Stoneridge DSRC Tester Manual

Stoneridge Electronics Ltd

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1 INTRODUCTION

The Stoneridge DSRC Tester is a small hand held DSRC Transceiver intended to be used for reading DSRC tachograph data in stationary vehicles, by an operator.

The DSRC tester is designed to operate from the internal battery for at least a full working day, under all climatic conditions, communicating with Optimo through a Bluetooth connection.

1.1 Antenna area

The antenna covers the shaded area on top of the unit as shown on the picture below. The area must not be covered when the radio is activated for reading OBUs. The antenna must be pointed in the direction of the OBU as the arrow indicates.

1.2 Abbreviations

BST	Beacon Service Table
BT	Bluetooth
DSRC	Dedicated Short Range Communication
OBU	On Board Unit
SAM	Secure Application Module
VST	Vehicle Service Table

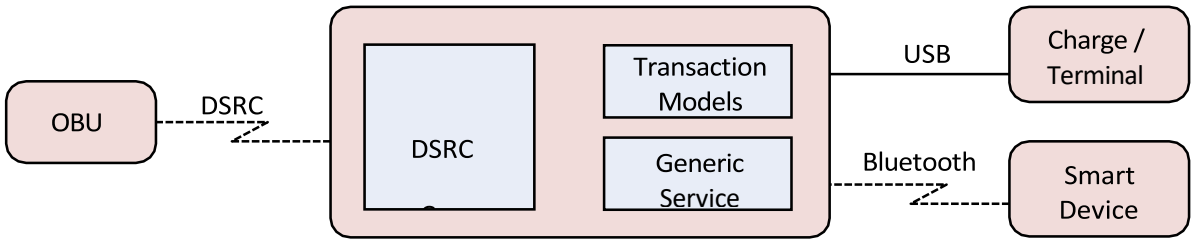


Figure 1: DSRC Tester system architecture

2 BATTERY CHARGING

RSE622 is powered by a rechargeable Li-Ion battery. A USB charger and cable are included for charging the battery from a standard socket. Please follow the charging procedure below to ensure correct operation of your RSE622

2.1 First Charge

a. Always use the USB charger and cable provided with the product
b. Plug in the charger and connect the usb charging lead to the DSRC tester
c. Switch on the charger and switch on the DSRC tester by briefly pressing the button on the DSRC tester. You should hear a single beep. The green led should flash twice at a 2 second interval and then the led should flash red at 2 second intervals to indicate charging
d. Should the red led not continue to flash after, then leave the product for 10 minutes and repeat the process outlined above. It is essential that the led is flashing red every two seconds to ensure correct charging
e. Do not remove the product from charge until the led flashes green every 2 seconds. The green led flashing at this rate indicates the product is fully charged and ready for use.
f. Charging time of the product is 4 hours

