TLS PC Link™

THERMAL LABELING SYSTEM

Programmer's Guide

www.tls2200.com

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Introduction

Scope

The ***TLS PC Link^{TM} Programmer's Guide*** is intended for technical personnel who have basic programming knowledge and intend to create their own programs to send controls down to the printer for printing labels (design their own label-creation software). A programming language allows the printer to be integrated with a piece of equipment such as a portable data terminal (PDT), scanner, wire tester, electrical meter, or medical device. Operators without programming experience may prefer to use a label-creation software package such as LabelMark^{TM} (included with every printer) or CODESOFT^{TM}. This guide offers detailed information on the Brady Programming Language (based off of the Datamax programming Language (DPL)), specifically regarding the writing, loading, and storing of programs for the control and production of label formats (designs) using the TLS PC Link Printer. The Brady Programming Language (BPL) provides a built-in communication language with every printer.

Note: The TLS PC Link Printer is referred to as "the printer" in this programmer's guide.

Be sure to check the Brady web site www.tls2200.com for the latest updates.

Programming Overview

Basic print language overview

The TLS PC Link Printer control language is based on Datamax DPL, revision D2.

The print language can be implemented as completely 7-bit ASCII characters. The ASCII table is shown in *Appendix C: ASCII Control Chart*. All commands and responses are sent as printable ASCII characters with a few exceptions:

1. Some control codes (non-printable ASCII characters) are sent to inform the printer that a command is to be received or terminated. Refer to table of *Control Codes* on page 3.

2. 8-bit binary image files can be sent. These include BMP and PCX files. Also, there is special download format based on Datamax's image load file and Windows' print drivers. This file can be sent as an 8-bit binary file or a 7-bit ASCII hex file.

3. International characters and symbols are sent as extended-ASCII or 8-bit characters.

Throughout the examples in the book, all characters are ASCII unless otherwise noted. Control characters are shown by their symbol in brackets. For example, the SOH control character is shown as <SOH>. The brackets are not symbols to be sent. Only the decimal value of 1 is sent. All hex values are shown with a preceding 0x. For example, 3D hex is shown as 0x3D. Whenever a value is sent as ASCII Hex, this means the hex value is sent as two ASCII characters. For example, 0x3D sent as ASCII Hex will send two ASCII characters '3' and 'D'.

Command Types

There are three main command types used to create labels and control the printer. These are:

Command Type	Description
Immediate Commands	Interrupts the printer to perform a particular action. The printer then resumes normal operations.
System-Level Commands	Performed in the sequence that they are received and generally control the printer's hardware. In addition, system-level commands allow memory

Command Type	Description
	configuration and image downloading.
Label-Formatting Commands	Used to control the position of text and images. The label format termination commands can selectively store and print the label and end the formatting process.

Control Codes

Control codes are used to inform the printer that a command is to be received or terminated. The control codes used are:

ASCII Char	Decimal Value	HEX Value	Printer Dump	Control Code for
SOH	1	0x01	^A	Start of Immediate Commands
STX	2	0x02	^B	Start of System Commands
CR	13	0x0D	^M	Termination of many commands

Power up Conditions

On power up, the unit is in the following modes:

- System Level Commands are accepted

- Immediate Commands are turned off

- Feedback Characters are turned off

The unit will never accept System Level Commands and Label Formatting Commands at the same time. When Label Formatting mode is entered, System Level Commands are disabled. After Label Formatting Mode is exited, System Level Commands can be received again.

Immediate Commands can be turned on and off. When turned on, they can be received in both Label Formatting Mode and System Level Mode. They are turned off with an Immediate Command, but turned back on with a System Level command.

Feedback Characters can be turned on and off with System Level Commands. When turned on, all System Level and Label Formatting Commands will reply

with a feedback character denoting success or an error. Feedback characters are defined in Appendix A. Each command lists the possible feedback characters. Immediate Commands never send these feedback characters. They will send a response if the Immediate Command requires one, such as Read Status String.

Generating and Printing a Label With the TLS PC Link Programming Language

The printer is capable of storing only one label format at a time. A label format specifies what is to be placed on the label. It specifies the text, fonts, barcodes, or image files to use. Some barcodes and fonts are resident in the printer. Fonts and barcodes that are not resident in the printer can only be printed by downloading a bitmap image file of the desired label or portion of the label containing these fonts and barcodes.

It is possible to store multiple image files in the unit. These image files will be lost if the unit is powered down. These files are stored with an 8 character name. When a label format is created, it can contain any number of images. These are specified in the label format by the image file name. The actual image file is not part of the label format. Therefore, an image only needs to be downloaded once, but can be used in multiple label formats.

The basic procedure to create and print a label follows:

1. Power up printer.

2. Enable feedback characters if they are to be used.

3. Download any image files.

4. Enter Label Formatting Mode.

5. Enter all label fields. Each field contains the following:

    field type: text, barcode, or image
    font size or barcode type
    location within label to place the object
    the text or file name of the object

6. Exit Label Formatting Mode.

7. Set print quantity.

8. Print label.

Each time label formatting mode is entered, it clears out the previous label format. Therefore, Label Formatting Mode cannot be entered and exited multiple times while creating the same label. The whole label must be created in one entry.

