

# Thermo Scientific Orbitrap Astral Series 1.1 Instrument Control Software Release Notes

This document lists installation notes, new features and improvements regarding the Thermo Scientific™ Orbitrap Astral Series 1.1 Instrument Control Software release. For information regarding the installation, features, functionality, and use of this product, refer to the following sources of information: *Orbitrap Astral Operating Manual*

## Installation notes

This section describes the supported target systems and the system requirements.

## Supported target systems

Thermo Scientific™ Orbitrap Astral™ mass spectrometer

## System requirements

The minimum hardware and software configurations required for Orbitrap Astral Series 1.1 Instrument Control Software operation are as follows:

System	Requirements
PC	3.0 GHz Quad Core Intel™ Processor 32 GB RAM 512 GB SSD Hard Drive DVD-ROM Drive Display Monitor Resolution of 1920 × 1080 Two Network Interface Cards (NIC), 1000 MBit/s
Software	Microsoft™ Windows™ 10 Enterprise 2021 LTSC Thermo Scientific™ Xcalibur™ 4.7

**TIP:** The Orbitrap Astral Series 1.1 Instrument Control Software was only tested within the delivered composition.

## Installation

**TIP:** Prepare the computer in advance of any new installation.

**NOTE: All Users**

Please perform a System Calibration or a Mass Calibration after a software upgrade or downgrade.

**NOTE: FAIMS Users**

Please reboot the FAIMS unit after the installation of the Orbitrap Astral Series 1.1 Instrument Control Software (switch Main Control Box off and on).

This guidance addresses a standard installation of a Windows computer acting as an access point for Orbitrap Astral based instruments. The current software version is 1.1. The guidance is valid at least up to this version. There are differences between nearly all computers, so even if you have a receipt of installation, be aware that the operating system or language settings might be different. The current explanations have Microsoft Windows 10 Enterprise LTSC 2021 and English in focus.

Thermo Fisher Scientific does not accept any warranty claims about the completeness of this instruction list. Consulting a Thermo Fisher Scientific support team member of Orbitrap Astral instruments is highly recommended for setting up a new PC.

**Technical requirements**

Choose a PC equipped as described at “[System Requirements](#)”.

**Operating system language**

English is the only tested language. It is recommended to switch to English language before installation. This installation instruction refers to names of English operating systems.

**Network setup**

At least two NICs must be present in the system. The one connected to the instrument must not be connected to the regular Internet connection. Only the instrument to be driven by this particular PC may be connected to the PC using a 1 GBit switch or hub. Additional devices like autosampler or LC systems may be connected to that switch, too.

Configure the IPv4 interface as follows:

- address 172.16.0.101
- network mask 255.255.0.0
- manual DNS selection with empty fields

**Physical links**

Use at least a Cat 6 patch cable. Double-check the quality of the cable if errors occur.

**Virus scanner and firewall**

Disable virus scanner and firewall during installation. Virus scanning can happen in advance and may stay turned on, if it is guaranteed that the firewall is turned off. The installation program informs only the built-in firewall of Windows properly. Other firewalls have to be

informed that the program Thermo Exploris Core Service (file locations see below) needs access to incoming and outgoing network traffic. Remember that the dedicated NIC is usually considered to be a “public network.” Firewall and virus scanner can be turned on after installation. Reboot the instrument to be sure that everything works.

**TIP:** Do not start the software installation before the network setup has been completed. See “[Network Setup](#)”.

### **File locations**

The default installation folder on the computer is C:\ProgramData\Thermo\Astral.

This instruction list uses C:\ProgramData\Thermo\Astral for easy reading, but depending on the installation package like Orbitrap Astral Instrument Control Software kit, this may be different. When the Orbitrap Astral software has been installed on a system, the folder of the previous installation will be reused.

### **Backup**

Several files and folders require a backup for later installation, either for crash recovery or for replacing the computer. The backup can be performed during normal operation.

These files and folders (see “File Locations” ) should be saved if present:

- C:\ProgramData\Thermo\Astral\instrument\msx\_instrument\_files
- C:\ProgramData\Thermo\Astral\Licenses.txt
- C:\Thermo\Instruments\Astral\[version]  
  \System\Programs\dependencies\msi\TNGConfig.xmb

Setup of a new computer without any backup requires assistance of the Orbitrap Astral support team of Thermo Fisher Scientific. The computer may require licenses or some extra configuration files.

