

**ES430.1 / ES432.1**  
**Lambda modules****SAFETY ADVICE** (English)

**Warning!** It is critical that you read and follow this safety advice, the product description including technical data and the associated technical documentation, which are facilitated on and to be downloaded from ETAS website, <[www.etas.com](http://www.etas.com)> (via Direct Product Access/select Product). Do not use the product if you cannot read and/or understand the Information for safe operation. If you do have questions for safe operation, please contact the ETAS hotline in your region <[www.etas.com/hotlines](http://www.etas.com/hotlines)>.

This ETAS product enables users to control systems which accomplish safety functions (e.g. in automobiles, automobile components and test facilities), to change safety relevant data, or to allocate those for further processing. Hence, the application of this product can be hazardous. Improper use and unskilled application without adequate instruction and experience in handling of such products may cause threats to life and physical conditions as well as damages to property.

Our products have been developed and released exclusively for use in applications defined in the product description.

Fitness and suitability of the products for any intended use beyond the utilization for which the products have been released (e.g. different stresses/strains or technical conditions) need to be verified by the user on own authority by taking appropriate actions and measures (e.g. by means of tests).

- ETAS products made available as **beta versions** of firmware, hardware and software are to be used exclusively in testing and evaluation. These products may have not sufficient technical documentation and not fulfill all requirements regarding quality and accuracy for market released series products. Therefore product performance may differ from the product description and your expectations. The product should be used only in controlled test environments. Do not use data and results from **beta versions** without prior and separate verification and validation and do not pass them to third parties without prior examination.
- Do not use this product if you do not have proper experience and training in using the product.
- To allow proper handling of ETAS products ETAS has released Known Issue Reports (KIR) on its website. Known Issue Reports provide information on known product problems of substantial relevance, including their technical impact, and give instructions on available solutions. Prior to the initial operation of the product you are required to verify whether a KIR is available for the current product version and adhere to available information in the KIR. Known Issue Reports can be found on ETAS website <[www.etas.com/kir](http://www.etas.com/kir)> (Password in KIR area: KETASIR).
- Program code and/or control actions of programs, which have been developed or modified as well as data of any kind, which have been identified by using ETAS products, will need to be verified with respect to reliability, quality and suitability prior to any use or dissemination.
- When using this product with systems which accomplish safety functions (e.g. in automobiles, automobile components and test facilities), that influence system behaviour and can affect the safe operation of the system, you must ensure that the system can be transitioned to a safe condition (e.g. emergency shutdown or emergency operation mode) if a malfunction or hazardous incident should occur.
- All applicable regulations and statutes regarding operation must be strictly followed when using this product.
- Use of this ETAS product or any program code, program control procedures in the public domain (e.g. on public roads) should not occur unless they have been tested and verified as being safe in advance. It is therefore recommended to use the products only in closed and designated test environment.



The User's Guide must be read prior to the startup of the product!

Requirements for users and duties for operators

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

The safety of systems that are using the product is the responsibility of the system integrator.

**ES430.1 / ES432.1**  
**Lambda modules**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.

Intended useRange of application of the product

This product was developed and approved for applications in the automotive area. The module is suitable for use in interiors, in the passenger cell, in the trunk, in the engine compartment or in the exterior area 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's Guide. With any deviating operation, the product safety is no longer ensured.
- Observe the requirements for the ambient conditions.
- 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 61140 (degree of protection III) to the connections of the module.
- Ensure the compliance with the connection and adjustment values (see the information in the chapter "Technical Data").
- Do not apply any voltages to the connections of the module 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.
- Use exclusively lab power supplies with double protection to the supply system (with double insulation / with reinforced insulation (DI/ RI)).
- The lab power supply must be approved for an operating altitude of 5,000 m and for an ambient temperature up to 120 °C.
- For normal operation of the modules as well as for very long standby operation, it is possible that the vehicle battery will be drained.

Connection to the power supply

- The power cord may not be connected directly to the vehicle battery or the lab power supply, but only via a suitable fuse.
- Ensure that the connections of the lab power supply, the power supply at the module 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!

**DANGER!**

Dangerous electrical voltage!

Connect the power cord only with a suitable vehicle battery or with a suitable lab power supply! 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.

**ES430.1 / ES432.1**  
**Lambda modules**Disconnecting from the power supply

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

- Disconnect the module from the lab power supply
  - Disconnecting device is the lab connector of the power cord or
  - Disconnecting device is the connector of the power cord at the connection of the module
- Disconnect the module from the vehicle battery
  - Disconnecting device is the lab connector of the power cord or
  - Disconnecting device is the connector of the power cord at the connection of the module
- Disconnect the vehicle battery.

CABLING

Approved cables:

- Use exclusively ETAS cables at the connections of the module!
- Adhere to the maximum permissible cable lengths!
- Do not use damaged cables! Cables may be repaired only by ETAS!

**CAUTION!**

- Never apply force to insert a plug into a socket. Ensure that there is no contamination in and on the connection, that the plug fits the socket, and that you correctly aligned the plugs with the connection.
- Damage possible to connectors of the modules or the ES4xx\_BRIDGE! Fasten the two modules with screws to the stop inside the module without canting them.

Operate the lambda probes only with the probe connector to be able to obtain valid measurements.  
For detailed information about cabling, see the User's Guide of the module.

**CAUTION!**

Potential equalization in the vehicle is possible via the shield of the connecting cables of the modules!  
Install the modules only at locations with the same electrical potential or isolate the modules from the installation location.

