DESCRIPTION

DEVICE NETWORK SYSTEM

TECHNICAL FIELD

The present disclosure relates to a device network system that performs high-frequency communication.

BACKGROUND ART

In an existing multi-air conditioner for a building, an indoor unit/outdoor unit connection line and an inter-system connection line are separately connected, and at the time of recognizing an indoor unit/outdoor unit system, the inter-system connection line is disconnected by a relay to create a state in which only indoor units and outdoor units of an identical system are present in a network, for the purpose of identifying the indoor units and the outdoor units of the identical system.

SUMMARY OF INVENTION

< Technical Problem >

However, in a case of performing communication by changing a communication scheme to a scheme of using a higher-frequency signal to increase a communication speed, disconnection by a relay according to a conventional method may cause crosstalk in which signals mutually leak due to a parasitic capacitance between contacts of the relay or substrate patterns and may cause coupling of networks divided by the relay. Thus, the relay does not fulfill the function in high-frequency communication. When communication lines of different networks that are not connected by a physical line are parallel to each other and a parasitic capacitance or mutual induction between the communication lines causes mutual leakage of signals and crosstalk, the networks that are not physically connected may couple to each other. When such crosstalk occurs, a device of a different network that is not physically connected may be recognized as a device of an identical system in a process of performing system recognition of a network by communication as in the conventional method.

Accordingly, there is an issue of establishing means for appropriately performing system recognition on devices connected to an identical system without recognizing a device of a different system as a device of the identical system in high-frequency communication.

< Solution to Problem >

According to an aspect, there is provided a device network system including a first network and a second network. The first network includes a first device group and a first line group. The first device group includes a plurality of devices. The first line group is connected to the plurality of devices. The second network includes a second device and a second line connected to the second device. The second device is physically separated from the first network. In a state in which the first device group is set in advance as a physically connectable group or in a state in which the first device group as a physically connectable group, in a case where the first device group or the second device detects occurrence of a state in which the second device is recognized as belonging to the physically connectable group associated with the first device group due to a presence of crosstalk that occurs between the first network and second network, the second device itself leaves the communication network or is caused to leave the communication network by the first device group.

In the above aspect of the device network system, in a case where a device that is not to belong to a group is recognized as belonging to the group, an action is performed under an assumption that the device does not belong to the group. Thus, system recognition is appropriately performed even in high-frequency communication.

In an embodiment of the device network system of the above aspect, in the first device group, a main device selected from among the plurality of devices determines whether the state in which the second device is recognized as belonging to the physically connectable group has occurred.

In an embodiment of the device network system of the above aspect, in the first device group, a main device selected from among the plurality of devices determines, using low-frequency communication, whether the plurality of devices except for the main device belong to the physically connectable group.

In an embodiment of the device network system of the above aspect, an action that the second device is caused to leave the communication network by the first device group includes an action of denying belonging of the second device to the physically connectable group.

In an embodiment of the device network system of the above aspect, in the first device group, a main device selected from among the plurality of devices denies belonging of the second device to the physically connectable group.

BRIEF DESCRIPTION OF DRAWINGS

[Fig. 1A] Fig. 1A is a conceptual diagram of system recognition.

[Fig. 1B] Fig. 1B is a flowchart of system recognition.

[Fig. 2] Fig. 2 is a conceptual diagram of system recognition in a case where systems are connected in a multistage manner.

CLAIMS

1. A device network system comprising:

a first network (10) including a first device group (100) and a first line group (110), the first device group including a plurality of devices (101, ⋯, 106), the first line group being connected to the plurality of devices; and

a second network (20) including a second device (203, 204) and a second line (213) connected to the second device, the second device being physically separated from the first network, wherein

in a state in which the first device group is set in advance as a physically connectable group or in a state in which the first device group is recognized as a physically connectable group, in a case where the first device group detects occurrence of a state in which the second device is recognized as belonging to the physically connectable group associated with the first device group due to a presence of crosstalk that occurs between the first network and second network, the second device itself leaves the communication network or is caused to leave the communication network by the first device group.

2. The device network system according to claim 1, wherein

in the first device group, a main device selected from among the plurality of devices determines whether the state in which the second device is recognized as belonging to the physically connectable group has occurred.

3. The device network system according to claim 1, wherein

in the first device group, a main device selected from among the plurality of devices determines, using low-frequency communication, whether the plurality of devices except for the main device belong to the physically connectable group.

4. The device network system according to claim 1, wherein

an action that the second device is caused to leave the communication network by the first device group includes an action of denying belonging of the second device to the physically connectable group.

5. The device network system according to claim 4, wherein

in the first device group, a main device selected from among the plurality of devices denies belonging of the second device to the physically connectable group.

6. The device network system according to claim 2, wherein

in the first device group, the main device determines, using low-frequency communication, whether the plurality of devices except for the main device belong to the physically connectable group.

7. The device network system according to claim 2, wherein

an action that the second device is caused to leave the communication network by the first device group includes an action of denying belonging of the second device to the physically connectable group.

8. The device network system according to claim 3, wherein

an action that the second device is caused to leave the communication network by the first device group includes an action of denying belonging of the second device to the physically connectable group.