### **Uninstalling**

The Installer will automatically remove outdated versions prior to the installation of a new version.

### **Installation**

Install using the ISO image or a copy of its content by executing the installation program OrbitrapAstralFullSetup.exe. Use the regular way of installation for best results. It detects several problems, if they exist at all.

### **Restoring a backup**

This step is not needed, if the installation was just an upgrade of the Orbitrap Astral software. All present configuration settings remain on uninstalling.

For setting up a replacement computer or after a disk crash, the restore procedure needs to be performed. The procedure requires administrator privileges. The restore procedure should happen after installation of the new software.

The installation place in the backup may be different to that of the present installation. Either use Instrument Configuration and look where files are located or check the folders appearing at “File Locations”.

**TIP:** It is important to stop the only program that interacts with the files coming from the backup. That is Thermo Exploris Core Service.

## To stop the Thermo Exploris Core Service

### Procedure

1. In Windows 10 desktop, open **Computer Management** (< > + <X>).
2. Select **Computer Management (Local) > Services and Applications > Services > Thermo Exploris Core Service**.
3. Right-click it and select **Stop**.  
Keep the dialog open.
4. After a new installation, the instrument has already created the msx\_instrument\_folder with default content. Replace the content of that folder by the files from the backup.
5. Use the open dialog to start the **Thermo Exploris Core Service** again. Alternatively, reboot the computer. If in doubt, contact the Orbitrap Astral support team of Thermo Fisher Scientific.

**Operation** Set the power setting to maximal performance.

**TIP:** Automatic updates of any kind, those of the operating system in particular, are usually set to automatic, but this may disturb instrument data acquisition. To not disturb your data acquisitions by automatic updates, we strongly recommend setting all updates to **manual** and checking for updates regularly.

Never put the computer to sleep (Control Panel\Hardware and Sound\Power Options\Edit Plan Settings).

## Supported instruments

The instruments listed in table below are supplied and supported in this release.

**Table 1** Supported instruments

Instrument	Instrument Control Software Version	Version No.
Orbitrap Astral MS	1.0	1.0.100.11
Orbitrap Astral MS	1.0 SP1	1.0.100.14
Orbitrap Astral MS	1.0 SP2	1.0.100.28
Orbitrap Astral MS	1.0 SP3	1.0.100.40
Orbitrap Astral MS	1.1	1.1.477.46

## New features and improvements

The table below lists new features, improvements and defect fixes in the Orbitrap Astral Series 1.1 Instrument Control Software release that were implemented since the Orbitrap Astral Series 1.0 SP3 Instrument Control Software release.

**Table 2** Changes realized with Orbitrap Astral Series 1.1 Instrument Control Software relative to Orbitrap Astral Series 1.0 SP3 Instrument Control Software

ID	Severity	Title
<b>New features</b>		
491821	—	Stepped CE Astral: The user needs the ability to perform the acquisition of single MS2 scan with multiple Collision Energy values when using Astral detector Type
425845	—	Full Profile OT: The user needs the ability to perform Orbitrap MS1 and MS2 acquisition with Full Profile in Intact Protein Mode
<b>Improvements</b>		
610911	—	NSI: The user needs an updated default value of Positive Spray Voltage for NSI in ME and Tune
431751	—	Orbitrap Astral shall automatically correct the ion foil voltage using the ICS
597081	—	FAIMS CV switching performance shall be improved
496128	—	UI: ME: The user needs the "Lock mass injection" to be a parameter in the scan properties for each scan type
407868	—	Method Editor: The System Templates must be saved in "Astral" folder
434211	—	UI: ME: The user needs the possibility to choose "Use EASY-IC" On/Off for each experiment/scan type in Timed Mode
469200	—	UI: ME: The user needs to be able to see the displayed absolute AGC target values
408025	—	Tune: Favorites/UserSettings and History information must be saved in "Astral" folders
448670	—	The user needs the ability to monitor pressure readbacks for Astral Analyzer in Tune
<b>Defect fixes</b>		
458725	3 - Medium	MongoDB uses large memory (>3GB) at background
459860	3 - Medium	If in DIA experiments (using Astral detector) a Loop Time is defined, as shorter than the Orbitrap transient time set in another experiment of the method, the instrument schedules not enough DIA scans to match the expected loop control time
594611	3 - Medium	Fluxscans are not used in edge cases (fm/lm +/- isolation width)