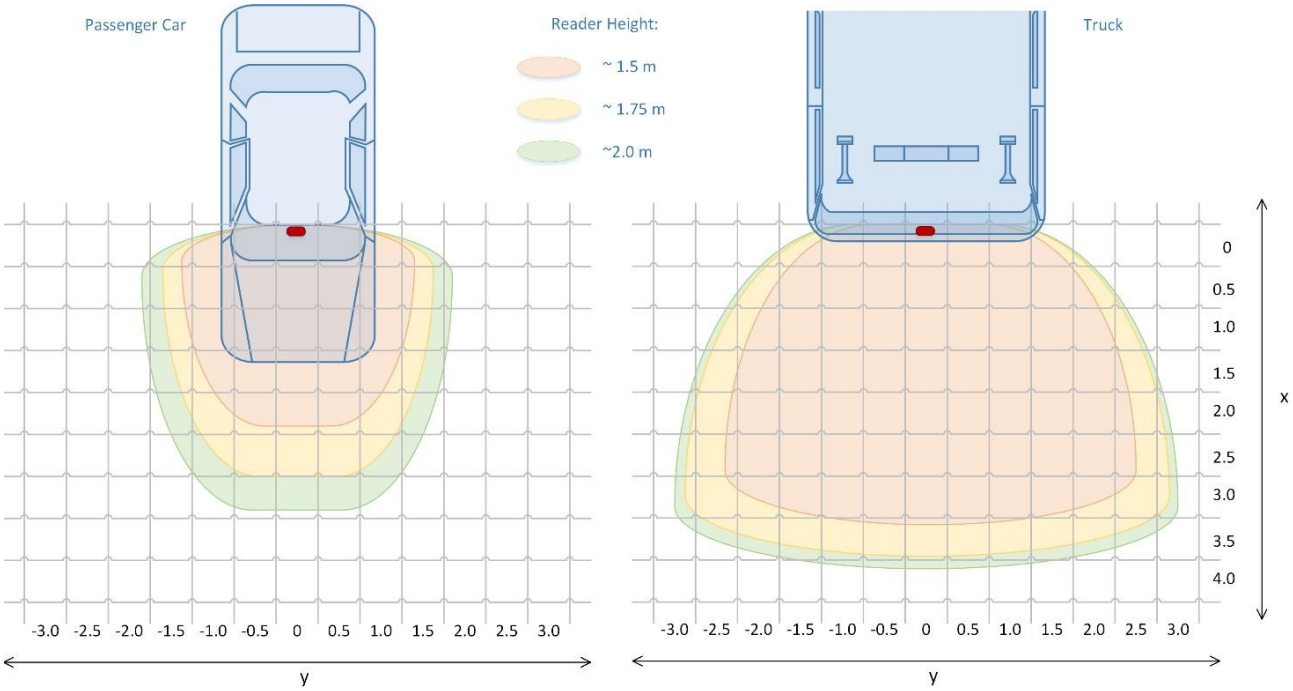
2.2 Subsequent Charges

a. All subsequent charging of the product should be completed using the same method as the first charge.
b. It is fully appreciated that it is not always possible to charge the product to full charge, i.e. green led flashing every 2 seconds. However, it is essential that the product is charge fully at least once per week otherwise lower product performance may be experienced

2.3 OBU Reading Zones

The longest reading range is achieved when OBU and Transceiver is pointing directly toward each other. Any angle on RSE622 or OBU is reducing the range.

The drawing below shows the typical OBU reading zones for passenger cars and trucks. The different coloured reading zones represent the RSE622 height above ground.



The reading zones diagram shows that the reading zone is smaller for light vehicles with angled windscreen at all height for the DSRC transceiver. When the RSE622 is held at “normal head height of a person (1,75m) is approximately x=3 by y=3 meters wide for a light vehicle (angled windscreen). The reading zone for a large vehicle with an almost vertical windscreen is x=4 by y=6 meters

3 HMI FUNCTIONS

The RSE622 has a set of human-machine interfaces as described in the next paragraphs.

3.1 Push Button

A light press on the push button will switch on the DSRC tester, it will respond with a blink, a beep and a short vibration.

The push button serves different functions depending on how long it is pressed.

Initial State	*Push button press time*	*Result*
RSE622 OFF	Any	RSE622 switched ON
RSE622 ON	Less than 3 seconds	DSRC radio activated
RSE622 ON	More than 3 seconds	RSE622 switched OFF
RSE622 ON	More than 20 seconds	RSE622 is reset to factory defaults, and switched OFF

3.2 Light

RSE622 has a multicolour LED on top of the casing. The tables below describes the different LED indications.

LED indications when the USB cable is connected:

Colour	*Interval*	*Mode*
NO	-	RSE622 OFF
Red	3 seconds	RSE622 ON, Battery charging
Green	3 seconds	RSE622 ON, Battery fully charged
Red	0.5 seconds	RSE622 ON, Battery charging, DSRC radio activated
Green	0.5 seconds	RSE622 ON, Battery fully charged, DSRC radio activated
White	0.5 seconds	RSE622 ON, BstTest running
Amber	Constant	RSE622 ON, firmware is being upgraded

LED indications when the USB cable is not connected:

Colour	*Interval*	*Mode*
NO	-	RSE622 OFF
Green	3 seconds	RSE622 ON, Battery OK
Yellow	3 seconds	RSE622 ON, Battery low (less than 2 operating hours remaining)
Blue	3 seconds	RSE622 ON, Bluetooth connected (will change to yellow when battery is low)
Blue	0.5 seconds	RSE622 ON, Bluetooth connected, DSRC radio activated (will be yellow when battery is low)
White	0.5 seconds	RSE622 ON, BstTest running

3.3 Sound

The built in buzzer signals the following events:

Event	*Sound signature*
RSE622 switched ON	Short beep
RSE622 switched OFF	Three short beeps
DSRC radio activated	Short beep
Reset to factory defaults	Long beep
OBU communication completed, transaction sent	Short beep
OBU communication timeout, no transaction	Three short beeps
Bluetooth connected	Short beep
Bluetooth disconnected	Three short beeps

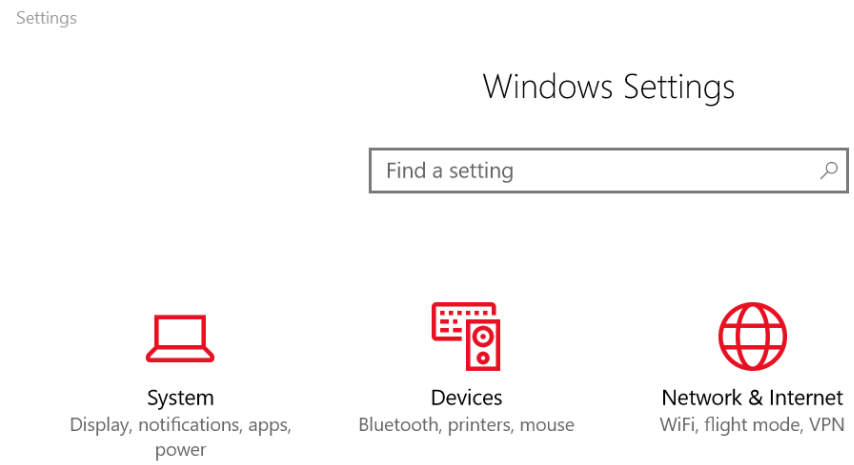
3.4 Vibration

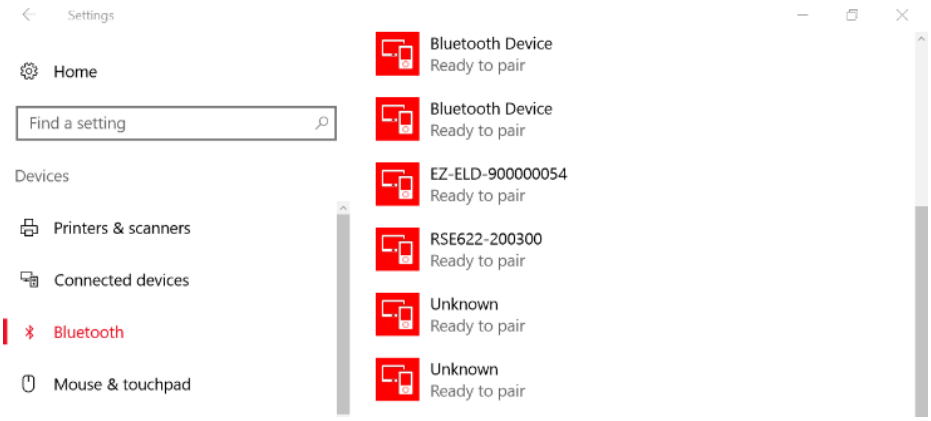
The built in vibration signals the following events:

Event	*Sound signature*
RSE622 switched ON	Short vibration
RSE622 switched OFF	Three short vibrations
DSRC radio activated	Short vibration
OBU communication completed, transaction sent	Short vibration
OBU communication timeout, no transaction	Three short vibrations

