H-32 User Guide

WINDOWS EMBEDDED COMPACT 7

Version 1.02

Opticon Sensors Europe B.V.

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Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules.
Rule 15.21: You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.
These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

For body worn operation, this phone has been tested and meets FCC RF exposure guidelines when used with an accessory that contains no metal and that positions the handset a minimum of 0.5 cm (0.20 in.) from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

Declaration of Conformity (DOC) with Regards to Essential Requirements of EU Directives and FCC requirements

Brand name: Opticon
Model: H32, H32-2D
Product: Windows Mobile PDA

Is in Conformity with the following:

EMC Directive:	2004/108/EC EN 55022: 2010/AC:2011 EN 55024: 2010 EN 301 489-1 V1.9.2: 2011 EN 301 489-17 V2.2.1: 2012
R&TTE Directive:	1999/5/EC EN 300 328 V1.7.1: 2006 EN 301 893 V1.6.1: 2011

FCC Part 15 Subpart B, Class B
FCC Part 15 Subpart C
This Device complies with Part 15 of the FCC rules.
Operation is subject to the following two conditions:

1. This device may not cause harmful interference and,
2. This device must accept any interference received, including interference that may cause undesired operation.

Safety:

Laser safety:	IEC 60825-1: 2007 (2nd Edition)
Photo biological safety of lamps and lamp systems:	IEC62471:2006-07 (1stEdition) / EN62471:2008-09
LVD:	IEC 60950-1:2005 (2nd Edition) / Am 1:2009 EN 60950-1: 2006+A11: 2009+A1: 2010+A12:2011
SAR:	EN62209-2:2010/ EN 50566:2013/ EN 62479:2010 OET 65

Environmental:

RoHS Directive: 2011/65/EU	EN 50581:2012
REACH Directive: 1907/2006/EC	Does not contain any of the Substances of Very High Concern (144 SVHC)
WEEE Directive: 2012/19/EU 2002/96/EC 2003/108/EC	EN 50419:2006

Safety Information

General

Please read the following information carefully before you start using this device to avoid any damages caused by improper usage:

- The device is not charged when you take it out of the box. Charge the battery for at least eight hours before first use. Do not remove the battery while charging.
- Do not use batteries which have not been specified by the manufacturer and not qualified with the system per the standard of IEEE-Std-1725 -2006, as this may present a risk of fire, explosion, leakage or other hazard.
- Do not charge the battery with an unspecified AC Adapter, as this may cause damage to both the device and the battery.
- When discarding the batteries, dispose of them in a proper manner, according to your local laws.
- Do not open the device housing or tamper with the device, as it will void your warranty.
- Do not apply excessive force on this product, as it may cause damage to the screen or the internal component.
- Do not use the device at gas or refueling stations, chemical plants, and places containing explosives or flammable materials. Observe local guidelines.
- Use only manufacturer specified stylus. Do not scratch the screen with sharp objects.
- Do not clean the screen with chemical detergents. Only use cloths specifically designed for cleaning liquid displays or a soft cloth moisturized with water drops, to wipe the device screen.
- Do not expose the device to direct sunlight or leave the device in a humid environment for extended periods of time as this may cause damage to the device and battery.
- Do not immerse the device in water.
- The device may interfere with the navigation and/or communication systems on aircraft. The laws of most countries prohibit using this device while on an aircraft. Observe local guidelines.
- This product may cause medical equipment to malfunction. The use of this device is forbidden in most hospitals and medical clinics. Observe local guidelines.

Additional Battery Information

Please read the following information carefully to understand battery safety.

- Do not disassemble or open, crush, bend or deform, puncture, or shred the battery.
- Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.
- Only use the battery for the system for which it was specified.
- Only use the battery with charging system that has been qualified with the system per this standard. Use of an unqualified battery or charger may present a risk of fire, explosion, leakage, or other hazard.
- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Battery usage by children should be supervised.
- Avoid dropping the H-32 or battery. If the H-32 or battery is dropped, especially on hard surface, and the user suspect damage, take it to service center for inspection.
- Improper battery use may result in a fire, explosion, or other hazard.
- Seek medical advice immediately if a battery has been swallowed.
- Do not leave the battery where the temperature is 60°C (140°F) or more.
- Do not solder lead directly to the battery body.
- Do not heat nor solder the terminals of the battery.
- Do not charge beyond the condition which described on the delivery specification.
- Do not inverse charge the battery.
- In the event the Battery Pack leaks and the fluid gets into one's eye, do not rub the eye. Rinse well with water and immediately seek medical care. If left untreated, the battery fluid could cause damage to the eye.
- Charge the battery at least every six months. An excessive over-discharge may cause an abnormal chemical reaction, which may result in acid leakage or fire of the battery.
- Despite being rechargeable, the battery has a limited life span. Replace it when usage time becomes short.

Safety of Laser Products: International Standards Laser Class 2

This product complies with JIS C6802: 2005 Class 2, IEC60825 -1+A2: 2001 Class 2 and 21CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007.
Class 2 Laser devices are not considered to be hazardous when used for their intended purpose.
Use of controls, adjustment of procedures other than those specified herein may result in hazardous laser light exposure. Do not look directly into the light beam with optical instruments; it may pose an eye hazard.

Document Revisions

Date	Version Number	Document Changes
24-04-2015	1.00	Initial Draft
09-11-2015	1.01	Factory reset update, troubleshooting update.
17-03-2016	1.02	Multi language OS, barcode firmware update tool, keypad table

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1 Introduction

1.1 Scope and Purpose

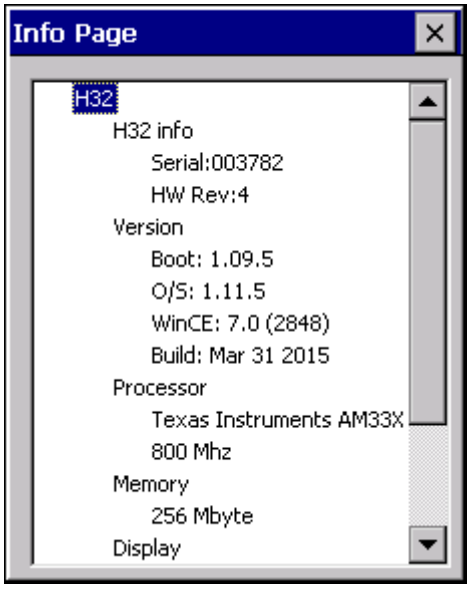
The H-32 user guide provides some basic information on setting up and operating the H-32 Windows Embedded Compact 7 terminal.

1.1.1 Configuration

The H-32 will be available in two different setups. The difference between the two terminals is the scan module. The H-32 with 1D option uses the Opticon MDL-2001 laser module and the H-32 with 2D option uses the Opticon MDI-3100 imager.

1.1.2 Software version

The H-32 runs a Windows Embedded Compact 7 operating system. To determine the current software version build for the H-32 tap -> **Control Panel** -> **Version** -> button.



1.1.3 Service Information

In case there is problem with the H-32 or more information is needed, contact Opticon Support.

support@opticon.com
support@opticonusa.com

When contacting the Opticon support please have the following information available:

- Model name H-32 1D or 2D
- Serial number
- Hardware revision
- O/S version

In case the H-32 was purchased through one of Opticons business partners, contact the Opticon business partner for support.

2 Getting Started

2.1 Overview

The H-32 is a ruggedized handheld barcode scanner. It has a Windows Embedded Compact 7 operating system several wireless connections options. The H-32 has an integrated numeric keyboard for easy data entry. The H-32 is powered by a main battery that can be removed and replaced without the need for special tools.

Wireless network and Bluetooth connections are handled by a Laird communication module. The WLAN has an 802.11 a/b/g/n radio working at 2.4 and 5GHz. The Bluetooth support 2.1 + EDR and support SPP, HID, file transfer, OBEX object push and PAN.

For the H-32 there are several accessories available including a single slot charging cradle a five slot multi cradle and a special holster.

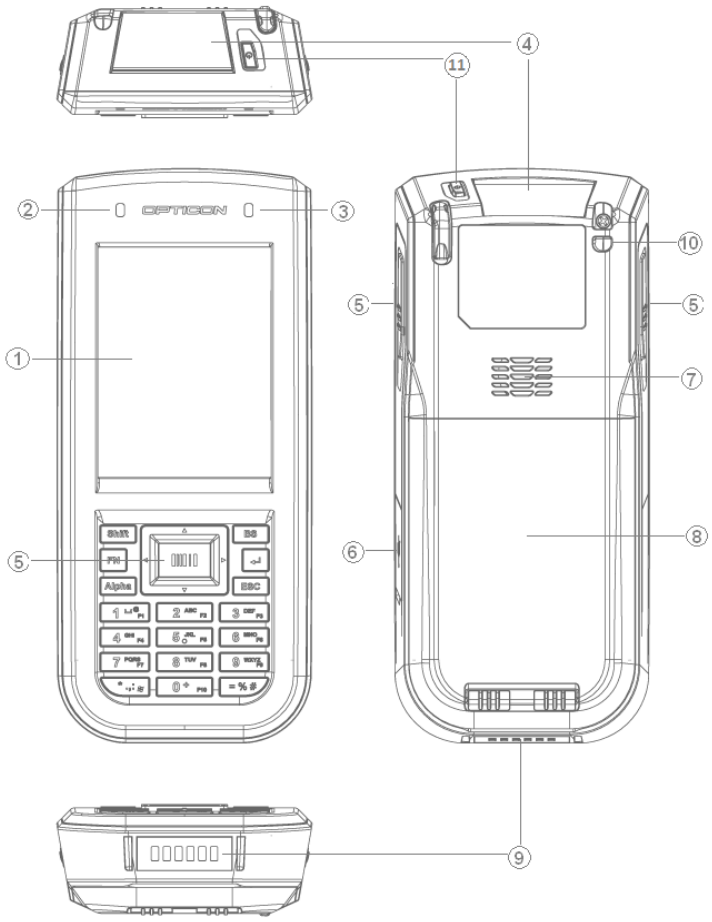
2.2 Unpacking

The H-32 is supplied in a white carton and should contain the following items.

