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## Introduction

The OPL9813 Default Application XFNS084x is a fully functional scanning and GPS tracking application. This application allows the user to scan and store any compatible barcode symbol (see **Supported Symbologies**) tagged with time, date, GPS coordinates and a unique identification number for the device. See **Settings** for complete details. These records are stored in an internal file which can be downloaded to a PC at any later date.

### Terminal Devices

Opticon Terminal devices (such as the OPL98xx series, OPL97xx series, OPH series, etc.) are effectively mini-computers. Just like a desktop computer, the functions that it can perform depend on the application installed on the device. These applications completely define the behavior of the device for all users, and as such, these types of devices do not have User Manuals in the traditional sense. What you will find instead are Application Manuals that fully explain the usage of a given application. It is appropriate and convenient to think of these Application Manuals as User Manuals for the device as long as the reader understands that the behavior changes with the installed application and not the device itself.

## Setup Instructions

### Download Software

#### PC Applications

The daily usage of the OPL9813 Application XFNS084x requires a free Opticon application called NetO32. This application can be downloaded from the link below. Download and run the installer.

<http://ftp.opticonusa.com/Downloads/NetO32.zip>

Initial setup of the OPL9813 Application XFNS084x may require the firmware to be downloaded to the OPL9813 from an attached PC, if the application was not pre-installed by the factory. This is common and expected in some situations. To perform the installation of the firmware, you must first download and install the free Opticon PC application Appload. You can download this PC application from the link below. Download and run the installer.

<http://ftp.opticonusa.com/Downloads/Appload.zip>

#### Device Firmware

As mentioned above, you may need to download the firmware for this application into your OPL9813 device. This is accomplished via the Appload PC application (see above). The process is simple, but the firmware file must first be downloaded. The file can be found at the link below.

<http://ftp.opticonusa.com/Downloads/XFNS084x.zip>

#### USB Drivers

If you will be using the OPL9813 companion cradle with its USB connection to your PC, you will need USB drivers. These can be downloaded from the link below. Simply run the installer (Admin privileges required) and Windows will take care of the rest.

<http://ftp.opticonusa.com/Downloads/USB%20Drivers%20Installer.zip>

### Setup Cradle

The OPL9813 requires the use of a companion cradle (we will use the Opticon CRD9723 charging + data cradle in these instructions) to charge, download data and install application firmware onto the device itself.

### Connect AC power

The OPL9813 cradle always requires AC power via the provided power adapter. Even when connecting the cradle to the PC via USB (which does provide some power), this is insufficient to power the cradle.

### Connect data cable

The OPL9813 cradle can be connected by either a USB connection or an RS232 connection. Do not attempt to use the cradle with both data cables connected simultaneously.

**USB:** Connect the larger square end (USB-B) into the back of the cradle and the wafer-shaped end (USB-A) into your PC. When this connection is complete, Windows will automatically associate the device with the USB drivers installed previously. Pay attention to the pop-up messages as they will provide you with the COM number Windows assigns the device. This will usually be the highest number available, typically COM4. This is necessary to know for later steps involving NetO32 and Appload.

**RS232:** Connect the RJ-45 connector to the back of the cradle and the DB-9 connector to the appropriate plug on your PC. As with USB, it is important to know the COM number associated with this connection. However, with RS232, Windows does not need to install additional drivers and typically the COM number is “hard-wired” to COM1.

## Install Device Application Firmware

As mentioned above, if there is a need to install the OPL9813 Application XFNS084x onto your device, use the following process. Note that you must have downloaded and installed the free Opticon PC application Appload (see above) as well as downloaded the firmware file itself.

- Install the battery into your OPL9813.
- Place the device on the cradle (scan window down, keys facing forward).
- Launch Appload.
- In Appload, navigate to **Settings > Port** and choose the COM number mentioned above.
- In Appload, navigate to **File > Download** and browse to the unzipped firmware file XFNS084x.hex.
  - **Important:** Do not remove the OPL9813 from the cradle, power off your PC or disconnect any of the cables while this process completes. Typical download times are only a few seconds.
- When the process is complete you can remove the OPL9813 from the cradle and put it to work or configure **Settings**.
- As soon as the OPL9813 is removed from the cradle, it will begin to emit a series of beeps. This is your notice that the Serial Number has not yet been programmed into the device’s memory. Scan the Serial Number barcode from the device’s box to store this data. If a mistake is made, this number

can be reset at a later date. See **Settings** for more information. The device will not exit this mode until the Serial Number barcode is scanned.

