Control Manual
SE5000-8 Smart Tachograph

Stoneridge

www.stoneridgeelectronics.com
www.SE5000.com

Important

The Stoneridge tachograph SE5000-8 has full type approval for use in the European union according with Commission Regulation (EU) 2016/799 of 18 March 2016 and other related legislatives.

The Approval Certificate number will be indicated on all Stoneridge tachograph.

The tachograph fulfils the requirements of UNECE regulation number 10, revision 05, in respect of electromagnetic compatibility.

Tachograph Version

Smart Tachograph SE5000-8.

Type approval number: e5 0002

Internet Information

Further information about Stoneridge SE5000-8 Smart Tachograph and about Stoneridge Electronics Ltd can be found at:

www.stoneridgeelectronics.com

Copyright

Changes

Stoneridge Electronics reserves the right to introduce changes in design, equipment, and technical features at any time. You cannot, therefore, base any claims on the data, illustrations or descriptions in this Manual.

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Introduction

This manual concerns the control mode of operation. However, knowledge of the operational mode of the unit is also required in case of driving a tachograph fitted vehicle.

A Stoneridge tachograph can be operated in one of four modes of operation:

- Operational (driver card or no card inserted)
- Control (control card inserted)
- Calibration (workshop card inserted)
- Company (company card inserted)

Company Lock-in/Lock-out details can be used to identify the true owners of blocks of stored tachograph data. Enforcement officers should encourage companies to Lock-in tachograph data as it not only identifies their company as the owner of the data, but also prevents third party company card owners from viewing or downloading their data.

Also, when transferring ownership of a tachograph to another company, the current tachograph owner must Lock-out the data before transfer of the tachograph. Thus any future data stored after the Lock-out would be clearly identified as not applying to them.

Due to data protection laws, care must be taken to ensure that the tachograph data is not downloaded and passed on to third parties without the permission of the tachograph owner.

The control card can be inserted in either of the trays. If control cards are inserted in both trays the card in tray 1 will be used for the control operation and the card in tray 2 will be ignored.

The Control Card

- Must be obtained via an application to the relevant authorities.
- Is valid for 2 years only.
- Will only be issued to enforcement officers or enforcement authorities.
- Are personal to the enforcement officer and authority and is not transferable.
- Allows read-only access to data stored in the driver card or in the tachographs internal memory respectively.
- Can store a minimum of 230 records of displaying and/or printing and/or VU downloading and/or card downloading. The maximum number of records is dependent on the card type. When the upper limit is reached the oldest data will be overwritten.

Note!

Extra care must be taken to ensure that only the authorised owner of a control card has access to it at all times.

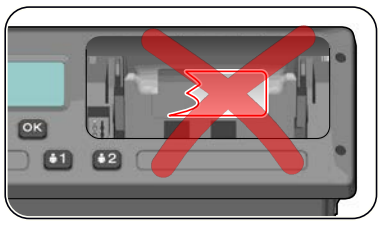
Don't open the Case

The tachograph has been installed by authorised personnel.

A tachograph case must never be opened. No tampering with or modifications to the tachograph system are permitted. A tamper label is placed inside the printer housing. The tamper label must not be torn apart.

Here you can see where the tampering label is placed and how it looks when it is untouched.

A tampered label might look like this.

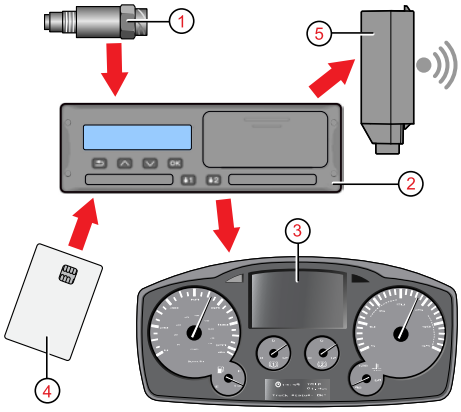


Note!

Unauthorized persons that modify this equipment are committing a punishable offence, depending on the legislation in the country concerned.

Overview

The Tachograph installation.



1. Encrypted motion sensor
2. Smart tachograph, with integrated display and printer
3. Display in vehicle's instrument cluster
4. Card
5. DSRC (Dedicated short-range communications)

Motion Sensor (1)

Used to provide the tachograph with speed signal pulses from the vehicle gearbox. To ensure the integrity of the speed sensor signal, the speed signal is transferred between the sensor and the tachograph in an encrypted form. Encrypting the speed signal ensures that any tampering with the signal will be detected and recorded.

Smart Tachograph (2)

The tachograph records and stores various data:

- Workshop or driver card data.
- Warnings and malfunctions relating to tachograph, driver, company and workshop.
- Vehicle information, odometer data and detailed speed.
- Tampering the tachograph. For more information on the tachograph, see the Driver & Company Manual.

Display in Instrument Cluster (3)

The display in the instrument cluster can be used to display information passed from the tachograph, such as speed (speedometer) and distance travelled (trip and odometer).

Control and Driver Card (4)

The following cards dedicated for specific usage can be used in the tachograph:

- Driver card - records the drivers activities.
- Control card - authority control and inspection.
- Workshop card - calibration mode.
- Company card - hauliers and vehicle owners, down loading and storage of data.

Note!

All cards are personal and may not be used by anyone else but the rightful card holder.

DSRC (5)

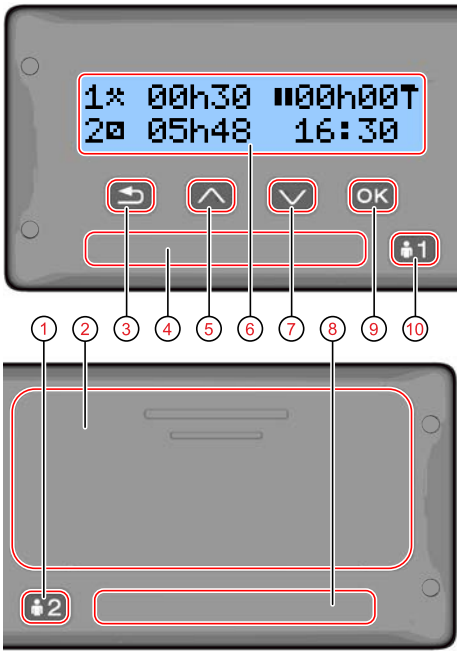
The DSRC, is a unit that is separate from the vehicle unit, and it is used to perform targeted roadside checks via microwave communication link.

User Interface

The tachograph detailed within this manual comprises two card tray mechanisms, a printer, an LCD display, a calibration/download interface (6-pin connector located behind paper cassette) and user controls, located in an ISO standard radio enclosure. This type of enclosure enables mounting in a variety of locations, ensuring that insertion and removal of the driver cards and operation of the controls can be easily achieved by an operator.

The tachograph complies with EU Regulations and displays and records speed and distance in metric units (kilometres per hour and kilometres respectively).

