ScanVision

Program for Setup and Monitoring of PTX SV Type Scanner/Verifier Products

P/N 002-8151 Rev E
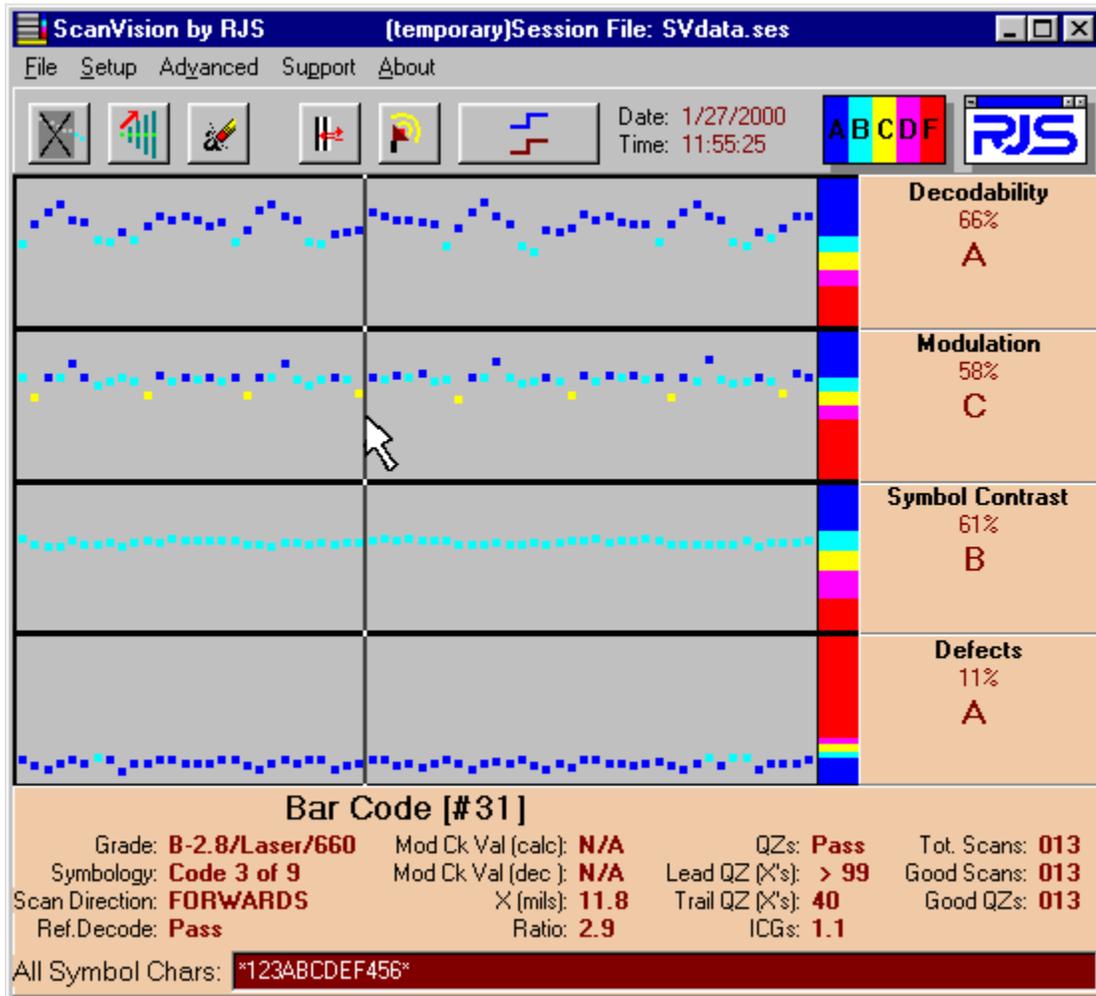
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INTRODUCTION

ScanVision is designed to be a tool used for system setup and real-time bar code monitoring of an PTX SV type scanner/verifier. It is a Windows 95/98/NT application with facilities for sending commands to the SV scanner/verifier and receiving the responses. The program can view bar code analysis results and monitor bar code printing/monitoring sessions. In addition, it can gather and display an ANSI method scan reflectance profile for a particular symbol placed in the SV unit's laser beam scan path. ScanVision also streams the analysis results received from the SV scanner/verifier to data files on hard disk that can be reviewed by ScanVision at a later time.

This manual refers to ScanVision versions 2.02 and higher.

SYSTEM REQUIREMENTS

The following hardware and software is required to use ScanVision:
1. A computer running either Windows 95, 98 or NT.
2. At least one available RS-232 serial port.
3. At least 32 MB RAM.
4. A hard disk with at least 15 MB of free space.
5. A color printer is recommended for users who wish to print analysis results.

