



Bluetooth Web Enabler™

Use Cases and Features 1.0

connectBlue

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Chapter 1

Introduction

The Bluetooth Web Enabler™ is the “Swiss army knife” when it comes to adding a Web-based user interface to devices. There is a range of different Bluetooth Web Enablers, each to be the solution for different applications; a set of those applications is described in this document.

The Bluetooth Web Enablers are Bluetooth qualified and type approved. No tests for Bluetooth qualification or type approval are required when providing your system with the Bluetooth Web Enabler.



This document describes some of the most important features of the Bluetooth Web Enabler as well as a number important of application scenarios – or see it as describing some of the sharpest blades of the “Swiss army knife” of Web Enabling.

Chapter 2

Use Cases and Features

2.1 Web-based User Interface over Bluetooth

Applicable Bluetooth Web Enabler models:

All models.

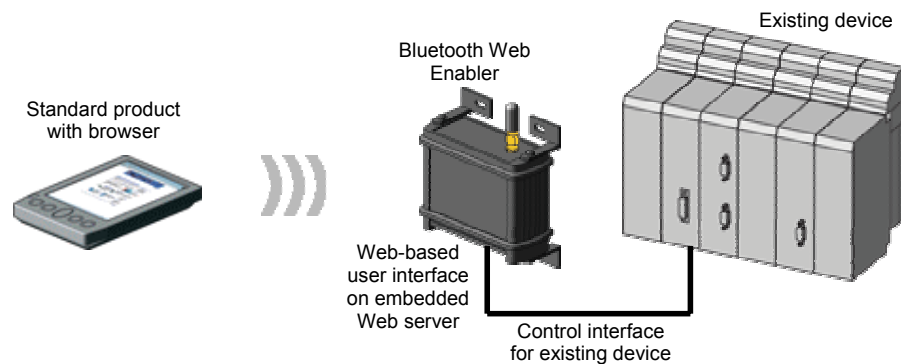
Covered Bluetooth Web Enabler Features:

Cable replacement, Customizable Web-based user interface, Built-in control protocol

The core functionality of the Bluetooth Web Enabler is to provide a Web-based user interface to existing devices. Any device connected to a Bluetooth Web Enabler can be controlled through a Web-based user interface through a normal Web browser.

Example scenario:

This scenario shows how the Bluetooth Web Enabler provides a Web-based user interface for the existing device. Once the existing device is Web enabled, any standard product having a browser, such as a PDA or a laptop, can control it. The existing device could be any device in the diverse range of vending machines and parking meters to industrial controllers and vehicle diagnostics systems.



The user interface resides on the Bluetooth Web Enabler in the internal Web server as normal Web pages. When the user wants to communicate with the existing device, the web pages are downloaded to the browser of the client providing a full-fledged user interface without installing any software on the client. The user interacts with the existing device through the user interface; these interactions are converted by the Bluetooth Web Enabler into control interface data for the existing device.

2.2 Web-based User Interface over Ethernet

Applicable Bluetooth Web Enabler models:

BWE 425, BWE 800, BWE 800C, AnyBus-X

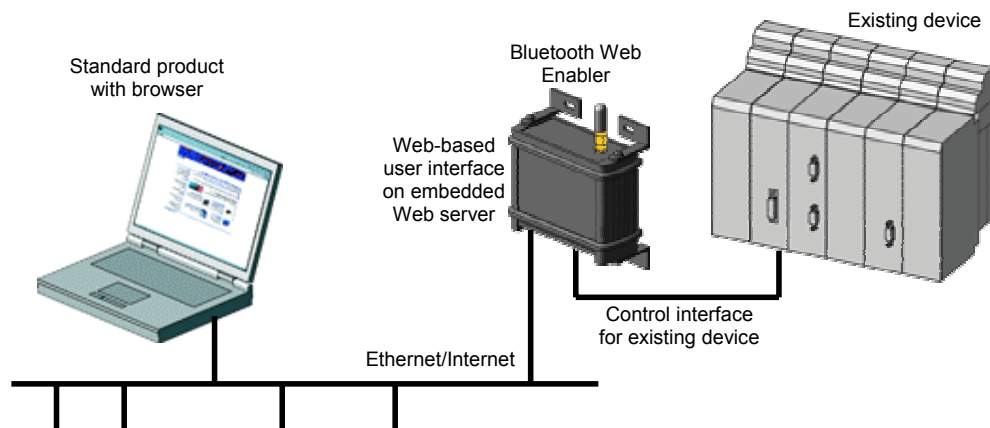
Covered Bluetooth Web Enabler Features:

Ethernet/Internet communication, Customizable Web-based user interface, Built-in control protocol

As in the Web-based User Interface over Bluetooth this scenario also shows the core functionality of the Bluetooth Web Enabler. In this case, the Web-based user interface for the existing device is reached over the Ethernet and Internet.

