Quick Check® 200 Series

User's Guide

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This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Class A Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Caution: Any changes or modifications made to this device that are not expressly approved by Welch Allyn, Inc. may void the user's authority to operate the equipment.

Canadian Notice

This equipment does not exceed the Class A limits for radio noise emissions as described in the Radio Interference Regulations of the Canadian Department of Communications (ICES-003).

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada (ICES-003).

$C \in$ The CE mark on the product indicates that the system has been tested to and conforms with the provisions noted within the 89/336/ EEC Electromagnetic Compatibility Directive.

For further information please contact:

> Hand Held Products (UK) Ltd.
> 1st Floor
> Dallam Court Dallam Lane
> Warrington, Cheshire WA2 7LT England

Hand Held Products shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked.

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1.0 About This Manual

This manual contains information on the Quick Check® 200 Series.

- Quick Start Command Code
- Detailed Operation
- Configuration / Programming
- Symbol Testing / Scan Results
- Printer Print outs
- Special Functions
- Quick Check Maintenance
- Single Scan to Result (SSTR)

1.1 Conventions

This manual uses several special symbols to refer to the controls on the instrument. The following table shows the symbols and their descriptions.

Symbol	Description
POWER or **Scroll** [<>] or **Select**	Represents a button on the Quick Check unit
-Specs- or OK-to-Scan	Shows the LED display on the Quick Check unit
♦	Indicates steps to follow to perform a procedure

1.2 QC200 "Low Battery" Warning

The Quick Check® 200 Series dynamically checks the condition of its battery when turned on and during menu cycles. If any test falls below a specified limit, the LCD will show "Low Battery" (and the unit "beeps" five times) as a warning that the battery's charge may be deteriorating. The QC200's microprocessor "sets" a system "flag" or "pointer" that indicates a degraded condition was measured for that particular test. With this "flag" set, further

cycling of the menu or attempts to scan will automatically bring about additional "Low Battery" indications.

This testing sequence has a power drain than normal scan or single menu functions. This protects the user by insuring a low battery indication before total unit power failure occurs, thus preserving proper unit operation. It is possible for an intermittent "false" low to be detected and reported due to variations in battery condition, temperature, component efficiency and rapid cycle time. When "Low Battery" is indicated, the operator should turn their QC200 off, allow one or two minutes for the battery to recover and then turn it back on. This sequence clears the Low Battery "flag" or "pointer". If the "Low Battery" indication returns immediately on power up, then the unit should be recharged. If not, the QC200 can continue to be used.

The QC200 can be recharged before the warning is seen. Alternately, it can be left connected to the charger when not in use. To extend battery life, battery manufacturers recommend you fully charge the unit, use it till the "Low Battery" indication is seen repeatedly, and then fully recharge before continued use.

2.0 Overview

The Quick Check® 200 Series is one of the HHP family of Quick Check bar code quality assurance devices. The Quick Check® 200 Series is fully portable and compatible with all major bar code symbologies. It is effectively two instruments in one, both an easy-to-use Pass/Fail quick tester and a powerful measuring tool for detailed testing and analysis of those same symbols.

Testing criteria within the Quick Check® 200 Series is based on the American National Standard X3.182-1990 "Bar Code Print Quality Guideline." The Quick Check family of bar code verifiers was designed specifically to fully implement this guideline guaranteeing symbol compliance to the standard. They provide a baseline in measurement accuracy against which all verifiers, new and old, should be judged.

The QC200 series determines print quality, wide to narrow ratios, print contrast and reflectance parameters, decodes and verifies character format as called for by application specifications. The quality information from the Quick Check® 200 Series is presented through an easy to read liquid crystal display (LCD), light emitting diodes (LEDs), audible tones and through its optional accessory printer. The knowledge gained using the Quick Check® 200 Series measurement modes is invaluable in educating the user about the critical optical characteristics of bar code symbols.

The Quick Check® 200 Series can verify the quality of:
- EAN/UPC family of symbols with or without addendum Code 39 with or without check character
- Interleaved 2 of 5 with or without check character
- Codabar/USS Codabar with or without check character
- Code 128 with all modes and characters displayed
- MSI Code
- Code 16K
- IATA 2 of 5
- Regular 2 of 5

2.1 Unpacking

When you first receive your Quick Check® 200 Series unit, you should carefully unpack it. Before attempting to use the instrument, inspect the contents of the package for any shipping damage. If there is evidence of shipping damage, please keep ALL packing materials and contact the delivery carrier AS SOON AS POSSIBLE for claim procedure. Confirm that you have the following items:

> QC200 Series model number ordered.
> AC Charger
> User's Guide

Manual Pack with:

> Test Symbols
> Warranty Card
> Gauge Ruler
> "X" Dimension Ruler

Please fill out the Warranty Card immediately. Also make a note of the serial number of the unit and the date purchased.

2.2 Charging the Battery

NOTE: The battery you received with your Quick Check® 200 unit may be discharged. Prior to initial use, the batteries should be charged for at least six (6) hours. The Quick Check® 200 unit is designed to operate only using the supplied NiCad rechargeable battery pack. It is not intended to be powered directly from an adapter or AC outlet. The Quick Check® 200 Series verifier is designed to make maximum use of its battery power. As a result, the unit will operate for a minimum of one (1) hour on a properly charged battery pack.

!!! WARNING!!!

DO NOT CONNECT YOUR QUICK CHECK TO ITS
CHARGER OR PRINTER UNLESS A BATTERY PACK IS
INSTALLED. TO DO SO WILL DAMAGE THE UNIT AND
VOID ITS WARRANTY!! ALL UNITS HAVE HAD A PACK
INSTALLED AT THE TIME OF MANUFACTURE.

USE **ONLY** A HHP SUPPLIED NICAD TYPE
RECHARGEABLE BATTERY PACK. USE OF OTHER
PACKS OR BATTERIES AND ATTEMPTS TO RECHARGE
THESE BATTERIES COULD CAUSE THE BATTERIES TO
EXPLODE, CAUSING DAMAGE TO THE UNIT AND
POSSIBLE PERSONAL INJURY!! DAMAGE CAUSED BY
ATTEMPTS TO RECHARGE OTHER THAN THE
SPECIFIED HHP QC200 SERIES BATTERY PACK WILL
VOID ANY AND ALL QUICK CHECK® 200 SERIES
WARRANTIES.

To charge the batteries:
1. Plug the AC charger into the power jack on the end of the
    Quick Check unit.

2. Plug the AC charger power unit into an appropriate VAC
    wall outlet.

3. Charge the batteries for a minimum of six (6) hours.

After allowing the proper battery charge time, your Quick Check
will be ready for operation.

If you experience any problems during this set up procedure,
carefully review the above steps and try again. If you still have
problems, contact your dealer or HHP for assistance.

2.3 Command Code "Quick Start"

The Quick Check® 200 Series is a complete, self-contained hand
held bar code verifier. Though we recommend you become

thoroughly familiar with the device and this manual before use, those familiar with bar code verification can easily set-up and use the QC200 within a matter of minutes (after it has been unpacked and initially charged) following the next steps:

1. Carefully unpack and inspect the unit. (See section titled UNPACKING for details)
2. Plug the QCAC charger into the QC200 and an AC wall outlet and charge the unit for a minimum of six hours. (See sectional titled CHARGING THE BATTERY for details)
3. After charging, turn the unit on by pressing and releasing the POWER button. You should hear four beeps indicating the unit is ready.
4. Next, select one of the following pre-printed "Quick Start" Command Codes appropriate for your use of the QC200, carefully place the tip of the QC200 on the Command Code of choice and scan the code.
5. The unit will respond with four beeps and return to the start up, ready to scan state.
6. You have now totally programmed your QC200 and are ready to scan your sample codes. After each scan, the custom LCD display will show decode, symbology type, PCS or ANSI grade, bar growth/shrinkage indication and any parameter areas where errors exist. If the code has passed all tests, one beep will be heard and the green LED will flash. If errors have been found, three beeps will be heard, the red LED will flash and one or more of the parameter areas will be lit on the LCD (DIM, REF and /or FMT) to show in what test criteria area(s) the fault exists.

Detailed information on proper scanning techniques and unit use can be found throughout this manual. If you have any problems during your "Quick Start," please refer to the rest of this manual or call Hand Held Products' Application Support.

  NOTE: Display Orientation (Right Handed vs. Left Handed) and Printer Interface selection **ARE NOT** set using the Command Code. Factory default settings for these are "Right Handed" and "QCHSP".

3.0 Detailed Operation

The Quick Check® 200 Series is a complete, self-contained hand held bar code verifier. The top panel features include a "POWER" button a "SELECT" button [0], a "SCROLL" [<>] button, a red and a green colored LED and a custom, multi-function, liquid crystal display (LCD). On the bottom of the instrument is the Serial Number label as well as two of the three case screws that must be removed for access to the internal battery. (WARNING: DO NOT attempt to replace the battery pack without first contacting Hand Held Products' Service Department!) A port on the end allows connection to a recharger or optional printer. The following figures show the unit's layout.

