THE GENERAL USE AND FUNCTIONING OF THE BAR CODE SCANNER IS DESCRIBED IN THIS DOCUMENT. ALSO GENERAL SETUP INSTRUCTIONS TO GET STARTED ARE DESCRIBED IN THIS DOCUMENT. FOR FURTHER INSTRUCTIONS CONSULT OPTICON OR YOUR LOCAL DEALER.

OPN2002: OPN2001 SIMULATION BLUETOOTH GUIDE
(Version RFG35106)

The OPN2001 simulation application makes it possible to use OPN2002 as if it's an OPN2001.

Like the OPN2001, the OPN2002 is able to retrieve barcode data and can be configured using its mini-USB cable. However, the OPN2002 also offers the same functionality using a Bluetooth connection.

This guide will describe how a Bluetooth connection can be established between your OPN2002 and remote Bluetooth device like a PC or laptop.

In this manual the OPN2001 PC Application (EGF3094D) will be used to demonstrate how a Bluetooth connection can be established on a Windows PC.

This application can also downloaded at www.opticon.com under:

> 'Service and support' > 'Software' > 'OPN2002'.

This guide will not describe:

- The default OPN2001 compatible operation. Please refer to the OPN2001 documentation for more information on this subject.

- How to develop your own OPN2001 compatible host application. Please download the SDK for the OPN2001 from our web site for more information.

- How to install and use a Bluetooth stack on your remote device. Please check the manual of your Bluetooth device for more information on this subject.

Loading the application on your OPN2002

All required software to load this application on your OPN2002 can be found on www.opticon.com:

> 'Service and support' > 'Software' > 'OPN2002'.

To be able to communicate with your OPN2002 using the mini-USB cable, make sure you've installed the Opticon USB drivers on your PC

Secondly you'll need the latest version of Appload, which is the PC application that can install new software on the OPN2002.

Make sure you've downloaded and extracted this application on your PC. The file name should have the following format: 'RBGV02xx_RFG3510x.hex'.

To load this file on your OPN2002 connect it to your PC or laptop using the mini-USB cable. Start Appload, select the (Virtual) COM port of your OPN2002 and then open the application file in Appload.

Supported features of the OPN2001 simulation application (RFG35106)

The following features are currently supported:

- OPN2001 compatible functionality
- (Limited) support of the Opticon Universal menu book to configure barcode decoders, pre- and suffixes, read modes, buzzer/LED settings, change Bluetooth configurations.
- Connecting to a remote device (as master) and transmit its data using an (incoming) Bluetooth virtual COM port.
- Making the OPN2002 connectable (as slave) to allow a remote device to find and connect the OPN2002 and allow the transmission of its data using an (outgoing) Bluetooth virtual COM port.
- Use of the trigger key and/or barcode labels to establish and disconnect a Bluetooth connection.
- Easy software upgrading by USB (VCP) or the CRD-2000 multi cradle (RS232) using Appload.

Getting started

By default the OPN2002 will operate almost identically as an OPN2001. So to retrieve barcode data and change configurations the mini-USB cable can be used.

Also by default a Bluetooth connection can be established using the OPN2002. However, this can only be done by reading bar code labels.

Since this isn't ideal in most situations, the OPN2001 simulation application can also be put in 'Bluetooth default' mode, which makes it possible to use the trigger key to quickly (re)connect and disconnect.

To make this selection of either 'OPN2001 compatible' operation and 'Bluetooth default' mode read one of the following two labels *:

OPN2001 compatible	
OPN2002 Bluetooth default	

Note: For easy-of-use all configuration labels in this manual can be read without reading the traditional SET/END labels.

Before trying to establish a Bluetooth connection first make sure that your remote Bluetooth device supports the Bluetooth Serial Port Profile (SPP). If it doesn't support this Bluetooth service, then it's not possible to use the OPN2002 as an OPN2001 with Bluetooth.

