

axicon

THE BARCODE EXPERTS



Axicon 15000 series 2D & linear barcode verifier user guide





www.axicon.com



This user guide was made using:
0.12 version of the Axicon Camera Verifier Software for Windows 10.



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Introduction

The Axicon 15000 series verifiers are designed to work with any PC running a currently supported version of Windows (Windows 7, Windows 8, Windows 10 - both 32 bit and 64 bit versions).

Specification and application

The 15200's field of view is 60mm x 45mm, and is designed to verify linear and 2D barcodes, including those used on retail point of sale and healthcare items. These are typically EAN/UPC or GS1 DataMatrix symbols.

The 15500's field of view is 95mm x 70mm, and may be used to scan a larger range of barcodes at different sizes. These include all GS1 symbols, and Code 93, Code 128, ITF, MSI Plessey - if they are no wider than 95mm.

The software is able to decode the following symbols:

Linear barcodes: EAN-8, EAN-13, UPC-A, UPC-E, Code 39, Code 93, Code 128, Codabar, ITF, MSI Plessey, GS1 DataBar, Laetus Pharmacode.

2D barcodes: Data Matrix, GS1 DataMatrix, QR Code, GS1 QR Code.

Application standards: Data content checking can be carried out on all the symbols that have been verified. This includes check digits, and combinations of GS1 application identifiers and their element strings especially for various healthcare applications.

Multiple barcodes within the field of view will be found and can be verified to the appropriate standards.



What is in the case.

- Axicon 15000 Series verifier
- Software CD
- Wallet containing this user guide and the calibration card.
- Cleaning cloth

System requirements

- Currently supported Windows Operating System (either 32 or 64 bit)
- 100 MB disc space
- 512 MB RAM minimum
- USB 2.0 port or higher

Software installation

Insert the CD into an appropriate drive and the Install program should start automatically. If it does not, run **autorun.exe**. When the software has been successfully installed, leave the CD in the drive, so that the USB driver will be installed when the verifier is connected to the computer. The software is called Axicon Camera Verifier, and the latest version can always be downloaded from the Axicon website, www.axicon.com. The software will check automatically if a later version is available. It can be used on any PC or laptop to view the verification scan files that have been saved even when the verifier is not connected.

Hardware installation

Connect the USB lead from the verifier to a USB2 or USB3 port on the computer. Please install the software before connecting the 15000 series verifier.



How the verifier works

The verifier must be connected to a PC or laptop that is running a currently supported version of Windows using the USB connection, and used with the Axicon Camera Verifier program.

The verifier has two buttons, which both do the same thing, and either one is pressed to turn the verifier on. The image capture process will start and you can see what the verifier sees on the main software window. When the barcodes you want to verify are in the right place, press one of the buttons again to begin the decoding and verification of the barcodes.

Ideally each barcode should be verified when it appears on the final filled item, in its final configuration. If the packaging by itself is verified, and is completely covered by the verifier, the verification process will be good.

If the verifier is placed on its side, or upside down, take care to minimise the effect of ambient light. Ensure that any semi-translucent substrates are backed by a uniform black surface to minimise the effect of light being transmitted through the substrate.

There are two buttons so that you can easily use the one that is most convenient if you have the verifier on its side or upside down. The keyboard shortcut Ctrl + G is the equivalent to pressing the button.

The image that has been captured and decoded can be saved as a scan file (.png), and this can be re-verified at any later time. The software allows the creation of verification reports for each barcode that appears in the image, and the user simply clicks on the relevant barcode for which a report is required.

More details about this process, saving scan files, and saving verification reports are explained later on in this user guide.

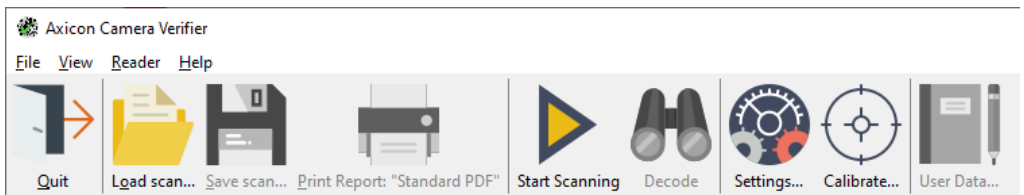


Calibration

When you use the verifier for the first time, it will tell you that it must be calibrated. This will ensure that its reflectance measurements are correct.

Take the calibration card from the plastic wallet, and place on a flat surface. Place the verifier over the EAN-13 barcode at the top left hand side of card so that it appears in the verifier window.

Then choose calibrate from the reader menu. The verifier will ask you to confirm positioning and that the RMax and RMin figures shown on the window match those printed on the card. If they are different, alter the numbers on the calibration tab in the settings menu and restart the calibration process. You will then need to press start.



The verifier software will then check the image, calibrate, and recheck the image. When this has been done a message Calibration Successful will be shown. After this message, another scan will be made so that you can check that the verification results are correct. The Rmin and Rmax figures need to agree with those on the calibration card.

The calibration card supplied with the verifier provides barcodes with known maximum and minimum reflectance values. The calibration card is certified for a minimum of one year (unless it has been physically damaged).

When it is not being used please keep the card flat in its plastic envelope, and away from direct sunlight. If the card shows any sign of damage - for example, scratches or any change in colour - please obtain a new card from us.



Getting started

After calibration, the home window for the software will look this:

The window main areas are explained below.

