

ReadyToProcess WAVE™ 25 IC

Release notes and installation instructions

1 Introduction

This document describes the implemented changes, improvements, and corrected issues in released versions of ReadyToProcess WAVE™ 25 Instrument Configuration (IC).

This document also describes how to install the IC, see [Installation instructions, on page 12](#).

Compatibility

For information about compatibility between different UNICORN™ versions and instrument configurations, see the UNICORN compatibility matrix at:

<http://www.cytiva.com/UNICORNcompatibility>.

2 Release 3.1.0.12

Improvements

WAVE™ 25 IC 3.1.0.12 is intended to support the new ICU board, which is introduced to ensure the supply of electronic components in WAVE 25 instruments. Therefore, WAVE 25 IC 3.1.0.12 is released, which includes support for both old and new ICU boards.

Corrected defects

- WAVE 25 IC 3.1.0.12 is intended to support the new ICU board.

Ref: 74528

3 Release 3.0.0.1

Improvements

WAVE 25 IC 3.0.0.1 is intended to support an alternative processor on the ICU board in existing WAVE 25 instruments.

Corrected defects

- The IC is re-branded to implement Cytiva brand guidelines.
Ref: 24634
- All the audit trail logs are now displaying Cytiva messages.
Ref: 24311
- The WAVE IC is repackaged to support both processors.
Ref: 26517

4 Release 2.0.9.0

Improvements

- Traditional **pH control** allows the deadband to be defined in **pH** units. User can select it from **System Control** → **System** → **Setting** → **pH** → **control** → **pH control deadband mode** → **Traditional**.
This is in addition to the existing **pH control** strategy, hereafter referred to as **Optimal** (**System Setting** → **pH control** → **pH control deadband mode** → **Optimal**)



IMPORTANT

The **pH control** strategy cannot be changed during the run. The default **pH control** strategy is **Optimal**.

- Transition time delay in the **Optimal** mode of **pH control** by **CO2/Base** and **O2/Speed** has been updated. The transition times are shorter when the system is operated at a single **Setpoint**. If the **Setpoint** is changed when the control is ON, transitions are triggered with longer transition times as per existing IC for one transition delay. Following which, the shorter cycles are restored.

Corrected defects

- WAVE process picture memory leak fixed.
Ref: 20926
- Hardware RAID functionality has been added for Win10 EPC. This functionality is similar to the Software RAID available in Win7 EPC image.
Ref: 20855
- The **pH** and **DO** status words has bee updated with additional error bits. An additional status word for **pH** errors has been added.
Ref: 20888



IMPORTANT

New IC is not forward or backward compatible for methods developed with **pH Control** related instructions. The same applies for the recipes (e.g., recipes created in DeltaV™) developed using any older ICs of WAVE or Xuri™. These methods and recipes must be modified as per the new IC instructions.

5 Release 2.0.8.0

Corrected defects

- Feedback for Right side temperature is now available for Tray 20: bag 20 L and Tray 50: Bag 50 L in Run data and through OPC.

Ref: 16355

- The Cell bag pressure readings for three inputs (O2, CO2, and Air / N2) in CBCU units are now available in Curve data, Run data, and through OPC.

Ref: 16356

- The overweight alarm appearing during sample mode is disabled now. Therefore, the alarm no longer appears during sample mode.

Ref: 16357

- Power failure notification is displayed when Instrument is reconnected after power failure.

Ref: 16358

- If the **Heating** option is **Disabled** in **System Settings**, an alarm is displayed when:
 - the user starts any manual instructions from the process picture during method run,
 - or
 - the user tries to execute a list of methods using the method queue.

The alarm will be displayed until the **Heating** option is changed to **Enable**.

Ref: 16512

6 Release 2.0.7.0

6.1 New features

Feature	Description
Digital Output for alarms and warnings	It is possible to connect the ReadyToProcess WAVE 25 system to an external alarm and warning device. Alarm It is possible to connect a system to an external alarm device through Digital Output by selecting the Enable check box for Digital Output for Alarms in System Control → System → Settings → Rocker → Digital Alarm Mode. Warning An external warning device can be connected to the system by installing and then selecting <code>unacknowledgeWarningsExtension</code>. This can be done through Tools → Extension Management.

Corrected defects

The **NextCU** continuously kept logging and caused the **NextCU** log file to increase in size. This eventually caused system disconnects. This issue has been solved by increasing the minimum scan time.

