

CREATING
POWER
SOLUTIONS



IoT-Modul

INSTALLATION & OPERATION

Hatz Digital Solutions

www.hatz.digital

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1 Legal notices

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Original manual

This manual has been translated into multiple languages.

The German version is the **original manual**. All other language versions are **translations** of the **original manual**.

2 General information

2.1 Introduction

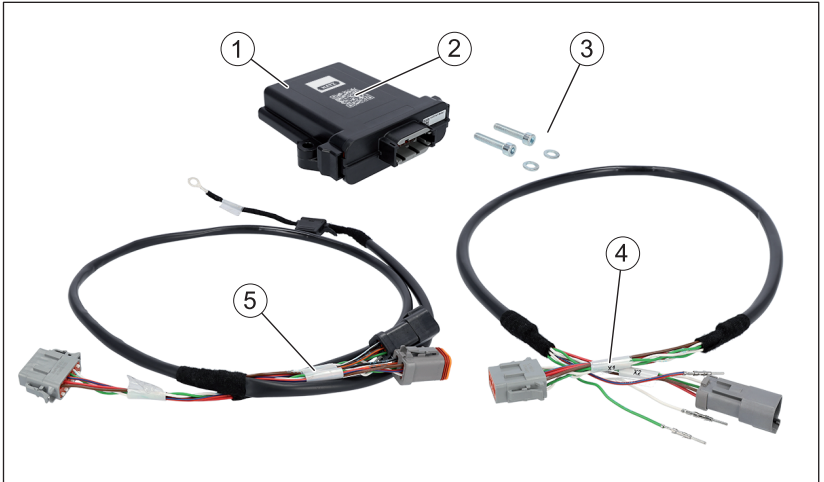
This document describes the function, startup and technical data of the Hatz IoT module. It also contains information on correct handling. Never open the housing of the module without first having received training from authorized persons such as Hatz employees or employees of the Hatz service network. Please familiarize yourself with the contents of this document before using the IoT module.

2.2 Functional description

The Hatz IoT module is a telematic system that communicates with a control unit via CAN. The module is used to read out the engine control unit data via the J1939, KWP2000 and UDS protocols. Data is sent over the mobile phone network to a cloud-based Hatz client for further data processing and analysis by Hatz. The send functionality is activated by Hatz after the contract is signed. For more information, see *4.2.2 Activation, page 15*

It is possible to connect external sensors to the module via vacant pins and to send data measured by the sensor to the Hatz infrastructure via the IoT module. This must be coordinated with Hatz Digital Solutions, as Hatz needs to make software adjustments for this to work.

2.3 Scope of delivery













1	IoT module
2	QR code (the QR code is required to perform the function check and to activate the IoT module.)
3	Fastening screws with washers
4	Wiring harness (version for 3H50 and 4H50)*
5	Wiring harness (version for 1B30E, 1B30VE, 1B50E, 1D90E)*

* The scope of delivery only contains one wiring harness, which depends on the selected engine type.

3 Safety

3.1 General safety instructions

 DANGER	
	<p>Danger to life from inhaling exhaust gases.</p> <p>Toxic engine exhaust gases can lead to loss of consciousness, and even death, in closed-off and poorly ventilated rooms.</p> <ul style="list-style-type: none"> ▪ Never operate the machine in closed-off or poorly ventilated rooms. ▪ Do not breathe in the exhaust gases.
 WARNING	
	<p>Danger of injury from failure to follow the Operating Instructions and from performing unauthorized tasks on the machine.</p> <ul style="list-style-type: none"> ▪ Follow all instructions. ▪ Do not perform activities for which no qualification is available. Contact properly trained personnel if necessary.
 WARNING	
	<p>Danger of injury and danger of incorrect operation due to inadequate personnel qualifications.</p> <ul style="list-style-type: none"> ▪ The personnel must have read and understood this manual or must possess the qualifications necessary for working with this equipment, acquired in training/instructional courses. ▪ Have the IoT module maintained by Hatz service personnel only. ▪ Failure to comply will cause the warranty to become void.

 WARNING	
	<p>Danger of injury or danger of property damage due to incorrect use of batteries.</p> <ul style="list-style-type: none">▪ Do not place tools on the battery.▪ Before performing work on the electrical equipment, always disconnect the negative battery terminal.▪ Never swap the positive (+) and negative (–) battery terminals.▪ It is imperative to prevent short circuits and mass contact of current carrying cables.▪ If faults occur, check the cable connections for good contact.
 CAUTION	
	<p>Danger of burns</p> <p>There is a danger of burns when working on a hot engine.</p> <ul style="list-style-type: none">▪ Switch off the engine and let it cool down.