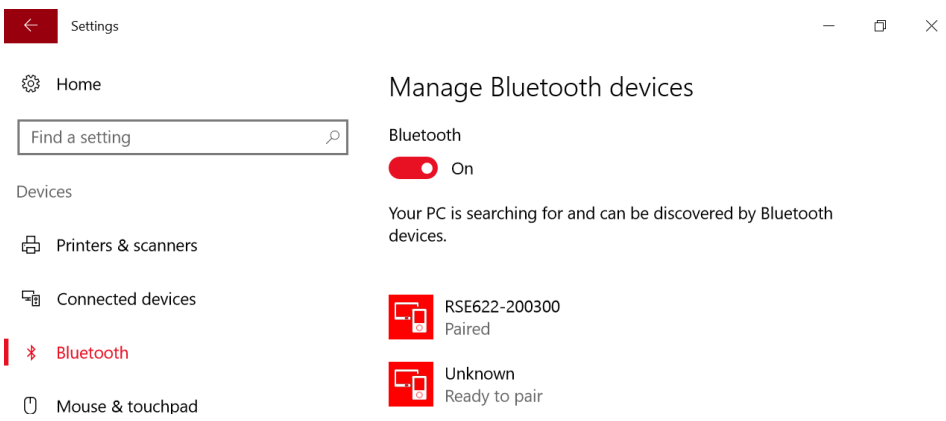
4. Optimo – Connecting the DSRC Device – 1st Time Installation

- Open Windows Settings on Optimo by touching the Windows Key and selecting the Settings Cog, then select Devices and Bluetooth





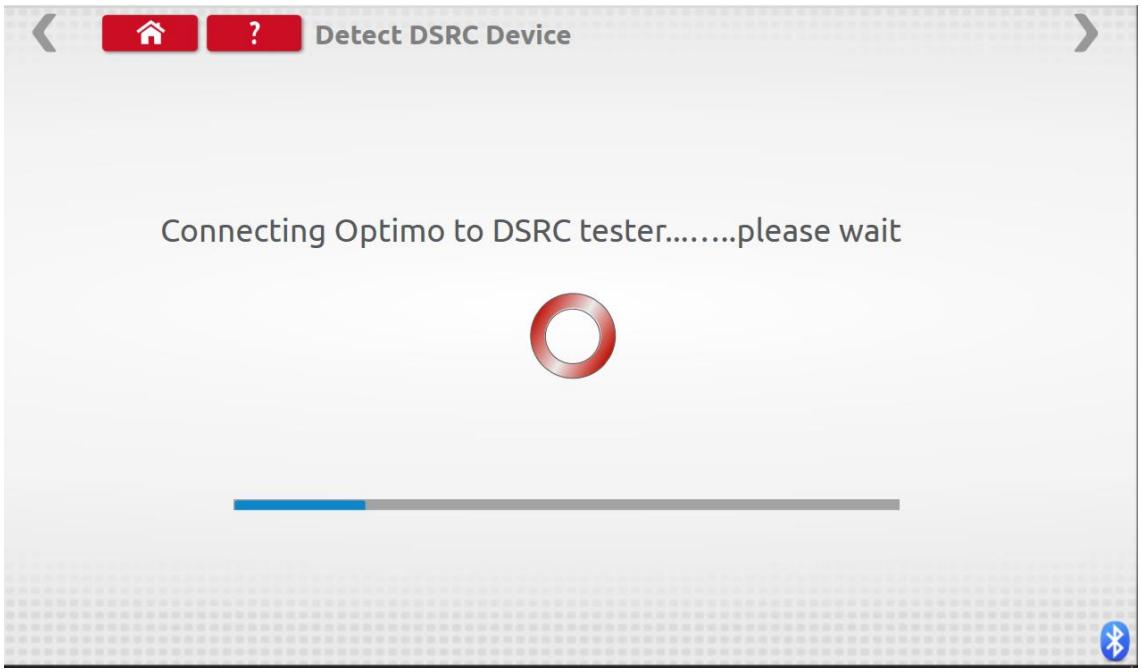
- Select RSE622 and pair the device, the screen below will appear on completion of pairing



