

Xaminer ELITE

Bar Code Verifier

User's Guide

Revision 2.0b

Stratix Corporation
4920 Avalon Ridge Parkway
Suite 600
Norcross GA 30071
1-800-883-8300
www.stratixcorp.com

Regulatory Information

Radio Frequency Interference Requirements

This device has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the Federal Communications Commissions Rules and Regulation.

Radio Frequency Interference Requirements - Canada

This Class A digital apparatus has been tested and found to be in compliance with the requirements of Industry Canada ICES-003 for Digital Apparatus.

Product Safety

This product has been tested and found to comply with the product safety requirements of UL 60950 and CAN/CSA-C22.2 No. 60950-00 for Information Technology Equipment, and has been approved as a UL Listed product.

Laser Devices

The Stratix Xaminer Elite complies with US 21CFR1040.10. The Xaminer Elite is a Class 2 laser product, as marked on the Laser Warning Label, located on the front of the product.

Class 2 laser scanners use a low power, visible light diode. As with any very bright light source, such as the sun, the user should avoid staring directly into the light beam. Momentary exposure to a Class 2 laser is not known to be harmful.

The provisions of 21CFR 1040 require that you be made aware of the following warning:

CAUTION – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Stratix Xaminer ELITE – Position of Class 2 Laser Warning Label



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Preface

Thank you for selecting the Stratix Xaminer ELITE bar code verifier manufactured and supported by Stratix Corporation. It is engineered to quality standards, and should prove to be both durable and reliable.

Stratix strives to achieve the highest quality in verification. Your selection of the Xaminer ELITE means you are taking similar strides to achieve quality in your bar coding environment. We applaud your commitment to quality.

Stratix Corporation . . .

Bar Code Systems. Solutions. Service.

Chapter 1 - Introduction

Why Verify

Verification of bar code symbols for quality is important to anyone printing or creating bar codes for business or industry.

Millions Spent

Each year companies and industries spend millions of dollars on hardware and software designed to capture the information encoded in a bar code. These expenses are justified by efficiencies that the users gain by incorporating bar coding into their daily operations.

Poor Quality Bar Codes Jeopardize Efficiency

Quite frequently, however, poor quality bar codes prohibit bar code users from realizing the full potential and benefits of bar code scanning.

Vendor Compliance

In the retail arena, poor quality bar codes have become so prevalent that many retailers have adopted vendor compliance programs recommending the use of verification equipment as a means of ensuring bar code quality.

Manufacturers of verification equipment offer products ranging from “Go/No Go” units to units providing detailed diagnostics including bar and space dimensions, print contrast levels, and American National Standard Institute (ANSI) grading.

Some verification units are offered with contact scanners, while others use non-contact scanners. Most verifiers in the market today read the symbologies outlined in this guide.

Printers and Manufacturers Use Scanners

Many printers and manufacturers use a bar code scanner as a means of determining the quality of a printed symbol. A scanner is a device that recognizes data encoded in a bar code symbol. These devices **do not** provide quality information and should **never** be used as a quality control device, or used in place of a bar code verifier.

Bar Code Verifiers vs. Bar Code Readers

Verification is a method of analyzing a printed bar code against a published specification to determine whether or not the bar code meets required specifications, and that it scans properly.

A verifier should be able to decode and measure even the most inferior symbol and indicate the area(s) where the symbol failed to meet quality standards. A scanner, on the otherhand, may not read a poorly printed symbol at all.

A bar code reader does not compare a scanned symbol to a written specification. Bar code readers cannot determine if a bar code symbol is read incorrectly, if it will be readable on the first scan, or able to be read at all. A bar code verifier makes all these important determinations before a symbol is mass-produced.

Verification Allows for Correction

Verification shows you where the aspects of a bar code symbol are substandard. Verification is the only true measure and assurance of bar code scannability.

Understanding the Basics of Bar Coding

As with any technology, the various facets of bar coding are not inherent. Those involved must understand all aspects of the technology before the full potential and benefits can be realized. An understanding of the basics of bar coding is the first step to insuring acceptable symbol quality.

Bar code verification allows you to implement the first steps of a bar code quality control program that guarantees a 100% scan rate. High quality bar codes assist trading partners in achieving maximum benefit from scanning technologies.

Scanning problems are often the result of the lack of knowledge or other oversights on the part of suppliers or packagers. With a thorough understanding of bar code technology, these occurrences can be virtually avoided.

When a bar code symbol scans successfully on the first attempt, accurate information is gathered in a timely manner. Poor bar code quality costs industries millions of dollars each year due to inaccurate key entry, lost productivity, and customer dissatisfaction.

The information in this chapter is designed to define and clarify the critical aspects of a bar code for the beginner as well as for the experienced user.

Common Bar Code Characteristics and Quality Control

There are four major types of bar codes (also referred to as symbologies). These four symbologies have common characteristics and should meet certain visual and technical quality control characteristics in the printing process.

Bar and Space Patterns - Characteristics

Each symbol has a defined pattern of bars and spaces that are machine-readable by a bar code reader. The widths of both the bars and spaces vary and represent different characters. The height of the bars has no such interpretative information, but provides data redundancy that does not limit the scanner to a single scan path.

As bar codes are printed, the bar and space dimensions may deviate from the desired size as a result of ink gain or loss that can occur. Each bar code symbol has a specified tolerance limit that allows for a certain amount of ink gain and/or loss. If the dimensions of a printed symbol are within this allowable tolerance limit, the symbol is considered to be “in-spec” and should scan on the first attempt with any scanner. Symbols that exceed the tolerance limits are “out-of-spec” and can adversely affect the scan rate.

Character Set

Each symbol has its own defined character set. In some cases, these sets are alphanumeric with additional special characters. Other symbologies are numeric and allow for the encoding of the numbers 0 through 9.

Human Readable Information - Quality Control

The information encoded in a bar code may be represented in human readable form printed above or below the printed symbol. This representation is optional with some bar codes, and mandatory with others. All encoded information should always be presented in human readable form, unless specifically stated otherwise.

Fixed vs. Varying Length

Some symbologies vary in length, depending on the amount of information needing representation. Other symbologies have a fixed length and always contain the same amount of information.

“X” Dimension

Each symbol contains an “X” dimension. This dimension defines the narrowest bar or space in a bar code symbol. This element is measured in thousandths of an inch, or mils (millimeters in metric measurements), and directly affects the physical length of a bar code symbol.

Modular vs. Binary

Modular bar codes contain encoded information with bars and spaces of varying widths. These varying widths are from one to four times the width of the “X” dimension. A binary code contains only two widths of bars and spaces. The first is the narrow bar or space in the bar code (the “X” dimension). The second is a wide bar or space (a multiple of the “X” dimension), and is determined by the allowable wide to narrow ratio.

Quiet Zones

Each printed symbol has a specified minimum quiet zone. The quiet zone is a defined minimum clear area that is at the beginning and end of a bar code symbol. The quiet zone must not contain any marks or conflicting artwork of any kind.

Start and Stop Patterns

Each symbology has a distinct pattern of bars and spaces at its beginning and end that identifies the symbology and scanning direction. The start pattern is normally at the left end of a horizontally oriented symbol. The stop pattern is normally at the right end of the symbol.

Spots and Voids

Each printed symbol should be checked for spots in the spaces and voids in the bars. Spots and voids can adversely affect successful scanning.

Truncation

Truncation is the shortening of the bar height, usually in an attempt to use less space on packaging. U.P.C. symbols have a specified height for each magnification. Truncation of a U.P.C. symbol should be considered as a last alternative to bar code marking, and is not endorsed by the UCC. Other symbologies have recommended height minimums.

Check Characters

Check characters are mandatory with some symbologies and optional with others. The check character allows a mathematical calculation to be performed that ensures the accuracy of the encoded information. Some bar code symbologies use one check character, while others use two check characters.

Print Contrast

Print contrast, now considered obsolete, but retained for historical purposes, is a measurement of the difference in reflective value between the bar color and the space color of a bar code symbol. Specifications typically state that a bar code symbol must achieve a minimum print contrast level (often called print contrast signal). The Xaminer uses a mathematical formula to calculate and measure the light reflectance of the bars and spaces.

Print Quality

Each printed symbol should exhibit uniform ink coverage from left to right and top to bottom.

Density

Symbologies are printed in a variety of sizes referred to as densities. Densities are measured in characters per inch (CPI). The density of a binary bar code is a direct function of the “X” dimension of a symbol and the selected wide to narrow ratio.

Symbol Location

Some symbology specifications include guidelines that define proper symbol placement on packaging. These specifications should be followed at all times.

The Universal Product Code

The Universal Product Code (U.P.C.) symbol is a standardized numbering system providing unique identification of an item. It is widely used in the retail community. The Uniform Code Council (UCC) administers U.P.C. guidelines and publishes the specifications for this symbology.

Two Commonly Used Versions

At present, there are two commonly used versions of the U.P.C. symbol designed for item-level identification.

- U.P.C.-A
- U.P.C.-E

The corresponding European equivalents are:

- EAN-8
- EAN-13

U.P.C.-E is a suppressed form of U.P.C.-A, and can be expanded to its “A” form. EAN-13 uses a special parity code to create a thirteenth data character within a U.P.C.-A size symbol. EAN-8 is a special short form and is unique and independent of EAN-13.

U.P.C.-A and U.P.C.-E

U.P.C.-A, Figure 1.1, is the more commonly used version.

U.P.C.-E, Figure 1.2, is a suppressed version of a U.P.C.-A, and is used mainly on small packaging that does not permit the use of the larger symbol.

***Note:** U.P.C.-E requires a number system character of zero, and the use of zeroes in the product identification number.

Figure 1.1



Figure 1.2



Character Set - Two bars and two spaces are required to encode a character. Characters are numeric only (0-9).

Start/Stop Pattern – For UPC-A and UPC-E, the code always starts with the following three elements:

- Narrow bar
- Narrow space
- Narrow bar

The U.P.C.-A stop pattern is:

- Narrow bar
- Narrow space
- Narrow bar

The U.P.C.-E stop pattern is:

- Narrow space
- Narrow bar
- Narrow space
- Narrow bar
- Narrow space
- Narrow bar

Middle Guard Bar Pattern - Divides the U.P.C. code into two halves of equal size, but with unique patterns, allowing the code to be read in omni-directional fashion. U.P.C.-E does not have a middle guard.

Code Type - Modular, fixed length (12 digits for U.P.C.-A; 6 encoded digits for U.P.C.-E with eight illustrated human readable digits. Eight digits for EAN-8 and 13 digits for EAN-13).

Human Readable - U.P.C.-A has 12 digits encoded. The human readable portion should display all 12. U.P.C.-E has 6 digits

encoded with the number system character and check digit character implied, but the UCC promotes printing all eight digits.

Check Digit - Required (Modulus 10 calculation).

Encoded Information - U.P.C.-A

- Number system character (one digit) - assigned by the UCC
- Manufacturer identification number (five digits) - assigned by the UCC
- Product information number (five digits) - user selected
- Check digit (one digit) - mathematical calculation

Allowable Sizes - Sizes for U.P.C.-A and U.P.C.-E are defined by a magnification factor based on the “X” dimension size. These magnifications range from 80% to 200% of the nominal size, or 100% size. The printing process further defines the allowable size. 100 % size is 1.235” in bar-to-bar width, 1.020” in height, and has an “X” dimension of 13 mils. See Appendix A for more information on dimensions and tolerances.

Interleaved 2 of 5 (ITF)

Interleaved 2 of 5 (I 2 of 5 or ITF), Figure 1.3, is a symbology commonly used in industrial and retail applications.

Common Format

A common format for this symbology is I 2 of 5 (ITF) SCC-14. The UCC recognizes the symbology for shipping container markings in the *U.P.C. Shipping Container Code and Symbol Specification Manual*.

Character Set – 5 bars or 5 spaces encode each character. Characters are numeric only (0-9).

Bar and Space Patterns - Characters are paired together. The first digit of the pair is encoded with five bars. The second digit is encoded with five interleaving spaces. Two of the five spaces or bars used to encode a character are always wide. See Figure 1.3 for an illustration of the interleaved encodation.

Figure 1.3



Start/Stop Pattern - Starts with four narrow elements, beginning with a bar, and ending with a space. The stop pattern is wide bar, (WB), narrow space (NS), narrow bar (NB).

Code Type - Binary, and of varying lengths. Requires an even number of digits to encode information.

Human Readable - Optional, and typically used.

Check Digit - Optional (modulus 10 calculation)

Encoded Information - Contingent upon data requirements, although an even number of digits is required. A leading zero should be added if an odd number of digits encoded.

Allowable sizes - The minimum “X” dimension is .0075”. The maximum “X” dimension is base on each particular application. The wide to narrow ratio is 2.0:1 to 3.0:1 with an “X” Dimension

greater than .020". Standards recommend that a symbol be printed at 3.0:1 whenever possible; ratios less than 2.2:1 are discouraged.

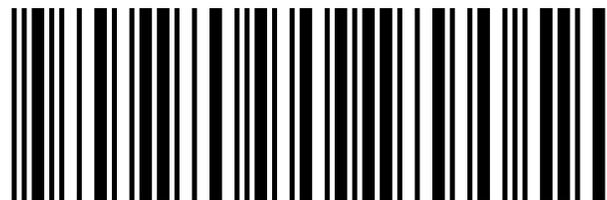
***Note:** The Xaminer Elite allows ratios up to 3.2 to conform to some specialized industrial standards.

Allowable Symbol Height – 0.2" or 15% of the symbol length, whichever is greater.

U.P.C. Shipping Container Symbol

The UPC Shipping Container Symbol, Figure 1.4, utilizes the I 2 of 5 (ITF) SCC-14 symbology. It is designed specifically for shipping carton markings in the retail industry, and has a required format and check character. Contact the UCC for additional information.

Figure 1.4



1 001234 567890 2

Code 3 of 9

Code 3 of 9 (Code 39) is a symbology popular in a variety of applications including the U.S. Department of Defense, and the automotive and healthcare industries.

Figure 1.5 is an example of a Code 39 symbol.

Figure 1.5



Character Set - 0 through 9, A to Z, the period (.), the percent sign (%), the dollar sign (\$), the blank space, and the plus sign (+). The asterisk (*) is used to represent the symbol's start and stop pattern.

Bar and Space Pattern - Three wide elements and six narrow elements. The intercharacter gap is nominally the same width as the narrow element.

Code Type - Binary, varying lengths.

Human Readable - Optional, and typically used.

Check Character - Optional (modulus 43 calculation).

Encoded Information - Contingent upon data requirements.

Allowable Sizes - The minimum "X" dimension is .0075". The wide to narrow ratio is 2.0:1 to 3.0:1 with an "X" dimension greater than .020". The maximum "X" dimension is based on each particular application. AIM recommends that the minimum

ratio never be allowed to go below 2.2, especially with smaller “X” dimensions.

***Note:** The Automotive Industry Action Group (AIAG) allows a wide to narrow ratio up to 3.2:1; therefore, the Xaminer ELITE can be set to read a wide to narrow ratio range of 2.0:1 to 3.2:1.

Allowable Symbol Height - 0.2" or 15% of the symbol length, whichever is greater.

Code 128

Code 128 is a versatile code that is used for a variety of applications. Figure 1.6 illustrates a Code 128 symbol.

Figure 1.6



Common Specifications

A common specification is the U.P.C./EAN-128 SCC-14, SSCC-18, U.P.C. coupon codes and HIBCC.

Character Set - The 128-character ASCII set. See Appendix B.

Bar and Space Patterns - Three bars and three spaces are required to encode a character. Subset C encodes two characters using three bars and three spaces.

Start/Stop Pattern - One of three start characters, A, B, or C should be used at the beginning of the symbol to define the initial code set. The stop pattern is seven elements comprised of four bars and three spaces. The start/stop pattern is not shown in human readable form.

Code Type - Modular, varying length.

Human Readable - Optional, and typically used. For UCC and SSCC applications, the human readable information is mandatory.

Check Character - Required (modulus 103 calculation). There are additional hidden characters that are part of the symbol's construction:

- Change set A, B, C
- Shift A↔B
- Func 1, 2, 3, 4
- Check character mandatory for Mod 103

Encoded Information - Contingent upon data requirements.

Allowable Sizes - Minimum "X" dimension is .0075".

Allowable Symbol Height – 0.2" or 15% of the symbol length, whichever is greater.

Code 128 Special Format Rules

The following are four special format rules that apply to Code 128 symbols for Start Function 1 AI, if AI equals:

- “00” for SSCC-18 format
 - “01” for SCC-14 format
 - “81” for one of five U.P.C. coupon codes
1. Any start Function 1 is considered a UCC formatted symbol. Only the above formats are explicitly checked.
 2. If Code 128 UCC is set, then the symbol must begin with any start and Function 1 character, otherwise an error message is generated and the Xaminer reports a failing grade for the symbol.
 3. The symbology descriptor is changed from Code 128 to SCC-14, SSCC-18, or a coupon code.
 4. Coupon codes are a part of a pair of a complex symbol set. Each coupon must be associated with a U.P.C.-A NSC 5 symbol (the first digit of a U.P.C.-A symbol must be a “5”).

U.P.C./EAN-128 Serial Shipping Container Symbol

The Serial Shipping Container Symbol, Figure 1.7, is a popular specification that uses Code 128 symbology. It is meaningful only when used in association with Electronic Data Interchange (EDI) and the Advance Shipping Notice (ASN). The UCC administers this specification. Contact the UCC for more information on this symbol.

Figure 1.7



The Xaminer ELITE automatically validates the format when it detects this type of symbol.

Reduced Space Symbology (RSS)

RSS family contains three symbol groups, RSS-14, RSS Limited and RSS Expanded.

RSS-14 group: encodes 14-digit EAN.UCC item identification. It has four versions: RSS-14, RSS-14 Truncated, RSS-14 Staked and RSS-14 Stacked Omni-direction.

Figure 1.8 is a RSS-14 symbol and Figure 1.9 is RSS-14 Stacked symbol.

Figure 1.8



Figure 1.9



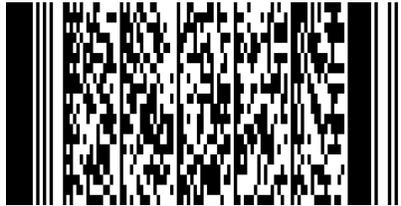
RSS Limited: encodes 14-digit EAN.UCC item identification in a linear symbol.

RSS Expanded: encodes EAN.UCC item identification plus supplementary AI element information such as weight and “best before”.

PDF 417

PDF 417 is a two-dimensional symbol. It is being adopted by many industrial groups (Department of Defense, state government’s medical, shipping) because of superior damage tolerance and large data storage capability. A typical PDF 417 symbol has error correction capability that allows the symbol to be damaged, and still recover encoded data. See Figure 2.0 for an illustration of the PDF 417 symbol.

Figure 2.0



Character Set

Any ASCII data character.

Bar and Space Patterns

Each group of four bars and four spaces makes up a codeword. These codewords have special meanings and functions dependant on where it is located in the symbol matrix. The outside rows are the row indicator. These indicate the total number of rows, total number of columns (size of the matrix), and the security level (amount of error correction). The upper portion of the data area is the basic encodation of the symbol. The lower portion is the error correction codewords. The data area codewords are compressed. Typically, the compression is 60-80 percent, depending on the nature of the data to be encoded. Some codewords are needed, while some are reserved for special uses.

Start/Stop Pattern

The continuous member on the left/right side of the symbol.

Human Readable

Normally the human readable is not provided. Stratix recommends that some code or fragment be printed for extreme recovery.

Symbol Size

Required to be printed in a uniform size. The Y dimension is to be three times the X dimension. Nominal X dimension is 10 mils, where the Y dimension equals the symbol height, and the X dimension equals the symbol width (smallest bar or space).

Composite Symbology

Composite symbol consists of a linear component associated with a multi-row 2D Composite Component. The linear component encodes the item's primary identification, and the 2D Component encodes the supplementary data such as a batch number or expiration date. The 2D Composite Component is printed above the linear component with the same X dimension as the linear component. Figure 2.1 illustrates an RSS-14 Stacked Composite symbol encoding 0103412345678900 and 17010200 respectively.

Figure 2.1



The Linear component is one of:

1. a member of the RSS family

2. a member of the EAN/UPC (EAN-13, EAN-8, UPC-A, or UPC-E)
3. UCC/EAN-128

The 2D Composite Component (abbreviated as CC) is one of:

1. CC-A, a variant of MicroPDF-417, designed for efficient encoding of supplemental application identifier data
2. CC-B, a MicroPDF417 symbol with a codeword of 920 in the first data codeword position as a linkage flag, and denoting EAN.UCC data compaction
3. CC-C a PDF417 symbol with a codeword of 920 in the first data codeword position as a linkage flag, and denoting EAN.UCC data compaction

Character Set

1. Both linear and 2D Composite Component encode a subset of ISO646, consisting of the upper and lowercase letters and digits, and 21 selected punctuation characters
2. The function character FNC1 and a Symbol Separator character

Supported component combinations

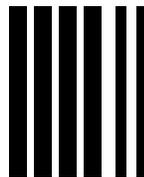
Based upon the width of the linear component, a choice of “best-fit” 2D composite Component is specified. Table lists all of the permissible combinations.

Linear Component	CC-A/CC-B	CC-C
RSS-14	4-columns	No
RSS-14 Stacked	2-columns	No
RSS-14 Stacked Omni	2-columns	No
RSS-Limited	3-columns	No
RSS-Expanded	4-columns	No
RSS-Expanded Stacked	4-columns	No
UPC-A/EAN-13	4-columns	No
EAN-8	3-columns	No
UPC-E	2-columns	No
UCC/EAN-128	4-columns	Yes

PharmaCode

PharmaCode is a binary code in which wide and narrow bars are used to represent numeric values. Unlike other symbologies, the spaces in PharmaCode are not used to encode information; only the bars hold value. Each PharmaCode may contain a maximum of 12 bars that are read from right to left, and allow for the encodation to include the values of 1 to 8190. See Figure 2.2 for an illustration of the PharmaCode symbol.

Figure 2.2



123

Bar Pattern

A bar is determined to be either wide or narrow. In the event all the bars are wide/narrow, the Xaminer ELITE software uses the spaces to make the wide/narrow judgment and generates a warning. The warning indicates bar gain/loss, as it could corrupt the encoded information. A wide bar is assigned a weight of two; a narrow bar is assigned a weight of 1. Starting from the right

side, the position number raised to a power of two is used, and multiplied by the weight. The right-most bar is then either 1 or 2.

