Detector ACE User Guide

Errata

The author believes that this document is accurate, and it has been carefully checked for accuracy. However sometimes errors do appear in the published version. If you believe that there is a mistake in this document then please contact the author.

E.&O.E.

Revision History

Version	Date	Revision Description
01	11-Feb-2014	Initial release, covers Detector ACE v1.01

Table of Contents

1. Introduction

iStud Vehicle Detectors are magnetometer based detectors that provide a yes/no indication of vehicle presence. Indication is by way of an open collector output that is toggled when a vehicle is present.

iStud Vehicle Detectors are microprocessor based and store a variety of configuration parameters and status indicators internally in non-volatile memory. These parameters and indicators can be viewed and adjusted by using the proprietary Detector ACE – a Microsoft Windows based application that is connected to the iStud Vehicle Detector using a Line Interface Card.

This user guide explains how to use the Detector ACE application to manage and configure iStud Vehicle Detectors.

Detector ACE

The Detector ACE application provides configuration and diagnostic facilities for iStud Vehicle Detectors. It has a standard Windows dialog interface that will be intuitive to most users.

Detector ACE is not essential for the day-to-day operation of the iStud system. It is only used when vehicle detectors need to be configured or if a problem needs to be diagnosed.

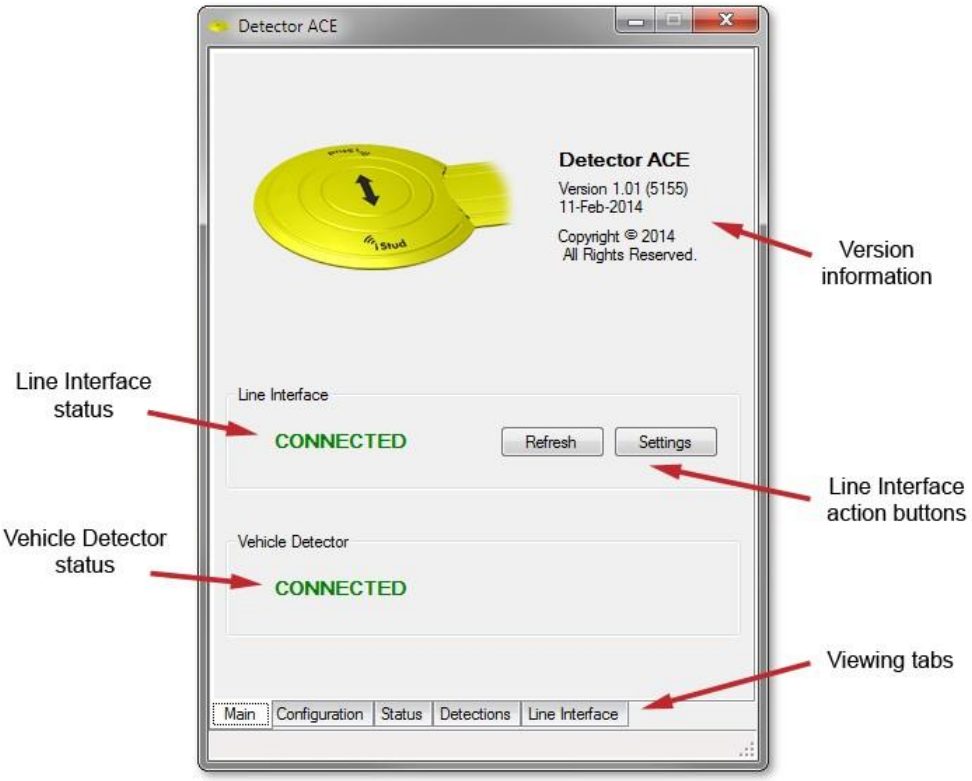
Installing Detector ACE

The Detector ACE application can be installed on most PCs / notebooks running Microsoft Windows XP or later, including Windows Vista and Windows 7.

Prior to installing, it is recommended that all other running applications be closed.

To commence installation, simply double-click the supplied setup.exe file and follow the prompts.

The Detector ACE Window



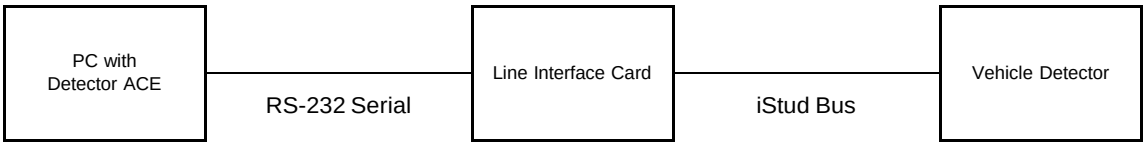
Window Elements

Element	Description
Line Interface status	Shows if a Line Interface Card is connected and communicating with the software.
Line Interface action buttons	Used to adjust PC port settings and re-establish the connection to the Line Interface Card.
Vehicle Detector status	Shows if a Vehicle Detector is correctly connected and communicating with the Line Interface Card.
Viewing tabs	Toggles between alternate pages of information and settings.
Version information	Confirms the version of the installed software.

