

Digital Tachograph EFAS-4 V03

**Brief introduction of EFAS V03
for responsible technicians**



e1*3821/85*2016/130*222*10

Digital EFAS-4 V03 in a nutshell

Draft version 2020-04-27

- ▶ Identification
- ▶ Paper change
- ▶ Battery replacement
- ▶ Connectivity
- ▶ Connecting RDD devices CAN /D8
- ▶ Extended Configuration options
- ▶ Extended Test options
- ▶ Resources
- ▶ Getting further help



Digital Tachograph EFAS-4 V03 — Identification

- ▶ Printed type labels with serial number
 - Body and printer bay show the same ser. no.
 - (Printer label differs)

- ▶ Electronical type label tachograph:

Menu: Infos▶	Infos: Tachograph	Serial number 012.0000101678
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Must match
printed serial
numbers

- ▶ Electronical info IMS function:

Menu: Infos▶	Infos: IMS	IMS: OFF Status: ?
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- ▶ Electronical info Company Locks:

Menu: Infos▶	Infos: Company locks	Company locks: not available
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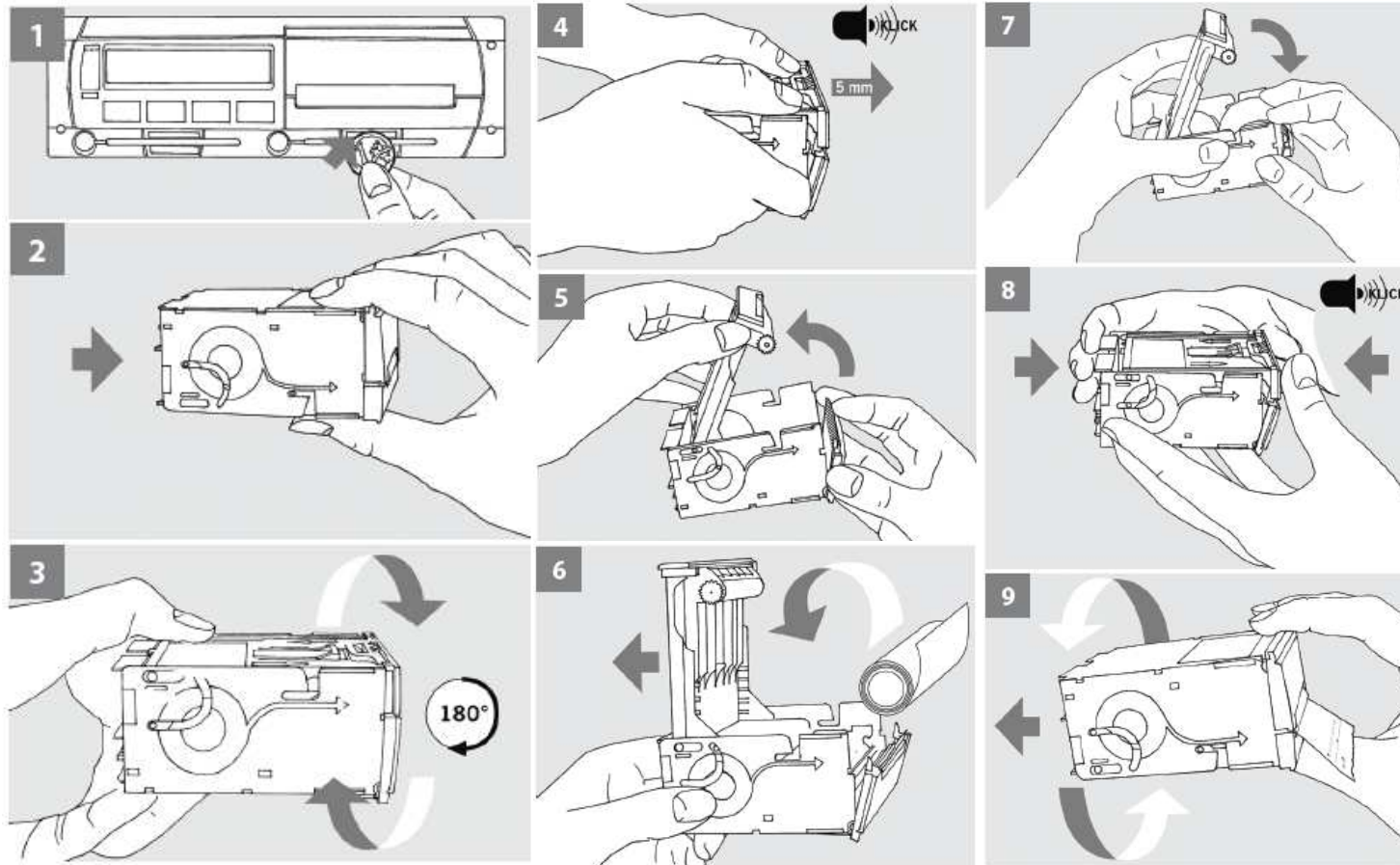
- ▶ Electronical info Activity Ignition:

Menu: Infos▶	Infos: Activity ignitio	01:- 01:H 02:- 02:H
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Quick language change: Press |<< 5 seconds.

Digital Tachograph EFAS-4 V03 — How to handle the printer



Only use paper, which is approved for digital tachographs e1-222.



Tachograph EFAS — Tester Tools

Draft state 27.04.2020

Model	Manufacturer	Digital EFAS-4 V03 (1B)	Smart EFAS-4 V05 (1C)
CD-3	Phelect sprl	Calibration as "DTCO 1381".	Unknown
CTC II / Workshop Tablet	Continental Automotive GmbH	CTCII: Requires software > V2.11	Tab 4 with: 2910002304900 (Smart Extended Lizenz) A2C59507497 (WorkshopLink Adapter)
MK-II / Optimo 1 + 2	STONERIDGE Electronics Ltd.	Calibration as "EFKON" ¹⁾	Unknown
MTT 2000	NTS GmbH	Calibration and Installation ¹⁾	Calibration and Installation ¹⁾
CD400/RTTS150/CORA1	CD Concept sprl	Calibration and Installation ¹⁾	Calibration and Installation ¹⁾
TC-net SMG , TC-PILOT	Tacho Control Semmler	Calibration and Installation ¹⁾	Calibration and Installation ¹⁾
UTP-10	MATT automotive	Calibration and Installation ¹⁾	Calibration and Installation ¹⁾
EFAS Service Tool (EST)	Intellic GmbH	Installation, Test, Documentation, but no calibration (w/k, l)	Installation, Test, Documentation, calibration support (input of extra seal numbers)

¹⁾ Use EFAS Service Tool as a companion tool for full access to EFAS parameters

Digital Tachograph EFAS-4 V03 — How-To change the buffer battery

Only if EFAS is activated a workshop card with **PIN** must be applied prior to lifting the cover.

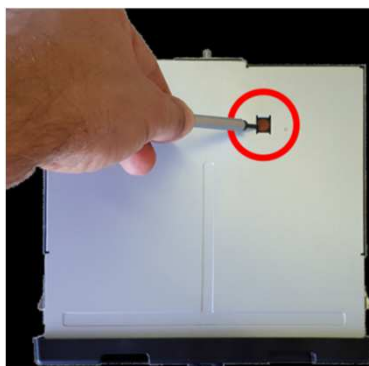
1) Insert Workshop Card and enter valid PIN



2) Connect EFAS to external battery power



3) Break the seal



4) Lift the cover



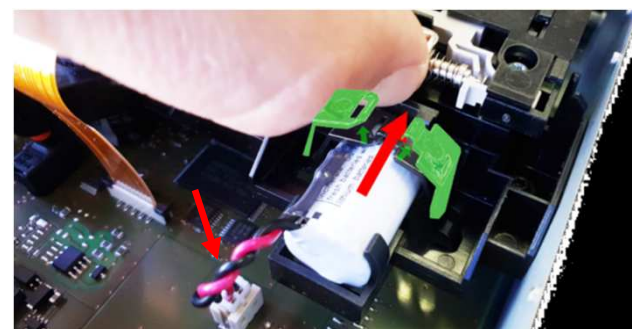
5) Remove old battery

6) Insert new battery



7) Close the battery lock

8) Close the body cover



9) Seal EFAS body again with **your workshop seal**

Digital Tachograph EFAS-4 V03 — Buffer Battery

- ▶ Replacing the internal buffer battery is a legal requirement
 - **Every two years** for installed units
 - **1 year after production date** of EFAS for stocked units

EFAS operates only according to its approval, while an internal buffer battery of type “Primary Lithium Thionyl Chloride (**Li-SOCl₂**) battery, **3,6V, 1100mAh**, size **½ AA**, with **current limiter** and **connector**” with sufficient capacity is installed.

