

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P73065WO1	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/IB2018/057659	International filing date (day/month/year) 02.10.2018	Priority date (day/month/year) 02.10.2017	
International Patent Classification (IPC) or national classification and IPC INV. H04W36/00			
Applicant Telefonaktiebolaget LM Ericsson (publ)			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>10</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (sent to the applicant and to the International Bureau) a total of <u>10</u> sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).			
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ Box No. II Priority ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability ☐ Box No. IV Lack of unity of invention ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement ☐ Box No. VI Certain documents cited ☒ Box No. VII Certain defects in the international application ☒ Box No. VIII Certain observations on the international application			
Date of submission of the demand 02.08.2019		Date of completion of this report 09.01.2020	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465		Authorized officer Davidovic, Sasa Telephone No. +49 89 2399-7264	



Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-30 as originally filed

Claims, Numbers

1-27 filed with the letter of

02-09-2019

Drawings, Sheets

1/3-3/3 as originally filed

- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IB2018/057659

6. ☒ With regard to top-up searches (Rules 66.1 *ter* and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 13.12.2019 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
 - ☐ Additional relevant documents have been discovered during the top-up search.
 - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded".

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-27</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-27</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-27</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

- D1 HUAWEI ET AL: "Cell search and system information acquisition improvements in eFeMTC",
3GPP DRAFT; R1-1712105, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE
,
vol. RAN WG1, no. Prague, Czech Republic; 20170821 - 20170825 20 August 2017 (2017-08-20), XP051314925,
Retrieved from the Internet:
URL:http://www.3gpp.org/ftp/Meetings_3GPP_SYNC/RAN1/Docs/
[retrieved on 2017-08-20]
- D2 HUAWEI ET AL: "System information acquisition enhancements for NB-IoT",
3GPP DRAFT; R2-1711334 SYSTEM INFORMATION ENHANCEMENTS IN NB-IOT, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANC
,
vol. RAN WG2, no. Prague, Czech Republic; 20171009 - 20171013 28 September 2017 (2017-09-28), XP051354489,
Retrieved from the Internet:
URL:http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_99bis/Docs/
[retrieved on 2017-09-28]
- D3 ERICSSON: "Reduced system acquisition time for NB-IoT",
3GPP DRAFT; R1-1706894 - REDUCED SYSTEM ACQUISITION TIME FOR NB-IOT, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FR
,
vol. TSG RAN, no. Hangzhou, China; 20170515 - 20170519 6 May 2017 (2017-05-06), XP051261553,
Retrieved from the Internet:
URL:http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_89/Docs/
[retrieved on 2017-05-06]

- D4 HUAWEI ET AL: "Skip system information reading for MTC upon cell reselection",
3GPP DRAFT; R2-1711217, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE
,
vol. RAN WG2, no. Prague, Czech Republic; 20171009 - 20171013 29 September 2017 (2017-09-29), XP051355467,
Retrieved from the Internet:
URL:http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_99bis/Docs/
[retrieved on 2017-09-29]

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1 The below-mentioned lack of clarity notwithstanding (Item VIII), it is noted that it appears that the features of independent **claims 1, 10 and 19** are not disclosed in or rendered obvious by the cited documents.
- 1.1 Document **D1** discloses a procedure for adapting acquisition of system information for MTC UEs based of information whether the SI of a neighbour cell has changed via an indicator in SIB of the serving cell. If the SIB of the serving cell indicates that the SI of the neighbouring cell has not changed, the UE obtains the SI (including CGI) of the neighbour cell from the memory of the UE and skips receiving the SI from the neighbouring cell. Otherwise, the UE obtains the SI (including CGI) by performing signal reception from the neighbouring cell, and as such requires longer time than obtaining the SI from the UE memory.

Document **D2** discloses a similar procedure to that of **D1**, where a UE performs skipping of SI reading of a neighbour cell if the serving cell indicates that the SI of the neighbour cell has not changed (and obtains the neighbour cell SI from

the UE memory), or performs SI reception from the neighbour cell if the serving cell indicates that that the SI of the neighbour cell has changed.

- 1.2 Both **D1** and **D2** fail to disclose the feature:
- DF: *"if a target cell transmits SI where the fields other than frame numbers do not change in different transmission periods over a certain period of time, obtaining by the WD from the target cell a Cell Global Identity (CGI) of the target cell within a first time period"* of **claims 1, 10 and 19**.