The tachograph also incorporates an internal clock, which is used to indicate the current time on the tachograph display. The tachograph is available for use in both 12 and 24 V vehicle systems.



1. Co-driver button
2. Printer, 6-pin calibration/download connector, behind the paper cassette
3. Back button
4. Driver card tray
5. Up button
6. Display
7. Down button
8. Co-driver card tray
9. OK button
10. Driver button

Downloading Data

General

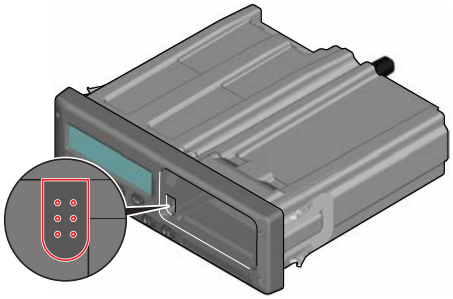
An enforcement officer can download data from a smart tachograph system. Downloading means the copying, together with a security digital signature, of a partial or a complete set of data that is stored in the memory of a tachograph or on a driver card.

The download must be done to aid investigations into "Drivers Hours" legislation checks and to aid determination of the validity of the smart tachograph systems. When carrying out "Drivers Hours" investigations, care must be taken to identify the true owners of blocks of stored tachograph data.

Dedicated download equipment or a valid control card is essential for the downloading of the data stored in the tachograph or on the driver card.

Download Equipment

Behind the paper cassette is a 6-pin connector located. This is where the required downloading equipment is connected.



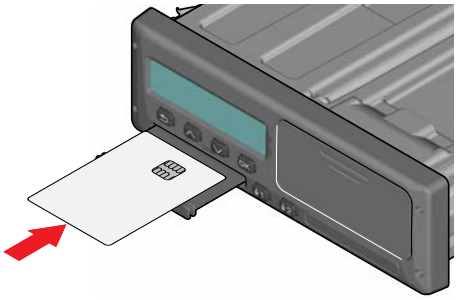
Control Card

A valid control card is required to download or to view driving data stored on either an inserted driver card or in the tachographs data memory. The control card provides read-access to the entire tachograph data memory contents whether or not the data has been company locked using a valid company card.

Inserting a Control Card

Insert the control card in either of the trays (No. 1 in our example).

1. Press and hold button **1** on the tachograph until the tray is opened.
2. Insert the card with the chip facing forward and upwards.
3. Close the tray by pushing it carefully forward.



The control card must be inserted to identify the controller/user.

4. Close the tray by pushing it in carefully. The tachograph now processes the control card data.

If the control card authentication fails, see **Display Messages** on page **23**.

The card tray is locked when the vehicle is in motion, while the tachograph is busy processing the control card and if the power supply to the tachograph is interrupted.

Eject a Control Card

1. Press button **1** or **2** on the tachograph and hold it until the tray opens.
2. Press the card up slightly from underneath through the opening on the tray, or push the edge of the tray down until the card pops out.
3. Close the tray by pushing it carefully forward.

Note!

Withdrawal of the Control Card is not possible in all menus.

Storing Data

When a control card is inserted into a tachograph in order to perform a control activity, a record of the control activity is stored on the control card and in the tachograph as described below. The type of controls that can be performed are displaying, downloading or printing data from the tachograph and/or the card.

Storing Data on the Control Card

On the control card a single record will be stored. This record contains the following:

- The card number.
- The issuing Member state, issuing authority name and the issue date.
- The beginning of card validity date, and card expiration date.
- The control body name and address.
- The surname and forename of the card holder.
- The preferred language.

Each time a control card is used to carry out a control activity the following data is stored on the control card:

- The date and time of the control activity.
- The type of control activity performed.
- The period downloaded, if applicable.
- The VRN (Vehicle Registration Number) and Member State registering authority of the controlled vehicle.
- The card number and card issuing Member State, of the controlled driver card.

Storing Control Activities in the Tachograph

Each time a control card is used to carry out a control activity a record of the activity is stored in the tachograph. The data in each record is:

- Date and time of the control.
- The control card number and card issuing Member State, and card generation.
- The type of control.

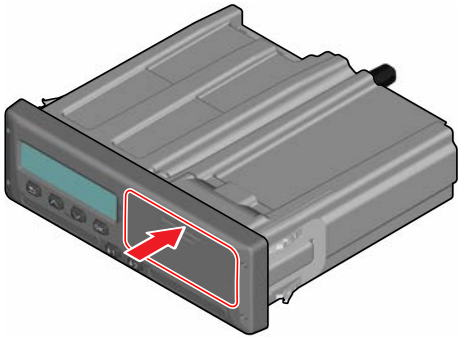
Note!

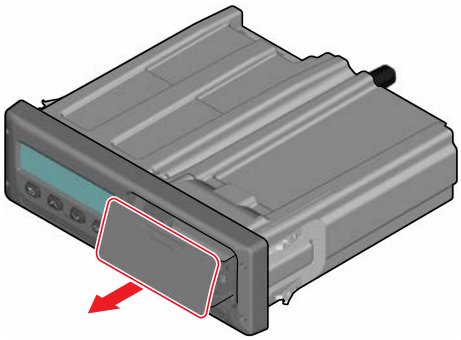
In case of downloading, the date of the oldest and most recent days downloaded must also be recorded.

Downloading Data

To download data do the following:

1. Remove the paper cassette.





2. Attach the download equipment to the tachograph through the 6-way front download connector.
3. Start downloading data according to the instruction on the download equipment.

When the download is completed, the following message will be displayed.

```
Download complete
```

If the download process has failed and is incomplete the following message will be displayed:

```
Download failed
```

If the download fails:

4. Remove the control card.
5. Check the connections.
6. Check the download equipment.
7. Re-insert the control card and redo the process until downloading is made.

If the data download cannot be completed and the following message is displayed:

```
Download fault
```

The tachograph is found to be the cause or if it is unsure whether the card or the tachograph is faulty, the vehicle must be taken to a Tachograph Workshop for investigation.

System Inspection

General

The control function involves a number of different functions associated with the smart tachograph system. A tachograph inspection is done to ensure that it still meets the EU legislation requirements.

For example, downloading and checking the data stored on either the driver card or in the tachograph internal memory, and an inspection of the tachograph system.

Note!

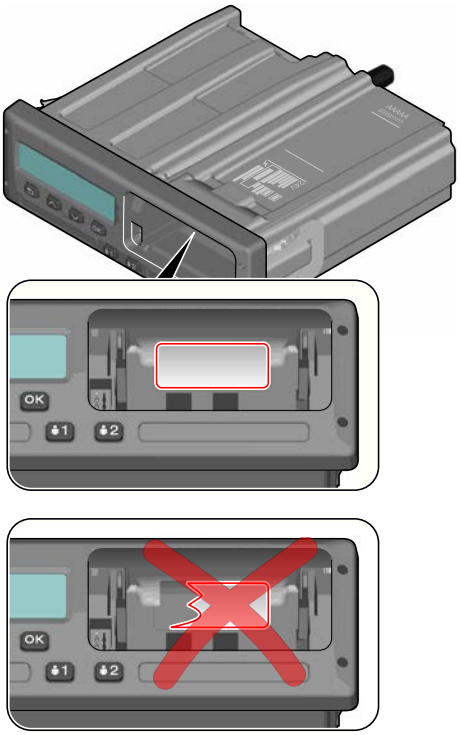
If any unit fails the inspection the vehicle must be taken to a Workshop for further investigation.

