Transcan® *Advance*
Install Guide

Seven Telematics Ltd

sales@seventelematics.com

+44 (0)1636 550 320

After sales : +44 (0)1903 837 000

Transscan® *Advance*

Install Guide

For further information on the products and services offered by Seven Telematics please visit: **www.seventelematics.com**

Please do not struggle to use the small diagrams as all diagrams and figures are in large format in the appendix.

Seven Telematics reserves the right
to make improvements in the products described in this manual at any time and without any notice.

Seven Telematics cannot accept
liability for any damages or loss of information resulting from the use of information contained in this document.

Transcan® *Advance*
Install Guide

Contents

Transcan® *Advance*
Install Guide

Important Note

Transcan Advance Temperature Recorders.

This manual refers to installation procedures of the Transcan Advance temperature recorders.

Temperature Inputs: The Transcan Advance supports a maximum of 8 temperature sensors using inputs T1-T8.

For further information concerning the use and operation of Transcan data recorders please refer to Transcan Advance User Reference Manual.

1.0   Introduction

This document provides guidance on the installation of Transcan temperature and data recorders supplied by Seven Telematics. Installations should be carried out in accordance with these recommendations as otherwise Seven Telematics may refuse to accept any subsequent warranty claim.

1.1   Installation overview

Transcan recorders are normally supplied with an installation kit which includes most of the components used for an installation. The procedure for installing a Transcan recorder involves mounting the recorder, the sensors and, if required, a Junction Box and then providing suitable connections between these components. These are shown in Figure 1.1 below which represents an in-cab installation using a junction box.
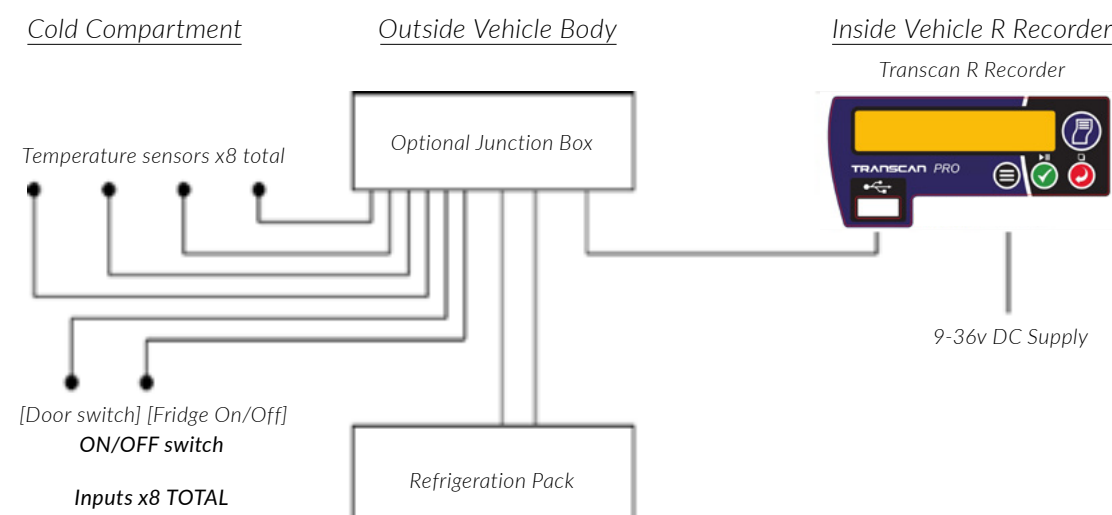
Cold Compartment   Outside Vehicle Body   Inside Vehicle R Recorder

Transcan R Recorder

Optional Junction Box

Temperature sensors x8 total

9-36v DC Supply

[Door switch] [Fridge On/Off]
ON/OFF switch

Inputs x8 TOTAL

Refrigeration Pack

Figure 1.1 Block Diagram of Typical Installation for R version with Junction Box.

The principal steps involved in completing an installation are as follows. For further details about any step refer to the section of this document which is indicated in brackets.