Ref nbr: 15855

7 Release 2.0.6.0

7.1 New features

Feature	Description
Filter heater	Both filter heaters on Wave 25 can be operated through UNICORN regardless of the mode of the operation (i.e. Dual or Single mode). The right-side filter heater can be enabled or disabled in System settings → Rocker → Enable Filter Heater(R) on single mode. Note: <i>The filter heater is only applicable for Bag 20 L and 50 L</i>

Feature	Description
Grouping of Run Data	A defect in grouping of Run data has been corrected. It is now possible to select the Run data from the existing Run data group on OPC.
Method templates	Three Method templates are added in the Wave 25 Instrument Configuration. These templates can be operated on single mode only. The method templates are Batch culture , Perfusion culture , and ActiCHO™ Media System .

8 Release 2.0.5.1

Minor changes

Change	Description
OPC alarms and events	UNICORN™ server was mixing multiple alarms into a single condition. All of the condition events are tagged identically, making it impossible for the client (the DataHub in this case) to distinguish one condition from another. In this new IC release the raised alarms and events will appear as individual alarm in OPC.
Media control perfusion mode feed flow for 8 L/day and 12 L/day	When the media control is being run in perfusion mode and the feed flow rate is set to 8 L/day and 12 L/day, in this new IC release no alarm appears saying feed rate set point is too low for performing the auto pump calibration .
Default heating enable	The Heating option in System Settings is enabled by default, this will make the system start heating once the rocking is turned on. When rocking is turned off the heating is off.

9 Release 2.0.4.0

9.1 New features

Feature	Description
Dual mode	It is now possible to select dual mode by selecting a component in System Properties → Edit . It will then be possible to run two Cellbags™ on Tray 20 and Tray 50. To run the 20 L and 50 L Cellbags, the dual component must be deselected.
Three pumps	Possibility to connect three Pump 25 units.
Dual weights in dual mode	When selecting the dual component, individual weight measurements for left and right Cellbags will be displayed. The left/right weight measurements are generated by solving mathematical equations using e.g. the individual data from the load cells. While the individual weights of the Cellbags can be distinguished, media control can be used also in dual mode.
Run pumps manually in flow mode	The pumps can be used manually in two modes: Flow or Speed . This simplifies e.g. the manual adding of feeds. A tool tip will help the user to enter a valid flow with respect to selected tube diameter and calibration result.
New pump roles	New feed roles are added to simplify the use of multiple feeds. In single mode the pump roles are: Acid, Base, Feed1, Harvest, Feed2, Feed3, and Feed4. In dual mode the pump roles are: Acid L, Base L, Feed1 L, Harvest L, Feed2 L, Feed3 L, Acid R, Base R, Feed1 R, Harvest R, Feed2 R, and Feed3 R.
O ₂ limits for DO control	Added possibility to limit the O ₂ set-points used by DO control.
Deviation alarm on/off in Process Picture	Check boxes are added in the Process Picture to easily enable/disable the deviation alarms for Temp / Gas flow / CO₂ / O₂ / pH / DO / Weight individually. These new check boxes make it possible for the user to easily see if a deviation alarm is enabled/disabled. The fields for entering the deviation alarm limits will be greyed out when an alarm is disabled.

Feature	Description
Grouping of run data	Run data is organized into small groups, making it easier to find the run data needed. Also, redundant run data already visible in the process picture is removed to increase ease of use.
Tool tips to help entering the media control parameters	To help the user to enter valid media control flow and weight, tool tips for these parameters are added. The range in the tool tip is dynamic and will change depending on selected bag size, tube diameter and Media control mode.
Calibration instructions for OPC users	Instructions to calibrate the instrument without using the UNICORN calibration dialog can be available by selecting the OPC component.
Two analog inputs	The two analog inputs are now activated in the software. It is also possible to select input mode Voltage, 0-20 mA Current or 4-20 mA Current individually for each port.
Cellbag selection in Process Picture improved	Only Cellbags possible to use with the detected tray size show up as selectable.
Temperature overshoot risk reduced	The temperature regulator in the rocker now makes a sanity check on the weight in order not to overshoot. Risk for faulty calibration is reduced by removing calibration buttons from the process picture, and CO ₂ inlet must be pressurized in order to be able to calibrate CO ₂ .
Risk for faulty calibration reduced	Risk for faulty calibration reduced by removing calibration buttons from the Process Picture , and the CO₂ inlet must be pressurized in order to be able to calibrate CO ₂ .
pH and DO Reading and Control On/Off buttons	When hovering over the right-hand side of the pH and DO buttons, the user now can choose between Reading and Control On/Off . 
Pump count down	The time left for pumps running for a limited time has been added to the pump icons.
Units for media addition	It is now possible to select between liter per day and mL per minute in the Media addition settings window.