INSTALLATION

There are two basic steps for installing Scan Vision. The program must be installed and a communication port must be set up.

ScanVision Software Installation

NOTE: To install ScanVision when a version of ScanVision already resides on the PC, first **uninstall** the residing ScanVision installation. To do this, click the Windows 'Start' button; click the 'Settings' menu item; click the 'Control Panel' to display the Control Panel Window. Double-click on the 'Add/Remove Programs' icon; the 'Add/Remove Programs Properties dialog box will appear. Click on the 'Install/Uninstall' tab. Scroll the list of items in the listbox to locate the 'ScanVision by RJS' item. Click on that item; then click the 'Add/Remove' button and follow the displayed instructions.

To install ScanVision on CD-ROM, insert the CD-ROM. Setup should launch automatically. If not, click the Start button; click the Settings menu item; click the Control Panel submenu item; then open the Add/Remove Programs applet and click on the Install button. Then follow the displayed installation instructions.

To install with diskettes, insert ScanVision Installation Diskette #1 into a floppy disk drive; e.g., drive A. Click the Windows 'Start' button; click the 'Run...' menu item; then Type A:setup.exe
Click the 'OK' button. Then follow the displayed installation instructions.

At the end of the installation procedure click the 'Finish' button to close the ScanVision Installation program. The ScanVision files are stored in a folder located in the Program Files folder. The executable file, ScanVision.exe, can be used to create a desktop shortcut to launch the ScanVision application. ScanVision can also be launched by clicking the Windows 'Start' button; clicking the 'Programs' menu item; and clicking the ScanVision sub-menu item.)

The first time ScanVision is launched, a dialog box is displayed that shows all of the communications ports on the PC in a drop-down list. Select the communications port that is connected to the SV scanner/verifier.

The initial screen displayed after successful installation is the Bar Code Analysis Screen. This is shown in Figure 1 and described in the Analysis Screens section.

PC Communication Port Setup

Plug the supplied null-modem serial cable into the PC and into the SV unit.

The PC communication port settings must match the ScanVision communication parameter settings. To match the communications port baud rate to the verifier baud rate, click the **Setup** item on the application **Menu Bar** (See Figure 1). Then click the 'Match Verifier Baudrate" menu item. ScanVision will detect the verifier's baud rate, and set the port to the detected value.

Software Operation Warnings

Do not let other Windows applications run concurrently with ScanVision. ScanVision operation depends on communication and timing issues that can be disrupted when ScanVision shares Windows resources with other applications. The resource sharing problem can include conflicts with Windows screensavers. ScanVision blocks screensaver operation.

This version of ScanVision limits the number of processed bar codes to 30,700 per session. To use ScanVision for monitoring larger amounts of bar codes, divide the job into multiple sessions, each less than 30,700 bar codes.

TITLE BAR – Screen Display

See Figure 1 in the Analysis Screens section. The area marked B is the title bar.
The application Title Bar is located at the top of the application window. It shows the application's name and the name of the data file that receives the analysis results generated by the verifier. The title changes to identify the current display mode.

The Title Bar also includes the standard Windows Minimize, Maximize and Application Termination buttons.

MENU BAR – Screen Display

See Figure 1 in the Analysis Screens section. The area marked C is the Menu Bar.
The Menu Bar is located just below the Title Bar. It lists five menu categories: File, Setup, Advanced, Support and About

File Menu

This menu controls data file handling functions, printing and application termination. The format is typical of any Windows type file menu.

Setup Menu

This menu is used to configure the ScanVision analysis displays and program the most common SV scanning and communication parameters.

Select Graphs
This item allows the user to select which bar code analysis parameter graphs are displayed on the Bar Code Analysis Screen (see Figure 1.)

Fail Criteria
This item allows the user to program the fail criteria for each graph displayed during Session Mode. In each ANSI method parameter graph (Reference Decode not included), a horizontal red line shows the user-set fail threshold. This is useful when viewing trends of individual parameters in the bar codes being analyzed.

Select Symbologies

This item allows the user to program the SV unit to enable/disable individual symbology decoders. This is useful for either more secure decoding or sometimes faster throughput if a single symbology type is always being analyzed.

Select Comm Port

This item allows the user to select a comm port in the host PC.

Change Verifier Baudrate

This item allows the user to program the SV scanner/verifier baud rate.

Match Verifier Baudrate

This item allows the user to allow ScanVision to detect and match the baud rate of an SV scanner/verifier. This is useful when using ScanVision as a diagnostic tool in a system that is using the SV communication interface. ScanVision can easily be inserted in the system without re-programming the SV serial port, therefore when re-connecting the SV unit back to the host, all communication parameters remain compatible with the host.