If your Bluetooth device doesn't support Bluetooth SPP, but does support Bluetooth HID, then you can only use your OPN2002 as an Bluetooth keyboard by installing the 'Bluetooth demo' application (RFG3531x) on your OPN2002. The software and manual of this application can be found on our web site.

The OPN2002 can establish a Bluetooth connection using two different methods:

Master mode	The OPN2002 will actively connect to your PC or Bluetooth device (default)
Slave mode	The OPN2002 will be made discoverable/connectable to allow the remote Bluetooth device to connect to your OPN2002.

On the following pages both methods will be described in detail.

Connecting your OPN2002 as master

If you want the OPN2002 to connect to a remote device (as master) it will be necessary to configure the Bluetooth address of the remote device first.

Usually the address is displayed on the product label as a hexadecimal code (example: 00-11-F6-03-39-69). Otherwise consult the documentation of the device to learn how to retrieve the Bluetooth address.

To configure this Bluetooth address in the OPN2002 you'll have to create a barcode label containing this hexadecimal code as described below.

Opticon provides a simple on-line application to create a barcode label containing a Bluetooth address. This application can be found at:

http://opticonfigure.opticon.com/bluetooth.asp
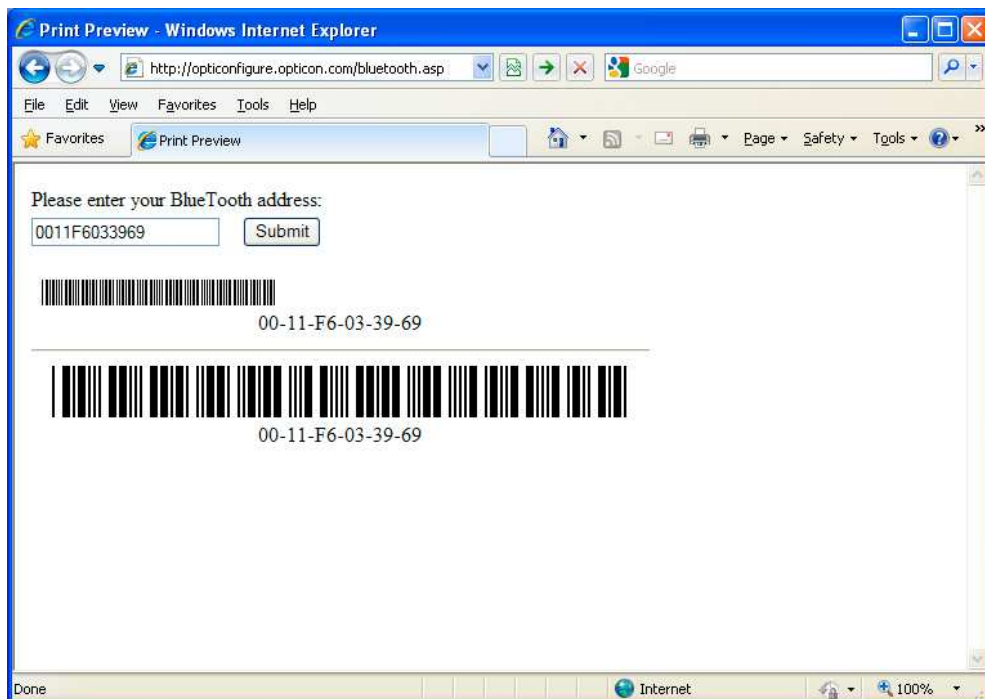
Print screen of the online Bluetooth address label generator.

Type in the 12 digits of the address using numbers and capitals without dashes, dots and spaces (example: 0011F6033969) and press submit.

After you've created the barcode, you can print it and should scan the barcode to configure the Bluetooth address and save it in non-volatile memory.

The OPN2002 will automatically try to establish a Bluetooth connection when reading this label, so this label can also be used to (re)connect to your remote Bluetooth device at any time as well.

