

METHOD AND APPARATUS FOR TRANSMITTING DCI, COMMUNICATION DEVICE AND STORAGE MEDIUM

CROSS-REFERENCE TO RELATED APPLICATION

This application is a national phase of International Application No. PCT/CN2019/115405, filed on November 04, 2019, the entire content of which is incorporated herein by reference.

TECHNICAL FIELD

The disclosure relates to the field of wireless communication technologies, and in particular to a method and an apparatus for transmitting downlink control information (DCI), a communication device and a storage medium.

BACKGROUND

In recent years, Internet of Things (IoT) has flourished, bringing many conveniences to human life and work. Machine Type Communication (MTC) is a typical representative of cellular IoT technologies. At present, the MTC technology has been widely applied in smart cities (e.g., meter reading), smart agriculture (e.g., collection of information such as temperature and humidity), smart transportation (e.g., bicycle sharing) and many other fields. A terminal applying the MTC technology can be referred to as an MTC terminal.

However, in a scheduling process of information transmission by the MTC terminal, it is found that there is a problem of large signaling overhead.

SUMMARY

Embodiments of the disclosure provide a method and an apparatus for transmitting DCI, a communication device and a storage medium.

According to a first aspect of embodiments of the disclosure, a method for transmitting DCI is provided, including: transmitting the DCI based on a mapping relationship between at least two of: a number of transmission blocks (TBs) in a multi-TB transmission, hybrid automatic repeat request (HARQ) process numbers in the multi-TB transmission, new data indicators (NDIs) in the multi-TB transmission and a resource configuration mode for the multi-TB transmission.

In some embodiments, the mapping relationship includes: a mapping relationship between the number of TBs and a starting number of consecutively-numbered HARQ process numbers;

WHAT IS CLAIMED IS:

1. A method for transmitting downlink control information (DCI), comprising:
transmitting the DCI based on a mapping relationship between at least two of: a number of transmission blocks (TBs) in a multi-TB transmission, hybrid automatic repeat request (HARQ) process numbers in the multi-TB transmission, new data indicators (NDIs) in the multi-TB transmission and a resource configuration mode for the multi-TB transmission.
2. The method as claimed in claim 1, wherein the mapping relationship comprises at least one of:
a mapping relationship between the number of TBs and a starting number of consecutively-numbered HARQ process numbers;
a mapping relationship between the number of TBs and any combination of the HARQ process numbers; and
a mapping relationship between the number of TBs and a predetermined combination of the HARQ process numbers.
3. The method as claimed in claim 1, wherein the mapping relationship is between at least the number of TBs in the multi-TB transmission and the resource configuration mode for the multi-TB transmission, and comprises at least one of:
a mapping relationship between the number of TBs and a resource configuration mode using different resource granularities as scheduling units;
and,
a mapping relationship between the number of TBs and a resource configuration mode for resource scheduling on different resource sets.
4. The method as claimed in claim 3, wherein, at least one of:
numbers of resources in the different resource sets are different;
and,

locations of resources in the different resource sets are different.

5. The method as claimed in claim 3 or 4, wherein the mapping relationship is between at least the number of TBs and the resource configuration mode using different resource granularities as scheduling units, and comprises at least one of:

a mapping relationship between a number of TBs that is less than a first threshold and a resource configuration mode using a first resource granularity as the scheduling unit;

and

a mapping relationship between a number of TBs that is equal to or greater than the first threshold and a resource configuration mode using a second resource granularity as the scheduling unit;

wherein, the second resource granularity is greater than the first resource granularity.

6. The method as claimed in claim 3 or 4, wherein the mapping relationship is between at least the number of TBs and the resource configuration mode for resource scheduling on different resource sets, and comprises:

a mapping relationship between a number of TBs that is less than a second threshold and a resource configuration mode for resource scheduling on a first resource set; and

a mapping relationship between a number of TBs that is equal to or greater than a second threshold and a resource configuration mode for resource scheduling on a second resource set;

wherein, a number of resource combination modes in the second resource set is smaller than a number of resource combination modes in the first resource set.

