

User's Guide

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1. Introduction

1.1 Scope

This document is applicable to the **Honeywell Dolphin™ 7800 Enterprise Digital Assistant, 70e (“Dolphin Black”), 99EX/99GX and 6500 Mobile Computers (collectively “Dolphin” or “Terminal”)** with Windows Embedded Handheld 6.5 and 2DTG Data Matrix Decoding applications utilizing its **DPM Edition library (DM_DPM)** and compiled in Windows Embedded Handheld 6.5 environment.

Library features are the same as for the full Windows version. They are described in detail in the User's Guide **“Data Matrix Decoding SDK (Professional, DPM, Enterprise editions)”**.

1.2 Normative and other references

ISO/IEC 16022 - Symbology specification - Data Matrix

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ISO/IEC 15415 - Symbol quality - Two-dimensional symbols

User's Guide "Honeywell Dolphin™ 7800 Enterprise Digital Assistant with Windows Embedded Handheld 6.5"

User's Guide "Honeywell Dolphin™ 99EX/99GX Mobile Computers with Windows Embedded Handheld 6.5"

User's Guide "Honeywell Dolphin™ 70e ('Black') Mobile Computers with Windows Embedded Handheld 6.5"

2. Delivery package composition

Delivery package is notated as **DPM_Dolphin_WEH6.5_v.xx.xx.zip**, and includes the following applications/files:

- **DPM_EH_ScanWedge.exe** – Scan Wedge application – emulates keyboard entry (sends decoded data to any "active window" application).
- **DPM_EH_MSWord.exe** – Data Matrix DPM Decoder, allows data to be automatically pasted directly to the Mobile MS Word/WordPad and monitor scanned sample on Terminal's display at the same time.
- **DPM_EH_Demo.exe** – Data Matrix DPM Decoder returning decoded data into the message box popping-up over the image of the captured symbol. Provides for monitoring scanned sample on Terminal's display while decoding.
- **ImagingProfiles.exm** – "DPM Profile" optimized for capturing DPM images (created by 2DTG) – default profile – "Fast"
- **ImagingProfiles_Robust/Fast** folders "DPM Profiles" optimized for robust/fast decoding (created by 2DTG)
- **License.txt** – license file (not required for trial mode).

Important!

All programs delivered as trial versions. Trial versions are fully functional but some characters in the decode output are artificially replaced with asterisks. Licensing (License.txt) is required in operational mode only.

3. Deployment

If 2DTG's DPM Decoding software is purchased together with Dolphin hardware, it comes as pre-installed add-on software. **No further installation is required** in this case.

If it is purchased without the Terminal, on-site installation is required. It's an easy procedure that practically does not take any time.

4. Synchronize Terminal with the host computer via Windows Mobile Device Center - WMDC (WIN 7-10, Vista) or ActiveSync (WIN XP).

- Note:** 1. Windows 8&10 requires small adjustment to connect to WMDC both on your PC: <https://support.tracerplus.com/article/291-windows-mobile-device-center-no-longer-working-in-windows-10> and on your Terminal:
2. Go To: Settings=>Connectivity=>USB to PC and uncheck “Enable Advanced network functionality” (for Windows 7 and XP it should be leaved checked)
5. Create a folder on the Terminal for DPM applications, received from 2DTG, – for example **File Explorer > 2DTG** - and unpack all files from the delivery package to this folder.
6. From this folder you can start any application – just by selecting and tapping appropriate file name.

4. Reading Technique

Follow the general guideline described in the “**Using the Scan Image Engine**” Chapter of the Terminal User’s Guide.

Two of DPM applications, supplied by 2DTG, allow for Image Preview to assist in selecting the optimal reading distance and angle, which sometimes is crucial for DPM marks. When the image capturing process is initiated, the touch screen displays a preview of the mark. Select the best view by slightly changing reading distance and angle.

Overall DPM mark reading involves few steps as follows:

- Position the terminal over the barcode.
- Project the aiming brackets by pressing and holding “Scan” key (both “Face” key and Side keys are available for DPM reading).