The screenshot shows the Axicon Camera Verifier software interface. The main window displays a calibration sheet with four barcode samples. The top right corner shows the application version 4.0/06/660 (A) and the status Application Validation: Pass. The interface is divided into several sections:

- General:** Shows the EAN-13 barcode 5012345678900 and its properties: Pass grade (1.5), X Dimension (390.3 µm, 100% (80%-200%)), Print Gain (32.5 µm; 8% (a:30.5%)), Check Character (OK; 0), Height (22.9 mm), Width (37.4 mm), Aperture (150 µm), Left Quiet Zone (10 items: 10 Pass), and Right Quiet Zone (10 items: 10 Pass).
- ISO Details:** Shows overall performance metrics: Overall (4.0 (A)), Minimum Reflectance (4.0 (A), 5.3%), Maximum Reflectance (86.0%), Threshold (45.7%), Reflectance Margin (24.5%), Symbol Contrast (40.9%), Minimum Edge Contrast (4.0 (A), 57.3%), Modulation (4.0 (A), 70.9%), Defects (4.0 (A), 3.3%), Decodability (4.0 (A), 81.0%), and Decode (4.0 (A)).
- GS1 Retail:** Shows the barcode 0105012345678900 and its properties: Status (Pass), Element (Grade), Value (4.0 (A)), and Description (Grade must be at least 1.5 (C)).
- Table:** A table with columns for Status, Element, Value, Description, Notes, Errors, and Warnings. It lists properties for the barcode 5012345678900:

Status	Element	Value	Description	Notes	Errors	Warnings
Pass	Grade	4.0 (A)	Grade must be at least 1.5 (C)			
Pass	Aperture	150 µm (06)	Required aperture: 150 µm (06)			
Pass	X dimension	330 µm	Allowed X dimension range: 249 µm to 660 µm			
N/A	Bar Height	22.9 mm	Height of bars should be at least 22.9 mm			

The top section includes the file menu and the toolbar with its command icons.












The File menu includes options for saving and loading scans, creating and printing reports. The View menu gives access to Settings (F5) and User data.

The Reader menu provides options for choosing which verifier is operational, reader information, scanning, decoding, and calibrating the reader (the verifier).

The Help menu provides access to the Axicon website, a check for software updates, and information about the software.



The Command icons on the tool bar are as follows:

-  Quit the application, or use Ctrl + Q
-  Load a saved barcode image, or use Ctrl + O
-  Save the current image and verification report, or use Ctrl + S
-  Print, or use Ctrl +P
-  Start collecting barcode images in the field of view, or press one of the two buttons on the verifier. This will be orange when the verifier is connected and grey when it is not. It will change into a pause icon when scanning.
-  Stop collecting images from the current reader.
-  Decode barcodes in the current image. This will change into a stop icon when the barcodes are being decoded.
-  Stop searching for barcodes.
-  Edit the settings for the application, or use F5
-  Used to calibrate the hardware, or use F2.
-  Display and edit user-defined data for this scan.



Getting started

The top right section provides the overall results for the verification. It will provide the grade in the format n.n/aa/www (X), where n.n is the ISO/IEC grade, aa is the aperture reference number, www the wavelength of the light being used for the verification in nanometres and X is the ANSI equivalent.

This panel also has three tabs, where the first set of information about the barcode is shown.

The General tab will show you the decoded data from the symbol, its x and y dimensions, the print gain, and the aperture size.

The Reader tab simply gives you detailed information about the verifier such as its serial number and build version, and when it was last calibrated.

The Scan tab provides details of when the image to be verified was scanned by the verifier.

The bottom right section includes two tabs; ISO and Details.

The ISO tab will include details of all the parameters defined by ISO/IEC for the particular barcode being verified.

The Details tab provides a breakdown of the results by individual scan line and by parameter for linear symbols only.

The bottom left panel will include details that relate to the analysis of a symbol by one or more of the optional plugins. Plugins are chosen by the user and they will be used to check if the symbol meets the requirements of one or more applications. More information about this is provided later on in this user guide.

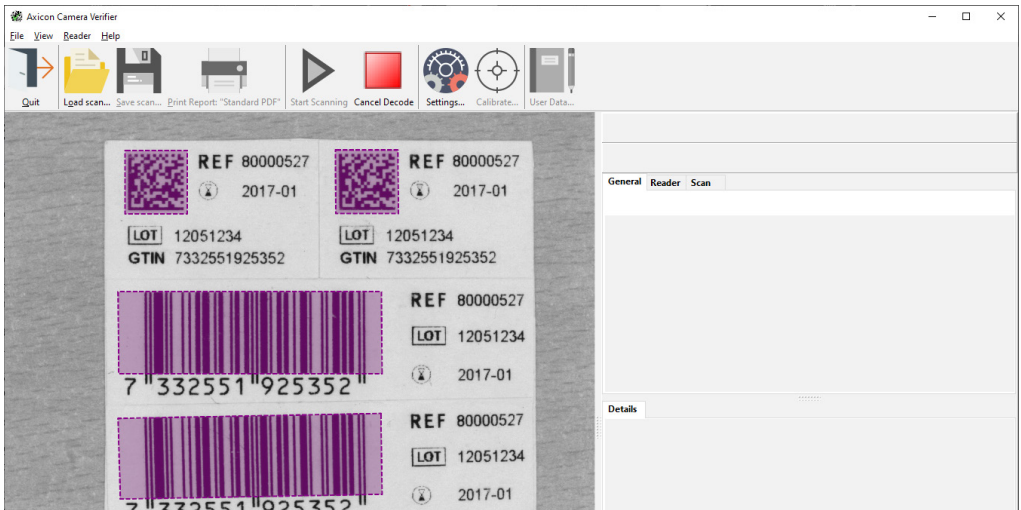
The status bar is at the very bottom of the window, and provides details of what the verifier is doing. If a verifier is not connected, the message 'Found Readers 0' will appear in the status bar. When a verifier is connected, the message will be 'Selected reader: xxxxx', where 'xxxxx' is the serial number of the verifier.