Figure A

Quick Check® 200 Control Buttons
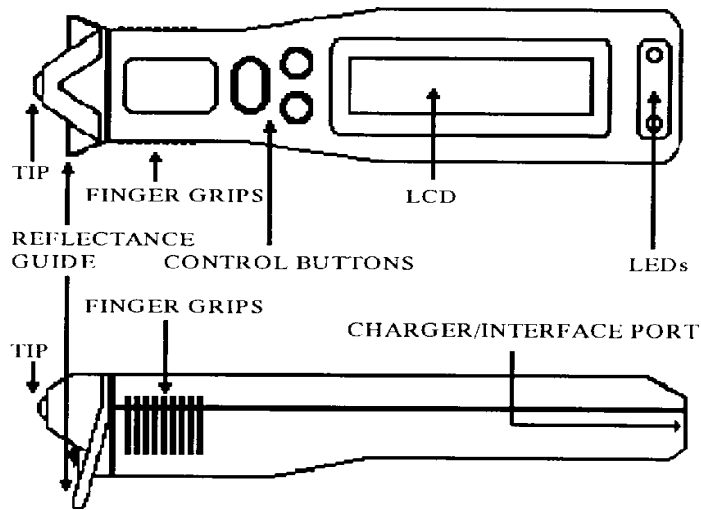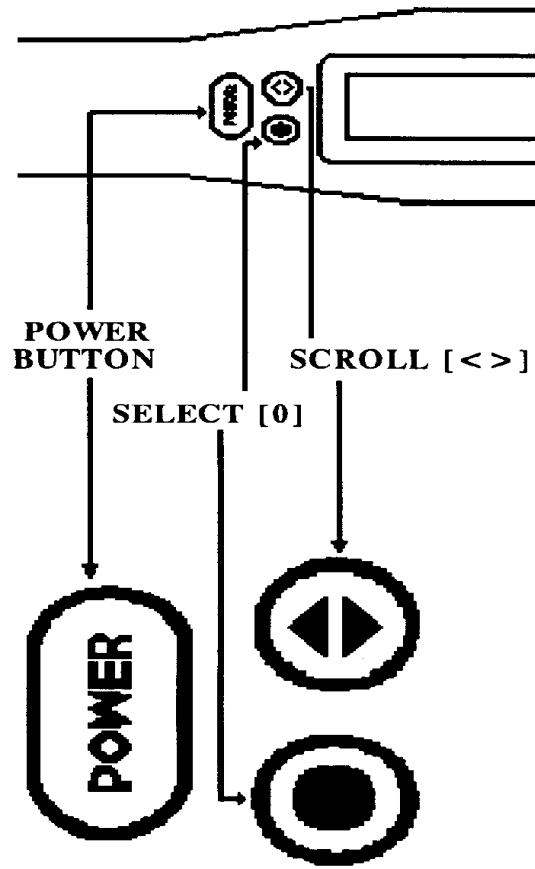
POWER
BUTTON

SCROLL [< >]

SELECT [0]

POWER

Figure B

3.1 Using the QC200

Before you turn the unit on and select a mode of operation, you should review the following to learn how to properly scan a bar code with it.

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To scan a bar code:

1. Hold the QC200 as you would a pen or pencil. The raised "finger grip ridges" on each side of the case near the optics/scanning tip are guides for finger placement.
2. Press the optics tip lightly against the surface to be scanned in the clear area (quiet zone) on either side of the bar code symbol. To maintain a proper scanning angle, be sure both the optics tip and the "reflectance guide" are flat on the surface to be scanned.
3. At about the same speed with which you would quickly underline one of the sentences in this text, and without interruption, move the QC200 evenly across the center (or approximate center) of the bar code.
4. Listen for a long beep tone quickly followed by a short beep tone signifying a good read. Note that a long beep followed by three short beeps indicates an error condition exists in the symbol scanned.

NOTE: Practice your scanning technique until you can successfully scan each of the supplied test symbols on each attempt. Some of the supplied test symbols have "intentional errors" in them to show the user how error conditions are reported.

3.2 Power ON/OFF

The Quick Check® 200 Series is turned on by pressing the POWER button, to which it responds by emitting four quick beeps and first displays:

[QC2xx aa/lll]

where "xx" identifies the model number, "aa" is the aperture size designation in "mils" (one thousandths of an inch) and "lll" is the spectral response or wavelength of illumination in nanometers. If there are stored print records (and the unit is connected to a Quick Check® AC Charger or Printer interface cable), the display then changes to:

[BUF xx% Ful>]

or it may read "LOW BATTERY!" or "RECALIBRATE!" if charging or reflectance calibration is needed.

The Quick Check® 200 Series shuts itself off after about a minute of inactivity. Alternately, the operator can shut the instrument off by pressing the button for about two seconds, until it beeps and clears the display.

3.3 Reflectance Scale Calibration

The first time you use the unit or charge the battery pack and periodically during normal operation, the Quick Check® 200 Series reflectance scale should be calibrated. Remove the QC200 Reflection Calibration Page (QCRFPG) from the manual and, with the unit at the proper scanning angle (so it rests on its "reflectance guide"), CAREFULLY scan the reference target symbol 10 times. Note that your first scan will yield a "triple" beep (one long, two short) as well as your tenth scan.

NOTE: TO INSURE MAXIMUM REFLECTANCE-SCALE ACCURACY FOR THE HIGHEST ACCURACY IN DATA COLLECTION, YOUR QUICK CHECK PERFORMS A CONSISTENCY TEST WHILE THE TEN CALIBRATION SCANS ARE MADE. IF, DURING THOSE SCANS, IT DETECTS REFLECTANCE READINGS SIGNIFICANTLY DIFFERENT FROM THE PREVIOUS ONES RECORDED, IT WILL AGAIN "BEEP" THREE (3) TIMES AND THE LCD WILL PROMPT YOU TO AGAIN BEGIN THE REFLECTANCE CALIBRATION PROCEDURE. IF DURING THE MEASUREMENT OF A SAMPLE SYMBOL AN "XX" or "- -" IS DISPLAYED OR PRINTED A REFLECTANCE VALUE, AND OUT OF RANGE READING HAS BEEN MADE. THE UNIT SHOULD BE RECALIBRATED AND THE SAMPLE SHOULD BE RESCANNED.

3.4 Initial Power Up Default Settings

The Quick Check® 200 Series powers up in whatever operating mode it was last left in. To facilitate "getting started", we have programmed the QC200 so that it will default, the first time it is powered up and calibrated, to the settings listed. The many possible variations available to the QC200 user will be outlined in later sections of this guide.

All codes Active (Auto-discrimination)
Those Codes are:
     Code 39
     Interleaved 2 of 5
     EAN/UPC 100% Magnification
     Codabar
     Code 128
     MSI
     16K

Other Configuration Settings:
        "NormalAccur" – Normal Accuracy
        "Trad'l P/F" – Traditional Tolerance Testing
        "Avg DMargin" – HHP Averaged Decodability
Margin
        "Ltr. Grades" – If ANSI is invoked, Letter
Grades used
        "Right Handed" – LCD Right Hand
Orientation
        "HS Printer" – Printer Interface set for HHP
QCHSP

An explanation of each of the above default settings can be
found in the CONFIGURATION/PROGRAMMING section.

4.0 Configuration/Programming

The Quick Check® 200 Series auto-recognizes or "autodiscriminates" seven bar code symbologies - - Codabar, Code 39, Interleaved 2/5, EAN/UPC, Code 128, MSI Code and Code 16K - - or alternately can check that symbols conform under any or all of several applications specifications; AIAG, BOOKLAND, CCBBA, Comp Tia/CTIA, SCC, SISAC, U.P.C.-COUPON CODE, dependent upon the QC200 Model. The QC200 also has a number of operator selectable test and configuration options. The QC200 user can program their unit for all of these options in two distinct ways. One is by simply scanning a specialized Code 128 called a Command Code. Predetermined Command Codes were used in the QC200 Quick Start section of this manual and are explained in a later section. The QC200's options can also be programmed manually.

The "heart" of the operation and manual programming of the Quick Check® 200 Series is centered around its "Select" and "Scroll" buttons. All functions with the QC200 are controlled by their use. Generally, pressing the Select [0] Button moves the user from menu "level" to menu "level". Pressing of the Scroll [<>] Button allows the user to pick an option within these levels. At the end of the manual are menu "flow charts" of the QC200 menu sequences. An explanation of what programmable selections are available follows.

4.1 Codes/Symbology Options

The Quick Check® 200 Series symbology selection configuration is set and controlled from within the QC200's programming menu structure, this is entered after power up by pressing the Select [0] Button two times as demonstrated through the next steps:

On power up, **[Qc2xx aa/lll]** is displayed.

If you press the Scroll [<>] Button the results of the last scan is displayed (the QC200 always stores the last sample scan). If you press the Select [0] Button the following is displayed:

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[Reflectom'r>]

This is the QC200's static Reflectometer option, which is described later in this manual. Pressing the Select [0] Button again bypasses this and changes the LCD to:

[- Specs - >]

The ">" indicates to the user that pressing the Scroll [<>] Button will allow them to select between the different code "specifications" (generic symbologies vs. applications) preprogrammed into the QC200. If you press Scroll [<>] here, you are put into the "Codes" (generic symbologies) mode with a resulting LCD of:

[- Codes - >]

Here you will be allowed to make certain modifications in the testing criteria used for the generic symbologies. These choices are also accepted or by-passed using the Select [0] and Scroll [<>] buttons. Pressing Select [0] will bring up the first set of options:

Codabar Options displayed on the LCD are:

[USS – Codabr>] or **[Trad Codabr>]**

This choice is between the original constant character width Codabar font (with Monarch's original print tolerances applied) and the compatible "rationalized" font described in AIM's USS – Codabar specification (with the appropriate USS tolerances applied). **NOTE:** An "x" shown during Codabar decoding indicates a missing stop/start character.

 Code 39 Options displayed on the LCD are:

[Cod39 no Ck>] or **[Code39 w/Ck>]**

This choice is whether to test for Code 39's optional Mod 43 Check Character (see AIM USS for Code 39).

Interleaved 2/5 Options displayed on the LCD are:

[Int25 no Ck>] or **[Int25 w/Ck>]**

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This choice is again whether to test for an optional Interleaved 2/5 Mod Check Character.

UPC/EAN/JAN Options displayed on the LCD are:

[UPC/EAN x.x>] where "x.x" represents a UPC/EAN magnification factor.

The possible choices are .80, .85, .90, .95, 1.0, 1.2, 1.4, 1.6, 1.8 or 2.0 and are cycled through by repeatedly pressing the Scroll [<>] Button. The default setting is 1.0 or 100%.

Code 128 Options displayed on the LCD are:

[Cd128 Modes>] or **[Cd128 Messg>]**

This choice is whether or not to have Special Extra Characters displayed and printed within the encoded message that show Code 128's Starting Mode, Mode Changes and Shifts. Normally this information is totally transparent to the user but it may assist in analyzing reading or printing problems.

When scanning Code 128 in the "Show Modes" setup, the LCD display and the printer "show" Code 128's "Special Extra Characters" as well as information on the symbol's check digit. Because of the nature of some of these characters, they are represented by special character "strings" as shown in the following table.

