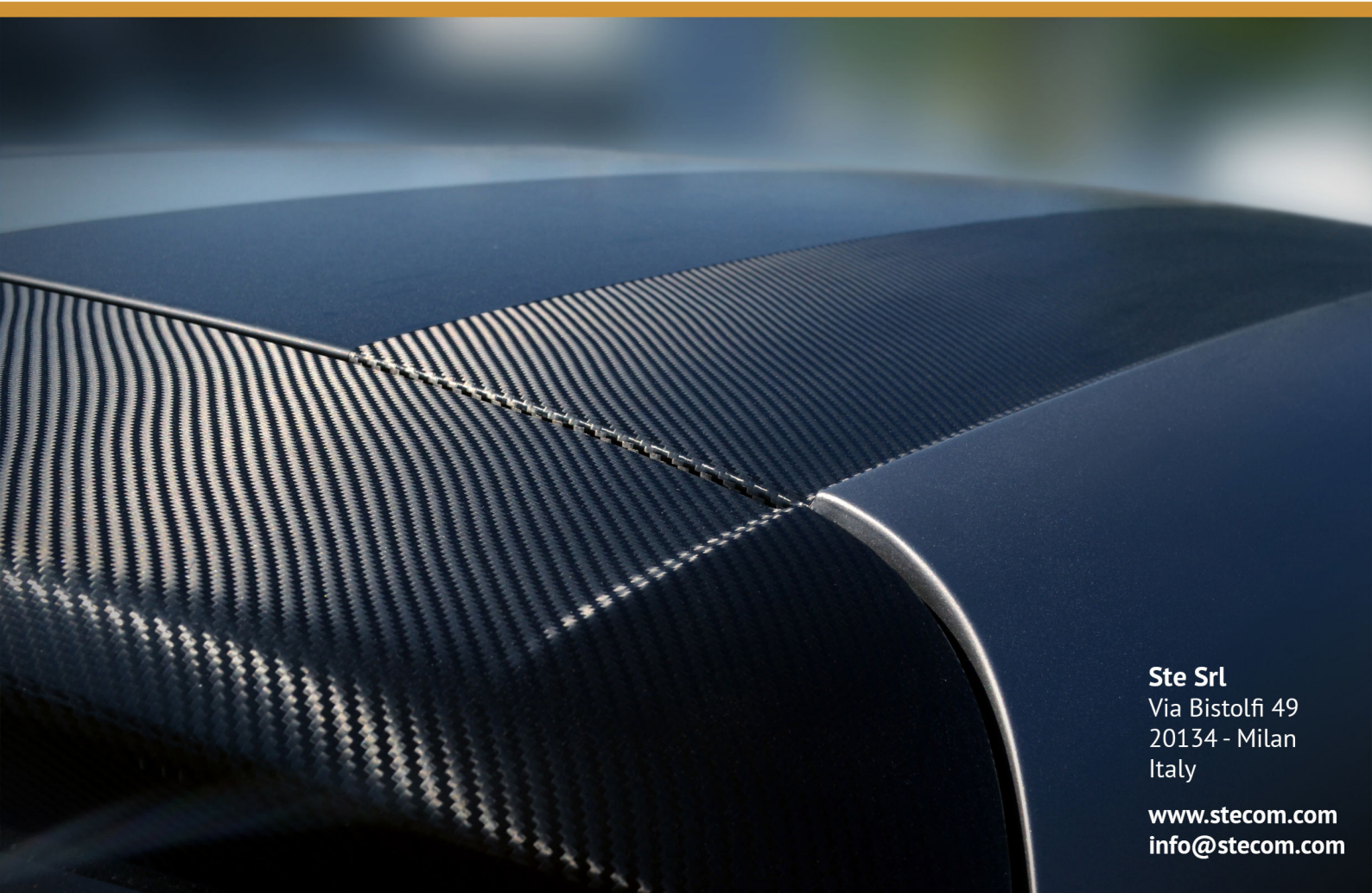




casehistory



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Automatic Meter Reading - AMR

