

CLAIMS

What is claimed is:

1. A communication method, wherein the method is applicable to a first terminal device, and comprises:

5 receiving first information from a network device, wherein the first information is used to indicate a first control resource set, a quantity of resource blocks of the first control resource set is N , a quantity of resource element group bundles REGbundles of the first control resource set is W , and bandwidth supported by the first terminal device is less than bandwidth corresponding to the N resource blocks, and N and W are positive integers;

10 monitoring a first control channel on M REGbundles in the W REGbundles, wherein M is less than W , indexes $\{i, i+1, \dots, i+(Y-1)\}$ of Y REGbundles in the M REGbundles are consecutive, indexes $\{i+(Y+X), i+(Y+X+1), \dots, i+(M-1+X)\}$ of remaining $(M-Y)$ REGbundles in the M REGbundles are consecutive, M represents a quantity of available REGbundles of the first terminal device, i , Y , and X are values determined by the first terminal device, M and Y are positive integers,
15 and i and X are integers greater than or equal to 0; or

monitoring the first control channel on M control channel element CCE resources corresponding to the M REGbundles in the W REGbundles, wherein M is less than W , indexes of Y CCE resources in the M CCE resources are $\{C1, C1+2, \dots, C1+(Y-1)\times 2\}$, and indexes of remaining $(M-Y)$ CCE resources in the M CCE resources are $\{C2, C2+2, \dots, C2+(M-Y-1)\times 2\}$;
20 or indexes of the M CCE resources in the M CCE resources are $\{C1, C1+2, \dots, C1+(M-1)\times 2\}$; and M represents the quantity of the available REGbundles of the first terminal device, $C1$, $C2$, Y , and X are values determined by the first terminal device, M and Y are positive integers, and $C1$ and $C2$ are integers greater than or equal to 0.

2. The method according to claim 1, wherein i is determined based on one or more of the bandwidth supported by the first terminal device, a quantity l of symbols comprised in the first control
25 resource set, N , W , a subcarrier spacing, a frequency range, a cell identifier, a radio frame number, a subframe number, and a slot number; and/or

Y is determined based on one or more of the bandwidth supported by the first terminal device, the quantity l of symbols, N , W , the subcarrier spacing, the frequency range, the cell identifier, the
30 radio frame number, the subframe number, and the slot number; and/or

X is determined based on one or more of the bandwidth supported by the first terminal device, the quantity l of symbols, N, W, the subcarrier spacing, the frequency range, the cell identifier, the radio frame number, the subframe number, and the slot number; and/or

5 C1 is determined based on one or more of the bandwidth supported by the first terminal device, the quantity l of symbols, N, W, the subcarrier spacing, the frequency range, the cell identifier, the radio frame number, the subframe number, and the slot number; and/or

C2 is determined based on one or more of the bandwidth supported by the first terminal device, the quantity l of symbols, N, W, the subcarrier spacing, the frequency range, the cell identifier, the radio frame number, the subframe number, and the slot number.

10 3. The method according to claim 1 or 2, wherein

$i = \{n + Z\} \bmod (W/2)$, wherein n represents an identifier of a cell in which the first terminal device is located, $Z = W/2 - 2^{l-u}$, l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and mod represents a REM operation; and/or

15 $Y = M/2$, or $Y = 2^{l-u}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter; and/or

$X = W/2 - 2^{l-u+1}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter; and/or

$X = \lceil W/2 - 2^{l-u+1} \rceil / 2$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter; and/or

20 $X = W/2 - 2^{l-1}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter.

4. The method according to claim 1 or 2, wherein

25 $C1 = 2N1 + T$, wherein $N1 = W/2 - 2^{l-u}$; when a result obtained through $n \bmod W$ is greater than or equal to 2^{l-u} and less than or equal to $2^{l-u} + W/2 - 1$, $T = 1$; when the result obtained through $n \bmod W$ is less than 2^{l-u} or greater than $2^{l-u} + W/2 - 1$, $T = 0$, wherein N represents an identifier of a cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and mod represents a REM operation; and/or

30 $C2 = 2N2 + 1 - T$, wherein $N2 = W/2 - 2^{l-u+1}$, or $N2 = \lceil W/2 - 2^{l-u+1} \rceil / 2$; when the result obtained through $n \bmod W$ is greater than or equal to 2^{l-u} and less than or equal to $2^{l-u} + W/2 - 1$, $T = 1$; when the result obtained through $n \bmod W$ is less than 2^{l-u} or greater than $2^{l-u} + W/2 - 1$, $T = 0$, wherein n

represents the identifier of the cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter; and/or

$Y=M/2$, or $Y=2^{l-u}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter.

