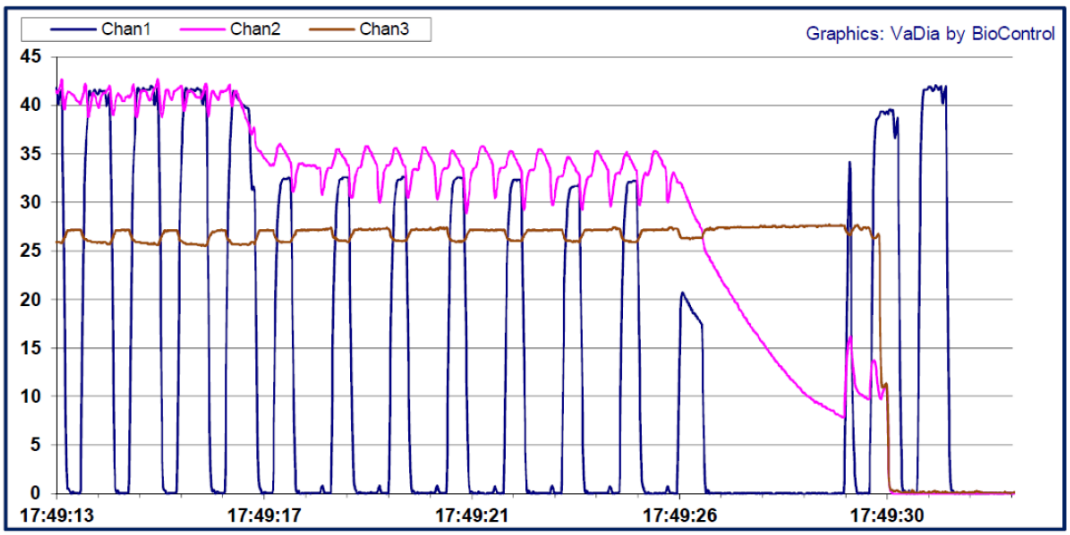
10.3. General Results

- **Machine on Time**
  Time in minutes and seconds from Start milking till End milking
- **Overmilking**
  Time in minutes and seconds in the Overmilking period (from Start Overmilking until Start Take-off)
- **SMT vacuum**
  Average vacuum in kPa of all datapoints of the short milk tube vacuum channel, given for various phases of milking:
  - Total – from Start milking till End milking
  - PFperiod – in the Peak-Flow period
  - Overmilking – in the Overmilking period
- **MPC vacuum**
  Average vacuum in kPa of all datapoints of the mouthpiece chamber in the Peak-Flow period and overmilking period.
- **Cyclic vacuum fluctuations**
  This value is assessed for ten pulsation cycles 60 seconds after the start of the Peak-Flow period. Average, maximum and minimum vacuum in each of the ten cycles are calculated. Finally the averages of the ten individual values are formed. Results are presented as fluctuations Above (maximum) or Below (minimum) the average vacuum.
- **Irregular vacuum fluctuations Type 2**
  An irregular vacuum fluctuation is a rapid drop of a certain magnitude in SMT vacuum. A vacuum change of 56 kPa/second and a magnitude of 14 kPa is set as limits to qualify for an event of Irregular vacuum fluctuations type 2. Results are given in events of Irregular fluctuations per milking.

10.4. Advanced Module Results

! The following data is only available if you have the “Advanced Module Activated”.

- **MPC Favourable**
  This value shows the percentage of recordings during the peak flow period within the range 10-30kPa. The value is shown for the two mouthpiece chamber channels.
- **MPC vacuum in Peak-Flow period**
  With the advanced module MPC vacuum for the second MPC channel is also shown
- **NPG, Negative Pressure Gradient**
  Short milk tube vacuum decline due to vacuum shut-off, while MPC vacuum stays high. “NPG” calculates the area for where the SMT vacuum (pink in image below) is lower than the MPC vacuum (brown in image below). Calculated for both MPC channels.



- **Irregular vacuum fluctuations Type 1**
  An irregular vacuum fluctuation is a rapid drop of a certain magnitude in SMT vacuum. A vacuum change of 100 kPa/second and a magnitude of 21 kPa is set as limits to qualify for an event of Irregular vacuum fluctuations type 1. Results are given in events of Irregular fluctuations per milking.
- **Detachment Time**

  Time from start take-off to end milking (End milking - Start take off).
- **Main Milking Time**

  Time of Peak Flow Period (Start overmilking - Start peak flow).
- **Let Down Time**

