



InfoSight Corporation

"We Barcode Difficult Stuff"™

QUALITAG® Metal Tag Printer

System Software Manual

Revision 1.21
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CHAPTER 1

1. SYSTEM SOFTWARE COMMANDS

1.1 INTRODUCTION

The QUALITAG® Tag Printer software allows the operator to control the Tag Printer operation and to alter selected system parameters. System functions include operational commands used to enter messages during normal system operation and maintenance commands used to troubleshoot the Tag Printer or to alter the appearance of the printed tags.

1.2 FEATURES

The QUALITAG® Tag Printer System has many features that are designed to provide maximum flexibility in solving a diversity of marking needs. Some of these features include:

- 5 message "buffers" for tag layouts
- Auto serialization for each buffer
- Automatic time and date insertion
- Fully Year 2000 Compliant
- RS232 serial port for host message download and control
- "Windows" like user interface for ease of use
- Non-volatile memory for saving buffers and parameters
- Diagnostic commands for installation and troubleshooting

1.3 USER INTERFACE

The user interface for the QUALITAG® Tag Printer software utilizes a "windows-like" environment with pop-up windows, pull-down menus, buttons, menu bars, etc. You control the software by interacting with these screen "objects".

1.3.1 Navigating Through A Window

The "focus" of the window is indicated when a field is shown in "reverse" video. That is, the characters of the field are shown in black letters on a light background. An item that has the focus is considered the "active" item. You can change the focus from one screen item to another by using the arrow keys

or the Tab key. Pressing Tab or Right/Down Arrows will advance the focus forward through the window. Pressing the Left or Up Arrow will move backwards through the window.

Once an item has the focus, it must be "selected" for its function to be activated. To select an item, simply press the "Enter" or "Return" key. Selecting an item will cause some action to take place depending on the item.

"Hot Keys" - Some screen items have an associated "hot key" to allow them to quickly gain the focus. If an item has a hot key, that key will be displayed in Bold. To direct the focus to an item with a hot key, hold down the "Control" key (labeled CTRL) and simultaneously press the corresponding hot key. For example, if an item has its "P" key highlighted, hold down the CTRL key and press the letter P and that item will get the focus.

Note that some screen items will immediately become selected when using its hot key while others will simply gain the focus.

CAUTION

The letter 'S' has not been used as a hotkey because the CTRL-S combination is used by the Esprit terminal as a "flow control" sequence. If you inadvertently press the CTRL-S keys, the terminal will appear to "hang" and will no longer respond to user input. To clear this condition, simply press the key sequence CTRL-Q. The terminal will now respond to your input.

1.3.2 Screen Items

The various screen items you will encounter in the QUALITAG® Tag Printer software and their use is described below.

Window - A window is simply an area of the screen that provides information to you and allows you to modify settings that control the system's operation. When a window "pops-up", it will appear over the top of the existing display. When you are finished with the window, it will "pop-down" and replace the previous display. Each window has a border around it to set it off from what is "behind" it and a title at the top to describe its function. When a window is "current", that is, it is the active window, its title will be displayed as bold. When another window becomes active, the previous window's title will become dim.

Menu Bar - A menu bar is a horizontal list of available menus presented at the top of the window. Each item in the list, when selected by pressing Enter will display a "pull-down" menu of items from which to select. When the list is presented, use the Up/Down Arrow keys or an item's hot key to select the desired menu item. When a "pull-down" menu is displayed, pressing

the Left or Right arrow keys will move to the previous or next menu item and automatically pull its menu down. Not all items in a Menu Bar are always available for selection. Some items become available only after entering a password.

Button - A button is a rectangular box with a command displayed inside it. A button is used to cause some action to take place. For example, pressing the "OK" button in a window usually means "The changes I have made are OK, so close the window and save the information." Some buttons have a hot key and may be selected by pressing that hot key, or you may tab to the button and press Enter.

Editable Field - An editable field allows you to enter information needed by the system. The information you enter depends on the type of field. For example, if the field is for entering text to be printed by the printer, you may enter any printable character into that field. If, however, the field is for entering a number, you may only enter characters consistent with a numeric value. You terminate entry of the field by pressing Enter, Return, Up Arrow, Down Arrow or Tab. Some editable fields allow entry of more characters than can fit on the display. With these fields, the information will "scroll" left and right within the field to allow you to edit the long text.

Status - A status field is used only to provide information to the operator about some aspect of the system. Such a field cannot be selected by the user.

Radio Buttons - A radio button group is a collection of items, each of which has a "button" control. Like the old style radio buttons on a car radio, pressing any one button deselects the previous button and selects the one pressed. Only one button in the group can be selected at a time. Radio buttons are used to allow you to choose from a group of mutually exclusive options.

Check Boxes - A check box is a selectable item that can be either "checked" or "unchecked" corresponding to "on" or "off". When a check box is checked, its feature is thus enabled.

By using these various screen items, the system presents information to you in a clear and concise manner and allows you to easily control the operation of the system.

new qty required and press the “enter” key. Below the count field is the S/N field. This field is the reserved Auto Serialization field and the number shown will be incremented after each tag is printed.

At the right side of the Operator Window are the mode and state fields that provide information about the status of the printer.

During operation of the system, the operator may enter data as needed in either the HEAT NO, COIL NO, or S/N fields.

Note that each data entry field shows a vertical bar in the first column. This is the “end of text” indicator and provides visual feedback to the operator of the location of the end of entered text. This indicator is useful for spotting trailing space characters in the entered text. Trailing spaces can be a problem if the operator entered text is to be encoded in a barcode.

If you need to exit the Operator Window at any time to perform any of the higher level functions such as tag layout, system setup or diagnostics, simply press the Control and X keys simultaneously. This will cause the Password entry screen to appear as shown in Figure 1-2:



Figure 1-2

You must type in the correct password and then select "OK" to switch to the Main Window. The default password as shipped from the factory is a null password (no password at all). If an incorrect password is entered, then an error window will appear. It is strongly recommended that you enter a new password after the system has been installed to protect sensitive operating data.

If you forget the password, press the Control and Z keys together and the “About” screen will appear. This screen provides a “PassCode” feature that can be used to temporarily override the password. Refer to section 1.4.2.1.1 for more information about the “About” screen and the PassCode feature.

1.4.2 Main Window

When the Marking system is first powered on, the display terminal shows the Main Window. This display is shown in Figure 1-3. The title of this window is "InfoSight Corporation - QUALITAG® Tag Printer".

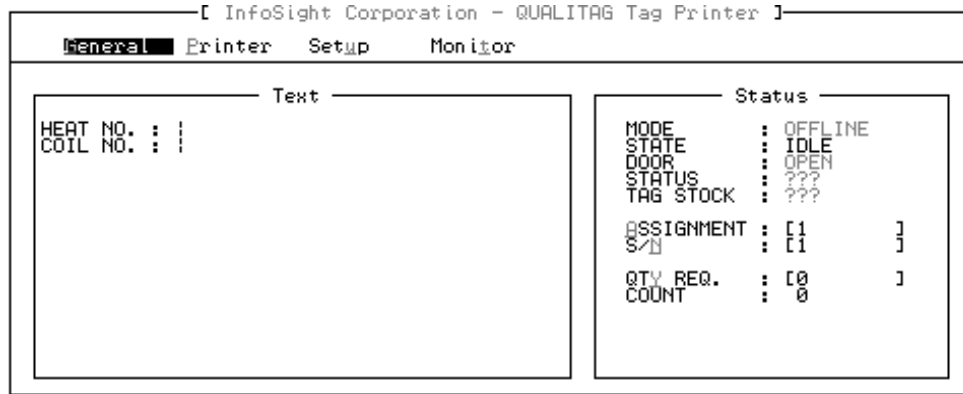


Figure 1-3

Just below the title is a Menu Bar providing all of the menu options available in the system. The last two menu items in the Menu Bar, Setup and Monitor, are not activated until the system is placed into "Supervisor's Mode" described later. Each item in the menu bar will be discussed later.

Underneath the Menu Bar are two display boxes showing system information. On the left is the "Text" area. This area shows each text line that has been configured for operator input. There can be from 1 to 15 lines of text displayed depending on the system configuration. As shown here, two lines of data entry have been enabled and are labeled HEAT NO and COIL NO. These data entry fields behave exactly as they do in the Operator Window described previously.

Next to the "Current Message" area is the "Status" area that presents various items describing the status of the system.

MODE

- The Mode field shows the current printer mode as controlled by the front panel Online button. This field will display the state **ONLINE** when the printer is on-line and able to print, or **OFFLINE** when the printer off-line and thus not able to print. Note that the system will not print unless the mode is **ON-LINE**. Note that if the printer has not completed its warm-up procedure when the Online button is pressed, the mode will display **HEATING** until warm-up is complete at which time it will show **ONLINE**.

- STATE** - The State field shows the current state of the printer (what it is doing). This field will display the state **IDLE** when it is doing nothing. Various other state messages will display when the printer is in the process of printing a tag.
- DOOR** - This field shows the status of the front door of the printer. The field will either display **CLOSED** or **OPEN** to reflect the state of the door. The printer cannot print tags when the door is open.
- STATUS** - This field shows various status messages about the printer. The information in this field can be useful for diagnosing certain printer problems.
- TAG STOCK** - This field shows the status of the tag stock and will show if stock is present or if an error has been detected.
- ASSIGNMENT** - This field shows the buffer number assigned for printing. The printer has five buffers for storing tag layouts. By entering a number between 1 and 5 and pressing the “enter” key, the assignment can be changed.
- S/N** - This field is the auto-serialization serial number entry field. This field contains an editable number up to 9 digits long which is incremented automatically after each print cycle.
- QTY REQ** - This field shows the quantity of tags required for batch printing. By entering a number in this field and pressing the “enter” key, the batch size will be changed and the Count field will be reset to zero.
- COUNT** - This field shows the current count of tags printed. When this value reaches or exceeds the value in the QTY REQ field, then the batch is complete and printing stops. The value in this field automatically resets to zero when a new QTY REQ is entered.

1.4.2.1 Menu Bar

The menu bar contains four menu items from which to select. General, Printer, Setup and Monitor menus are available. Each item and its associated pull-down menu are described in the following sections.

1.4.2.1.1 General

The general menu is used to perform certain operations that affect the overall operation of the system. When it is selected, a pull-down menu will appear as shown in Figure 1-4.

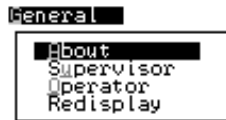


Figure 1-4

1.4.2.1.1.1 About Window

General Menu - About - The About menu item will cause the "About" window to appear as shown below in Figure 1-5. The About window shows the InfoSight Corporation copyright and program version number. Refer to this window to find the program version number if needed.



Figure 1-5

If the supervisor's password is forgotten, this screen can be used to get a temporary password from InfoSight Corporation to allow supervisor entry. Simply copy the characters shown in the PassCode field of the About window and call InfoSight Corporation at 740-642-3600. You will be given a temporary password that will be good for the remainder of the hour.

General Menu - Supervisor - The Supervisor menu item is used to place the system into "supervisor" mode of operation. On power-up, the system defaults to "operator" mode. When in operator mode, the Setup and Monitor menu items are not available. To access the Setup and Monitor menu items, you must first activate the supervisor mode. When selecting this menu item, the "Password" window will appear as shown in Figure 1-2. You must type in the correct password and then select "OK" to switch modes. The default password as shipped from the factory is a null password (no password at all). If an incorrect password is entered, then an error window will appear. It is strongly recommended that you enter a new password after the system has been installed to protect sensitive operating data.

General Menu - Operator - The Operator menu item is used to place the system back into the "operator" mode of operation. No password is required. To protect the Setup and Monitor functions from unauthorized use, it is advised that the system be kept in operator mode during normal operation. If the Operator or Batch Windows are enabled, selecting this menu item will cause the corresponding Window to appear replacing the Main Window. If neither the Operator nor Batch Windows are enabled, the supervisor functions of the Main Window will simply be disabled.