ID	Severity	Title
597496	3 - Medium	DIA: Methods miswriting mass window centres as 524.265 in raw file instrument method
598230	3 - Medium	Missing Plot: Mass Calibration
591844	3 - Medium	Tune: Pressure Mode always set to Standard Pressure after startup
592082	3 - Medium	Tune UI: Astral Turbo pumps readbacks are swapped
467823	3 - Medium	Issue with DIA Windows Definition with Windows Optimization "On" under certain conditions
470082	3 - Medium	Max IT information is not copied when using copy/paste functionality of MS2 information - instead default max IT (10 ms) is used
439849	3 - Medium	"Use EASY-IC" dropdown is not available if LM correction mode is set to "timed"
412392	2 - High	Instrument reported to be set to standby because of open source, but continued the sequence
424847	3 - Medium	The search window for the EASY-IC lockmass is shifted by outliers
426171	3 - Medium	"Bakeout cooling time" and other ICB/HICB timers are reset by software update
415413	3 - Medium	Astral Mass Stabilization is performed at different timepoints within a LC-MS run
455566	3 - Medium	Syringe does not get turned off during Electronics Smart Calibration in User System Calibration
456040	2 - High	Setting the Funnel RF Level to default is not in Astral Default Scan Settings

The table below lists defect fixes in the Orbitrap Astral Series 1.0 SP3 Instrument Control Software release that were implemented since the Orbitrap Astral Series 1.0 SP2 Instrument Control Software release.

**Table 3** Changes realized with Orbitrap Astral Series 1.0 SP3 Instrument Control Software relative to Orbitrap Astral Series 1.0 SP2 Instrument Control Software

Defect Fixes		
ID	Severity	Title
466217	1 - Critical	Large Time Gap between MS1 and data-dependent MS2 scan.
553186	2 - High	Insufficient IRM settling time causing unstable fragmentation pattern in Orbitrap MS2 scans.
452322	1 - Critical	Ion Control not working well under low intensity, high background conditions.
414707	3 - Medium	False positive initial bus error warnings from DPRTrap Board.

## Defect Fixes

427472	2 - High	Detector Calibration failing with “Too few ions in focused peak.”
449905	2 - High	Suboptimal setting of channel saturation threshold.
234095	2 - High	Astral analyzer pressure readbacks not displayed in Tune.

The table below lists defect fixes in the Orbitrap Astral Series 1.0 SP2 Instrument Control Software release that were implemented since the Orbitrap Astral Series 1.0 SP1 Instrument Control Software release.

**Table 4** Changes realized with Orbitrap Astral Series 1.0 SP2 Instrument Control Software relative to Orbitrap Astral Series 1.0 SP1 Instrument Control Software

## Defect Fixes

ID	Severity	Title
357681	4 - Low	Method execution waits for temperatures to stabilize while 'Wait for Temperatures to stabilize' option is unchecked in Instrument Configuration.
361874	3 - Medium	Missing fields in the scan header/trailer.
398882	3 - Medium	AGC calculations for method using more than one FAIMS CV ( $\Delta > 1$ ) are based on single CV.
403091	3 - Medium	Raw file: Scan headers of ASTMS scans report irrelevant FT resolution.
407881	3 - Medium	Data Acquisition using lock mass correction is not aborted while Internal Calibrant Source is faulty/defective.
396718	1 - Critical	Data Acquisition: FAIMS occasionally returns “source is open” right after the start of a method while source is closed.
416835	1 - Critical	Both the restart from an error as well as quick system restart fail with a restart loop.
418457	1 - Critical	Orbitrap mode scan rate too low after reboot of system.
424800	3 - Medium	Orbitrap easyIC lockmass correction (timed / Scan-to-Scan modes) is not functional if the first mass of the scan range is above $m/z$ 275.
424984	1 - Critical	Failing Signal Stability Evaluation - high TIC variations in Orbitrap signal.
425564	3 - Medium	Bake-out plot is not redisplayed after the system entered standby.
427904	3 - Medium	Block voltage insufficient for Curve Corrector on systems with large non-zero curve corrector settings.
428554	3 - Medium	Activating microscans shifts the mass centroid in Astral spectra.

