

ReadMe FluentControl 3.7

Introduction

This document contains important information about FluentControl 3.7. Please read it carefully before installing or upgrading the software. Our [Knowledge Portal](#) has additional information on FluentControl and other Fluent related topics.

1. [Installation and Upgrades](#)
2. [Changes in FluentControl 3.7](#)
3. [Additional Information](#)
4. [Compliance Features](#)
5. [Known issues in FluentControl 3.7](#)
6. [FluentSetup 3.7](#)
7. [Appendix: overview of changes in recent FluentControl releases](#)

Important info for systems upgrading from a previous FluentControl version to FluentControl 3.7

Device placements stored on instrument

Different to previous FluentControl versions, FluentControl 3.7 stores the placement (coordinate) values of non-grid-based devices (i.e., Readers, Washers, Centrifuges) and carrier site adjustments on the instrument instead of in the database on the PC hard drive. For more information, see section 2 of this ReadMe.

Systems with an RGA upgrading from FluentControl 2.8 or older

After upgrading from FluentControl 2.8 or older to FluentControl 3.7, the Gripper Alignment QC Setup Action needs to be re-executed in FluentSetup. A Tecan Field Service Engineer must be on site to perform this test. When upgrading from FluentControl 3.0 or higher to FluentControl 3.7, execution of the Gripper Alignment QC Setup Action is not required.

Introspect 3.0

FluentControl 3.7 installs the new IoT Client version 3.0. Contrary to IoT Client 2.x, IoT Client 3.0 does not read FluentControl log files. To prevent loss of data, ensure that any relevant log files have been parsed prior to upgrading FluentControl.

Upgrading from 2.x to 3.0 is not possible. If you are using the IoT Client to send data to Introspect, please manually uninstall IoT Client Bundle 2.x before upgrading to FluentControl 3.7.

Introspect 3.0 shows incomplete runtime error information when using FluentControl 3.7. This issue will be fixed in a later software version.

1. Installation and Upgrades

Considerations before installation or upgrade

Operating system

FluentControl 3.7 is compatible with Windows 11 Enterprise (IoT) LTSC 2024 and Windows 10 Enterprise (IoT) LTSC 2021. Tecan cannot support technical issues arising from running FluentControl on an incompatible operating system.

FluentControl uses Windows components, especially the .NET library. Please install the current .NET security and quality updates to prevent a negative impact on FluentControl.

Computer requirements

The minimum requirements to run FluentControl can be found in Chapter 4.1 Computer Requirements of the FluentControl 3.7 Manual. To guarantee a good performance, Tecan recommends using an Intel® Core™ i7 or equivalent processor. Scheduler applications require more computing power, and it is recommended to use an Intel® Core™ i9 or equivalent.

Since early 2022, all new Fluent instruments have DeckCheck camera(s) integrated in the chassis. DeckCheck commands may be integrated in methods to check prior to a run that the worktable has been set up correctly. DeckCheck can be disabled Configure System. DeckCheck does not work when using a separate graphics card, a graphics chip integrated into the processor must be used instead. The speed of the DeckCheck command execution depends on the PC hardware configuration.

Anti-virus software and FluentControl

Tecan recommends refraining from actively scanning hard drives or memory while a run is in progress in FluentControl. If a virus scan must be executed during a run, exclude (whitelist) the following directories and their subdirectories from the scan:

```
C:\Program Files (x86)\Tecan  
C:\Program Files (x86)\Common Files\Tecan  
C:\Program Files\Tecan  
C:\ProgramData\Tecan
```

User Administration Settings

In rare cases, the Login Settings and Password Settings in Settings > User Administration (Lock Time, Minimum password length, etc.) are reset to defaults during the upgrade. If the User Administration is used and settings have been customized, please note down or take a screenshot of those settings before upgrading.

DriverFramework & 3rd party drivers

Current versions of the DriverFramework only allows the use of drivers for which a license has been purchased. For questions about DriverFramework driver licenses, please contact your local helpdesk.

FluentControl 3.7 is compatible with DriverFramework 3.1.12 or higher. If DriverFramework 3.1.11 or lower is used, the License Manager will not find a valid license and FluentControl and its sub-drivers are only available in simulation mode (see DriverManager, show hidden drivers).

For certain 3rd party device models or firmware, a newer version of the DriverFramework may be needed. For SiLA2 drivers, and any other questions about drivers in FluentControl, please contact your local Tecan helpdesk.

Upgrade the DriverFramework before upgrading FluentControl. Upgrade the DriverFramework as follows:

1. Upgrade within the same DriverFramework series (e.g., 3.1.2 to 3.1.12): run the latest DriverFramework installer
2. Upgrade between series (e.g., 2.4 to 3.1.12):
 - a. Do not run the installer
 - b. Backup the file "C:\ProgramData\Tecan\DriverFramework\SystemConfig.ini" which contains all driver settings of the current installation
 - c. Un-Install the previous DriverFramework and remove the above file from the folder (keep your backup)
 - d. Install the new DriverFramework
 - e. Add each driver with the same name as before the upgrade
 - f. Consult the backup SystemConfig.ini for names and parameters
3. DriverFramework 3.1.12 or higher no longer allow the use of the dot (.) character in the driver module name. If drivers with such naming are present, uninstall the driver from FluentControl before upgrading. After upgrading, add the driver back without the dot (.) in the name and update any scripts accordingly.

FluentControl must always be started before launching the DriverFramework 3.2.x or lower, otherwise the driver license check will fail.

Before upgrading FluentControl, make sure that the latest versions of any 3rd party device drivers are installed.

Restore Points

Reverting to a restore point is not possible, if the restore point was created before an upgrade to FluentControl 3.7.

Upgrade procedure

When upgrading from FluentControl 2.2 or lower, uninstall FluentControl and run the FluentControl 3.7 installer. When upgrading from FluentControl 2.3 or higher, please upgrade as described below. It is not necessary to uninstall and reinstall FluentControl.

Logfiles of the upgrade process may be created by running the autorun.exe through MSIEXEC from the command line:

```
msiexec /i "D:\FluentControlMasterCD\AutoPlay\Install\Tecan  
FluentControl.msi" /L*VX "C:\Fluent_install.log"
```

Change the paths in italics as needed.

To upgrade FluentControl, follow these steps and reboot the computer whenever prompted to do so:

- a) Close FluentControl
- b) Execute the autorun.exe

- c) Execute installation steps in the following order:

Step 1: Pre-Installation

Step 2: Install FluentControl

FluentControl 3.7 executes a database cleanup step as part of the upgrade process, which may take some time.

Step 3: Post-Installation

(optional) Step 4: Install Sample Tracking

- d) Install the DisplayLink driver for the touch monitor from the 'Touch Screen Driver' folder. Please consult the ReadMe for the DisplayLink driver first.

After the installation or upgrade

A Tecan Field Service Engineer must open FluentSetup to perform any necessary firmware updates and service actions.

Open FluentControl and accept importing the updated labware definitions. This process may take some time to complete.

If activated, open User Administration and verify that the login and password settings are correct. If necessary, restore the previous settings.

Please check any scripts, processes and methods for validity and execute test runs.