Visual Check

1. Ensure that there is no damage to or drill-holes in the entire exterior casing including underneath rubber acorn, which would imply a tampering attempt.
2. Check for evidence of tampering with the seals and labels.
3. Check for additional seals and labels that do not belong to the tachograph, as they might cover drill-holes.
4. Check that the heat seals is present.
5. Check the tachograph type approval mark.
6. Check that the predetermined breakpoints are unbroken.

A. Predetermined breakpoint.

7. Check that all tachograph system seals are intact.
8. Confirm the presence of the installation plaque.
9. Check that the label and Stoneridge logotype hologram is present and in one piece. The position of the label is shown in the illustration below.



Inspection Procedure

Follow this procedure to confirm that the function of the recording equipment is correct:

1. Check that the operation of the recording equipment including data storage on cards is satisfactory.
2. Determine that the tachograph operates within maximum tolerances for both speed and distance.
3. Compare that the actual circumference and tyre size corresponds with the information on the installation plaque.
4. Check the internally stored calibration factors according to the installation plaque with a technical printout.
5. Check the internally stored vehicle parameters, VIN (Vehicle Identification Number) and VRN (Vehicle Registration Number) and compare to the actual vehicle data with a technical printout
6. Check the correctness of the UTC time.

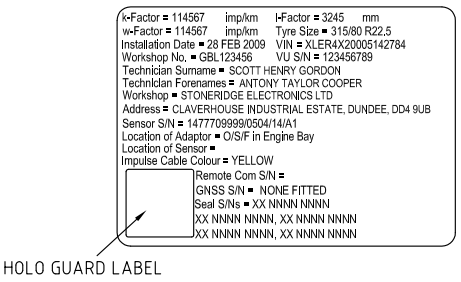
Installation Plaque

The final part of the smart tachograph system installation procedure is the completion and fitment of an installation plaque.

The installation plaque must be clearly visible and easily accessible. The installation plaque is normally placed on the recording equipment, the vehicle's "B" pillar or the doorframe on the driver's side of the vehicle.

The installation plaque state the following:

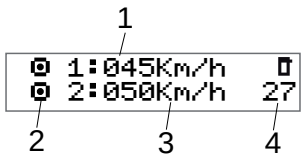
- Constant of the tachograph, K factor (imp/km).
- Effective circumference of the wheel tyres, L factor (mm).
- Characteristic coefficient of the vehicle, W factor (imp/km).
- Tyre size.
- Vehicle Identification Number (VIN).
- Name, address or trade name of the approved fitter or workshop.
- Date of calibration.
- Information that the GNSS facility is internal.
- The serial number of the DSRC.
- The serial numbers of the seals in place (up to 5).
- The part where the motion sensor is installed.



Checking Second Source Motion Sensor

The tachograph always uses a second source of motion signal (via the GNSS system), and this section describes how this shall be checked. Checking can be carried out by viewing the Motion Sensor View.

With the control card, or workshop card inserted, press the arrow down button several times until you reach the last view, which is the Motion Sensor View. See position (3) below to check if a second source motion sensor is present.



1. Primary Motion Sensor speed.
2. Indicates motion. If this pictogram is shown (-), no motion, or speed below a set threshold, is detected.
3. Second source of motion speed. The digits shows the speed indication of the second source (GNSS speed).
   If these characters (- - -) are shown instead of the digits, the tachograph does not receive signals from a second source motion sensor.
4. Fault number, if fault is present. If there is no fault this section is blank.

Pictograms

Symbols

This is a list of the most frequently shown symbols on the display and on the printouts.

Symbol	Description
	Function not available
	Driver or slot
	Co-driver or slot
	Card
	Eject
	Work
	Driving/driver (mode of Operation)
	Rest/break
	Available
	Ferry / train crossing
OUT	Out of scope, -i.e. no activities time durations are calculated
	Local time/location
	Start of daily work period
	End of daily work period
	Break
	From or to
	Printer, printout
	Paper
	Display
	Processing, please wait
	Time, clock
UTC	UTC time
24h	Daily
	Weekly
	Two weeks
Σ	Total/summary
	Speed
	Over speeding
	Faults
!	Events
?	Pre-warning/question/unknown activity
	Workshop
	Company
	Controller
	Manufacturer
	Security
	External storage/download
	Buttons
✓	Finished
	Tachograph (VU), vehicle
	Tyre size
	Sensor
	Power supply
	Print
	Print, submenu
	Company lock
	Places

Symbol	Description
	Places, sub menu
	Settings
	GNSS positioning facility
	ITS interface
	Remote communication facility (DSRC)

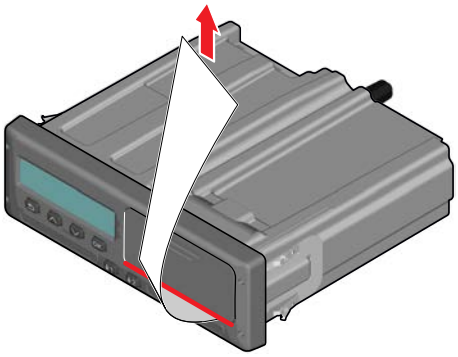
Symbol Combinations

The following combination of symbols are the most common.

Symbols	Description
	Location start of daily work period
	Location end of daily work period
	From time (UTC)
	To time (UTC)
	Local time
	Crew driving
	Driving time for two weeks
OUT	Out of scope - begin
OUT	Out of scope - end
	Ferry/train mode - begin
	Ferry/train mode - end
	Cumulative driving time of current day
	Printer low temperature
	Printer high temperature
	No card
	Driver card
	Workshop card
	Company card
	Control card
	Control place
	From vehicle
	Position after 3 hours accumulated driving time

Printouts

You can view the information stored in the tachograph and on the driver cards by printing it on paper or by showing it on the display. There are a number of different presentations available, which you can read more about in **Printout Examples below**



Printout Data

1. Press **OK** to show the menu and select:
   `PRINT`
2. Press **OK** and select the type of printout to make. Then press **OK**.

Some types of printouts require specification of the driver card and a date. If so the following is displayed:

`Select card 1 or 2`

3. Select **1** to make a printout for the current driver's card or **2** to make a printout for a co-driver's card.

Some printouts require selection of the file system generation (generation 2 cards has two file systems (gen 1 and gen 2). If so the following is displayed:

`Card gen 1 or 2`

4. If applicable, select card file system generation 1 or 2
5. Select the desired date by using the arrow buttons and press **OK**.
6. Now you select whether to view the data on the display only or to make a printout on paper.