- Choose suitable locations for the temperature sensors and status switches (2.1, 2.2)
- Choose a suitable mounting position for the recorder (3.1, 3.2, 3.3)
- Identify a suitable power supply point (2.3)
- Choose a suitable location for the Junction Box, if required (2.4)
- Install the Junction Box, if used, and route the connecting cable to the recorder
- Mounting location (2.4)
- Install protective covering for the sensor wiring and install the sensors (2.1, 2.2)
- Install and connect the recorder (3)
- Check the installation (4)
- Commission the recorder (5)

Any holes drilled in the insulated body panels must be sealed using a good quality silicone sealant to prevent water ingress. Sensor and status switch wiring should be suitably protected.

1.2   Transcan Temperature Recorders

The Transcan Advance is available in 3 formats: R, T and C (for in-cab installation on a vertical bulkhead).

1.3   Temperature Sensors

Transcan Advance temperature and data recorders use thermistor sensors for temperature measurement. The recorders are designed to operate only with sensors supplied by Seven Telematics

1.4   Status Monitoring

Status inputs (On/Off switch inputs) may be used to monitor e.g.: door and defrost operations. The recorder configuration parameters may be set to accommodate either normal (closed contact) or reverse (open contact) acting switches (see the User Reference Manual for further details).

1.4 Status Monitoring Cont.

Transcan Advance:

Status input 1 (labelled on the back of the unit) of the Transcan Advance should ONLY be used to automatically enable/disable out of range temperature alarms via a switch operated by the refrigeration unit (Ext. Alarm Control).

Status input 2 (labelled on the back of the unit) is normally used to monitor door operation and is used for the rear door while status input 3 (labelled on the back of the unit) is normally used to monitor defrost operations. Status input 4-8 (labelled on the back of the unit) are user definable and may be used to monitor other switches as maybe found in dual compartment vehicles e.g. to monitor the operation of a second (side) door.

1.5 Transcan R & C Version

The R version is intended for use in rigid vehicles where it is mounted in the driver's cab (see figure 1.2). The recorder is housed in a radio-style enclosure which fits a standard DIN size radio slot.

The C version is intended for use in rigid vehicles where it is mounted in the drivers cab on a suitable vertical surface or bulkhead. The C version is useful in vehicles which do not have a spare DIN slot and the R version cannot be easily accommodated.

Connections to R and C recorders are made via connectors at the rear of the device. These connect the temperature sensors, the status inputs and the power supply/alarm output respectively.

Door Switch   *Temperature Sensor*   *Defrost Sensor*

Junction Box [Optional]

R Type
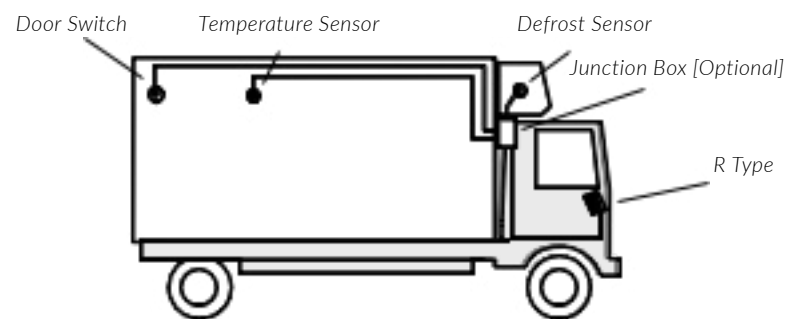
Figure 1.2 Internal Mounting

1.6 Transcan T Version

The T version is intended for external installation and is suitable for trailers and semi-trailers. It is housed in a weatherproof enclosure and may be fitted in a wide variety of locations. It is usually fitted to the front bulkhead adjacent to the refrigeration unit (see figure1.3).

Door Switch   *Temperature Sensor*   *Defrost Sensor*

T Type
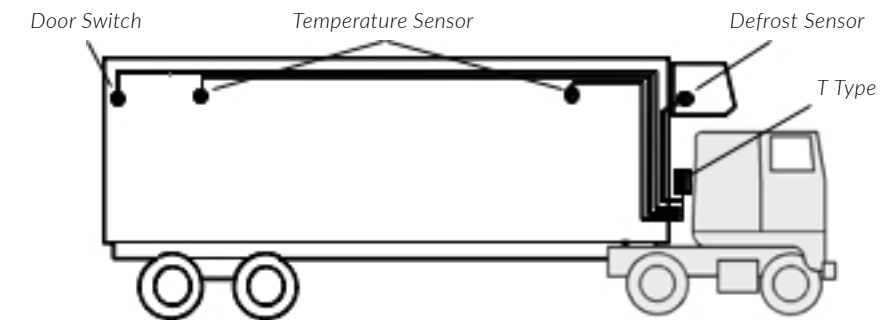
Figure 1.3 External Mounting

Connections to the recorder are made via connectors at the rear of the device. These connect the temperature sensors, the status inputs and the power supply/alarm output respectively. Connecting cables pass through glanded cable entry points fitted to the enclosure, and are wired to the rear connectors of the device.