3D Simulator instrument configuration

It is strongly recommended after installing FluentControl that the instrument's configuration is selected in *Settings > Configure System > Instrument configuration*. The instrument's configuration name is based on the serial number of the connected instrument:



If working with the 3D Simulator to develop methods for a specific instrument that is not connected to that PC, the instrument's configuration can be used. Copy the .config file *C:\ProgramData\Tecan\VisionX\InstrumentConfigurations* from the Fluent PC to the same folder on the PC not connected to the Fluent. Launch FluentControl and select the configuration in *Settings > Configure System > Instrument configuration*.

Registering the IoT client

Information on how to register the IoT Client can be found on the [Knowledge Portal](#).

The Tecan Connect app can be downloaded from the App Store and Google Play Store for Apple and Android devices respectively.

Touch monitor configuration

For more information on touch monitor configuration, refer to the ReadMe for DisplayLink driver in the Touch Screen Driver folder on the FluentControl installation medium.

After upgrade from FluentControl 2.5 or lower, Tecan Connect commands are not available

The Common Notification Service (CNS) was replaced by Tecan Connect in FluentControl 2.6. When upgrading from FluentControl 2.5 or lower to FluentControl 3.7, the CNS command remain available in the Controlbar and the Tecan Connect commands are not present. To resolve this issue, contact the local helpdesk.

2. Changes in FluentControl 3.7

The following changes have been made in FluentControl 3.7

- Compatibility with Windows 11 Enterprise (IoT) LTSC 2024
- Default liquid class 'Water Free Dispense' supports pressure based liquid level detection (pLLD)
- FCA and MCA smart commands support dynamic tip handling
- Updates to Transfer Phase command for the Phase Separator
 - New well attribute 'TransferPhaseResult' for source labware
 - Support of retry after initial liquid level detection does not detect any liquid
 - Support for defining tip re-use
 - Empty tip contents can now pipette back to source tubes and wells
 - New well attribute 'TransferredReplicateCountForTransferPhase' to store total number of achieved replicates per source tube
- Support for XY move during dispense ("spiral pipetting")
- Default pipetting path added to tube labware (13x100 and 16x100) for Aspirate/Dispense with XY Tracking ("spiral pipetting")
- 3D simulator supports MultiSense AirFCA and pLLD
- Improved robustness of (Air)FCA tip pickup procedure
- Scheduler:
 - support for defining process iteration by variable
 - improved timing constraint definition for individual labware
 - long running processes: skip automatic FluentControl restart on defined days of the week
 - long running processes: persist variables after automatic restart
- Support for Advanced Worklist feature
- Updated labware definitions of FCA 350µl DiTi and FCA 1000µl Wide Bore DiTi
- Enhanced software support for Resolvex i300
- FluentAPI supports arrays and querying labware type
- Compatibility with SiLA2 Client (driver) v2.3 and SPARKControl Magellan 3.2 SP1
- Integration of IoT Client 3.0 and TeMotion II v4.1.1 firmware
- Bug fixes and improvements

See Revision History FluentControl 3.7 for a complete list of bug fixes and changes. See FluentControl Manual for more information on software functions.

Updated labware definitions of FCA 350µl DiTi and FCA 1000µl Wide Bore DiTi

To ensure that the definitions reflect the correct physical dimensions of the tips, we updated the following read-only (default) tip labware definitions in FluentControl 3.7:

- FCA 350µl DiTi: Mount offset changed from 13.70mm to 12.93mm (reduced by 0.77mm)
- FCA 1000µl Wide Bore DiTi: Mount offset changed from 13.70mm to 13.14mm (reduced by 0.56mm)

Important for upgrades from previous FluentControl versions: if a workaround (e.g., adjusting carrier or labware offsets) was used for this labware, it may be necessary to re-teach the carrier or labware to align with the updated definitions.

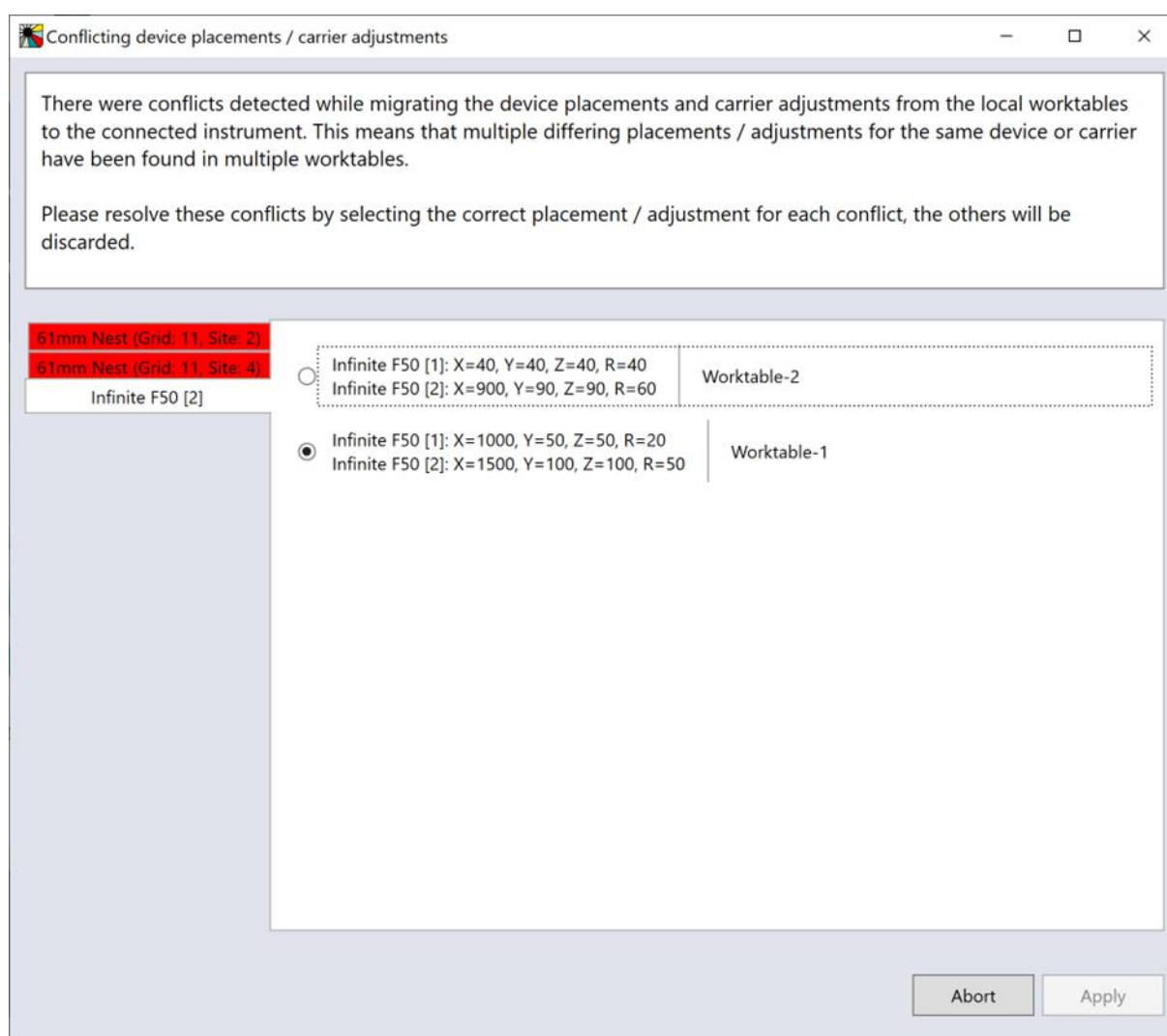
Device placements and carrier site adjustments are stored on the instrument

Since FluentControl 3.6, the placement (teaching) values of non-grid-based devices, such as a centrifuge or a HydroFlex washer, are stored on the instrument's Te-Control board in the LocationCorrection.config file. Adjustments to carrier sites are stored on the instrument as well. When a computer running FluentControl 3.6 or higher is connected to an instrument, the values stored on the instrument are automatically compared to the values in the FluentControl database on the PC. If there are any discrepancies, the FluentControl database is updated with the values from the instrument.

