CLAIMS

1. A method in a user equipment for measuring the instantaneous downlink channel quality indicator (CQI), and reporting the measured CQI to the network when higher order modulation of 64QAM and above can be used for downlink data transmission, characterized by the steps of:
- deriving a true CQI based upon at least one network controlled parameter and a measured channel quality parameter;
- scaling said true CQI value to a new CQI value such that the new CQI will fall within a specified range of CQI values;
- reporting the new CQI achieved by scaling the derived CQI value in order to report every CQI value with the same number of bits over the entire reporting range.

2. A method according to claim 1, wherein the derived CQI value is scaled by a scaling factor which is a function of a signal-to-interference ratio (SIR) measured by the user equipment

3. A method according to claim 2, wherein the derived CQI is scaled by a scaling factor which is a function of the SIR estimated on HS-PDSCH in a CDMA system.

4. A method according to claim 2, wherein the derived CQI is scaled by a scaling factor which is a function of the SIR estimated on common pilot symbols in a CDMA system.

5. A method according to claim 2, wherein the derived CQI is scaled by a scaling factor which is a function of the SIR estimated on DL-SCH.

6. A method according to claim 2, wherein the derived CQI is scaled by a scaling factor which is a function of the SIR estimated on downlink reference signals.

7. A method according to any of the previous claims, wherein the user equipment takes into consideration at least two network signaled power offset values, where the first value is larger than the second one, to scale the derived CQI depending upon the value of the derived CQI in relation to a certain threshold.

8. A method according to claim 7, wherein the user equipment initially derives its CQI using the first power offset value, i.e. the larger value.

9. A method according to claim 8, wherein if the derived CQI is smaller than the threshold then the user equipment shall scale the CQI according to the first value of the power offset otherwise the second value of the power offset is used to scale the derived CQI.

10. A method according to any preceding claim, wherein the higher order modulation is 64 QAM.

11. A method according to any preceding claim, further characterized by:

scaling said true CQI value to a new CQI value by a scaling factor which is a function of a second channel quality parameter measured by the user equipment.

12. A method as claimed in claim 11, wherein the second channel quality parameter is the same as the first channel quality parameter.

13. A user equipment, for communicating with a radio base station in a wireless telecommunications network, wherein the user equipment is configured to measure the instantaneous downlink channel quality indicator, and report the measured channel quality indicator to the network, by means of the method according to any of claims 1 to 12.

14. A method in a base station of receiving the downlink channel quality indicator (CQI) from the user equipment and using the received CQI for transmitting data and if necessary using higher order modulation such as 64 QAM, characterized by:

- Interpreting the reported CQI according to a scaling applied by the user equipment on the derived true CQI.

15. A radio base station for communicating with a plurality of user equipments, and having means for connection to a radio network controller of a wireless telecommunications network, wherein the radio base station is configured to receive a downlink channel quality indicator from a user equipment, by means of the method according to claim 14.

16. A method in a base station of receiving downlink channel quality indicator (CQI) from a user equipment and using the received CQI to be able to transmit data and if necessary using higher order modulation, characterized by:

- Collecting the statistics of the received CQI reports and based on the statistics reporting an event to the radio network controller in case the CQI statistics indicate significant change in the downlink channel quality.

17. A method according to claim 16, wherein the received CQI is used for transmitting data on HS-PDSCH in a CDMA system.

18. A method according to claim 16 or 17, wherein the higher order modulation is 64 QAM.

19. A radio base station for communicating with a plurality of user equipments, and having means for connection to a radio network controller of a wireless telecommunications network, wherein the radio base station is configured to receive a downlink channel quality indicator from a user equipment, by means of the method according to one of claims 16 to 18.

20. A method in a radio network controller of receiving the downlink channel quality measurements and signaling to the base station the configured power offset, which is currently used by the user equipment to derive the CQI and report the derived CQI to the base station, characterized by the steps of

- configuring an event at the base station to indicate significant change in CQI statistics.
- receiving and interpreting the event reported by the base station.
- reconfiguring the power offset at the user equipment if necessary.
- signaling the reconfigured power offset to the base station if the reconfiguration was done at the user equipment.

21. A radio network controller for communicating with a radio base station of a wireless telecommunications network, the radio network controller being configured to receive the downlink channel quality measurements and signal to the base station by means of the method according to claim 20.

22. A method in a radio network controller of configuring a user equipment with parameters to assist the user equipment in deriving CQI, characterized by,

- configuring the user equipment with at least two different power offset values to be used by the user equipment to derive the CQI and in addition if necessary also,
- configuring the user equipment with a threshold value (μ) to trigger which power offset value to be used by the user equipment.

