PRINTRONIX AUTO ID

Online Data Validator 2D User's Manual

ODV2D for T8000 and T6000e Printers

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. 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 an 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.

Unauthorized changes or modifications could void the user's authority to operate the equipment.

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.

Any change or modification to this product voids the user's authority to operate it per FCC Part 15 Subpart A Section 15.21 regulations.

Canada

This Class A digital apparatus complies with Canadian ICES-003 and RSS 210.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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Marking by the CE symbol indicates compliance of this Printronix system to the EMC Directive and the Low Voltage Directive of the European Union. Such marking is indicative that this Printronix system meets the following technical standards:

- EN 55022 — “Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment.”
- EN 55024 — “Electromagnetic Immunity Requirements for Information Technology Equipment”
- EN 60950 — “Safety of Information Technology Equipment.”

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This product has been tested and found to comply with the limits of Class A Information Technology Equipment according to European standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication devices.

WARNING

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

CE Symbol

CE

Taiwan

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Compliance Statements

The TSC Printronix Auto ID Online Data Validator 2D gathers data per the ISO/ANSI method of verification to perform practically all the industry standard bar code quality parameter calculations. These include all ISO/ANSI method parameters for 1-D and 2-D barcodes along with decoding the symbol.

Reflectance Compliance – 660 nm Wavelength (Red) Light

The reflectance values embedded in the calibration symbol supplied with each ODV2D are measured using a calibrated ISO compliant verifier.

ISO/ANSI Method Compliance

The Printronix ODV2D gathers data and performs all ISO/ANSI method parameter calculations per the ISO/IEC 15416 (1-D) and ISO/IEC 15415 (2-D), and ANSI X3.182-1990 methodologies with a few special considerations and exceptions. The ODV2D also conforms to ISO/IEC 15426-1 and 15426-2 per the requirements specified in Section 2 of both documents, with some exceptions.

The exceptions and considerations are related to the instrument's design and mission. The design incorporates a proprietary image scanner that has been assembled with a fixed focal length to produce a calibrated dot resolution for measuring 10mil or larger minimum X-dimensions. Further, the measurement accuracy of some grading parameters may be lower than identified in the standard.

The mission is to not only analyze bar code quality, but also to detect any printer failures, process failures or media problems. For maximum performance and to conform to quality specifications, a fixed mounting distance and angle are required.

An image scan resolution that can detect errors of the particular print method is highly recommended. The scan resolution used may or may not correspond to the recommendations in various specifications that it be related to the X dimension of a particular symbol, but instead correspond to the printer's resolution or some other parameter(s) critical in the application. A major philosophy of an on-line verification system is; if the printer and/or process is operating correctly and the media has proper reflectance properties, the best print quality for that particular print method and material is achieved by definition.

Special Considerations

1. Final system tests are performed at the proper focus distance and at an angle of 27 degrees. Units with common focus distances are checked to yield analysis results within 10% of the ISO verifier accuracy requirements.
2. All ODV2D's use the same light source with a wavelength of 624 +/- 10 nm. Therefore, any ISO/ANSI overall symbol grade calculated by an ODV includes 624 as the wavelength portion of the grade.

Exceptions to the ISO/ANSI Method

The Defects calculation does not include the quiet zone area. A separate quiet zone check is implemented to more easily isolate print problems vs. setup problems in an on-line environment.

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1 *ODV2D Usage*

Overview

If the ODV2D was shipped attached to the printer, the alignment and calibration can be checked before use following the Grading Submenu procedures starting on page 37 of this manual.

If the ODV2D was received unattached, the installation and initial alignment and calibration of the ODV2D must only be performed by trained service personnel. Contact your equipment provider or Printronix Auto ID Service Representative for more information about the initial setup.

The online data verifier/validator (ODV2D) is a precise measurement device for use with the T8000 4-inch and 6-inch and T6000e 4-inch printers. Once properly installed, it will perform well in even harsh environments with reasonable care. The ODV2D for one and two-dimensional barcodes is a fully integrated bar code camera scanning device mounted to the printer above the paper exit. When activated, it records the image of the printed output looking for bar codes in any right-angle orientation (0°, 90°, 180°, 270°). When it finds a bar code, it determines what type of bar code, confirms the data encoded, and provides the ISO grading, performing both functions of validation and verification.

As the label passes under the camera, the ODV2D grades the bar code, confirms the data printed matches the data sent* and sends a report to the printer. The printer response is determined by the ODV2D settings, explained in “Configuring the ODV2D”.

*If the barcode is sent as a bitmap, pdf, or other static image file, the data cannot be matched.

	Certification Model Numbers
T6000e series	PTXTHM104, T60004e, SI400,SI400R, L0064R, YQ004, YQ004R, T62R4e, T63R4e, T66R4e, T6204e, T6304e, T6604e
T8000 series	PTXTHH104, PTXTHH106

Capability Highlights

The ODV2D system is a camera-based system with red LEDs that flash at a given frequency to illuminate the surface of the label as it exits the printer. A sensor is used to record slices of the image as the output moves past the lens and then stitches them together for analysis. Thus, the entire image is recorded by the ODV2D for analysis which allows verification of 1-D barcodes in ladder and picket fence orientations and 2-D barcode grading.

The summary of capabilities are as follows:

- The ODV2D supports all orientations of barcodes (0°, 90°, 180°, 270° degrees).
- The ODV2D supports full ISO-based grading for PDF417, DataMatrix, and QR symbologies.
- Barcodes printed as graphics (Win Drivers, WYSIWIG label programs) do not require additional setup. The printer will dynamically inspect and identify all properly scaled graphic barcodes.
- The ODV2D firmware can be downloaded via the printer or via the ODV2D internal webpage.
- The ODV2D has an Ethernet port (hidden by cover plate) for access by trained service personnel to an onboard webpage that provides:

- Calibration and Alignment Wizards
- Trending Analysis
- The ability to capture and view images from the camera
- Advanced Diagnostics

- The calibration and alignment values can be checked via the Printer Control Panel (see page 32).
- White Gain and Reflectance values can be re-calibrated via the Printer Control Panel (see page 33).
- The overall grading accuracy can be checked using the Calibration Plaque (p/n P220237-001 for 4-inch model and p/n P220404-001 for the 6-inch model) provided with the unit via the Printer Control Panel.

Supported Barcodes

Table 1 lists the symbologies supported by the ODV2D.

Table 1 Symbologies Supported

1D Barcode	2D Barcode
Code 39	PDF417
Interleaved 2/5	PDF417 Limited
Code 93	Micro PDF417
Code 128	DataMatrix (Square)
UPC/EAN	DataMatrix (Rectangle)
UPC/EAN Supplemental	QR
Codabar	

Operational Parameters

The design parameters of the validator are as follows:

- The ODV2D can support labels of 24 inches maximum length.
- The ODV2D can track the performance of up to 50 barcodes on a label.
- The ODV2D can support 2-8 IPS setting for picket fence and 2-6 IPS for ladder.
- The ODV2D 4-inch requires a minimum narrow bar width of 10 mils (0.010 inch). This is equivalent to 2 dots at 203 DPI or 3 dots at 300 DPI.
- The ODV2D 6-inch 203 dpi requires a minimum narrow bar width of 15 mils (0.015 inch). This is equivalent to 3 dots at 203 DPI.
- The ODV2D 6-inch 300 dpi requires a minimum narrow bar width of 13.3 mils (0.0133 inch). This is equivalent to 3 dots at 300 DPI.
- The ODV2D can support bar codes with a minimum height dimension of 0.10 inch (linear 1-D codes).
- Depending on the complexity of the form and number of barcodes, the printer may pause between labels if required to complete the calculations on a given label.

Alignment and Calibration

If the ODV2D was shipped attached to the printer, the alignment and calibration can be checked before use following the Grading Submenu procedures starting on page 40 of this manual.

If the ODV2D was received unattached, the installation and initial alignment and calibration of the ODV2D must only be performed by trained service personnel. Contact your equipment provider or TSC Printronix Auto ID Service Representative for more information about the initial setup.

Purposes of Calibration

Calibration is needed for the following three purposes:

- To make sure the ODV2D unit is functioning properly. This requires the use of a Calibration Plaque that was supplied with your unit.
- To make sure the ODV2D unit is properly aligned with the printer. The ODV2D unit is connected via a bracket and fine tuning may be required if the unit is bumped or transported to another location.
- To make sure the ambient lighting conditions are considered when grading barcodes.

Enable the ODV2D

IMPORTANT **If you make any changes to the default configuration menu items, you will be prompted to save the configuration when you attempt to put the printer online. See the printer's *Administrator's Manual* for more information about saving configurations.**

Enabling and Disabling

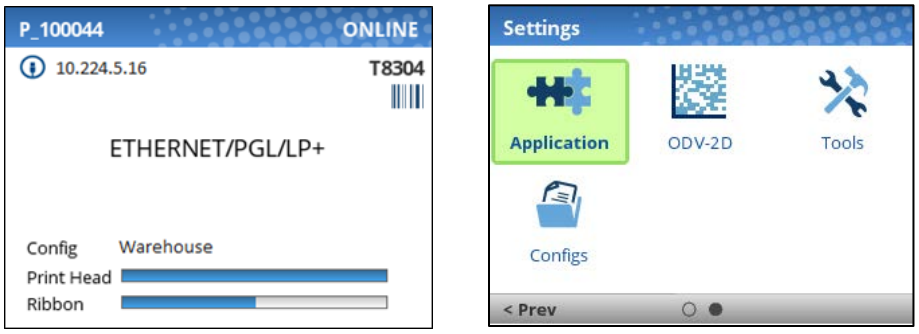
Software can automatically detect an installed validator when the printer is powered up. The state of the ODV2D can be observed from the ONLINE screen as shown in Figure 1 below. If the printer is powered up with *Configs* > *Control* > *Power-Up Config* set to "Factory", the ODV2D icon can be selected and *ODV2-2D* > *Control* > *Validator Active* can be set to "Enable".

If Power-Up Config. is not set to Factory, the ODV2D icon can be selected, but *ODV2D* > *Control* > *Validator Active* is set to "Disable". Set this menu to "Enable" and save the configuration as described in the printer's *Administrator's Manual*. In the same manner, the validator can be disabled.

IMPORTANT **Do not disable or enable the ODV2D with data in the buffer.**

- The ONLINE screen will show the "enabled" validator symbol  under the model number when the ODV2D is installed AND enabled via the menu *ODV2D* > *Control* > *Validator Active*.
- The ONLINE screen will show the "disabled" validator symbol  under the model number when the ODV2D is installed and disabled via the menu *ODV2D* > *Control* > *Validator Active*.
- If no ODV2D is installed, then no validator symbol will be present on the ONLINE screen.
- The Settings screen will use validator icons as follows:
    - If the ODV2D is not installed, the greyed-out ODV2D icon will be present.
    - If the ODV2D is installed, the colored ODV2D icon will be present.
- Within the menu section, the ODV2D will use *ODV2D* (e.g., *ODV2D* > *Control*).

Figure 1 Online Screen and ODV2D Icon



Once the ODV2D is installed, the *ODV2D* section under Settings can be selected and the ODV2D configured. However, it may not be enabled by default:

- If the printer is powered up with the menu *Configs* > *Control* > *Power-Up Config* set to Factory, the *ODV2D* > *Control* > *Validator Active* will be set to “Enable” automatically.
- If the printer is powered up with *Configs* > *Control* > *Power-Up Config* to something other than Factory, the *ODV2D* > *Control* > *Validator Active* is set to “Disable”.

To enable the ODV2D, change the menu *ODV2D* > *Control* > *Validator Active* to “Enable” and save the configuration as described in the printer’s *Administrator’s Manual*.

2 Operation

ODV2D Menu Overview

The ODV2D menu section is structured into five submenus as follows:

- The **Control** submenu is used to configure how the ODV2D will operate with respect to the results provided by the validator. Those menus are described below.
- The **Symbology** submenu is used to configure which orientations and symbologies will be graded and which will be ignored.
- The **Grading** submenu is used to configure grading criteria of the barcodes found by the validator. Those menus are described below.
- The **Calibrate** submenu is used to confirm proper alignment and to re-calibrate the white gain and reflectance values. Those menus are described below.
- The **Diagnostics** submenu is used to run test procedures to help determine the accuracy and troubleshoot the validator. Those menus are described below.
- The **Statistics** submenu is general read-only and used to gather and report statistics on how the validator is reporting on print jobs sent to the printer. Those items are described below.

