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(54) METHOD, DIAGNOSTIC SYSTEM AND CONFIGURATION SYSTEM FOR OPERATING A DEVICE FOR REQUESTING DIAGNOSTIC DATA OF A VEHICLE AND A COMMUNICATION DEVICE

Verfahren, Diagnosesystem und Konfigurationssystem zum Betrieb einer Vorrichtung zur Anforderung von Diagnosedaten eines Fahrzeugs und eine Kommunikationsvorrichtung

Procédé, système de diagnostic et système de configuration de fonctionnement d'un dispositif pour demander des données de diagnostic de véhicule et dispositif de communication

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Description

[0001] The invention relates to a method for operating a device for requesting diagnostic data of a vehicle and a configuration system for operating a device for requesting diagnostic data of a vehicle, a communication device and a communication server.

[0002] Today devices for requesting diagnostic data of a vehicle often communicate via a standardized connection with the vehicle, as, for example, defined by ISO15031. However, via such a standardized connection only little data can be requested, as, for example, emission related data.

[0003] US 2009/276115 A1 discloses a method of diagnosing a vehicle having an onboard computer. The onboard computer is configured to transmit a vehicle identification number in response to receipt of an identification request. This document discloses the preamble of independent claim 1.

[0004] US 2004/227523 A1 discloses a device for retrieving diagnostic information from a vehicle diagnostic system. The device comprises a cellular phone and an adaptor for connecting the cellular phone to the vehicle diagnostic system.

[0005] US 2014/195099 A1 discloses a system for providing vehicle specific diagnostics for a vehicle using a smart phone. The system comprises a vehicle decoder, a diagnostic database and a computer readable medium downloadable onto the smart phone.

[0006] US 2013/317694 A1 discloses a method comprising receiving, at a computing device, vehicle information comprising identification information of a vehicle and information describing condition of the vehicle, the method further comprising matching, by the computing device, the vehicle information to content of a vehicle repair database so as to identify repair information relating to the vehicle.

[0007] The object of the invention is to provide a method and a system for operating versatilely a device for requesting diagnostic data of a vehicle and a communication device.

[0008] This object is achieved by the features of the independent claims. An advantageous embodiment of the invention is given in the sub-claim.

[0009] The invention is distinguished according to a first aspect by a method for operating a device for requesting diagnostic data of a vehicle and a communication device according to claim 1.

[0010] Identification data is requested from the vehicle by the device. In response to receiving the identification data from the vehicle, the identification data is sent to a communication device. In response to receiving the identification data by the communication device configuration data for a vehicle or manufacture specific communication is requested from a configuration server depending on the identification data by the communication device. In response to receiving the configuration data by the communication device, the configuration data is sent to the device. In response to receiving the configuration data by the device, the configuration data is stored in the device for requesting diagnostic data of the vehicle by use of the configuration data for the vehicle or manufacture specific communication.

[0011] If the identification data which is requested from the vehicle is not sufficient, additional data for identification can be requested from a web server and/or from the communication device, wherein this additional request may be manually initiated.

[0012] By storing the configuration data not only a standardized connection with the vehicle, as, for example, defined by ISO15031, is possible, but also a non-standardized vehicle or manufacture specific communication. Thus, many different diagnostic data can be requested, as for example, information about a variable service and/or information about a given sensor of the vehicle.

[0013] The identification data comprises a vehicle identification number and the configuration data is requested from the configuration server depending on the vehicle identification number.

[0014] By use of the vehicle identification number a very easy determination of the configuration data is possible.

[0015] The configuration data for the vehicle or manufacture specific communication is requested from the configuration server depending on a vehicle identification number by requesting control unit detection data from the configuration server depending on the vehicle identification number by the communication device. Further, in response to receiving the control unit detection data by the communication device the control unit detection data is sent to the device. In response to receiving the control unit detection data by the device at least one control unit of the vehicle is identified by use of the control unit detection data and an information about the at least one control unit is sent to the communication device. In response to receiving the information about the at least one control unit by the communication device the configuration data for the vehicle or manufacture specific communication is requested depending on the information about the at least one control unit.

[0016] By use of the control unit detection data it can be very exactly determined which diagnostic data can be requested from the vehicle.

[0017] According to an embodiment, in response to receiving a request for requesting diagnostic data by the device the diagnostic data of the vehicle is requested by the device by use of a given protocol for the vehicle or manufacture specific communication which is given by the configuration data. In response to receiving the diagnostic data by the device the diagnostic data is sent by the device by use of a given universal protocol to the communication device, wherein

the given universal protocol is different from the protocol for the vehicle or manufacture specific communication.

[0018] The vehicle or manufacture specific communication is often not very efficient. By the given universal protocol a much more efficient communication between the device and the communication device is possible, especially for a wireless communication. For example, for the vehicle or manufacture specific communication above 200 bytes can be necessary to send given requested diagnostic data, wherein only about 40 bytes are necessary by use of the given universal protocol.

[0019] According to the invention, a start of a cranking phase of the vehicle is determined by the device. A transient minimum voltage in the cranking phase is determined by the device. The determined transient minimum voltage is compared by the device with a given limit minimum voltage which is given by the configuration data.

[0020] Normally a determination of a battery status by use of control units is not possible because of the low sampling rate of the control units, but the device can be used for a determination of the battery status. For these measurements the device is, for example, directly connected with a battery supply voltage pin of the vehicle.

[0021] According to the invention, the device is configured to determine a start of a cranking phase of the vehicle,

- the device is further configured to determine a transient minimum voltage in the cranking phase,
- the device is further configured to compare the determined transient minimum voltage with a given limit minimum voltage which is given by the configuration data, wherein dependent on the comparison the battery status to predict pending failure or insufficient capacity to start the vehicle is determined by the device and/or the communication device.

[0022] Hereby a very exact determination of the battery status is possible.

[0023] According to a further aspect the invention is distinguished by a configuration system, wherein the configuration system comprises the device, the communication device and the configuration server comprising the configuration data for vehicle or manufacture specific communication, being configured to execute the method according to the first aspect or the advantageous embodiment of the method according to the first aspect.