Due to the above mentioned distinguishing feature, **claims 1, 10 and 19** are novel over disclosure of **D1** and **D2** (Articles 33(1) and 33(2) PCT).

- 1.3 Document **D1** relates to adapting (i.e. accelerating) acquisition of system information for MTC UEs based on information whether the SI of a neighbour cell has changed, presents most of the details on how the SI obtaining (i.e. SI reception skipping) procedure is performed, and as such provides the best starting point for the assessment of an inventive step. Therefore, **D1** is considered to be the closest prior art.

The technical effect achieved by the above mentioned distinguishing feature DF is reduction of time needed to obtain neighbour cell SI.

The objective technical problem may therefore be regarded as how to provide an alternative solution to achieve the technical effect.

- 1.4 The solution to the above mentioned objective technical problem, as defined by the subject-matter of independent **claims 1, 10 and 19**, is neither disclosed in nor rendered obvious from the disclosure of document **D1**, either alone or in combination with any of cited prior art documents, including **D2**.

In particular, both **D1** and **D2** only disclose usage of stored (i.e. previously obtained) neighbour cell SI in order to accelerate the procedure of obtaining the neighbour cell SI if indicated that the SI has not changed. Both **D1** and **D2** are silent on obtaining neighbour cell SI (in case it has not changed) by receiving it from the neighbour cell, wherein the obtaining procedure is shorter than a standard full SI/CGI reception procedure (i.e. the SI reception procedure where some parts of the SI, other than frame numbers, have changed in different SI

transmission periods). It is noted that even though **D1** and **D2** both disclose usage of combining/aggregation of SI receptions over different SI modification periods in order to accelerate SI reception for MTC devices, this procedure is not disclosed with relation to SI reception of neighbour cells, but is (implicitly) only proposed for SI reception of the serving cell. Finally, when taking into account the common knowledge of the skilled person, the feature combination included in independent **claims 1, 10 and 19** of the present application is not rendered obvious.

The alternative solution provided by the above mentioned distinguishing features overcomes in a non-obvious way the disadvantages of the solutions disclosed in **D1** and **D2** by receiving the SI from the target cell also in case when the SI has not changed in different transmission periods over a certain period of time, wherein in this case a shorter (i.e. a faster) reception procedure is used (e.g. by combining multiple SI transmissions received over different modification periods), and thereby avoiding reliance on previously received/stored SI. In this way the UE assures that it uses correct and up-to-date SI, which in case of the solutions provided by **D1** and **D2** may be outdated (e.g. in case the UE incorrectly decodes the latest indication of neighbour SI change and does not perform SI reading and update, which is particularly possible in case of MTC UEs located in enhanced coverage regions), or incorrectly stored in the UE (e.g. due to close distance of the MTC device/sensor to an interfering apparatus, e.g. a power line, electromagnetic device, etc.).

Thus, the subject-matter of independent **claims 1, 10 and 19** is neither disclosed in, nor rendered obvious from the disclosure of document **D1** or any of the other prior art documents, neither on its own nor in the combination. As a consequence, the skilled person, departing from the available prior art and common knowledge in this technical field, would not arrive to the subject-matter of the present invention without using any inventive skills.

Therefore, it is considered that the subject-matter of independent **claims 1, 10 and 19** involves an inventive step (Articles 33(1) and 33(3) PCT).

- 2 **Dependent claims 2-9, 11-18 and 20-27** define advantageous embodiments of **claims 1, 10 and 19**, respectively.

Therefore, it is considered that the subject-matter of dependent **claims 2-9, 11-18 and 20-27** is equally new and involves an inventive step (Articles 33(1), 33(2) and 33(3) PCT).

- 3 Finally, the subject-matter of **claims 1-27** is considered as industrially applicable (Articles 33(1) and 33(4) PCT).