The ODV2D menu structure and its defaults are summarized in

Figure 2 and Figure 3**.**

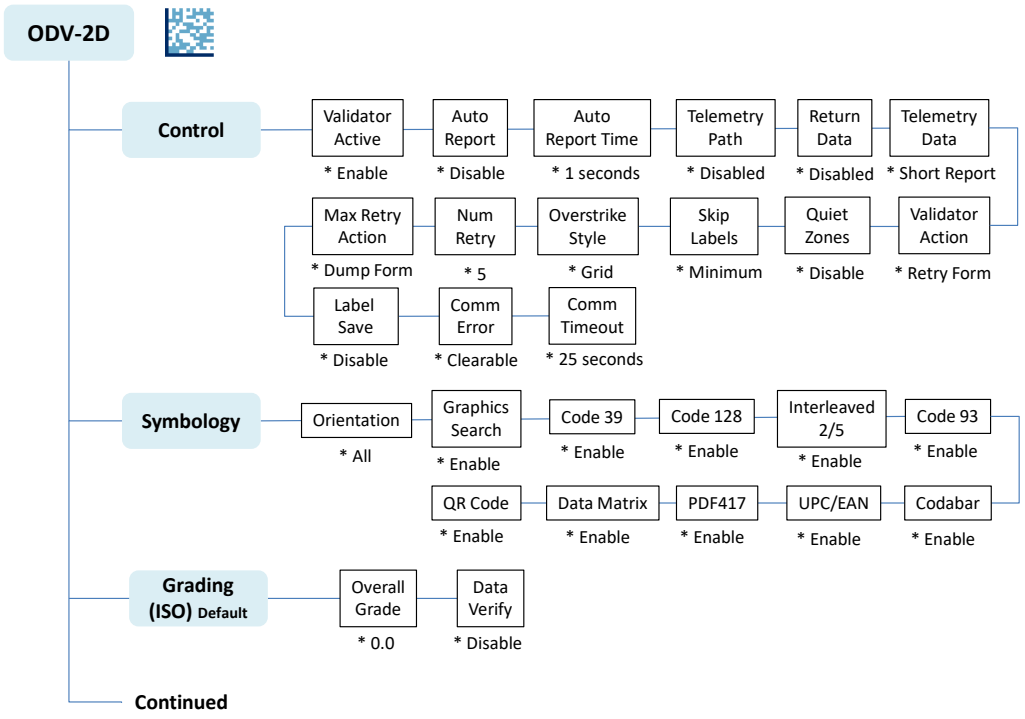


Figure 2 ODV2D Section and Submenus

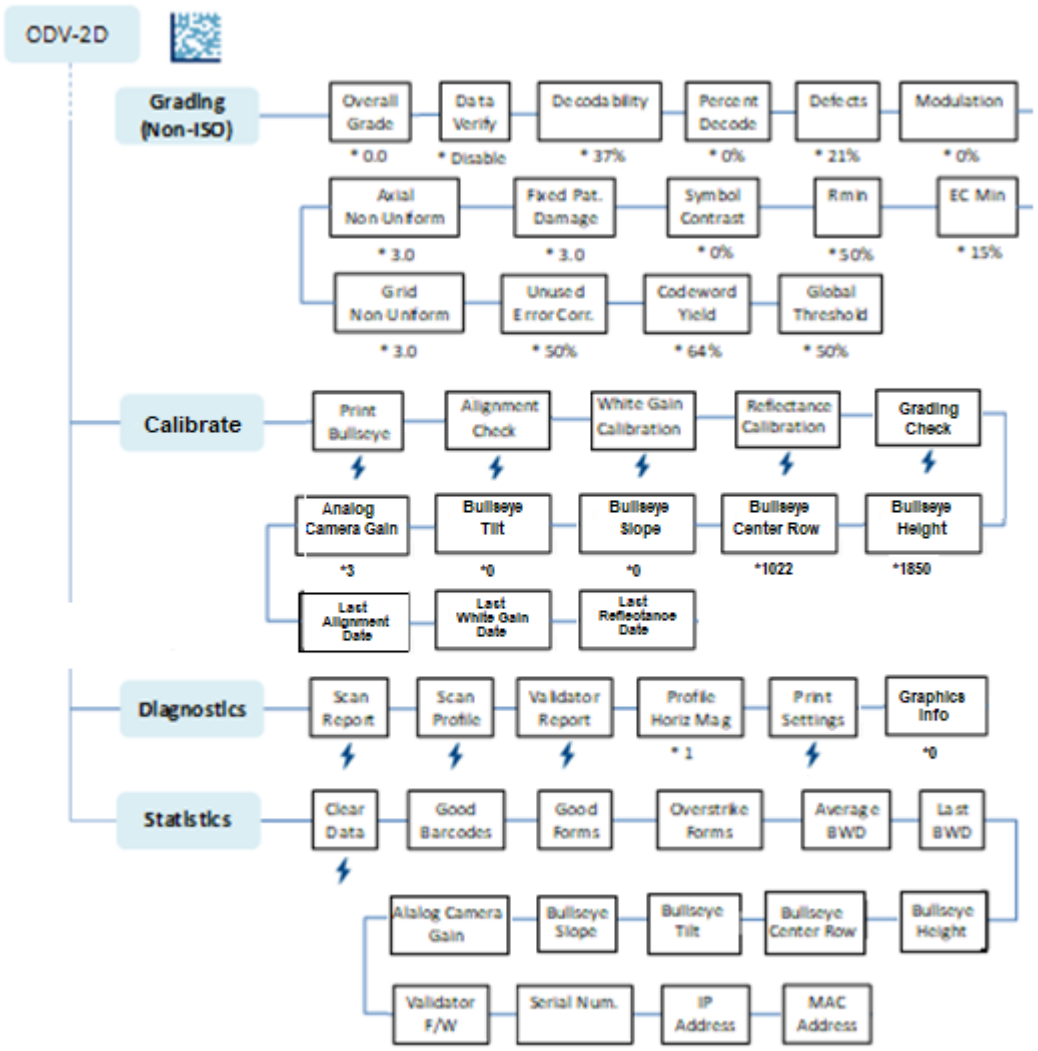


Figure 3 Validator Section and Submenus, Continued

Configuring the ODV2D

Configuring the validator is done by selecting the ODV2D icon within the printer's menu Settings section. The ODV2D comes equipped with a default setting for each configuration option, and it works without having to change any of these options. However, in some cases it is necessary to adjust these options, which are described below.

IMPORTANT **If you are unable to select the ODV2D icon or the icon is grey , then the validator is not properly installed. Please contact the Printronix Customer Support Center.**

IMPORTANT **If you make any changes to the default configuration menu items, you will be prompted to save the configuration. See "Auto Save Configuration" in the printer's *Administrator's Manual*.**

Validator Reporting

After any completed print job or Bar Code Demo page, you can request a report from the printer which describes the validation statistics since the printer was turned on, or since the last data reset.

Requesting a Validator Report

This procedure prints a summarized validator report

1. Press the PAUSE key to take the printer OFFLINE.
2. If necessary, press the UP+DOWN ARROW keys at the same time to unlock the front panel.
3. Enter the menu *Tools* > *Print Tests* > *Run Tests*.
4. Find the printer test named “Valid. Report” and press the ENTER key.
5. Lock the panel again using the UP+DOWN ARROW keys.
6. Press PAUSE again to put the printer ONLINE.

Defining the Output Destination (Telemetry Path)

You may want to send a streaming flow of validation data to the PNE Auto ID Data Manager application during the print job. By default, this function is disabled.

To enable this function, set the menu *ODV2D* > *Control* > *Telemetry Path* to “Network Port”. The printer then outputs the bar code analysis and underlying data from the validator to the PNE connected to the network port so the validator data can be seen and analyzed with the optional remote management software.

Sending Validation Data (Return Data)

You may want to send a streaming flow of validation data to an external device during the print job. By default, this function is disabled.

To enable this function, set the menu *ODV2D* > *Control* > *Return Data* to “Data+Grade” or “Data+Grade+Fail”. The printer then outputs the bar code analysis and underlying data from the validator to a device connected to the port defined in the *System* > *Printer Mgmt* > *Ret. Status Port* menu so the ODV2D data can be seen and analyzed.

Resetting ODV2D Data

The ODV2D reports on all bar codes it detects since the last data reset. For example, you print a large batch of labels with bar codes and then print a validator report. Then you print another batch of labels with bar codes and print another report. The report will contain information on both batch jobs. However, if you reset the ODV2D data between batch jobs, the second report will only contain information on the second batch job.

To reset Validator Data, execute the menu *ODV2D* > *Statistics* > *Clear Data*.

Control Submenu

Several ODV2D options which define specific parameters for certain print jobs can be set from the printer configuration menu.

Validator Active

ODV2D > Control > Validator Active	
Software can automatically detect an installed validator when the printer is powered up. If the printer is powered up with *Configs* > *Control* > *Power-Up Config* set to "Factory", the Validator icon can be selected and this option is set to "Enable". If *Power-Up Config* is not set to Factory, the Validator icon can be selected, but this option is set to "Disable".	
Disable	The ODV2D is disabled and not active.
Enable	The ODV2D is enabled and active.
Factory Default	Depends on *Configs* > *Control* > *Power-Up Config* setting. See above.
IMPORTANT	**Do not disable or enable the ODV2D with data in the buffer. See "Resetting ODV2D Data".**
IMPORTANT	**When exiting Power Saver Mode, about 120 seconds is required to re-initialize ODV2D. A message will be displayed alerting the user of the delay.**

Auto Report

ODV2D > Control > Auto Report	
This function allows you to disable or enable an automatic validator report printout after a batch job or Bar Code Demo page.	
Disable	No automatic validator report is printed after the job.
Enable	The validator report is printed after the batch job. The end of the batch is determined by either the EXECUTE command or by timeout using *ODV2D* > *Control* > *Auto Report Time* to the desired value (1 to 10 seconds).
Print&Clear	Same functionality as *Enable* with the validator statistics are cleared after the report is printed. After the report is printed, the front panel message will display informing the user the statistics are reset.
Scan Report	A diagnostic printout of bar code analysis parameters calculated by the ODV2D is printed. It allows you to determine which parameter may be the cause of bar code verification failures. The report printed is based on the last Full Report received from the ODV2D. Allows sending a bar code print job to the printer, having bar code evaluated by the ODV2D, and view a report of the parameters as seen by the ODV2D. For forms with multiple bar codes, only information from the last processed bar code will be included in the report. To view validator parameters for all bar codes on a form, use Auto ID Data Manager in PrintNet Enterprise.
Factory Default	Disable

Auto Report Time

ODV2D > Control > Auto Report Time	
This function allows you to set the timeout for the Auto Report in seconds. If the printer is idle for the set number of seconds, an Auto Report will be generated if Auto Report is set to Enable.	
Minimum	1 seconds
Maximum	10 seconds
Factory Default	1 seconds

Telemetry Path

ODV2D > Control > Telemetry Path	
You may want to send a streaming flow of validation data to the PNE Auto ID Data Manager application during the print job. By default, this function is disabled. To enable this function, set this menu Path to “Network Port”. The printer then outputs the bar code analysis and underlying data from the validator to the PNE connected to the network port so the validator data can be seen and analyzed with the optional remote management software.	
Disabled	The ODV2D does not send any data to an external device.
Network Port	The printer outputs the bar code analysis and underlying data from the ODV2D to a device connected to the network port so the validator data can be seen and analyzed with the optional remote management software.
Factory Default	Disabled

Return Data

ODV2D > Control > Return Data	
This option enables the ODV2D to send data out the status port as defined by *System > Printer Mgmt > Ret. Status Port. If System > Printer Mgmt > Ret. Status Port uses E-NET Stat Port, use System > Printer Mgmt >Status Port Number to set port.* This feature is designed to work best with *ODV2D > Control > Validator Action* set to *Retry Form*.	
Disable	No data will be returned through the status port.
Data+Grade	The following data will be sent out the status port for every barcode found: *Grade, Barcode Data <Carriage Return><Line Feed>*
Data+Grade+Fail	In addition to barcode grades and data, a failure indication will be sent out the return status port if the validator fails a label Max Retry times: *FAIL<Carriage Return><Line Feed>*
Factory Default	Disable
IMPORTANT	When the menu is set to something other than *Disable*, the printer will automatically change *ODV2D > Control > Telemetry Data* to *Full Report* since it is required for the feature. If, however, the user subsequently changes *Telemetry Data* to something different, barcode grades data will no longer be returned.

Telemetry Data

The validator sends a report to the selected data output destination. There are three different options controlled by the *ODV2D* > *Control* > *Telemetry Data* menu:

ODV2D > Control > Telemetry Data	
The validator sends a report to the selected data output destination. There are three different options based on this menu.	
Short Report	Default setting. Provides the encoded failure cause or pass indication and the bar width deviation, shown as a percentage.
Full Report	Provides a completed report of all the data captured by the validator.
Validation Mode	Provides the same data as the Short Report, but adds the actual bar code data read.
Factory Default	Short Report

Validator Action (Error Action)

The printer response is the same whether the error stems from a bad or missing bar code. This section will provide details on each particular selection and how it affects printer operation.

Forms Printed After an Error Detection

Because of physical differences between the location of the printhead and the beam, one or more forms may print after a bad form (a form with a bar code error that the validator detected).

The number of forms printed after a bad form depends on the *Media* > *Image* > *Label Length*, *Media* > *Speed* > *Print Speed*, and *Media* > *Speed* > *Slew Speed* settings. Shorter forms and faster speeds tend to increase the number of forms printed before the ODV2D has a chance to detect an error. Also, the ODV2D may not detect an error on forms that have bar codes near the bottom of the form until the next form has already started printing.

Forms that print after a bad form are treated differently, depending upon the error action mode selected (see Table 6). Modes that require a reprint operation may need to reprint more than just the bad form.

