axicon
THE BARCODE EXPERTS

Axicon 12600-12900 range 2D barcode verifiers

user guide

GS1 UK Industry Partner

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Introduction

An Axicon verifier is a high-precision quality control device and should be handled with due care.

Only use power and data cables supplied by Axicon. Use of non-approved accessories will invalidate the warranty.

If the verifier is dropped (or subjected to similar misuse) the accuracy of the results may be affected. The unit should be returned to Axicon immediately for servicing.

Axicon recommends that the verifier is factory re-calibrated annually. The unit should be returned to Axicon or to your approved Axicon reseller for this servicing.

The following table shows the various models in the Axicon 12000 series which can be used in conjunction with this software – and their typical applications:

Model	Field of view	Application
12000	24 x 18mm	High resolution 2D codes
12500	40 x 24mm	High to medium resolution 2D codes
12600	51 x 38mm	EAN/UPC and 2D codes
12700	70 x 51mm	EAN/UPC and large 2D codes
12800	34 x 25.5mm	Direct part marked (DPM) items
12900	34 x 25.5mm	Direct part marked (DPM) items

What is in the case

- Axicon 12600, 12700, 12800 or 12900 2D verifier.
- Power supply and fly lead.
- Mains lead.
- Wallet containing this documentation booklet, software CD and the calibration card.

Optional extras

Axicon also offer the following optional extras to be used in conjunction with the system:

- Installation qualification and operational qualification procedural documentation.
- Performance Qualification Test Kit – Comprising a set of test cards traceable to international standards and full procedural instructions.
- Set of Reference Test Cards – traceable to international standards.

Installation

System requirements
A Microsoft-supported version of Windows (32 or 64 bit)
512 MB of RAM (Minimum)
A USB 2.0 port
Microsoft .NET Framework Version 3.5 SP1 or later

Please do not connect the verifier to your PC before the software has been installed. If the software has not been installed, Microsoft Windows will attempt to find the appropriate drivers for the verifier online, and the wrong ones will be installed.

The Webscan TruCheck software requires the .NET Framework version 3.5 to be installed. The software installation process will check whether the .NET framework is present, and install it if necessary.

Insert the software CD into an appropriate drive and the Install program should start automatically. If not run **Setup.exe**. Set the location where you would like the software installed, and specify whether the installation should be for a single user or all users. You will be asked to confirm the installation before it takes place, and it will then be confirmed. The software will then ask you if you want to install the USB drivers.

After the software installation has been completed, please connect the verifier to install the USB drivers prior to running the software.

Hardware installation
Connect the metal connector on the end of the verifier fly-lead to the metal connector on the power supply lead. Plug the mains lead into the power supply module, and connect the mains lead to the power supply.

Plug the USB lead from the verifier into a USB2 port on the computer. The USB2 drivers that are needed will be installed automatically.

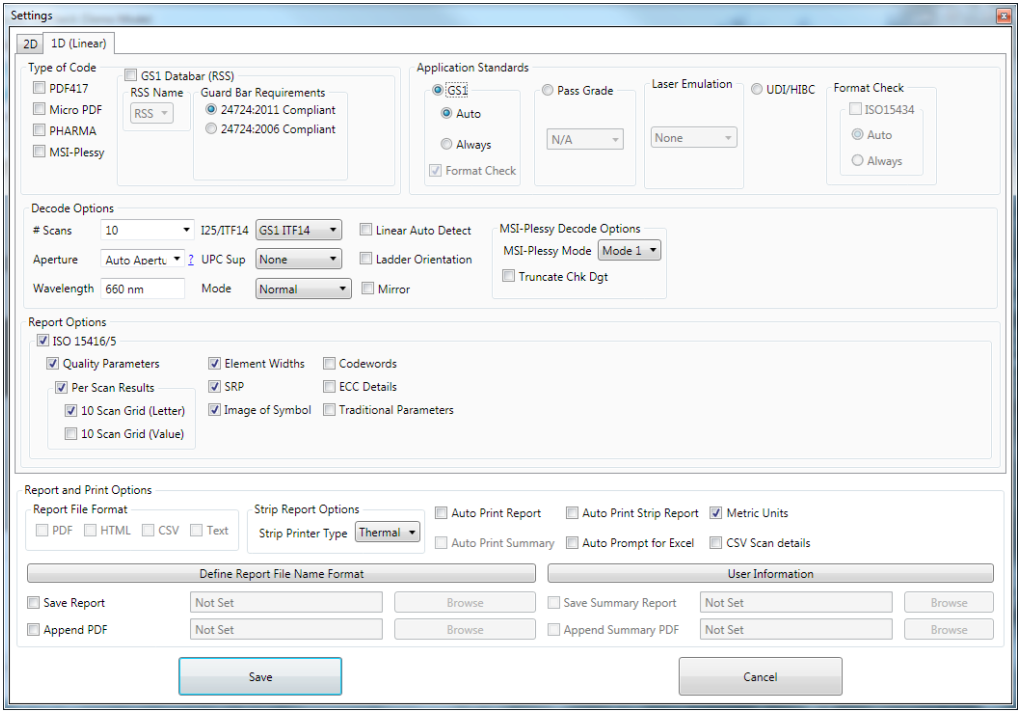
Running the software for the first time
When running the software for the first time, you will be asked to specify certain application options.