5. The method according to claim 1 or 2, wherein

$i=n \bmod (W/2)+Z$, wherein n represents an identifier of a cell in which the first terminal device is located, $Z=W/2-2^{l-u+1}$, or $Z=[W/2-2^{l-u+1}]/2$, wherein l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and $\bmod$ represents a REM operation; and/or

$Y=M/2$, or $Y=2^{l-u}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter; and/or

$X=0$.

6. The method according to claim 1 or 2, wherein

$C1=2N1+T$, wherein $N1=W/2-2^{l-u+1}$, or $N1=[W/2-2^{l-u+1}]/2$; when a result obtained through $n \bmod W$ is greater than or equal to 0 and less than or equal to $W/2-1$, $T=0$; when the result obtained through $n \bmod W$ is greater than $W/2-1$, $T=1$, wherein n represents an identifier of a cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and $\bmod$ represents a REM operation; and/or

$Y=M/2$, or $Y=2^{l-u}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter.

7. The method according to claim 1 or 2, wherein the monitoring a first control channel comprises: monitoring the first control channel in a first resource subset or a second resource set, wherein

i , Y , and X in the first resource subset satisfy the following feature: When a result obtained through $n \bmod W/2$ is greater than or equal to 1 and less than or equal to 2^{l+1} , $i=0$, wherein $Y=n \bmod W/2$, and $X=Z$; when the result obtained through $n \bmod W/2$ is less than 1 or greater than or equal to 2^{l+1} , $i=(n+Z) \bmod W/2$, and $X=0$, wherein $Z=W/2-2^{l-u+1}$, or $Z=[W/2-2^{l-u+1}]/2$, n represents an identifier of a cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and $\bmod$ represents a REM operation; and/or

i, Y, and X in the second resource subset satisfy the following feature: When the result obtained through $n \bmod W/2$ is greater than or equal to 1 and less than or equal to 2^{l+1} , $i=W/2$, $Y=n \bmod W/2$, and $X=Z$; when the result obtained through $n \bmod W/2$ is less than 1 or greater than or equal to 2^{l+1} , $i=(n+Z) \bmod W/2+W/2$, and $X=0$, wherein $Z=W/2-2^{l-u+1}$ or $Z=[W/2-2^{l-u+1}]/2$, n represents the identifier of the cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is the subcarrier spacing parameter, and mod represents the REM operation.

8. The method according to claim 1 or 2, wherein

the monitoring a first control channel comprises: monitoring the first control channel in a first resource subset or a second resource set, wherein

i, Y, and X in the first resource subset satisfy the following feature: When a result obtained through $n \bmod W$ is greater than or equal to 1 and less than or equal to N, $C1=W+1-(n \bmod W) \times 2$, $Y=n \bmod 2^{l+1}$, and $C2=Z$; when the result obtained through $n \bmod W$ is greater than or equal to $1+W/2$ and less than or equal to $N+W/2$, $C1=W-(n \bmod W) \times 2$, $Y=n \bmod 2^{l+1}$, $C2=Z+1$, and $N2=n \bmod W/2$; when the result obtained through $n \bmod W$ is greater than or equal to $N+1$ and less than or equal to $W/2$, $C1=Z+1$; when the result obtained through $n \bmod W$ is less than 1 or greater than $N+W/2$, $C1=Z$, wherein $N=2^{l+1}$, $Z=W/2-2^{l-u+1}$ or $Z=[W/2-2^{l-u+1}]/2$, n represents an identifier of a cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and mod represents a REM operation; and/or