2. Getting Started

This chapter describes how to configure the Detector ACE to connect to a Vehicle Detector and carry out some basic operations.

Physical Connection



A standard RS-232 serial COM port is used on the host PC for the connection to the Line Interface Card. If the PC does not have a built-in serial port then a USB serial adapter can be used. This connection is labelled ‘COMMS’ on the Line Interface Card and uses an RJ-45 to DB-9 cable.

The connection between the Line Interface Card and the Vehicle Detector is known as the ‘iStud Bus’. It uses 3 wires to carry both power and data to the detector.

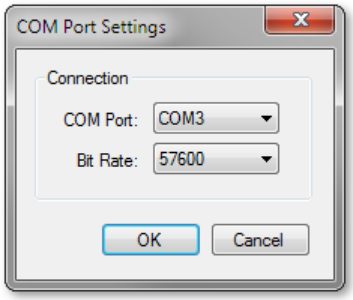
Connect both the RS-232 Serial and iStud Bus cables and then apply power to the Line Interface Card.

Connection Settings

The connection settings are configured during the first use of Detector ACE. Once set, they are stored on the PC and do not need to be changed.

COM Port Settings

Clicking the ‘Settings’ button on the Main tab shows the following dialog:



Parameter	Setting
COM Port	Choose a COM port from the drop-down list. All COM ports available on the PC are shown in the list. USB adapters can be identified by viewing the list with the adapter disconnected and then connecting the adapter and comparing the difference.
Bit Rate	Must agree with the Line Interface Card’s rate. A value of 57600 is currently used.

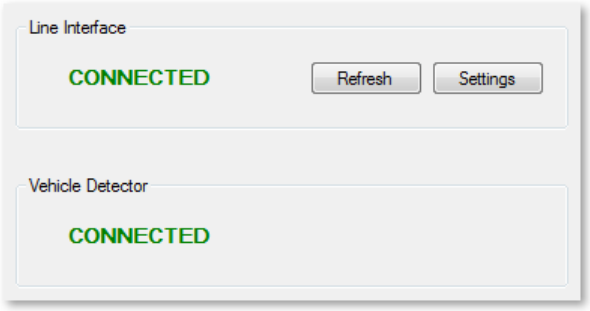
Click ‘OK’ to apply the settings or ‘Cancel’ to close the dialog without saving.

Note If using a USB serial adapter then be sure to connect it to the same USB port on the PC every time that the Detector ACE is used. This is because Windows associates the COM port number with specific USB port / adapter combinations.

If you wish to connect your USB serial adapter to a different port than the one used previously, then simply change the COM Port setting as shown above.

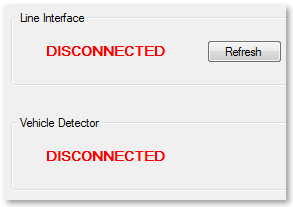
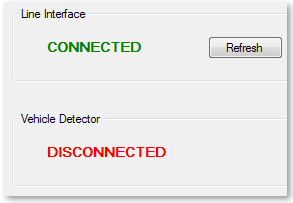
Establishing the Connection

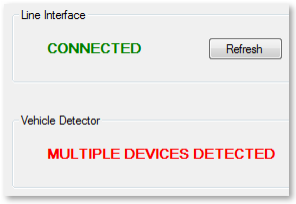
Once the connection settings have been made, click the 'Refresh' button on the Main tab. If the connection is successful then the following indication will be seen and some additional tabs will appear at the bottom of the window.



Troubleshooting

If the above indication is not seen then the following action can be taken.

Indication	Description / Action
	The link from PC to Line Interface Card (LIC) is not working. • Check that all cables are connected • Check LIC power supply Ensure that LEDs on the front of the LIC flash when power is first applied to LIC • Check that COM Port settings are correct • If using a USB serial adapter, use the *USB Troubleshooting Procedure* below.
	The link from PC to Line Interface Card (LIC) is working; however the iStud Bus between the LIC and Vehicle Detector is not operational. • Check that the iStud Bus cable is connected • Check that the Vehicle Detector has been completely isolated from all other equipment and is only connected to the LIC



Both the link from PC to Line Interface Card (LIC) and the iStud Bus are operational, however more than one Vehicle Detector is connected to the iStud Bus.

