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(54) **Antenna with levelling device and associated method**

(57) The invention concerns an antenna 3 for a telecommunication system, which comprises a sensor 7 for detecting its horizontal orientation (= to the left in Fig. 3). The sensor allows to efficiently ensure correct orientation

of the antenna during installation. The direction information representing the measured horizontal orientation is readable to a control processor in e.g. a base station transceiver system BTS of a telecommunication system and it is usable e.g. during the setup of the antenna.

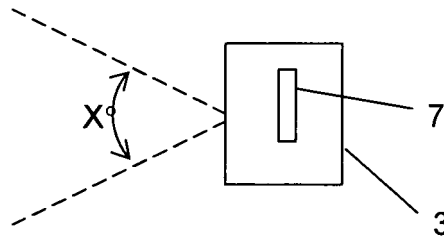


Fig. 3

Description

Technical field of the invention

[0001] The invention concerns an antenna for a telecommunication system.

Background of the invention

[0002] Mobile communication systems as for example cellular telecommunication systems (e.g. 2G, 3G, LTE etc. known in detail from www.etsi.org specifications which are herewith incorporated by reference) use base stations to communicate over an air interface with a handset. State-of-the-art base stations are made out of standard building blocks that are connected through standard interfaces (for example flexi-base stations from Nokia Siemens Networks). Such a base station can be installed by field technicians without the usage of complex equipment and installation procedures. The directional antennas of a base station need to be connected to certain BTS (Base Transceiver Station) connectors to support the correct sectors.

[0003] The direction of antennas in the ports through which they are connected are usually predefined in installation instructions and considered by installation technicians as part of the installation process of antennas and ports. However, this process is quite error-prone, resulting in additional site visits and efforts to identify the correct antenna orientation and cables etc.

Summary of the invention

[0004] It can be seen as an object of the invention to efficiently ensure correct orientation of the antenna during installation. The objective is fulfilled by the independent claim.

[0005] The dependent claims define advantageous modifications thereof.

[0006] Specifically there is provided an antenna for a telecommunication system **characterized in that** it comprises a sensor for detecting its horizontal orientation. The invention allows to identify the horizontal orientation of the antenna, e.g. during an installation process.

Modifications of the invention may include the following:

[0007] Preferably the sensor of the antenna is a magnetic sensor for detecting the horizontal orientation in the earth magnetic field, especially a hall sensor.

[0008] Preferably the sensor is in the antenna head of the antenna.

[0009] Preferably the sensor detects its horizontal orientation with an accuracy of at least 45° to allow sufficient identification of its horizontal orientation.

[0010] Preferably the direction information representing the measured horizontal orientation is readable to a BTS control processor and used during installation proc-

ess of the antenna.

[0011] The direction information is preferably used for setup of a BTS controller.

[0012] The telecommunication system is advantageously a cellular telecommunication system, as for example a 2G, 3G or LTE communication system etc. Alternatively, it can be a WLAN telecommunication system.

[0013] Other aspects features and advantages of the present invention will become more fully apparent from the following detailed description of preferred embodiments thereof which is to be taken in conjunction with appended drawings, in which

Fig. 1 schematically shows components of a cellular telecommunication system,

Fig. 2 schematically shows (a lateral view of) an antenna with a sensor for detecting its horizontal orientation,

Fig. 3 schematically shows (top view of) the antenna and sensor in Fig. 2.

[0014] Fig. 1 very schematically shows a mobile telecommunication system with a mobile handset 1 communicating over an air interface 2 via the antenna 3 of a BTS system with switching or routing elements 4 communicating via an antenna 5 with a further handset 6 of a telecommunication system. Further details of cellular telecommunication systems and antennas are known to one skilled in the art from e.g. www.etsi.org specifications.

Antennas are used in cellular mobile telecommunication systems to send/receive data over an air interface from/to a cellular mobile handset (mobile handsets are e.g. available from Nokia Inc. at www.nokia.com). Data can e.g. be voice data for voice communication or other data for e.g. surfing in the internet. There are antennas which cover only a certain area, e.g. a sector of X degrees (X° can e.g. be 45°) defined (theoretically, as in reality the beams cannot that exactly defined) e.g. by to half-lines originating from the antenna as shown in Fig. 3. In this case it is important that the horizontal orientation such antenna is as desired, and moreover preferably that the orientation is known to a component of the telecommunication system.

Fig. 2 schematically shows a BTS, an antenna 3 and a module 7, which module 7 detects the horizontal orientation of itself and thereby the horizontal orientation (= to the left in Fig. 3) of the antenna 3.

