



AS_SOD Box
Switch-off Delay Box
User's Guide

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Contents

1	About this Manual	5
1.1	Identification of Safety Notices	5
1.2	Presentation of Information	6
1.3	Scope of Supply	6
2	Basic Safety Notices	7
2.1	General Safety Information	7
2.2	Requirements for Users and Duties for Operators	7
2.3	Intended Use	7
3	Hardware	11
3.1	Switch-off Delay Box	11
3.2	Power Supply Cable	11
3.3	Connectors, Control Elements and LEDs	12
4	Function and Getting Started	13
4.1	Cabling	13
4.1.1	Current Consumption of the Test Setup	13
4.1.2	Overview	13
4.2	Activating the basic Function	14
4.3	Switching the Box on	14
4.4	Using the "T.15 Trigger" Input	14
4.5	Using the Function „permanent (if $U_b > 13V$)“	14
4.6	Function when powered from Vehicle Battery for the first Time	15
4.7	Using the white Socket T.30 [10]	15
4.8	LED Display Description	15
4.9	Automatic Switch-on at Engine Start Detection	15
4.10	Behavior with under Voltage of the Vehicle Battery	16
4.10.1	Drop below 10 Volt while the Box is off	16
4.10.2	Drop below 10 Volt while the Box is on	16
5	Technical Data	18
5.1	General Data	18
5.1.1	Product Labeling	18
5.1.2	Fulfilled Standards and Norms	19
5.1.3	Environmental Conditions	19
5.1.4	Maintenance the Product	19
5.1.5	Cleaning the Product	19
5.1.6	Mechanical Data	19
5.2	RoHS Conformity	20
5.2.1	European Union	20
5.2.2	China	20
5.3	CE Labeling	20
5.4	Taking the Product Back and Recycling	20

5.5	Declarable Substances	21
5.6	Use of Open Source Software	21
5.7	Electrical Data	22
5.7.1	Power Supply	22
5.7.2	Switch-off Time Delay	22
6	Order Information	23
6.1	Switch-off Delay Box	23
7	ETAS Contact Addresses	24
	Figures	25
	Index	26

1 About this Manual

This chapter contains information about the following topics:

- "Identification of Safety Notices" on page 5
- "Presentation of Information" on page 6
- "Scope of Supply" on page 6

1.1 Identification of Safety Notices

The safety notices contained in this manual are identified with the danger symbol shown below:



The safety notices shown below are used for this purpose. They provide notes to extremely important information. Please read this information carefully.



DANGER

indicates an immediate danger with a high risk of death or serious injury, if not avoided.



WARNING

indicates a possible danger with moderate risk of death or (serious) injury, if not avoided.



CAUTION

identifies a hazard with low risk that could result in minor or medium physical injuries or property damages if not avoided.

1.2 Presentation of Information

All activities to be performed by the user are presented in a "Use Case" format. That is, the goal to be accomplished is briefly defined in the heading, and the respective steps required for reaching this goal are then presented in a list. The presentation looks as follows:

Goal definition:

any advance information...

1. Step 1

Any explanation for step 1...

2. Step 2

Any explanation for step 2...

3. Step 3

Any explanation for step 3...

Any concluding comments...

1.2.0.1 Typographical conventions

The following typographical conventions are used:

Bold

Labels of the device

Italic

Particularly important text passages

Important notes for the user are presented as follows:



NOTE

Important note for the user.

1.3 Scope of Supply

Prior to the initial commissioning of the product, please check whether the product was delivered with all required components and cables (see chapter 6.1 on page 23).

2 Basic Safety Notices

This chapter contains information about the following topics:

- "General Safety Information" on page 7
- "Requirements for Users and Duties for Operators" on page 7
- "Intended Use" on page 7

2.1 General Safety Information

Please observe the Product Safety Notices ("ETAS Safety Notice") and the following safety notices to avoid health issues or damage to the device.