Note: Dolphin 99EX/GX (unlike Dolphin 7800) features “blinking” illumination in DPM mode – it’s normal. “Aiming” and “Illumination” settings in ImagingProfiles (Appendix 1) are disabled for Dolphin 99EX/GX in DPM mode.

- Center the aimer crosshair over (or near) the barcode.
- Hold the Device such that its front surface is tilted to the mark surface (to prevent unwanted reflection), and the mark is within the “high-vis aiming pattern”. Depending upon the type of the mark the hade may vary within a ~ 15-45-degree range.
- Slightly change reading distance and angle as necessary to read the DPM mark by monitoring the Image Preview.
- Hold the “Scan” button until the symbol is decoded, or you decided to terminate this attempt. When image is decoded the device will stop reading automatically (the terminal beeps).
- Hold the “Scan” button until the symbol is decoded, or you decided to terminate this attempt. When image is decoded the device will stop reading automatically (terminal beeps).

Important!

Dolphin 7800 and 99EX/99GX Terminals are equipped with 56XX image engines, which may come in different models HD (High Density), SR (Standard Range) and ER (Extended Range). It is recommended to use HD model (resolution of 5 mils on a Data Matrix “paper” label) for DPM reading. Please note, that for DPM marks the effective resolution is even slightly lower than that (might be 7-8 mils), so HD model would be always preferable.

Reading Distance for DPM marks is from 0.5 to 12 inches for most samples depending upon the Terminal’s scanning engine model (HD, SR or ER). The optimal distance for SR model for most readings would be ~ 4-8 inches. Depending upon the mark and lighting conditions maximum distance might be as great as ~ 15 inches.

Important!

Try to avoid direct lighting or bright ambient light when scanning DPM (particularly Dot Peen) samples to prevent patches of reflected light.

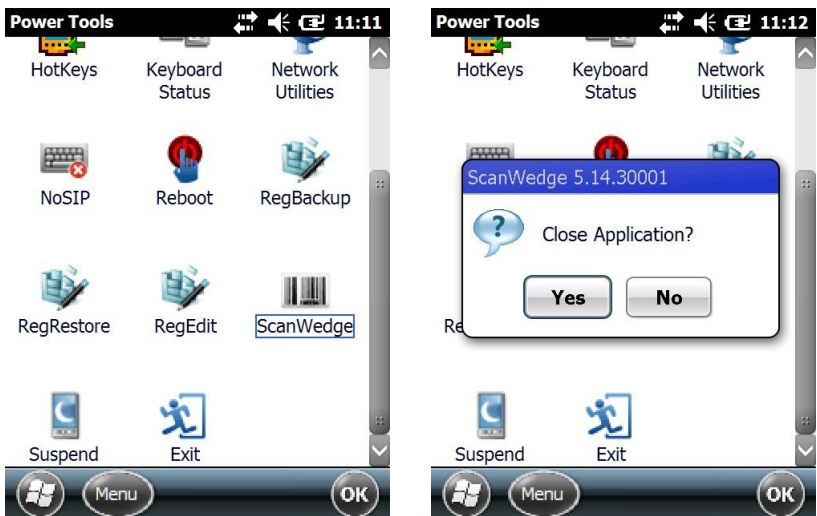
Launching applications for the first time creates **tmpImagingProfiles.exe** file in the operational directory – it is normal - it’s a backup of the original **ImagingProfiles.exe** file.

5. Running the Applications

2DTG offers three DPM software applications designed to meet different decode requirements: DPM_EH_ScanWedge, DPM_EH_MSWord and DPM_EH_Demo.

System Scan Wedge must be disabled before running 2DTG’s applications:

- GOTO:
Start > Power Tools
- Tap “ScanWedge”
- “Pop-up” message box will ask to confirm that you want to close application
- Tap “Yes”



To access 2DTG’s applications, tap File Explorer > 2DTG:

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- Select **DPM_EH_ScanWedge** to be able to send decoded data to the foreground application as keystrokes,
- Select **DPM_EH_MSWord** to be able to automatically paste decoded data directly to the Mobile MS Word/WordPad application installed on the terminal (it should be opened in the background at this time), or
- Select **DPM_EH_Demo** if you just want to see the decode result on the Terminal screen.