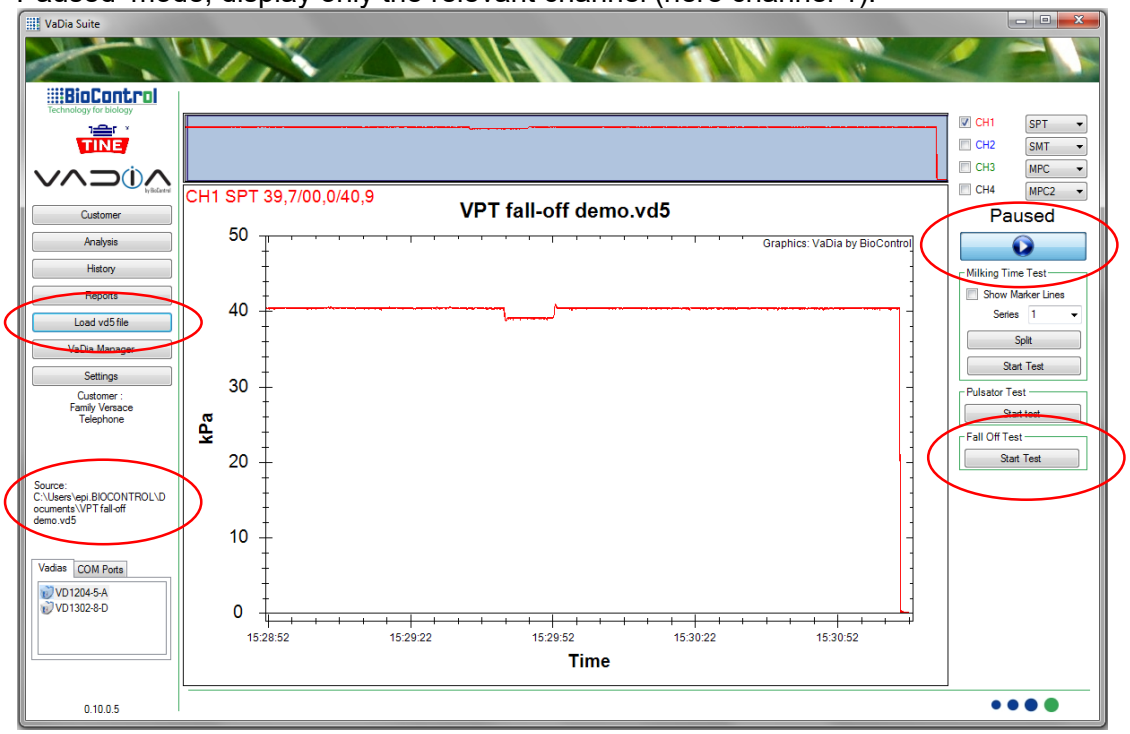
  Time from attachment to start Peak Flow Period.
- **Preparation Time**

  Time from start to end preparation. Recorded with “Milking Registration”, only available with Advanced Module. See chapter 8 for more information about Milking Registration.

11. FALLOFF TEST (OFFLINE)

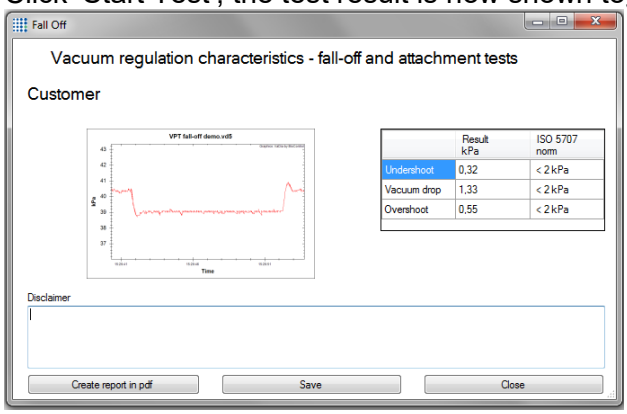
The VaDia Suite module 'Falloff Test' tests the vacuum recovery response when a cluster falls-off and is attached, refer to ISO 5707 for details.
To explain the working of this module, data from a vd5-file called 'VPT Fall-off demo' is used. This file is present on the CD that was supplied with your VaDia Suite and can also be downloaded from the Community Section on our website http://www.biocontrol.no/index.php?root=comm&branch=vadia&leaf=soft.

Select Falloff Test in the right column on the screen.
Open the dataset by selecting 'Load vd5 file' in the left column. Make sure the program is in 'Paused' mode, display only the relevant channel (here channel 1).



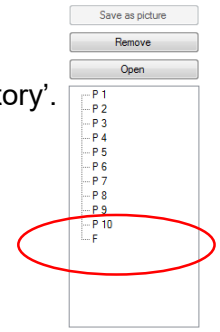
11.1. Falloff test results and report

Click 'Start Test', the test result is now shown together with the ISO 5707 boundaries.



	Result kPa	ISO 5707 norm
Undershoot	0,32	< 2 kPa
Vacuum drop	1,33	< 2 kPa
Overshoot	0,55	< 2 kPa

Press 'Save' to store the test result, the report is now listed in 'History'.

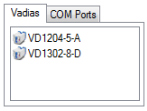


12. VADIA SUITE ONLINE ANALYSIS

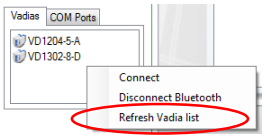
12.1. VaDia Suite Bluetooth connection

! Make sure the VaDia's you want to connect to are in Bluetooth-mode (double check in VaDia Manager that the VaDia mode displays 'LOG BT', see VaDia Startup Guide).
VaDia Suite will automatically find the VaDia's that are in Bluetooth-mode. At start-up the Connection Box in the left column of the screen will show:

The active VaDia's in range that have been found are listed in the Connection Box:



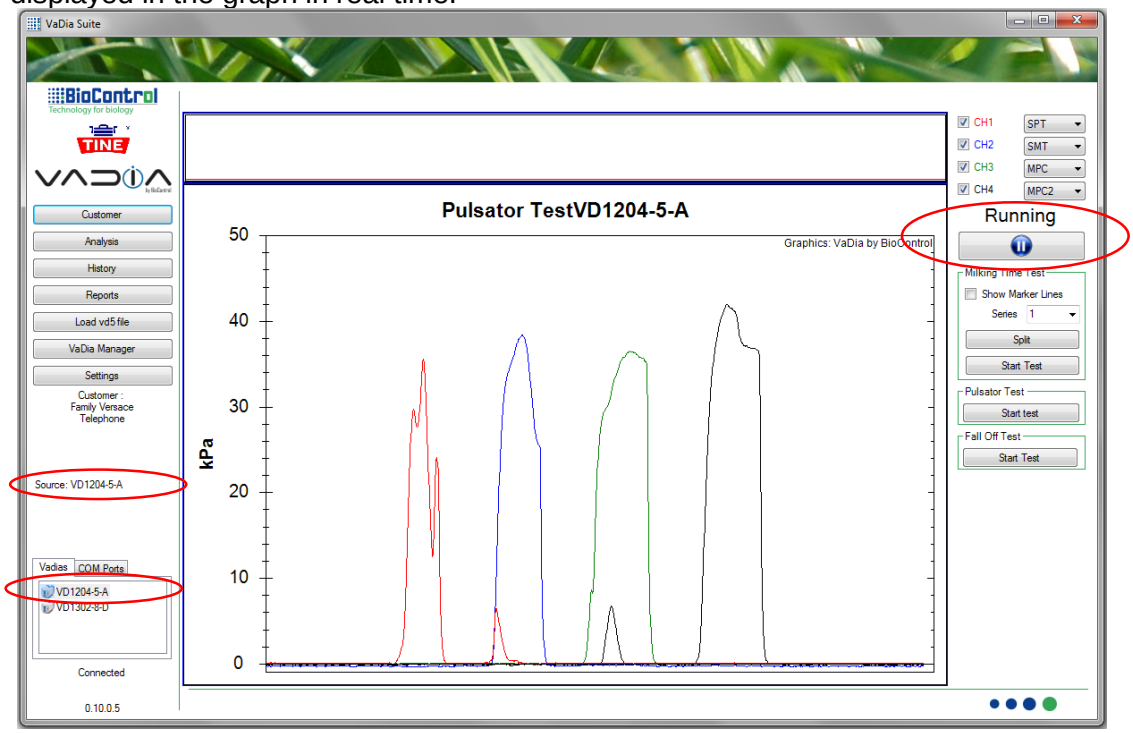
The first time a *new* VaDia is connected via Bluetooth it will not display in the Connection Box. Then right mouseclick and 'Refresh VaDia list'. VaDia Suite will now search again and will find it. It will now be displayed automatically next time VaDia Suite starts-up.



12.2. VaDia Suite online analysis

To start an online loading and analysis, select in the Connection Box the VaDia that you want to connect to via Bluetooth.

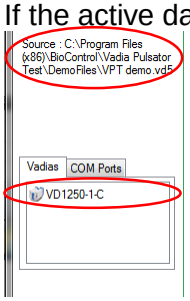
To toggle between mode 'Paused' and 'Running' click  and 
The SPACE bar can also be used to toggle between 'Paused' and 'Running'.
Put VaDia Suite in the mode 'Running'.
Blow in the vacuum tubes to test if the Bluetooth connection is working, the data will be displayed in the graph in real time.



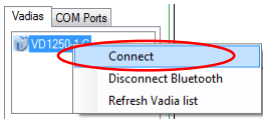
Note: all tests (Milking Time Test, Pulsator Test and Falloff Test) can only be executed in the mode 'Paused'. So first collect the data in the mode 'Running', and then go in mode 'Paused'. The displayed data can then be analyzed as a vd5-file.

12.3. Go to Streaming Bluetooth mode again after opening file

If the active dataset is the dataset from file, the VaDia is not connected.



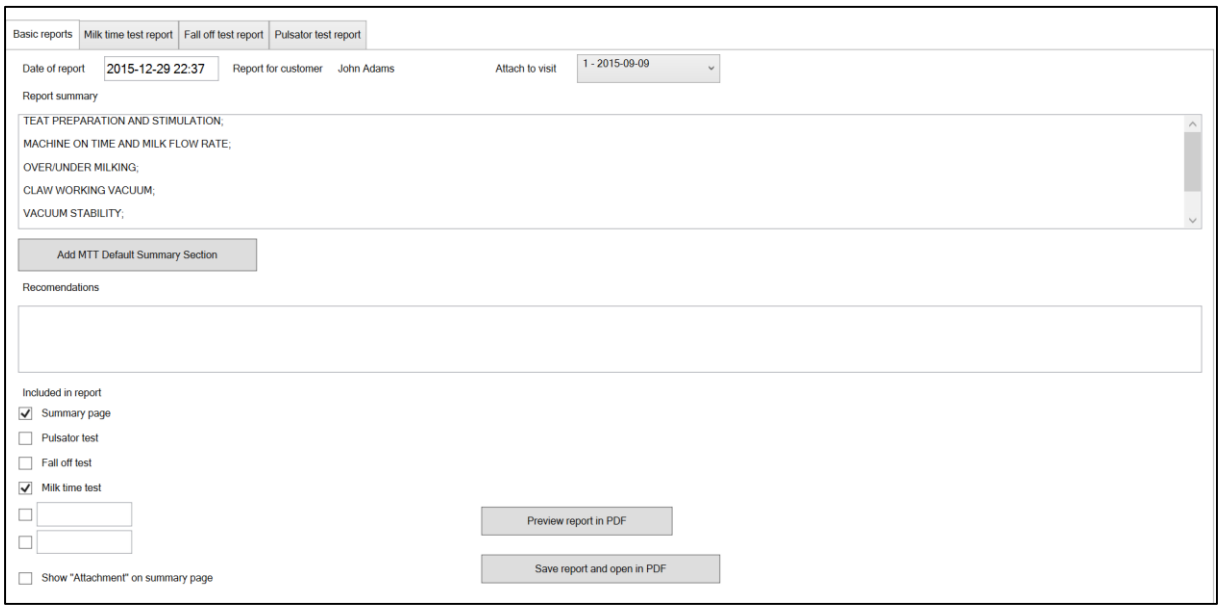
Then right mouseclick in the VaDia window and 'Connect' to make the Bluetooth streaming data the active dataset again:



13. REPORTING

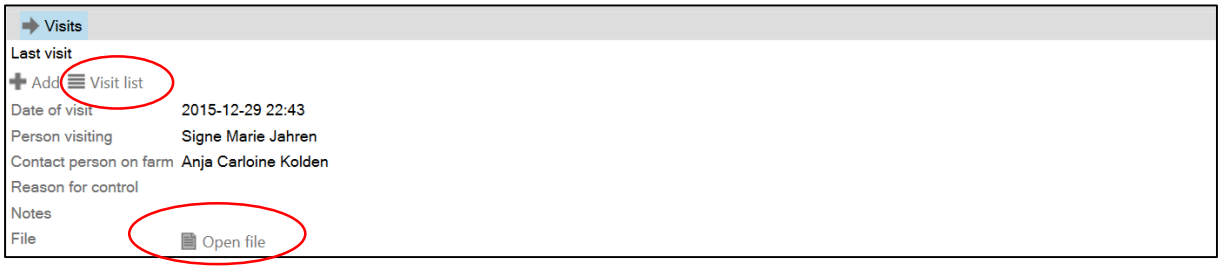
13.1. Basic Reports

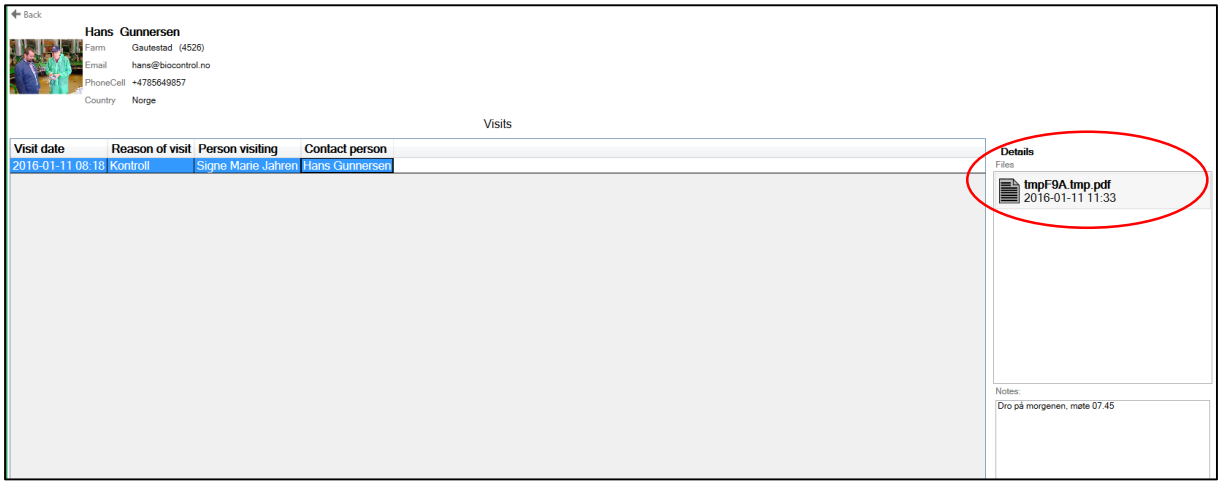
With the Basic Report tab you can write a report summary and recommendations to the report. You should also attach the report to visit (must first be created under customer and the tab “visits”), and choose what should be included in the report.



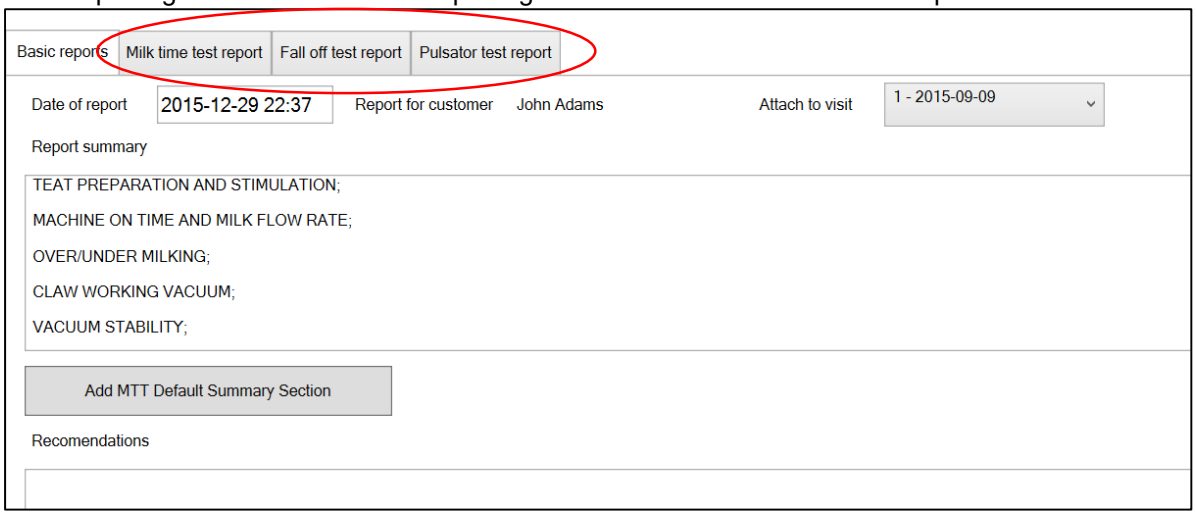
Click on “Preview report” to see the report, or click “save report and open in PDF” to save the report to the customer/visit and open the PDF.