Re Item VII

Certain defects in the international application

- 1 Any independent claim should have been correctly cast in the two-part form, with those features which in combination are part of the nearest prior art being placed in the preamble (see Rule 6.3(b) PCT).
- 2 Reference signs in parenthesis should have been included in the claims in order to increase their intelligibility (see Rule 6.2(b) PCT).
- 3 It is noted that **claims 1, 2, 5, 10, 11, 14, 19, 20 and 23** include bracketed abbreviations (i.e. SI, WD, CGI, QSI, T0, Tr) which are not reference signs in the sense of Rule 6.2(b) PCT. In order to meet the requirements of Article 6 PCT the brackets around said abbreviations should have been replaced by commas.
- 4 The documents **D1-D3**, which represent a relevant state of the art with regard to the present invention, should have been identified in the opening part of the description and the relevant background art disclosed therein should have been briefly discussed (see Rule 5.1(a)(ii) PCT).
- 5 The opening part of the description should have been brought into conformity with the wording of any new or amended independent claim(s) (see Rule 5.1(a)(iii) PCT).

Re Item VIII

Certain observations on the international application

- 1 The application does not meet the requirements of Article 6 PCT, because the following claims are not clear.
- 1.1 The subject-matter of **claim 1** is not clear (Article 6 PCT), as the wording of said claim leaves the reader in doubt as to what the term "*target cell*" of said claim relates to.

The same objection also applies to **claims 10 and 19**, which relate to corresponding apparatuses.

To overcome the objection, the Applicant should have amended **claims 1, 10 and 19** by replacing the term "*target cell*" by the term "*neighbour cell*" based page 16, lines 30-34, of the description. Any dependent claim comprising the term "*target cell*" should have been amended accordingly.

- 1.2 **Claim 1** does not meet the requirements of Article 6 PCT because the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

In particular, the features "*obtaining a cell global identity, CGI, of the target cell within a first/second time period*" are the results of using the procedures P1 and P2, respectively, of obtaining the CGI by using different types of decoding mechanisms (please refer also to description page 27, lines 1-21, in particular line 1 stating that the procedures P1 and P2 may differ in that the WD is able to acquire the SI of target cell during a first time T1 period when applying procedure P1 and during a second time period T2 when applying procedure P2), and as such do not define the features (i.e. P1 and P2) which are necessary to achieve the step of obtaining CGI within a first/second time periods.

The same objection also applies to **claims 10 and 19**, which relate to corresponding apparatuses.

To overcome the clarity objection the Applicant should have amended **claims 1, 10 and 19** such that they include the features of the procedures P1 and P2.

- 1.3 Although **claims 10 and 19** have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT (see also PCT Guidelines 5.42).

In particular, **claim 10** relates to a UE apparatus comprising processing circuitry and a memory, the apparatus adapted to perform the steps of the method of claim 1, and **claim 19** relates to a UE apparatus comprising a processing module and a memory module, the processing module being adapted to perform the steps of the method of claim 1, wherein the term "processing module" also includes processing circuitry, and memory module also includes memory.

To overcome the objection the Applicant should have deleted **claims 10-18** or **claims 19-27**.

- 1.4 The subject-matter of **claims 25 and 26** is not clear (Article 6 PCT), as said claims depend on independent **claim 19**, wherein the feature of determining or obtaining information whether or not the target cell is going to transmit QSI, which is further specified in **claims 25 and 26**, is only defined in dependent **claim 24**.

To overcome the objection the Applicant should have amended **claims 25 and 26** such that they depend on **claim 24**.

Page 1 of 7

Written Opinion

Attending to this matter:

Date:

Reference:

Alex Nicolaescu
Patent agent

2019-09-02

Ref: P73065WO1

BY FAX: (49 89) 2399 4465

International Preliminary Examining Authority
European Patent Office
Munich

PCT APPLICATION NO. PCT/IB2018/057659**Our Reference: P73065WO1****Applicant: TELEFONAKTIEBOLAGET L M ERICSON (PUBL)**

Dear Madam, Sir,

Enclosures

Substitute pages 31-33 (with substitute Claims);

Remarks

In response to the Written Opinion and International Search Report dated Dec. 07, 2018, we hereby submit replacement claims 1-27 and the following remarks.

Originally filed claims 1-34 have been replaced by the amended claims 1-27 provided in the enclosed claim set. The present amendment clarifies the claims by explicitly stating that **the Cell Global Identity (CGI) is obtained by the UE from the network's target cell**, in both the situation where the System Information (SI) is stationary, and in the situation where the SI is non-stationary.