   - To view the data on the display only, select:

   `display`

   - Press **OK** and scroll through the data using the arrow buttons and then press **OK** to return.
   - To make a printout on paper, select

   `printer`

   - Press **OK**. The display will show:

   `Printer busy`

   - If you would like to cancel the process, press and hold the **Back** button. Wait until the message is cleared and then pull the printout upwards to tear it off.

Note!

To avoid paper jam make sure the slot on the paper cassette is not blocked.

Printout Examples

On the following pages there are a number of printout examples that can be selected from the `PRINT` menu:

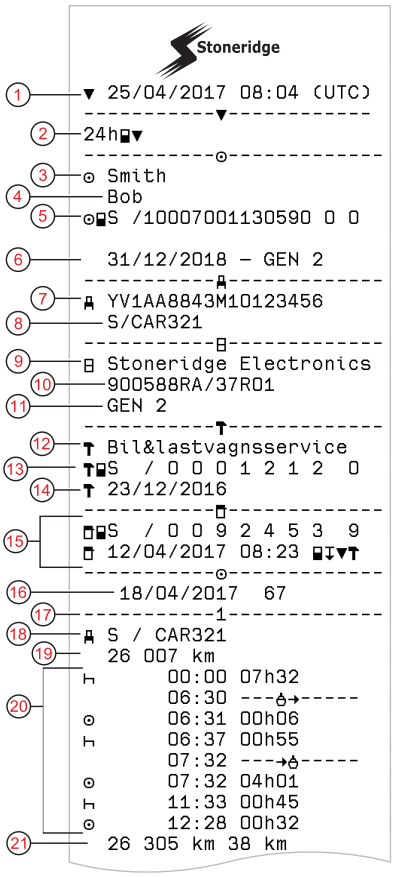
- Daily printout (card) `24h card` (including local time).
- Daily printout (VU) `24h vehicle` (including local time).
- Event and faults (card) `event card`.
- Event and faults (VU) `event vu`.
- Technical data `technical data`.
- Overspeeding `overspeeding`.
- Historic cards `historic cards`.

Daily Printout (card)

This printout lists all activities stored on the driver card (or co-driver card) for the selected date (legal requirement). UTC time is used.

The display shows the following (on the second line):

```
24h card
```

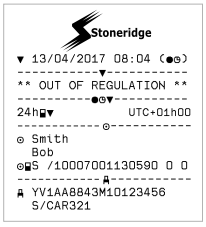


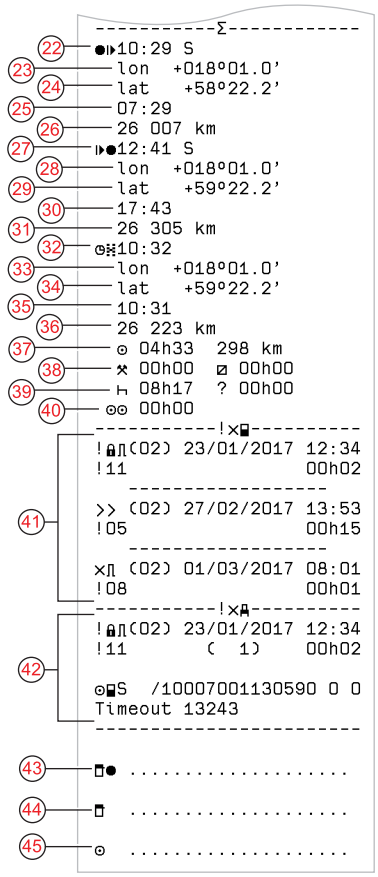
1. Printout date and time
2. Type of printout (24h, card)
3. Card holder's surname
4. Card holder's first name
5. Type of card, Country, and Card Identification.
6. Card expiration date and generation
7. Vehicle identification, VIN
8. Registering member state and Vehicle Registration Number, VRN
9. Tachograph manufacturer
10. Tachograph part number
11. Tachograph generation number
12. Responsible workshop for last calibration
13. Workshop card number
14. Date of last calibration
15. Last control the inspected driver has been subjected to
16. Enquiry date and daily card presence counter
17. Tray where card was inserted
18. VRN, Vehicle Registration Number, for the vehicle where the driver card was inserted
19. Vehicle odometer at card insertion
20. Activities with driver card inserted, start and duration time
21. Card withdrawal: Vehicle odometer and distance travelled since last insertion for which odometer is known

Daily Printout (card) continued

To make it easier to check the activities on the printout you can select local time instead of UTC. The printout contains in all other respect the same information.

Note!
The text OUT OF REGULATION indicates that this printout doesn't comply with any regulation.





22. Time and location at the start of daily period
23. Longitude at the start of daily period
24. Latitude at the start of daily period
25. Time of latest position from GNSS
26. Odometer at the start of daily period
27. Time and location at the end of daily period
28. Longitude at the end of daily period
29. Latitude at the end of daily period
30. Time of latest position from GNSS
31. Odometer at the end of daily period
32. Time after 3 hours of accumulated driving
33. Longitude after 3 hours of accumulated driving
34. Latitude after 3 hours of accumulated driving
35. Time of latest position from GNSS
36. Odometer after 3 hours of accumulated driving
37. Total driving duration and distance
38. Total duration of **work** and **available**
39. Total duration of **rest** and **unknown**
40. Total duration of crew activities
41. Events and faults from the driver card
42. Events and faults from the VU, vehicle unit
43. Control place
44. Controller's signature
45. Driver's signature

Daily Printout (VU) (1/3)

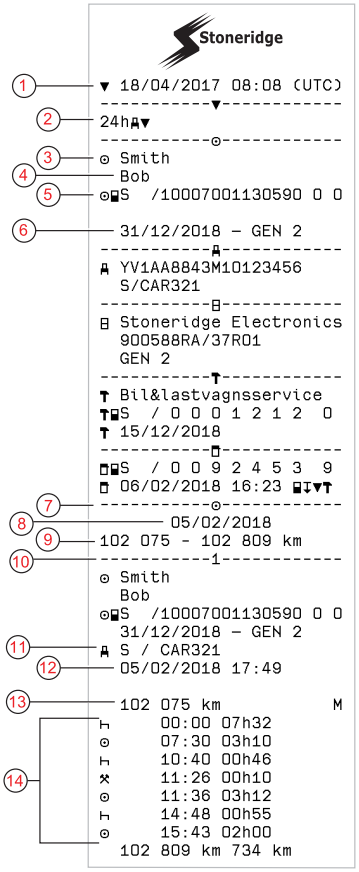
M=Manual entries of driver activities.

This printout lists all activities stored in the tachograph (VU) for the selected date (legal requirement). UTC time is used. The printout is dependent of the following:

- If no card is inserted, select either the current day or any of the eight previous calendar days.
- When a card is inserted, select any day stored in the tachograph, out of a maximum of typically the recent 28 days. If no data is available for the selected date, the printout will not be initiated.