Example scenario:

The scenario below shows how the Bluetooth Web Enabler provides a Web-based user interface for the existing device. All clients on the network can reach the Web-based user interface for the existing device. Typical existing devices that are ideal for this type of control are devices in a remote location where there is access to a network such as water pump stations, production facilities, and traffic control systems.



Updates in the user interface are automatically propagated to all the clients on the network since the user interface is Web-based. This is one of the major benefits of Web-based user interfaces compared to application based user interfaces. All clients using an application based user interface have to have a special control application installed locally before it can access the system. The administration of this grows with the number of clients on the network and introduces special attention when updating the user interface - very often leading to different clients having different versions of the control application. Web-based user interfaces guarantee that:

1. All clients have the latest user interface
2. All clients have the same user interface

This eliminates all administration of updates and installations of control applications.

2.3 Web-based User Interface over GSM

Applicable Bluetooth Web Enabler models:

BWE 125 Telematics, BWE 425 Telematics

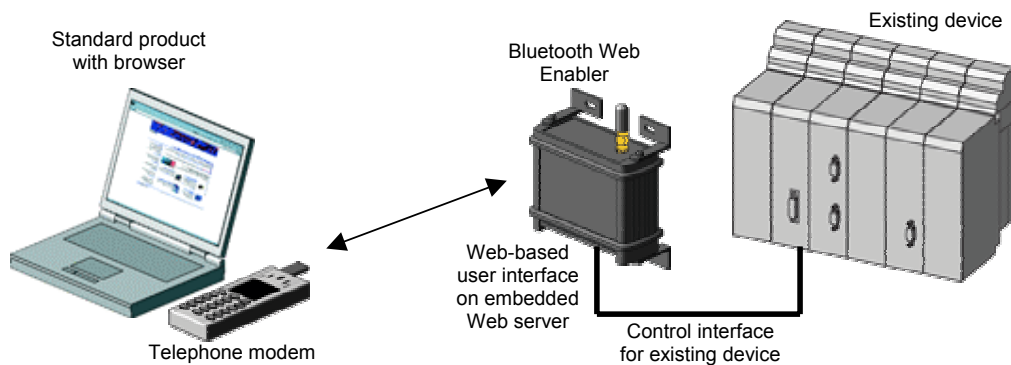
Covered Bluetooth Web Enabler Features:

GSM/GPRS communication, Customizable Web-based user interface, Built-in control protocol

As in the scenarios for Web-based User Interface over Bluetooth and Ethernet this scenario also shows the core functionality of the Bluetooth Web Enabler. In this case, the Web-based user interface for the existing device is reached over a GSM/GPRS network.

Example scenario:

In the scenario below, the Bluetooth Web Enabler provides a Web-based user interface for the existing device. Since the user interface is accessible over GSM and GPRS, the existing device can be controlled and monitored from anywhere in the world where there is a GSM/GPRS network. Ideal existing devices for this type of control are devices in locations that have no access to Ethernet/Internet or other cable based networks or mobile equipment e.g. geological measurement stations, moving transport vehicles, and building construction sites.



Using GSM communication gives a double mobility; the existing devices can be located anywhere where there is a GSM network and the user can be located anywhere where it's possible to use a modem.