Feature	Description
Set stop angle	When a new stop angle is set, the rocker moves to that angle.
Disable over-weight alarm	The user may now disable the alarm that triggers when the bag is overfilled.

Minor changes

Change	Description
Pump manual instructions changed	Since the number of pump roles has increased radically, the old instructions associated with the pump role were no longer practical. Instead, the pump role is now a parameter in the pump instructions. The new pump instructions are Start pump, Stop pump, Pump RPM, Pump flow, Rate mode, Tube inner diameter and Reset accumulated volume. The tube inner diameter is no longer set by the manual instructions Acid, Base, Feed and Harvest. The Pump RPM is now set by the instruction Pump RPM, and no longer by the Start Pump instruction. The instructions Acid and Base now only set the parameter Molarity. The instructions Feed and Harvest are removed.
Pump calibration made more free	The calibration of pumps is no longer depending on the role of the pump. That means that the pump calibration of feed/harvest pumps is no longer depending on the media control flow set point, and the acid base pump calibration is no longer always done at 100 RPM. Now the user sets whether the pump shall be calibrated at a certain flow or at a certain RPM individually for each pump.
Shorter run data names	Names of run data are made shorter, so that the whole name is visible in the Run Data pane when a data is selected.

Change	Description
Improved warning/error handling	The beginning of warning/error messages now clearly shows from what part of the instrument they are coming. The error handling of the pumps is improved. Error handling of "rocking over current" is improved. Overweight warnings will come only from rocker - not also from pH control.
Media control instruction split into two instructions	To separate the auto calibration settings from other media control settings, the instruction Media control (general) is split into two instructions: Media control (general) and Auto Calibration .
Detailed pH/DO data removed	Detailed pH/DO data such as phase, temperature compensation and LED current are removed. That data can instead be retrieved from system log files by making a system error report. The amplitude curve data remains.
Sampling frequency of set-points decreased	To compensate for the increased amount of data due to the instrument configuration allowing dual mode, the sampling frequency of the "reading back" of several set points is decreased. This regards only the reading of the actual set points from the system to the client, and has no effect on the system performance.
Performance upgrades of Process Picture	Removal of unnecessary repeated function calls to reduce load of the Process Picture .
New line design from pumps to Cellbag(s) in Process Picture	To handle the increased number of pump heads and the possibility to use dual bags, the design of the lines connecting the pump heads with the Cellbags(s) is slightly re-worked.
pH/DO reading on/off buttons removed from System Settings	The old pH/DO reading on/off buttons are removed from System Settings . They are replaced by the new pH/DO Control/Reading On/Off buttons (see New features).

Change	Description
Heating disabled by default	To avoid starting the heating with no filled bags on the tray, the default setting that did start the heating as soon as the rocking starts is now changed. The default setting is now that the heating needs to be started manually by the user. This setting can easily be changed if desired by the user.
Set correct MFC flow units	Code adjusted to handle new version of the Mass Flow Controller (MFC) in CBCU.
System report information	Detailed logging information from the rocker is stored in the service log (which is included in system report).
"No bag" option added	The instructions for setting Cellbag size now contain the option "No bag".

Bug fixes

Internal case number	Description
HCSDM00253390	To prevent the harvest pump to be stopped when shutting off Media control in media addition mode.
HCSDM00268315	Text messages on Pump errors improved (error 23, 28 and 29).
HCSDM00241066	Connecting line from pH/DO icon to CO2/O2 corrected, in Process Picture .
HCSDM00242514	Message pH/DO reading is on but is inactive shown with red color in Process Picture .
HCSDM00254008	The correct pump RPM is now showed during calibration.
HCSDM00250576	Connecting line between DO and Air/N2 icon in Process Picture removed.
HCSDM00241080	When the sampling icon is orange during sampling mode, it is now possible to click on it and see why it is orange.
HCSDM00239488	The instruction default values for manual transition delay times corrected.
HCSDM00239493	The reset of the over-weight alarm is now working properly.