- Only connect one Vehicle Detector to the iStud Bus at a time

USB Troubleshooting Procedure

If using a USB serial adapter, the correct COM Port can be verified as follows:

1. From the Main tab, click ‘Settings’ and then open the COM Port pull-down list.
2. Note down all COM Ports and then click ‘Cancel’.
3. Disconnect the USB serial adapter from the PC.
4. From the Main tab, click ‘Settings’ and then open the COM Port pull-down list.
5. Determine which COM Port is missing from the list made in step 2 above. The missing port number is the one that should be used when the USB adapter is connected to the same USB port on the PC (the COM Port number will differ if the USB adapter is connected to a different port on the PC).
6. If no missing COM Port was found in step 5 then either the USB adapter or USB port on the PC is faulty.
    - Check the USB port on the PC with another device (such as a USB flash memory stick) for correct operation.
    - Try the USB serial adapter in a different USB port. Select one that is directly on the PC; do not use an external USB hub.

3. Configuring and Viewing

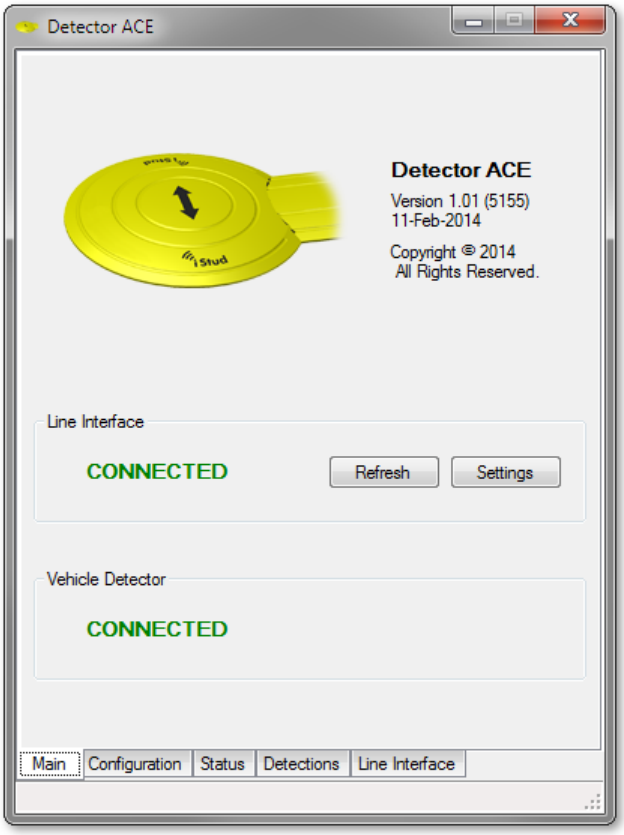
The Detector ACE application is arranged as a logical series of pages which are selected by clicking on tabs at the bottom of the window.

Each of these pages is explained in greater detail below.

Main Tab

The Main tab shows the status of the two physical/logical links:

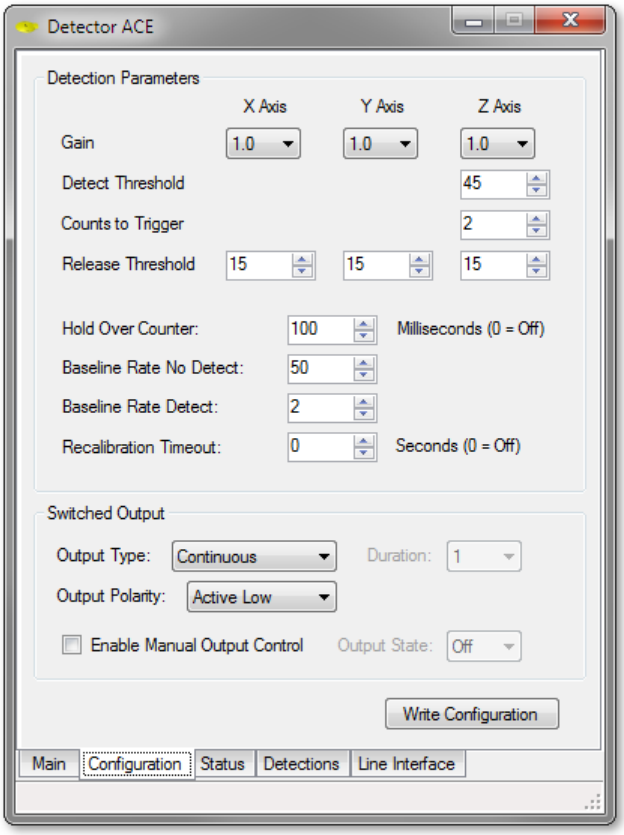
- PC to Line Interface Card
- Line Interface Card to Vehicle Detector



It also has two Line Interface action buttons which allow the link parameters to be adjusted. Their operation is described in section 2 above.

