

Claims

810

1. User Equipment (10), UE, for a Radio Access Network, the UE (10) being adapted for transmitting acknowledgement signaling pertaining to downlink data, the downlink data comprising one or more downlink data elements; wherein the acknowledgement signaling has an uplink signaling format comprising one or more acknowledgement substructures, each of the substructures carrying acknowledgement information pertaining to a downlink data element; wherein further each of the acknowledgment substructures is mapped to a different of the downlink data elements based on at least one acknowledgement position indication provided in downlink control signaling received by the UE (10);

815

820

the acknowledgement position indication comprising a timing indication;
the timing indication indicating a slot for transmitting the acknowledgement signaling;

825

the acknowledgement position indication further comprising a resource selection indication indicating a Physical Uplink Control Channel, PUCCH, resource for transmitting the acknowledgement signaling,

the PUCCH resource being a time-frequency resource and being selected by the resource selection indication from a pool of resources configured to the UE to be available for transmitting the acknowledgement signaling in the slot indicated by the timing indication;

830

wherein further resources of the configured pool of resources the PUCCH resource for transmitting the acknowledgement signaling have different associated formats for transmission of the acknowledgement signaling or different payload size.

835

2. Network node (100) for a Radio Access Network, the network node (100) being adapted for transmitting downlink control signaling comprising an acknowledgement position indication; wherein the acknowledgement position indication indicates a mapping of at least one acknowledgement substructure of an uplink signaling format comprising one or more acknowledgement substructures to a corresponding data element of downlink data, wherein further the acknowledgement substructure is mapped for carrying acknowledgement information pertaining to the downlink data element;

840

the acknowledgement position indication comprising a timing indication;

the timing indication indicating a slot for transmitting the acknowledgement signaling;

845 the acknowledgement position indication further comprising a resource selection indication indicating a Physical Uplink Control Channel, PUCCH, resource for transmitting the acknowledgement signaling,

the PUCCH resource being a time-frequency resource and being selected by the resource selection indication from a pool of resources configured to the UE to
850 be available for transmitting the acknowledgement signaling in the slot indicated by the timing indication;

wherein further resources of the configured pool of resources the PUCCH resource for transmitting the acknowledgement signaling have different associated formats for transmission of the acknowledgement signaling or different payload size.

855

3. Method of operating a User Equipment (10), UE, in a Radio Access Network, the method comprising transmitting acknowledgement signaling pertaining to downlink data, the downlink data comprising one or more downlink data elements; wherein the acknowledgement signaling has an uplink signaling format comprising one or more
860 acknowledgement substructures, each of the substructures carrying acknowledgement information pertaining to a downlink data element; wherein further each of the acknowledgment substructures is mapped to a different of the downlink data elements based on at least one acknowledgement position indication provided in downlink control signaling received by the UE (10);

865 the acknowledgement position indication comprising a timing indication; the timing indication indicating a slot for transmitting the acknowledgement signaling;

the acknowledgement position indication further comprising a resource selection indication indicating a Physical Uplink Control Channel, PUCCH, resource
870 for transmitting the acknowledgement signaling,

the PUCCH resource being a time-frequency resource and being selected by the resource selection indication from a pool of resources configured to the UE to be available for transmitting the acknowledgement signaling in the slot indicated by the timing indication;

875 wherein further resources of the configured pool of resources the PUCCH
resource for transmitting the acknowledgement signaling have different associated
formats for transmission of the acknowledgement signaling or different payload size.

4. Method of operating a network node (100) in a Radio Access Network, the method
880 comprising: transmitting downlink control signaling comprising an acknowledgement
position indication; wherein the acknowledgement position indication indicates a
mapping of at least one acknowledgement substructure of an uplink signaling format
comprising one or more acknowledgement substructures to a corresponding data
element of downlink data, wherein the acknowledgement substructure is mapped for
885 carrying acknowledgement information pertaining to the downlink data element

 the acknowledgement position indication comprising a timing indication;
 the timing indication indicating a slot for transmitting the acknowledgement
signaling;

 the acknowledgement position indication further comprising a resource
890 selection indication indicating a Physical Uplink Control Channel, PUCCH, resource
for transmitting the acknowledgement signaling,

 the PUCCH resource being a time-frequency resource and being selected
by the resource selection indication from a pool of resources configured to the UE to
be available for transmitting the acknowledgement signaling in the slot indicated by the
895 timing indication;

 wherein further resources of the configured pool of resources the PUCCH
resource for transmitting the acknowledgement signaling have different associated
formats for transmission of the acknowledgement signaling or different payload size.

900 5. Method or device according to one of the preceding claims, wherein the downlink
control signaling and the downlink data are transmitted on different channels, in
particular different physical channels.

6. Method or device according to one of the preceding claims, wherein
905 acknowledgement information represents an acknowledgment or non-
acknowledgement of correct reception of the corresponding data element, and
optionally represents an indication of non-reception.

910 7. Method or device according to one of the preceding claims, wherein the
acknowledgement position indication is selective between two or more different uplink
signaling formats.

915 8. Method or device according to one of the preceding claims, wherein the
acknowledgment position indication indicates a timing and/or resource for transmitting
the acknowledgement signaling.

920 9. Method or device according to one of the preceding claims, wherein the downlink
control signaling comprises one or more messages, wherein each message may
comprise at least one acknowledgement position indication.

10. Method or device according to one of the preceding claims, wherein the
acknowledgment position indication pertains to one downlink data element.

925 11. Method or device according to one of the preceding claims, wherein the
acknowledgement position indication comprises a timing indication like a timing
parameter, the timing indication indicating a timing for transmitting the
acknowledgement signaling, as well as indicating to which acknowledgement
substructure of a resource a data element is mapped.

930 12. Method or device according to one of the preceding claims, wherein a timing
represents a time interval like a slot for transmitting the acknowledgement signaling.

935 13. Program product comprising instructions causing processing circuitry to perform
and/or control a method according to one of claims 3 to 12.

14. Carrier medium arrangement carrying and/or storing a program product according
to claim 13.

940