The application mode ‘UDI/HIBC’ relates to requirements of the Health Industry Barcode Standard, so choose this if necessary. Most users choose the “Don’t print report after each scan” option. You can always change these later if you need to.

Software (1D)

The Webscan TruCheck software will enable you to verify both 1D (linear) and 2D barcodes. The software can be configured to meet your requirements when verifying both types of barcode.

Configuration of the 1D mode
Double click on the 1D icon to display the configuration screen.



If you are using the verifier to check GS1 barcodes, make sure that the GS1 option is selected in the top right of this window. This will automatically set the correct pass grade for the symbols. In the **Decode Options** section you can choose how many scans are to be used for each verification (ISO/IEC 15416 specifies 10), the size of aperture to be used if you do not want this to be decided automatically, and whether to use the general ITF (Standard I25) or GS1 ITF-14 decode algorithm.

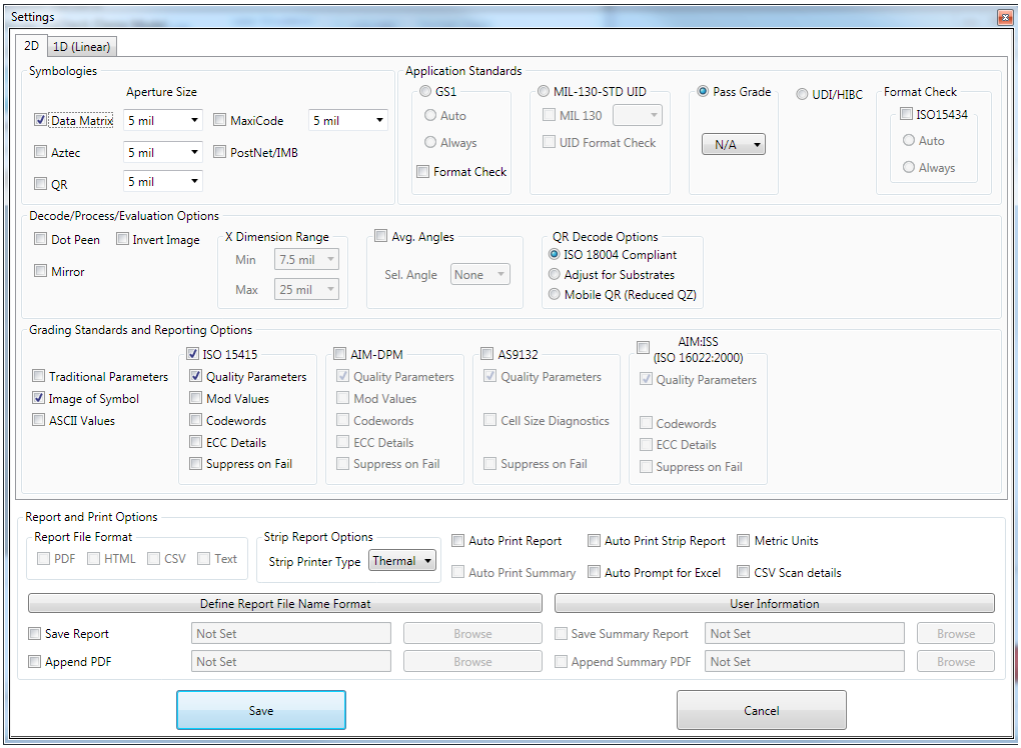
The **Report Options** section allows you to decide how much information you would like included in the verification report. You will need to have **ISO 15416/5** selected. If you choose **Quality Parameters**, more information about each parameter will be provided. If you also choose **Per Scan Details**, information relating to each of the scans will be provided individually. To include an image of the barcode that has been verified, select **Image of Symbol**.