Requirements for the place of installation

- Place the module or the module block on a smooth, even and firm foundation.
- The module or module block must always be securely fastened.

Requirements for the ventilation

- Keep the module away from heat sources and protect it against direct exposure to the sun.
- The free space above and behind the module must be selected so that sufficient air circulation is ensured.

Fixing the module on a carrier system

When selecting the carrier system, observe the static and dynamic forces that could be created by the module or the module block at the carrier system.

**CAUTION!**

Damage or destruction of the module is possible. The modules of series ES400 are approved only for installation and operation at components or locations that ensure compliance with the technical data of the modules, such as:

- the resistance to vibration of the modules (for example, install modules only on spring-loaded bodies, not on wheel suspensions or directly at the motor) and
- temperature resistance of the modules (for example, do not install modules on the motor, turbocharger, exhaust manifold or their environments).

During the installation of the modules, observe the permissible temperature range of the cable ties being used!

Damage of the module and loss of Properties acc. to IP6x!**CAUTION!**

- Standing water at the pressure compensating element (PCE) damages the membrane! Observe the direction of installation for vertical installation of the module!
- Do not open or modify the module housing! Work on the module housing may be performed only by ETAS.

**ES430.1 / ES432.1****Lambda modules**Transport

- Mount and connect the modules only at the location of their startup!
- Do not transport the modules at the cable of the module or at other cables.

Maintenance

The product is maintenance-free.

Repair

If a repair of an ETAS hardware product should become necessary, send the product to ETAS.

Cleaning the module housing

- Use a dry or lightly moistened, soft, lint-free cloth for cleaning the module housing.
- Do not use any sprays, solvents or abrasive cleaners which could damage the housing.
- Ensure that no moisture enters the housing. Never spray cleaning agents directly onto the module.

Identifications on the product

Connection	Meaning	
IN	Daisy-chain in	Input; Ethernet connection to the upstream module or the PC, power supply of the module
OUT	Daisy-chain out	Output; Ethernet connection and power supply of the downstream module
CH	LAMBDA	Connection of lambda probe cable

Notes about specific components

The modules ES430.1 and ES432.1 are universal lambda measurement devices which, together with lambda probes, allow emission measurements for gasoline, diesel and CNG engines.

During the operation at the module, the lambda probe requires a supply voltage for the probe heater. This supply voltage must be provided separately at the probe cable.

**CAUTION!**

Damage to the lambda probe when operating without probe heater! During the operation and as soon as the lambda probe is exposed to the emissions of a combustion process, the heater of the probe must be supplied with current. The regulated heating voltage is supplied at the probe connector if the probe cable is connected with a separate voltage supply and connected to the module, and if the signal for switching on the heater is present at the probe cable.

**CAUTION!**

Risk of burns! The lambda probe is very hot during operation and for some time after its use.

**CAUTION!**

Operate the lambda probe only at modules with current firmware! Before startup, update the firmware of the module with the HSP service software to avoid damages to the lambda probe!

Supported probe types

ES430.1	Robert Bosch LSU 4.9
ES432.1	Robert Bosch LSU 4.9, LSU ADV

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Ambient conditions

Operating temperature range	-40 °C to +120 °C / -40 °F to +248 °F
Storage temperature range (module without packaging)	-40 °C to +125 °C / -40 °F to +257 °F
Relative humidity (non-condensing)	0 to 95%
Operating altitude	max. 5000 m / 16400 ft
Contamination level	2
Degree of protection	IP67

Voltage supply

Operating voltage (dry environment)	Temperature range -40 °C to +85 °C: 5 V to 50 V DC
	Temperature range -40 °C to +120 °C: 6 V to 50 V DC
Operating voltage (humid environment)	Temperature range -40 °C to +85 °C: 5 V to 32 V DC
	Temperature range -40 °C to +120 °C: 6 V to 32 V DC
Power consumption (normal operation, room temperature, without probe heater)	max. 3 W
Reverse-polarity protection, overload protection	with cable CBEP410, CBEP415, CBEP420, CBEP425, CBEP430 or with safety cable CBEP4105, CBEP4155, CBEP4205, CBEP4255, CBEP4305
Fuse of power cord	MINI automotive blade-type fuse, quick-acting, 3 A, 58 V, replaceable
Fuse of power supply of lambda probe cable	Lambda probe cable CBAL410, CBAL451, CBAL452, CBAL463: MINI automotive blade-type fuse, quick-acting, 5 A, 58 V, replaceable
	Lambda probe cable CBAL472: MINI automotive blade-type fuse, quick-acting, 7.5 A, 58 V, replaceable

Mechanical data

Dimensions (H x W x D)	51.5 mm x 40 mm x 142 mm / 37.5 mm x 40 mm x 129 mm
	2.03 in x 1.57 in x 5.59 in / 1.48 in x 1.57 in x 5.08 in
Weight	0.35 kg / 0.77 lb

**Note:**

Some products from ETAS GmbH (e.g. modules, boards, cables) use components with materials that are subject to declaration in accordance with the REACH regulation (EC) no.1907/2006. Detailed information is located in the ETAS download center in the customer information "REACH Declaration" [[www.etas.com/Reach](http://www.etas.com/Reach)]. This information is continuously being updated.

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**Warning!** If you fail to follow this safety advice, there might be a risk of death, serious injury or property damage. The ETAS Group and their representatives shall not be liable for any damage or injury caused by improper use of the product. ETAS provides trainings regarding the proper and intended use of this product.