- Repeat this process for any devices you have. Once all are done, you may uninstall Appload and delete the firmware files as they are not needed for day-to-day operations.

## Setup NetO32

NetO32 is a free Opticon PC application used to download data to and from an Opticon terminal device such as the OPL9813. NetO32 was downloaded and installed previously in this document, so launch NetO32 from the desktop shortcut or the Start Menu to begin.

- In NetO32 navigate to **Tools > Options**.
- From the menu on the left select **RS232**.
- Select the **COM Port** as mentioned earlier.
- Set the Baudrate to **115200**.
- Click **Apply**.
- From the menu on the left select **Download**.
- Change the **Receiving Directory** to a directory of your choice. This is the folder all data files from the OPL9813 will be stored each time it is placed on the cradle.
- Choose the download behavior from the following list:
  - **Append**: Each new data file is tacked onto the end of any existing data files of the same name. All data files coming from the OPL9813 with Application XFNS084x installed will be named DATA.txt. No data is lost with this method.
  - **Overwrite**: Each new data file will delete any existing data files of the same name and replace them with the new content from the device. All previous data is lost with this method unless the data file is backed up either manually or by another automated process (not covered by this manual).
  - **Unique**: Each new data file will be given a new name. For example DATA.txt will be the first file name, DATA.000 will be the second, DATA.001 the third, etc. No data is lost with this method.
- Click **OK** to return to the main application window.

The final setup in setting up NetO32 is to save these settings. NetO32 does not retain settings after the application has been closed, but they can be stored and retrieved for later use; select **File > Save** to do this. Opticon recommends naming the config file something specific to your usage such as the project it is used for or your company name. Since these config files are stored in the NetO32 install folder by default, this makes it easier to distinguish your configuration files from NetO32's own files.

## Usage Instructions

### Collect Data

Collecting Data with the OPL9813 is a very simple process; simply point the device at the barcode you wish to scan and press the trigger key. The trigger key is the center of the three keys on the face of the device. It is not necessary to continue to hold the key while aiming the device though this is not prohibited either. Depending on the **Trigger Mode** (see **Settings**), upon a successful scan, the laser line will either shut off to be triggered again manually at a later time, or remain on in anticipation of scanning additional barcodes. Note that in multi-scan mode, duplicate barcodes are prohibited.

Each time a barcode is scanned, a record is created in the data file on the device. This record contains GPS coordinates, time and data, the barcode data and some additional information (see **Data File** for more information). This data will be stored on the device until it is downloaded to your PC.

### Retrieve Data

Data Retrieval for application XFNS084x has been streamlined a great deal and is typically accomplished in a matter of seconds.

### Start NetO32

Launch the NetO32 application (described previously) and load your configuration settings from the File menu. See **Setup NetO32** for additional information on this topic.

Select **Protocol > Start** to activate NetO32's polling process which allows data transfer.

### Place OPL9813 in cradle

That's it. Once the device is placed in the cradle, it will detect that NetO32 is already polling and respond accordingly. All data from the device will be uploaded into your **Receiving Directory** and removed from the device using the settings configured previously.

### Stop NetO32

It is good practice to cease NetO32's polling by selecting **Protocol > Stop** from the menu when data retrieval is complete. NetO32 may now be closed safely and the data collection process can begin again.

## Data File

### Basics

The Data stored on the OPL9813 with application XFNS084x is all kept in a file named DATA.txt on the device disk. This data will persist up to a week after main battery power has been depleted though common sense suggests not to test that feature if you can avoid it. This file is essentially a database of records with each line representing a new record. Each record stores similar data in a consistent format detailed below.