The module provides data representing its horizontal orientation (and eventually also an identification of itself or the antenna or the site) to a base station transceiver system BTS 8 control processor 9 which can use the data to identify the horizontal orientation of the antenna (and if identification data is sent also to identify an antenna during an installation process which can for example be an automatic auto-commissioning process). The sensor preferably is a magnetic sensor which in a very simple case can be a hall generator. (Alternatively other sensors

for identifying the orientation of the antenna can be used, e.g. all kinds of compass systems etc.)

[0015] What has been described above is what is presently considered to be a preferred embodiment of the present invention. However, as is apparent to the skilled reader, it is provided for illustrative purposes only and is in no way intended to that the present invention is restricted thereto. Rather, it is the intention that all variations and modifications be included which fall within the spirit and scope of the appended claims.

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10. Method according to claim 9, **characterized in that** the direction information is read by a processor (9) of a telecommunication network element (BTS 8).

11. Method according to claim 9 or 10, **characterized in that** the direction information is read during setup of the antenna (3) and used for the setup of the antenna.

Claims

1. Antenna (3) for a telecommunication system, **characterized in that** it comprises a sensor (7) for detecting its (7; 3) horizontal orientation. 15
2. Antenna according to claim 1, **characterized in that** the sensor (7) is a magnetic sensor for detecting the horizontal orientation in the earth magnetic field. 20
3. Antenna according to claim 2, **characterized in that** the sensor (7) is a hall sensor. 25
4. Antenna according to any of the preceding claims, **characterized in that** the sensor (7) is in the antenna head of the antenna. 30
5. Antenna according to any of the preceding claims, **characterized in that** the sensor (7) detects its horizontal orientation with an accuracy of at least 45°. 35
6. Antenna according to any of the preceding claims, **characterized in that** the direction information representing the measured horizontal orientation is readable to a control processor and usable during the setup of the antenna. 40
7. Antenna according to any of the preceding claims, **characterized in that** the telecommunication system is a cellular telecommunication system and that the antenna is a cellular mobile telecommunication system antenna. 45
8. Antenna according to any of the preceding claims, **characterized in that** the telecommunication system is a WLAN telecommunication system. 50
9. Method for detecting the orientation of an antenna (3), **characterized in that** direction information representing the horizontal orientation of the antenna is measured by a sensor (7) connected to the antenna (3). 55

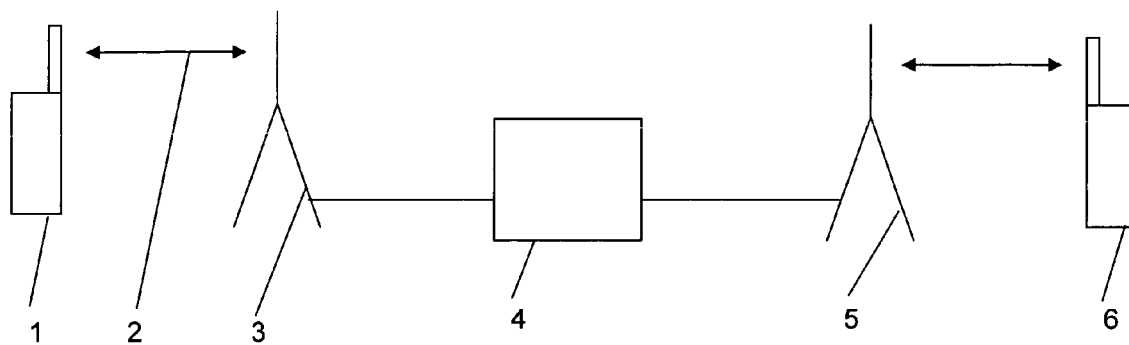


Fig. 1

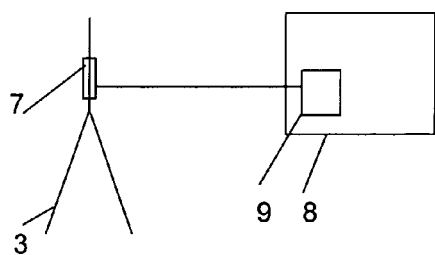


Fig. 2

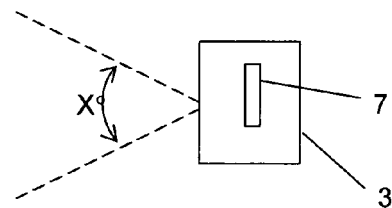


Fig. 3



European Patent
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Application Number
EP 08 00 3205

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 March 2008	Examiner Van Dooren, Gerry
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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