ODV2D > Control > Validator Action	
The printer response is the same whether the error stems from a bad or missing bar code. It is determined by the Validator Action setting.	
Stop	If the validator detects a bar code failure, the print job stops.
Overstrike	Use Overstrike mode when you want bad labels to be marked and not reprinted. When running short labels, labels following the bad label may be overstruck too, but will be reprinted. Overstrike mode will work with any Gap/Mark sensor setting.
Overstrike One	Use Overstrike One mode when you want only bad labels to be marked and not reprinted. Overstrike One mode cannot be used when the Sensor is set to Disable.
Retry Form	This mode is similar to the Overstrike and Overstrike One modes. However, instead of resuming printing where the printer had left off, the printer will reprint the bad label too.
Stop & Retry	The printer will stop printing and display the error message. After the error message is cleared and the appropriate labels are skipped from *ODV2D > Control > Skip Labels*, it will reprint the bad form and any other forms printed prior to the physical stop.
Grade&Report	The entire print job will print uninterrupted. If one or more errors is detected, the printer status indicator lamp flashes, the alarm sounds, and the error message “Bar code fails / Job has errors” displays.
Rescan Form	Similar to the Retry Form mode, however, instead of backing up and overstriking the form, the printer will back up and rescan the bad form and any other forms that have already printed.
Rescan&Retry	Similar to Rescan Form with one exception: after the printer has rescanned the form and overstruck it if there was still a fault, it will reprint and rescan the same form again.
Rescan&Stop	Similar to the Retry Form mode, however, instead of backing up and overstriking the form, the printer will back up and rescan the bad form and any other forms that have already printed.
Factory Default	Retry Form

Table 2 Actions Done to Forms after a Bad Form

Stop

If the ODV2D detects a bar code failure, the print job stops, the printer status indicator lamp flashes, the alarm sounds, and the appropriate error message displays.

The printer remains in a fault condition until you press the PAUSE key. This clears the error message and takes the printer OFFLINE. You must correct any condition that may have caused the fault. When ready,

the printer can be put back ONLINE and it will resume printing with the form immediately following the bad form and any other forms printed prior to the physical stop (see “Forms Printed After an Error Detection”).

Overstrike

Use Overstrike mode when you want bad labels to be marked, but not reprinted (i.e., when using pre-numbered labels).

If the system detects a bar code failure, the print job stops, the printer status indicator lamp flashes, the alarm sounds, and the appropriate error message displays.

Without pausing, the printer then automatically reverses to the top of the bad form.

It then prints an obliterating pattern over the bad form and any other forms printed prior to the physical stop (see “Forms Printed After an Error Detection”). By default, the obliterating pattern is a grid of fine lines which clearly marks the label as bad but allows you to read what was originally printed.

NOTE: If short forms are being run, more than one form may be backed up and overstruck. If more than one form is overstruck, only the first overstruck form is lost (the one with the missing or bad bar code), and a separate print command is required to resend it from the host, if needed. The rest of the overstruck forms are automatically reprinted.

The *ODV2D > Control > Overstrike Style* options are: Grid, Grey, Checkerboard, or Error Type Msg. Select “Error Type Message” to see the error message printed on the bad form as the Overstrike Style.

After the overstrike printing, the printer clears the error message and stops the alarm, then resumes normal printing at the point the job was stopped.

Overstrike One

Similar to Overstrike, use Overstrike One mode when you want a bad label to be marked but not reprinted.

If the system detects a bar code failure, the print job stops, the printer status indicator lamp flashes, the alarm sounds, and the appropriate error message displays. The printer then automatically reverses to the top of the bad form. It then prints an obliterating pattern over the bad form ONLY. All other forms printed prior to the physical stop will NOT be overstruck and are still good.

By default, the obliterating pattern is a grid of fine lines which clearly marks the label as bad but allows you to read what was originally printed.

The *ODV2D > Control > Overstrike Style* options are: Grid, Grey, Checkerboard, or Error Type Msg. Select “Error Type Message” to see the error message printed on the bad form as the Overstrike Style.

After the overstrike printing, the printer clears the error message and stops the alarm, then resumes printing at the point the job was stopped.

Retry Form

This mode is like the Overstrike mode. However, instead of resuming printing where the printer had left off, the printer will attempt to reprint the bad form. The number of times the printer will attempt to print the form is determined by the *ODV2D > Control > Num Retry* setting

The printer will stop, indicate an error, and overstrike. Then it will skip several blank labels, depending on the setting for *ODV2D > Control > Skip Labels*. It will then slew to the next top of a blank form and reprint the bad form and any other overstruck forms (see “Forms Printed After an Error Detection”).

Once the *ODV2D > Control > Num Retry* counter has been exhausted, the print job stops completely. After you clear the error message, the printer will print the same label or the next label, depending on the setting for *ODV2D > Control > Max Retry Action*.

Stop & Retry

This mode is like the Stop mode: the printer will stop printing and display the error message. After you clear the error message, it will then skip several blank labels, depending on the setting for *ODV2D >*

Control > *Skip Labels*. Then it will slew to the next top of a blank form and reprint the bad form and any other forms printed prior to the physical stop (see “Forms Printed After an Error Detection”).

NOTE: The number of times the printer will attempt to reprint the bad form is determined by the *ODV2D* > *Control* > *Num Retry* setting.

The printer will stop after the specified *ODV2D* > *Control* > *Num Retry* attempts. After you clear the error message, the printer will print the same label or the next label, depending on the setting for *ODV2D* > *Control* > *Max Retry Action*.

Grade&Report

In this mode, the entire print job will print uninterrupted. If one or more errors is detected, the printer status indicator lamp flashes, the alarm sounds, and the error message “Bar code fails / Job has errors” displays.

IMPORTANT **The error message lets you know that at least one bad form printed. To determine which form(s) are bad, you must manually scan all of them.**

The printer remains in a fault condition until you press the PAUSE key. This clears the error message and takes the printer OFFLINE. Correct any condition that may have caused the fault, then press PAUSE to place the printer back ONLINE.

Rescan Form

This mode is like the Retry Form mode, however, instead of backing up and overstriking the form, the printer will back up and rescan the bad form and any other forms that have already printed (see “Forms Printed After an Error Detection”).

NOTE: The printer will only attempt this once before declaring an error.

If the printer scans these forms correctly on any of the rescans, it will continue printing with the next form.

If the printer fails to scan these forms correctly, it will overstrike the forms, stop, and indicate an error like Stop mode. After you clear the error message, the printer will skip several blank labels, depending on the setting for *ODV2D* > *Control* > *Skip Labels*.

It will then slew to the next top of a blank form and reprint the same form or go the next form, depending on the setting for *ODV2D* > *Control* > *Max Retry Action*.

NOTE: The only difference between Rescan Form and Rescan&Stop is that when a form still fails after all the rescans, Rescan Form will overstrike the bad form, whereas Rescan&Stop will not.

Rescan&Retry

This mode is similar to Rescan Form with one exception: after the printer has rescanned the form and overstruck it if there was still a fault, it will reprint and rescan the same form again.

NOTE: The printer will only attempt this once before declaring an error.

The number of times the printer will attempt to *reprint* the bad form is determined by the *ODV2D* > *Control* > *Num Retry* setting.

If the printer scans these forms correctly on any of the rescans or reprints, it will continue printing with the next form.

If the printer fails to scan these forms correctly on all the rescans and reprints, it will overstrike the forms, stop, and indicate an error like Stop mode. After you clear the error message, the printer will skip several blank labels, depending on the setting for *ODV2D* > *Control* > *Skip Labels*.

It will then slew to the next top of a blank form and reprint the same form or go the next form, depending on the setting for *ODV2D* > *Control* > *Max Retry Action*.

Rescan&Stop

This mode is like the Retry Form mode, however, instead of backing up and overstriking the form, the printer will back up and rescan the bad form and any other forms that have already printed (see “Forms Printed After an Error Detection”).

NOTE: The printer will only attempt this once before declaring an error.

If the printer scans these forms correctly on any of the rescans, it will continue printing with the next form.

If the printer fails to scan these forms correctly on all the rescans, it will stop and indicate an error like Stop mode. After you clear the error message, the printer will skip several blank labels, depending on the setting for *ODV2D > Control > Skip Labels*.

It will then slew to the next top of a blank form and reprint the same form or go to the next form, depending on the setting for *ODV2D > Control > Max Retry Action*.

NOTE: The only difference between Rescan Form and Rescan&Stop is that when a form still fails after all the rescans, Rescan Form will overstrike the bad form, whereas Rescan&Stop will not.

Quiet Zones

ODV2D > Control > Quiet Zones	
Quiet zones are the white spaces surrounding the bar code. Each bar code requires a minimum quiet zone distance in order for the bar code to be scanned properly. The validator requires a minimum distance of 1/2” or 20 times the minimum element width (x-dimension), whichever is greater, between bar codes.	
Disable	The quiet zone is not included in pass/fail criteria.
Enable	The bar code quiet zone is included as part of the pass/fail criteria.
Factory Default	Disable
IMPORTANT	**The validator does not recognize x-dimensions greater than 40 mil with Quiet Zones enabled.**

Skip Labels

ODV2D > Control > Skip Labels	
This option is used for skipping blank labels after bad labels have been marked. It is useful when you want to have extra blank labels in between bad and good ones.	
Minimum	Up to one blank label skipped.
Maximum	Up to two blank labels skipped.
Factory Default	Minimum
IMPORTANT	**Minimum and Maximum blank labels are only applicable for forms 2 inches (5.08 cm) high or more. For labels less than 2 inches high, the minimum and maximum blank labels may vary.**

Overstrike Style

ODV2D > Control > Overstrike Style	
This option is used for marking bad labels with different overstrike styles: Grid (the default), Grey, Checkerboard, or Error Type Msg.	
Grid	Grid Pattern
Grey	Grey Pattern
Checkerboard	Checkerboard Pattern
Error Type Msg	Error Msg with type of failure will overwrite label
Factory Default	Grid

Num Retry

ODV2D > Control > Num Retry	
This option allows you to set the number of times a form will be printed before the printer stops. After you clear the error message, the printer will print the same form or the next form, depending on the setting for Max Retry Action (see “Max Retry Action” below).	
Minimum	3
Maximum	5
Factory Default	5
IMPORTANT	**This setting is utilized only when Validator Action is set to Retry Form, Stop & Retry, or Rescan&Retry. See “Validator Action (Error Action)”.**

Max Retry Action

ODV2D > Control > Max Retry Action	
This option determines what the printer will do with the current form once the Num Retry counter has been exhausted (see “Num Retry” above). In the case of any Rescan modes, only one rescan form will be attempted.	
Dump Form	After you clear the fault the form will be dumped and printing will resume with the next form.
Keep Form	After you clear the fault printing will resume with the same form again. It will not attempt to print the next form until the problem form has printed correctly.
Factory Default	Dump Form
IMPORTANT	**This setting is utilized only when Validator Action is set to Retry Form, Stop & Retry, Rescan Form, Rescan&Retry, or Rescan&Stop. “Validator Action (Error Action)”.**

Label Save

ODV2D > Control > Label Save	
The printer will often be printing a label when it determines that the label printed before the immediate label was defective.	
Disable	When set to disable, the printer pulls both labels back, overstrikes them and then reprints them.
Enable	With Label Save enabled, the ODV will accept or reject the label it just printed before it prints the next label. When a label is found defective, it will only overstrike that label.
Factory Default	Disable
IMPORTANT	**Label Save enabled causes a slight throughput reduction.**

Comm Error

ODV2D > Control > Comm Error	
This menu allows the 'Validator not communicating' error to be clearable by the user or not clearable by the user.	
Not Clearable	The user must resolve the error and recycle the printer power to print.
Clearable	The user will be able to clear the fault and print jobs. Barcodes in these jobs will not be validated.
Factory Default	Clearable

Comm Timeout

ODV2D > Control > Skip Labels	
This option is used to control the threshold of time the validator does not respond with verification status before declaring an error.	
Minimum	10 seconds
Maximum	180 seconds
Factory Default	25 seconds
IMPORTANT	**For labels with complex and significant data encoded in 2D barcodes, this menu may need to be increased.**

Symbology Submenu

Several ODV2D options which define which barcodes will be graded and which will be ignored. This can be chosen based on symbology or orientation. Note there are also PTX-SETUP commands that can be used to configure these options as described in Section "PTX_SETUP Control".

Orientation

ODV2D > Symbology > Orientation	
This menu selects the barcode orientations that will be processed and graded and which will be ignored.	
All	All orientations will be graded.
Picket	Picket barcodes and 2-D barcodes in 0 and 180 degree rotations.
Ladder	Ladder barcodes and 2-D barcodes in 90 and 270 degree rotations.
Factory Default	All

Graphics Search

ODV2D > Symbology > Graphics Search	
This menu determines if parts of the label defined with graphics (as opposed to emulation commands) should be searched for barcodes. Graphics are often used in jobs sent via Windows Drivers or from a Postscript or PDF emulation. Searching graphics takes more processing time and this menu should be disabled for jobs with heavy graphics usage in which barcodes don't exist.	
Enable	Search graphics for barcodes.
Disable	Ignore graphics in terms of barcodes.
Factory Default	Enable

Code 39

ODV2D > Symbology > Code 39	
Determines if Code 39 barcodes should be processed or ignored.	
Enable	Search for Code 39 barcodes.
Disable	Ignore Code 39 barcodes.
Factory Default	Enable

Code 128

ODV2D > Symbology > Code 128	
Determines if Code 128 barcodes should be processed or ignored.	
Enable	Search for Code 128 barcodes.
Disable	Ignore Code 128 barcodes.
Factory Default	Enable

Interleaved 2/5

ODV2D > Symbology > Interleaved 2/5	
Determines if Interleaved 2/5 barcodes should be processed or ignored.	
Enable	Search for Interleaved 2/5 barcodes.
Disable	Ignore Interleaved 2/5 barcodes.
Factory Default	Enable

Code 93

ODV2D > Symbology > Code 93	
Determines if Code 93 barcodes should be processed or ignored.	
Enable	Search for Code 93 barcodes.
Disable	Ignore Code 93 barcodes.
Factory Default	Enable

Codabar

ODV2D > Symbology > Codabar	
Determines if Codabar barcodes should be processed or ignored.	
Enable	Search for Codabar barcodes.
Disable	Ignore Codabar barcodes.
Factory Default	Enable

UPC/EAN

ODV2D > Symbology > UPC/EAN	
Determines if UPC/EAN barcodes should be processed or ignored.	
Enable	Search for UPC/EAN barcodes.
Disable	Ignore UPC/EAN barcodes.
Factory Default	Enable

PDF417

ODV2D > Symbology > PDF417	
Determines if PDF417 barcodes should be processed or ignored.	
Enable	Search for PDF417 barcodes.
Disable	Ignore PDF417 barcodes.
Factory Default	Enable

Data Matrix

ODV2D > Symbology > Data Matrix	
Determines if Data Matrix barcodes should be processed or ignored.	
Enable	Search for Data Matrix barcodes.
Disable	Ignore Data Matrix barcodes.
Factory Default	Enable

QR Code

ODV2D > Symbology > Code QR	
Determines if QR Code barcodes should be processed or ignored.	
Enable	Search for QR Code barcodes.
Disable	Ignore QR Code barcodes.
Factory Default	Enable

Grading Submenu

As described in Section **"ISO versus Non-ISO"**, the menu **Grading Mode** will determine how this section will be used and configured.