The **Report and Print Options** section allows you to choose in which format the verification reports should be produced, and where they will be saved automatically. Select **Metric Units** at the right of this section if you would like measurements in µm or leave blank if you would like measurements in mils (thousandths of an inch). It is not possible to save verification reports manually, so it is important to choose a file directory where they can be easily accessed. The reports will be named in the format **decoded data in the symbol_DD_MM_YY HH_MM_SS.**, for example **12345678_25_12_16 13_45_20**.

Having saved the verification reports automatically, you will be able to rename them manually using the normal **Save as** option.

Software (2D)

Configuration of the 2D mode
Double click on the 2D icon to display the configuration screen.



These settings are for the verification of Data Matrix, GS1 DataMatrix, QR Code, GS1 QR Code and Aztec codes. Maxicode verification is an extra feature that may be added if required.

Under the **Application Standards** section, select the GS1 option if this is relevant. The MIL-130-STD setting relates to the USA's Department of Defense standard for unique identification. The UDI/HIBC setting relates to the Health Industry Barcode standard for unique identification.

In the **Grading Standards and Reporting Options** section you can choose how much information will be included in the verification report. GS1 users should ensure that ISO 15415 option is selected. The other options to the right of this are only usable with the Axicon 12800 and 12900 verifier which is designed to verify direct part marked symbols.

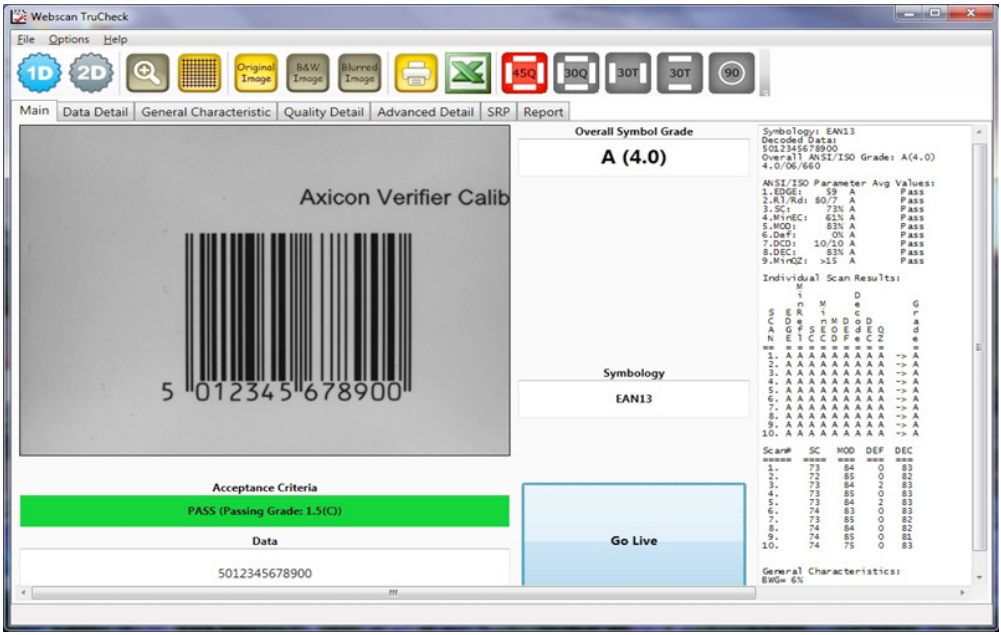
Saving and printing
The saving of reports takes place automatically, and you will have established where they will be saved during the configuration process. They will be saved in the format you have chosen (PDF, HTML, CSV or text) and you can print them as you would any other document.

Using the verifier

It will be easier to use the verifier if you position it so that the cable is away from you with the **Start** button on its right hand side.

Notice the large **Go Live** button at the bottom of the main command window. When you click this, or press the **Start** button on the verifier, a live image will appear in the window. Position the verifier so that the barcode is in its centre.

The **Go Live** button will now say **Verify code**. Click on this, or press the **Start** button again, and the verification will begin. After a few seconds the results will appear in the window, with the ISO grade appearing in the centre.