The next bar to the left is either 2 or 4, and the next is either 4 or 8. These values are added together to form the complete number. The pattern is repeated until completed (a large space is encountered).

Xaminer ELITE Capabilities

Your Xaminer ELITE bar code verifier is designed to ensure that all bar codes you produce and/or use are in compliance with industry standards. Although extremely reliable, the Xaminer ELITE does not:

- Check symbol height (truncation)
- Determine the presence of human readable characters.

Auto Discriminating

The Xaminer ELITE contains an auto-discriminating feature allowing it to be configured to recognize numerous standard symbology formats.

- Standard 1-D symbologies:
 - Code 128
 - UCC/EAN – SCC14
 - UCC/EAN – SSCC18
 - Coupon Code (recognizes all five types)
 - Code 39
 - Code 93
 - Codabar
 - I 2 of 5
 - UCC Symbols
 - U.P.C. A with supplemental 2, 5
 - U.P.C. E with supplemental 2, 5
 - EAN 8 with supplemental 2, 5
 - EAN13 with supplemental 2, 5
 - RSS Symbols (Xaminer ELITE Plus only)
 - RSS-14 (including Stacked and Truncated)
 - RSS Limited
 - RSS Expanded (Including Expanded Stacked)
- 2-D Symbologies (Xaminer ELITE Plus only)
 - PDF 417 -- auto discrimination only occurs when going from linear to PDF.
 - Composite Symbols
 - CC-A
 - CC-B

- CC-C

PharmaCode (Optional) – **Does not auto discriminate since it is a symbology apart from standard linear codes.**

Chapter 2 - Using the Xaminer ELITE

Getting Started

Unpacking

Before going any further, take a moment to check the contents of the package to ensure your order was shipped complete. Make sure no items are damaged or omitted. Your package should include:

- Xaminer ELITE verifier (with/without analog wand, depending on your model purchased)
- Xaminer ELITE User's Guide
- Quick Reference Guide
- NIST traceability document

If you purchased an Elite IS or Elite Plus model, your package will also include the following items:

- Stand
- Communication Cable
- Power Supply
- Secondary Power Cable
- Laser Calibration Check Card

Optional Accessories

The following optional accessories, if purchased separately, may be included in your package:

- Carrying case
- Text printer
- SVS supporting personal computer software (available depending on model purchased)

Stratix Corporation

- Extra Nickel-Metal-Hydride (NiMH) rechargeable batteries – AA size
- Battery charger
- Carrier with shoulder harness for portable use
- Holster and belt

Shipping Considerations

Careful consideration was taken when these items were packaged. In the event any of these items are missing or arrived damaged, please notify Stratix Corporation **within two business days** of receipt of your Xaminer ELITE.

Warranty Information

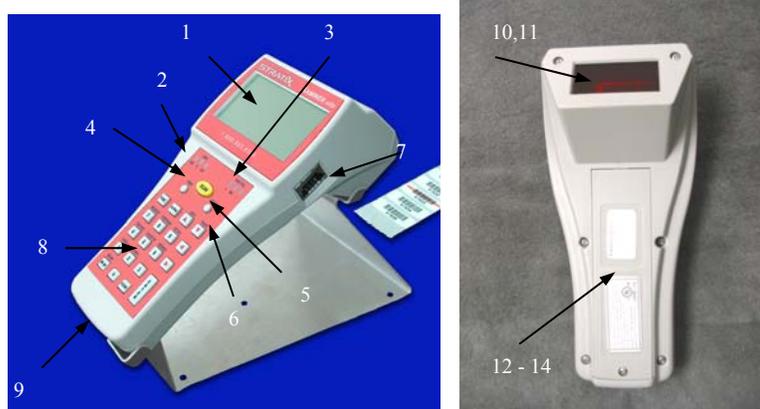
Your Xaminer ELITE includes a 12-month manufacturer's warranty on all parts and labor. Extended service contracts are available that offer extended warranty terms. Contact Stratix Corporation at 1-800-883-8300 for more information on these programs, or visit the Stratix website at www.stratixcorp.com.

Xaminer ELITE Major Components

The Xaminer ELITE consists of the major components shown in the following table and in Figure 2.1.

1. 128 x 64 pixel LCD displaying 8 rows x 20+ columns of data	2. ANSI Grade LED's	3. BAR TOL (Bar Tolerance) LED's
4. PWR (Power) key	5. "SCAN" Key	6. Error Help Key
7. Analog Wand connector	8. Keypad	9. Serial port (RJ-41)
10. Integrated laser scanner (Elite IS_P, Elite IS & Elite Plus models)	11. Scanner window	12. Battery compartment cover
13. Battery compartment	14. AA NiMH batteries (4) (Optional)	

Figure 2.1



Communications Cable

The Xaminer ELITE has a communications cable that can be used to provide communication with a Windows PC. It also provides external power to the unit from a wall outlet for times when battery operation is not desired, (e.g., during terminal and program updates).

Figure 2.2



Changing the Batteries

Follow these steps to replace the batteries with new fresh cells:

1. Turn the Xaminer ELITE off.
2. Remove the screw from the battery access door and remove it.

Figure 2.3



3. Remove the old cells from the compartment and replace them with fresh cells, following the orientation instructions on the inside of the access door.





4. Replace the battery access door and reinstall the screw.

Xaminer ELITE Action Keys

The Xaminer ELITE keypad contains action keys designed to reduce the number of keystrokes required to perform certain tasks. These functions operate from any of the verification screens. The following table lists and describes the action keys.

Action	Description	Action	Description
Help	Displays verification failure details to LCD	► (Next)	Advance to next screen in verification or review modes
Func ►	Review next line of encoded data in PDF symbol	◄ (Prior)	Back to previous screen in verification or review modes
Func ◄	Review previous line of encoded data in PDF symbol	▲	Increment next higher number, or move pointer forward.
Mag (▲)	Set magnification for UPC symbols; use with ▲ or ▼ to change value	▼	Increment to next lower number, or move pointer backward.
Print (▼)	Select output option for stored records. Upload to either PC or external printer.	Func + (0)	Return to Main Menu
Mode (3)	Change between Full and Partial ANSI modes	Beam (BK SP)	Beam Pos. – Allows you to line up the beam on a symbol.
Memory (7)	Displays number of records in memory and records remaining until memory is full	Clear	Clear scan counters for the next scan; clears alpha or numeric data entries
Compare (8)	Activate Data Compare feature for matching encoded data to a master symbol	Enter	Activate laser/verification; move to next operation in menu
Detail (9)	Elem. Detail – if active, provides bar/ space measurements based on length of symbol	Scan	Activate laser/verification
Calib CK (5)	Activate calibration check featuring using numbered test card provided with terminal	PWR	Power unit on or off
Cont + (1)	Increase LCD screen contrast	Cont – (2)	Decrease LCD screen contrast
BK SP	Moves pointer backwards in user ID and password menus.	Tag Rec (4)	Mark record
Review (6)	Review Mode	*	Not Used

Preparing to Scan

Introduction

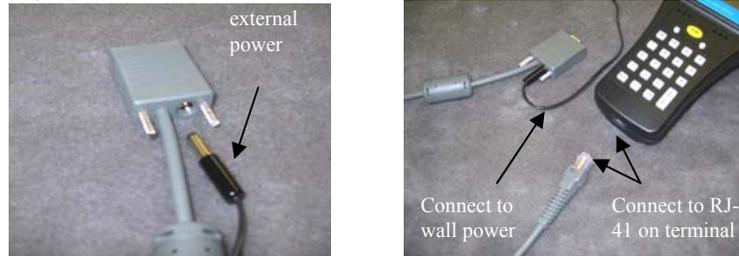
Your Xaminer ELITE is shipped to you already configured and ready to perform bar code verification scans. This section discusses what you need to do before beginning the verification process.

The following applies to terminals equipped with an integrated scan engine. If your Elite is not equipped with a laser, refer to the section entitled “Using the Elite in Wand Mode” later in this chapter.

To Prepare for Scanning

1. Determine if you will operate the unit on battery power, or via the external power supply. Install the batteries or connect the external power as shown in Figure 2.4 below.

Figure 2.4



2. Place the Xaminer Elite in the stand (unless using in Partial ANSI mode. Please see Using Partial ANSI Mode, later in this chapter).
3. Press **PWR**.

To turn on the unit, press and hold the **PWR** key for a moment then release. After a moment, you will hear a tone indicating the unit is starting up. The Xaminer Elite starts in the Ready to Verify mode. If you do not need to change scanner types, you are ready to scan right away!

```
STRATIX
XAMINER Elite Plus

LASER Ready   F_ANSI

Verify 1-D & 2-D

stratixcorp.com  |||
```

4. If you need to change the Elite's configuration, press **FUNC+0**. to access the Main Menu screen from any operating mode. Although the Xaminer Elite comes pre-configured with the most commonly used settings, you may wish to change the Scanner Type, or set/change the passing ANSI grade at this point. Further instructions on using the Main Menu can be found in Section 2-28.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

5. When all changes have been completed, Press **Enter** until the Ready to Verify screen reappears.

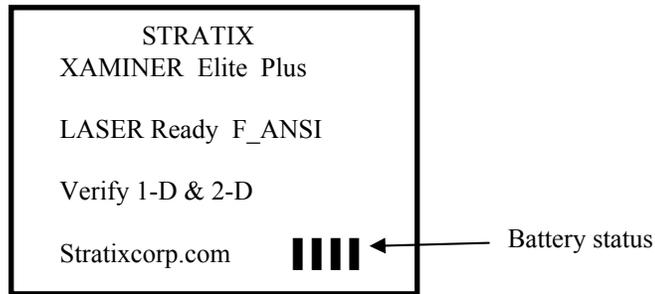
6. Begin scanning your bar codes.

⚠ Warning: Never look directly into the laser beam emitted by the unit. Doing so may result in serious eye damage.

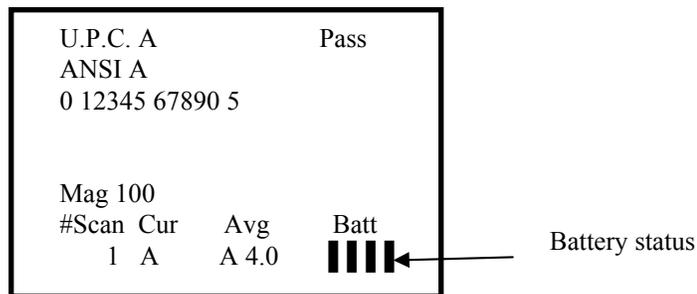
Elite Battery status

Elite has battery status in “Ready to Scan Screen” and “Verification Screen”

Ready to Scan Screen:



Verification Screen:



Battery Status:

4 Bars: Battery is in full level (AC Power is full level)

3 Bars: Battery is in medium level

2 Bars: Battery is in low level, recharge the batteries

1 Bar: Battery is in warning level, scan will be disabled

Using the Laser Scanner

Activating the Scanner

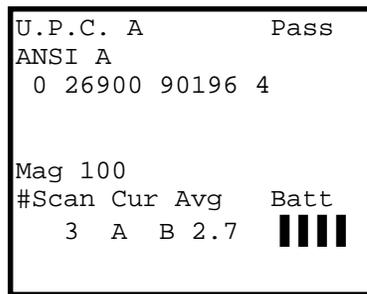
1. Point or align the laser scan line over the desired bar code, using the **BEAM** key. When this key is pressed, the laser fires for 2-3 seconds to allow you to locate the target code for scanning. No data is captured in this process.
2. To begin verifying barcodes, press the yellow **SCAN** button at the top center of the keypad, or press the **Enter** key to activate the scanner.

A thin, red laser beam spans the entire length of the bar code symbol, and a message briefly appears as the scan is in progress.

☛ **Note:** If you have just turned power on to the Elite, first press **Beam (BK SP)** before attempting to verify a barcode. This need only be done once as long as power is applied to the terminal.

3. The unit will either report the results of your scan as shown below, or return to the Ready to Verify screen. If the latter occurs, it means the Xaminer Elite was unable to verify your barcode. You may need to reposition the barcode to enable the unit to properly read and verify the sample.

4. Upon a successful verification scan, the unit will emit a single beep signaling a “Pass” result relative the ANSI Grade setting (preset at ANSI C). A “Fail” result is indicated by two beeps, and is caused by either an overall grade below the ANSI Grade setting, or the Bar Tolerance outside the code limits.
5. The results of your scan appear on the screen with the designation **Pass** or **Fail**, in the upper right portion of the screen.



6. Immediately below the results screen, LED’s give you a visual indication of your result. The LED’s on the left give the Overall ANSI Grade for the scan (A or B = Green, C = Yellow, D or F = Red). The LED’s on the right report Bar Tolerance (Green in the center is passing, Red on either side indicates bar size too wide or too narrow).
7. The details of your verification results can be viewed by using the red left and right arrows to page through the screens following the overall results screen. An explanation of each screen is provided in Chapter 9.

Scanning 2-D or Multirow Symbols (RSS Stacked, PDF417 and Composite)

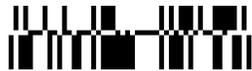
When scanning with the ELITE verifier it is important to use the stand provided. This is even more important when scanning multirow or 2-dimensional codes. PDF417 is a 2-D symbol. Certain versions of the RSS family (RSS Stacked and RSS Expanded Stacked) are multirow 1-D symbols. Both require the user to move the laser beam path across the code while scanning in order to complete data collection. Only the Xaminer Elite Plus model is equipped to verify these codes. The Xaminer Elite and Elite IS models are only able to verify 1-D codes.

Begin with the ELITE positioned so that the laser beam crosses the code. While in the Ready to Verify mode, press the Beam (BK SP) key. To scan one of these symbols, the verifier must pass up and down the code while keeping the laser beam parallel to the rows, as shown by the arrows in the illustration below. The beam must cross all rows in the code to complete a successful scan.



Verifying Multirow RSS Codes

RSS Stacked and RSS Expanded stacked have two or more rows separated by thin row dividers. The beam must pass across each row and divider in order to complete a verification scan. An example of this type of code is shown below.

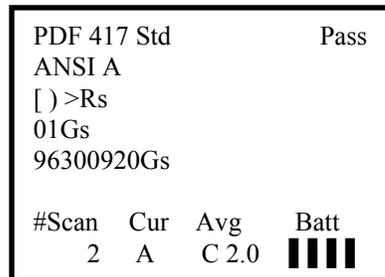


Either the top or the bottom row may be scanned first. Slide the stand smoothly across each row while the laser is scanning until verification is complete, as signaled by the beep tones.

Verifying PDF Codes

PDF codes are true 2-dimensional symbols and there is information in each row that must be captured. The stand should be able to slide

smoothly to provide for a consistent movement of the laser across the symbol. Be sure to scan the entire symbol, from the top row through the bottom row, ensuring that the beam extends outward past the Start and Stop bars. It may take several passes over the code before the verifier is able to decode the symbol. In some cases the verifier may not be able to identify all code words. When the Xaminer Elite has completed a successful verification scan, you may view the encoded data by paging through one or more screens, depending on how much data was encoded in the symbol. An example of the encoded data screen(s) might look like:



By pressing the FUNC key followed by the red ► key, the LCD increments another line of encoded data. For example, the next screen would look like:

```
PDF 417 Std      Pass
ANSI A
01Gs
96300920Gs
840Gs

#Scan  Cur  Avg  Batt
   2   A   C 2.0  █ █ █ █
```

Successive lines of encoded data may be reviewed by repeatedly pressing FUNC and the red ► or ◀ keys. If at any time you would like to exit this process, simply press the red ► key alone, and you will proceed to the verification results screens. The complete set of encoded data, and verification results, may also be uploaded to a PC or to an external dot matrix or thermal printers, if your model is so equipped (contact your Stratix account manger for more details). In some cases where the unit is unable to decode the symbol, the Xaminer ELITE may display one of two PDF 417 Incomplete screens.

```
PDF 417 INCOMPLETE  v
Not Seen 55 of 80
Can Solve: Yes
0 PDF Status
1 Show As Is
2 Resume Scan
```

```
PDF 417 INCOMPLETE  v
Not Seen 123
Can Solve: No
0 PDF Status
1 Show As Is
2 Resume Scan
```

Yes or **No** appears in the **Can Solve** field showing whether the Xaminer ELITE was able to gather sufficient information on the symbol to effectively decode it.

From the PDF 417 Incomplete screen:

- Press **0**, PDF Stats, to view statistical information on the symbol. The table below defines each field.

```
Status  v
Rows 99  Cols 99
Security Level  999
Code Words ..... 999
Error Correction 999
Error Used ..... 999
Missing Words .. 999
Encode Data Cnt 9999
```

Name	Definition
------	------------

Rows/Columns	Size of Matrix (Data Area plus row indicators)
Security Level	Indicated by levels 1-8.
Code Words	Total Number of code words, in data area
Error Correction	Number of error correction code words.
Errors Used	Number of error correction code words used.
Missing Words	Number of code words not seen.
Encode Data Cnt	Number of data characters after translation of code words to ASCII data.

- Press Enter to complete the verification process.
- Press **1**, Show As Is, or **Enter** to display the first in the set of verification screens, although the information is not representative of a successful scan.
- Press **2**, Resume Scan, to continue collecting additional verification data on the symbol.

☛ **Note:** Resume Scan may not result in a successful scan. The Xaminer ELITE may display the PDF 417 Incomplete screen continually until the entire contents of the symbol are verified.

Verifying Composite Codes

There are two steps for Composite verifying as it consists of two codes, one linear code and one Composite code.

1. Verify the linear code (bottom code) following the 1D or RSS multi row barcode scanning procedure.
2. Verify the 2D Composite code (top code) following PDF scanning procedure.

Using the Elite in Wand Mode

The Xaminer Elite is capable of verifying most 1-D barcodes via an external handheld contact scanner, or “wand”. If your unit is so equipped, it can be easily configured for use by plugging the appropriate wand into the Elite and configuring its operation from the main menu.

Installing the Wand

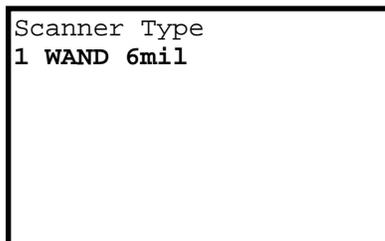
1. Choose the wand desired for use from among those supplied with your model. The Elite supports three different wand apertures: 6-mil, 10-mil and 20-mil. Each wand is calibrated for use at the factory and is ready to be used.
2. Ensure the Elite is powered off. Plug the connector into the right side of the Elite, adjacent to the LCD. The unit does not need to be in the stand to be used with the wand.
3. Power on the Elite as normal. The Ready to Verify screen should appear. Unless the unit is already configured for Wand use, there will be no power applied to the wand and you will be unable to scan barcodes at this point.
4. Press **Func + 0** to go to the Main Menu. Then press **5**, Scanner Type.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

5. The Scanner Type screen appears indicating which scan device is currently active. Its default setting is Laser unless you have the basic Elite model without integrated laser scan engine.

```
Scanner Type
1 LASER
```

6. Press **1** to toggle through all the scan devices available with your unit. As an example, press **1** to change the terminal from Laser to 6-mil wand mode.



Scanner Type
1 WAND 6mil

7. Press **Enter** twice to return to Ready to Verify status. You should now notice that the laser diode in the wand tip is lit. You are now ready to verify bar codes using the 6-mil aperture wand.
8. To change the device setting again, repeat these steps, toggling through the scanner types until the desired setting is established. Then return to the Ready to Verify screen to begin verifying again.

Removing or Changing the Wand

1. When you are finished using the Wand and wish to return to verifying with the integrated Laser from the stand, or you would like to use a different aperture wand, first follow the steps above to select the scanner type and change the selected type to Laser (or select a different wand).
2. Press Enter to return to the Main Menu and power off the Elite.
3. Remove the wand. Replace it with the new selected wand if necessary.

4. Apply power to the terminal. You are ready to begin verifying codes again.

Scanning Bar Codes with the Wand

The steps below describe the techniques necessary to properly collect data for verification using the wand. In this example, a 6-mil aperture wand is used, but the steps are the same regardless of the wand type in use.

1. Power up the Elite and set the appropriate scanner type.
2. Hold the wand so that the flat portion of the plastic guide is flat against the media being tested. The wand body should make an angle of about 30 degrees from vertical and the wand tip should be adjacent to the media.



3. Begin with the wand tip outside of the bars in the code on either side of the code being tested. Grasp the sides of the wand guide with either hand to support the wand.
4. Smoothly swipe the wand across the code to the other side. You will get either an audible beep if the verification results are passing or two beeps if one or more parameters have failed. If the Elite does not respond to a swipe with a beep tone, it means that the unit has failed to decode the symbol being tested and you should repeat the swipe.



For best results, use a slower swipe speed for codes with narrower element sizes (such as < 100% Mag UPC, or Code 128), and faster swipes for less dense codes (such as Shipping Container codes). A good rule of thumb is to swipe as if you were underlining the code, or swiping a credit card at a retail checkout

stand, maintaining as constant a speed as possible all the way across the code.

5. If the swipe is successful, the Elite will report verification results to the LCD in the same manner as for the laser. Please see Chapter 9, *Understanding the Verification Screens* for the details.

Using Partial ANSI Mode

Partial ANSI mode is an optional capability available on some Elite models. Your unit must be equipped with an integrated laser (IS, Plus models) in order to use this feature. If your Elite is so equipped, the following instructions will guide you in activating this operating mode. Contact your Stratix account manager if your unit is not so configured, and you would like to upgrade to add this function.

Partial ANSI mode is typically used with the Xaminer Elite in portable, handheld, battery-powered configuration. It may also be used in the table stand if desired. Partial ANSI mode may not be used with the Wand. Only 1-D codes may be verified using Partial ANSI mode.

Before using Partial ANSI Mode without an external power supply, fully charged NiMH rechargeable batteries must be installed in the unit. **IMPORTANT:** Carefully read, understand and follow the battery installation instructions in this manual, and on the labels inside the battery compartment. Failure to properly orient and install the cells will prevent the Elite from operating and may damage the unit!