### Record Format

Each record stored maintains the following format. Note that each field is comma separated. All white-space is contained wholly within the field and not part of any delimiter.

```
123456,12213.244W,4727.568N,18/07/2012 08:48:05,"BREAD CRUMB":XFNS0843 1 minutes,1
```

**[Device Serial Number],[Longitude],[Latitude],[Date/Time],[Message],[GPS Fix Indicator]**

#### **Device Serial Number**

This is the serial number of the device as printed on the safety label on the underside of the OPL9813. Note that it is possible for the data in the file and the data on the label not to match (intentionally or otherwise) if the wrong serial number was stored during device setup. See **Settings** for a method to correct this.

#### **Longitude**

This is the first of two GPS coordinates. Longitude specifically refers to the East/West positioning of the coordinate. Specific **GPS String Formats** are described in detail further in this document.

#### **Latitude**

As with longitude the format is identical, except that this data represents the North/South positioning of the coordinate.

#### **Data/Time**

As expected, this is the date and time the record was stored, whether it is a barcode scan or a GPS breadcrumb. More on breadcrumbs later.

**Date** is recorded in the dd/mm/yyyy format. Single digits are zero padded.

**Time** is a 24-hour clock in the hh:mm:ss format. Single digits are zero padded.

Date and Time are separated by a single space. Time is set and maintained automatically by satellite once a GPS fix is established. Leap-year is supported and handled automatically. As a requirement, Daylight Saving Time is not supported, but this can easily be accounted for. See **Time Zone** settings for further information on this.

## Message

This field contains the most varied data.

### File Created

```
"BREAD CRUMB":XFNS0843 1 minutes
```

This is the first message recorded when the DATA.txt record file is first created. It will always be the first record type in a file. After "BREAD CRUMB" follows the application version number, followed by a single space, followed by a number indicating the GPS Breadcrumb interval. This number is left padded with spaces up to 2 characters wide so 1 minute would appear as " 1 minutes" and 10 minutes would appear as "10 minutes". See the **GPS Breadcrumbs** setting for further information.

### Fix Attained

```
"BREAD CRUMB": 1 minutes
```

This message is recorded when a GPS fix is established. It is a duplicate of the **Breadcrumb Set Record Type**. As the **File Created** type, you will also see the GPS Breadcrumb interval in the same format. Note that this record is only recorded when breadcrumbs are enabled. See the Breadcrumbs setting for further information.

### Breadcrumb Set

```
"BREAD CRUMB": 1 minutes
```

This message is recorded when the Breadcrumb setting is changed. Note that the time interval (1 in this case) always takes up 2 character spaces in the record, thus a two digit number will not include a space after the colon. You will also see this record the first time a GPS Breadcrumb is recorded when the device first attains a fix. See the **GPS Breadcrumbs** setting for further information on breadcrumbs.

### Breadcrumbs Disabled

```
"BREAD CRUMB":OFF
```

This record type will be collected when the breadcrumb interval is set to 0, effectively disabling breadcrumbs. See the **GPS Breadcrumbs** setting for further information.

**Breadcrumb**

"BREAD CRUMB"

A breadcrumb record is collected each time a set interval elapses, determined by the Breadcrumb setting. See the **GPS Breadcrumbs** setting for further information.

**Scan**

<My Barcode Data>

Any other record in the file is a barcode scan. This section contains the data encoded in the barcode exactly as it is printed. Note that it is not uncommon that the human readable text printed below many barcodes will not always match the barcode itself. Non-printable ASCII characters are preserved in the data file though they may not display properly when viewed, depending on your text editor.

**GPS Fix Indicator**

This field is a boolean 1 or 0 indicating whether the device had a GPS fix at the time the record was stored.

## GPS Strings

### GPS String Formats

GPS strings can be represented in a variety of formats. Each format represents the same location on Earth and the formats can be readily translated from one to another.

GPS coordinates are logged in longitude/latitude pairs within each record in the data file. See the **Record Format** section for more information on the data file. Longitude indicates the East/West positioning and latitude indicates North/South. Subsequently, there is a capital N, S, E or W at the end of each GPS string (i.e. 122.22073W,47.45946N). The first portion of the coordinate (whether longitude or latitude, the same rules apply) can be in one of three formats: Degree, Degree Minute or Degree Minute Second. The GPS Format setting determines what each coordinate in a given record will look like. Subsequent changes to the GPS Format setting will not change existing records; the change will only apply to records collected after the change. All Record Types use the same GPS formatting.

