

## 1 Purpose

This document describes the differences between the new software version **Metrohm IC Driver 2.1 for Empower®** and its predecessor **Metrohm IC Driver 2.0 for Empower®**.

This release of **Metrohm IC Driver 2.1 for Empower®** replaces all previous releases.

## 2 New features

### New instruments

- Integration of device **940 Professional IC Vario TWO** (2.940.2100)
- Integration of device **944 Professional UV/VIS Detector Vario** (2.944.0010)
- Integration of device **941 Eluent Production Module** (2.941.0010) with functional limitations
- Integration of device **IC Amperometric Detector** (2.850.9110) with its modes DC, PAD and FlexIPAD
- Integration of device **945 Professional Detector Vario – Conductivity**. (version: 2.945.0010)
- Integration of device **945 Professional Detector Vario – Conductivity & Amperometry**. (version: 2.945.0030)
- Integration of device **942 Extension Module Vario SeS/PP** (version: 2.942.0500)
- Integration of IC equipment **Liquid Handling Station, left** (6.5330.130).

### New features

- In the instrument method, the parameter injection volume can be chosen in the time-program commands of the 800 Dosino.
- The 741 Magnetic Stirrer can be controlled (2.741.0010).
- The system pressure can be measured in an additional data channel, for support issues.
- The cell constant of the conductivity detector is automatically read out from the chip and displayed in the instrument method.
- The Liquid Handling Station, left (6.5330.130) can be used with the 858 Professional Sample Processor.
- The dosino can be used for regeneration of the suppressor.

- The dose-in gradient can be controlled when a dosino is connected to an IC instrument, for example a 930 Compact IC Flex.
- 945 Professional Detector Vario can be used for detection in a HPLC System.
- 2 IC Instruments can be used in an instrument method.

## 3 Improvements

### Improvements for the 889 IC Sample Center

- The 889 IC Sample Center can be used with Rack 12 x 22 mm, 12 vials (6.2041.210).
- The 889 IC Sample Center can be used with 96 position SBS plates (high and low version).
- The 889 IC Sample Center can be used with 384 position SBS plates.
- The injection loop size can be configured.
- The volume of the syringe can be configured.
- The volume of the injection needle can be configured.
- The volume of the buffer loop can be configured.

## 4 Fixed bugs

- Some steps in the time program were only started but not completely finished when the next step in the time program had already been executed. This has been fixed.
- Data acquisition with the conductivity detector was not working, when the detector temperature had been set to 35 °C. This has been fixed.
- In the method editor, the entry field "use start-up time" for the high-pressure pump was not disabled when the checkbox had been unchecked. This has been fixed.
- Negative values blocked the scan lines command window and the set lines command window of the Remote Box. This has been fixed.
- More information has been added to the PostRunReport.
- In the 889 IC Sample Center status panel, the range on the volume field for the syringe was not checked. This has been fixed.
- The SQ Detector 2 from Waters caused a server busy error. This has been fixed.
- In manual control of 889 IC Sample Center the on/off button for the cooling was not updated. This has been fixed.
- In the instrument method report, the pump rate of the peristaltic pump of the 858 Sample Processor was reported incorrectly. The pump rate was reported as pump rate + 1. This has been fixed.
- With gradient runs, it could happen that chromatogram data is corrupt after the end of the runtime. This has been fixed.
- Too long columns in reports resulted in an error (Oracle Error ORA-12899). The columns were shortened.

## 5 Known bugs

### Installation

- When installing Metrohm IC Driver 2.1 for Empower on Windows 10, the driver for the 889 IC Sample Center is not installed automatically. It is necessary to install the driver for the 889 IC Sample Center manually.
- The installer does not always delete all files when uninstalling the Metrohm IC Driver for Empower.

