





INFICON

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Table of Contents

1	Introduction	4
2	Installation of the PC Application	4
3	Connecting to an Integrated Identifier	4
3.1	LED Indicator	4
3.2	USB Connector	4
3.3	RS-232 Connector	5
3.4	Power Supply Connector	5
4	Connecting to AST-ID (Standalone Only)	5
5	Running the PC Application	6
5.1	Com Port Settings	6
5.2	Connection	7
5.3	Disconnection	8
6	SAE Commands	8
7	Non-SAE Commands	10
7.1	Calibration	10
7.2	Extended Commands	10
8	Diagnostics	11
9	Configuration	12
10	Program	13
11	Troubleshooting	14

1 Introduction

This manual is to be used in conjunction with the AST-ID Integrated Refrigerant Identifier manual and the AST-ID Refrigerant Identifier manual. It describes the protocol required for communicating with automotive air conditioning equipment and using the AST-ID Config Pro PC application which simulates the communications with automotive air conditioning equipment.

The AST-ID Config Pro PC application can be used with both integrated and standalone versions of AST-ID.

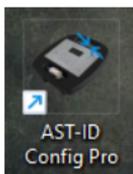
This comprehensive PC software application allows service unit manufacturers and other suitably trained users to test, calibrate and configure the identifiers during the production process.

This manual also covers the protocol required for communications between SAE J2843, SAE J2851 or SAE J3030 automotive air conditioning service equipment.

2 Installation of the PC Application

This is a Windows® compatible application. A copy of the application (.zip format) is available to approved customers only.

Extract the files to a suitable folder on your PC and then run the **Setup.msi** file. This installs the application onto your PC and places a shortcut icon on the desktop, as shown below.



3 Connecting to an Integrated Identifier

Either the USB or RS-232 output of the AST-ID Integrated Refrigerant Identifier can be connected to the PC on which the application is installed.

If the RS-232 connection is used, the PC must be fitted with an appropriate interface card such as PCI or PCI Express. Alternatively, an RS-232 to USB adapter can be used to allow connection to a USB port on the PC.

AST-ID requires power from a 12 V(dc) power supply.

3.1 LED Indicator

The LED illuminates or flashes red or green, indicating the state or process the identifier is in. See the AST-ID or AST-ID Integrated manuals for more information.

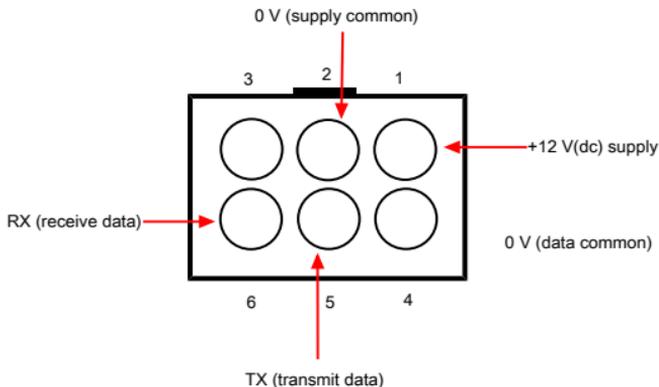
3.2 USB Connector

The USB connector is a standard Type B socket.

3.3 RS-232 Connector

The module is fitted with a 6-way plug from the "TE Connectivity® Mini-Universal MATE-N-LOK®" series mounted onto the internal circuit board.

Rear view of module RS-232 connector



3.4 Power Supply Connector

The nominal 12 V(dc) power supply for AST-ID can either be provided as part of the RS-232 cable using the connections shown above, or separately supplied via a 2.5 mm power jack plug connected as shown below.



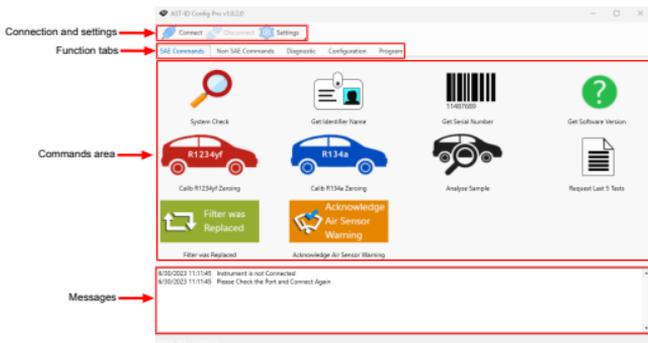
4 Connecting to AST-ID (Standalone Only)

Connect a USB cable between the USB port of the computer and the USB type A connector situated on the left-hand side of AST-ID (as viewed from the front).