Operating the verifier

Make sure the Axiicon Camera Verifier program is open, the verifier is connected, and press one of the buttons on the verifier or press the orange 'Start scanning' arrow on the toolbar. Then place the verifier over the barcode(s).

The message 'Scanning' will appear in the status bar at the bottom of the window. With the verifier held still, press one of the verifier buttons again to begin the decode process. You can also press the 'decode' icon in the tool bar. Do not move the verifier until 'Cancel decode' appears.



The verifier will draw a purple box around each of the barcodes it has found. You must click on one of these to select it, and then the results will be displayed. Click on any other barcode to see its results. Clicking on the selected code will zoom in.

When only one symbol is present the code will be selected automatically. To verify the next barcode, simply press one of the verifier buttons or the orange arrow to begin the scanning again. This action will clear all the details of the previous verification.

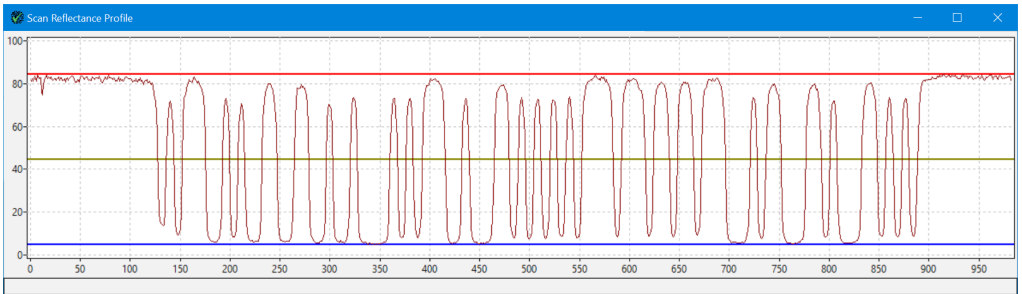
Any linear barcode will be verified using ten different scan lines, as specified by ISO/IEC 15416, and the verification grade will be based on the average of these ten readings.



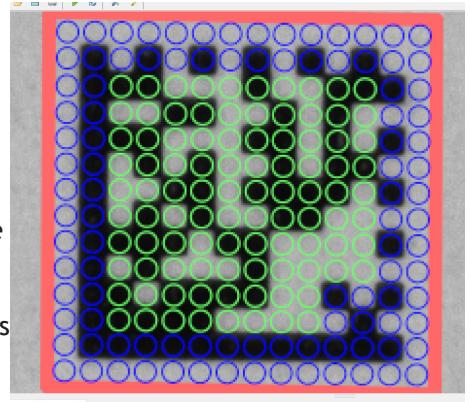
Operating the verifier

The bottom right hand section of the window, with the ISO and Details tabs, will provide you with more information, especially about linear symbols.

If the ISO tab is selected, and you click on the names for each parameter in turn, you will see the scan lines across the barcode shown in the verifier window. These will change colour according to whether that parameter has a pass (in green) or a fail (in red) for that particular scan line. To get a scan reflectance profile of your linear barcode you can click on the Details tab and select individual scans, and then a particular scan info (1 to 10). The scan reflectance profile (SRP) will now show at the bottom of the scan info results. Click on the reflectance profile to enlarge it.



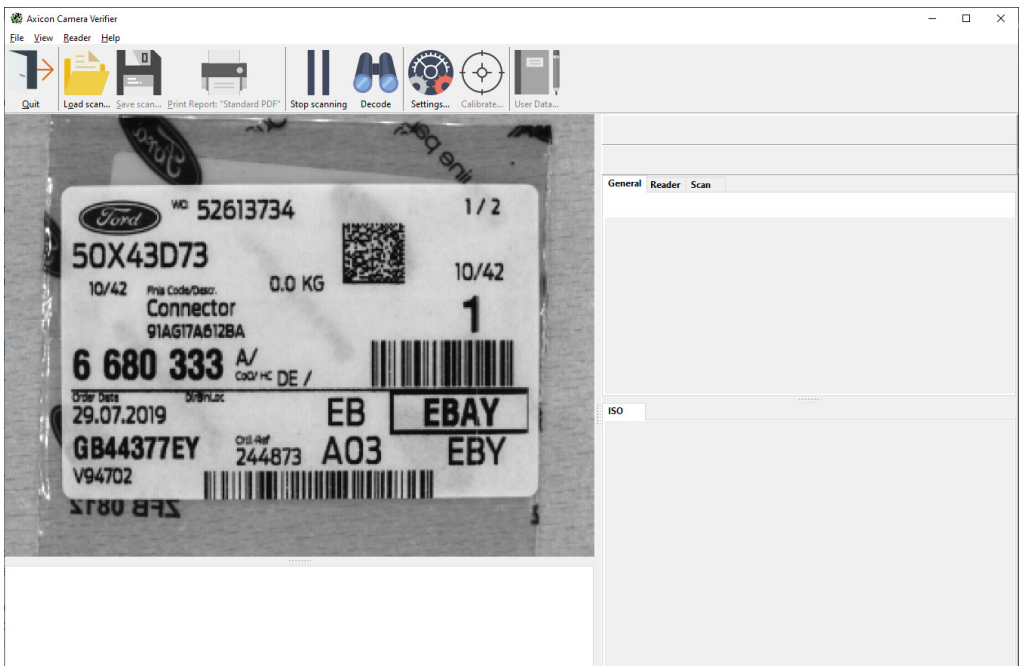
If you select an area of the SRP using your mouse it will be enlarged. Click away from the enlargement to return to the complete SRP. With a 2D symbol only the ISO tab will appear. When there are several symbols, click on each in turn to see its results. The now solid border will change to different status colours to indicate whether the symbol has passed or failed. Now click on the selected symbol to enlarge it. To see how each module has been assessed, click on the name of one of the parameters. The size of the circle shows the aperture size, and a change in colour will highlight any relevant modules for that particular parameter. Blue is the neutral colour for all these displays.