1.7 Optional Junction Box

In order to simplify certain installations a Junction Box may be included. This is used to connect the sensor wiring to a single multi-core cable which is then routed to the recorder. This arrangement is commonly used with the R version recorders when the application involves more than 3 sensors.

Transcan® *Advance*
Install Guide

2.0   Installing The Sensors

2.1   Positioning the Temperature Sensors

The correct operation of the system depends on positioning the temperature sensors appropriately, and this part of the installation requires some planning prior to commencing work. It is usual to install one sensor in each compartment and one to monitor the temperature of the air returning to the temperature control system.

Several things need to be considered when selecting sensor positions:
- The sensors must not be in air pockets, but must be clear of the refrigerator airflow.
- The sensor mounting clips must be clear of possible damage from doors and/or movable partitions.
- The sensors should be located at least 0.5 metres from interior lights.
- An extra length of sensor cable should be concealed within the protective to allow the covering sensors to be lowered to a convenient height for verification checks, this should be at least to floor level.

If all the above conditions can be satisfied, the ideal location for the compartment sensor is on the centre line of the vehicle roof, about one third from the rear of the compartment to be monitored. However, a compromise often has to be made.

There is usually no duct provided for the sensor cables to pass through the bulkhead and it is therefore necessary to drill through the front wall of the vehicle compartment. It is also normally necessary to fit trunking to the inside of the compartment to provide a protected route for the sensor cabling.

All holes must be re-sealed following drilling and cable feeding to prevent water ingress or condensation inside the body. It is preferable to route the cables to the recorder inside the refrigeration unit. However this is often not possible and it may therefore be necessary to fit protective covering to the outside of the vehicle body.

2.2   Positioning The Status Switches

2.2.1   Location of Door Switches

Seven Telematics supply a switch suitable for monitoring door operations. This is a magnetic proximity switch which has a single pole normally open contact. The activating magnet should be placed on the roller or hinged door and the switch located in a suitable position to operate the contact, but such as to avoid damage during loading and unloading. When the door is shut the magnet should be located within 5mm of the fixed part of the switch. If the door frame is of magnetic material both the switch and the operating magnet should be spaced off the surface by 10mm.

Status input 2 is normally used to monitor door operations and is usually used for the rear door. Status input 4 is user definable and is commonly used to monitor the operation of a second (side) door.

2.2.2   Installing the Defrost and Fridge On/Off Detectors

In order to monitor defrost operation it is necessary to connect status input 3 to the refrigeration unit defrost control circuitry. For Transcan Advance, status input 1 is always used for External alarm control enable/disable. The refrigeration unit wiring connections will depend upon the type of fridge used, and reference should be made to the manufacturer's detailed wiring diagrams to determine the appropriate connections.

Detectors should be securely mounted in the refrigeration unit control panel and powered from the required point in the fridge wiring, depending upon the fridge type. If in doubt contact Seven Telematics (or fridge manufacturer) for advice on how to make these connections.

2.3   Power Supply

The power supply to the Transcan may be taken from the vehicle or fridge battery supply, whichever is the more convenient. The supply may be any voltage between 9 V and 36V DC.

The DC supply shall be either from a vehicle battery fused in-line with an automotive spade type 2A fuse or from an approved mains operated SELV power supply rated for 3A peaks and either rated as a limited power source (LPS) or limited to 65VA. The mains operated power supply should be suitable for IEC installation category II.

2.3   Power Supply Cont.

The fuse must be fitted close to the power supply point and any exposed terminals protected so that they are not subject to corrosion. The recorder must be powered by a permanent supply.

For in cab installations the recorder requires a live and switched supplies which can be located in the vehicle fuse box. For external (trailer) installations the permanent live supply can be taken from the fridge starter motor and the switched supply (if required) from the fridge control panel.

