August 2006

BARTEC Safe.t® news

The BARTEC Customer Information

Mobile data terminals (MC 9060^{ex}) are used in conjunction with bar code scanners to control the flow of materials and administer recipes. Stationary operator terminals (POLARIS) with WLAN interface are used for process control at batch plants to produce active ingredients for pharmaceuticals.

WLAN in Ex Areas

Wireless data transmission offers the advantage of greater mobility

The transmission of data within Wireless LAN nets is becoming increasingly important because of the undisputed advantage of mobility.

Familiar applications are computer networks in offices. However, this technology is also used in the process engineering industry – in the field – to control materials and processes and for the maintenance and upkeep of machinery and plants.

Typical fields of application are warehouse logistics, recipe administration in production and the conducting of repetitive checks on systems requiring monitoring. The devices used for data acquisition are usually mobile devices that communicate wirelessly with a higher-ranking ERP system.

Applications in process engineering industries often concern hazardous areas, where the risk of ignition necessitates the application of additional safety requirements to the design of the networks and mobile and stationary devices.

Operators of Ex plants were sceptical about WLAN at the beginning; after all, just a few years ago, there were hardly any hardware components on the market. Today the industry is very open to new technology and this trend is proven by the greatly increased demand for explosion–protected mobile computers.

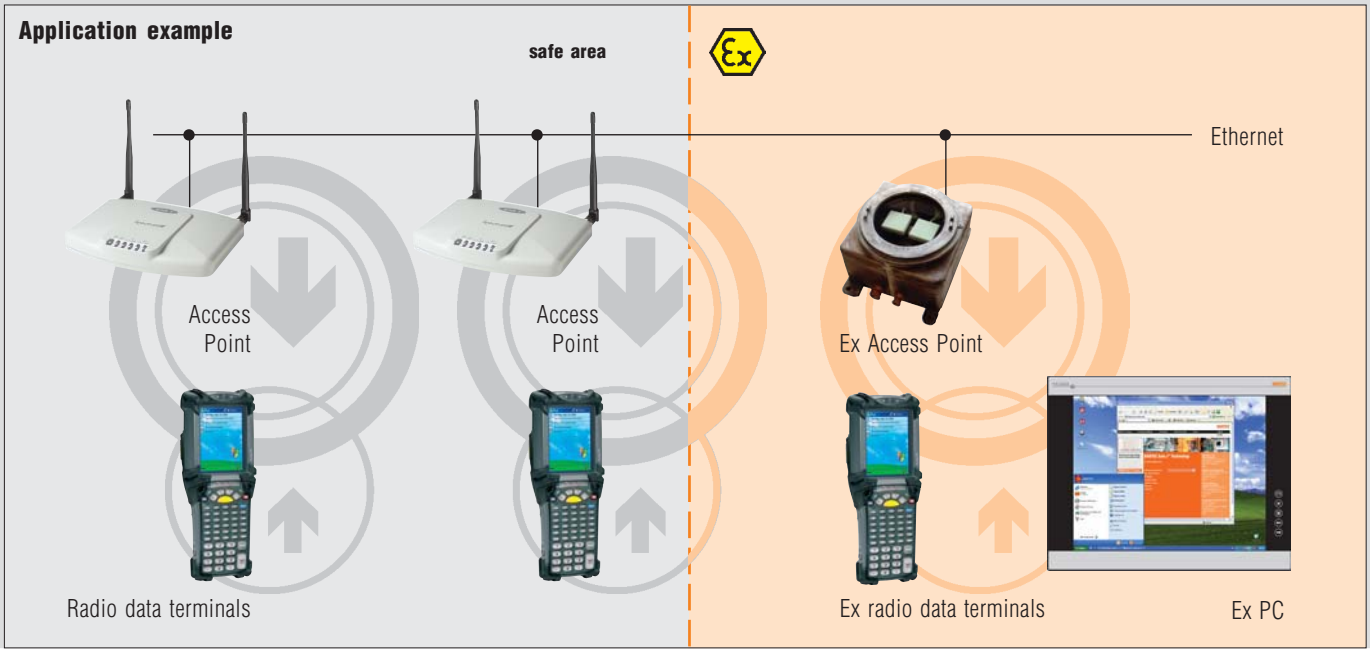
Requirements for WLAN in Ex Areas

A WLAN consists of at least one or more access points that communicate via Ethernet. The available data throughput depends on the distance between the access points.