 **NOTE**

Carefully read the documentation (Product Safety Advice and this User's Guide) that belongs to the product prior to the startup.

ETAS GmbH does not assume any liability for damages resulting from improper handling, unintended use or non-observance of the safety precautions.

2.2 Requirements for Users and Duties for Operators

The product must be assembled, operated and maintained only if you have the necessary qualifications and experience for this product. Incorrect operation or operation by users without sufficient qualifications may lead to injuries, death or property damage.

General safety at work

The existing regulations for safety at work and accident prevention must be followed. All applicable regulations and statutes regarding operation must be strictly followed when using this product.

2.3 Intended Use

The Switch-off Delay Box AS_SOD is used for the temporary voltage supply of devices that are supplied from the vehicle on-board voltage supply. The Switch-off Delay Box is connected between vehicle battery and consumer. A cable is included in the delivery for connection to the vehicle battery.

Range of Application of the Product

This product was developed and approved for applications in the automotive area. The product is suitable for use in interiors, in the passenger compartment or in the trunk of vehicles. For use in other application areas, please contact your ETAS contact partner.

Requirements for the technical state of the product

The product is designed in accordance with state-of-the-art technology and recognized safety rules. The product may be operated only in a technically flawless condition and according to the intended purpose and with regard to safety and dangers as stated in the respective product documentation. If the product is not used according to its intended purpose, the protection of the product may be impaired.

Requirements for operation

- Use the product only according to the specifications in the corresponding user manual. If the product is used in any other way, product safety is no longer ensured.
- Note the requirements for the ambient conditions.
- Do not use the product in a wet or damp environment.
- Do not use the product in potentially explosive atmospheres.

Electrical safety and power supply

- Observe the regulations applicable at the operating location concerning electrical safety as well as the laws and regulations concerning work safety!
- Connect only current circuits with safety extra-low voltage in accordance with EN 61010 (degree of protection III) to the box connections.
- Ensure that the connection and setting values are adhered to (see the information in the chapter "Technical Data").
- Do not apply any voltages to the box connections that do not correspond to the specifications of the respective connection.

Power supply

- The power supply for the product must be safely disconnected from the supply voltage. For example, use a car battery or a suitable lab power supply.
- Only use lab power supplies with dual protection for the supply network (with double/reinforced insulation (DI/RI)). This requirement is met by lab power supplies that comply with IEC/EN 60950 or IEC/EN 61010.
- The lab power supply must be approved for use at a height of 5000 m and in ambient temperatures of up to 70 °C.
- In regular operation of the modules as well as very long standby operation, a discharge of the vehicle battery is possible.

Connection to the power supply



DANGER

Dangerous electrical voltage!

Connect the power cable only with a suitable vehicle battery! The connection to power outlets is not allowed!

To prevent an inadvertent insertion in power outlets, ETAS recommends to equip the power cords with safety banana plugs in areas with power outlets.

- When installing in a vehicle or connecting to a lab power supply, ensure that the supply line is fused directly after the vehicle battery, or lab power supply, with a fusible cutout with maximum 5 A. The power cord included in the delivery must not be crushed or come into contact with sharp-edged or hot components.
- Ensure that the connections for the power supply at the box and the vehicle battery are easily accessible.
- Route the power cord in such a way that it is protected against abrasion, damages, deformation and kinking. Do not place any objects on the power cord!

Disconnecting from the power supply

The box does not have an operating voltage switch. The box can be de-energized as follows:

- Switching off the lab power supply or
- Disconnecting the base module from the lab power supply (the Lemo connector on the delivered power supply cable is the isolating device) or
- Disconnecting the box from the vehicle battery (the Lemo connector on the delivered power supply cable is the isolating device) or
- Disconnect the vehicle battery.

Approved cables

- Use ETAS cables exclusively at the box connections.
- Do not use any damaged cables.
- Never apply force to insert a plug into a cable lug. Ensure that there is no contamination in or on the socket, that the plug and cable lug fits the socket and that you have correctly aligned them to the socket.