General Menu - Redisplay - The redisplay menu item is used to force the printer to redisplay the main screen. This is useful if the display becomes corrupted or if the terminal is turned off and on again without cycling power to the printer itself.

1.4.2.1.2 Printer

The printer menu is used to perform certain operations that effect the printer itself. When it is selected, a pull-down menu will appear as shown in Figure 1-6.

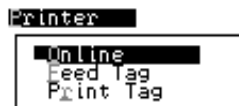


Figure 1-6

Printer Menu - Online - The Online menu item is used to place the printer into the online mode. This is an alternative to pressing the online pushbutton on the front panel of the printer. If the printer is completely warmed-up, it will go online immediately, otherwise it will finish warming first.

Printer Menu - Feed Tag - The Feed Tag menu item is used to feed a tag through the printer. This is an alternative to pressing the Feed Out and Feed In pushbuttons on the front panel.

Printer Menu - Print Tag - The Print Tag menu item is used to begin a print cycle. This is an alternative to pressing the Print pushbutton on the front panel.

1.4.2.1.3 Setup

The Setup menu is used to perform certain functions required to setup the system in preparation for marking. The setup item is only available when in the Supervisor mode of operation. When it is selected, a pull-down menu will appear as shown in Figure 1-7.



Figure 1-7

1.4.2.1.3.1 Printer Setup Window

Setup Menu - Marker - The Marker menu item is used to setup the parameters that control the way the printer operates. Note that these values will be set by the factory and will probably never need to be adjusted in the field. When the Marker menu item is selected, the "Marker Setup" window Figure 1-8 will appear.



Figure 1-8

The " Marker Setup" window is primarily used to set the various low-level parameters that control the tag size, printer speed, timing, configuration, etc. The parameters that may be set in this window are described below:

- Tag Length** - This parameter defines the length of the tag to be printed. Enter the length in either inches or millimeters as required for the current units setting.
- Tag Width** - This parameter defines the width of the tag to be printed. Enter the width in either inches or millimeters as needed.
- Print Speed** - This parameter defines the speed at which the tag is printed. Enter the speed either in inches per second or millimeters per second as required. Note that the print speed setting has an effect on print quality.

At the bottom of the screen are four buttons which, when selected, will perform a function as follows:

- OK** - The OK button will save all of your new settings and then close the window.
- Cancel** - The Cancel button will abandon your new settings and close the window. Any changes you made to these settings will be lost.
- Defaults** - The Defaults button will replace all of the displayed settings with the currently defined "defaults". The defaults will be displayed but will only be saved if "OK" is subsequently chosen.

Advanced - The Advanced button will activate the advanced printer setup window as described next.

1.4.2.1.3.2 Marker Advanced Setup Window



Figure 1-9

The "Marker Advanced Setup" window is used to set the printer parameters that are not normally changed in regular operation. These parameters should only be changed under the direction of InfoSight Corporation personnel. The parameters that may be set in this window are described below:

Dancer Distance - This parameter defines the distance between the primary nip point (print head) and the secondary transfer nip.

Tag Length Delta Distance - This parameter defines a distance that is subtracted from the tag length when moving the tag while printing.

Nick to Tearoff Distance - This parameter defines the distance between the notch sensor and the tag tear-off location.

Nick to Nip Distance - This parameter defines the distance between the notch sensor and the secondary transfer nip.

Reheat Immersion Distance - This parameter defines the distance that the tag will be retracted into the

heater core after a tag has been removed from tear-off.

Heater Temperature - This parameter defines the temperature of the heater core in degrees F or C as required.

Heater Temp Overshoot - This parameter defines the amount of temperature overshoot beyond the setting value when the printer is warming up for the first time after power up. This value is entered as a percentage.

Film Backup Speed - This parameter defines the speed that the film will be reversed after the tag is printed. The value is specified in inches per second or millimeters per second as required.

Tag Jog Speed - This parameter defines the speed that the tag will move when it is being jogged by the front panel feed controls. The value is specified in inches per second or millimeters per second as required.

Tag Feed Speed - This parameter defines the speed that the tag will move when it is being fed by the front panel feed controls or by the operator terminal. The value is specified in inches per second or millimeters per second as required.

Microcom Resolution - This parameter defines the resolution of the integrated print engine. The value is specified in dots per inch or millimeter as required.

Microcom Contrast - This parameter defines the contrast setting of the integrated print engine. The value specified is unit-less.

At the bottom of the screen are five buttons which, when selected, will perform a function as follows:

OK - The OK button will save all of your new settings and then close the window.

- Cancel** - The Cancel button will abandon your new settings and close the window. Any changes you made to these settings will be lost.
- Defaults** - The Defaults button will replace all of the displayed settings with the currently defined "defaults". The defaults will be displayed but will only be saved if "OK" is subsequently chosen.
- Tag Motor** - The Tag Motor button will activate the motor setup window as described next.
- Timing** - The Timing button will activate the timing setup window as described next.

1.4.2.1.3.3 Stepper Motor Setup Window

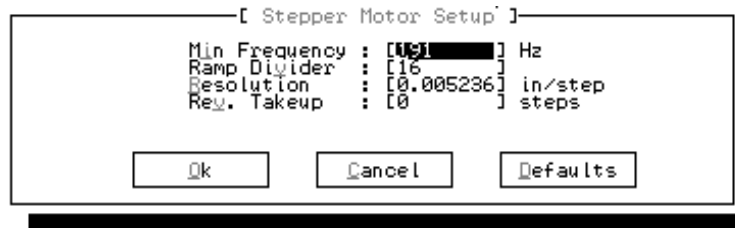


Figure 1-10

The " Stepper Motor Setup" window is used to set the parameters that control the tag feed stepper motor. These parameters should only be changed under the direction of InfoSight Corporation personnel. The parameters that may be set in this window are described below:

- Minimum Frequency** - This parameter defines the minimum or starting frequency of the stepper motor when it begins to accelerate. The value is specified in Hertz.
- Ramp Divider** - This parameter defines the divider used to generate the ramp table. The ramp table defines the acceleration profile of the stepper motor.
- Resolution** - This parameter defines the resolution of the stepper motor. The value is specified in inches per step or millimeters per step as required.

Reversing Takeup - This parameter defines the number of additional steps to be applied to the stepper motor whenever the motor changes direction. This parameter is used to compensate for "slop" in the drive train. The value is specified in steps.

At the bottom of the screen are three buttons which, when selected, will perform a function as follows:

OK - The OK button will save all of your new settings and then close the window.

Cancel - The Cancel button will abandon your new settings and close the window. Any changes you made to these settings will be lost.

Defaults - The Defaults button will replace all of the displayed settings with the currently defined "defaults". The defaults will be displayed but will only be saved if "OK" is subsequently chosen.

1.4.2.1.3.4 Time Delay Setup Window

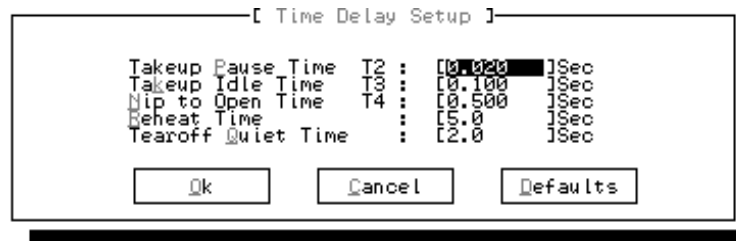


Figure 1-11

The " Time Delay Setup" window is used to set the parameters that control the timing of the printer. These parameters should only be changed under the direction of InfoSight Corporation personnel. The parameters that may be set in this window are described below:

Takeup Pause Time T2 - This parameter defines the time in seconds that the printer will delay after turning the

take-up solenoid off before turning the nip solenoid on.

Takeup Idle Time T3 - This parameter defines the time in seconds that the printer will delay after turning the nip solenoid on before beginning to move the tag.

Nip to Open Time T4 - This parameter defines the time in seconds that the printer will delay after the nip solenoid is turned off before turning the take-up solenoid off.

Reheat Time - This parameter defines the time in seconds that the tag will require re-heating when it is retracted after a print.

Tearoff Quiet Time - This parameter defines the time in seconds that the printer must see no activity in the tag tear-off sensor. After this "quiet" time, the tag material will be retracted into the heater core.

At the bottom of the screen are three buttons which, when selected, will perform a function as follows:

OK - The OK button will save all of your new settings and then close the window.

Cancel - The Cancel button will abandon your new settings and close the window. Any changes you made to these settings will be lost.

Defaults - The Defaults button will replace all of the displayed settings with the currently defined "defaults". The defaults will be displayed but will only be saved if "OK" is subsequently chosen.

1.4.2.1.3.5 Tag Layout Window

Setup Menu - Tag Layout - The Tag Layout menu item is used to edit the tag layout of a message buffer. When the Tag Layout menu item is selected, the "Tag Layout Screen" window of Figure 1-12 will appear.

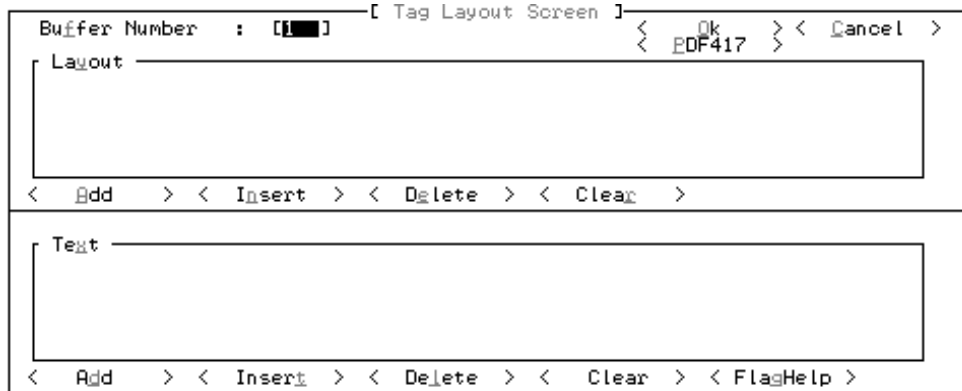


Figure 1-12

The "Tag Layout Screen" window is primarily used when you wish to modify a tag layout or create a new layout from scratch.

The first item on the "Tag Layout Screen" window is the Buffer Number. If you change the value in this editable field and press the "enter" key, then the other associated values for the new buffer will replace the values shown. Use this field to change to another buffer to edit.

In the upper right corner of the screen are three buttons that will perform the following functions when selected:

- OK** - The OK button will save the layout then close the window.
- Cancel** - The Cancel button will abandon your layout changes and close the window. Any changes you made to the layout will be lost.
- PDF417** - The PDF417 button is used to place a PDF417 code into the layout. When selected, the PDF417 layout editor will appear. This window is described later.

The tag layout is specified using Label Design Language (LDL). This language allows concise specification of text, graphics and barcodes in the label including location, size and content.

Below the buffer number field is an area that shows the layout of the tag. This area lists the format lines for the current tag. Below this layout area are several buttons used to modify the format.

Add - The Add button is used to add a new line to the format. When this button is selected, a new format line is added to the end of the format list and a window will appear allowing you to enter the format information. For details of the Layout Field Edit Screen, refer to Figure 1-13 and the accompanying description.

Insert - The Insert button will insert a new format line into the format. The insertion point must first be specified by tabbing to the Layout field (or pressing Control Y). Once the insertion point is highlighted, press the "enter" key once. A ">" character will appear next to the line indicating that it is selected. Pressing the "enter" key again will invoke the Layout Field Edit Screen to allow you to enter the information for the format line.

Delete - The Delete button is used to delete a line from the format. First, select the line to delete as described in the paragraph above. When the "enter" key is pressed the second time, a confirmation window will appear requiring you to confirm the deletion. After confirmation, the line will be deleted.

Clear - The Clear button is used to delete all lines from the format. When the clear button is pressed, a confirmation window will appear requiring you to confirm the clear operation. After confirmation, the format will be cleared.