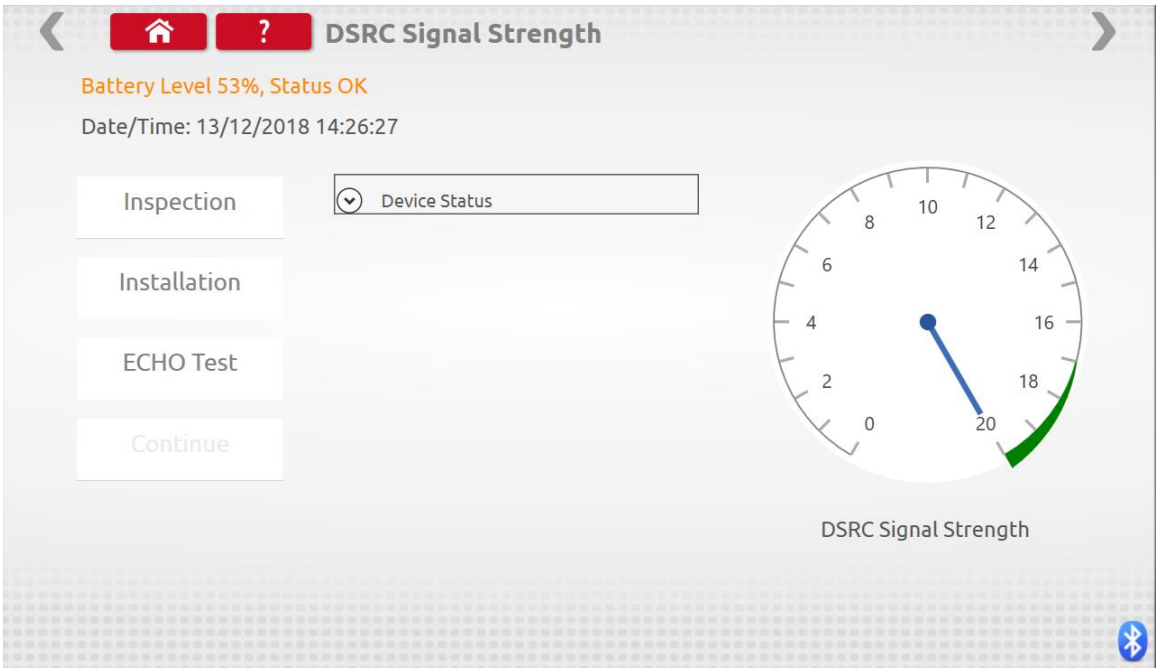
- Once the device has been paired there will be no need to repeat this process again