Cropping

If the verifier has to look at a complicated image, with a number of barcodes, and other images with rectangular edges, the software will take some time to make sure that any rectangular edges are not plausible 2D barcode images before decoding all the barcodes correctly. Cropping the image so that it only contains the barcode you are interested in will speed up this process. This cropping will also reduce the size of the scan file.



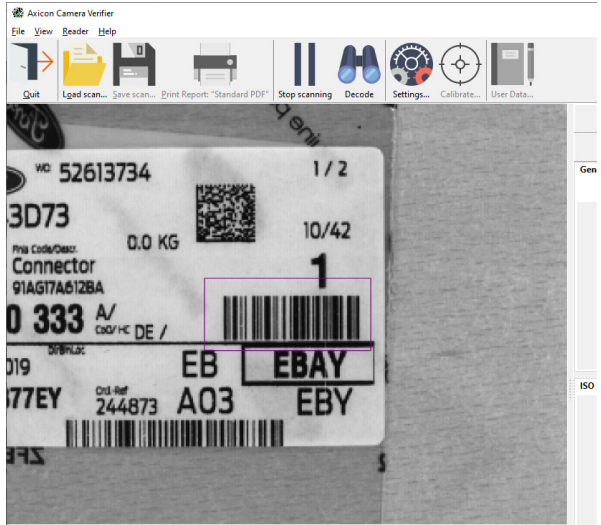
Reposition the verifier during the scanning process so that the barcode is approximately in the centre of the field of view. Then left click outside and above the barcode, and a rectangular crop box will be drawn in the centre. You may need to click again to make sure the box is large enough, and you may need to re-centre the barcode. Now click on the 'Search for barcodes' icon or press one of the verifier buttons. The crop box will become the whole image, the image in the box will be decoded, and the verification results will appear on the right. The rest of the field of view will have been ignored.



Cropping

Click on the selected image to enlarge it, and click again to take it back to its original size.

Clicking on the orange arrow icon to restart the scanning process (for another barcode) will reveal that the cropping box is still present inside the original field of view. Right clicking within the image panel will remove the box, and left clicking will create a new crop box.



0.0/05/660 (F)

Application Validation: N/A

General	Reader	Scan
6680333		
Code 128		
Pass grade		1.5
X Dimension		252.2 µm
Print Gain		228 µm, 1% (+33.0%)
Check Character		OK: 101
Height		7.3 mm
Width		27.9 mm
Aperture		125 µm
Left Quiet Zone		10 items: 10 Pass
Right Quiet Zone		10 items: 10 Fail

ISO	Details
Overall	0.0 (F) *
Minimum Reflectance	4.0 (A), 0.0% *
Maximum Reflectance	88.9% *
Threshold	44.5% *
Reflectance Margin	7.0% *
Symbol Contrast	4.9 (A), 88.9% *
Minimum Edge Contrast	4.0 (A), 44.4% *
Modulation	32.0 (C), 50.0% *
Defects	0.2 (F), 41.2% *
Decodability	32.6 (B), 43.0% *
Decode	0.0 (F) *



Saving and using scan files

The image, and verification and plugin results of any codes that have been verified can be saved in a scan file. This is done by choosing 'Save As' from the File menu.

The scan file is the basis for the verification reports that are created from it. For example, one scan file may include four barcodes if each one has been decoded and each barcode will have its own verification results.