Below the layout area in the window is the text definition area. This area lists the text specifications for text and barcode fields and corresponds to the layout specification. Below the text specification are several buttons that perform the following functions:

Add - The Add button is used to add a new text line to the text specification. When this button is selected, a new text line is added to the end of the text list and a window will appear allowing you to enter the text information. For details of the Text Edit Screen, refer to Figure 1-14 and the accompanying description.

Insert - The Insert button will insert a new text line into the text specification. The insertion point must first be specified by tabbing to the Text field (or pressing Control X). Once the insertion point is highlighted, press the "enter" key once. A ">" character will appear next to the line indicating that it is selected. Pressing the "enter" key again will invoke the Text Edit Screen to allow you to enter the information for the text line.

Delete - The Delete button is used to delete a line from the text specification. First, select the line to delete as described in the paragraph above. When the "enter" key is pressed the second time, a confirmation window will appear requiring you to confirm the deletion. After confirmation, the line will be deleted.

Clear - The Clear button is used to delete all lines from the text specification. When the clear button is pressed, a confirmation window will appear requiring you to confirm the clear operation. After confirmation, the text specification will be cleared.

1.4.2.1.3.6 Layout Field Edit Window

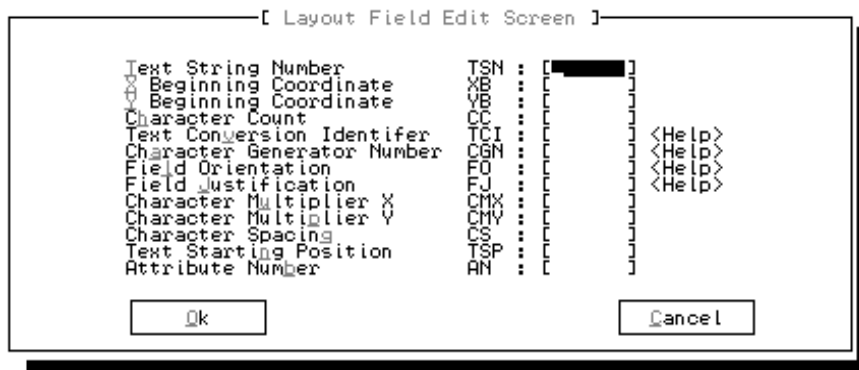


Figure 1-13

The "Layout Field Edit Screen" window is used to enter or modify one line of the layout format. Each field on this screen is one parameter of the Layout Design Language. These parameters contain the information necessary to position data (text, bar codes, graphics, etc.) on the label. It is not necessary to

enter values for all of the field parameters; the default values will be used if left blank. Field default values are shown after the abbreviation. For an example layout, refer to Section 3-1.

Text String Number **TSN** 1 - This parameter determines from which text string the field obtains the data. This allows for more than one field to use the same text string. A TSN of 1 accesses the first line of data. A TSN of 2 accesses the second line of data and so forth. The referenced text fields are specified in the "Text" area of the "Tag Layout Screen". A graphic image field must point to a valid text string that contains at least one character. The maximum value for this parameter is 65535.

X Beginning Coordinate **XB** 0 - This parameter specifies the X coordinate of the field, measured in dots. The far left edge of the tag as viewed from the front of the printer is X coordinate 1. There is no X coordinate 0. The X coordinate increases in size from left to right. An XB of 203 would place the text one inch from the left side of the tag.

Y Beginning Coordinate **YB** 0 - This parameter specifies the Y coordinate of the field, measured in dots. A YB of 1 would be specified as the first edge of the tag coming out of the front of the printer during a print cycle. The Y coordinate increases in size from the bottom to the top of the tag. A YB of 203 would place text one inch from the bottom of the tag.

Character Count **CC** * - This parameter determines the number of characters that will be used in a field. This field is only significant if it has a value of 1 which is used when specifying a graphic image. * The default value for this field depends on the character generator (CGN) used.

Text Conversion Identifier **TCI** 1 - This parameter determines what form the text string will be printed. The following table contains the legal values for this field and the text conversion method to be used. The Help button next to this field will bring up a list of legal TCI values from which to chose.

Table 1-1

TCI	Conversion Method
1	Text (standard)
2	Text surrounded by asterisks
3	Text with UPC-A/UPC-E checksum digit added

8	Downloadable fonts and graphics
12	UPC-A bar code
13	UPC-E bar code (send 11 digits)
14	UPC-E bar code (send 7 digits)
15	Interleaved 2 of 5 bar code
16	Code 39 bar code
17	Text with UPC-E checksum and extended bars added
20	EAN-13 bar code
21	EAN-8 bar code
22	Text with EAN-13 checksum and extended bars added
23	Text with EAN-8 checksum and extended bars added
24	MSI 1 (Plessey)
25	MSI 2 (Plessey)
26	MSI 3 (Plessey)
28	Text with MSI checksum added – Type 1
29	Text with MSI checksum added – Type 2
32	Text with UPC-A checksum and extended bars added
33	Text with UPC-A with extended bars added
36	Postnet (Zip+4)
37	Postnet (Zip+6)
38	Maxicode bar code
40	Code 128 bar code (automatic compression)
41	Code 128 bar code (manual compression)
42	Codabar bar code
43	Code 93 bar code
44	AS-10 bar code
46	PDF417 bar code
50	UCC/EAN-128 bar code
51	Text with UCC/EAN-128 information

Character Generator Number CGN ** - This parameter is used to specify the character set when using embedded fonts. When accessing downloaded fonts or graphics, this field is used to select which downloaded font or graphic to use. Valid slots for downloaded items are 1 through 20. Embedded fonts are described in the following table.

Table 1-2

CGN	Point	Font Type
1	6	Arial Normal
2	6	Arial Bold

3	8	Arial Normal
4	8	Arial bold
5	10	Arial Normal
6	12	Arial Normal
7	14	Arial Normal
8	18	Arial Normal
9	12	OCR-A
10	12	OCR-B

Embedded Bar Codes: Many bar codes can be printed with various ratios and character spacing options. The following table illustrates these options.

Table 1-3

Bar Code	CGN	Ratio	Height	Spacing	FO
Code 39	2	2:1	1	2	0123
	3	3:1	1	2	0123
	5	5:2	1	2	0123
	8	8:3	1	3	0123
I 2 of 5	2	2:1	1	-	0123
	3	3:1	1	-	0123
	5	5:2	1	-	0123
UPC/EAN	-	40%	1	-	0123
UPC Readable	-	40%	1	-	0123
Code 128 & UCC/EAN - 128	-	40%	1	-	0123
Codabar	2	2:1	1	-	0123
	3	3:1	1	-	0123
	5	5:2	1	-	0123
Code 93	-	2:1	1	-	0123
AS-10	-	2:1	1	-	0123
Maxicode	2	-	-	-	0123
	3	-	-	-	0123
	4	-	-	-	0123
	5	-	-	-	0123
	6	-	-	-	0123
MSI Plessey	-	1:1	1	-	0123

Field Orientation **FO** 0 - This parameter defines the rotation of the field. The point of rotation is determined from the field justification. The following table defines the valid entries for this parameter. The Help button will display this list for easy selection.

Table 1-4

Code	Rotation
0	0 degrees (normal rotation)
1	180 degrees (upside-down rotation)
2	90 degrees (left rotation)
3	270 degrees (right rotation)

Field Justification **FJ** 0 - This parameter defines the justification of the field. The following table defines the valid entries for this parameter. The Help button will display this list for easy selection.

Table 1-5

Code	Justification
0	Left justified above base-line
1	Right justified above base-line
2	Left justified below base-line
3	Right justified below base-line
4	Centered above base-line
5	Centered below base-line

The next table shows how to obtain proper character placement relative to orientations and justifications.

Table 1-6

Rotation	Field Orientation and Justification
0, 180 degrees	0 – Left justified above base-line 1 – Right justified above base-line 2 – Left justified below base-line 3 – Right justified below base-line 4 – Centered above base-line 5 – Centered below base-line
90,270 degrees	0 – Left justified above base-line 1 – Right justified above base-line 2 – Left justified below base-line 3 – Right justified below base-line 4 – Centered on Y axis, right of X coordinate 5 – Centered on Y axis, left of X coordinate

Character Multiplier X **CMX** 1 - This parameter multiplies each character in the X direction. The valid range is 1 to 65536.

Character Multiplier Y **CMY** 1 - This parameter multiplies each character in the Y direction. The valid range is 1 to 65536.

Character Spacing **CS** * - This parameter adjusts the spacing between characters. If this parameter is not used, the default for the selected character generator (CGN) is used. The values (0-127) add dots and (128-255) subtract dots. Bar codes have default spacing according to the indicated multiplier. Multiplying a text string will not multiply the spacing between characters – use this parameter to properly space the characters.

Text Starting Position **TSP** 1 - This parameter marks the starting position of the character in the text string to be used as data. This is useful for allowing several fields to use sections of the same string, minimizing the amount of data transmitted.

Attribute Number **AN** 0 - This parameter is used to set the attributes of the field. If set to 2, the character spacing will be fixed/non-proportional. A value of 0 is proportional (if available). Reversed text (white on black) is created by setting this value to 1 and printing a black box on top of the text. A value of 3 will print both fixed/non-proportional character spacing and reversed text.

OK - The OK button will save all of your new settings and then close the window.

Cancel - The Cancel button will abandon your new settings and close the window. Any changes you made to these settings will be lost.

1.4.2.1.3.7 Text Edit Screen

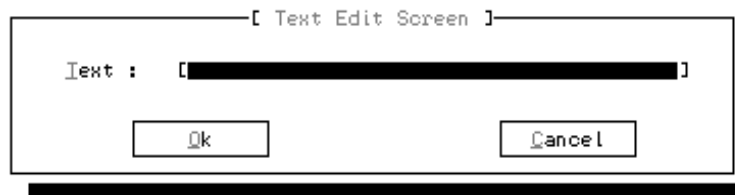


Figure 1-14

The "Text Edit Screen" window is used to enter or modify one line of the text specification. Enter the text specification string as desired. Embedded flags can be used for automatic insertion. Table 1-7 shows the embedded message flags. For an example of text fields and how they are used, refer to Section 3-2.

Embedded Message Flags

Table 1-7

Flag	Data Inserted Into Message For Printing
%A	Abbreviated Weekday (MON, TUE, WED, THU, FRI, SAT, SUN)
%B	Abbreviated Month (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC)
%C	Date and Time (MM/DD/YY HH:MM, with HH = 00-23)
%D	Day of the month (01 - 31)
%E	User Year code
%H	Hour of the day (00 - 23)
%I	Hour of the day (00 - 12)
%J	Julian day of the year (001 - 366)
%K	Month Code (1 - 9, O, N, D)
%L	Last digit of the year (0 - 9)
%M	Month (01 - 12)
%N	Minutes of the hour (00 - 59)
%#O	Operator entry field # (1-8)
%P	AM or PM
%#S	Serial Number where # represents desired number of digits (1-9)
%T	Time (HH:MM, with HH = 00 - 23)
%U	User Month code
%W	Weekday number (1 = Sunday to 7 = Saturday)
%X	Date (MM/DD/YY)
%Y	Year (00 - 99)
%Z	User Shift code

OK - The OK button will save all of your new settings and then close the window.

Cancel - The Cancel button will abandon your new settings and close the window. Any changes you made to these settings will be lost.

1.4.2.1.3.8 PDF417 Bar Code Setup Screen



Figure 1-15

The " PDF417 Bar Code Setup Screen" window is used to enter or modify the specification for a PDF417 two-dimensional code. Only one PDF417 code per buffer is allowed. Note that after configuring the PDF417 specification, you must still add a format line to the layout specifying a PDF417 code. For an example of how to enter a PDF417 code specification, refer to Section 3-3.

The display area labeled PDF417 contains a list of the specification strings that define the code's appearance and contents. Each line of the specification must be entered individually using the edit buttons at the bottom of the window.