#### Degree Hemisphere (DH)

Longitude: 122.22073W  
Latitude: 47.45946N

#### Degree Minute Hemisphere (DMH)

This form is also sometimes called NMEA RAW

Longitude: 12213.244W  
Latitude: 4727.568N

#### Degree Minute Second Hemisphere (DMSH)

Longitude: 122:13:14.06W  
Latitude: 47:27:34.1N

### GPS String Conversion

As mentioned above, GPS strings can be converted from one to another with some simple math.

The Degree format is exactly that, it's the exact degree position of your location with relation to the equator for longitude or the Prime Meridian for latitude. The degree of your longitudinal position can then be anywhere from less than 1 degree to 180 degrees (East or West) and from less than 1 degree to 90 degrees latitudinal (North or South). One degree is divided into 60 minutes and one minute is divided into 60 seconds. For the sake of discussion, we can ignore the hemisphere and just focus

on the numbers. For the above coordinates, we begin with 122.22073W,47.45946N or otherwise stated 122 degrees and a fraction for longitude and 47 degrees and a fraction for latitude. This is Degree format. To convert this to Degree Minute format, we multiply the fraction by 60. This gives us 122 degrees and 13.244 minutes longitude and 47 degrees and 27.568 minutes latitude or otherwise 122:13.244W,47:27.568N. To further convert to Degree Minute Second format, we follow the pattern and multiply the fraction of the minutes by 60.  $.568 \times 60 = 34.08$  seconds and  $.244 \times 60 = 14.64$ . Thus, we finally have 122:13:14.06W,47:27:34.1N. Conversions back towards the Degree format can be achieved by dividing by 60 rather than multiplying. For example,  $14.64 / 60 = .244$  and  $13.244 / 60 = .22073$  giving us 122.22073 again.

### Example

**D** 122.22073 degrees

$$.22073 \times 60 = 13.244$$

**D M** 122 degrees 13.244 minutes

$$.244 \times 60 = 14.64$$

**D M S** 122 degrees 13 minutes 14.64 seconds

$$14.64 / 60 = .244$$

**D M** 122 degrees 13.244 minutes

$$13.244 / 60 = .22073$$

**D** 122.22073 degrees

## Settings

The following are the options available to customize the behavior of the application and device. To configure any given setting, scan the appropriate barcode immediately following the settings description. Note: Changing any setting does not change the records already stored on the device; only new records stored after the change has taken effect. This is by design. It can take approximately 60 seconds for some changes to have full effect on new records.

### Device Serial Number

Each OPL9813 running XFNS084x stores a 6 digit number in memory so that data records can identify the specific unit that recorded the data. Typically this ID number matches the serial number of the unit.

The first time this application boots after a fresh installation, it will enter a mode which emits an alert beep indicating that the serial number barcode from the device's packaging should be scanned. Typically this is done at the production facility when the application is first installed.

In the event the stored serial number is incorrect or must be changed, this can be accomplished by scanning the below barcode, followed by an appropriate 6 digit numeric barcode representing the device's serial number.

Reset Serial Number

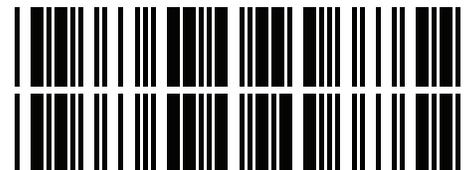


### Trigger Mode

The trigger mode determines the behavior of the scanner upon a successful barcode read. The first option is called **Single Read Mode** and the second is **Multiple Read Mode**. In both modes, the trigger key must be pressed to activate the laser but need not be held. Single Read Mode is very effective in noisy environments or if the good read beep cannot otherwise be heard and the LED cannot be easily watched as the laser turns off immediately upon a successful scan. Multiple Read Mode will cause the laser to remain active and scanning until it detects a period of about 6 seconds with no new barcodes scanned. Note that it is not possible to scan a barcode that has been scanned previously when in Multiple Read Mode, regardless of which mode the barcode was scanned in. Single Read Mode will allow any barcode to be scanned at any time.