7. The method as claimed in claim 1, wherein the mapping relationship comprises:

a mapping relationship between the number of TBs and a first indication state of the NDIs, wherein the first indication state is for indicating that each of the TBs is in a new transmission state;

or,

a mapping relationship between the number of TBs and a second indication state of the

NDIs, wherein the second indication state is for indicating that each of the TBs is in a retransmission state.

8. A method for determining information, comprises:

receiving downlink control information (DCI); and

determining, based on a mapping relationship indicated by the DCI, at least one of the following information: a number of transmission blocks (TBs) in a multi-TB transmission, hybrid automatic repeat request (HARQ) process numbers in the multi-TB transmission, new data indicators (NDIs) in the multi-TB transmission and a resource configuration mode for the multi-TB transmission.

9. An apparatus for transmitting downlink control information (DCI), comprising:

a transmitting module, configured to, transmit the DCI based on a mapping relationship between at least two of: a number of transmission blocks (TBs) in a multi-TB transmission, hybrid automatic repeat request (HARQ) process numbers in the multi-TB transmission, new data indicators (NDIs) in the multi-TB transmission and a resource configuration mode for the multi-TB transmission.

10. The apparatus as claimed in claim 9, wherein the mapping relationship comprises at least one of:

a mapping relationship between the number of TBs and a starting number of consecutively-numbered HARQ process numbers;

a mapping relationship between the number of TBs and any combination of the HARQ process numbers; and

a mapping relationship between the number of TBs and a predetermined combination of the HARQ process numbers.

11. The apparatus as claimed in claim 9, wherein the mapping relationship is between at least the number of TBs in the multi-TB transmission and the resource configuration mode for

the multi-TB transmission, and comprises at least one of:

a mapping relationship between the number of TBs and a resource configuration mode using different resource granularities as scheduling units;

and,

a mapping relationship between the number of TBs and a resource configuration mode for resource scheduling on different resource sets.

12. The apparatus as claimed in claim 11, wherein, at least one of:

numbers of resources in the different resource sets are different;

and,

locations of resources in the different resource sets are different.

13. The apparatus as claimed in claim 11 or 12, wherein the mapping relationship is between at least the number of TBs and the resource configuration mode using different resource granularities as scheduling units, and comprises at least one of:

a mapping relationship between a number of TBs that is less than a first threshold and a resource configuration mode using a first resource granularity as the scheduling unit;

and

a mapping relationship between a number of TBs that is equal to or greater than the first threshold and a resource configuration mode using a second resource granularity as the scheduling unit;

wherein, the second resource granularity is greater than the first resource granularity.

14. The apparatus as claimed in claim 11 or 12, wherein the mapping relationship is between at least the number of TBs and the resource configuration mode for resource scheduling on different resource sets, and comprises:

a mapping relationship between a number of TBs that is less than a second threshold and a resource configuration mode for resource scheduling on a first resource set; and

a mapping relationship between a number of TBs that is equal to or greater than a second

threshold and a resource configuration mode for resource scheduling on a second resource set;
wherein, a number of resource combination modes in the second resource set is smaller than a number of resource combination modes in the first resource set.

15. The apparatus as claimed in claim 9, wherein the mapping relationship comprises:
a mapping relationship between the number of TBs and a first indication state of the NDIs, wherein the first indication state is for indicating that each of the TBs is in a new transmission state;
or,
a mapping relationship between the number of TBs and a second indication state of the NDIs, wherein the second indication state is for indicating that each of the TBs is in a retransmission state.

16. An apparatus for determining information, comprises:
a receiving module, configured to receive downlink control information (DCI); and
a determining module, configured to determine, based on a mapping relationship indicated by the DCI, at least one of the following information: a number of transmission blocks (TBs) in a multi-TB transmission, hybrid automatic repeat request (HARQ) process numbers in the multi-TB transmission, new data indicators (NDIs) in the multi-TB transmission and a resource configuration mode for the multi-TB transmission.

17. A communication device, comprising:
an antenna;
a memory; and
a processor, connected to the antenna and the memory and configured to, by executing computer executable programs stored on the memory, control the antenna to transmit and receive and perform the method as claimed in any one of claims 1 to 7 or as claimed in claim 8.

18. A computer storage medium having stored therein computer executable instructions that, when executed by a processor, the method as claimed in any one of claims 1 to 7 or as claimed in claim 8 is performed.