TECAN

HydroWasher Device Driver

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- Model name of your product
- Serial number (SN) of your product
- Software and software version (if applicable)
- Description of the problem and contact person
- Date and time when the problem occurred
- Steps that you have already taken to correct the problem
- Your contact information (phone number, fax number, e-mail address, etc.)

WARNING

CAREFULLY READ AND FOLLOW THE INSTRUCTIONS PROVIDED IN THIS DOCUMENT BEFORE OPERATING THE INSTRUMENT.

Notice

Every effort has been made to avoid errors in text and diagrams; however, Tecan Austria GmbH assumes no responsibility for any errors that may appear in this publication.

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We would appreciate any comments on this publication.

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About the Instructions for Use

This document is intended as a reference and *Instructions for Use* for the Hydro Washer Device Driver.

This document instructs how to:

- Install the software
- Operate the software

Remark on Screenshots

Data and parameters displayed in screenshots vary depending on the instrument connected. Details and examples are described in the respective **Instructions for Use** of the instrument connected.

The version number displayed in screenshots may not always be the one of the currently released version. Screenshots are replaced only if content related to application has changed.

Warnings, Cautions and Notes

The following types of notices are used in this publication to highlight important information or to warn the user of a potentially dangerous situation:

	Note ***Gives helpful information.***

	CAUTION **INDICATES A POSSIBILITY OF INSTRUMENT DAMAGE OR DATA LOSS IF INSTRUCTIONS ARE NOT FOLLOWED.**

	WARNING **INDICATES THE POSSIBILITY OF SEVERE PERSONAL INJURY, LOSS OF LIFE OR EQUIPMENT DAMAGE IF THE INSTRUCTIONS ARE NOT FOLLOWED.**

Symbols

Company Address	Manufactured by

Table of Contents

1. Introduction

The HydroWasher Device Driver is a software extension for Freedom EVOware.

The driver controls the washers HydroFlex and HydroSpeed from Tecan-AU. All versions of the HydroFlex and the HydroSpeed washers are covered by the driver.

2. Version History

2.1 HydroWasher V1.0.4

First version of the driver.

Only support of Freedom EVOware 2.0 and the "standard" HydroFlex instrument.

2.2 HydroWasher V2.0.8

Support of Freedom EVOware 2.0 and 2.1.

Supports new features of HydroFlex Enhancements (e.g. Low VAC, etc.)

Doesn't work with "standard" HydroFlex instrument.

2.3 HydroWasher V2.1.0

Based on Version V2.0.8

Additional support of strip selection through Freedom EVOware variables (StripCount, StripMask)

Implementation of additional Logging Appender for CommonLoggingServer support.

2.4 HydroWasher V2.2.0.3

Based on Version 2.1.0

This version of the driver supports the HydroSpeed instrument.

There is **NO** support for the HydroFlex instrument in this version.

2.5   HydroWasher V4.1

Based on Version 2.2.0.3

Support of HydroFlex and HydroSpeed instrument in one driver

Win7 32/64 Bit support

Print Button added to the WasherEditor accessible via Wash-macro

MCS-Messages (Aspirate,Dispense) added for a better SampleTracking integration

Better integration of EVOware Logging

Instrument Version is read during connect and printed to logFile

HydroSpeed specific changes:

- WashEx macro removed

- pLLD Support for HydroSpeed added

- AntiClog functionality added. This is a similar function like *AutoRinse* function of the HydroFlex.

2.6   HydroWasher V4.2

- The customized z-height was not displayed correctly in the Dispense- and Wash-strips in the Russian and Italian operating systems. Fixed.

- EVOware Stripmask/Stripcount did not work correctly. Fixed.

- Problem with long comments in PDFX files: The name must not exceed 14 characters. If it is longer it will be abbreviated automatically.

- Improved driver logging implemented.

3. Hardware Requirements

The device is connected to the PC using a USB cable. The one that is shipped together with the washer instruments must always be used.

If you are using an USB hub, it must be an active hub.

4. Installation

The driver normally comes together with the washer instruments on the HydroControl CD.

In normal cases it is enough to call the Setup of the driver from the CD.

