[CLAIMS]

[Claim 1]

An on-vehicle device mounted on a vehicle and configured to acquire probe information related to traveling of the vehicle during activation and transmit the probe information to a center server that executes a process of charging the vehicle which has traveled in a charge area on the basis of the probe information, the on-vehicle device comprising:

a CPU;

a detection sensor capable of detecting the motion of the vehicle;

a disconnection detection unit configured to detect presence or absence of disconnection of an input line to which an activation signal is input from the vehicle; and

a power supply control unit that is connected to a battery of the vehicle through a power supply line and configured to activate the on-vehicle device by starting to supply power to the CPU from the battery when the activation signal is input, deactivate the on-vehicle device by stopping to supply power to the CPU when the activation signal is not input, and supply power to the detection sensor and the disconnection detection unit from the battery regardless of whether or not the activation signal is input,

wherein the disconnection detection unit includes:

an activation determination unit that is configured to determine whether the activation signal of the vehicle is input through the input line;

a motion determination unit that is configured to determine whether the vehicle is moving on the basis of a detection signal which is received from the detection sensor; and

a determination unit that is configured to determine that the input line is disconnected in a case where it is determined that the activation signal is not input and it is determined that the vehicle is moving.

[Claim 2]

The on-vehicle device according to claim 1, wherein, in a case where it is determined that the input line is disconnected, the determination unit is configured to store information indicating the disconnection of the input line in a storage unit.

[Claim 3]

The on-vehicle device according to claim 1 or 2, wherein the disconnection detection unit includes a notification processing unit that, in a case where it is determined that the input line is disconnected, is configured to notify of information indicating the disconnection of the input line and identification information from which the vehicle is able to be specified in association with each other.

[Claim 4]

The on-vehicle device according to any one of claims 1 to 3, further comprising a satellite signal reception unit that, as the detection sensor, is configured to specify a position

of the vehicle on the basis of a signal received from a satellite and output the specified position as the detection signal,

wherein the motion determination unit is configured to compare the detection signals which are continuous in time series and determines whether the vehicle is moving.

[Claim 5]

The on-vehicle device according to any one of claims 1 to 3, further comprising a gyro sensor that, as the detection sensor, is configured to measure an angular velocity of the vehicle and output the measured angular velocity as the detection signal,

wherein the motion determination unit is configured to compare the detection signals which are continuous in time series and determines whether the vehicle is moving.

[Claim 6]

The on-vehicle device according to any one of claims 1 to 3, further comprising an acceleration sensor that, as the detection sensor, is configured to measure an acceleration of the vehicle and output the measured acceleration as the detection signal,

wherein the motion determination unit is configured to compare the detection signals which are continuous in time series and determines whether the vehicle is moving.

[Claim 7]

The on-vehicle device according to any one of claims 1 to 3, further comprising a broadband communication unit that, as the detection sensor, is configured to perform broadband communication through a base station and output a base station ID from which the base station is able to be identified as the detection signal,

wherein the motion determination unit is configured to compare the detection signals which are continuous in time series and determines whether the vehicle is moving.

[Claim 8]

The on-vehicle device according to any one of claims 1 to 3, further comprising a detection signal acquisition unit that is configured to receive a detection signal which is output from the detection sensor provided in the vehicle and includes at least one of a speed, an acceleration, an angular velocity, and a steering angle of the vehicle,

wherein the motion determination unit is configured to compare the detection signals which are continuous in time series and determines whether the vehicle is moving.

[Claim 9]

A vehicle comprising the on-vehicle device according to any one of claims 1 to 8.

[Claim 10]

A disconnection detection method of detecting presence or absence of disconnection of an input line of an on-vehicle device that includes:

a CPU;

a detection sensor capable of detecting the motion of a vehicle;

a disconnection detection unit configured to detect the presence or absence of disconnection of the input line to which an activation signal is input from the vehicle; and

a power supply control unit that is connected to a battery of the vehicle through a power supply line and configured to activate the on-vehicle device by starting to supply power to the CPU from the battery when the activation signal is input, deactivate the on-vehicle device by stopping to supply power to the CPU when the activation signal is not input, and supply power to the detection sensor and the disconnection detection unit from the battery regardless of whether or not the activation signal is input,

wherein the on-vehicle device is configured to acquire probe information related to traveling of the vehicle during activation and transmit the probe information to a center server that executes a process of charging the vehicle which has traveled in a charge area on the basis of the probe information,

the method comprising:

an activation determination step of determining whether the activation signal of the vehicle is input through the input line;

a motion determination step of determining whether the vehicle is moving on the basis of a detection signal which is received from the detection sensor; and

a determination step of determining that the input line is disconnected in a case where it is determined that the activation signal is not input and it is determined that the vehicle is moving.

[Claim 11]

A program causing a computer of an on-vehicle device mounted in a vehicle to function, the on-vehicle device including:

a CPU;

a detection sensor capable of detecting the motion of a vehicle;

a disconnection detection unit configured to detect the presence or absence of disconnection of the input line to which an activation signal is input from the vehicle; and

a power supply control unit that is connected to a battery of the vehicle through a power supply line and configured to activate the on-vehicle device by starting to supply power to the CPU from the battery when the activation signal is input, deactivate the on-vehicle device by stopping to supply power to the CPU when the activation signal is not input, and supply power to the detection sensor and the disconnection detection unit from the battery regardless of whether or not the activation signal is input,

wherein the on-vehicle device is configured to acquire probe information related to traveling of the vehicle during activation and transmit the probe information to a center server that executes a process of charging the vehicle which has traveled in a charge area on the basis of the probe information,

the program causing the computer to execute:

an activation determination step of determining whether the activation signal of the vehicle is input through the input line;

a motion determination step of determining whether the vehicle is moving on the basis of a detection signal which is received from the detection sensor; and

a determination step of determining that the input line is disconnected in a case where it is determined that the activation signal is not input and it is determined that the vehicle is moving.

[Claim 12]

The on-vehicle device according to any one of claims 1 to 8, wherein the power supply control unit is configured to activate the on-vehicle device by starting to supply power to the CPU from the battery in a case where it is determined that the activation signal is not input and it is determined that the vehicle is moving.