Depending on the Operating System and Bluetooth stack of your PC or laptop, it is mandatory to first open the (incoming) Bluetooth Virtual Com port before you will be able to connect your OPN2002 as master.

To open the (incoming) Bluetooth COM port in the OPN2001 PC Application first make sure the 'Show all' option is checked to be able to select any COM port. After that select the (incoming) Bluetooth Virtual COM port of your Bluetooth stack to select and open this port.


Screenshot of the OPN2001 PC application

After opening the Bluetooth COM port in the OPN2001 PC application the connection status indicator will become **red**. This indicator will stay red as long as there's no active (Bluetooth) connection.

The first time you try to connect your OPN2002 to another Bluetooth device you will have to scan the created Bluetooth address label. After that, it will also be possible to do a connection attempt by pressing the trigger key for 5 seconds (until the blue LED starts blinking) or by reading the 'connect' label, which can be found in chapter 2.3.1 of the Universal menu book.

If you authentication enabled (default) on your remote device, then you will be requested to enter a PIN code (or passkey). The default PIN code of the OPN2002 equals the last 4 digits of the Bluetooth address. These last 4 digits of the Bluetooth address are also shown in the Bluetooth name of the OPN2002.

If you wish to use a different PIN code, then this is possible by using the 'Set/end PIN-code label' menu options, which can be found in chapter 2.3.2 of the Universal menu book.
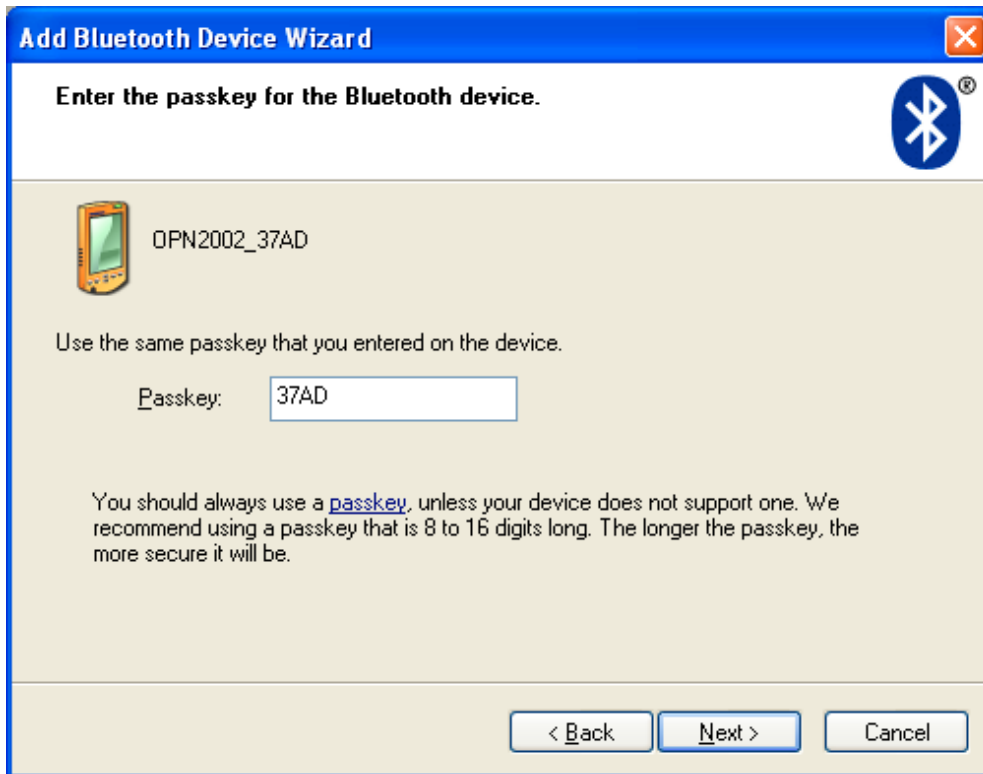
Example of a request on a Windows device to enter a passkey (a.k.a. PIN-code)

When executed correctly your OPN2002 should now be connected to your remote device. To indicate that the OPN2002 is successfully connected it will sound a high beep tone. Also the connection indicator of the OPN2001 PC Application should turn green.