Activating Partial ANSI Mode – Menu Method

1. Power up the unit as usual. The Ready to Verify screen appears (shown here in Full ANSI mode).

```
Stratix
Xaminer Elite Plus

LASER Ready    F_ANSI

Verify 1-D & 2-D

stratixcorp.com  █ █ █ █
```

2. To change to Partial ANSI mode using the Main Menu, press **Func+0** to bring up the Main Menu and select option 2, Setup Options.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

3. Select option **1 Analysis Mode**

```
Setup Options
1 Analysis Mode
2 Memory
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
```

4. Press **2** Verification Mode, to switch between Full and Partial ANSI mode.

```
Analysis Mode
1 Verify 1-D
2 Verification Mode:
  Full ANSI
3 ANSI Pass on C
4 Corrugated
5 Negative Film No
6 Traditional Yes
```

```
Analysis Mode
1 Verify 1-D
2 Verification Mode:
  Partial ANSI
3 ANSI Pass on C
4 Corrugated
5 Negative Film No
6 Traditional Yes
```

5. Press **Enter** 3 times to return to the Ready screen, which now reflects that the user is in Partial ANSI mode. Note that only 1-D codes may be verified using Partial ANSI mode.

```
Stratix
Xaminer Elite Plus

LASER Ready    P_ANSI

Verify 1-D

stratixcorp.com  █ █ █ █
```

Activating Partial ANSI Mode – Hotkey Method

An alternate method of switching between Full and Partial ANSI modes is to use a hotkey function programmed to key #3 on the Elite keypad. This feature may be accessed from the Ready to Verify or Results screens.

1. Place the Elite in Ready to Verify condition (shown here in Full ANSI mode).

```
Stratix
Xaminer Elite Plus
LASER Ready    F_ANSI
Verify 1-D & 2-D
```

2. Press **3** on the Elite keypad, enabling Verification Mode toggling.

```
Verification Mode
F1 Full ANSI
```

3. Press **Func+1** to switch to Partial ANSI mode.

```
Verification Mode
F1 Partial ANSI
```

4. Press **Enter** to return to Ready to Verify, and note that mode has switched to Partial ANSI. Repeat these steps at any time to change verification mode.

```
Stratix
Xaminer Elite Plus
LASER Ready    P_ANSI
Verify 1-D
stratixcorp.com  █ █ █ █
```

You may now verify barcodes using the Partial ANSI verification mode (See Chapters 6 & 9 to learn about the analysis method and results screens associated with this mode). Simply aim the verifier at the desired code and scan it as previously described. This method is similar to using a conventional handheld scanner.

☛ **NOTE:** For best results, the Elite must scan codes within a controlled range of distances from the unit. The available range varies with element size within the scanned code. Contact your Stratix

account manager for assistance and training in using Partial ANSI verification mode.

Using the Main Menu

All functions of the Xaminer ELITE are accessed from the Main Menu.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

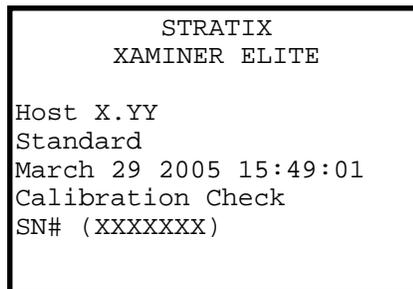
Accessing the Host Screen from the Main Menu:

1. Press **PWR** (Power), then **Func+0** will take you to the Main Menu.
2. Pressing **Func+0** again will take you backwards one level to the first Host screen.
3. Viewing the Host Screens

The Host screen provides basic information about the factory build of your Xaminer Elite verifier:

- Manufacturer's name & Model type
- Host firmware version information
- Host firmware **released** date and time
- Serial number
- Calibration status

The following is the first of the four Logo/Version screens:



Press left (◀) or right (▶) arrow keys to view the remaining three screens. These screens route you through the calibration status of each device mode you have installed (Laser or Wand or both, depending on model).

4. Press **Enter** or **FUNC+0** to return to the Main Menu.

***Note:** Specific protected administrative options can be accessed from the Logo/Version screens. You must use a specific key combination to access these administrative features. Contact your system administrator or Stratix for more information.

Setting Up Your Device Using the Main Menu

Your Xaminer ELITE comes pre-configured and ready to scan; no additional configuration is required. However, you may adjust the factory configuration via the Main Menu options to fit your particular needs. Changing the configuration settings on your device allows you to:

- Select your symbology
- Define and print reports

- Store data in memory
- Analyze data in ANSI mode, traditional mode, or both
- Define minimum acceptable bar code character guidelines
- Set minimum ANSI pass/fail thresholds

Configuring Your Symbology

There are nine major symbologies supported by the Xaminer ELITE (depending on model):

- U.P.C./EAN
- Code 39
- I 2 of 5 (ITF)
- Code 128
- Codabar
- Code 93
- PharmaCode (optional)
- RSS (ELITE Plus series)
- PDF 417 (ELITE Plus series)
- Composite (ELITE Plus series)

These symbologies are accessed from the Bar Code Types menu.

To Access the Bar Code Types Menu:

1. From the Main Menu, Press **1**, Bar Code Type.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

The Bar Code Types Menu screen appears.

```
Bar Code Types Menu
1 1-D Symbologies
2 Pharmacode
3 RSS
4 PDF 417
5 Composite
```

2. You may choose any of the available options on this screen. To configure most common codes, press **1**, 1-D Symbologies.

```
Bar Code Types 1-D
1 U. P. C. / EAN
2 Code 39
3 I 2of5 (ITF)
4 Code 128
5 Codabar
6 Code 93
```

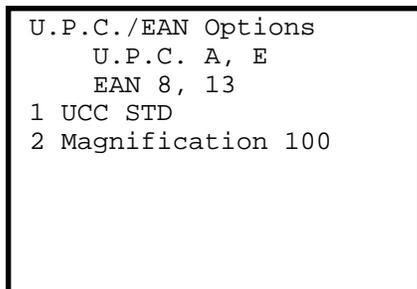
3. Select one of the Bar Code Types to configure for verification. The following presents the steps for each option.

To Configure U.P.C/EAN:

1. Press **1**, U.P.C. / EAN on the Bar Code Types 1-D screen.

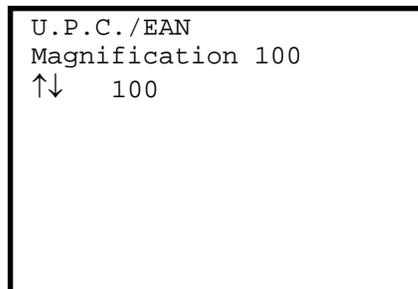
```
Bar Code Types 1-D
1 U.P.C. / EAN
2 Code 39
3 I 2of5 (ITF)
4 Code 128
5 Codabar
6 Code 93
```

The U.P.C./EAN Options screen appears.



2. Press **1**, UCC, to toggle between STD (standard) format and OFF (no format). The default is STD. In the verify mode, decode allows the Xaminer ELITE to actively look for a U.P.C./EAN symbol to scan. The unit auto-discriminates among the **active** symbologies.
3. Press **2**, Magnification, to change the magnification level. The U.P.C./EAN Magnification screen appears. **Note:** This feature may be accessed at any time from outside the Menu screens by pressing the **Mag** button on the keypad.

Magnification allows you to set the size or factor for the symbol. Use the size chart located in the back cover of this guide to check the size of the code being verified.



4. Press the Up (▲) and Down (▼) to increase or decrease the magnification by factors of five from 80 to 200. The default is 100.

***Note:** The magnification function supports Traditional bar tolerance testing.

5. Press **Enter** to set the magnification and return to the U.P.C./EAN Options screen.
6. Press **Enter** again to return to the Bar Code Types 1-D screen.

***Note:** From any screen, pressing **Enter** repeatedly will take you back up one menu level, until you reach the Main Menu. From the Main Menu, pressing **Enter** again will bring you to Ready to Verify mode.

To Configure Code 3 of 9:

1. Press **2**, Code 39, on the Bar Code Types 1-D screen.

```
Bar Code Types 1-D
1 U.P.C. / EAN
2 Code 39
3 I 2of5 (ITF)
4 Code 128
5 Codabar
6 Code 93
```

The Options Code 39 screen appears where you can select the desired option(s). Pressing **1** or **2** enables toggling thru several optional settings, described below. At any time, when your changes are complete, press Enter to return to the Bar Code Types 1-D menu.

```
Options Code 39
1 C39 STD
2 CDV NONE
3 Ratio Max 3.2
4 Ratio Min 2.0
```

2. Press **1** repeatedly to scroll through and select the desired Code 39 format. Available formats are:

- C39 STD - AIM Standard
- C39 HIBCC - Health Industry Bar Code Council
- C39 OFF

The default value is C39 STD.

3. Press **2** repeatedly to select the desired check digit value. Available values are:

- MOD 43 STD - Automatic Identification Manufacturers (AIM) standard
- MOD 43 WT - Weighted Mod 43 standard
- CDV NONE - No check digit calculation

The default value is CDV NONE.

4. Press **3** or **4** to choose between Ratio Max and Ratio Min. The **■** symbol on the screen moves to indicate which ratio is selected. The settings you entered appear in the Ratio field.

```
Options Code 39
1 C39 STD
2 CDV NONE
3 ■Ratio Max 3.2
4 Ratio Min 2.0
```

Press...	To...
Up Arrow	Increase the selected value by 0.1.
Down Arrow	Decrease the selected value by 0.1.
Clear from either field	Automatically set the minimum and maximum ratios to 3.2 and 2.0 respectively.

The minimum ratio must be less than or equal to the maximum ratio. The maximum ratio must be greater than or equal to the minimum ratio.

Both ratios may range only between 2.0 and 3.2.

To Configure I 2 of 5:

1. Press **3**, I 2 of 5 (ITF), on the Bar Code Types 1-D screen.

Bar Code Types 1-D
1 U.P.C. / EAN
2 Code 39
3 I 2 of 5 (ITF)
4 Code 128
5 Codabar
6 Code 93

2. The Options I 2of5 screen appears.

```
Options I 2of5
1 I25 STD
2 CDV NONE
3 ►Ratio Max 3.2
4 Ratio Min 2.0
5 I25 L/R On
```

3. Press **1** repeatedly to scroll through and select the desired format. Available formats are:

- I25 STD (AIM Standard)
- I25 SCC-14 – uses UCC decodability rules instead of AIM standards, checks the length to ensure it to be 14 characters, and validates the U.P.C. check character.
- I25 Off

The default is I25 Std.

4. Press **2** to select the desired check digit value. Available values are:

- UCC MOD 10
- CDV NONE

The default value is NONE.

5. Press **3** or **4** to choose between Ratio Max 3.2 and Ratio Min 2.0. The **■** symbol on the screen moves to indicate which ratio is selected. The settings you entered appear in the Ratio fields.

```
Options I 2of5
1 I25 STD
2 CDV NONE
3 ■Ratio Max 3.2
4 Ratio Min 2.0
5 I25 L/R On
```

Press...	To...
Up Arrow	Increase the selected value by 0.1.
Down Arrow	Decrease the selected value by 0.1.
Clear from either field	Automatically set the minimum and maximum ratios to 2.0 and 3.2 respectively.

The minimum ratio must be less than or equal to the maximum ratio. The maximum ratio must be greater than or equal to the minimum ratio.

Both ratios may range only between 2.0 and 3.2.

6. Press **5** to choose I25 Left character L (start) and Right character R (stop) on or off.

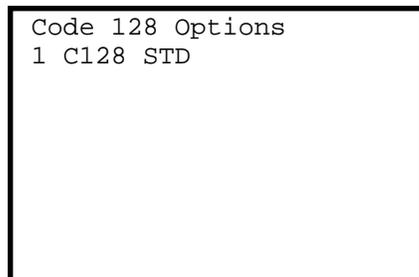
```
Options I 2of5
1 I25 STD
2 CDV NONE
3 ■Ratio Max 3.2
4 Ratio Min 2.0
5 I25 L/R On
```

To Configure Code 128:

1. Press **4**, Code 128, on the Bar Code Types 1-D screen.

```
Bar Code Types 1-D
1 U.P.C. / EAN
2 Code 39
3 I 2of5 (ITF)
4 Code 128
5 Codabar
6 Code 93
```

The Code 128 Options screen appears.



2. Press **1** to scroll through the desired formats. Available formats are:

- C128 STD (AIM Standard)
- C128 SCC-14
- C128 SSCC-18
- C128 HIBCC (Health Industry Bar Code Council)
- C128 Coupon
- C128 UCC (Uniform Code Council format)
- C128 OFF

The default is C128 STD

3. Press **Enter** to exit this function and return to the Bar Code Types 1-D screen.

To Configure Codabar:

1. Press **5**, Codabar, on the Bar Code Types 1-D screen.

```
Bar Code Types 1-D
1 U.P.C. / EAN
2 Code 39
3 I 2of5 (ITF)
4 Code 128
5 Codabar
6 Code 93
```

The Options Codabar screen appears

```
Options Codabar
1 CBar STD
2 CDV NONE
3  Ratio Max 3.2
4 Ratio Min 2.0
```

2. Press **1** to scroll through the desired formats. Available formats are:

- CBar STD
- CBar OFF

The default is CBar STD.

3. Press **2** to select the desired check digit value. Available values are:

- UCC MOD 16
- CDV NONE

The default value is CDV NONE.

4. Press **3** or **4** to choose between Ratio Max 3.2 and Ratio Min 2.0. The **■** symbol on the screen moves to indicate which ratio is selected. The settings you entered appear in the Ratio fields.

```
Options Codabar
1 I25 STD
2 CDV NONE
3 ■Ratio Max 3.2
4 Ratio Min 2.0
```

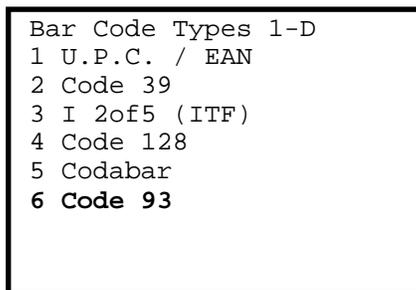
AIM standards only allow a 3.0 ratio maximum. Some industrial standards allow up to 3.2.

Press...	To...
Up Arrow	Increase the selected value by 0.1.
Down Arrow	Decrease the selected value by 0.1.
Clear from either field	Automatically set the minimum and maximum ratios to 2.0 and 3.2 respectively.

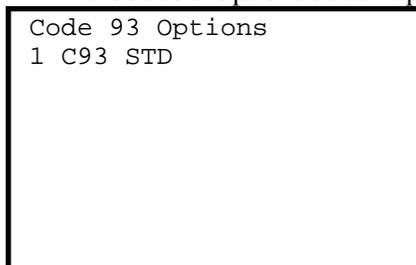
The minimum ratio must be less than or equal to the maximum ratio. The maximum ratio must be greater than or equal to the minimum ratio.

To Configure Code 93:

1. Press **6**, Code 93, on the Bar Code Types 1-D screen.



The Code 93 Options screen appears.



2. Press **1** to toggle between the two available formats:
 - C93 STD
 - C93 OFF

The default is C93 STD.

3. Press **Enter** to return to the Bar Code Types 1-D screen.

To Configure PharmaCode:

1. Press **2**, to select PharmaCode On or Off

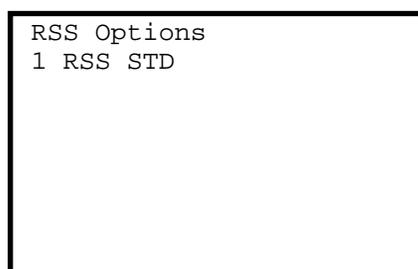
```
Bar Code Types Menu
1 1-D Symbologies
2 Pharmacode Off
3 RSS
4 PDF 417
5 Composite
```

To Configure RSS:

1. Press **3**, on Bar Code Types Menu

```
Bar Code Types Menu
1 1-D Symbologies
2 Pharmacode Off
3 RSS
4 PDF 417
5 Composite
```

The RSS Options screen appears



2. Press **1** to toggle between the two available formats:

- RSS STD
- RSS OFF

The default is RSS STD.

3. Press **Enter** to return to the Bar Code Types 1-D screen.

To Configure PDF 417:

1. If not already at the Bar Code Types Menu screen, press Func + 0 to go to the Main Menu, then press 1 to select Bar Code Type
2. Press **4**, to select PDF 417.

```
Bar Code Types Menu
1 1-D Symbolologies
2 Pharmacode
3 RSS
4 PDF 417
5 Composite
```

The PDF 417 Options screen appears.

```
PDF 417 Options
1 PDF STD
```

3. Press **1** to toggle between the three available formats:
 - PDF STD
 - PDF TRUNC (for truncated PDF417 code only)
 - PDF OFF

The default is **PDF OFF**.

Press **Enter** to return to the Bar Code Types Menu screen.

To Configure Composite:

4. Press **5**, on Bar Code Types Menu

```
Bar Code Types Menu
1 1-D Symbolologies
2 Pharmacode Off
3 RSS
4 PDF 417
5 Composite
```

The Composite Options screen appears

```
Composite Options
1 Composite STD
```

2. Press **1** to toggle between the two available formats:

- Composite STD
- Composite OFF

The default is Composite **OFF**.

3. Press **Enter** to return to the Bar Code Types 1-D screen.

Calibration Check Routine

If your Xaminer Elite terminal is equipped with a laser scan engine (Elite IS or Elite Plus models), you can perform a Calibration Check using the Calibration Check Card Shipped with your verifier.

• **Note:** The Calibration Check Card must be kept in a clean environment and kept free from damage in order for it to give accurate results. When the card becomes dirty, scratched or dull it will no longer be reliable. Stratix recommends replacing the card on an annual basis; however, depending on the condition of the card, it may be necessary to replace it more often. The calibration check routine does not replace your annual calibration. The calibration check routine **DOES NOT** calibrate your verifier.

The following are the steps to conduct the Calibration Check.

1. Place the Xaminer Elite in the Table Top stand and connect the unit to external power using the serial communications cable and power supply provided with your unit.
2. Power the unit on.
3. Press the **Calib Ck** key (Key #5) on the keypad. The Calibration Check screen appears.

```
Calibration Check
1 Begin

Last Check:

BK SP → Guide Beam
```

4. Press the **Beam** key (Bk Sp) to enable the laser and position the beam in the middle of the barcode on the Calibration Check Card.
5. Press **1** to begin the calibration check.
6. If the calibration check is successful, press **Enter** to return to the Main Menu.
7. If the calibration check is unsuccessful, press **Enter** and try the test again starting at step #3 above. You may need to adjust the location of the beam again, particularly if there is evidence of damage to the card.
8. If the calibration check continues to be unsuccessful after several attempts, contact Stratix Customer Support at 1-800-883-8300 to arrange the return of your verifier for recalibration.

Chapter 3 – Using Setup Options

Introduction

Use the Setup Options screen to:

- Configure scan analysis options and parameters
- Configure memory parameters
- Turn element detail settings on or off
- Set the Xaminer to display the first verification screen
- Set password parameters
- Set user ID and job ID
- Configure the communications port

Accessing the Setup Options Screen

To access the Setup Options screen:

1. Press **2**, Setup Options, from the Main Menu.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

2. The Setup Options screen appears.

```
Setup Options
1 Analysis Mode
2 Memory
3 Miscellaneous
4 Set Password
5 User/Job Id
6 Print/Upload
```

Analysis Mode Setting

1. Press **1**, Analysis Mode.

```
Setup Options
1 Analysis Mode
2 Memory
3 Miscellaneous
4 Set Password
5 User/Job Id
6 Print/Upload
```

The Analysis Mode screen appears.

```
Analysis Mode
1 Verify 1-D
2 Verification Mode:
  Full ANSI
3 ANSI Pass On C
4 Corrugated
5 Negative Film No
6 Traditional Yes
```

3. Press **1** to scroll through available bar code types:
 - Verify 1-D or Verify 1-D & 2-D
 - Verify PharmaCode
 4. Press **2**, Verification Mode, to select the desired verification mode. Available modes are:
 - Full ANSI (used with table stand) – 1-D and 2-D
 - Partial ANSI (typically when using the Elite in portable, battery powered mode) – 1-D codes only.
- ☛ **Note:** This selection may also be accessed by pressing **3** on the keypad in either Ready to Verify mode or when viewing results, then pressing **Func +1** to switch between modes.
5. Press **3**, ANSI Pass On, to select the desired minimum passing grade criteria. Values are A, B, C, D, or F.

6. Press 4, Corrugated, to allow the user to set Symbol Contrast to a minimum grade of “D”, while requiring all other ANSI parameters to meet a minimum of “C”.

```
Analysis Mode
1 Verify 1-D
2 Verification Mode:
  Full ANSI
3 ANSI Pass On C
4 Corrugated
5 Negative Film No
6 Traditional Yes
```

The Corrugated menu appears.

```
Corrugated Setup
1 Corrugated Yes
2 Corrugated SC D
```

7. Press **1**, Corrugated, to toggle between Yes (activated) or No (deactivated)
8. Press **2**, Corrugated SC, to set the Symbol Contrast threshold. Once the Corrugated option has been activated, the Symbol Contrast threshold will be a “D”, unless changed.

Once this option has been activated, the Xaminer Elite will give a “Pass” indicator and an “overall analysis in spec” message as long as Symbol Contrast is a “D” or better, and the other ANSI parameters are a “C” or better.

*Refer to the Fibre Box Association Guidelines for details regarding the acceptability of a “D” for ANSI Symbol Contrast.

- This option is only to be used for Interleaved 2 of 5 bar codes printed directly on kraft corrugate.
9. Press **Enter** to confirm changes and back to the Analysis Mode screen

```
Analysis Mode
1 Verify 1-D
2 Verification Mode:
  Full ANSI
3 ANSI Pass On C
4 Corrugated
5 Negative Film No
6 Traditional Yes
```

10. Press **5**, Negative Film , to toggle between Yes (activated) or No (deactivated)

```
Analysis Mode
1 Verify 1-D
2 Verification Mode:
  Full ANSI
3 ANSI Pass On C
4 Corrugated
5 Negative Film No
6 Traditional Yes
```

11. Press **6**, Traditional , to toggle between Traditional Grade Yes (activated) or No (deactivated)

Note: When “No” is selected for Traditional, Elite will not grade Bar Tolerance, and the final verification “Pass” or “Fail” grade has no relationship with Bar Tolerance

12. Press **Enter** to return to the Setup Options menu

Memory

Use the Memory Options screen to clear the memory and setup the store records option.