5. Optimo – Echo Test, Inspection Test and Installation Test

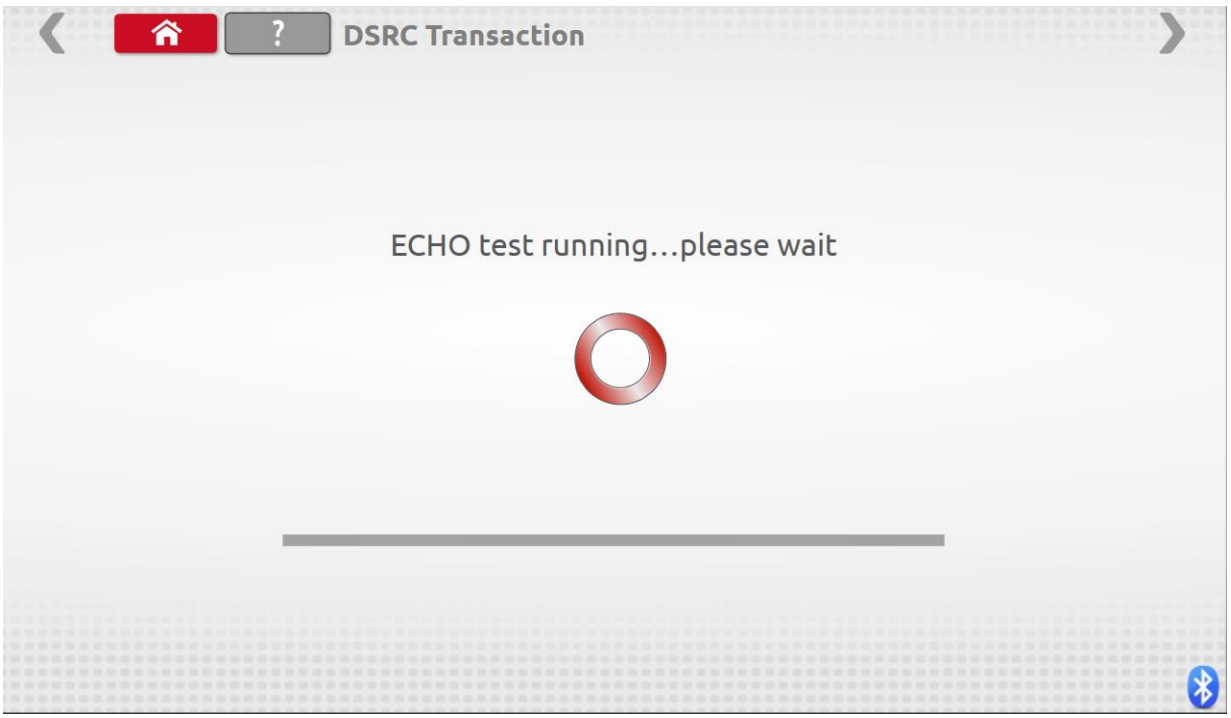
- Switch on the DSRC tester and the led on the unit will indicate green. Place your workshop card in the slot provided on Optimo, chip side downwards. Select the DSRC icon on the screen.
- Once the application opens the screen below will be obtained and the led on the DSRC tester will turn blue when connection is complete. Connection of the device will take several seconds.