2.4   Installing the Junction Box [Optional]

2.4.1   Mounting the Junction Box

When junction boxes are used, all temperature sensors and status inputs are routed to these boxes via two multicore cables to connect the junction boxes to the Transcan. The positioning of these junction boxes will depend on the vehicle type, but where possible it should be placed on the outside bulkhead of the vehicle, near to the cab and refrigeration unit in order to keep cable runs as short as possible.

The junction box is supplied with a connector strip and mounting plate and with glands for each cable entry. First decide on the mounting location of the box and then the number of cable entries that are required.

The box must be drilled and one gland installed for each cable to be connected. All glands should be fitted to the underside of the junction box. The glands should not be over tightened or the thread may be damaged. If a torque wrench is available do not exceed a torque of 1.5 Nm. There is space for up to seven 12.5mm glands and one 19mm gland if these are staggered. The junction box may be fitted directly to a flat surface or using the supplied mounting lugs with 12.5mm No.6 self-tapping screws. Never drill fixing holes in the junction box as these will almost certainly result in water ingress.

2.4.2   Installing the Multi-Core Cable

The multi-core cable which connects the junction box to the recorder must be routed carefully.

Where the cable runs on the outside of the body it should be secured in place either by running it inside existing protective covering or fixing it to existing cables with cable ties. If neither of these options is available new protective covering must be fitted. Where the cable passes under the vehicle cab the cable should be fixed to existing cables with cable ties at intervals of approximately 150mm. Care should be taken to route the cable clear of potential damage from debris thrown up by the road wheels.

2.4.3   Connecting the Junction Box

When the box has been mounted the connections to the connecting strip should be made in accordance with the wiring tables and diagrams provided and which are illustrated in Figure 2.1. All the cores of the multi-core cable should be connected even if they are not used as this makes the installation more secure and facilitates future modifications. Unused cores should not be cut back.

Figure 2.1

Transcan® *Advance*
Install Guide

3.0 Installing the Recorder

3.1 Positioning the R Version

The R version of the Transcan recorder is designed to be mounted within the cab of a vehicle in a DIN size radio slot. If such a slot is available then it should be used, otherwise an alternative mounting position must be chosen.

Ensure that the position chosen allows the driver to see the display and operate the keyboard. In addition it must be remembered that access to the printer drawer is required to replace the paper roll and this requires clearance above the recorder. It should be noted that installations must be in accordance with the current Use and Construction Regulations for the vehicle concerned. These normally forbid fitting the recorder to the top surface of the vehicle dashboard, where to do so could partially obstruct the drivers view through the vehicle windscreen.

Figure 3.1 Mounting componets for R

3.1.1 Mounting in a Radio Slot

The recorder is retained in the mounting cage by spring locking plates fitted to each side. Once fitted into the cage, the removal procedure is to insert the keys provided into the keyways at each side of the front face of the recorder to release the locks. This should be attempted before fitting the cage into the facia as it requires some practise.

If necessary cut an appropriate slot for the mounting cage in the dashboard. Then fix the mounting cage by inserting it into the slot and bending the fixing blades to secure it in the dashboard. Slide the recorder into the cage until it locks into position.

3.1.2 Mounting Under the Dashboard

Fit the mounting cage to the mounting enclosure as described above. Then fix this enclosure to the underside of the dash board using the fixing plugs and screws provided, using the enclosure angle plates under the screws. Finally, slide the recorder into the cage until it locks into position. See figure 3.1 for details.

3.2 Positioning the C Version

Select a suitable flat surface inside the drivers cab which allows access to the recorder display and controls.

Fix the recorder mounting enclosure to the surface using the screws provided and snap out the required number of cable entry points. Feed the cables through the cable entry holes created and secure the cables to the anchor points inside the mounting enclosure with the fixings provided.

3.3 Positioning the T Version

Select a suitable flat surface on the front outside bulkhead of the trailer or vehicle on which to install the recorder enclosure. This is normally on the vehicle's off-side in a position where the driver will be able to readily open the enclosure door, view the display and reach the operating keys. Take special care with trailer installations and ensure that the location will be accessible even when the tractor unit is connected.

3.3 Positioning the T Version Cont.

Fasten the recorder enclosure to the surface of the vehicle using the fixing plugs, screws and washers supplied. Ensure that the fixing plugs are fitted flush with the mounting surface so that vibration of the enclosure is minimised. Excessive vibration may cause damage to the enclosure. The maximum recommended hole size for the fixing plugs is 11mm diameter.