Configuration Tab

Selecting the “Configuration” tab shows the following page:



Detection Parameters

The detection parameters determine how the Vehicle Detector responds to changes in the surrounding magnetic field and are described below.

Parameter	Setting
Gain	Controls the analogue front end amplification of the signal from the magnetometer. Discrete values between 0.5 and 2.0 can be selected from the pull-down list.
Detect Threshold	Sets the magnitude change required (away from the baseline value) before a vehicle detection event is triggered.
Counts to Trigger	The number of consecutive samples for which the magnetic signal must exceed the Detect Threshold before a vehicle detection event is triggered.

Release Threshold	Specifies the minimum magnitude required to continue a detection event once the event has commenced. This value is usually set lower than the Detect Threshold.
Hold Over Counter	Specifies the time period for which the magnetic magnitude must drop below the Release Threshold to end a detection event.
Baseline Rate No Detect	The rate at which the baseline magnetic value changes (in response to background changes) when the Vehicle Detector is in its idle state (no detection event in progress).
Baseline Rate Detect	The rate at which the baseline magnetic value changes (in response to background changes) when the Vehicle Detector is in its triggered state (detection event in progress). Usually set much lower than Baseline Rate No Detect.
Recalibration Timeout	Setting a value greater than 0 will cause the Vehicle Detector to perform an automatic recalibration in the event that a detection event has persisted for a time greater than the number of seconds specified. Use with caution; usually set to 0.

Switched Output

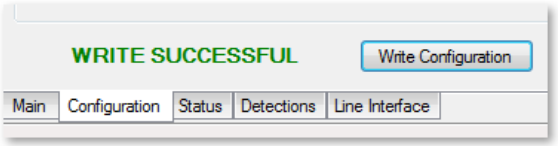
The Switched Output settings control how each detection event is signalled to the connected equipment.

Parameter	Setting
Output Type	One of the following: • Continuous Output is held in the active state for the entire time while a detection event is in progress. • Timed Output is toggled to the active state at the start of a detection event and then returns to the idle state after the period specified in Duration elapses.
Duration	The period, in seconds, for which the output remains active when an event occurs. Applies only when Output Type is set to “Timed”.
Output Polarity	Desired output when a vehicle is detected. Can be either “Active High” or “Active Low”.
Enable Manual Output Control	Allows the output to be forced to a specific state. For testing purposes only.
Output State	State to be used during Manual Output Control

Write Configuration

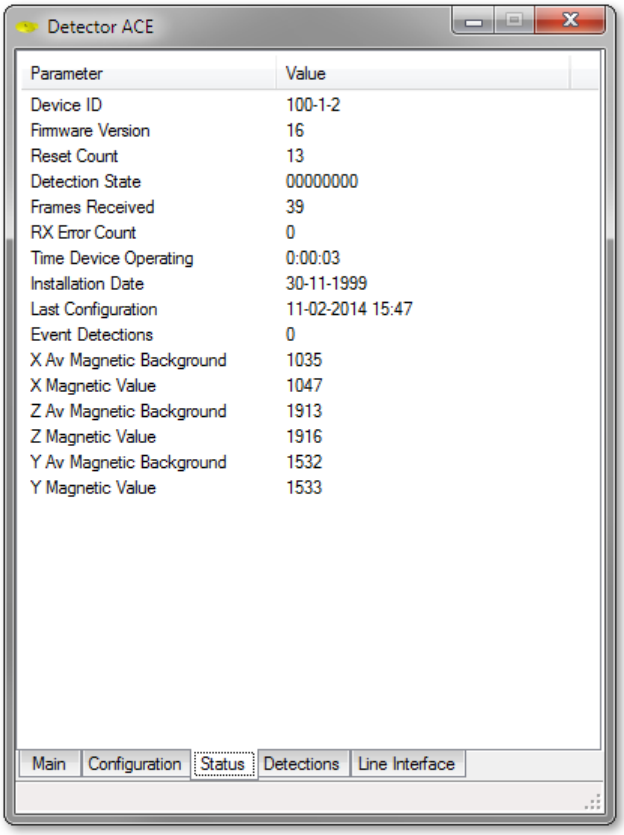
To save all of the settings on the Configuration tab to the Vehicle Detector, click the 'Write Configuration' button. All of the settings are saved to the Vehicle Detector's non-volatile memory.