[0024] Exemplary embodiments of the invention are explained in the following with the aid of schematic drawings.

[0025] These are as follows:

Figure 1 a network comprising a diagnostic system;

Figure 2 a diagram of a battery voltage;

Figure 3 a first flowchart for operating the diagnostic system;

Figure 4 a second flowchart for operating the diagnostic system, which does not form part of the invention;

Figure 5 a third flowchart for operating the diagnostic system, which does not form part of the invention; and

Figure 6 a fourth flowchart for operating the diagnostic system, which does not form part of the invention.

[0026] Figure 1 shows a network. The network comprises a diagnostic system 1. The diagnostic system 1 comprises a device 3 for requesting diagnostic data of a vehicle 10 and a communication device 5. The device 3 is, for example, built in a dongle. The communication device 5 is, for example, built in a smartphone, laptop, PC and/or telematics device.

[0027] The device 3 can, for example, be plugged into an onboard diagnostic, OBD, plug of the vehicle 10 to communicate with control units of the vehicle 10.

[0028] The device 3 is further configured to communicate with the communication device 5, for example via a wireless communication as, for example, Bluetooth.

[0029] The communication device 5 is configured to communicate with the device 3, for example, via a wireless communication as, for example, Bluetooth. The communication device 5 is configured to communicate with a configuration server 30 and/or with a customer server 40, for example, via internet 20.

[0030] The configuration server 30 is configured to communicate with the communication device 5, for example, via internet 20. The configuration server 30 is further configured to communicate with a diagnostic database 35.

[0031] Figure 2 shows a diagram of a measured battery voltage, which can be measured by the device 3. For this, the device 3 is configured to determine a start of a cranking phase of the vehicle 10. The device 3 is further configured to determine a transient minimum voltage V1 in the cranking phase. The device 3 is further configured to compare the determined transient minimum voltage V1 with a given limit minimum voltage which is given by a configuration data, which will be later described. Dependent on the comparison a battery status to predict pending failure or insufficient capacity to start the vehicle 10 is determined by the device 3 and/or the communication device 5.

[0032] Additionally the device 3 can be configured to determine an initial voltage V2 of a sustained cranking period of the cranking phase. The device 3 is, for example, further configured to determine an end voltage V3 of the sustained cranking period of the cranking phase. The device 3 is, for example, further configured to compare the determined initial voltage V2 and the determined end voltage V3 with a given limit initial voltage and a given limit end voltage which are given by the configuration data. Dependent on the comparisons a battery status to predict pending failure or insufficient capacity to start the vehicle 10 can be determined, for example, by the device 3 and/or the communication device 5.

[0033] Figure 3 shows a first flowchart of a first program for operating the diagnostic system 1 for receiving the configuration data. The configuration data are used for a vehicle or manufacture specific communication of the device 3 with the vehicle 10. The configuration data are additionally used for the above explained determination of the battery status.

[0034] The first program can be executed distributed on the device 3, the communication device 5 and the configuration server 30.

[0035] In a step S1 the program is started and, for example, variables are initialized.

[0036] In a step S3 identification data is requested from the device 3 by the communication device 5. The identification data comprises for example a vehicle identification number.

[0037] In a step S5 the identification data is requested from the vehicle 10 by the device 3.

[0038] In a step S7 the identification data is checked by the device 3. If the identification data is not correct the program is continued in a step S9. If the identification data is correct the program is continued in a step S11.

[0039] In the step S9 the identification data is requested from the vehicle 10 by use of a user input.

[0040] In the step S11 the identification data is sent from the communication device 5 to the configuration server 30.

[0041] In the step S13 the identification data is decoded by the configuration server 30.

[0042] In the step S15 a control unit detection data package is created by the configuration server 30 depending on the identification data by use of the diagnostic database 35 and the control unit detection data package is sent to the communication device 5. The control unit detection data package can comprise control unit detection data for one control unit or for more than one control unit. The control unit detection data package is, for example, encrypted, for example, by use of AES256.

[0043] In the step S17 in response to receiving the control unit detection data package by the communication device 5 control unit detection data is send to the device 3 for identifying at least one control unit of the vehicle 10 by use of the control unit detection data.

[0044] In the step S19 in response to receiving the control unit detection data by the device 3 at least one control unit of the vehicle 10 by use of the control unit detection data is identified and an information about the at least one control unit is sent to the communication device 5.

[0045] In the step S21 it is checked by the communication device 5 control unit detection data package comprises further control unit detection data. If the control unit detection data package comprises further control unit detection data the program is continued in the step S19 and further control unit detection data is sent to the device 3, if not the program is continued in a step S23.

[0046] In the step S23 it is checked by the communication device 5 if at least one control unit was identified. If at least one control unit was identified the information about the at least one control unit is sent to the configuration server 30 and the program is continued in a step S27, if no control unit was identified the program is continued in a step S25.

[0047] In the step S25 the program is stopped and can, for example, be restarted in the step S1.

[0048] In the step S27 configuration data for a vehicle or manufacture specific communication is requested by the communication device 5 from the configuration server 30 depending on the information about the at least one control unit, for example, by use of a web server. The web server, for example, comprises a token-system for security.

[0049] In a step S29 the configuration data is built by the configuration server 30, in particular by the web server and the configuration data is sent to the communication device 5.

[0050] In a step S31 in response to receiving the configuration data by the communication device 5, the configuration data is sent to the device 3.

[0051] In a step S33 the configuration data is stored and/or loaded into the device 3 for requesting diagnostic data of the vehicle 10 by use of the configuration data for the vehicle or manufacture specific communication.

[0052] In the step S35 the program is stopped and can, for example, be restarted in the step S1.

[0053] Figure 4 shows a second flowchart of a second program for determining a list of diagnostic data which can be requested from the vehicle 10. The second program is, for example, started at vehicle logon.

[0054] The second program can be executed distributed on the device 3, the communication device 5 and the configuration server 30.