3.2 Device-specific safety instructions

- The Hatz IoT module may be installed on a machine by qualified personnel only and in accordance with electromagnetic compatibility (EMC) standards and the low-voltage directive.
- Electrical connections may only be established as described in chapter 4.1 *Installation of the IoT module, page 9*.
- In the event of a fault, please contact your nearest HATZ service. For contact data, see chapter Legal notices or www.hatz-diesel.com. Manipulation of the IoT module can lead to serious safety deficiencies and endanger persons and machines. Manipulations of the IoT module are prohibited and will lead to the exclusion of any liability and warranty claims.

4 Installation and startup

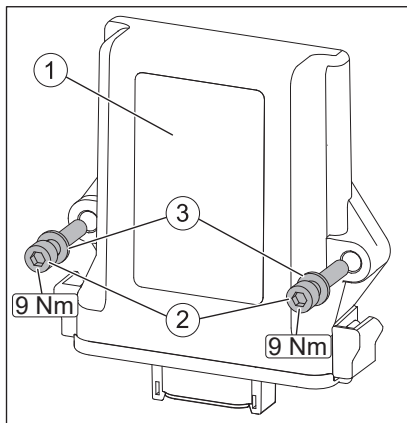
4.1 Installation of the IoT module

4.1.1 Installation location and position

After the IoT module is installed, it must be ensured that:

- No water can enter into the module along the wiring loom. The module must be mounted with the plug facing down.
- The module is not installed in a complete metallic enclosure as this can interfere with reception. We recommend positioning the unit close to slots or grills if installing under a cover.
- Adequate ventilation must be provided since the maximum ambient temperature of 70 °C must not be exceeded.
- The IoT module cannot come into contact with other device components and any additional fastening elements.

Overview



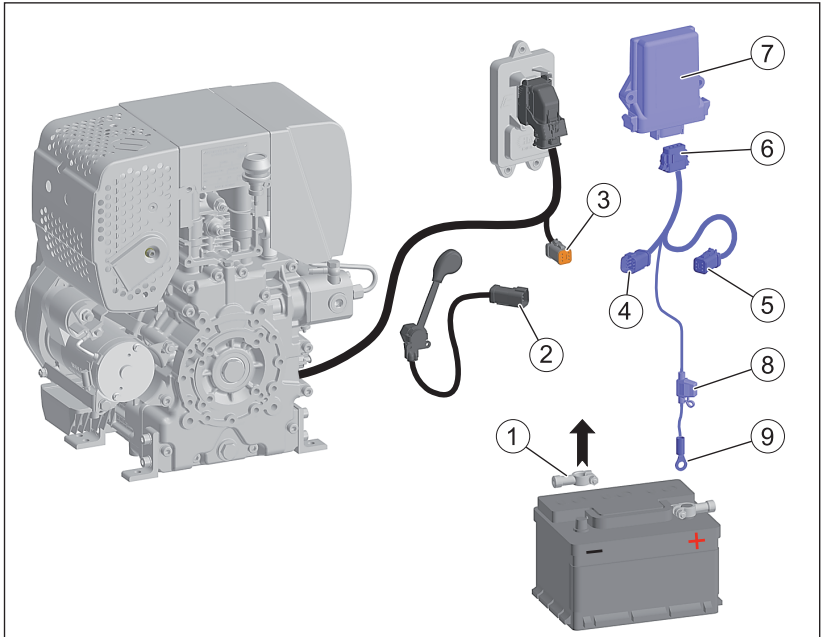
1	IoT module
2	Cylinder head screws M6x30
3	Washers

Procedure

Step	Activity
1	To fasten the IoT module (1), use the supplied cylinder head screws (2) including washers (3). Tightening torque 9 Nm.

4.1.2 Electrical installation of engines 1B30E, 1B30VE, 1B50E, 1D90E

Overview



1	Terminal clamp (negative terminal)
2	CAN plug on CAN speed control (optional)
3	CAN plug on engine wiring harness
4	CAN plug on IoT wiring harness
5	CAN plug for CAN speed control or other CAN devices
6	Central plug for IoT module
7	IoT module
8	Fuse holder
9	Cable lug for connecting to the positive battery terminal

Procedure

Step	Activity
1	Switch off the engine. Turn the starting key to position "0".
2	Release the terminal clamp at the negative terminal (1) and detach it safely from the battery.