You should now be able to retrieve or delete barcodes from the OPN2002, set the time and date and change configurations just like a normal OPN2001.

Depending on the Operating System and Bluetooth stack of your PC or laptop, the Bluetooth connection will be automatically closed when you close the COM port in the OPN2001 PC Application.

If your PC or laptop hasn't closed the connection, then the OPN2002 will automatically disconnect after 10 minutes of inactivity. (See chapter 2.3.5 of the Universal menu book to change this setting).

It's also possible to manually disconnect your OPN2002 by pressing the trigger key for 5 seconds or by reading the DISCONNECT label (See also Universal menu book chapters 2.3.1 and 2.3.4)

Manually disconnect	
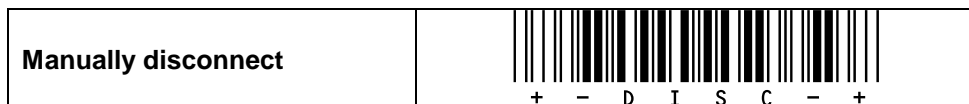
If you lose your Bluetooth connection, then the OPN2002 won't automatically try to reconnect. You can reconnect manually by pressing the trigger key for 5 seconds or by reading the Bluetooth address label again. To change this behavior, use the menu options found in chapter 2.3.6 of the menu book.

It's also possible to reconnect by reading the CONNECT label below.

Manually connect	
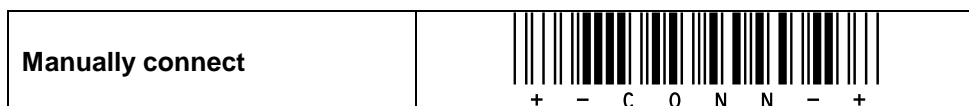
Connecting to the OPN2002 as slave

When you want a remote Bluetooth device to connect with your OPN2002, then it is not necessary to configure the remote Bluetooth address, but you will have to make your OPN2002 discoverable and connectable to allow the remote device to find and connect to your OPN2002.

To make your OPN2002 discoverable and connectable for 2 minutes read the 'Make discoverable and connectable label' (see also Universal menu book chapter 2.3.1)

Make discoverable and connectable	‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖ + – D S C O – +

It's also possible to press the trigger key for 5 seconds for this purpose, but you will have to change the default **'trigger to connect' (master)** behavior to **'trigger to make connectable'**. Read one of the options below to select the preferred configuration.

| Trigger to connect	‖‖‖‖‖‖‖‖‖‖‖‖‖ B B C
Trigger to make connectable / discoverable	‖‖‖‖‖‖‖‖‖‖‖‖‖ B B D