> ***Note***
> ***IMPORTANT:***
> ***Freedom EVOware must be already installed on the PC:***
>
> ***After successful installation the driver must be configured as described below.***
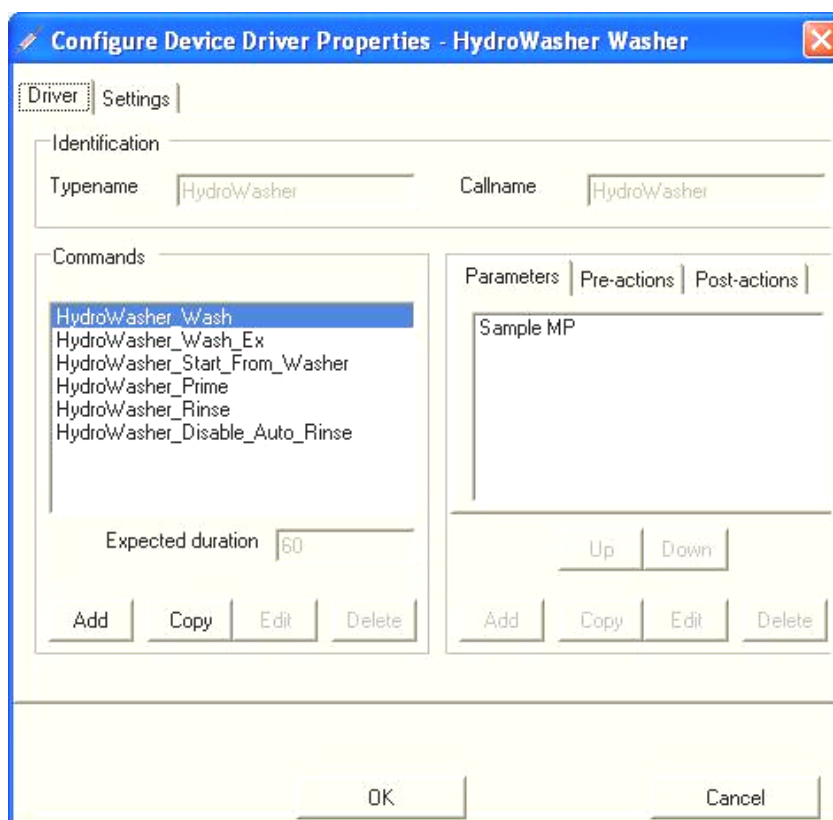
5. Driver Configuration

There are two tabs for device driver configuration in the Configure Device Driver Properties dialog.
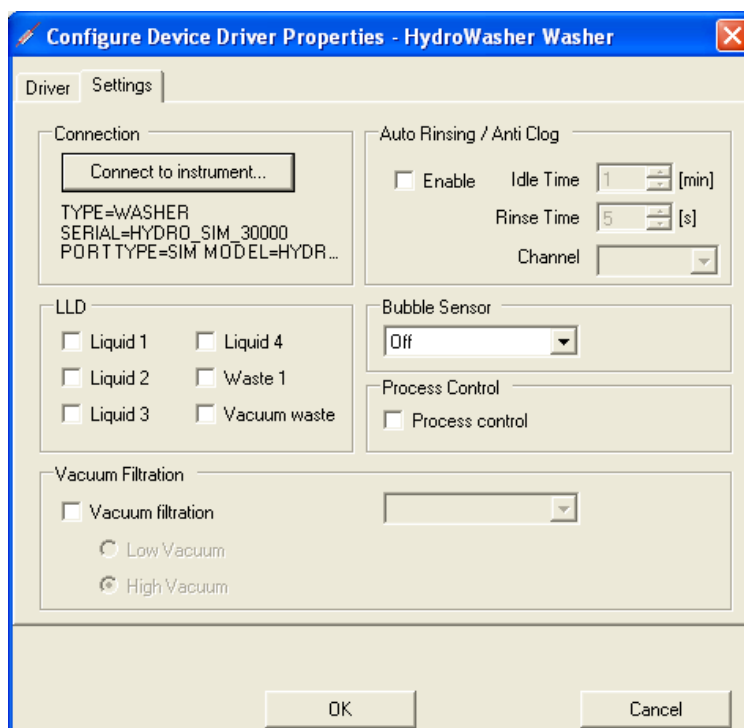
The values here come from the INI file. The INI file will be updated if any of those values changes. The INI file must not be edited manually.

5.1 Driver

Normally, there is no need to make any changes on the Driver Page. The entries in the Commands group box represent the commands/macros that can be used with the Tecan washers.

5.2   Settings

The Settings page is used for configuration of the instrument modules and settings.

5.2.1   Connection

Selects the washer to be connected.

All Washers that are connected to the PC are shown in the Instrument Connection dialog box.

5.2.2   Auto Rinsing/Anti Clog

When enabled, the washer driver will perform an automated Rinse Procedure with the given "Rinse Time" on the selected "Channel". This procedure will be repeated in intervals defined by the "Idle Time".

When using the driver together with a HydroSpeed instrument the functionallity is called "*Anti Clog*". For the HydroSpeed it is only possible to set the "Idle Time".

5.2.3   LLD

Enables/disables the Liquid Level Detection on the various channels.

5.2.4   Bubble Sensor

Enables/disables the Bubble Sensor and sets the threshold.