Grading Mode

ODV2D > Grading > Grading Mode	
This menu selects the type of barcode grading performed. The mode selected will dictate the types of barcode grading faults that will be reported during validation.	
ISO	The Overall Grade per ISO standards will determine if the barcodes pass or not. All quality parameter menus will be hidden and only **Overall Grade** will be selectable.
Non-ISO	This mode allows the user to set custom failure thresholds on individual barcode quality parameters. Changing individual quality parameters may lead to non-ISO standard grading. All quality parameter menus are visible and user adjustable in this mode.
Factory Default	ISO
WARNING	**It is recommended that only users that understand both the ISO standards and the end user barcode quality requirements change any parameters when in the non-ISO mode.**

Overall Grade

ODV2D > Grading > Overall Grade	
This menu item sets the value used by the validator for pass/fail threshold during the analysis of bar codes. Instead of a letter grade, numbers are used to allow for more resolution. Higher values create a stricter pass criterion. The numbers can be translated to letter grades per below: Letter Grade A = 3.5 to 4.0 range Letter Grade B = 2.5 to 3.4 range Letter Grade C = 1.5 to 2.4 range Letter Grade D = 0.5 to 1.4 range Letter Grade F = 0.0 to 0.4 range The Overall Grade is determined by taking the lowest grade obtained for any of the applicable bar code quality parameters. See Section “Parameter Applicability” for more details.	
Minimum	0.0
Maximum	4.0
Factory Default	0.0
IMPORTANT	**Any bar code with a grade below this threshold value will cause the printer to display the Overall Grade Fail error message (see “Troubleshooting Error** Messages**”) and take the appropriate error action.**

Data Verify

ODV2D > Grading > Data Verify	
This menu chooses whether to compare the data that comes from the validator is the same as the data that was used to create the barcode from the emulations.	
Disable	The data used by the emulations to create the barcode is not compared to the data returned from the verifier.
Enable	The data used by the emulations to create the barcode is compared to the data returned from the verifier. If there is a mismatch, then the fault *Data Mismatch* will be declared if the successive retries do not solve the problem.
Factory Default	Disable
IMPORTANT	**The data is only compared when the emulation is providing the data. Barcodes that are encoded via graphics cannot compare data.**

Decodability

ODV2D > Grading > Decodability	
Decodability is a measurement of the variance in the width of the bars and spaces which compose the bar code. It always factors into the Overall Grade. This menu allows the user to specify a stricter requirement for Decodability beyond the ISO compliant overall grade. The ODV2D will fail any barcode with a Decodability at or below the value set in this menu, regardless of overall grade.	
BARCODES	All 1D, PDF417
Minimum	30%
Maximum	90%
Factory Default	37%
IMPORTANT	**Factors into the Overall Grade (page 31).**

Percent Decode

ODV2D > Grading > Percent Decode	
You can set how strict the validator grades each bar code. For example, setting Percent Decode to 60% means that 60% of the scanned bar code must be readable for the ODV2D to give the bar code a passing grade. The higher the percentage value chosen, the stricter the validator grades.	
BARCODES	All 1D
Minimum	0%
Maximum	99%
Factory Default	0%
IMPORTANT	**Factors into the Overall Grade (page 31).**

Defects

ODV2D > Grading > Defects	
You can set how strict the validator grades the irregularities such as voids and spots found within elements and quiet zones for each bar code. For example, the Defects default is 21%. This means that if the bar code and quiet zone defects exceed 21%, the ODV2D gives the bar code a failing grade. The lower the percentage value chosen, the stricter the ODV2D grades.	
BARCODES	All 1D, PDF417
Minimum	0%
Maximum	100%
Factory Default	21%
IMPORTANT	**Factors into the Overall Grade (page 31).**

Modulation

ODV2D > Grading > Modulation	
Modulation measures how well the ODV2D sees the wide elements (bars or spaces) relative to the narrow elements. This menu item sets the value used by the ODV2D for pass/fail threshold during the analysis of bar codes. Higher values create a stricter criterion for passing.	
BARCODES	All
Minimum	0%
Maximum	100%
Factory Default	0%
IMPORTANT	**Factors into the Overall Grade (page 31).**

EC Min

ODV2D > Grading > EC Min	
This menu item sets the minimum edge contrast, which is the worst edge transition (bar to space or space to bar) used by the ODV2D for pass/fail threshold during the analysis of bar codes. Bar codes with an edge contrast below this threshold will fail. The higher the value, the stricter the criterion.	
BARCODES	All 1D, PDF417
Minimum	0%
Maximum	100%
Factory Default	15%
IMPORTANT	**Factors into the Overall Grade (page 31).**

RMin

ODV2D > Grading > RMin	
This menu item sets the minimum reflectance value used by the ODV2D for pass/fail threshold used during the analysis of bar codes. A bar code will fail if all the bar reflectance values are above the percentage of space reflectance set by this threshold. For example, an Rmin setting of 50% requires that at least one bar reflectance value fall under the midpoint of the reflectance value read for the highest space reflectance.	
BARCODES	All 1D, PDF417
Minimum	0%
Maximum	100%
Factory Default	50%
IMPORTANT	**Factors into the Overall Grade (page 31).**

Symbol Contrast

ODV2D > Grading > Symbol Contrast	
Symbol Contrast represents the contrast between the bars and spaces in the bar code used by the validator for pass/fail threshold used during the analysis of bar codes. The bar code must have a certain level of contrast to be recognized by the ODV2D. Bar codes with a symbol contrast below the threshold will fail. The higher the value, the stricter the criterion for passing.	
BARCODES	All
Minimum	0%
Maximum	100%
Factory Default	0%
IMPORTANT	**Factors into the Overall Grade (page 31).**

Fixed Pattern Damage

ODV2D > Grading > Fixed Pat. Damage	
Fixed Pattern Damage is a measurement of damage to the finder pattern where modulation scores for the fixed pattern portions of 2D matrix barcodes are degraded. This failure may be caused by physical damage to the code such as a mark or scuff or may be due to printing errors such as a bad print head. The ODV2D will fail any barcode with a fixed pattern damage at or below the value set in this menu, regardless of overall grade.	
BARCODES	DataMatrix, QR
Minimum	0.0
Maximum	4.0
Factory Default	3.0
IMPORTANT	**Factors into the Overall Grade (page 31).**

Axial Non-Uniformity

ODV2D > Grading > Axial Non-Uniform	
Axial Non-Uniformity is a measurement of the uneven scaling of symbol obtained by measuring the module centers in both the X and Y axis. Low axial non-uniformity grades may be caused by software errors in code generation or print speed variation during printing. The ODV2D will fail any barcode with an axial non-uniformity at or below the value set in this menu, regardless of overall grade.	
BARCODES	DataMatrix, QR
Minimum	0.0
Maximum	4.0
Factory Default	3.0
IMPORTANT	**Factors into the Overall Grade (page 31).**

Grid Non-Uniformity

ODV2D > Grading > Grid Non-Uniform	
Grid Non-Uniformity is a measurement of deviation of the scanned grid from the ideal grid (deviation of measured grid intersection positions of a 2D matrix barcode from ideal theoretical positions). Low grid non-uniformity grades may be caused by media slippage during printing. The ODV2D will fail any barcode with grid non-uniformity at or below the value set in this menu, regardless of overall grade.	
BARCODES	DataMatrix, QR
Minimum	0.0
Maximum	4.0
Factory Default	3.0
IMPORTANT	**Factors into the Overall Grade (page 31).**

Unused Error Correction

ODV2D > Grading > Unused Error Corr.	
Unused Error Correction is a measurement of the amount of margin available to recover damage using error correction. Low unused error correction is usually due to regional or spot damage in the code. The ODV2D will fail any barcode with an unused error correction at or below the value set in this menu, regardless of overall grade.	
BARCODES	PDF417, DataMatrix, QR
Minimum	0%
Maximum	100%
Factory Default	50%
IMPORTANT	**Factors into the Overall Grade (page 31).**

Codeword Yield

ODV2D > Grading > Codeword Yield	
Codeword yield is a measurement of the number of validly decoded code words expressed as a percentage of the maximum number of code words that could have been decoded. The amount of margin available to recover damage using error correction. Low codeword yield may indicate a y-axis failure in the barcode such as thermal drag. The ODV2D will fail any barcode with a codeword yield at or below the value set in this menu, regardless of overall grade.	
BARCODES	PDF417
Minimum	0%
Maximum	100%
Factory Default	64%
IMPORTANT	**Factors into the Overall Grade (page 31).**

Global Threshold

ODV2D > Grading > Global Threshold	
This menu sets the threshold used by ODV2D to interpret a scan reflectance profile into bars and spaces. Reflectance profile values above the Global Threshold are spaces and values below the threshold are bars. The Global Threshold will set the bar/space transition point between the highest (Rmax) and lowest (Rmin) reflectance of a scan profile. The bar/space transition point formula is: Rmin + (Rmax – Rmin) * (Global Threshold) / 100.	
BARCODES	All
Minimum	0%
Maximum	100%
Factory Default	50%
IMPORTANT	**Factors into the Overall Grade (page 31).**

Calibrate Submenu

The steps defined in this submenu allow the end user to check that the ODV2D remains in calibration and to set the white gain and reflectance values based on known values on the Printronix Auto ID GS1 Calibration plaque. A test of 1D barcode grading accuracy can be run using the same plaque.

Print Bullseye

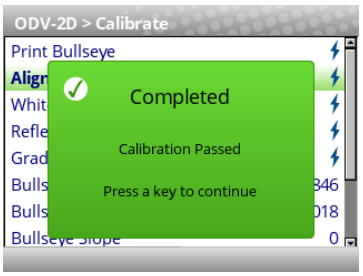
ODV2D > Calibrate > Print Bullseye
The Bullseye pattern is used for the calibration process to align the ODV2D unit properly with respect to center-line, tilt and slope. Before printing the Bullseye pattern, make sure that full width media is installed, and that the image quality is properly adjusted. This executable menu will print the Bullseye pattern 0.20” from the lead edge of the label.

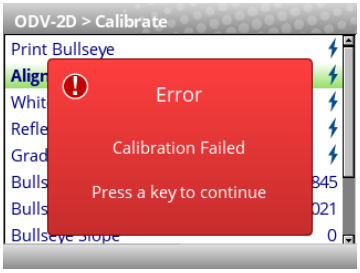
Alignment Check

ODV2D > Calibrate > Alignment Check
This is used to test that the unit is still properly aligned using the Bullseye test pattern. When selected, a label will advance, and the Bullseye pattern will be printed. Let the extra label hang. A poor Bullseye image will cause the alignment check to fail. If the first check does fail, check the print quality, make corrections as needed, then re-run the test (refer to printer’s Administrators Manual for details on adjusting image print quality).

After the check is made, either the Calibration Complete screen or the Error screen will be displayed:

Refer to the Troubleshooting section of this manual for the complete table of error messages and possible solutions.





If the Completed screen appears, press any key to return to normal operation. If the Error screen appears, make sure that the Bullseye pattern is dark black, without any white voids in the lines. If the Bullseye print quality is poor, correct the issue and re-run the test.

If the test fails a second time, the ODV2D alignment is beyond allowable limits and should be re-aligned and re-calibrated. In most cases, the equipment will continue to run in this condition. However, barcode grades may be one grade lower (i.e. B= C) than actual. The system will never pass a failing barcode. Please contact your TSC Printronix Auto ID Service Representative or authorized service provider to perform the re-calibration and alignment process.

White Gain Calibration

ODV2D > Calibrate > White Gain Calibration
This is used to reset the White Gain values using the Calibration Plaque that was provided with the ODV2D. Place the “white” side of the plaque into the printer’s exit nip below the ODV2D (see photo). Follow the on-screen prompts to complete this adjustment.