Determining Printer Status

There are two methods to determine the printer status:

- Feedback Characters
- Immediate Command to Request Status

If feedback characters are used, a response is given after each System Level or Label Formatting Command is completed. If an error occurs on a command, it is known immediately by the response. When a print command is sent, a print complete character is sent by the printer when the print is done. If an error occurred during the print such as being out of labels, the feedback character contains this error.

If feedback characters are not used, the status can be determined by requesting it with an Immediate Command. After a print command is sent, the printer can be queried with a Send ASCII Status String Command. This command will tell if the printer is busy printing or if an error has occurred. If using this method, it is important to have immediate commands enabled. They must be enabled before a print command is sent, or they will not be enabled until after the print job is complete.

COM Port Settings

In order to establish communication between the TLS PC Link printer and your PC, you must have the correct COM port settings:

Setting	Value
BPS	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	Hardware

Immediate Commands <SOH>

When the printer receives an **immediate command** it will stop whatever it is doing and perform that command. After the command is complete, the printer will resume the operation it interrupted. Immediate commands are turned off on power up, and can be turned on with the System-Level Command "Enable SOH Commands (STX H)". When Immediate Commands are enabled, they may be issued at any time. Because of this, it is necessary to disable immediate commands whenever sending image files that contain 8-bit data. The image data in these files may contain an immediate command start code that will be misinterpreted. These can be disabled using immediate command <SOH> D. Immediate commands consist of:

1. Attention Character
2. Command Character
3. Parameters (if any)

Summary of Immediate Commands

The following immediate commands are discussed in this section. Refer to the page number listed to the right of each command for more information and a sample command.

Immediate Command	Page
Reset (SOH #)	7
Send ASCII Status String (SOH A)	8
Toggle Pause (SOH B)	9
Cancel (SOH C)	10
Disable SOH (SOH D)	10
Send Batch Quantity (SOH E)	10

Reset (SOH #)

This command resets the printer. Resetting the printer returns all settings to default and clears both the input and print buffers. The command also clears the internal RAM memory.

Sample:

<SOH>#

The printer will now reset.

Printer Response: `Version 01.01 12/21/00<CR>`

The printer always sends out the Version on power up.

Send ASCII Status String (SOH A)

This command allows the host computer to check the printer for its current status. The printer returns a string of eight characters to the host computer, followed by a carriage return. Each character is either `Y` or `N` indicating whether the associated condition is true or false (`Y` = true). Byte 1 is the first character transmitted by the printer.

Error statuses relating to printer hardware conditions are only updated when performing a print or feed command. For example, this command does not test to see if the printhead is open, it only tests if it was open on the last print or feed command.

Sample:

<SOH>A

Printer Response: `abcdefgh<CR>`

Byte	Character Y/N	Condition
1	a = Y/N	Y = Printhead open
2	b = Y/N	Y = Out of Labels
3	c = Y/N	Y = Out of Ribbon
4	d = Y/N	Y = Printing Batch
5	e = Y/N	Y = Busy Printing
6	f = Y/N	Y = Printer Paused
7	g = Y/N	Y = Touch Cell Error
8	h = Y/N	Y = Low Battery

Toggle Pause (SOH B)

This command toggles the printer's paused state between on and off.

Sample:

   <SOH>B

This command will illuminate the pause/stop light and suspend printing. Printing will not be suspended in the middle of a label. If a label is being printed, the printer will finish the label and then pause.

Printing will resume when the SOH B command is sent to the printer again.

Cancel (SOH C)

The stop/cancel function will immediately stop the printer and cancel the current print job. If currently in the middle of printing a label, it will stop printing and feed the label to the cut position.

Sample:

   <SOH>C

Disable SOH (SOH D)

This command causes the printer to ignore immediate commands (^A). The SOH shutdown command must be sent before loading graphic images that are sent using 8-bit data. These image files may contain data sequences that could be interpreted as an immediate command.

Sample:

   <SOH>D

After the SOH shutdown command is sent, immediate commands can be turned back on by sending the system command <STX> H or by resetting the printer. If feedback characters are enabled, a code will be sent back to the host when the SOH commands are enabled. If feedback characters are not used, it is good practice to check batch quantities <SOH>E to verify that the SOH commands are working. This test should not occur in label formatting mode. If it is sent during label formatting mode, and SOH commands are not yet enabled, this command will be misinterpreted.

Send Batch Quantity (SOH E)

This command causes the printer to send back a 4-digit number indicating the quantity of labels left to print in the current batch, followed by a carriage return. Communications latency may cause this value to be higher than actual on some printers.

Sample:

   <SOH>E

   Printer Response: 0000<CR>

System-Level Commands <STX>

The most commonly used commands are the **system-level commands**. These commands are used to load and store graphic information and to control the printer. System-level commands may be used before or after immediate commands but cannot be issued among label-formatting commands. System-level commands can be used to override default parameter values. System commands consist of:

1. Attention Character
2. Command Character
3. Parameters (if any).

Summary of System Level Commands

The following system level commands are discussed in this section. Refer to the page number listed to the right of each command for more information and a sample command.

System Level Command	Page
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Enable Feedback Characters (STX a)	12
Enter Heat Setting Offset (STX b)	13
Disable Feeding to Cut Position after Print (STX C)	13
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System Level Command	Page
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Disable Feedback Characters (STX A)

This command disables the feedback ASCII characters.