Internal case number	Description
HCSDM00244685	The system can now recover after a filter heater warning without restarting the system.
HCSDM00281228	If the weight was changed during rocking, the weight displayed when the rocking stopped was slightly wrong. The correct weight is now displayed.
HCSDM00272247	No CO ₂ calibration possible if CO2 inlet is not pressurized.
HCSDM00238561	High harvest flow error now resets when the error is no longer present, or the control is switched off.
HCSDM00238562	Calibration error on pump head B fixed. The previous calibration for pump head B is not reset when a calibration is rejected.
HCSDM00243934	Rocking motion default value set to 30% (previously the Rocking Profile was set to 30% during manufacturing).
HCSDM00252974	A saturation function now reduces the weight range that can go into the heating control algorithm. That is to reduce bad heating control behavior when the weight is tared wrong.
HCSDM00238299	No tray temp alarm is sent when tray is absent.
HCSDM00238554	The system can now start rocking automatically after multiple power interruptions.
HCSDM00238326	The initial motion phase of the rocker made at transition to RUN state of the instrument will now stop at the desired stop angle.
HCSDM00265635	Pump RPM deviation alarm fixed not to give false alarms.
HCSDM00244685	Inability to recover from short circuited filter heater fixed.
HCSDM00239493	Overweight alarm fixed to reset properly.
HCSDM00255049	A check is made that requested flow is within available flow range before a pump is started in flow mode.
HCSDM00282482	Rocker error codes improved.

Internal case number	Description
HCSDM00238518	pH control using acid or base and Media control will give orange color in Process Picture when in sampling mode instead of red.
HCSDM00313388	Error when Cellbag temperature is outside the valid range is now also displayed in Process Picture .
HCSDM00238555	The rocker Power button lights red and there is a red warning in Process Picture when rocking is stopped in tilted position.
HCSDM00239492	When deviation limits are changed, the temperature will remain stable. Previously the temperature could fall by 0.5°C.
HCSDM00239494	Incorrect Accumulated volume update corrected.
HCSDM00308209	False gas flow deviation alarm corrected.
HCSDM00311374	CO2 deviation alarm delay default value updated to 120 s.
HCSDM00240830	Measurement of Current RMS value is corrected.

10 Installation instructions



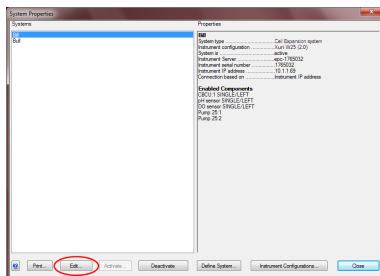
IMPORTANT

- Before installing the Instrument Configuration, check the UNICORN compatibility matrix for compatibility between your IC version and the UNICORN version.
- We recommend to use the latest version of the Instrument Configuration. Contact Cytiva service personnel to understand the impact that an upgrade or a downgrade can have on older Instrument Configurations.

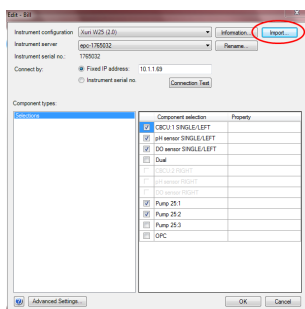
Tip: *If you are updating a previous installation, make a note of the **Component selection** for each **Component type** in **UNICORN System Properties** →**Edit** before changing the **Instrument configuration**.*

Step Action

- 1 Download the instrument configuration zip file to your computer.
Note: Do not unzip the file.
- 2 Open the **Administration** module in the UNICORN software and choose **System Properties**.
- 3 In the **System Properties** dialog, select your system and click **Edit**.



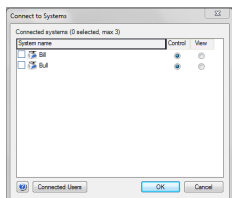
- 4 Click **Import...**



- 5 Locate the configuration zip file on your computer and click **Open**.
- 6 When the import is completed, select the new **Instrument configuration** from the drop-down list.
- 7 Verify that all **Component types** have the correct check marks in the **Component selection** list and click **OK**. The instrument will be restarted.
- 8 Restart the UNICORN software. The new instrument configuration will now be in use.

Step	Action
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- | | |
|---|--|
| 9 | Open the System Control module, click Connect to Systems and select your system. |
|---|--|



Note:

*An update from configuration WAVE_1.0.3.0 to WAVE_2.0.4.0, or higher, generates several error messages, since the module versions are incompatible with each other until all modules have been updated. Click **Acknowledge** to remove the error messages.*

- | | |
|----|--|
| 10 | Open the System Control module, click Connect to Systems and deselect your system. |
| 11 | Switch off and then restart the instrument. |
| 12 | Open the System Control module, click Connect to Systems and select your system. |

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