[0055] In a step S40 the program is started, for example, after the first program was stopped and, for example, variables are initialized.

[0056] In an optional step S41 a security authentication is done by the communication device 5.

[0057] In an optional step S43 a security authentication is done by the device 3.

[0058] In a step S44 a request is sent from the communication device 5 to the device 3 for getting a list of supported diagnostic data which also can be called supported live readings.

[0059] In a step S45 a vehicle or manufacture specific communication is started by the device 3 with control units for which the configuration data was stored. Optionally a standardized communication with other and/or the same control units is started by the device 3.

[0060] In a step S47 a list of all supported live readings is built by the device 3, for example, by interrogating all control units and attempting all live data commands which are given to the device 3 by a diagnostic package. The list is, for example, separated in a part for diagnostic data which can be requested by a vehicle or manufacture specific communication and diagnostic data which can be requested by a standardized communication, as, for example, defined by ISO15031. The diagnostic data which can be requested by a standardized communication can also be called Level 1 diagnostics. The diagnostic data which can be requested by a vehicle or manufacture specific communication can also be called Level 2 diagnostics.

[0061] In a step S49 the list is sent to the communication device 5.

[0062] In a step S51 the list is, for example, displayed and or logged by the communication device 5 and the program is stopped. An example list is shown in the table 1.

Table 1: list of all supported live readings

Live reading	Level 2 supported	Level 1 supported
Engine Speed	YES control unit 1	YES
Vehicle Speed	YES control unit 1	YES
Coolant Temp	YES control unit 1	YES
Intake Air Temperature	YES control unit 1	YES
Mass Air Flow	NO	NO
Absolute Throttle Position	NO	NO
Odometer	YES control unit 3	N/A
Brake Pedal	YES control unit 2	N/A
Fuel Level	NO	NO
Distance till service	YES control unit 3	N/A

[0063] Figure 5 shows a simplified flowchart of the second program.

[0064] In a step S60 the request is sent from the communication device 5 to the device 3 for getting the list of supported live readings.

[0065] In a step S61 the list of all supported live readings is built by the device 3, for example, by interrogating all control units and attempting all live data commands which are given to the device 3 by a diagnostic package.

[0066] In a step S63 the list is sent to the communication device 5.

[0067] In a step S65 the list is stored in the communication device 5 and the program is stopped.

[0068] Figure 6 shows a flowchart of a third program to get diagnostic data.

[0069] In a step S100 the program is started and, for example, variables are initialized.

[0070] In a step S101 a request for requesting diagnostic data is sent by the communication device 5 to the device 3.

[0071] In a step S103 the list of all supported live readings is provided by the device 3 which was built for example in the step S61 and/or S47.

[0072] In a step S105 it is checked by the device 3 if the requested diagnostic data is supported by use of the list. If the requested diagnostic data is not supported the program is continued in a step S160. If the requested diagnostic data is supported the program is continued in a step S107.

[0073] In a step S107 it is checked by the device 3 if the configuration data is needed or if the requested diagnostic data can be requested by use of a given standardized protocol. If the configuration data is needed the program is continued in a step S120. If the configuration data is not needed the program is continued in a step S109.

[0074] In a step S109 the diagnostic data is requested by the device 3 from the vehicle 10 by use of a given standardized protocol.

[0075] In a step S111 the request for diagnostic data is received by the vehicle 10.

[0076] In a step S113 the diagnostic data is sent back to the device 3 from the vehicle 10.

[0077] In a step S115 the diagnostic data is received by the device 3 and the diagnostic data is decoded and the

program is continued in a step S150.

[0078] In the step S120 the required configuration data is loaded for a vehicle or manufacture specific communication, in particular, for the use of a given protocol for the vehicle or manufacture specific communication which is given by the configuration data.

[0079] In a step S123 a wakeup/start command is sent by the device 3 to the control unit from which the diagnostic data is requested.

[0080] In a step S125 a wakeup sequence is started in the control unit.

[0081] In a step S127 the wakeup sequence is finished in the control unit.

[0082] In a step S129 a diagnostic data request for the requested diagnostic data is loaded by the device 3 by use of the configuration data.

[0083] In a step S131 the diagnostic data request is sent by the device 3 to the control unit.

[0084] In a step S133 the control unit receives the diagnostic data request.

[0085] In a step S135 the requested diagnostic data is sent by the control unit to the device 3.

[0086] In a step S137 a request is sent by the device 3 for stopping the communication with the control unit to the control unit.

[0087] In a step S139 the communication is stopped by the control unit.

[0088] In a step S141 a stop acknowledgment is sent by the control unit to the device 3 and the program is continued in the step S150.

[0089] In the step S150 the diagnostic data is stored by the device 3.

[0090] In a step S160 it is checked by the device 3 if further diagnostic data is requested. If further diagnostic data is requested the program is continued in the step S103. If no further diagnostic data is requested the program is continued in a step S161.

[0091] In the step S161 the diagnostic data is sent by the device 3 to the communication device 5, in particular by use of a given universal protocol, wherein the given universal protocol is different from the protocol for the vehicle or manufacture specific communication.

[0092] In a step S163 the diagnostic data is displayed by the communication device 5 and/or stored in the communication device 5.

[0093] In a step S170 it is checked by the device 3 if the diagnostic data is to be requested again, for example, in a given interval. If the diagnostic data is to be requested again, the program is continued in the step S103. If the diagnostic data is not to be requested again, the program is continued in a step S173.

[0094] In the step S173 the program is stopped and can, for example, be restarted in the step S1.

[0095] By storing the configuration data not only a standardized connection with the vehicle 10, as, for example, defined by ISO15031, is possible, but also a non-standardized vehicle or manufacture specific communication. Thus, many different diagnostic data can be requested, as, for example, information about a variable service and/or information about a given sensor of the vehicle 10. Further, the battery status can be determined.