Sample:

> <STX>A

No feedback response

Enable Feedback Characters (STX a)

This command enables the feedback ASCII characters. These feedback characters contain valuable information about system errors, printing completion, and enabling of immediate commands. These characters are listed in Appendix A. The printer is initialized with feedback characters turned off. When feedback characters are enabled, all commands will have a response associated with them. When there are no errors, the response will be '0'. There is no response to the <STX> a command.

Sample:

> <STX>a

No feedback response

Enter Heat Setting Offset (STX b)

This command changes the "on time" of dots on the printhead. The printer powers up with a default setting determined from the media type installed. Varying this number changes the amount of time the dots are "turned on" which in turn changes the amount of heat transferred from the printhead to the media. The range of valid settings is -5 to +5 that corresponds to an offset of +/- 500 microseconds. This command is helpful when the printer is used with several different media types. When a label format is sent to the printer and the media requires more or less heat than the amount set by the default temperature, the host device can send a command before or after the format to correct the heat setting for the media being used.

<STX>bsnn

Where:

     s   '+' or '-' sign, can be either for setting of 0

    nn   two digit heat offset value (00-05)

Sample:
    <STX>b+05

The above sample sets the printer for a heat value of +5.

Feedback possibilities: 0,1,2

Disable Feeding to Cut Position after Print (STX C)

This command will stop the printer from feeding to the cut position after printing. This command should only be used in conjunction with STX c. This is used to send multiple print commands without feeding to the cut position after each print. The STX c command is sent at the end to feed to the cut position and re-enable feeding to the cut position for all future print commands.

<STX>C

Feedback possibilities (only sent if feedback characters are turned on): 0,1, or 2

Enable Feeding to Cut Position after Print and Perform a Feed to Cut (STX c)

This command will feed the printer to the cut position. It will also enable feeding to the cut position after all future print commands. It is to be used in conjunction with STX C.

<STX>c

Feedback possibilities (only sent if feedback characters are turned on): 1,2,6,7,8,A,B,E,F,J

Set Quantity for Stored Label (STX E)

This command sets the number of labels to print for the label format currently stored in the print buffer. The most recent label sent to the printer will automatically remain stored in the buffer until the printer is reset, turned off, or a batch is canceled. This command is also used in conjunction with the STX G command, which will print the labels.

<STX>Ennnn

Where:

    nnnn-   a four-digit quantity, including leading zeros

Sample:

    <STX>E0025

    <STX>G

The above sample will print 25 labels of the current label format in memory.

Feedback possibilities: 0,1,2

Form Feed (STX F)

This command feeds one label to the top of form.

Sample:

    `<STX>F`

Feedback possibilities: 0,1,2,6,7,8,A,B,E,F

Set Form Stop Position (STX f)

This command is used to adjust the cutter stop position. When a label is printed, the printer will feed the label to the cut position. This command adjusts the stop position to allow for desired cutting alignment. When the next label format is sent to the printer, it will automatically backfeed to the start-of-print position. If a quantity of more than one label is to be printed (See Set Quantity for Stored Label (STX E), the printer will operate without feeding to the cut position between labels. It will feed to the cut position after the last label.

`<STX>fsnn`

Where:

    s-   sign of offset, '+' or '-'

    nn-   two digit value of offset

The valid range is -08 to +08.

Sample:

    `<STX>f+08`

The above sample adjusts the stop position 8 pixels from default. The '+' means that the paper will feed out 8 pixels further.

Feedback possibilities: 0,1,2,6,7,8,A,B,E,F

Print Last Label Format (STX G)

This command prints a previously formatted label. This command is used when there is a label format in the buffer. The STX E command is used to enter the quantity. (If the STX E command is not used only one label will print.)

Sample:

    <STX>G

Feedback possibilities: 1,2,6,7,8,A,B,C,D,E,F,G,H

Enable SOH Commands (STX H)

This command is used to enable Immediate Commands on power-up or to re-enable them if they have been turned off for downloading image data. If feedback characters are enabled, a code will be sent out from the printer to inform the host that Immediate Commands are again enabled.

Sample:

    <SOH>D

    <STX> IBpTest <CR> data...data

    <STX>H

The sample above will disable SOH commands, download a PCX image, then re-enable SOH commands.

Feedback possibilities: 1,2,5

Input Image Data (STX I)

This command precedes the download of image data from the host to the printer. The data that immediately follows the command string will be image data. If Immediate Commands have been enabled and if any of the 8-bit input formats are to be used, it is necessary to disable the immediate level command interpreter by executing a SOH D command before issuing this command. To print an image, select font type Y, (see '**Generating Label Formats**'). Data sent to this field is also used as the name of the defined graphic image.

<STX>*lbfnnnnnnn*n<CR>data

Where:

b-   Data Type

b Value	Image Data Value Range
A	ASCII Characters 0-9, A-F, (7bit)
B	00-FF, (8 bit)

f-Format Designation, B,b, P, p, U

Designator	Format
B	BMP 8-bit format (image will be flipped), B&W
b	BMP 8-bit format (save image as received), B&W
P	PCX 8-bit format (image will be flipped), B&W
p	PCX 8-bit format (save image as received), B&W
U	generic image load file (can be sent as 7- or 8-bit)

Refer to *Appendix B: Image File Definitions.*

*nnnnnnn*n-Up to 8 characters used as an image name, must be terminated by <CR>.