After you've made the OPN2002 discoverable you can let your remote device discover all Bluetooth devices in range to find your OPN2002.
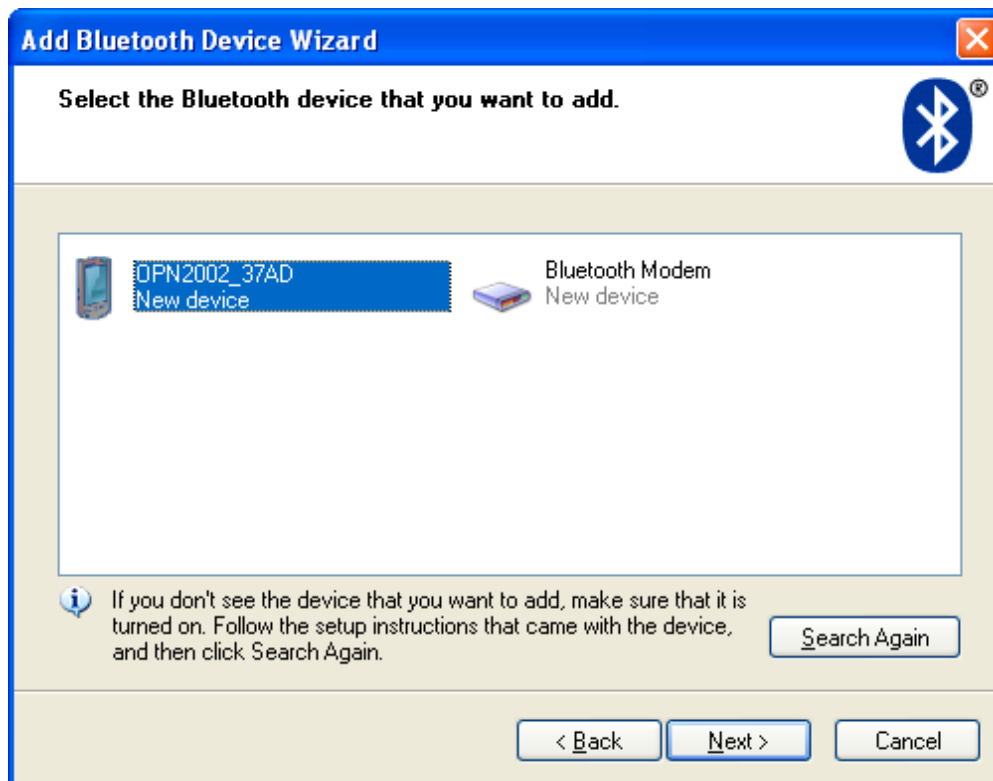
Screenshot of discovered Bluetooth devices.

After you've successfully discovered your OPN2002, you can try to let your remote device pair with your OPN2002.

If you haven't disabled authentication on your remote device, then you will be requested to enter a PIN code (or passkey) on your remote device. The default PIN code of the OPN2002 equals the last 4 digits of the Bluetooth address. These last 4 digits of the Bluetooth address are also shown in the Bluetooth name of the OPN2002. If you wish to use a different PIN code, then this is possible by using the 'Set/End PIN-code label' menu options, which can be found in chapter 2.3.2 of the Universal menu book.
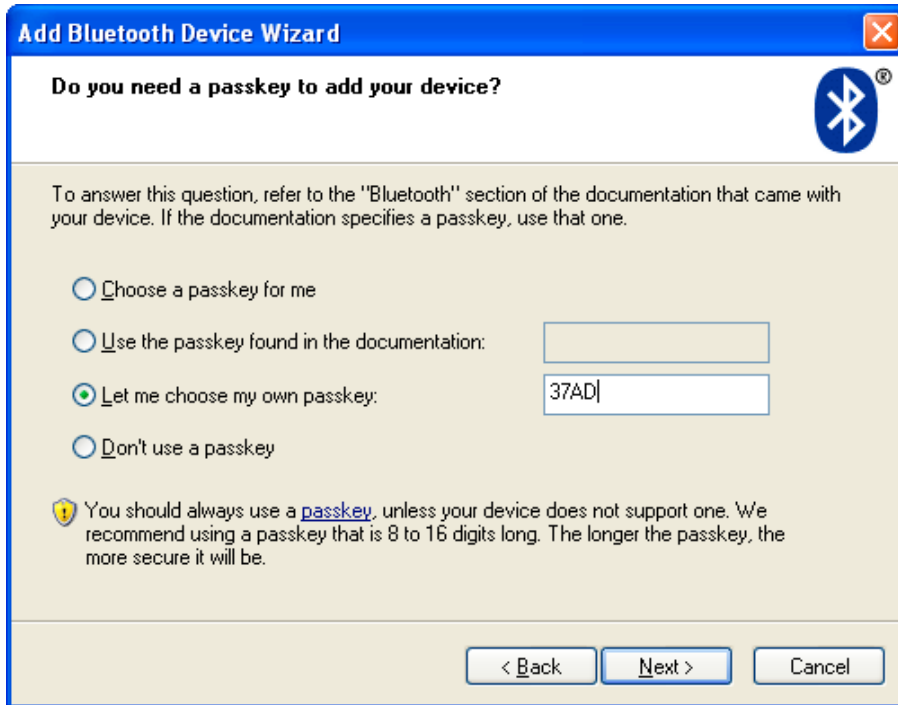
Screenshot of entering a passkey (a.k.a. PIN-code) on a Windows device

