

CLOSE PROXIMITY VEHICULAR DATA TRANSMISSION

FIELD

The present disclosure relates to data transmission, and more particularly to a method and system of close proximity transmission of data associated with a vehicle.

BACKGROUND

Currently methods and systems for moving data off of and onto vehicles in transit, such as commercial aircraft involve high cost infrastructure modifications to ground facilities and aircraft. Additionally, non-standard and varying frequencies are in use among different airports which further exacerbates data transmission from aircraft at terminal gates to airline databases and storage servers/warehouses. Further, the ability to transmit data securely using existing communications systems at various airports may be problematic. Accordingly, there currently is a need for a low cost solution for moving data off of and onto vehicles in transit, such as commercial aircraft and other common carriers, that securely transfers the data without any tampering, interception by unauthorized entities, or transfer to unauthorized recipients or devices, and also insures the validity and authenticity of the origin of the data and that the data is reliable.

SUMMARY

In accordance with an embodiment, a method for close proximity vehicular data transmission may include detecting, by a processor onboard a vehicle, a predetermined condition for activating a short range radio frequency (RF) transceiver onboard the vehicle, wherein the onboard short range RF transceiver is configured to transmit and receive signals within a limited distance from the onboard short range RF transceiver. The method may also include activating, by the processor, the onboard short range RF transceiver in response to at least detecting the predetermined condition and establishing a communications link between the onboard short range RF transceiver and a predetermined mobile communications device assigned to a particular crew member. The method may also include transmitting vehicular data from the onboard short range RF transceiver to the predetermined mobile communications device. The vehicle may be an aircraft and activating the onboard short range RF transceiver may include activating the onboard short range RF transceiver in response to detecting a weight on wheels condition of the aircraft and a request to activate the onboard short range RF transceiver being within an expected time frame based on at least one of a flight schedule of the aircraft, a flight plan of the aircraft and aircraft operational activity recorded by an onboard information system.

In accordance with another embodiment, a method for close proximity vehicular data transmission may include establishing a communications link between a ground short range RF transceiver and a predetermined mobile communications device assigned to a particular crew member, wherein the ground short range transceiver is configured to transmit and receive signals within a limited distance from the ground short range transceiver. The method may also include validating the predetermined mobile communications device for receiving vehicular data for transfer to an onboard vehicle information system of a specific vehicle. Validating the mobile communications device may include determining that the predetermined mobile communications device is authorized to transfer vehicular data for the specific vehicle and that a request for transferring the vehicular data is within an expected time frame. The method may further include transmitting the vehicular data by the ground short range RF transceiver to the predetermined mobile communications device in response to validating the mobile communications device.

In accordance with a further embodiment, a system for close proximity vehicular data transmission may include a processor onboard a vehicle and the processor being configured to detect a predetermined condition of the vehicle. The system may also include a data storage device onboard the vehicle for storing vehicular operational data. The system may further include a short range radio frequency (RF) transceiver onboard the vehicle. The onboard short range RF transceiver may be activated in response to at least the predetermined condition being detected and the onboard short range RF transceiver being configured to transmit the vehicular operational data to a predetermined mobile communications device assigned to a particular crew member. The onboard short range RF transceiver is configured to transmit and receive signals within a limited distance from the onboard short range RF transceiver. The vehicle may be an aircraft and the onboard short range RF transceiver may be activated in response to detecting a weight on wheels condition of the aircraft and a request to activate the onboard short range RF transceiver being within an expected time frame based on at least one of a flight schedule of the aircraft, a flight plan of the aircraft and aircraft operational activity recorded by an onboard information system. A change in a flight plan or a flight schedule may result in a change of the expected time frame for which the RF transceiver is deemed valid.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF DRAWINGS

The following detailed description of embodiments refers to the accompanying drawings, which illustrate specific embodiments of the disclosure. Other embodiments having different structures and operations do not depart from the scope of the present disclosure.

What is claimed is:

1. A method for close proximity vehicular data transmission, comprising:
 - detecting, by a processor onboard a vehicle, a predetermined condition for activating a short range radio frequency (RF) transceiver onboard the vehicle, wherein the onboard short range RF transceiver is configured to transmit and receive signals within a limited distance from the onboard short range RF transceiver;
 - activating, by the processor, the onboard short range RF transceiver in response to at least detecting the predetermined condition;
 - establishing a communications link between the onboard short range RF transceiver and a predetermined mobile communications device assigned to a particular crew member; and
 - transmitting vehicular data from the onboard short range RF transceiver to the predetermined mobile communications device,wherein the vehicle is an aircraft and wherein activating the onboard short range RF transceiver comprises activating the onboard short range RF transceiver in response to detecting a weight on wheels condition of the aircraft and a request to activate the onboard short range RF transceiver being within an expected time frame based on at least one of a flight schedule of the aircraft, a flight plan of the aircraft and aircraft operational activity recorded by an onboard information system.
2. The method of claim 1, further comprising determining authorization to activate the onboard short range RF transceiver in response to detecting the predetermined condition.
3. The method of claim 2, wherein detecting the predetermined condition comprises detecting the weight on wheels condition of the aircraft and determining authorization to activate the onboard short range RF transceiver comprises determining that activation of the onboard short range RF transceiver is within an expected time frame based on at least one of a flight schedule of the aircraft, a flight plan of the aircraft and aircraft operational activity recorded by

an onboard information system, wherein a change in the flight plan or the flight schedule of the aircraft results in a change of the expected time frame.