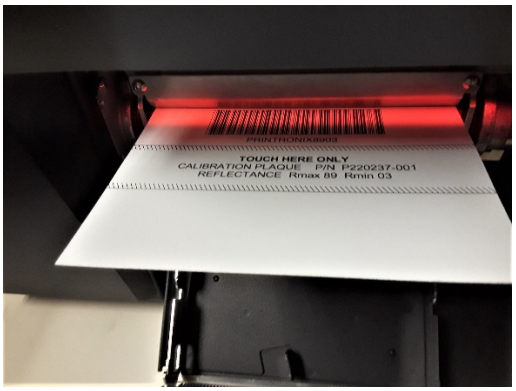
Reflectance Calibration

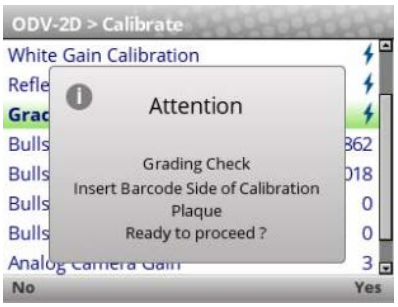
ODV2D > Calibrate > Reflectance Calibration
This is used to reset the Reflectance values using the Calibration Plaque that was provided with the ODV2D. Place the “Barcode” side of the plaque into the printer’s exit nip below the ODV2D (see photo). Follow the on-screen prompts to complete this adjustment.

Grading Check

ODV2D > Calibrate > Grading Check
This is used to check the barcode grading against a known standard bar-code using the Calibration Plaque that was provided with the ODV2D. Once selected, the display will instruct you to insert the Calibration Plaque, and after confirmation the ODV2D will start grading the barcode.

Once the Grading Check is selected, the display will instruct you to insert the Calibration Plaque as shown below (barcode towards the printer), then press the Right SOFT key for Yes when ready and the ODV2D will start scanning the barcode.



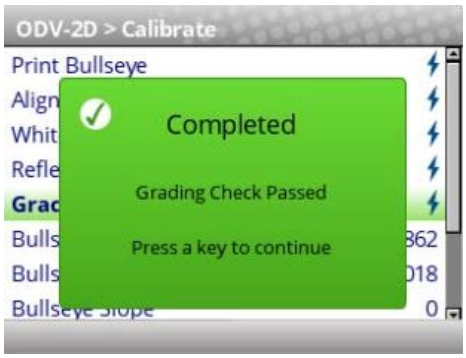


The ODV2D decides if the check passes under the following conditions:

- Overall Grade >= 3.5 (Grade A)
- Symbol Contrast >= 70 (ISO Grade 4 minimum)

Pass / Fail results will be displayed in one of the following popup messages:

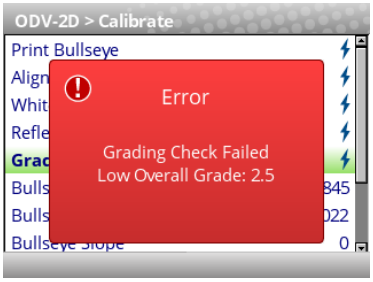
- Calibration Passed
  -When Decoded ok, Overall Grade >= 3.5, Symbol Contrast >= 70)



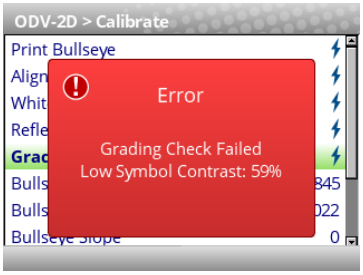
If the test passes, press any key to return the printer to normal operation.

If the Grading Check fails…

- Overall Grade Fail - When Decoded ok, good contrast, but Overall Grade < 3.5

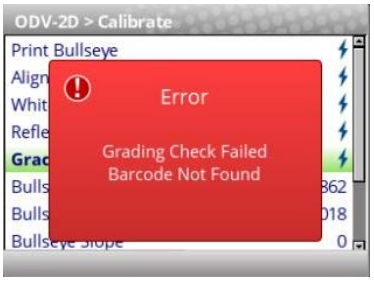


- Symbol Contrast too low - When Decoded ok, but Symbol Contrast < 70)



In most cases, the equipment will continue to run in these conditions. However, barcode grades may be reported one grade lower (i.e. B= C) than actual. The system will never pass a failing barcode.

- Calibration Failed, Barcode Not Found - When barcode cannot be decoded



Make sure the Calibration Plaque is oriented correctly into the printer as shown above. If not, reposition the card and run the Grading Check a second time.

Check that the Calibration Plaque has no smudges, fingerprints or other contamination that would prevent the scanner from reading and properly grading the barcode. Only perform this test with a clean, undamaged Calibration Plaque.

Bullseye Height

ODV2D > Calibrate > Bullseye Height	
This menu item displays the value determined during the alignment process.	
Minimum	1829
Maximum	1870
Measured Value	Will display actual value – must be between Min/Max

Bullseye Center Row

ODV2D > Calibrate > Bullseye Center Row	
This menu item displays the value determined during the alignment process.	
Minimum	1020
Maximum	1025
Measured Value	Will display actual value – must be between Min/Max

Bullseye Slope

ODV2D > Calibrate > Bullseye Slope	
This menu item displays the value determined during the alignment process.	
Minimum	- 20
Maximum	20
Measured Value	Will display actual value – must be between Min/Max

Bullseye Tilt

ODV2D > Calibrate > Bullseye Tilt	
This menu item displays the value determined during the alignment process.	
Minimum	- 100
Maximum	100
Measured Value	Will display actual value – must be between Min/Max

Analog Camera Gain

ODV2D > Calibrate > Analog Camera Gain	
Advanced User Item: This menu item displays the value determined during the calibration process.	
Measured Value	Will display actual value. Useful for advanced trouble shooting (no user adjustments available).

Last Alignment Date

ODV2D > Calibrate > Last Alignment Date	
Displays the Date when the last alignment check was performed	
Value	Day-Month-Year (actual)

Last White Gain Date

ODV2D > Calibrate > Last White Gain Date	
Displays the Date when the last White Gain Calibration was performed	
Value	Day-Month-Year (actual)

Last Reflectance Date

ODV2D > Calibrate > Last Reflectance Date	
Displays the Date when the last Reflectance Calibration was performed	
Value	Day-Month-Year (actual)

Diagnostics Submenu

Scan Report

IMPORTANT **To print a Scan Report, *ODV2D > Control >Telemetry Data* must be set to the option "Full Report".**

This executable menu item prints a diagnostic printout of bar code analysis parameters calculated by the ODV2D. It allows you to determine which parameter may be the cause of bar code verification failures. The report printed is based on the last Full Report received from the ODV2D. This allows you to send a bar code print job to the printer, have the bar code evaluated by the ODV2D, and view a report of the parameters as seen by the ODV2D.

For forms with multiple bar codes, only information from the last processed bar code will be included in the report. To view validator parameters for all bar codes on a form, use the Auto ID Data Manager within PrintNet Enterprise.

IMPORTANT **If the label is not wide enough, not all the information will print.**

The printed report is generated from ODV2D reports received by the printer during printing. The report does not include information about bar codes that are placed in the ODV2D scanning beam while the printer is idle or from print jobs that generate an "Unscannable: xx Missing Codes" error message.

The number of Total Scans and Good Scans can help you determine if the print speed is set too high and causing borderline failures. The Scan Report is based on the last Full Report received by the validator. Therefore, if the last bar code printed is positioned close to the last inch of the form, and on-demand printing occurs to force the last bar code to be fed past the ODV2D beam, the Total Scans and Good Scans reported will not be the same as those reported by the ODV2D when printing at the set *Media* > *Speed* > *Print Speed*. This is because the on-demand printing portion is done at a fixed print speed which may be higher or lower than the set Print Speed. For example, a bar code printed at 7 ips may yield eight Total Scans, but if printed in an on-demand printing mode it may yield 18 Total Scans.

Scan Report Information

1. "ERROR:" followed by highest priority failure message (if an error other than "Unscannable Code" occurred) or "None" if no error occurred
2. Orientation (does not apply to 2-D codes)
3. Printout of characters read from the bar code
4. Symbology Type Read (e.g., Code 39, Code 128)
5. Overall Grade (letter grade and calculated/number value)
6. Aperture (mils)
7. Wavelength (nm)
8. X dimension (mils)
9. Decodability (%)
10. Modulation (%)
11. Symbol Contrast (%)
12. Edge Contrast (%)
13. Defects (%)
14. Rmin
15. Rmax
16. PCS (Print Contrast Signal)
17. Percent Decode (%)
18. Bar Deviation Avg (%)

19. Min. Bar Deviation (%)
20. Max. Bar Deviation (%)
21. Ratio
22. Good Scans
23. Total Scans

The following is a sample scan report of a Code 39, 10 mil bar code containing "*PTX8702*" with a quiet zone violation:

SCAN REPORT

ERROR: Bar code quiet zone too small	
Orientation	Picket
Barcode Data:	[ST]PTX8702[ST]
Symbology	Code 39
Overall Grade	C (2.1)
Aperture (mils)	10
Wavelength (nm)	624
X dimension (mils)	09.9
Decodeability (%)	65
Modulation (%)	34
Symbol Contrast (%)	68
Edge Contrast (%)	30
Defects (%)	14
Rmin	4
Rmax	86
PCS	92
Percent Decode (%)	100
Bar Deviation Avg (%)	-16
Min. Bar Deviation (%)	-31
Max. Bar Deviation (%)	-4
Ratio	2.0
Good Scans	10
Total Scans	10

Scan Profile

This is an executable menu that prints the scan reflectance profile of a picket fence bar code placed in the ODV2D camera beam. It does not work for ladder or 2-D codes.

IMPORTANT: You will need a minimum installed label width of 2 inches to support the Scan Profile printout.

1. Press the PAUSE key to take the printer OFFLINE.
2. If necessary, press the UP+DOWN ARROW keys at the same time to unlock the front panel.
3. Find *ODV2D* > *Diagnostics* > *Scan Profile*.
4. Place a bar code in the scanning beam path.
5. Press ENTER key to scan the bar code.
6. When prompted on the control panel, remove the scanned bar code.
7. Press ENTER key to print the scan profile.
8. Lock the panel again using the UP+DOWN ARROW keys.
9. Press PAUSE again to put the printer ONLINE.

The length of the scan profile printed depends on the *ODV2D* > *Diagnostics* > *Profile Horiz Mag* setting.

The scan profile will print either a 1.5” wide or a 3” wide graph depending on the *Media* > *Image* > *Label Width* setting. (Label widths less than 4” print the smaller 1.5” wide profile.)

IMPORTANT: **Printing is done in continuous mode without considering media gap/marks. Use continuous media or else the scan profile may distort at the media gap/marks.**

Figure 4 shows two sample scan profile graphs. The left uses a **Profile Horiz Mag** of 1 (default) and the right uses a **Profile Horiz Mag** of 2. These graphs only show the profile of actual bar code data. The dashed lines represent the 90% and 10% marks. You can use these to help set the gain and offset (if necessary).

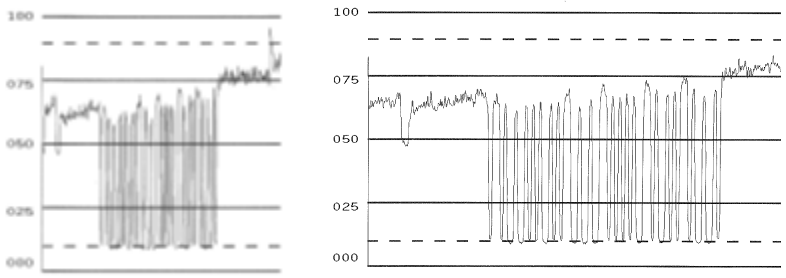


Figure 4 Sample Scan Profile (Profile Horiz Mag 1 & 2)

Profile Horiz Mag

ODV2D > Diagnostics > Profile Horiz Mag	
This menu item selects the horizontal magnification for printing the scan profile. This allows you to zoom in on the profile. Magnification values are multiples of the scan profile length.	
Minimum	1
Maximum	4
Factory Default	1

Print Settings

This is an executable menu item that reads and prints the settings used by the ODV2D.

The response received from the ODV2D after sending the ~DV (retrieves version), ~HT (retrieves hardware settings), and ~PT8 (retrieves parameter settings) commands are printed. Use the printout to view all the active settings the validator is using and to determine if there is any invalid setting which may be causing problems. Table 2 is a sample printout (separated into different columns).

Table 3 Print Settings

~DV Response	~HT Response	~PT8 Response
ODV2D SYSTEM: P300356-V1.16A ODV2D APP: P300398-V1.16D ODV2D DSP: P300358-V1.16A	SerialPort=/dev/ttyS1 TopRow=1018 Aperture=1 DSPDebug=0 EnableCalibrationGain=1 EnableCalibrationGrid=1 CalibrationGridParallax=2.2 CalibrationGridStretch=-1 FinderThreshold=45 PixelGainScale=86 PixelGainoffset=3 LineSyncsPerFrame=3 CalibrationGainCount=10 CameraAnalogGain=6 CenterPosition=2455 PixelSize=2 SerialNumber=30dv21725006	Full Frame RMin=6 RMax=92 Scale=90.956 Offset=7.02174

Graphics Info

ODV2D > Diagnostics > Graphics Info	
This menu item will save the barcode analysis of graphics data onto an SD card (if present) or within the Flash File System, named **Cfind_xxx.BMP**. This file is a BMP graphics which shows how the graphic elements were interpreted and can be useful to determine if the barcode was properly identified. When the menu is set to zero, no analysis will be saved. When the menu is set above zero, that number of label analyses will be saved onto the SD card (if present) or Flash File System. As the labels are printed, this menu will decrement automatically back to zero.	
Minimum	0
Maximum	5
Default	0

Statistics Submenu

Clear Data

ODV2D > Statistics > Clear Data
The ODV2D reports on all bar codes it detects since the last data reset. For example, you print a large batch of labels with bar codes and then print a validator report. Then you print another batch of labels with bar codes and print another report. The report will contain information on both batch jobs. However, if you reset the validator data between batch jobs, the second report will only contain information on the second batch job. This executable menu will clear all the statistics shown in this Statistics submenu.