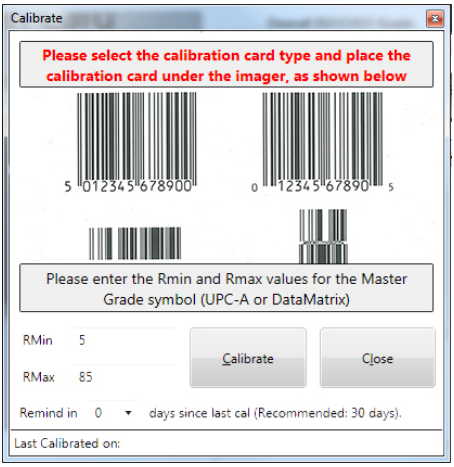
Calibration

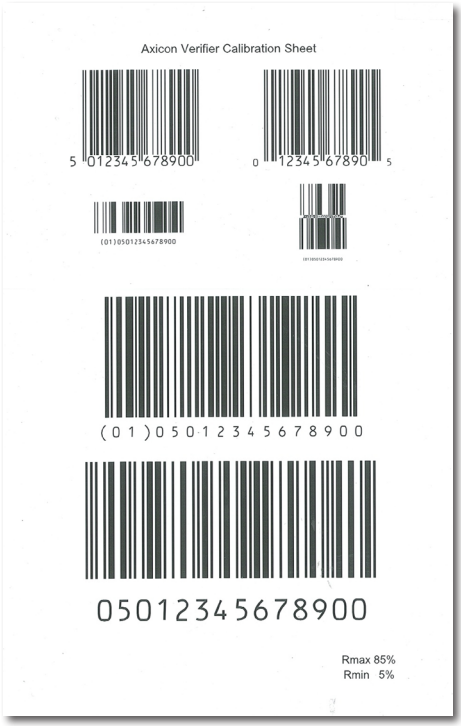
You must calibrate the verifier on a regular basis and we recommend that this is done at least every 15 days. You can set a calibration notification message with the software, and this can be set to a maximum interval of 90 days.

Take the calibration card out of the plastic wallet and check that it is not damaged or marked. Place the verifier over the card so that the bars of the largest barcode are vertical in the camera window.

Click on the **Start** button of the verifier to activate the camera.

Go to **Options**, then select **Calibrate Remote**. The calibration dialogue box will be displayed:





Select the linear barcode, and make sure the Rmin and Rmax values match those on your calibration card. Set the calibration reminder to 15 days, and then click on the calibrate button. The calibration will take about 5 seconds and then the successful window will appear. Press **OK**, and then close the window.

Verification results

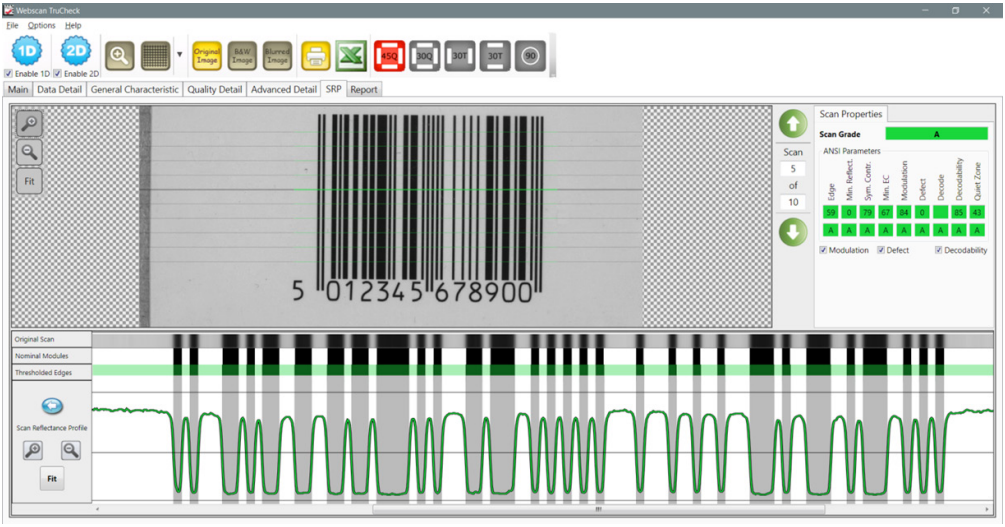
Main | Data Detail | General Characteristic | Quality Detail | Advanced Detail | Histogram | Report

The Main tab provides an image of the barcode that has just been verified, together with its overall grade to the right of the image, and at the far right, a detailed summary of the results that includes the aperture reference number and the wavelength of light being used.