Below the PDF417 specification list are several buttons that perform the following functions:

Add - The Add button is used to add a new line to the PDF417 specification. When this button is selected, a new line is added to the end of the list and a window will appear allowing you to enter the text information.

Insert - The Insert button will insert a new line into the specification. The insertion point must first be specified by tabbing to the PDF417 field (or pressing Control P). Once the insertion point is highlighted, press the "enter" key once. A ">" character will appear next to the line indicating that it is selected. Pressing the "enter" key again will invoke the PDF417 Edit Screen to allow you to enter the information for the line.

Delete - The Delete button is used to delete a line from the specification. First, select the line to delete

as described in the paragraph above. When the "enter" key is pressed the second time, a confirmation window will appear requiring you to confirm the deletion. After confirmation, the line will be deleted.

Clear - The Clear button is used to delete all lines from the specification. When the clear button is pressed, a confirmation window will appear requiring you to confirm the clear operation. After confirmation, the text specification will be cleared.

OK - The OK button will save the PDF417 specification and then close the window.

Cancel - The Cancel button will abandon the PDF417 specification changes and close the window. Any changes you made to these settings will be lost.

1.4.2.1.3.9 Operator Setup Screen

Setup Menu - Operator - The Operator menu item is used to setup the parameters that control the way the operator interacts with the printer. Note that these values will be set by the factory and will probably never need to be adjusted in the field. When the Operator menu item is selected, the "Operator Setup" window of Figure 1-16 will appear.

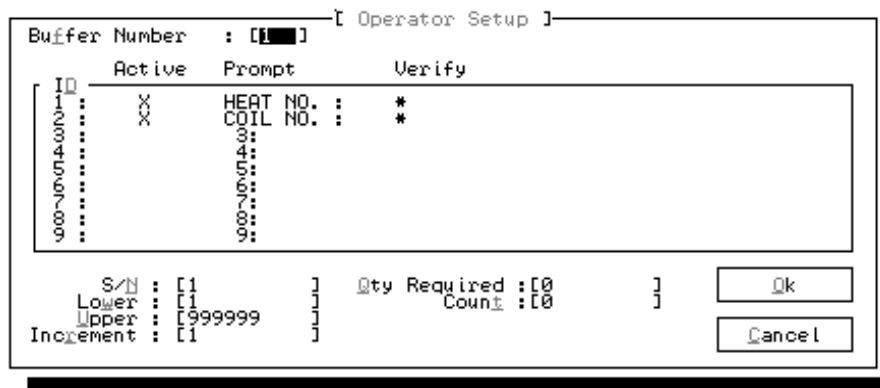


Figure 1-16

The "Operator Setup" window is used when you wish to modify the way that the operator interacts with the system for a given buffer.

This window contains the operator setup definition fields. These fifteen fields define whether the field is active, the prompt text and the verification format for this buffer. You may activate up to fifteen operator entry fields as needed for your application. To edit a field, position the cursor on the field so that it is highlighted and then press the enter key to select it. Pressing the enter key again will bring up an editor for the field. The settings for each field are described below.

Active - This field is a check box that indicates the field is activated. If the box is checked, then this field will become active on the Main, Operator and Batch windows. An active field will have its prompt displayed, it will allow the user to edit a text string, and it will verify the validity of the operator's entry. An inactive field will not appear on the screen nor can it be edited.

Prompt - This field is a string of text characters that will appear on the display to prompt the user about what to enter in the field. The prompt can be any text string up to 10 characters long.

Verify - This field is a string of special-function characters that is used to verify the validity of the data entered by the operator. Any character string can be entered, but some characters have special meaning as described below. For each character entered that is not on the list below, the operator must enter that exact character in the data field. For positions that contain the characters below, the operator can enter data as described.

Table 1-8

Special	Valid Entry
#	Any single digit 0 through 9
\$	Any single letter A-Z or a space
?	Any single letter, number or symbol
*	Any number of characters, even zero
[Begins a list of acceptable characters.
]	Ends the character list

The following are examples of verify strings and good/bad operator entries.

Verify:	\$#####	
OK:	A12345 X84967 D00001	
Bad:	A87 812345 B987H5	Five digits required Must start with letter H not allowed there
Verify:	#[ABC]?\$\$	
OK:	5B8RR 8CKMN	
Bad:	9W6AA ABCD4	W not from ABC list Must start with digit and end in letter
Verify:	#*	
OK:	5 8IUY87 2IU87UY6TY67	
Bad:	U H98765	Must start with digit Must start with digit

Below the operator fields and to the left of the window are the Auto Serialization values. The QUALITAG® Tag Printer is capable of automatically generating a sequential number and printing it on each print cycle. A different serial number can be printed by each of the message buffers. The four fields shown here give you control over what number is printed, as well as how overflows are handled.

- S/N** - This field is the actual serial number that will be used on the next print cycle.
- Lower** - This field is the lower limit value used on overflows and underflows.
- Upper** - This field is the upper limit value used on overflows and underflows.
- Increment** - This field is the increment number that is added to the serial number after each print. The increment can be any positive or negative integer number.

When the print cycle is completed the printer checks to see if the serial number was included as part of the message. If it was, the increment value is

added to the serial number. The increment value can be positive for increasing serial numbers, or negative for decreasing serial numbers. If the increment is positive and the new value of the serial number is greater than the upper limit, then the serial number is set equal to the lower limit value. If the increment is negative and the new serial number is less than the lower limit value, then the serial number is set equal to the upper limit value. The number printed on the next print cycle will be the lower limit value.

The serial number field added to the print message by including the “serial number flag” into one of the message text strings. The serial number flag is the percent key, followed by a single digit specifying the number of digits to include in the serial number, and the letter “S”. For example, to include a six-digit serial number in your message, enter the following flag into your print message at the desired location.

%6S

This flag will be replaced by the current value of the serial number and extended out to six digits. If the number is less than six digits long, then leading zero characters will be prefixed to the field.

If the serial number increment range (lower limit to upper limit) will exceed the number of digits you have specified in your serial number flag, then the results will be unpredictable.

To the right of the auto-serialization fields are the quantity fields. These fields are used to specify the number of tags to print in a batch. These settings can be overridden by the operator on the main screen.

Qty Required - This field specifies the number of tags to print in a batch.

Count - This field shows the current count of tags printed for the buffer. Typically, this field is set to zero when the buffer is first configured.

At the bottom-right of the screen are two buttons which, when selected, will perform a function as follows:

OK - This button will save all of your new operator settings and then close the window.

Cancel - This button will abandon your new settings and close the window. Any changes you made to these settings will be lost.

1.4.2.1.3.10 Screen Setup

Setup Menu - Screens - The Screens menu item is used to setup the screen with which the operator will interact. When the Screens menu item is selected, the "Screen Setup" window of Figure 1-17 will appear.

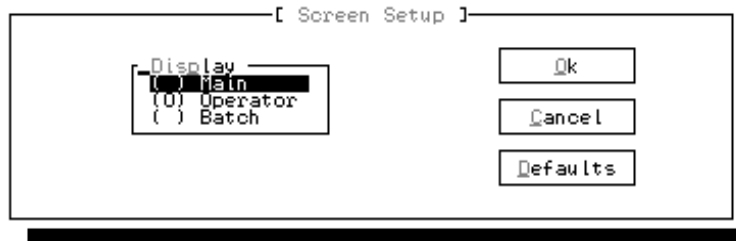


Figure 1-17

The "Screen Setup" window is used select which screen the operator will use to interact with the system.

This window contains a radio group to select the interaction screen. The settings for this selection are described below.

Main - This selection indicates that the operator will interact with the main display screen. However, the screen will default to "operator" mode, which means that the setup and monitor menus will not be available for selection.

Operator - This selection indicates that the operator will interact with the operator display screen. The operator will only be able to enter text strings and change the serial number and quantity fields. Minimal information about the printer's status will be provided.

Batch - This selection indicates that the operator will interact with the batch display screen. The batch screen allows the operator to create multiple batches to be run. Once begun, the batch will be printed in order until complete or cancelled.

At the right of the screen are three buttons which, when selected, will perform a function as follows:

- OK** - The OK button will save your new setting and then close the window.
- Cancel** - The Cancel button will abandon your new setting and close the window. Any changes you made to the setting will be lost.
- Defaults** - The Defaults button will replace the displayed setting with the currently defined "defaults". The defaults will be displayed but will only be saved if "OK" is subsequently chosen.

1.4.2.1.3.11 Host Setup Screen

Setup Menu - Host - The Host menu item is used to setup certain parameters that affect serial communications with the host. When the Host menu item is selected, the "Host Setup" window of Figure 1-18 will appear.

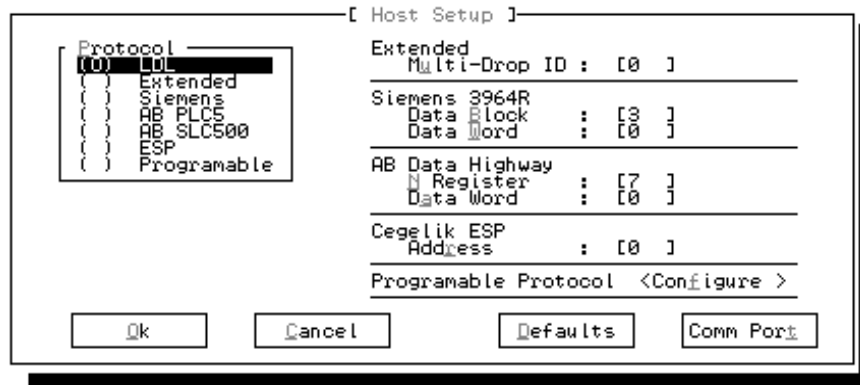


Figure 1-18

The "Host Setup" window is used when you wish to set the communications parameters to match your host. Refer to chapter 2 "Communications" for a description of the messaging protocol used for host communications. The parameters that may be set in this window are described below:

- Protocol** - The protocol parameter defines the "rules" followed by both the host and the printer to allow the host to control the printer. Several protocols are provided by the QUALITAG® printer. The default protocol is LDL (Label Design Language). Please

refer to Chapter 2 for a complete description of the available protocols.

Depending on the protocol selected, certain additional parameters may be required to configure the host interface. Each of these additional parameters is described below by protocol.

LDL - No additional parameters are required by the LDL protocol.

Extended - The Extended Protocol has an optional Multi-Drop ID that must be specified only if the printer is part of an RS485 (modems required) multi-drop network. For direct peer-to-peer connections, set the ID to zero.

Siemens - The Siemens Protocol (3964R) requires you to specify the data block / data word of the memory location in the printer where the host will be writing data.

AB PLC5 - The Allen Bradley PLC5 Protocol (DF1) requires you to specify the N register and data word address of the memory location in the printer where the host will be writing data.

AB SLC500 - The Allen Bradley SLC500 Protocol (DF1) requires you to specify the N register and data word address of the memory location in the printer where the host will be writing data.

ESP - The Cegelik ESP Protocol requires you to specify the address of the memory location in the printer where the host will be writing data.

Programmable - The Programmable Protocol (DF1) requires you to several parameters to configure a custom protocol. Select the “configure” button at the right of the screen to set these additional parameters. See Figure 1-19 below.

At the bottom of the Host-setup screen is four buttons which, when selected, will perform a function as follows:

OK - The OK button will save your new settings and then close the window.

Cancel - The Cancel button will abandon your new settings and close the window. Any changes you made to the setting will be lost.

Defaults - The Defaults button will replace the displayed settings with the currently defined “defaults”. The defaults will be displayed but will only be saved if “OK” is subsequently chosen.

Comm Port - The Comm Port button will activate “Comm Setup” window as shown in Figure 1-20 below.

1.4.2.1.3.12 Programmable Protocol Setup Screen



Figure 1-19

Start Character - The Start Character is used to specify the decimal value of an ASCII character that is used to start a data download from the host. All characters received prior to this character are ignored. If no start character is required set this value to zero.