If successful, the OPN2002 should now be successfully paired with your remote Bluetooth device and an (outgoing) Virtual Com port should be available to be used.

To be able to open the Bluetooth connection with the OPN2002 make sure your OPN2002 is still connectable (the blue LED should still be blinking), then open the outgoing Bluetooth Virtual COM port in the OPN2001 PC Application.

If you loose your connection or close the Virtual Com port manually, then the OPN2002 will stay connectable for about 2 minutes. After those 2 minutes use the trigger key or the 'Make connectable label' to make the OPN2002 connectable again and allow the remote device to re-establish the connection by opening the COM port again.

The OPN2002 will automatically disconnect after 10 minutes of inactivity. (See chapter 2.3.5 of the Universal menu book to change this setting).

It's also possible to manually disconnect your OPN2002 by pressing the trigger key for 5 seconds or by reading the 'Disconnect' label in the Universal menu book. (See chapter 2.3.1 and 2.3.4 of the Universal menu book)

| **Manually disconnect** | + - D I S C - + |

Additional Bluetooth features

In the Opticon Universal menu book additional Bluetooth features can be found for Opticon barcode readers with Bluetooth support. Some of these features are also available for this application.

Below these options will be briefly mentioned. For more information and the actual configuration labels to use these options, please refer to chapter 2.3 of the Universal menu book.

1. Bluetooth connection labels

Below you will find a list of connection control labels, which can be useful to quickly reconnect or disconnect your OPN2002.

Manually connect	‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖‖ + - C O N N - +
Manually disconnect	‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖‖ + - D I S C - +
Make discoverable and connectable	‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖‖ + - D S C O - +
Manually unpair *	‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖‖ + - U N P R - +

* Note: Reading the 'unpair' label will force the OPN2002 to redo the pairing on the next connection attempt. This can be useful in situations that you don't want unauthorized people to connect your OPN2002 to your remote device.

In case you're in the situation that you want to connect the OPN2002 to a Bluetooth device, but you don't have the possibility to print a Bluetooth address label containing the Bluetooth address, then it's also possible to configure the Bluetooth address using the Universal menu book. The Set/End Bluetooth address labels can be found in chapter 2.3.1 including more information on how to use them. The direct input labels of chapter 4.3.3 can be used to enter the 12 digits of the Bluetooth address.

2. Bluetooth security options

In situations that you want a more secure Bluetooth connection there are a couple of menu options available for this purpose. Using these options it is possible to change the default passkey (PIN-code), enable encryption and make authentication mandatory. These options are described in chapter 2.3.2 of the Universal menu book. It's also possible to read the unpair label above to ensure that the OPN2002 needs to pair again the next time it is used.

3. Trigger-to-connect options

By default the OPN2002 can reconnect by pressing the trigger key for 5 seconds. This option can be disabled and also the time of 5 seconds can be changed between 1 and 9 seconds.

When you're using the OPN2002 in slave mode, it's also possible to make your OPN2002 discoverable and connectable again by pressing the trigger key by enabling the 'Trigger to make connectable/discoverable' option.

More information about these options can be found in chapter 2.3.3 of the Universal menu book.

4. Trigger-to-disconnect options

By default the OPN2002 will disconnect by pressing the trigger key for 5 seconds. However, it is possible to disable or configure a 'trigger-to-disconnect' time between 1 and 9 seconds. These options can be found in chapter 2.3.4 of the Universal menu book.