2.4 Combination of Access Interfaces

Applicable Bluetooth Web Enabler models:

BWE 425*, BWE 425 Telematics, BWE 800*, BWE 800C*, AnyBus-X*

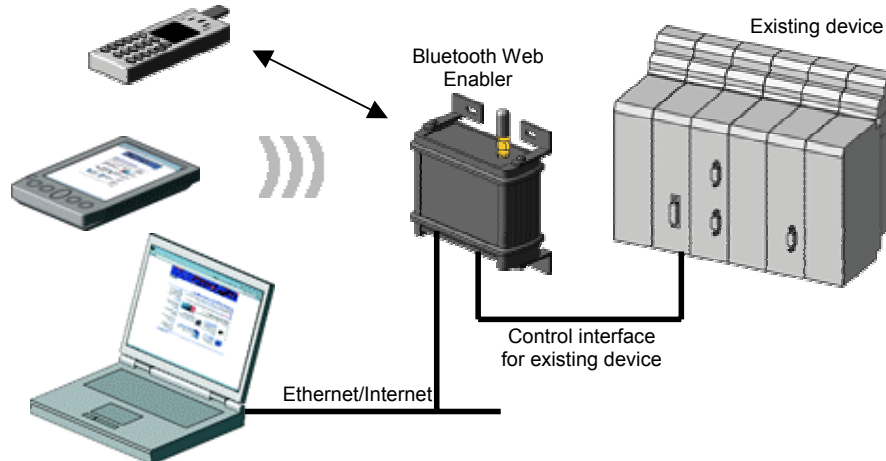
*Ethernet/Internet and Bluetooth

Covered Bluetooth Web Enabler Features:

Bluetooth communication, Ethernet/Internet communication, GSM/GPRS communication, Customizable Web-based user interface, Built-in control protocol.

Example scenario:

This scenario shows a combination of the scenarios including Web-based user interface over Bluetooth, Ethernet/Internet, and GSM/GPRS. The strength of combining access interfaces enables local, remote, and global control. Local control is typically used by a service technician on location of the existing device, while remote control is enabled via Ethernet/Internet or GSM/GPRS e.g. from a control central. Regardless of local, remote, or global access, the web-based user interface looks exactly the same for every user.



The combination of communication types also enables network access functionality – both Bluetooth to network access as well as dial-in functionality to from GSM to the network. This enables a user to reach all devices on the network. See the scenarios “Wireless Network Access Point” and “BWE as Multi Protocol Converter”.

2.5 Wireless Network Access Point

Applicable Bluetooth Web Enabler models:

BWE 425, BWE 425 Telematics, BWE 800, BWE 800C, AnyBus-X, Rugged Bluetooth Access Point

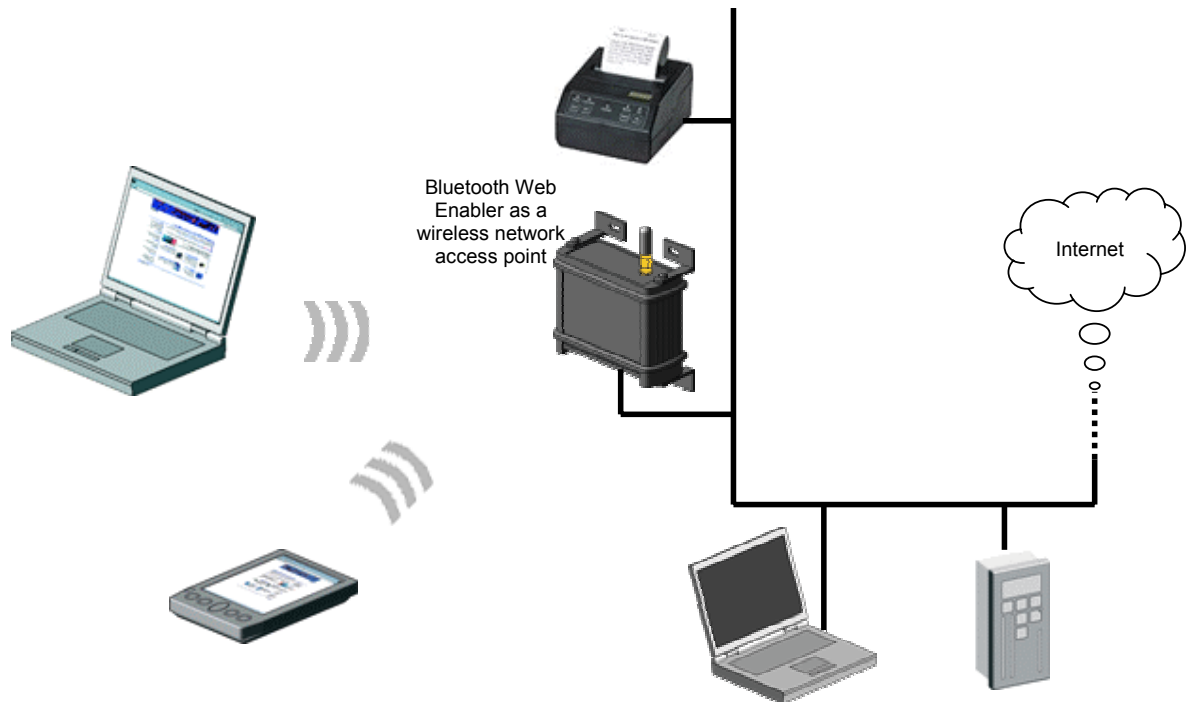
Covered Bluetooth Web Enabler Features:

Ethernet/Internet communication, Bluetooth communication, DHCP, DNS

Many times, users have to access a network without being constrained by cables. These situations also involves several users who come and go – connects and disconnects the access to the network. The IP65 approved quality of the Bluetooth Web Enabler makes it ideal for exposed environments such as airports, museums, public hot-spots, schools, industrial plants etc.

Example scenario:

In the scenario below, the Bluetooth Web Enabler provides wireless access to the network. Users, in this case a laptop and a PDA, get access to all the devices on the network (such as printers, PC, servers etc) as well as to the Internet, assuming the network has an Internet connection. Since the Bluetooth Web Enabler has DHCP support, providing a wireless network access by using the Bluetooth Web Enabler is a matter of plug-n-play.



In the case of BWE 425 Telematics, the Bluetooth Web Enabler also has dial-in functionality to the network over a GSM link. See also the scenario “Combination of Access Interfaces”.

2.6 Data Logging

Applicable Bluetooth Web Enabler models:

All models.

Covered Bluetooth Web Enabler Features:

Data logger, Built-in control protocol, Web-based user interface, FTP

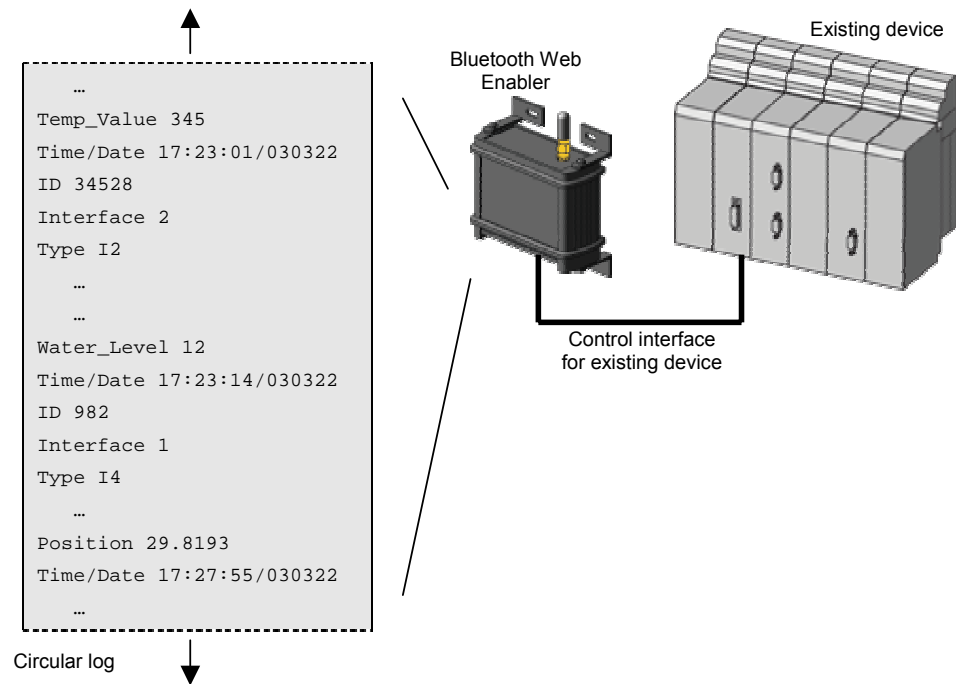
The log system of the Bluetooth Web Enabler consists of two different log areas used for storing important process values received from the existing device.

The first log area is a simple circular log and is used as a “crash recorder” when an error occurs. Values are polled periodically and a hysteresis is used to avoid unnecessary log entries. This log is transferred to a host system when needed and the transfer is initiated from a Web page.