The display shows the following (on the second line):

`24h vehicle`

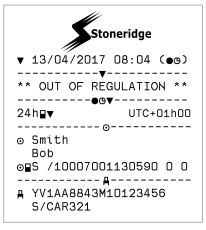


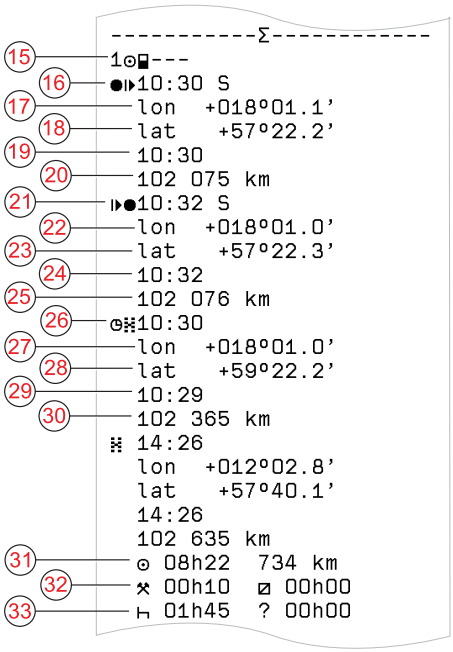
1. Printout date and time
2. Type of printout (24h, VU)
3. Card holder's surname
4. Card holder's first name
5. Card and country identification number
6. Card expiration date and generation
7. Activities stored in the VU per slot in chronological order
8. Enquiry date
9. Vehicle odometer at 00:00 and 24:00
10. Driver (slot 1)
11. Registration member state and vehicle registration number of previous vehicle used
12. Date and time of card withdrawal from previous vehicle
13. Vehicle odometer at card insertion
14. Activities with start and duration time

Daily Printout (VU) (2/3)

To make it easier to check the activities on the printout you can select local time instead of UTC. The printout contains in all other respect the same information.

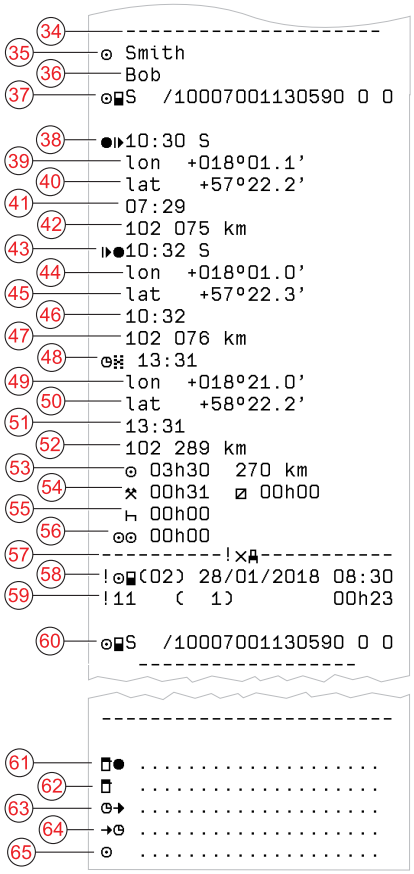
Note!
The text OUT OF REGULATION indicates that this printout doesn't comply with any regulation.





15. Periods without card in driver slot
16. Time and location at the start of daily period
17. Longitude at the start of daily period
18. Latitude at the start of daily period
19. Time of latest position from GNSS
20. Odometer on start of daily period
21. Time and location at the end of daily period
22. Longitude at the end of daily period
23. Latitude at the end of daily period
24. Time of latest position from GNSS
25. Odometer on end of daily period
26. Time after 3 hours of accumulated driving
27. Longitude after 3 hours of accumulated driving
28. Latitude after 3 hours of accumulated driving
29. Time of latest position from GNSS
30. Odometer after 3 hours of accumulated driving
31. Total driving duration and distance
32. Total duration of **work** and **available**
33. Total duration of **rest** and **unknown**

Daily Printout (VU) (3/3)



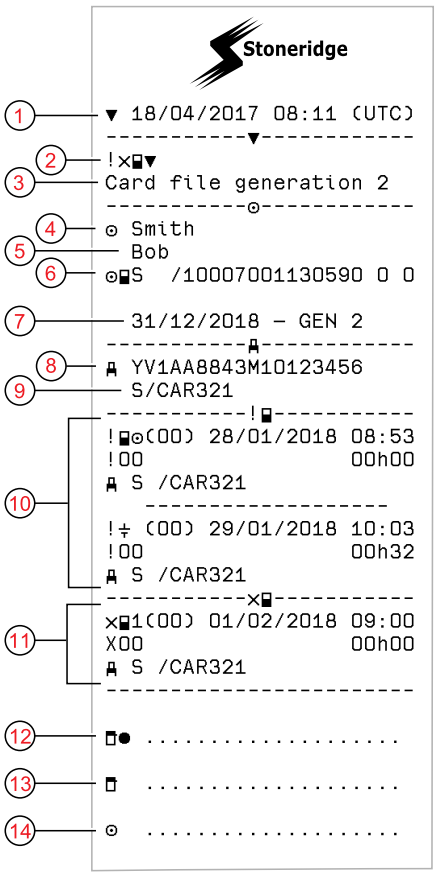
34. Record identifier (VU daily summary per driver)
35. Driver surname
36. Driver's first name(s)
37. Driver's card identification
38. Time and location at the start of daily period
39. Longitude at the start of daily period
40. Latitude at the start of daily period
41. Time of latest position from GNSS
42. Odometer on start of daily period
43. Time and location at the end of daily period
44. Longitude at the end of daily period
45. Latitude at the end of daily period
46. Time of latest position from GNSS
47. Odometer on end of daily period
48. Time after 3 hours of accumulated driving
49. Longitude after 3 hours of accumulated driving
50. Latitude after 3 hours of accumulated driving
51. Time of latest position from GNSS
52. Odometer after 3 hours of accumulated driving
53. Total driving duration and distance
54. Total duration of **work** and **available**
55. Total duration of **rest** and **unknown**
56. Total duration of crew activities
57. Events and faults
58. Type, purpose, and start time of event
59. Additional code, repetitions that day, duration
60. Card identification
61. Control place
62. Controller signature
63. From time
64. To time
65. Driver signature

Events and Faults (card)

This printout lists all warnings and faults stored on the card (legal requirement). UTC time is used.

