



ASTON IMPACT TROUBLESHOOTING GUIDE

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Revision History

Revision	ECO	Change Log	Author
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INTRODUCTION

1.1. About Aston Impact

Aston Impact uses mass spectrometry to quantify the composition of constituents in an analyte by filtering associated ions according to their mass-to-charge ratio (m/z) and measuring their abundance. A mass spectrum, consisting of ion signal vs m/z is generated by scanning the filter to the voltage schedule.

Within its compact platform, Aston Impact, uses high-performance electronics and analytical algorithms to display the mass spectrum and compute compositions in real time without sacrificing response time, sensitivity, resolution, or accuracy.

The result is a highly configurable, quantitative real-time analytical tool which has the versatility to address many applications in industrial and laboratory environments.

1.2. Document scope

This document provides an overview of the initial troubleshooting steps that can be performed by the end users of Aston Impact

1.3. Intended audience

This document is for the reference of an operator who is responsible for setting up and using the Aston Impact product as part of their process.

1.4. Software release notes

Software release notes with new features, resolved issues, known limitations etc. are available at the [Atonarp knowledge base](#)

1.5. Document version history

VERSION	DATE	DESCRIPTION
1.0	June 2022	The initial draft of Aston impact

1.6. Safety guidelines

Users must read the general safety information, potential hazards, and associated warnings for the Aston Impact system. Recommended precautions must be taken to minimize hazards.



WARNING!

All work described in this document must be carried out by persons who have suitable technical training and the necessary experience, or who are working under the supervision of the end-user of the product. Only qualified Atonarp representatives or Atonarp-approved personnel must install and service the equipment.

1.7. Unit conventions

UNIT NAME	SI UNIT	CONVERSION
Pressure	HectoPascal (hPa)	1 hPa = 0.750 Torr = 100 Pa
Current	Ampere (A)	1 A = 10^6 μ A, 10^{12} pA, 10^3 mA
Frequency	Hertz (Hz)	1 Hz = 10^{-6} MHz
Capacitance	Farad (F)	1 F = 10^{12} pF
Temperature	Kelvin	K = 273.15 + °C

* NOTE

The following units of mass are interchangeably used in this document and/or Aston Impact software - amu, u, Da, Th.

1.8. Document support

Any errors, comments, and questions regarding this document can be communicated through techpubs@atonarp.com

1.9. Customer support

When issues are encountered with the operation of Aston Impact, or if there are any queries regarding the product, it is advised to raise a support request at the Atonarp customer portal available at engsupport@atonarp.com. For more information about the portal, see [Customer support](#) in the Maintenance & Repair guide.

2. POSSIBLE ISSUES AND DEBUG

2.1. Categories of Issues

2.1.0. Connectivity Issues

2.1.0.0. Unable to connect to Aston using Aston UI

Issue	Possible Causes	Initial Troubleshooting
Unable to connect to Aston using the Aston UI Application	The Ethernet port on the Aston is not connected	Verify if the Aston is connected to the host PC using a LAN cable either through ethernet or P2P
	Aston is booting/running a diagnostic test	Wait for 10 mins and try again. If the issue persists, contact Atonarp support

2.1.0.1. Unable to connect to Aston through GRPC

Issue	Possible Causes	Initial Troubleshooting
Unable to connect to Aston through GRPC API	The Ethernet port on the Aston is not connected	Verify if the Aston is connected to the host PC using a LAN cable either through ethernet or P2P
	Aston is booting/running a diagnostic test	Wait for 10 mins and try again. If the issue persists, contact Atonarp support
	Aston IP address is used to connect instead of the hostname	Please use the hostname instead of the IP address.

2.1.0.2. Unable to connect to Aston through Modbus

Issue	Possible Causes	Initial Troubleshooting
Unable to connect to Aston through Modbus	The Ethernet port on the Aston is not connected	Verify if the Aston is connected to the host PC using a LAN cable either through ethernet or P2P
	Aston is booting/running a diagnostic test	Wait for 10 mins and try again. If the issue persists, contact Atonarp support
	Aston IP address is used to connect instead of the hostname	Please use the hostname instead of the IP address.

2.1.1. Operational Issues

2.1.1.0. Unable to Initialize Aston Impact

Issue	Possible Causes	Initial Troubleshooting
Unable to Initialize Aston Impact	The pressure is too high	During the initialization sequence verify if the pressure goes below 1E-03Pa. If not, then either the input pressure is too high or there is a leak in the system
	Filament is broken	Initialization would fail if the filament option chosen has gone bad. Try switching to the other filament and try again
	Turbo pump communication error	Under rare circumstances, it is possible that the Turbo pump communication has failed. This is often resolved with a power cycle

2.1.1.1. Aston UI Application is slow or unresponsive

Issue	Possible Causes	Initial Troubleshooting
Aston UI Application is slow or unresponsive	PC specification does not meet recommended specification	Confirm if the PC being used to run the Aston UI Application meets the required specification.
	UI is hung/frozen	Close and open the Aston UI application

2.1.1.2. Scan stopped abruptly

Issue	Possible Causes	Initial Troubleshooting
Scan execution stopped	Resonant frequency	1. Execute resonant frequency from the Calibration section of the Aston Application. 2. Verify that the resonant frequency is between 3.54-3.55 Mhz 3. If not set the resonant frequency 40Khz less that the resonant frequency obtained in step #1
	Interlock / Pressure Breach	1. Scan can stop if there was a pressure breach as part of the interlock/safety mechanism in Aston 2. This can be verified from the Activity Logs

2.1.1.3. Ion Current Saturation

Issue	Possible Causes	Initial Troubleshooting
Ion Current Saturates	SEM Voltage is too high	SEM Voltage has a range of 1-1499V, the SEM voltage needs to be adjusted (reduced) to an appropriate level
	Auto range is not selected in Settings	Confirm from the Settings page if SEM auto range is selected

2.1.2. Spectrum Quality Issues

Issue	Possible Causes	Initial Troubleshooting
High Background current	Ion Detector Offset is not tuned	Ion Detector offset needs to be calibrated
	Range2 is enabled	Range2 has higher background
Peaks of the gasses have been shifted	Mass Axis correction is not performed	1. Use Auto MAC option under Calibration to perform the tuning and mass axis correction
No clear spectrum	Inlet valve is closed	Confirm if the inlet valve is open and the chamber pressure is above 1E-05Pa
	Filament is turned off	Confirm if the filament is in ON state and an emission above 100uA is set
	Filament has gone bad	Try switching to a different filament

2.1.3. Other Miscellaneous Issues

2.1.3.0. Hardware Failure

Issue	Possible Causes	Initial Troubleshooting
Hardware Error	One of the hardware could not be communicated to	1. Execute Diagnostic tests and verify if there are any failures 2. Power cycle the Aston

2.1.3.1. Resonant Frequency outside range

Issue	Possible Causes	Initial Troubleshooting
Resonant Frequency outside range	Resonant Frequency is outside the expected range	1. Power cycle Aston, confirm if the issue resolves 2. If #1 does not resolve the varactor in the RF Drive needs to be tuned again

2.1.3.2. RF Search Timeout

Issue	Possible Causes	Initial Troubleshooting
RF Search Timeout	RF Search timed out	Power cycle Aston and confirm if the issue resolves

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