Data—Image data

Sample:

    <SOH>D

    <STX> IBpTest <CR> data...data

    <STX>H

The above sample instructs the printer to receive an 8-bit .PCX image sent by 8-bit data, named 'Test'. It disables immediate commands first, then re-enables them after.

Feedback possibilities: 0,1,2,3,4

Extended System Commands (STX K)

This command allows for expansion of the DPL-system commands.

Enter Label Formatting Command (STX L)

This command switches the printer to the label-formatting command input mode. Once in this mode, the printer expects to receive field record definition and label-formatting commands until command E or X is received. System-level commands will be ignored until the label formatting is terminated with E or X. Immediate commands will be accepted, but if immediate commands are disabled, they could get misinterpreted as a label format command. See label-formatting commands for additional information.

Sample:

    <STX>L

Feedback possibilities: 0,1,2

Set Printer to Metric (STX m)

This command sets the printer to measure in metric. When this command is sent, all measurements will be interpreted as metric values in terms of mm/10, (e.g., <STX>M0500 will be interpreted as 50.0mm.). See <STX>n.

Sample:

    <STX>m

Default setting: Inches

Feedback possibilities: 0,1,2

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Set Printer to Inches (STX n)

This command sets the printer to interpret measurements in inches in terms of in./100, (e.g., <STX>M0500 will be interpreted as 5.00in.). See STX m.

Sample:

    <STX>n

Default setting: Inches

Feedback possibilities: 0,1,2

Set Start of Print Offset (STX O)

This command sets the point where printing starts, relative to the top-of-form position. Top-of-form is the point where a label edge is detected by the label edge sensor. The printer will feed from the top-of-form to the offset point specified in this command, and begin printing there. This offset value is independent of the STX f, set form stop position command.

<STX>Osnn

Where:

  s-   sign of offset, '+' or '-'

  nn-   two digit value of offset

The valid range is -05 to +99.

Sample:

    <STX>O+05

The above sample sets a start of print position of 5 pixels after the default position.

Feedback possibilities: 0,1,2

Horizontal Alignment Offset (STX o)

This command sets the point where printing starts relative to the left edge of the label. This is an offset value from the default position.

\<STX\>osnn

Where:

  s-   sign of offset, '+' or '-'

  nn-   two digit value of offset

The valid range is -05 to +99.

Feedback possibilities: 0,1,2

Set Continuous Label Length (STX P)

This command will set the label length for continuous material. The label length can be set from 0.00 inches to 6.00 inches (0.0mm to 152.4mm). This command is useful for terminal block labels. It can be used with \<STX\>S to generate the correct spacing between the terminals. If the length is set to zero, the printer will be in banner mode. In banner mode, the label length is determined by the amount of data on the label. The printer will print until there is no more data up to 6 inches.

\<STX\>Pnnnn

Where:

  nnnn-   a four-digit label length in in/100 or mm/10

Sample:

\<STX\>L

190000900000000TEST1\<CR\>

190000901000000TEST2\<CR\>

X\<CR\>

\<STX\>P0100

\<STX\>G

\<STX\>P0000

\<STX\>G

This sample creates a label format with "TEST1" placed at the upper left corner of the label, and "TEST2" placed 1" below this. The first <STX>P sets the paper length to 1". Thus, the following <STX>G will print this label only 1" long and only "TEST1" will be printed. The second <STX>P command sets the paper length to 0", thus putting it in banner mode. The following <STX>G command will print both text strings and stop printing immediately after "TEST2".

Feedback Possibilities: 0,1,2

Clear All Memory (STX Q)

This command instructs the printer to clear all images from memory.

Sample:

   <STX>Q

Feedback possibilities: 0,1,2

Set Continuous Label Spacing (STX S)

This command will set the label spacing for continuous material. The spacing can be set down to zero. This command can be used with <STX>P to generate desired label lengths and spacing for continuous material. If the label length is set to zero using <STX>P (banner mode), this setting is ignored. A 1/4" spacing is always used in banner mode. When the label length is set to non-zero, this spacing is only used when printing batches, or in the special case where the feed-to-cut function is disabled (<STX>C). See Examples section for an extensive terminal block example.

<STX>Snnnn

Where:

 nnnn-   a four-digit label length in in/100 or mm/10

Sample:

<STX>L

190000900000000TEST01<CR>

+001<CR>

X<CR>

<STX>P0050

<STX>S0000

<STX>E0003

<STX>G

This example will print 3 serialized labels: "TEST01", "TEST02", and "TEST03". The label length is 0.5" and the spacing between labels is set to zero.

Feedback Possibilities: 0,1,2

Printhead Dot Pattern Test Label (STX T)

This command instructs the printer to print a dot pattern test label. To view the full test pattern use the media as wide as the print width and at least 1.5-in. (38.1-mm) long.

Sending this command will clear the current label format that is stored.