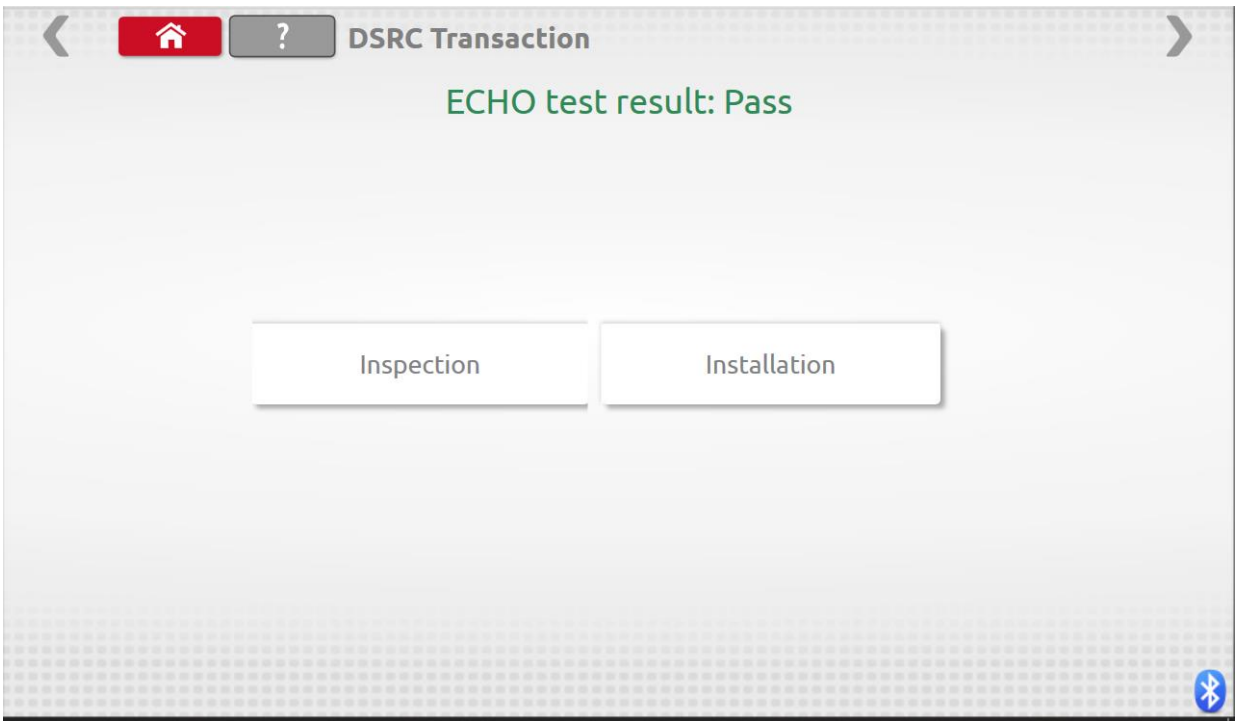


- If you are in range of a DSRC transmitting device the screen below will be obtained. Your screen must look like this before you can proceed with any DSRC testing.

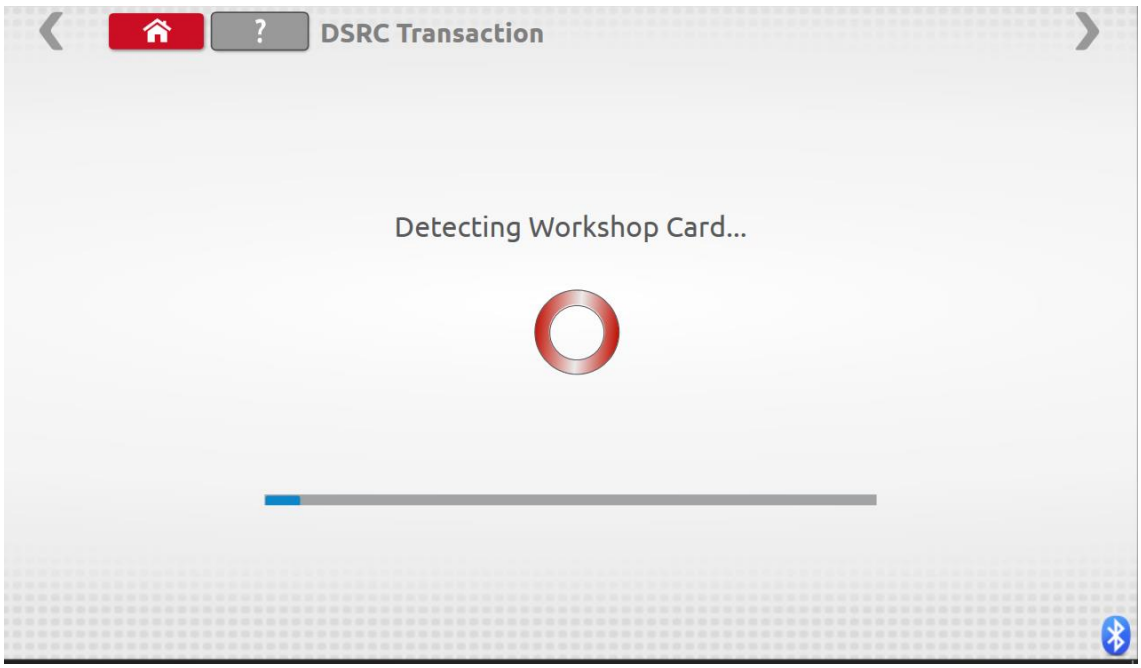


- Select one of the tests, note that an Echo test is always performed by default no matter which test is selected
- Both Inspection test and Installation test show the same screens illustrated below.
- Inspection test is used during for a vehicle calibration.
- Installation test is used when the installation of a new, complete tachograph system is fitted to a vehicle