Intellic recommends the use of original equipment type Intellic part no. 10155122

Alternative solutions **must be certified** for use in Smart Tachographs according to **Annex 1B of CR (EU) 2018/502** and may be based on:

- MINIMAX ENERGY , 3.6V, 1200mAh, ER14250H
- VITZRO CELL, 3.6 V, 1200 mAh, SB-AA02
- Tekcell 3.6V, 1200mAh, SB-AA02
- Tadiran Batteries, 3.6 V, 1100 mAh, SL750



Digital Tachograph EFAS-4 V03 — Rear Connections / Connector Label

D-Connector

- ▶ Status and Warning Output
- ▶ Speed Output (conf.)
- ▶ Serial Outputs (k-Line, Info)

C-Connector

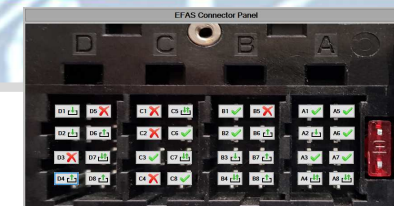
- ▶ Second CAN-Bus (CAN-C)
- ▶ CAN-C Termination Y/N
- ▶ RPM Output

B-Connector

- ▶ Motion Sensor Interface
- ▶ Speed Output
- ▶ Impulse Output

A-Connector

- ▶ Power & Ignition
- ▶ Illumination
- ▶ Primary CAN-Bus (CAN-A)

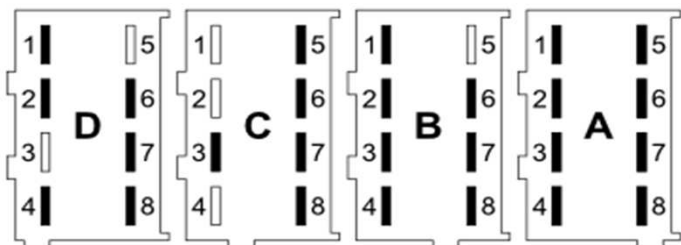


D1: Status 1	D5: not connected
D2: Status 2	D6: V-Imp. (conf.)
D3: not connected	D7: Serial D7
D4: Warning OUT	D8: Serial D8

C1: not connected	C5: CAN High (C)
C2: not connected	C6: CAN Gnd. (C)
C3: Engine RPM	C7: CAN Low (C)
C4: not connected	C8: CAN Term. (C)

B1: Sensor +	B5: not connected
B2: Sensor -	B6: V-Impulse
B3: Sensor Pulse	B7: V-Impulse
B4: Sensor Data	B8: 4 Imp./m

A1: Battery + (30)	A5: Battery - (31a)
A2: Illum. (58)	A6: Ground (31)
A3: Ignition (15)	A7: CAN Gnd. (A)
A4: CAN High (A)	A8: CAN Low (A)



CAN Term. (A)

**DO NOT DISCONNECT
WITHOUT WORKSHOP
CARD!**

**PLEASE SEE SERVICE
MANUAL FOR DETAILS.**

CAN-A Termination

Motion Sensor Power Supply
 U_o : 10V, I_o : 31,2mA, P_o : 0.31W
 L_o : 10mH, C_o : 29nF

INTELLIC

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Digital Tachograph EFAS-4 V03 — Retrofitting RDD via CAN

► The goal:

- Connecting a retrofitted Remote Data Downloading (RDD) Device via CAN AUX to a Digital Tachograph system EFAS-4 V03 when already some ECU is connecting.

► Assumed starting condition Digital EFAS-4 V03:

- Digital EFAS-4 V03 and some ECU (e.g. IMS module) are installed in the vehicle and are connected via CAN AUX (the red plug).
- CAN AUX is assumed to be configured to 250 kbps and 29 bits and is terminated on both sides with 120 ohms each, resulting termination impedance = 60 Ohms.
- RDD-Protocols (FMS, UDS) are disabled for CAN AUX at EFAS.

► Assumed factory delivery condition of RDD device:

- RDD device is configured for CAN connection via FMS / UDS at 250 kbps / 29 bits.
- RDD device has a built-in termination resistor of 120 Ohm.