Switching on the AS_SOD-Box

Press the "Start" button to switch the box on and start the running the set time. If you press the "Start" button once again, the set time starts running once again. Automatic switch-off is announced by a cyclic signal tone 30 seconds beforehand.

The "Start" button can be pressed any time to extend the time by the set value once again without a switch-off. The box can be switched off at any time with the "Stop" button.

Requirements of the Installation Location

- Place the box on a smooth, level and firm surface.
- The box must always be firmly secured.

Fix the box on a carrier system

- When selecting the carrier system, note the static and dynamic forces that could be created by the box on the carrier system.

Requirements on the ventilation

- Keep the box away from heat sources and protect it against direct exposure to the sun.
- The clearance around the box must be selected so that sufficient air circulation is ensured.

Transport

- Connect the box only at the location of its startup!
- Do not transport the box by its power cord or any other cables.

Maintenance

The product is maintenance-free.

Repairs

If the AS_SOD Box needs to be repaired, return the product to ETAS..

Cleaning the box housing

- Use a dry or slightly dampened, soft, lint-free cloth to clean the box housing.
- Do not use any sprays, solvents or abrasive cleaners which could damage the housing.
- Make sure that no moisture enters the housing. Never spray cleaning agents directly onto the box.

Ambient conditions

The housing and the connectors of the box as well as the plug connectors of the cables meet the degree of protection IP30.

Opening the box



CAUTION

Damage to the box and loss of properties based on IP30!

Do not open or alter the box housing.

Work on the box housing must only be performed by ETAS.

Cabling

For detailed information about cabling, see the User's Guide of the box.

3 Hardware

3.1 Switch-off Delay Box

The Switch-off Delay Box AS_SOD Box allows the time limited power supply of devices which are supplied by the vehicle battery.



Fig. 3-1 Switch-off Delay Box

The Switch-off Delay Box will be connected between vehicle battery and load. For the connection to the vehicle battery a cable is delivered.