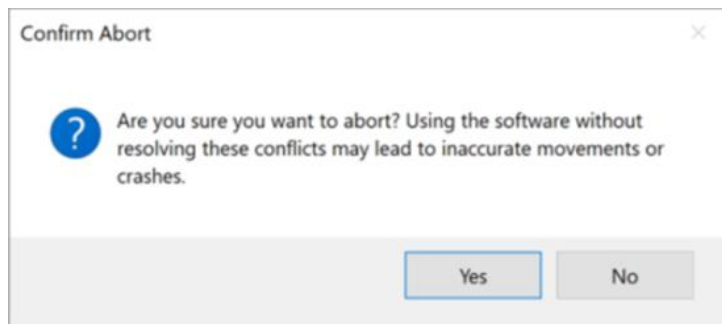
What happens when I upgrade from FluentControl 3.5 or lower to FluentControl 3.7?

After the upgrade, the device placement and carrier site adjustment values from the FluentControl database are uploaded to the instrument. This happens when FluentControl or FluentSetup, whichever is used first, are connected to an instrument which has no LocationCorrection.config file on its Te-Control board. Before the upload, a restore point is created.

On systems with many (old) worktables in the FluentControl database, it can happen that the same device does not have identical placement values across all worktables. FluentControl 3.7 detects these discrepancies during the upgrade process and allows you to select the worktable with the correct placement values or site adjustment values for each device or carrier:



It is possible to abort this dialog so that the worktables on the system can be reviewed to determine which ones contain the correct device placement values. Note that while the upload process is not fully completed, the software should not be used beyond inspecting the worktables. To continue the upload process, FluentControl must be restarted.



What happens when I upgrade from FluentControl 3.6 to FluentControl 3.7?

FluentControl 3.6 was the first FluentControl version that could store the device placement values on the Te-Control. Upgrading to FluentControl 3.7 will not change the values stored in the LocationCorrection.config file or the FluentControl database.

Some systems with a 3rd party device will have had to use a workaround in FluentControl 3.6 to achieve correct placement. An offset of 80mm had to be subtracted from the y-coordinate. This 80mm offset will have to be manually re-added in FluentControl 3.7, as the workaround is no longer needed.

What happens when I connect a computer running FluentControl 3.7 to an instrument that already has device placement and carrier site adjustment values stored?

The values from the instrument will be downloaded to the computer and updated in the FluentControl database.

What happens when I import a .ZEIA file into FluentControl 3.7 and I am connected / then connect to an instrument that already has device placement and carrier site adjustment values stored?

The values from the instrument will be downloaded to the computer and updated in the FluentControl database.

At which point during teaching are teaching values uploaded to the instrument? How can I update the placement or adjustment values on the instrument?

1. By adding a device to the worktable and saving the Adjustment values in the Placement tab of the carrier definition. See also Fig. 1. Below.
2. By adjusting a carrier site on a worktable, either via the carrier definition or the labware definition editors. See also Fig. 2 and Fig. 3 below.

Placement

Robot: [Dropdown]

Labware for teaching: 96 Well Flat [Dropdown]

Site to teach: Site 1 [Dropdown]

Grip position: [Diagram of robot arm with red dot]

Adjustment: X: 24.41, Y: -71.78, Z: 83, °: 0

[Transfer] [Save]

Fig. 1. Non-grid-based devices are taught using the Placement section of the device carrier definition. These values are stored on the instrument.

Robot Vectors

Carrier currently selected for teaching: 9 Nest Hotel[001]
RGA 1 is currently selected in the Move Tool.

Location: HotelMP_Pos [Dropdown] Position: Site 1 [Dropdown] Vector: Narrow [Dropdown]

Robot: RGA 1 [Dropdown]

Adjustment: X: 0, Y: 0, Z: 0 [mm] [Show delta] [Save]

☒ Site definition in carrier template
☐ Individual position of location in this workspace

The adjustment only affects the site currently selected for teaching.
Site adjustments in the carrier template will only be effective in this workspace after saving.

Define Coordinates


X [mm]	Abs	Y [mm]	Abs	Z [mm]	Abs	Rotation Z [°]	Abs
872.0	<input type="checkbox"/>	492.9	<input type="checkbox"/>	249.5	<input type="checkbox"/>	90.0	<input type="checkbox"/>
872.0	<input type="checkbox"/>	670.5	<input type="checkbox"/>	249.5	<input type="checkbox"/>	90.0	<input type="checkbox"/>
872.0	<input type="checkbox"/>	670.5	<input type="checkbox"/>	244.5	<input type="checkbox"/>	90.0	<input type="checkbox"/>

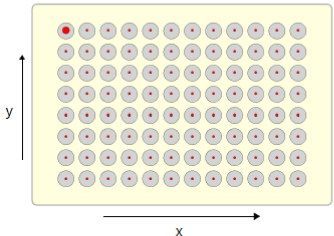
Fig. 2. Site-specific adjustments to carriers are stored on the instrument when the radio button 'Individual position of location in this workspace' is chosen.

Labware currently selected for teaching: 96 Well Flat[001]
Arm currently selected for teaching: RGA 1

Current compartment

Pipetting positions All values are specified in [mm].

	X	Y		
(position #1)	14.38	74.24		<< Transfer
(position #96)	113.38	11.24		<< Transfer



(adjustment) X: Y: Z:

The adjustment only affects the site hosting the currently selected labware.

Z-Coordinates







Z-Travel		22.40		<< Transfer
Z-Start		14.30		<< Transfer
Z-Dispense		12.40		<< Transfer
Z-Max		4.00		<< Transfer
Z-Bottom		3.50		<< Transfer

Fig. 3. Site-specific adjustments to carriers can also be made via the labware editor. These values are stored on the instrument.

FCA and MCA commands support dynamic tip handling

Dynamic tip handling allows the user to define one tip type per volume range. The software automatically mounts the correct tip type according to the volume to be pipetted.

When the Dynamic Tip Handling checkbox is checked, a string specifying the tip types per volume range can be entered. For example:

20:FCA DiTi 50µl Filtered;80:FCA DiTi 200µl;

This string is interpreted by FluentControl as: for volumes less or equal to 20 µl, the tip type is FCA DiTi 50µl Filtered; for volumes between 20 µl and 80 µl, tip type is FCA DiTi 200µl. For volumes larger than 80 µl, the default tip type, defined in the drop-down list, shall be used.

The following commands support dynamic tip handling: Load Worklist (including for R; and T; records), Sample Transfer, Reagent Distribution, Standard Curve, Transfer Individual Volumes, MCA96 Transfer Liquid and MCA384 Transfer Liquid.