3.4 Connecting the Recorder

All connections to the recorder are via connectors at the rear of the instrument (see figure 3.2 for details). For ease of maintenance make sure that enough slack wiring is left so that the recorder may be withdrawn from its housing with the connections intact.

3.4.1 Connecting the Temperature Sensors

The temperature sensors are connected to CON 1, marked Temperature Sensor Inputs 1 to 8. The sensors are precision thermistors and the polarity of these connections is unimportant. Each sensor terminates in two wires and up to 4 sensors per block may be connected. As indicated by the label at the rear of the instrument. The screen for each probe must be connected to the recorder chassis using the clamp provided.

In the event of the sensors being connected using a multicore cable the even numbered pins (i.e. pins 2, 4, 6 and 8) are common and connected together within the recorder.
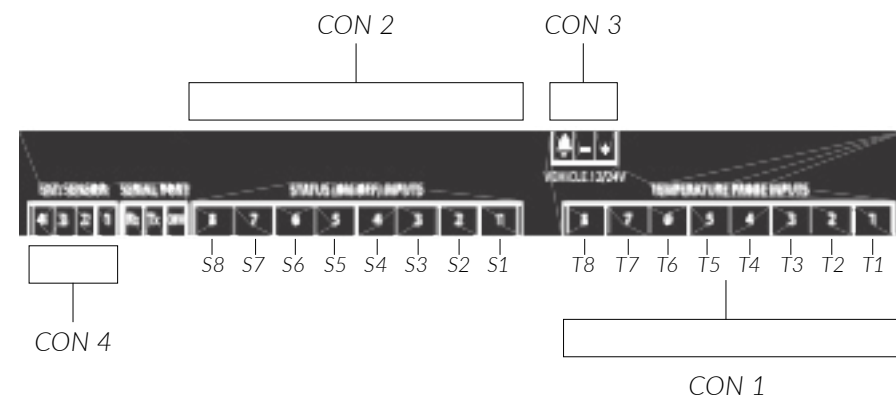

Figure 3.2 Recorder Connections

3.4.2 Connecting the Status Inputs

The Transcan monitors status inputs as ON/OFF switches. Status inputs are connected to CON2, marked Status (On/Off) Inputs, 1 to 8 as shown in figure 3.2.

In the event of the status detectors being connected using a multicore cable the odd numbered pins (i.e. pins 1, 3, 5 and 7) are common within the recorder.

3.4.3 Connecting the Power Supply

The 3-pin connector CON3 is used to connect the power and provide connection for the alarm output. The power is connected to pins + and – with the positive supply on pin 1(bell icon). The supply may be at any voltage between 9V and 36V DC.

The power supply cable used for installation should be 16/0.2 multicore with PVC outer sheath.

3.4.4 Connecting an External Alarm Device

Pin 3 of connector CON3 is used for the alarm signal. To use this facility connect an external alarm device (e.g. beacon) between the vehicle positive supply and this input. When an alarm occurs this input is connected to zero volts and will switch a current of up to 1 amp.

3.4.5 Connecting a Humidity Sensor [Optional]

Displays the reading from the humidity probe. To install it use CON 4 as described below:
1 – Red colour
2 – Green colour
3 – Yellow colour
4 – Blue colour

We recommend fitting the humidity sensor on a flat surface and avoiding contact with water.

Seven Telematics
Transcan Advance Install Guide
16

Seven Telematics
Transcan Advance Install Guide

Seven Telematics
Transcan Advance Install Guide
17

Transcan® *Advance*
Install Guide

4.0 Installation Checks

4.1 Power Supply

Check that the incoming supply at the connector is taken from the vehicle 9-36 volt supply via a 2-amp fuse and has correct polarity. Then connect the recorder and insert it into its housing.

4.2 Display

Ensure that the display shows one or more temperatures (depending on the number of channels turned on in the configuration). If more or less temperature channels are required please refer to User Reference Manual, section 5.2.4

4.3 Temperature Sensors

Before testing the recorder wait 5 minutes to allow the temperature sensors to stabilize. Then check that the displayed temperatures are as expected. A display of - - - - - indicates that the corresponding sensor is not enabled, while a display of + # # # . # indicates an error on that input (channel).

