CLAIMS

1. An optical head end, wherein the optical head end is used in a communication system, the communication system comprises the optical head end, a first optical terminal, and n second optical terminals managed by the first optical terminal, the first optical terminal is connected to the optical head end through an optical port, the n second optical terminals are connected in series through electrical ports, the first optical terminal is connected, through an electrical port, to the n second optical terminals connected in series, n is an integer greater than 0, and the optical head end comprises:

a transceiver module, configured to obtain data of at least one of the n second optical terminals; and

a processing module, configured to generate a data frame based on the data of the at least one of the n second optical terminals, wherein the data frame comprises the data of the at least one of the n second optical terminals, wherein

the transceiver module is further configured to send the data frame to the first optical terminal.

2. The optical head end according to claim 1, wherein the data frame comprises a data processing field of the first optical terminal and a data processing field of each of the n second optical terminals; and

the transceiver module is further configured to receive, from the first optical terminal, a data frame after data exchange, wherein an optical terminal corresponding to at least one data processing field in the data frame after data exchange performs data exchange on the data processing field, and the optical terminal corresponding to the data processing field comprises the first optical terminal and/or the second optical terminal.

3. The optical head end according to claim 1 or 2, wherein

the transceiver module is further configured to obtain information about the first optical terminal and information about the n second optical terminals from the first optical terminal;

the processing module is further configured to determine a management identifier of the first optical terminal and a management identifier of each of the n second optical terminals based on the information about the first optical terminal and the information about the n second optical terminals; and

the transceiver module is further configured to send the management identifier of the first optical terminal and the management identifier of each of the n second optical terminals to the first optical terminal.

4. The optical head end according to claim 3, wherein information about each second optical terminal comprises bandwidth information of the second optical terminal, a physical address of

the second optical terminal, and electrical port information of the second optical terminal.

5. The optical head end according to claim 3 or 4, wherein the processing module is further configured to generate a management table, wherein the management table comprises the information about the first optical terminal, the information about each second optical terminal, the management identifier of the first optical terminal, the management identifier of each second optical terminal, and third indication information, and the third indication information indicates that the second optical terminal is managed by the first optical terminal.

6. The optical head end according to claim 5, wherein the communication system further comprises a control device and field devices, the control device is connected to the optical head end, the first optical terminal is connected to at least one field device, and each second optical terminal is connected to at least one field device;

the transceiver module is specifically configured to obtain the data of the at least one second optical terminal from the control device; and

the processing module is specifically configured to generate the data frame based on the data of the at least one second optical terminal and the management table.

7. A first optical terminal, wherein the first optical terminal is used in a communication system, the communication system comprises an optical head end, the first optical terminal, and n second optical terminals managed by the first optical terminal, the first optical terminal is connected to the optical head end through an optical port, the n second optical terminals are connected in series through electrical ports, the first optical terminal is connected, through an electrical port, to the n second optical terminals connected in series, n is an integer greater than 0, and the first optical terminal comprises:

a transceiver module, configured to obtain a data frame from the optical head end through the optical port, wherein the data frame comprises data of at least one of the n second optical terminals, wherein

the transceiver module is further configured to send, through the electrical port, a data frame to a second optical terminal connected to the first optical terminal.

8. The first optical terminal according to claim 7, wherein the data frame comprises a data processing field of the first optical terminal and a data processing field of each of the n second optical terminals;

the first optical terminal further comprises a processing module;

the processing module is configured to perform data exchange based on the data processing field corresponding to the first optical terminal in the data frame; and

the transceiver module is specifically configured to send, through the electrical port to the second optical terminal connected to the first optical terminal, a data frame after data exchange.

9. The first optical terminal according to claim 7 or 8, wherein the transceiver module is further configured to:

receive, from the second optical terminal through the electrical port, a data frame after data exchange; and

send, to the optical head end through the optical port, the data frame after data exchange.

10. The first optical terminal according to any one of claims 7 to 9, wherein a frame header of the data frame comprises a management identifier of each second optical terminal; and

the transceiver module is specifically configured to forward, based on a management identifier of the second optical terminal connected to the first optical terminal, a data frame to the second optical terminal in a cut-through manner.

11. A second optical terminal, wherein the second optical terminal is used in a communication system, the communication system comprises an optical head end, a first optical terminal, and n second optical terminals managed by the first optical terminal, the first optical terminal is connected to the optical head end through an optical port, the n second optical terminals are connected in series through electrical ports, the first optical terminal is connected, through an electrical port, to the n second optical terminals connected in series, n is an integer greater than 0, and the second optical terminal comprises:

a transceiver module, configured to receive a data frame from the first optical terminal or a previous-level second optical terminal through an electrical port; and

a processing module, configured to obtain data of the second optical terminal in the data frame, wherein

the transceiver module is further configured to send a data frame to a next-level second optical terminal connected to the second optical terminal.

12. The second optical terminal according to claim 11, wherein the data frame comprises a data processing field of the first optical terminal and a data processing field of each of the n second optical terminals;

the processing module is specifically configured to perform data exchange based on a data processing field that corresponds to the second optical terminal and that is in the received data frame; and

the transceiver module is specifically configured to send, to the next-level second optical terminal connected to the second optical terminal, a data frame after data exchange.

13. The second optical terminal according to claim 12, wherein

the transceiver module is further configured to transparently transmit, to the first optical terminal through at least one second optical terminal, a data frame after data exchange.

14. The second optical terminal according to any one of claims 11 to 13, wherein a frame

header of the data frame comprises a management identifier of each second optical terminal; and

the transceiver module is specifically configured to forward, based on a management identifier of the next-level second optical terminal connected to the second optical terminal, the data frame to the next-level second optical terminal in a cut-through manner.

15. The second optical terminal according to claim 13 or 14, wherein the frame header of the data frame further comprises first indication information, and the first indication information indicates the first optical terminal to send a data frame to a second optical terminal connected to the first optical terminal.