

CLAIMS

1. A method of wireless communication performed by an enhanced machine-type communications (eMTC) user equipment (UE), comprising: receiving, via a system information block (SIB) type 1 (SIB-1), an indicator comprising a one-bit flag configured to indicate whether use of a control region of a Long Term Evolution (LTE) physical downlink control channel (PDCCH) for a downlink transmission is enabled or disabled; and receiving, based at least in part on a backward compatible resource element mapping that is determined based at least in part on receiving the indicator, the downlink transmission during the control region.
2. The method of claim 1, wherein the indicator is included in a system information block message or a radio resource control message.
3. The method of claim 1, wherein the downlink transmission is associated with a machine-type communications physical downlink control channel or a physical downlink shared channel.
4. The method of claim 1, wherein the indicator identifies one or more symbols in the control region for the downlink transmission.
5. The method of claim 1, wherein the indicator includes two or more bitmaps, wherein a first bitmap, of the two or more bitmaps, identifies a set of frequency domain resources using at least one of: a resource block granularity, a narrowband granularity, and wherein a second bitmap, of the two or more bitmaps, identifies a set of time domain resources of subframes associated with the control region.
6. The method of claim 1, wherein the downlink transmission is received using at least one of: a narrowband, of a set of narrowbands of the control region, configured by a bitmap, a physical resource block, of a set of physical resource blocks of the control region, configured by the bitmap, or a subframe, of a set of subframes associated with the control region, configured by the bitmap.
7. The method of claim 1, wherein the downlink transmission is received using the control region of a subframe and a data region of the subframe and the backward compatible resource element mapping is performed on a frequency first, time second basis for the data region and then to the control region.
8. The method of claim 1, wherein the downlink transmission is received using the control region of a subframe and a data region of the subframe and the backward compatible resource element mapping is performed using the data region and then repeating in-phase and quadrature (IQ) data of a subset of symbols of the data region to the control region.
9. The method of claim 8, wherein the subset of symbols is an initial subset of symbols of a second slot of the data region.
10. The method of claim 8, wherein the subset of symbols is another subset of symbols of the data region and the backward compatible resource element mapping includes puncturing one or more resource elements reserved for cell specific reference signals in the control region.

11. The method of claim 1, wherein resource element mapping is performed on at least one of a per radio network temporary identifier basis, a per search space basis, or a per channel type basis.

12. The method of claim 1, wherein the eMTC UE is configured to provide a capability indication identifying a capability of receiving the downlink transmission in the control region, and wherein the downlink transmission in the control region is received based at least in part on providing the capability indication.

13. The method of claim 1, wherein the backward compatible resource element mapping is a channel-specific resource element mapping.

14. The method of claim 1, wherein the eMTC UE is configured to decode the downlink transmission, based at least in part on the backward compatible resource element mapping, using bits of a data region and without decoding bits of a control region.

15. The method of claim 1, wherein the eMTC UE is configured to decode the downlink transmission using bits of a data region and bits of a control region.

16. A method of wireless communication performed by a network entity, comprising: transmitting, via a system information block (SIB) type 1 (SIB-1) and for an enhanced machine-type communications (eMTC) user equipment (UE), an indicator comprising a one-bit flag configured to indicate whether use of a control region of a Long Term Evolution (LTE) physical downlink control channel (PDCCH) for a downlink transmission is enabled or disabled, wherein the indicator is associated with identifying a backward compatible resource element mapping for the downlink transmission; and transmitting, based at least in part on transmitting the indicator and in accordance with the backward compatible resource element mapping, the downlink transmission during the control region.

17. The method of claim 16, wherein the indicator is included in a system information block message or a radio resource control message.

18. The method of claim 16, wherein the downlink transmission is associated with a machine-type communications physical downlink control channel or a physical downlink shared channel.

19. The method of claim 16, wherein the indicator identifies one or more symbols in the control region for the downlink transmission.

20. The method of claim 16, wherein the indicator includes two or more bitmaps, wherein a first bitmap, of the two or more bitmaps, identifies a set of frequency domain resources using at least one of: a resource block granularity, a narrowband granularity, and wherein a second bitmap, of the two or more bitmaps, identifies a set of time domain resources of subframes associated with the control region.

21. The method of claim 16, wherein the downlink transmission is transmitted using at least one of: a narrowband, of a set of narrowbands of the control region, configured by a bitmap, a physical resource block, of a set of physical resource blocks of the control region, configured by the bitmap, or a subframe, of a set of subframes associated with the control region, configured by the bitmap.