Minimum Codes Per Sync

This item allows the user to program the minimum number of bar codes expected in a sync interval. This parameter is important for detecting No Read conditions.

Ladder Mode and Picket Fence Mode

These items allow the user to program the SV unit to scan bar codes travelling in either "picket fence" or "ladder" direction. "Picket fence" orientation is defined as the bar code travelling through the laser beam in the direction of the height of its bars. "Ladder" orientation is defined as the bar code travelling through the laser beam in the direction of the beam path. **NOTE: In cases where the SV is scanning bar codes statically placed in the beam, the "picket fence" direction must be used.**

Advanced Menu

This menu is an extension of the Setup Menu, providing less commonly used, but useful SV system features.

Toggle Display Updating

This item enables/disables display updates in real time. Disallowing updates is useful to allow ScanVision to keep up with a high throughput application.

Toggle Additional Results

This item enables/disables additional analysis parameters to be displayed on the Bottom Panel of the Bar Code Analysis Screen. The additional parameters are intended for debug use only while working with PTX Technical Support.

Static Codes Mode

This item allows the user to set the SV to scan and analyze bar codes placed statically (not moving) in the laser beam.

Moving Codes Mode

This item allows the user to set the SV unit to scan and analyze bar codes that are moving through the laser beam.

Download New Firmware

This item is used for updating the firmware revision level in an SV scanner/verifier.

Support Menu

This menu provides special diagnostic displays and a Comm port feature that are intended to be used only while working with PTX Technical Support.

About (Menu Item)

This item lists information about the origin of ScanVision, the version number of this copy (it also queries the SV unit for its firmware version number) and it shows the copyright warning.

SPEEDBUTTON BAR – Screen Display

See Figure 1 in the Analysis Screens section. The area marked A is the Speedbutton Bar.
The buttons on this bar give quick access to various application modes and features.

Show All Data Points, Last 64 Data Points

, Toggles the "show all data points" mode and the 'show last 64 data points" mode. In the 'last 64 data points" mode, the Graph Display Area (see Figure 1) is updated immediately as the SV scanner/verifier processes each bar code. In the "show all data points" mode, bar code processing can continue, but the ScanVision display is not updated until the user toggles back to the "show last 64 data points" mode. **The Grade Bar (Color Bar) is dimmed when display updates are suspended.**

Zoom In

 Toggles the **Zoom-In** mode. First, it switches from normal mode (displays results for the last 64 bar codes), to 'All' mode (displays all the data points from the session). To zoom-in, hold down the left mouse button and drag the mouse-pointer to a desired data point in the Graph Display Area; Hold down the Ctrl-key when the left mouse button is released (then release the Ctrl-key.) The plots are stretched to show only half of the data on each side of the mouse pointer. To zoom further into the data, repeat this process.

Erase Current Session Data

 Erases all of the data in the current session. Also, the data in the corresponding hard disk files is deleted.

Reflectance Profile

 Scan and Display a new **Reflectance Profile**. (See Figure 3 in the Analysis Screen Section)

Transmit SV Commands

 This button invokes a special screen where up to fourteen individual commands may be composed and transmitted in any order. Proper use requires knowledge of the SV download language. See the SV Download language technical manual for details. This function is intended for advanced setup involving special functions not normally accessed by ScanVision. These can include special transmission formats, special commands in a custom SV firmware version or diagnostic functions used by PTX technical service personnel.

Report an Analysis

Reports a new analysis of any bar code(s) currently in the SV unit's beam path. This is most useful in setup where scan distance and orientation is being finalized. It is also useful when using the SV unit as a standalone verifier scanning codes being manually placed in the beam by the user.

MODES OF OPERATION

ScanVision operates in two basic modes: Session and Reflectance Profile.

Session Mode

This mode scans, analyzes and provides reports on individual bar codes. Reporting is accomplished via the Bar Code Analysis Screen (see Figure 1). The parameters analyzed and many of the parameters displayed are user programmable

Session Mode is entered by default when the program is initially started. It can also be entered from the Reflectance Profile Mode by clicking the Return to Session Mode Speedbutton (see Figure 3.) The Bar Code Analysis Screen (see Figure 1) is displayed and analysis from bar codes passing through the SV unit's beam will be displayed. In cases where a bar code is statically held in the beam analysis of the code can be accessed by clicking the Report an Analysis Speedbutton.