The display shows the following (on the second line):

`event card`



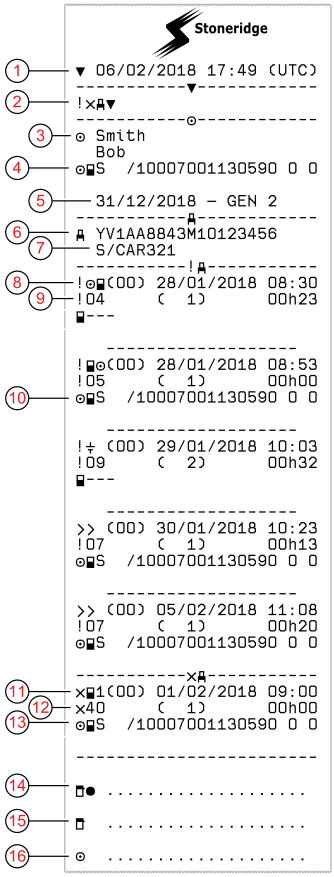
1. Date and time
2. Type of printout (event and faults, card)
3. Card file system (generation 1 or 2)
4. Card holder's surname
5. Card holder's first name
6. Card and country identification number
7. Card expiration date and generation
8. Vehicle identification number VIN
9. Registering member state and Vehicle Registration Number, VRN
10. List of all events stored on the card
11. List of all faults stored on the card
12. Control place
13. Controller's signature
14. Driver's signature

Events and Faults (VU)

This printout lists all warnings and faults stored in the tachograph or vehicle unit (legal requirement). UTC time is used.

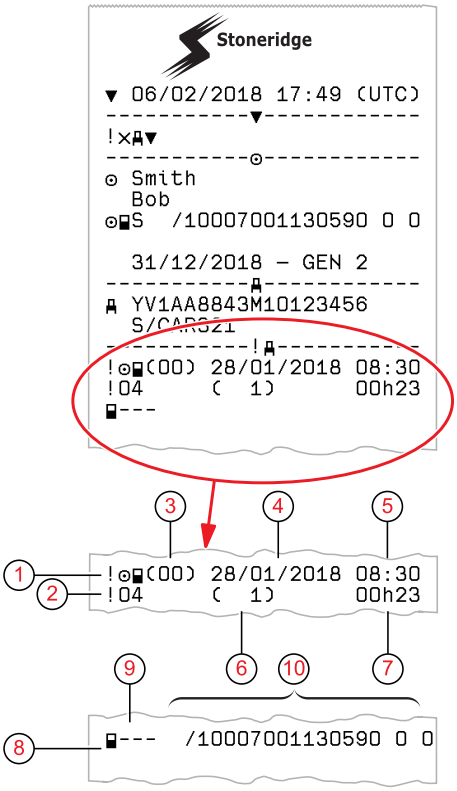
The display shows the following (on the second line):

`event vehicle`



1. Date and time of the printout
2. Type of printout (events and faults, VU)
3. Card holder
4. Card identification
5. Card expiration date and generation
6. Vehicle Identification Number (VIN)
7. Registering member state and Vehicle Registration Number, VRN
8. Type, purpose, and start time of event
9. Additional code, number of similar events, and duration of event
10. Card identification
11. Type, purpose, and start time of fault
12. Additional code, number of similar faults, and duration of fault
13. Card identification
14. Control place
15. Controller signature
16. Driver signature

Details of Events and Faults (VU)



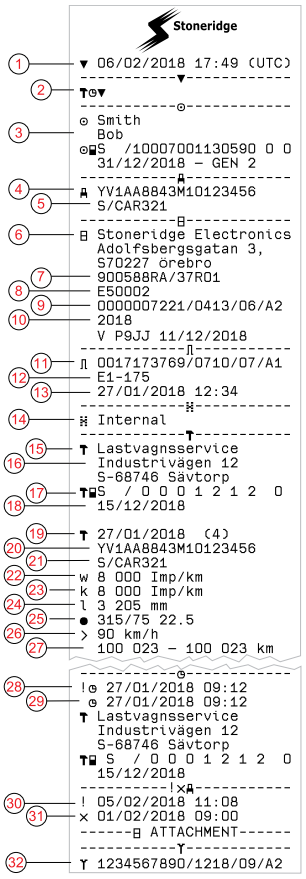
1. Type of event or fault.
2. Event or fault code.
3. Event or fault record purpose (All purposes are not saved for each event):
   00 - one of the 10 most recent (or last) events or faults.
   01 - the longest event for one of the last 10 days of occurrence.
   02 - one of the 5 longest events over the last 365 days.
   03 - the last event for one of the last 10 days of occurrence.
   04 - the most serious event for one of the last 10 days of occurrence.
   05 - one of the 5 most serious events over the last 365 days.
   06 - the first event or fault having occurred after the last calibration.
   07 - an active/on-going event or fault.
4. Date of event or fault.
5. Start time of event or fault.
6. Number of events of the same type during the day.
7. Duration of event or fault.
8. Card inserted in slot 1 at the beginning of event or fault (Driver card).
9. Card issue country.
10. Card number (shown with every second number replaced with a space if not in calibration or company mode or if no card is inserted

Technical Data

This printout list data as speed settings, tyre size, calibration data and time of adjustments.

The display shows the following (on the second line):

technical data



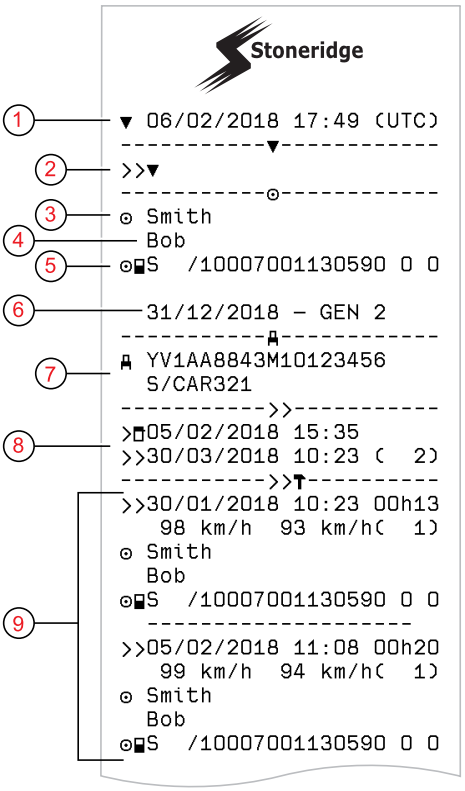
1. Date and time
2. Type of printout (technical data)
3. Cardholder ID
4. Vehicle Identification Number (VIN)
5. Registering member state and Vehicle Registration Number, VRN
6. Tachograph manufacturer
7. Tachograph part number
8. Tachograph approval number
9. Tachograph serial number, type of equipment and code of manufacturer
10. Year of manufacture and software version and installation date
11. Motion sensor serial number
12. Motion sensor approval number
13. Date and time of motion sensor pairing (The last 20 pairings will be stored)
14. GNSS coupling data
15. Workshop performing the last calibration
16. Workshop address
17. Workshop card identification
18. Workshop card expiry date
19. Calibration date and purpose
20. VIN
21. VRN and country of registration
22. Characteristic coefficient of vehicle
23. Constant of the recording equipment
24. Effective circumference of wheel tyres
25. Vehicle tyre size
26. Speed limiting device setting
27. Old and new odometer values
28. Old date and time (Before time adjustment)
29. New date and time (After time adjustment)
30. Most recent event date and time
31. Most recent fault date and time
32. DSRC serial number

Overspeeding

This printout lists overspeeding events together with duration and the name of the driver.