Written Opinion

Attending to this matter:

Date:

Reference

Alex Nicolaescu
Patent agent

2019-09-02

Ref: P73065WO1

The present amendments does not add new subject-matter. Support for the amendments can be throughout he Detailed Description in the patent application where the various embodiments describe in detail that the UE acquires from the target cell the SI with the CGI.

Inventive Step

The outstanding Written Opinion cites reference documents D1, D2, and D3 as a basis of rejection of the claimed invention under PCT Art. 33(2) for an alleged lack of inventive step.

In response to the outstanding Written Opinion, Applicant amended the independent claims 1, 10, 19, and 28.

In view of the present amendment, Applicant respectfully submits that the limitations of the amended claim 1 are neither taught, nor suggested by the teachings of D1, D2, and D3, taken alone or in combination.

For example, the amended claim 1 is now directed to a method for adapting System Information (SI) acquisition in a Wireless Device (WD), comprising the steps of:

- a) if a target cell transmits SI where the fields other than frame numbers do not change in different transmission periods over a certain period of time, **obtaining by the WD from the target cell a Cell Global Identity (CGI) of the target cell within a first time period**, and
- b) otherwise, **obtaining by the WD from the target cell the CGI of the target cell within a second time period longer than the first time period**.

Claim 1 was amended to clarify that the CGI is acquired by the WD **from the target cell**, both when the SI is stationary or not.

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Alex Nicolaescu
Patent agent

2019-09-02

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The other independent claims have undergone similar amendments.

This differs drastically from the teachings of D1, D2, and D3 where if the SI does not change, i.e. if it is stationary, the WD simply avoids (skips) reading it from the messages coming from the network, and rather uses e.g. an SI read from the device's memory.

D1 (in section 2.3) explores ways to reduce the system information acquisition time **by skipping the MIB/SIB** when "the assumption (is) that the system information shall not change frequently" (Section 2.3, lines 5-6). Such skipping may be done using "a flag indicating whether the reading of MIB/SIB1-BR can be skipped or not" (Section 2.3, last 2 lines).

The Examiner acknowledges the same in the outstanding Report. The Examiner asserts that because skipping the reading of SI sent from the network side is taught in D1, this renders the Applicant's claimed invention unpatentable.

D2 too (in Section 2.4) proposes skipping reading the SIB1-NB sent from the network side for the same purposes. When camped on a cell, a UE may skip the MIB-NB acquisition to reduce the SI acquisition time.

D3 in its Section 4 also proposes to skip the reading of MIB-NB and SIB1-NB since SI rarely changes.

Applicant agrees that D1, D2, and D3 suggest skipping the reading of the system information from the network node in order to reduce the system acquisition time. In such scenarios, according to the teachings of D1, D2, and D3, the WD falls back on using previously acquired system information that is already stored in the terminal's memory and uses this system information to deduct or determine the CGI.

In other words, if it is determined that the SI does not change, it is easier and faster for the UE to simply re-use the system information as previously stored in the terminal's memory, as the Examiner also asserts in Item V, section 1.1. of the outstanding report.

Written Opinion

Attending to this matter:

Date:

Reference:

Alex Nicolaescu
Patent agent

2019-09-02

Ref: P73065WO1

In light of the teachings of D1, D2, and D3, the problem solved by embodiments of the present invention can be defined as how to reduce the SI time while at the same time, avoid reliance on previously stored SI in the WD memory. Such previous recording may be, for example, out of date, versus the actual SI destined to the WD.

Applicant's amended invention proposes a new scheme, where system information containing the CGI is always acquired from the network [Emphasis Added], as follows:

1. A method for adapting System Information (SI) acquisition in a Wireless Device (WD), comprising the steps of:
 - a. if a target cell transmits SI where the fields other than frame numbers do not change in different transmission periods over a certain period of time, obtaining by the WD from the target cell a Cell Global Identity (CGI) of the target cell within a first time period, and
 - b. otherwise, obtaining by the WD from the target cell the CGI of the target cell within a second time period longer than the first time period.

This scheme teaches away from D1, D2, and D3.

In summary, while the Applicant's claim indeed acquires the CG differently, indeed, depending if the SI changes or not, the CGI is still always acquired from the target cell of the network, not from local terminal memory as previously stored.

This feature teaches away from the prior art that does the opposite of what the cited prior art does, i.e. skipping the reading of the SI from the network altogether.

In light of the above, Applicant respectfully submits that claim 1 is novel and a possesses inventive step, in view of the cited prior art, taken alone or in combination.