When a DPM application is open, press the **Scan** (“Face” or side) key to activate the imager engine.

Important!

Only one application can access Imager at the same time. Close any APP accessing the Imager before starting the new one.

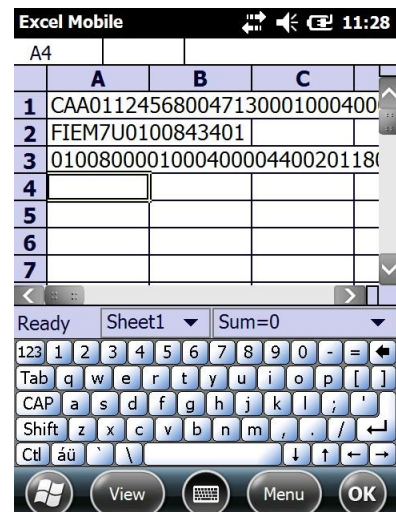
5.1 DPM_EH_ScanWedge

This application is functionally like the system’s ScanWedge utility – it sends data from the DPM Decoder to the foreground application as keystrokes (as if the data were entered via a keyboard). The foreground application is the open software application whose window is currently active on the display.

This is particularly useful when working in the network environment with the software programs providing a direct connection from a mobile device to any web or legacy host application - like, for example, a ClientMax - client software platform for mobile devices.

For parsing decode data to the foreground application:

- Launch the program - tap **File Explorer > 2DTG > DPM_EH_ScanWedge**
- Launch data collection application (MS Excel, for instance) while keeping DPM_EH_ScanWedge running.
- Place cursor into a position where you want the decode data to be parsed.
- Project the aiming brackets by pressing and holding “Scan” key as it is described in Section 4.
- Hold “Scan” button until a symbol is decoded.
- Decoded data will be parsed to the foreground application (MS Excel, for example). Each new read will be placed on a new line (cell).



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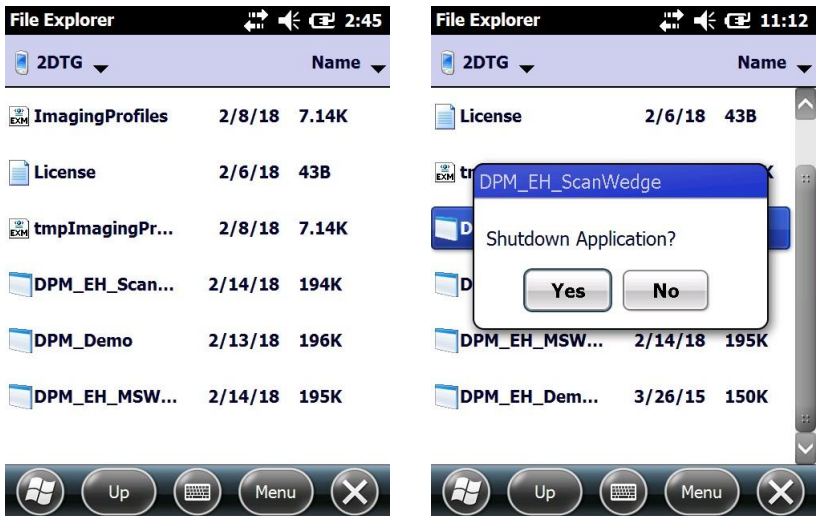
Overall this application operates the same way as DPM_EH_MSWord with the exception that you cannot monitor the image on the Terminal display while scanning.

Important!

Only alphanumeric characters of the English alphabet and special symbols can be sent.

To close application:

- GOTO –
Start > File Explorer > 2DTG
- tap DPM_EH_ScanWedge
- “Pop-up” message box will ask to confirm that you want to close application
- Choose “Yes”



5.2 DPM_EH_MSWord

- Launch the program - tap **File Explorer > 2DTG > DPM_EH_MSWord** - a blank Decoder’s window opens.
- Project the aiming brackets by pressing and holding “Scan” key as it is described in Section 4 - you can monitor the image quality while changing the reading distance and angle (see pictures below).