3.2 Power Supply Cable

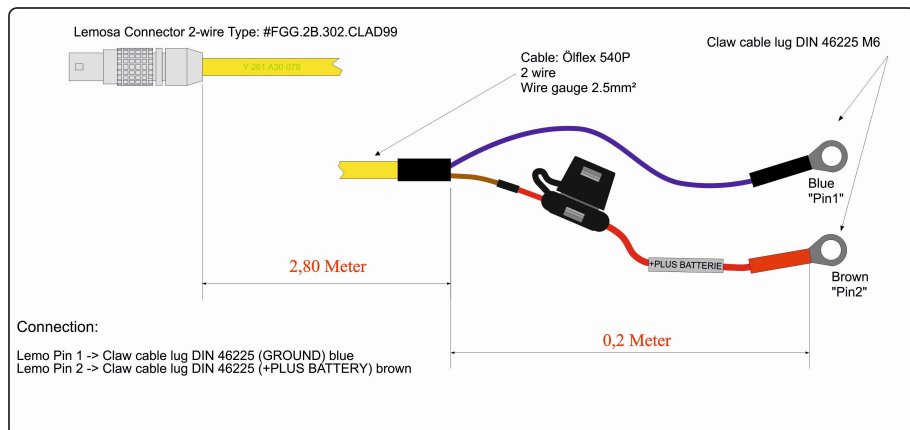


Fig. 3-2 Power Supply Cable

3.3 Connectors, Control Elements and LEDs

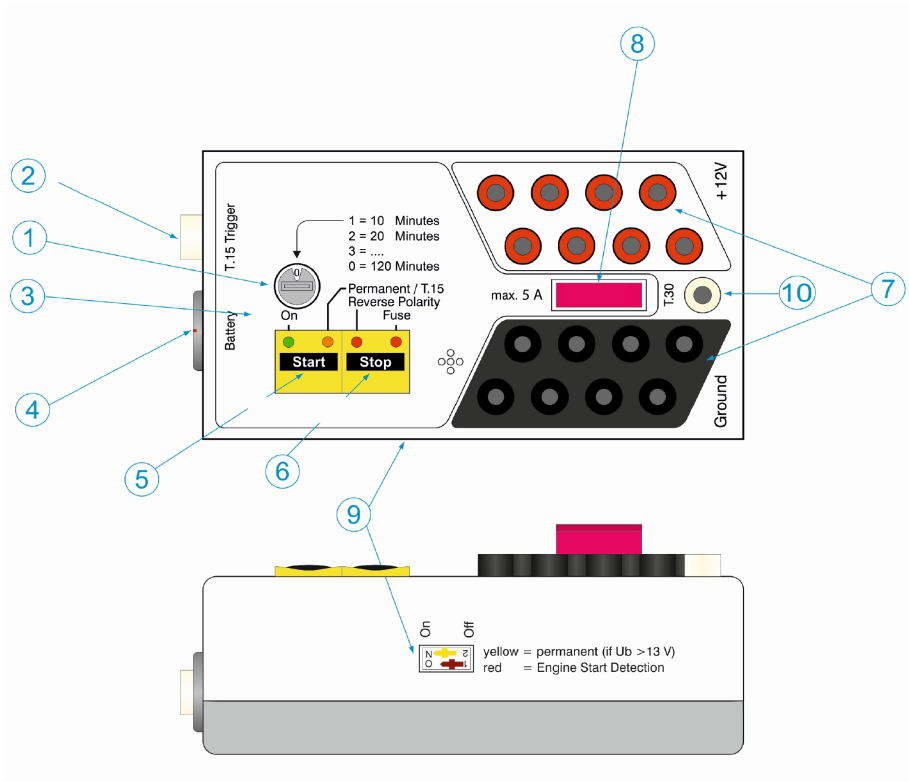


Fig. 3-3 Connectors, Control Elements and LEDs

Nb. in Fig. 3-3	Description	Function / Anzeige
1	Rotary switch	Set time
2	Input T.15	Trigger
3	LED „ON“	Relais on (energized)
	LED „Permanent/T15“	Continous operation
	LED „Reverse Polarity“	Check cable polarity
	LED „Fuse“	Fuse blown
4	Power supply	Input, connection to vehicle battery
5	Button „Start“	Start of a function
6	Button „Stop“	Stop of a function
7	Power supply	Output, connection to the load
8	Fuse 5 Ampere	Fuse protection
9	Slide switch	Special funtions
10	T.30	Output, continous power

4 Function and Getting Started

4.1 Cabling

4.1.1 Current Consumption of the Test Setup

Check whether the power consumption of the hardware connected to the Switch-off Delay Box exceeds the maximum load current of the box.

If the maximum load current of the box is exceeded, only connect the ES820.1 Drive Recorder to the Switch-off Delay Box. In this case, the other modules must be operated independently of the box and connected to the ES820.1 Drive Recorder via the CBE260 cable.

i NOTE

Be sure to check that the ports carry no voltage, before starting the cabling.

4.1.2 Overview

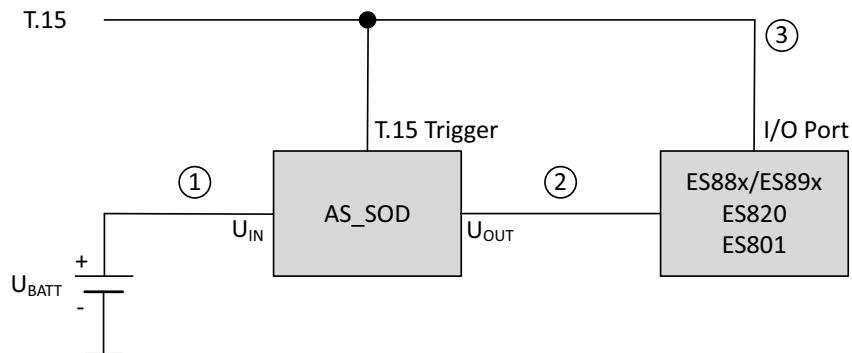


Fig. 4-1 Cabling

Nb. in Fig. 4-1	Cable
1	Power supply cable of the Switch-off Delay Box
2	Connection cable of the ES801.1
3	ES820.1 I/O cable CBV821

⚠ DANGER

Dangerous electrical voltage!