Good Barcodes

ODV2D > Statistics > Good Barcodes
The number of bar code reports sent from the ODV2D since the last Clear Data command.

Good Forms

ODV2D > Statistics > Good Forms
The number of good (non-overstruck) forms printed since the last Clear Data command.

Overstrike Forms

ODV2D > Statistics > Overstrike Forms
The number of forms containing a bar code that fell below the minimum acceptable level since the last Clear Data command.

Average BWD

ODV2D > Statistics > Average BWD
The average of all Bar Width Deviations reported since the last Clear Data command, shown as a percentage.

Last BWD

ODV2D > Statistics > Last BWD
The Bar Width Deviation included in the most recent report received from the validator, shown as a percentage.

IMPORTANT **A bar code's Bar Width Deviation is determined by comparing the bar width the ODV2D expects to the bar width that is actually printed. For example, if the bar width is printed exactly as the validator expects, the BWD is 0%. However, if the bar width as printed is 25% wider or narrower than the validator expects it to be, it reports a BWD of 25%.**

Validator F/W

ODV2D > Statistics > Validator F/W
Shows the firmware version installed in the ODV2D.

Serial Number

ODV2D > Statistics > Serial Num.
Shows the serial number of the ODV2D installed.

IP Address

ODV2D > Statistics > IP Address
Shows the IP Address of the Ethernet diagnostic port on the ODV. The Ethernet is accessible from the side of the ODV (needs to remove cover plate to expose).

MAC Address

ODV2D > Statistics > MAC Address
Shows the MAC Address of the Ethernet diagnostic port on the ODV. This is the Manufacturer's assigned number and is unique for each ODV2D. The MAC Address is stored with the SD memory card.

Setup Considerations

There are several factors which contribute to successful bar code validation, including printer speed, on-demand print settings, calibration, and ambient light. The following sections describe how to ensure your ODV2D validator is scanning and reporting properly.

Note on Energy Star

The menu *System* > *Energy Star* > *Pwr Saver Active* is by default enabled and *System* > *Energy Star* > *Pwr Saver Time* is set to 5 minutes. Because Energy Star requires the ODV to be completely shut down, the time to revive the ODV2D can be more than 30 seconds which can be challenging for on-demand applications. The user is recommended to either increase the *Pwr Saver Time* or disable *Pwr Saver Active* menus if the revival time is not satisfactory.

Print Speed Limits

The print speed limits of 2~8 IPS are based on steady paper motion and the ability of the ODV2D camera system to gather and process the data effectively in real-time. If your application is not acting reliably, there are several possible factors including the reflectivity of the media and/or ambient light. Users should decrease the print speed in these situations to see if this improves performance.

NOTE: The speed is limited to 8 IPS for 1D picket fence and 2-D barcodes >= 13mil and to 6 IPS for 1D ladder or 2-D barcodes <13mil. The speed will be automatically reduced depending on the label content and remain there.

Page Size and Barcode Limits

The camera system of the ODV2D gathers an entire label image during processing and is limited to 24” labels in *Media* > *Image* > *Label Length* due to memory and overhead requirements. In addition, no more than 50 codes can be processed in each label.

Minimum Bar Width

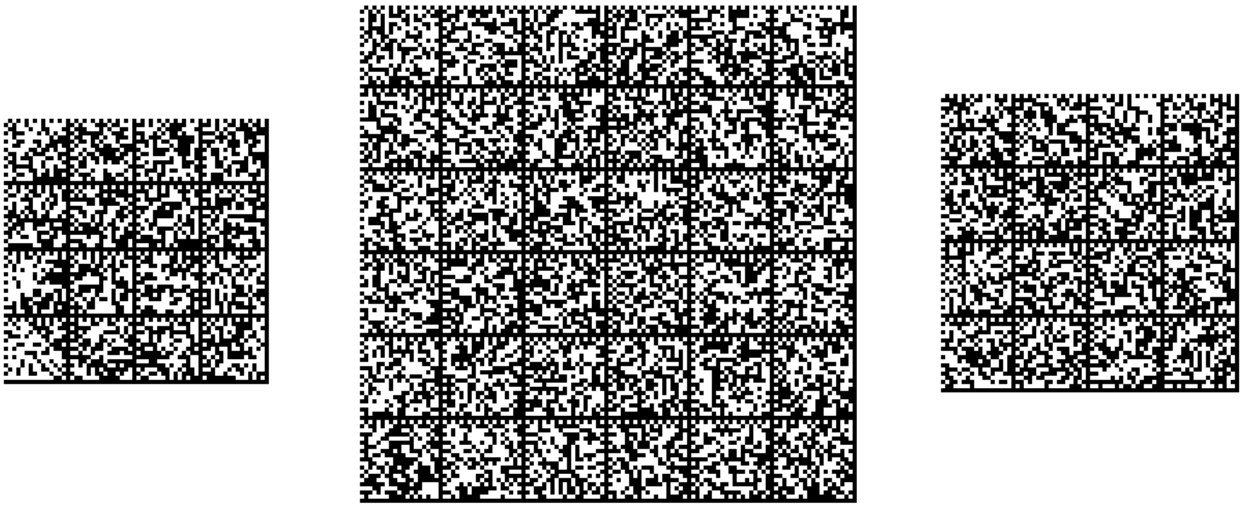
The barcode width “X” dimension must be at least 10-mil (0.010 inches) for use on the 4-inch models, 13.3-mil (0.0133 inches) for 6-inch 300 dpi model or 15-mil (0.015 inches) for the 6-inch 203 dpi model. This is required to provide full ISO grading capabilities. Note: smaller dimensions may be read, but cannot be accurately graded.

Minimum Barcode Height

The barcode height of 1D codes must be at least 0.10 inches. This is required to get the necessary area to do a proper ISO validation. The print speed is not a limiting factor in this requirement.

Data Matrix Complexity

While the ODV2D is capable of run-time analysis of complex barcodes, there are limitations based on the size of the minimum element combined with the level of data. Barcodes below are examples of 10-mil barcodes that are extremely complex and therefore may not read well for all medias, speeds, and print intensities.



On-Demand Printing

For each bar code to be successfully validated, the entire bar code must pass completely under the beam, even when the printer is set up for on-demand printing. In cases where the bar code is close to the bottom of a label and the printer is in an on-demand printing mode, the printer automatically pushes the label past the scanning beam. Once the bar code is validated, the printer retracts the label back to be cut or torn off.

Because the printer must push out and then retract labels in on-demand printing modes, the extra movements slow the printing process. You can avoid this by adjusting the form so that the bar code appears early enough on the form so that it will pass completely under the scanning beam during normal printing. This may involve rotating the form or moving the bar code to a different position on the form.

Checking the Firmware Revision Number

For troubleshooting purposes, you may need to reference the ODV2D firmware revision number. This can be found in two different places within the Settings section:

- ODV2D > Statistics > Validator F/W.
- Tools > About > Validator F/W.

PTX_SETUP Control

There are several PTX_SETUP commands that configure the ODV2D symbologies and orientations that will be processed or ignored, including the ability to skip processing entire labels.

PTX_SETUP commands have the following format:

(SFCC)PTX_SETUP

Command–Sub Command;*Value*

PTX_END

The SFCC value by default is hex 21 (!) and the entire set of PTX_SETUP commands can be found in the T8000 Administrator's Manual. Table 3 lists those commands.

Table 4 PTX_SETUP Commands for ODV2D

Command	Sub-Command	Parameter	Description
ODV	**GRAPHICS**	*ON or 1* *OFF or 0*	When enabled, search graphics within the job for barcodes. Otherwise, ignore the graphics and only process the barcode command from the emulations.
	ORIENT	*ALL* *PICKET* *LADDER*	Choose the orientations of the barcodes to process.
	SKIP	*0 = OFF* *1-9999 = #* *> 9999 = ON*	Skip a certain number of labels from ODV2D processing. If zero, no labels will be skipped (ignored). If 1-9999, this number of labels will be skipped. Numbers > 9999 will result in indefinite skipping of labels.
	CODE39	*ON or 1* *OFF or 0*	When enabled, Code 39 barcodes will be processed. Otherwise, they will be ignored on the label.
	CODE128	*ON or 1* *OFF or 0*	When enabled, Code 128 barcodes will be processed. Otherwise, they will be ignored on the label.
	INT2/5	*ON or 1* *OFF or 0*	When enabled, Interleaved 2/5 barcodes will be processed. Otherwise, they will be ignored on the
	CODE93	*ON or 1* *OFF or 0*	When enabled, Code 93 barcodes will be processed. Otherwise, they will be ignored on the label.
	CODABAR	*ON or 1* *OFF or 0*	When enabled, Codabar barcodes will be processed. Otherwise, they will be ignored on the label.

Command	Sub-Command	Parameter	Description
	UPC/EAN	*ON or 1* *OFF or 0*	When enabled, UPC and EAN bar-codes will be processed. Otherwise, they will be ignored on the label.
	PDF417	*ON or 1* *OFF or 0*	When enabled, PDF417 barcodes will be processed. Otherwise, they will be ignored on the label.
	DATAMATRIX	*ON or 1* *OFF or 0*	When enabled, Data Matrix bar-codes will be processed. Otherwise, they will be ignored on the label.
	QR	*ON or 1* *OFF or 0*	When enabled, QR barcodes will be processed. Otherwise, they will be ignored on the label.

IMPORTANT When PTX_SETUP commands are sent, they will change the front panel menus (if available) in the Section “Symbology Submenu”.

Grading Parameters

Grading A-F

Several ISO and traditional parameters are individually graded per the ISO and ANSI specifications, and these individual grades are combined to make an overall ISO-compliant grade. The ODV2D will always fail any barcodes which have grades less than or equal to the value specified in the Overall Grade menu. Instead of grade letters (A-F), numbers are used to allow for more resolution. ISO-compliant letter grades correspond to numerical grades as shown in the table below.

Table 5 Grading Numerical Range

Overall Grade	Description
3.5 or better A	Grade A barcodes should scan easily first time with most scanning equipment. The goal should be to produce this quality codes.
2.5 – 3.5 B	Codes of this quality may read after a single scan. If a second scan is required, the probability of success is very high.
1.5 – 2.5 C	This is the minimum quality level for an acceptable barcode. Re-scanning is necessary to get a successful read.
0.5 – 1.5 D	This grade is only acceptable for ITF-14 bar codes printed on to fiberboard.
0.4 – 0.0 F	This grade is unacceptable

ISO versus Non-ISO

In terms of grading the form, there are two different modes available based on the menu setting *ODV2D* > *Grading* > *Grading Mode*:

- ISO – In this mode, all grading parameters are based on ISO standards. Only the **Overall Grade** menu is user adjustable to generate a fault. When this mode is selected all other menus in this section are hidden and reset. The grading results are then based on the ISO specifications.
- Non-ISO – This mode allows the user to set custom failure thresholds on individual barcode quality parameters. Changing individual quality parameters may lead to non-ISO standard grading. It is recommended that only users that understand both the ISO standards and the end user barcode quality requirements change any setting that affects the barcode quality parameters. All quality parameter menus are visible and user adjustable in this mode

Parameter Applicability

Barcode verifiers use parameters dictated by industry standards for grading and reporting barcodes. The table below shows a summary of the industry standard parameters used for barcode grading as shown in Table 5.

Table 6 Configurable Analysis Parameters

Parameter	1D	2D	
		Stacked	Matrix
Modulation	x	x	x
Symbol Contrast	x	x	x
Overall Grade	x	x	x
Rmin	x	x	
ECmin	x	x	
Defects	x	x	
Decodability	x	x	

Fixed Pattern Damage			x
Axial Nonuniformity			x
Grid Nonuniformity			x
Unused Error Correction Code		x	x

NOTE: Stacked Barcodes include PDF417. Matrix barcodes include DataMatrix, QR, and Aztec.

Calculations

The ODV2D follows the specified algorithm defined in the ANSI X3.182 specification for determining the Overall Grade based on an average. Although it is not defined, the validator truncates the result of all analysis parameters averages for a slightly stricter grading.

A side effect of the ANSI specified algorithm is that the Overall Grade may be lower than any of the averaged analysis parameters. This occurs because the Overall Grade is based on the lowest grade on any scan converted to a single digit grade (A to F, 4 to 0) which is then averaged. This usually occurs when a single analysis parameter has a value just above or just below the Overall Grade.

Example

The Decodeability value of 51 displays as B, but the Overall Grade displays as C.

The bar code was scanned five times: three scans had values of 0.49 (grade C) and two scans had values of 0.54 (grade B).

The Decodeability grading calculation is:
(3 x 0.49) + (2 x 0.54) = 2.55
2.55 ÷ 5 = 0.51 (grade B)

The Overall Grade calculation is:
(3 x 2.0) + (2 x 3.0) = 12
12 ÷ 5 = 2.4 (grade C)

Also, with certain combinations of multiple analysis parameters and possibly the truncation used on the analysis parameter's average, the Overall Grade may be higher than an individual analysis parameter grade.