- H-32 terminal including stylus
- Wrist strap
- Stylus connection cord
- USB cable
- Quick start guide

✔ Note: The battery of the H-32 is an item that is sold separately.

2.3 H-32 Detailed View



No.	Part Function
1	LCD Display
2	Charging status LED
3	Barcode scanning status LED
4	Optical scan window
5	Barcode trigger keys
6	Micro USB connector
7	Speaker
8	Battery lid
9	System connector
10	Eyelet for wrist strap and stylus cord
11	Power button

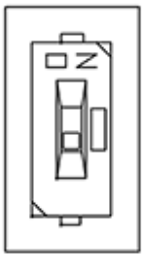
2.4 Initial setup

To use the H-32 for the first time:

- Connect accessories
- Enable the backup battery
- Insert main battery
- Connect power source
- Power on H-32
- Configure H-32

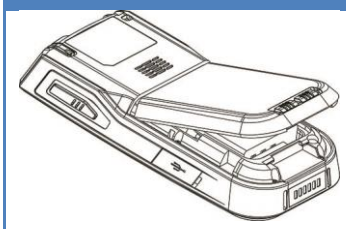
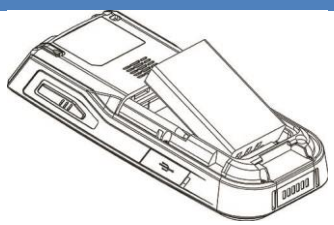
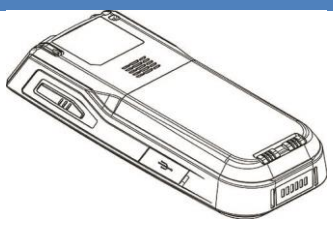
2.4.1 Enable backup battery

To enable the backup battery in the H-32 the battery lid needs to be removed.

	When the dip switch slide is in the ON position the backup battery is enabled.
	When the backup battery is in the off position then the backup battery is disabled

✔ Note: Set dip switch slide to the off position when H-32 is not going to be used for a long time to prevent deep discharge.

2.4.2 Installing main battery

Step 1	Step 2	Step 3
		
Remove battery cover by moving the two slides to each other.	Insert the battery with the contacts first then align the battery contacts to the spring contacts in the H-32 and push in the battery.	Put the battery cover back and move the slides to the outside.

2.4.3 Charging the battery

Before using the H-32 for the first time, charge the main battery until the charging indicator turns green.

To charge the H-32 use either the supplied USB cable or the single slot or five slot multi cradle. The backup battery is automatically charged when the dip switch has been set to

the ON position. Charging of this backup battery can take more than 24 hours to fully charge. The backup battery is only used for swapping main battery.

Source	Charging time
USB Cable	Approximately 8 hours
Single slot cradle	Approximately 4 hours 30 minutes
5 slot multi cradle	Approximately 4 hours 30 minutes

H-32 Charging LED indicator

Charge status LED	Description
Off	H-32 is not charging; H-32 is not correctly inserted in the cradle or charger is not powered.
RED	Charging; Battery status very low.
ORANGE	Charging; Battery status between low and fully charged.
GREEN	Charging complete battery fully charged.

✔ Note: Charge state status LED update can take up to 5 seconds to show the correct state.

2.4.4 Charging temperature

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). The charging of the main battery is controlled by the intelligent H-32 power management system. When temperatures exceed the 40°C the power management system will stop charging and continue when an acceptable temperature is reached. This will help for safe operation and longer battery life.

2.4.5 Power on the H-32

To power on the H-32 press the H-32 red power button. When turning on the H-32for the first time or after a reset the Opticon splash screen appears for 50 seconds. If the H-32 detects that screen calibration is not correct the screen calibration will appear. This calibration will always appear after a factory reset.

✔ Note: When H-32 powers up after inserting battery for the first time, the device boots up and powers on automatically.

2.4.5.1 Calibrate the display

Calibrate the touch screen to have the cursor match the tip of the stylus. Remove the stylus from the H-32. Carefully press and hold the tip of the stylus on the center of every target. Repeat the same steps while the target moves around the screen, then tap the screen to continue.

3 Using the H-32

This chapter explains the buttons, status icons, and controls on the H-32, and provides basic instructions for using the H-32.

3.1 Tapping touch screen with the H-32 stylus

✔ Note: Always use the supplied H-32 stylus for tapping the touch screen. Never use a pencil, pen or other sharp or abrasive object on the touch screen.

Hold the stylus as if it were a pen or pencil. Touch an element on the screen with the tip of the stylus from the screen. When the stylus is not used place it back in the stylus holder.

The use of the stylus similar as the use of a mouse with a difference that a right-click of the mouse can be simulated by tap and holding the touch screen. When a stylus is lost a replacement can be ordered.

✔ Note: The stylus is meant to use with the touch screen. Never use the stylus on the power or keypad buttons, use a finger to operate these buttons.

3.2 Calibrating the touch screen

If the touch screen is not responding properly to the stylus tap it might be needed to recalibrate the touch screen.

Recalibration involves tapping the center of the target. If the center is missed keep the stylus on the screen and move the tip of the styles to the targets center and the lift the stylus.

To recalibrate the display, tap -> **Control Panel** -> **Stylus** -> **Calibration** tab. To begin recalibration, tap the Recalibrate button. Carefully press and hold the tip of the stylus on the center of every target. Repeat the same steps while the target moves around the screen, then tap the screen to continue.

3.3 Backlight

The backlight of the H-32 is high current consumer in the H-32. Setting the backlight brightness and backlight timer can have a big effect on operation time.

3.3.1 Adjust display backlight timer

To get to the backlight timer tap -> **Control Panel** -> **Display** -> **Backlight** tab. There are two options for the backlight timer. Option one is when the H-32 is running on battery power. Option two is when the H-32 is being charged by either cradle or USB cable. The H-32 default settings are for battery power 30 seconds and for external power 10 minutes. After the time has expired the backlight is turned off. When both checkboxes for battery and external power are unchecked the backlight will never turn off while the H-32 is on.

3.3.2 Adjust display backlight brightness

To get to the backlight brightness dialog tap -> **Control Panel** -> **Display** -> **Backlight** tab and tap the Advanced button. The default brightness is set to 30%. The brightness can be changed by moving the slider to the left or right. Changing the slider setting will show immediately the slider backlight brightness. The new settings are applied when the OK button is tapped. Tapping the ✕ button will ignore the slider settings and use the previous brightness setting.

3.4 Date time

The H-32 has in internal real time clock. When the H-32 is started for the first time the default date is 1-1-2015. The default time zone is Pacific Time. Default a date/time synchronizing service is running in the H-32. Time sync happens automatically when there is a Wi-Fi connection and the set time server can be reached.

3.4.1 Set Date and Time zone

To get to the Date/Time properties dialog there are two options, double tap the clock in the Taskbar or tap -> **Control Panel** -> **Date/Time**. In the Date/Time properties dialog the date, time and Time zone can be set a checkbox is available for enabling automatic adjustment for daylight saving time. After making changes tap the apply button or tap the OK button.

3.4.2 Change Time sync settings

Time synchronization settings can be changed but only from the registry. To have the registry changes to take effect then either programmatically a new sync is requested or a reboot of the H-32 is needed.

Time service registry setting

```
[HKEY_LOCAL_MACHINE\Services\TIMESVC]
"server"=hex(7):\
       74,6F,63,6B,2E,75,73,6E,6F,2E,6E,61,76,79,2E,6D,69,6C,00,\
       74,69,6D,65,2E,77,69,6E,64,6F,77,73,2E,63,6F,6D,00,00
"refresh"=dword:0036EE80
"recoveryrefresh"=dword:000493E0
```

Value: type	Description
Server REG_SZ or REG_MULTI_SZ	Default 2 time servers have been set in the H-32. The above settings match. tock.usno.navy.mil time.windows.com
Refresh DWORD	Specifies the period, in milliseconds, between synchronizations with the SNTP server. This value needs to be higher the recoveryrefresh value minimum value is 300000 (0x000493E0) milliseconds. Default refresh time 1 hour.
Recoveryrefresh DWORD	Specifies the time, in milliseconds, until next synchronization if the previous attempt failed. Default recovery refresh time is 5 minutes.

✔ Note: Both SNTP and NTP are clients of the User Datagram Protocol (UDP). The UDP port number assigned to NTP is 123.