Wireless M-Bus

169MHz Network

“CONNECTING INNOVATION FOR INTELLIGENT WIRELESS”

Ste

Engineering Department
2014



169MHz - AMR

The 169MHz ISM Band

The use of the 169,4 to 169,8 MHz radio spectrum band for ERMES in the Community has decreased dramatically or even ceased altogether, with the result that this radi spectrum band is not being efficiently utilised by ERMES and could therefore be better used to fulfil other Community policy needs.²⁵. As mandated, the CEPT has produced a new frequency plan and channel arrangement allowing six types of preferred applications to share the radio spectrum band from 169,4 up to 169,8125 MHz, in order to meet several Community policy needs. Recently ECC Decision addresses the frequency band of 169 MHz band for use in additional applications: the subject matter of this Decision is the harmonisation of the conditions for the availability and efficient use of the 169,4-169,8125 MHz for the purposes of applications such as "Airing aids", "Social alarms", "Meter readings", "Tracing and asset tracking", "Paging" and "Private mobile radio services".

A⁺ AMR automatic meter READING



Cuby: a new gateway concept

Cuby is a new STE proprietary multi-technology concept. With just few easy steps CUBY is able to create an effective sensors network at high energetic efficiency. A wide range of different sensors can be mounted within the same system: low consumption MicroSp, 169Mhz Systems, Wireless M-Bus, Zig-Bee sensors as well as Bluetooth. Thanks to wi-fi connection Cuby becomes a hub of the internet network. Cuby it's a new way of thinking wireless. Thanks to Cuby we can today focus on the application itself better than thinking how to technically achieve it. Cuby is able to autonomously all the data exchange process among devices. Thinking about new solutions and applications both B2C and B2B will be just a piece of cake. The system is supplied along with a web-server software which enables final user to manage all linked devices. You can also constantly check-up sensors status as well as manage alarms and events. Cuby is an outstanding starting point to kick off your idea!

The Sp.Net: network evolution

Sp.net is the new multi-technology sensors network produced by STE. Thanks to **sp.net** you will be able to create your own wireless infrastructure with just few easy steps while saving your money. **Sp.net** can include different solutions such as low-consumption MicroSp systems, ZigBee sensors, Bluetooth and WiFi which can be managed just by one fully integrated Gateway perfectly equipped to handle everything at its best. With **sp.net** you will be able to control any kind of sensor within any environment. A wide range of applications which go from small home sensors to bigger urban systems as well as more sophisticated use such as checking wheel pressure through a sensor placed into the tyre which sends data directly to your smartphone. Any object, no matter whether big or small, can be part of your **sp.net** network.



Micro.Sp Alliance

Micro.Sp: the enabling technology for a Greener and more Sustainable world. The Micro.Sp Alliance develops and promotes a breakthrough in Energy Efficient Wireless Sensors (EEWS): based on the extremely advanced Micro.Sp technology, the new standard aims to contribute to enable the market of "Internet of Things" (IoT) and smartphone based applications as well as to monitor and control objects in the network. Micro.Sp alliance delivers a new method of creating wireless sensors by using standard components normally available on the market, thus supporting the widespread of cost effective solutions for a large spectrum of applications. The alliance's vision is to offer the highest grade of integration along with the most advanced solution for a cost effective approach to the business, contributing to reduce installation, operational costs and to reduce the environmental impact. We believe in a greener and smarter world and our mission is to offer a new technology for everyone and everything.

169MHz - AMR



First in Europe

First in Europe to introduce new 169 MHz frequency SRD receiver and transmitter for AMR and social alarm applications in UK. STE has been successfully integrated in market leaders who "designs for leading "tele-care" and "tele-health" solutions, supporting older people and those with long-term needs to live independently, by effectively managing their health and well-being". About AMR market, STE works with major companies to control consumption and management of data sent. Thanks to 169MHz Technology is possible to make sensors pressure or temperature for territorial control.

