Contents

1. Overview

Adapter is an optical addition[i] to the Xenon 1900/1902 scanner to extend its capabilities (resolution) to the area of very small (less than 10 mils) Data Matrix symbols. Depending upon the model HD/ SR/ER, Xenon has a resolution ranging from 5 to 7.5 mils, but for DPM samples it is worse than that – between ~ 9 – 13 mils. In general, reading technique for the "Scanner + Adapter" requires adapter to be put in contact (or close to contact) with the sample.

The overall view of the Adapter is depicted in the Table below:

DPM Adapter	Adapter attached to a Xenon scanner	Contact reading requirement

2DTG offers 2 adapter models, as follows:

- **18-LDS4X0008FG**, having Diffuser for reading marks on shiny surfaces. The Adapter is recommended f[i]or use with Xenon 1900/1902/HD.

- **18-LDS4X0408FG**, having 40 mm Adapters (lens) built-in (in addition to diffuser) for reading particularly small marks. This Adapter is recommended for use with Xenon 1900/1902/SR/ER.

Since the Xenon's Data Matrix Decoder is not capable of "reading" Dot Peen marks, it is strongly recommended to use DPM Decoder (Plugin) by 2DTG when using the Adapter.
IcEveryCode^TM **DPM Decoder (Plugin)** is a software program based on Data Matrix decoding library, developed by 2D Technology Group specifically for DPM (Direct Part Marking), including Dot Peen, applications**.**

The Decoder is integrated into the **Xenon 1900/1902** images by means of **TotalFreedom™ Plug-In SDK** with the objective to extend their capabilities into DPM area.

The DPM Decoder is installed as an add-on feature specifically for DPM applications though it can be used for "reading" regular Data Matrix symbols as well, of course. It can be temporarily turned OFF if necessary as it is described below.

Since it's the add-on feature, most of the recommendations and settings, described in the **"Xenon™ 1900/1902 User's Guide"** are fully applied.

Specific features related to the Plugin and Decoder operation are described in this Guide.

2. Adapter Assembly

Normally, DPM Adapter, sold by 2DTG, is a permanent fixture (with the option to remove) on Xenon 1900 and 1902 scanners. In other words, it is permanently affixed to a Xenon Scanner unless otherwise requested. In this case end user needs to do nothing and can start using scanner right "from the box".

If you purchased Adapter separately, you can also start using it right "from the box" by seating it using friction alone. Simply seat the Adapter into the scanner aperture so that it stays in place. Apply firm pressure to hold the Adapter in place.

However, for the heavy use we recommend to affix Adapter to the scanner.

Important:
Failing to observe special assembly instructions could result in damage to the Adapter, the scanner, or both.

 The screw used in the permanent affixture of the Adapter is a ¾" length self tapping Torx screw. The ¾" screw holds the Adapter in place so that it is fixed and cannot be removed without unscrewing the screws.

2.1   "I8-LDS4X0008FG" Adapter (Diffuser)

The ¾" screw is already located in each side of the Adapter, but will need to be tightened, when mating with a scanner, to make the Adapter permanent.

Included with your product is a small plastic bag containing a 1/16 hex key.

Seat the Adapter into the front aperture of the scanner with the plastic slotted screws on top and the legs pointing downward, then use the hex key to reach through the corresponding holes in the plastic guide to tighten the ¾" screws. Make sure the Adapter is seated firmly in place before tightening the screws. Tighten them so that the Adapter does not pull out when applying moderate pressure to pull it out.

To make the Adapter removable, remove the two ¾" screws using the hex key through the holes in the plastic guide. Simply seat the Adapter into the scanner aperture so that it stays in place. Apply firm pressure to hold the Adapter in place.

2.2   "I8-LDS4X0408FG" Adapter (40 mm lens)

The ¾" screw is already located in each side of the Adapter, but will need to be tightened, when mating with a scanner, to make the Adapter permanent.

Included with your product is a small plastic bag containing a 1/16 hex key, and two ¼" Torx screws

Seat the Adapter into the front aperture of the scanner with the plastic slotted screws on top and the legs pointing downward, then use the hex key to reach through the corresponding holes in the plastic guide to tighten the ¾" screws. Make sure the Adapter is seated firmly in place before tightening the screws. Tighten them so that the Adapter does not pull out when applying moderate pressure to pull it out.

The ¼" screw in the lock kit holds the lens holder in place, but at the same time renders the Adapter removable.

To make the Adapter removable, the ¾" screw will need to be removed and replaced with the ¼" screw. Use the 1/16 hex key to reach through the corresponding holes in the plastic guide and unscrew the Torx screws, *one at a time*, because they hold the lens in place, and replace each one with the ¼" screw provided in the unlock kit.

See **Figure 1** for the location of the ¾" screws in the Adapter Housing. **Figure 2** illustrates the side holes in the Adapter housing through which the ¾" screws protrude and lock the Adapter into place in the front of the scanner.
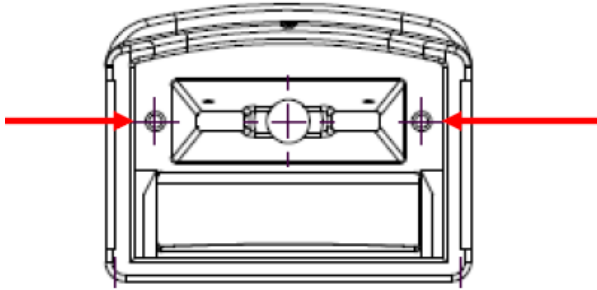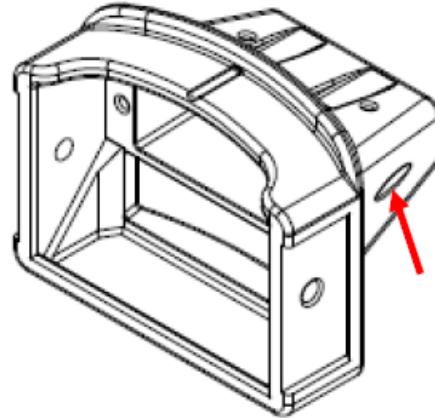