CODE 128 CHARACTER TRANSLATION TABLE					
CHARACTER	LCD	PRINTER	CHARACTER	LCD	PRINTER
00(NUL)	0	<NL>	15(NAK)	15	<NK>
01(SOH)	1	<SH>	16(SYN)	16	<SY>
02(STX)	2	<SX>	17(ETB)	17	<EB>
03(ETX)	3	<EX>	18(CAN)	18	<CN>
04(EOQ)	4	<ET>	19(EM)	19	<EM>
05(ENQ)	5	<EQ>	1A(SUB)	1A	<SB>
06(ACK)	6	<AK>	1B(ESC)	1B	<ES>
07(BEL)	7	<BL>	1C(FS)	1C	<FS>
08(BS)	8	<SC>	1D(GS)	1D	<GS>
09(HT)	9	<HT>	1E(RS)	1E	<RS>
0A(LF)	A	<LF>	1F(US)	1F	<US>
0B(VT)	B	<VT>	7F(DEL)	*	<DL>
0C(FF)	C	<FF>			
0D(CR)	D	<CR>	FCN1	F1	<F1>
0E(SO)	E	<SO>	FCN2	F2	<F2>
0F(SI)	F	<SI>	FCN3	F3	<F3>
10(DLE)	10	<DE>	FCN4	F4	<F4>
11(DC1)	11	<D1>	Mode A	A	<A:>
12(DC2)	12	<D2>	ModeB	B	<B:>
13(DC3)	13	<D3>	ModeC	C	<C:>
14(DC4)	14	<D4>	Shift	Sh	<Xh>

* - No "special" displayed character for <DEL>

Code 16K Options displayed on the LCD are:

[Cd16K Modes>] or **[Cd16K Messg>]**

Selection here is similar to that described under Code 128. When scanning a Code 16K symbol, the QC200 reports quality information on each individual row of the code. After the appropriate number of rows has been decoded, the QC200 will also output the complete Code 16K encoded message. Note that Code 16K uses many of the same special character "strings" as those listed for Code 128. An additional character, the "Pad" character is shown as **Pd** on the LCD and printouts.

MSI Code Options displayed on the LCD are:

[MSI NoUsrCk>] or **[MSI Mod10Ck>]** or **[MSI Mod11CK>]**

which allows the selection of no user specified second check digit or a user specified second check digit of either the Modulo 10 or Modulo 11 type.

NOTE: The MSI "System" Check Digit, which is inherent to the code, is displayed on the Quick Check's LCD line after decode. In some cases it may not be shown as a "human readable" digit on printed samples.

If, after the initial LCD output of "- Codes - >", the Scroll [<>] Button is pressed twice, the operator is then prompted to select an application specification.

4.2 "Application"/Model Options

A QC200 is preprogrammed with Industry Applications according to the Model selected. These application tests not only test the codes for generic print quality parameters, as applied by the applications, but also test for application specific formats, check characters and data identifiers. The selection of an application is accomplished by turning on the QC200.

[QC2xx aa/lll] where "xx" identifies the model number.

Continue by pressing the Select [0]button two (2) times.

[- Specs - >] is displayed.

Press the Scroll [<>] button

[- Codes - >] is the next display.

Continue by pressing the Scroll [<>] button until the Industry Application of choice is display. (message displays for each application are found on page 20) Then press the Select [0] button to accept this Industry Application. **NOTE: Only one (1) Industry Application may be selected at a time.**

The available Industry Applications to select from include;

AIAG [- - AIAG - - >] – Automotive applications
BOOKLAND [- Bookland - >] – Book applications
CCBBA [- CCBBA - >] – Blood Bank applications
Comp Tia/CTIA/ABCD [- - ABCD - - >] – Computer applications
HIBCC [- HIBCC - >] – Health Care applications
LOGMARS [- LOGMARS - >] – Government applications
SCC[- - - SCC - - - >] – Retail (SCS/ITF, EAN-128, UCC 128 Serial)
SISAC [- SISAC - >] – Serial Coding applications
U.P.C. [Coupon Code >] – Coupon Coding applications

If additional user information must be input when an application is selected, the user will be prompted to do so after the Select button [0] has been pressed. Those applications need additional input follow:

AIAG the user must indicate whether they are the "supplier" of the bar code or the "customer" receiving the bar code (the AIAG application specification adjusts acceptance criteria accordingly).

[AIAG Custmr >] or **[AIAG Supplr >]**

Pressing the Select [0] Button accepts the choice, the Scroll [<>] Button bypasses.

SCC This application requires the entry of a magnification factor for the Interleaved 2/5 symbols to be tested (thereby setting appropriate tolerances!). The user steps through the choices (>75%, 74%, 70%, 66%, 62%, 58%, 54%, 50%) using the Scroll [<>] Button. Selection is made using the Select [0] Button.

BOOKLAND As with the UPC/EAN/JAN codes mentioned earlier, the Bookland codes (which are based on those symbols) require input of a magnification factor. Again, the possible choices are .80, .85, .90, .95, 1.0, 1.2, 1.4, 1.6, 1.8 or 2.0 and are cycled through by repeatedly pressing the Scroll [<>] Button. Default is 1.0 or 100%.

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Model Selections:
QC200 – Symbologies only
QC210 – Retail Model. Symbologies plus retail/book industry applications.   (SCC;BOOKLAND;SISAC)
QC220 – Health Model. Symbologies plus health industry applications**.**   (SCC;HIBSS;CCBBA)
QC230 – Industrial/Government Model. Symbologies plus industrial/government**.(**LOGMARS;AIAG;ABDC/CTIA;SCC)
QC250 – All Industry Applications plus Symbologies

4.3 "Tests" Options

After Power up and pressing the Select [0] Button three times, you are brought to the "Test" Programming Sections:

[- Tests - >]

Pressing the Scroll [<>]Button once at this point will access the area of the QC200's programming where test procedures are determined. Use of the Select [0] and Scroll [<>] buttons here will allow you to select the unit's pass/fail level criteria (Traditional vs. ANSI), use of a higher level of statistical accuracy for measurement of each scan path (NormalAccur vs. ExtendAccur), type of Decodability calculation to use (Avg DMargin vs. Decodability) and whether, when ANSI is the pass/fail criteria, letter or number grading is used (Ltr. Grades vs. Num. Grades). An explanation of these possible selections follow.

"Trad'l P/F" vs. "ANSI PrQual> A" / "ANSI PrQual> B"/ "ANSI PrQual? C"/"ANSI PrQual> D"   The Quick Check® 200 Series can apply Pass/Fail criteria based on either the "Traditional" bar code print tolerances and PCS measurements or the "Graded" methodology specified in the ANSI Standard "Bar Code Print Quality – Guideline" X3.182. Upon any measurement scan, the QC200 beeps either once to indicate a passing symbol or three (3) times to indicate failure of one or more tests. Choose here whether to apply Traditional Pass/Fail criteria -- PCS value and Print Tolerances – or the graded <A> through <F> criteria and scales from ANSI's Print Quality Guideline.

"NormalAccur" vs. "ExtendAccur" The Quick Check® 200 Series is capable of scanning in a "Normal Accuracy" mode as well as in "Extended Accuracy". In the "Extended Accuracy" Mode, ALL individual parameter measurements and results are averaged over eight (8) successive scans of a given scan path of the symbol under test, greatly reducing reading variability due to variations in scanning motion and minor scan path variations. This is not to be confused with ANSI's recommended ten (10) scan symbol average, where ten (10) individual symbol scans have their final scan grade averaged.

"Avg DMargin" vs. "Decodability" "Decodability" is an ANSI graded measure of how close a given scan comes to a reference decode failure due to variations in the bar and/or space widths. The Quick Check® 200 Series has the ability to analyze a symbol using "Decodability Margin" (Avg DMargin in the QC200) as well as true "ANSI" Decodability (Decodability in the QC200). "Decodability Margin" is the character-averaged value of Decodability. Decodability is what percentage of the symbology's safe decoding margin is left for the scanner after printing errors. Lower margin values and corresponding lower grades indicate an increased susceptibility to decoding failure due to scanning errors such as, for example, acceleration or bar or space size deviations. **NOTE:** Variations in scan speed affects ANSI Decodability. When hand scanning set this option to **"Avg DMargin"**. **"Decodability"** (ANSI Decodability) should only be used by those who have a very consistent and smooth scanning action or with automated scanning. The QC200 will "measure" your scanning and prompt you to "Scan Faster", "Scan Slower" or "Scan Evenly" if it detects gross variations in your scan rates.

"Ltr. Grades" vs. "Num. Grades" When the QC200 has been set to an ANSI grade for its test criteria, the user can have that ANSI grade reported as a letter or as a number (4.0=A, 3.0=B, 2.0=C, 1.0=D and 0.0=F) by selection either **"Ltr. Grades"** or **"Num. Grades"** here.

4.4 "Config." Options

After Power up and pressing the Select [0] Button four times, you are brought to the **"Config."** Programming Section:

[- Config. - >]

Pressing the Scroll [<>] Button once at this point will access the area of the QC200's programming where reporting configuration is determined. Use of the Select [0] and Scroll[<>] Buttons here will allow you to select the unit's LCD orientation (Left Handed vs. Right Handed), raise or lower the beeper pitch or effect volume (Raise Pitch in single steps or Lower Pitch in single steps), select the HHP QC printer (HS Printer, VHS Printer or Std Printer) and finally save the settings in non-volatile RAM for future use. An explanation of these possible selections follows:

"Left Handed" vs. "Right Handed" The QC200's custom LCD display can have its text and read-outs oriented for either a left handed or right handed user. This automatic "flipping" of the LCD image makes the unit easy to use and read by all operators. Selection of either orientation is done here by pressing the Scroll [<>] Button.

"Raise Pitch" Repeated pressing of the Scroll[<>] Button increases the pitch/volume of the QC200 beeper.

"Lower Pitch" Repeated pressing of the Scroll[<>] Button increases the pitch/volume of the QC200 beeper.

"Std Printer" vs. "HS Printer" vs. "VHS Printer" . The Quick Check® 200 Series supports all three of Hand Held Products' accessory printers. The QCP, QCHSP and QCSSP printer interface software is selected here by pressing the Scroll [<>] Button until the desired setting is shown on the LCD.

To save these settings and the other previous selected options, the user again presses the Select [0] Button after leaving the desired accessory printer selection on the LCD. This brings the following message to the LCD:

[SaveSetngs?>]

Pressing the Select [0] Button will by-pass this (effectively answering "NO"), but pressing the Scroll [<>] Button will accept it, changing the LCD to :

[Confirm**>]**

This gives the user a last chance to change their minds and abort the changes. Again, pressing Select [0] will by-pass it, but pressing Scroll[<>] will accept it changing the LCD to:

[- Busy! -] then to **[Version yyyy]** and finally to **[QC2xx aa/lll]**

as the non-volatile memory is updated. The "yyyy" represents the base software's "checksum". This number can be used by Hand Held Products' Service Department when identifying a QC200. (If the Select [0] Button is pressed after "SaveSetngs?>" or "**Confirm**>", the LCD changes automatically to the "Version yyyy" message.