Telemetry and M2M application on Sub-GHz "SRD" bands.

Sub GHz SRD bands are ideal for license-free low speed data transmission application. The SRD basic concept is to allow free use of certain frequency bands based on a reduced probability to cause interference to other "Primary Services". Limits are posed on max radiated RF power, on transmission duty cycle with other sophisticated requirements to reduce the interference probability, like LBT (Listen Before Talk) and AFA (Adaptive Frequency Agility). In Europe SRD are regulated by ETSI EN 300 220 and by CEPT ERC 70-03 Recommendation. Other Countries have similar standards such as the FCC Rules Part 15 and Part 90 in the United States.



Sub-GHz data transceiver increase wireless range.

High speed data transmission, such as Bluetooth or Wi-Fi, requires a broad radio channel (typically one or more MHz) so these applications are made at 2,4GHz and beyond. Sub-GHz SRD Bands are the ideal choice for low speed, short message data transmission. The band can be channelized with channel spacing of 12,5, 25 or 50 kHz hence a narrow receiver selectivity can be employed with a correspondent in channel noise reduction and receive sensitivity increment. The modulation normally employed is the Narrow Band Frequency Modulation (NBFM) and the receiver sensitivity can easily reach level of minus 120 to minus 135 dBm. Apart the transmitter output power that on some frequencies can go to 500 mW, it is evident the consistent "Link budget" margin increment. Another big advantage is the possibility to program the radio on a lot of different channels reducing the possibility of message collision or interferences. Also the range increase must be considered: these Sub-GHz lower frequencies deliver more distance for a given power level. This is mainly due to a lower obstacle attenuation and a less pronounced reflection of radio waves with a reduced probability of multipath signal cancellation.

The environment detection

Water and Gas Management
Transportation
Food Temperature Monitoring
Environmental monitoring
Tele-care / Tele-Health
Asset tracking



Wireless M-Bus



Wireless M-Bus

Wireless M-bus is derived from Wired M-bus specifications initially written in the 90' for remote reading of gas, water and electricity meters. Later the Wired M-bus was extended and the radio variant Wireless M-Bus was introduced into the European Standard EN 13757 as Part 4 and 5.

The Standard currently consists of:

- EN 13757 - 1 : 2002 Data exchange
- EN 13757 - 2 : 2004 Physical and link layer
- EN 13757 - 3 : 2011 Dedicated application layer
- EN 13757 - 4 : 2011 Wireless meter readout
- EN 13757 - 5 : 2009 Wireless relaying
- EN 13757 - 6 : 2009 Local Bus

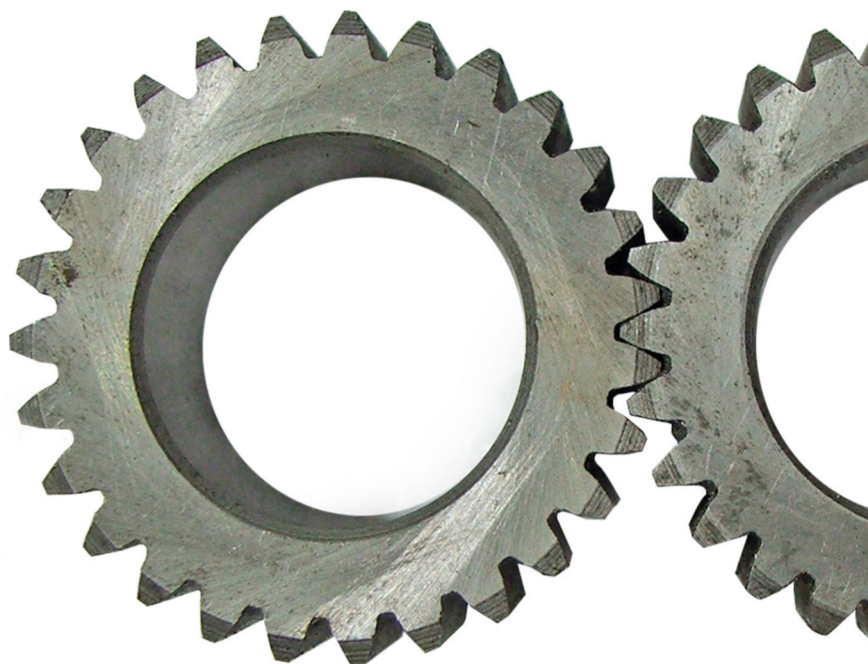
Wireless M-bus is specified in EN 13757-4 to operate on the ISM European frequency bands (868 - 434 - 169 MHz) and must comply with the SRD (Short Range Devices) standard EN 300 220-1 v2.4.1 (2012.01) and with the CEPT Recommendation ERC REC70-03 (May 2013 edition) – Annex 1 and Annex 2.