Written Opinion

Attending to this matter:

Date:

Reference:

Alex Nicolaescu
Patent agent

2019-09-02

Ref: P73065WO1

Claims 10, 19, 28 are independent node claims that have limitations similar to those discussed herein with reference to claim 1, and therefore they are submitted as being patentable for the same reasons.

The dependent claims include further limitations and because they are dependent of parent claims submitted herein to be patentable for the reasons described in detail hereinabove, they are submitted as being patentable too.

For the reasons set forth above, Applicant respectfully requests confirmation of the novelty and inventive step of all claims.

Item VII: Certain defects in the international application

1. The independent claims are said not to be in the two-part form.

Applicant thanks the Examiner for the present indication and takes note of the objection. Applicant will correct the deficiency if and when entering national stage in a jurisdiction that has a similar requirement.

2. The features of the claims are said not to be provided with reference signs placed in parenthesis.

Applicant thanks the Examiner for the present indication and takes note of the objection. Applicant will correct the deficiency if and when entering national stage in a jurisdiction that has a similar requirement.

3. Brackets are used in the claims

Applicant thanks the Examiner for the present indication and takes note of the objection. Applicant will correct the deficiency if and when entering national stage in a jurisdiction that has a similar requirement.

4. Relevant background art should be disclosed in the description

Written Opinion

Attending to this matter:

Date:

Reference:

Alex Nicolaescu
Patent agent

2019-09-02

Ref: P73065WO1

Applicant thanks the Examiner for the present indication and takes note of the objection. Applicant will correct the deficiency if and when entering national stage in a jurisdiction that has a similar requirement.

5. The description should be adapted to the new claims

Applicant thanks the Examiner for the present indication and takes note of the objection. Applicant will correct the deficiency if and when entering national stage in a jurisdiction that has a similar requirement.

6. Amendment should be supported by the Description

The present amendments does not add new subject-matter. Support for the amendments can be throughout he Detailed Description in the patent application where the various embodiments describe in detail that the UE acquires from the target cell the SI with the CGI.

7. Support for the amendment of the claims

See above.

8. Explanation of the amendments.

See above.

Item VIII: Other observations

1.1 Claim 1, 10, and 19 are not clear because the term "the fields" lack antecedent. Responsive thereto, Applicant amended these claims to replace the term "the fields" by the term "fields".

1.2 Applicant thanks the Examiner for the present indication and takes note of the objection. Applicant will correct the deficiency if and when entering national stage in a jurisdiction that has a similar requirement.

Written Opinion

Page 7 of 7

Attending to this matter:

Date:

Reference

Alex Nicolaescu
Patent agent

2019-09-02

Ref: P73065WO1

1.3 Applicant thanks the Examiner for the present indication and takes note of the objection. Applicant will correct the deficiency if and when entering national stage in a jurisdiction that has a similar requirement. Note too that claims 28-33 have been cancelled from the application.

1.4 Claim 9 has been amended to remove the term "embodiment" and rather refer to preceding claim 6.

1.5 and 1.6 Applicant thanks the Examiner for the present indication and takes note of the objection. Applicant will correct the deficiency if and when entering national stage in a jurisdiction that has a similar requirement.

Conclusion

In light of all of the above, the Applicant respectfully request indication of the allowability of the patent application.

Yours faithfully,

for TELEFONAKTIEBOLAGET L M ERICSSON (publ)



Alex Nicolaescu

Claims:

1. A method for adapting System Information (SI) acquisition in a Wireless Device (WD), comprising the steps of:
 - a) If a target cell transmits SI where fields other than frame numbers do not change in different transmission periods over a certain period of time, obtaining by the WD from the target cell a Cell Global Identity (CGI) of the target cell within a first time period, and
 - b) otherwise, obtaining by the WD from the target cell the CGI of the target cell within a second time period longer than the first time period.
2. The method of claim 1, further comprising the step of:
 - c) prior to step a), using information as to whether or not the target cell is going to transmit SI that is Quasi-Stationary SI (QSI) where the fields other than frame numbers do not change in different transmission periods over the certain period of time to select a procedure for SI acquisition, wherein a first SI acquisition procedure is selected in step a) and a second SI acquisition procedure is selected in step b).
3. The method of claim 1, wherein in step a) the WD combines at least some fields, other than the fields related to frame numbers, from multiple SI transmissions, to acquire the SI.
4. The method of claim 3, wherein the fields related to frame numbers are fields that include a counter-like information of the frames.
5. The method of claim 2, wherein the information as to whether or not the target cell is going to transmit QSI includes a period of time of a certain length (T0) starting at a given reference time (Tr) during a cell change procedure of the WD towards the target cell.
6. The method of claim 2 wherein the method further comprises the step of:

determining or obtaining by the WD the information as to whether or not the target cell is going to transmit QSI for at least the certain period of time.
7. The method of claim 6, wherein the step of determining whether or not the target cell is going to transmit QSI for at least the certain period of time comprises receiving a message from a network node, the message being indicative of whether or not the target cell is going to transmit QSI for at least the certain period of time.
8. The method of claim 6, wherein the step of determining or obtaining by the WD the information as to whether or not the target cell is going to transmit QSI for at least the certain period of time comprises the WD making a determination using one of pre-defined rules, information from another node, and historical information.
9. The method as per claim 6, further comprising the step of:

following the acquisition of the SI, performing a cell change towards the target cell.
10. A Wireless Device (WD) comprising processing circuitry and a memory for storing instructions, the WD being adapted to obtain from a target cell a Cell Global Identity (CGI) of a target cell within a first time period if the target cell transmits System Information (SI) where fields other than frame numbers do not change in different transmission periods over a certain

period of time, and otherwise, to obtain from the target cell the CGI of the target cell within a second time period longer than the first time period.

11. The WD of claim 10 being further adapted to use information as to whether or not a target cell is going to transmit SI that is Quasi-Stationary SI (QSI) where the fields other than frame numbers do not change in different transmission periods over the certain period of time to select a procedure for SI acquisition, wherein a first SI acquisition procedure is selected to obtain the CGI of the target cell within a first time period, and a second SI acquisition procedure is selected to obtain the CGI of the target cell within the second time period.

12. The WD of claim 10, wherein the WD combines at least some fields, other than the fields related to frame numbers, from multiple SI transmissions, to obtain the CGI of the target cell within a first time period.

13. The WD of claim 12, wherein the fields related to frame numbers are fields that include a counter-like information of the frames.

14. The WD of claim 11, wherein the information as to whether or not the target cell is going to transmit QSI includes a period of time of a certain length (T_0) starting at a given reference time (T_r) during a cell change procedure of the WD towards the target cell.

15. The WD of claim 11, wherein the WD is further adapted to determine or obtain the information as to whether or not the target cell is going to transmit QSI for at least the certain period of time.

16. The WD of claim 15, wherein to determine whether or not the target cell is going to transmit QSI for at least the certain period of time comprises receiving a message from a network node, the message being indicative of whether or not the target cell is going to transmit QSI for at least the certain period of time.

17. The WD of claim 15, wherein the step of determining or obtaining information as to whether or not the target cell is going to transmit QSI for at least the certain period of time comprises the WD making a determination using one of pre-defined rules, information from another node, and historical information.

18. The WD of claim 15, further comprising the step of:
following the acquisition of the SI, performing a cell change towards the target cell.

19. A Wireless Device (WD) comprising a processing module and a memory module, the processing module being adapted to obtain from the target cell a Cell Global Identity (CGI) of a target cell within a first time period if the target cell transmits SI where fields other than frame numbers do not change in different transmission periods over a certain period of time, and otherwise, to obtain from the target cell the CGI of the target cell within a second time period longer than the first time period.

20. The WD of claim 19 wherein the processing module is further adapted to use information as to whether or not a target cell is going to transmit SI that is Quasi-Stationary SI (QSI) where the fields other than frame numbers do not change in different transmission periods over the certain period of time to select a procedure for SI acquisition, wherein a first SI acquisition procedure is selected to obtain the CGI of the target cell within the first time period, and a second SI acquisition procedure is selected to obtain the CGI of the target cell within the second time period.

21. The WD of claim 19, wherein the processing module is further adapted to combine at least some fields, other than the fields related to frame numbers, from multiple SI transmissions, to obtain the CGI of the target cell within the first time period.

22. The WD of claim 19, wherein the fields related to frame numbers are fields that include a counter-like information of the frames.