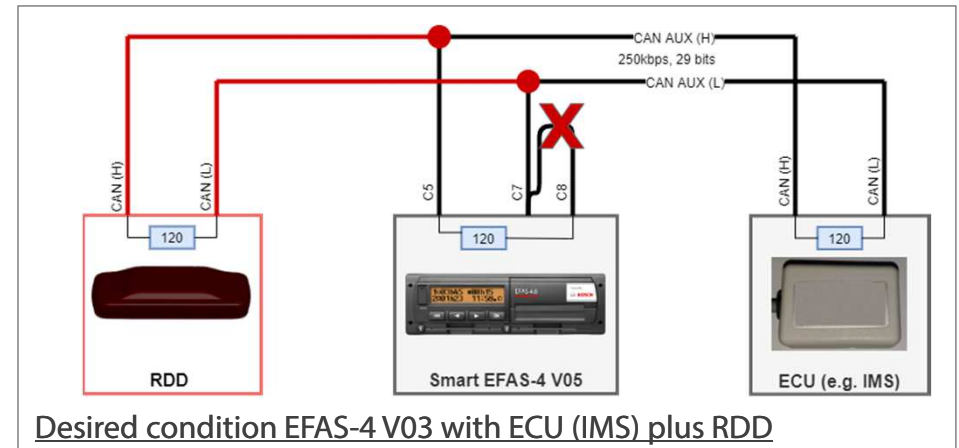
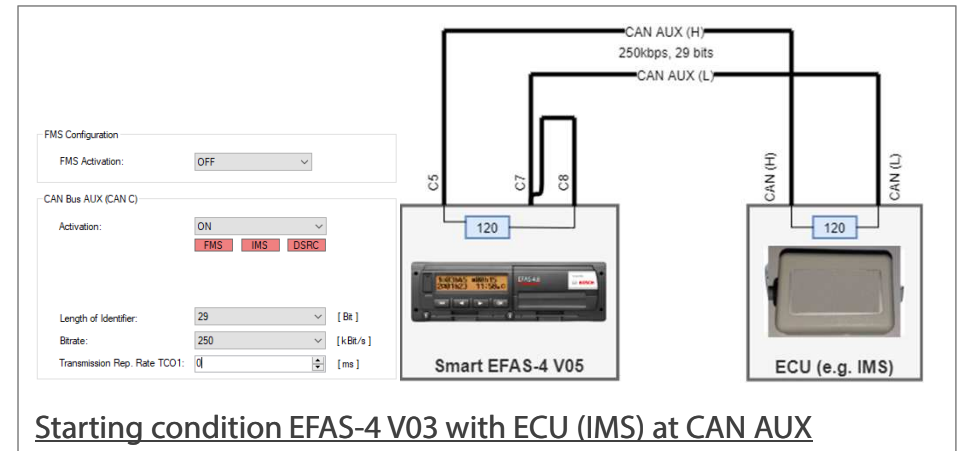
► Required changes (requires **Workshop Card**):

- Additional** connection of RDD device at **CAN AUX (C5, C7)** at EFAS.
- The resulting termination impedance = **60 ohms** of the CAN AUX **must be retained**.
- If necessary**, the termination on the EFAS must be deactivated. In this case, the **bridge wire** between C7 and C8 on the EFAS must be **opened**.
- Enable protocol "FMS Activation = AUX-Bus" at EFAS-4 V03 and leave the other settings unchanged (e.g. 29 bits, 250kbps, 0ms)

FMS Configuration

FMS Activation:

AUX-Bus



Supply and general connections are not shown!!

Digital Tachograph EFAS-4 V03 — Retrofitting RDD via D8

► The goal:

- Connecting a retrofitted Remote Data Downloading (RDD) Device via D8 to a Smart Tachograph system EFAS-4 V03.

► Factory delivery condition Smart EFAS-4 V03:

- D8: Info-Interface-Protocol (IIP) with 10V enabled

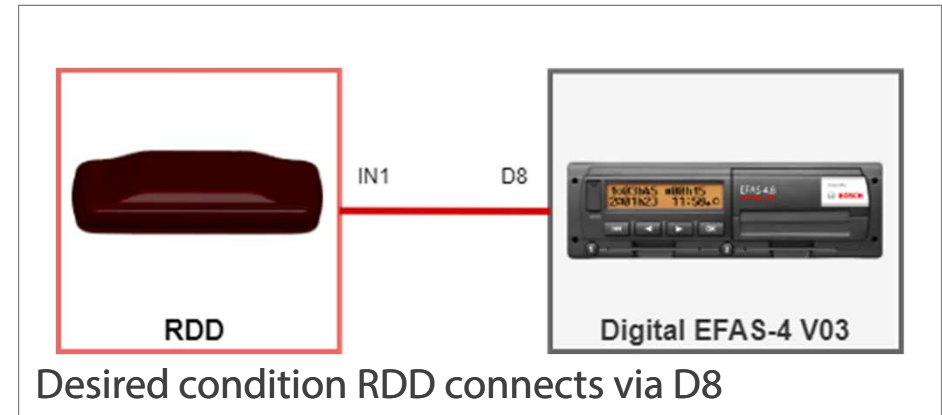
Protocol Selection D8:

► Factory delivery condition of RDD device :

- The RDD device is assumed to allow receiving a serial data stream according to “Info-Interface-Protocol”, marked by the identifier “EFAS”.

► Required changes (requires **Workshop Card**):

- Establish electrical connection between serial input of RDD device and serial output D8 of EFAS.
- If necessary, update the firmware of the RDD device so that the “EFAS” identifier is accepted.



Digital Tachograph EFAS-4 V03 — RDD solutions supporting EFAS #1

Product	Producer	Web link	Required SW release	Remark
TuckLinc	Astrata	https://www.astrata.eu	—	—
TCO4HCV	Ruptela	info@ruptela.com	—	—
C4 Max	Frotcom	http://www.frotcom.com	—	—
RDU GPRS2	TachoSafe	https://tachosafe.ro	—	—
Fleetbox	Buyond	http://www.buyound.de	—	—
TX-Go	Transics GmbH	https://www.transics.com	—	—
TX-Sky	Transics GmbH	https://www.transics.com	—	—
Link 510	TomTom	https://telematics.tomtom.com	9.2.5036	CAN, D8
Sistem iTac	Intendia	https://intendia.com	0.5.25	—

State as of 2020-03. Contact support@Intellic.com to register your solution.

Digital Tachograph EFAS-4 V03 — RDD solutions supporting EFAS #2

Product	Producer	Web link	Required SW release	Remark
MiX	MiX Telematics	https://www.mixtelematics.com	—	—
Tachofresh RDL	Tachofresh	https://www.tachofresh.com	—	—
Telematik	Aplicom	https://www.aplicom	—	—
CubiQ	Fleetgo	https://fleetgo.com	—	—
FM6300	Teltonika	https://teltonika-gps.com	—	—
Tachocomplete	Yellowfox	https://www.yellowfox.de	—	—
Locatel Fleet Solution	Locatel	http://www.locatel.es	—	—
GPL1000	Astrata	https://www.astrata.de	—	—
SYRFM10	SEYiR	https://www.seyirmobil.com	—	—

State as of 2020-03. Contact support@Intellic.com to register your solution.

Digital Tachograph EFAS-4 V03 — Extended Configuration Options

Free¹⁾ EFAS Service Tool offers access to extended configuration options without special tools¹⁾:

► CAN Bus MAIN und AUX

- Bitrate
- Identifier length
- TCO1 transmission interval
- Communication protocols
- Non-standard interface assignment for DSRC, RDD
- Wake-up options for CAN Bus MAIN and AUX to support unmanned RDD operation

► Company settings

► iCounter options

► And much more...



Intellic OC2513

¹⁾ free, as in free beer

²⁾ Apart from the connection cable OC2513 between the PC and the EFAS 6-pin front socket

 The screenshot shows the 'EFAS Service Tool' configuration window. It is divided into several sections:

- FMS Configuration:** FMS Activation: AUX-Bus (dropdown).
- DSRC:** DSRC via CAN: (dropdown).
- CAN Bus AUX (CAN C):**
 - Activation: ON (dropdown).
 - Protocol selection: FMS (green), IMS (red), DSRC (red).
 - Length of Identifier: 29 [Bit] (dropdown).
 - Bitrate: 250 [kBit/s] (dropdown).
 - Transmission Rep. Rate TCO1: 0 [ms] (dropdown).
- CAN Bus MAIN (CAN A):**
 - Activation: ON (dropdown).
 - Protocol selection: FMS (red), IMS (red), DSRC (red).
 - Standard protocol selection: Universal E-tacho/Combi instrument (dropdown).
 - Diagnosis protocol: Standard UDS (ISO 14229) (dropdown).
 - Length of Identifier: 29 [Bit] (dropdown).
 - Bitrate: 500 [kBit/s] (dropdown).
 - Transmission Rep. Rate TCO1: 50 [ms] (dropdown).
- CAN Bus AUX (CAN C) - Extras:**
 - CAN Bit Sample Point: 87.2 [%] (dropdown).
 - CAN Sync. Jump Width: 2 [Tq] (dropdown).
 - CAN Sample Mode: single (dropdown).
 - Bus priority level TCO1 message: Priority 3 (default) (dropdown).
 - Message Selection: DRTD1 (checked), TCO2 (unchecked), DRTD2 (checked), TCO3 (unchecked).
 - VU wakeup via CAN AUX bus: ON (LCD: OFF) (dropdown).
- CAN Bus MAIN (CAN A) - Extras:**
 - CAN Bit Sample Point: 87.2 [%] (dropdown).
 - CAN Frame Timeout Factor: 3 [s] (dropdown).
 - CAN Sync. Jump Width: 2 [Tq] (dropdown).
 - CAN Sample Mode: single (dropdown).
 - Priority Level TCO1 Message: Priority 3 (default) (dropdown).
 - Error Management Init. Inhibition: 2.0 [s] (dropdown).
 - Message Selection: DRTD1 (checked), TCO2 (unchecked), DRTD2 (checked), TCO3 (unchecked).
 - VU wakeup via CAN MAIN bus: OFF (dropdown).
- Company Settings:**
 - Local time/print out: through menu (dropdown).
 - Activity/Ignition on: No change (dropdown).
 - Activity/Ignition off: No change (dropdown).
 - Activity/Ignition on (2): No change (dropdown).
 - Activity/Ignition off (2): No change (dropdown).
- iCounter:**
 - iCounter active: checked.
 - Show warnings:
 - for driver cards: checked.
 - for driver and workshop cards: unchecked.
 - Show warning type:
 - Nine hour daily driving time: checked.
 - Maximum daily driving time: checked.
 - Weekly driving time: checked.
 - Two-weeks driving time: checked.
 - New rest period: checked.

Digital Tachograph EFAS-4 V03 — Extended test options

Free **EFAS Service Tool** offers extended test options without special tools, e.g. for

- ▶ HW components, like
 - Battery (Buffer battery)
 - Printer
- ▶ External modules/functions, like
 - IMS
 - Pulse outputs
 - Digital in- /outputs
- ▶ Interfaces, like
 - CAN A
 - CAN C
 - Motion sensor

¹⁾ free, as in free beer

²⁾ Apart from the connection cable between the PC and the EFAS 6-pin front socket

The screenshot displays the EFAS Service Tool interface with several test modules:

- Test ISO 16844, Printer:** Includes buttons for Test Printout, Printer Temperature, and Printer Charset (set to ISO-8859-1).
- HW Test:** A grid of buttons for Motion Sensor, Battery, Power Supply, I/O, Pulses, Shaft, Engine Speed, and Buzzer and LED Test, each with a Stop button.
- KWP Test Routines:** Buttons for IMS Test Start, GNSS Test Start, and DSRC Test Start, each with a Stop button.
- Test ISO 16844 Display:** Shows 4 Tests (Test 1-4) with checkboxes. Below are GNSS Test parameters: Error State (0), Data Valid (NO), Satellites (0 of 0), Accuracy (231), Fix Mode (1), Latitude (0° 0' 0.0" N), and Longitude (0° 0' 0.0" E). Includes Test and Check Position buttons.
- Training Box:** A checkbox for intellic Training Box and a Deactivate button.
- Keyboard Test:** Test and Stop buttons.
- CAN A Test:** Shows Activated status, Rx Error (0), Tx Error (0), and a Test button.
- CAN C Test:** Shows Activated status, Rx Error (0), Tx Error (0), and a Test button.