The RadioModem Solution

Wireless data transmission can benefit of a big choice of Tx, Rx and Transceiver Integrated Circuits from many IC Manufacturers. Also on the market there is a huge offer of complete radio modules. These offers are very attractive but do not solve the problem of the "Communication Protocol". RF communication protocol is a very specialized Job: it is a mix of RF skill and data transmission theory competence in a little-known field of electronic. Low current consumption applications (the case of battery operated wireless remotized sensors) is another example where high specialized solutions must be deployed. So the best choice for easy solutions and fast to the market time is to employ "Embedded Protocol Radiomodems".

Wireless M-Bus Network

Devices employed in the Wireless M-Bus Network are classified as either "METER" or "OTHER". "OTHER" defines any device employed to collect data from the "Meter", "Concentrators", "Gateways", "Bridge", "Repeaters" and "Receivers" (stationary or mobile). The EN 13757- 4 defines six "Modes" for the RF Link to collect data and to send commands to "Meters". The Ste family Radiomodem module comes with wireless modem functionality and a powerfull capability to implement the M-Bus protocol to be used as "Meter" or "Concentrator" and "Bridge/Repeater".



Cuby: a new gateway concept



outdoor Cuby gateway

01 cuby

Cuby is a new STE proprietary multi-technology concept. With just few easy steps CUBY is able to create an effective sensors network at high energetic efficiency. A wide range of different sensors can be mounted within the same system: low consumption MicroSp, 169Mhz Systems, Wireless M-Bus, Zig-Bee sensors as well as Bluetooth. Thanks to wi-fi connection Cuby becomes a hub of the internet network. Registered Trademark Patent Pending

02 multi-technology

Cuby has on-board all technologies needed for the accomplishment of typical wireless infrastructure focused on a wireless sensors network. The system is able to simultaneously handle all on-board peripherals thanks to an extremely performant firmware. In this regard, either managing monodirectional low-consumption sensors or controlling data collecting hubs within an urban environment it becomes simply possible and real. User friendliness and the expansion capability turn the CUBY into an essential choice should you wish to realise an highly professional product.

03 a new concept

Cuby it's a new way of thinking wireless. Thanks to Cuby we can today focus on the application itself better than thinking how to technically achieve it. Cuby is able to autonomously all the data exchange process among devices. Thinking about new solutions and applications both B2C and B2B will be just a piece of cake. The system is supplied along with a web-server software which enables final user to manage all linked devices. You can also constantly check-up sensors status as well as manage alarms and events. Cuby is an outstanding starting point to kick off your idea!