The quantity of access points needed and their positions are determined using radio measurement and taking account of local factors (building or open space). This is based on the required data throughput and the number of clients. Since usually only small quantities of data (storage locations or recipes) are transmitted, the data transfer rate in Ex areas is lower than for example in office environments.

Apart from sparks, flames or hot surfaces, electromagnetic waves also rank as potential sources of ignition and are subject to specific limit values. Technical report CLC/pr TR50427 or Clarification Sheet ExNB/04/160/CS describe the ignition limit values at receiver systems for continuous radio frequency sources.

More than 90% of all WLAN installations in the Ex area are found in zone 1, which makes it necessary to use explosion-protected measuring instruments when taking measurements. A practical alternative is in some countries a special permit in conjunction with a gas warning device.



Two different antenna techniques are available for the access points. Where the internal solution is used, flat antennas are fitted into an enclosure with Ex d protection. The lid of the flame-proof encapsulated enclosure has a glass pane. Functionality is assured in spite of attenuation from the pane and metal enclosure.

As an alternative, two external antennas with the appropriate Ex examination can be connected. These have higher radio power. Another variant consists of installing the access point outside the hazardous area and the external explosion-protected antennas in the hazardous area.

Electric equipment (stationary or mobile) for use in zone 1 is subject to the ATEX Directive 94/9/EC and must comply the requirements for category II 2G. The BARTEC devices are designed for temperature class T6 and explosion subgroup IIC.

WLAN solutions for Ex areas

from one source

BARTEC offers you ex solutions to suit your requirements for every commercially available access point.
Our experienced specialists will be happy to design your WLAN in the hazardous area for you.

www.bartec-group.com/wlan

Radiostandards

- IEEE 802.11, safe WLAN, directive 03103, version 1.0
- Various radio standards under IEEE 802.11 work on two different frequencies in general. Transmission powers of 100 mW in the 2.4-GHz range and of 30 to 1000 mW in the 5-GHz field allow ranges of 10 m to 70 m in buildings and 30 m to 300 m in the open air.
- Up to now, the 802.11 protocol has been most successful in establishing itself. It also offers compatibility with the 802.11b standard.
- The 802.11a standard, on account of its poorer ranges and associated higher costs, is only recommendable in the case of a permanent fault in the 2.4-GHz field.
- In the future all devices are to conform to the safety standard 802.11i because this is the only standard that provides reliable data transmission. At present, the great number of proprietary protocols can sometimes lead to incompatibility between different manufacturers.

The ATEX Directives in Practice

The ATEX Directive 1999/92/EC (see also national law) lays down the duties of the employer/operator with respect to safety in hazardous areas. The core purposes in the sense of this directive are:

- evaluation of danger and classification in zones.
- definition of measures to protect people in hazardous areas.
- drawing up of the explosion protection document.

BARTEC ATEX Services

For more than 30 years now, specialists at BARTEC have been managing a great number of issues concerning the field of explosion protection. You can benefit from BARTEC's experience as you implement the new ATEX Directives.

The ATEX specialists' repertoire includes:

- Stocktaking and the examination of electrical devices and systems including the corresponding documentation (type examination certificates, conformity declarations and operating instructions).
- The safety evaluation (evaluation of the risk of ignition) of existing process engineering machinery and equipment (mechanical explosion protection).
- The inspection of existing documents on explosion protection and the drawing up of the explosion protection document.
- The qualification of competent persons in explosion protection.