Step	Activity
3	If the CAN plug (3) is connected – for example, by a CAN speed control – disconnect the plug connection (2+3).
4	Connect the CAN plugs (3+4).
5	Connect the CAN plugs (2+5). If there is no CAN device, the plug (5) remains vacant.
6	Connect the central plug (6) to the IoT module (7). The plug is properly positioned if a slight "clicking" sound is heard.
7	Connect the cable lug (9) to the positive battery terminal.
8	Ensure that the wiring harness is routed and attached such that the plug connections and the fuse holder are protected against pulling, pushing and vibration forces (strain relief).
9	Connect the terminal clamp to the negative terminal (1) of the battery.

NOTICE



All wiring harnesses and cables must be equipped with strain relief after max. 100 mm at the same vibration level as the plug connection.

NOTICE

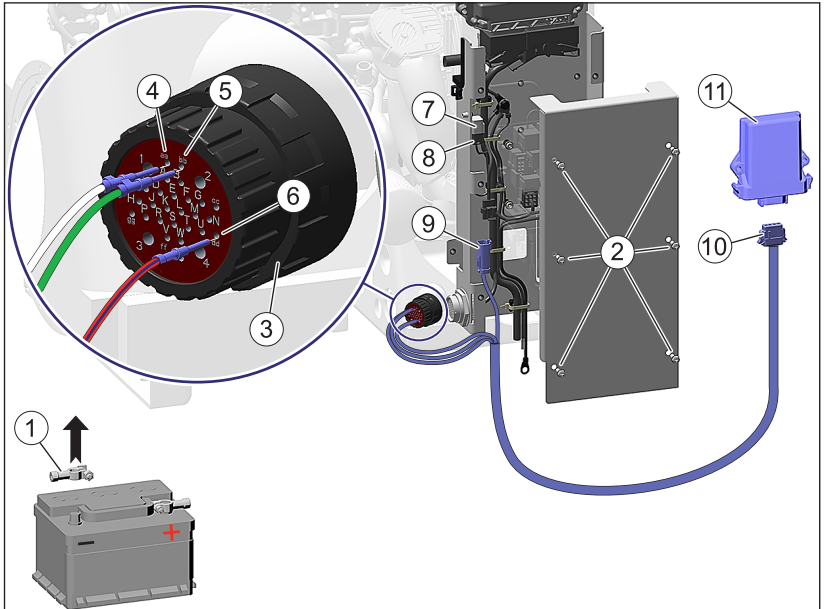


All wiring harnesses must be laid in such a way that their properties are not endangered. Note the following criteria here:

- Protection against external influences, e.g., high temperatures, chemical substances, (spray) water etc.
- Protection against motor vibrations, shocks, direct pressure on cables, sharp edges and thus against mechanical damage to the cables.
- Compliance with permissible bending radii and tensile forces.

4.1.3 Electrical installation of the engines 3H50 and 4H50

Overview



1	Terminal clamp (negative terminal)
2	Fastening screws for covering the central electronics
3	Plug for customer control
4	Plug-in position aa (CAN high – cable color white)
5	Plug-in position bb (CAN low – cable color green)
6	Plug-in position dd (terminal 15 – cable color red-blue)
7	Protective cap for diagnostic plug
8	CAN plug on engine wiring harness (diagnostic plug)
9	CAN plug on IoT wiring harness
10	Central plug for IoT module
11	IoT module

NOTICE

If one or more of the specified slots (4 - 6) is already occupied, alternative slots can be used:

- For slot **aa** alternative slot **P**
- For slot **bb** alternative slot **S**
- For slot **dd** alternative slot **2**

If all of the above slots are already occupied, the IoT module can no longer be connected to the connector (3), as our slots are unsuitable for a two-wire connection.

Please ensure that a position corresponding to the CAN topology position for connecting the IoT module is selected. Take care not to create a star-shaped topology.

Procedure

Step	Activity
1	Switch off the engine. Turn the starting key to position "0".
2	Release the terminal clamp at the negative terminal (1) and detach it safely from the battery.
3	Unscrew the fastening screws (2) and remove the cover from the central electrics.
4	Remove the plug (3).
5	Plug the pins (4, 5, and 6) into the provided plug-in positions; see overview and notice. Pierce the seal and insert the respective pin fully into the plug until it engages.
6	Install the plug (3).
7	Pull the CAN plug (8) out of the protective sleeve (7) and connect it with the CAN plug (9) of the IoT wiring harness.
8	Connect the central plug (10) to the IoT module (11). The plug is properly positioned if a slight "clicking" sound is heard.
9	Ensure that the wiring harness is routed and attached such that the plug connections are protected against pulling, pushing and vibration forces (strain relief).
10	Install the cover of the central electrics.
11	Connect the terminal clamp to the negative battery terminal (1).

NOTICE

All wiring harnesses and cables must be equipped with strain relief after max. 100 mm at the same vibration level as the plug connection.