Claims

1. Method for operating a device (3) for requesting diagnostic data of a vehicle (10) and a communication device (5), wherein

   - identification data is requested from the vehicle (10) by the device (3),
   - in response to receiving the identification data from the vehicle (10), the identification data is sent to the communication device (5),
   - in response to receiving the identification data by the communication device (5), configuration data for a vehicle or manufacture specific communication is requested from a configuration server (30) depending on the identification data by the communication device (5),
   - in response to receiving the configuration data by the communication device (5), the configuration data is sent to the device (3),
   - in response to receiving the configuration data by the device (3), the configuration data is stored in the device (3) for requesting diagnostic data of the vehicle (10) by use of the configuration data for the vehicle or manufacture specific communication,

   wherein the identification data comprises a vehicle identification number and the configuration data is requested from the configuration server (30) depending on the vehicle identification number, **characterized in that** the configuration data for the vehicle or manufacture specific communication is requested from the configuration server (30) depending on the vehicle identification number by

- requesting control unit detection data from the configuration server (30) depending on the vehicle identification number by the communication device (5),
- in response to receiving the control unit detection data by the communication device (5) sending the control unit detection data to the device (3),
- in response to receiving the control unit detection data by the device (3) identifying at least one control unit of the vehicle (10) by use of the control unit detection data and sending an information about the at least one control unit to the communication device (5),
- in response to receiving the information about the at least one control unit by the communication device (5) requesting the configuration data for the vehicle or manufacture specific communication depending on the information about the at least one control unit and

wherein the configuration data is used for determination of a battery status, wherein

- the device (3) is configured to determine a start of a cranking phase of the vehicle (10),
- the device (3) is further configured to determine a transient minimum voltage (V1) in the cranking phase,
- the device (3) is further configured to compare the determined transient minimum voltage (V1) with a given limit minimum voltage which is given by the configuration data,

wherein dependent on the comparison the battery status to predict pending failure or insufficient capacity to start the vehicle (10) is determined by the device (3) and/or the communication device (5).

2. Method according to claim 1, wherein

- in response to receiving a request for requesting diagnostic data by the device (3) the diagnostic data of the vehicle (10) is requested by the device (3) by use of a given protocol for the vehicle or manufacture specific communication which is given by the configuration data and
- in response to receiving the diagnostic data by the device (3) the diagnostic data is sent by the device (3) by use of a given universal protocol to the communication device (5), wherein the given universal protocol is different from the protocol for the vehicle or manufacture specific communication.

3. Configuration system, wherein the configuration system comprises a device (3), a communication device (5) and a configuration server (30) comprising configuration data for a vehicle or manufacture specific communication, being configured to execute the method according to anyone of the claims 1 or 2.

Patentansprüche

1. Verfahren zum Betreiben einer Vorrichtung (3) zur Anforderung von Diagnosedaten eines Fahrzeugs (10) und Kommunikationsvorrichtung (5), wobei

- Identifikationsdaten vom Fahrzeug (10) durch die Vorrichtung (3) angefordert werden,
- als Reaktion auf den Empfang der Identifikationsdaten vom Fahrzeug (10) die Identifikationsdaten an die Kommunikationsvorrichtung (5) gesendet werden,
- als Reaktion auf den Empfang der Identifikationsdaten durch die Kommunikationsvorrichtung (5) Konfigurationsdaten für eine fahrzeug- oder herstellerspezifische Kommunikation von einem Konfigurationsserver (30) in Abhängigkeit von den Identifikationsdaten durch die Kommunikationsvorrichtung (5) angefordert werden,
- als Reaktion auf den Empfang der Konfigurationsdaten durch die Kommunikationsvorrichtung (5) die Konfigurationsdaten an die Vorrichtung (3) gesendet werden,
- als Reaktion auf den Empfang der Konfigurationsdaten durch die Vorrichtung (3) die Konfigurationsdaten in der Vorrichtung (3) gespeichert werden, um Diagnosedaten des Fahrzeugs (10) anzufordern, indem die Konfigurationsdaten für die fahrzeug- oder herstellerspezifische Kommunikation verwendet werden,

wobei die Identifikationsdaten eine Fahrzeugidentifikationsnummer umfassen und die Konfigurationsdaten vom Konfigurationsserver (30) angefordert werden, in Abhängigkeit von der Fahrzeugidentifikationsnummer, **dadurch gekennzeichnet, dass**

die Konfigurationsdaten für die fahrzeug- oder herstellerspezifische Kommunikation vom Konfigurationsserver (30) angefordert werden, in Abhängigkeit von der Fahrzeugidentifikationsnummer, indem

- Steuereinheit-Erkennungsdaten vom Konfigurationsserver (30) in Abhängigkeit von der Fahrzeugidenti-

fikationsnummer durch die Kommunikationsvorrichtung (5) angefordert werden,
- als Reaktion auf den Empfang der Steuereinheit-Erkennungsdaten durch die Kommunikationsvorrichtung (5) die Steuereinheit-Erkennungsdaten an die Vorrichtung (3) gesendet werden,
- als Reaktion auf den Empfang der Steuereinheit-Erkennungsdaten durch die Vorrichtung (3) die mindestens eine Steuereinheit des Fahrzeugs (10) unter Verwendung der Steuereinheit-Erkennungsdaten identifiziert wird und eine Information über die mindestens eine Steuereinheit an die Kommunikationsvorrichtung (5) gesendet wird,
- als Reaktion auf den Empfang der Information über die mindestens eine Steuereinheit durch die Kommunikationsvorrichtung (5) die Konfigurationsdaten für die fahrzeug- oder herstellerspezifische Kommunikation anfordert werden, in Abhängigkeit von den Informationen über die mindestens eine Steuereinheit, und wobei die Konfigurationsdaten zur Bestimmung eines Batteriestatus verwendet werden, wobei
- die Vorrichtung (3) dafür ausgelegt ist, den Beginn einer Anlassphase des Fahrzeugs (10) zu bestimmen,
- die Vorrichtung (3) ferner dafür ausgelegt ist, eine transiente Mindestspannung (V1) in der Anlassphase zu bestimmen,
- die Vorrichtung (3) ferner dafür ausgelegt ist, die bestimmte transiente Mindestspannung (V1) mit einem vorgegebenen Mindestspannungs-Grenzwert zu vergleichen, der durch die Konfigurationsdaten vorgegeben ist,

wobei abhängig vom Vergleich der Batteriestatus zum Vorhersagen eines bevorstehenden Ausfalls oder einer unzureichenden Kapazität zum Starten des Fahrzeugs (10) durch die Vorrichtung (3) und/oder die Kommunikationsvorrichtung (5) bestimmt wird.