04 it's easy to use

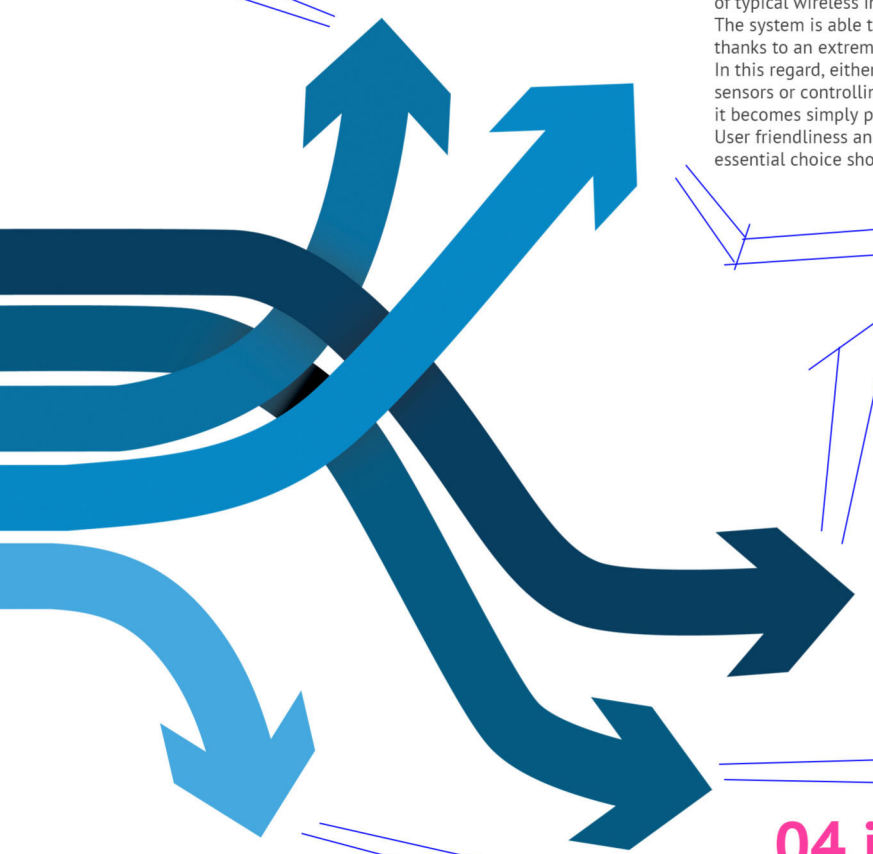
"Between two explanations go for the clearer one
Between two shapes pick the the most basic one
Between two words....the shortest."

Cuby is meant to make things easier. The developing team has mainly focused on creating an extremely performant and innovative product which could be massively easy and user friendly device. Trying to realize a complete product aiming to reduce the developing time was quite a complex goal to achieve. Eventually we think that Cuby is the result of our success.

05 all in one

Cuby is an all-in-one platform including:

- Last generation radio receiving Micro-SP
- RTX Radio 169Mhz Wireless M-Bus
- Wi-Fi Module
- Bluetooth module
- RJ45 Interface
- USB connector
- GSM Module



CLOUD SENSORS

There are many parameters that can be measured and wirelessly delivered to the receiver. The Sensors become integral part a wide range of object and appliances. They are extremely compact and powered by small batteries or energy harvester.



APPLIANCES SENSORS



SWITCH SENSORS



3 AXIS SENSORS



SOCIAL ALARMS



LEVEL SENSORS



LOGISTICS SENSORS



HUMIDITY SENSORS



PARKING SENSORS



LAMP SENSORS



AUTOMOTIVE SENSORS



HOME SENSORS



POWER SENSORS



METER READING



LIGHTNESS SENSORS



TEMPERATURE SENSORS



sp.net
wireless sensors



WSN

WIRELESS SENSORS NETWORK is a particular kind of network, characterized by a distributed architecture. It consists of a autonomous electronic devices that collects data from the environment and to communicate to another device. This device is the "Gateway".



GATEWAY CUBY

Cuby collects data from multi-technology sensors and manages them individually at the same time. It can be used both indoors and outdoors. It is a scalable solution and usable in different contexts. It can be powered by a solar panel, both by a battery or directly connected to the power line.



INTERNET

Cuby uses a Wifi technology and/or GSM to post to Internet the data collection and make them easily to access.

WEB APPLICATION

Thanks to the Web server interface it's easy to access to the data . Thus you can manage the sensors of your wireless sensors network from any devices commonly used such as smartphone or tablet.