Standard memory – limited to a **maximum of 250 records**. Once the maximum is reached, the Elite will not store any more records, and will display the warning message until the memory is cleared. You will be able to continue verifying bar codes, and the results will be displayed to the LCD, but will not be stored in memory.

Pharmacode allocated memory – A segment of the Xaminer Elite's memory is dedicated to storing Pharmacode records, should that option be configured. There are a **maximum of 20 records** available. The Elite will display the warning message in this mode if the 20 records maximum is reached, at which time the user will be prompted to Clear or Upload these specific records before continuing.

To Set the Memory

Press 2, Memory, on the Setup Options screen.

```
Setup Options
1 Analysis Mode
2 Memory
3 Miscellaneous
4 Set Password
5 User/Job Id
6 Print/Upload
```

The Memory Options screen appears.

```
Memory Options
1 Clear Memory
2 Store Records Yes

Max Records Store
250
```

1. Press **1**, Clear Memory, to clear and defragment the Xaminer Elite's memory. This operation takes approximately 25 seconds, regardless of the number of records stored.
2. The Erase Memory confirmation screen appears. The number of records currently in the memory buffer is displayed directly below the Max Records Store field.

```
ERASE MEMORY!  
ARE YOU SURE?  
CLEAR KEY ==> ERASE!  
  
Records In Memory  
12
```

3. Press the **Clear** to erase all records stored in the memory buffer and return to the Memory Options screen

-or-

Press **Enter** to return to the Memory Options screen without clearing the memory buffer.

☛ Note: Pressing the Clear key will permanently erase ALL records from the unit's memory. This action cannot be undone. Upload any records to your PC or printer first if needed!

4. Press 2 to select Store Record “Yes” or “No” option. “Yes” indicates the verification result will be stored in memory, “No” indicate the verification results will not be stored in the memory and it is used for view only.

☛ Note: For Pharmacode, Elite will store the verification result in memory even the Store Record selection is “No”.

Hot Key Access

To quickly access the Erase Memory confirmation screen, press the **Memory** key from any of the verification screens.

Miscellaneous Setting

Press **3**, Miscellaneous, on the Setup Options screen.

```
Setup Options
1 Analysis Mode
2 Memory
3 Miscellaneous
4 Set Password
5 User/Job Id
6 Print/Upload
```

The Miscellaneous screen appears.

```
Miscellaneous
1 Element Detail
2 Scan Go To Top Yes
3 Coupon Link Yes
4 Show Hidden Yes
5 Avg Scan Numb 10
6 Factory Defaults
```

Setting Element Detail

The Element Detail is set from the Miscellaneous screen.

The Miscellaneous screen appears.

```
Miscellaneous
1 Element Detail
2 Scan Go To Top Yes
3 Coupon Link Yes
4 Show Hidden Yes
5 Avg Scan Numb 10
6 Factory Defaults
```

1. Press 1, Element Detail, The Element Detail Setup Screen appears:

```
Element Detail Setup
1 ELEM Detail Yes
2 Inch/Metric Inch
```

2. Press 1 to toggle the element detail on (**Yes**) or off (**No**).
3. Press 2 to toggle the element width using inch or metric.

When Element Detail is turned on, you can view symbol element detail. See the section entitled, *Working with Element Detail*, in *Chapter 9, Understanding Verification Screens*, for more information.

***Note:** Element detail must be turned on in order for the **Detail** action key to work from the verification screens.

4. Press **Enter** to return to the Setup Options screen.

Displaying the First Verification Record Screen

Each scan generates a set of up to seven verification screens. Use the Miscellaneous screen to set the Xaminer to display the first verification record screen after performing a scan.

The First Verification Record Screen is set from the Miscellaneous screen.

The Miscellaneous screen appears.

```
Miscellaneous
1 Element Detail No
2 Scan Goto Top Yes
3 Coupon Link Yes
4 Show Hidden Yes
5 Avg Scan Numb 10
6 Factory Defaults
```

1. Press **2**, Scan Goto Top, to toggle between **Yes** or **No**.

If **Yes** is selected, subsequent verification scans will send the user to the same results record page each time. See *Chapter 9, Understanding Verification Screens*, for more information on verification screens.

Setting Coupon Link

The Coupon Link is set from the Miscellaneous screen.

The Miscellaneous screen appears.

```
Miscellaneous
1 Element Detail No
2 Scan Goto Top Yes
3 Coupon Link Yes
4 Show Hidden Yes
5 Avg Scan Numb 10
6 Factory Defaults
```

Press **3**, Coupon Link, to toggle between Yes or No

Setting Hidden Character

The Hidden Character is set from the Miscellaneous screen.

The Miscellaneous screen appears.

```
Miscellaneous
1 Element Detail No
2 Scan Goto Top Yes
3 Coupon Link Yes
4 Show Hidden Yes
5 Avg Scan Numb 10
6 Factory Defaults
```

Press **4**, Show Hidden, to toggle between (show hidden character) or **No** (not show hidden character)

Setting Average Scan Number

The Average Scan Number is set from the Miscellaneous screen.

The Miscellaneous screen appears.

```
Miscellaneous
1 Element Detail No
2 Scan Goto Top Yes
3 Coupon Link Yes
4 Show Hidden Yes
5 Avg Scan Numb 10
6 Factory Defaults
```

Press **5**, Avg Scan Numb, to toggle average scan number 1,3, 5 or 10.

Note: When in Avg Mode, say 10 scans, Elite will discard the previous 9 scan records and only stores the 10th record. In other

words, each record actually stored would be the 10th record and would contain the average for the 10 scans as well as the information relating to the last scan. The Ready Scan Screen will be display:

Required Scan#:

Successfully #:

Setting Factory Defaults

The Factory Defaults is set from the Miscellaneous screen.

The Miscellaneous screen appears.

```
Miscellaneous
1 Element Detail No
2 Scan Goto Top Yes
3 Coupon Link Yes
4 Show Hidden Yes
5 Avg Scan Numb 10
6 Factory Defaults
```

1. Press **6**, Factory Defaults, the factory Defaults screen appears:

```
RESET TO  
FACTORY DEFAULTS  
ARE YOU SURE?  
  
CLEAR KEY ==> RESET!
```

2. Press the **Clear** to reset the factory default

-or-

Press **Enter** to return to the Miscellaneous screen without doing the reset

3. Press **Enter** to return to the Setup Options screen

Setting a Password

Use the Set Password screen to restrict access and usage of the Xaminer Elite to authorized users. When access is restricted, only those with password can access the unit's Main Menu and related sub-menus. Only one password can be assigned to the Xaminer Elite.

To Set a Password:

1. Press **4**, Set Password, on the Setup Options screen.

```
Setup Options
1 Analysis Mode
2 Memory
3 Miscellaneous
4 Set Password
5 User/Job Id
6 SVS/Loader
7 Custom Options
```

The Set Password screen appears.

```
Set Password
Restrictive Access
F1 No
↑
```

2. You can type in a new password of up to 20 characters in length.

As each character is typed, the arrow indicator moves from one position to the next, overwriting the existing password.

- Press **BK SP** (backspace) to delete characters from the arrow indicator position backwards.
- Press **Clear** to clear the entire field of all characters you typed.

3. Press **FUNC+1** (F1) to turn the password restrictive access on (**Yes**) or off (**No**). See the section entitled, *Restricted Access*, at the end of this chapter for important information.
4. Press **Enter** to accept the settings and return to the Setup Options screen.

Ψ Warning: Do not forget your password! There is no way to retrieve it from the Xaminer Elite, and the unit's functionality will be inaccessible. Write your password down, and keep it in a safe place for reference when necessary.

Changing a Password

To Change a Password:

1. Follow Step 1 as described in the section entitled, *Setting a Password*.
2. Type in a new password directly over the existing password
- or -
press **Clear** to clear the field and type a new password.

```
Set Password
Restrictive Access
F1 No
5128
↑
```

3. Press **Enter** to accept the settings and return to the Setup Options screen.

Restricted Access

Restricting access to the Xaminer Elite allows individuals to perform verification scans using only the settings you determine.

When the password is turned on, access to the Xaminer Elite's Main Menu is restricted. You will only be able to perform verification scans using the existing settings.

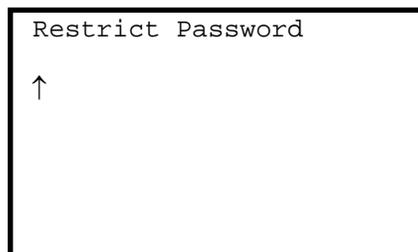
Restricted Access – Accessing the Main Menu

After exiting the terminal configuration mode, you must use your password to regain access the Main Menu.

To Access the Main Menu in Restricted Access Mode:

1. From any verification screen, press **FUNC+0**.

The Restrict Password screen appears.



2. Type in the password assigned to your Xaminer Elite.

```
Restrict Password  v
123456
  ↑
```

If necessary, press **BK SP** (backspace) to delete characters from the arrow indicator position backwards; or press **Clear** to clear the entire field of all characters you typed.

3. Press **Enter** to view the Main Menu.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

If the password you typed was incorrect, the Ready to Verify screen appears instead.

Setting User ID and Job ID

Use the User ID screen to include user identification information when printing reports. The user ID becomes a part of the Xaminer Elite verification records.

To Set User ID:

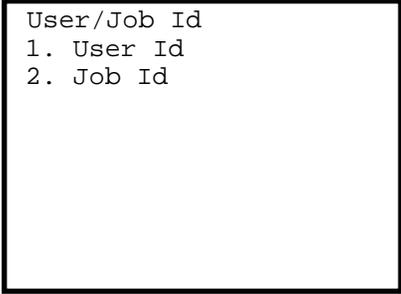
1. Press **2**, Setup Options, from the Main Menu.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

The Setup Options screen appears.

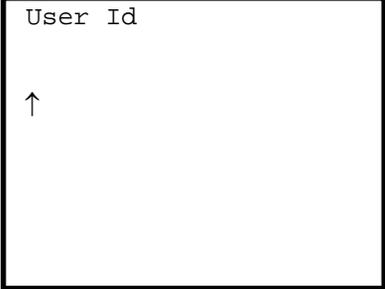
```
Setup Options
1 Analysis Mode
2 Memory
3 Miscellaneous
4 Set Password
5 User/Job Id
6 SVS/Loader
7 Custom Options
```

2. Press **5**, User/Job Id. The User/Job Id screen appears.



```
User/Job Id
1. User Id
2. Job Id
```

Press 1 to the User Id Screen



```
User Id
↑
```

3. Type in a numeric user identification up to 20 characters in length.

As each character is typed, the arrow indicator moves from one position to the next.

- Press **BK SP** (backspace) to delete characters from the arrow indicator position backwards.
- Press the left (◀) and right (▶) arrows keys to move the cursor to a specific location, and type a new character in place of the existing character.

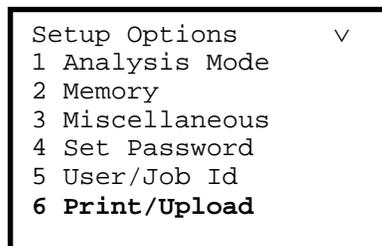
- Press **Clear** to clear the entire field of all characters you typed.
4. Press **Enter** to accept the settings and return to the Setup Options screen.
 5. Job Id settings are the same as User Id settings

Configuring the Communications Port

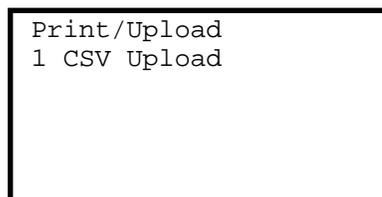
Use the Print/Upload screen to configure the Xaminer Elite for communicating with a printer or personal computer.

To Configure Port Usage for Printing

1. Press **6**, Print/Upload, from the Setup Options screen.



The Print/Upload screen appears.



2. Press **1** to toggle between **Printing** and **CSV** (Comma Separated Variable) **Upload** modes.
3. Press **Enter** to accept the settings and return to the Print/Upload screen.

Chapter 4 - Understanding the Administrative Menu

Use the Admin Options menu to:

- Set the date and time
- Set the timeout period
- Select the volume level

Accessing the Administrative Menu

1. Press **3**, Admin Options, from the Main Menu.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

The Admin Options screen appears.

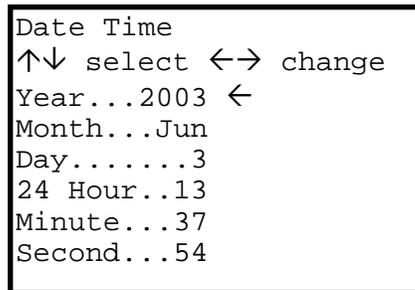
```
Admin Options
1 Date/Time
2 Set Timeout
3 Volume
```

Setting the Date and Time

To Set the Date and Time:

1. Press **1**, Date/Time, on the Admin Options screen.

A screen appears where you can set the date, and time.



The screenshot shows a terminal-style interface for setting the date and time. At the top, it says "Date Time" followed by instructions: "↑↓ select ←→ change". Below this, the current settings are listed: "Year...2003 ←", "Month...Jun", "Day.....3", "24 Hour..13", "Minute...37", and "Second...54". A left-pointing arrow is positioned to the right of the "Year...2003" line, indicating it is the selected item.

2. Press the up (▲) or down (▼) arrow keys to select the item you wish to change. The ← pointer will move to the selected item.
3. Use the forward (▶) and back (◀) arrow keys to change the value of the selected item.
The selected display mode appears at the top of the screen.
4. Press **Enter** to return to the Admin Options screen.

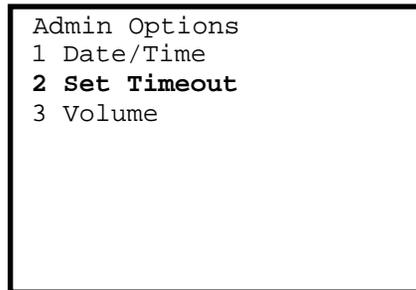
Setting the Timeout Period

⚠ **Warning:** Timeout should be set to **Off** only when using the AC adapter. If not, the Elite's battery will be drained

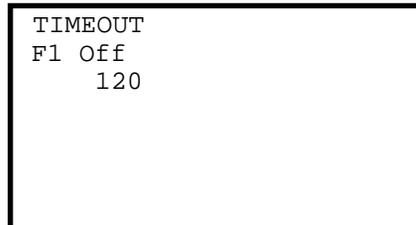
unnecessarily, resulting in shorter times between battery charge/replacement.

To Set the Timeout Period:

1. Press **2**, Set Timeout, on the Admin Options screen.
- 2.



The Timeout screen appears.



2. Press **FUNC+1** to toggle between turning the timeout feature **On (Enable)** or **Off**.

• **Note:** The timeout period is in seconds.

• **Note:** Turn the timeout off to keep the Xaminer Elite on at all times until you manually turn the power off.

3. Use the up (**▲**) and down (**▼**) arrow keys to change the timeout period in increments of one second.

• **Note:** You can also press **Clear** to reset the timeout period to zero seconds, then type in a new value.

4. Press **Enter** to accept the information and return to the Admin Options screen.

Adjusting the Volume Control

1. To Adjust the Volume to High or Low, press **3**, Volume, on the Admin Options screen
2. Press **3** repeatedly to toggle the beep volume to high or low.

```
Admin Options
1 Date/Time
2 Set Timeout
3 Volume High
```

3. Press **Enter** to accept the information and return to the Admin Options screen.

Chapter 5 - Using the Check Digit Value (CDV) Calculator

Introduction

A check digit character is a character included in the encodation of a bar code symbol whose value is used to perform a mathematical check to ensure the accuracy of the decoded data. Each symbology has a different set of check digit calculations. The Xaminer Elite check digit calculator automatically performs check digit calculations on each symbol verification scan. Some calculations are required, while others are optional. There also may be more than one check digit calculation performed during each scan. Use the CDV Calculator menu to calculate the check digit characters for the following bar code symbols:

- U.P.C.-A
- U.P.C.-E
- EAN-13
- UCC/EAN SCC-14
- UCC/EAN SSSC-18
- I25 (ITF) SCC-14
- C39 Mod 43
- A reserved Code 128 bar code symbol
- Additional custom bar code symbol, if included

Accessing the CD Calculation Screens

To Access the CDV Calculator Menu screen:

```
MAIN MENU          v
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

1. Press **4**, Check Digit Calc. on the Main Menu.

The CDV Calc. Menu screen appears.

```
CDV CALC. MENU     v
1 U.P.C. A <==> E
2 EAN 13
3 UCC Shipping
4 C39 MOD 43
```

2. Select the type of bar code symbol for which you want to perform a check digit calculation, then perform the calculations as described in the following section entitled, Performing Check Digit Calculations.

Performing Check Digit Calculations

This section explains how to perform check digit verification calculations for the various bar code symbols.

Procedures for U.P.C. - A and U.P.C. -E

1. Press **1**, U.P.C. A <==> E from the CDV Calc. Menu screen.

```
CDV CALC. MENU      v
1 U.P.C. A <==> E
2 EAN 13
3 UCC Shipping
4 C39 MOD 43
```

2. The Check Digit U.P.C. screen appears.

```
CHECK DIGIT U.P.C
0 23456 00007 3
0 23456_      3
F1 Toggle A <==> E
```

U.P.C.-A indicator

U.P.C.-E indicator

3. Type in the appropriate digits using the keypad. Press **Clear** to clear the information and begin again.

After the last digit is typed, the check digit is calculated and automatically displayed in the last position on the line.

***Note:** When all digits are entered, the Xaminer automatically calculates the check digit. Every U.P.C.-E symbol has a corresponding U.P.C.-A check character. Not every U.P.C.-A has a corresponding U.P.C.-E check character.

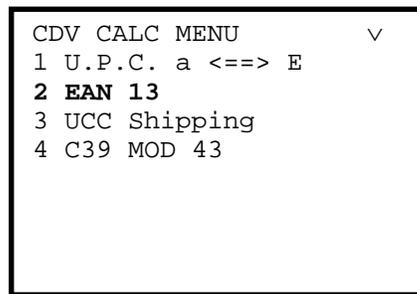
***Note:** If you type in a symbol code on the U.P.C.-E indicator line, the corresponding symbol code is automatically displayed on the U.P.C.-A indicator line. If you type in a symbol code on the U.P.C.-A indicator line, the corresponding symbol code is automatically displayed on the U.P.C.-E indicator line if possible. If there is not an exact match, the U.P.C.-E indicator line is populated with asterisks (*).

Press...	To...
Left Arrow	Move the cursor one position to the left within a field.
Right Arrow	Move the cursor one position to the right within a field.
Numeric Key	Type in a specific numeral.
FUNC+1	Switch between the two lines of information.
Clear	Clear the contents of the entire field.

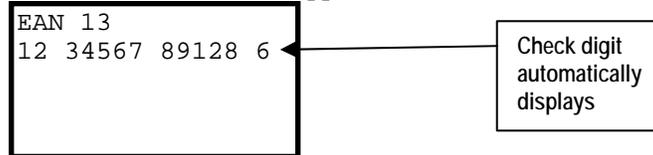
4. Press **F1** to switch between the two lines of information.
5. Press **Enter**, to return to the CDV Calc. Menu screen.

Procedures for EAN-13

1. Press **2**, EAN 13 from the CDV Calc. Menu screen.



The EAN 13 screen appears.



2. Type in the appropriate digits using the keypad. Press **Clear** to clear the information and begin again

Press...	To...
Left Arrow	Move the cursor one position to the left within a field.
Right Arrow	Move the cursor one position to the right within a field.
Numeric Key	Type in a specific numeral.
Clear	Clear the contents of the entire field.

After the last digit is typed, the check digit is calculated and automatically displayed in the last position on the line.

3. Press **Enter**, to return to the CDV Calc. Menu screen.

Procedures for UCC Shipping (Container) Codes (UCC/EAN SSCC-18)

1. Press **3**, UCC Shipping, from the CDV Calc. Menu screen.

```
CDV CALC MENU
1 U.P.C. a <==> E
2 EAN 13
3 UCC Shipping
4 C39 MOD 43
```

The UCC/EAN SSCC-18 screen appears.

```
UCC/EAN SSCC-18
(00) 1 2345678
      91234
CD: 3
F1 Toggle
```

The diagram shows a rectangular box containing the text from the UCC/EAN SSCC-18 screen. Two callout boxes are positioned to the right of the main box. The first callout box, labeled 'Symbol type', has an arrow pointing to the title 'UCC/EAN SSCC-18' at the top of the main box. The second callout box, labeled 'CD field', has an arrow pointing to the line 'CD: 3' in the main box.

2. Press **FUNC+1** to select the other available symbol types:
 - UCC/EAN SSCC-18 (default)
 - UCC/EAN SCC-14
 - I25 (ITF) SCC-14

The selected symbol type appears at the top of the screen.
(UCC/EAN SSCC-18 is used in this example).

3. Type in the appropriate digits using the keypad.

After the last digit is typed, the check digit is calculated and automatically displayed in the CD field.

***Note:** SSCC-18 has an additional check digit that is part of the hidden construction of the symbol.

Press...	To...
Left Arrow	Move the cursor one position to the left within a field.
Right Arrow	Move the cursor one position to the right within a field.
Numeric Key	Type in a specific numeral.
Clear	Clear the contents of the entire field.
Func+1	Move to the next UCC symbol type.

4. Press **Enter**, to return to the CDV Calc. Menu screen.

Procedures for UCC/EAN SCC-14

1. Press **FUNC+1** from the UCC/EAN SSCC-18 screen until the UCC/EAN SCC-14 screen appears.

```
UCC/EAN SCC-14
(01) 1 2345678
      91234
CD: 3
F1 Toggle
```

2. Type in the appropriate digits using the keypad.

Press...	To...
Left Arrow	Move the cursor one position to the left within a field.
Right Arrow	Move the cursor one position to the right within a field.
Numeric Key	Type in a specific numeral.
Clear	Clear the contents of the entire field.
Func+1	Move to the next UCC symbol type.

After the last digit is typed, the check digit is calculated and automatically displayed in the CD field.

3. Press **Enter**, to return to the CDV Calc. Menu screen.

Procedures for I25 (ITF) SCC-14

1. Press **FUNC+1** until the I25 (ITF) SCC-14 screen appears.