For parsing decode data into MS Word/WordPad:

- Launch MS Word/WordPad.
- Place cursor into the position where you want the decoded data to be parsed.
- Launch DPM_EH_MSWord (you can also scan while keeping it in the background, but in this case, you will not be able to monitor the image in the Decoder’s window, while reading DPM marks).
- Read the symbol (press and hold “Scan” button).
- Switch to the MS Word/WordPad. All decoded data are parsed to here - each new read on a new line.

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5.3 DPM_EH_Demo.exe

This application is particularly useful when you do not need to parse data into the data collection system but want just to see the decode result. The result is printed to the “pop-up” Message Box. Like with the DPM_EH_MSWord you can monitor the image while finding the best scanning position for your device.

- Launch the program - tap **File Explorer > 2DTG > DPM_EH_Demo** - a blank Decoder’s window opens.
- Project the aiming brackets by pressing and holding “Face Scan” key as it is described in Section 4 - you can monitor the image quality while changing the reading distance and angle (see pictures below).
Decode result is shown in the “pop-up” Message Box.
- To close application - tap “x” in the upper-right corner of the Decoder’s window.



5.4 Decode speed

Decode speed strongly depends on the Image profile chosen for decoding.

We offer 2 profiles optimized for different kind of DPM samples and located in the corresponding folders of the Delivery package:

- Folder “**ImagingProfiles_Robust**” – for all types of DPM samples, particularly “Dot Peened”
- Folder “**ImagingProfiles_Fast**” – for most DPM samples (including Dot Peened), particularly having relatively good contrast – default profile.

To switch to the “Robust” profile just replace default profile in the “2DTG DPM” folder with the “Robust” one (copy it from “Robust” folder).

The profile can also be adjusted for specific application as it’s described in the Appendix 1.

Aimer and Illumination can also be turned OFF/ON as it’s described in the Appendix 1 (except for Dolphin 99EX/GX).

6. Licensing DPM Decoder

License for each Mobile Computer is generated using proprietary encryption mechanism, which uses Device’s **Terminal Number** as an input parameter to generate configuration file **License.txt**. The Computer will check the license status every time the DPM Decoder is launched.

How to get your License Key:

1. Enter Terminal Serial Number(s) in the “Order Comments” window at the end of the Check-out process when buying licenses from 2DTG’ web-site.
2. Configuration file for each submitted **Terminal Serial Number** will be e-mailed to you within 24 hours.
3. Contact Customer Support if you have any questions regarding this matter.

Copy received **License.txt** file into the same directory where you have placed **2DTG’s** applications. If **License Key** is invalid, the error message will pop-up: “License Key is invalid. Trial mode.” – the program will continue to operate in trial mode.

How to find your Terminal Serial Number:

On your Terminal go to **Program Files > Power Tools** and open **SysInfo** file (double tap on it).

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The **Terminal Serial Number** is in the SYSTEM INFO section.

You can save the file (**File / Save to File**) and keep it on your host computer for convenience.

7. Verifying that DPM Decoder is installed/enabled

If, at any time, you need to make sure the DPM Decoder is enabled try to read Data Matrix symbols below. If you can decode these symbols – Decoder is installed and running correctly.



Operational Decoder:			Trial Decoder:		
2D Technology Group	Test1	Data Matrix xxx	2D Technol*****	Tes**	Data Mat*****