NOTICE

All wiring harnesses must be laid in such a way that their properties are not endangered. Note the following criteria here:

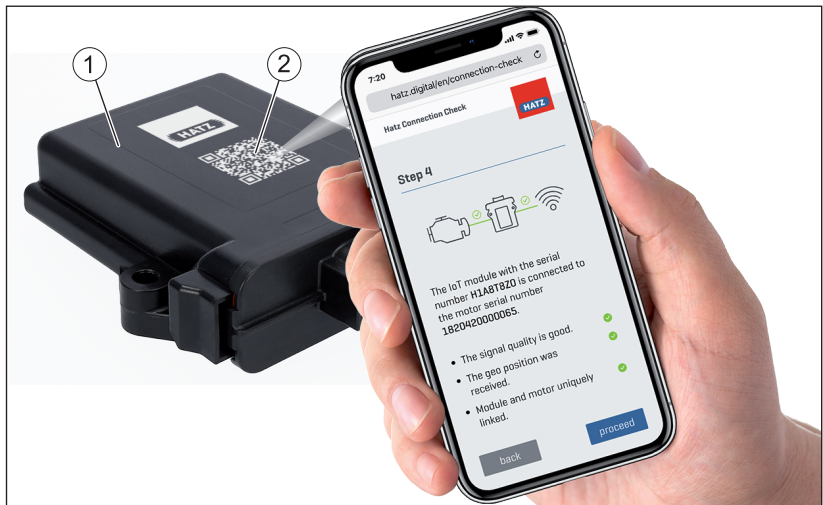
- Protection against external influences, e.g., high temperatures, chemical substances, (spray) water etc.
- Protection against motor vibrations, shocks, direct pressure on cables, sharp edges and thus against mechanical damage to the cables.
- Compliance with permissible bending radii and tensile forces.

4.2 Starting up the IoT module

4.2.1 Function check and module-engine pairing

Before using the IoT module, the module and engine must be uniquely paired via the respective serial numbers. The module-engine pairing is performed by the function check, which can be performed by workshops or by the operator/owner.

Overview



1

IoT module

2	QR code
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Procedure

Step	Activity
1	Scan the QR code on the IoT module with a smartphone.
2	The forwarding link takes you to the browser-based interface, "Hatz Connection Check".
3	To activate the equipment and register, please follow the instructions on the screen.

4.2.2 Activation

The owner/operator of the machine can start up the IoT module only in combination with digital products and services from Hatz Digital Solutions that are subject to a fee.

The IoT module is uniquely paired with the engine by means of the function check including the module-engine pairing. The module cannot be used with multiple engines. When replacing engines, please contact Hatz Service Digital (extension 5056, service.digital@hatz.com) to have the pairing enabled for a fee.

To use the feature, the following must first be accomplished: company registration, user and engine registration, agreement with the Hatz licensing terms, and ordering of a paid software package. When ordering the software package, you will be sent the necessary URLs for these processes by e-mail. Registration is also possible using our website <https://hatz.digital/en/login/>.

Company and user registration

Before being able to use various digital products from Motorenfabrik Hatz, the company and user must be registered at <https://hatz.digital/en/login/user-registration/>.

For the initial registration we need the following information:

- Identification of the customer group (operator/owner, OEM Service network, OEM, Hatz Service network)
- Contact data of the company incl. the VAT ID
- User registration (name, contact data)
- Request regarding the use of digital IoT-based products and services

The engine registration is performed either directly following the user registration or at a later date.

Engine registration

To use the digital products and services, every Hatz engine must be registered individually. The registration can be performed directly after the company and user are registered or after the <https://hatz.digital/en/login/engine-registration/>.

The following information is required:

- Engine serial number
- Type of application, machine manufacturer, machine type, machine serial number
- Date of purchase
- Dealer information (name, address, contact data)

Hatz will validate your information and activate the services you booked within 2 workdays at most.

Digital Solutions Manager

The Digital Solutions Manager serves as a central management and visualization tool for your purchased digital products and services. After company and user registration, it is available on <https://hatz.digital/en/login/> in the login area.

