Amended claims 1 – 9(Clean)

1. (Currently Amended) A detection system for vehicle-mounted Ethernet link synchronization signal, suitable for vehicle-mounted Ethernet device to determine synchronization signal sent by external device, comprising:

a signal characteristic judgment module, the signal characteristic judgment module generates a synchronization mode identifier according to signal characteristic of the synchronizing signal, the signal characteristic being periodic counting results of high levels of the synchronization signal within a predetermined period;

a rate judgment module, the rate judgment module generates a working rate identifier according to the synchronizing signal;

a synchronization module, wherein the synchronization module is respectively connected with the signal characteristic judgment module and the rate judgment module, and the synchronization module generates synchronization information for handshake between the vehicle-mounted Ethernet device and the external device according to the synchronization mode identifier and the working rate identifier and outputs the synchronization information;

the synchronization mode identifier comprises a continuous signal and a pulse signal;

the rate judgment module further comprises a continuous signal detection module, and the continuous signal detection module is connected to the signal characteristic judgment module;

when the synchronization mode identifier indicates as the continuous signal, the continuous signal detection module directly outputs a pre-configured continuous signal pattern rate, which functions as the working rate identifier, to the synchronization module.

2. (Original) The detection system of claim 1, wherein the signal characteristic judgment module comprises:

a timing module, the timing module generates a clock signal;

a counting module, the counting module is connected to the timing module and generates periodic counting results based on the input clock signal and synchronization signal to function as the signal characteristic;

a judgment module, the judgment module generates the synchronization mode identifier based on the signal characteristic.

3. (Original) The detection system of claim 1, wherein the rate judgment module comprises:

a sampling module, the sampling module samples the synchronization signal to form a sampling data;

a decision module, the decision module generates a PN sequence based on the sampling data;

a detection module, the detection module is connected to the decision module and generates the working rate identifier based on the PN sequence.

4. (Original) The detection system of claim 3, wherein the rate judgment module further comprises:

a gain control module, an input terminal of the gain control module receives the synchronization signal, and an output terminal of the gain control module is connected to an input terminal of the sampling module;

the gain control module generates a gain parameter based on a signal amplitude of the synchronization signal and a pre-set sampling range corresponding to the sampling range of the sampling module;

the gain control module adjusts a gain value of the synchronization signal using the gain parameter, and outputs the gain value to the sampling module.

5. (Original) The detection system of claim 3, wherein the rate judgment module further comprises:

a sampling clock generation module, the sampling clock generation module generates a sampling clock signal;

a clock recovery module, the clock recovery module is connected to the sampling clock generation module, and the clock recovery module adjusts the sampling clock signal based on a pre-configured optimal sampling parameter so as to generate an adjusted clock signal;

the sampling module receives the adjusted clock signal, and samples the synchronization signal based on the adjusted clock signal to obtain the sampling data.

6. (Original) The detection system of claim 1, wherein the rate judgment module further comprises:

an equalization module, an input terminal of the equalization module is connected to the sampling module, and an output terminal of the equalization module is connected to the decision module;

the equalization module obtains the sampling data, and eliminates an inter-symbol interference from the sampling data to output the sampling data to the decision module.

7. (Original) The detection system of claim 6, wherein the equalization module comprises:

a forward equalizer, the forward equalizer is connected to the sampling module, the forward equalizer obtains the sampling data, and the forward equalizer eliminates forward symbol interference from the sampling data to generate an intermediate equalized data;

a decision feedback filter, the decision feedback filter is connected to the forward equalizer, the decision feedback filter eliminates backward symbol

interference from the intermediate equalized data to output the intermediate equalized data which functions as the sampling data with the inter-symbol interference eliminated.

8. (Original) The detection system of claim 3, wherein the continuous signal detection module is also connected to the sampling module, the decision module, and the detection module respectively;

when the synchronization mode identifier indicates as a continuous signal, the continuous signal detection module further controls the sampling module, the decision module, and the detection module to cease processing the synchronization signal.

9. (Original) The detection system of claim 3, wherein the detection module comprises:

a reference signal generation module, the reference signal generation module sequentially generates pre-configured reference sequence signals；

the reference sequence signals correspond to the synchronization signal under different working rates of the Ethernet device respectively,

an auto-correlation module, the auto-correlation module is connected to the reference signal generation module and the decision module respectively, the auto-correlation module performs sliding auto-correlation processing on the reference sequence signals and the PN sequence to obtain an auto-correlation result;

a detection judgment module, the detection judgment module is connected to the reference signal generation module and the auto-correlation module respectively, the detection judgment module determines whether the working rate corresponding to the PN sequence is obtained based on the auto-correlation result,

if the working rate is obtained, the detection judgment module generates the working rate identifier based on the working rate;

if the working rate is not obtained, the detection judgment module controls the reference signal generation module to generate new reference sequence signals.