2. Verfahren gemäß Anspruch 1, wobei

- als Reaktion auf den Empfang einer Anforderung zum Anfordern von Diagnosedaten durch die Vorrichtung (3) die Diagnosedaten des Fahrzeugs (10) durch die Vorrichtung (3) unter Verwendung eines vorgegebenen Protokolls für die fahrzeug- oder herstellerspezifische Kommunikation, das durch die Konfigurationsdaten vorgegeben ist, angefordert werden, und
- als Reaktion auf den Empfang der Diagnosedaten durch die Vorrichtung (3) die Diagnosedaten durch die Vorrichtung (3) unter Verwendung eines vorgegebenen universellen Protokolls an die Kommunikationsvorrichtung (5) gesendet werden, wobei das vorgegebene universelle Protokoll von dem Protokoll für die fahrzeug- oder herstellerspezifische Kommunikation verschieden ist.

3. Konfigurationssystem, wobei das Konfigurationssystem eine Vorrichtung (3), eine Kommunikationsvorrichtung (5) und einen Konfigurationsserver (30), der Konfigurationsdaten für eine fahrzeug- oder herstellerspezifische Kommunikation umfasst, umfasst und dafür ausgelegt ist, das Verfahren gemäß einem der Ansprüche 1 oder 2 auszuführen.

Revendications

1. Procédé de fonctionnement d'un dispositif (3) de demande de données de diagnostic d'un véhicule (10) et d'un dispositif de communication (5), dans lequel :

- le dispositif (3) demande des données d'identification au véhicule (10),
- en réponse à la réception des données d'identification depuis le véhicule (10), les données d'identification sont envoyées au dispositif de communication (5),
- en réponse à la réception des données d'identification par le dispositif de communication (5), les données de configuration pour une communication spécifique au véhicule ou à la fabrication sont demandées à un serveur de configuration (30) en fonction des données d'identification par le dispositif de communication (5),
- en réponse à la réception des données de configuration par le dispositif de communication (5), les données de configuration sont envoyées au dispositif (3),
- en réponse à la réception des données de configuration par le dispositif (3), les données de configuration sont stockées dans le dispositif (3) pour demander des données de diagnostic du véhicule (10) à l'aide des données de configuration pour la communication spécifique au véhicule ou à la fabrication,

où les données d'identification comprennent un numéro d'identification du véhicule et les données de configuration sont demandées au serveur de configuration (30) en fonction du numéro d'identification du véhicule, **caractérisé**

en ce que :

les données de configuration pour la communication spécifique au véhicule ou à la fabrication sont demandées au serveur de configuration (30) en fonction du numéro d'identification du véhicule :

- en demandant au serveur de configuration (30) des données de détection de l'unité de commande en fonction du numéro d'identification du véhicule, par le dispositif de communication (5),
- en réponse à la réception des données de détection de l'unité de commande par le dispositif de communication (5), en envoyant les données de détection de l'unité de commande au dispositif (3),
- en réponse à la réception des données de détection de l'unité de commande par le dispositif (3), en identifiant au moins une unité de commande du véhicule (10) en utilisant les données de détection de l'unité de commande et en envoyant une information sur l'au moins une unité de commande au dispositif de communication (5),
- en réponse à la réception par le dispositif de communication (5) des informations relatives à l'au moins une unité de commande, en demandant les données de configuration pour la communication spécifique au véhicule ou à la fabrication en fonction des informations relatives à l'au moins une unité de commande, et

où les données de configuration sont utilisées pour déterminer l'état de la batterie, où :

- le dispositif (3) est configuré pour déterminer le début d'une phase de démarrage du véhicule (10),
- le dispositif (3) est en outre configuré pour déterminer une tension minimale transitoire (V1) dans la phase de démarrage,
- le dispositif (3) est en outre configuré pour comparer la tension minimale transitoire déterminée (V1) à une tension minimale limite donnée qui est donnée par les données de configuration,

où, en fonction de la comparaison, l'état de la batterie afin de prévoir une défaillance imminente ou une capacité insuffisante pour démarrer le véhicule (10) est déterminé par le dispositif (3) et/ou le dispositif de communication (5).

2. Procédé selon la revendication 1, dans lequel :

- en réponse à la réception d'une demande de données de diagnostic par le dispositif (3), les données de diagnostic du véhicule (10) sont demandées par le dispositif (3) au moyen d'un protocole donné pour la communication spécifique au véhicule ou à la fabrication, qui est donné par les données de configuration, et
- en réponse à la réception des données de diagnostic par le dispositif (3), les données de diagnostic sont envoyées par le dispositif (3) au moyen d'un protocole universel donné au dispositif de communication (5), le protocole universel donné étant différent du protocole pour la communication spécifique au véhicule ou à la fabrication.

3. Système de configuration, où le système de configuration comprend un dispositif (3), un dispositif de communication (5) et un serveur de configuration (30) comprenant des données de configuration pour une communication spécifique au véhicule ou à la fabrication, étant configuré pour exécuter le procédé selon l'une quelconque des revendications 1 ou 2.

