You Are Here.

Rüdiger Ide

Where am I?
An important feature of situation-aware mobile assistants which are currently developed by the department »Mobile Multimedia Technologies« of the Fraunhofer IGD Rostock, is a fast information access, so that the user can be served with the desired information in the right place at the right time. This requirement can be met if the system is able to determine the physical surrounding. Sensor technology for position determination of persons and the identification of physical objects make this task possible. For outdoor applications, GPS-(Global Positioning System) receivers are suitable. Inside buildings systems must be used, which are based on infrared-marks, electrical and magnetical fields, ultrasonic or inertial navigation.

IrDA-Beacon Infrared Transmitters
The infrared beacons of the Fraunhofer IGD Rostock (cf. Figure 1) are miniaturized infrared transmitters, which send identification signals into the infrared-band permanently or cyclical.

The infrared-signals use the IrDA modulation of the Infrared Data Association (IrDA), which was founded in 1993 as a standardization consortium by several producers. By using the IrDA-standard, every mobile computer which normally has an infrared interface can receive and understand these signals today. Expensive special units are not needed.

Specification
The following features distinguish the IrDA-Beacon Infrared Transmitters:
- emitting a pulsed infrared beam using a wavelength of 850-900nm,
- use of the IrDA Physical Layer,
- variable distance, 2-25m depending on construction type,
- variable emit area depending on construction type (cf. Figure 1-3),

German Abstract

Eine wichtige Eigenschaft mobiler situationsgesteuerter Assistenz-Systeme sollte der schnelle Informationszugriff sein, damit dem Anwender am richtigen Ort zur richtigen Zeit die gewünschte Information angeboten werden kann. Um dieser Anforderung näher zu kommen, sollte es dem System möglich sein, die physische Umgebung zu erkennen. Sensortechnik, auf Basis von Infrarot-Licht, übernimmt diese Aufgabe für die Positionsbestimmung und Objekterkennung innerhalb von Gebäuden.

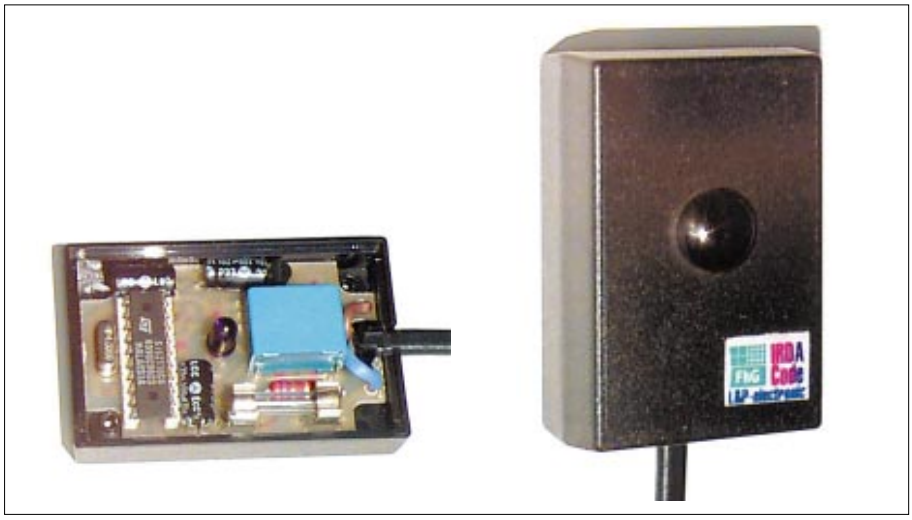

Figure 1: IrDA-Beacon, small type, opened and closed

Figure 2: IrDA-Beacon, battery use

- AC power or battery use are possible,
- up to 7 week standby with 4 AA batteries,
- integrated error correction to detect and correct receiving errors,
- wall or ceiling use possible (cf. Figure 3),
- full autonomous work.

Potential Application Areas
The IrDA-Beacon Infrared Transmitters can be used for several tasks in the area of mobile information systems:

- extraction of surrounding information
- object identification
- position and orientation determination
- relations of physical objects
- object tracking

Depending on the basic principle of infrared, there must be a line of sight between beacon and mobile unit. This must not be a disadvantage, because it also allows to identify the user´s orientation (which is very important for recognizing the objects the user is currently looking at). Because of the wide spread of IrDA in almost every mobile computers (Laptop, Pentop, PDA, Handheld-PC ...) the IrDA-Beacon technology can be used on almost all platforms without hardware modification of the system. Therefore, information systems based on IrDA-Beacon Infrared Transmitters could also be used on mobile devices which are not specifically designed for, e.g. private used PDAs or organizers (a special software is needed).

Reference Applications
The IrDA-Beacon Infrared Transmitters are produced with different form factors and can be used for different applications. Here are three examples:

eGuide - Mobile visitor information systems
eGuide is a mobile system for visitors of a museum or a presentation. It presents information about the objects or other important messages. Therefore, eGuide takes into consideration the actual position of the visitor via IrDA-Beacon Infrared Transmitters. It also shows the objects of the surrounding.

MONAD - Network documentation and Administration
The Monad System helps network engineers in larger buildings with documentation and administration of network connections. Here, IrDA-Beacon Infrared Transmitters are used for the determination of localities and certain network components which helps to prevent errors in inputs.

Telebuddy (see the article in this issue)
In the Telebuddy system a visible body (»the eyes and ears of the Internet«) can accompany a pedestrian when visiting exhibitions, and talk about the shared experience. The Telebuddy combines the mobile web camera concept with communication possibilities of Internet chat. IrDA-Beacon Transmitters are used e.g. for identifying certain locations to provide Internet communities with additional information about that location.

Point of contact

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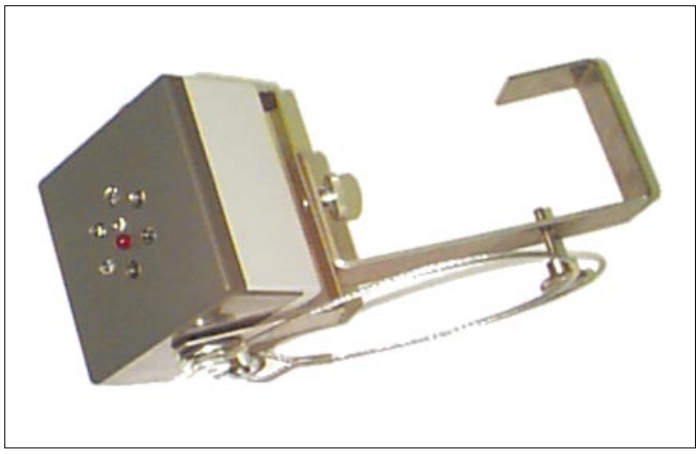

Figure 3: IrDA-Beacon, battery use, ceiling assembly