Sample:

    <STX>T

Feedback possibilities: 1,2,6,7,8,A,B,C,D,E,F,G

Send Binary Touch Cell Data (STX t)

This command instructs the printer to send the touch cell data from the media as 32 bytes of binary (8-bit) data. A few of these bytes contain useful information about the print media as follows:

Byte 2,3:   Label quantity remaining as a 16-bit value

Byte 6:   Bit 0 is set for notched labels and clear for continuous

Byte 7,8:   X offset in pixels as a 16-bit value

Byte 9,10:   Y offset in pixels as a 16-bit value

Byte 11,12:   Width of label in pixels as a 16-bit value

Byte 13,14:   Length of label in pixels as a 16-bit value

Sample:

    <STX>t

Response:

    0x01 0x00 0x78 0x00 0x00 0x1B 0x00 0x00 0x00 0x00 0x01 0x2B 0x01 0x2B 0x11 0xC6

    0x32 0x00 0x02 0x00 0x01 0x01 0x00 0x00 0x02 0x94 0x00 0x00 0x00 0x00 0x00 0xF1

This sample read the data from a PTL-32-423 label which is 1.5"x1.5". This tells

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the following:

Byte 2,3:   0x0078 means there are 0x78 or 120 labels remaining.

Byte 6:   0x1B has bit 0 equal to '1', therefore this is notched material

Byte 7,8:   0x0000 means there is no X offset

Byte 9,10:   0x0000 means there is no Y offset

Byte 11,12: 0x012B means this label is 0x12B or 299 pixels wide

Byte 13,14: 0x012B means this label is 0x12B or 299 pixels long

Feedback Possibilities: 0,1,2,E

Label Format Field Replacement (STX U)

This command places new label data into format fields. Format fields are used to build a label. The new data string must equal the original string length and contain valid data. To easily keep track of fields put all of the fields to be updated with the command at the beginning of the label format. A maximum of 99 format fields can be updated. Fields are numbered consecutively 01 to 99 in the order in which they are received.

<STX>Unnss..s<CR>

Where:

nn-	is the format field number, 2 digits
ss..-	is the new string data followed by a <CR>

Sample:

> <STX>L
>
> 190000501000100data field1<CR>
>
> 190000501100110data field2<CR>
>
> 190000501200120data field 3<CR>
>
> X<CR>
>
> <STX>E0001
>
> <STX>G
>
> <STX>U01New data F1<CR>
>
> <STX>U02New data F2<CR>
>
> <STX>E0002
>
> <STX>G

The sample above results in three printed labels, the first is formatted with the commands between <STX>L and X<CR>. The next two labels print with the replacement data contained in the <STX>U commands, (see <STX>E and <STX>G).

Feedback possibilities: 0,1,2,I

Send ASCII Touch Cell Data (STX V)

This command causes the printer to send back the touch cell data from the media in a user-readable 7-bit ASCII Hex format. For interpretation of this data, see <STX>t.

Sample:

    <STX>V

Response:

    01007800001B00000000012B012B11C6320002000101000002940000000000F1

This sample reads the same data as the sample in <STX>t.

Feedback Possibilities: 0,1,2,E

Printer's Firmware Version Information (STX v)

This command causes the printer to respond by sending a version string. The version may be different from printer to printer.

Sample:

    <STX>v

Printer Response: `Version 01.01 12/21/00<CR>`

Feedback possibilities: 0,1,2

Request Memory Information (STX W)

This command requests a directory listing of images in the printer memory. It will list all images stored and the remaining memory available.

    <STX>Wa

Where:

   a-   File Type Identification Code

             'G' for Graphic (Image) File Type

Sample:

    <STX>WG

Printer Response:

    LOGO1<CR>

LOGO2<CR>

MEM 8C30<CR>

This shows that there are two images stored called "LOGO1" and "LOGO2". The remaining memory is in hex. There are 0x8C30 bytes remaining (35,888 decimal).

Notes on Image Storage:

Image Files are not stored directly. Excess header information is removed. Following are typical storage sizes for each file type:

File Type B,b:

BMP Files are stored with a reduced header size. Typical size = BMP File size - 45 bytes.

File Type P,p:

PCX Files are stored with a reduced header size. Typical size = PCX File Size - 111 bytes.

File Type U:

These Files add a header. Typical size = Data Size + 16 bytes.

Feedback possibilities: 0,1,2

Delete File (STX x)

This command removes a specific file from memory. The file name is removed from the file directory and thus cannot be accessed. The actual storage space occupied by the file is not released. The pack command can be issued to reclaim all deleted file storage space, (see STX z).

Sample:

<STX>xtnn...n<CR>

Where:

	x	ASCII x (0x78)
t		the file type identification code
		'G' for Graphic (Image) file type
nn...n		the file name to delete. Up to 8 characters for images

Feedback possibilities: 0,1,2

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Pack Memory (STX z)

This command causes the printer to reclaim all storage space associated with all deleted files.

Sample:

    <STX>z

Feedback possibilities: 0,1,2

Extended-System Commands <STX>K

Command Character	Command

None Implemented

Label-Formatting Commands

An <STX>L command switches the printer from the system level to the label-formatting command processor. All commands after <STX>L are interpreted as label-formatting commands. These commands define the format of the label to be printed.

Label Formatting Command	Page
Sets format attribute (A)	30
Sets column offset amount (C)	31
Terminates label formatting mode and print label (E)	31
Sets row offset amount (R)	31
Terminates label formatting mode (X)	32
+ (-) Make Last Field Entered Increment (Decrement) Numeric	33
> (<) Make Last Field Entered Increment (Decrement) Alphanumeric	34
Sets count by amount (^)	35

Set Format Attribute (A)

This command specifies the type of format operation and remains in effect until another format command is specified or another label format has begun (<STX>L). Each label format defaults to attribute 1 - XOR.