Before using the digital content for the first time and before any software changes, you must actively agree to our terms and conditions when logging in. The terms and conditions can be found here: <https://hatz.digital/en/conditions>

The following content can be managed via the Digital Solutions Manager:

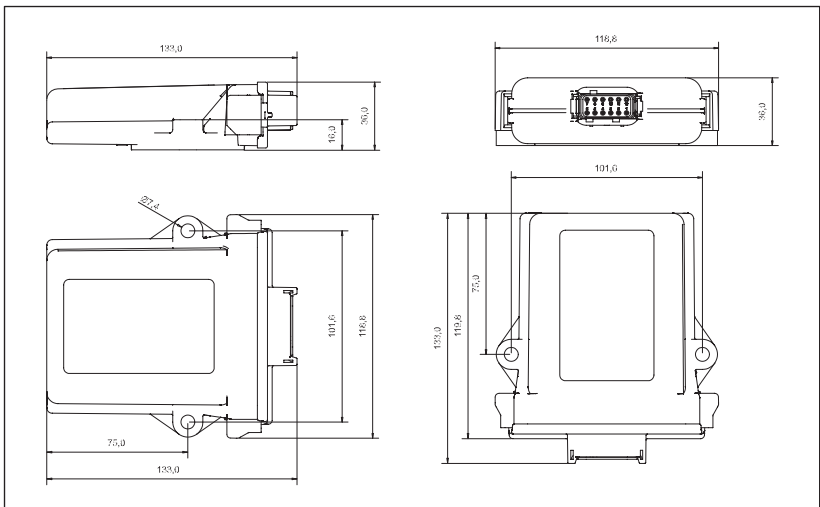
- Access data, master data, user authorizations, notifications
- Overview of registered engines incl. allocation of the ordered digital packages
- View of order status
- View & download options for invoices

5 Technical data

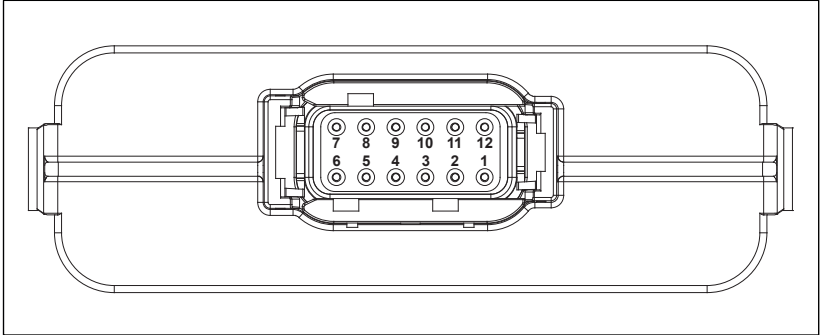
5.1 Module

CPU	32-bit microcontroller
CAN	2x CAN interface (ISO 11898)
Protocols	J1939, KWP2000, UDS
Power supply	Permanent plus and/or lithium-ion battery 18650
Connectivity	LTE-M, 2-G (GSM)
Logging memory	8 GB
Permissible voltage range	6 to 36 volt (DC)
Dimensions	(133 x 119 x 36) mm
Ambient temperature when operating with an internal power supply:	
▪ Charging process	0 to 40 °C
▪ Discharging process	-20 to 70 °C
Cable length for connecting to ECU	1 meter

5.2 Dimensions



5.3 Pin assignment



PIN	Function	Info
1	GND	Weight
2	T30	Permanent plus, 6 ... 36 V, external 3A fuse
3	T15	Switched plus from ignition switch
4	CAN0L	HighSpeed CAN 2.08, customer CAN
5	CAN0H	HighSpeed CAN 2.08, customer CAN
6	DIN1	Optional digital/analog input, high-active
7	DIN2	Optional digital/analog input, high-active
8	DIN3	Not occupied
9	DOUT1	Optional digital output, low-side, 150 mA
10	DOUT2	Optional digital output, low-side, 150 mA
11	CAN1L	HighSpeed CAN 2.08, diagnostic CAN
12	CAN1H	HighSpeed CAN 2.08, diagnostic CAN

6 Declaration of conformity



EU - Declaration of Conformity



Manufacturer Motorenfabrik Hatz GmbH & Co.KG
Ernst-Hatz-Straße 16
94099 Ruhstorf a. d. Rott
Germany

Product name **HATZ IoT-Modul**
Model designation **v2.6**
Continuous serial number: **XXXX0001**

The subject of the declaration described above complies with the relevant Union harmonization legislation:

2014/35/EU Low Voltage Directive (LVD)
2014/30/EU EMC Directive (EMC)

Indication of the relevant harmonized standards used or indication of the other technical specifications in relation to which conformity is declared:

LVD: EN 60204-1:2018
EMC: EN 62368-1:2014+A11:2017

Person authorized to compile the technical documentation:

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Ruhstorf, 6. April 2023

CTO Dr. Thierfelder

This declaration applies only to the product in the condition in which it was put on the market; parts and/or interventions subsequently fitted by the end user and/or modifications made to the machinery are not covered by this declaration. The sole responsibility for issuing this declaration of conformity lies with the manufacturer.

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