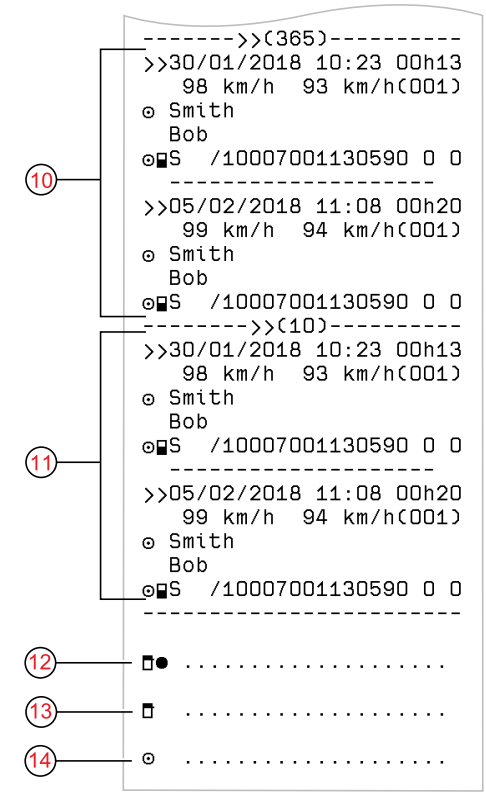
The display shows the following (on the second line):

`overspeeding`



1. Date and time.
2. Type of printout. (overspeeding). Speed limiting device setting.
3. Card holder's surname.
4. Card holder's first name.
5. Card and country identification number.
6. Expiry date of the driver card.
7. Vehicle identification. VIN, registering member state and VRN.
8. Date and time of the last overspeeding control.
9. Date and time of first overspeeding and number of over speeding events since the last over speeding control.
   First overspeeding after the last calibration. Date time and duration. Max and average speed. Driver and drivers card identification.

Overspeeding continued



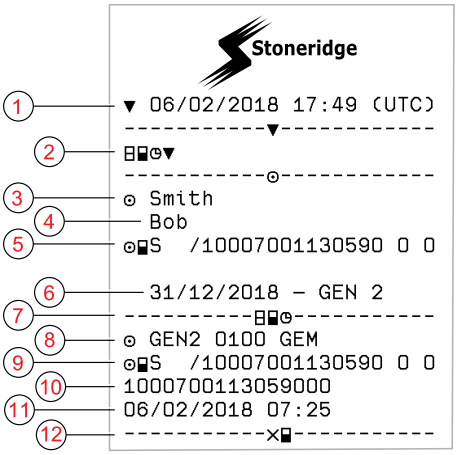
10. Five most serious overspeeding over the last 365 days. Date time and duration. Max and average speed. Driver and drivers card identification.
11. Most serious overspeeding events over the last ten days. Date time and duration. Max and average speed. Driver and drivers card identification.
12. Control place.
13. Controller's signature.
14. Driver's signature.

Historic Cards

This printout lists the history of cards used in the Tachograph.

The display shows the following (on the second line):

`historic cards`



1. Date and time
2. Type of printout: History of inserted cards
3. Card holder's surname
4. Card holder's first name
5. Card and country identification number
6. Expiration date and generation of the driver card
7. Cards insertion section
8. Type of card, generation, version, manufacturer
9. Card identification
10. Card serial number
11. Date and time of last card insertion
12. Faults from card section

Display Messages

There are four type of messages that can be seen on the display.

- **Messages** - contains information on processes or reminders to the driver. Messages are not stored and can not be printed. Press the **Back** button to clear the message.
- **Pre-warnings** - appear as early reminders to the warnings. Pre-warnings, except DDS and WTD related, are stored and can be printed. Press the **OK** button twice to clear the Pre-warning.
- **Warnings**- appear in the event of e.g. overspeeding or violations of the law or if tachograph not can be recording. Warnings are stored and can be printed. Press the **OK** button twice to clear the Warning.
- **Faults** - are more critical than warnings and are displayed if there is a fault detected in the tachograph, in the sensor or driver card. In addition faults are presented if tampering with the equipment is detected. Faults are stored and can be printed. Press the **OK** button to acknowledge the Fault.

Display	Description	Action
⛔	Message Entry not possible while driving. Related to the operator.	Stop the vehicle and try the entry again. If the symbol still is present when vehicle stopped, disconnect and reconnect the tachograph and retry. If the symbol still is present after reconnect, tachograph must be decommissioned.
✕ Absence of GNSS pos info	The VU is unable to detect any valid GNSS satellite signal for a long time	Make sure the GNSS antenna is not covered with or close to large metallic parts
! Already in control mode	Message Two control cards inserted. The second card will be ejected without being processed (authenticated). Related to the operator.	Insert only one Control card.
! Card auth.failure	Fault The tachograph security check for the card in slot 1 failed. Similar message for slot 2. Related to the tachograph.	Check that the inserted card is valid and correctly inserted. Check if the card works in another tachograph. Try to insert another card.
✕ Card fault	Fault The card in slot 1 is defective. Similar message for slot 2. Related to the card.	Eject the card and check it visually. Check the tachograph with a functional card.
! Card conflict	Warning An invalid card combination has been detected. Related to the card.	Withdraw the offending card.
! → ✕ Card eject without saving	Message Data could not be stored on the card withdrawn from slot 2 due to an error. Simiar message for slot 1. Related to the card.	Clean the card with a soft damp cloth and try again. In case of a faulty card, contact the responsible authority in the country in which you are located.
Card expired	Message The card in slot 1 has expired. Similar message for slot 2. Related to the operator.	Remove the card and replaced it with a valid one.
! Card expiry	Message The card in slot 1 will expire (Day/Month) . Similar message for slot 2. Related to the operator.	Contact the responsible authority to get a new card.

Display Messages

Display	Description	Action
Card ins. while driving	Warning A tachograph card is inserted in any slot while driving. Related to the operator.	No further action required.
Card integrity error	Fault Corrupt data detected when reading data from the card in slot 2 to the tachograph. Similar message for slot 1. Related to the card.	Clean the card with a soft damp cloth and try again. In case of a faulty card, contact the responsible authority in the country in which you are located.
Data integrity error	Fault Corrupted files have been detected in the tachograph. These files will not have a valid signature when downloaded. Related to the tachograph.	Check for evidence of tampering with the tachograph. If there is evidence of tampering the tachograph must be decommissioned and replaced.
d/m download card	Message Indicates the time to next download of the card (Day/Month) in slot 1. Similar message for slot 2	Prepare for download.
d/m download vehicle	Message Indicates the time to next download from the tachograph (Day/Month).	Prepare for download.
Download complete	Message The tachograph download process has been completed successfully.	No further action required.
Download failed	Warning The tachograph download process has failed and is incomplete. [Workshop card]	Retry the download. Check the connections and the download equipment. Re-insert the card and retry the download. Replace or repair the download equipment if required. If the tachograph is faulty beyond repair it must be decommissioned and replaced.
Driving can't open slot	Message An attempt was made to open the slot while the vehicle was in motion. Related to the operator.	Stop the vehicle. The card tray can be opened only when the vehicle is stationary.
Driving w/o valid card	Warning Driving without an appropriate card, or with an inappropriate card combination. Related to the operator.	Stop and remove inappropriate card.
fn× Function not possible	Message The desired function cannot be carried out. Related to the tachograph.	No further action required.
Hardware sabotage	Fault Authenticated card has been removed by force. Related to the operator.	The tachograph must be decommissioned and replaced.
Insertion of a non valid card	Warning A non-valid card has been inserted to a slot. Related to the operator.	Check that the card has not been inserted upside down or is expired.