When a linear barcode has been verified, the details for each of the ten scans the verifier has used to calculate the final result are also provided.

The other tabs provide the results set out in slightly different ways.

The most interesting tab is called SRP (for Scan Reflectance Profile) and this provides a graph showing the brightness of the symbol measured across its width. The high points represent the spaces, while the lowest points represent the bars. The round green arrow buttons allow you to move through the ten different scans, and as you do this, the SRP will change as will the results shown to their right. You can also magnify the size of the barcode by using the icons on the far left of the screen.



When you look above the SRP itself you will see three bands. The first one, called **Original Scan**, represents what the verifier saw as it scanned that part of the barcode. The **Nominal Modules** band represents the different module widths (x-dimension widths) of a perfect barcode, and if you hover over these with your cursor, the software will tell you how wide each element (bar or space) is. The **Threshold Edges** band shows you the edges that have been detected by the verification algorithm. If you move your cursor over this band, a small window will appear that provides the reflectance value for each element, and the letter grades and percentage values for Modulation, Defects, and Decodability.

Verifying 2D symbols

You follow the same procedure as for linear symbols, after making sure that you have selected **Enable 2D** below the blue 2D configuration icon at the top of the command window. The results screen will now include an image of the code, with additional details that are required by ISO/IEC 15415.

There is no SRP tab for 2D barcodes, so the one called **Histogram** provides details of the different reflectances of all the modules. The **Advanced Detail** tab provides a diagram that shows the modulation values for each element. In this example, one module is missing, so its value is 0.

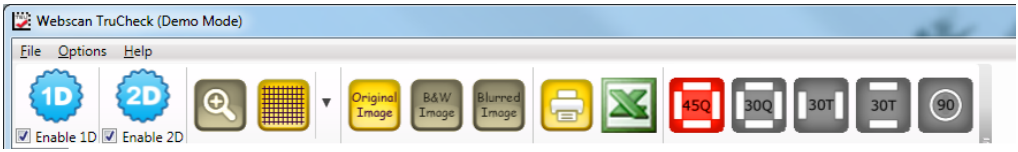
Main | Data Detail | General Characteristic | Quality Detail | Advanced Detail | Histogram | Report

	-1	0	1	2	3	4	5	6	7	8	9	10
-1	96	82	96	92	94	89	100	87	89	91	85	96
0	82	82	87	87	87	78	84	78	84	80	89	92
1	89	85	87	82	83	73	78	83	83	82	80	80
2	82	83	78	85	80	80	77	83	89	89	85	87
3	87	89	91	87	82	82	87	0	78	84	80	96
4	91	92	87	78	82	87	92	82	92	78	80	91
5	89	92	87	83	66	80	82	87	80	75	80	84
6	82	80	80	89	85	78	82	82	83	87	77	94
7	87	96	92	82	87	82	78	78	85	87	94	87
8	96	80	91	85	84	84	80	73	82	85	84	91
9	89	87	80	92	82	75	92	94	98	85	80	94
10	92	92	91	94	96	94	92	82	92	91	89	92

Using the 12800 and 12900

Direct part marked symbols
The Axicon 12800 and Axicon 12900 are designed to read direct part marked (DPM) 2D symbols that are often etched or dot peened onto metallic surfaces. These symbols can be verified in accordance with ISO/IEC 15415 or ISO/IEC TR 29158 (formerly known as the AIM Quality Guideline for Direct Park Marking). This second approach allows for the angle of illumination to be changed, so the user can select angles of 45°, 30°, or 90°, and also whether the 30° illumination should be on all four sides or only two sides.