Assignment (view from front)

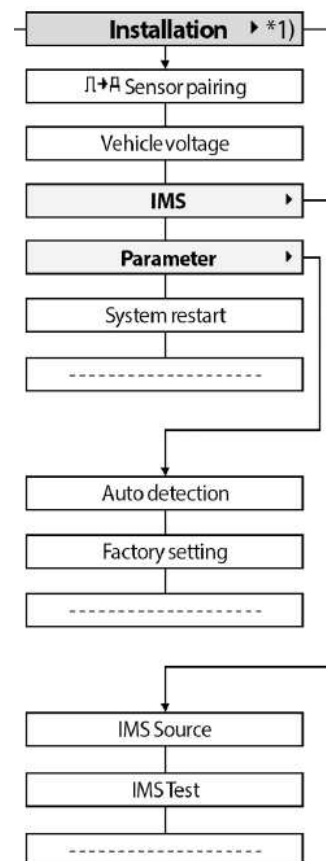
Pin	Meaning
1	Ground (GND)
2	K-line data interface (bidirectional)
3	RS232 data interface (RxD → receive)
4	I/O signal for calibration (bidirectional)
5	EFAS supply voltage less max. 3 V
6	RS232 data interface (TxD → transmit)

Note: 6-pin interface is supporting **all standard download and tester tools**, since interface is standardized by EU.

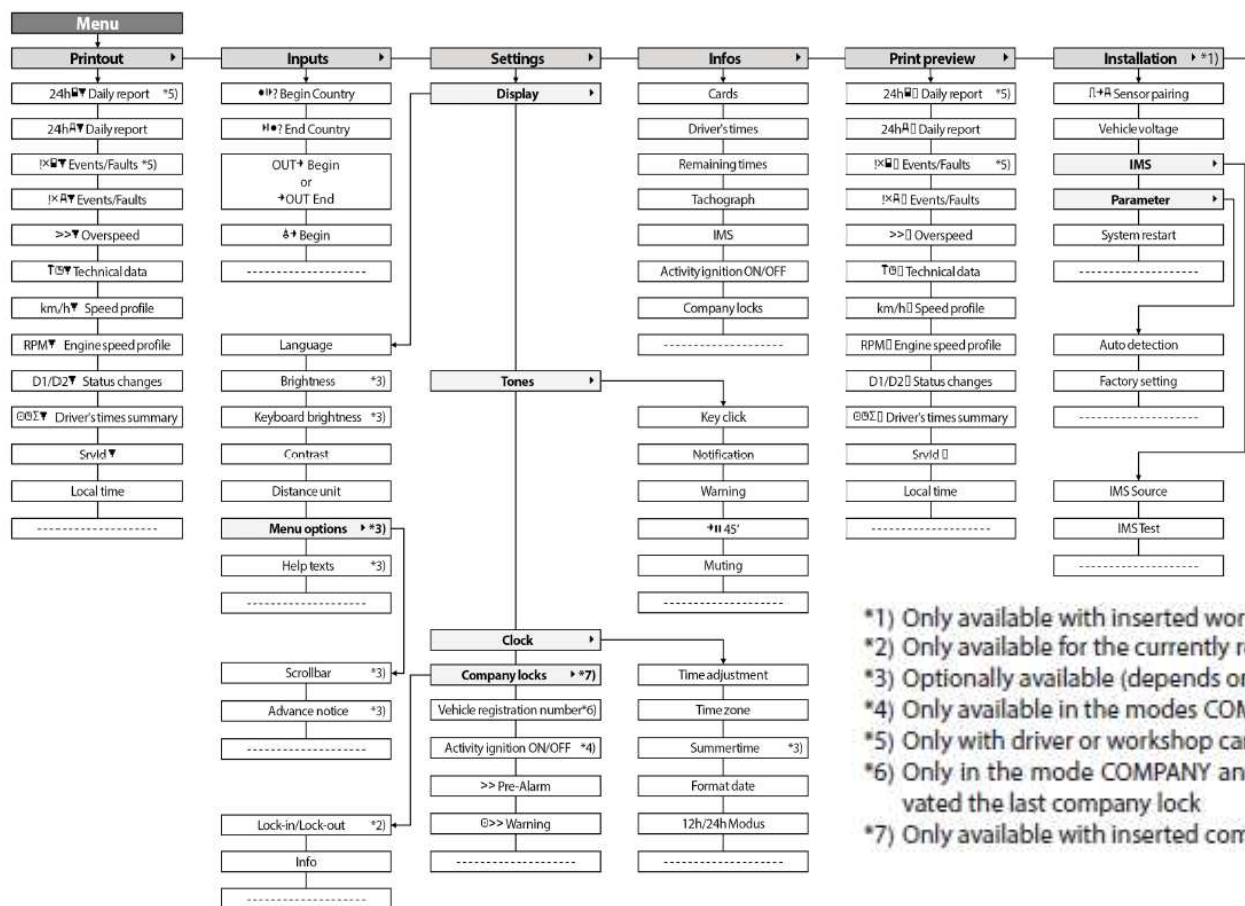
Digital EFAS-4 V03 — Installation support by menu