3.5 Power scheme

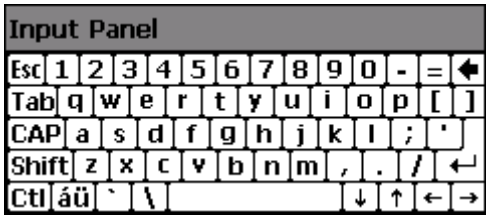
The power scheme is used for power control. There are three different states that the power scheme supports. The settings for the power scheme can be set for AC powered (charging) or battery powered operation. To get to the power scheme tap -> **Control Panel** -> **Power** -> **Schemes** tab.

State	Description
User Idle	After the user idle timer has expired the H-32 will shut down a number of services e.g. the backlight.
System Idle	After the System idle time has expired more services will be shut down.
Suspend	When the suspend timer has expired the H-32 will be turned off. This has the same effect as if the user pressed the power button for a short time.

The power scheme timers work cumulative. This means that the system idle timer can only expire after the user timer has expired. When all three idle states are set to one minute the H-32 power scheme operate like this:

- User Idle – after 1 minute inactivity
- System idle – after 2 minutes of inactivity
- Suspend – after 3 minutes of inactivity

3.6 Input Panel / Virtual keyboard



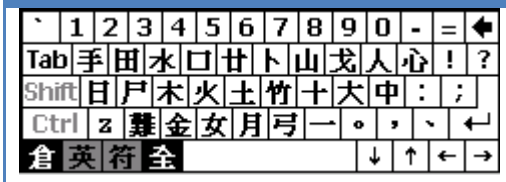
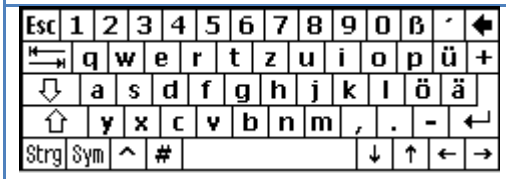
The input panel or also called virtual keyboard can be used to input data. The input panel will not come up automatically when the cursor is placed into an edit field. The keyboard can be controlled from the taskbar. If the automatic mode of the input panel is wanted a registry key needs to be changed.

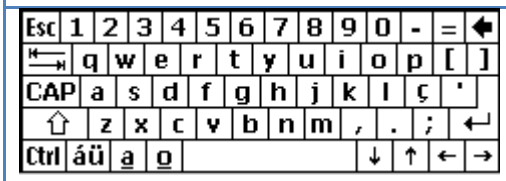
Input panel registry setting

```
[HKEY_CURRENT_USER\ControlPanel\Sip]
      "TurnOffAutoDeploy"=dword:00000000
```

Value: type	Description
TurnOffAutoDeploy REG_DWORD	The default value for this key is 0. If this value is set to 0, the auto deploy is turned on. If this value is set to 1, the auto deploy feature is permanently turned off.

When the multiple language OS is used then there will be additional keyboards available.

Keyboard	Description
	Chajei IM Name keyboard. To use this keyboard also the Microsoft Chan Jei pIME needs to be set from the -> **Control Panel** -> **Regional Settings** -> **Input** tab.
	French AZERTY keyboard layout
	German QWERTZ keyboard layout

	International keyboard can also input Korean. To be able to input Korean the Microsoft Korean IME97 needs to be set from the -> **Control Panel** -> **Regional Settings** -> **Input** tab.
	Phonetic IM Name keyboard. To be able to input Traditional Chinese with this keyboard the Microsoft Bopomofo pIME input method need to be selected from the -> **Control Panel** -> **Regional Settings** -> **Input** tab.
	Portuguese keyboard layout.
	Russian keyboard layout.
	Default QWERTY US keyboard layout

✔ Note: For some keyboards to get the correct values on the display of the H-32 also the correct language needs to be set from the Regional control panel.

3.7 Language

If a MUI version of the H-32 OS is loaded then a setup of the user interface language is possible. To change the user interface language tap the -> **Control Panel** -> **Regional Settings** -> **Language** tab. Select the wanted language from the combobox and tap the OK button. A dialog box appears that a reboot is needed to have the language actually change. Close the dialog box by the OK button, close all open applications and hold to power button pressed for about 8 seconds to perform a reboot. After the H-32 is rebooted the interface language is set to the selected language.

Supported languages are:

- Chinese (Traditional, Taiwan)
- English (United States)
- French (France)
- German (Germany)
- Italian (Italy)
- Korean (Korea)
- Portuguese (Brazil)
- Russian (Russia)
- Spanish (Spain, International Sort)

English is the default language if a factory reset is then the language is preset to English.

✔ In the non MUI OS version this option is greyed out.

3.8 Reboot / Reset

The H-32 supports two types of reboot/reset. This is a normal reboot where the operating system is restarted no saved data or registry changes are lost. The second option is a factory reset. A factory reset will wipe all registry changes and data from the NAND and make the H-32 startup as if it is just being unboxed.

3.8.1 Reboot

To reboot the H-32 press the power button for approximately 8 seconds until the vibrating motor is felt. Release the power button and wait for the H-32 to startup.

3.8.2 Factory Reset

To start a factory reset first reboot the H-32 by pressing the power button for approximately 8 seconds until the vibrating motor is felt. Release the power button and keep the [*] + [6] button combination pressed until the OPTICON logo appears on the LCD display. Now release the button combination.

The next operation will be different depending on the bootloader version.

Bootloader version	Description
Pre bootloader version 1.12.0	An immediate Factory reset message appears on the display and the factory reset is started.
Bootloader 1.12.0 and up	A factory restart warning message is shown on the display with a request to enter the passcode to start the factory reset. The passcode will be the last 4 digits of the serial number. Failing to enter the correct passcode will reboot the H-32 normally. Passcode example: Serial number: 000123 Passcode: 0123 On a correct passcode a factory reset message appears.

Now wait until the H-32 is booted and do the screen calibration before the H-32 can be operated.

✔ Note: A factory reset will not touch or alter data stored on the micro SD card.

4 Power modes and batteries

4.1 Power modes

The H-32 supports several power modes that have their specifics. A small description of the different are explained in this chapter. Changes to the power mode timings can be made from tap -> **Control Panel** -> **Power** -> **Schemes** tab.

4.1.1 On

In the On state, the keyboard touch screen and all peripherals function normally. The display backlight will be on until either the user idle timer or the backlight timer expires. User activity events will keep the H-32 in the on state.

Typical H-32 user activity events are:

- Touch screen tap
- Keypad or trigger key presses
- USB cable insert or removal
- Cradle insert or removal
- Short power key press

4.1.2 User Idle

In the User idle state the backlight will be off. The user activity events described in the on state will put change the H-32 power state from User idle to on. When the user idle timer has expired the H-32 will go to the system idle state.

4.1.3 System Idle

In the System idle state some of the peripherals are put into a low power consuming state. One of the user activity events will put the H-32 back to the on state. If the System idle timer expires then the H-32 will go to the suspend state.

4.1.4 Suspend state

In the suspend state all peripherals are put into the lowest power consumption mode as possible. In the suspend state it is possible to hot swap the main battery but only if the backup battery is fully charged. The H-32 will go into suspend state after the system idle timer has expired or the power button is pressed for one second. From software it is also possible to suspend the H-32.

To wake the H-32 when suspended a wakeup even is needed. Possible wakeup events are a short press of the power button, cradle insert or removal or USB cable insert or removal. After a wake event the H-32 will go to the On power state.

4.1.5 Off

The H-32 will enter the Off state when the main battery and backup battery are depleted. Cradle insertion or USB cable insert will boot the H-32 like if a reset has been done.

4.2 Batteries

The H-32 is designed to work with a replaceable 1800mAh Lithium-ion battery pack. Under constant use the battery pack should last about 4 hours before a battery swap or recharge is needed. When the H-32 is docked into the cradle or when the H-32 battery pack is inserted in the charger slot of the CRD-32 battery charging will take about 4 hours and 30 minutes. When charging is done by the USB cable charging of a depleted battery can take up to 8 hours.

4.2.1 Checking battery status

To check the battery status tap -> **Control Panel** -> **Power** -> **Battery** tab. The main battery will give an indication of the battery charge still available in the battery. When a power source is changes it will take 30 seconds before a new indication is shown. The percentage shown is not a hard value but more an indication. The backup battery has no indication of the current status.

4.2.2 Main battery pack

The Main battery pack is used for powering the H-32 some care needs to be taken when inserting the battery into the battery compartment of the H-32. A fully charged main battery can operate about 4 hours continuously. Longer operation times are possible when different use cases are applied.

✔ Note: When the main battery and the backup battery are both depleted the H-32 will turn off. After charging or swapping battery the H-32 will startup and continue from the last saved registry state.

4.2.3 Backup battery

The backup battery is small battery cell connected direct to the PCB. This cell is very slowly charged over time and can take more than 24 hours to be fully charged. To enable the battery the micro switch in the battery compartment need to be set to the ON position. The backup battery in the H-32 used for supplying a limited duration of electrical current when the main battery cannot supply the needed amount of power. The time that the H-32 can keep its state while being suspended and running on the backup battery is several seconds.