4.4 Status Inputs

Check that the display status input symbols (which are displayed at the right hand side of the display) change when the corresponding input state changes.

Transcan Advance:
Status Input 1 should only be used to automatically enable/disable out of range temperature alarms via a switch input operated by the refrigeration unit (External Alarm Control).

The displayed symbol for status input 2 (when used as a defrost/deice switch) should be either an open box (door open) or a filled box (door closed) according to the state of the door switch (this is a factory default setting).

The displayed symbol for status input 3 (when used as a defrost/deice switch) should be active droplets when the defrost cycle is operating (this is a factory default setting).

The displayed symbol for status input 4-8 is user selected. The recorder summary page shows 4 enabled temperatures per page to one degree resolution together with symbols that indicate the current state of each enabled switch input or 2 per page at 0.1 degree resolution.

To set the recorder to the summary please refer to *User Reference Manual, section 5.2.3*

If more or less switch inputs are required please refer to *User Reference Manual, section 5.2.3*

4.5 Alarm Signal

The internal audible alarm signal (buzzer) and the external alarm output are both turned on when a temperature alarm occurs. Pressing the <IMG tick> key confirms/accept the alarm status. The external alarm output is only turned off when the alarm status no longer exists. i.e. temperature channel is back in range or alarm is disable.

Transcan Advance Alarms are automatically disabled when the refrigeration unit is switched off provided that a suitable detector is connected to status input 1 and the Alarm Enable parameter (External Alarm Control) is set to ON.

Transcan® *Advance*
Install Guide

5.0 Recorder Commissioning

When the installation checks described in section 4 have been satisfactorily completed the recorder may be commissioned. The commissioning procedure consists of the following:

- Checking and adjusting the parameter list configuration
- Checking and adjusting the time and date (if required)
- Checking and adjusting the recording interval
- Setting the printing style (values or graphs)
- Printing a journey file to verify operation (please refer to user reference manual, section 3.2)

5.1 Parameter List Configuration

The complete set of user parameters is called the User Parameter File or UPF. All Transcan recorders are factory set with a UPF which has been chosen to suit the expected application. As a result, modifications to the UPF are normally limited to the entry of the vehicle identity by setting the parameter "Set Vehicle ID".

Please refer to *User Reference Manual, section 5.1*

5.1.1 Temperature Channels

The Transcan Advance recorder supports eight temperature channels. For convenience each channel will have been pre-set with a description and Seven Telematics recommend that these, and the corresponding location of the sensors, are maintained wherever possible.

The normal factory settings are:
> Channel 1 = Front
> Channel 2 = Rear

However, these may have been preset differently if specified. Ensure that the required channels are switched on and that their descriptions are set correctly.

Please refer to *User Reference Manual, section 5.2.4*

For example, to use the recorder to monitor three temperatures in a dual compartment vehicle which has sensors installed for Air Return, Front Compartment and Rear Compartment, it is necessary to set:

> Channel 1 > ON
> Channel 1 name > Front
>
> Channel 2 > ON
> Channel 2 name > Rear
>
> Channel 3 > ON
> Channel 3 name > Air Ret
>
> Channel 4-8 > OFF

5.1.2 Status Inputs

The recorder provides for up to eight status (on/off) inputs.

Status Input 1 is reserved for controlling the external alarm control enable/disable with the Transcan Advance. To activate the External Alarm control the Status Input 1 must be connected to this input (switch) and set the following parameters:

> Alarm Enable > ON
> Alarm Reverse > OFF

In this case a closed contact on this input (e.g. from refrigeration unit (ON/OFF) will cause the alarms to be enabled. When the contact is opened (i.e. detector de-energised) the recorder will disable alarms, although this action may be delayed by the user defined Extended Time parameter. To continue for an additional time after the contact is opened, set the following parameters as shown (Please refer to user reference manual, section 4.4.2):

> Extend time > 00:30   e.g. for 30 minutes extension.

This facility is commonly used with multidrop vehicles or where the fridge is switched off for a short period at the delivery point.

5.1.2 Status Inputs Cont.

Status Input 2 is default for a door switch input. To use this input to monitor door openings it is necessary to install a door switch and set the following parameters (Please refer to *User Reference Manual, section 5.2.3*):

Door switch > ON
Door reverse > OFF

Status Input 3 is default for the De-Ice (defrost) input. To use this input to monitor the defrost operation of the fridge it is necessary to install a defrost detector and set

De-Ice switch > ON
De-Ice reverse > OFF

This enables the De-Ice status input so that a closed contact represents defrost in operation.