Character Offset - The Character Offset specifies the number of characters after the start character that the printer should start accumulating text. A setting of 1 will begin extraction on the first character after the start character.

Chars to Extract - This parameter tells the printer how many characters to extract from the host download.

Terminating Char - This parameter specifies the decimal value of the ASCII character that terminates the download. If no terminating character is required set this field to zero.

Char to Ignore - This parameter specifies the decimal value of an ASCII character that should be ignored. This parameter is optional and may be set to zero.

At the bottom of the Programmable Protocol setup screen are three buttons which, when selected, will perform a function as follows:

OK - The OK button will save your new settings and then close the window.

Cancel - The Cancel button will abandon your new settings and close the window. Any changes you made to the setting will be lost.

Defaults - The Defaults button will replace the displayed settings with the currently defined "defaults". The defaults will be displayed but will only be saved if "OK" is subsequently chosen.

1.4.2.1.3.13 Comm Setup Screen

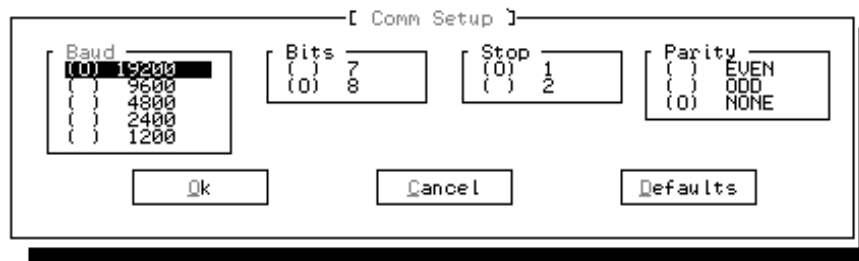


Figure 1-20

The "Comm Setup" window is used when you wish to set the communications parameters to match your host. Refer to chapter 2 "Communications" for a description of the messaging protocol used for host communications. The parameters that may be set in this window are described below:

Baud - The baud parameter defines the number of "bits per second" for serial communications. Five settings are available for selection. Select the radio button adjacent to the desired setting.

Bits - The bits parameter defines the number of data bits transmitted for each character in the transmission. Select either 7 or 8 bits by selecting the corresponding radio button.

Stop - The stop parameter defines the number of stop bits transmitted for each character. Select either 1 or 2 by selecting the corresponding radio button.

Parity - The parity parameter defines the type of parity used to aid in communications fault detection. Select Even, Odd or None by selecting the corresponding radio button.

At the bottom of the screen are three buttons which, when selected, will perform a function as follows:

OK - This button will save all of your new settings and then close the window.

Cancel - This button will abandon your new settings and close the window. Any changes you made to these settings will be lost.

Defaults - This button will replace all of the displayed settings with the currently defined "defaults". The defaults will be displayed but will only be saved if "OK" is subsequently chosen.

1.4.2.1.3.14 Units Setup Screen

Setup Menu - Units - The Units menu item is used to select the units of measure to be used by the system. When the Units menu item is selected, the "Units Setup" window of Figure 1-21 will appear.

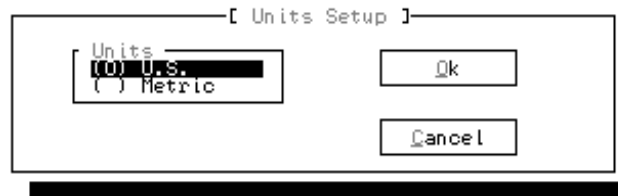


Figure 1-21

The "Units Setup" window is used when you wish to change the type of units used by the system. The window provides a radio button group to allow you to select either U.S. units or Metric units.

At the bottom of the screen are two buttons which, when selected, will perform a function as follows:

- OK** This button will save your new units setting and then close the window.
- Cancel** This button will abandon your changes and close the window. Any changes you made to the units setting will be lost.

1.4.2.1.3.15 User Tables Editor Screen

Setup Menu - User Tables - The User Tables menu item is used to change the parameters that effect the "User" insert-able message fields (i.e. User Year, User Month, and User Shift). When the User Tables menu item is selected, the "User Tables Editor" window of Figure 1-22 will appear.



Figure 1-22

The "User Tables Editor" window is used when you wish to change the user table codes. This window provides six data entry fields as follows:

User Month - You can enter a string of twelve characters, where each character represents a code for the months of January through December. When you place the user month code flag (%U) into a print message, it will be replaced by the code character for the current month.

User Year - You can enter a string of ten characters, where each character represents a code for the last digit of the year of the decade (0-9). When you place the user year code flag (%E) into a print message, it will be replaced by the code character for the current year of the decade.

User Shift - You can enter a string of three characters, where each character represents a code for work shifts 1, 2 and 3 respectively. When you place the user shift code flag (%Z) into a message, it will be replaced by the code character for the current work shift. The current work shift is determined from the shift starting times schedule described below.

Shift Start 1 - You can enter the starting time of day, in 24-hour format, of the starting time of work shift 1. This time is used to determine what shift is active for the user shift code selection.

Shift Start 2 - You can enter the starting time of day, in 24-hour format, of the starting time of work shift 2. This time is used to determine what shift is active for the user shift code selection.

Shift Start 3 - You can enter the starting time of day, in 24-hour format, of the starting time of work shift 3. This

time is used to determine what shift is active for the user shift code selection.

If your company only has two work shifts per day, set the Shift 3 start time equal to the Shift 2 start time.

At the bottom of the screen are two buttons which, when selected, will perform a function as follows:

- OK** - This button will save your new user table settings and then close the window.
- Cancel** - This button will abandon your changes and close the window. Any changes you made to the user table settings will be lost.

1.4.2.1.3.16 Password Setup Screen

Setup Menu - Password - The Password menu item is used to change the supervisor's password that is required to enter the Supervisor Mode of operation. When the Password menu item is selected, the "Change Password" window of Figure 1-23 will appear.



```
[ Change Password ]
Enter Old Password : [ ]
Enter New Password : [ ]
Verify New Password : [ ]
Ok Cancel
```

Figure 1-23

The "Change Password" window is used when you wish to change the supervisor's password to a new setting. The window provides three text entry fields as follows:

- Enter Old Password** - You must enter the old (existing) password in this field. This ensures that the password can only be changed by someone who knows the current value.

Enter New Password - Enter your new password value. You may include any alpha - numeric text string up to ten characters long. The password will display as asterisks while you type to prevent prying eyes from seeing the new password.

Verify New Password - Enter the new password again. This field must match the New Password field above it or the password cannot be changed. This field is required to minimize the likelihood of typing in an incorrect character in the New Password field. Since these edit fields do not show what you type, you would be unable to reproduce the new password and the Supervisor's functions would be forever locked out.

At the bottom of the screen are two buttons which, when selected, will perform a function as follows:

OK This button will save your new password and then close the window.

Cancel This button will abandon your changes and close the window. Any changes you made to the password will be lost.

The system as shipped from the factory contains no password (a null password). It is highly recommended that this password be changed immediately after installation to avoid unauthorized access to sensitive setup parameters.

Note that if you forget your password, you can use the PassCode obtained from InfoSight Corporation as the "old" password to allow you to enter a new password. Contact InfoSight Corporation for more information.

1.4.2.1.3.17 Time / Date Setup Screen

Setup Menu - Time / Date - The Time/Date menu item is used to change the time and date of the system's clock/calendar. When the Time/Date menu item is selected, the "Time / Date Setup" window of Figure 1-24 will appear.

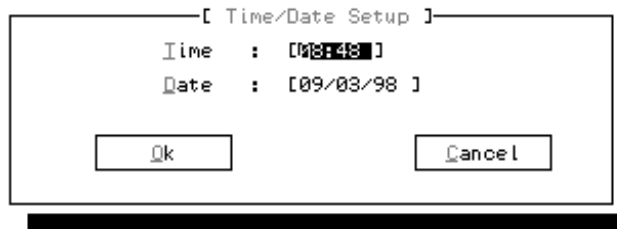


Figure 1-24

Time - Enter the current time of day in 24 hour format (HH:MM). Note that the time will not actually be set until you press the OK button, so do not wait too long after making your entry before pressing OK or the time will not be accurate.

Date - Enter the current date, MM/DD/YY. Note that the year is entered as the last two digits of the year – no century indicator is allowed. The software is fully Year 2000 compliant and will recognize all year values less than 80 as being in the 21st century.

When the window is first activated, the current time and date will be displayed in the edit fields. The time and date will not be updated automatically while the window is active.

At the bottom of the screen are two buttons which, when selected, will perform a function as follows:

OK - This button will save your new time and/or date setting and then close the window.

Cancel - This button will abandon your changes and close the window. Any changes you made to the time and/or date setting will be lost.

1.4.2.1.3.18 Setup Report Print Screen

Setup Menu - Print Report - The Print Report menu item is used to print a paper report of all of the printer's setup parameters and tag

layouts. When the Print Report menu item is selected, the “Setup Report Print Screen” window of Figure 1-25 will appear.

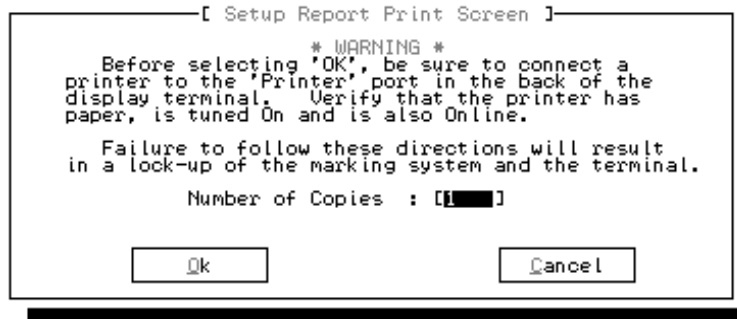


Figure 1-25

Before printing the report, you must connect a dot-matrix printer to the “Printer” port in the back of the display terminal. The printer must have a parallel Centronics type port. Use a standard PC-compatible printer cable to connect the printer to the terminal. Make sure the printer is online and has paper before proceeding.

Number of Copies - Enter the number of report copies you wish to print. Note that the report will require nearly 50 pages per copy.

At the bottom of the screen are two buttons which, when selected, will perform a function as follows:

OK - This button will begin printing the report. While the report is being printed, you cannot perform any other operations with the printer. When the report is completed, the window will close.

Cancel - This button will close the window without printing the report.

1.4.2.1.3.19 Setup – Set Defaults Screen

Setup Menu - Defaults - The Defaults menu item is used to copy the current setup parameters into the Default memory location. This function is used to save the default parameters for an application so that these

defaults can be restored as needed. Make sure that all of the parameters are set the way you want them before selecting this option.

When the Defaults menu item is selected, the "Setup - Set Defaults" window of Figure 1-26 will appear

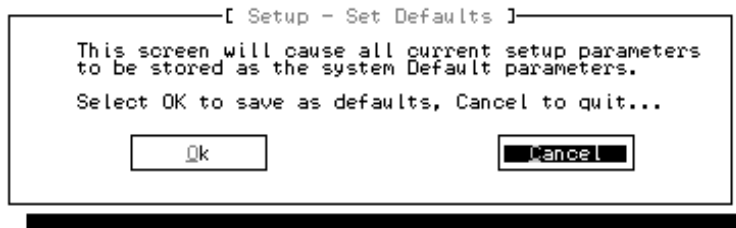


Figure 1-26

This screen gives you a warning and a last change to change your mind about setting the default parameters. Once the current parameters are copied to the Defaults, there is NO WAY to return them to their original settings except by manually re-entering each one.

At the bottom of the screen are two buttons which, when selected, will perform a function as follows:

OK - This button will make the current setup parameters the defaults and then close the window.

Cancel - This button will abort the Set Defaults operation leaving your previous defaults unchanged.

1.4.2.1.4 Monitor

The Monitor menu is used to perform certain diagnostic functions required to verify proper operation or diagnose certain problems. The Monitor menu is only available when in the Supervisor mode of operation. When the menu is selected, a pull-down menu will appear as shown in Figure 1-27.