5 Running the PC Application

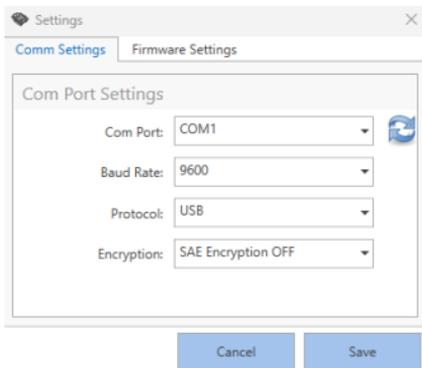
1. Connect AST-ID to the PC using either a USB or RS-232 connection as described in sections 3 and 4.
2. Turn AST-ID on.
3. Run the application by clicking on the desktop shortcut. The screen appears as shown below.

There are four main areas of the page:



5.1 Com Port Settings

1. Click on the Settings tab; the following box appears.



2. Using the drop-down menus, choose the appropriate settings detailed below and select **Save**.

Com Port: Select the appropriate COM port (e.g. COM1 or COM3).

Protocol: USB or RS232

Baud rate (USB only): Select 9600 or 115200

Encryption: Choose one of the following:

SAE encryption OFF	SAE output provides individual gas readings as per SAE J2912. Note that SAE J2912 specifies the use of encryption.
SAE encryption ON	
VDA encryption OFF	VDA output provides PASS/FAIL only. (Fails if purity is below 95%.)
VDA encryption ON	

NOTICE

It may be necessary to try various combinations of **Port** and **Baud Rate** settings until you are able to successfully connect your PC to AST-ID.

1. If **Data Encryption** is selected, the output is encrypted with the AES-256 algorithm by AST-ID prior to transmission to the service unit. The service unit needs to have the capability to de-encrypt the data.
2. If the settings have been successfully saved, the following typical messages are displayed.

```
30/11/2018 15:40:16 Selected Com Port : COM4
30/11/2018 15:40:16 Selected Baud Rate : 9600
30/11/2018 15:40:16 Selected Protocol : RS232
30/11/2018 15:40:16 Encryption Technique : VDA Encryption ON
30/11/2018 15:40:16 Settings Saved Successfully. Please Connect to Proceed...
```

Status: Not Connected

5.2 Connection

1. Click on **Connect**.
2. If the connection to AST-ID is successful, the following typical messages are displayed.

```
30/11/2018 15:40:10 Settings saved successfully. Please connect to proceed...
30/11/2018 15:43:08 Testing Connection...
30/11/2018 15:43:08 Opening Port...
30/11/2018 15:43:09 Command Sent : #P13
30/11/2018 15:43:10 Instrument Reply : ACK
30/11/2018 15:43:10 Instrument successfully Connected
30/11/2018 15:43:10 Ready...
```

Status: Connected

5.3 Disconnection

1. Click on **Disconnect**.
2. If AST-ID is disconnected, the message "Instrument successfully disconnected" is displayed as shown in the last line of the message window.

```

30/11/2018 15:43:06 Testing Connection...
30/11/2018 15:43:08 Opening Port...
30/11/2018 15:43:09 Command Sent : #P13
30/11/2018 15:43:10 Instrument Reply : ACK
30/11/2018 15:43:10 Instrument successfully Connected
30/11/2018 15:43:10 Ready...
30/11/2018 15:44:21 Instrument successfully disconnected
  
```

Status: Not Connected

6 SAE Commands

The **SAE Commands** states the communications protocol required for AST-ID to communicate with a recovery/recycle/recharge machine and the PC application. The SAE Commands tab allows the PC application to simulate the commands sent from an A/C Recharge Station in accordance with SAE Surface Vehicle Standard J2912.

This enables AST-ID units to be tested both before and during service.