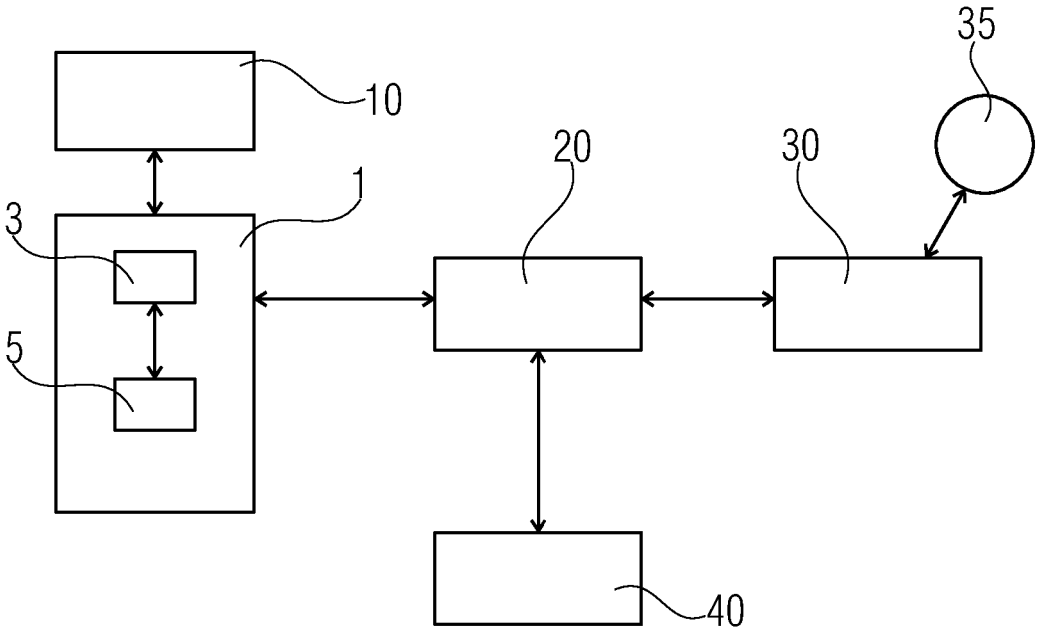

FIG 1

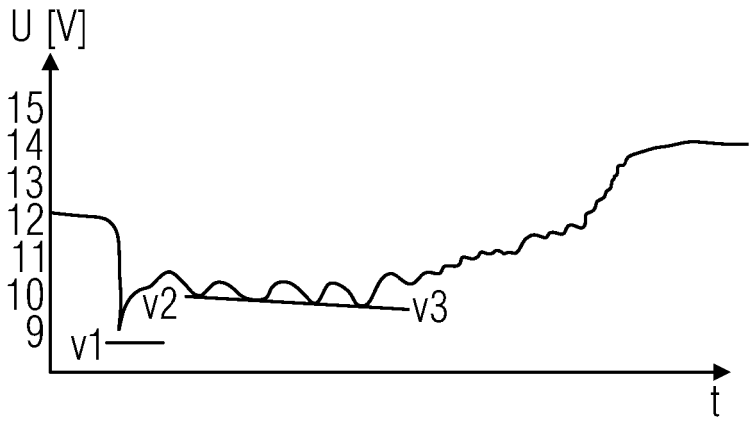

FIG 2

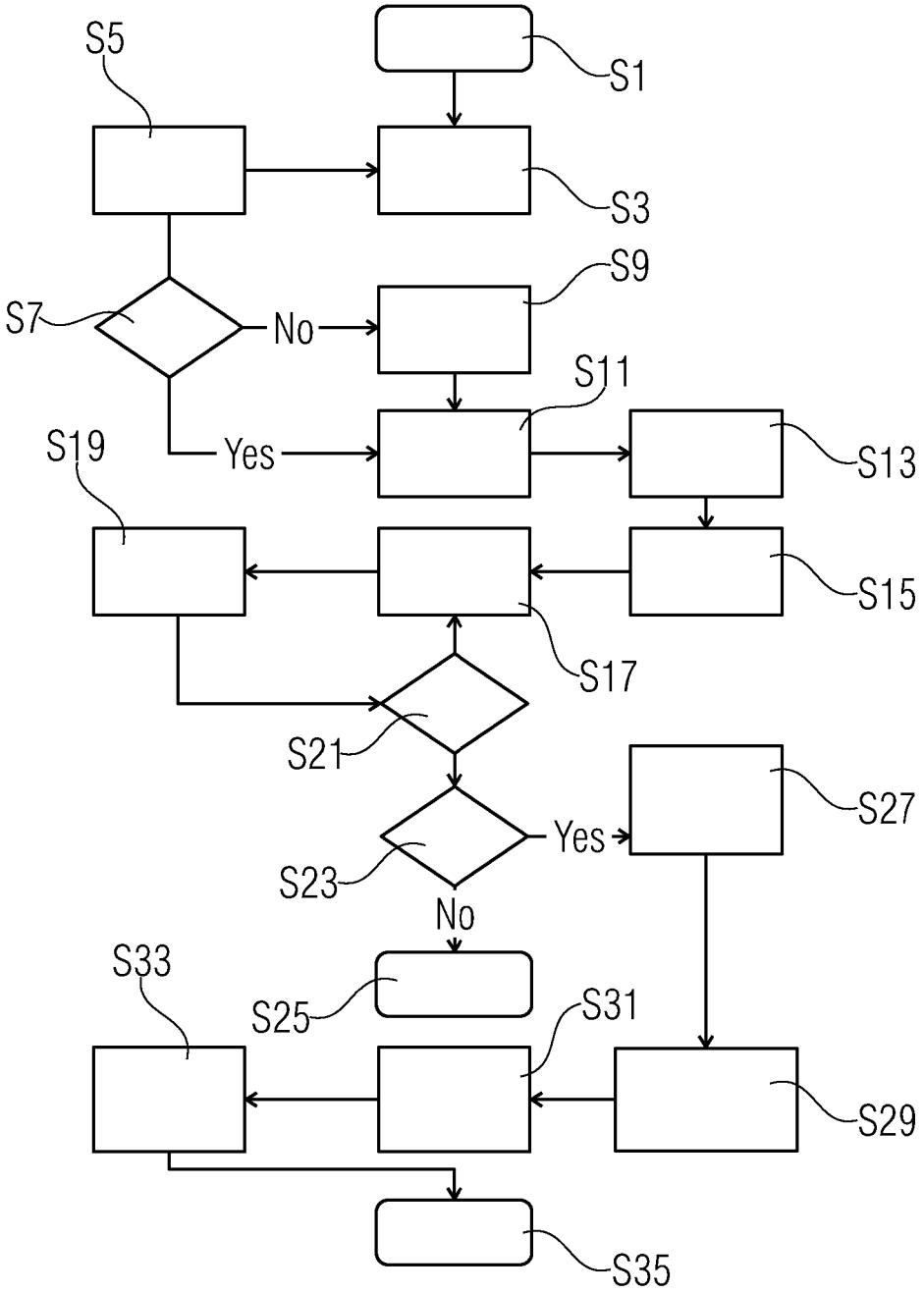
S1
S3
S5
S7
No
S9
S11
Yes
S13
S15
S17
S19
S21
S23
Yes
S27
No
S25
S29
S31
S33
S35