Connect the power cable only with a suitable vehicle battery! The connection to power outlets is not allowed!

The claw-type cable delivered with the Switch-off Delay Box should be connected directly to the battery. The Lemo plug connection [4] on the device can be disconnected for easier mounting.

While applying voltage for the first time, the device is switched on and remains so for the set time [1].

4.2 Activating the basic Function

The basic function of the Switch-off Delay Box can be used when both lateral slide switches **[9]** are in position „Off“ and the white socket **[2]** „T.15 Trigger“ is disconnected.

4.3 Switching the Box on

Pressing the button „Start“ **[5]** switches the box on and the set time begins to elapse. The set time begins to elapse again by pressing the „Start“ button **[5]** once more. The automatic switch-off is marked by a cycling beep that starts 30 seconds before the shutdown.

By pressing the button „Start“ **[5]** it is possible to extend the time by the set value again and without switching off the system. It is possible to turn off the box at any time by pressing the button „Stop“ **[6]**.

4.4 Using the “T.15 Trigger” Input

The box is switched-on if voltage is applied at the input “T.15 Trigger” **[2]**. As long as this voltage is present, the relay remains energized and the set delay time does not elapse.

If no voltage is present any more at the input, the relay remains energized initially and the set delay time begins to elapse. The automatic switch-off is notified 30 seconds beforehand through a beep.

At any point of time, the box can be manually switched-off using the button “Stop” **[6]** or the set time begins to elapse again by pressing the button “Start” **[5]**.

While aborting using the button “Stop” **[6]** the device remains off till “T.15 Trigger” **[2]** is not energized any more. It is switched on again only by energizing “T.15 Trigger” **[2]** again.

4.5 Using the Function „permanent (if $U_b > 13V$)“

This function additionally evaluates the supply voltage of the box. If there is no option to connect the “T.15 Trigger” signal in the vehicle, the box can be manually switched on again using the “Start button” **[5]**.

As long as the supply voltage is greater than 13.0 Volt (if the engine is running in the vehicle), the box remains switched-on without the set time beginning to elapse. If the battery voltage sinks below this value, the set time begins to elapse. If the supply exceeds 13.0 Volt again, the time elapse is aborted and the complete procedure can again begin from the start. The set delay time is discarded and the complete set time would again elapse before the box is switched off.

In this switch position **[9]**, the aforementioned functionality of the input “T.15 Trigger” is provided to the full extent and thus, always has priority.

It should be noted that the evaluation of the battery voltage cannot actively switch-on the box. Thus, only one early switch-off can be prevented.

4.6 Function when powered from Vehicle Battery for the first Time

The automatic switching-on of the device while applying the battery voltage can be used as a special function. The set time expires and the box turns off.

If, for example, T.15 is connected to the socket [2] the box exits this special function mode and then works as described above. In this example, it would work as described in chapter "Using the "T.15 Trigger" Input" on page 14.

4.7 Using the white Socket T.30 [10]

This socket can be used for permanent supply of consumers. Irrespective of all other functions, the supply voltage supplied to socket [4] is always applied there, protected by fuse [8].