⚠ CAUTION

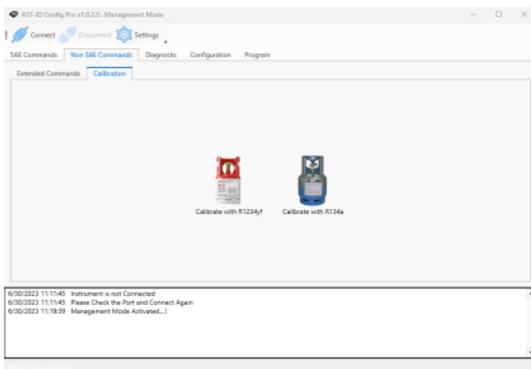
The message area of the window displays the command issued when clicking on an icon. A corresponding replay from AST-ID then appears in the message area as detailed in the following table. Please note that after powering the instrument, the first SAE command sent is ignored.

Icon Name	Command	Reply	Remark
System check	N	ACK	System OK
		Q	Request calibration (zero the gas sensors in ambient air)
		F	Replace oil filter
		O	The air sensor expires soon
		NAK	In warm-up period or fault condition
Get device name	D	d#### (C/R)	E.g. d0353
Get serial number	B	b##### (C/R)	E.g. b0012345
Get software version	G	g####	E.g. Version 1.0 = g0100
Calibrate R1234yf	C	c	Zeroing the gas sensors in ambient air in preparation for an R1234yf analysis. Acknowledge when zeroing is complete or select NAK for not ready or fault
		ACK	
		NAK	

Icon Name	Command	Reply	Remark
Calibrate R134a	W	c ACK NAK	Zeroing the gas sensors in ambient air in preparation for an R134a analysis. Acknowledge when zeroing is complete or select NAK for not ready or fault
Analyze sample	A	NAK	Not ready or fault, see Troubleshooting
		a	Analyzing
		A data stream is received when analysis is completed followed by C/R. This is either encrypted or non-encrypted according to the setting chosen in section 5.1.	
Request last 5 tests	L	l Followed by the data	Analysis data from the last five tests are sent out, separated by a carriage return.
Filter was replaced	R	r	Reset the filter counter.
Acknowledge air sensor warning	O	o	Air sensor warnings are suppressed for five readings.
Acknowledge		ACK	Reset the filter counter.
Negative (not ready)		NAK	
Custom Command			
Restore backup	#X	ACK NAK	ACK if function is successful or NAK if unsuccessful.

7 Non-SAE Commands

7.1 Calibration

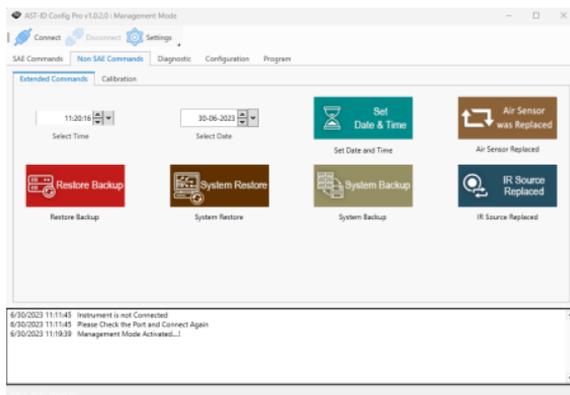


CAUTION

The calibration function is for use by INFICON personnel only.

7.2 Extended Commands

The Extended Commands tab provides six functions:



Set Date and Time – clicking on the icon sends the date and time selected in the drop-down menus to AST-ID. The time and date can be adjusted using the **Select Time** and **Select Date** boxes.

Air Sensor Replaced – clicking on the icon sends a command to AST-ID to register that a new air sensor has been fitted. This action changes the date fitted information within the identifier and causes it to automatically turn on its internal pump and carry out a zero-air calibration. A management password is required.

NOTICE

The following commands are for INFICON personnel only.

Restore Backup – This function restores AST-ID to its factory configuration. A management password is required.

System Restore – This function is password protected and removes all data from AST-ID.

System Backup – This function is password protected.