```

I25 (ITF) SCC-14
      1 23 45678
        91234
CD: 3
F1 Toggle

```

2. Type in the appropriate digits using the keypad.

After the last digit is typed, the check digit is calculated and automatically displayed in the CD field.

Press...	To...
Left Arrow	Move the cursor one position to the left within a field.
Right Arrow	Move the cursor one position to the right within a field.
Numeric Key	Type in a specific numeral.
Clear	Clear the contents of the entire field.
Func+1	Move to the next UCC symbol type.

3. Press **Enter**, to return to the CDV Calc. Menu screen.

Procedures for C39 Mod 43 for Standard and Weighted

1. Press **4**, C39 MOD 43, from the CDV Calc. Menu screen.

```
CDV CALC MENU
1 U.P.C. a <==> E
2 EAN 13
3 UCC Shipping
4 C39 MOD 43
```

The C39 MOD 43 screen appears.

```
C39 MOD 43

-

STD CD: U
WT CD: 1
```

2. Type in the appropriate character(s) using the Up (▲) or Down (▼) arrow keys. Valid characters are:
 - A - Z
 - 0 - 9
 - Dash (-)
 - Period (.)
 - Blank displayed as “<space>” on the screen.
 - Dollar Sign (\$)
 - Forward Slash (/)
 - Plus Sign (+)
 - Percent Sign (%).

A check digit calculation is performed for each character or combination of characters as they are entered. The results appear in the STD (Standard) and WT (Weighted) fields.

Press...	To...
Left Arrow	Move the cursor one position to the left within a field.
Right Arrow	Move the cursor one position to the right within a field.
Numeric Key	Type in a specific numeral.
Up Arrow	Move forward one valid character.
Down Arrow	Move backward one valid character.
Clear	Clear the contents of the entire field. Changes the CD fields to No Data .

3. Press **Enter** to return to the CDV Calc. Menu screen.

Chapter 6 - Understanding Grading Methods

Introduction

Grading is used to analyze bar code data. The Xaminer Elite uses the ANSI (American National Standards Institute) grading method.

ANSI Mode Testing

Use this method of testing to analyze the print quality of a bar code using ANSI guidelines. ANSI standards grade a bar code symbol based on eight separately calculated and graded measurements. Four of the measurements are given a pass/fail grade of “A” or “F.” The remaining four measurements are graded “A” through “F”.

***Note:** U.P.C./EAN has a ninth grading parameter of “A” or “F” for the quiet zone. The other symbologies treat the quiet zone as part of symbol reference decode.

The Xaminer Elite performs all the tests as defined in ISO/IEC 15416 (2000-08-15) and ANSI document X3.182-1990, as well as other standards applicable to AIM, UCC, and EAN documents.

ANSI Guidelines

ANSI guidelines define that the results displayed represent the worst character that was evaluated. For example, a U.P.C. symbol could have 11 good characters and one bad character.

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The pass/fail criteria for a bar code would be based on the one bad character.

Traditional Mode Testing

Built-in traditional mode testing is used to analyze the print quality of a bar code symbol by evaluating the bar and space dimensions, print contrast signal (PCS) and encodation.

Selecting ANSI Grading Criteria

To Select Grading Criteria

1. Select **2**, Setup Options, from the Main Menu.

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

The Setup Options screen appears.

```
Setup Options
1 Analysis Mode
2 Memory
3 Miscellaneous
4 Set Password
5 User/Job Id
6 Print/Upload
```

2. Press **1**, Analysis Mode.

```
Setup Options
1 Analysis Mode
2 Memory
3 Miscellaneous
4 Set Password
5 User/Job Id
6 Print/Upload
```

The Analysis Mode screen appears.

```
Analysis Mode
1 Verify 1-D
2 Verification Mode:
  Full ANSI
3 ANSI Pass On C
4 Corrugated
5 Negative Film No
6 Traditional Yes
```

3. Press **3**, ANSI Pass On, repeatedly, to select the desired minimum passing grade criteria. Valid values are A, B, C, D, or F.
4. Press **Enter** to return to the Setup Options menu.

Partial ANSI Mode Testing

Some models of the Elite may be optionally configured to support Partial ANSI testing of barcodes. This mode is for those users who require mobile use of the verifier throughout their facility, where it is inconvenient or impossible to verify codes in a fixed stand, or who otherwise do not desire to grade codes against the full ANSI requirements.

In Partial ANSI mode, the Elite will report a subset of the eight ANSI parameters (Edge Determination, Reference Decode, and Decodability), plus the Overall ANSI grade, Quiet Zone grade, and Bar Tolerance. The individual parameters are graded using the same ANSI criteria as defined for Full ANSI verification. The Overall grade is based against only the subset of Partial ANSI parameters verified.

Partial ANSI mode is typically used with the Elite as a mobile, hand-held, battery powered terminal. The user aims and scans much as one would with a conventional barcode scanner. See Chapter 2 Using the Xaminer Elite, for details on activating and using the Elite in Partial ANSI mode.

If your Xaminer Elite verifier is not currently capable of Partial ANSI operation, and you would like to add this optional capability, please contact your Stratix account representative.

Chapter 7 - Printing Reports and Uploading Verification Data

Introduction

Use the Xaminer to:

- Print ASCII text verification data to the printer
- Upload verification data to another system or application (Comma Separated Value - CSV)

A Stratix direct thermal or dot matrix printer is recommended for use with your Xaminer Elite. This chapter assumes that you are using one of these types of printer for printing purposes.

Setting Up the Printer

To Set Up the Printer:

1. Attach the 25-pin male-to-male gender changer (supplied) to the printer port on the printer.
2. Attach the 25-pin end of the printer cable (supplied with the printer) to the printer port located on the back of the printer.
3. Attach the other end of the cable to the 25-pin connector of the Xaminer Elite communications cable).
4. Attach the power cord to the printer.
5. Plug the printer AC power cord into any 110-volt electrical outlet.

The green power light on the printer will illuminate when the printer is turned on.

Printing Verification Reports

1. Follow Steps 1 through 4 as shown in the previous section entitled, *Setting Up the Printer*.
2. Scan the symbol(s) you want to analyze.

Verification data appears on the screen.

```
U.P.C. A      Pass
ANSI A
0 12345 00006 5

Mag 100
#Scan Cur Avg  Batt
 11  A  C 2.4  IIII
```

3. Press **Print** key.

The Output Options screen appears.

```
Output Options
F1 Printing
F2 Current Record
F3 Tag Records

Total Stored  18
Numb to Print 1
```

4. Ensure that **Printing** appears as the selected mode. Press **Func+1** (F1) to select **Printing** if **CSV Upload** is displayed.
5. Set up and activate your communications software to the following parameters in order receive the data.

Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits	1

6. Type in the number of records to print, if other than the last record. Records will be printed from the current record backwards from the Elite's memory.
7. Press **Enter** to print the requested records. The number of records printed directly corresponds to the number indicated in the Total Stored field on the Output Options screen.

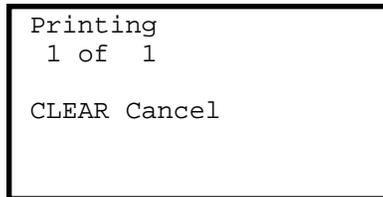
-or-

Press **Func+2** (F2) to print the current record being displayed.

-or-

Press **Func+3** (F3) to print or upload records that have been previously marked.

The Printing screen appears.



The report is printed. The following two pages are examples of typical U.P.C. and PDF verification analysis reports.

Figure 7.1 - Verification Analysis Report for U.P.C.

```

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1-800-883-8300
www.stratixcorp.com

XAMINER Elite VERIFIER REPORT
Host 2.11
SN#: XE00001
Date 25/Apr/2006   Time 11:43:56
User Id: 1234
Job Id: 5678
U.P.C. A           Mag 100   Pass
 0 12345 67890 5

Scanner: LASER
Verification Mode: Full ANSI
ANSI Pass On: C
-----
ANSI/ISO OVERALL A/ 6/650: Pass
Edge Determination ..... A
Symbol Reference Decode..... A
Decodability ..... 82% A
Quiet Zone ..... A
Defects ..... 9% A
Edge Contrast Minimum ..... 65% A
Modulation ..... 88% A
Reflect Min ..... 7% A
Symbol Contrast..... 74% A
#Scans 1   ANSI Avg Scan.. A 4.0
-----
Traditional: Pass
Bar Tolerance ..... 13% A
Bar Tolerance Min ..... -13%
Bar Tolerance Max..... 68%
Global Threshold ..... 44%
Reflect Min ..... 7%
Reflect Max ..... 81%
PCS (Print Contrast Signal) ... 91% A
-----
User Defined Tests
Ratio ..... N/A
Optional Cdv .. N/A
Data Compare .. N/A
-----
SYMBOL IN SPEC
    
```

Heading and symbol information

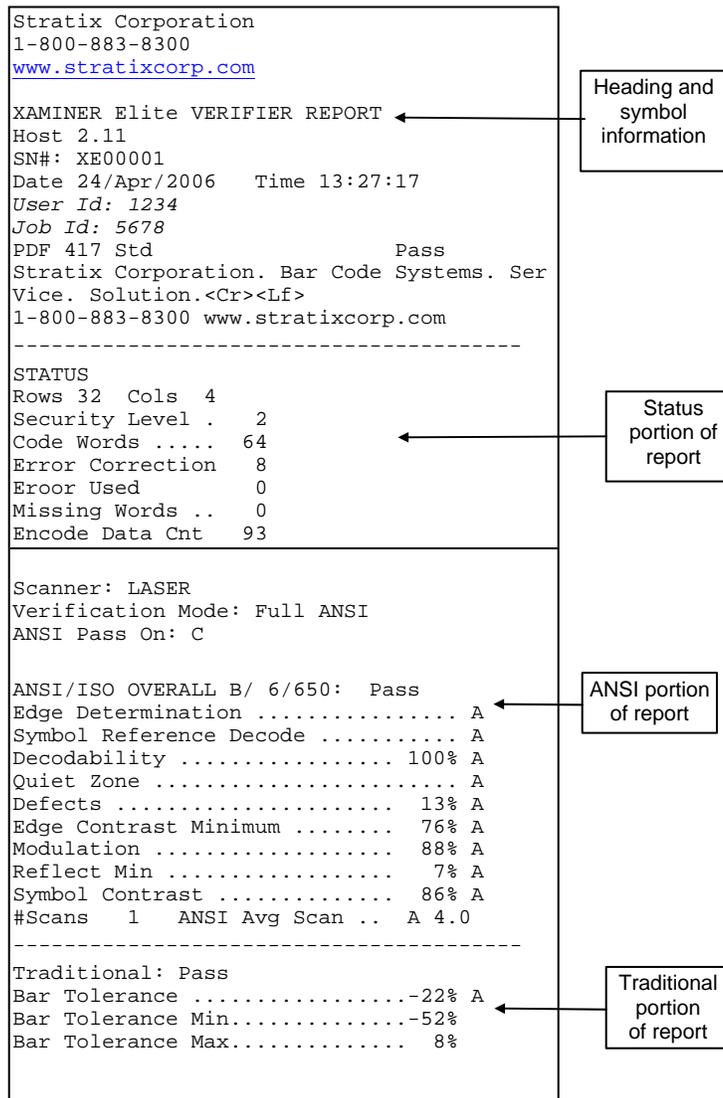
ANSI portion of report

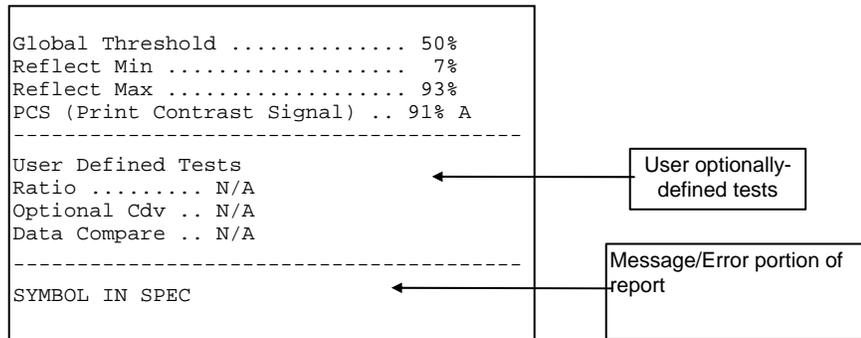
Traditional portion of report

User optionally-defined tests

Message/Error portion of report.
Printed only if symbol fails

Figure 7.2 - Verification Analysis Report for PDF





Uploading Verification Data

The Xaminer Elite can upload symbol verification analysis record data in comma-separated value (CSV) format. This verification data can be uploaded to your PC via HyperTerminal to an application of your choosing, or to Stratix's SVS application.

Note: Uploading CSV data to your own application requires that you interpret the individual fields in the data. This can be both complex and time consuming. Stratix strongly recommends that you use our SVS application, which conveniently displays your results in a Windows user interface. This powerful tool enables you to menu-select the data you wish to display, print results, view the analog Scan Reflectance Profile for your scan, and export a formatted Excel CSV file from your PC. Contact your Stratix Account representative for more details.

The following provides instructions for uploading data to the SVS application, followed by the steps for uploading data to an Excel spreadsheet via HyperTerminal.

To Upload Verification Data to Stratix SVS:

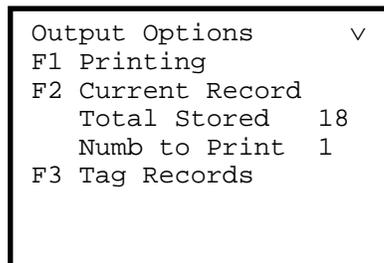
1. Connect the 9-pin end of the optional Xaminer Elite communications/printer cable to the 9-pin communications port located on your computer system.

2. Scan the symbol(s) you want to analyze.

The verification data appears on the screen.

3. Press **Print** key.

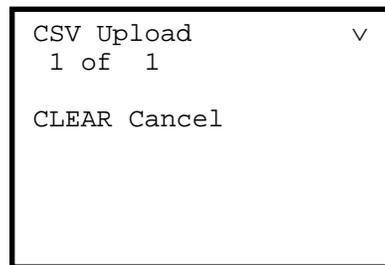
The Output Options screen appears.



4. Ensure that **CSV Upload** appears as the selected mode. Press **Func+1** (F1) to select **CSV Upload** if **Printing** appears.
5. Open SVS. There will typically be 3 blank windows tiled on your screen: 1 Symbol Data, 2 Statistics, and 3 Measured Grades.
6. On the Elite, type in the number of records to upload, if other than the last record. Records will be uploaded from the current record backwards from the Elite's memory.

7. Press **Enter**.

The CSV Upload screen appears.



8. The verification data is uploaded, and the results populate the three SVS windows.
9. Under the “Window” toolbar at the top of the SVS screen, select either “Measured Grades Settings” or “Statistics/Excel CSV Data Fields Settings” to customize the records data displayed. The latter menu enables you to select those data you wish to upload to an Excel spreadsheet, if desired.
10. To upload to an Excel spreadsheet from SVS, select the “Tools” dropdown menu from the SVS toolbar at the top of the page. From that menu, pick “Excel CSV File”. Your data is immediately uploaded to an Excel spreadsheet, preformatted and ready to use.
11. For further information on using SVS, consult the SVS Users Guide provided with the application.

To Upload Verification Data to a Windows PC via HyperTerminal:

• **Note:** Only the Xaminer Elite IS and Elite Plus models are capable of this procedure.

1. Connect the Xaminer Elite to your PC as described earlier. Place the terminal in Ready to Verify mode.
2. On your PC, open the Start Menu on your Windows toolbar.
3. Select Programs: Communications: Accessories: HyperTerminal.
4. The HyperTerminal session window appears. Type any convenient name (e.g., Elite Upload). Once named, the session setup will be saved under HyperTerminal, so that you can select it again later. Click OK when finished.
5. The “Connect To” window appears. Select “Connect Using” tab and pick Com1. Click OK.
6. The Com1 Port Settings window appears. Set the following parameters, then click OK:
 - a. Baud Rate: 38,400
 - b. Data Bits: 8
 - c. Parity: None
 - d. Stop Bits: 1
 - e. Flow Control: None
7. On the HyperTerminal toolbar, choose the Transfer menu.

8. Select “Capture Text...” and type the desired filename. This is where your upload data will be stored. The filename must end with a .txt extension.
9. On the Elite, press **Func + 0** to go to the Main Menu. Select **2 Setup**, then **6 Print/Upload**.
10. Toggle by pressing **1** until CSV Upload is selected.
11. Press **Enter** three times to return to Ready to Verify mode.
12. Verify one or more bar codes as desired.
13. Press the Print button on the Elite keypad. Select **Func + 1** as needed to change the setting from “Printing” to CSV Upload”.
14. Type in the desired number of records to upload. Note that the records load sequentially from the most recent backwards.
15. Press Enter. The uploaded records will be displayed in your HyperTerminal session window. It will look similar to the data shown in the next example for a PDF417 upload.
16. When finished uploading data, select the Transfer window again from the HyperTerminal toolbar and choose “Stop”.
17. Open Microsoft Excel. Click on the icon, or select from the Excel File menu, to open a new file.

18. Select “All Files” when the Open New File box appears, and type in, or browse to, the filename you used to save your upload data. Click OK
19. A “Text Import Wizard” box appears. Choose “Next”, then change the default selection from “Tab” to “Comma” on the next screen. Choose “Next” again, then choose “Finish”.
20. Your upload data will now be displayed in a series of columns on the Excel spreadsheet. Each column has a meaning, but there will be no column titles to identify the fields. You will need to use Table T7.2, found later in this chapter, to identify each column.

• **Note:** The commonly used ANSI and Traditional results are found in Columns 12 through 38 in the data.

The formatted symbol information data for the scanned symbol(s) appears on your computer screen similar to those shown in figure 7.3 below. In this example, data is representative of a **UPCA** symbol, record symbol data, and encodation data. Tables T7.1, T7.2, and T7.3 explain each portion of the verification data examples respectively.

Figure 7.3

```
300,1,6,650,408,24,100,0,0,2,15,A,A,A,82,A,9,A,A,65,A,88,A,7,A  
,74,A,13,100,-  
,13,26, ,0,0,0,91,7,81,44,T,115,9,T,88,9,P,53,53,0,0,0,0,0,T,5  
9.59.563.15.15.0.0.0.0.0.1.1.1.0.F.T.F.F.1.C.0.D
```

Record Symbol Data

```
301,000f1 G012345M678905G1
```

Encodation Data

```
322,0,T,T,T,T,090,003,066,003,000,000,T,F,T,000,000,2006,04,  
25,16,27,48,000,00000,00000,1234 ,1146007668
```

Host CSV Data

Table T7.1 – Record Symbol Data

Data format	Description
300	Record ID, symbol data
1	Scanner Types: 1=laser
6	Aperture in mils
650	Wavelength in nanometers
408	Symbol group, 408 = UCC group
24	Symbol type, 24 = UPCA
100	SCode0: for UCC group magnification (100%)
0*	SCode1: zero, no assigned meaning
0*	SCode2: zero, no assigned meaning
2*	Rule used: 2 = UCC decode and grading rules
15	Data length actual
A	ANSI overall letter grade
A	ANSI reference symbol decode
A,82	ANSI decodability letter, number
A,9	ANSI defects letter, number
A	ANSI edge determination letter
A,65	ANSI edge contrast minimum letter, number
A,88(20)	ANSI modulation letter, number
A,7	ANSI reflection minimum letter, number
A,74	ANSI signal contrast letter, number
A	ANSI UCC quiet zone letter (always given)
13	Bar tolerance (percent used)
100	Bar tolerance allowed (percent)
-13	Bar tolerance min (percent)

* See technical references

Data format	Description
<i>26</i>	Bar tolerance max (percent)
<i>T</i>	Boolean true/false indicator – Ratio OK
<i>0</i>	(Ratio 28 = 2.8)
<i>0</i>	Min ratio
<i>0</i>	Max ratio
<i>91</i>	PCS - Print contrast signal
<i>7</i>	Reflect signal min (percent of ANSI range)
<i>81</i>	Reflect signal max (percent of ANSI range)
<i>44</i>	Reference global threshold (percent of ANSI range). Parameter may change to raw numbers
<i>T</i>	Boolean true/false indicator – Left quiet zone OK
<i>115</i>	Left quiet zone ratio (X modules seen)
<i>9</i>	Left quiet zone required (X modules seen)
<i>T</i>	Boolean true/false indicator – right quiet zone OK
<i>88</i>	Right quiet zone ratio (X modules seen)
<i>9</i>	Right quiet zone required (X modules seen)
<i>P</i>	Required CDV OK code P = Pass
<i>53</i>	CDV required calculated
<i>53</i>	CDV required actual scanned
<i>0</i>	Optional CDV type code – zero = none
<i>0</i>	Optional CDV OK, if any
<i>0</i>	CDV optional calculated
<i>0</i>	CDV optional actual scanned
<i>0</i>	Bad character, if any
<i>0</i>	Bad character offset
<i>F</i>	Boolean true/false indicator – Decode direction left to right (not valid for PDF)

Data format	Description
	symbols)
<i>59</i>	Number of elements, actual
<i>59</i>	Number of elements, expected. (Used to determine if scan is valid.)
<i>563</i>	X dimension (CPU timer counts)
<i>15</i>	Number of symbol character
<i>15</i>	Number of valid character
<i>0</i>	Scan direction code (direction of laser, not symbol orientation)
<i>0</i>	Error chain code
<i>0</i>	Symbol error 0
<i>0</i>	Symbol error 1
<i>0</i>	Symbol error 2
<i>0</i>	N/A
<i>1</i>	N/A
<i>1</i>	N/A
<i>1</i>	N/A
<i>0</i>	N/A
<i>F</i>	N/A
<i>T</i>	N/A
<i>F</i>	N/A
<i>F</i>	Ambient light indicator
<i>1</i>	Full/Partial ANSI indicator
<i>C</i>	ANSI Pass On grade
<i>0</i>	Corrugated indicator
<i>D</i>	Corrugated Symbol Contrast Pass On grade
<i>/r/n</i>	Carriage return, line feed

Table T7.2 – Encodation Data

301,			
SOH	0x01	4-digit length (hex)	
STX	0x02	data	
EOT	0x04	4-digit CRC 16	

***Note:** U.P.C. -A symbols have a space reserved on the left for EAN 13 symbols, with the thirteenth digit as the country code.

***Note:** The encodation is not formatted. Code 128 contains hidden character codes as follows (hex value, meaning):

0xE0	C128 shift character
0xE1	C128 function 1, and Code 97 shift 1
0xE2	C128 function 2, and Code 97 shift 2
0xE3	C128 function 3, and Code 97 shift 3
0xE4	C128 function 4, and Code 97 shift 4
0xE5	C128 change set A
0xE6	C128 change set B
0xE7	C128 change set C
0xEA	left guard: start set A and Code 93 guard
0xEB	left guard: start set B
0xEC	left guard: start set C
0xEE	place holder: check digit
0xEF	right guard

Table T7.3 Host CSV Data

Data format	Description
322	Record ID, host CSV data
0	Record tag ID - 0=no, 1=yes
T	Boolean true/false indicator – T = symbol passed all tests, F = symbol failed some or all tests
T	Boolean true/false indicator – T = symbol passed user specified tests, F = symbol failed some or all tests
T	Boolean true/false indicator – T = symbol passed ANSI tests, F = symbol failed some or all tests
T	Boolean true/false indicator – T = symbol passed other user specified tests, F = symbol failed some or all tests
090	ANSI Multiscan sum. A=40, B=30, C=20, D=10, F=0. Used to calculate ANSI average grade
003	ANSI multiscan count. Number of records use to calculate ANSI average grade
066	ANSI average grade. 64=A, 65=B, 66=C, 67=D, 69=F.
003	ANSI average digit
000	ANSI average tenth or the tenths digit
000	N/A
T	Boolean true/false indicator – Ratio within user defined limits (Always true for modular symbologies.)
F	Boolean true/false indicator – Data compare

Data format	Description
	active
T	Boolean true/false indicator – Symbol passed data compare test
000	First member of host error codes. 0=no error
000	Second member of host error codes. 0=no error
2006	Year of scan, always four digits
04	Month of scan
25	Day of scan
16	Hour of scan
27	Minute of scan
48	Second of scan
000	Days out of calibration – 0= in calibration
00000	Size of symbol in cell length
00000	Measured size of symbol in arbitrary units
1234	User ID field, default is spaces
1145990636	Time stamp
/r/n	Carriage return, line feed

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Chapter 8 –Custom Menu Functions

Use the Custom Options menu to:

- Get a reflection percentage

In order to get the reflectance, the wand must connect with the Xaminer Elite, and ensure the scanner type for the connecting wand is correct.

Accessing the Custom Options Menu

1. Press **7**, Custom Options, from the Main Menu