An

Where:

n-	is either a 1, 2, 3 or 5
1 = XOR Mode:	This is the default mode regions, where text strings, images, or barcodes intersect will not be printed, (an odd number of overlapping objects will print).
2 = Transparent Mode:	This optional mode allows the intersection of text strings, images, and barcodes to print. This allows the user to print fields on top of one another. (i.e., the letter I printed on top of a dash would combine to show a plus).
3 = Opaque Mode:	Interacting text is obliterated by the text formatted last, each character cell is treated as opaque.
5 = Inverse Mode:	This mode allows inverse (white on black) printing. A proportionally sized border and background are printed as in a photographic negative.

Sample:

<STX>L

A2<CR>

190001001000100PCLINK<CR>

190001001100110PCLINK<CR>

E<CR>

The above sample sets the printer to transparent mode and prints one label showing overlapping text.

Feedback possibilities: 0,1,2

Set Column Offset Amount (C)

This command allows horizontal adjustment of the point where printing begins. This is a left margin The 'C' command instructs the printer to print label formats **nnnn** units to the right of the position that the format specifies.

Cnnnn

Where:

nnnn-	is a four-digit number for the column offset, in/100 or mm/10—the printer default is 0 for offset.

Sample:

<STX>L

C0050

190000901000100PCLINK<CR>

The above sample will shift all format data .5 inches to the right, unless the printer is in metric mode, (see label-formatting command M).

Feedback possibilities: 0,1,2

Terminate Label Formatting Mode and Print Label (E)

When the printer is processing label-formatting commands and receives an **'**E' command, it will immediately print a label based on the data it has received. Even if no printable data has been received, the printer will generate and feed a label, (other termination commands is **'**X'). Commands sent to the printer after a terminate label command must be of either immediate or system.

E<CR>

Sample:

<STX>L

121100000000000Testing<CR>

E<CR>

The above label format will print a label.

Feedback possibilities: 1,2,6,7,8,A,B,C,D,E,F,G,H

Set Row Offset Amount (R)

This command allows vertical adjustment of the point where printing begins. This is a top margin. The 'R' command instructs the printer to print label formats

nnnn increments above the position the format specifies. Valid input values are numbers between 0000 and 9999, (refer to the C, Set Column Offset Amount Command.)

Rnnnn

Where:

     nnnn =   is a four-digit offset 0000-9999, in/100 or mm/10

Sample:

     <STX>L

     R0037<CR>

     190000901000100SAMPLE LABEL<CR>

     E<CR>

The above sample sets the printer's offset row amount to 37 hundredths of an inch, unless the printer is in metric mode.

Feedback possibilities: 0,1,2

Terminate Label-Formatting Mode (X)

When the printer is in label-formatting mode and receives an **X** command, it will immediately switch to the system-command mode and generate a label format based on whatever data it has already received. However, unlike the 'E' command, it will not print a label. (Other termination commands is 'E'.)

Sample:

     <STX>L

     190000901000100SAMPLE<CR>

     X<CR>

The above sample will result in label formatting, but no label will be printed. The system command STX G will cause the label to print.

Feedback possibilities: 0,1,2

+ (-) Make Last Field Entered Increment (Decrement) Numeric

The printer is capable of automatically incrementing and decrementing fields on each label of a batch printed. This command is useful for serializing labels. The command format is

*pii

Where:

* -	Is + for numeric increment, or - for numeric decrement
p -	Is the fill character that is displayed for zeros on the left
ii -	Is the amount to increment the field by from 01 to 99

Sample:

<STX>L

19000090000000012345<CR>

+001<CR>

X<CR>

<STX>E0003

<STX>G

The above sample will generate a single field label format that prints the initial label with a value of 12345 and then increments by one for the next two labels.

This command will only affect numbers. If a character other than a number is inserted, it will affect all numbers to the right of this character. Any numbers to the left of it will be ignored. If the fill character is a space, leading zeros will be printed blank. Some examples follow:

Field Data	Command	Label 1	Label 2
0001	+001	0001	0002
0001	+ 99	1	100
A9C999	+001	A9C999	A9C000
1000	–001	1000	0999
1000	– 01	1000	999

> (<) Make Last Field Entered Increment (Decrement) AlphaNumeric

The printer is capable of automatically incrementing and decrementing fields on each label of a batch printed. This command will increment or decrement an alphanumeric field. This command is useful for serializing labels. The command format is

pii

Where:

* -	Is + for numeric increment, or - for numeric decrement
p -	Fill character currently not supported, but must be sent
ii -	Is the amount to increment the field by from 01 to 99

Sample:

<STX>L

190000900000000ABC<CR>

>001<CR>

X<CR>

<STX>E0003

<STX>G

The above sample will generate a single field label format that prints the initial label with a value of ABC and then increments by one for the next two labels (ABD and ABE).