Reports that have been saved to a customer/visit can be found under the “Customer” menu by choosing the customer, then the tab “visits” and by clicking “open file”. Alternatively you can click on the “visit list” to get a list of all visits and see attached files:

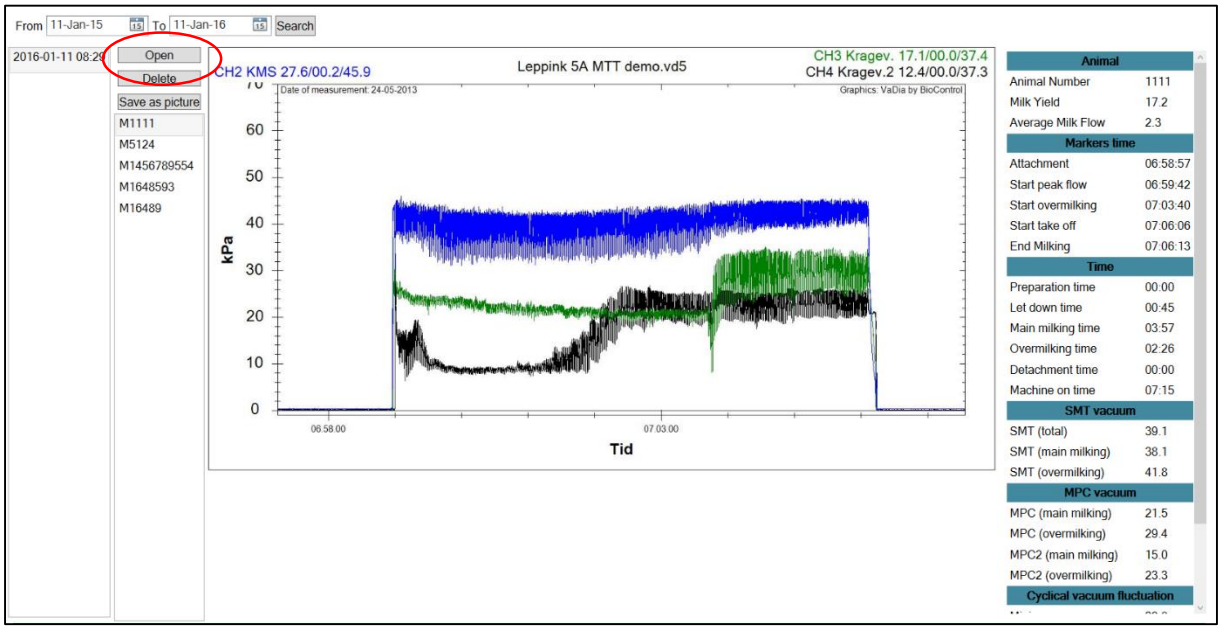




If you have Advanced Module activated you can use the tabs “Milking Time Test Reporting”, “Fall-Off Test Reporting” and “Pulsator Test Reporting” to select data to include in the report.



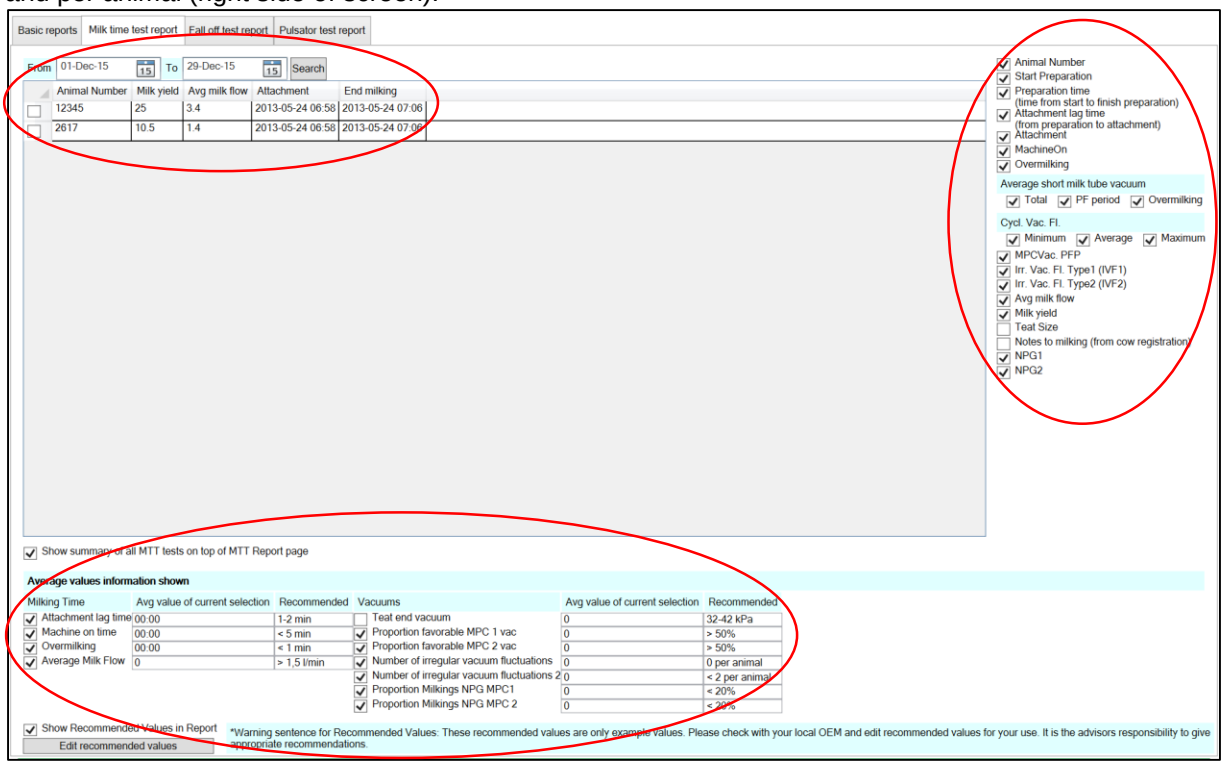
If you do not have the advanced module you can go to “History”, click on the data set of tests you want to add to the report, and then click “Open” to add the analyses in the dataset to the report.
You can choose a different dataset and click “open” to have the two datasets in the same report.
To “clear” selection of data sets for report, change customer.