Please refer to *User Reference Manual, section 5.2.3*

5.1.3 Header and Title

The Header parameter is normally used for the vehicle identity or registration number and the factory setting is AB51 CDE for type R recorders and TRL 1234 for type T recorders. Set the Header to the correct vehicle identity.

The Title consists of 12-character identifiers (Title 1 and Title 2) which appear at the start of all reports. The factory setting for Title 1 is "Company" and for Title 2 "More details". Set the title as required. This is normally the name of the user.

Please refer to *User Reference Manual, section 5.2.5*

5.2 Time and Date

Please refer to *User Reference Manual, section 4.3*

5.3 Recording Interval

The recording interval is factory set to 10 minutes.
Please refer to *User Reference Manual, section 2.7*

5.4 User Documentation

Available from www.seventelematics.co.uk

Transcan® *Advance*
Install Guide

6.0 Specification

Transcan temperature recorders are designed to meet the requirements of EN12830 and other national requirements to support the objectives of directives 92/1/EEC (amended by 93/43/EEC) -usually known as the Quick Frozen Food Directive.

6.1 Type of Application

Transcan temperature recorders are suitable for recording storage temperatures and transport temperatures.

6.2 Temperature Measuring Range

Temperature Recording Range and Accuracy:

-50 to +50°C accurate to ±1°C

-40 to +40°C accurate to ±0.5°C

Resolution:

0.1°C

6.3 Autonomous Power

The battery powers the real-time clock. The battery is not user-replaceable and the Transcan should be returned to the manufacturer before the end of the 10-year expiry period for the battery to be replaced.

6.4 Environment

In the event of the printer being subject to drips or spillage, it should be allowed to dry out before use. In order to ensure that a printout may be made on demand, a spare printer roll should be carried at all times.

Recording Operating Temperature:	- 30 to +70C
Printing Operating temperature:	- 10 to +50C
Storage Temperature:	- 40 to +85C
Vibration – meets requirements of EN 60068:	1993

Degree of protection:

IP65 for Trailer version	– Suitable for outdoor use
IP20 for rigid version	– Suitable for indoor use only

6.5 Supply Voltage

The DC supply shall be either from a vehicle battery fused in-line with an automotive spade type 2A fuse or from an approved mains operated SELV power supply rated for 3A peaks and either rated as a limited power source (LPS) or limited to 65VA. The mains operated power supply should be suitable for IEC installation category II.

Power:

Input Voltage:	9-36V DC
USB Output Voltage:	5V
USB Output Current:	0.5A

6.6 Recording Period

May be set from 1 minute to 60 minutes. For the installation to comply with current legislation, the user must not set the recording period less than 10 minutes.

6.7 Recording Duration

The memory capacity for the Transcan is 4 Mb. This allows for all eight temperature probes to be recorded continuously with the following capacity:

10 minute record interval – 786 days

6.8 Data Archiving

To satisfy the requirements of national legislation, data must be retained for at least one year. The files may be printed, stored locally upon the recorder, printed on the internal printer or transferred via a USB device to a PC. It is recommended that this is done at least once a month. Records from the internal printer should be kept in a clean dry place to ensure that they are legible after one year.

6.9 Time Recording Error

Relative error over seven days, maximum one minute.

6.10 EMC

TUV Rheinland.

Test Report Num:
21276432_001 (The unit has been tested to EN 61326 and EN 50498)

6.11 Power Surge

Conforms with BS AU 243 (ISO7637-1) grade 4.

6.12 Electrical safety

Conforms with EN 61010-1. Safety may be impaired if installation instructions are not adhered to.

6.13 Periodic verification

In accordance with EN13486.

6.14 Power Consumption

Transcan Advance: 58 mA

6.15 IEC Symbols Used

Direct current

Consult manual

Caution

Transcan® *Advance*
Install Guide

7.0   Cleaning and Maintenance

For further information on the products and services offered by Seven Telematics please visit:

www.seventelematics.com

Transcan® *Advance*

Install Guide

Seven Telematics Ltd.
+44 (0)1636 550320