Session Mode Notes

ScanVision updates the bar code analysis graphs each time a bar code is processed by the verifier; but there is a limit to the graph update rate that ScanVision can sustain. Factors that determine the processing load include the bar code analysis rate (bar codes per second) and the number of displayed analysis parameter graphs (selected by the user). The Windows communications facility has a data buffer that allows the graph processing to 'catch up' between bursts of transmitted data. If the incoming data volume exceeds the application's processing limit it will lag farther and farther behind until the buffer overflows and the communications port ceases to operate. If this condition occurs, port operation can be restored by clicking the Initialize Com Port item in the Support Menu list. When using ScanVision to monitor a printing session, the user can test for processing lag during short sample runs by intermittently blocking the beam path and noting the resulting analysis graph update lag. If the apparent lag time is longer when the time between blocking the beam is longer, then an adjustment is required; either reduce the speed the bar codes are traveling through the laser beam or change to a ScanVision display mode that requires less graphic processing. (e.g. see the Toggle Display Updating item in the Advanced Menu list.)

ScanVision streams the verifier analysis results directly to data files on hard disk as the data are received from the verifier. There are two data files: one, contains the verifier analysis results; the other file contains the date and time when each bar code was processed (supplied by the PC clock). The two default files are deleted and a new pair of default files are created each time the ScanVision application is launched. Therefore, the user must rename the files to preserve session analysis results. To do this, use the 'Save As' item in the File Menu. Enter a filename without a trailing file-type identifier. ScanVision uses that name to create two files: one, for the session analysis results data (.ses); and the other for the date/time data (.tim).

When ScanVision is launched it exhibits the same configuration it had when it was last shut down. The configuration parameters that are maintained between application launches include window position, shape and the user selected display mode options. The configuration saving capability extends to selected application's dialog boxes that can be repositioned and reshaped by the user.

Reflectance Profile Mode

This mode gathers and displays a scan reflectance profile for the entire scan path. The profile is displayed with the Reflectance Profile Screen (see Figure 3.) **Reflectance Profile Mode is enabled by clicking the Reflectance Profile Speedbutton.**

ANALYSIS SCREENS

There are two analysis screens used for setup and monitoring an SV type scanner/verifier. These are the Bar Code Analysis Screen and the Reflectance Profile Screen.

Bar Code Analysis Screen

This screen provides all analysis results for a particular bar code. It also shows many bar code analysis results over time. An example is shown in Figure 1 below. Each individual parameter analysis result for one bar code is indicated by a dot on a parameter graph in the Graph Display Area and can be easily accessed via the mouse.

Various points on the screen are marked with numbered and lettered references. Lettered references apply to ScanVision screens in general. The numbered references apply to this screen in particular. Descriptions for each point are included below.

Figure 1 – Bar Code Analysis Screen
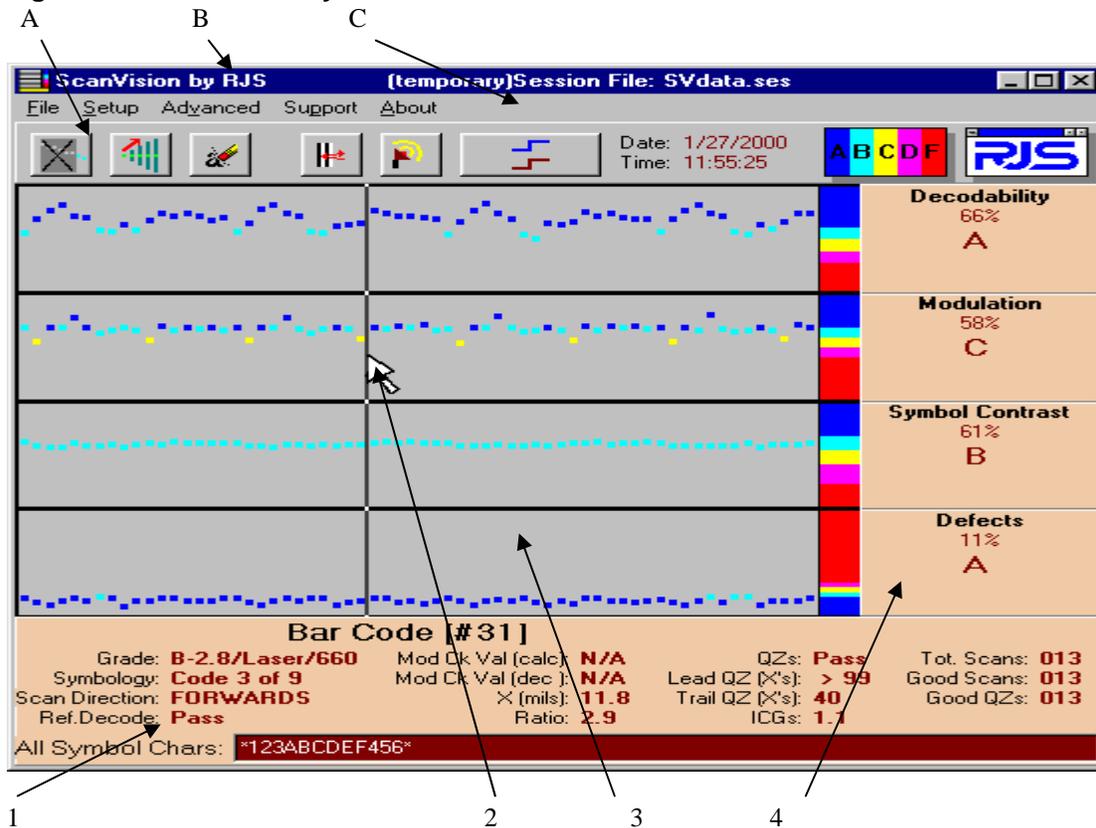
1. **BOTTOM PANEL**