BARTEC safety technicians and engineers co-ordinate with your specialists from the areas of safety engineering, process engineering, mechanics, and electronic measurement and control engineering to work out practical solutions – quickly and competently - to satisfy safety requirements in the sense of the Directive 1999/92/EC.

Helpful Information for the Implementation of the ATEX Regulations

European and international standards provide assistance for the implementation of the requirements under the Directive 1999/92/EC.

The basic concepts for explosion protection, the classification of zones, as well as the installation and operation in areas with explosive gases, vapours and dusts are subject to following international standards:

EN 1127-1
Explosive atmospheres
Explosion prevention and protection
Part 1: Basic concepts and methodology

Electrical apparatus for use

- **in explosive gas atmosphere**
  IEC/EN 60079-10
  Classification of hazardous areas
  IEC/EN 60079-14
  Electrical installations in hazardous areas
  IEC/EN 60079-17 Inspection and maintenance of electrical installations in hazardous areas
- **in the presence of combustible dust**
  IEC/EN 61241-10 Classificaton of areas where combustible dusts are may be present
  IEC/EN 61241-14 Selection and installation
  IEC/EN 61241-17 Inspection and maintenance of electrical installations in hazardous areas.

Also the new BARTEC brochure „Basic concepts for explosion protection" contains besides an introduction into the physical basics of explosion protection, numerous schematic illustrations as well as schemes and tables supporting daily work.

Those interested in this tool can order it per e-mail free of charge info@bartec.de or downloaded under:
www.bartec-group.com/explosionprotection

Please find more helpful links on explosion protection, the ATEX Directives and relevant Guidelines on the BARTEC website www.bartec-group.com/atex

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Sensor Innovation Award 2006

Creative developer know-how and many years of experience have paid off. The „Hygrophil DT“ optical dewpoint sensor developed in a co-operation between Bartec's development team in Gotteszell and the Institute For Physical High Technology came 2nd in the Sensor Innovation Award 2006.

Bartec's multiply patented optical dewpoint sensor particularly impressed the jury with its high measuring accuracy at a cost much lower than that of customary systems. The totally novel measurement principle and the compact design it allows open up many new application possibilities. One such area is that of Medical Technology. The BARTEC sensor system can measure and monitor the exact degree of moisture in inhaled air, which is especially necessary for accelerating healing in patients who are in intensive care units or are undergoing long-term ventilation. It also proves its worth in industry and in air-conditioning technology. Plants, automatic machinery and robots supplied with compressed air only work perfectly and reliably if the moisture content is measured and controlled exactly. The BARTEC sensor determines the humidity in the compressed air and provides an early warning if a certain limit value is exceeded.

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Successful Presentation at PCIC Europe 2006

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BARTEC's lecture at the third European PCIC conference went down very well. Over 50 applications had been received for the third round of the conference in Amsterdam from June 7 – 9, 2006. Karel Neleman from BARTEC Netherlands, explained to the very interested participants how to select the right explosion-proof devices and solutions and gave them a vivid presentation of the essential selection parameters. In addition to the conference, BARTEC presented the highlights of its innovative portfolio of products and services.

The aim of PCIC Europe is to serve as a forum for experts from operators, manufacturers, authorities and certifying bodies in all EU Member States and also from other regions in the world to meet and discuss their experiences. The next conference will be held in Paris from June 13 to 15, 2007 and BARTEC will once again submit a contribution.

Innovation Awards 2006 of the German Industry

BARTEC's innovative strength and unfailing instinct for new products and new applications have been rewarded. BARTEC won the innovation award of the German Industry with POLARIS, the novel POLARIS Panel PC series with wireless communication. The newly-developed Panel PC series was considered superior to rival products from as many as 200 competitors from the industry.

The members of the expert jury were particularly convinced by the possibility presented by POLARIS of transferring the kind of computer technology that is standard in non-hazardous areas into hazardous areas also. They were also enthusiastic about the exchange of data by means of wireless LAN and the many diverse fields of application.

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