23. A method according to claim 22, wherein the larger power offset is configured to be used by the user equipment to report the CQI when the derived CQI is less than the specified threshold or the configured threshold (μ), otherwise the smaller power offset is configured to be used by the user equipment to report the CQI.

24. A radio network controller for communicating through a radio base station of a wireless telecommunications network with at least one user equipment, the radio network controller being configured to configure the user equipment by means of the method according to claim 22 or 23.

25. A method in a wireless telecommunications network, for measuring an instantaneous downlink channel quality indicator (CQI) and reporting the measured CQI to the network, characterized by the steps of:

in a user equipment, measuring a channel quality parameter;

in the user equipment, deriving a first CQI value on the basis of the measured channel quality parameter and at least a first offset;

in the user equipment, updating said first offset;

in the user equipment, deriving a second CQI value on the basis of the measured channel quality parameter and said updated first offset, such that the second CQI value falls within a specified range of CQI values; and

in the user equipment, reporting said second CQI value to the network.

26. A method as claimed in claim 25, wherein the measured channel quality parameter is a signal-to-interference ratio (SIR).

27. A method as claimed in claim 25 or 26, wherein the first CQI value comprises a first number of bits and the specified range of CQI values corresponds to a second number of bits, the first number of bits being greater than the second number of bits.

28. A method as claimed in any one of claims 25–27, wherein said updating step comprises:

in the user equipment, selecting one of a plurality of preset first offset values.

29. A method as claimed in claim 28, wherein said updating step further comprises:

in the user equipment, comparing said first CQI value with a threshold value;

wherein said selecting step is based on the result of said comparison.

30. A user equipment, for communicating with a radio base station in a wireless telecommunications network, wherein the user equipment is configured to measure the instantaneous downlink channel quality indicator, and report the measured channel quality indicator to the network, by means of the method according to any of claims 25 to 29.

**Claims**

1. A method in a user equipment (40) for measuring the instantaneous downlink channel quality indicator, CQI, and reporting the measured CQI to the network when higher order modulation of 64QAM and above can be used for downlink data transmission, the method comprises the step of:

- deriving (110) a true CQI based upon at least one network controlled parameter and a measured channel quality parameter;

the method being characterized by the further steps of

- scaling (120) said true CQI value by multiplying with a scaling factor to a new CQI value such that the new CQI will fall within a specified range of CQI values;

- reporting (130) the new CQI achieved by scaling the derived CQI value in order to report every CQI value with the same number of bits over the entire reporting range.

2. A method according to claim 1, wherein the derived CQI value is scaled (120) by the scaling factor which is a function of a signal-to-interference ratio, SIR, measured by the user equipment.

3. A method according to claim 2, wherein the derived CQI is scaled (120) by the scaling factor which is a function of the SIR estimated on HS-PDSCH in a CDMA system.

4. A method according to claim 2, wherein the derived CQI is scaled (120) by the scaling factor which is a function of the SIR estimated on common pilot symbols in a CDMA system.

5. A method according to claim 2, wherein the derived CQI is scaled (120) by the scaling factor which is a function of the SIR estimated on DL-SCH.

6. A method according to claim 2, wherein the derived CQI is scaled (120) by the scaling factor which is a function of the SIR estimated on downlink reference signals.

7. A method according to any of the previous claims, wherein the user equipment (40) takes into consideration at least two network signaled power offset values, where the first value is larger than the second one, to scale the derived CQI depending upon the value of the derived CQI in relation to a certain threshold.

8. A method according to claim 7, wherein the user equipment (40) initially derives its CQI using the first power offset value, i.e. the larger value.

9. A method according to claim 8, wherein if the derived CQI is smaller than the threshold then the user equipment (40) shall scale (120) the CQI according to the first value of the power offset otherwise the second value of the power offset is used to scale (120) the derived COI.

10. A method according to any preceding claim, wherein the higher order modulation is 64 QAM.

11. A method according to any preceding claim, further characterized by:

Scaling (120) said true CQI value to a new CQI value by a scaling factor which is a function of a second channel quality parameter measured by the user equipment.

12. A method as claimed in claim 11, wherein the second channel quality parameter is the same as the first channel quality parameter.

13. A user equipment (40), for communicating with a radio base station (20) in a wireless telecommunications network (10), wherein the user equipment (40) is configured to measure the instantaneous downlink channel quality indicator, and report the measured channel quality indicator to the network, by means of the method according to any of claims 1 to 12.