5.2.5 Process Control

Enables/disables the Process Control module.

This option is only available for HydroFlex if the instrument is equipped with a Process Control module.

5.2.6 Vacuum Filtration

Enables/disables the Vaccum Filtration module.

Select between High/Low Vacuum. Only the options that are available through the instrument are accessable.

Furthermore, you can select a unit for the pressure. Default is "mBar".

The High/Low Vaccum Radiobuttons are only available for HydroFlex instruments.

5.2.7 pLLD

pLLD is only available for HydroSpeed.

For the vaccum waste you can eighter use a "normal" LLD or a pLLD sensor, depending on your instrument.
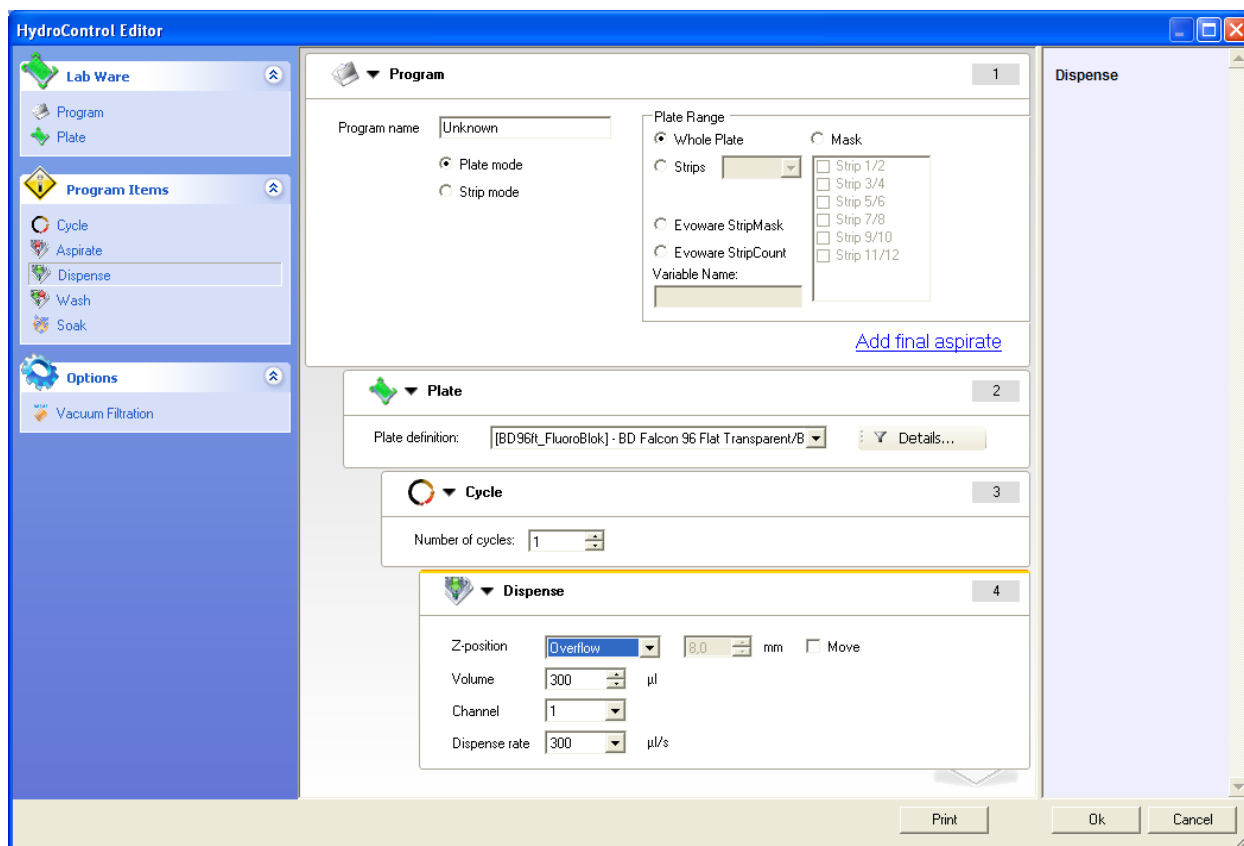
6. Macro Reference

The driver supports the following 8 macros for device control.

6.1.1 *HydroWasher_Wash*

This command is used to define a wash program. The screenshot shows the wash program editor of the HydroControl software. For further information see the HydroControl Manual.

Details about the "Plate Range" in the Program Strip can be found in chapter 6.1.3 HydroWasher_StartFromWasher.

6.1.2   HydroWasher_WashEx

Only available for HydroFlex instrument.