4.2.4 Battery hot swap

When main battery power gets low the battery can be hot swapped. This can be done by putting the H-32 in suspend state by pressing the power button for about 1 second or by opening the battery lid. When the main battery is removed from the compartment the backup battery will keep the current state for several seconds. Quickly put in a fresh fully charged battery. Close the battery lid and briefly press the power button. The H-32 will return to the same state as before the suspend state. Full operational recovery can take several seconds while the client is reestablishing a network connection.

4.2.5 Charging the main battery

Charging the main battery can be done inside the H-32. The H-32 needs to be connected by an external power source. As external power source there are 3 possible options.

- USB cable
- CRD-32
- CRD-32-E5

When the main battery is not inside the H-32 the main battery can be put in the charging slot of the H-32.

5 Barcode data capture

5.1 Introduction

The H-32 provides two types of barcode data capture options:

- 1D Laser scanner
- 2D Imager

5.1.1 1D laser scanner

H-32 with the 1D laser scanner holds the Opticon MDL-2001 laser module.

Benefits:

- Reading a wide variety of 1D barcode types
- Fast scanning
- Intuitive aiming for easy point and shoot operation
- Lower power consumption compared to 2D imager
- Scan PDF417, MicroPDF417, RSS composite and RSS stacked barcode types (slow)

5.1.2 2D imager

The H-32 with the 2D imager holds the Opticon MDI-3100 barcode imager.

Benefits:

- Reading a wide variety of 1D and 2D barcodes
- Intuitive green aiming LED for easy scanning

5.2 Scanning consideration

Scanning a barcode consist of the following operation, aim, scan and decode. To get better scanning performances consider vary the range and the scan angle of the H-32.

5.2.1 Range

Any scanning device decodes well over a particular working range (minimum and maximum distances from the bar code). This range varies according to bar code density and scanning device optics.

Scanning within range brings quick and constant decodes; scanning too close or too far away prevents decoding of the barcode. Move the H-32 closer or further away to find the best working range for the barcodes being scanned. The best range can vary based on barcode type, density, barcode quality, lighting conditions.

5.2.2 Angle

For the laser module scan angle is important for good decoding performance. When a laser beam reflects directly back into scan module it can blind the module preventing it from being able to decode the barcode. To avoid this tilt the H-32 so that the laser beam does not have a 90° angle to the barcode.

✔ Note: Contact Opticon support if scanning a barcode stays difficult after the range and angle consideration. Under normal condition scanning and decoding a properly printed barcode should be quick and easy.

5.3 Laser scanning

A good starting point when scanning a barcode with the 1D laser module is to have the H-32 about 10 cm away from the barcode. Make sure that the emitted laser line crosses all the bars of the barcode. When at the correct position and angle decoding is instant.

5.4 Imager scanning

A good starting point when scanning a barcode with the 2D imager is to have the H-32 about 10 cm away from the barcode. Now position the green aiming bar over the 1D or 2D barcode. When decoding of the barcode is possible it will be instant otherwise change the reading distance.

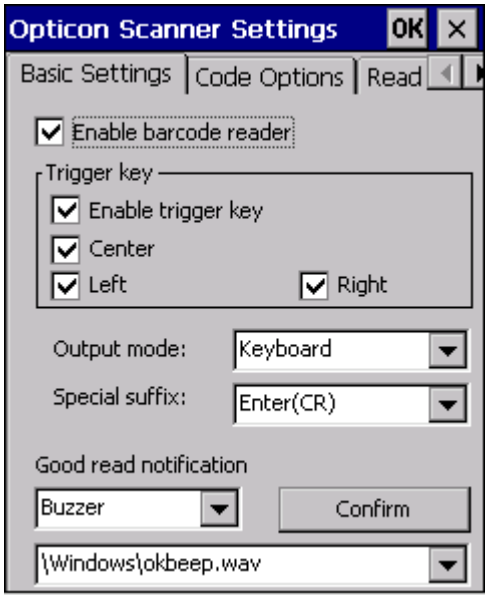
5.5 Setup barcode module

The 1D and 2D barcode module in the H-32 have a lot options that can be set. These setting can be made from the Opticon Scanner Settings application. This application controls the behavior of the barcode module. The settings that are done in this application are stored into the registry except the special settings that are done additional settings tab. These settings are stored in a barcode setup file.

The Opticon Scanner Settings application can be reached by tapping -> **Control Panel** -> **Scanner Settings** icon. Another way to get the Opticon Scanner Settings application is to look for the barcode icon in the notification bar and tap the icon.

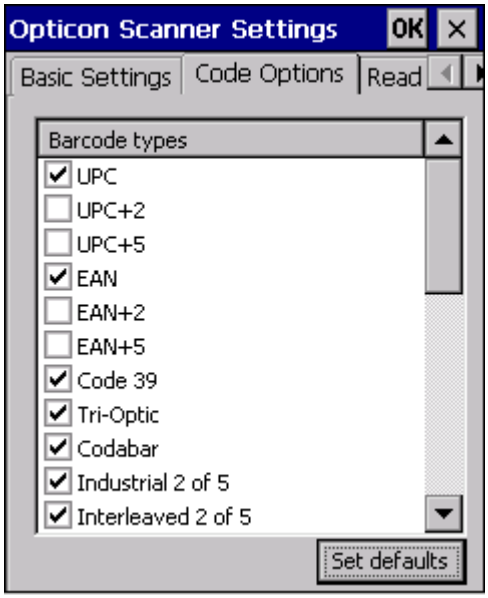
✔ Note: Most settings take effect only after the application is closed by the OK button.

5.5.1 Basic Settings

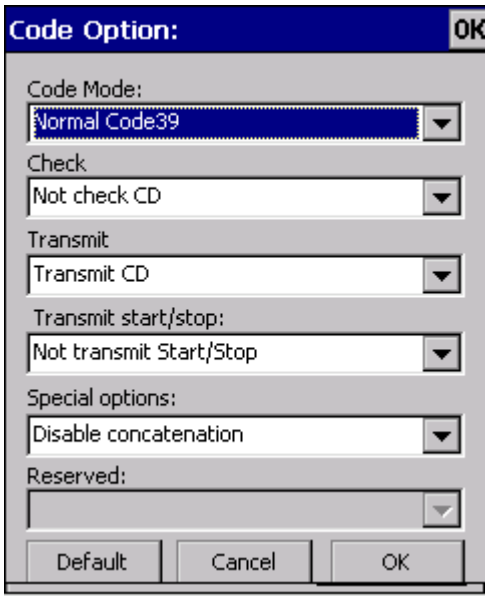


Option	Description
Enable barcode reader	Enable or disable the barcode reader. Changing the checkbox will show either an enabled or disabled barcode icon in the tray bar.
Enable trigger key	Disable all the hardware trigger keys. A software trigger is still possible.
Center, Left, Right	With these checkboxes a single hardware trigger key can be enabled or disabled.
Output mode	Buffer, Keyboard or Clipboard. **Buffer** – The scanned barcode data is available from software SDK only. **Keyboard** – The scanned barcode is outputted as if someone is typing barcode. **Clipboard** – Scanned barcode data is outputted as if a clipboard copy done (CTRL+C, CTRL+V)
Special suffix	With the special suffix option a specific character is outputted as a keystroke after the scanned barcode is outputted. This option is not available when output mode is buffer.
Good read notification	With the good read notification user feedback of a scanned barcode can set. This can be audio feedback or vibrator feedback. When buzzer or buzzer and vibrator are selected an audio file can be selected for good read feedback. The selected setting can be tested by taping the confirm button.

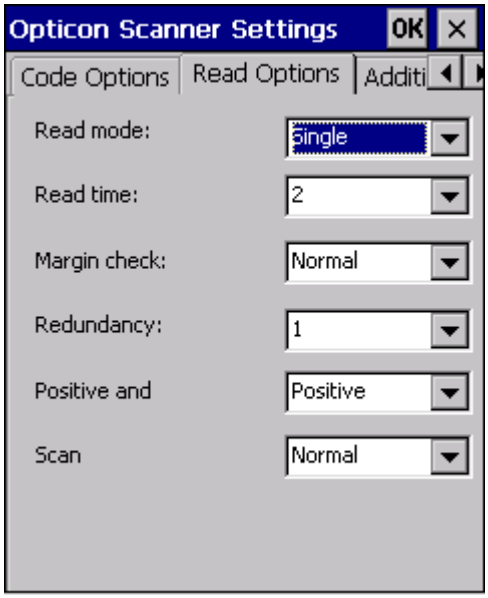
5.5.2 Code Options



From the code options tab barcode types that need to be supported can be enabled or disabled. Some of these barcode support some standard options that can be reached by tap and holding a specific barcode type. When this is done popup menu appears and click the code option. Now the code option menu is shown.



5.5.3 Read Options



Option	Description
Read mode	**Single** – When a barcode has been decoded, the barcode reader will be turned off. The reader needs to be triggered again to decode another barcode. **Multiple** – When a barcode has been decoded, the barcode reader will stay on for a time set by read time. The decoded barcode cannot be scanned after the decoded barcode has not been detected for a number of scans.
Read time	The time that the barcode reader is on after a trigger has been pressed or when a barcode is decoded in multiple read mode. The read time is set in seconds
Margin check	With the margin check option the specified margin before the start and end of the barcode can be made smaller. Setting the margin to a too small setting may increase or trigger partial or ghost reads. Do not use a smaller margin check then necessary. If possible replace the barcode label that have a correct start and stop margin.
Redundancy	This is the number of times that a barcode label needs to decoded again after a successful decode. Setting redundancy to 1 means that a barcode is decoded twice.
Positive	Positive barcodes are black bars on a white surface. Negative barcodes are white bars on a black surface. Both possibilities to decode positive and negative barcodes.
Scan	Set the scan width of the 1D laser module. This option is not supported with a 2D imager.