### Gradient

- In an instrument method with a high-pressure gradient, there is no warning if the flow rate of the pumps is lower than 100% in total.
- The steps of a gradient profile are not sorted automatically in chronological order.
- Pump 1 must be part of a high-pressure gradient. Otherwise, a high-pressure gradient does not work.
- The system can freeze, if a sequence contains several methods with gradients and each method contains a different gradient mixing ratio. The problem can be avoided by turning off the pump before switching to the next method.
- In a high-pressure gradient with a start-up time of  $\geq 4$  minutes and different proportions in the mixing ratio for each eluent, the flow of the individual pumps might be slightly wrong. To avoid this problem, set a start-up time of  $< 4$  minutes.
- The combination of Dose-in gradient and Dosino regeneration MSM leads to an instrument failure. The sequence will be aborted.

### Errors and instrument failures

- Datapoints are transferred with 32-bit time stamps. If the instrument is running uninterrupted, a counter overflow occurs approximately every 5 days. If the counter overflow occurs during data acquisition, it will cause an instrument failure. The sequence will be stopped. Metrohm recommends to restart the IC instrument every 5 days as described in *8.0102.8002 Tutorial IC Driver 2.1 for Empower, chapter 16 Stopping the process*.
- When using a shutdown method at the end of a sequence in a dual system, an instrument failure occurs.
- The Message Center does not always report enough information about instrument failures.
- A script error occurs irregularly in the Run Samples section of dual IC systems.
- Errors that occur during the initialization phase are not logged.

- After initializing the 858 Professional Sample Processor, the following commands cannot be used:
  - Lift move (manual control)
  - Arm move (manual control)
  - Lift command (time program)
  - Swing command (time program)

Otherwise, an instrument failure occurs.

To avoid an instrument failure, execute a move command to any rack position after initializing.

### Communication

- Sometimes, the instrument status is idle although the driver does not recognize all instruments.
- Metrohm IC Driver for Empower 2.1 does sporadically have difficulties to read the connected instruments correctly in a new system or after a restart.
- In the status panel, the pressure of the high-pressure pump is not refreshed after the system has been stopped with the **Abort** button.
- If the 889 IC Sample Center is unplugged, the status in the status panel is incorrect. There is a discrepancy between the status panel and the message center. The status panel shows the instrument status **Idle**. The message center shows several instrument errors. If the 889 IC Sample Center is plugged in again, the instrument status is **Failure**, although the instrument works.

### Various problems

- In an offline method, the number of detectors is configured automatically. It is not possible to adjust this configuration.
- In the manual control of the 941 Eluent Production Module, it is not possible to produce more than 1 eluent at the same time.
- In a system with a 940 Professional IC Vario and 2 high-pressure pumps, the time program command **Measure pressure** does not always record the pressure of both pumps. The problem is related to the presence of detectors. If a detector is connected to socket 1 on the backside of the IC, the pressure is only recorded for pump 1. If a detector is connected to socket 2, the pressure is only recorded for pump 2. If detectors are connected to both sockets, the pressure is recorded for both pumps.
- The 2.858.0010 Professional Sample Processor does not contain a peristaltic pump. Nevertheless, a peristaltic pump is displayed in Empower®. Using the peristaltic pump does not cause an error.

## **6 Compatibility**

### **6.1 Compatibility with Empower®**

The Metrohm IC Driver 2.1 for Empower® is compatible with the following Empower® versions:

- Empower 3 FR2
- Empower 3 FR3
- Empower 3 FR4
- Empower 3 FR5

### **6.2 Compatibility with Windows**

The Metrohm IC Driver 2.1 for Empower® is compatible with the following Windows versions:

- Metrohm IC Driver 2.1 for Empower® with Empower 3 FR2
  - 64-bit version of Windows XP
  - 64-bit version of Windows 7
- Metrohm IC Driver 2.1 for Empower® with Empower 3 FR3
  - 64-bit version of Windows 7
  - 64-bit version of Windows 8.1
- Metrohm IC Driver 2.1 for Empower® with Empower 3 FR4
  - 64-bit version of Windows 7
  - 64-bit version of Windows 10
- Metrohm IC Driver 2.1 for Empower® with Empower 3 FR5
  - 64-bit version of Windows 10