5.0 Symbol Testing & Scan Results

The Quick Check® 200 Series acquires data during a measurement scan utilizing the new software-intensive "ScanProfile" methodology as specified in ANSI's "Bar Code Print Quality Guideline" (ANSI x3.182). (**NOTE:** In all cases, the more smooth and slow the scan, the more accurate the results.) the user may be prompted with a series of beeps (one long and three short) and one of the following displays:

[Scan Slower!] or **[Scan Evenly!]** or **[Scan Faster!]**

indicating that the scan was either too fast, too uneven/erratic or too slow for proper data collection. A practiced, more deliberate and smooth rescan should be made to insure accurate results.

Both pass/fail testing and detailed measurements on a given symbol are obtained simply by scanning across it with the QC200. The most accurate results will be obtained by starting just outside the quiet zone and scanning in a single, smooth motion with the optics tips and reflectance guide "foot" lightly touching the symbol surface. Practice helps! A successful measurement will be signaled by beeping, a blinking green (pass) or red (fail) LED and the display showing results such as:
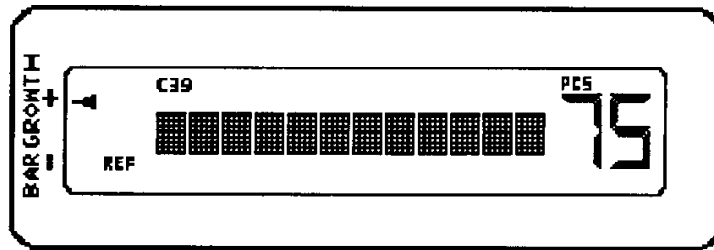
If in Traditional P/F Test Mode. When in ANSI Grading Test Mode, the PCS value shown is replaced with an ANSI letter grade or its numerical equivalent.

A symbol that consistently produces no beeping is either fatally out-of-spec or of an unknown or unprogrammed bar code symbology.

The QC200's customer LCD display shows the user a complete synopsis of the scan results. The information shown includes the decode of the symbol's encoded characters (dot matrix characters in the middle of the LCD), the symbology type (across the LCD top), the PCS or ANSI Grade (on the right when in the Right Handed viewing orientation), an indication of bar growth/shrinkage (small arrows to the extreme left of the LCD when in the Right Handed viewing orientation) and in what parameter any error may have occurred (the key words DIM, REF and/or FMT will light just to the left of the symbol decode, when in the Right Handed viewing orientation).

If the encoded message in a bar code symbol exceeds 12 characters, the right most character of the display will be a "right arrow" (>). In that case, pressing the Scroll[<>] Button will "scroll" the encoded message and allow the remainder of the message, in 11 character portion, to be viewed.

As mentioned above, uniform bar growth or shrinkage is displayed by a vertical series of "arrows" on the LCD. One "arrow" will remain lit to indicate the average bar width error in relation to traditional print tolerance allowances. When centered between the "+" and "-" on the label, the bar growth/shrinkage is at a minimum. As the arrow position moves toward the "-", increasing amount of shrinkage is seen. Conversely, a move toward the "+" indicates bar growth. When the arrow directly across from either the "+" or "-" is lit, traditional bar width tolerances have been exceeded. There are seven arrows in the scale.

With each test scan of a symbol, the QC200 also indicates the sample's pass/fail status with a characteristic "beep" pattern. One long beep with ONE short indicates that the symbol passes the appropriate battery of tests. One long beep with THREE short beeps indicates that it fails in some regard. Thus pass/fail testing proceeds by simply scanning symbols and listening for a triple beep. Upon any failure, the LCD indicates the parameter area where the failure occurred. These areas are indicated by a three-letter abbreviation.

DIM = a DIMENSIONAL parameter error
REF = a REFLECTANCE (contrast) parameter error
FMT = a FORMAT parameter error

In a symbol with multiple errors, you will have more than one of the above indicators lit. Exact details of the failure can be obtained by following the procedures in the section that follows.

When in the ANSI Grading mode, every **tenth** measurement of a given symbol (or every **eightieth** measurement if also in **Extended Accuracy** mode) will cause the results message for the last scan to be replaced with:

[g/aa/lll**] x.x**

reflecting the ANSI Symbol Grade (average of the ten Scan Grades per ANSI procedures). In this display, "g" is the ANSI Grade (A,B,C,D or F), "aa" is the verifier's aperture size, "lll" is the verifier's spectral response and "x.x" is the numerical value the ANSI letter grade was derived from.

5.1 Test Result Details

5.1.1 Dimensional Parameters

After a successful scan is made, detailed results in the Dimensional Parameters area are accessed by first pressing the Select [0] Button once. This will produce the display:

[Dim'l Data>] P (or F)

Either the "P" or "F" will be shown to indicate if the symbol under test passed or failed the Dimensional Parameters. Pressing the Scroll [<>] Button will move you into the Dimensional Parameters details. The order the displays are shown changes dependent upon whether the QC200 is set for "Traditional" or " ANSI" testing criteria (though in each case all the same displays are shown). For this document, the order used with "Traditional" test criteria is illustrated, with the first display showing:

[AvgBar x.xxX] P (or F)

AvgBar is the average bar print error. It is the value or amount of average bar growth or shrinkage in the measured symbol relative to its X dimension. This value is compared against Traditional print tolerance criteria with the "P" of "F" showing compliance or non-compliance. Pressing the Scroll [<>] Button again changes the display to:

[W/N Ratio x.xx] P (or F)

W/N Ratio is the wide-to-narrow ratio and is measured for those symbologies where it is meaningful, namely Code 39, Interleaved 2/5 and USS-Codabar; otherwise, it is not displayed. This value is compared against either generic limit (1.8 to 3.2) or a target fixed value (e.g., 2.5 + 0.2) to determine if it passes or fails. An out-of-range W/N ratio is considered a dimensional error under BOTH Traditional and Graded testing criteria.

Another press of the Scroll [<>] Button will display (**ONLY IF** applicable errors have been found) certain Global Threshold, Reference Decode or Reference Algorithm failure messages such as:

[GloThrsFAILS] F or **[RefDcod FAIL] F** or **[RefAlgoFAILS] F**

Global Threshold ANSI's Symbol Grading methodology requires foremost that a global reflectance threshold set simply at the halfway point between R(min) and R(max) should "find" every bar and space in the symbol. The Quick Check® 200 Series uses the ANSI prescribed methodology for precise edge location and indicates when the global threshold requirement has not been met. **"Reference Decode or Algorithm"** ANSI's Graded symbol testing criteria requires that a given scan be decodable using certain "reference" algorithms, else the scan fails. Similarly, certain application specifications call for specific formats, checks or characters that must be in the symbol. The Quick Check® 200 Series employs advanced decoding schemes to test the necessary reference decoding and algorithms. If any errors are encountered, a failure is indicated appropriately.

If errors were not found in these areas, the next display would read:

[D Margin xx%] Grade or **[Decod'ty xx%]Grade**

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Decodability/Decodability "Margin" Decodability" is a Graded measure of how close a given scan comes to a reference decode failure due to variations in bar and space widths. The Quick Check® 200's "Avg DMargin" is the character-averaged value of Decodability. Decodability is what percentage of the symbology's safe decoding margin is left for the scanner after printing errors. Lower margin values and corresponding lower grades indicate an increased susceptibility to decoding failure due to scanning errors such as, for example, acceleration or bar or space size deviation. Decodability "Margin" is stated as "D Margin" in the QC200's LCD Dimensional Details display and ANSI decodability is listed as "Decod'ty".

If the Scroll [<>] Button is again pressed, various other Dimensional Parameter errors might be displayed next. Examples of these follow:

[BAD QuietZon] F -- Indicates insufficient Quiet Zone width
[WIDE IC Gap] F -- Indicates the InterCharacter Gap is too wide
[BAD StrtStop] F -- Indicates either the Start or Stop Characters are bad
[BAD GuardPat] F – Indicates that the Guard Bar Pattern in a UPC/EAN/JAN symbol is bad
[BAD Separatr] F – Indicates a bad Separator Pattern

Pressing the Scroll [<>] Button again produces the display:

[Total xxx"X"]

Total xxx"X" indicates the total symbol width expressed in "X" dimensions. "Formally" a bar code symbol's width includes the quiet zones, however the value presented here is a calculated count of the number of "X" dimensions from the starting bar through the ending bar of the scanned symbol. The operator can use this value and the symbol's actual measured width to calculate X. By pressing Scroll [<>] again, the display becomes:

[Calc "X"? 0]

The **"X" DIMENSION** can now be calculated by first pressing the Select [0] Button (pressing Scroll [<>] will by-pass this operation) giving the following display:

[SymLen=0.--"]

By then entering the symbol's width as measured with the supplied ruler in decimal inches (e.g., 1.24), the operator provides the key parameter for calculating X. To change the value of "0.--", press the Scroll [<>] Button. This increments the first digit from "0" to "9". When the desired digit is shown, press Select [0] to accept and move to the next digit. After all three are filled in, the Quick Check® 200 series then calculates the X Dimension and displays it in the following manner:

[X is x.xxxx"]

If 0.00 is entered, the X remains uncalculated. The "total" width of any EAN/UPC symbol is that of the main symbol, ignoring a possible addendum.

5.1.2 Reflectance Parameters

After a successful scan is made, detailed results in the Reflectance Parameters area are accessed either by first stepping through the Dimensional Details as shown above or by pressing the Select [0] Button twice. This will produce the display:

[Refl Data >] P (or F)

Again, either the "P" or "F" will be shown to indicate if the symbol under test passed or failed the Reflectance Parameters. Pressing the Scroll [<>] Button will move you into the Reflectance Parameters details. The order of the displays are shown changes dependent upon whether the QC200 is set for "Traditional" or "ANSI" testing criteria (though in each case all the same displays are shown). For this document, the order used with "Traditional" test criteria is illustrated, with the first display showing:

[PCS xx%] P (or F)

and then pressing the Scroll [<>] Button again will give:

[Rl:Rd xx:xx%] P (or F)

Print Contrast Signal (PCS), Light Reflectance (Rl) and Dark Reflectance (Rd) are all "Traditional" measures of symbol contrast. PCS is based on the reflectance of light areas,

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Rl and dark areas, Rd. These values are determined using a definition of Rl and Rd as the Peak Light and Peak Dark points seen during the scan. Thus Rl = R(max) and Rd = R(min) in current terminology. The Traditional pass/fail criteria are PCS > 75% with Rl > 25% and Rd <30%. **NOTE: IF DURING THE MEASUREMENT OF A SAMPLE SYMBOL AN "XX" IS DISPLAYED OR PRINTED AS A Rl, Rd or PCS REFLECTANCE VALUE, AND "OUT OF RANGE" READING HAS BEEN MADE.**
THE QC200 SHOULD BE RE-CALIBRATED AND THE SAMPLE SHOULD BE RESCANNED. Again pressing the Scroll [<>] Button will change the display to:
[SymContr xx%] Grade

Symbol Contrast (SC) is a Graded measure of the difference between the highest reflectance value R(max) and lowest reflectance value R (min) seen during a measurement scan. Another press of the Scroll [<>] Button changes the display to show:

[Rmin/Rmx xx%] Grade

Rmin/Rmx has an additional Pass/Fail (Grade "A" or "F") requirement that it be at or below 50%. Press the Scroll [<>] Button again to get:

[Modul'n xx%] Grade

Modulation (MOD) is an ANSI graded criterion equal to Edge Contrast (min) divided by Symbol Contrast.