The WashEx command is identical to the Wash command described above, except for one difference: before the wash program is processed by the instrument, the channel information of all the strips of the wash program is replaced by the channel number that is stored in a file. This file is typically located at:
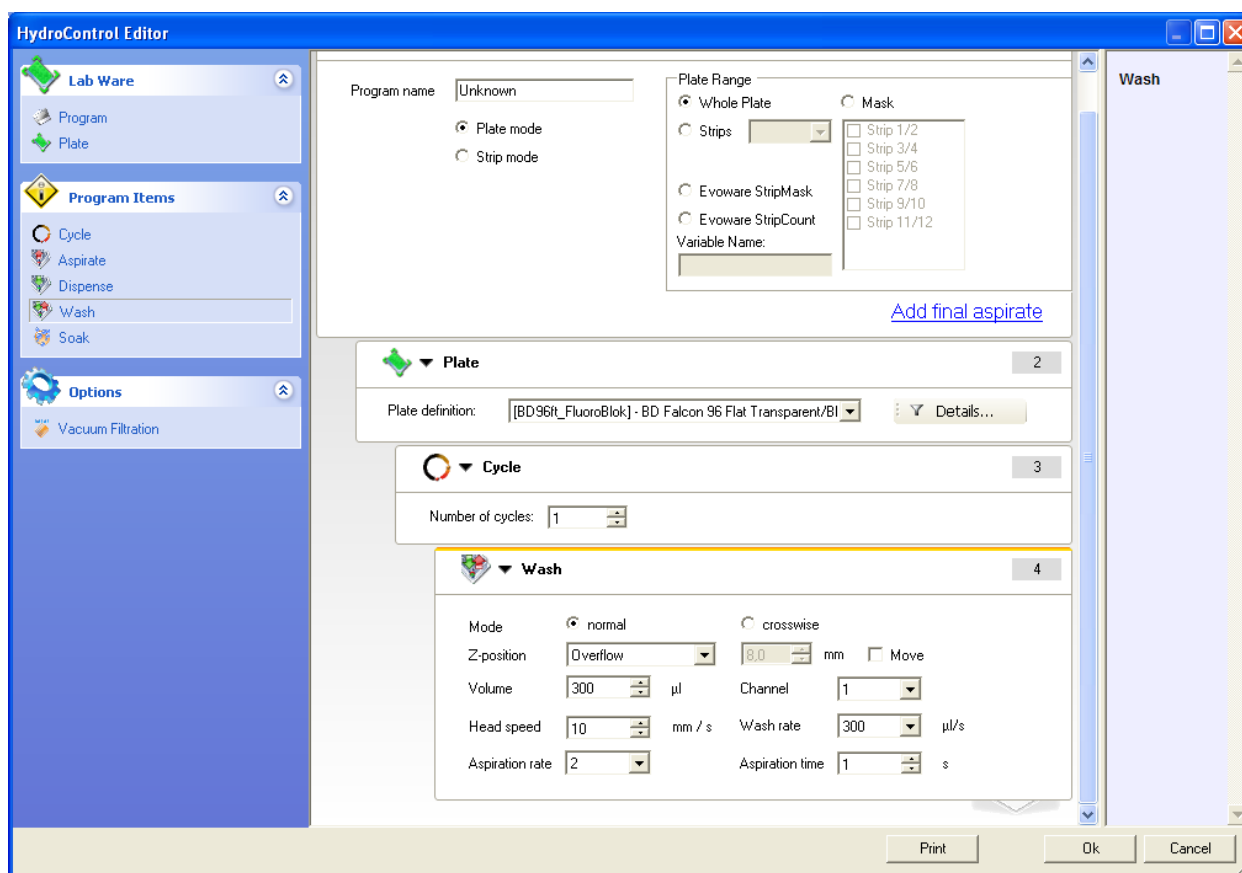
WindowsXP: C:\Documents and Settings\All Users\Application Data\Tecan\Config

Windows Vista/Windows 7: C:\ProgramData\Tecan\Config\

Filename: EVOwareHydroWasherConfig.ini

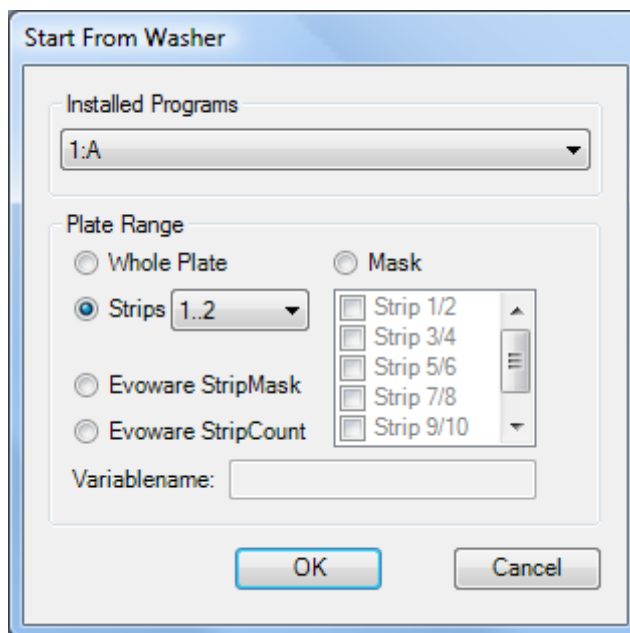File Content:

```
[WashEx]
Channel = 2
```