MCA Transfer Liquid

MCA96 1 25 µl; MCA Liquid Transfer Tip Mix
Source: 96 Well Flat[001]; Destination: 96 Well Flat[002]; Samples

Title

Volume [µl]
25

Tip Type
MCA96, 1000ul Filtered SBS

☒ Dynamic Tip Handling
*20:MCA96 DITI 50µl Filtered;80

Tip Waste
MCA Thru Deck Waste Chute_1

Liquid Class
MCA Liquid Transfer Tip Mix

Number of Samples
1

Advanced
☐ Tip Touch after Dispense
☐ Keep tips mounted
 Arm Parking Position

96 Well Flat[001] 96 Well Flat[002]

Advanced
☐ Mix before Aspirate
 Mix Volume [µl]
 Mix Cycles

Advanced
☐ Mix after Dispense
 Mix Volume [µl]
 Mix Cycles

Scheduler enhancements for long running processes – using Tasks

FluentControl 3.7 enables more control over when the automatic restart of FluentControl is performed. A TWL file can be used to define the time and day(s) when the software shall restart. To allow the restarts on Mondays and Thursdays at 10:30 am, the TWL syntax should be:

R, 10:30, 1, 4

In previous FluentControl versions, the values of any variables with scope 'Run' reverted to their defaults after the automatic restart of the application. In FluentControl 3.7 it is possible to select which variables of scope 'Run' shall retain their values even after the software restarts. For this purpose, the Persist checkbox was introduced in the Variables section:

Script Name Manual1 Rename Expected Runtime 0 : 20 : 0 [hh:mm:ss] Comment

Variables

Name	Type	Value	Scope	Persist	Read only	Query at startup	Query text
Var1	String	abc	Parameter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Var2	String	def	Iteration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Var3	Integer	0	Parameter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Var4	Floating Point	1.1	Run	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			Script	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

XY move during dispense

The new liquid class Microscript command 'Dispense Liquid with XYTracking' can be used to perform synchronous movements of the pipetting channels in x, y and z. The behavior mirrors that of 'Aspirate Liquid with XYTracking' and both commands use the x, y coordinates defined in the labware attribute 'XYTrackingSequence'. Tubes 13x100 and 16x100 have been updated with a default 'spiral' set of x,y coordinates stored in that labware attribute.

Dispense Liquid with XYTracking

dispenseVolume µl dispenseSpeed µl/s 0
dispenseAcceleration µl/s² dispenseDeceleration µl/s²

Liquid Volume [µl] dispenseVolume

Dispense Acceleration [µl/s²] dispenseAcceleration

Dispense Speed [µl/s] dispenseSpeed

Dispense Deceleration [µl/s²] dispenseDeceleration

Use Tracking dispenseTrackingOnOff

Pulse Volume [µl] 0

Pulse Acceleration [µl/s²] dispenseAcceleration

Pulse Speed [µl/s] dispenseSpeed

Pulse Deceleration [µl/s²] dispenseDeceleration

Custom Attributes		
Attribute Name	Data Type	Attribute Value
CldSensitivityCalculationLabware	String	Tube
Grasp_location_N	3D Vector	0,0,25 [mm]
Grasp_location_W	3D Vector	0,0,25 [mm]
MapTemplateName	String	Tube 16x100mm
XYTrackingSequence	String	"(0,0),(-1.2,-1.2),(-1.2,1.2),(1.2,1.2),(1.2,-1.2),(0,-3.6)" (x1,y1), (x2, y2), ..
WorkspaceDeltaLevel	Integer	-1

Enhanced software support for i300 (PWI 125924)

FluentControl 3.7 includes many improvements to the integration of the Resolvex i300. For those using the device in FluentControl 3.6 and upgrading to FluentControl 3.7, it is important to open each i300 script and re-save it again, before starting any runs. This updates the referenced liquid classes.

Transfer Phase command for the Phase Separator

The Transfer Phase command simplifies programming a Phase Separator workflow. The minimum and / or desired replicate volume and number of replicates that should be pipetted from the upper phase can be defined. The liquid is transferred into the destination labware according to the settings in the command and the liquid class, such that the liquid-liquid separation layer remains undisturbed. Automated error handling is supported and can be configured in the liquid class. A default single pipetting Phase Separator liquid class, which can be used with 1000 µl tips and tube labware, is available in FluentControl.

On request, a template single liquid class for use with 200 and 1000 µl tips and tube and plate labware, as well as a template multi pipetting liquid class can be provided.

003

Transfer Phase

FCA 1, 200 Phase Separator Plasma Free Multi
Source: 1x24 16mm Tubes 100mm barcode[001] A1 - H1 -> Destination: 1x16 15ml Falcon Tube Runner[001] A1 - P1 3

Title

Replicate Volume [µl]
200

Minimum Replicate Volume [µl]
Optional

Tip Type
FCA, 1000ul Filtered

Tip Waste
FCA Thru Deck Waste Chute_1

Advanced
Safety distance to separation layer [mm]
5
☐ Ends when separation layer detected

Overview

Source
1x24 16mm Tubes 100mm barcode[001]

Destination
1x16 15ml Falcon Tube Runner[001]

Advanced
Well Offset
0
X-Offset
0
Y-Offset
0
Expected Separation Layer Range [%]
0
40

Advanced
Well Offset
0
X-Offset
0
Y-Offset
0

Liquid Class
Phase Separator Plasma Free Multi

Number of Replicates
3

Replicates Direction

Advanced
Max Tip Reuse
1

Tip Selection
Optional
0

Tip Offset
0

Airgap Volume [µl]
20

Airgap Speed [µl/s]
61

EmptyTipContent Liquid Class
Empty Tip

EmptyTipContent Labware
1x16 15ml Falcon Tube Runner[001]

3. Additional Information

Deprecated commands removed

The deprecated commands Dilution, Normalization, Store Standard Curve and Load Standard Curve have been removed. The (In Situ) Normalization Calculation and Transfer Individual Volumes commands must be used instead.

When scripts using the deprecated commands are imported, they are replaced with placeholder commands and an error prompt is shown. Such scripts can be opened and edited.

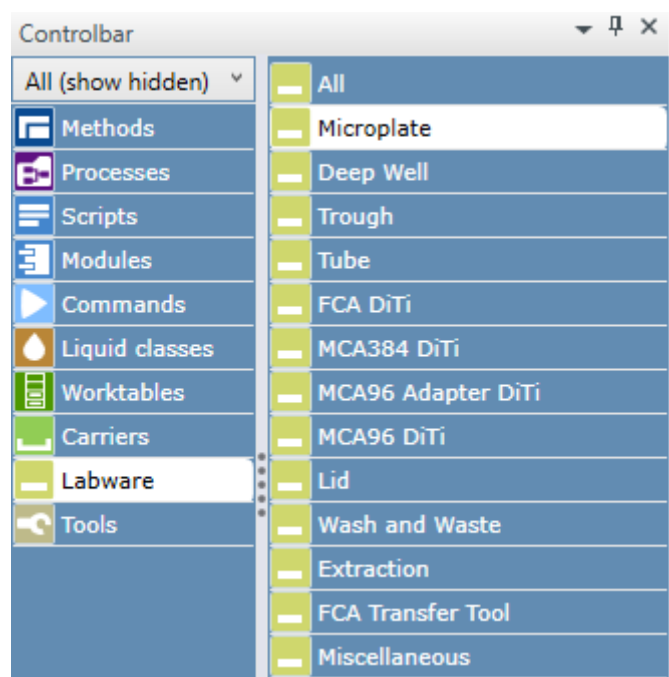
MCA384 Get Tips and MCA384 Drop Tips commands renamed, new MCA384 Get Tips and MCA384 Drop Tips commands

The MCA384 “*Get Tips*” and MCA384 “*Drop Tips*” commands have been renamed to MCA384 “*Pick Up Tips*” and MCA384 “*Set Tips Back*” to align with the behavior of the equivalent FCA commands. The “*Pick Up Tips*” / “*Set Tips Back*” commands can be used to define from which labware specific tips are to be mounted or where they are to be dropped again. When the “*Get Tips*” command is used, FluentControl automatically determines where the next available tips are.