5.5.4 Additional Settings

In the Additional Settings tab special options can be set that are not possible from the normal tabs. These Additional Settings are done after all other settings from the other tabs have been sent to the barcode module. Adding a special option to the additional settings can result that some options that was disabled from one of the other tabs is still enabled by the additional settings. The additional settings are menu commands concatenated. Menu options supported are 2, 3 or 4 characters wide. When entering a 3 character menu code when entering a 3 character menu code a '[' prefix is needed. When entering a 4 character menu code a ']' prefix is needed.

After editing the InitBCR.bcr file the set items can be tested by tapping the update button. The entered command string is sent to the barcode module to see if the barcode module accepts the command string.

Several options are not allowed to be used from the additional setting menu. These settings can be found in the windows folder. "bcrBasicCmds_1D." for 1D settings and "bcrBasicCmds_2D." for 2D settings. One of these files will be available after a first update has been done based on the barcode module type.

5.5.5 Barcode Registry settings

The items set from the barcode settings application or from the software SDK are also stored in the registry. The locations of these settings are:

```
[HKEY_LOCAL_MACHINE\Software\Opticon\BCRCTL]
[HKEY_LOCAL_MACHINE\Software\Opticon\BCRLib]
```

5.6 Tray Icons

There are two tray icons possible representing the barcode reader status.

Icon	Description
	Barcode reader is disabled or is in an error condition and cannot be used.
	Barcode reader is enabled and fully working

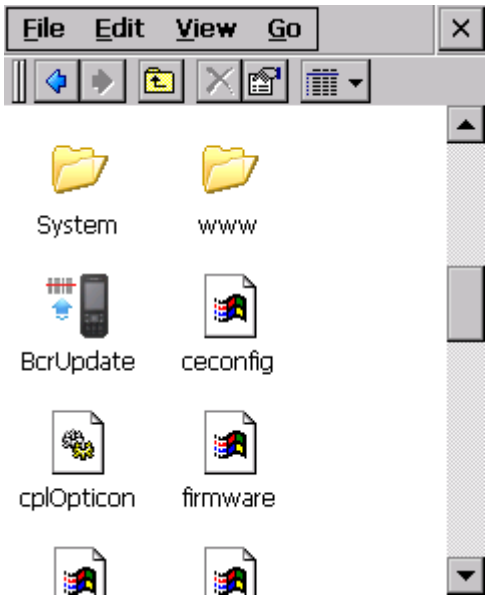
5.7 Barcode Software SDK

The barcode module can also be configured and operated from a custom application by using the Barcode SDK for the H-32. This SDK has a help file explain the functions and features possible with the SDK. Contact Opticon support if more help required.

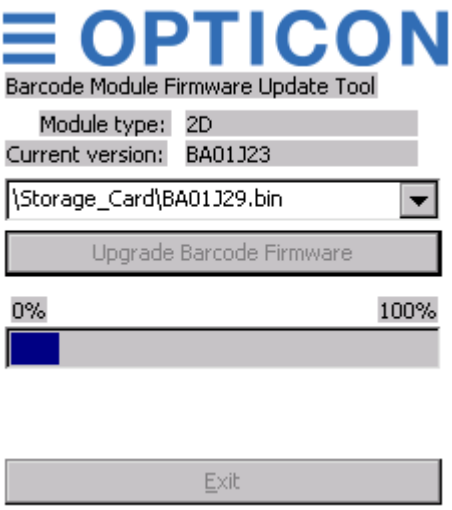
5.8 Updating Barcode Module Firmware

In the H-32 it is possible to update the firmware in the 1D and the 2D module. The application needed for this update is located in the \Windows folder. To update the barcode module firmware in the H-32 copy the firmware file into the H-32 or in the micro SD card inside the H-32. For the MDL-2001 1D laser module the firmware file is called RBAVxxxx.HEX for the MDI-3100 2D module BA01Jxx.BIN. The x marks the version number.

To start the update open the Windows Explorer and go to the Windows folder. Tap the BcrUpdate application.



In the dropdown list select the wanted firmware update file. The application will only show the files based on the extension that match the firmware. This means for 1D barcode modules it will show all HEX files and for 2D all the BIN files. To start the actual update, tap the Upgrade Barcode Firmware button.



After the update is completed a notification dialog is show. Now close the update application by tapping the Exit button.

✔ Note: Keep the H-32 charged while doing a firmware update.

6 Wi-Fi and Bluetooth

Wi-Fi and Bluetooth radio communication is handled inside the H-32 by a Laird radio module. The Wi-Fi and Bluetooth radio can be controlled from the Laird Connection Manager (LCM). LCM allows you to view all radio and security settings, and status. It also enables you to troubleshoot connectivity issues.

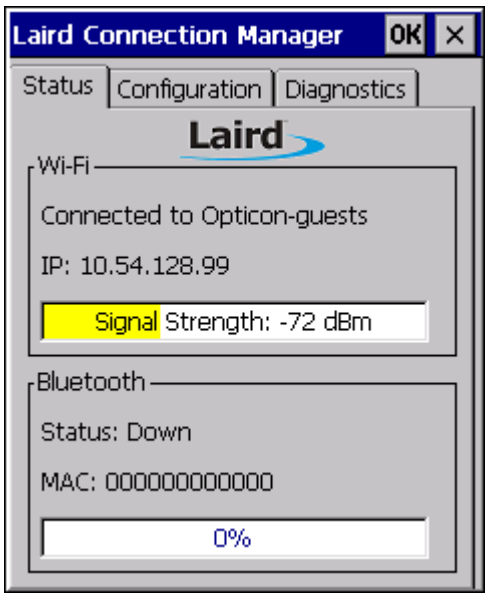
The following is a detailed list of what you can view using the LCM:

- Individual Laird Wi-Fi radio configuration profile contents including radio and security settings.
- Global settings, which apply to every profile.
- A snapshot status of the current wireless network connection.
- Detailed status information on the radio, the access point to which it is connected, and the RF connection on link between the two.
- In-depth diagnostic information on the radio and its connection, so users can accurately report key data to an administrator when there is a connection or performance issue.
- Other radio information, such as software versions and regulatory domains.

6.1 Accessing the Laird Connection Manager

To access the LCM tap -> **Programs** -> **Laird connection manager** or by tapping -> **Settings** -> **Control Panel** -> **Wi-Fi** or by tapping the Wi-Fi signal strength or Bluetooth icon from the tray bar.

6.1.1 Status tab



The status tab is divided into Wi-Fi and Bluetooth sections. The Wi-Fi section provides status information on the radio's Wi-Fi connection between the client device and the access point to which it's associated. The Bluetooth section provides status information on the radio's Bluetooth connection between the client device and the destination device.

The Status tab displays the following sections:

- Status - Wi-Fi
- Status – Bluetooth

6.1.1.1 Wi-Fi Status

Status	Description
Down	The radio is not recognized by Laird software and therefore is not associated or authenticated.
Disabled	The radio is disabled. To enable the radio, check the Wi-Fi check box located on the Configuration window. When the radio is disabled, it does not attempt to make a connection to an access point.
Not Associated	The radio has not established a connection to an access point.
Associated	The radio has established a connection to an access point but is not EAP authenticated. The radio cannot communicate unless it is associated and EAP authenticated.
Connected to [SSID]	The radio is connected to the named SSID.

✔ Note: If the Encryption type is set to WEP or Open (None), it can communicate (send data) while in the Associated state.

IP Displays the IP address of the H-32 Wi-Fi connection.

Signal Strength displays the signal strength (or RSSI) in dBm.

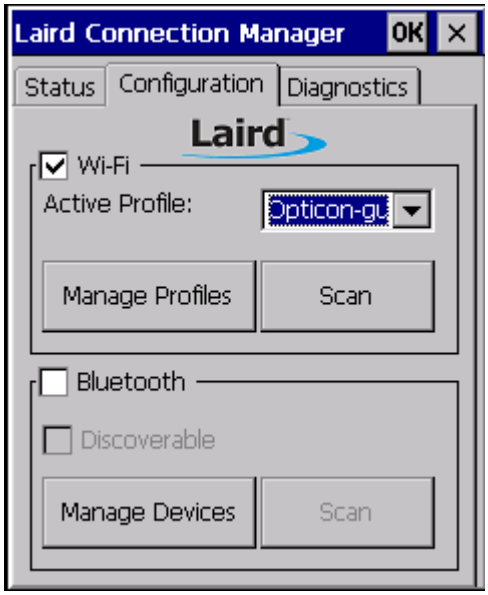
6.1.1.2 Bluetooth Status

Status	Description
Down	The radio is not recognized by Laird software and therefore is not associated or authenticated.
Disabled	The radio is disabled. To enable the radio, check the Bluetooth check box located on the Configuration window. When the radio is disabled, it does not attempt to make a connection to an access point.
Not Connected	The radio is not connected to any Bluetooth devices.
Paired, Not Connected	The radio has found a Bluetooth device but is not paired with it.
Connected	The radio is connected to a Bluetooth device.

