CLAIMS

1. An integrated control system for a rail vehicle collision test, comprising:

an industrial control subsystem, wherein the industrial control subsystem comprises one or more subsystems of a collision vehicle subsystem, a high-speed camera subsystem, a lighting control subsystem, a dynamic force measurement subsystem, an on-board test subsystem, an intelligent driving subsystem, and a synchronous triggering subsystem; and the industrial control subsystem is configured to: send a system status of the one or more subsystems to a centralized control center control room subsystem, and perform an operation based on a control signal sent by the centralized control center control room subsystem; and the control signal comprises a synchronization signal, a trigger signal, and an emergency stop signal;

a video monitoring and wireless network integration subsystem, configured to: obtain a shooting video of a test rail vehicle in a collision test, create a data transmission network, and transmit the shooting video to the centralized control center control room subsystem and a database subsystem through the data transmission network;

the database subsystem, configured to store the shooting video;

a ground speed measurement and positioning subsystem, configured to: obtain a real-time speed of the test rail vehicle when the test rail vehicle passes a preset position point in the collision test, send the real-time speed and positioning information of the preset position point to the centralized control center control room subsystem, and receive a control instruction sent by the centralized control center control room subsystem; and

the centralized control center control room subsystem, configured to: display the shooting video, obtain the system status of the one or more subsystems of the industrial control subsystem, send the control signal to the industrial control subsystem based on the system status or an experimental requirement, and send the control instruction based on the real-time speed and the positioning information of the preset position point;

wherein the collision vehicle subsystem is configured to: control the test rail vehicle to perform a decoupling operation in a case that the emergency stop signal is not received

within a preset time period when the test rail vehicle is in the collision test.

2. The integrated control system for a rail vehicle collision test according to claim 1, wherein the centralized control center control room subsystem being configured to obtain the system status of the one or more subsystems of the industrial control subsystem and send the control signal to the industrial control subsystem based on the system status or the experimental requirement comprises the centralized control center control room subsystem being configured to: determine whether the system status comprises a system failure status, and send the emergency stop signal to the industrial control subsystem in case of determining that the system status comprises the system failure status.

3. The integrated control system for a rail vehicle collision test according to claim 1, wherein the centralized control center control room subsystem being configured to send the control instruction based on the real-time speed and the positioning information of the preset position point comprises the centralized control center control room subsystem being configured to: determine whether an absolute value of a difference between the real-time speed and a preset speed is greater than a first preset difference value, send a speed control instruction to the industrial control subsystem in case of determining that the absolute value of the difference between the real-time speed and the preset speed is greater than the first preset difference value, and send an emergency stop instruction to the industrial control subsystem in case of determining that the absolute value of the difference between the real-time speed and the preset speed is not greater than the first preset difference value.

4. The integrated control system for a rail vehicle collision test according to claim 1, wherein the collision vehicle subsystem is configured to: send a decoupling state to the centralized control center control room subsystem.

5. An integrated control method for a rail vehicle collision test, applied to the integrated control system for a rail vehicle collision test according to any one of claims 1 to 4, the integrated control method comprising:

obtaining a system status of each subsystem, and determining a control signal based on the system status or an experimental requirement;

obtaining a shooting video of a test rail vehicle in a collision test, creating a data transmission network, and transmitting the shooting video through the data transmission

network;

obtaining a real-time speed of the test rail vehicle when the test rail vehicle passes a preset position point in the collision test and positioning information of the preset position point;

determining a control instruction based on the real-time speed and the positioning information of the preset position point;

performing an operation based on the control signal and the control instruction, wherein the control signal comprises a synchronization signal, a trigger signal, and an emergency stop signal; and

controlling the test rail vehicle to perform a decoupling operation in a case that the emergency stop signal is not received within a preset time period when the test rail vehicle is in the collision test.

6. The integrated control method for a rail vehicle collision test according to claim 5, wherein the obtaining a system status of each subsystem, and determining a control signal based on the system status or an experimental requirement comprises:

determining whether the system status comprises a system failure status, and sending the emergency stop signal to the industrial control subsystem in case of determining that the system status comprises the system failure status.

7. The integrated control method for a rail vehicle collision test according to claim 5, wherein the determining a control instruction based on the real-time speed and the positioning information of the preset position point comprises:

determining whether an absolute value of a difference between the real-time speed and a preset speed is greater than a first preset difference value;

sending a speed control instruction to the industrial control subsystem in case of determining that the absolute value of the difference between the real-time speed and the preset speed is greater than the first preset difference value; and

sending an emergency stop instruction to the industrial control subsystem in case of determining that the absolute value of the difference between the real-time speed and the preset speed is not greater than the first preset difference value.

8. The integrated control method for a rail vehicle collision test according to claim 5, further comprising: sending a decoupling state to the centralized control center control room subsystem.