Scripts, processes, or methods from older FluentControl versions are automatically updated with the new command names during the upgrade or import process. No manual changes to scripts, processes or methods are needed.

Disposable Tip labware definitions in the Controlbar

Since the introduction of the MCA96 arm on the Fluent, some DiTi labware definitions have moved to different subsections of the Labware menu in the Controlbar. The *MCA96 DiTi* section contains tip definitions for the MCA96 arm. The *MCA96 Adapter DiTi* section contains tip definitions for the MCA384 with a 96 tip adapter mounted.



FCA and MCA96 use the same disposable tips

The MCA96 and the FCA use identical disposable tips. However, for correct tip pickup, the arms require unique settings in the tip labware definitions. In FluentControl, distinct disposable tip labware must be placed on the virtual worktable for each of the arm types. It is therefore not possible for both arms to use the same tip box. The MCA96 disposable tip labware can be found in the *Labware > MCA96 DiTi* section of the Controlbar, and the FCA disposable tip labware can be found in the *Labware > FCA DiTi* section.

Carrier definitions of 480/780/1080 Base Unit updated and read-only

In FluentControl 3.7, the carrier site definitions of the Base Units have been updated and the definitions are now read-only. This resolves an issue in previous FluentControl versions, where adding certain carriers to certain grid segments to the worktable caused site numbering across the worktable to change. Affected carriers were:

- SideSegmentGridRight
 - 2 Grid Right 147mm / 87mm
 - 4 Landscape 7mm Nest Right
 - Landscape Nest Base Segment Right
- SideExtensionSiteRight
 - 1080/780/480 Extension Right
 - 300 Shelf Right

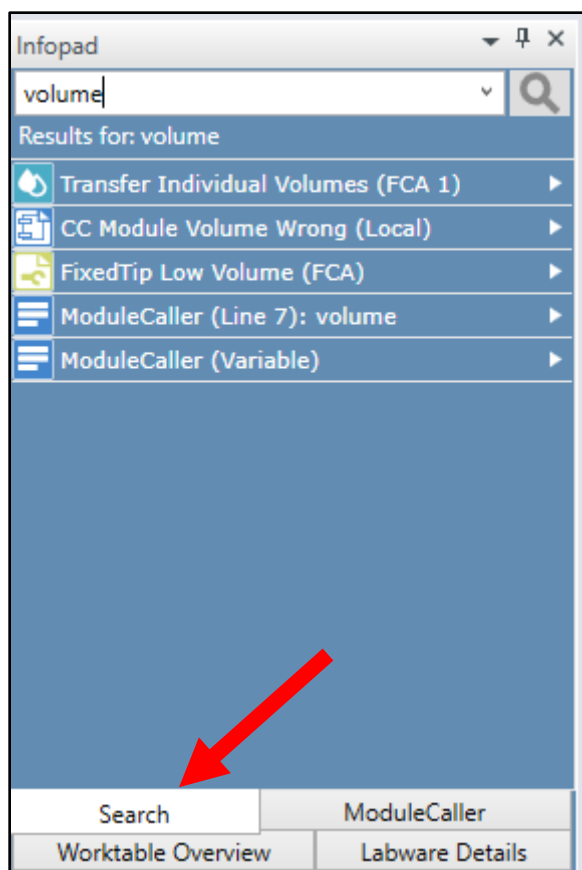
Base Unit definitions will be automatically updated after the software is upgraded. If site numbering in existing methods is affected by the upgrade, and updating the methods (recommended) is not possible, simply import the Base Unit definitions of the old FluentControl version.

Online Help

When FluentControl is in edit mode, pressing the <F1> key will open the Online Help. The section relevant to the selected or displayed GUI elements will be shown. Online Help content is identical to the FluentControl Manual.

Search function

FluentControl has a search function in the Infopad. Search results have the same drag and drop behavior as Controlbar elements. The search is active in all currently open Scripts, Modules and the Controlbar.



OLEG log viewer tool

FluentControl 3.7 installs the OLEG log viewer tool as well as the Log Viewer tool installed by previous versions of FluentControl. These tools are designed to analyze instrument log files for troubleshooting purposes. The OLEG log viewer has a built-in Help function, through which its software manual can be accessed.

Liquid classes created in FluentControl 3.7 cannot be used in FluentControl 3.2 or lower

To enable the Pressure Monitored Pipetting AI (PMP AI) and the Phase Separator features, a new hardware module on the FCA called MultiSense is supported since FluentControl 3.3. In the liquid class section Detection & Positioning, a new cLLD Sensitivity Group setting called 'MultiSense' has been added. MultiSense arms do not require the cLLD Sensitivity Group to be set to 'Low', 'Medium', or 'High' – the setting 'MultiSense' is used for all liquids. This change means that Liquid classes created in FluentControl 3.7 cannot be used in FluentControl 3.2 or lower.

Driver version mismatch between Windows and FluentControl

In Windows 'Add or remove programs', the version of the driver's DLL file is displayed. This is the actual version of the driver. In FluentControl Configure System > Drivers > Available Drivers the version of the driver's EXE file is displayed in the Version column, which does not (always) correspond to the actual version of the driver.

Teaching Nests next to MCA Thru Deck Waste Chute

Accessing the nests next to the MCA Thru Deck Waste Chute with the RGA in narrow orientation is not possible with the default vectors. If access is required, please duplicate the nests, and teach a custom vector. Z-travel should be taught higher than the Waste Chute to avoid Pathfinder errors.

When duplicating a manufactured labware item the custom attribute “ToolIDName” needs to be manually re-added

The custom attribute “ToolIDName” must be unique. When duplicating a manufactured labware item, for example disposable tips, this attribute is automatically removed. If a “ToolIDName” is not manually re-added, the context check error “Invalid DiTi labware selected. ToolType and ToolIDName Custom Attributes must be set.” is shown if the item is used in a script.

FluentControl Scheduler: exporting reference files for Processes and for Carousel command

Processes created in FluentControl 3.3 or lower and using the “Assign labware by barcode file” feature must be opened in FluentControl 3.7 and saved again. Otherwise, the barcode file(s) referenced will not be included when exporting the Process with dependencies. The same applies for scripts or processes which use the “LoadBCFromFile” command for the Fluent Carousel or Cytomat.

Trough dimensions and cLLD volume detection

Depending on the manufacturer of the labware, the dimensions of trough labware in FluentControl (for example the “300ml SBS” trough) may need finetuning so that the detected volume reflects the actual volume within the labware. Please refer to the manufacturer dimension specification of the inside of the trough to modify the labware definition in FluentControl.