6.1.3   *HydroWasher_StartFromWasher*

The StartFromWasher command is used to execute programs that are stored on the instrument.

Additionally, the range of the plate that should be processed must also be selected.

Plate Range:

Whole Plate: the whole plate is processed

Mask: only for HydroFlex instruments

only the selected rows are processed

Strips: only for HydroFlex instruments

beginning with the first row the plate is processed up till the selected row

Evoware StripMask: only for HydroFlex instruments

same as Mask, but the selected strips are set by a Freedom EVOware Variable at runtime. (Labware Attribut: StripMask)

The strips are bitwise coded, the value must be between (1 and 4095).

Normally you have to set this by variable assignment in Freedom EVOware. However the Freedom EVOware Sample oriented add-on automatically sets this for plates it pipettes.

When using Freedom EVOware Standard you must set a Variable Name in the appropriate field. The value of the variable must be set before this macro. To set the variable use the Freedom EVOware command "Set Variable".

When using Freedom EVOware Plus, the value of the variable is either set by the Labware attribute or within a script using the Freedom EVOware command "Set Variable". The second option is the same as described above when using Freedom EVOware Standard. In the case that both a Labware attribute sets the value and also a VariableName is used, the driver takes the value from the Labware attribute first.

Adding the strip mask attribute.

Freedom EVOware Plus creates this attribute automatically, but in Freedom EVOware standard you will have to create it by hand. This only has to be done once. Edit the labware by right clicking on the labware on the worktable, and go to the Advanced Tab, and click attributes;
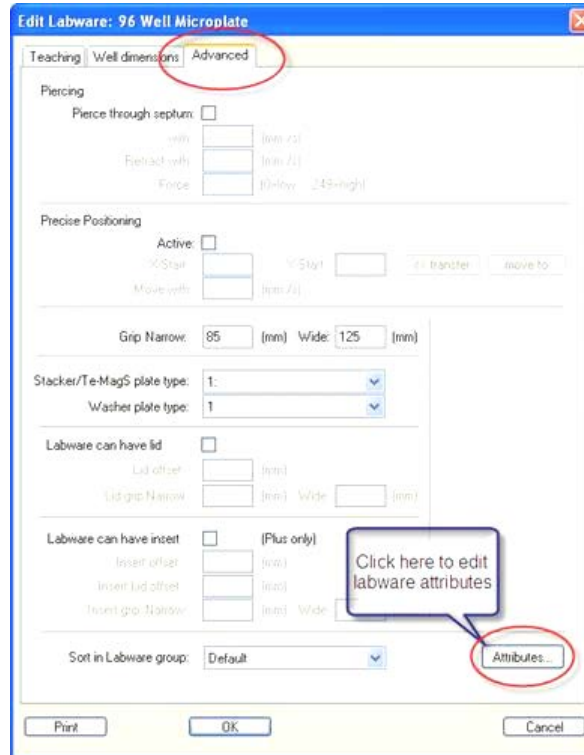
After clicking Attributes, you will see the attributes dialog.

Click Add, select the Strip Mask Attribute from the list, and then click OK.
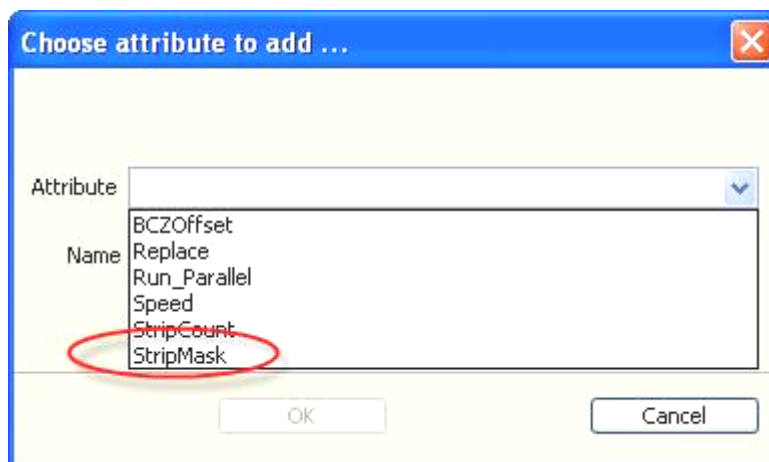
Evoware StripCount: only for HydroFlex instruments