## Defect Fixes

429956	3 - Medium	TNG System Check Negative: system
429981	3 - Medium	“Short burn-in of ICS” is always run during System Check.
430132	3 - Medium	Previous plot is not redisplayed after Astral analyzer polarity switch.
430259	1 - Critical	Discharge evaluation not actually setting to negative mode during discharge event.
431767	3 - Medium	Missing Quick Gas Capillary Check to allow the user to assess if a capillary is blocked.
433742	3 - Medium	Scan Start Timing fallback option may lead to out of order retention times.
434485	3 - Medium	Missing checks in Tune Diagnostics.
436967	3 - Medium	Astral service bundle mostly empty (no astral data).
442099	2 - High	System Calibration: Quad RF DDS frequency does not get set always on boot.
450428	1 - Critical	After performing Mass and System check from Tune, a drift of about 1 <i>m/z</i> unit may be observed in mass spectra acquired with Astral detector.

The table below lists defect fixes in the Orbitrap Astral Series 1.0 SP1 Instrument Control Software release that were implemented since the Orbitrap Astral Series 1.0 Instrument Control Software release.

**Table 5** Changes realized with Orbitrap Astral Series 1.0 SP1 Instrument Control Software relative to Orbitrap Astral Series 1.0 Instrument Control Software

## Defect Fixes

ID	Severity	Title
412822	1 - Critical	Occasionally spikes can be observed in ion chromatogram while ion spray stable.
419732	1 - Critical	EASY-IC: Lockmass expected position does not change with polarity.
421872	1 - Critical	XML method modification interface is not functional.
419661	2 - High	System Calibration/Check: Change PrOSA Scaling specifications.
416053	3 - Medium	System Calibration/Check: HCD Fragmentation and Trapping Efficiency Check leads to a SW internal failure (occasionally).

## Known issues

The table below lists all known issues that exist in the Orbitrap Astral Series 1.1 Instrument Control Software release.

**Table 6** Known Issues

ID	Severity	Title
347288	4 - Low	Tune: Setting incorrect Syringe Pump flow rate displays wrong message “the syringe may be out of sample”. Remedy: Remove and place the syringe again into the pump to release the backpressure.
375776	3 - Medium	Tune: “Continue to batch reports” option is not available after running diagnostic/optimization procedure.
362826	3 - Medium	ME: Selection of scan nodes is not possible when Method Editor window is not maximized.
357067	3 - Medium	Isolation $m/z$ range below $m/z$ 40 does not trigger a validation error when resulting from an inappropriate isolation offset setting. Remedy: Enter an isolation offset value that complies with accepted isolation range.
387627	4 - Low	RF values are not converted to account for differences between S-lens and funnel when importing OE120/240/MX methods. Remedy: Please manually adjust the RF value accordingly.
402163	3 - Medium	When Internal Calibrant Source is faulty/defective, the warning message is incomplete, missing the following text: “The mass accuracy performance may be slightly lower than in regular conditions.”
402347	4 - Low	With Fine Astral Mass Calibration (part of System Calibration), result messages are not located below the associated plots in PDF report.
404844	3 - Medium	Xcalibur: If the file name contains the symbol $\mu$ , two raw data files are generated instead of one. Remedy: Do not use symbol $\mu$ in file name.
430614	3 - Medium	Scintillator Voltage not set when reconnecting after Data System PC reboot or software upgrade. Remedy: Reset the instrument after the reboot/software reset.
614321	3 - Medium	Ion Foil Correction and Astral Mass Stabilization can fail due to uncalibrated ICS source. Remedy: Perform Negative Polarity System Calibration from time to time even if not using the system in negative polarity mode.
503511	3 - Medium	Multiple error messages about ion foil adjustment in Xcalibur. Remedy: Please close manually windows reporting the error messages.

ID	Severity	Title
639762	3 - Medium	<p>After changing at setting in Tune, while the Instrument is in Intact Protein mode, Injection Time is unregulated.</p> <p>Remedy: In Tune, switch to peptide application mode, and then back to intact protein mode.</p>
676639	3 - Medium	<p>FAIMS: Temperature differences above 20° between inner and outer electrode might not be reachable and cause timeouts.</p> <p>Remedy: When using "User Defined" FAIMS Mode in Method Editor, adjust FAIMS Inner Electrode Temp/ FAIMS Outer Electrode Temp in order keep the temperature difference between the two electrodes below 20°C.</p>

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