FIG 3

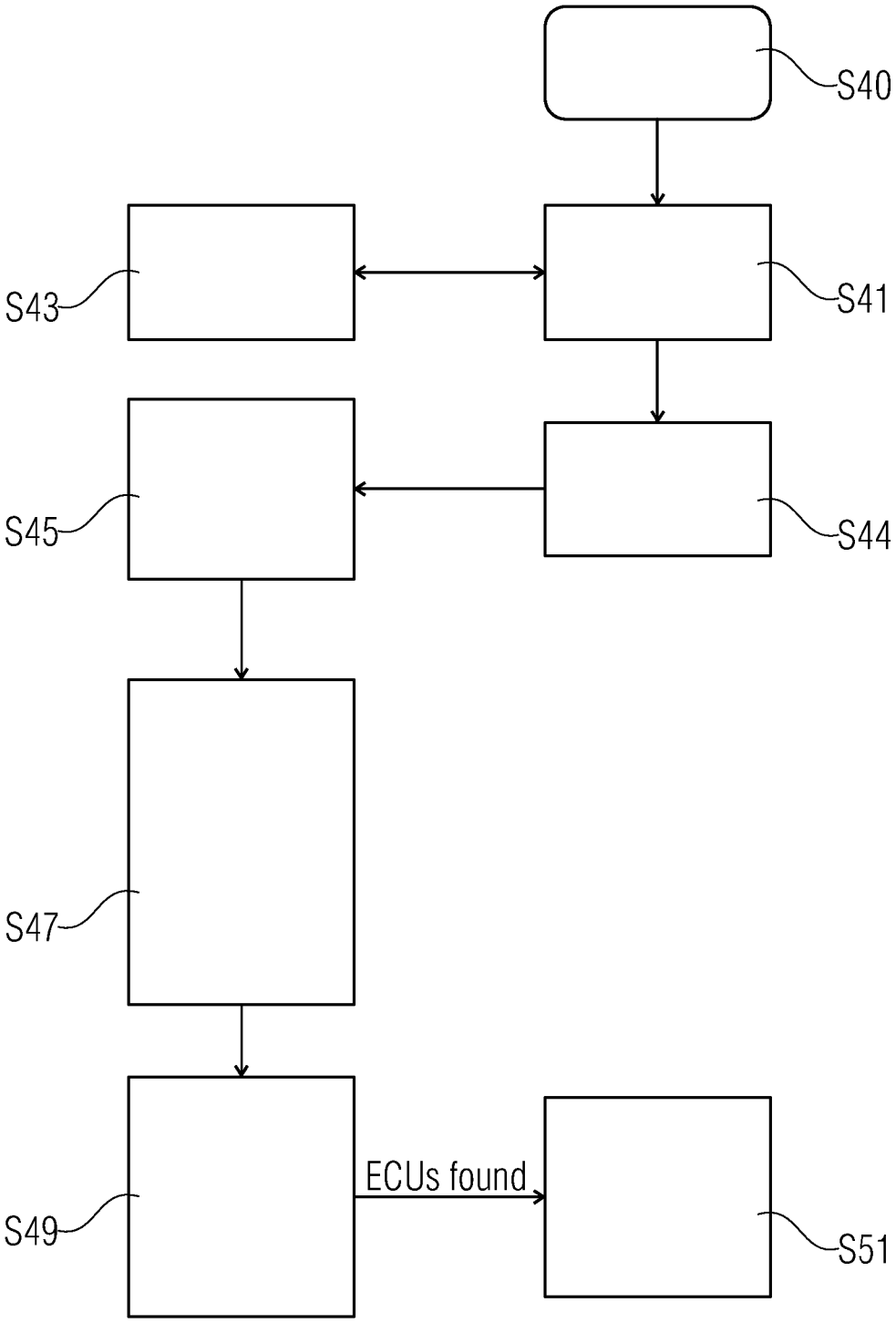

FIG 4

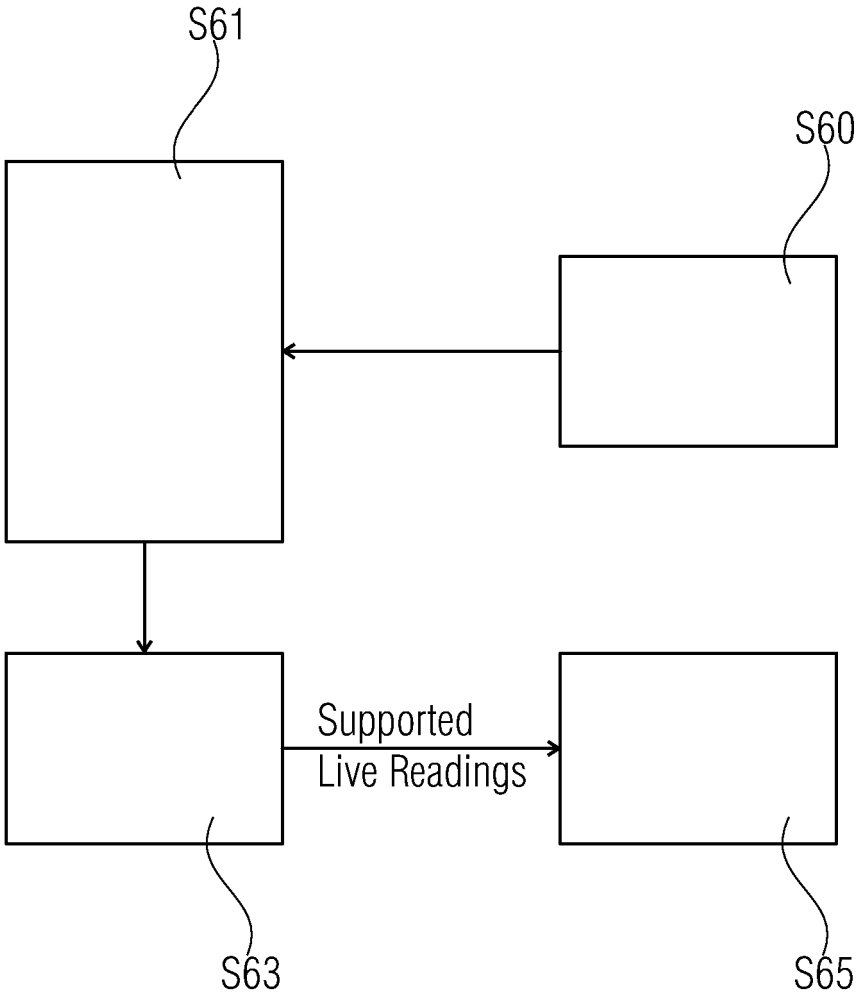

FIG 5

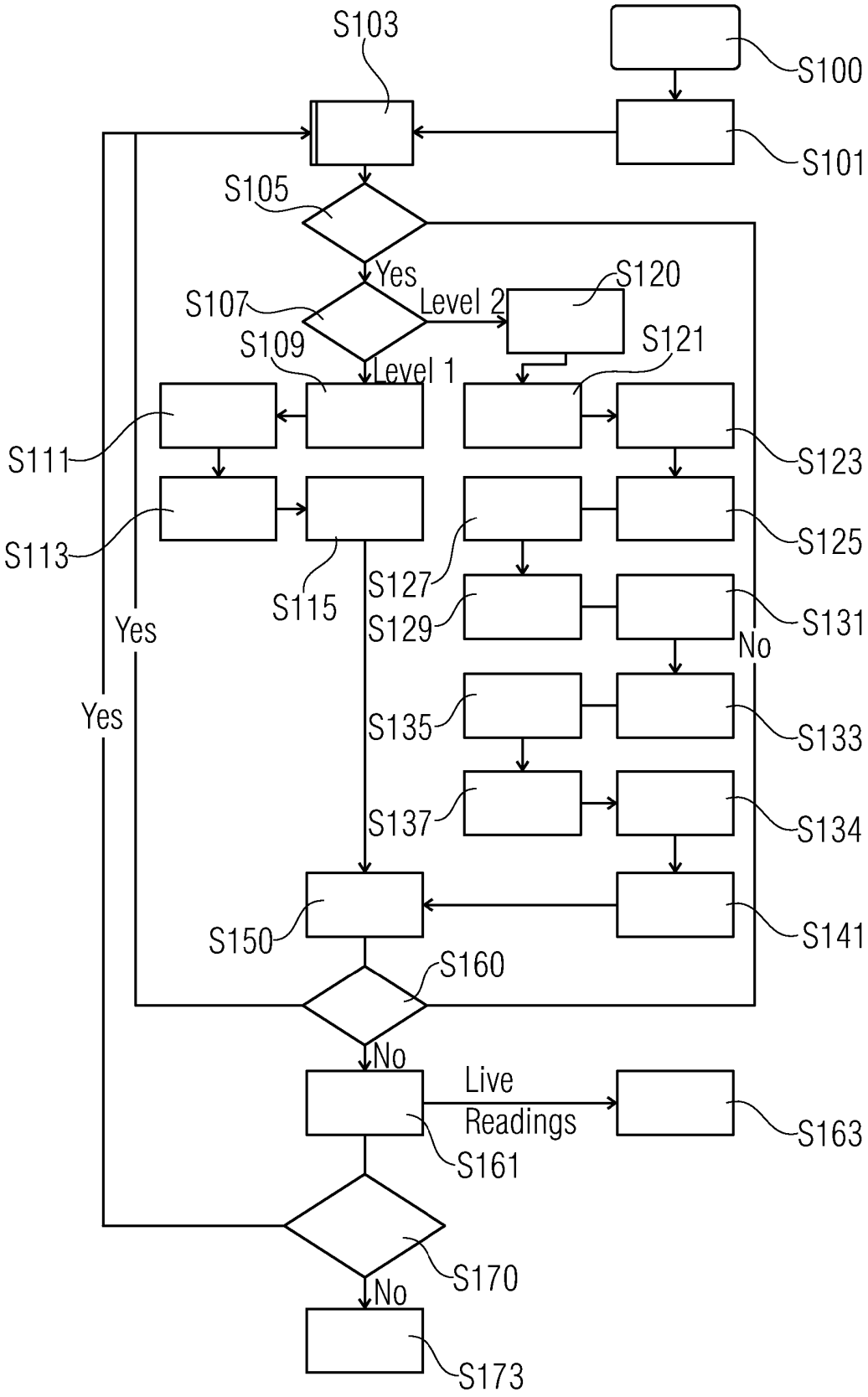
S103
S100
S101
S105
Yes
S120
S107
Level 2
S109
S121
Level 1
S111
S123
S113
S125
S127
S115
S129
S131
No
Yes
Yes
S135
S133
S137
S134
S150
S141
S160
No
Live
Readings
S163
S161
S170
No
S173

FIG 6

REFERENCES CITED IN THE DESCRIPTION

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