[Edge(mn) xx%] Grade

Edge Contrast Minimum (Ecmin or Edge(mn)) is the minimum value of Edge Contrast (EC) seen during a measurement scan. Edge Contrast (EC) is the reflectance difference between an adjacent bar and space. The Pass/Fail requirement (Grade "A" or "F" here is that the EC(min) be >15%. Another press of the Scroll [<>] Button brings us to the final Reflectance parameter detail of:

[Defects xx%] Grade

Defects is the Graded measure of the maximum Element Reflectance Non-uniformity (noise WITHIN any element due to spots, voids, etc.) normalized to symbol Contrast.

5.1.3 Format Parameters

After a successful scan is made, detailed results in the Format Parameters area are accessed either by first stepping through the Dimensional and Reflectance Details as shown above or by pressing the Select [0] Button three (3) times.

[Msg Format >] P (or F)

Either the "P" or "F" will be shown to indicate if the symbol under test passed or failed the Format Parameters. Pressing the Scroll [<>] Button will move you into the Format Parameters details. The order the displays are shown changes dependent upon whether the QC200 is set for "Traditional" or "ANSI" testing criteria (though in each case all the same displays are shown). For this document, the order used with "Traditional" test criteria is illustrated. **If** an Application Specification has been activated, the normal sequence will be superseded by the following display:

[APPL *Type*]

where APPL will be the appropriate Application and Type will be any possible sub-identifier within that application. Repeated pressing of the Scroll [<>] Button will then show any other application specific errors such as:

[BAD Source]

and will finally come to:

[MsgLength xx] P (or F)

Message Length is the length of an encoded message. The length may need to be checked against an application-specified length restriction. Another press of the Scroll [<>] Button displays:

[No Check Chr] P or

[ChkChr Checks] P or

[ChkChr Fails] F

Check Characters may be mandatory under a bar code symbology specification, required by the user or by an application specification: either, neither, or both! The display screen will reflect the requirement and the result. Repeated

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pressing of the Scroll [<>] Button will reveal any additional error situations such as:

[BAD Symbology] F if a wrong code type is found.

At this point (or any other point during the scrolling of results), pressing the Select [0] Button will cycle the QC200 into its "Store" (if not hooked to a printer) or "Print" (if hooked to a printer) sequence. The print sequence is explained in Section 6.

6.0 Printer Print Out Samples

[Store Data?>]

When a printer is not attached or is turned off, you are asked if you wish to store the measured results in a 20-scan print buffer. Pressing the
Scroll [<>] Button will store the scan. The buffer's contents can later be dumped to the printer. When a QC200, that has stored data, is hooked to a printer and the QC200 is then turned on, the first display will be a query on whether or not to dump the stored information. **NOTE:** The QC200 will also "see" the QCAC Charger as a "printer" when it is connected.

[Print Data?>]

When a printer is attached to the Quick Check® 200, you are asked if you wish to print the most recent scan. Pressing the Scroll [<>] Button will cause the current testing results to be printed and the following display will show:

[- Busy ! -]

NOTE: Printing can be halted after starting by momentarily pressing the **POWER** button on the QC200. Printing will stop as soon as the printer's internal buffer is clear.

6.1 Print Out Samples

All of the measurements obtained during a measurement scan are saved in a temporary buffer. When a printer is not connected those measurements can be transferred to a 20-scan print buffer as described above. When a printer is attached and powered, it produces a listing of full measurement details. From a QCP or QCHSP, the print out would look similar to the following:

```
\\\Quick Check® 200\\\

660 nm, 06 mil Scanner

UPC-A: 100% Mag. Factor

021200074424

Avg Bar Err = +.04X OK!
DecodeMargin = 92%  <A>
Symbol Total = 095 "X"


Prnt Contr Sig = 94% OK!
Reflect (Light) = 75% OK!
Reflect (Dark) = 03% OK!
Symbol Contrst = 72% <A>
R(min)/R(max) = 04% <A>
Modulation = 79%     <A>
EdgeContr(min) = 57% <A>
"Defects" = 05%          <A>

Message Length = 11  OK!
Check Charctr Passes  OK!

   Traditional Tests <PASS>
    Bar Growth: IN TOL (+)
        "P C S" – OK
   Traditional Tests - PASS -
     Format Tests - PASS -

     ANSI Parameters <A>
    Dimension Checks <P>
      Format Checks <P>
   Profile QualityGrade <A>
```

From a QCSSP, a typical printout would look more like the following:

```
            -    Quick Check® 200 -

            660 nm, 06 mil Scanner

                   Code 39

              *+A123B4C5D6E711*


  AvgBar = +.05 X OK!   W/N Ratio = 2.9 OK!
  DecodMargn = 88% <A>   Symbol Totals 264X

PCS = 90% OK!   R(L) = 79%  OK!   R(D) = 07%  OK!
 SymbolContr = 72% <A>   R(mn)/R(mx) = 09% <A>
  Modulation = 61% <B>  EdgeCtr(mn) = 44% <A>
                "Defects" = 04% <A>


  Msg Length = 15  OK!    -No-Check Character

              Bar Growth:  IN TOL
                 "P C S" : OK
             Traditional Tests -PASS-
              Format Tests -PASS-

             ANSI Parameters: <B>
             Dimension Checks: <P>
              Format Checks: <P>
           Profile Quality Grade is <B>
```

For all printers, on the tenth scan of a given symbol (or eightieth scan if in "Extended Accuracy" mode), a message similar to the following will be appended to the normal printout.

For the QCP and QCHSP:

```
**********************
****

  * Symbol Quality Grade *

  * Avg 4.0 = > A/06/660*

**********************
****
```

And from the QCSSP:

```
**************************************************
******
        Symbol Quality Grade: Avg 3.0 = > B/06/660
**************************************************
******
```

Each result shown in the printout is information also available on the display as previously described. Having the wrong printer setting, if encountered, may cause printing difficulties. This is set within the "Config." Menu as explained previously.

Printing can also be initiated in either a single ("on demand") or continuous ("auto-print") print mode **by use of the Printer Control Command Codes found later in this manual.**

NOTE: Printing can be halted after starting by momentarily pressing the **POWER** button on the QC200. Printing will stop as soon as the printer's internal buffer is clear.

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7.0 Special Functions

SPECIAL FUNCTIONS

The Quick Check® 200 series can be set to a special "static" reflectance measurement function (Reflectometer Mode). This mode is especially useful in investigating the underlying optical characteristics of bar code symbols. The Reflectometer Mode, along with the Command Code mode is covered below.

7.1 Reflectometer Mode

This menu selectable Special Function is entered by pressing the Scroll [<>] Button when [Reflectom'r>] is present on the LCD. Then in this special reflectometer mode, the reflectance "seen" by the QC200's optics is continuously displays as both a two digit reflectance percentage and on a graphic bar graph as soon as the mode is invoked.

Here the xx% and the graphic bar graph (or "gas gauge") represent a reflectance value of 00% to 100% from the static reflectometer. This mode is not "memorized" when the unit is shut off. When turning the unit back on after power down, it will be necessary to re-establish the Reflectometer Mode if needed. For these values to be meaningful and consistent, it is critical first that reflectance calibration have been performed recently and second that the QC200 be held with its "reflectance foot" and optics tip both touching the sample to maintain the proper angle.

7.2 Command Code Programming

The Quick Check® 200 series has the unique ability to be "pre-programmed" by the user by scanning a specially encoded code 128 symbol. This symbol will automatically make all the selections normally made by the user stepping through the normal menu sequence. This is particularly useful if the user has one or two particular setups that they are constantly switching between. Samples of Command Codes, such as the

Command Code to "reset" the QC200 back to all generic default settings, are included with each unit.

NOTE: Display orientation (Right Handed vs. Left Handed) and Printer Interface selection **ARE NOT** set using the Command Code. Factory default settings for these are "Right handed" and "QCHSP".

Users with one of the accessory Quick Check® Printers can produce a Command Code of their QC200's present set-up by following the next steps;

First be sure your Quick Check® 200 is connected to a Quick Check® Printer, that the proper interface selection has been made and both are turned on. Next, locate the Special Features Bar Code Menu in the back of this manual. On this Menu sheet are two codes, Command Code "Unlocked" and Command Code "Locked". Scanning either will result in the Quick Check ® Printer printing the specialized code 128 you can use for rapid one step programming of your QC200.

The Command Code "Locked" code allows the user to add a feature to the Command Code that will "lock" the menu programming after that code is scanned the first time. This prevents access to reprogramming of the unit by the casual user. The "lock" can not be removed unless the user scans another, previously prepared, Command Code that does not have the "lock" function in it, such as the "reset" Command Code supplied in this manual. (**NOTE:** Before actually using this code, label it along the line provided with a description and make a copy of it on your office copier. This helps improve the bar code quality. Making a "reduced size" copy will help also.)