i, Y, and X in the second resource subset satisfy the following feature: When the result obtained through $n \bmod W$ is greater than or equal to 1 and less than or equal to N, $C1=W-(N \bmod W) \times 2$, $Y=n \bmod 2^{l+1}$, and $C2=Z+1$; when the result obtained through $n \bmod W$ is greater than or equal to $1+W/2$ and less than or equal to $N+W/2$, $C1=W+1-(n \bmod W) \times 2$, $Y=n \bmod 2^{l+1}$, $C2=Z$, and $N2=n \bmod W/2$; when $n \bmod W$ is greater than or equal to $N+1$ and less than or equal to $W/2$, $C1=Z$; when $n \bmod W$ is greater than or equal to 1 and less than or equal to $N+W/2$, $C1=Z+1$, wherein $N=2^{l+1}$, $Z=W/2-2^{l-u+1}$, or $Z=[W/2-2^{l-u+1}]/2$, n represents the identifier of the cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is the subcarrier spacing parameter, and mod represents the REM operation.

9. The method according to claim 8, wherein the monitoring the first control channel in a first resource subset or a second resource set comprises:

monitoring the first control channel on a resource of the first resource subset in a first time unit and monitoring the first control channel on a resource of the second resource subset in a second time unit.

10. The method according to any one of claims 1 to 9, wherein the method further comprises:

5 receiving, by the first terminal device, second information before receiving the first information, wherein the second information indicates the first terminal device to monitor the first control channel on a resource of the first control resource set, or monitor the first control channel on a resource set not overlapping the first control resource set.

11. A communication method, wherein the method is applicable to a network device, and
10 comprises:

sending first information to a first terminal device, wherein the first information is used to indicate a first control resource set, a quantity of resource blocks of the first control resource set is N, a quantity of resource element group bundles REGbundles of the first control resource set is W, and bandwidth supported by the first terminal device is less than bandwidth corresponding to the N
15 resource blocks, and N and W are positive integers;

sending a first control channel on M REGbundles in the W REGbundles, wherein M is less than W, indexes $\{i, i+1, \dots, i+(Y-1)\}$ of Y REGbundles in the M REGbundles are consecutive, indexes $\{i+(Y+X), i+(Y+X+1), \dots, i+(M-1+X)\}$ of remaining (M-Y) REGbundles in the M REGbundles are consecutive, M represents a quantity of available REGbundles of the first terminal device, i, Y, and X are values determined by the first terminal device, M and Y are positive integers, and i and
20 X are integers greater than or equal to 0; or

sending the first control channel on M control channel element CCE resources corresponding to the M REGbundles in the W REGbundles, wherein M is less than W, indexes of Y CCE resources in the M CCE resources are $\{C1, C1+2, \dots, C1+(Y-1)\times 2\}$, and indexes of remaining (M-Y) CCE
25 resources in the M CCE resources are $\{C2, C2+2, \dots, C2+(M-Y-1)\times 2\}$; or indexes of the M CCE resources in the M CCE resources are $\{C1, C1+2, \dots, C1+(M-1)\times 2\}$; and M represents the quantity of the available REGbundles of the first terminal device, C1, C2, Y, and X are values determined by the first terminal device, M and Y are positive integers, and C1 and C2 are integers greater than or equal to 0.

12. The method according to claim 11, wherein i is determined based on one or more of the bandwidth supported by the first terminal device, a quantity l of symbols comprised in the first

control resource set, N , W , a subcarrier spacing, a frequency range, a cell identifier, a radio frame number, a subframe number, and a slot number; and/or

Y is determined based on one or more of the bandwidth supported by the first terminal device, the quantity l of symbols, N , W , the subcarrier spacing, the frequency range, the cell identifier, the radio frame number, the subframe number, and the slot number; and/or

X is determined based on one or more of the bandwidth supported by the first terminal device, the quantity l of symbols, N , W , the subcarrier spacing, the frequency range, the cell identifier, the radio frame number, the subframe number, and the slot number; and/or

$C1$ is determined based on one or more of the bandwidth supported by the first terminal device, the quantity l of symbols, N , W , the subcarrier spacing, the frequency range, the cell identifier, the radio frame number, the subframe number, and the slot number; and/or

$C2$ is determined based on one or more of the bandwidth supported by the first terminal device, the quantity l of symbols, N , W , the subcarrier spacing, the frequency range, the cell identifier, the radio frame number, the subframe number, and the slot number.