same as Strips, but the selected number of rows are set by a Freedom EVOware Variable at runtime. (Labware Attribut: StripCount)
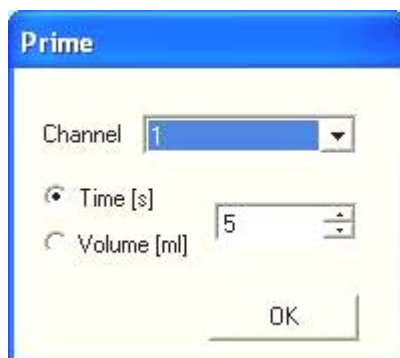
> ***Note***
> ***Be careful when using Evoware StripMask and StripCount together with a 16-way manifold; a 16-way manifold always processes 2 rows at once.***
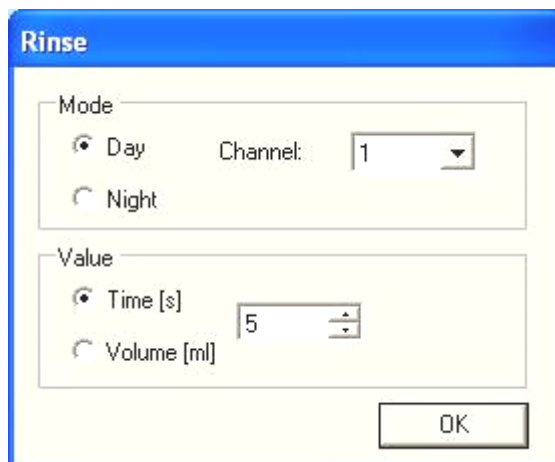
6.1.4 HydroWasher_Prime

Select the Prime command to perform a prime procedure. Select the channel and set the Time or the Volume for priming.

6.1.5   *HydroWasher_Rinse*

Select the Rinse command to perform a rinse procedure. Select the Channel, Mode (Day or Night) and set the Time or the Volume for priming.


6.1.6   *HydroWasher_DisableAutoRinse*

The DisableAutoRinse command is used to disable the AutoRinse feature that is set in the configuration settings of the driver. After using this command the AutoRinse timer will remain disabled until the whole program is finished.

6.1.7   *HydroWasher_PrepareVAC*

This command is used together with an external high vacuum station. Before using the vacuum station in a wash program the necessary vacuum pressure must be reached. This command must be called once before the wash program that needs the vacuum filtration.
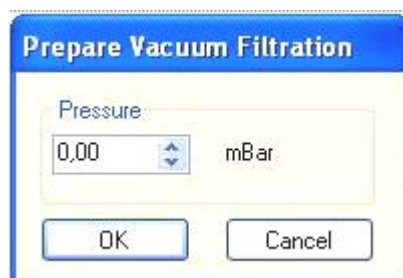
6.1.8   *HydroWasher_StopPrepareVAC*

This command is the opposite of "Prepare VAC". Use this macro if you performed "Prepare VAC" and vacuum filtration is no longer required in your program.

7. Error Messages

7.1 HydroFlex

The following table shows all possible errors that can be sent by the HydroFlex instrument and are processed by the driver.

Error Number	Error Text	Possible source of defect
ERR000	'{0}' … not a valid command	Invalid Firmware commando, Error during transmission, Invalid User input
ERR001	Param: {0}, Value: '{1}' is not def	Parameter for the given command is invalid, Invalid User input, Error during transmission
ERR002	DISPENSE PUMP/SENSOR NOT WORKING	Forked light barrier defect, Pump motor defect
ERR003	Manifold detection broken	Forked light barrier defect at manifold detection board, Wrong mounted manifold
ERR004	No Manifold detected	Forked light barrier defect at manifold detection board, Manifold not mounted
ERR005	Param: {0}, Value: '{1}' is out of range	Given parametervalue out of range, Error during transmission, Invalid User input
ERR006	Not enough parameter	Error during transmission, Invalid User input
ERR007	Manifold Head Up	Wrong offset, wrong plate
ERR008	No Plate inserted	No plate was placed on the carrier. The plate detection sensor is broken
ERR009	LLD-Error{0}	LLD not attached but activated, Channel empty/full
ERR010	Bubbles {0} < {1}	Bubbles in the tube, Bottle empty, instrument leak
ERR011	Home not found: {0}	Motor seize or defect
ERR012	Timeout Mod {0} Time {1}	The given module did not response within the given time. Module defect or not connected
ERR013	Aspiration not allowed (VAC active)	If Vacuum Filtration is active, an aspirate action is not allowed