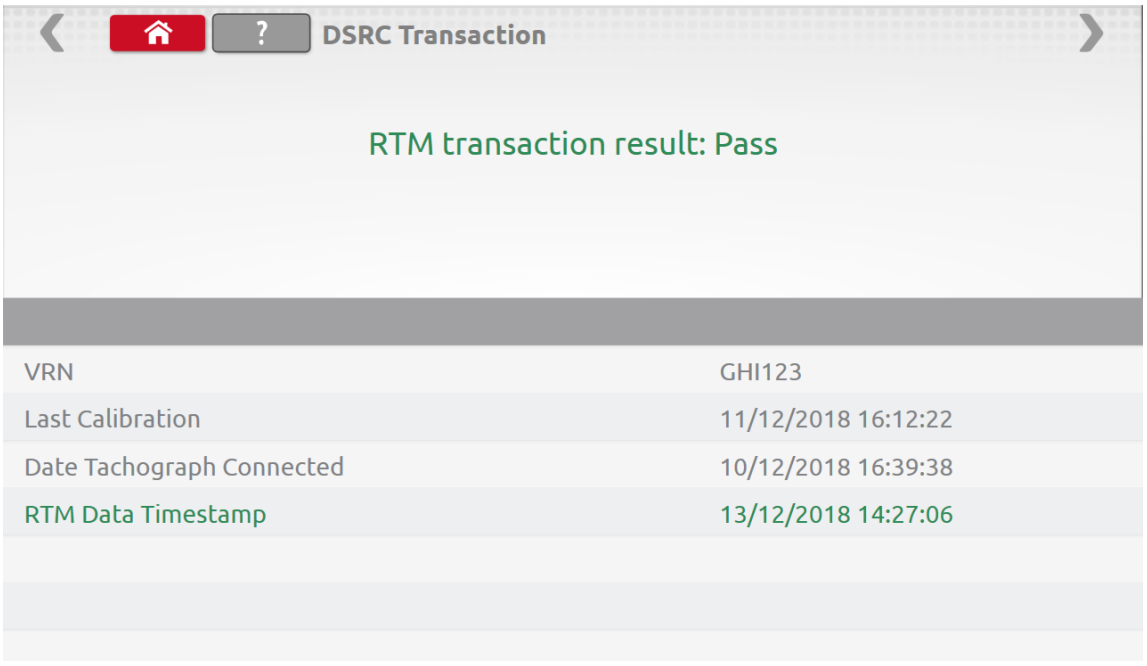




- Make sure your workshop card is in the card slot in Optimo, chip side down
- On selection of either test, Optimo will look for your workshop card as illustrated below



- On completion of the test the results screen below will be shown



- DSRC Testing now complete, remove your workshop card from Optimo

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REGISTER OF
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Declaration of Conformity

Manufacturer	Q-Free ASA
Product identification	RSE622
Description	Radio Transceiver for use in applications such as Electronic Fee Collection, Electronic registration Identification and Parking & Access applications
Declaration	This declaration of conformity is issued under the sole responsibility of the manufacturer. The identified product is in conformance with all essential requirements of the radio equipment directive 2014/53/EU, EMC Directive 2014/30/EU, Safety Directive 2014/35/EU, RoHS Directive 2011/65/EU, WEEE directive 2012/19/EU.
Product Standards applied	EN12253 DSRC Physical layer EN12795 DSRC Link layer EN12834 DSRC Application layer EN13372 Communication profiles for DSRC
Application Standards applied	ISO14906 DSRC for Electronic Fee Collection (EFC)
Harmonized test standards applied	ETSI EN 300 674 Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band; Part 1 (v.1.2.1): General characteristics and test methods for Road Side Units (RSU) and On-Board Units (OBU) Part 2-1 (V1.1.1): Requirements for the Road Side Units (RSU) EN 301 489 Electromagnetic compatibility and Radio spectrum Matters (ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 1 (V1.9.2): Common technical requirements Part 3 (V1.6.1): Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz IEC 60950-1:2005 (Second Edition); Am 1:2009 + Am 2:2013 Information technology equipment - Safety IEC 60529 (2013) Degrees of protection provided by enclosures (IP Code)

Authorized signature, Manufacturer

Ståle Toverød

Name: Ståle Toverød
Position: Product owner

Date of issue: 17.02.2016

Place of issue: Trondheim, Norway

Additional information
For additional documentation, contact Q-Free ASA.