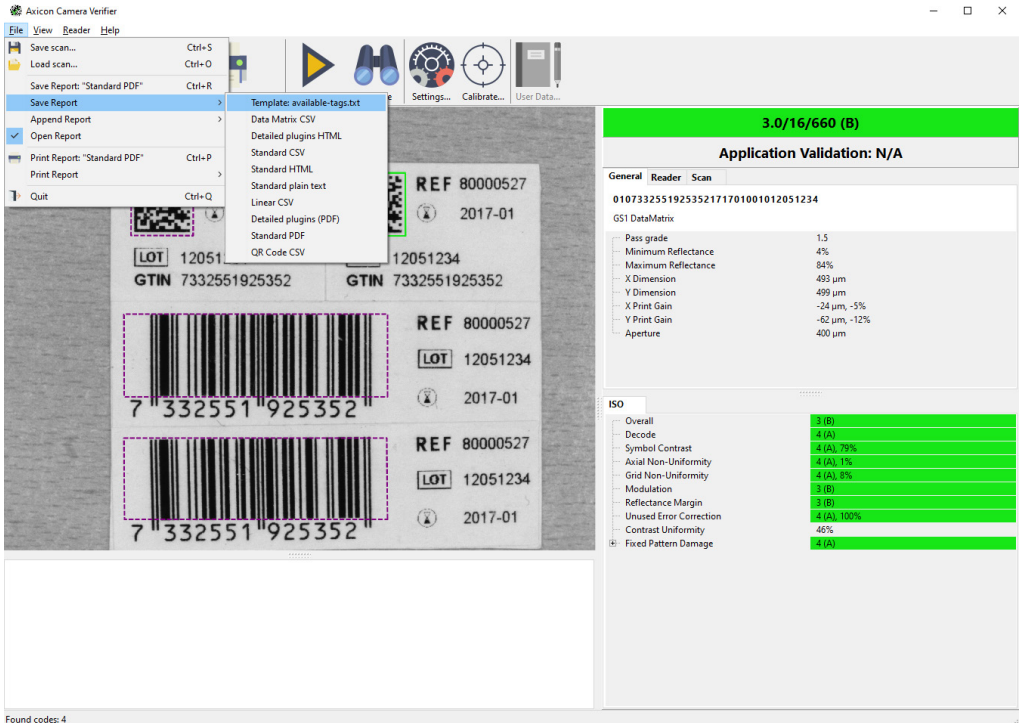
To open a saved scan, select Load Scan from the File menu.

When a saved scan file is opened by the application, the original data is available and displayed. In addition, the original image can also be re-verified using the 'search for barcodes and decode them' icon - this will then automatically use any plugins that are activated regardless of whether the plugins were used at the time of original verification. The plugin details will be included in each verification report.

The full verification results are then shown and reports can be viewed (and printed) as required.



Saving and printing reports



A verification report may be saved in .csv, .pdf, .html or .txt formats. Additionally reports can be manually saved for subsequent printing or printed without saving.

Select 'Save Report' from the File menu and select the required format from the list. This selection will be remembered and can be repeated with the shortcut Ctrl + R.

If you want the report to be automatically opened on creation (for example, if there is a need to print the report) then tick the 'Open Report' box.

You can append verification reports if you are using a CSV format, and you have ticked the 'Append Report' box. If this box is left unticked and the file name is not changed, the data will be overwritten.



Settings

The verifier has a range of configuration settings. These can be set by clicking on **View** and then selecting **Settings**.

Appearance: The Appearance tab allows you to set the appropriate colours for “Fail”, “Warning” and “Pass”, choose the language, set the units of measurement to metric or imperial units and set the pass grade. Plugins (chosen on the next tab) will often have pass grades, but if you want to set a higher value for the pass grade, make the change here. Hover text will appear to help you understand these settings. The appearance tab also offers the option to resize the appearance of the toolbar and to show text.

Plugins:

Available Plugins:	Status
80% Aperture	Off
Brazil Healthcare	Off
CIP	Default (Off)
Code 39 Check Character	Default (On)
DAVA Healthcare	Default (Off)
GS1 Data Content	Off
GS1 Distribution	Default (On)
GS1 Documents, Assets & Locations	Default (On)
GS1 Global Service Relation Numbers	Off
GS1 Healthcare (bedside)	Off
GS1 Healthcare Retail	Off
GS1 Pharmacy & Distribution	Default (On)
GS1 Retail (point-of-sale)	Default (On)
GS1 Retail (point-of-sale) & Distribution	Default (Off)
HIBC	Default (On)
ITF Check Digit	Default (On)
Luhn Check Digit (ITF)	Default (Off)
Performance Qualification	Off
Pharma Pack	Default (Off)

Plugin Description:
This plugin will recommend that an aperture of 80% of the module size of a two dimensional code should be used for verification.

Default aperture (2D)

- ISO/IEC 15415
- Percentage of module size: %
- Fixed value: μ m

When no plugins recommend an aperture (2D)