Example

The Decodeability value of 48 displays as C, but the Overall Grade displays as B.

The bar code was scanned five times: four scans had values of 0.51 (grade B) and one scan had a value of 0.40 (grade C).

The Decodeability grading calculation is:
(4 x 0.51) + (1 x 0.40) = 2.44
2.44 ÷ 5 = .49 (grade C)

The Overall Grade calculation is:
(4 x 3.0) + (1 x 2.0) = 14
14 ÷ 5 = 2.8 (grade B)

Bar Code Failures

The ODV2D tells the printer to announce a fault condition in two situations:

- When the validator detects a bad bar code
- When the validator detects no bar code where it expects to find one.

How the printer reacts to these faults is determined by the printer's configuration settings, as described in this section.

Process for 1-D Barcode Analysis

The following flow chart in Figure 5 is an overview of how the ODV2D performs the 1-D barcode analysis.

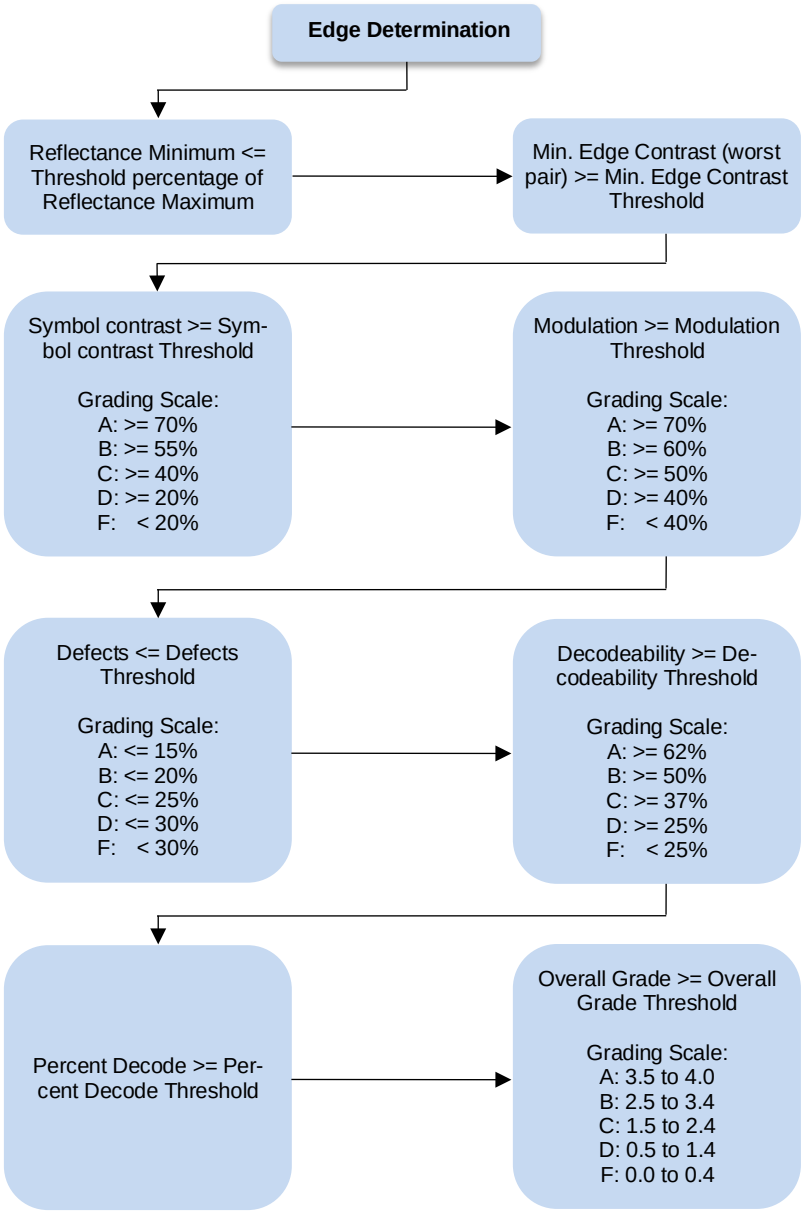


Figure 5 1-D Barcode Analysis

Bad Bar Code Error Detection

The ODV2D examines every bar code that passes under the beam and sends an analysis report to the printer. If a bar code is reported to have failed to meet any of the acceptance criteria, an error condition is reported. How the printer then reacts is described in “Validator Action (Error Action)”.

Missing Bar Code Error Detection

A bar code may print so poorly that the ODV2D cannot detect it, and the printer does not receive an analysis report for the code. To catch this problem, the printer tracks the position of the last label printed and knows when it should have completely passed the beam. It can then compare the number of bar code analysis reports it expected to the number it received. If the printer does not receive enough bar code reports, it enters an error condition. How the printer then reacts is described in “Validator Action (Error Action)”.

The number of bar codes expected is determined one of two ways:

- If Auto is selected for the *ODV2D* > *Control* > *Number of Codes* parameter, the printer compares the number of bar code commands it receives from the software to the number of analysis reports it receives from the validator.
- You can set the number of bar codes generated by a bitmapped image that the printer should expect per form by selecting a value in the *ODV2D* > *Control* > *Number of Codes* parameter. **This option should not be used (even with graphics) unless the default “Auto” selection is not working.**

3 Troubleshooting

Validation Demo Page

The 2-D bar code validation demo page allows you to test or demonstrate proper validator operation without a host computer. This page contains several bar code symbologies (including 2-D) and is recommended for 4x6 labels.

NOTE: If the menu *Media* > *Image* > *Label Width* or *Media* > *Image* > *Label Length* or *Media* > *Image* > *Label Width* is set to something other than 4" or 6", respectively, then some of the barcodes may not print. This does not invalidate the test but does not allow the entire scan width to be verified. If the label dimensions are too small, no barcodes will be printed.

To print and validate the bar code validation demo page:

1. Load the factory default configuration. (Refer to the printer's *Administrator's Manual*.)
2. Set *ODV2D* > *Control* > *Validator Active* to "Enable".
3. Set *Sensors* > *Control* > *Gap/Mark Sensor* to "Gap".
4. Load media.
5. Using *Sensors* > *Calibrate* > *Auto Calibrate* or by selecting  in the Home screen, run Auto Calibrate for proper gap sensing.
6. Enter the menu *Tools* > *Print Tests* > *Run Tests*. If the panel is locked, press the UP+DOWN ARROW keys simultaneously to unlock.
7. Find the printer test named "Barcode Demo 2D" and press the ENTER key.
8. The printer will return ONLINE automatically and print one demo page.
9. To simulate a bad bar code reading, block the scanning beam with an opaque object while the bar code moves under the beam. When you block the beam, the ODV2D will generate a reading error and will perform a default error action. The default setting for *ODV2D* > *Control* > *Validator Action* is "Retry Form". Using the factory default settings, the printer will pull the label with the bad barcode back, overstrike the entire label, reprint the barcodes on the next label, and then stop.
10. Press the PAUSE key to take the printer OFFLINE.
11. Lock the panel again using the UP+DOWN ARROW keys.
12. Press the PAUSE key to place the printer back ONLINE.

Error Messages

The ODV2D can detect several errors. When one of these errors occurs, the validator alerts the printer to perform the currently selected error action (see "Validator Action (Error Action)") and show the appropriate error message on the printer display. Validator error messages are explained in Table 6.

Table 6. Message List

Displayed Message	Solution/Explanation
Bar code fails Job has errors	This message appears when at least one label in a batch of labels has a data validation error and Validator Action is set to Grade&Report. 1. Press PAUSE to clear the message. 2. Manually scan all the bar codes in the label batch, then reprint the bad labels
Bar Code Improper Data Format	Data validation error: the bar code is not properly encoded. For example, a check sum is incorrect, a required number of characters is not met, or the required terminator characters are not included. This problem is almost always caused by incorrect form or host application design. 1. Fix the application so it sends data in the correct bar code format.
Bar code quiet zone too small	Data validation error: the blank zone(s) left or right of the bar code is not big enough to meet the minimum requirement. Typically, this occurs in forms where bar codes are placed too close to other elements, the bar code is too close to an edge of the media, or the media's position is shifting. The minimum quiet zone on each end of the bar code should be ten times the minimum element width or 1/4 inch, whichever is greater. In addition, between bar codes, the validator requires a minimum distance of 20 times the minimum element width or 1/2 inch, whichever is greater. 1. Fix the application. 2. Disable *ODV2D* > *Control* > *Quiet Zone* menu.
Calibration warning	The validator has detected that it needs calibration. This message is a reminder and does not halt printing. 1. Press PAUSE to clear the message. Calibrate the validator. See "Calibration".
Checksum Failure	The bar code data fails the checksum check or is missing the checksum digit. 1. Verify that the checksum digit exists in the bar code and that it is the correct value.

Table 6. Message List

Displayed Message	Solution/Explanation
Contrast too low Check media	Data validation error: the contrast between bars and spaces is not sufficient. This can be caused by too little heat in the thermal transfer or by use of colored media or ribbons. 1. Increase *Media* > *Image* > *Print Intensity* or reduce *Media* > *Speed* > *Print Speed* by menu or host software, change media, or set *ODV2D* > *Grading* > *Symbol Contrast* to 0% (to disable it).
ODV COMM ERR See Manual	Communication error between printer and online data validator (ODV). 1. Cycle power. 2. If the problem persists, contact your authorized customer service representative.
ODV Error Data Mismatch	The data that was encoded by the emulation is different than the data that the validator reported. 1. Adjust *Media* > *Image* > *Print Intensity* and *Media* > *Speed* > *Print Speed* menu or via host software. 2. Adjust the printhead pressure. (Refer to the Administrator's Manual.).
ODV Error: 35 Data Invalid	The ODV2D has not been properly aligned or calibrated during installation. The full alignment and calibration routine must be performed. Contact your Printronix Service Representative or provider for more information about the initial setup.
Overall Grade Fail	Overall data validation failure: decodability, percent decode, defects, modulation, EC Min, Rmin, and/or Symbol Contrast. 1. Press PAUSE to clear the message. 2. Adjust the parameter that is causing the failure. To see which parameter is failing, run a Scan Report (page 42). 3. Lower the *ODV2D* > *Grading* > *Overall Grade* to a point where the worst parameter grade will be above the Overall Grade threshold.

Table 6. Message List

Displayed Message	Solution/Explanation
Poor scanning Check heat&head	Data validation failure: decodability. The difference between wide and narrow elements is too close for the validator to reliably discern. This usually indicates an improperly set heat/speed/pressure combination or the loss of a printhead element. 3. Adjust *Media* > *Image* > *Print Intensity* and *Media* > *Speed* > *Print Speed* menu or via host software. 4. Adjust the printhead pressure. (Refer to the Administrator's Manual.).
Poor scanning Check media	Data validation failure: percent decode. The validator detected gross inconsistencies within the height of the bar code. These types of failures are likely attributed to large blemishes within the bar code, caused by ribbon wrinkle or debris on media. 1. Check for a wrinkled ribbon or debris on media. Roll wrinkled area onto take-up spindle. 2. Adjust the printhead pressure blocks. (Refer to the Administrator's Manual.).
Poor scanning Inspect head	Data validation failure: hardware defect. The validator detected unexpected dark spots in spaces or light spots in bars. This usually indicates a poor ribbon/media combination, a dirty printhead, or a burned pixel. 1. Check that paper and ribbon are clean, unwrinkled, and installed correctly. 2. Clean the printhead. 3. If message reappears, replace the printhead.
Speed Exceeds Validator Limit	Print Speed is set above the maximum allowed for bar code printing by the validator as the Power-Up configuration with the validator option installed. An attempt was made to set *Media* > *Speed* > *Print Speed* above the maximum allowed via menu or host software. Speed is limited to 2-8 IPS. In the case ladder barcodes are present, the speed will be reduced automatically to 6 IPS and remain there.

Table 6. Message List

Displayed Message	Solution/Explanation
Unscannable: xx Missing Codes	Data validation error: missing bar code. An expected bar code is missing or was printed so poorly that the validator cannot detect it. xx = number of bar codes missing on the form that caused the error. 1. Check that paper and ribbon are clean, unwrinkled, and installed correctly. 2. Run a print job and check that the validator beam is not obstructed; remove obstructions as necessary. 3. Run a print job and check that the READ LED flashes as bar codes exit the printer. If the READ LED does not flash, cycle power and run the job again. If the READ LED does not flash, inspect the cables and the cable connections. If the cables are undamaged and the connections are good, replace the validator. 4. If using bitmapped bar codes, set *ODV2D* > *Control* > *Number of Codes* to the number of codes per form (not Auto). 5. Adjust *Media* > *Image* > *Print Intensity* and *Media* > *Speed* > *Print Speed* in the menu or via host software. 6. Make sure that all expected bar codes are printing. If the physical label is too small, the image may be clipped. 7. Press PAUSE to clear the message. 8. Execute the *ODV2D* > *Statistics* > *Clear Data* function.
Validator not communicating	The *ODV2D* > *Control* > *Validator Active* is enabled in the menu, but when the printer was first powered up it could not communicate with it. Another possibility is the validator was connected to the printer and then later removed. 1. Check that the validator signal cable is securely connected to the validator unit. 2. Disable *ODV2D* > *Control* > *Validator Active*. Save this setting in the *Configs* > *Control* > *Power-Up* configuration and reboot the printer.