7. Error Messages

Error Number	Error Text	Possible source of defect
ERR014	Vac Fil not enabled	Appears if a program contains a vacuum filtration strip although the vacuum module is disabled.
ERR015	Steploss: {0}	A motor produced some step loss
ERR016	Dispense Error {0}	Dispense needle congested or not maintained
ERR017	Aspirate Error{0}	aspirate needle congested or not maintained
ERR018	Process Control: HPC Function Error {0}	Drops between needles
ERR019	VAC not reached	Vacuum not reached in a certain time interval.
ERR020	VAC not prepared	Vacuum pump not active.
ERR021	PC System Error	PC Module not working, not connected

7.2 HydroSpeed

The following table shows all possible errors that can be sent by the HydroSpeed instrument and are processed by the driver.

Error Number	Error Text	Possible source of defect
ERR000	NO_ERROR_QQ	---
ERR001	INVALID_COMMAND	Wrong command syntax
ERR002	PARAMETER_OUT_OF_RANGE	Wrong command syntax
ERR003	INVALID_NUMBER_OF_PARAMETERS	Wrong command syntax
ERR004	INVALID_PARAMETER	Wrong command syntax
ERR005	ERR_INVALID_PARAMETER_AT	Wrong command syntax
ERR006	PRAEFIX_MISSING	Wrong command syntax
ERR007	RS485_TIMEOUT	Communication problem with internal module
ERR008	INVALID_MODULE	Download communication problem or SIBUS
ERR009	ERR_BINARY_TRANSFER	Communication problem with internal module. Occurs when DOWNLOADING and when transfering plate definitions to the display module.
ERR010	X_INIT_ERROR	Error at motor initialization
ERR011	Y_INIT_ERROR	Error at motor initialization
ERR012	Z_INIT_ERROR	Error at motor initialization
ERR013	MODULE_ERR	Communication problem at download
ERR014	ERR_CHECKSUM	Communication problem with internal module
ERR015	ERR_STEPLOSS	Steploss error: can occur at program end or with particular service routines
ERR016	ERR_NOMEMORY	Occurs only with DOWNLOAD command Wrong Downloadfile (manipulated)
ERR017	ERR_MEMORYACCESS	Occurs only with DOWNLOAD command Wrong Downloadfile (manipulated)
ERR018	ERR_USBTIMEOUT	Only with SIBUS or DOWNLOAD. Occurs if no data is sent from USB within a certain time

Error Number	Error Text	Possible source of defect
ERR019	ERR_INVALIDPREFIX	Wrong command syntax
ERR020	PARAMETER_OUT_OF_RANGE_STRLEN	Only with SIBUS commands
ERR021	USB_QUEUEOUT_OVERFLOW	This error cannot actually happen, because if this error occurs communication has been interrupted.
ERR022	ERR_HEADUP	Wash head is touching. Can occur with every wash head movement.
ERR023	ERR_ASPIRATION	Not used
ERR024	ERR_DISPENSE	Not used
ERR025	ERR_WASH	Not used
ERR026	ERR_VACUUM	Error while building up vacuum. Vacuum could not be built up within the requested time.
ERR027	ERR_PRIME	Not used
ERR028	ERR_RINSE	Not used
ERR029	ERR_SOAK	Not used
ERR030	ERR_LLD_INLET	At program start or during progam run: inlet bottle empty
ERR031	ERR_LLD_WASTE	At program start or during progam run: waste bottle empty
ERR032	ERR_MOTOR_MOVE	Error during motor movement, only with ABSOLUTE command
ERR033	ERR_DISPPUMP_TIMEOUT	Dispense pump is busy too long. Does not rotate or flow rate is to low.
ERR034	ERR_STEPPER_PARAM_OUTOFFRANGE	Occurs if an attempt is made to move motor to a position outside the defined range of movement for the respective motor.
ERR035	ERR_NOWASHHEAD	Occurs at program start if no wash head is installed.
ERR036	ERR_PLATEHEAD	Plate and wash head do not match.
ERR037	ERR_BUBBLE	Occurs during program run, if the bubble sensor has exceeded a certain cutoff. Does not occur with Prime and Rinse!
ERR038	ERR_PLATEPOS	Occurs at program start, if the plate detection sensor does not display a certain signal at a defined position.
ERR039	ERR_POWERFAIL	This error message is displayed if voltage supply has been interrupted during a program run.