Results are presented for one bar code (the default shows the results for the **last** processed bar code indicated by the column of dots at the far right of the Graph Display Area). Results for other bar codes may be reviewed by dragging the mouse pointer (while holding down the left mouse button) to the data point of interest in the Graph Display Area.

2. **BAR CODE ANALYSIS RESULTS for a PREVIOUS BAR CODE**

This is an example of reviewing a bar code other than the last one processed as described in section 1. above. A vertical line appears while dragging the mouse with the left mouse button held down. Analysis results are shown for the column of dots (the bar code) nearest the vertical line. For example, Figure 1 exhibits the analysis results for 110th bar code in the session.

3. **GRAPH DISPLAY AREA**

This area of the display shows bar code analysis results for each graph type selected by the user. Analysis results are indicated by a dot's vertical position within a plot and by the dot's color. The displayed parameters are programmed via the Setup Menu in the Menu Bar.

NOTE: After some time in the session, the individual analysis points will increase to the point they will appear as a continuous waveform or line. The Zoom-in Speedbutton can be used to select a particular analysis dot in this case. See 2. above for selecting other bar codes.

4. **RIGHT PANEL**

This area displays additional analysis results of the code described in the Bottom Panel section. Unlike the Bottom Panel, the parameters displayed in this section are user programmable via the Setup Menu in the Menu Bar. Click on the Select Graphs menu item.