```
MAIN MENU
1 Bar Code Type
2 Setup Options
3 Admin Options
4 Check Digit Calc.
5 Scanner Type
6 SVS/Loader
7 Custom Options
```

The Custom Options menu appears.

Custom Options 1 Reflectance 2 Can Stand: No 3 Calib Warning Yes

1. Press **1**, Reflectance, on the Custom Options screen.

A screen appears where you can get the reflectance for the location on which the wand tip is placed. To obtain the reflection percentage, place the tip on the desired location and Press **1**. The Elite will report a reflectance percentage for that location.

2. Press **2**, Can Stand, to toggle between Yes (activated) or No (deactivated) fro Can Stand

3. Press **3**, Calib Warning, to toggle between Yes (activated) or No (deactivated) for Calibration warning

Note:

Stratix can implement other Custom Menu functions for you on the Xaminer Elite to provide special features as required by individual customers. For specifics on the available features and functionality, contact your Stratix Corporation, Inc. Sales Representative at 1-800-883-8300.

Chapter 9 – Understanding the Verification Screens

Introduction

This chapter explains how to view and read bar code symbol verification data as it is scanned using the Xaminer Elite.

Reading Verification Screens

There are six verification data screens created with each scan (seven verification data screens, plus additional data review features, when verifying *PDF 417 and Composite symbols).

Each time a bar code symbol is scanned, the Xaminer Elite displays verification data on these screens. The type of symbol scanned determines the verification screens available. Figures 9.1 and 9.2 on the following pages show examples of all the Xaminer Elite verification screens for 1-D (including RSS) and PDF 417 verification screens respectively.

* PDF 417, RSS and Composite availability, options, and functionality are included only with the Xaminer Elite Plus Verifier.

Figure 9.1 – 1-D Symbology (including RSS)

Screen 1

U.P.C. A	Pass
ANSI A	
0 12345 00006 5	
Mag 100	
#Scan Cur Avg	Batt
10 A B 3.2	

Screen 2

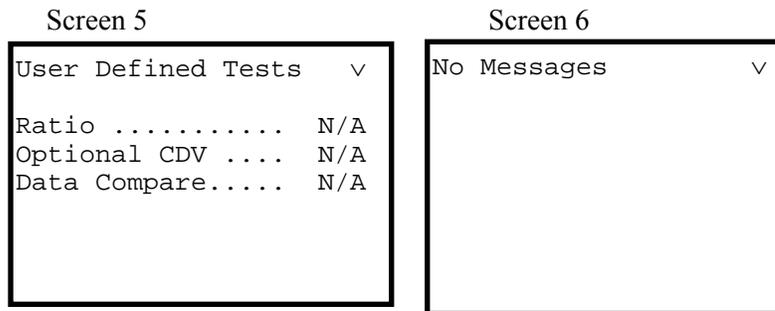
ANSI/ISO OVERALL	A
Elem Determine ...	A
Ref Decode (UCC) .	A
Decodability	72%A
Quiet Zone	A
#Scan Cur Avg	Batt
10 A B 3.2	

Screen 3

ANSI/ISO OVERALL	A
Defects	5% A
ECmin	53% A
Modulation ..	70% A
RMin	7% A
Contrast	76% A
#Scan Cur Avg	Batt
10 A B 3.2	

Screen 4

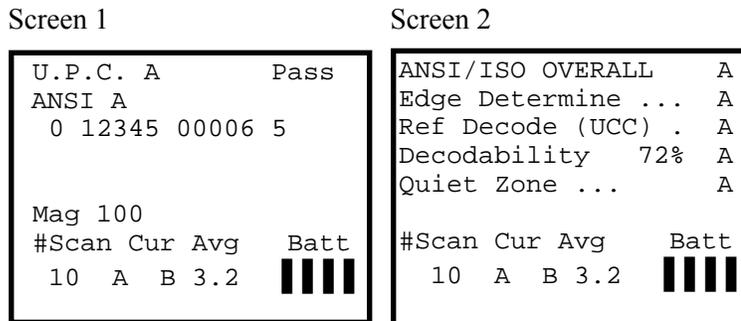
GRADES (TRAD)	∨
Bar Tolerance	-26%
Bar Range Min	-58%
Bar Range Max	13%
Global Threshold	48%
RMin	7%
RMax	83%
PCS	88%



Partial ANSI Mode Screens

When used in Partial ANSI mode, the Elite grades and reports a subset of the ANSI parameters: Edge Determination, Reference Decode, and Decodability. The Overall grade (determined from the grade of the subset parameters), Quiet Zone and (if applicable) , Bar Tolerance, and Wide-Narrow ratio are also reported.

Figure 9.1a – Partial ANSI Screens (1-D Symbology)



Screen 3

GRADES (TRAD)	∨
Bar Tolerance	-26%
Bar Range Min	-58%
Bar Range Max	13%

Screen 4

User Defined Tests	∨
Ratio	N/A
Optional CDV	N/A
Data Compare.....	N/A

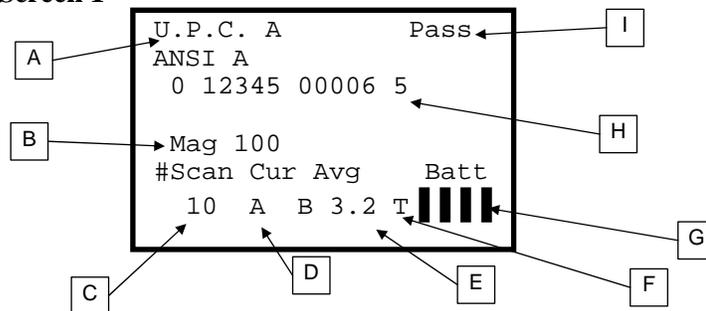
Screen 5

No Messages	∨
-------------	---

Defining the Verification Screens for 1-D Symbologies

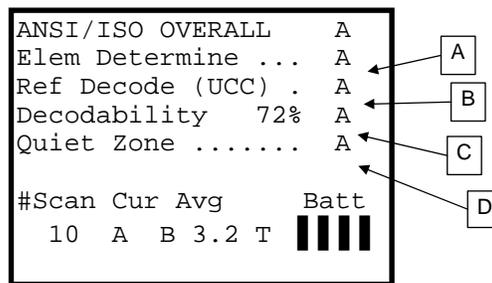
This section explains the 1-D verification screens.

Screen 1



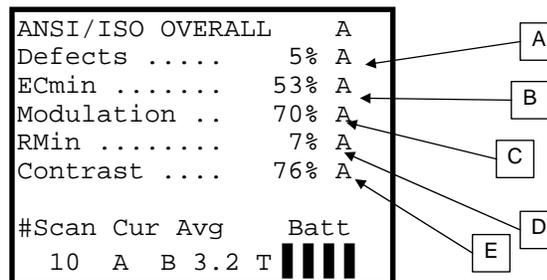
Item	Description
A	Symbol type.
B	The magnification level for the symbol. If Code 39 or I 25 (ITF), this field shows wide to narrow ratio. If Code 128, field is blank.
C	The total scan numbers
D	Current grade for the scan.
E	The average grade for the total number of scans as indicated by the #Scan field.
F	Record tagged indicator. T= Tagged; blank = not tagged.
G	Battery Status
H	Symbol content.
I	Pass/Fail indicator.

Screen 2



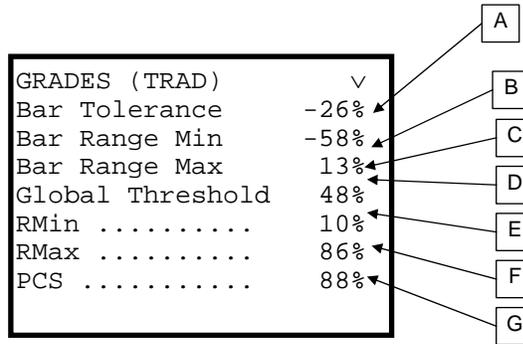
Item	Description
A	Element determination grade indicator. Rated as A or F.
B	Symbol decode grade indicator. Rated A or F.
C	The symbol decodability percentage for ANSI using U.P.C. standards, or ANSI AIM using AIM standards.
D	Quiet zone grade. Rated A or F

Screen 3



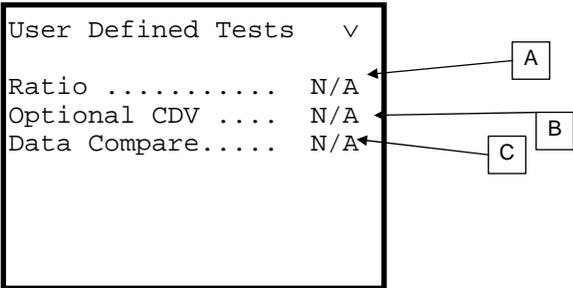
Item	Description
A	Indicates the percentage of defects (spots, voids) in the scanned symbols. Rated A, B, C, D, or F.
B	Minimum edge contrast percentage. The smallest difference in reflectance between any particular space and adjoining bar, including quiet zones. Rated A or F.
C	The modulation percentage. Graded on the relationship between the Edge Contrast Minimum (ECmin) and the Symbol Contrast (SC). Rated A, B, C, D, or F.
D	The minimum reflectance value.
E	Symbol contrast percentage. Rated A, B, C, D, or F.

Screen 4



Item	Description
A	Average Bar Tolerance determined for the symbol. Positive means bar growth, negative means bar loss.
B	Minimum bar growth as a percent of tolerance.
C	Maximum bar growth as a percent of tolerance.
D	Halfway (midway) point between the Rmax and Rmin values.
E	Minimum reflectance value.
F	Maximum reflectance value.
G	Traditional print contrast signal.

Screen 5



Item	Description
A	Wide to narrow ratio(Code 3 of 9, Interleaved 2 of 5).
B	Indicates if the symbol's check digit values have passed or failed.
C	Pass/Fail field indicates if the bar code symbol matches the proper specifications for all symbols of the same type. If a different symbology or encodation is detected, the symbol fails.

Screen 6



You will see this screen if there are no error messages.

Figure 9.2 – PDF 417

Screen 1

```

PDF 417 Std      Pass
ANSI A
STRATIX
Bar Code Systems
Solutions. Service

#Scan Cur Avg  Batt
 10  A  B 3.2  █ █ █
    
```

Screen 2

```

STATUS
Rows 24  Cols  6
Security Level .    5
Code Words .....  96
Error Correction   64
Error Used .....   4
Missing Words ..   0
Encode Data Cnt   47
    
```

Screen 3

```

ANSI/ISO OVERALL  A
Elem Determine ... A
Ref Decode (AIM) . A
Decodability 94%  A
Quiet Zone ..... A

#Scan Cur Avg  Batt
 10  A  B 3.2  █ █ █
    
```

Screen 4

```

ANSI/ISO OVERALL  A
Defects .....    5% A
ECmin .....      53% A
Modulation ..    70% A
Rmin .....       7% A
Contrast ....    76% A
#Scan Cur Avg  Batt
 10  A  B 3.2  █ █ █
    
```

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Screen 5

GRADES (TRAD)	∨
Bar Tolerance	-26%
Bar Range Min	-58%
Bar Range Max	13%
Global Threshold	48%
RMin	10%
RMax	86%
PCS	88%

Screen 6

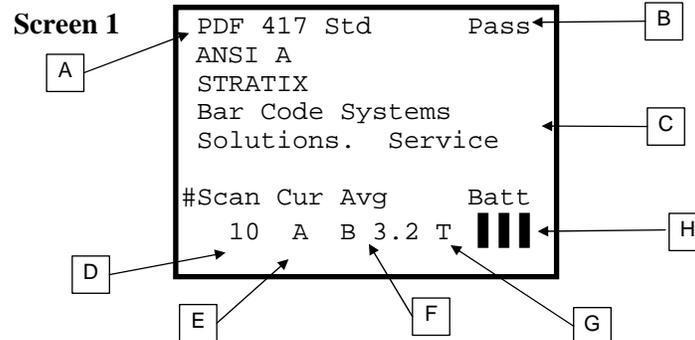
User Defined Tests	∨
Ratio	N/A
Optional Cdv	N/A
Data Compare.....	N/A

Screen 7

617 PDF Warning	∨
Seen Start/Stop	
Different Count	
Check Start/Stop	
600 PDF	
Missing Codewords	
In Matrix	

Defining the Verification Screens for PDF 417

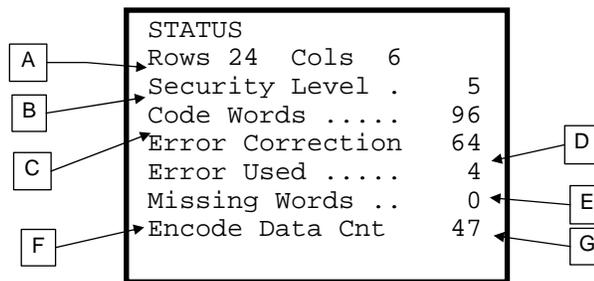
This section explains the components of each of the PDF 417 verification screens. The inverse fields represent non-printable control characters. See *Appendix D* for more information.



Item	Description
A	Symbol type.
B	Symbol pass/fail indicator.
C	Symbol content.
D	The total scan numbers
E	Current grade for the scan.
F	The average grade for the total number of scans as indicated by the #Scan field.
G	Record tagged indicator. T= Tagged; blank = not tagged.
H	Battery Status

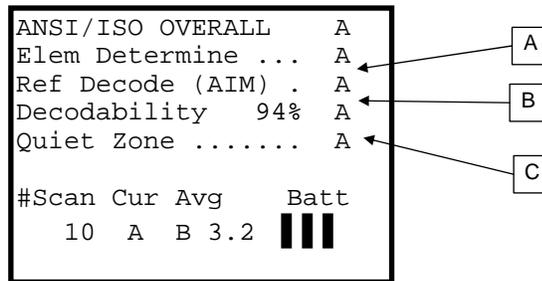
☛ **Note:** PDF417 codes may contain a great deal of data. To review all the data prior to continuing to the other verification screens, Press **FUNC + ►** or **Func + ◀** repeatedly. This will increment the data line by line. You may return to this screen any time in the process to start over.

Screen 2



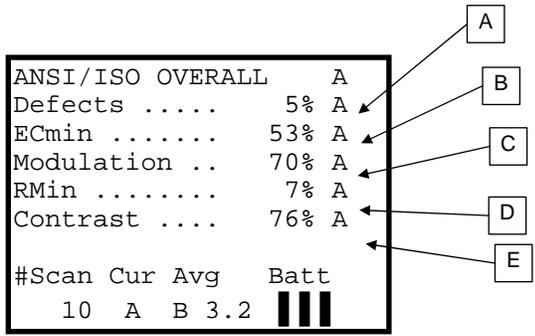
Item	Description
A	The number of columns and rows for the symbol.
B	The assigned security level.
C	The number of codewords.
D	The error correction value.
E	The number of errors accepted for the scan.
F	The number of missing codewords.
G	The encoded data count.

Screen 3



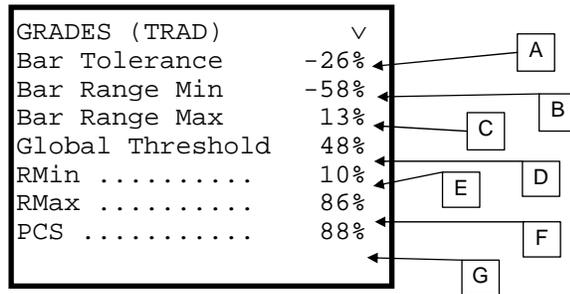
Item	Description
A	Element Determination grade indicator. Graded as A or F.
B	Symbol decode grade indicator. Rated A or F.
C	The symbol decodability percentage.

Screen 4



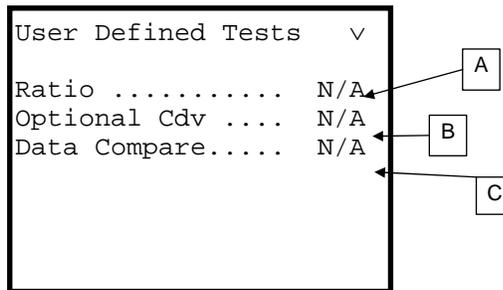
Item	Description
A	Indicates the percentage of defects (spots, voids) in the scanned symbols. Rated A, B, C, D, or F.
B	Minimum edge contrast percentage. The smallest difference in reflectance between any particular space and adjoining bar, including quiet zones. Rated A or F.
C	The modulation percentage. Graded on the relationship between the Edge Contrast Minimum (ECmin) and the Symbol Contrast (SC). Rated A, B, C, D, or F.
D	The minimum reflectance value.
E	Symbol contrast percentage. Rated A, B, C, D, or F.

Screen 5



Item	Description
A	Average Bar Tolerance determined for the symbol. Positive means bar growth, negative means bar loss.
B	Minimum bar growth as a percent of tolerance.
C	Maximum bar growth as a percent of tolerance.
D	Halfway (midway) point between the Rmax and Rmin values.
E	Minimum reflectance value.
F	Maximum reflectance value.
G	Traditional print contrast signal.

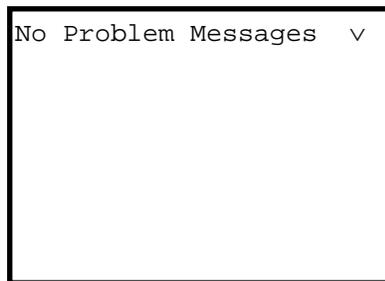
Screen 6



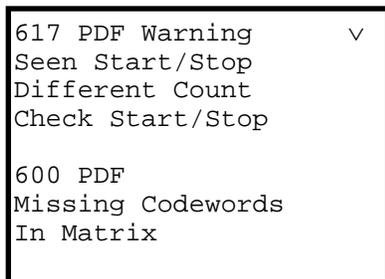
Item	Description
A	Wide to narrow ratio.
B	Indicates if the symbol's check digit values have passed or failed.
C	Pass/Fail indicator indicates if the bar code symbol matches the proper specifications for all symbols of the same type. If a different symbology or encodation is detected, the symbol fails. The data comparison allows the hidden internal representation of the symbol to be used for comparison.

Screen 7

You will see this screen if there are no errors messages.



If there are errors, they will appear as shown below. There may be up to two messages displayed per screen.



Refer to Chapter 10 for more information regarding error messages.

Reviewing Verification Records

1. Press 6 (REVIEW) From Ready to Scan Screen or any Verification Screen, Review Mode Screen appears:

```
U.P.C. A          Pass
ANSI A
 0 12345 00006 5

Mag 100
REVIEW MODE
 10 of 10
```

2. Press FUNC + up (▲) or FUNC + down (▼) arrow keys to select the scan record you wish view
3. Use the forward (▶) and back (◀) arrow keys to view the value of the selected scan record.

☛ **Note:** Review Mode is not available for Pharmacode.

Tagging a Verification Record

1. Press 4 (TAG REC) from any Verification Screen to toggle between tagging the recode or not. (See the section entitled, *Defining the Verification Screens for 1-D Symbologies*, on P9-5, for Record Tagged indicator information.)

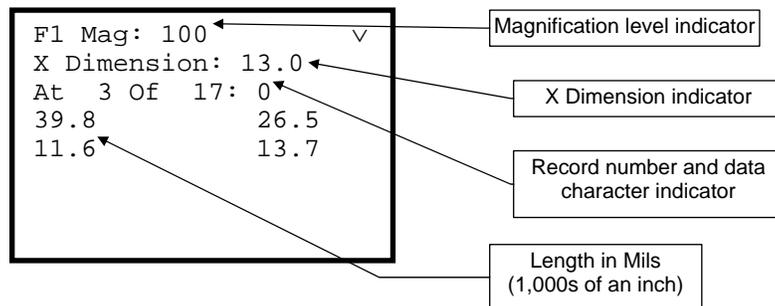
Working With Element Detail

Use the Element Detail screen to view symbol magnification and length information.

To View Symbol Element Detail Information:

1. Make sure you are in the Verification mode, and that the Element Detail feature is turned on. (See the section entitled, *Setting Element Detail*, in Chapter 3, *Setup Options, Miscellaneous*, for specific information.)
2. After a verification scan, press **Elem. Detail** (the **9** key) from any verification screen.

The Element Detail screen appears.



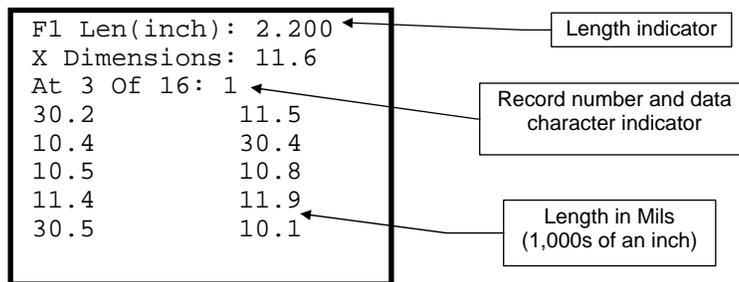
3. Press **Func+1** (F1) to toggle between magnification (Mag) and Length (Len) modes. The default mode is Magnification. Note that Mag is only used with UPC/EAN codes.
 - Use the left arrow (◀) and right arrow (▶) keys to view all the records indicated by the record number indicator.
 - Use the up arrow (▲) and down arrow (▼) keys change the magnification by increments of five from 80 to 200.

To View Symbol Length Information:

1. Make sure you are in the Verification mode, and that the Element Detail feature is turned on. (See the section entitled, *Setting Element Detail*, in Chapter 3, *Setup Options*, for specific information.)
2. Press **Elem. Detail** (the **E** key) from any verification screen.

The Element Detail screen appears.

3. Press **Func+1** (F1) to toggle from magnification (Mag) mode to Length (Len) mode.



4. Type in the overall symbol length in inches.
 - Use the left arrow (◀) and right arrow (▶) keys to view all the records indicated by the record number indicator.

Understanding Ambient Light

Ambient light refers to the background illumination in your scanning environment. If this warning appears, move the Elite to an area with less direct overhead or outside light and try again. If you experience this issue repeatedly, contact Stratix Customer Support for assistance.

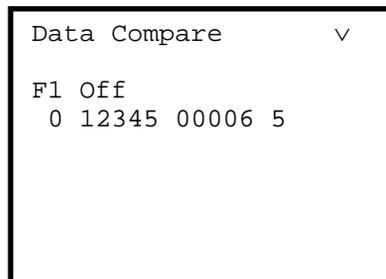
Using Data Compare

The Data Compare feature is used to compare symbology and encodation information against a specific known target.

To Use the Data Compare Feature:

1. Scan the bar code requiring verification.
2. Press the **Compare** key.

The Data Compare screen appears.



3. Press **Func+1** to activate data compare. The default setting is Off. This will enable the Data Compare function. It will remain set until disabled.
4. Press **Enter** to save the settings from the last verification scan.
5. Press **Enter** to scan other bar codes.
If the information does not match the target bar code, FAIL appears in the Data Compare field. However, the other verification data on the scanned code is available for review in the results screens.

Chapter 10 – Error Messages

Introduction

The following table lists possible error messages you may encounter when using your Xaminer Elite bar code verifier. Each error message listed is accompanied by a definition. If you experience any problems while using your Xaminer, call the Stratix Troubleshooting Hotline at 1-800-883-8300.

Error Number	Error	Definition
0	-----	Internal system error. Contact Stratix.
10	Failed ANSI Edge Determine Actual: F Pass On: C	Failed ANSI edge determination.
11	Failed Symbol Decode Actual: D Pass On: C	Failed ANSI Symbol Reference Decode.
12	Failed ANSI Decodability	Failed ANSI decodability - grade was less than specified.

Error Number	Error	Definition
13	Failed ANSI Defects Actual: D Pass On: C	ANSI defects grade less than user specified.
14	Failed ANSI Edge Contrast Actual: D Pass On: C	Failed ANSI edge contrast minimum less than user specified.
15	Failed ANSI Modulation Actual: D Pass On: C	Failed ANSI modulation less than user specified.
16	Failed ANSI Reflect Minimum Actual: D Pass On: C	Failed ANSI Reflect Minimum less than user specified.
17	Failed ANSI Symbol Contrast Actual: D Pass On: C	Failed ANSI Symbol Contrast less than user specified.

Error Number	Error	Definition
18	Failed ANSI UCC Quiet Zone Actual: F Pass On: C	If the symbol is a member of UCC group, then failed quiet zone test. Otherwise, quiet zone is part of symbol reference decode.
20	Quiet Zone Left is too small Actual 7 Required 10	The left quiet zone is too small for the symbol.
21	Quiet Zone Right is too small Actual 8 Required 9	The right quiet zone is too small for the symbol. UCC supplemental quiet zone is handled separately. This is quiet zone on the right of the supplemental.
30	Traditional Bar Tolerance Gain 110% Allow 100%	Bar gain exceeds allowed value.
31	Traditional Bar Tolerance Loss 110% Allow 100%	Bar loss exceeds allowed value.

Error Number	Error	Definition
32	Traditional Print Contrast Signal Less Than 75%	Print contrast value less than 75%.
100	C128 Fail Number of Elements Actual 11 Expected 110	Based on the apparent quiet zones, there are an invalid number of elements. Requires a higher aggressive level.
101	C128 Fail Bad Start Guard	Could not locate a valid start code.
102	C128 Fail Stop Not Found	Could not find the stop code.
103	C128 Fail Embedded Start	A start symbol was located inside (between other symbol characters) the symbol. Use change set. May be caused by symbol(s) overlapping.
104	C128 Fail Embedded Stop	A stop symbol was located inside the symbol. Insufficient quiet zone or very bad construction. May be caused by symbol(s) overlapping.

Error Number	Error	Definition
105	C128 Failed Lookup Bad Symbol Pattern	The bar/space pattern does not form any valid combination.
106	C128 Mod 103 Fail Required Cdv Actual 49 Expected 48	Code 128 modulus 103 check digit verification is incorrect. The numbers are index values into the Code 128 table, not actual characters.
107	C128 Fail Shift Follows Shift	A shift code follows a shift code. Bad symbol construction.
108	C128 Fail Change Set Follows Change Set	It is illegal for a change set code to follow a change set code.
109	C128 Fail Optional Cdv (121) Actual 1 Expected 0	The optional check digit used by UCC applications symbols (namely SCC-14, SSCC-18). The number is the check digit. The number in parenthesis is the optional test code.
110	C128 Fail Bad Module Pattern	Similar to a failed lookup, but specifically the module pattern is invalid.

Error Number	Error	Definition
111	C128 Fail Bad Module Pattern (Bar)	Similar to a failed lookup, but specifically the bar module(s) are invalid.
112	C128 Fail Bad Module Pattern (Space)	Similar to a failed lookup, but specifically, the space module(s) are invalid.
113	C128 Fail 'V' Test	Standard requires this test. Error not normally seen. Contact Stratix.
114	C128 Fail Invalid Ratio Pattern	Adjacent modules are either very small or very large. The module is either less than 0.5 or more than 4.5 times the X dimension.
115	C128 Fail Edge 2 Edge Test	Caused by inconsistent bar gain/loss.
116	C128 Fail 'P' Test	Standard requires this test. Contact Stratix.
120	UCC C128 Not Member of UCC Class	User has specified this symbol must be a member of the UCC applications. Specifically, a Function One code not found immediately after the start code.

Error Number	Error	Definition
121	UCC C128 Coupon Bad Offer Field	Expected offer field has too many or too few characters.
122	UCC C128 Coupon Bad Null Form	The null coupon is badly formed. The encodation field string is invalid.
123	UCC C128 Coupon Bad AI 21 Field	Expected to find application identifier 21. May be using the wrong application identifier.
124	UCC 128 Coupon Bad House Field	Expected house field has too many or too few characters. The house field length is fixed, and should be populated with leading zeroes.
125	UCC C128 Coupon Bad Character Encoded	For a coupon code, an invalid character was located. There may be too many or too few characters, the wrong application identifier, or an invalid type inserted. Example: the parentheses are not encoded.
126	UCC C128 Coupon Bad Date Field	Expected date field has too many or too few characters.

Error Number	Error	Definition
127	UCC C128 Coupon Bad Format Field	Expected format field has too many or too few characters.
200	C39 Fail Number of Elements Actual 11 Expected 110	Based on apparent quiet zones, there are an invalid number of elements. Requires a higher aggressive level.
201	C39 Fail Start Not Found	No start code found.
202	C39 Fail Stop Not Found	No stop code found.
203	C39 Fail Embedded Guard	A guard was located inside the symbol. Bad symbol construction possibly two joining or overlapping symbols.
204	C39 Failed Lookup Bad Symbol Pattern	The bar/space pattern does not form any valid combination.
205	C39 Fail Bad Intercharacter Gap	The space between symbol codes does not meet standards.

Error Number	Error	Definition
206	C39 Fail Wide to Narrow Ratio Actual 4.0:1 Expected 2.0:3.2	The average wide to narrow ratio is out of standard boundaries. There is another test for user-defined limits.
207	C39 Fail Optional Cdv (121) Actual Z Expected A	User-specified optional check digit. The actual check is shown. The number in parentheses is the optional test code: 121 standard modulus 43, 122 weighted modulus 43.
208	C39 Failed Lookup Not Three Wide	There were not three wide elements in the set of nine.
300	C93 Fail Number Of Elements Actual 11 Expected 110	Based on apparent quiet zones, there are in invalid number of elements. Requires a higher aggressive level.
301	C93 Fail Start Not Found	Did not find a valid start code.
302	C93 Fail Stop Not Found	Did not find a valid stop code.

Error Number	Error	Definition
303	C93 Fail Embedded Guard	A start/stop code found between characters. Bad symbol construction, possibly two joined or overlapping symbols.
304	C93 Failed Lookup Bad Symbol Pattern	The bar/space pattern does not form any valid combination.
305	C93 Fail Req (121) 'C' Cdv Actual Z Expected A	First of two required check digits. The actual character is shown. The number in parentheses is zero for the 'C' test.
306	C93 Fail Req (121) 'K' Cdv Actual Z Expected A	Second of two required check digits. The actual character is shown. The number in parentheses is 121 for the 'K' test.
307	C93 Fail Shift Follows Shift	A shift code follows a shift code. This is illegal.
308	C93 Fail Could Not Translate Encodation	The combination of shift and start codes does not make a valid translation to encodation.

Error Number	Error	Definition
309	C93 Fail Edge To Edge Test	The edge-to-edge test failed.
400	Codabar Fail Number Of Elements Actual 11 Expected 110	Based on the apparent quiet zones, there are an invalid number of elements. Requires a higher aggressive level.
401	Codabar Fail Start Not Found	Did not find a valid start code.
402	Codabar Fail Stop Not Found	Did not find a valid stop code.
403	Codabar Fail Embedded Guard	A start/stop code was found between characters. Bad symbol construction, possibly two joined or overlapping symbols.
404	Codabar Failed Lookup Bad Symbol Pattern	The bar space pattern does not form any valid combination.
405	Codabar Fail Bad Intercharacter Gap	The intercharacter gap is too large or small. Less than 0.5 or greater than 4.5.

Error Number	Error	Definition
406	Codabar Fail Wide To Narrow Ratio Actual 4.0:1 Allow 2.0:3.2	The average ratio of wide to narrow elements is out of standard limits. There is a separate test for user-defined limits.
407	Codabar Fail Optional Cdv (121) Actual Z Expected A	Optional codabar check digit. The actual character is shown. The number in parentheses is the optional test code.
408	Codabar Failed Lookup Not Three Wide	There were not three wide elements out of seven.
500	I 2 of 5 Fail Number of Elements Actual 11 Expected 110	Based on apparent quiet zones, there are an invalid number of elements. Requires a higher aggressive level.
501	I 2 of 5 Fail Left Guard Short Scan?	The left guard was not found. Possibly a short right to left scan. Symbol may be upside down.
502	I 2 of 5 Fail Right Guard Short Scan?	The right guard was not found. Possibly a short left to right scan.

Error Number	Error	Definition
503	I 2 of 5 Fail Failed Lookup Bad Symbol Pattern	The symbol pattern does not form any valid combination.
504	I 2 of 5 Fail Optional Cdv (121) Actual Z Expected A	Optional check digit. The actual number shown. The number in parentheses is the actual test code.
505	I 2 of 5 Fail Wide To Narrow Ratio Actual 4.0:1 Allow 2.0:3.2	The average ratio of wide to narrow elements is out of standard limits. There is a separate test for user-defined limits.
506	I 2 of 5 Fail Lookup Failed Parity Check	The parity pattern is invalid. Bad symbol construction.
507	I 2 of 5 Fail Lookup Failed Not Two Wide Bars	The symbol did not have two wide bar elements of five.
508	I 2 of 5 Fail Lookup Failed Not Two Wide Spaces	The symbol did not have two wide space elements of five.
510	I 2 of 5 User Failed UCC SCC-14 Length Check 14 Digits Required	The user has specified that the symbol must be a UCC SCC-14 format. Too many or too few digits found.

Error Number	Error	Definition
600	PDF Missing Codewords In Matrix Not Scanned?	Not all PDF codewords recognized. They may not be there to be recognized, or the scan pattern did not cover that portion of the symbol.
601	PDF Fail Inconsistent Row Div Indicator	The row number in the row indicator was not consistent for all row indicators.
602	PDF Fail Inconsistent Row Mod Indicator	The modulus in the row mod indicator was not consistent for all row indicators.
603	PDF Fail Inconsistent Column Indicator	The column number in the row indicator was not consistent for all row indicators.
604	PDF Fail Security Level Inconsistent	The security level number in the row indicator was not consistent for all row indicators.
605	PDF Failed Bad Start	Bad start character.
606	PDF Failed Bad Stop	Bad stop character.
607	PDF Fail Failed Error Correction	The symbol scanned failed error correction.

Error Number	Error	Definition
608	PDF Fail Data Length Not Equal Expected	The data length (first codeword in data section) did not match expected for size of matrix less error correction.
610	PDF Fail Bad Indicator	One or more of the row indicators did not make sense. Normally generates column, row, security level message.
612	Codeword 913 Translation Bad Byte Character	The character after a 913 (Shift To Byte) has a value greater than "0xff" (255). Valid range is "0" to "0xff"
613	Codeword 901 Translation Bad Byte Character	Translation may have a section that is byte mode. One code word has a value greater than "0xff" (255). See 612 above for additional information.
614	Codeword 921 Is NOT First Code- word - Reader Initialization	Ref 2.2.7, Codeword 921 is required to be the first data codeword immediately after the length descriptor.
616	PDF Warning No Stop Truncated Symbol?	Stop symbol not recognized. Possible incomplete symbol.

Error Number	Error	Definition
617	PDF Warning Seen Start/Stop Different Count Check Start/Stop	Different number of start/stop characters seen.
618	Codeword 924 Bad Required Byte Compaction Block	924 requires blocks of six codewords. The last block was not six codewords long.
619	Sub-Mode Change Follows Sub-Mode Change	Alpha compaction mode does not permit a sub-mode change to follow another.
630	Composite Fail Bad Byte Mode Type	CC-B/CC-C shall be encoded using Byte Compaction mode
631	Composite Fail Bad Left RAP	CC-A/CC-B left Row Address Pattern (RAP) invalid
632	Composite Fail Bad Center RAP	CC-A/CC-B center Row Address Pattern (RAP) invalid
633	Composite Fail Bad Right RAP	CC-A/CC-B right Row Address Pattern (RAP) invalid
637	Composite Warning Composite Codeword Missing	Not all Composite codewords recognized. They may not be there to be recognized, or the scan pattern did not cover that

Error Number	Error	Definition
		portion of the symbol.
700	U.P.C./EAN Fail Number of Elements Actual 11 Expected 110	Based on the apparent quiet zones, there are an invalid number of elements. Requires a higher aggressive level.
701	U.P.C./EAN Fail Bad Left Guard	Could not find the left guard. Requires a higher aggressive level.
702	U.P.C./EAN Fail Bad Middle Guard	The middle guard location is not valid (1,1,1,1,1) pattern. Typically too much bar gain/loss.
703	U.P.C./EAN Fail Bad Right Guard	Could not find the right guard. U.P.C. -E right guard is separate error message.

Error Number	Error	Definition
704	U.P.C./E Fail Bad Right Guard	The right guard is not a valid 1,1,1,1,1 bar/space pattern.
705	Supplemental Bad Guard	Reserved: The supplemental guard is invalid. Normally required to be valid to detect supplement is present.
706	U.P.C./EAN Failed Lookup Bad Symbol Pattern	The symbol pattern does not form any valid combination.
707	U.P.C./EAN (121) Fail Required Cdv Actual 1 Expected 0	Required check digit for UCC/EAN symbols. The number in parentheses is the test code for modulus 10.
708	U.P.C./EAN Fail Bad Module Pattern	The module pattern used for lookup is invalid. Badly constructed symbol.
709	U.P.C./EAN Fail Bad Ratio Pattern	The individual bar/space elements are very thin (less than 0.5x) or very thick (greater than 4.5x.).
710	U.P.C. A Fail Bad Parity Pattern	Invalid even/odd parity pattern for symbol.
711	U.P.C. E Fail Bad Parity Pattern	Invalid parity pattern for U.P.C.-E, cannot generate CDV.

Error Number	Error	Definition
712	EAN Bad Parity Pattern	The parity pattern does not match any allowed for U.P.C./EAN combinations. The symbol is probably an EAN symbol, but cannot generate the thirteenth digit.
713	Supplemental Bad Parity For Add 2	Invalid parity for supplemental add 2.
714	Supplemental Bad Parity for Add 5	Invalid parity for supplemental add 5.
715	Supplemental Quiet Zone	The supplemental quiet zone is less than nine times or more than 12 times "X" dim.
716	Supplemental Bad Intercharacter Pattern Bar, Space	The intercharacter pattern is not 1X bar, 1X space.
717	U.P.C. A Coupon Is Not Coupon System Number	Reserved: Some variants require that the U.P.C. coupon code be scanned with its C128 symbol. This indicates not system '5' for the U.P.C. symbol.
718	U.P.C./EAN Bad Parity Pattern	The parity pattern not all odd/even. See also error message 719.
719	U.P.C./EAN	The left side parity pattern

Error Number	Error	Definition
	Failed Discrimination	was not three odd/even. If EAN 13, cannot generate the thirteenth digit. If U.P.C., the symbol is badly constructed.
900	Internal Data Too Big for Internal Arrays	Some internal data array has overflowed. The symbol is too big to process.
901	Internal Digital Edges Not Equal ANSI Edges	Reserved: Some specialized variants check to see if the digital edge generator matches the ANSI edge.
902	UCC SCC (121) Fail (Mod 10) Cdv Actual Z Expected A	This is the UCC SCC-14, SSCC-18 check digit. The actual number is shown. The number in parentheses is the test code.
903	UCC SSC Bad Char In Encodation	Generic: A non-numeric character encountered when only numeric characters are allowed.
904	HIBCC Required Cdv (121) Actual 1 Expected 0	The required HIBCC check digit verification is incorrect. The number in parentheses is the optional test code: 121 standard modulus 43.

Error Number	Error	Definition
905	HIBCC Bad Character	A character in the HIBCC symbol is not allowed.
906	Internal Inconsistent XDim Scanning?	The X dimension is not consistent for the symbol. Possibility of an internal scanner engine failure.
907	Fail Symbol Is Negative Image	Reserved: The symbol is reversed printed, bars are white, spaces are black. Some variants will allow negative images, such as film masters.
1001	User Test Wide To Narrow Ratio Actual 4.0:1 Allow 2.0:3.2	The user has specified the ratio must be tighter than allowable standards.
1002	User Test Failed Data Compare	The symbol/encodation did not match as specified by the user. Data compare must be turned on for this test.
1003	User Test Failed Data Lookup	Reserved: The software will perform a data lookup for specialized variants. The scan symbol is not in the table.

Glossary

AIM - Automatic Identification Manufactures; a trade association of providers of automatic identification standards and services. Publishers of industry standards; specifically symbology for code 128, code 39, I 2 of 5, Codabar, and others.

Alphanumeric – The character set that contains the letters A-Z and numbers 0-9.

ANSI (American National Standards Institute) - a non-governmental organization responsible for the development of manufacturing standards. Specifically ANSI Specification X3.182 Bar Code Print Quality Guideline. Each symbology must further define the reference decode algorithm, plus other information needed by the symbology.

ANSI X.12 - The American National Standards Institute standard for two-way electronic transmission of data between trading partners.

Aperture - The effective spot size of the laser beam light.

ASCII - The character set and code described in American National Standard Code for Information Interchange. The ASCII character set is used for information interchange between data processing systems, communication systems, and associated equipment.

Autodiscrimination - A function of bar code reading equipment that allows the verifier to differentiate correctly between more than one symbology.

Background - The area surrounding a printed bar code symbol, including the spaces and quiet zones.

Bar – An element of lower reflectance in a printed barcode symbol.

Bar Code – An array of parallel rectangular bars and spaces that together represent data elements or characters in a particular symbology. The bars and spaces are arranged in a predetermined pattern following unambiguous rules defined by the symbology. See also "Symbol."

Bar Height – The dimension of a bar measured perpendicular to the bar width.