23. The WD of claim 20, wherein the information as to whether or not the target cell is going to transmit QSI includes a period of time of a certain length (T0) starting at a given reference time (Tr) during a cell change procedure of the WD towards the target cell.

24. The WD of claim 20, wherein the processing module is further adapted to determine or obtain the information as to whether or not the target cell is going to transmit QSI for at least the certain period of time.

25. The WD of claim 19, wherein determining whether or not the target cell is going to transmit QSI for at least the certain period of time comprises receiving a message from a network node, the message being indicative of whether or not the target cell is going to transmit QSI for at least the certain period of time.

26. The WD of claim 19, wherein determining or obtaining information as to whether or not the target cell is going to transmit QSI for at least the certain period of time comprises the WD making a determination using one of pre-defined rules, information from another node, and historical information.

27. The WD of claim 19, wherein following the acquisition of the SI, performing a cell change towards the target cell.

REIVINDICACIONES

1. Un método para la adaptación de adquisición de Información del sistema (SI) en
5 un Dispositivo inalámbrico (WD), caracterizado porque comprende los pasos de:
 - a) si una celda objetivo transmite SI donde los campos que no sean números de trama no cambian en diferentes períodos de transmisión durante un período de tiempo determinado, obteniendo por parte del WD una Identidad global de celda (CGI) de la celda objetivo dentro de un primer período de tiempo, y
 - 10 b) de lo contrario, obtener la CGI de la celda objetivo dentro de un segundo período de tiempo más largo que el primer período de tiempo.
2. El método de la reivindicación 1, comprende además el paso de:
 - c) antes del paso a), usar información sobre si la celda objetivo va a transmitir o
15 no SI que es SI cuasi estacionaria (QSI) donde los campos que no sean números de trama no cambian en diferentes períodos de transmisión durante el período de tiempo determinado para seleccionar un procedimiento para la adquisición de SI, caracterizado porque se selecciona un primer procedimiento de adquisición de SI en el paso a) y se selecciona un segundo procedimiento de adquisición de SI en el paso
 - 20 b).
3. El método de la reivindicación 1, caracterizado porque en el paso a) el WD combina al menos algunos campos, distintos a los campos relacionados con los números de trama, de múltiples transmisiones de SI, para adquirir la SI.
- 25 4. El método de la reivindicación 3, caracterizado porque los campos relacionados con los números de trama son campos que incluyen una información como la de un contador de tramas.

5. El método de la reivindicación 2, caracterizado porque la información sobre si la celda objetivo va a transmitir o no QSI que incluye un período de tiempo de cierta longitud (TO) que comienza en un tiempo de referencia (Tr) dado durante un procedimiento de cambio de celda del WD hacia la celda objetivo.

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6. El método de la reivindicación 2 caracterizado porque el método comprende además el paso de:

- a. determinar u obtener por el WD la información sobre si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado.

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7. El método de la reivindicación 6, caracterizado porque el paso de determinar si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado comprende recibir un mensaje desde un nodo de red, donde el mensaje indica si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado.

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8. El método de la reivindicación 6, caracterizado porque the step of determinar u obtener por el WD la información sobre si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado comprende que el WD haga una determinación usando una de las reglas predefinidas, información de otro nodo, e información histórica.

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9. El método según la reivindicación 6, comprende además el paso de:

- a. tras la adquisición de la SI, realizar un cambio de celda hacia la celda objetivo.

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10. Un Dispositivo inalámbrico (WD) que comprende circuitos de procesamiento y una memoria para almacenar instrucciones, donde el WD está adaptado para obtener una Identidad global de celda (CGI) de una celda objetivo dentro de un primer período de tiempo si la celda objetivo transmite Información del sistema (SI) donde los campos

que no sean números de trama no cambian en diferentes períodos de transmisión durante un período de tiempo determinado, y de lo contrario, para obtener la CGI de la celda objetivo dentro de un segundo período de tiempo más largo que el primer período de tiempo.

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11. El WD de la reivindicación 10 estando adaptado además para usar información sobre si una celda objetivo va a transmitir o no SI que es SI cuasi estacionaria (QSI) donde los campos que no sean números de trama no cambian en diferentes períodos de transmisión durante el período de tiempo determinado para seleccionar un procedimiento para la adquisición de SI, caracterizado porque se selecciona un primer procedimiento de adquisición de SI para obtener la CGI de la celda objetivo dentro de un primer período de tiempo, y se selecciona un segundo procedimiento de adquisición de SI para obtener la CGI de la celda objetivo dentro del segundo período de tiempo.