Figure 1-27

1.4.2.1.4.1 Monitor I/O Select Screen

Monitor Menu - I/O - The I/O menu item is used to view the digital Inputs and Outputs for the printer. When the menu item is selected, the "Monitor I/O Select" window will appear. Figure 1-28 shows the appearance of the window.



Figure 1-28

Selecting either Group 1 or Group 2 will cause the corresponding I/O viewer window to appear. Selecting the Cancel button will close the selection window.

When the I/O monitor window is active, it will show the status of each of the 24 I/O points in the group. If an I/O point is "off" or inactive, then it will be displayed as a "-" / [-" symbol. If the I/O point is "on" or active, then it will be displayed as a "-" / [-" symbol. These symbols are universally recognized as relay contact points in the inactive and active states. As the state of the external I/O points change in response to various stimuli, the symbols on the display will change to reflect the new status. In this way, you can quickly determine if an I/O point is properly activating.

Adjacent to each I/O point state is a numbered button. The numbers in the buttons reflect the I/O point number. Since these are in fact buttons, they may be selected by tabbing to the desired point and pressing Enter. Selecting a button will force the point to toggle to its opposite state if it is an Output point. Input points cannot be forced, as they are controlled by external activity.

Please note that when using the I/O monitor to force outputs, that the system is still active and controlling itself. Thus, if you set an output it is quite

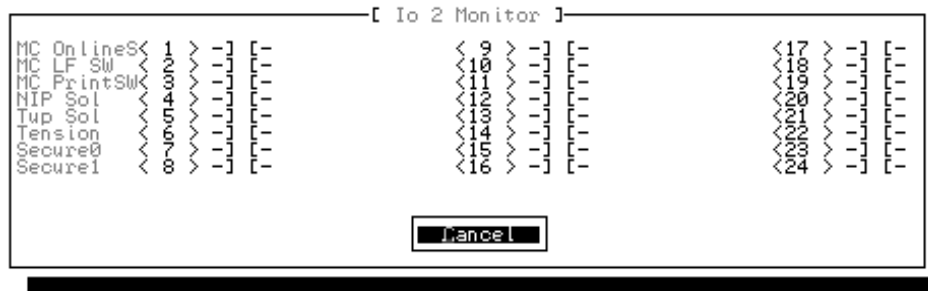


Figure 1-30

Monitor Menu - Heater - The Heater menu item allows you to view and/or change the setting of the heater core temperature. When the Heater menu item is selected, the "Heater Monitor" window will appear. Figure 1-31 shows the appearance of this window.

1.4.2.1.4.4 Heater Monitor Screen



Figure 1-31

The "Heater Monitor" window is used to manually control heater core set point temperature. The functions that may be performed in this window are described below:

Heater Setting - This field allows you to enter a number corresponding to a desired temperature setting for the heater core. The field also shows the current setting of the core.

Output This button, when selected, will take the current heater setting field and send it to heater core controller.

Cancel This button will close Heater Monitor window.

DigiPot

This button will activate the "DigiPot Monitor" window. This window is used to directly access the heater core controller at a much lower level.

1.4.2.1.4.5 DigiPot Monitor Screen

The "DigiPot Monitor" window is used to manually control heater core controller at its lowest level.

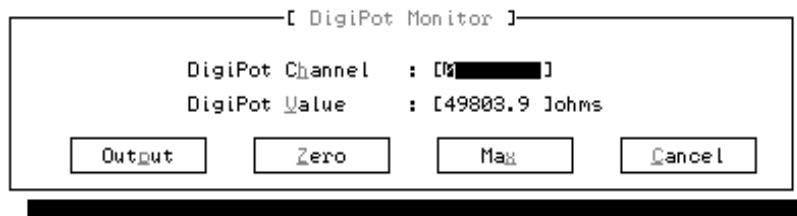


Figure 1-32

The DigiPot is a digitally controlled potentiometer that outputs the heater core set point value. The DigiPot has two channels but only the first one, channel 0, is used by the printer. The functions that may be performed in this window are described below:

DigiPot Channel - This field allows you to enter the channel number of the DigiPot to control. The QUALITAG® printer only uses channel zero at this time.

DigiPot Value - This field allows you to enter a number corresponding to the output value of the DigiPot in Ohms. The range of the output is 0 to 50,000 ohms. The resulting heater core temperature is non-linearly proportional to the DigiPot output resistance.

Output - This button, when selected, will take the current DigiPot setting field and send it to the DigiPot channel specified.

Zero - This button, when selected, will set the selected channel to zero ohms.

Max - This button, when selected, will set the selected channel to 50,000 ohms.

Cancel - This button will close DigiPot Monitor window.

1.4.2.1.4.6 Jog Motor Monitor Screen

Monitor Menu - Jog Motor - The Jog Motor menu item allows you to jog the stepper motor that moves the tag material through the printer. When the Jog Motor menu item is selected, the "Jog Motor" window will appear. Figure 1-33 shows the appearance of this window.



Figure 1-33

The "Jog Motor" window is used to manually move the tag feed stepper motor. The functions that may be performed in this window are described below:

Distance - This field allows you to enter a number corresponding to a desired distance to move the motor. This field is only used by the "Move" button described below. This number may be negative for reverse feed or positive for forward feed. The current "location" and status of the motor are displayed next to this field.

Move - This button, when selected, will move the tag feed motor by the distance specified.

Jog Fwd - This button, when selected, will jog the motor in the forward direction. Press this button again to stop the motor.

Jog Rev - This button, when selected, will jog the motor in the reverse direction. Press this button again to stop the motor.

Cancel This button will close Jog Motor window.

Monitor Menu - Debug - The Debug menu item is intended for low level access to the printer's electronics controller. This window is to be used only by qualified InfoSight Corporation personnel.

1.4.3 Batch Window

When the Marking system is first powered on, the display terminal shows the Batch Window if it has been configured for "batch" display mode. This display is shown in Figure 1-34. The title of this window is "InfoSight QUALITAG® Tag Printer - Batch Screen".

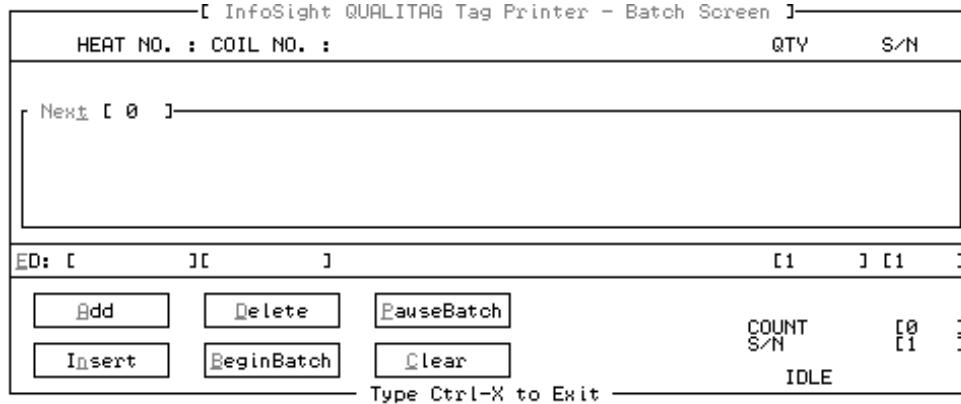


Figure 1-34

The Batch Window is an optional screen that functions "on top of" the Main Window and is used to provide the capability to print multiple batches of tags. Up to twenty batches can be entered into the printer. Once batch printing is started, all batches will print without operator intervention.

Below the window's title are the column headings for the operator entry fields that have been enabled. Up to five operator entry fields may be used in the batch screen.

Below the column headings is a list of upcoming batches. The next batch to be printed will be at the top of the list with subsequent batches listed below.

Below the batch list is the edit line. Each column has an edit field associated with it. Enter data into these fields for the appropriate columns and then press either the Add or Insert buttons to place the edit data into the batch list.

The buttons at the bottom of the screen perform the following functions when selected.

Add - This button, when selected, will add a batch to the end of the batch list. The data for the batch comes from the column edit fields, the Qty field and the S/N field. If there is no room in the batch list for an additional batch, then an error message will be displayed.

Insert - This button, when selected, will add a batch to the batch list at a specified insertion point. You must first specify the insertion point by highlighting a batch in the list and pressing the "enter" key once. The data for the batch comes from the column edit fields, the Qty field and the S/N field. If there is no room in the batch list for an additional batch, then an error message will be displayed.

Delete - This button, when selected, will delete a batch from the batch list. You must first specify the batch to delete by highlighting it in the list and pressing the "enter" key once. You will be asked to confirm the deletion.

Begin Batch - This button, when selected, will begin printing tags using the data from the first batch in the list. The batch will be "popped" off the list and placed above it (just beneath the column headings.) As each tag is printed, the quantity and serial number fields will be updated. When the batch is completed, the next batch in the list, if any, will be printed. This will continue until there are no remaining batches in the list, until cancelled by the operator, or until an error occurs.

Pause Batch - This button, when selected, will stop printing the current batch. The state of the current batch will be saved by "pushing" the batch back onto the top of the batch list. Select the Begin Batch button to resume printing where the batch left off.

Clear - This button, when selected, will clear all batches in the batch list. You will be asked to confirm the clear operation.

If you need to exit the Batch Window at any time to perform any of the higher level functions such as tag layout, system setup or diagnostics, simply press the Control and X keys simultaneously. This will cause the Password entry screen to appear.

You must type in the correct password and then select "OK" to switch to the Main Window. The default password as shipped from the factory is a null password (no password at all). If an incorrect password is entered, then an error window will appear. It is strongly recommended that you enter a new password after the system has been installed to protect sensitive operating data.

If you forget the password, press the Control and Z keys together and the "About" screen will appear. This screen provides a "PassCode" feature that can be used to temporarily override the password. Refer to section 1.4.2.1.1 for more information about the "About" screen and the PassCode feature.

CHAPTER 2

2. COMMUNICATIONS

The QUALTAG™ printer has several communications protocols built into it to allow a host computer to send data and control the printer. This section describes the various communications protocols available.

The QUALITAG® printer has the following protocols. Protocol selection is via the Setup menu, Host menu item.

- Label Design Language (LDL)
- Extended Protocol
- Siemens 3964R
- Allen Bradley Data Highway (DF1)
- Cegelik GEM80
- Programmable (user configurable)

Communications is established via an RS232 serial connection with the following parameters:

Table 2-1

Baud Rate	Selectable 1200,2400,4800,9600,19200
Data Bits	7 or 8
Parity	NONE, ODD or EVEN
Start Bits	1
Stop Bits	1 or 2
Three Wire	RX, TX and GND

2.1 LABEL DESIGN LANGUAGE (LDL)

The form of LDL implemented in the QUALITAG® printer is a subset of the full command set defined by Microcom Corporation. The commands recognized by the QUALITAG® printer are defined below.

XON/XOFF handshaking is implemented to control flow of information to the printer when the printer's input buffer is nearly full. When the buffer is nearly

full, the printer will send an XOFF character to the host. When the buffer has sufficient room for additional input, the printer will send an XON character to the host.

For all the commands listed below, the printer will recognize either the one-character control character or the two-character caret and alpha character sequence. In other words, for a PC keyboard, the same command can be generated either by holding down the control key and pressing the letter or by entering two characters – the ^ (a caret, the character generated if you press the Shift key and the number 6) and an alpha character (upper or lower case.)

Some mainframe and mini-computers cannot use the ASCII '^' character. In these cases, substitute the ASCII pipe symbol '|' or use the one character control-code representation.

Special Printer Control Codes

The following control codes perform special functions. All other control characters are ignored.

- ^A Accumulator Mode: Used to supply parameters for ^D commands. These parameters must be positive decimal integers.
- ^D Command Mode: Used to issue commands to the printer. This command is usually preceded by a ^A sequence (see above.) ^D commands must be terminated with a Carriage Return or with another control sequence. The Carriage Return character can optionally be followed by a Line Feed character.

