Detector ACE User Guide

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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.

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Revision History

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

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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:

COM Port Settings
Connection
COM Port: COM3 -
Bit Rate: 57600 💌
OK Cancel

Setting
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.
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.

Refresh Settings

Troubleshooting

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

Indication

Description / Action

Line Interface DISCONNECTED Refresh	The link from PC to Line Interface Card (LIC) is not working.
Vehicle Detector	Check that all cables are connected
DISCONNECTED	 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.
Line Interface CONNECTED Refresh Vehicle Detector	The link from PC to Line Interface Card (LIC) is working; however the iStud Bus between the LIC and Vehicle Detector is not operational.
DISCONNECTED	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

Refresh
DETECTED

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

Detector ACE	
And	Detector ACE Version 1.01 (5155) 11-Feb-2014 Copyright © 2014 All Rights Reserved.
Line Interface CONNECTED	Refresh Settings
Vehicle Detector	
Main Configuration Status Detections	Line Interface

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:

Detector ACE			_ _ x
Detection Parameters			
	X Axis	Y Axis	Z Axis
Gain	1.0 🔻	1.0 🔻	1.0 👻
Detect Threshold			45 🌲
Counts to Trigger			2
Release Threshold	15 🌲	15 🌲	15 🌻
Hold Over Counter:	100	÷ Millised	conds (0 = Off)
Baseline Rate No Det	ect: 50	* *	
Baseline Rate Detect	2	* *	
Recalibration Timeout	: 0	÷ Second	ds (0 = Off)
Switched Output			
Output Type: Contin	nuous 🔻	Duration:	1 -
Output Polarity: Act	ive Low 🔻		
Enable Manual O	utput Control	Output State:	Off 👻
		Write	Configuration
Main Configuration St	atus Detection	s Line Interfac	e

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 S	pecifies 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

WriteConfiguration

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:

WRITE SUCCESSFUL				Write Configuration		
Main	Configuration	Status	Detections	Line Interface		

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:

😕 Detector AC	E				
Time	Event ID	Samples	X Total	Y Total	Z Total 🔺
00075274	004	00044	00001397	00001527	0000189
00081021	005	00037	00000816	00000545	0000212
00089865	006	00035	00001247	00001215	0000278
00099174	007	00090	00008426	00010571	0001464
00126466	008	00040	00000927	00001077	0000239
00133845	009	00074	00003365	00008272	0000758
00148278	010	00054	00000990	00002336	0000068
00154790	011	00042	00000569	00001473	0000088
00163654	012	00057	00001290	00003224	0000300
00185262	013	00054	00001024	00002883	0000222
00248918	014	00044	00000854	00001000	0000227
					T
·	111				•
	2 3	4 5	6	7 8	9 10
		- 5	Ŭ		5 10
Main Configu	ration State	Is Detectio	ns Line Int	erface	
- Coninge				011000	
					:

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:

😕 Dete	ector A	CE						×
Status	+ Con	figuration	1:					
Parameter			Val	Value				
LIC Dev	LIC Device ID			5-1	5-1-1			
LIC Nar	LIC Name							
Firmwar	Firmware Version			15	15			
Reset C	Reset Count			64	64			
Last Re	Last Reset Type			Pov	Power On			
Time LI	C Ope	rating		0:0	0:05			
Installat	ion Da	te		30-	30-11-1999			
Last Co	Last Configuration			21-	21-10-2013 11:46			
Bus Op	erating	Status		Rur	Running			
Periodic	Periodic Status Poll				abled			Ŧ
СОМ Е	Events	:						
Time		SEQ	Device		Des	cription		-
15:48:5	56.3	012			Req	uest LIC Stat	us	
15:48:5	56.3	005	5-1-1		LIC	Status		
15:48:5	15:48:56.3 013			Request LIC Config				
15:48:5	15:48:56.4 006 5-1-1			LIC Config				
15:48:5	15:48:56.4 014			Request Device Status				
15:48:5	15:48:56.6 007 100-1-2			Device Status from Channel 1				
15:48:5	15:48:56.6 015			Request Device Config				
15:48:5	15:48:56.8 008 100-1-2			Device Config from Channel 1			-	
Main	Config	guration	Status	Detect	tions	Line Interfa	ce	
							_	:

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.