This command will affect numbers and both lowercase and uppercase letters. If a non-alphanumeric character is inserted, it will affect all alphanumerics to the right of this character. Any alphanumerics to the left of it will be ignored. The increment/decrement value is numeric only. Some examples follow:

Field Data	Command	Label 1	Label 2
A9	>001	A9	B0
a9	>019	a9	c8
A$Z9	>001	A$Z9	A$A0
Ba0	<001	Ba0	Az9
Ba0	<099	Ba0	Aq1

Set Count By Amount (^)

An application using incrementing or deincrementing fields (+, -, >, <) will occasionally require that more than one label be printed with the same values before the field data is updated. This situation is handled with the *^nn* command. All printers default to 1. This command is set once for the whole label format and affects all serialized fields in that label format.

^nn

Where:

> *nn-* is a two-digit value that specifies the number of labels to be generated before the incrementing or deincrementing fields on the label

Sample:

```
<STX>L

19000040000000012345<CR>

-001<CR>

^02<CR>

X<CR>

<STX>E0006

<STX>G
```

The above sample prints two labels with the same field value before decrementing the field. Six labels are printed.

Feedback possibilities: 0,1,2

Generating Label Formats

Example 1

Example 2

Direction of
paper movement

Printed labels
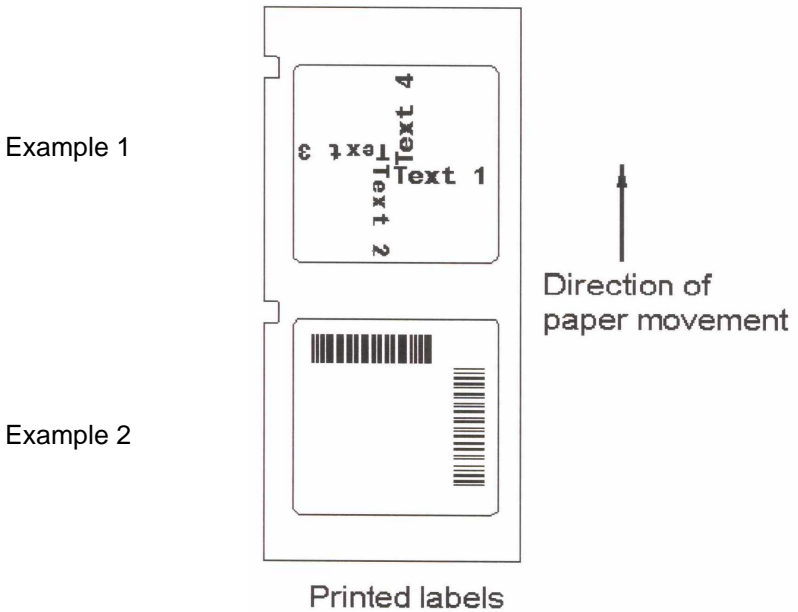
A label format is all the data, in the form of records, that lies between an
<STX>L and either a terminating **E<cr>** or **X<cr>**. Other system level
commands may procede the **<STX>L** command for printer setup.

A record is a data string that contains the information to be printed on the labels.
Every record <u>must</u> end with a termination character (a carriage return **<cr>**).

A record is made of three parts. (1) A header that is 15 bytes in length, (2) the
data to be printed, and (3) a termination character that marks the end of the field.
The header is used to select the appearance of the data when printed by choosing
rotation, font type, size, and position options. Every header contains similar
information, but this information may be used in different ways by different
record types.

There are currently three types of record currently supported by the *TLS PC Link*
printer at this time:

1. Bitmapped fonts
2. Barcode
3. Images

The structure of a record

The 15-byte header portion of a record is composed as follows:

<u>a b c d eee ffff gggg</u>

a	b	c	d	eee	ffff	gggg

where: **a** = rotation* **1** = 0° **2 =** 90° **3** = 180° **4 =** 270°

*Rotation is only supported for fonts and barcodes. Images cannot be rotated.

b = Font, Barcode, or Image

      9   = font (Arial Mono Alternative)

      a-c = barcode with no human readable

where

           a   = Code 39
           b   = Code 39 w/check character
           c   = Code 128

      Y   = image file (pcx, bmp, or 7-bit ASCII)

c,d = width and height multiplier (currently not supported and to be set to 0)

eee = font size identifier (corresponds to TLS code)/ barcode height. eee is 000 when contained in an image record (pcx,bmp,etc)

Font Options are 001-019

Refer to *Appendix E: Fonts.*

ffff = row , the vertical element

gggg = column, the horizontal element

(ffff & gggg are effected by unit of measure set by format commands m & n)

The header is then followed by the data field. A string of data can be up to 255 characters in length. Characters placed in the data field will be printed as long as they fall within the physical width of the label being used. It is possible for characters to "fall" off the sides of a label if the **ffff** and/or **gggg** row/column parameters are inappropriate.

When the last record is sent to the printer, the formatting session is ended by sending one of the terminator label formatting commands, **E** or **X**.

Examples of a Label Format:

Example 1 (1.5" x 1.5" Label, PTL-32):
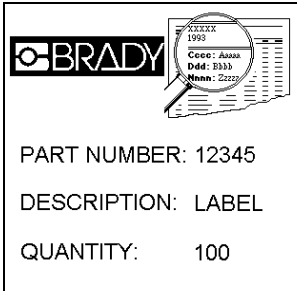
Note: The bitmaps shown are not supplied. For reference to insert your own bitmaps, the brady.bmp file is 168 pixels x 142 pixels. The logo.bmp bitmap is 139 pixels x 124 pixels.