5. Auto disconnect options

To save power, it's possible to automatically let the OPN2002 disconnect if it has been idle for the configured time (ranging between 10 and 60 minutes). Using chapter 2.3.5 of the Universal menu book the OPN2002 the auto disconnect time can be configured.

Note: On early models of the OPN2002 this feature might not work.

6. Auto reconnect options

By default the OPN2002 won't try to reconnect after a connection loss. However, a reconnect time can be configured to automatically reconnect after a connection loss. These options can be found in chapter 2.3.6 of the Universal menu book.

7. Power saving options

The universal menu book (chapter 2.3.7) also lists a number of wireless power saving options to reduce the power consumption of the OPN2002. These options can be set in this application as well. However, it is not recommended to use these options, because they increase the response time of the OPN2002, which in return can cause time-outs on OPN2001 compatible PC applications.

Trouble shooting

Since the OPN2002 doesn't have a display, it also doesn't have a system menu to resort to when you've installed a crashing application that prevents you from loading new software on the OPN2002.

For this reason the OPN2002 has a few escape mechanisms to allow you to restart, halt your application and/or install new software. This can be very useful in case the OPN2002 has crashed or is constantly restarting due to a crashing application.

Restart mechanisms

Automatic	The OPN2002 has a watchdog timer to determine whether the OS is still running or has crashed. This watchdog will cause the OPN2002 to restart after 3 seconds if the OS has crashed. This watchdog timer will not cause a restart when only the application has crashed.
Manually	The OPN2002 has a manual restart mechanism that allows you to restart in situations that the OS is still running, but your the application has crashed. In order to activate this mechanism, press and hold the trigger or delete key for at least 20 seconds. After the OPN2002 has sounded the restart beep, you can release the key to complete the restart.

Halting your application

Firstly, make sure your battery isn't empty and your mini-USB cable is not connected to the OPN2002. Then restart your application using one of the two restart methods listed above, while keeping the trigger key pressed.
While keeping the trigger key pressed, insert the mini-USB cable into the OPN2002 to halt the application.

If successful, the LED of your OPN2002 should now be blinking orange. You should now be able to load new application or OS software.

Halting the Operating System (only necessary in case a corrupt OS is installed)

Firstly, make sure your battery isn't empty and your mini-USB cable is not connected to the OPN2002. Then restart your application using one of the 2 methods listed above, while keeping the delete key pressed.
While keeping the delete key pressed, insert the mini-USB cable into the OPN2002 to halt the Operating system.

If successful, the LED of your OPN2002 should now be blinking red. You should now be able to load a new OS.

Software updates

In the future more features and/or bug fixes can be implemented into the Operating system of the OPN2002 and/or this application. To find out if there are software updates available, please check www.opticon.com. All available software and documentation for the OPN2002 can be found under.

'Service and support' > 'Software / Manual' > 'OPN2002'.

Note: This application will always be released as a combined file containing both the latest Operating System as well as the application. This is done to prevent incompatibilities and make sure that any bug fixes in the Operating system are automatically fixed after installing the latest application update.

.

Version history

RFG35100	Beta release	August 7th, 2009
RFG35101	First official release	September 9th, 2009
RFG35102	Bug fixes related to battery management and bar code reading; Watchdog mechanism added	October 23rd, 2010
RFG35103	Fixed crash at erasing the barcode memory; improved loading of new software	November 12th, 2010
RFG35104	Fixed menu book bug; improved trigger response time.	February 4th, 2010
RFG35105	Fixed long stretched beep when erasing barcodes and storing settings; fixed error message on setting of parameters in OPN2001 demo; fixed 'no-communication' without 'wakeup' problem.	March 29th, 2010
RFG35106	**Add Bluetooth support** Fixed too slow anti-contact-bounce setting	April 23rd, 2010

Note: Bug fixes and added features in the (attached) Operating System of the OPN2002 are not always listed in the application version history above.