

Claims

[Claim 1]

A communication device comprising:

transmission and reception circuitry configured to
5 communicate with an external communication device via a
data signal line and a clock signal line, the
communication including transmitting and receiving data
via the data signal line, the data including an expected
parity and a payload, the expected parity including a
10 first expected parity bit and a second expected parity
bit; and

control circuitry configured to perform a parity
check to received data by calculating a first calculated
parity bit and a second calculated parity bit and
15 comparing the first expected parity bit to the first
calculated parity bit and the second expected parity bit
to the second calculated parity bit,

wherein one of the first calculated parity bit or
the second calculated parity bit are calculated based on
20 the data using an XOR function on one of all odd payload
bits or all even payload bits, and the other one of the
first calculated parity bit or the second calculated
parity bit are calculated using an XOR function of the
other of all odd payload bits or all even payload bits
25 adding 1,

wherein, in a case where the control circuitry determines
that an error has occurred, the control circuitry causes
the transmission and reception circuitry to transmit a
negative acknowledgement signal to the external
30 communication device and the control circuitry causes the
transmission and reception circuitry to interrupt the

communication.

[Claim 2]

The communication device according to claim 1,
5 wherein the control circuitry is configured to calculate
the first calculated parity bit using the XOR function of
all odd payload bits, and to calculate the second
calculated parity bit using the XOR function of all even
payload bits adding 1.

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[Claim 3]

The communication device according to claim 1,
wherein the control circuitry is configured to calculate
the first calculated parity bit using the XOR function of
15 all odd payload bits adding 1, and to calculate the
second calculated parity bit using the XOR function of
all even payload bits.

[Claim 4]

The communication device according to claim 1,
20 wherein the control circuitry is configured to determine
that an error has occurred when the first expected parity
bit does not match the first calculated parity bit,
and/or the second expected parity bit does not match the
second calculated parity bit.

25 [Claim 5]

The communication device according to claim 4,
wherein, in a case where the control circuitry determines
that the error has occurred, the control circuitry causes
the transmission and reception circuitry to restart
30 communication with the external communication device.

[Claim 6]

The communication device according to claim 4,
wherein, in the case where the control circuitry
determines that the error has occurred, the control
circuitry causes the transmission and reception circuitry
5 not to transmit an acknowledgement signal to the external
communication device.

[Claim 7]

The communication device according to claim 1,
wherein the transmission and reception circuitry is
10 configured to communicate in an SDR mode and an HDR mode,
data communication being performed at a first transfer
rate in the SDR mode, the data communication being
performed at a second transfer rate higher than the first
transfer rate in the HDR mode.

15 [Claim 8]

The communication device according to claim 7,
wherein the control circuitry is configured to perform
the parity check to the received data in the HDR mode.

[Claim 9]

20 A communication device comprising:

transmission and reception circuitry configured to
communicate with an external communication device via a
data signal line and a clock signal line, the
communication including transmitting and receiving data
25 via the data signal line, the data including a parity and
a payload, the parity including a first parity bit and a
second parity bit; and

control circuitry configured to calculate the
parity for the data to be transmitted by the transmission
30 and reception circuitry by calculating the first parity
bit and the second parity bit, and to append the parity

to the payload,

wherein one of the first parity bit or the second parity bit are calculated based on the data using an XOR function on one of all odd payload bits or all even payload bits, and the other one of the first parity bit or the second parity bit are calculated using an XOR function of the other of all odd payload bits or all even payload bits adding 1,

wherein the control circuitry is configured to determine that an error has occurred by receiving a negative acknowledgement signal from the external communication device and the control circuitry causes the transmission and reception circuitry to interrupt the communication.
[Claim 10]

The communication device according to claim 9, wherein the control circuitry is configured to calculate the first parity bit using the XOR function of all odd payload bits, and to calculate the second parity bit using the XOR function of all even payload bits adding 1.
[Claim 11]

The communication device according to claim 9, wherein the control circuitry is configured to calculate the first parity bit using the XOR function of all odd payload bits adding 1, and to calculate the second parity bit using the XOR function of all even payload bits.
[Claim 12]

The communication device according to claim 9, wherein the control circuitry is configured to determine whether an error has occurred and, in a case where the control circuitry determines that the error has occurred, the control circuitry causes the transmission and

reception circuitry to restart communication with the external communication device.

[Claim 13]

The communication device according to claim 9,
5 wherein the transmission and reception circuitry is configured to communicate in an SDR mode and an HDR mode, data communication being performed at a first transfer rate in the SDR mode, the data communication being performed at a second transfer rate higher than the first
10 transfer rate in the HDR mode.

[Claim 14]

The communication device according to claim 13, wherein the control circuitry is configured to calculate the parity in the HDR mode.

15 [Claim 15]

A communication system, comprising:

a first communication device, including:

first transmission and reception circuitry configured to communicate via a data signal line and a
20 clock signal line, the communication including transmitting and receiving data via the data signal line, the data including an expected parity and a payload, the expected parity including a first expected parity bit and a second expected parity bit, and

25 first control circuitry configured to calculate the expected parity for the data to be transmitted by the first transmission and reception circuitry, and to add the expected parity to the payload; and

30 a second communication device, including:

second transmission and reception circuitry

configured to communicate with the first communication device via the data signal line and the clock signal line, the communication including transmitting and receiving the data via the data signal line,

5 second control circuitry configured to perform a parity check to the data received by the second transmission and reception circuitry by calculating a first calculated parity bit and a second calculated parity bit and comparing the first expected parity bit to
10 the first calculated parity bit and the second expected parity bit to the second calculated parity bit,

 wherein one of the first expected parity bit or the second expected parity bit are calculated based on the data using an XOR function on one of all odd payload
15 bits or all even payload bits, and the other one of the first expected parity bit or the second expected parity bit are calculated using an XOR function of the other of all odd payload bits or all even payload bits adding 1, wherein the first control circuitry is configured to
20 determine that an error has occurred by receiving a negative acknowledgement signal from the second communication device and the first control circuitry causes the first transmission and reception circuitry to interrupt the communication.

25 and

 wherein one of the first calculated parity bit or the second calculated parity bit are calculated based on the data using an XOR function on one of all odd payload bits or all even payload bits, and the other one of the
30 first calculated parity bit or the second calculated parity bit are calculated using an XOR function of the

other of all odd payload bits or all even payload bits
adding 1,

wherein, in a case where the second control circuitry
determines that the error has occurred, the second

5 control circuitry causes the second transmission and
reception circuitry to transmit the negative
acknowledgement signal to the first communication device
and the second control circuitry causes the second
transmission and reception circuitry to interrupt the
10 communication.

[Claim 16]

The communication system according to claim 15,
wherein the second control circuitry is configured to
calculate the first calculated parity bit using the XOR
15 function of all odd payload bits, and to calculate the
second calculated parity bit using the XOR function of
all even payload bits adding 1.

[Claim 17]

The communication system according to claim 15,
20 wherein the second control circuitry is configured to
calculate the first calculated parity bit using the XOR
function of all odd payload bits adding 1, and to
calculate the second calculated parity bit using the XOR
function of all even payload bits.

25 [Claim 18]

The communication system according to claim 15,
wherein:

the second control circuitry is configured to
determine that an error has occurred when the first
30 expected parity bit does not match the first calculated
parity bit, and/or the second expected parity bit does

not match the second calculated parity bit, and

in a case where the second control circuitry
determines that the error has occurred, the control
circuitry causes the first communication device to
5 restart communication with the second communication
device.