13.2. Milking Time Test Report

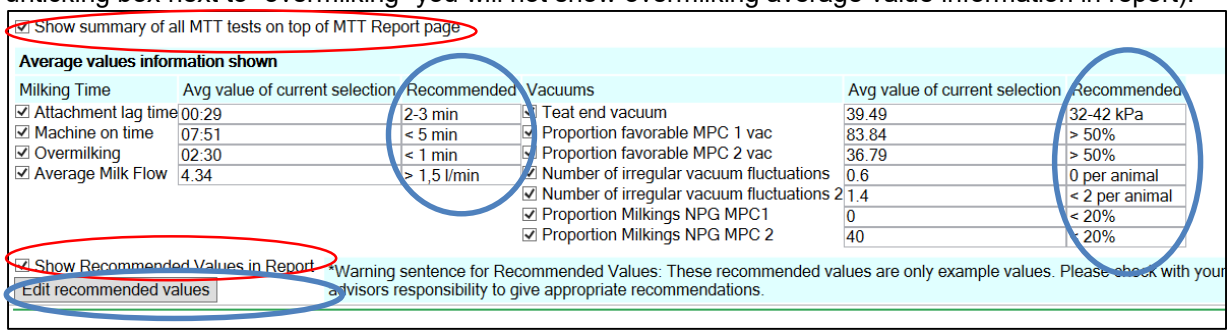
! ***This tab is only available if you have Advanced Module activated.***

In the Milking Time Test Report tab you can choose what Milking Time Test analysis to attach to the report by choosing dates and clicking “Search”. Click on the box to the left of the milking time test to attach it to the report.
You can also choose what data to show in the report of average values (of all milk time tests selected) and per animal (right side of screen):



Average Values Information

Average values are calculated based on MTT analyses chosen to attach to the report.
Tick/untick the box “show summary of all MTT tests on top of MTT report page” if you do not want to show these average values in your report. You can also tick/untick the box “Show recommended values in report” to decide if you want to show the “recommended” values in your report (or only the calculated averages).
Click on “edit recommended values” to be able to write in the boxes under “recommended” to edit values.
Tick/untick boxes next to each calculated value to remove value from the report (for example by unticking box next to “overmilking” you will not show overmilking average value information in report).

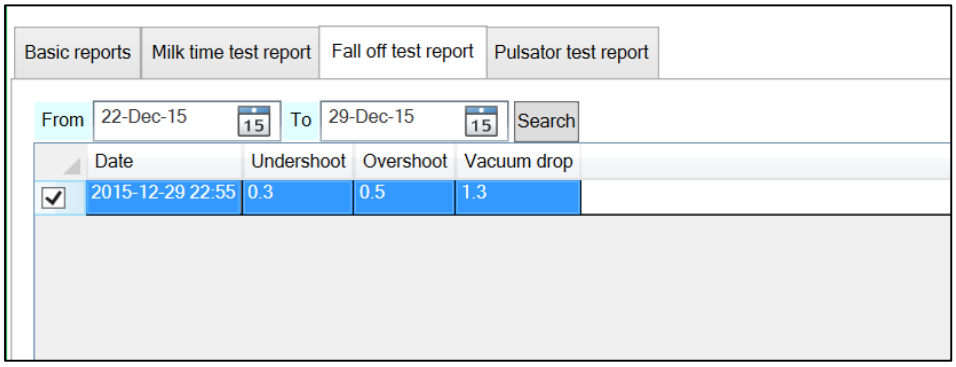


! ***OBS! The recommended values are only example values! It is the advisors responsibility to edit values to give appropriate recommendations.***

13.3. Fall Off Test Report

! ***This tab is only available if you have Advanced Module activated.***

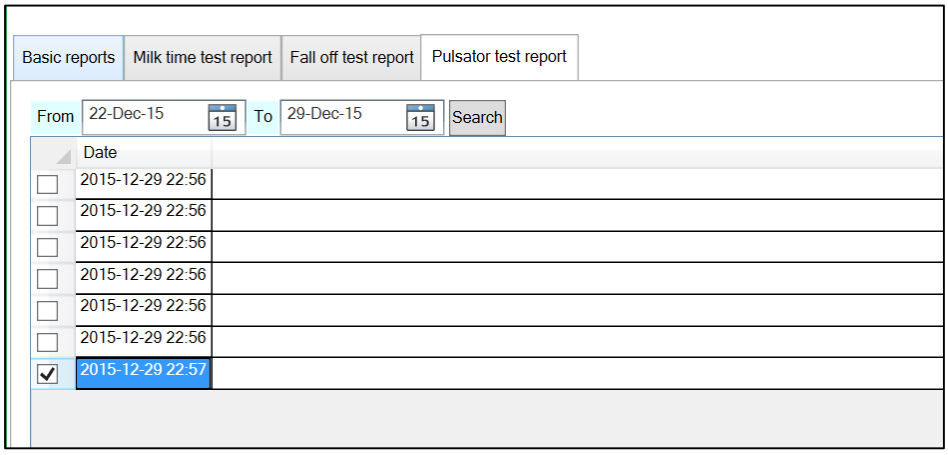
You can choose what test analyses to attach to the report by choosing dates and clicking “Search”. Click on the box to the left of the milking time test to attach it to the report:



13.4. Pulsator Test Report

! ***This tab is only available if you have Advanced Module activated.***

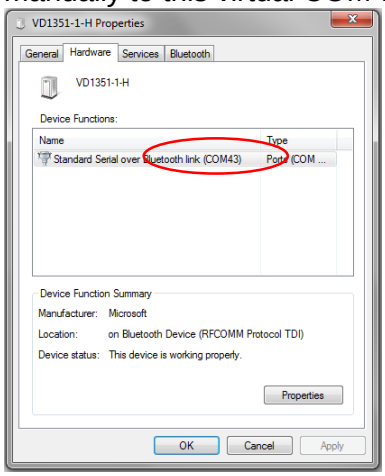
You can choose what test analyses to attach to the report by choosing dates and clicking “Search”. Click on the box to the left of the milking time test to attach it to the report:

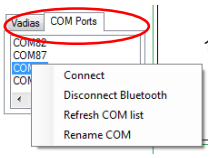


14. TROUBLE SHOOTING

14.1. Streaming Bluetooth: VaDia Suite doesn't find my VaDia

In rare cases it can happen that a VaDia is not found automatically. In that case look-up the virtual COM-Port of this VaDia in the PC's Configuration tools and connect VaDia Suite manually to this virtual COM-Port by selecting it in the tab 'Com Ports':

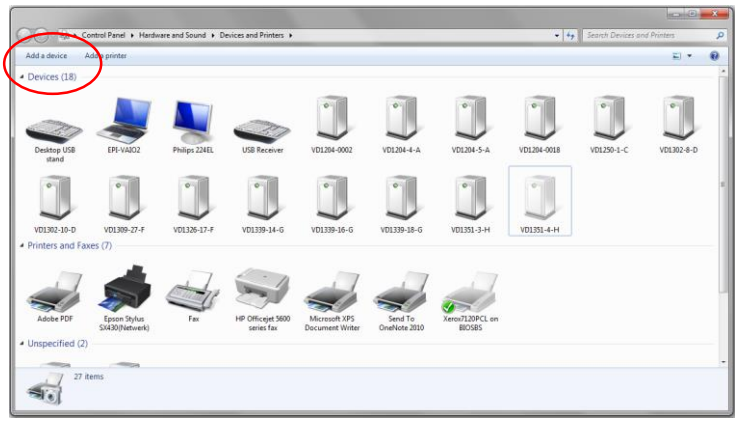




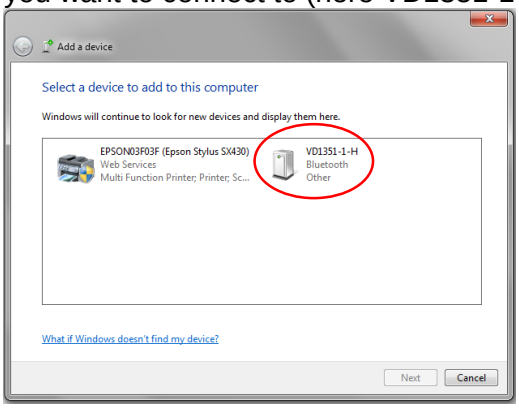
VaDia Suite will then always use this Com Port when Bluetooth connecting to this VaDia.

Follow these steps to find the COM Port:

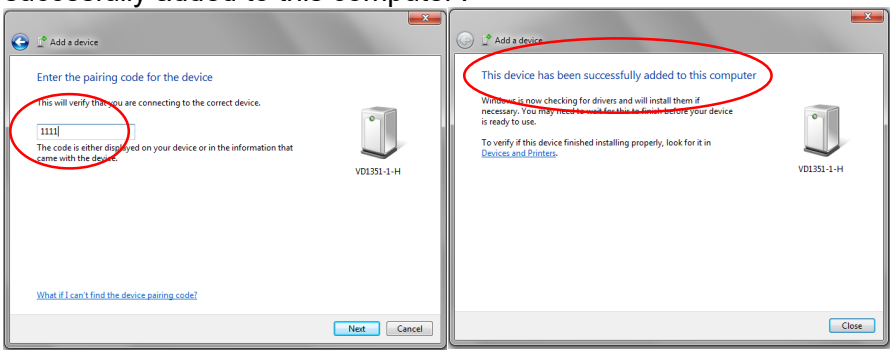
- PC: ensure that the PC is equipped with Bluetooth and that the Bluetooth on the PC is switched on.
- VaDia: start a log session in Bluetooth mode, double check that the VaDia mode displays 'LOG BT' (see VaDia Startup Guide)
- Go to 'Start'>'Control Panel'>'Hardware and Sound'>'Devices and Printers' and select 'Add a device'.



- The PC will search and find Bluetooth devices that are not connected yet. Click the VaDia you want to connect to (here VD1351-1-H):

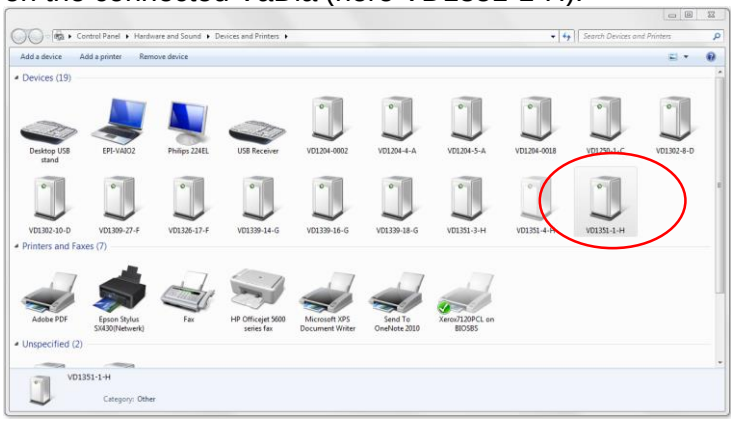


- Enter pairing code ‘1111’ when requested and wait for the message ‘this device has been succesfully added to this computer’.