4.8 LED Display Description

LED	Display	Description
ON	Green	LED lights up when the consumers connected to [7] are supplied with voltage (internal relay energized)
Permanent T.15	Yellow	LED lights up when terminal T.15 is connected to socket [2] With activated (= ON) Function [9] „permanent (if $U_b > 13\text{ V}$)“ the LED also lights up when the supply voltage at [4] is higher than approx. 13 Volt. This shows that the set time is not expiring.
Reverse Polarity	Red	LED lights up when connection the supply cable [4] to the car battery, inadvertently reversing the positive and negative ("reverse polarity").
Fuse	Red	LED lights up when the fuse [8] built in the box is blown. (Note: the fuse near the battery will not be monitored).

4.9 Automatic Switch-on at Engine Start Detection

This function is activated by the small red slide switch [9] located on the side of the box. If this "Engine Start Detection" switch is in the "ON" position, the box can evaluate a typical engine start event and automatically switch on itself. When starting the engine, the battery voltage usually breaks down temporarily and this process is evaluated and verified.

If the battery voltage at [4] drops below 10 Volt, the box waits for a time window of 15 seconds. If the battery voltage rises above 10 Volt again during this time, the connected loads are provisionally supplied (internal relay is energized). Within another 60 seconds, the battery voltage must rise above 13 volts (generator charges), then the relay remains on because of a plausible startup process. If this is not the case, a fault is assumed and the relay is switched off again.

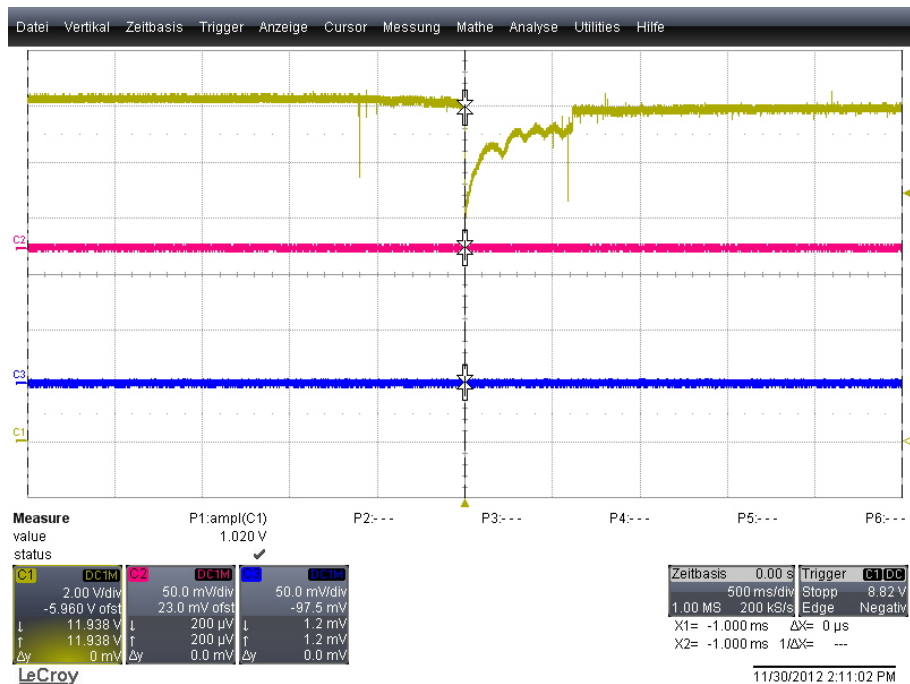


Fig. 4-2 Typical Voltage Curve at Engine Start

4.10 Behavior with under Voltage of the Vehicle Battery

When the „Engine Start Detection“ function [9] (laterally mounted red slide switch in the “ON” position) is activated, the battery voltage is monitored. A slow drop in the supply voltage (“discharged battery”) below the threshold of 10 Volt is signed by beeping and flashing. A distinction is made whether this case happens during normal operation (internal relay energized) or inactive low-power standby mode (relay unenergized).

4.10.1 Drop below 10 Volt while the Box is off

In this case, the unit beeps cyclically every 20 seconds and the “Permanent / T15” LED flashes. Although this somewhat increases the standby power consumption, but the user gets at least a feedback and can recharge the battery.