Table 6. Message List

Displayed Message	Solution/Explanation
VERIFIER CODE INCOMPATIBLE	The validator code is not compatible with the printer firmware code. This is the case when the feature capability does not match. 1. Contact Customer Service for the latest printer firmware and validator firmware. 2. Upgrade the validator firmware first. If the error message goes away, then no more needs to be done. 3. If the incompatible message persists, then upgrade the printer firmware as described in the *T8000 Administrator's Manua*l.

If you are having problems with the validator, consult Table 7 for a list of symptoms and possible solutions.

Table 7. Troubleshooting the Validator

Symptom	Solution
The ODV2D beam does not come on.	1. Make sure the power/data cable is plugged into the ODV2D and the controller board on the printer. 2. Make sure the validator has not been disabled in the *ODV2D > Control > Validator Active* menu. See “Enabling and Disabling the Validator”. 3. Print a bar code validation demo page (page 12). 4. Call your service representative if the problem persists.
The ODV2D beam does not cover the entire width of the labels being printed.	There is something wrong with the LED array. Call your service representative if the problem persists.
The printer pauses after scanning each label.	For complex labels with 2-D or several 1-D bar-codes, the printer might be waiting for the ODV2D to complete analysis. Try reducing the print speed to minimize pausing.
Printing less than 10 mil (0.010 inch) x-dimension width bar codes constantly causes error messag-es.	The validator does not recognize x-dimensions as smaller than10 mil. If you must print bar codes this size, disable the validator to prevent error reports. See “Enabling and Disabling the Validator”.
The printed labels look clean, but the validator is still reporting an error message.	The validator glass may be dirty, distorting the report results. Power down the printer and clean the glass using a household glass cleaner and a dry, lint-free cloth.

Table 7. Troubleshooting the Validator

Symptom	Solution
The printed bar codes are causing error conditions.	There are several factors which could be causing validation errors: • The ODV2D is not properly aligned with the printer. See “Calibration”. • Make sure the entire bar code passes completely under the scanning beam. • The media is not falling straight down when exiting the print path thereby distorting the images taken by the camera. • The validator and printer are not properly communicating. Test the validator operation without using a host. See “Bar Code Validation Demo Page”. • Bar code width. The validator can recognize x-dimensions as narrow as 10 mils. • Bar code size. A minimum height of 0.10 inch is required for validation. If problems persist, increase the bar code height.

Table 7. Troubleshooting the Validator

Symptom	Solution
The printed bar codes are causing error conditions. (continued)	• Bar code type. The validator only recognizes the following linear, picket fence bar codes: Codabar, Code 39, Code 93, Code 128, Interleaved 2 of 5, and UPC/EAN, PDF417, Data Matrix, and QR. • Bar code spacing. The validator requires a minimum distance of 1/2 inch or 20 times the minimum element width, whichever is greater, between bar codes. • Printer speed. See “Print Speed Limits”. If problems persist, decrease the *Media* > *Speed* > *Print Speed*. • Be sure the bar code is not printing on the extreme edges of the label. • Clean the printhead. See “Cleaning” in the *Administrator’s Manual*. • Check that paper and ribbon are clean, unwrinkled, and installed correctly. • Check the number of bar codes being validated concurrently. The validator can track the performance of up to 50 barcodes at one time.

If the problem with the printer is not fixed by one of these troubleshooting methods, call your authorized service representative or the Printronix Customer Support Center. See “Printronix Auto ID Customer Support Center”.

4 *Maintenance*

The ODV2D is a self-contained unit that requires only periodic cleaning. Every so often, power down the printer and use a household glass cleaner and a dry, lint-free cloth to clean the glass.

There are no field serviceable items inside the validator imaging unit. It is sealed with tamper-evident tape at the factory. If the tape has been removed, the words “VOID” will appear indicating that the Product Warranty is now VOID.

A *Addendum*

Software License Agreement

CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE USING THIS PRINTER. USING THIS PRINTER INDICATES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THESE TERMS AND CONDITIONS, PROMPTLY RETURN THE PRINTER AND ALL ACCOMPANYING HARDWARE AND WRITTEN MATERIALS TO THE PLACE YOU OBTAINED THEM, AND YOUR MONEY WILL BE REFUNDED.

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Open Source Acknowledgements

The ODV2D version V2 and version V3e run several components on a Linux based system that include proprietary code for the ODV2D application along with many open source components. This section details which open source components are used along with the license information. Table 7 lists the various open source components used by these versions.

Table 7 Open Source Components

Package	Version	Description	Mods	License
Angstrom Linux	2.6.32	The Angstrom Linux operating system.	Y	GPL 2.0
Linux	4.19.94	The Linux operating system.	Y	GPL 2.0
Linux Boot Loader (U-Boot)	2011.06 2019.01	Loads the operating system during boot.	Y	GPL 2.0+
Aptina Video Driver	Unknown	Controls the ODV2D camera.	Y	GPL 2.0
Busybox	1.31.1	Linux communications interface	N	GPL 2.0
GNU C Libraries	2.25	Dynamically linked C/C++ Libraries	N	LGPL 3.0
uClibc-ng - Embedded C library	1.0.32	C library for embedded Linux systems	N	LGPL 2.1
OpenCV	2.4.13	Optimized Image Processing Library	Y	BSD
OpenCV3	3.4.9	Optimized Image Processing Library	N	BSD
ZXing Barcode Reader	3.3.0-1.03E	Barcode Decoding Library	Y	Apache 2.0
Mongoose Web Server	3.1	Enables a webpage for Diagnostics	Y	MIT
TI-IPC	3.50.04.08	Inter-processor communications	N	BSD

For packages that are GPL or LPGL and required modifications (see Column “Mods” in Table 7), Printronix Auto ID provides all changes on the company’s website to allow the public an easy way to download.

The various licenses are disclosed as required in Section “Open Source Licenses”.

Linux

The Linux operating system (Version 4.19.94) is compiled and linked independently of the ODV2D application and tailored for embedded devices and shipped with the BeagleBoard-x15 and BeagleBone. Information about Linux can be found at https://git.ti.com/cgit/ti-linux-kernel/ti-linux-kernel/.

Changes have been made to Linux modules and thus based on the GPL 2.0 License (Section “GPL 2.0”) these changes must be made available to the public.

Linux Boot Loader

The **Linux Boot Loader (U-Boot)** (Version 2019.0) is compiled and linked as a separate program within the ODV2D system and not directly linked to the application. Its purpose is to load and start the Linux operating system and setting any necessary environment variables. Information about U-Boot can be found at https://git.ti.com/cgit/processor-sdk/processor-sdk-u-boot.

Changes have been made to U-Boot and thus based on the GPL 3.0 License (Section “GPL 3.0”) these changes must be made available to the public.

Aptina Video Driver Module

The Aptina Video Driver Module (Version unknown) is used to capture images for the ODV2D system. The driver module is compiled separately and bundled with the Angstrom Linux operating system. It does not have any direct linkage with the proprietary ODV2D application. This module is described at https://github.com/Aptina/BeagleBoard-xM/blob/master/MT9V034/Angstrom/README_Beagleboard-xM_mt9v034.txt.

Changes have been made to this driver module and thus based on the GPL 2.0 License (Section "GPL 2.0") these changes must be made available to the public.

This can be downloaded at https://github.com/Aptina/BeagleBoard-xM/tree/master/MT9P031/Angstrom.

Busybox

BusyBox is a software suite that provides multiple Unix/Linux utilities in a single executable file. Many of the tools it provides are designed to work with interfaces provided by the Linux kernel. As the single executable, it replaces basic functions of more than 300 common commands. It is released as free software (http://www.busybox.net/downloads) under the terms of the GNU General Public License, version 2

GNU C Libraries

The GNU C Libraries (Version 2.25) are a standard for Unix and Linux operating systems. Applications written in C need these libraries and thus they must be included with the Angstrom Linux package.

The GNU C Libraries are under LGPL 3.0 License (Section "LGPL 3.0") and compiled separately and dynamically linked with the Linux operating system. The GNU C Libraries have not been modified and they do not have any direct linkage with the proprietary ODV2D application. Since no changes have been made, there is nothing that must be made available to the public.

The GNU C Libraries can be downloaded at Included in Linux root file system http://www.angstrom-distribution.org/builder/.

OpenCV3

From http://opencv.org/about.html: OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. Being a BSD-licensed product, the OpenCV Library is under the BSD License and compiled and dynamically linked with the ODV2D application.

The OpenCV Library (Version 3.4.9) can be downloaded at Included in Linux root file system https://docs.opencv.org/3.4.9/ . The license information in the source code is available here.

ZXing Barcode Reader

From https://code.google.com/p/zxing/: ZXing (pronounced "zebra crossing") is an open-source, multi-format 1D/2D barcode image processing library implemented in Java, with ports to other languages. Our focus is on using the built-in camera on mobile phones to scan and decode barcodes on the device, without communicating with a server. However, the project can be used to encode and decode barcodes on desktops and servers as well.

The ZXing Barcode Reader (Version 3.3) is under the Apache 2.0 License (Section "Apache 2.0") is compiled and statically linked with the ODV2D application. Changes have been made but are not required for disclosure.

The ZXing Barcode Reader can be downloaded at http://zxing.googlecode.com/files/ZXing-2.0.zip. The licensor is Sean Owen and headers in the source code contain the following information:

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Mongoose Web Server

From http://code.google.com/p/mongoose: Project mission is to provide simple, functional, embeddable web server to make it easy for application and device developers to implement web interface for their application and devices, and to offer a simple development environment.

The Mongoose Embedded Web Server (Version 3.1) is under the MIT License is compiled and statically linked with the ODV2D application. It is used for diagnostics. Changes have been made but are not required for disclosure.

The Mongoose Web Server can be downloaded at http://code.google.com/p/mongoose/downloads/list. The licensor is Sergey Lyubka. Below is the information in the source code header.

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Additional Open Source Components

Package	Version	Description	License
argp-standalone	1.3	Standalone version of argp - part of glibc library	LGPL-2.0+
busybox	1.31.1	Library of common UNIX utilities	GPL-2.0
dropbear	2019.78	Provides a Secure Shell-compatible server and client	MIT, BSD-2-Clause, BSD-3-Clause
e2fsprogs	1.45.5	Utilities for Linux ext2 file system	GPL-2.0, MIT-like with advertising clause (libss and libet)
gdb	8.2.1	GNU Project debugger	GPL-2.0+, LGPL-2.0+, GPL-3.0+, LGPL-3.0+
gptfdisk	1.0.4	Disk partitioning tool	GPL-2.0+
htop	2.2.0	Interactive process viewer	GPL-2.0
ifplugd	0.28	Daemon to configure ethernet device	GPL-2.0+
jitterentropy-library	2.2.0	Random number generator	GPL-2.0 or BSD-3-Clause
jpeg-turbo	2.0.4	JPEG image codec that uses SIMD instructions	IJG (libjpeg), BSD-3-Clause (TurboJPEG), Zlib (SIMD)
libconfig	1.7.2	Library for processing structured config files	LGPL-2.1+
libcvblobs	V8.3-1.01C	Open CV Blob detection	unknown
libdaemon	0.14	C library for writing UNIX daemons	LGPL-2.1+
libgpiod	1.4.1	C library for use with the Linux GPIO char device	LGPL-2.1+
libopenssl	1.1.1f	Library for SSL and TSL protocols	OpenSSL or SSLeay
libpng	1.6.37	Library for Portable Network Graphics (PNG image format)	Libpng-2.0
libsysfs	2.1.0	Interface for querying system device information	GPL-2.0 (utilities), LGPL-2.1+ (library)
libubootenv		Access to U-Boot environment.	LGPL-2.1
libzlib	1.2.11	Data-compression library	Zlib
mmc-utils		Tool for configuring eMMC storage devices	GPL-2.0
ncurses	6.1	Tool to update displays	MIT with advertising clause
popt	1.16	Libraries to parse command-line options	MIT
rng-tools	6.9	Random number generator tools	GPL-2.0

swupdate	2019.11	Update embedded system software	GPL-2.0+ with OpenSSL exception, LGPL-2.1+, MIT
ti-cmem	4.16.00.00	Interface to the contiguous memory allocator	GPL-2.0
ti-omapconf	1.74	TI OMAP Processors Diagnostic Tool	GPL-2.0, BSD
ti-vpdma-fw	Mar-12	TI Video Input Port and Video Processing Engine	TI-TSPA
unzip	60	Zipfile-extraction program	Info-ZIP
zip	3	Compression and file packaging/archive utility	Info-ZIP

Open Source Licenses

This section provides (as required) the licenses displayed for all open source components. They are references as needed for Section “Open Source Acknowledgements”. The BSD license and MIT license do not require explanation but do require the author’s disclaimers are included which is done in the earlier referenced section.

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Version 2, June 1991

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B *Contact Information*

Printronix Auto ID Customer Support Center

IMPORTANT **Please have the following information available prior to calling the Printronix Customer Support Center:**

- Model number
- Serial number (located on the back of the printer)
- Installed options (i.e., interface and host type if applicable to the problem)
- Configuration printout: Refer to the *Administrator's Manual.*
- Is the problem with a new install or an existing printer?
- Description of the problem (be specific)
- Good and bad pictures that clearly show the problem (faxing or emailing of these pictures may be required)

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Europe, Middle East, and Africa	+31 (0) 24 3030 340 EMEA_support@PrintronixAutoID.com
Asia Pacific	+886 3 990 6155 APAC_support@PrintronixAutoID.com
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