4. The method of claim 3, further comprising:

activating the onboard short range RF transceiver in response to detecting the weight on wheels condition of the aircraft and the activation of the onboard short range RF transceiver being within the expected time frame; and

transmitting an error message to at least a cockpit display in response to activation of the onboard short range RF transceiver not being authorized.

5. The method of any of claims 1-2, further comprising validating the predetermined mobile communications device prior to transmitting the vehicular data.

6. The method of claim 5, wherein validating the predetermined mobile communications device comprises determining if the predetermined mobile communications device is authorized for a particular vehicle on which the predetermined mobile communication device is currently onboard.

7. The method of any of claims 5-6, wherein validating the predetermined mobile communications device comprises:

determining if the predetermined mobile communications device is authorized for a particular vehicle on which the predetermined mobile communication device is currently onboard; and

determining if a data transfer request to the predetermined mobile communications device is within an expected time frame.

8. The method of claim 7, wherein the vehicle is a specific aircraft and wherein the method further comprises determining the expected time frame based on at least one of a flight plan schedule for the specific aircraft, an airline route schedule, an aircraft crew schedule, a mobile communications device to crew assignment and a match between the mobile communication device to crew assignment and the specific aircraft.

9. The method of any of claims 1-2 or 5, further comprising establishing a communications link between the mobile communications device and a ground short range RF transceiver in response to the particular crew member carrying the mobile communications device off the vehicle, wherein the ground short range RF transceiver is configured to transmit and receive signals within a limited distance from the ground short range RF transceiver.

10. The method of claim 9, further comprising:

validating the mobile communications device for transmitting the vehicular data to the ground short range RF transceiver, wherein validating the mobile communications device comprises determining that the mobile communications device is authorized for transferring the vehicular data of the vehicle and that a request for transferring the vehicular data is within an expected time frame; and

transmitting the vehicular data to the ground short range RF transceiver in response to validating the mobile communications device.

11. The method of claim 10, wherein the vehicle is an aircraft, the method further comprising transmitting the vehicular data to an airline data store.

12. A system for close proximity vehicular data transmission, comprising:

a processor onboard a vehicle, the processor being configured to detect a predetermined condition of the vehicle;

a data storage device onboard the vehicle for storing vehicular operational data;

a short range radio frequency (RF) transceiver onboard the vehicle, the onboard short range RF transceiver being activated in response to at least the predetermined condition being detected and the onboard short range RF transceiver being configured to transmit the vehicular operational data to a predetermined mobile communications device assigned to a particular crew member, wherein the onboard short range RF transceiver is configured to transmit and receive signals within a limited distance from the onboard short range RF transceiver,

wherein the vehicle is an aircraft and the onboard short range RF transceiver is activated in response to detecting a weight on wheels condition of the aircraft and a request to activate the onboard short range RF transceiver being within an expected time frame based on at least one of a flight schedule of the aircraft, a flight plan of the aircraft and aircraft operational activity recorded by an onboard information system, wherein a change in a flight plan or a flight schedule results in a change of the expected time frame for which the RF transceiver is deemed valid.

13. The system of claim 12, wherein the predetermined mobile communications device is validated prior to transmitting the vehicular operational data, the predetermined mobile communications device is validated by determining if the predetermined mobile communications device is authorized for a particular vehicle on which the predetermined mobile communication device is currently onboard and by determining if a data transfer request to the predetermined mobile communications device is within an expected time frame.

14. The system of claim 13, wherein the vehicle is a specific aircraft and the expected time frame is determined based on at least one of a flight plan schedule for the specific aircraft, an airline route schedule, an aircraft crew schedule, a mobile communications device to crew assignment and a match between the mobile communication device to crew assignment and the specific aircraft, wherein a change in a flight plan or a flight schedule results in a change of the expected time frame for which the predetermined mobile communications device is deemed valid.

15. The system of any of claims 12-13, further comprising a ground short range RF transceiver configured to establish a communications link with the predetermined mobile communications device in response to the particular crew member carrying the mobile communications device off the vehicle and the mobile communications device being detected, the vehicular operational data being transmitted from the predetermined mobile communications device to the ground short range RF transceiver in response to validating the predetermined mobile communications device, wherein the ground short range RF transceiver is configured to

transmit and receive signals within a limited distance from the ground short range RF transceiver.