- Warn and use default
- Use default silently
- Show prompt

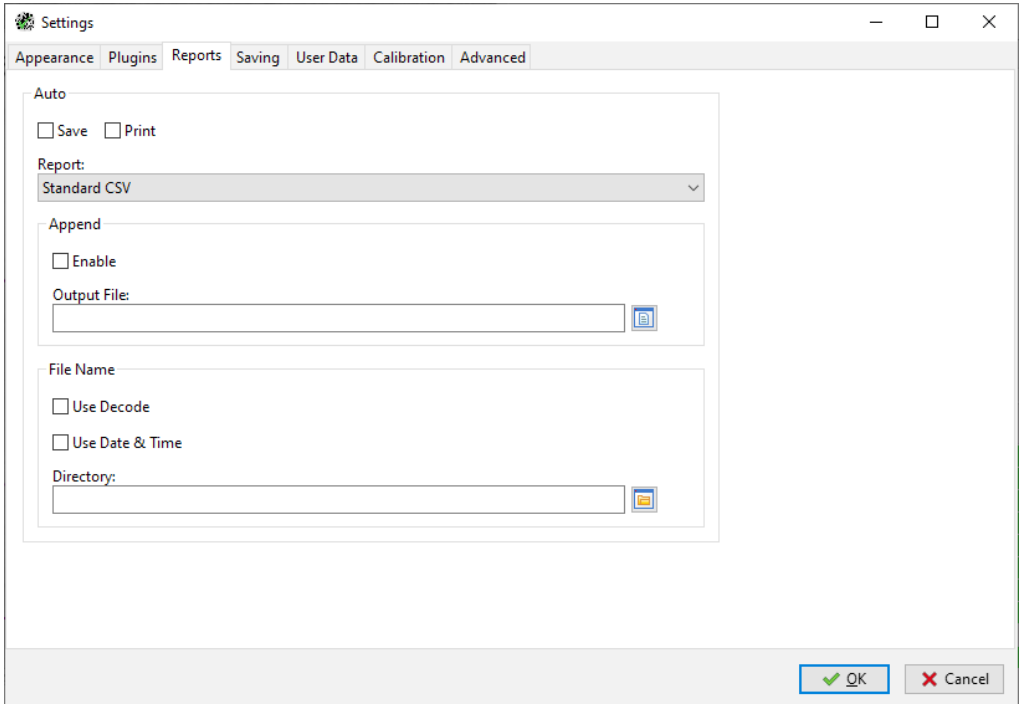


Settings

Plugins: The Plugins tab is used to select how the symbols will be checked for their data content, their dimensions, and any other aspects defined by a particular application. These include GS1 Data Content, which will check for correct combinations of application identifiers, GS1 Retail (point-of-sale) which will check the type and size of the barcode, and many more. By default, many plugins are switched off. To change this, select the plugin you require, and choose from the drop-down list: **On** will check relevant codes, **Always Show** will check every code, and **Off** will deactivate the plugin.

The plugins tab also offers the choice to change the default aperture for 2D barcodes and to prompt when no plugins recommend an aperture.

Reports





Reports: In this window you can enable automatic saving and/or printing of reports. Select the type of report file and choose an output file where the data will be kept. There is an option to add the records to an existing file rather than replacing the file, which is of benefit with text files, including CSV files. Choose Append and then where you want these reports kept.

If Use Decode box is ticked, the report name will automatically be created using the first digits of the decoded number.

If Use Date and Time box is ticked, the report name will automatically be created using the date followed by the time as a file name.

If Use Decode and Use Date and Time boxes are both ticked, the file name will automatically be created using the decoded number followed by the date and time.

Saving: The Saving tab can be used to enable automatic saving of all of the scan files for audit purposes. The enable box must be ticked for the software to save the scan files. Browse to your chosen location in the directory.

If Use Decode or Use Date & Time (or both) are ticked, then the dialogue box will appear with the pre-selected data and allow the operator to override this if required.



Settings

User Data: User Data allows you to program the Axicon 15000 series software to ask questions when a verification is being made, to collect the answers and to store these with the verification report. This supplementary user data will then always be displayed with the verification report.

Such data may typically be a job reference number or batch number, but equally it could be information about the barcode such as the substrate or print process or details about the operator, the department or the site. Multiple questions can be entered if desired.

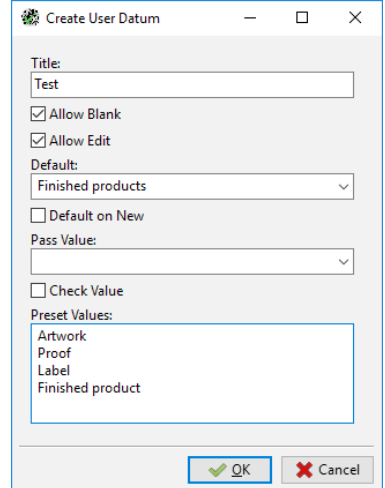
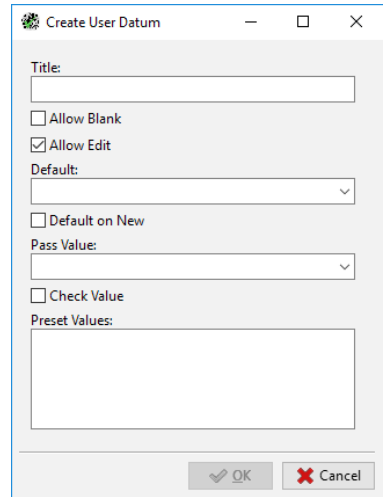
To set up the User Data:

From the View menu select Settings. Click on the User Data tab of the Settings window. To add a User Data item press the + symbol at the bottom left of the window. The Create User Datum window will be shown. This can now be completed as required.

An example of a Job Reference entry is shown here. The title is entered and the Allow Blank is un-ticked to force you to enter data into this field.

This sample shows how you can be offered a pull-down menu of options but with a default option given. The default can be left blank. When the list of selected questions has been completed press the OK button.

Now when you verify a barcode and select ‘save’ scan the User Data dialogue window will appear and allow you to enter the required information. If you now save the scan file the User Data information is automatically saved with it.





When loading a pre-saved scan file for which User Data has been attached you simply need to load the scan file, and re-verify the code using the Search for all barcodes icon and then select View/User- Data from the pull-down menu.

The Axicon software also includes a facility for transferring the User data settings from an existing scan file (whether made from this computer or not). Simply load an existing scan file, go to the View/settings/User Data screen and then press the 'Add the user data fields' icon.

There are also facilities to edit an existing User Data entry (ideal for adding items to a pull-down menu). You can also clear any existing User Data requirements and prompt the user data to always show.



Settings

Calibration

Settings

Appearance | Plugins | Reports | Saving | User Data | Calibration | Advanced

Calibration card reflectance

RMin: 5 RMax: 85

Expiry

Days until calibration reminder: 28

Allow scanning when calibration expired

OK Cancel

This window allows users to enter the minimum (RMin) and maximum (RMax) reflectance values for calibration (see page 7).

This window also allows the option to change days until calibration reminder and to allow or not scanning when calibration has expired.