MAC: Shows the local MAC address of the Bluetooth device. The Bluetooth radio needs to be enabled once to show the correct address otherwise it will contain only zeros.

Signal strength: indication of the connection signal strength.

6.1.2 Configuration tab



The Configuration tab allows Wi-Fi and Bluetooth to be enabled and disabled. It also allows users to manage Wi-Fi profiles, Bluetooth devices, and to scan for both.

The Configuration tab displays the following two sections:

- Configuration - Wi-Fi
- Configuration – Bluetooth

6.1.2.1 Configuration - Wi-Fi

Check on/off box	Check to enable or disable Wi-Fi
Active Profile	Displays the name of the active profile. Use the drop-down menu to select a different profile.
Manage Profiles	Allows user to change profiles and global configurations, and enables administrative abilities.
Scan	Opens the scan window to scan the area for available SSIDs. Also displays RSSI and security.

The Wi-Fi Manage Profiles page allows you to view profile properties and settings.

There are two tabs listed under Manage Profiles:

- Wi-Fi - Profile
- Wi-Fi - Globals

6.1.2.2 Wi-Fi – Profile

Profile settings are radio and security settings that are stored for each configuration profile. Other than viewing the settings for each profile, the functions and settings located on the Profile window are only available to administrators. Non-administrators may not edit any items on this tab.

The Profile tab displays the following properties and options:

Property and Value table	Displays the properties of each profile and its respective value.
Profile drop-down menu	Displays the current profile and a list of all profiles previously configured or used.
New	Allows a profile to be added to the list.
Delete	Deletes a profile from the list.
Value box	Displays the value of a prospective property.
Commit	Saves the changed value.

The following properties are covered in the Wi-Fi Profile Property and Value table:

- Authentication
- Bit Rate
- Client Name
- Encryption
- Fast Reauth
- Power Save
- Profile Name
- Radio Mode
- SSID
- Tx Power
- WPA/WPA2

6.1.2.3 Wi-Fi – Globals

The Globals tab displays the source device's Wi-Fi global values that apply to all profiles and settings that apply to LCM itself. The following subsections allow these values to be modified:

Property and Value table	Displays various properties and their respective values.
Value box	Displays the current and available alternative values for the selected property.
Commit	Saves the changed value.

✔ Note: When you tap Commit, a registry flush occurs for all settings.

The following properties are covered in the Wi-Fi Globals Property and Value table:

- Roam Trigger
- Roam Delta
- Roam Period
- BG Channel Set
- DFS Channels
- DFS Scan Time
- Ad Hoc Channel
- Aggressive Scan
- CCX features
- WMM
- Auth Server
- TTLS Inner Method
- PMK Caching
- Tx Diversity
- Rx Diversity
- Frag Thresh
- RTS Thresh
- LED
- Tray Icon
- Admin Passwords (Admin Only)
- Auth Timeout
- Certs Path
- Ping Payload
- Ping Timeout
- Ping Delay
- Logon Options

6.1.3 Configuration – Bluetooth

The Bluetooth panel of the Configuration tab displays the source device's Bluetooth settings. The following options are available:

Bluetooth checkbox	Check to enable or disable Bluetooth.
Discoverable checkbox	Check to enable or disable device from discoverability. The device is discoverable for 60 seconds before automatic turn-off.
Manage Devices	Allows users to add and remove devices, profiles, and local services.
Scan	Click Scan under "Bluetooth" to find a device. Remote devices in discoverable mode can then be discovered. After using Scan to find a device an user can double-click an icon and begin the pairing process. Depending on the remote device, a user may be required to enter input to successfully pair with the remote device. Clicking Refresh refreshes the Bluetooth scan.

There are two tabs listed under Manage Devices:

- Bluetooth Devices
- Bluetooth Local Services

6.1.3.1 Bluetooth Devices

The Devices tab displays discoverable and previously-discovered devices. Additionally, this tab allows connection and disconnection with remote Bluetooth devices. The following options are available:

Devices name and services box	Displays Bluetooth devices in range and the connectivity of each device. Select the device or service and click Connect to enable it. The background of the service's icon changes

	from blue to green when it is enabled.
Pair/Unpair	Pair or unpair the selected radio or service with the selected device.
Connect/Remove	Connects or removes the selected device from the list; removing a device closes out any connections with the device and removes any pairing that occurred. Note: You must manually connect to services unless they are set to Auto Start.
Services/Settings	Displays service profiles for the selected device, or settings for the selected service.
Send File	Sends files to the selected device.

6.1.3.2 Bluetooth Local Services

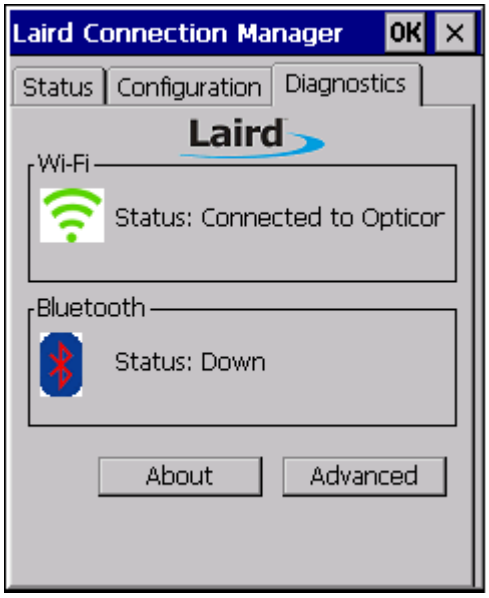
The Local Services displays the source device's current Bluetooth devices. The following subsections allow these values to be modified:

Service table	Lists the services available on a device, the state of Auto-Start, and the COM port number associated with the service.
Add Serial Service button	Manually adds a service to the Service table.
Delete	Deletes a selected service.
Settings	Shows specific settings for a selected service.

The Service table displays the following information:

- HID
- PAN
- OBEX Object Push
- File Transfer
- BT Serial Port

6.1.4 Diagnostic tab



The Diagnostics tab enables you to troubleshoot connection issues within LCM.

The Diagnostics tab displays the following:

Wi-Fi	Status enabled/disabled
Bluetooth	Status enabled/disabled
About	Tap to display LCM information including driver and the LCM version.
Advanced	Tap to display advanced settings for Wi-Fi, strength percentage, and quality percentage.

To view advanced settings for Wi-Fi, tap Advanced. There are three drop-down options in Advanced:

- Wi-Fi Status
- Wi-Fi Ping Tools
- Wi-Fi Debug

6.1.4.1 Advanced – Wi-Fi Status

Profile	The name of the active profile.
Status	Indicates the current Wi-Fi association status of the Laird Wi-Fi radio (see Table 4)
Device information	Device name and other information including IP address, MAC address, and Tx power.
AP information	AP name and AP information (for the AP to which the Laird Wi-Fi radio is associated), IP address, MAC address, beacon period, channel, and bit rate.
Connection information	Information including the WLAN connection (between Laird Wi-Fi radio and AP) information including signal strength (RSSI), and signal quality percentage.

6.1.4.2 Advanced – Wi-Fi Ping Tools

Profile	The name of the active profile.
Destination	The destination of the ping in use.
Ping Payload	The amount of data (in bytes) that is transmitted on a ping. Use the drop down menu to choose 32, 64, 128, 256, 512, or 1024 bytes.
Ping Delay text box	The amount of time (in milliseconds or ms) between successive ping requests.
Timeout ms text box	How long to wait for a ping before timing out and sending the next ping.
Start Ping/Stop Ping	Start a continuous ping to the address in the output area to the button. Once the button is tapped, its name and function changes to Stop Ping. Pings continue until you tap Stop Ping, move to a different LCM window, exit LCM, or remove the radio. ✔ Note: If your device has both a Laird Wi-Fi radio and another network adapter active, then pings may go out over the non-Laird network adapter. ✔ Note: The access point's IP address is the default for a ping although any valid IP address can be manually entered.
Release/Renew	Obtain a new IP address through DHCP release/renew. LCM logs all activity in the output area next to the button.
(Re)connect	Initiate a reconnect of the radio: Disable and enable the radio, apply (or reapply) the current profile, attempt to associate to the wireless LAN, and attempt to authenticate to the wireless LAN. LCM logs all activity in the output area next to the button.

6.1.4.3 Advanced – Wi-Fi Debug

Profile	The name of the active profile.
Driver Debug	Enable or disable Driver Debug mode.
Drop-down menu	Set the debug parameters. Debug may be of low, medium, or high detail and may be sent over serial connection or logged as a text file.
Regulatory Domain	Displays Wi-Fi rules according to country.

6.1.5 Using the Laird system tray

On Windows CE, Laird software includes a service that displays an icon in the Windows System Tray. This icon provides a visual status for the Wi-Fi radio and provides access to the LCM application.

✔ Note: Tap the icon to launch the LCM application.

The service is active and displays an icon in the System Tray only when all of the following conditions are met:

- The device is active.
- Windows Zero Config (WZC) is not active.
- The LCM Tray Icon global setting is On (the default setting).