A.   See Speedbutton Bar section

B.   See Title Bar section

C.   See Menu Bar section

Color Coding

This is an important feature of the ScanVision presentation scheme. Medium blue, light blue, yellow, magenta and red indicate ANSI method bar code parameter grades A, B, C, D and F, respectively. The dots indicating the bar code parameters in the Graph Display Area are each color coded to indicate the grade for that particular parameter for that particular bar code.
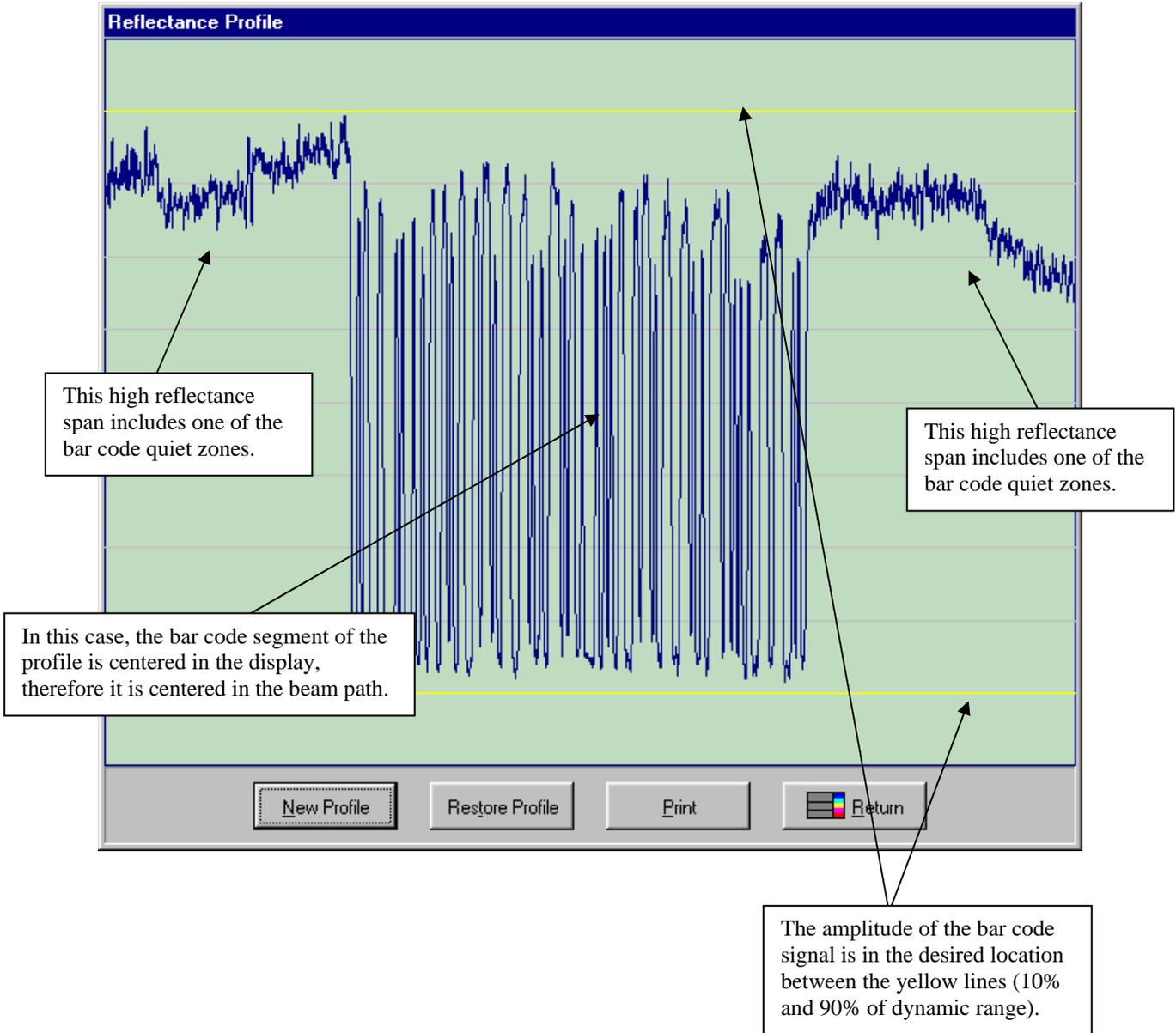
Figure 2 – Color Coding
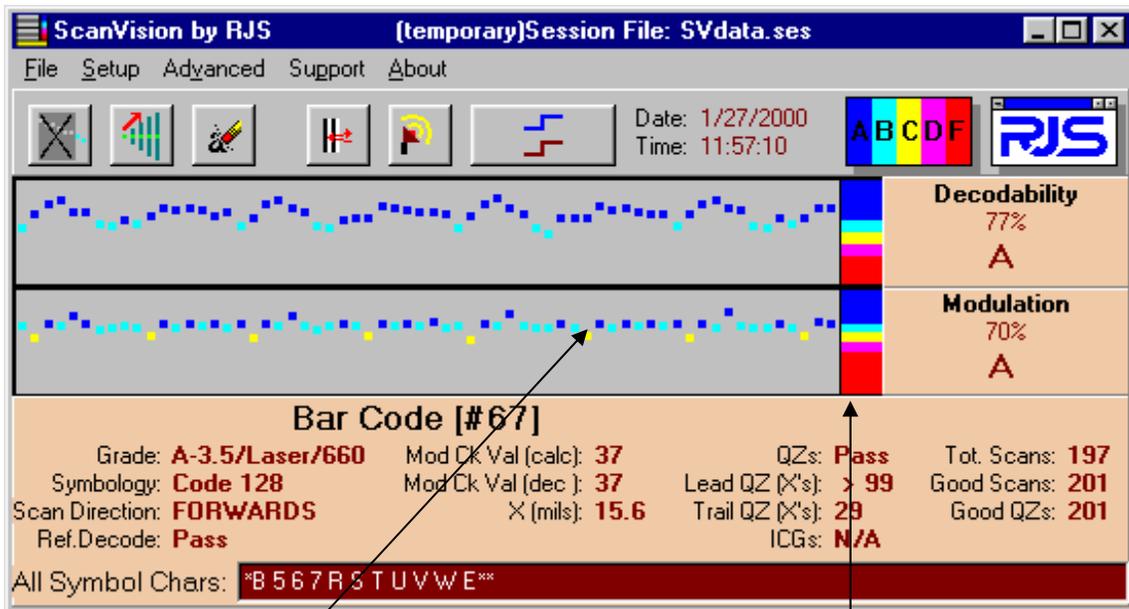
Dot color indicates the ANSI grade value for a bar code.