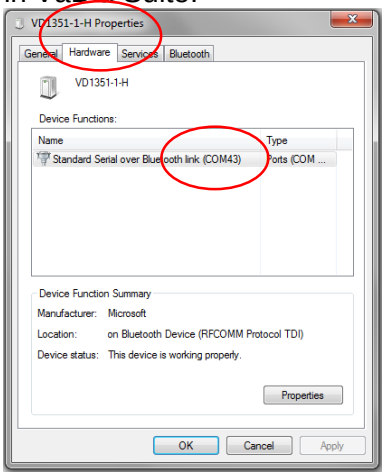


- After some time (< 1 minute), this message will display. It is now ready to use.

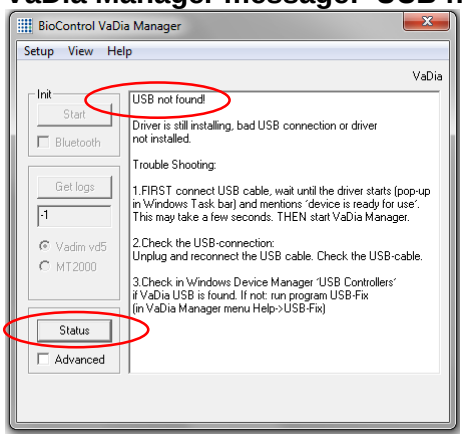
- Go to ‘Start’>’Control Panel’>’Hardware and Sound’>’Devices and Printers’ and right-click on the connected VaDia (here VD1351-1-H).



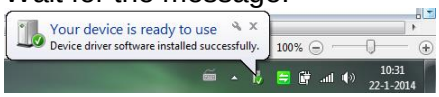
- Go to Properties>Hardware and note the COM-Port (here COM43). Select this COM-port in VaDia Suite.



14.2. VaDia Manager message: ‘USB not found!

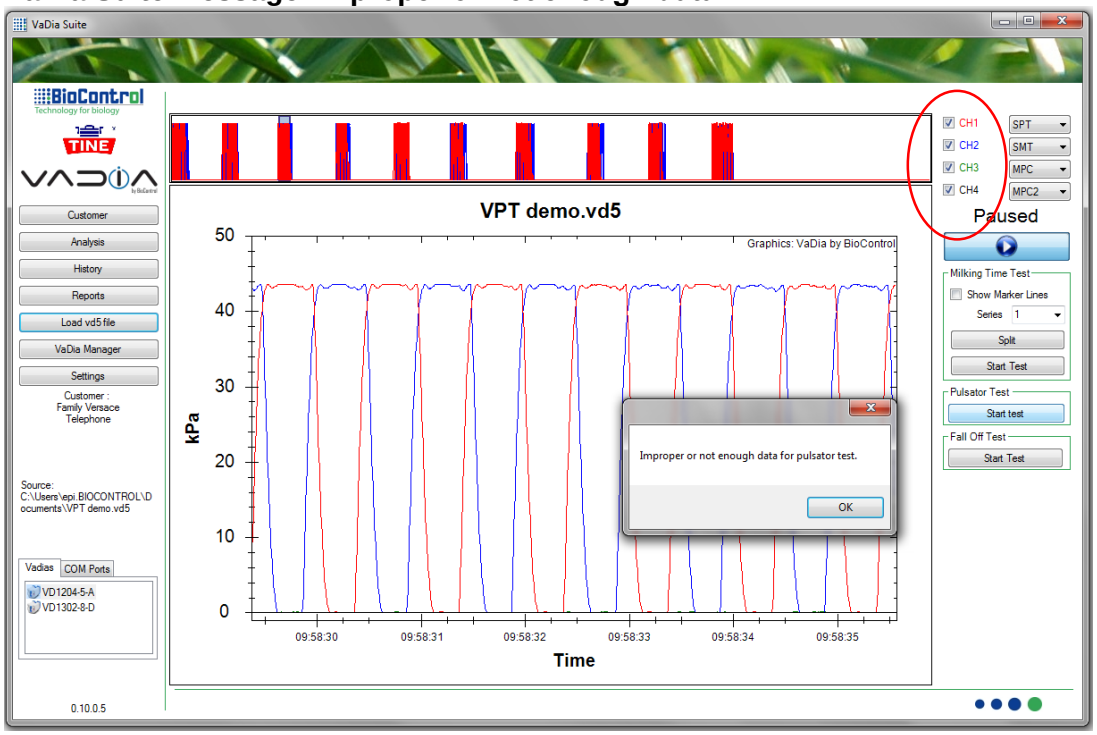


When connecting the VaDia to the PC this screen is displayed when the initialization of the PC-USB port is delayed. Follow the instructions displayed in the screen.
Wait for the message:



Note: the USB-connection is refreshed by clicking ‘Status’

14.3. VaDia Suite message ‘Improper or not enough data’



Here CH3 and CH4 are selected but have no data. Unselect CH3 and CH4.
The same error message shows in the Falloff Test.

References:
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www.biocontrol.no/vadia