Single Scan Mode

Multiple-Scan Mode



## Time Zone

All time zones from GMT -11 to GMT +14 are supported by this application. Note that Daylight Saving Time is not directly supported given the varied usage of this policy from region to region, but can be configured manually by changing the time zone setting as appropriate throughout the year. For example, Phoenix, Arizona does not follow Daylight Saving Time and as such remains at GMT -7 year-round. San Francisco, California on the other hand, switches from GMT -7 to GMT -8 depending on the time of year. The website [www.timeanddate.com](http://www.timeanddate.com) is a useful resource for determining time zones.

GMT + 0



GMT - 1



GMT - 2



GMT - 3



GMT - 4



GMT - 5



GMT - 6



GMT - 7



GMT - 8



GMT - 9



GMT - 10



GMT - 11



GMT - 12



GMT + 1



GMT + 2



GMT + 3



GMT + 4



GMT + 5



GMT + 6



GMT + 7



GMT + 8



GMT + 9



GMT + 10



GMT + 11



GMT + 12



GMT + 13



GMT + 14



## GPS String Format

The GPS String Format (see the **GPS Strings** section for full details) can be changed by scanning the barcode for the desired string format.

GPS Format: DH



GPS Format: DMH



GPS Format: DMSH



## GPS Breadcrumbs

At a pre-determined interval, the OPL9813 will store a GPS Breadcrumb (that is, a time and date coded set of GPS records not associated with a barcode scan or any other user activity). This GPS breadcrumb, not relying on user input can be used to track the user of the device at stages where scanning does not occur throughout the day. As this feature does impact battery life, it can be disabled by setting the interval to 0. Any full minute increment from 1 minute to 60 minutes can be set. Default is 15 minutes.

Breadcrumbs: OFF



Breadcrumbs: 1 minute



Breadcrumbs: 5 minute



Breadcrumbs: 10 minute



Breadcrumbs: 15 minute



Breadcrumbs: 20 minute



Breadcrumbs: 25 minute

Breadcrumbs: 30 minute

Breadcrumbs: 35 minute

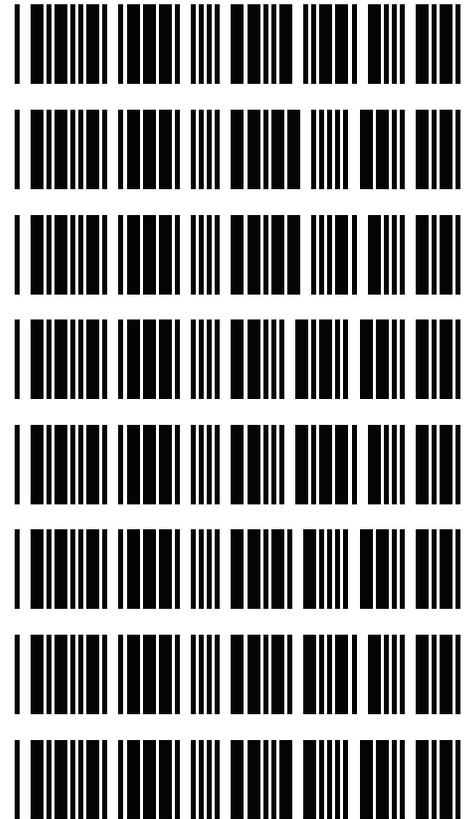
Breadcrumbs: 40 minute

Breadcrumbs: 45 minute

Breadcrumbs: 50 minute

Breadcrumbs: 55 minute

Breadcrumbs: 60 minute



## Supported Symbologies

A symbology is a specific form of barcode, much like an alphabet. The barcodes in this document, for example, are all of the symbology Code 39. The following symbologies are supported by this application for daily usage.

- UPC/EAN
- Code 39
- Codabar
- Code 2 of 5
- IATA
- MSI/Plessey
- Telepen
- UK/Plessey
- Code 128
- EAN 128
- Code 93
- Code 11
- Korean Postal Authority Code
- GS1 Databar (formerly RSS)
- Composite Codes