When the service is active, it queries the radio every three seconds for connection status. Based on the radio's response to the query, the service displays one of the following icons:

	The radio is not associated/authenticated to an AP.
	The signal strength (RSSI) for the current AP (to which the radio is associated) is -90 dBm or weaker, which means that a Laird 802.11b/g radio will operate at 802.11b data rates only.
	The RSSI for the current AP is stronger than -90 dBm but not stronger than -70 dBm, which means that a Laird radio will operate at 802.11g or 802.11a data rates that are less than 54 Mbps
	The RSSI for the current AP is stronger than -70 dBm but not stronger than -50 dBm, which means that a Laird radio should operate consistently at 54 Mbps
	The RSSI for the current AP is stronger than -50 dBm.

6.1.6 LCM Bluetooth Tray Icon

The Bluetooth tray icon displays connectivity and power status for the Bluetooth radio. It displays one of the following:

	The Bluetooth radio is disabled, and therefore disconnected.
	The Bluetooth radio is enabled, but is not connected.
	The Bluetooth radio is connected to a device.

Tapping the icon launches the LCM. On the H-32 it might be possible that the System Tray icon is not visible while LCM is running, although the service remains active.

- Note: If LCM usually runs on the H-32, or if you want to maximize performance, then you should disable the System Tray icon service by setting the Tray Icon global setting to Off and power cycling the device.

7 Keypad

The H-32 is equipped with a 23-key keypad. The 23-key keypad contains function keys, navigation key, numeric and alpha numeric keys. The function keys have a blue marking to input function keys the FN key needs to be pressed first. To input the alpha numeric keys the alpha key needs to be pressed first. To get capital characters press first the Alpha key and then the Shift key

The function keys can be programmed to start an application. To program function keys tap -> **Settings** -> **Control Panel** -> **Version** ->.

✔ Note: To enter a <TAB> key press first FN key and then '='.

In the tray bar it is possible to see what mode of the keypad the H-32 is in.

Fn	H-32 keypad is in function mode all blue keys will be true now. The equal = sign will act as a horizontal tab.
a	Alpha key was pressed the numeric input will show lower case characters.
A	Alpha key was pressed and then the shift key. All keypad input will be capital characters.

✔ Note: Never use the stylus or any other sharp pointy object on the power button or keypad keys only use a finger to operate these buttons.

7.1 Keypad table

Normal	FN	Alpha	Shift + Alpha
BS	BS	BS	BS
Enter	Enter	Enter	Enter
ESC	ESC	ESC	ESC
1	F1	SPACE @\/	SPACE @|?
2	F2	abc	ABC
3	F3	def	DEF
4	F4	ghi	GHI
5	F5	jkl	JKL
6	F6	mno	MNO
7	F7	pqrs	PQRS
8	F8	tuv	TUV
9	F9	wxyz	WXYZ
*		.,:;	>< ::
0	F10	+-[]	+_{}
=	TAB	%#$&	%#$&

8 Update OS image

The OS inside the H-32 can be updated. The H-32 supports three different ways of updating an OS image.

- Update by RESCUE DISK
- Update by NAND IMAGE
- Update by UPDATE OS IMAGE

A new OS can be downloaded from the www.opticon.com website. A particular update image contains all the files needed to handle the described update procedures. A fully charged battery is needed to do an update. When doing an update the H-32 can be connected to power source to prevent H-32 to go low power mode.

8.1 Update by RESCUE DISK

Update by rescue disk will do a complete update and clear all data and registry settings from the NAND inside the H-32. After doing an update this way the H-32 will be back to factory default.

To start the update a bootable micro SD card is needed. The maximum size of the micro SD card is 2GB.

Place the micro SD card in the PC and copy the content of the **RESCUE DISK** folder to the root of the micro SD card. After the copy has completed put the micro SD card in the micro SD card slot in the H-32. Put in the battery and boot the H-32. The OS update will start automatically. Update is complete when the LED indicators turn green and a message on the LCD display will indicate that update has completed.

Remove the micro SD card from the H-32 and boot the H-32 to start.

8.2 Update by NAND IMAGE

Update by NAND image will update the OS image. Doing an update this way will preserve data in H-32. It is likely that the registry will be cleared after doing update by NAND image. Updates have been tested with micro SDHC card up to 16GB.

Place the micro SD card in the PC and copy the content of the **NAND IMAGE** folder to the root of the micro SD card. After the copy has completed put the micro SD card in the micro SD card slot in the H-32. Put in the battery and boot the H-32. Press keypad key [3] until the Opticon logo appears on the display. Release the key and press the center trigger button to start the OS update. Wait until the update has completed message appears on the LCD display.

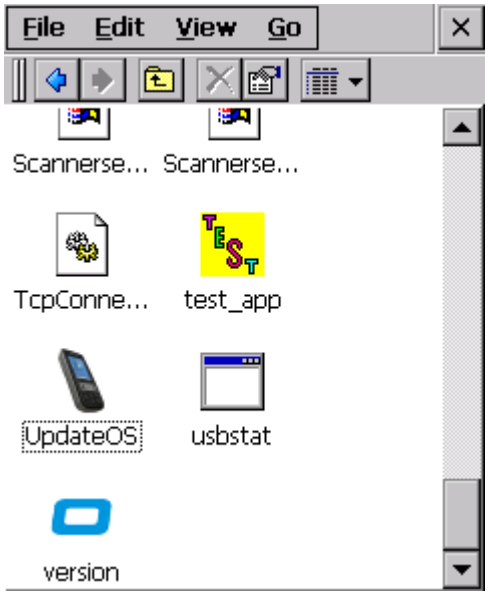
Reboot the H-32 to have the H-32 run the new OS.

From boot loader version 1.12.2 a manual reboot is no longer needed after a successful update. When boot loader 1.12.2 is handling the installation it will show a successful installation message for 3 seconds before it starts a reboot.

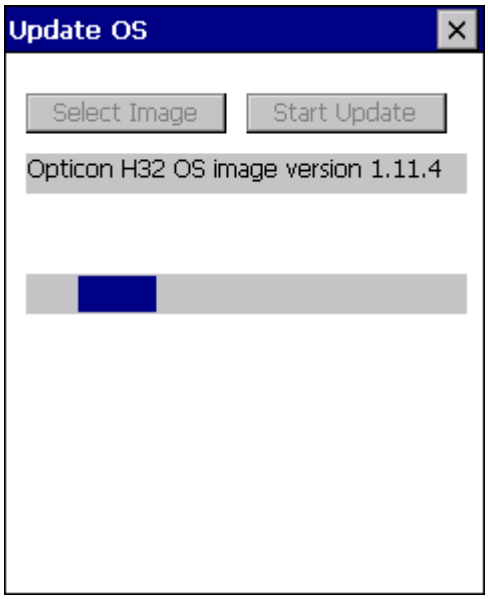
8.3 Update by UPDATE OS IMAGE

Update the OS by the update OS image way is the easiest and the preferred way of updating the H-32 OS image. Updating an OS image this way can preserve registry setting and data. There are some advanced command line options available.

Copy the H-32OSxxxxx.IMG file in the H-32 or on a micro SD card that is inserted into the H-32. In the H-32 open the Windows Explorer and go to the Windows folder. Tap the UpdateOS application.



Tap the Select Image button and browse to the folder where the image is located, select the image and click the Open button. Tap the Start Update button to proceed with the update.



When the update completes the H-32 will automatically reboot. Now when the H-32 is started it will set the registry items back as they were before the update. When the

registry is updated the H-32 will reboot again to make the registry changes final. When the H-32 is now rebooted it is ready for use.

8.3.1 Command line options

The UpdateOS image tool has a few specific command line options. These options are not accessible from the UpdateOS user interface to prevent accidental wipe of the H-32.

Option	Description
-noui	Do not show the user interface.
-clean	After an OS update brings the H-32 back to factory default. ✔ Note: All data and registry changes are removed.
-sd	Safe the registry changes to the micro SD card. After a reboot the registry changes are restored to the H-32. ✔ Note: This option works best with the –clean option to restore registry settings.

Example:

Command line settings to update OS image from the micro SD card. Registry settings are stored in the micro SD card.

```
\>\Windows\UpdateOS -sd \Storage_Card\H32OS1122.IMG
```

✔ Note: The saved registry settings are removed are restoring them in the H-32.

8.4 Switching from non MUI to a MUI OS version

Changing the OS from non MUI to a MUI version and vice versa will involve a complete wipe of the NAND Flash. The MUI version of the H-32 OS needs more storage space and because of that the partition that holds the OS image needs to be increased. This will result in that the data storage partition will decrease.

The update table will show what is different during the update procedure. The best and easiest way is to do a RESCUE DISK update when switching between single language OS or MUI OS.

✔ Do not use the update by UPDATE OS IMAGE when switching between single and MUI OS version. This way of updating will involve extra steps that makes the update complicated.