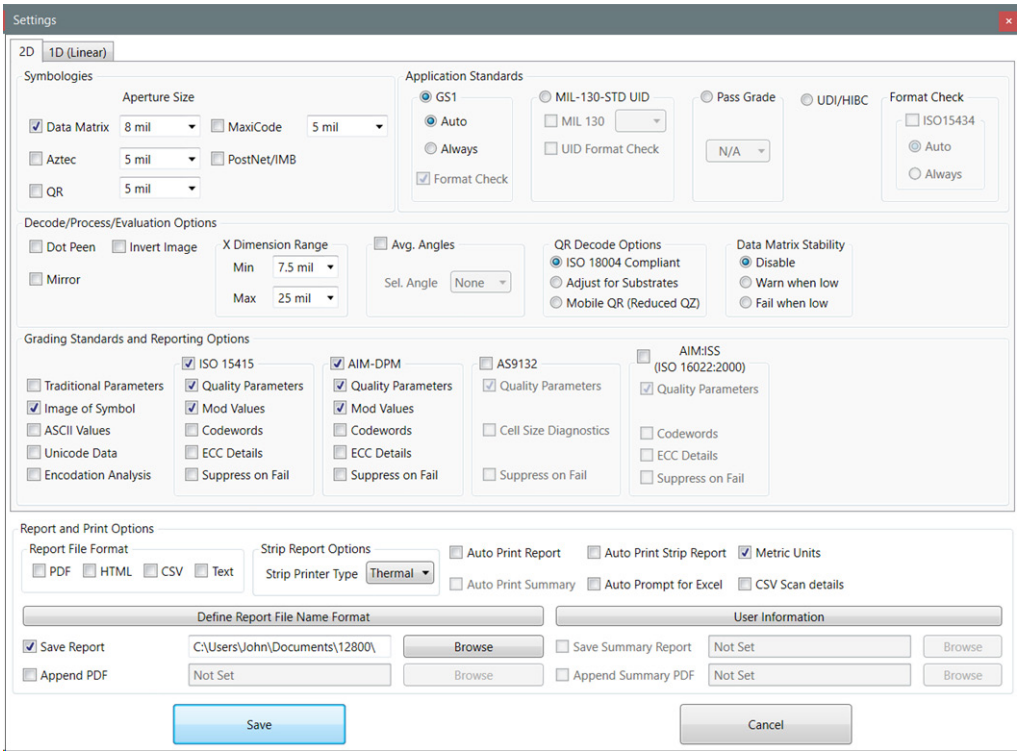
The Axicon 12800 is designed to read symbols on the same plane as its base, while the Axicon 12900 has an adjustable height. This means that the Axicon 12900 can be used to read DPM symbols marked on more unusually shaped objects or where the marking is slightly recessed. The appropriate buttons to change the angle of illumination appear at the top of the main command window, to the right of the green **x** icon.



You should first try to see if you can obtain an acceptable pass grade by using the ISO/IEC 15415 standard, and then if not, by using the ISO/IEC TR 29158 (AIM-DPM) approach. The 2D configuration settings will need to be changed to allow for the AIM-DPM approach and for any other requirements such as those for the USA's Department of Defense's MIL 130 standard.

If you are verifying 2D symbols produced on highly reflective surfaces, you will have to try out these options to see if you can obtain a suitable pass grade.

The tabs in the main window provide the same type of information as they do for the Axicon 12600 and 12700.



If both the GS1 ISO/IEC 15415 and AIM-DPM approaches are selected, the verification report will include both sets of results.

Using the 12900

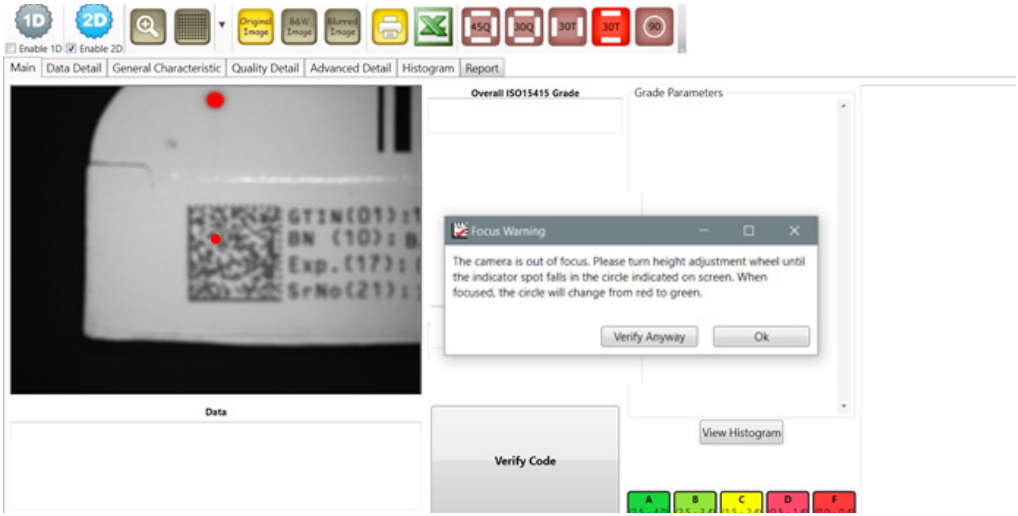
You will use the aluminium handwheel at the top of the verifier to adjust its height above the base plate. The software for this verifier is identical to that for the Axicon 12800, except that it will check if the verifier is the correct distance away from the symbol to be verified after you have clicked on the **Go Live** button.