| Figure 1 | Figure 2 |

3. DPM Plugin Installation

If Plugin is purchased together with the Area Imager, it comes as pre-installed add-on software. No further installation is required for its operation.
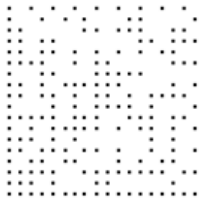
If it is purchased without the Imager, on-site installation is required. It's an easy procedure that takes only few minutes. The procedure is described in the "Plugin Installation Instructions" and "Quick Start Guide" located on the product page: http://www.2dtg.com/content/dpm-plugin-honeywell-handheld.

In any event it is recommended (required in the second case) to install "**EZConfig Scanning**" Utility, which simplifies scanner configuration by incorporating an easy-to-use graphical user interface (GUI) that saves time and increases productivity. It is particularly useful in programming functions, that can be performed on a Honeywell scanning device connected to a PC COM port, and viewing captured images.

4. Verifying that Plugin is installed/enabled

If, at any time, you need to make sure the plugin is enabled (without checking plugin status in the EZConfig utility) try to read Data Matrix symbols below. If you can decode these symbols – plugin is installed and running correctly.

Operational Plugin:			Trial/Demo Plugin:		
2D Technology Group	Test1	Data Matrix xxx	2D Technol*********	Tes**	Data Mat*******

5. Reading Techniques

5.1 Reading without Adapter

Follow the general guideline described in the Reading Techniques section of the **"Xenon™ 1900/1902 User's Guide"** (p. 1-8).

For DPM marks - hold the Imager such that its front surface is tilted to the mark surface, and the mark is centered. Depending upon the type of the mark the tilt may vary within a 45-65 degree range (Xenon1900/1902).

Reading Distance for DPM marks is from 0.5 to 6 inches for most samples (average ~ 4.5 inch), approximately. So, the optimal distance for most readings would be ~ 2-4 inches. Depending upon the mark and lighting conditions maximum distance might be as great as ~ 8 inches.

5.2 Reading with Adapter

Adapter was designed initially to address a shiny CURVED surface that had been etched with a bar code. It is well known that DPM marks on such surfaces require special (diffuse) illumination to be "readable" by a scanner. Xenon scanner lacks such an illumination – it's a general purpose device though with a very good optics. Introducing a "diffuse surface" positioned at 45 degrees to the incident rays provides decent illumination, acceptable, in general, for DPM reading - **18-LDS4X0008FG** model – not only for shiny substrates, but for a variety of other surfaces and marks (particularly, Dot Peen), as well. The Adapter can be also enhanced by the magnifying lens to enable scanner to decode very small DPM symbols - **18-LDS4X0408FG** model.

Recommended module size range for different Adapter models is described in the table below:

"Xenon 1900/1902 + DPM Adapter" - Performance Evaluation						
Scanning Device	Module size range				Reading Distance	Field of View
Xenon GHD			> 10mils			0 - 4.5"	Manufacture's Default
Xenon GHD + DPM Adapter 18-LDS4X0008FG		5-15 mils				0 - 1.5"	Close to Default
Xenon GSR/GER + DPM Adapter 18-LDS4X0408FG	3-10 mils					Contact Reading only	Reduced to 6 mm on contact reading
Important: 2DTG's DPM Plugin has to be installed to the Xenon area imager to ensure such DPM performance.						

There are three recommendations for DPM reading using Adapter:

1. Unlike the scanner without adapter (5.1), the reading angle in this case is close to 90 degrees due to the special adapter configuration. Data Matrix code must be lined up within the Field of View (FOV) using the built in guide. It is specially designed with a crease, which facilitates proper vertical alignment with every scan. Keeping the guide in, or near, contact, ensures the proper angle is achieved.

   However, there are two limitations that need to be taken into account, particularly when using "40 mm Adapter":

   - "Contact reading" requirement can make the reading procedure ergonomically inconvenient, if the object that is being scanned rests flat on the table, because the scanner is tilted away from the user. It is recommended to hold part in your hand when reading a symbol, if it's possible (see the picture above).
   - "40 mm Adapter" (**18-LDS4X0408FG** model) reduces Xenon's FOV substantially – Data Matrix size on the surface shall be less than 6 mm to fit into the Adapter's window.

2. For "Diffuse Adapter" (**18-LDS4X0008FG** model), on the other hand, these limitations are less critical – "contact reading" is not so strong requirement and FOV is close to default. More than that, we would recommend to detach "clear plastic guide" from Adapter (two screws on the sides) if the operator has enough experience in working with Xenon scanner and can keep the mark in its FOV. However, it should be remembered that reading angle (for "non-contact case") might differ from 90 degrees due to illumination imperfections.

3. 2DTG's DPM Plugin has to be installed to the Xenon Scanner to ensure DPM performance on the variety of other surfaces and marks (particularly, Dot Peen).

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[i] Developed and manufactured by InData Systems, Inc. (USA).