The table below summarizes the commands recognized by the printer. In some cases, the ^A parameter is not required.

^A	^D	Command
	2	Text String Entry Mode: Precedes the text strings that are supplied to the various fields in the label.
	3	Print Command: Begins a print cycle. Either one label or a batch of labels will be printing depending on the Quantity Required setting.
	11	Print Test Label: Begins printing a single test label (same as holding the Print Button on the front panel for 4 seconds.)
	12	Feed One Label: Feeds forward one label.

	30	Change Clock: Use the sequence below to set the time and date of the real-time clock. ^D30 (return) HH:MM:SS (return) DD/MM/YY/W (return)
	56	Select User Defined Layout: Signals to the printer the end of the label fields and precedes the text fields in a format file.
	57	Enter Label Format Mode: Tells the printer that information for a label is following.
XX	58	Set Buffer Assignment: Tells the printer to use one of the five layout buffers for further processing. XX must be a value from 1 to 5.
XX	75	Load Label Count: Tells the printer to set the Quantity Required to the value XX.
	77	Load PDF417 Bar Code Data: Tells the printer that data is coming for the PDF417 style two-dimensional bar code.
	100	Clear Memory: This command will clear all downloaded fonts and graphics.
XX	106	Load Graphic Image or Font into User Memory: This command will precede the download of a graphic image or font. Use the ^A XX value to specify the slot the image is to occupy (1-20). Note that you may not overwrite an existing graphic or slot. You must first clear all memory using ^D100 prior to overwriting a slot.

For an example of a tag layout, refer to Section 3. A typical download sequence for this tag layout would be.

^D77 PDF417 information	Begin PDF471 download See Section 3-3
^D57 Format Fields ^D56	Begin Format download See Section 3-1 End Format Download
^D2 Text Fields ^D3	Begin Text download See Section 3-2 Begin printing the tag

Note that each line sent must be terminated by a Carriage Return or Carriage Return/Line Feed pair.

2.2 EXTENDED PROTOCOL

This section will describe the **Extended Communications Protocol** as implemented with the QUALITAG® Tag Printer system software. Extended Protocol is intended to provide secure communications with an intelligent host device. This discussion assumes familiarity with the ASCII character code as well as fundamental computer programming skills.

XON/XOFF handshaking is implemented to control flow of information to the printer when the printer's input buffer is nearly full. When the buffer is nearly full, the printer will send an XOFF character to the host. When the buffer has sufficient room for additional input, the printer will send an XON character to the host.

Communications with the QUALITAG® Tag Printer controller is accomplished via a Master / Slave arrangement with the Host being the Master and the QUALITAG® Tag Printer the slave. The slave will only transmit in response to a message from the master.

Note: All transmissions are in standard ASCII utilizing the following control characters:

Table 2-2

Char	Definition	Hex	Decimal
SOH	- Start of Header	0x01	1
STX	- Start of Text	0x02	2
ETX	- End of Text	0x03	3
CR	- Carriage Return	0x0D	13
ACK	- Acknowledge	0x06	6
NAK	- Negative Ack	0x15	21

2.2.1 Master Data Format

SOH TYPE STX [DATA TEXT] ETX [BCC] CR

Where,

TYPE - A single printable ASCII character that defines the meaning and the contents of the message [DATA TEXT] field. Message types may be custom defined

for certain applications as required. Standard message types are defined later.

[DATA TEXT] - An optional field which contains the actual data of the transmission. Some message types require no data since the "message" is conveyed by the TYPE character.

BCC - This is an optional field used to improve link reliability by providing fault detection. The BCC is computed by taking an eight bit addition of the TYPE and DATA TEXT characters and transmitting them as a three digit ASCII decimal number in the range 001 to 255. Refer to the example BCC computation later in this document.

2.2.2 Slave Data Format (response)

The slave will respond to the master's transmission in one of two ways depending on whether errors were detected or not.

or

SOH	TYPE	ACK	STX	[DATA TEXT]	ETX	BCC	CR
SOH	TYPE	NAK	STX	[DATA TEXT]	ETX	BCC	CR

If no errors were detected in the reception of the packet, then the first response will be sent back to the master. If any errors were detected (e.g. Parity, Framing, Overrun, BCC, Format, etc.) then the second (NAK) message will be sent. Note that the ACK message does not necessarily imply that the DATA TEXT field itself is correctly presented, just that no communications errors occurred.

The TYPE character will always be the same as the received TYPE.

The DATA TEXT field is optional and depends on the message TYPE. The BCC field will always be present in the response.

2.2.3 Retries

If the host does not receive a response from the QUALITAG® Tag Printer within three seconds, or it receives a NAK response, it should re transmit the entire packet. If, after three retries (four tries total), the host has not received a response the host should declare the link "down".

2.2.4 Standard Message Types

The following is a list of message types that are provided with the marking system.

2.2.4.1 Message Data

1 through 9 - The DATA TEXT contains a text string which is a message to be placed into the Operator Text register in the field specified by the data type. Since the message text is stored in the Operator Text register, a corresponding flag must be placed into the layout text to cause this data to be printed. There is no message type allowing the host to send text to Operator Text registers ten through fifteen. Use message type zero below to send to registers ten through fifteen. The response message contains no data in the DATA TEXT field.

0 (zero) - The DATA TEXT field contains up to fifteen text strings separated by semicolons. These strings correspond to the fifteen Operator Text registers. The response message contains no data in the DATA TEXT field.

2.2.4.2 Assign a Buffer

A - The DATA TEXT field contains an ASCII string which represents a number (from 1 to 5) specifying the buffer number to Assign for printing. The response message contains no data in the DATA TEXT field.

#

- The message buffer to assign.

2.2.4.3 Query for Buffer Assignment

B - This type is used to query the printer to determine which buffer is currently assigned. The response message will contain the currently assigned buffer number in the DATA TEXT field. Use this message to obtain the currently assigned buffer before assigning a new buffer if you will wish to restore the original setting later.

2.2.4.4 Comm Link Check

C - This type is used to check the communications link integrity. No data is required in the message, and no data is returned in the response. An ACK response will indicate that the link is functioning properly.

2.2.4.5 Feed Tag

F - This type is used to have the printer feed one tag. The response message contains no data in the DATA TEXT field.

2.2.4.6 Print a Tag (Go)

G - This type is used to cause the printer to begin printing. The print cycle will only begin if the printer is On-line. The response message contains no data in the DATA TEXT field.

2.2.4.7 Query Printer for Mode

M - This type is used to query the printer for its current mode of operation. The response message contains two numbers separated by commas in the DATA TEXT field.

The first number specifies the printer mode:

- 0 Offline
- 1 Heating
- 2 Online

The second number specifies the printer state:

- 0 Idle
- 1 Retract
- 2 Re-heating
- 3 Move to Print
- 4 Begin Printing
- 5 Printing
- 6 Move to Tear off

- 7 Tear off
- 8 Batch Paused

2.2.4.8 Place Printer On-line

O - This type is used to force the printer to go On-line. The response message contains no data in the DATA TEXT field.

2.2.4.9 Printer Setup Parameters

P - This type is used to send Parameter setup information to the printer. Parameter data is sent down in packets, where each packet uses the P message type. The first character of the DATA TEXT field must be a sub-type that identifies the packet type. Following the packet-type character is the data for the parameters. The response message contains no data in the DATA TEXT field. The message sub-types are as follows:

D - This sub-type is used to instruct the system to store the currently loaded parameters as the default parameters. Once this operation is performed, the current parameters will be used whenever the operator selects "Defaults" in a setup screen. There is no data in the DATA TEXT field of the message or the response.

G - This sub-type is reserved for future use.

H - This sub-type is used to download Host parameters. The DATA TEXT field must contain 13 integers, separated by commas:

#, #, #, #, #, #, #, #, #, #, #, #, #, #

Each parameter represents

- # - Protocol
 - 0 LDL
 - 1 Extended
 - 2 Siemens

- 3 AB PLC 5
- 4 AB SLC 500
- 6 Cegelik ESP
- 7 Programmable
- # - Extended Station Address
- # - Siemens Data Block
- # - Siemens Data Word
- # - Allen Bradley N Register
- # - Allen Bradley Data Word
- # - Cegelik ESP Address
- # - Programmable Start Character
- # - Programmable Offset
- # - Programmable Length
- # - Programmable Terminator
- # - Programmable Character to Ignore
- # - Flags

There will be no data in the DATA TEXT field of the response message.

I - This sub-type is used to download Timing parameters. The DATA TEXT field must contain five floating-point numbers followed by one integer, separated by commas:

#.#,#.#,#.#,#.#,#.#,#

Each parameter represents

- #.# - Take-up Pause Time
- #.# - Take-up Idle Time
- #.# - Nip Open Time
- #.# - Reheat Time
- #.# - Tear-Off Quiet Time
- # - Flags

M - This sub-type indicates that the DATA TEXT field contains the printer configuration parameters. These parameters, separated by commas, must have the following format:

#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#,#.#

Each number represented by #.# are floating point values with the decimal point optional. Each number represented by a single # is an integer value. The numbers represent in order the following values:

- ## - Print Speed
- ## - Film Backup Speed
- ## - Jog Speed
- ## - Feed Speed
- ## - Tag Length
- ## - Tag Width
- ## - Dancer Distance
- ## - Tag Delta Distance
- ## - Reheat Immersion Distance
- ## - Nip Distance
- ## - Tear-off Distance
- ## - Heater Temperature
- ## - Heater Overshoot Percentage
- ## - Microcom Resolution
- # - Microcom Contrast
- # - Flags

O - This sub-type indicates that the DATA TEXT field contains the communications parameters. These parameters, separated by commas, must have the following format:

#, #, #, #

Each number is a single digit in length. The numbers represent the following fields:

- # - Baud Rate
 - 0 19200
 - 1 9600
 - 2 4800
 - 3 2400
 - 4 1200
- # - Data Bits (0=7, 1=8)
- # - Stop Bits (0=1, 1=2)
- # - Parity (0=Even, 1=Odd, 2=None)

P - This sub-type indicates that the characters in the DATA TEXT field are new password strings. Up to 6 strings, separated by commas, can be included in the message. The first string is the Supervisor password and the second string is the Operator Data Entry password. All other passwords are reserved for future use.

R - This sub-type is used to send the User Tables. The DATA TEXT field must contain six strings separated by commas.

SSS , SSS , SSS , SSS , SSS , SSS

The strings represent the following data fields:

sss - User Year Table (10 characters)
sss - User Month Table (12 characters)
sss - User Shift Table (3 characters)
sss - Shift Schedule 1 (HH:MM)
sss - Shift Schedule 2 (HH:MM)
sss - Shift Schedule 3 (HH:MM)

T - This sub-type indicates that the DATA TEXT field contains the stepper motor parameters. These parameters, separated by commas, must have the following format:

#.# , # , # , # , #

Each number represented by *#.#* are floating point values with the decimal point optional. Each number represented by a single *#* is an integer value. The numbers represent in order the following values:

#.# - Motor Resolution
- Minimum Frequency
- Ramp Divider
- Reversing Take-up
- Flags

U - This sub-type indicates that the Units of measure follow in the message. The character in the DATA TEXT field determines the new setting of the units.

0 (ASCII zero) - English Units
1 (ASCII one) - Metric Units

2.2.4.10 Download Record Information

R - This type is used to send Record information for the currently assigned data buffer. This type allows the transmission of more than just printable text strings.

Record data is sent down in packets, where each packet uses the R message type. The first character of the DATA TEXT field must be a sub-type which identifies the packet type. Following the packet type character is the data for the record. The response message contains no data in the DATA TEXT file. The message sub-types are as follows:

Q - This sub-type is used to send the quantity required for the currently assigned message buffer. The first item in the DATA TEXT field is the number of tags to print (qty required) followed by the count. Following the slot number are the rest of the data fields for the slot.