These codes are also produced by HHP. Contact Customer Administration at HHP about this service. It will be necessary to make the following selections;

OPERATING MODE

Extended Accuracy (8-Scan/Scan path average)
      ON(ExtendAccur) or OFF(NormalAccur)

Decodability (choose one)
      Hand Held Products' Decodability Margin (Avg DMargin)

      ANSI's (Decodability)

Pass/Fail Criteria (choose one)
      "Traditional" P/F (Trad'l P/F) or
      ANSI Grades – D, C, B, or A

ANSI Grading by LETTER or NUMBER (choose one)
      Letter Grades (Ltr.Grades)

      Number Grades (Num. Grades)

Program Menu Lock
      On or Off

Reflectometer Mode
      On or Off

SPECIFICATION

Generic Codes vs. Application Spec (choose one)
      Generic Codes (if selected an Application cannot also
be selected)

Code 39 Yes or No   *and*   Mod Check? Yes or No

Interleaved 2 of 5 Yes or No   *and*   Mod Check? Yes or No

UPC/EAN/JAN Yes or No
      Magnification Factor?_ _ _ (Default is 100)
        Choices – 080/085/090/095/100/120/140/160/180/200

Codabar Yes or No
      Traditional Codabar? Yes or No
      USS Codabar? Yes or No

Code 128 Yes or No *and* Modes or Messages (choose one)

MSI Code Yes or No
      User Check Digit? Yes or No
      Mod 10 or Mod 11? (choose one)

Code 16K Yes or No *and* Modes or Messages? (choose
one)

Application Specification

CCBBA	Yes or No
HIBCC	Yes or No
AIAG	Yes or No
Bookland	Yes or No
SISAC	Yes or No
Logmars	Yes or No
CompTia/CITA(ABCD)	Yes or No
SCC	Yes or No

I 2/5 mag factor? _ _ _ (default 075)

8.0 Quick Check Maintenance

8.1 Battery Charging

Charging the battery pack > > when the batteries require recharging, the LOW BATTERY!! Prompt will flash on the LCD. The unit will not allow further scans until it has been turned off and the batteries recharge to a level above the operational minimum. The batteries will only recharge when the Quick Check is not in use.

To charge the batteries in the unit:

1. Plug the QC charger into the power jack on the end of the Quick Check.

2. Plug the AC charger power cube into an appropriate VAC wall outlet.

3. Charge the batteries for a minimum of six (6) hours.

After following the proper battery charging time, your Quick Check will be ready for operation.

8.2 Scanner Tip Cleaning

Occasionally the scanner tip and its optically clear window may become partially obstructed by ink, paper fibers or other deposits. To insure reliable scanning, you should check the tip periodically and clean it if dirty.

To clean the scanner tip:

1. With the Quick Check turned off, lightly dust the tip with a soft camel's hairbrush or equally soft device.

2. If ink or deposits are still evident, using a mild cleaning solution and soft applicator (cotton swab), wipe the tip to clean.

NOTE: Damaged wand tips may be replaced. Contact the Customer Administration or Service Department for details.

8.3 Reflectance Calibration Page Replacement

The Reflectance Calibration Page that comes with your Quick Check® 200 is used for setting the unit's reflection calibration point. This page is a precision made standard. If it should become physically damaged or dirty, it should be replaced in order to insure proper operation of the unit. Contact Customer Administration at HHP to order replacements.

8.4 Troubleshooting

If your Quick Check fails to operate properly after following all operation instructions carefully, do not open the case or attempt to repair. This will void the warranty. Contact HHP for assistance.

9.0 Single Scan To Result (SSTR)

Hand Held Products' Single Scan To Result (SSTR) feature allows the user to quickly and easily access test results using the following SSTR bar codes, without having to step through each of the QC200's individual result menu steps.

After a test scan is completed, the user can find the result they are interested in by simply scanning the appropriate SSTR Code. If another result is required, simply scan that SSTR code.

You can set the QC200 to display a particular parameter as the default "first message" after each test scan by scanning the "INSTALL" SSTR Code, then the SSTR Code that you desire as your default and finally scanning the "SAVE SETTINGS" SSTR Code twice.

By installing the "First Failure" SSTR Code as the default, your QC200 will display as its default first message, whichever parameter fails "first" on a test scan. The order of test/failure is the same order as that of the parameters listed in a QC200 printout. See the "PRINT-OUTS" section of this manual.

Installing the "Decode" SSTR Code will reset the QC200 to factory default report settings.

NOTE: All parameter test results are still accessible by using the QC200's Select [0] and Scroll [◇] buttons as outline in the "TEST RESULT DETAILS" section of this manual.

10.0 Printer Information

10.1 Saving Data

When you scan a bar code symbol, and you do not have a printer connected to the Quick Check, or it is connected by not turned on, the Quick Check can save the measured data in its temporary buffer. You can send scan results to this temporary buffer by using special Print/Store Codes or stepping through the menus. Later you can send this data to a printer.

When a printer is attached to the Quick check and turned on, you can print the results stored in the buffer or, if the buffer is empty, the current results, using the special Print/Store Codes or stepping through the menus.

When you turn on the Quick Check and the buffer has stored data or you fill the buffer during use, the display will tell you. You can print or delete the stored records. Instructions are provided later in this section.

10.2 Reviewing printouts

The Quick Check can print to three Quick Check printers. The printouts from the QCP and QCHSP look similar while the printout from the QCSSP looks different. Both types are shown in the Figure 10-1.
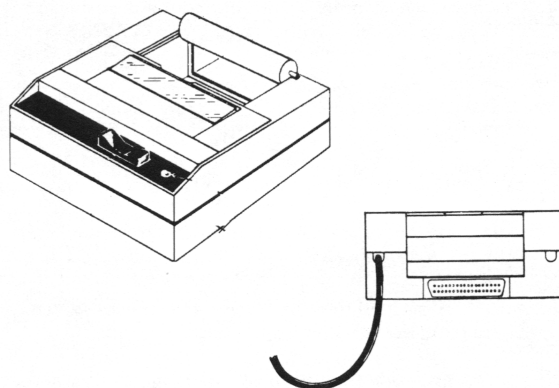
Figure 10-1 QCP and QCHSP Printers

Figure 10-2, QCP and QCHSP printout.

\\\Quick Check® 200\\\

660 nm, 06 mil Scanner

UPC-A: 100% Mag. Factor

021200074424

Avg Bar Err = +.04X OK!
DecodeMargin = 92% <A>
Symbol Total = 095 "X"

Prnt Contr Sig = 94% OK!
Reflect (Light) = 75% OK!
Reflect (Dark) = 03% OK!
Symbol Contrst = 72% <A>
R(min)/R(max) = 04% <A>
Modulation = 79%   <A>
EdgeContr(min) = 57% <A>
"Defects" = 05%   <A>

Message Length = 11 OK!
Check Charctr Passes OK!

Traditional Tests <PASS>
Bar Growth: IN TOL (+)
"P C S" – OK
Traditional Tests - PASS -
Format Tests - PASS -

ANSI Parameters <A>
Dimension Checks <P>
Format Checks <P>
Profile QualityGrade <A>

Figure 10-3. QCSSP printout

```
-    Quick Check® 200 -

660 nm, 06 mil Scanner

Code 39

*+A123B4C5D6E711*


AvgBar = +.05 X OK!   W/N Ratio = 2.9 OK!
DecodMargn = 88% <A>   Symbol Totals 264X


PCS = 90% OK!   R(L) = 79%  OK!   R(D) = 07%  OK!
SymbolContr = 72% <A>   R(mn)/R(mx) = 09% <A>
Modulation = 61% <B>  EdgeCtr(mn) = 44% <A>
"Defects" = 04% <A>


Msg Length = 15  OK!    -No-Check Character


Bar Growth:  IN TOL
"P C S" : OK
Traditional Tests -PASS-
Format Tests -PASS-

ANSI Parameters: <B>
Dimension Checks: <P>
Format Checks: <P>
Profile Quality Grade is <B>
```

10.3 *Using a printer*

The Quick Check supports three different HHP serial printers:

- Quick Check Printer (QCP)

- Quick Check High Speed Printer (QCHSP)

- Quick Check Super Speed Printer (QCSSP)

The QC and QCHSP are both impact printers. The QCSSP is a thermal printer with high quality output.

When you first receive your printer, you should carefully unpack it. Before attempting to use it, inspect the contents of the package for any shipping damage. If there is evidence of damage, please keep ALL packing materials and contact the delivery carrier as soon as possible for claim procedure.

Confirm that you have the following items:

- printer

- QCSSP, one roll of thermal paper
  QCP and QCHSP, one roll of paper

- QCSSP, AC power cord
  QCP and QCHPS, Power Supply

For maximum printer performance, follow these general precautions for any type of printer:

- Never place the printer where it is exposed to direct sunlight.

- Never apply power while you are plugging or unplugging an input connector.

- Do not print without paper or a ribbon as this may damage the print head.

- Do not subject the printer to temperatures below 5°C or above 40°C during operations, or to a sudden change in temperature.

- Insert the connectors so that a slight pressure seats the cable properly. Never force the connectors as this could damage the cable.

10.4 Print your work

1. Connect your printer to the Quick Check and turn both units on.
2. Scan a bar code symbol.
3. Scan the appropriate special Print/Store Code. The Codes are located on a tabbed page in this manual. There are four codes, one for each type of Quick Check printer and one for a PC printer. The Quick Check sends your data to the printer and begins printing.

10.5 Save data when a printer is not connected

1. Scan a bar code symbol.
2. Scan the appropriate special Print/Store Code. The Codes are located on a tabbed page in this manual. There are four codes, one for each type of Quick Check printer and one for a PC printer. You can save results from up to 25 scans in this buffer and then connect the printer and print your results.

OR

3. Press Select [0] four times or until Store Data? appears. Press Select [0] again to store the data. The data is stored in the temporary buffer. You can save results from up to 25 scans in this buffer. When you connect a printer and turn it on, you can print the data.

10.6 Review data from the last scan:

1. If the Quick Check is turned off, turn it on.
The message, BUF XX% Ful appears.
2. Press Scroll [<>]
The message, Print Bufr? appears.
3. Review the data, press Scroll [<>]
Information from the last bar code scanned appears.

10.7 Print or delete stored data:

1. Connect your printer to the Quick Check and turn on both units.
2. Turn on Quick Check.
The message, Buf XX% Ful appears.
3. Press Scroll [<>].
The message, Print Bufr? appears.

4. To print the stored data, press Scroll [<>] twice. After you press Scroll [<>] once, the message, **Confimr** appears. The Quick Check sends the data to the printer. After you press Scroll [<>] a second time, the message – Busy!- appears.

OR

5. To delete the stored data, press Select [0] twice. After you press Select [0] once, the message, Dump Buffr? appears. After you press Select [0] a second time, the message, **Confimr** appears.

10.8 Stop printing

1. During printing, press and momentarily hold the power switch on the Quick Check. Printing stops when the printer's internal buffer is clear.