Repair installation no longer available

In previous FluentControl versions, it was possible to execute a repair of the installation. This feature has been removed. To repair issues with an installation, simply uninstall and reinstall the software instead. For help with FluentControl issues, please contact the local helpdesk.

Touch monitor content shown on main monitor if instrument is disconnected or turned off

If the PC loses connection to the Fluent, for example if it is powered off or the USB cable is disconnected, the touch monitor content is displayed on the main monitor.

The easiest solution is to turn on the instrument, verify the USB connection, and restart FluentControl. The fastest solution is to turn on the instrument and change a setting in Settings > Configure System > Drivers > TouchTools (e.g., de-select and re-select Use Full Screen checkbox).

Microsoft Remote Desktop Protocol (RDP)

Tecan sporadically receives reports of issues when using RDP with FluentControl. FluentControl was not tested with Microsoft Remote Desktop Protocol (RDP) and compatibility is not guaranteed. Issues such as FluentControl crashes caused by using RDP will not be analyzed and resolved by Tecan product support.

Detection & Positioning during dispense: ‘Z Offset’ behavior and user interface update

In previous FluentControl versions, when liquid level detection was selected, any Z Offset value defined in the ‘Detection & Positioning’ section of the liquid class was added to the submerge depth, even though that input field was greyed out. In current FluentControl versions, Z Offset values are not taken into consideration when liquid level detection is used. The user interface was updated to clarify this behavior:

Pre-FluentControl 3.5 user interface

Detection & Positioning
based on Tip Type

Liquid Level Detection

Liquid Level Detection
cLLD

cLLD Sensitivity Group
Medium conductivity liquid
Detect

Submerge
1
[mm]

Z Position
Z Max

Z Offset
5
[mm]



FluentControl 3.5 and higher user interface

Detection & Positioning
based on Tip Type

Liquid Level Detection

Liquid Level Detection
None

cLLD Sensitivity Group
Medium conductivity liquid
Detect

LLD Submerge
0
[mm]

No LLD Z Position
Z Dispense

No LLD Z Offset
0
[mm]



Pressure Monitored Pipetting AI cannot be used together with the Phase Separator commands

The PMP AI algorithms have not been trained to evaluate the pressure profiles resulting from executing the Phase Separator workflows. To avoid run time errors, do not switch on PMP AI when running a Phase Separator method.

4. Compliance Features

This section contains a brief overview of some of the features that FluentControl offers to support compliant usage.

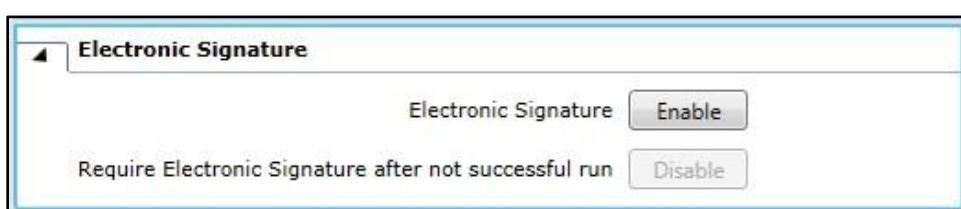
Audit Trail

Changes to all data objects, user logins and logouts, runs status, errors, changes to variables, and more are logged in the Audit Trail. By default, Audit Trail .csv files are saved in:

C:\ProgramData\Tecan\VisionX\AuditTrail

Electronic Signatures (requires Fluent Gx Assurance Software license)

Electronic signatures must be used in combination with User Administration. Enable this feature in Settings > User Administration.



Reason and user credentials must be given upon saving any changes in FluentControl. The input will be saved in the Audit Trail.

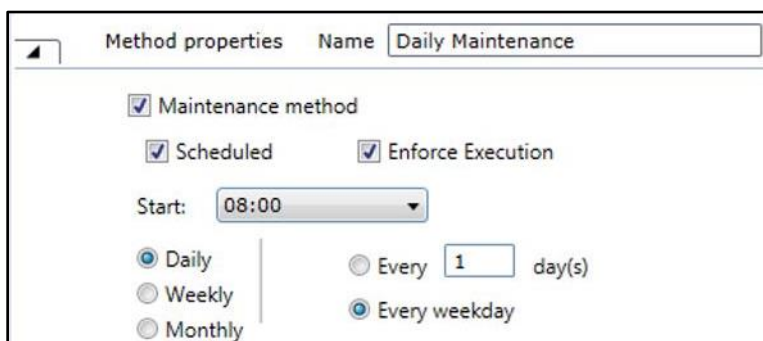
Data Audit Tool (requires Fluent Gx Assurance Software license)

This tool can be opened via the Start menu. It verifies the electronic records for a given date range, including validity of all database files, validity of all Audit Trail logs, no presence of unexpected files and no missing files.

It also enables the export of the human readable files (.xml formatted checksum protected text files) to a single directory. This export can be used for an audit or for backup and archival purposes. Please note that this is an intensive check and may take a few minutes to execute.

Scheduled and Enforced System Care Methods

In the Method Editor, methods may be scheduled based on calendar events, like a recurring meeting in Outlook. If a scheduled, enforced method is due, no other methods can be executed until it has been run.



5. Known issues in FluentControl 3.7

This section contains information about known issues and guidance on avoiding or handling them. If issues not described here are encountered, please contact the local helpdesk.

Opening FluentControl Manual from FluentControl Installer window can cause a software crash (PWI 127253)

An issue in Adobe Acrobat Reader can lead to the autorun FluentControl Installer to crash if the FluentControl Manual is opened via the button in that window. When this happens, the Adobe Acrobat Reader installation can become corrupted. If Microsoft Edge is defined as the default PDF reader, the issue does not occur.

Device carrier definitions that are duplicated in FluentControl 3.7 cannot be taught (PWI 126124)

When a device carrier definition is duplicated in FluentControl 3.7, the attribute MapTemplateName is identical for the original as well as the copy. When teaching the placements of these devices, only the placements of the device taught last is retained in the software. To prevent the issue, edit the attribute MapTemplateName of the copy and set it to something different from the original carrier.

Device carrier definitions that were duplicated in a previous FluentControl version are not affected.

3D Simulator cannot simulate Transfer Phase command using a liquid class with liquid level detection for dispense (PWI 125267)

To simulate a method using the Transfer Phase command with the 3D Simulator, switch off cLLD for Dispense in the liquid class used by the command. The liquid class 'Phase Separator Contact Wet' is used by default.

After upgrading FluentControl, worktable items using customized mesh (x3d) files can become invisible (PWI 127152)

The FluentControl upgrade process can currently not handle mesh (x3d) files with the same name but different contents. If custom mesh files were used in FluentControl and they have the same file names as the default mesh files, the items become invisible on the worktable after an upgrade. To prevent or correct the issue, give the mesh file a unique name before or after upgrading FluentControl.

FluentAPI expression resolver cannot handle some FluentControl functions (PWI 120544)

Some functions that work as expected in FluentControl return an empty string when called via the FluentAPI. Functions ScriptName(), ProcessName(), WorktableName() and potentially others are affected. A workaround is to save the output of the desired function via the FluentControl script as a variable with scope 'run' and query this variable using the FluentAPI.

Scheduler: FluentControl crashes when Process that becomes due needs variable of scope run but the variable is not defined (PWI 127359)

The workaround for this issue is to make sure that the required variables are defined before the Process becomes due, or defined within the Process that becomes due.