22. The method of claim 16, wherein the downlink transmission is transmitted using the control region of a subframe and a data region of the subframe and the backward compatible resource element mapping is performed on a frequency first, time second basis for the data region and then to the control region.
23. The method of claim 16, wherein the downlink transmission is transmitted using the control region of a subframe and a data region of the subframe and the backward compatible resource element mapping is performed using the data region and then repeating in-phase and quadrature (IQ) data of a subset of symbols of the data region to the control region.
24. The method of claim 23, wherein the subset of symbols is an initial subset of symbols of a second slot of the data region.
25. The method of claim 23, wherein the subset of symbols is another subset of symbols of a data region and the backward compatible resource element mapping includes puncturing one or more resource elements reserved for cell specific reference signals in the control region.
26. The method of claim 16, wherein resource element mapping is performed on at least one of a per radio network temporary identifier basis, a per search space basis, or a per channel type basis.
27. The method of claim 16, wherein the network entity is configured to receive a capability indication identifying a capability of the eMTC UE of receiving the downlink transmission in the control region, and wherein the downlink transmission is transmitted based at least in part on receiving the capability indication.
28. The method of claim 16, wherein the backward compatible resource element mapping is a channel-specific resource element mapping.
29. The method of claim 16, wherein the backwards compatible resource element mapping is configured such that the downlink transmission is decodable using bits of a data region and without decoding bits of a control region.
30. The method of claim 16, wherein the backwards compatible resource element mapping is configured such that the downlink transmission is decodable using bits of a data region and bits of a control region.
31. An enhanced machine type communications (eMTC) user equipment (UE) for wireless communication, comprising: a memory; and one or more processors, coupled to the memory, configured to: receive, via a system information block (SIB) type 1 (SIB-1), an indicator comprising a one-bit flag configured to indicate whether use of a control region of a Long Term Evolution (LTE) physical downlink control channel (PDCCH) for a downlink transmission is enabled or disabled; and receive, based at least in part on a backward compatible resource element mapping that is determined based at least in part on receiving the indicator, the downlink transmission during the control region.
32. The UE of claim 31, wherein the indicator is included in a system information block message or a radio resource control message.
33. The UE of claim 31, wherein the downlink transmission is associated with a machine-type communications physical downlink control channel or a physical downlink shared channel.

34. The UE of claim 31, wherein the indicator identifies one or more symbols in the control region for the downlink transmission.

35. A network entity for wireless communication, comprising: a memory; and one or more processors, coupled to the memory, configured to: transmit, via a system information block (SIB) type 1 (SIB-1) and for an enhanced machine-type communications (eMTC) user equipment (UE), an indicator comprising a one-bit flag configured to indicate whether use of a control region of a Long Term Evolution (LTE) physical downlink control channel (PDCCH) for a downlink transmission is enabled or disabled, wherein the indicator is associated with identifying a backward compatible resource element mapping for the downlink transmission; and transmit, based at least in part on transmitting the indicator and in accordance with the backward compatible resource element mapping, the downlink transmission during the control region.

36. The network entity of claim 35, wherein the indicator is included in a system information block message or a radio resource control message.

37. The network entity of claim 35, wherein the downlink transmission is associated with a machine-type communications physical downlink control channel or a physical downlink shared channel.

38. The network entity of claim 35, wherein the indicator identifies one or more symbols in the control region for the downlink transmission.

39. A non-transitory computer-readable medium storing one or more instructions for wireless communication, the one or more instructions comprising: one or more instructions that, when executed by one or more processors of an enhanced machine-type communications (eMTC) user equipment (UE), cause the one or more processors to: receive, via a system information block (SIB) type 1 (SIB-1), an indicator comprising a one-bit flag configured to indicate whether use of a control region of a Long Term Evolution (LTE) physical downlink control channel (PDCCH) for a downlink transmission is enabled or disabled; and receive, based at least in part on a backward compatible resource element mapping that is determined based at least in part on receiving the indicator, the downlink transmission during the control region.

40. The non-transitory computer-readable medium of claim 39, wherein the indicator is included in a system information block message or a radio resource control message.

41. The non-transitory computer-readable medium of claim 39, wherein the downlink transmission is associated with a machine-type communications physical downlink control channel or a physical downlink shared channel.

42. The non-transitory computer-readable medium of claim 39, wherein the indicator identifies one or more symbols in the control region for the downlink transmission.

43. A non-transitory computer-readable medium storing one or more instructions for wireless communication, the one or more instructions comprising: one or more instructions that, when executed by one or more processors of network entity, cause the one or more processors to: transmit, via a system information block (SIB) type 1 (SIB-1) and for an enhanced machine-type communications (eMTC) user equipment (UE), an indicator comprising a one-bit flag configured to indicate whether use of a control region of a Long Term Evolution (LTE) physical downlink control channel (PDCCH) for a downlink transmission is enabled or

disabled to the cMTC UE, wherein the indicator is associated with identifying a backward compatible resource element mapping for the downlink transmission; and transmit, based at least in part on transmitting the indicator and in accordance with the backward compatible resource element mapping, the downlink transmission during the control region.

44. The non-transitory computer-readable medium of claim 43, wherein the indicator is included in a system information block message or a radio resource control message.

45. The non-transitory computer-readable medium of claim 43, wherein the downlink transmission is associated with a machine-type communications physical downlink control channel or a physical downlink shared channel.

46. An apparatus for wireless communication, comprising: means for receiving, via a system information block (SIB) type 1 (SIB-1), an indicator comprising a one-bit flag configured to indicate whether use of a control region of a Long Term Evolution (LTE) physical downlink control channel (PDCCH) for a downlink transmission is enabled or disabled; and means for receiving, based at least in part on a backward compatible resource element mapping that is determined based at least in part on receiving the indicator, the downlink transmission during the control region.

47. The apparatus of claim 46, wherein the indicator is included in a system information block message or a radio resource control message.

48. The apparatus of claim 46, wherein the downlink transmission is associated with a machine-type communications physical downlink control channel or a physical downlink shared channel.

49. An apparatus for wireless communication, comprising: means for transmitting, via a system information block (SIB) type 1 (SIB-1) and for an enhanced machine-type communications (eMTC) user equipment (UE), an indicator comprising a one-bit flag configured to indicate whether use of a control region of a Long Term Evolution (LTE) physical downlink control channel (PDCCH) for a downlink transmission is enabled or disabled, wherein the indicator is associated with identifying a backward compatible resource element mapping for the downlink transmission; and means for transmitting, based at least in part on transmitting the indicator and in accordance with the backward compatible resource element mapping, the downlink transmission during the control region.

50. The apparatus of claim 49, wherein the indicator is included in a system information block message or a radio resource control message.