OR

2. Wait until the printer stops automatically.

10.9 Using the QCP and QCHSP

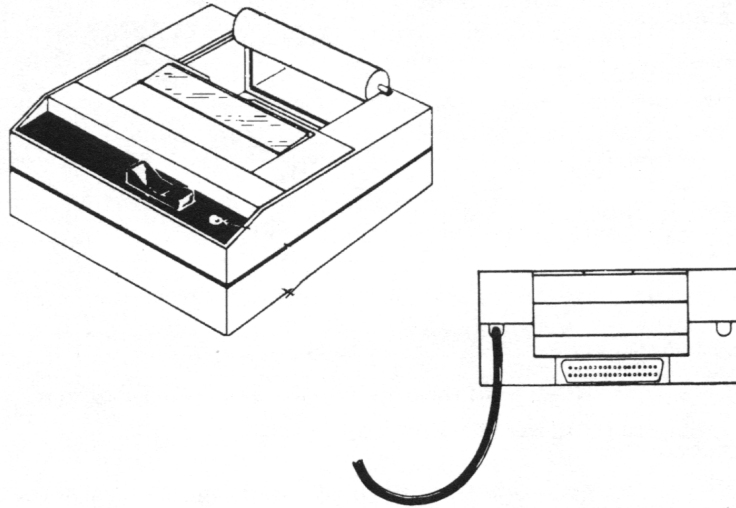**The QCP and QCHSP are shown in Figure 10-4.**

Figure 10-4. QCP and QCHSP

A three-position power switch on the printer's front panel determines its function as described in the table below.

Switch Position	Function
Down Left	Off
Center	On
Down Right	Paper Feed

A red light-emitting diode (LED) to the right of the power switch lights to indicate to On and Paper Feed states.

The printer has a VAC wall-outlet-mounted transformer with an 8-foot cord. The power transformer cord has a transformer on one end and has a mating connector to the printer on the other end.

An interface cable connects the printer directly to the Quick Check to provide easy exchange of scanning results. The connectors on each end of the cable are keyed so that they cannot be plugged in the wrong way.

10.10 Setup the QCP or QCHSP:

1. Place the printer on a hard, flat surface such as a table or desktop.
2. Press the power switch into the Off (down left) position.
3. Plug the power connector from the transformer into the printer.
4. Plug the transformer into a wall outlet.

10.11 Install or replace the QCP or QCHSP paper roll:

1. Press the printer power switch to the Off (down left) position.
2. Remove the printer cover by locating the four small grooves embossed on each side of the printer cover and tilting the cover open by pushing down gently on both sets of these grooves.
3. If necessary, remove the empty roll. Press and hold the power switch in the Paper Feed (down right) position to advance the paper about one inch beyond the paper cutter.

Warning: Do not pull paper out of the back of the printer. This will damage the mechanism.

4. Unroll several inches of paper from a new roll and cut a straight edge on the paper if its is jagged or wrinkled. A straight edge helps guide the paper into the printer.
5. Slide the paper's straight edge into the slot between the paper compartment and the printer compartment until about one-quarter of an inch is inserted as shown in Figure 10-5.
6. Press the power switch to the center On positions and wait a few seconds
7. While holding the paper in place, press and hold the power switch in the Paper Feed (down right) position until an inch of paper emerges from the printer and then release the switch.
8. Pull the paper through the printer until several inches are exposed.
9. Put the paper spindle into the paper roll and place the roll and spindle onto the grooves near the back of the printer as shown in Figure 10-5.
10. Roll the paper to take up any slack inside the printer.

11. Ensure the roll turns freely. If the paper roll does not turn freely, the paper may jam and damage the printer mechanism.
12. Slide the paper's straight edge through the slot in the printer cover.
13. Replace the printer cover by pushing the back of it down into place and pressing the front down to lock it in place.
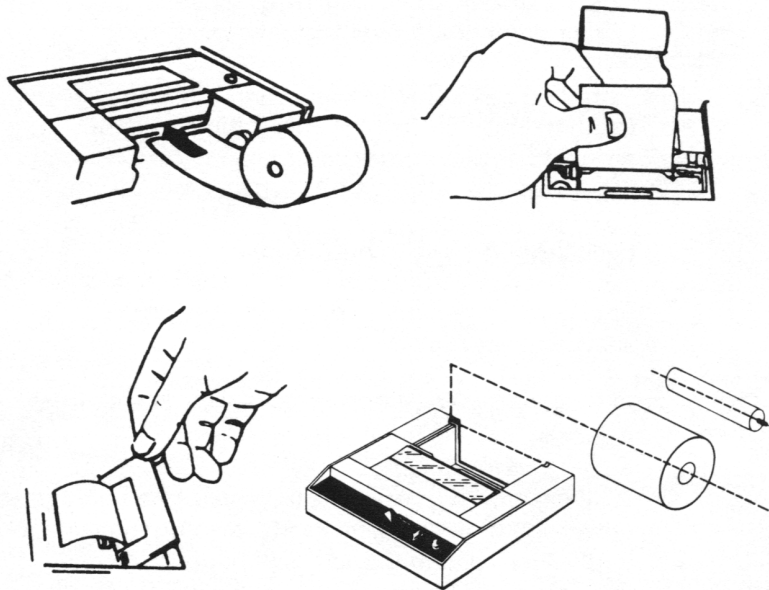

Figure 10-5. Replacing the QCP or QCHSP paper roll

10.12 Remove ribbon cartridge from the QCP or QCHSP

1. Press the printer power switch to the Off (down left) position.
2. Remove the printer cover by locating the four small grooves embossed on each side of the printer cover and tilting the cover open by pushing down gently on both sets of these grooves. The ribbon cartridge should be visible.
3. Push down on the right side of the ribbon cartridge (marked PUSH) and remove the cartridge from the printer compartment.

4. Slide the paper through the gap between the inked ribbon and the frame of the new ribbon cartridge.
5. Set the new cartridge into the printer compartment and press both sides to secure it in place. The cartridge must be properly seated and aligned for the best print quality. If you get ribbon ink on the printer's plastic case, wipe it off immediately. Once the ink dries it is difficult to remove.
6. Replace the printer cover by pushing the back of it down into place and pressing the front down to lock it in place.
7. Turn the cartridge ribbon advance knob (marked by an arrow on the cartridge) clockwise to remove slack from the ribbon.
8. Replace the printer cover.

10.13 Connect the QCP or QCHSP to the Quick Check

1. Press the printer power switch to the Off (down left) position.
2. Plug the transformer into an outlet.
3. Plug the interface cable into the socket on the side of the Quick Check.
4. Connect the 12-pin connector of the interface cable into the rear of the printer. Secure the connector by tightening the screws on each side of the connector.

Press the power switch to the On (center) position. The red LED lights and a Ready message appear which indicates the printer's build-in microprocessor has verified its internal operation prints.

10.14 Perform a QCP or QCHSP self-test:

The self-test tests the print head and ribbon.

1. Ensure the power switch is in the Off (down left) position and there is paper in the printer.
2. Plug the power source into the printer.
3. Press and hold the power switch in the Paper Feed (down right) position until the LED lights and the printer starts to operate.
4. Release the power switch, The printer performs the self-test and prints its full set of character.

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10.15 Troubleshooting the QCP or QCHSP

Having the incorrect printer interface configuration setting for the type of printer you are using may cause printing difficulties. Set the QCP to Std and the QCHSP to HSP.

If you use the printer infrequently, the print impression sometimes becomes weak because the ribbon dries out. If the printed material is difficult to read and you suspect this is the cause of the problem, advance to a properly inked portion of the ribbon by pressing the power switch into the Paper Feed position.
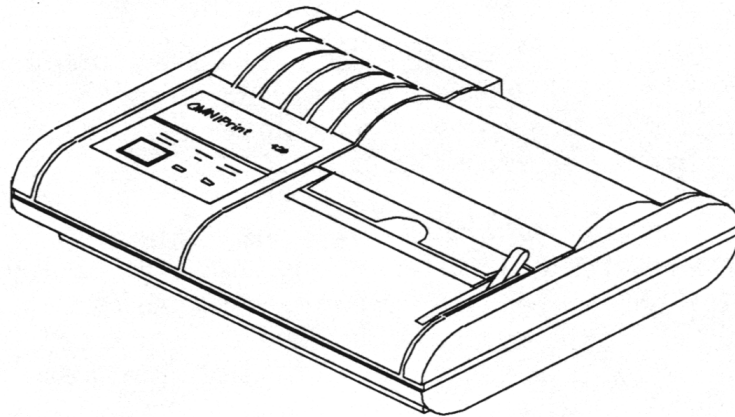
The QCSSP is shown in Figure 10-6.

Figure 10-6. QCSSP

The power switch is located on the printer's rear panel. It toggles between on and off. A red light-emitting diode (LED) to the front of the printer indicates the on and off status. If this light is lit, the printer is turned on. If this light is not lit, the printer is turned off. If this light flashes, a printer error exists. Refer to Troubleshooting later in this section for a list of the possible errors.

The Paper Feed button on the front panel has two functions. It feeds paper into the printer and is used for the printer self-test. The Paper Empty LED lights when the paper roll is empty. The printer head lever is located on the front of the printer. This lever raises and lowers the printer head. You will need to raise the printer head to load paper. When this lever is raised, the Power LED flashes and the printer will not operate. You will need to lower the printer head to use the printer.

A panel of DIPswitches is located on the rear of the printer. These switches are set at the factory for proper operation with the Quick Check.

An interface cable connects the printer directly to the Quick Check to provide easy exchange of scanning results. The connectors on each end of the cable are keyed so that they cannot be plugged in the wrong way.

HHP recommends you use the thermal paper they supply for correct operation of the QCSSP. The order number is QCTP. Contact HHP Customer Administration at the numbers listed on the front cover of the manual.

10.16 Turn on and off the QCSSP

1. To turn on the printer, press the power switch to the On position. The Power LED lights.
2. To turn off the printer, press the power switch to the Off position. The Power LED turns off.

After you turn off the printer, wait at least three seconds to turn on the power for the proper initialization procedure.

10.17 Setup the QCSSP

1. Place the printer on a hard, flat surface such as a table or desktop.
2. Press the power switch into the Off position.
3. Plug the power cable into the printer
4. Plug the other end of the power cable into a wall outlet.

10.18 Install or replace the QCSSP paper roll:

1. Press the printer power switch to the Off position.
2. Lift the paper roll cover.
3. Raise the print head by moving the printer head lever toward you until it stops.
4. If necessary, remove the empty roll. If there is any paper on the roll, gently pull it out the front of the printer.

Warning: Do not pull paper out of the back of the printer, as this will damage the mechanism.

5. Unroll several inches of paper from a new roll and cut a straight edge on the paper if it is jagged or wrinkled. A straight edge helps guide the paper into the printer.
6. Hold the paper roll so the paper will feed from the bottom of the roll into the printer and place the roll in the paper trough.
7. Using your fingers feed the end of the paper into the space below the round platen.
8. Lower the printer head by moving the printer head lever away from you until it stops.
9. Press Paper Feed to feed the paper until it extends out of the top about an inch.
10. Close the paper cover. Be sure the paper is above the lid.