Scheduler: Create Task command cannot resolve expressions and does not support leading zeros of labware indices (PWI 126803)

The Create Task command supports the use of variables in its parameter field, but currently cannot resolve expressions like 'AssayPlate["+index+"]' directly. It currently does not support auto-completing leading zeros of labware indices either. A helper variable must be assigned instead, for example 'AssayPlate[00"+index+"]', which can then be used in the Create Task parameter fields.

Te-Chrom script command changes do not trigger 'save' button to become active (PWI 126496)

When a Te-Chrom command is used within an If-Else branch that is not considered by the context check, i.e., an orange dot at the script line, FluentControl does not detect any changes to the command's parameters. The save button does not become active and closing the script without saving will undo any changes made. As a workaround, the Te-Chrom command can be moved to a location where context check reaches it (e.g. line 1) and then, after the desired changes are made, moved back into the If-Else branch.

Method approval does not flag Methods as not-released when liquid class, carrier or labware settings have been changed (PWI 127090)

When settings of liquid classes, carriers or labware used by an approved Method are changed, FluentControl does not indicate that the Method is no longer approved by showing a red square on the Method's name. Operators are still prevented from running such Methods until they are re-released.

Runtime Error for 7mm Nest when 10ul or short 50ul tips mounted on MCA96 (PWI 118380)

During script edit time there will be no context check error when these tips are used for pipetting with an MCA96 on a microplate located on a 7mm nest. The user will only get an error during runtime that pipetting with these tips is not possible.

Default liquid class "*Whole Blood Pierce Single*" is only verified for use with 200 µl (PWI 115350)

The default liquid class "*Whole Blood Pierce Single*" is verified for use with a volume of 200 µl. When using it with lower or higher volumes, the trailing air gap (TAG) is aspirated but not dispensed. The liquid class' MicroScript must be adapted when using it with volumes higher or lower than 200 µl. Default Liquid class "*Whole Blood Pierce Multi*" can be used with all volumes defined in that liquid class.

Additional known issues

Below are additional issues that may be encountered. Fixed issues will be listed in the Revision History of future versions of FluentControl. PWI = Project Work Item.

PWI	Title
113950	[Scheduler] Trace View message is shown to switch into task mode although the switch is done automatically
114596	[Scheduler] Freeze after fatal error by transfer labware
118374	[Scheduler] Missing FluentControl Scheduler logs when Automated DiTi Handling cannot be executed
118663	FluentControl and FluentSetup cannot start after upgrade from 3.1 to 3.4 or later, with an MCA96 connected
121351	Last dispense of multi-dispense runs out of liquid and target volume is reduced to available volume but Sample Tracking reports a higher volume than was dispensed
121537	Tip contents not removed on SW side when tip is dropped by Air FCA or Liquid FCA

122528	FluentControl crashes during Method Recovery when files required by Method are missing
122979	Open script via FC command line parameter -script results in context-check errors that aren't present when opening that script manually
122979	Vector Teaching in Carriers: "Move arm to" buttons not working
123402	Convert CSV to GWL command does not recognize variable at parameter 'Stop with line'
123430	Manual Restart required after configuring SiLA2 commands
123445	After last Nested FCA Tip is fetched there is an empty error message Replace Used DiTi Rack
124113	Labware not displayed after expanding command
124235	"Find and Replace Arm" does not work for FCA Transfer Labware command
124303	Arm positions for DeckCheck image capture: RGA rotation is not taken into account
124343	Pressing stop button after manually pausing the run does not stop the run when journalling is disabled
124733	[Usability] FluentControl crashes when clicking Login button on TouchTools before logging in
124877	Sometimes the Snapshot tool does not include the latest log
125248	[i300] Evaporator manifold tracking fails if profile execution moves manifold bottom to top
125257	[i300] FluentControl crashes if an unexpected manifold ID string is reported
125275	Too much in plunger error message at Wash with 5ml syringes
125311	[i300] Evaporate Recording: Target Temperature is showing as -2 initially
125373	[i300] Initialization fails after Fluent Control restart
125377	Liquid Class with 0uL/s aspirate and dispense speed causes FluentControl to crash
125400	Dispense Command well selection not working properly when non-grid based device rotated by degree values with decimals
125401	Fluent Control crashes after a path with Excel file was set, but Excel is not installed
125449	[i300] Manual input of pressure should be limited (max 5.5 bar, and final entry with low pressure) input is parsed correct, time duration is minimum 1
125453	[i300] Evaporator flow is not monitored during heat-up
125454	[i300] Bubble Sensor generates warning instead of error
125538	[i300] Recovery and followup after Z Move fast stop during Evaporate Recording
125543	[i300] 100ml Trough (on i300 segment) Z-Max cannot be reached by air FCA with 50ul DiTi tip
125596	[Scheduler] Additional resource "FCA {0}" is displayed in Gantt Chart if Variable Pipetting Loop command is used in the Process
125627	Wait script command creates wrong recovery point
125761	[i300] Visibility of Lifetime of i300 instrument in Introspect/Ignite
125884	[i300] Sample Tracking Report does not include bubble sensor error/warning
126124	Device placement for devices duplicated in FluentControl 3.7 not working
126369	[PhaseSeparator] Sometimes FluentControl freezes when Transfer Phase command has deep well plate as the source labware
126496	Te-Chrom command changes not detected if the script line is not reached by context-check
126731	[Scheduler] Continuous Loading via Add button in TouchTools leads to invalid expression error for variable of scope iteration
126800	When EVA Adapter tries to pick up incorrect tips (for MCA96) the context-check message text presented is not relevant

126803	[Scheduler] Create Task command cannot resolve expressions like other script commands
126846	[Performance] FC gets unresponsive during "Simulating transfer labware movement".
126877	Aspirate step leads to "Specified Cast is not valid" error and run abort
127090	Method Approval does not flag methods for re-release when liquid class or labware settings are edited
127143	FluentControl deadlock when stopping run during FluentID StartLoading command
127152	After upgrading FluentControl worktable items with customized mesh (x3d) files become invisible
127174	Tracking at Dispense moves up and down when Z-max is close to Z-bottom
127280	FluentControl becomes not responding when try to open Settings in Menu
127325	FluentControl crashes when trying to delete Process copied to another folder
127359	[Scheduler] FluentControl crashes when due process has undefined run scope variable
127417	During FluentID scan the message 'See the touch interface for instructions' appears on the touch monitor instead of the main monitor
127475	[i300] XE Pump 3 Way Valve blockage not recognized by SW
127516	Touchtools shows previous XAML progress bar after different XAML
127533	[Scheduler] In rare cases, Traceview Process iteration array count incorrect after FluentControl restart
127618	Pressing save button in robot vectors in carrier editor without making any adjustments to the carrier does not show error message.
127671	Error message unclear for AirFCA "Specific argument was out of range of valid values Parameter name: volume" when pipetting more than one channel
127697	FCA MoveArm command is not splitting up move when needed Y spread is not possible
127740	RGA crash into FCA during Transfer Labware at execution of TeChrom SmartCommand

6. FluentSetup 3.7

After upgrade from FluentControl 2.8 or older to FluentControl 3.7, QC action “Gripper Alignment” needs to be re-executed

Due to a change in the RGA initialization procedure in FluentControl 3.0, the RGA rotational axis may have a small deviation of around 3-4° in its position. Therefore, the QC action “Gripper Alignment” needs to be re-executed to set this offset back to 0. A Tecan Field Service Engineer must perform this intervention.