Color/Grade Bar

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Reflectance Profile Screen

This screen displays a reflectance profile for SV unit's entire scan path. An example is shown in Figure 3 below.

Figure 3 – Reflectance Profile Screen

This high reflectance span includes one of the bar code quiet zones.

In this case, the bar code segment of the profile is centered in the display, therefore it is centered in the beam path.

This high reflectance span includes one of the bar code quiet zones.

The amplitude of the bar code signal is in the desired location between the yellow lines (10% and 90% of dynamic range).

SV SCANNER/VERIFIER SETUP PROCEDURE

Installation of an SV scanner/verifier requires proper mounting position, port configuration(s) and LED configurations to ensure reliable and accurate operation. This section describes the procedures for using ScanVision to ensure proper SV setup and installation.

Each SV unit has a label showing the specified mounting distance and angle for its particular scanner. Follow the steps below to ensure the SV unit is properly mounted and programmed.

1. Mount the SV unit at the proper distance and angle. Use Figure 4 as a reference.
2. Connect the power and communication cables to the SV unit.
3. Set the SV unit for picket fence bar code travel direction.
4. Place a sample bar code in the center of the intended laser beam path. For best results, this sample should match the type of bar code(s) and material that is to be analyzed in the final application. Knowing the X dimension (narrow element width of the bar code(s) is a big plus as will be seen in Step 5.
5. Take a Scan Profile with ScanVision.
    a. Ensure the bar code(s) is in the center of the scan path.
    b. Ensure the scan profile contains no distortion from light reflecting from objects in or near the light path. (An example of a good reflectance profile is provided in the ScanVision Operator's Guide.) One major aspect in a good profile is the low reflectance points (the bars) in the symbol are uniform all the way across the code. Optimum signal amplitude should be adjusted so the bar code element reflectances are between the 90% and 10% marks shown in yellow on the screen. Scanner angle has the most effect on the signal amplitude.
    c. Continue adjusting the SV unit's placement a good, centered scan profile is obtained. The scan angle may have to be altered slightly or a light shield may have to be installed in extreme cases to achieve a good reflectance profile.
6. * Place ScanVision in Session Mode.
    a. Click on the Report an Analysis Speedbutton.
    b. Ensure that X in the lower panel of the Bar Code Analysis Screen matches the X dimension of the symbol within +/- .1 mil.
    c. Adjust distance of the SV100 from the bar code until the X dimension matches the desired value. (If X is analyzed as too large, move the scanner farther away; if X is too small, move the scanner closer.)
7. Repeat steps 4 and 5 until no more mounting adjustments are required.
8. Remove the symbol from the laser beam path.
9. Program the SV unit's ports, LED's, sync mode, etc. (if required).
10. Calibrate the SV unit if any reflectance parameters (such as symbol contrast) are programmed in this application to report to a host or activate any ports. Each SV unit is supplied with a calibration symbol.
11. The SV scanner/verifier is now ready to operate for picket fence bar code travel direction. If Ladder Mode is being used and the desired scanning length for ladder bar code travel direction is programmed, place the unit in ladder mode. The unit is now ready to operate. If ladder mode scanning length is to be programmed, continue with the following steps.
12. Turn off partial decodes using the ~Lp0 command.
13. Display additional results in ScanVision through the Advanced Menu.
14. ** Place a sample of a bar code that is to be analyzed on the farthest position towards the left end of the laser beam where the code is intended to be scanned.
15. Analyze the code by clicking the ScanVision Report an Analysis Speedbutton.
16. Confirm the code is being read and analysis results are proper. If not, move the code to the right until acceptable analysis results are achieved.
17. Record the value of the "Hor Pos" value in the additional parameters for the acceptable analysis. This value will consist of four digits. This value will be used for the "Set Ladder Start Position" setting later in the procedure.

18. Move the code to the farthest position towards the right end of the laser beam where the code is intended to be scanned.
19. Similar to steps 15, 16 and 17, obtain an acceptable analysis and record the "Hor Pos" value for the acceptable analysis. This value will be used for the "Set Ladder Stop Position" setting later in the procedure.
20. Place the unit in Ladder mode through the Setup Menu. Place the proper values for the "Set Ladder Start Position" and "Set Ladder Stop Position" boxes during menu process.
21. Enable partial decodes if desired for this application.
22. The unit is now ready to operate for ladder bar code direction.

*This step is not mandatory, but highly recommended. Scanner focus is dependent on the scan distance. Good focus maximizes the SV unit's ability to detect printer errors and failures. If this step is omitted, take extra precaution in setting and measuring the scan distance.