Advanced: This window allows you to lock all the settings for the verifier so that other users cannot change them, and to require individual users to login before using the software.

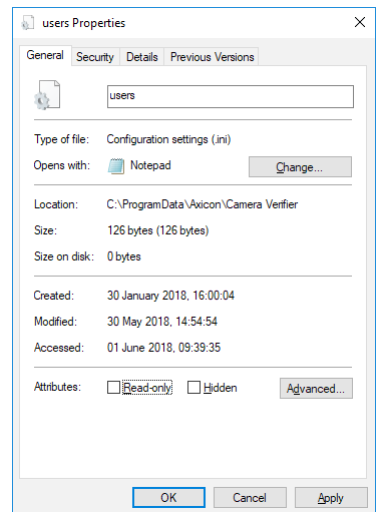
By default the settings for the Axicon Camera Verifier software are configurable by each user of the software. This means that if several people use the same PC and verifier, and login in with their own user names and passwords, they can each change the settings to suit their use of the verifier.

The detailed settings for the verifier, such as its calibration record, are used by all users, so that a change of user will not require the verifier to be re-calibrated.

To use this window you will need to change the settings for the ‘users.ini’ file, which is in the common configuration directory. This file normally has a read-only attribute which disables the common configuration and user login settings. This is done to prevent changing the settings by accident because it will affect all users on the computer.

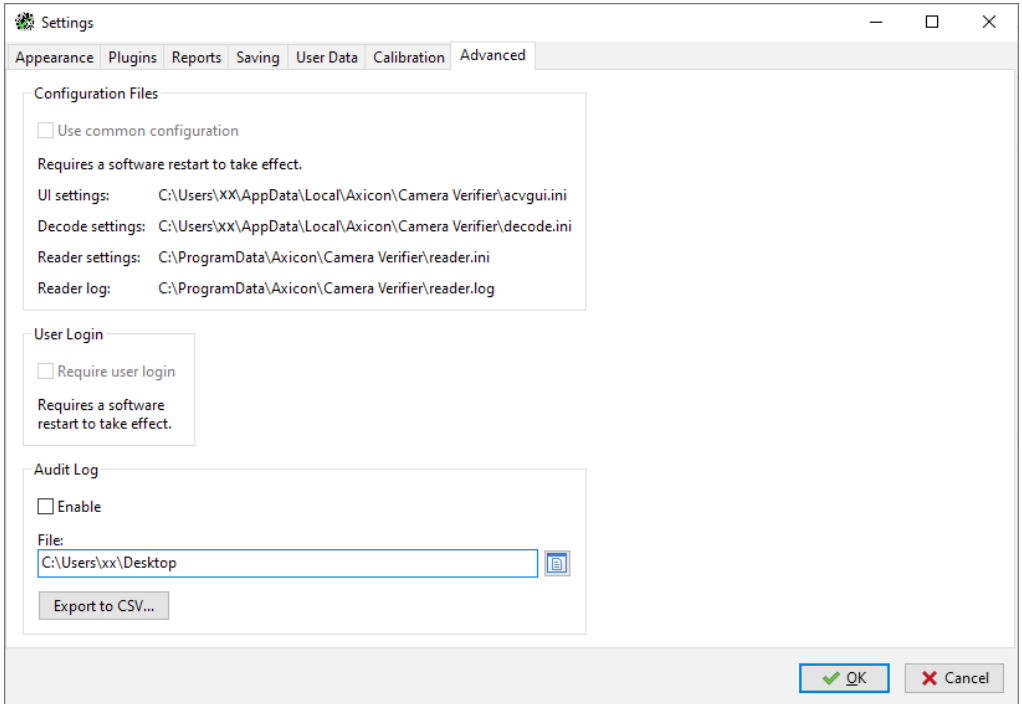
Go to C:\ProgramData\Axicon\Camera Verifier, right-click on ‘users.ini’, select ‘Properties’ and untick the ‘Read-only’ tick box and click on ‘OK’.

The common configuration and user login options will now be enabled in the Advanced window of the Settings dialog.