4.10.2 Drop below 10 Volt while the Box is on

The box will continue to operate as usual and all function are available. However, the beeper is switched on permanently to signal to the user that the battery is already very far discharged and there is a problem. If the supply voltage decreases even more as result of further operation, the correct function of the relay can no longer be guaranteed because the holding voltage of the relay coil is undershot (see chapter 5.7 on page 22)

 NOTE

A vehicle battery is considered earlier than at 10 volts as "discharged". The threshold of 10 Volt is given by hardware standard and is primarily used to detect the engine start event. The under voltage detection therefore only signals an already discharged battery as an additional function and does not prevent its further discharge.

5 Technical Data





5.1 General Data

5.1.1 Product Labeling



Fig. 5-1 Product Label

The following symbols are used for product labeling:

Symbol	Description
	Prior to operating the product, be sure to read the user's guide!
SN: 1234567	Serial number (seven-digit)
Vx.y.z	Hardware version of the product
F 00K 123 456	Ordering number of the product, see chapter 6.1 on page 23
7 - 16 V	Operating voltage range (DC)
5 A	Current consumption, max.
	Labeling for CE conformity, see chapter 5.3 on page 20
	Labeling for WEEE, see chapter 5.4 on page 20
	Labeling for RoHS (China), see chapter 5.2.2 on page 20

5.1.2 Fulfilled Standards and Norms

The Switch-off Delay Box adheres to the following standards and norms:

Norm	Test
EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements
EN 60 529	Degrees of protection provided by enclosures (IP code)
EN 60 068-2-32	Basic environmental testing procedures; part 2: tests; test Ed: free fall

5.1.3 Environmental Conditions

Temperature range (operation)	-20 °C to +70 °C -4 °F to +158 °F
Temperature range (storage) (box without packaging)	-20 °C to +70 °C -4 °F to +158 °F
Relative humidity (non-condensing)	0 to 85%
Implementation altitude	max. 5000 m/ 16400 ft
Protection class	IP30
Degree of pollution	2

NOTE

The module is suited for use in interiors, in the passenger compartment or in the luggage compartment of vehicles. The module is **not** suited for installation in the engine compartment and similar environments.

5.1.4 Maintenance the Product

Do not open or change the module! Works on the box housing may be executed only by qualified technical personnel. Send defect boxes to ETAS.

5.1.5 Cleaning the Product

We recommend to clean the product with a dry cloth.

5.1.6 Mechanical Data

Dimensions, with fuse (H x W x D)	51 mm x 65 mm x 125 mm 2.0 in x 2.6 in x 4.9 in
Weight (without power supply cable)	Approx. 0.24 kg/ 0.5 lbs

5.2 RoHS Conformity

5.2.1 European Union

The EU Directive 2011/65/EU limits the use of certain dangerous materials for electrical and electronic devices (RoHS conformity).

This product does not contain any of the restricted substances specified in the EU Directive 2011/65/EU or exceeds the maximum concentrations stipulated therein. For individual electronic components used in our products, there are currently no equivalent alternative substances, which is why we make use of the exception 7C-I in Annex III of this Directive.

ETAS confirms that the product corresponds to this directive which is applicable in the European Union.

5.2.2 China

ETAS confirms that the product meets the product-specific applicable guidelines of the China RoHS (Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation) applicable in China with the China RoHS marking affixed to the product or its packaging.

5.3 CE Labeling

ETAS confirms that the product meets the product-specific, applicable European guideline with a CE label on the product or its packaging. CE conformity declaration for the product is available upon request.

5.4 Taking the Product Back and Recycling

The European Union has passed a directive called Waste Electrical and Electronic Equipment, or WEEE for short, to ensure that systems are setup throughout the EU for the collection, treating and recycling of electronic waste.

