

Agenda item:

Source: Ericsson

Title: Additional required measurements in UTRA/FDD

Document for: Approval

1 Introduction

At RAN WG2#5 several measurement quantities were incorporated in TS 25.302 v2.4.0 as measurement to be provided by the physical layer to higher layers. Among the new measurements incorporated in TS 25.302 are Transport CH BLER, Physical CH BER, UE Tx Power. The aim of this document is to incorporate these three measurement quantities in the layer 1 specification 25.231.

2 Measurements defined by WG2

2.1 General

Our understanding is that TSG RAN WG2 specifies which measurements that are needed from the physical layer (25.302). The measurements in this section have been defined by WG2 in 25.302 v2.4.0 and therefore the necessity of the measurement quantities are not discussed in this section, as they are already decided within WG2.

2.2 Transport CH BLER

This measurement is an estimation of the transport channel block error rate (BLER). The BLER measurement is based on evaluation of the CRC added to each transport block. The calculated BLER value for a transport channel can be updated at each reception of a transport block. It shall be possible to estimate BLER both for uplink and downlink transport channels.

The transport CH BLER can for example be used in the outer loop power control.

2.3 Physical CH BER

The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding. The BER estimation of a physical channel shall be calculated only on the data part. It shall be possible to estimate BER both for uplink and downlink channels.

The BER measurement can be used in situations where faster response of the channel quality than what can be provided by the BLER measurement is needed. The BER measurement can for example be used together with the BLER measurement in the outer loop power control.

2.4 UE Tx Power

The total UE transmitted power on one carrier measured on DPCCH/DPDCH. The reference point for the total Tx power measurement shall be the UE antenna connector.

The total transmitted power can be used for monitoring if the average Tx power is reaching an upper or lower power limit, this upper or lower limit can either be connected to the UE capability or also a max and min set by the network.

It is our understanding that it very difficult to achieve good absolute accuracy on this measurement and therefore the precision requirement set to 3dB by WG2 in 25.302 v2.4.0 may have to be investigated further by WG4 before it can be accepted by WG1.

3 Proposal

It is proposed that UE layer 1 shall be able to measure and report the following quantities:

1. Transport CH BLER,
2. Physical CH BER,
3. UE Tx Power,

to higher layers.

It is proposed that UTRAN layer 1 shall be able to measure and report the following quantities:

1. Transport CH BLER,
2. Physical CH BER,

to higher layers.

Text proposals for the proposed measurements are found in section 4.

4 Text Proposal for TS 25.231

8 Radio link measurements

8.1 UE measurement abilities

8.1.6 Transport CH BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block.
Purpose	Outer loop power control.
Filtering	TBD.
Range/mapping	TBD.

Transport channel(s) where the measurement shall be possible.	Idle mode/Connected mode (I/C)	
	Intra-frequency	Inter-frequency
Transport channel DCH carried by physical channel DPCH after RL combination.	C	N.A.

8.1.7 Physical CH BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding. The BER estimation shall be calculated only on the data part.
Purpose	Outer loop power control.

Filtering	TBD.
Range/mapping	TBD.

Transport channel(s) where the measurement shall be possible.	Idle mode/Connected mode (I/C)	
	Intra-frequency	Inter-frequency
Transport channel DCH carried by physical channel DPCH after RL combination.	C	N.A.

8.1.8 UE TX Power

Note that the precision requirement on UE Tx Power set to 3dB by WG2 in 25.302 v2.4.0 has to be further investigated by WG4 before it can be accepted by WG1.

Definition	The total UE transmitted power on one carrier measured on DPCCH/DPDCH. The reference point for the UE TX Power shall be the UE antenna connector.
Purpose	Monitoring if the average Tx power is reaching an upper or lower power limit, either connected to the UE capability or set by the network.
Filtering	TBD.
Range/mapping	TBD.

8.2 UTRAN measurement abilities

8.2.5 Transport CH BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block.
Purpose	Handover evaluation, outer loop power control.
Filtering	TBD.
Range/mapping	TBD.

Transport channel(s) where the measurement shall be possible.
Transport channel DCH carried by physical channel DPDCH after RL combination.

8.2.6 Physical CH BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding. The BER estimation shall be calculated only on the data part.
Purpose	Macrodiversity combining, outer loop power control.
Filtering	TBD.

Range/mapping	TBD.
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Transport channel(s) where the measurement shall be possible.
Transport channel DCH carried by physical channel DPDCH after RL combination.

5 References

[1] TS 25.302 v2.4.0 Services provided by the Physical Layer