Bidirectionally Decodable – A bar code symbology capable of being read successfully, independent of scanning direction.

Binary Codes (Two-Width Symbology) – A bar code symbology whose bars and spaces are characterized simply as wide or narrow. Codabar, Code 39, and I 2 of 5 are examples.

Character Set - Those characters that can be encoded in a particular bar code symbology.

Character or Symbol Character - The smallest group of elements, as defined by a symbology that represents a piece of information (number, letter, punctuation mark, or symbology defined control).

Check Character, Check Digit (CD), or Check Digit Verification - A symbol character included in a symbol whose value is calculated by a mathematical formula. Used to confirm the accuracy of the encoded data.

Check Digit - See “ Check Character.”

Clear Area – See “Quiet Zone.”

Codabar – A mostly-numeric bar code symbology.

Code 128 – A full ASCII bar code symbology capable of encoding all 128 ASCII characters as well as the extended ASCII characters.

Code 39 – (Code 3 of 9) A full alphanumeric code symbology.

Code 93 – A full alphanumeric bar code symbology capable of encoding all 128 ASCII characters

Code Set – The specific assignment of data characters to symbol characters.

CSV – Comma Separated Variable

Data Character – A letter, digit or other member of the ASCII character set.

Decodability ANSI - A measure of printing accuracy as perceived by the scanning device. Uses a reference decode algorithm as the basis of measurement. 100% means a perfect symbol. Reported as a letter grade 'A' through 'F'.

Decode (ANSI and Traditional) - Process used to determine if a printed symbol conforms to the requirements of the symbology. Determines if a symbol's characters are valid, start and stop patterns, required check digits, quiet zone acceptable; wide to narrow ratio (if applicable) acceptable; intercharacter gap (if applicable) acceptable. ANSI reports as a letter grade 'A' or 'F'. Traditional is pass/fail.

Decode, Pass - A symbol meets industry standards and passes user specified tests. Used internally to indicate that a symbol has passed the decode without errors. It also passes any additional users specified tests or requirements.

Decode, Fail - A symbol has failed one or more requirements.

Decoder – As part of a bar code reading system, the electronic package that receives the signals from the scanner, performs the algorithm to interpret the signals into meaningful data and provides the interface to other devices.

EAN International - The European equivalent of UCC. It has slightly different requirements, most notably EAN 13.

Edge Contrast Minimum (ECmin), ANSI - The smallest analog difference between adjacent elements (high to low or low to high) for the symbol. 100% means a perfect symbol. Reported as a letter grade 'A' or 'F'.

Element - A single bar or space.

Error, or Symbol Error - A specific symbology error. Can also be a user-defined test that failed. Used to provide information to the user on how to correct the problem detected.

Font – A specific size and style of type.

Global Threshold, ANSI - On a Scan Reflectance Profile, the reflectance level that determines what is considered a bar or space. The threshold is from the scanner viewpoint, not the printed symbol. It is calculated by determining the Symbol Contrast and Reflectance Minimum. The formula is $GT = Rmin + (SC/2)$. The Global Threshold is exactly mid way between the maximum and minimum in the Scan Reflectance Profile. The formula, $GT = (Rmax + Rmin)/2$, is algebraically identical to the standard's formula.

Guards - Guards are special additional bars and spaces used to frame a symbol. They are used by the scanning hardware to properly locate and synchronize on the symbol.

Human Readable Interpretation – The letters, digits or other characters associated with specific symbol characters and printed along with the bar code symbol.

Intercharacter Gap – The space between two adjacent bar code characters in a discrete code. For example, the space between characters in Code 39.

Interleaved Two-of-Five – (I 2 of 5, I 2/5, ITF) A numeric bar code symbology.

Magnification - Different sizes of the U.P.C. symbol which are uniformly magnified or reduced from the nominal size. The range of magnifications available is from 80% to 200%.

Modulation, ANSI - The ratio of Edge Contrast Minimum to Symbol Contrast. The formula is $Mod = (Ecmin / SC)$. Note: Modulation is extremely sensitive to the color contrast of the printed symbol. 100% means a perfect symbol. Reported as a letter grade 'A' to 'F'.

Module – The narrowest nominal width unit of measure in a symbol. One or more modules are used to construct an element.

Modulo – An arithmetic operation in which the result is the remainder after division.

Multi-Row Symbology – Symbologies where a long symbol is broken into sections and stacked one upon another similar to sentences in a paragraph.

Modulo Check Digit or Character - See Check Character.

Nominal - The ideal or intended value for a given parameter, measurement grade.

Numeric – A character set that includes only the numbers 0-9.

Overall ANSI Grade - Also referred to as Overall Profile Grade. The lowest grade received on any of the ANSI parameters.

Overhead – In a bar code system, the fixed number of characters required for start, stop, and checking in a given symbol. For example, a symbol requiring a start/stop and two check characters are required to be printed.

Print Contrast Signal (PCS) - A historical measurement, now obsolete. Included for reference and to support older industrial specification. The formula is $PCS = (R_{spaces} - R_{bars}) / (R_{spaces})$. Since there is no external reference (as with ANSI) it is not very useful. R_{spaces} = Reflectance of spaces. R_{bars} = Reflectance of bars.

Print Quality - The measure of compliance of a bar code symbol to the requirement of dimensional tolerances, edge roughness, spots, voids, reflectance, PCS, quiet zone, and encodation.

Quiet Zone - This is an area of space, free of any spots or printing marks on the sides of the symbol. They are required for a scanning device to correctly find a symbol. The allowed size is different for each symbology.

Reader – A device comprised of a scanner and a decoder.

Reflectance 100% (R100), ANSI - An ANSI defined measurement. All analog measurements are relative to this value. For comparison, good white printing stock is between 80% and 85%.

Reflectance Maximum, Rmax - The largest analog reflectance in the Scan Reflectance Profile. Measured as a percentage of ANSI defined R100.

Reflectance Minimum, Rmin - The smallest analog reflectance in the Scan Reflectance Profile. Measured as a percentage of ANSI defined R100.

Scanner – An electronic device to acquire and convert reflected light from the bars and spaces from a symbol into electrical signals for processing by the decoder.

Scan Profile – A record of the reflectance measured as a function of position during a scan across the entire bar code symbol.

Scan Reflectance Profile (SRP), ANSI - An analog profile of the reflected signal strength a scanner detects as a symbol is scanned. Looks like a series of peaks and valleys. The ANSI standard is defined in terms of this profile.

Stacked Codes – See “Multi-Row Symbology”.

Start/Stop Character or Pattern - A special bar code character that provides the scanner with start and stop reading instructions, as well as scanning direction. The start character is normally at the left-hand end of a horizontally oriented symbol, with the stop character at the right-hand end.

Space – An element of higher reflectance in a bar code symbol.

Spot – The undesirable presence of an area of low reflectance in a space.

Symbol - An array of bars and spaces arranged in a predetermined pattern governed by specific rules. These rules are referred to as the symbology. The actual printed bar code symbol.

Symbol Character – A unique bar and/or space pattern that is defined for the symbology. There is not necessarily a one-to-one or unique correlation between symbol characters and data characters. Depending on the symbology, symbol characters may have a unique associated symbol value.

Symbol Quality - The measure of how well a symbol conforms to specifications.

Symbology - A specific set of rules and requirements to which a symbol (bar code) must conform. Additional requirements may be required by a specific industrial standard or application.

Symbology Identifier – An optional three character code which may prefix transmitted data from a bar code reader indicating the symbology read and any options enabled in the reader or special features of a symbology encountered.

UCC - See “Uniform Code Council.”

Uniform Code Council (UCC) - The governing organization that administers the U.P.C. symbology and related retail standards for the United States. Similar organizations exist for other countries.

U.P.C - See “Universal Product Code.”

Uniform Symbol Specification (USS) - The actual symbology guidelines published by AIM.

Universal Product Code - The standard bar code symbol for retail applications in the United States and Canada.

U.S.S. - See “Uniform Symbol Specification.”

Validation - To check a symbol's data against user provided information. To allow the user to specify additional tests a given symbol's data must pass.

Verify - To check a symbol against the published standards for that particular symbology.

Verify Record - The information record of a bar code symbol. Contains the bar code information (ANSI, encodation, traditional, and internal).

Void – The undesirable presence of an area of high reflectance in a bar.

Wide to Narrow Ratio (Ratio) – The size difference between the narrow element (or X dimension), and the wide element. Example: 2.5:1 indicates that the wide element is 2.5 times the size of the narrow element.

“X” Dimension - The intended width of the narrow elements dictated by the application, or symbology specification.

Appendix A - U.P.C. Specification Symbol Dimensions and Tolerances

Percent Mag.	Width *	Width**	Minimum Guard Bar Height	X Dimension	Tolerance
80%	.988	1.175	.768	10.4	1.4
85%	1.045	1.243	.812	11.0	2.0
90%	1.112	1.322	.864	11.7	2.7
95%	1.174	1.395	.886	12.3	3.4
100%	1.235	1.469	.960	13.0	4.0
105%	1.297	1.542	1.034	13.6	4.3
110%	1.359	1.616	1.056	14.3	4.6
115%	1.425	1.695	1.108	15.0	4.9
120%	1.482	1.763	1.152	15.6	5.2
125%	1.544	1.836	1.182	16.2	5.5
130%	1.606	1.910	1.248	16.7	5.8
135%	1.668	1.983	1.255	17.5	6.1
140%	1.829	2.057	1.344	18.2	6.4
145%	1.792	2.130	1.403	18.8	6.7
150%	1.853	2.204	1.440	19.5	7.0
155%	1.913	2.277	1.477	20.2	7.3
160%	1.976	2.350	1.536	20.7	7.6

English (in inches)

*** Width of the symbol from left guard bar to right guard bar**

**** Width of the symbol including the minimum quiet zone**

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Percent Mag.	Width *	Width**	Minimum Guard Bar Height	X Dimension	Tolerance
170%	2.100	2.497	1.632	22.1	8.2
180%	2.223	2.644	1.728	23.4	8.8
190%	2.347	2.791	1.824	24.7	9.4
200%	2.470	2.938	1.920	26.0	10.1

English (in inches)

*** Width of the symbol from left guard bar to right guard bar**

**** Width of the symbol including the minimum quiet zone**

Appendix B - Code 128 Character Set

Value (for CDV calculations)	Subset Code A	Definition	Subset Code B	Subset Code C
0	SP	space	SP	00
1	!	exclamation	!	01
2	“	quote	“	02
3	#	pound	#	03
4	\$	dollar	\$	04
5	%	percent	%	05
6	&	ampersand	&	06
7	`	single quote	`	07
8	(left parenth	(08
9)	right parenth)	09
10	*	asterisk	*	10
11	+	plus	+	11
12	,	comma	,	12
13	-	dash	-	13
14	.	period	.	14
15	/	forward slash	/	15
16	0		0	16
17	1		1	17
18	2		2	18
19	3		3	19
20	4		4	20
21	5		5	21
22	6		6	22
23	7		7	23

Value (for CDV calculations)	Subset Code A	Definition	Subset Code B	Subset Code C
24	8		8	24
25	9		9	25
26	:	colon	:	26
27	;	semi-colon	;	27
28	<	less than	<	28
29	=	equal	=	29
30	>	greater than	>	30
31	?	question	?	31
32	@	at symbol	@	32
33	A		A	33
34	B		B	34
35	C		C	35
36	D		D	36
37	E		E	37
38	F		F	38
39	G		G	39
40	H		H	40
41	I		I	41
42	J		J	42
43	K		K	43
44	L		L	44
45	M		M	45
46	N		N	46
47	O		O	47
48	P		P	48
49	Q		Q	49
50	R		R	50
51	S		S	51

Value (for CDV calculations)	Subset Code A	Definition	Subset Code B	Subset Code C
52	T		T	52
53	U		U	53
54	V		V	54
55	W		W	55
56	X		X	56
57	Y		Y	57
58	Z		Z	58
59	[left bracket	[59
60	\	backward slash	\	60
61]	right bracket]	61
62	^	caret	^	62
63	_	underscore	_	63
64	NUL	accent	´	64
65	SOH		a	65
66	STX		b	66
67	ETX		c	67
68	EOT		d	68
69	ENQ		e	69
70	ACK		f	70
71	BEL		g	71
72	BS		h	72
73	HT		i	73
74	LF		j	74
75	VT		k	75
76	FF		l	76
77	CR		m	77
78	SO		n	78
79	SI		o	79

Value (for CDV calculations)	Subset Code A	Definition	Subset Code B	Subset Code C
80	DLE		p	80
81	DC1		q	81
82	DC2		r	82
83	DC3		s	83
84	DC4		t	84
85	NAK		u	85
86	SYN		v	86
87	ETB		w	87
88	CAN		x	88
89	EM		y	89
90	SUB		z	90
91	ESC	left curly bracket	{	91
92	FS	exclamation	!	92
93	GS	rt. curly bracket	}	93
94	RS	tilde	~	94
95	US		DEL	95
96	*FNC 3		*FNC 3	96
97	*FNC 2		*FNC 2	97
98	*SHIFT		*SHIFT	98
99	*CODE C		*CODE C	99
100	*CODE B		*FNC 4	*CODE B

*Hidden characters

Value*	Subset	Subset	Subset
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	Code A	Code B	Code C
101	*FNC 4	*CODE A	*CODE A
102	*FNC 1	*FNC 1	*FNC 1
103	*START(CODE A)	*START	*START
104	*START(CODE B)	*START	*START
105	*START(CODE C)	*START	*START
STOP	*STOP	*STOP	*STOP

***Hidden characters**

Appendix C - References

- ISO/IEC 15416 (2000-08-15) – Automatic identification and data capture techniques, bar code print quality test specifications, linear symbols.
- ISO/IEC 15415 (2004-06-15) – Automatic identification and data capture techniques, bar code print quality test specifications, two dimensional symbols.
- ISO/IEC 15426-1 (2000-07-15) – Automatic identification and data capture techniques, bar code verifier conformance specification, Part 1: linear symbols.
- ISO/IEC 15426-2 (2005-03-15) – Automatic identification and data capture techniques, bar code verifier conformance specification, Part 2:Two_dimensional symbols.
- ANSI X3.182-1990 (3/30/90) – American Nations Standard for Information Systems, Bar Code Print Quality - Guideline
- Quality Specifications for the U.P.C. Printed Symbol (9/94) – Part 1, General Information, Part 2, U.P.C. Verifier Use, Part 3, Verifier/Printer Design.

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- Coupon Extended Code and In-Store Coupon Code (2/94)
- Application Standard for Shipping Container Codes (12/95)
- AIM (Automatic Identification Machinery) Uniform Symbology Specification – Code 128 (3/93); Code 39 (3/93); Code 93, Codabar (6/93); I 2 of 5, PDF417 (7/94).
- American National Standards Institute (ANSI) web site offers up-to-date resources on national and international standards activities (<http://www.ansi.org/>).
- Uniform Code Council web site (<http://www.uc-council.org>).

Appendix D – Supplemental Encodation Information

A range of valid control characters can be encoded and have no standard display form. PDF 417, and many other formats, can have these characters encoded. To assist operators in locating these characters, the Xaminer shows an inverse display with two or three letters that represent these special characters. The table below shows these forms.

Displayed	Hex Value	Description
Nul	0x00	Null character
Soh	0x01	Start of header
Stx	0x02	Start of text
Etx	0x03	End of text
Eot	0x04	End of transmission
Enq	0x05	Inquire
Ack	0x06	Acknowledge (Positive, or Ok)
Bel	0x07	Bell (ring device bell, PC beep)
Bs	0x08	Back space (destructive)
Ht	0x09	Horizontal Tab
Lf	0x0a	Line Feed (same column position, down one line)
Vt	0x0b	Vertical Tab
Ff	0x0c	Form Feed (new page in printing, clear screen)
Cr	0x0d	Carriage Return (same line,

Displayed	Hex Value	Description
		left most position)
So	0x0e	Shift out (special control, operation)
Si	0x0f	Shift in (return to normal control, operation)
Dle	0x10	Data Link Escape (next character has special meaning)
Dc1	0x11	Device Control 1
Dc2	0x12	Device Control 2
Dc3	0x13	Device Control 3
Dc4	0x14	Device Control 4
Nak	0x15	Negative Acknowledge
Syn	0x16	Synchronize
Etb	0x17	End of Medium
Can	0x18	Cancel
Em	0x19	Emit next character to device
Sub	0x1a	Substitute
Esc	0x1b	Escape
Fs	0x1c	Field Separator
Gs	0x1d	Group Separator
Rs	0x1e	Record Separator
Us	0x1f	Unit Separator

Appendix E – Xaminer Elite Special Characters

There are a number of bar code construction characters that have no equivalent display character. When scanning Code 128, Code 93, or PDF 417, this becomes evident. The following table shows the characters as they appear on the LCD display screen, how they look when printed out, and what they represent.

LCD	Printed	Comment	
Ω	Ω	Code 128 Start A	Code 93 Guard
À	δ	Code 128 Start B	
Ä	ω	Code 128 Start C	
Ш	σ	Code 128 Change To Set A	
η	μ	Code 128 Change To Set B	
Φ	τ	Code 128 Change To Set C	
Ÿ	β	Code 128 Function 1	Code 93 Shift 1
И	Г	Code 128 Function 2	Code 93 Shift 2
Г	π	Code 128 Function 3	Code 93 Shift 3

LCD	Printed	Comment	
Σ	Σ	Code 128 Function 4	Code 93 Shift 4
Y	α	Code 128 Shift	
ä	E	Code 128 Modulus 103 Check Character Position	
ä	Π	Code 128 Stop	

If viewing the Comma Separated Variable (CSV) encodation data stream then:

- G = Symbol character is a guard, U.P.C.
- E = Symbol character is right guard, U.P.C. E.
- M = Symbol character is middle guard, U.P.C.
- S = Symbol character is supplemental guard, U.P.C.
- Q = Indicates a quiet zone, U.P.C.
- ? = Indicates a bad character location.
- # = Indicates a bad character location.

For the ASCII control characters, the Xaminer uses an inverse display (white letters on a black background) with one or two letters to describe that character. For the text printer, a set of angle brackets (< >) is used to show the control characters. Additionally, a new line is started to improve the overall readability of the display. A new line in the bar code is shown as <Cr>, <Lf> or both.

String	Comment
Nul	Null character, no visible representation
Soh	Start of header
Stx	Start of text
Etx	End of text
Eot	End of transmission
Enq	Enquire
Ack	Positive Acknowledgment
Bel	Ring device bell (Cause a beep in DOS)
Bs	Back Space (cursor)
Ht	Horizontal tab
Lf	Line feed
Vt	Vertical tab
Ff	Form Feed (new page, blank screen)
Cr	Carriage Return
So	Shift device out
Si	Shift device in
Dle	Data link escape
Dc1	Device control 1
Dc2	Device control 2
Dc3	Device control 3
Dc4	Device control 4
Nak	Negative acknowledgement
Syn	Synchronous Idle

String	Comment
Etb	End transmission block
Can	Cancel
Em	End of medium
Sub	Substitute
Esc	Escape
Fs	File Separator
Gs	Group Separator
Rs	Record Separator
Us	Unit Separator

A range of valid control characters can be encoded that have no standard display form. PDF 417, and many other formats, can have these control characters encoded. To assist operators in locating these characters, the Xaminer shows an inverse display with two or three letters that represent these special characters. The following table shows these forms.

Displayed	Hex Value	Description
Nul	0x00	Null character
Soh	0x01	Start of header
Stx	0x02	Start of text
Etx	0x03	End of text
Eot	0x04	End of transmission
Enq	0x05	Inquire
Ack	0x06	Acknowledge (Positive, or Ok)

Displayed	Hex Value	Description
Bel	0x07	Bell (ring device bell, PC beep)
Bs	0x08	Back space (destructive)
Ht	0x09	Horizontal Tab
Lf	0x0a	Line Feed (same column position, down one line)
Vt	0x0b	Vertical Tab
Ff	0x0c	Form Feed (new page in printing, clear screen)
Cr	0x0d	Carriage Return (same line, left most position)
So	0x0e	Shift out (special control, operation)
Si	0x0f	Shift in (return to normal control, operation)
Dle	0x10	Data Link Escape (next character has special meaning)
Dc1	0x11	Device Control 1
Dc2	0x12	Device Control 2
Dc3	0x13	Device Control 3
Dc4	0x14	Device Control 4
Nak	0x15	Negative Acknowledge
Syn	0x16	Synchronize
Etb	0x17	End of Medium
Can	0x18	Cancel

Displayed	Hex Value	Description
Em	0x19	Emit next character to device
Sub	0x1a	Substitute
Esc	0x1b	Escape
Fs	0x1c	Field Separator
Gs	0x1d	Group Separator
Rs	0x1e	Record Separator
Us	0x1f	Unit Separator

Appendix F – GS1 US Standards Glossary: LEGACY TERM

In order to better align the terms and phrases used around the globe for our unique system of standards, **GS1 US BarCodes and eCom**, maintains this global glossary for your reference. The old legacy terms are listed in alphabetical order with the current term now in use next to them.

LEGACY TERM	CURRENT TERM
auxiliary pattern	auxiliary guard pattern
Clear Area	Quiet Zone
Contrast	Symbol Contrast
DUN-14 (Despatch Unit Number)	GTIN-14
EAN	GS1
EAN International	GS1 Global Office
EAN Member Organization	GS1 Member Organization
EAN/UCC-8 Data Structure	GTIN-8
EAN/UCC-8 Identification Number	GTIN-8
EAN/UCC-12 Data Structure	GTIN-12, Coupon-12, RCN-12, and VMN-12
EAN/UCC-12 Identification Number	GTIN-12, GLN, GDTI, Coupon-12, RCN-12, and VMN-12
EAN/UCC-13 Data Structure	GTIN-13, Coupon-13, RCN-13, and VMN-13
EAN/UCC-13 Identification Number	GTIN-13, GLN, GDTI, Coupon-13, RCN-13, and VMN-13
EAN/UCC-14 Data Structure	GTIN-14
EAN/UCC-14 Identification Number	GTIN-14
EAN.UCC Company Prefix	GS1 Company Prefix
EAN.UCC Prefix	GS1 Prefix
EAN.UCC XML	GS1 XML
Interleaved 2 of 5	ITF-14 Symbol
Item Number	Item Reference
Item Reference Number	Item Reference

Light Margin	Quiet Zone
Light Margin Indicator	Quiet Zone Indicator
Manufacturer's ID	GS1 Company Prefix
Manufacturer's Number	GS1 Company Prefix
Number System Character	U.P.C. Prefix
Numbering Organization (NO)	GS1 Member Organization
Packaging Indicator	Indicator
Packaging Type	Extension digit
print gain/loss	bar gain/loss
printability gauge	Print Gain Gauge
SCC-14	GTIN-14
SSCC Serial Number	Serial Reference
standard numbering structures	data structure
Symbol Control Character	symbology element
UCC	GS1 US
UCC-12 Data Structure	GTIN-12, GDTI-12, Coupon -12, RCN-12, and VMN-12
UCC-12 Identification Number	GTIN-12, GDTI-12, Coupon -12, RCN-12, and VMN-12
UCC/EAN-128	GS1-128
Uniform Code Council, Inc.	GS1 US
UCC Company Prefix	U.P.C. Company Prefix
UCC Prefix	U.P.C. Prefix