8. Appendix 1. Editing DPM Profile on the host computer

- Make a backup copy of the **ImagingProfiles.exm** file.
- Open the **ImagingProfiles.exm** file, received from 2DTG, with the Notepad on your computer.
- Scroll through its content down to the **2dtg profile** (default profile is depicted):

```
<Section name="2dtg" flags="8">
  <Section name="Automatic Exposure Control">
    <Key name="Exposure Method">1</Key>
    <Key name="Target Value">140</Key>
    <Key name="Target Percentile">65</Key>
    <Key name="Target Accept Gap">32</Key>
    <Key name="Max Exp">520</Key>
    <Key name="Max Gain">1</Key>
    <Key name="Conform Image">1</Key>
    <Key name="Conform Tries">3</Key>
    <Key name="Specular Exclusion">4</Key>
    <Key name="Specular Sat">250</Key>
    <Key name="Specular Limit">5</Key>
  </Section>
  <Section name="Processing">
    <Section name="Histogram Stretch">
      <Key name="Flags">1</Key>
      <Key name="Low">2</Key>
      <Key name="High">2</Key>
      <Key name="Mode">1</Key>
    </Section>
    <Section name="Gamma Correction">
      <Key name="Flags">1</Key>
      <Key name="Gamma">0.45</Key>
    </Section>
    <Section name="Infinity Filter">
      <Key name="Flags">1</Key>
    </Section>
  </Section>
  <Section name="Settings">
    <Key name="Aimer">1</Key>
    <Key name="Illumination">1</Key>
  </Section>
</Section>
```

- Change parameters as required (see the Table below for the parameters description) and save the file without changing its name.

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- Synchronize Terminal with the host computer via Mobile Center (WIN 7, Vista) or ActiveSync (WIN XP).
- Replace **ImagingProfiles.exm** on the device with the new file.

Adjustable DPM Profile Parameters

Parameter	Description
Illumination/Aiming:	<p><Key name="Aimer">1</Key> "1" – ON; "0": - OFF</p> <p><Key name="Illumination">1</Key> "1" – ON; "0": - OFF</p>
Robust / Fast Decode Mode	<p><Section name="Infinity Filter"> "Robust" Mode</p> <p><Key name="Flags">1</Key></p> <p></Section></p>
Automatic Exposure Mode Parameters	
EXPOSURE METHOD	<p>Set to one of the following :</p> <ul style="list-style-type: none"> • "0" - Uses all image data when calculating automatic exposure setting • "1" - Uses only the data in the center of the image when calculating automatic exposure setting • "2" - Uses all image data, but weights the data in the center of the image more heavily when calculating automatic exposure setting
TARGET VALUE	The auto exposure algorithm tries to get a given percentile of all of the pixel values of the image, to fall at a target value. This parameter specifies the desired target value. The default value for this parameter is 150 (for DPM – 200), with a minimum of 1 and a maximum of 255.
TARGET PERCENTILE	The auto exposure algorithm tries to get a given percentile of all of the pixel values of the image, to fall at a certain value. This parameter sets where that percentile is in the image data. This value is configurable between 1 and 99, where 1 represents the darkest percentile of the image, and 99 represents the lightest percentile of the image.
TARGET ACCEPT GAP	This specifies how far the pixel value of the TargetPercentile can stray from the TargetValue but still be considered an acceptable image. The default value for this parameter is 10 (for DPM – 32), the minimum value is 1 and the maximum value is 50. It should be noted however that as this value gets smaller, the time to acquire a conforming image might be lengthened.
MAX EXP	This specifies the maximum exposure value to be used by the auto exposure logic during image acquisition. The default value for this parameter is 1312 (for DPM – 400), the minimum value is 1 and the maximum value is 7874, in units of 127uS. It should be noted that this parameter would allow for the adjustment of the frame rate of the imager to achieve larger exposure times; therefore it will affect the speed at which the imager acquires an image.

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MAX GAIN	This specifies the maximum gain value to be used by the auto exposure logic during image acquisition. The default value for this parameter is 1, the minimum value is 1 and the maximum value is 4.
CONFORM IMAGE	Where the auto exposure software is always trying to get the TargetPercentile of pixel data to fall at the TargetValue, this parameter tells the image acquisition software that the acquired image must conform to the defined imager settings, (target percentile, target value, number of updates). The default value for this parameter is 0 (for DPM – 1) for false, indicating that every image regardless of whether or not the target percentile of pixel values falls within the acceptance gap of the target value.
CONFORM TRIES	This specifies the maximum number of attempts that the auto exposure logic can use while attempting to acquire an image that conforms to the target values set up for the auto exposure algorithm, before considering the image as conforming. This parameter is only valid when the ImageMustConform value is set to 1 or true. The default value for this parameter is 6 (for DPM – 3), the minimum value is 1 and the maximum value is 8.