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12. El WD de la reivindicación 10, caracterizado porque el WD combina al menos algunos campos, distintos a los campos relacionados con los números de trama, de múltiples transmisiones de SI, para obtener la CGI de la celda objetivo dentro de un primer período de tiempo.

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13. El WD de la reivindicación 12, caracterizado porque los campos relacionados con los números de trama son campos que incluyen una información como la de un contador de tramas.

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14. El WD de la reivindicación 11, caracterizado porque la información sobre si la celda objetivo va a transmitir o no QSI incluye un período de tiempo de cierta longitud (TO) que comienza en un tiempo de referencia (Tr) dado durante un procedimiento de cambio de celda del WD hacia la celda objetivo.

15. El WD de la reivindicación 11, caracterizado porque el WD está además adaptado para determinar u obtener la información sobre si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado.

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16. El WD de la reivindicación 15, caracterizado porque to determine si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado comprende recibir un mensaje desde un nodo de red, donde el mensaje indica si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado.

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17. El WD de la reivindicación 15, caracterizado porque el paso de determinar u obtener información sobre si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado comprende que el WD haga una determinación usando una de las reglas predefinidas, información de otro nodo, e información histórica.

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18. El WD de la reivindicación 15, comprende además el paso de:

a. tras la adquisición de la SI, realizar un cambio de celda hacia la celda objetivo.

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19. Un Dispositivo inalámbrico (WD) que comprende un módulo de procesamiento y un módulo de memoria, donde el módulo de procesamiento está adaptado para obtener una Identidad global de celda (CGI) de una celda objetivo dentro de un primer período de tiempo si la celda objetivo transmite SI donde los campos que no sean números de trama no cambian en diferentes períodos de transmisión durante un período de tiempo determinado, y de lo contrario, para obtener la CGI de la celda objetivo dentro de un segundo período de tiempo más largo que el primer período de tiempo.

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20. El WD de la reivindicación 19 caracterizado porque el módulo de procesamiento está además adaptado para usar información sobre si una celda objetivo va a transmitir o no SI que es SI cuasi estacionaria (QSI) donde los campos que no sean números de trama no cambian en diferentes períodos de transmisión durante el período de tiempo determinado para seleccionar un procedimiento para la adquisición de SI, caracterizado porque se selecciona un primer procedimiento de adquisición de SI para obtener la CGI de la celda objetivo dentro del primer período de tiempo, y se selecciona un segundo procedimiento de adquisición de SI para obtener la CGI de la celda objetivo dentro del segundo período de tiempo.

21. El WD de la reivindicación 19, caracterizado porque el módulo de procesamiento está adaptado además para combinar al menos algunos campos, distintos a los campos relacionados con los números de trama, de múltiples transmisiones de SI, para obtener la CGI de la celda objetivo dentro del primer período de tiempo.

22. El WD de la reivindicación 19, caracterizado porque los campos relacionados con los números de trama son campos que incluyen una información como la de un contador de tramas.

23. El WD de la reivindicación 20, caracterizado porque la información sobre si la celda objetivo va a transmitir o no QSI que incluye un período de tiempo de cierta longitud (TO) que comienza en un tiempo de referencia (Tr) dado durante un procedimiento de cambio de celda del WD hacia la celda objetivo.

24. El WD de la reivindicación 20, caracterizado porque el módulo de procesamiento está además adaptado para determinar u obtener la información sobre si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado.

25. El WD de la reivindicación 19, caracterizado porque determinar si la celda objetivo

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va a transmitir o no QSI durante al menos el período de tiempo determinado comprende recibir un mensaje desde un nodo de red, donde el mensaje indica si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado.

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26. El WD de la reivindicación 19, caracterizado porque determinar u obtener información sobre si la celda objetivo va a transmitir o no QSI durante al menos el período de tiempo determinado comprende que el WD haga una determinación usando una de las reglas predefinidas, información de otro nodo, e información histórica.

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27. El WD de la reivindicación 19, caracterizado porque tras la adquisición de la SI, realizar un cambio de celda hacia la celda objetivo.