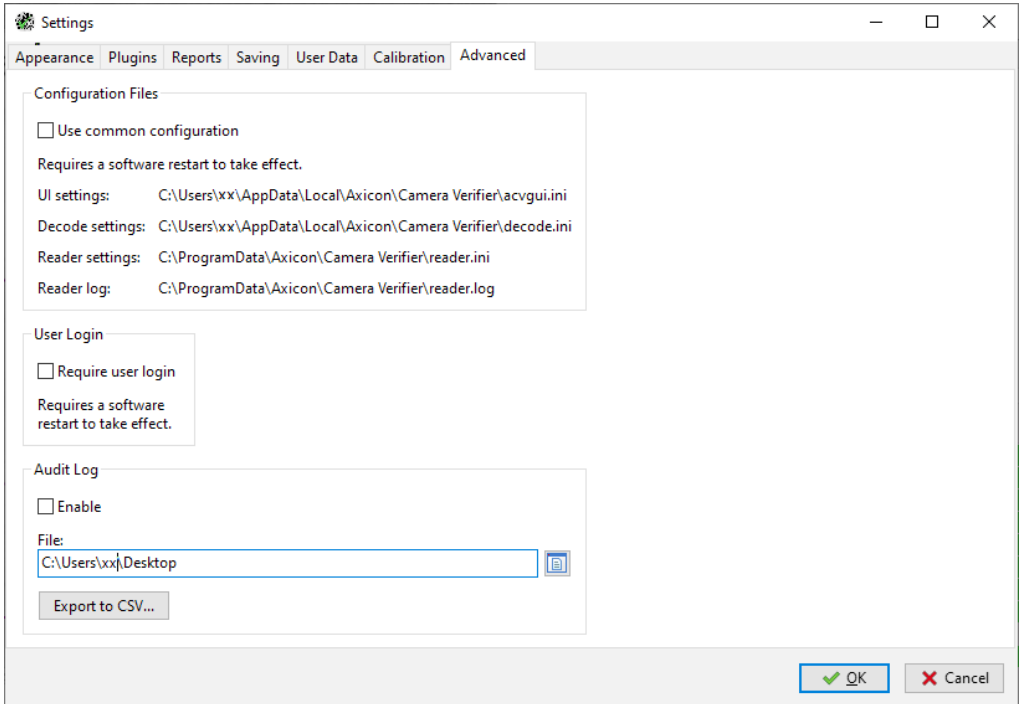
Settings



When you tick the ‘Use common configuration’ box, all the settings that you have made will be applied to everyone that uses the computer. If you tick the ‘Require user login’ box, every time a person opens the software, the computer’s normal operating system login screen will appear. The settings are now locked by the user that enabled the option and only this user can disable it, at which point individual users can make changes to the settings as before.

You must restart the software now so that these changes take effect. If you return to this window, you will see that it now looks like the image on next page.

You can now see that all these settings are held in the common configuration directory and no individual configuration directory is referred to.



The common configuration directory is: C:\ProgramData\Axicon\Camera Verifier and the individual configuration directory is C:\Users\[User Name]\AppData\Local\Axicon\Camera Verifier.

You, the user that controls the configuration can also add write permissions for other users to the settings file (acvgui.ini). This means that other users could be given permission to change the shared settings, but not be able to change the use of the common configuration for all users.

In the Advanced tab of the setting menu there is a new Audit Log option. This will create a log of all setting changes, scanning and calibration in a csv file. Browse location to save the trail and click “export to CSV” to view the audit log.



Warranty

Axicon 15000 series verifier is sold with a two year parts and labour warranty against manufacturing defects. This is a return to bench warranty with shipping costs in one direction being borne by the customer/distributor.

Should you need to return the unit to Axicon the original case (plus appropriate packaging) must be used. If the equipment is returned without the original case, we will automatically charge an additional sum for its replacement.

Axicon's standard repair turnaround time is 7-10 working days. This standard warranty does not include the provision of a loan unit. Loan units can be supplied on request.

Axicon reserves the right to charge an inspection fee for any equipment returned under warranty for which no fault is found. Please contact us to obtain an RMA number before returning any equipment. This number must be quoted on all documentation. We cannot accept responsibility for equipment returned without an RMA number.



Maintenance agreement

A service contract may be purchased within 30 days from the date of despatch. This allows you to return your verifier back to us at no extra cost for its annual VCAS (verifier conformance and alignment service) so that you can be sure it still measures barcode quality in accordance with the requirements of ISO/IEC 15426-1 and ISO/IEC 15426-2.

The service contract will also extend the warranty beyond two years, so that if it breaks down, all parts and labour will be provided free of any extra charges. The only exception is when the verifier has been misused, in which case labour costs will be covered, but not those of the parts.



Software licence agreement

This software is Copyright © Axicon Auto ID Limited

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No disassembly or decryption

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Transfer

Your licence will automatically terminate upon any transfer of the software. Upon transfer, you must deliver the software, including any copies and related documentation, to the transferee. The transferee must accept these licence terms as a condition of the transfer.

Termination

Axicon may terminate your licence upon notice of failure to comply with any of these terms. Upon termination, you must immediately destroy the software, together with all copies, adaptations and merged portions in any form.

Export requirements

You may not export or re-export the software in contravention of any applicable laws or regulations.

This agreement should be construed in accordance with the laws of England.



Disclaimer

In the following the expression **Verifier** means the verifier hardware and the associated software.

We have taken care to ensure that this Verifier is free from defects. However since we have no control over the circumstances in which you might use the Verifier, you must satisfy yourself that the performance of the Verifier is suitable for your needs. Neither Axicon Auto ID Limited nor the vendor of this Verifier can accept any liability for any loss or damage (consequential or otherwise) which may be caused by use of this Verifier.

If the Verifier or any part of it is defective in any way, or in some other way does not meet your expectations, the liability of Axicon Auto ID Limited is limited to the cost of the product. You should bear this limitation in mind if you use this Verifier in any situations where the acceptance or rejection of shipments of goods or your reputation may depend upon the quality of a barcode.



Annual service

All verifiers need servicing every year to ensure that they measure barcode quality in accordance with the relevant ISO/IEC standards. This verifier conformance and alignment service (VCAS) ensures that the verifier is internally dust-free, checks that it is focused correctly, and adjust the hardware to account for any change in the brightness of the LEDs used to illuminate the barcodes.

This annual service is not the same as user calibration, as it looks at the output of the LEDs and corrects for any variance in their evenness of illumination across the whole field of view. Over time the LEDs will fade but they will not fade uniformly. User calibration ensures that the verifier is measuring the darkest and brightest reflectance's correctly but it cannot correct for any variance in the illumination.

After your verifier has been serviced, we will return it you with the latest version of the software on CD together with a new calibration sheet, and a new user guide that will include the new certificate of ISO/IEC conformance. You will then need to calibrate the verifier before you use it again. The latest software can always be downloaded free of charge from our website, www.axicon.com.



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