The second log area is also a circular buffer but used for storing more event related information. The Bluetooth Web Enabler stores information at certain events in the process of the existing device. This information is stored in a file and transferred to a central analysis and statistics system on a periodical basis.

Example scenario:

In the scenario below, the Bluetooth Web Enabler is configured to log values from the existing device, which in this case happens to be temperature value, water level value, and position value. This log can be viewed over the Web or downloaded using FTP.



2.7 Reversed Access Point

Applicable Bluetooth Web Enabler models:

BWE 425, BWE 425 Telematics, BWE 800, BWE 800C, AnyBus-X, Rugged Bluetooth Access Point

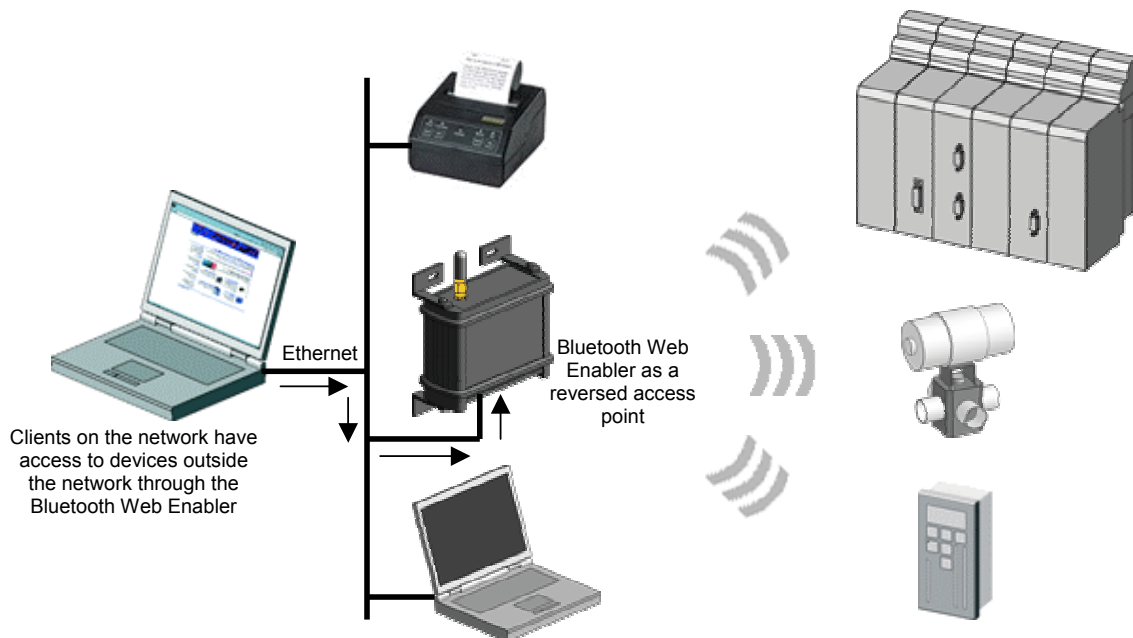
Covered Bluetooth Web Enabler Features:

Reversed Access Point, Built-in control protocol, Web-based user interface

There are lots of situations where the user, sitting on the network, wants to access equipment outside the network. The reversed access point functionality of the Bluetooth Web Enabler enables a user to search, connect, and disconnect to devices outside the network.

Example scenario:

In the scenario below, the user accesses devices outside the network by communicating from the Laptop and out via the Bluetooth Web Enabler. The user has the possibility to search for devices outside the network through the Web-based user interface of the Bluetooth Web Enabler.



2.8 Alarming through SMS or Email

Applicable Bluetooth Web Enabler models:

BWE 125 Telematics¹⁾, BWE 425²⁾, BWE 425 Telematics, BWE 800²⁾, BWE 800C²⁾, AnyBus-X²⁾