Once the saving process has been successfully completed, a confirmation appears briefly at the bottom of the window as shown:



Status Tab

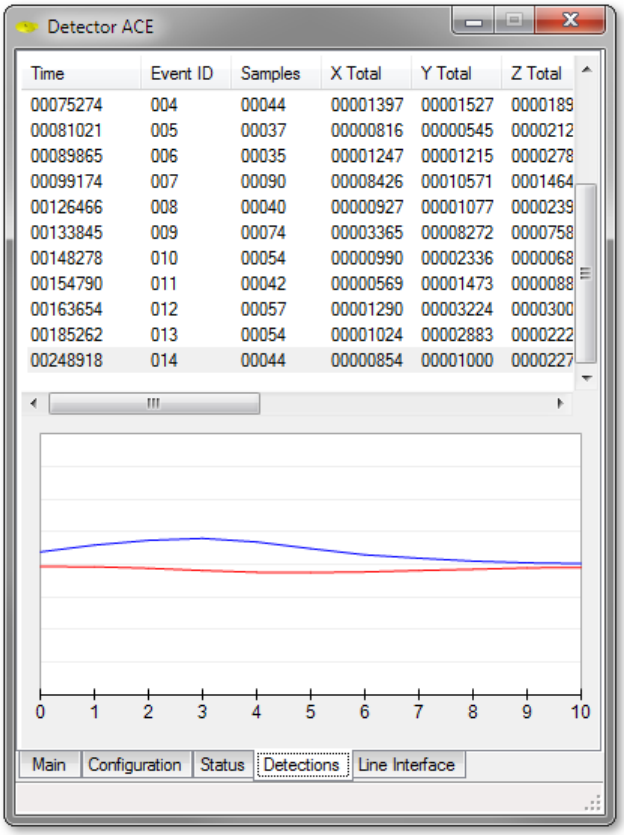
Selecting the “Status” tab shows the following page:



The Status tab shows status information from the connected vehicle detector. This tab only appears once a vehicle detector is successfully connected to the iStud Bus.

Detections Tab

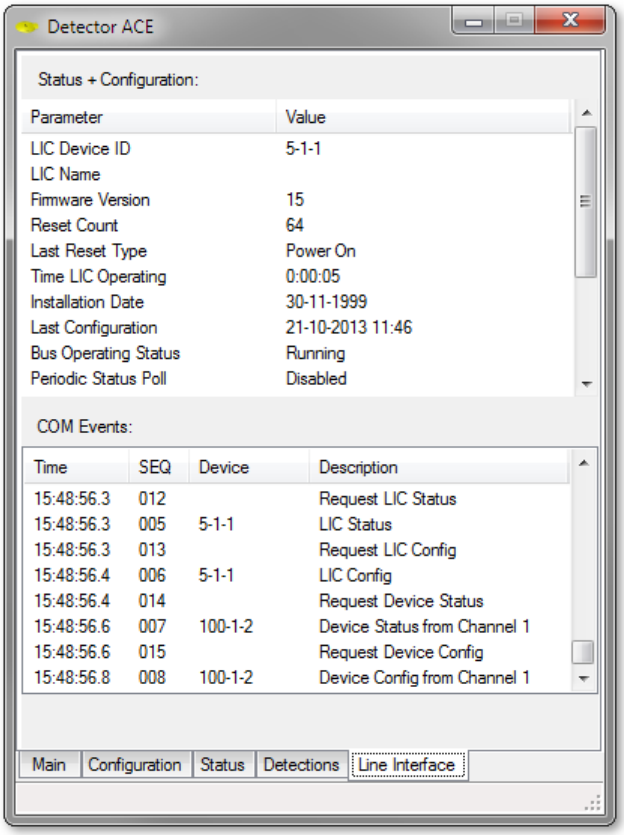
Selecting the “Detections” tab shows the following page:



The Detections tab can be helpful in diagnosing vehicle detection problems. It shows summary information along with magnetic waveform images for vehicle detection events.

Line Interface Tab

Selecting the “Line Interface” tab shows the following page:



The Line Interface tab can be helpful in diagnosing communication problems. It is divided into two sections. The upper section shows a number of internal parameters from the Line Interface Card, while the lower section shows the messages being sent and received on the RS232 serial interface. You may be asked to provide a copy of this information when calling for technical support.