This ensures that the devices are recycled in a resource-saving way representing no danger to health or the environment.



Fig. 5-2 WEEE Symbol

The WEEE symbol (see Fig. 5-2 on page 20) on the product or its packaging shows that the product must not be disposed of as residual garbage.

The user is obliged to collect the old devices separately and return them to the WEEE take-back system for recycling.

The WEEE directive concerns all ETAS devices but not external cables or batteries.

For more information on the ETAS GmbH Recycling Program, contact the ETAS sales and service locations (see chapter 7 on page 24).

5.5 **Declarable Substances**

European Union

Some products from ETAS GmbH (e.g. modules, boards, cables) use components with substances that are subject to declaration in accordance with the REACH regulation (EU) no.1907/2006.

Detailed information is located in the ETAS download center in the customer information "REACH Declaration" (www.etas.com/Reach). This information is continuously being updated.

5.6 **Use of Open Source Software**

The product uses Open Source Software (OSS). This software is installed in the product at the time of delivery and does not have to be installed or updated by the user. Reference shall be made to the use of the software in order to fulfill OSS licensing terms. Additional information is available in the document "OSS Attributions List" at the ETAS website www.etas.com.

5.7 Electrical Data

5.7.1 Power Supply

Power supply	7.0 to 16.0 V DC	nominal 12.0 V
Current consumption at 12 V	Standby	0.2 mA
	Relay on	ca. 113 mA
Current consumption at 14 V	Standby	0.22 mA
	Relay on	ca. 155 mA
Trigger input (T.15)	7 V to 16 V DC	< 1 mA
Load current	Continuous current	5 A
Switch-on current	Max.	40 A
Protection	Box internal	5 A (SAE J2077, ISO 8820-3 Type F)
	Power supply cable box (supplied)	5A T (IEC 60127-2)
Reverse polarity protection	The device is protected against reverse polarity of the supply voltage.	
Power supply cable	Length	3.0 m

5.7.2 Switch-off Time Delay

Rotary switch position	Switch-off time delay [minutes]
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
0	120

6 Order Information

6.1 Switch-off Delay Box

Order name	Short name	Order number
Switch-off Delay Box	AS_SOD Box	H-00K-027-352

Package content

Switch-off Delay Box,
Power Supply Cable,
List "Content of this Package",
Switch-off Delay Box Safety Advice,
China-RoHS-leaflet_Compact_green_cn

7 ETAS Contact Addresses

ETAS Headquarters

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Germany

Phone: +49 711 3423-0
Fax: +49 711 3423-2106
Internet: www.etas.com

ETAS Subsidiaries and Technical Support

For details of your local sales office as well as your local technical support team and product hotlines, take a look at the ETAS website:

ETAS subsidiaries Internet: www.etas.com/en/contact.php
ETAS technical support Internet: www.etas.com/en/hotlines.php

Figures

Fig. 3-1	Switch-off Delay Box	11
Fig. 3-2	Power Supply Cable	11
Fig. 3-3	Connectors, Control Elements and LEDs	12
Fig. 4-1	Cabling	13
Fig. 4-2	Typical Voltage Curve at Engine Start	16
Fig. 5-1	Product Label	18
Fig. 5-2	WEEE Symbol	20

Index

C	
CE conformity declaration	20
D	
Data	
Mechanical	19
Technical	18
Documentation	7
M	
Mechanical Data	19
N	
Norms	19
O	
Operation	
Conventions	6
Use Case	6
P	
Presentation of information	6
Product	
Exclusion of liability	7
Product Back	20
R	
REACH regulation (EU)	21
Recycling	20
RoHS conformity	
China	20
European Union	20
S	
Safety notices	
basic	7
Identification	5
Safety precautions	7
Scope of supply	6
Standards	19
Standards and Norms	19
T	
Technical Data	18
U	
Use, intended	7
W	
Waste Electrical and Electronic Equipment	20
WEEE	20
WEEE take-back System	20