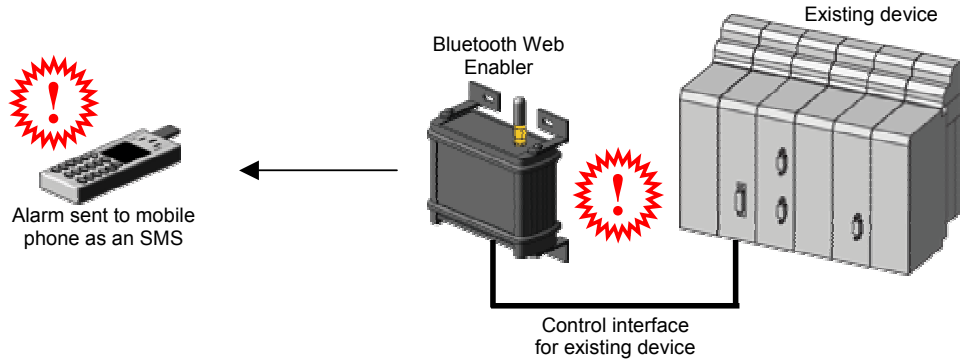
¹⁾ Alarm through SMS only

²⁾ Alarm through Email only

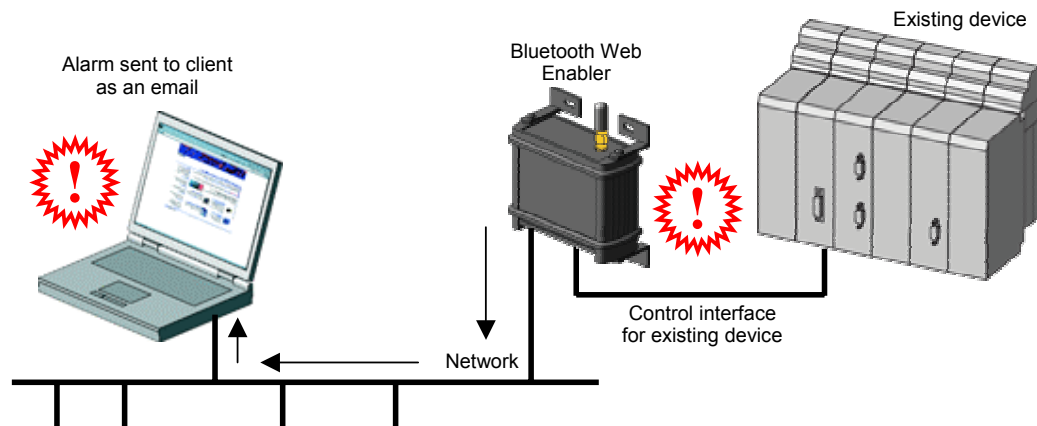
Covered Bluetooth Web Enabler Features:

Alarm manager, Built-in control protocol, Email, SMS

In the scenario of SMS alarming, an SMS is sent to one or several pre-specified mobile phones. The triggering event of the alarm is configurable by the user.



In the same manner, an email is sent when an alarm is executed in the Bluetooth Web Enabler.



2.9 User Interface Update During Operation

Applicable Bluetooth Web Enabler models:

All models.

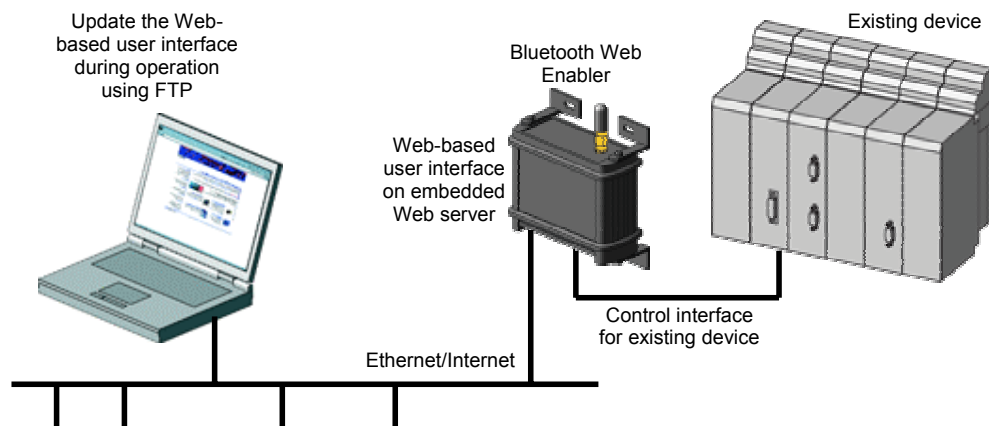
Covered Bluetooth Web Enabler Features:

FTP communication, Web-based user interface

Without having to unplug, disconnect, or in any other way disturb the operation of the existing device, the Web-based user interface can be updated anytime using FTP.