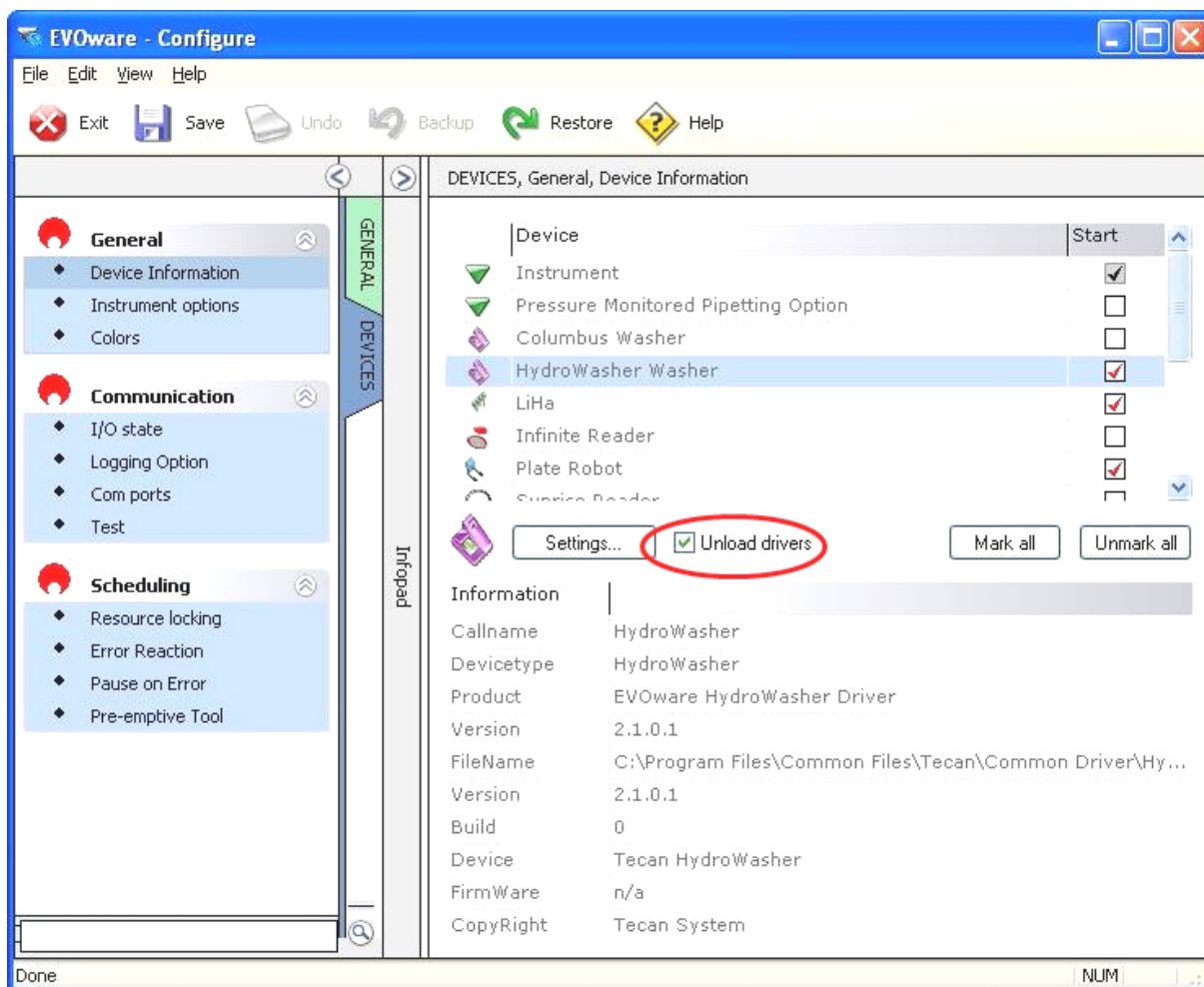| Error Number	Error Text	Possible source of defect
ERR040	Er_PLLD	pLLD error
ERR041	ERR_INDEXINGWAS HHEAD	Wash head indexing error
ERR042	ERR_INVALIDPROG RAMSTEP	Program definition is not consistent → loss of data → firmware bug?

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8. Known Issues/Bugs

When using Driver Version 2.0.8 or 2.1.0 together with Freedom EVOware 2.1 SP1, Freedom EVOware could get a timeout while executing a macro of the HydroWasher Driver. This occurs when restarting Freedom EVOware without "Unloading" the driver or when the driver is configured without restarting and "unloading".

This is a known bug of Freedom EVOware 2.1 SP1 and has nothing to do with the driver itself.

SP2 of Freedom EVOware 2.1 will fix this problem (not yet released as of 2008-04-16).

Workaround:

Always enable Checkbox "Unload drivers" of HydroWasher Driver (See screenshot below) and restart Freedom EVOware after configuring the Driver.

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Numbers refer to pages.