Menu:
Installation▶

- ▶ EFAS supports **installation options** via menu
- ▶ **Sensor pairing** allows pairing of motion sensor
- ▶ Vehicle voltage allows adaption to battery voltage 12V/24V.
- ▶ **Parameter** allows to change basic system parameters
 - **Auto detection automatically** tweaks system settings to best match the vehicle's requirements.
 - **Factory setting** restores ex-works system settings.
- ▶ **IMS Source** allows change the IMS source setting (WSI/ABS, Pulse on C3, Vehicle Distance, etc.) **w/o tester.**
- ▶ **IMS Test** allows to verify IMS function **w/o tester.**
- ▶ System restart allows to restart EFAS with connected battery.
- ▶ Note: Installation menu requires valid workshop card



Digital Tachograph EFAS-4 V03 — Menu map



*1) Only available with inserted workshop card (mode CALIBRATION)

*2) Only available for the currently registered company

*3) Optionally available (depends on the device settings)

*4) Only available in the modes COMPANY or CALIBRATION

*5) Only with driver or workshop card inserted

*6) Only in the mode COMPANY and only if the inserted company card belongs to the company which activated the last company lock

*7) Only available with inserted company card

Digital Tachograph EFAS-4 V03 - Resources

- ▶ Download link for **free** EFAS Service Tool
 - http://portal.intellic.com/download/dms/EFAS%20Service%20Tool/SetupEFAS_ServiceTool_Recent.exe
- ▶ Download link for **free** User Manual
 - DE: http://portal.intellic.com/download/dms/EFAS-4.8/1030-130-SEC-BDA_E4_8_DE.pdf
 - EU: http://portal.intellic.com/download/dms/EFAS-4.8/1030-130-SEC-BDA_E4_8.pdf
- ▶ Download link for **free** Workshop manual
 - EN: http://portal.intellic.com/download/dms/EFAS-4.8/1030-131-SEC-EN12_WHB_E4_8.pdf
 - DE: http://portal.intellic.com/download/dms/EFAS-4.8/1030-131-SEC-DE15_WHB_E4_8.pdf
- ▶ Download link for free IMS How-To
 - EN: http://portal.intellic.com/download/dms/EFAS-4.8/EN_EFAS-408_IMS_2020-03-20.pdf
- ▶ Download link for Approval Certificate e1*3821/85*2016/130*222*10
 - EU: http://portal.intellic.com/download/dms/EFAS-4.8/Bauartgenehmigung_EFAS4_V3.52.pdf

Digital Tachograph EFAS-4 V03 – Help line

► Where to get further help (English/German)

- Email: support@Intellic.com
- Phone: +49 30 46407 222
- WhatsApp/Telegram:
 - +49 171 2043 757
 - +49 163 7679 502



► What you should provide :

- Print Technical Data

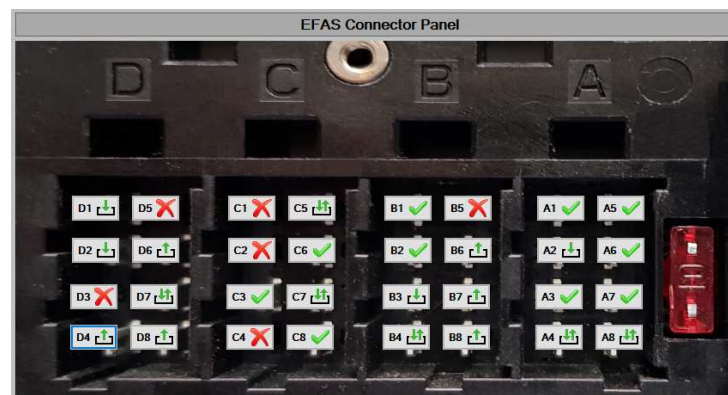


- Print SrvID



- List of external devices connecting to EFAS, like RDD or other devices (IMS, Toll/ITS)

- List of used connection on the A-D connectors, including fuse state:



- Or simply send a comprehensive installation report via email to EFAS Technical Support using EFAS Service Tool



Technical support...