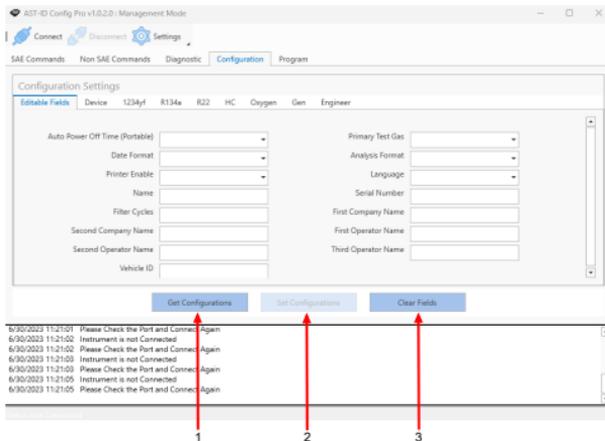
IR Source Replaced – This function is password protected.

8 Diagnostics

The **Diagnostics** tab provides live technical information about the operational performance of the various sensors inside AST-ID and can be used by trained staff or members of the INFICON support team to diagnose performance issues with the instrument and provide a recommended course of action to be taken if a fault develops.

9 Configuration

The **Configuration** tab shows the current configuration of AST-ID. It contains nine individual menu tabs of which only the **Editable Fields** tab is available for the user to carry out changes. It provides a convenient way in which to set up the various user defined fields; for example, when setting up a new AST-ID for its first use.



1	Get configurations	Allows the user to retrieve the current settings from AST-ID.
2	Set configurations	Allows the user to enter new data into the editable fields, which is then programmed into AST-ID.
3	Clear fields	Removes the on-screen data within all fields, however it does not clear the settings within AST-ID. Field data must be entered before selecting Set Configurations .



If there is a data field with a grey background, this indicates that it is not relevant to the type of instrument connected to the PC; for example, the **Auto Power Off Time** field would not be applicable for an AST-ID Integrated built into an A/C Service Station that is continuously powered when in use.

Data within the following menu tabs can be viewed, but not changed:

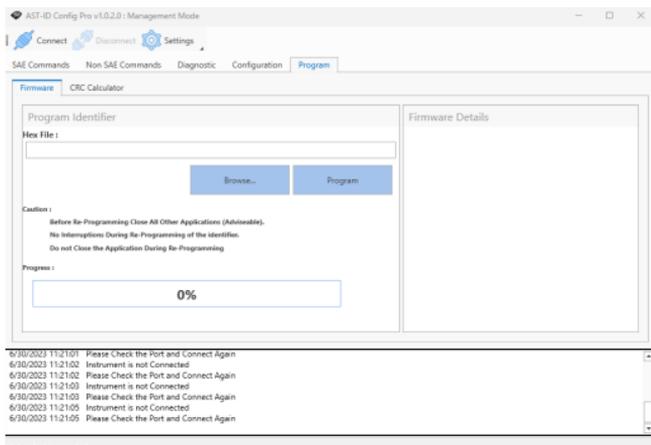
- Device
- 1234yf
- R134a
- R22
- HC
- Oxygen
- Gen

Access to the **Engineer** tab content requires user authentication via a password, and is for use by INFICON personnel only.



10 Program

The Program tab enables AST-ID to be reprogrammed with the last firmware provided on the INFICON website.



11 Troubleshooting

Connection to AST-ID

Problem / Error	Cause	Remedy
Failed to connect to AST-ID, please check the port and connect again	Incorrect COM setting	Select the correct COM port, baud rate, protocol, and encryption status.
	Incorrect wiring configuration on RS232	Rectify the connection faults.

SAE Commands

Problem / Error	Cause	Remedy
After "Calibrate R1234yf/ R134a" is selected, AST-ID reply is NAK	Low flow rate	There is a blocked air inlet or a defective pump. Refrigerant gas has been sucked into the air inlet or the sample has been applied too early. Place AST-ID in clean air and retry.
	Sensor outputs too low	Arrange for recalibration of AST-ID.
After "Analyze Sample" is selected, AST-ID replay is NAK, Analyze Sample Failed, or error code 00005	A healthy flow rate has not been detected for a 60 second period	Investigate the cause, e.g. oil ingress, blocked sample line, or sample pressure too high or low.
	A valid air calibration has not been performed within the last 10 minutes	Perform zero cycle.
	The air sensor requires replacement	Replace the air sensor.
	AST-ID required recalibration	Arrange for recalibration of AST-ID.
	Air calibration process has failed	Investigate the cause, e.g. oil ingress or blocked sample line.
	Sensor outputs are too low	Contact INFICON or your local distributor.



If none of the above remedies resolves the issue, please contact INFICON or your local distributor.



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