Claims

What is claimed is:

1. A train control system comprising:

a train set including at least one railway car;

a track switch controller;

at least one first set of two track points located along a path of the train set;

at least one second set of two trackpoints located along a track switch section;

at least one RFID tag having no preprogrammed data and which is located at each of the at least one first set of two track points configured to store dynamic and static characteristics of the train set as it passes the at least one first set of two track points;

wherein the dynamic characteristics stored on the at least one RFID tag are configured to be updated at the at least one first set of two track points, according to characteristics of the train set passing by the at least one first set of two track points;

at least one RFID tag having no preprogrammed data and which is located at each of the at least one first set of two track points and the at least one second set of two track points, the at least one RFID tag being configured to store dynamic and static characteristics of the train set as it passes the at least one second set of the at least two track switches; and

at least one RFID tag reader located on the at least one railway car connected to a network;

wherein the at least one railway car writes data to the at least one RFID tag such that the data is read by the at least one RFID tag reader of a following railway car ; and

wherein the data of the at least one RFID tag is overwritten with new data each time

the at least one railway car passes by the at least one first set of two track points and as it passes by the at least one second set of the two track points .

2. The train control system of claim 1, wherein the at least one RFID tag further comprises a type 1 RFID tag or a type 2 RFID tag.

3. The train control system of claim 2, wherein the at least one type 2 RFID tag is connected to a second type 2 RFID tag by an RS485 or serial data transmission cable, wherein the type 2 RFID tag by an RS485 or serial data transmission cable, wherein the type 2 RFID tag includes an I2C to RS485 converter connected to an RFID chip connected by I2C BUS connection, connected by a parallel connection to a tag antenna.

4. The train control system of claim 1, wherein the at least one RFID tag reader comprises an RF transparent enclosure containing inside at least a pair of reader antennas wired to a chip reader, connected to at least one leading railway car or at least one trailing railway car by a wire.

5. The train control system of claim 2, wherein the type 1 RFID tag and the RFID tag reader have a separation between approximately 7 inches and 40 inches.

6. The train control system of claim 1, wherein the RFID tag reader is located on an underside of a leading railway car or an underside of a trailing railway car.

7. The train control system of claim 2, wherein the at least one train type 1 RFID tag comprises multiple type 1 RFID tags spaced apart by less than approximately 30 feet from each other.

8. The train control system of claim 1, wherein a network database on a leading railway car is connected to a network database on the trailing railway car by a Bluetooth or a Wi-Fi connection.

9. The train control system of claim 1, wherein the network of the leading railway car further comprises a radar.

10. The train control system of claim 1, wherein a network of a leading railway car or a network of a trailing railway car is connected to a wireless communication network comprising an Ultra-Wide Band, LWIP, LWA, WLAN, ADSL, Cable, or LTE network at locations where the track points are at an open track, and a Wi-Fi network at locations wherein the track points are at an enclosed track.

11. The system of claim 1, further comprising at least one trailing railway car.

12. A method of controlling a train system comprising the steps of:

a first train car of a first train set communicating to a first car of a second train set via a centralized data network route control center, the communication including a track database, a schedule database, a track switch controller, and a route database; and

the first train car of the first train set communicating to the first car of the second train set via a communication system, the communication system including:

at least a first set of two track points located along a path of the first train set;

at least a second set of two trackpoints located along a track switch;

at least one first RFID tag having no preprogrammed data and which is located at each of the at least one first set of two track points and at least one second set of trackpoints, wherein the at least one first RFID tag is configured to store dynamic and static characteristics of the first train set as it passes the at least one first set of two

track points; wherein the dynamic characteristics stored on the at least one RFID tag are configured to be updated at the at least one first set of two track points, according to characteristics of the train set passing by the at least one first set of two track points

at least one second RFID tag having no preprogrammed data and which is located at each of the at least one first set of two trackpoints and at least one second set of track points, wherein the at least one second RFID tag configured to store dynamic and static characteristics of the train set as it passes the at least one second set of two track points; and

at least one RFID tag reader located on the first train set and at least one RFID tag reader located on the second train set;

wherein the first car of the first train set writes data to the at least one RFID tag such that the data is read by the at least one RFID tag reader of the second car of the second train set and wherein the data of the at least one RFID tag is overwritten with new data each time the first car of the first train set passes by at least one first set of two track points and as it passes by the at least one second set of the two track points ; and wherein the track switch controller is configured to determine operational distance between the first train set and the second train set

13. The method of claim 12, wherein the first train car of the first train set communicates, to the first car of the second train set via the communication system, a speed, a location, and a headway of the first train.

14. The method of claim 12, wherein the RFID tag further comprises a type 1 RFID tag or type 2 RFID tag.

15. The method of claim 12, wherein the communication system comprises a backup or a fail-safe system.

16. The method of claim 14, wherein the type 1 RFID tag or the type 2 RFID tag of the backup system stores a speed, a brake status, a train ID, a switch status, a time stamp, and a schedule of a latest train to pass the type 1 RFID tag or the type 2 RFID tag.

17. The method of claim 14, further comprising:

rewriting the speed, the brake status, the train ID, the switch status, the time stamp, and the schedule of a latest train to pass the type 1 RFID tag or the type 2 RFID tag, with a next train to pass the type 1 RFID tag or the type 2 RFID tag.

18. The method of claim 12, wherein a speed of a train is adjusted by a backup communication system based on a rail visual distance and time of passing of a preceding train.

19. The method of claim 12, wherein the type 1 RFID tag and the type 2 RFID tag have unique identifiers.

20. The method of claim 17, wherein the rewriting step is completed within between approximately 10 milliseconds and approximately 30 milliseconds.

21. The method of claim 12, wherein the type 1 RFID tag and the type 2 RFID tag include volatile memory.