,

- # - The Quantity Required
- # - The Count of tags printed

S - This sub-type is used to send the serial number and its associated upper and lower range values. The DATA TEXT field must contain four integer values separated by commas. Each number can be from 1 to 9 digits in length.

, # , # ,

- # - The serial number
- # - The lower limit value
- # - The upper limit value
- # - The increment value

2.2.4.11 Query for Status

S - This type is used to query the printer for its current status. There is no DATA TEXT field for this type. The ACK response message from the printer will contain a DATA TEXT field. This field will contain four numbers separated by commas. These numbers represent the states of the four I/O ports of the printer. The numbers must be converted into binary, where each bit will represent the state of an input or output point.

#, #, #, #

- # - The value of the current state of port 1
- # - The value of the current state of port 2
- # - The value of the current state of port 3
- # - The value of the current state of port 4

Field 1 - Port 1

- | | | |
|-----|-----------|------------|
| Bit | 0 (lsb) - | PRINT PB |
| | 1 - | ERROR PB |
| | 2 - | ONLINE PB |
| | 3 - | JOG FWD PB |
| | 4 - | JOG REV PB |
| | 5 - | |
| | 6 - | HEATER |
| | 7 - | DOOR SW |

Field 2 - Port 2

- | | | |
|-----|-----------|------------|
| Bit | 0 (lsb) - | PRINT LT |
| | 1 - | ERROR LT |
| | 2 - | ONLINE LT |
| | 3 - | JOG FWD LT |
| | 4 - | JOG REV LT |
| | 5 - | |
| | 6 - | |
| | 7 - | SONALERT |

Field 3 - Port 3

- | | | |
|-----|-----------|--|
| Bit | 0 (lsb) - | |
| | 1 - | |

2	-	
3	-	TEAROFF SENSOR
4	-	MC PRINTING
5	-	MC ONLINE
6	-	MC ERROR
7	-	MC POWER

Field 4 - Port 4

Bit	0 (lsb)	-	MC ONLINE SW
	1	-	MC LINEFEED SW
	2	-	MC PRINT SW
	3	-	NIP SOL
	4	-	TUP MOTOR
	5	-	TENSION MOTOR
	6	-	
	7	-	

2.2.4.12 Set Time and Date

T - This type is used to set the time and date of the printer's built-in clock/calendar. The DATA TEXT field for this message must contain the time and date separated by commas in the following format:

HH:MM,MM/DD/YY

HH:MM - The current time of day in 24 hour format
MM/DD/YY - The current date.

There is no data in the DATA TEXT field of the response message.

2.2.5 Example BCC Computation

The following example is a typical transmission including the BCC.

To download the character string 'ABC123' to line 1 of the currently assigned message buffer, send the following message.

SOH 1 STX ABC123 ETX 141 CR

where '1' is the message TYPE and 141 is the BCC. The BCC is computed as follows (note all math shown in hexadecimal):

- 1) BCC = Message TYPE character + DATA TEXT characters.

	031H	1	- Message Type
	041H	A	}
	042H	B	}
	043H	C	} message Text
	031H	1	}
	032H	2	}
+	033H	3	}
<hr/>			
	18DH		

2) We are only interested in the lower eight bits of the sum, so we discard the first digit and keep the lower two. This results in a BCC of 8DH. Note that when performing the summation in an eight bit variable (e.g. unsigned char in 'C') that the most significant bits are automatically truncated. If the master's programming language is incapable of doing eight bit addition, then the same result can be obtained by taking the MODULO 256 operation on a sixteen bit sum. The MODULO operation is division where the Remainder is kept and the Quotient is discarded.

3) Once the BCC value is obtained, it must be placed into the message packet after the ETX character. The BCC must be transmitted in its decimal ASCII form. The decimal equivalent of the hexadecimal value 8DH is 141 decimal. Converting the value 141 into three ASCII characters yields 031H, 034H and 031H. These three characters become the transmitted BCC.

The actual data transmitted (in hex) by the host for this message is:

001H 031H 002H 041H 042H 043H 031H
032H 033H 003H 031H 034H 031H 00DH

4) If the printer receives the message correctly, it will respond with the following message:

001H 031H 006H 002H 003H 030H 034H 039H 00DH

which equates to the following ASCII message:

SOH 1 ACK STX ETX 049 CR

Note that if the printer detected an error in receiving the message from the host it would respond with a NAK (015H) character in place of the ACK. The BCC would be unaffected by this since the ACK/NAK is not included in the BCC computation.

2.3 SIEMENS 3964R

The Siemens 3964R protocol is a full-duplex peer-to-peer protocol used by Seimens Programmable Logic Controllers. The QUALITAG® printer can emulate a PLC CPU525 so that it can communicate with other Siemens PLC devices.

To communicate with the QUALITAG® printer in the Siemens 3964R protocol, you must first setup the Data Block and Data Word values. These parameters combine to specify a memory location within the printer where the host will be writing data. Any write to this memory address will be interpreted by the printer as a download of Operator Text register values. The following format must be followed:

#,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS

The initial number is the desired layout buffer and must range from one to five. Following the buffer number and separated by semicolons are the fifteen Operator Text fields.

Note that the printer *will not* automatically begin a print cycle upon receipt of this message.

For details regarding the Siemens 3964R protocol, please consult the Siemens company.

2.4 ALLEN BRADLEY DH (DF1)

The Allen Bradley DF1 protocol is a full-duplex peer-to-peer protocol used by Allen Bradley Programmable Logic Controllers. The QUALITAG® printer can

emulate the DF1 protocol for both PLC5 and SLC500 processors so that it can communicate with other Allen Bradley PLC devices.

To communicate with the QUALITAG® printer in the DF1 protocol, you must first setup the N Register and Data Word values. These parameters combine to specify a memory location within the printer where the host will be writing data. Any write to this memory address will be interpreted by the printer as a download of Operator Text register values. The following format must be followed:

#,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS

The initial number is the desired layout buffer and must range from one to five. Following the buffer number and separated by semicolons are the fifteen Operator Text fields.

Note that the printer *will not* automatically begin a print cycle upon receipt of this message.

For details regarding the DF1 protocol, please consult the Allen Bradley company.

2.5 CEGELIK GEM80

The Cegelik GEM80 protocol is a half-duplex master-slave protocol used by Cegelik Programmable Logic Controllers. The QUALITAG® printer can emulate the GEM80 protocol for Cegelik processors so that it can communicate with other Cegelik PLC devices.

To communicate with the QUALITAG® printer in the GEM80 protocol, you must first setup the Address value. This parameter specifies a memory location within the printer where the host will be writing data. Any write to this memory address will be interpreted by the printer as a download of Operator Text register values. The following format must be followed:

#,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS

The initial number is the desired layout buffer and must range from one to five. Following the buffer number and separated by semicolons are the fifteen Operator Text fields.

Note that the printer *will not* automatically begin a print cycle upon receipt of this message.

For details regarding the GEM80 protocol, please consult the Cegelik company.

2.6 PROGRAMMABLE PROTOCOL

The programmable protocol provides a mechanism for communicating with the QUALITAG® printer using an unfamiliar protocol. By configuring the various programmable protocol parameters, a wide range of devices can communicate with the printer without special software development.

Most communications protocols begin with a unique character that is called the Start Character. This ASCII code will not appear anywhere else in the transmission and uniquely identifies the beginning of a download sequence. This code value must be placed into the Start Character field of the programmable protocol setup screen. If no unique starting character is available in the protocol, then the Start Character parameter must be set to zero.

Often, a message transmission contains some type of header that helps to identify the message. When using programmable protocol, it is required that this header be skipped so that the actual data can be extracted. To accommodate this need, the Programmable Offset parameter is provided. Enter a number that is the number of characters *after* the Start Character where the actual data begins. If there is not header information to be skipped, enter one in the Offset parameter to begin collecting data immediately after the Start Character.

Once data collection begins, the printer must know how many characters to accumulate. The Programmable Length parameter tells the printer how many characters to accumulate. Note that this places a requirement on the host to always send the same number of characters.

Most data communications protocols have a unique character that terminates the transmission. The decimal value of this character must be entered into the Terminating Character parameter. If a protocol does not provide a terminator, then this field can be set to zero and the printer will begin waiting for another transmission immediately after receiving the correct number of data characters.

Sometimes a communications protocol will have a character that causes a problem by interfering with other aspects of the protocol. For example, a transmission will often end with a Carriage Return / Line Feed pair. To strip off these characters, you can enter the decimal value of the character code into the Character to Ignore parameter. In the example we would enter 10 so that the Line Feed (ASCII value = 10) would be ignored.

Note that the printer will not respond to the transmission in any way.

The data received from the transmission will be interpreted to be the buffer assignment followed by fifteen strings to be placed into the Operator Text registers. The following format must be followed:

`#,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS,SSS`

The initial number is the desired layout buffer and must range from one to five. Following the buffer number and separated by semicolons are the fifteen Operator Text fields.

Note that the printer *will* automatically begin a print cycle upon receipt of this message.

Chapter 3

3. SAMPLE TAG LAYOUT

This appendix contains a detailed description of a sample tag layout to aid in designing a tag.

Refer to Figure 3-1 below for an example of the printed tag.



Figure 3-1

The following layout and text fields are used to create the tag of Figure 3-1. Note that the layout information presented next does not include the LDL codes required for download. The layout is shown as it would be manually entered via the operator terminal.

3.1 LAYOUT FIELDS

The layout fields shown below, with the exception of the PDF417 code, each reference a text field from Section 3-2. The PDF417 code gets its information from the specification shown in Section 3-3.

1,240,215,1,46,1	// PDF 417
1,190,220,20,1,8,3	// TAG NUMBER HUMAN
2,480,195,20,1,8,3,,1,2	// QUALITAG
3,60,825,50,1,4,,,,2,4	// HI RES
4,120,95,20,16,,3,,100,4	// 3 OF 9 BARCODE
5,60,785,50,1,4,,,,2,4	// ALL BARCODES
6,60,745,50,1,4,,,,2,4	// LOW COST
7,60,705,50,1,4,,,,2,4	// PICKLE RESISTANT
8,60,665,50,1,4,,,,2,4	// QUIET
9,60,625,50,1,4,,,,2,4	// 550 DEG OR HIGHER
10,20,815,50,1,8,,,,,1,1	// ASTERISKS
10,20,775,50,1,8,,,,,1,1	
10,20,735,50,1,8,,,,,1,1	
10,20,695,50,1,8,,,,,1,1	
10,20,655,50,1,8,,,,,1,1	
10,20,615,50,1,8,,,,,1,1	
11,455,455,50,1,6,3,,1,1	// TRADEMARK SYMBOL
12,120,650,50,1,4,,,,1,1	// DEGREE SYMBOL
13,545,195,50,1,4,3,,2,2	// INFOSIGHT AND PHONE

3.2 TEXT STRINGS

There are thirteen text strings associated with this layout. Some strings are referenced more than once in the layout fields. Text strings are referred to by their position in the list. The first string is numbered 1 and so on.

2112
QUALITAG
HIGH RESOLUTION (200 DPI)
12345
ALL BARCODES
LOW COST
PICKLE RESISTANT
QUIET
550 F OR HIGHER
*
TM

o
InfoSight 888-642-3600

3.3 PDF417 BAR CODE DATA

```
:InfoSight Corporation           // Must begin with colon
20700 US RT 23
Chillicothe, Ohio USA 45601
888-642-3600^]                 // Note ^] Escape Sequence
90                               // Number of rows
30                               // Number of columns
90                               // Rotation: 0,90,180,270 only
100                             // Error correction %
6                               // Level of error correction
2:3                             // Aspect ratio
```

The PDF417 code is a high-density two-dimension code that can encrypt large amounts of data in a small area. The text to be encoded begins with a colon character and must end with the ^] sequence. The text may contain carriage returns and other escape sequences.

The format field associated with the PDF417 code must specify a TCI of 46 and a CC of 1. The text string associated with this format field needs to contain only one printable character. This character is used only as a placeholder and is not printed.