The screen will look like this, with a new 'Focus warning' window in the middle, if the Verify Code button has been clicked before focussing the image.

Adjust the height using the handwheel, so that the two red dots overlap. The red laser spot will move up or down the image as the handwheel is turned. Best focus will be achieved when the red laser spot is aligned with the small red ring that is shown in the middle of the image and when these two coincide, the red ring will change to a green coloured ring and the Verify code button can then be clicked to decode and verify the symbol.

Caution: Take care when adjusting the height of the verifier above an awkwardly-shaped item to make sure that no part of it damages the unprotected components inside the verifier. The Axicon 12900 uses a Class 2 laser beam during its height adjustment process.

Do not attempt to look directly at its source.


Enable 1D
Enable 2D
Original Image
B&W Image
Blurred Image
45Q
30Q
30T
30T
90
Main
Data Detail
General Characteristic
Quality Detail
Advanced Detail
Histogram
Report
Overall ISO15415 Grade
Grade Parameters
Focus Warning
The camera is out of focus. Please turn height adjustment wheel until the indicator spot falls in the circle indicated on screen. When focused, the circle will change from red to green.
Verify Anyway
Ok
Data
Verify Code
View Histogram
A
B
C
D
F

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 adjusts 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 reflectances 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 card, 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.

To arrange for your verifier to be serviced:

1. Contact us on
   Telephone: +44 (0) 1869 351155 | Fax +44 (0) 1869 352404
   Email: vcas@axicon.com
2. We will provide you with an RMA number (Return to Manufacturer Authority) and an RMA form.
3. Please fill in all details requested on the RMA form, including the RMA number.
4. Return the verifier (including all cables) in its original case with the completed RMA form, purchase order and your payment details to us at Axicon Auto ID Ltd, Church Road, Weston on the Green, Oxfordshire OX25 3QP. We cannot take responsibility for units returned in alternative packaging.
5. We will normally complete the service and re-calibration of your verifier within 7-10 days.

Axicon warranty

The Axicon 12600, 12700 or 12800 are sold with a one 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 us the original transit case (plus appropriate packaging) must be used. If the equipment is returned without the original transit case, we will automatically charge an additional sum for the replacement of this packaging.

We reserve 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 (return to manufacturer authorisation) number before returning any equipment. This number must be quoted on all documentation. We cannot accept responsibility for equipment returned without an RMA number.

THE BARCODE EXPERTS

Church Road, Weston on the Green,
Oxfordshire, OX25 3QP, UK

Certificate of ISO/IEC conformance

We, Axicon Auto ID Limited, of Church Road, Weston on the Green, Oxfordshire, OX25 3QP, UK, hereby declare, that the following barcode verifier(s):

Model number(s) .....

Serial number(s) .....

has been designed and manufactured at our address in the UK to verify barcode quality and to conform to: ISO/IEC 15426-1 and ISO/IEC 15426-2 barcode verifier conformance specification.

The equipment has been tested and calibrated using primary reference test symbols traceable to the USA's National Institute of Standards and Technology's reflectance standards. We also state that this equipment, when used with the latest verifier software, and configured appropriately has the features to meet the requirements of the United States Food and Drug Administration regulation, Title 21 CFR Part 11.

This verifier has been quality assurance checked today, and conforms to these ISO/IEC standards. This declaration of conformity is valid for a year.

Issue date .....

Expiry date .....

Authorised signatory .....

Signatory Name .....

At or before the expiry date the verifier should be returned to Axicon for its annual servicing. This VCAS (verifier conformance and alignment service) will ensure that the verifier remains conformant to ISO/IEC 15426-1 and ISO/IEC 15426-2 for another year.

Contact us

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