13. The method according to claim 11 or 12, wherein

$i = \{n + Z\} \bmod (W/2)$, wherein n represents an identifier of a cell in which the first terminal device is located, $Z = W/2 - 2^{l-u}$, l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and $\bmod$ represents a REM operation; and/or

$Y = M/2$, or $Y = 2^{l-u}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter; and/or

$X = W/2 - 2^{l-u+1}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter; and/or

$X = [W/2 - 2^{l-u+1}]/2$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter; and/or

$X = W/2 - 2^{l-1}$, wherein l represents the quantity of symbols comprised in the first control resource set, and u is the subcarrier spacing parameter.

14. The method according to claim 11 or 12, wherein

$C1 = 2N1 + T$, wherein $N1 = W/2 - 2^{l-u}$; when a result obtained through $n \bmod W$ is greater than or equal to 2^{l-u} and less than or equal to $2^{l-u} + W/2 - 1$, $T = 1$; when the result obtained through $n \bmod W$ is less than 2^{l-u} or greater than $2^{l-u} + W/2 - 1$, $T = 0$, wherein N represents an identifier of a cell in which the first terminal device is located, l represents the quantity of symbols comprised in the

first control resource set, u is a subcarrier spacing parameter, and mod represents a REM operation;
and/or

$C2=2N2+1-T$, wherein $N2=W/2-2^{l-u+1}$, or $N2=(W/2-2^{l-u+1})/2$; when the result obtained through n
 $\text{mod } W$ is greater than or equal to 2^{l-u} and less than or equal to $2^{l-u}+W/2-1$, $T=1$; when the result
5 obtained through $n \text{ mod } W$ is less than 2^{l-u} or greater than $2^{l-u}+W/2-1$, $T=0$, wherein n represents
the identifier of the cell in which the first terminal device is located, l represents the quantity of
symbols comprised in the first control resource set, and u is the subcarrier spacing parameter;
and/or

$Y=M/2$, or $Y=2^{l-u}$, wherein l represents the quantity of symbols comprised in the first control
10 resource set, and u is the subcarrier spacing parameter.

15. The method according to claim 11 or 12, wherein

$i=n \text{ mod } (W/2)+Z$, wherein n represents an identifier of a cell in which the first terminal device is
located, $Z=W/2-2^{l-u+1}$, or $Z=[W/2-2^{l-u+1}]/2$, wherein l represents the quantity of symbols
comprised in the first control resource set, u is a subcarrier spacing parameter, and mod represents
15 a REM operation; and/or

$Y=M/2$, or $Y=2^{l-u}$, wherein l represents the quantity of symbols comprised in the first control
resource set, and u is the subcarrier spacing parameter; and/or

$X=0$.

16. The method according to claim 11 or 12, wherein

20 $C1=2N1+T$, wherein $N1=W/2-2^{l-u+1}$, or $N1=[W/2-2^{l-u+1}]/2$; when a result obtained through $n \text{ mod } W$
is greater than or equal to 0 and less than or equal to $W/2-1$, $T=0$; when the result obtained
through $n \text{ mod } W$ is greater than $W/2-1$, $T=1$, wherein n represents an identifier of a cell in which
the first terminal device is located, l represents the quantity of symbols comprised in the first
control resource set, u is a subcarrier spacing parameter, and mod represents a REM operation;
25 and/or

$Y=M/2$, or $Y=2^{l-u}$, wherein l represents the quantity of symbols comprised in the first control
resource set, and u is the subcarrier spacing parameter.

17. The method according to claim 11 or 12, wherein the monitoring a first control channel
comprises: monitoring the first control channel in a first resource subset or a second resource set,
30 wherein

i , Y , and X in the first resource subset satisfy the following feature: When a result obtained through