8.4.1 Update table

OS From	Update Method	Description
1.12.1	1.12.2 NAND IMAGE	Normal update procedure
1.12.1	1.12.2 RESCUE DISK	Normal update procedure
1.12.1	1.12.2 UPDATE OS IMAGE	Normal update procedure
1.12.1	1.12.2 MUI NAND IMAGE	Update stalls. Do a reboot. The display will show the Opticon logo with the message creating OS partition this partition creation will take a long time. After OS partition is created a message Error, no OS found... will show with a countdown counter. Keep button [3] pressed until the key message appears and then release. Now press the center trigger button to complete the update.
1.12.1	1.12.2 MUI RESCUE DISK	Normal update procedure [1]
1.12.1	1.12.2 MUI UPDATE OS IMAGE	Shortly after starting the OS update the H-32 will reboot. The display will show the Opticon logo with the message creating OS partition this partition creation will take a long time. After OS partition is created a message Error, no OS found... will show with a countdown counter. To revive the H-32 the NK.BIN file needs to be copied to the root of a microSD card. Install the card in the H-32 and keep button [3] pressed until the key message appears at the bottom of the display. Release the [3] button and press the center trigger button. After downloading the NK.BIN into the H-32 the H32 will reboot.
1.12.2	1.12.2 MUI NAND IMAGE	After download is started a message appears on the display. Error, OS image too big… Now after 10 seconds the H-32 will reboot automatically. The display will show the Opticon logo with the message creating OS partition this partition creation will take a long time. After OS partition is created a message Error, no OS found... will show with a countdown counter. Keep button [3] pressed until the key message appears and then release. Now press the center trigger button to complete the update.
1.12.2	1.12.2 MUI RESCUE DISK	Normal update procedure [1]

OS From	Update Method	Description
1.12.2	1.12.2 MUI UPDATE OS IMAGE	Shortly after starting the OS update the H-32 will reboot. The display will show the Opticon logo with the message creating OS partition this partition creation will take a long time. After OS partition is created a message Error, no OS found... will show with a countdown counter. To revive the H-32 the NK.BIN file needs to be copied to the root of a microSD card. Install the card in the H-32 and keep button [3] pressed until the key message appears at the bottom of the display. Release the [3] button and press the center trigger button. After downloading the NK.BIN into the H-32 the H32 will reboot.
MUI 1.12.2	1.12.2 NAND IMAGE	Update completes and H-32 does a reboot. The display will show the Opticon logo with the message creating OS partition this partition creation will take a long time. After OS partition is created a message Error, no OS found... will show with a countdown counter. Keep button [3] pressed until the key message appears and then release. Now press the center trigger button to complete the update.
MUI 1.12.2	1.12.2 RESCUE DISK	Normal update procedure [1]
MUI 1.12.2	1.12.2 UPDATE OS IMAGE	After starting the OS update the H-32 will reboot. The display will show the Opticon logo with the message creating OS partition this partition creation will take a long time. After OS partition is created a message Error, no OS found... will show with a countdown counter. To revive the H-32 the NK.BIN file needs to be copied to the root of a microSD card. Install the card in the H-32 and keep button [3] pressed until the key message appears at the bottom of the display. Release the [3] button and press the center trigger button. After downloading the NK.BIN into the H-32 the H32 will reboot.

[1] Normal update procedure will involve a complete format of the NAND disk in the H-32.

9 Troubleshooting the H-32

Problem	Cause	Solution
H-32 does not turn on.	Main battery not charged.	Charge or replace the main battery.
	Main battery not inserted.	Place the main battery
	Main battery not installed properly.	Install the battery as instructed in chapter installing main battery.
	System crash.	Reboot the H-32. If the H-32 still does not turn on try to do a factory reset.
Battery does not charge.	Extreme battery temperature.	Battery does not charge if ambient temperature is below 0°C or above 40°C.
	Main battery failed.	Replace the main battery.
	H-32 removed from power source while charging.	Connect the H-32 to a power source.
Screen is dark.	H-32 is in User or system idle state.	Tap the screen or press a button to get into active state.
	H-32 is off.	Press the power button or connect to a power source to wake the H-32.
Communication failed.	H-32 was removed from cradle or USB communication cable.	Put the H-32 back in the cradle or reattach the USB cable and retry communication.
	Wi-Fi or Bluetooth out of range.	Move the H-32 into the Wi-Fi or Bluetooth range.
	ActiveSync connected while trying to do TCP/IP communication.	Disconnect the USB cable to the PC or remove from the single slot cradle if connected to the PC by USB cable.
H-32 does not emit sound.	Volume setting is low or turned off.	Enable or increase sound volume from the Control Panel Volume & Sound applet.
	Scanner settings audio feedback notification disabled.	Open the Opticon Scanner Settings applet from the control panel or from the tray bar. Set good read notification to buzzer and wav file and test with Confirm button.
H-32 turns itself off.	H-32 inactivity timeout occurred.	The H-32 turns itself off after a period of inactivity. This period can be set from the Control Panel, Power applet in the Schemes tab. Set the timeout for battery an AC power to user comfortable time.
	Battery is depleted.	Charge or replace the main battery.

Problem	Cause	Solution
Tapping with the stylus does not match the position on the LCD.	Touch panel not properly aligned.	Touch panel needs to be re-aligned. Go to Control Panel, Stylus, Calibration tab and click the recalibrate button. Follow instructions on the LCD. If needed the calibration can be reached by operating the keypad only. Use FN + = for horizontal tab.
Message appears that memory is full.	Too many files stored in the H-32.	Remove unneeded files.
H-32 reboots after main battery hot swap.	Backup battery condition too low.	Make sure that backup battery switch in the battery compartment is set to the ON position and that it has at least been charged for 24 hours.
	Hot swap of main battery too slow.	The backup battery can hold the charge for a very short time. Perform a quick main battery swap. When backup battery has been used for a swap it needs time to get to an acceptable level again.
H-32 cannot scan barcode.	Unreadable barcode.	Barcode damaged, defaced or out of specification.
	H-32 barcode type not enabled.	Enable the barcode type from the scanner manager applet.
	H-32 is out of scanning range or at a wrong angle.	Change reading distance and angle. Check the chapter Scanning considerations.
	H-32 does not give user feedback that barcode is scanned.	Set the Good read notification from the Scanner Manager applet.
	H-32 Optical Scan Window is dirty.	Clean the H-32 Optical Scan Window
H-32 keeps rebooting	Power pushed into the H-32 housing.	Carefully use the stylus to get the power button in the correct position. Power button was pushed in with the stylus or other sharp object, only use fingers to operate buttons and keys.
H-32 does not boot red key message in display.	One of the keypad keys has been pushed under the housing.	Carefully use the styles to get the stuck key to the correct position. The keypad key was pushed in with the stylus or other sharp object, only use fingers to operate buttons and keys. To find out what key is stuck see keypad table below.
H-32 shows Factory Reset!! During boot.	Keypad keys [*] + [6] have been pressed during boot.	Normal operation.
	Keypad keys [*] + [6] have been pressed during boot and pass code was entered.	Normal operation.

Problem	Cause	Solution
H-32 shows Write OS to NAND during boot.	Keypad key [3] pressed during boot.	Normal operation. Follow update procedure or reboot H-32
	Keypad key [3] stuck under H-32 housing.	Carefully use the stylus to get the stuck [3] key to the correct position. The keypad key was pushed in with the stylus or other sharp object, only use fingers to operate buttons and keys.
H-32 not Roaming as expected	Wi-Fi AP and H-32 both have roaming enabled.	Some Wi-Fi AP also have a roaming option enabled. When this is the case either disable roaming on the AP or on the H-32.
	Roaming is slow	In an environment with low RF coverage have the aggressive scan option enabled. This may be done through the "Aggressive Scan" menu item on the Global Settings tab in the Laird Connection Manager (LCM). Changing the Aggressive Scan value from "Off" to "On" will enable this feature.
	Roaming is slow	In some environments such as environments with more than enough RF coverage (and significant co-channel interference) it may be desirable to disable Aggressive Roaming. This may be done through the "Aggressive Scan" menu item on the Global Settings tab in the Laird Connection Manager (LCM). Changing the Aggressive Scan value from "On" to "Off" will disable this feature.
	Roaming is slow	Disable unused bands from the H-32. When all bands are enabled the H-32 will scan all the bands for the best roaming candidates. E.G. when an access point is being used that only supports BG set the Radio mode BG Rates full in the Laird connection manager (LCM).
H-32 has less available memory after OS update	Update from single language OS to Multilanguage OS.	Normal operation. The single language OS will have about 185MB of free storage space. The MUI OS version will have about 156MB of
H-32 shows “Error, no OS found...” during boot	OS switch between MUI and single or vice versa.	Normal operation after switching OS from single language to MUI OS version or vice versa the NAND flash is completely formatted. This results in the removal of the NK.BIN. To restore the H-32 copy the NK.BIN file on a micro SD card and put it in the H-32. Press the [3] button until the key message appears. Release the key and wait for the download to complete.

Key	Value (HEX)	Key	Value (HEX)
Shift	00000001	**3**	00002000
UP	00000002	**4**	00004000
BS	00000004	**5**	00008000
FN	00000008	**6**	00010000
LEFT	00000010	**7**	00020000
Trigger Center	00000020	**8**	00040000
Right	00000040	**9**	00080000
Enter	00000080	*****	00100000
Alpha	00000100	**0**	00200000
Down	00000200	**.**	00400000
ESC	00000400	**Trigger Left**	00800000
1	00000800	**Trigger Right**	01000000
2	00001000		

The values represent keys that can be pressed. It is possible that different values will appear on the LCD. When this happens it will mean that more than one key is pressed at this time.

Example 1.

Trigger Center and BS key both pressed.

```
00000020 + 00000004 = 00000024
```

Example 2.

ESC and “1” key both pressed.

```
00000400 + 00000800 = 00000C00
```