10.19 Perform a QCSSP self-test

The self-test tests the print head.

1. Ensure the power switch is in the Off position and there is paper in the printer.
2. Plug the power source into the printer.
3. Press and hold down Paper Feed while you press the power switch on. The printer begins to print the self-test. The printer will continue printing the self-test until you stop it. You can stop printing by pressing Paper Feed.

The first line printed is the printer identification line.

The second line tells you the type of communications interface that the printer is using (SERIAL) and the baud rate setting (VHS).

With serial communication set, the third line tells you the handshake mode with which the printer is working. The standard handshake for RS232 communications is the BUSY handshake setting.

The fourth line tells you the amount of RAM (Random Access Memory) buffer installed in the printer. The QCSSP is shipped with a 1K (kilobyte) buffer.

10.20 Troubleshooting the QCSSP

Printing difficulties may be caused by:

- the wrong printer interface configuration option for the type of printer you are using. The QCSSP should be set to VHS.

- the wrong communications interface. The QCSSP should use the serial communications interface. If this is incorrect on the printer self-test, you should contact HHP.

Table 10-1 lists the types of problems that might occur during QCSSP operation and gives you information about resolving the error.

Table 10-1. QCSSP troubleshooting chart

Indication	**Cause/Corrective Action**
Printing slowed power LED flashes	May be high temperature, when unit cools printing resumes at standard speed
Printing stopped	May be loss of power, check supply. Data will be lost.
Printing stopped and Paper Empty LED on	Replace paper. Be sure to lower print head
Printing stopped and Power LED flashes	1. If print head is raised, lower it. 2. May be an overvoltage or undervoltage, check line, wait for voltage to return to acceptable level. 3. May be high temperature, when unit cools, printing resumes at standard speed.

Indication	Cause/Corrective Action
Printing special characters while using RS-232 connection "?" is framing error "@" is overrun error	May be interface connection error. 1. Check connections; ensure serial communications is selected. 2. Check cable integrity. 3. Check baud rate (VHS) with QC
Paper Jam	Remove jammed paper
Non	Power Surge

11.0 Customer Service

11.1 Obtaining Factory Service

Hand Held Products provides service for all its products through a service center located in Charlotte, North Carolina. To obtain warranty or non-warranty service, return the unit to Hand Held Products (postage paid) with a copy of the dated purchase record attached.

In the United States, please contact the Hand Held Products' Product Service Department at the address/telephone number listed below to obtain a Return Material Authorization number (RMA #).

HHP Product Service Department - US
7510 E. Independence Blvd.
Charlotte, NC 28227
Telephone: (800) 782-4263
                (704) 568-0536
Fax: (704) 532-4191
E-mail: productservice@handheld.com

Hours: 8am – 5pm EST, Monday – Friday

For service in Europe, please contact your Hand Held Products' representative or your local distributor.
European Office
Hand Held Products, Ltd.
Hondsruglaan 87 D
5628 DB Eindhoven
The Netherlands
Telephone: Int+31 40 242 4486
Fax: Int+31 40 242 5672

United Kingdom Office
Hand Held Products (UK) Ltd.
Dallam Court
Dallam Lane
Warrington
Cheshire WA2 7LT
United Kingdom
Telephone: Int+44 (0) 1 925 240055
Or   Int+353 1 216 0070
Fax: Int+44 (0) 1 925 631280
Or   Int+353 1 295 6353

For service in Asia, please contact your Hand Held Products' representative or your local distributor.
Asia Pacific Office
Hand Held Products
10/F Tung Sun Commercial Centre
194-200 Lockhart Road
Wanchai, Hong Kong
Telephone: Int+852-2511-3050 or 2511-3132
Fax: Int+852-251-1355

For service in Japan, please contact your Hand Held Products' representative or your local distributor.
Japan Office
Hand Held Products
Bon Marusan 8F
3-5-1 Kanda-Jinbocho
Chiyoda-ku
Toyko, 101, Japan
Telephone: Int+81-3-5212-7392
Fax: Int+81-3-3261-7372

For service in Latin America, please contact your Hand Held Products' representative or your local distributor.

Latin America Office
Hand Held Products
5117 Castello Drive
Suite 1
Naples, FL 34103
Telephone: (941) 263-7600
Fax: (941) 263-9689

11.2 Technical Support

If, after reading this manual you need assistance over the phone, please have the following information ready:
- Model and serial number of your unit
- Maintenance contract information (if you have a contract)
- Test or diagnostic printout if applicable
- Detailed explanation of the problem or question
- Your company's phone and fax numbers
- Name of vender purchased from

Application Support:
North America:
Telephone: (315) 685-2476 (8 a.m. to 6 p.m. EST)
Fax number: (315) 685-4960
Email: support@handheld.com
Europe:
Telephone-European
Office: Int+31 40 242 4486
U.K. Office: Int+44 1925 240055
Email: support@handheld.com
Asia:
Telephone: Int+852-2511-3050 or 2511-3132
Email: support@handheld.com

Limited Warranty

Welch Allyn Data Collection, Inc., d/b/a Hand Held Products ("HHP") warrants its products to be free from defects in materials and workmanship and to conform to HHP's published specifications applicable to the products purchased at the time of shipment. This warranty does not cover any HHP product which is (i) improperly installed or used; (ii) damaged by accident or negligence, including failure to follow the proper maintenance, service, and cleaning schedule; or (iii) damaged as a result of (A) modification or alteration by the purchaser or other party, (B) excessive voltage or current supplied to or drawn from the interface connections, (C) static electricity or electro-static discharge, (D) operation under conditions beyond the specified operating parameters, or (E) repair or service of the product by anyone other than HHP or its authorized representatives.

This warranty shall extend from the time of shipment for the duration published by HHP for the product at the time of purchase ("Warranty Period"). Any defective product must be returned (at purchaser's expense) during the Warranty Period to HHP's factory or authorized service center for inspection. No product will be accepted by HHP without a Return Materials Authorization, which may be obtained by contacting HHP. In the event that the product is returned to HHP or its authorized service center within the Warranty Period and HHP determines to its satisfaction that the product is defective due to defects in materials or workmanship, HHP, at its sole option, will either repair or replace the product without charge, except for return shipping to HHP.
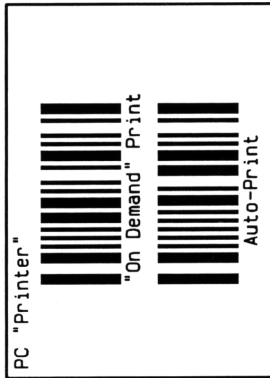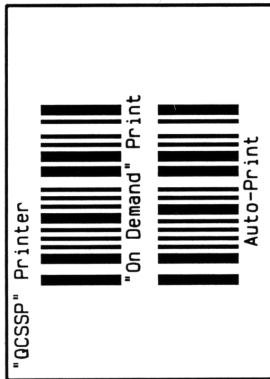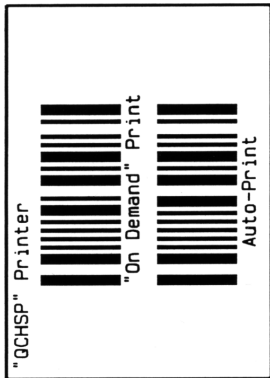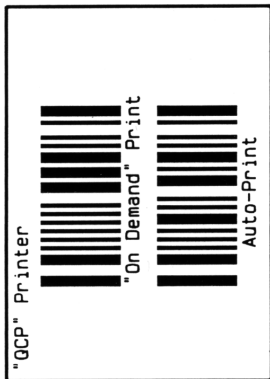
EXCEPT AS MAY BE OTHERWISE PROVIDED BY APPLICABLE LAW, THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER COVENANTS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, ORAL OR WRITTEN, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. *(Continued, next page)*

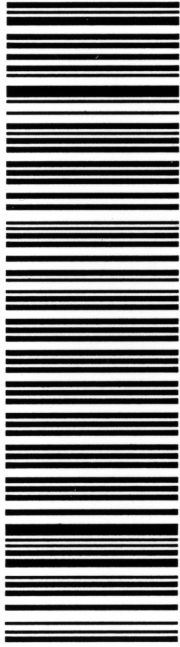### Limited Warranty (continued)

HHP'S RESPONSIBILITY AND PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT. IN NO EVENT SHALL HHP BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, AND, IN NO EVENT, SHALL ANY LIABILITY OF HHP ARISING IN CONNECTION WITH ANY PRODUCT SOLD HEREUNDER (WHETHER SUCH LIABILITY ARISES FROM A CLAIM BASED ON CONTRACT, WARRANTY, TORT, OR OTHERWISE) EXCEED THE ACTUAL AMOUNT PAID TO HHP FOR THE PRODUCT. THESE LIMITATIONS ON LIABILITY SHALL REMAIN IN FULL FORCE AND EFFECT EVEN WHEN HHP MAY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH INJURIES, LOSSES, OR DAMAGES. SOME STATES, PROVINCES, OR COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

All provisions of this Limited Warranty are separate and severable, which means that if any provision is held invalid and unenforceable, such determination shall not affect the validity of enforceability of the other provisions hereof.

The limited duration of the warranty for the Quick Check 200 Series is two (2) years.

"QCHSP" Printer

"On Demand" Print

Auto-Print

PC "Printer"

"On Demand" Print

Auto-Print

"QCP" Printer

"On Demand" Print

Auto-Print

"QCSSP" Printer

"On Demand" Print

Auto-Print

QC200 Printer Control COMMAND CODES
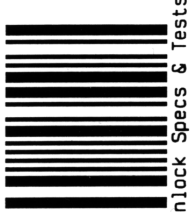
‖‖‖ Traditional Test Parameters (Pass/Fail criteria)

‖‖‖ ANSI Test Parameters (Grade D or better accepted)

QC200 Quick Start COMMAND CODES

Unlock Specs & Tests

Command Code (Unlocked)

Lock Specs & Tests

Command Code (Locked)

QC200 Special Function COMMAND CODES

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QC200 SSTR Menu

- Decode -

- Average Bar Error -

- W/N Ratio -

- Decodability -

- P.C.S. -

- R(l) & R(d) -

- Symbol Contrast -

- Modulation -

- Minimum Edge -

- Defects -

- Symbol Type -

- Message Length -

- First "Failure" -

- INSTALL -

- SAVE SETTINGS -

HAND HELD® PRODUCTS

a WelchAllyn® affiliate

4619 Jordan Road
P.O. Box 187
Skaneateles Falls, New York 13153-0187

QC200/UG Rev B