** This procedure assumes the SV unit is mounted as shown in Figure 4 with the protruding surface up and the user is looking at the beam from behind the SV100. In this orientation, the beam is sweeping from left to right.

SCANNER POSITIONING

Each SV100 has an attached label that indicates the type of scanner, focus distance and recommended scan angle. Use the scan distance and scan angle information to mount the scanner per Figure 2.

Figure 4 – Scanner Positioning

Scan Distance

Laser Beam

Scan Angle

Beam Intersects Bar Code Here
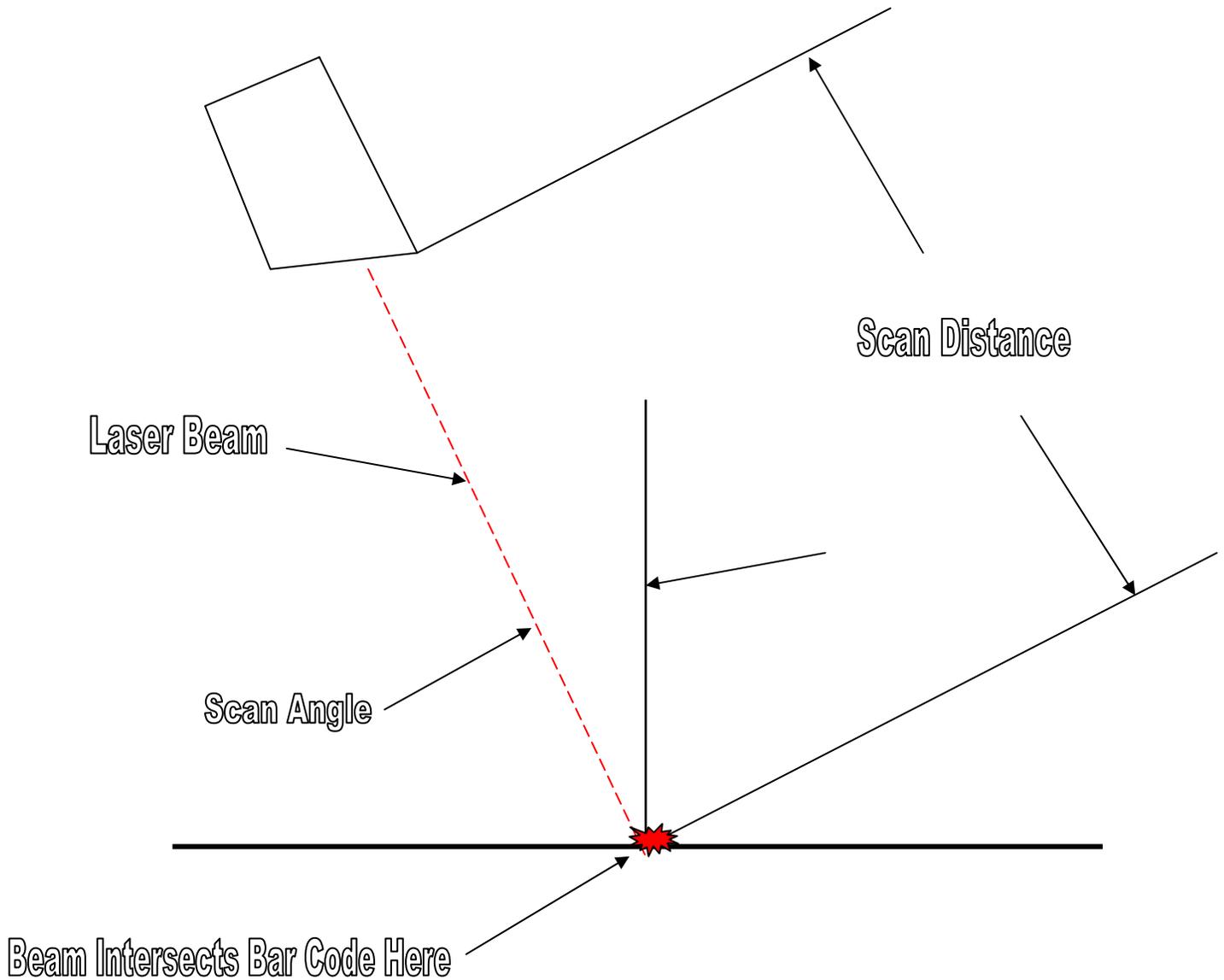
Notes:
1. Scan distance is measured from the protruding edge of the face of the scanner.
2. Scan angle is measured in degrees relative to vertical from the surface of the bar code.
3. The scanner can be mounted in any orientation, the figure is meant to show the beam angle relative to the bar code placement in the beam.