Example scenario:

In the scenario below, the user interface residing in the Bluetooth Web Enabler is updated via FTP over the network. Updating the user interface can also be done via FTP over Bluetooth or GSM.



2.10 User Access Control

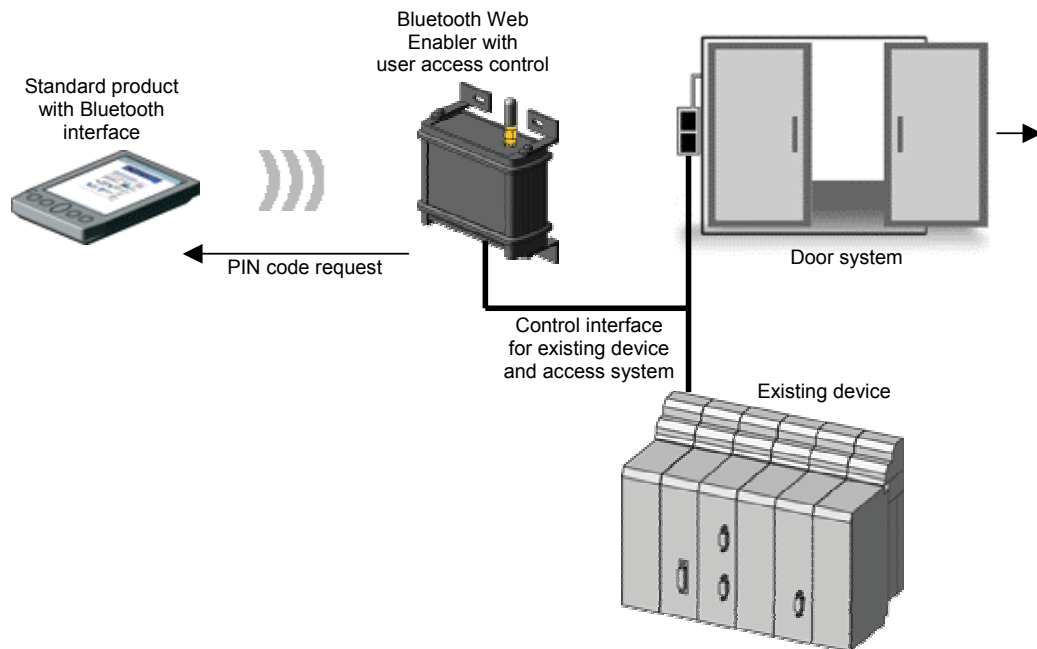
Applicable Bluetooth Web Enabler models:
Implementation in progress.

Covered Bluetooth Web Enabler Features:
User Access Control, Bluetooth communication

The Bluetooth Web Enabler has user access control management built-in, this is used for controlling the physical access of personnel in buildings. When a user wants to access a facility, the Bluetooth Web Enabler automatically issues a request for a pass PIN code over the Bluetooth link. All Bluetooth units supports this security mechanism why it is ideal to use mobile phones, PDAs etc as devices for authorizing access.

Example scenario:

In the scenario below, the user connects to the Bluetooth Web Enabler where upon the Bluetooth Web Enabler automatically issues a request for a PIN code from the user. If the PIN code is valid, the user is granted access through the door. This validation is performed securely which means that no PIN codes are transferred over the Bluetooth link.



2.11 BWE as Multi Protocol Converter

Applicable Bluetooth Web Enabler models:

Implementation in progress.

Covered Bluetooth Web Enabler Features:

Protocol routing, Built-in control protocol

The Bluetooth Web Enabler has built-in support for a range of standard control protocols such as Modbus, MMS, AnyBus (Profibus, DeviceNet etc) as well as user-defined protocols over the serial interface (RS232/422/485). Since the Bluetooth Web Enabler works as a Network Access Point (see the scenario "Wireless Network Access Point"), there is also the option to have transparent access to process data in devices on the network. The built-in protocol routing functionality of the Bluetooth Web Enabler makes it possible to communicate between systems using different protocols.

Example scenario:

The scenario below shows various interfaces where different systems use different protocols. The Bluetooth Web Enabler works as a protocol router between the protocols, translating the data communication and making it possible to integrate all the systems.