Display	Description	Action
Last sess. not closed ok	Warning The driver card in tray 1 was ejected incorrectly during the last session. The previous card withdrawal in tray 1 was not completed correctly by the tachograph. Similar message for slot 2. Related to the card.	Eject the card and check it visually. Clean the card with a soft damp cloth and try again. In case of faulty card, contact relevant authority to get it replaced.
M.....! Memory full!	Message Manual entries memory full. Related to the operator.	Modify the manual entries so that the total number of entries is less.
New time? 03:01	Message Daylight saving time changes.	Answer **YES** to start or end daylight saving time. Answer **NO** or press the **Back** button to cancel.
d/m next calibration	Warning Next mandatory calibration has to be carried out (d/m = Day /Month)	Plan for the calibration.
No driver/ workshop card	Message A function has been selected that requires an inserted driver or workshop card. Related to the operator.	Insert a driver or workshop card.
No further details	Fault An unknown type of sensor error occurred. Related to the motion sensor.	Replace the motion sensor.
Power supply interruption	Warning The power supply to the tachograph has been interrupted for more than 200 milliseconds. Cranking voltage should not cause this event. The event is not generated in calibration mode. Related to the vehicle.	Check the vehicle and tachograph power supply levels. Check the power supply cables. Check the vehicle´s battery and replace if necessary.
Printer high temperature	Message The printing could not start, or the ongoing printing has been interrupted, because the temperature of the printer is too high. Related to the printer.	Wait until the printer temperature is in allowable range and try to print again.
Printer low power	Message The ongoing printing has been interrupted because the tachograph input voltage is too low. Related to the vehicle.	Check that the ignition is on. Check the vehicle battery voltage, connections, etc.
Printer low temperature	Message The printing could not start because the temperature of the printer is too low. Related to the printer.	Wait until the printer temperature is in allowable range and try to print again.
Printer out of paper	Message The ongoing printing has been interrupted because the printer is out of paper.	Replace paper. If fault remains active for no apparent reason the tachograph must be decommissioned and replaced.
Printing cancelled	Message The ongoing printing has been cancelled.	No further action required.
Remote Detection fault	Fault Cannot communicate with the Remote Detection facility (DSRC)	
Security violation	Tampering with hardware has been detected	Visit a smart tachograph workshop to have the equipment checked.

Display Messages

Display	Description	Action
!🔒⎍ Sensor auth. failure	Fault The tachograph does not detect the sensor. Related to the motion sensor.	
!🔒⎍🖷 Sensor auth. failure		Check motion sensor operation and all wiring. Check for evidence of tampering. Pair the motion sensor and tachograph again. Perform a new calibration of the tachograph system. Replace the sensor if found faulty.
!⎍=0 Sensor cable fault	Warning No pulses received from motion sensor, but encrypted data is received.Related to the motion sensor.	Check the motion sensor operation and wiring. Replace the motion sensor if necessary.
!⎍>0 Sensor cable fault	Warning Pulses received from motion sensor, but encrypted data missing or mismatch. Related to the motion sensor.	Check the motion sensor operation and wiring. Replace the motion sensor if necessary.
×⎍🖷 Sensor comms error	Fault Motion sensor communication error. Related to the motion sensor.	Check the motion sensor operation and wiring. Replace the motion sensor if necessary.
!⎍ Sensor data error	Warning Signal failure between motion sensor and tachograph. Related to the motion sensor.	Check the motion sensor operation and wiring. Replace the motion sensor if necessary. Check for evidence of tampering. If the error remains active for no apparent reason, decommission and replace the tachograph.
!🔒⎍/⎍ Sensor data integrity error	Fault Internal motion sensor error, stored data integrity failure. Related to the motion sensor	Replace the motion sensor if necessary.
×⎍🖷 Sensor no acknowledge	Fault Motion sensor communication error. Related to the motion sensor.	Check the motion sensor operation and wiring. Replace the motion sensor if necessary.
×🖷←⎍ Sensor no answer	Fault Motion sensor communication error. Related to the motion sensor.	Check the motion sensor operation and wiring. Replace the motion sensor if necessary.
!⎍ϟ Sensor no power signal	Fault Motion sensor has no power. Related to the motion sensor.	Check the vehicle battery voltage, wiring, etc. Replace the motion sensor if necessary.
×🖷⎍ϟ↑ Sensor power high	Fault Motion sensor power too high. Related to the motion sensor.	Check the vehicle battery voltage, wiring, etc. Replace the motion sensor if necessary.
×🖷⎍ϟ↓ Sensor power low	Fault Motion sensor power too low. Related to the motion sensor.	Check the vehicle battery voltage, wiring, etc. Replace the motion sensor if necessary.
🖷→T? Service pre-warning	Message Next calibration, pre-warning.	Perform a calibration.

Display	Description	Action
! Time conflict GNSS versus VU	Message The internal clock and the GNSS clock differs more than 1 minute	Make sure the GNSS antenna is not covered or that the GNSS signal is distorted.
!→ Time for service	Message The tachograph is out of calibration.	Perform a calibration.
→ Timeout no key pressed	Message The tachograph is waiting for input. Timeout 1 min or 20 min.	Press the appropriate buttons and complete the process. Timeout can be changed in Settings menu.
×1/2× Unable to open slot	Message The card tray concerned cannot be opened. Related to the tachograph.	Check that the ignition is on. If the tray is still faulty - Visit a smart tachograph workshop to have the equipment checked.
! Unauth. change of sensor	Fault The sensor has been changed since last pairing. Related to the motion sensor.	Check the motion sensor operation and all wiring. - replace sensor if faulty Check for evidence of tampering. Pair the motion sensor and the tachograph again. Perform a new calibration of the tachograph system. Replace the sensor if found faulty.
! Vehicle Motion Conflict	Message GNSS motion sensor and primary motions sensor data contradicts. Related to the motion sensor.	Check second source sensor operation and primary sensor and its wiring. Check for evidence of tampering. Use reference cables.
! 12/10 VU expiry	Warning The tachograph (VU) will expire at the displayed date.	
× VU internal fault	Fault The tachograph has detected an internal fault. Related to the tachograph.	

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