$n \bmod W/2$ is greater than or equal to 1 and less than or equal to 2^{l+1} , $i=0$, wherein $Y=n \bmod W/2$, and $X=Z$; when the result obtained through $n \bmod W/2$ is less than 1 or greater than or equal to 2^{l+1} , $i=(n+Z) \bmod W/2$, and $X=0$, wherein $Z=W/2-2^{l-u+1}$, or $Z=[W/2-2^{l-u+1}]/2$, n represents an identifier of a cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and $\bmod$ represents a REM operation; and/or
 i , Y , and X in the second resource subset satisfy the following feature: When the result obtained through $n \bmod W/2$ is greater than or equal to 1 and less than or equal to 2^{l+1} , $i=W/2$, $Y=n \bmod W/2$, and $X=Z$; when the result obtained through $n \bmod W/2$ is less than 1 or greater than or equal to 2^{l+1} , $i=(n+Z) \bmod W/2+W/2$, and $X=0$, wherein $Z=W/2-2^{l-u+1}$ or $Z=[W/2-2^{l-u+1}]/2$, n represents the identifier of the cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is the subcarrier spacing parameter, and $\bmod$ represents the REM operation.

18. The method according to claim 11 or 12, wherein
 the monitoring a first control channel comprises: monitoring the first control channel in a first resource subset or a second resource set, wherein

i , Y , and X in the first resource subset satisfy the following feature: When a result obtained through $n \bmod W$ is greater than or equal to 1 and less than or equal to N , $C1=W+1-(n \bmod W) \times 2$, $Y=n \bmod 2^{l+1}$, and $C2=Z$; when the result obtained through $n \bmod W$ is greater than or equal to $1+W/2$ and less than or equal to $N+W/2$, $C1=W-(n \bmod W) \times 2$, $Y=n \bmod 2^{l+1}$, $C2=Z+1$, and $N2=n \bmod W/2$; when the result obtained through $n \bmod W$ is greater than or equal to $N+1$ and less than or equal to $W/2$, $C1=Z+1$; when the result obtained through $n \bmod W$ is less than 1 or greater than $N+W/2$, $C1=Z$, wherein $N=2^{l+1}$, $Z=W/2-2^{l-u+1}$ or $Z=[W/2-2^{l-u+1}]/2$, n represents an identifier of a cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is a subcarrier spacing parameter, and $\bmod$ represents a REM operation; and/or

i , Y , and X in the second resource subset satisfy the following feature: When the result obtained through $n \bmod W$ is greater than or equal to 1 and less than or equal to N , $C1=W-(N \bmod W) \times 2$, $Y=n \bmod 2^{l+1}$, and $C2=Z+1$; when the result obtained through $n \bmod W$ is greater than or equal to $1+W/2$ and less than or equal to $N+W/2$, $C1=W+1-(n \bmod W) \times 2$, $Y=n \bmod 2^{l+1}$, $C2=Z$, and $N2=n \bmod W/2$; when $n \bmod W$ is greater than or equal to $N+1$ and less than or equal to $W/2$, $C1=Z$;

when $n \bmod W$ is greater than or equal to 1 and less than or equal to $N+W/2$, $C1=Z+1$, wherein $N=2^{l+1}$, $Z=W/2-2^{l-u+1}$, or $Z=[W/2-2^{l-u+1}]/2$, n represents the identifier of the cell in which the first terminal device is located, l represents the quantity of symbols comprised in the first control resource set, u is the subcarrier spacing parameter, and $\bmod$ represents the REM operation.

- 5 19. The method according to claim 18, wherein the monitoring the first control channel in a first resource subset or a second resource set comprises:

monitoring the first control channel on a resource of the first resource subset in a first time unit and monitoring the first control channel on a resource of the second resource subset in a second time unit.

- 10 20. The method according to any one of claims 11 to 19, wherein the method further comprises: receiving, by the first terminal device, second information before receiving the first information, wherein the second information indicates the first terminal device to monitor the first control channel on a resource of the first control resource set, or monitor the first control channel on a resource set not overlapping the first control resource set.

- 15 21. A communications apparatus, comprising a transceiver module and a processing module, wherein

the processing module is configured to implement the method according to any one of claims 1 to 10 by using the transceiver module.

22. A communications apparatus, comprising a processor and a communications interface, wherein
20 the communications interface is coupled to the processor, and the processor is configured to perform the method according to any one of claims 11 to 20.

23. A computer storage medium, wherein the computer storage medium stores a program or instructions, and when the program or the instructions is/are executed by an apparatus, the method according to any one of claims 1 to 10 or any one of claims 11 to 20 is implemented.

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