Execution of DeckCheck Setup cannot be executed twice in a row (ID 110011)

This issue occurs sporadically and can be resolved by restarting FluentSetup and executing DeckCheck Setup again.

Z-break test cannot be executed for second RGA (ID 121747)

When the Z-break test for the second RGA is started on a dual RGA instrument, the test is not executed and an ‘Value cannot be null’ error message is displayed. Two workarounds have been identified:

- Use a clean installation where the folder "DataBase\SystemSpecific\Worktable\Components" is empty before running the installer
- Import the Full Export Database.zeia file which is found on the MasterMedia to overwrite older labware items

RGA might collide with Resolvex i300 during Random Move Test (ID 124979)

To avoid a collision of the RGA with the Resolvex i300, remove the i300 from the worktable before executing the Random Move Test.

7. Appendix: overview of changes in recent FluentControl releases

The following changes have been made in FluentControl 3.6

- New Transfer Phase command for the Phase Separator
- New integrated driver for the Brooks PreciseFlex 400 robotic arm
- New pooling feature in the Sample Transfer smart command
- New FluentAPI support for DeckCheck
- New Email notifications feature
- New Capture Worktable command for DeckCheck
- New Script for Loading Guide feature
- New Device placements and carrier site adjustments are stored on the instrument
- System liquid can now be dispensed via Worklists (Liquid FCA only)
- Te-Chrom smart command supports gradient collection workflow
- Scheduler support of 0 Process iterations
- Software support for 2 RGA on one Fluent (dual RGA)
- Enhanced software support for Resolvex i300
- New Optimized Log Extractor G (OLEG) log file viewer tool
- Bug fixes and improvements

The following changes have been made in FluentControl 3.5

- Snapshot Tool enhancements
- Scheduler enhancements
- Support for pressure based liquid level detection (pLLD) for MultiSense AirFCA
- Support for XY move during aspirate
- Support for dual RGA (available via Labwerx)
- Support for i300
- Integration of IoT Client V2.7
- New instrument worktable layer
- Bug fixes and improvements

The following changes have been made in FluentControl 3.4

- Software support for new MCA96 arm
- New MCA96 Transfer Liquid smart commands
- Updated Te-Chrom smart command
- Software support for new MultiSense board for AirFCA
- Software support for new Phase Separator
- FluentSetup: new firmware TeMotion I V1.10.0.11416, TeMotion II V3.3, and TeGIO II V1.1.0-0-g8e1cb3550
- User Management System (UMS) version 1.1.13 integration
- DisplayLink USB Graphics Software for Windows V11.0 M0
- Sample Tracking 1.4 SP2
- SPARKControl Magellan 3.2 fixes issue with automation interface

The following changes have been made in FluentControl 3.3

- Windows 10 Enterprise LTSC 2019 (1809) and Windows 10 Enterprise LTSC 2021 (version 21H2) compatibility
- Software support for new MCA96 arm

- MCA384 Get Tips and MCA384 Drop Tips commands have been renamed to MCA384 Pick Up Tips and MCA384 Set Tips Back
- New MCA384 Get Tips and MCA384 Drop Tips commands
- New MCA Transfer Liquid smart command for MCA384 with EVA adapter
- New Te-Chrom smart command
- Software support for new MultiSense board for AirFCA
- Software support for new Phase Separator
- Delay command only available for MicroScript
- Removed possibility to run a repair installation
- FluentSetup: new firmware TeMotion I V1.10, TeMotion II V3.1.2 and UniBootloader II V1.3.1
- IoT Client 2.6 integration
- User Management System (UMS) version 1.1.13 integration

The following changes have been made in FluentControl 3.2

- Windows 10 Enterprise LTSC 2021 (version 21H2) compatibility
- FCA Y-spread > 38 mm with all 8 channels used in parallel no longer causes physical collision with labware
- Tube Rotator: support of mixed tip configuration
- Usability improvements related to DreamPrep NGS
- New Module Controlbar icon
- Improved context check for nested Modules and Subroutines
- Customizable tool tips for variables of scope parameter
- New WorktableName() function
- Sample Tracking command Register Labware with Platemap and option Folder now works
- Improved MCA384 DiTi pickup
- MCA384 Get Tips command saves partial tip settings in GUI
- DeckCheck command improvements
- Fluent Scheduler
 - Scheduler GUI elements correctly linked to Online Help
 - Support for dynamic loading
 - Support for long running processes (weeks): Create Task and Start Tasks commands
 - Support for conditions and branches
 - Ability to stop and resume long running processes
- IoT Client 2.5 SP1 integration
- Sample Tracking 1.4 SP1 integration
 - Improved functionality when using the FluentID
 - Minor bug fixes
- User Management System (UMS) version 1.1.12 integration

The following changes have been made in FluentControl 3.1

- Fluent Scheduler: select labware for process iterations via a barcode file
- Fluent Scheduler: incubation at <Base>
- Fluent Scheduler: Gantt Chart visible in Touch Tools
- Support for new 50µL short filtered DiTis in standard tray, including 5 new Liquid Classes
- FCA 5mL DiTis can be used (not supported in FluentControl 2.8 and 3.0)
- Snapshot Tool always collects large dump files
- Variables can be used in Te-Incubator (MIO) and Te-Shake commands (not supported in FluentControl 2.8 and 3.0)
- Improved DeckCheck usability at edit and run time

- Magellan output format configurable when not for use with FluentControl (not supported in FluentControl 2.8 and 3.0)
- MCA waste chute with drop guide supports both MCA384 and MCA96 tips
- IoT client upgraded to version 2.5 integration
- Sample Tracking version 1.4 integration
- User Management System (UMS) version 1.1.11 integration

The following changes have been made in FluentControl 3.0

- Scheduling feature to schedule processes and protocols (FluentControl Scheduler)
- Software Support for Pressure Monitored Pipetting (PMP AI)
- Software Support for DeckCheck
- New FluentID runner available for 15ml Falcon tubes
- Improved normalization calculation command with sample well offset and range possibility
- Fast simulation mode for physical devices
- Extended FC autorun UI with PostInstaller and ReadMe to improve installation process
- Default logging mode changed to 'Info' and improved logging
- Improved ST information when emptying tip contents
- Mix&Pierce: Tip stuck in septum error message can now be manually removed when tip is released
- New warning when available volume is less than what is requested for dispense
- Integrated IoT client upgraded to version 2.3
- Removing QC -Kit Scripts and Liquid classes from Master Media

The following changes have been made in FluentControl 2.8

- ZeroG mode can be toggled from the TouchTools monitor
- New Fast Simulation Mode for 3D Simulator for arms (FCA, MCA, RGA) and timers. Drivers are not included. To enable this Fast Simulation must be enabled in configuration.
- New Confirm Standard Curve command
- New and updated QC-Kit scripts on installation medium
- Loop command is allowed in Wizard group
- New barcode verification option for FluentID
- New variable scope Parameter
- Scripts can be saved as Modules in new command bar section
- Software support added for
 - Drop Spectrometer
 - MCA waste chute with drop guide
 - 12 Well Trough SBS
 - 15mL Falcon Tube FluentID Runner
- SnapShot Tool improvements
- Improved performance when editing long scripts
- Integrated IoT client upgraded to version 2.1 SP1