STX>Q	;clear image memory
<STX>n	;put printer in inches mode
<STX>IBBbrady<CR><brady.bmp>	;Store brady.bmp file
<STX>IBBlogo<CR><logo.bmp>	;Store logo.bmp file
<STX>L	;enter label format mode
1Y0000000250000brady<CR>	;specify brady image at X=0.00",Y=0.25"
1Y0000000100082logo<CR>	;specify logo image at X=0.82",Y=0.10"
190000600700005PART NUMBER:<CR>	;specify text at X=0.05",Y=0.70"
190000600950005DESCRIPTION:<CR>	;specify text at X=0.05",Y=0.95"
190000601200005QUANTITY:<CR>	;specify text at X=0.05",Y=1.20"
19000060070010012345<CR>	;specify text at X=1.00",Y=0.70"
190000600950100LABEL<CR>	;specify text at X=1.00",Y=0.95"
190000601200100100<CR>	;specify text at X=1.00",Y=1.20"
X<CR>	;exit label format mode
<STX>E0002	;set print quantity to 2 labels
<STX>G	;print two labels

Change Part Number and Print Again:

Method 1 (New label format):

<STX>L	;enter label format mode
1Y0000000250000brady<CR>	;specify brady image at X=0.00",Y=0.25"
1Y0000000100082logo<CR>	;specify logo image at X=0.82",Y=0.10"
190000600700005PART NUMBER:<CR>	;specify text at X=0.05",Y=0.70"
190000600950005DESCRIPTION:<CR>	;specify text at X=0.05",Y=0.95"
190000601200005QUANTITY:<CR>	;specify text at X=0.05",Y=1.20"
19000060070010**056789**<CR>	;specify text at X=1.00",Y=0.70"
190000600950100LABEL<CR>	;specify text at X=1.00",Y=0.95"
190000601200100100<CR>	;specify text at X=1.00",Y=1.20"
X<CR>	;exit label format mode
<STX>G	;print two labels

Method 2 (Update Field):

<STX>U06**56789**<CR>	;Replace field*
<STX>G	;print two labels

Note: The new field string "56789" must be the exact same length as the old string "12345". This field is number 06 because they are numbered in the order they were entered in the label format, starting with 01.

Example 2 (1.9" x 4.0" Label, PTL-38):
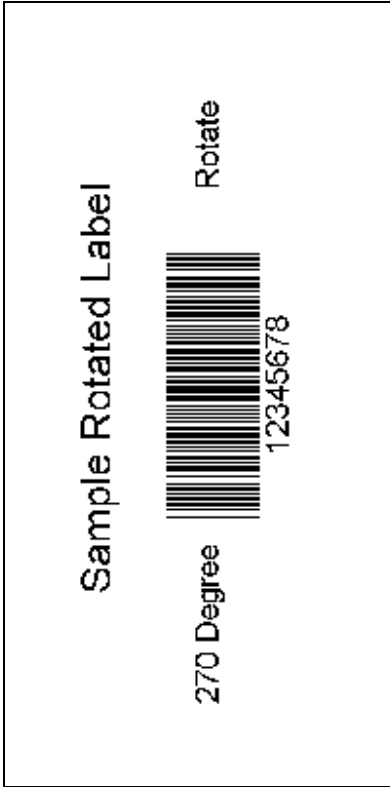
<STX>n	;put printer in inches mode
<STX>L	;enter label format mode
490000803000030Sample Rotated Label<CR>	;specify text at X=0.30",Y=3.00"
490000603500090270 Degree<CR>	;specify text at X=0.90",Y=3.50"
490000601100090Rotate<CR>	;specify text at X=0.90",Y=1.10"
4a000500255008012345678<CR>	;specify barcode at X=0.80",Y=2.55"
490000602250135122345678<CR>	;specify text at X=1.35",Y=2.25"
X<CR>	;exit label format mode

`<STX>Q0002`	;set print quantity to 2 labels
`<STX>G`	;print two identical labels

Serialize Barcode:

This requires sending the label format again. Since Bar Code "12345678" and Text "12345678" are separate fields, they must both be serialized in order for the text to match the bar code.

`<STX>L`	;enter label format mode
`490000803000030Sample Rotated Label<CR>`	;specify text at X=0.30",Y=3.00"
`490000603500090270 Degree<CR>`	;specify text at X=0.90",Y=3.50"
`490000601100090Rotate<CR>`	;specify text at X=0.90",Y=1.10"
`4a000500025500801234 5678<CR>`	;specify barcode at X=0.80",Y=2.55"
`+001<CR>`	;make previous field increment by 1
`490000602250135123 45678<CR>`	;specify text at X=1.35",Y=2.25"
`+001<CR>`	;make previous field increment by 1
`X<CR>`	;exit label format mode
`<STX>G`	;print two serialized labels ;12345678 and 12345679

Example 3 (0.24" continuous terminal block material, PTLTB-400-240):

To print a terminal block label, it is necessary to set the label size and spacing. In order to obtain this spacing, the printer must not be fed to the cut position between terminal block positions on the label. The <STX>C command is used to disable this function. This example is for a terminal block with a 0.5" pitch.

$\leftarrow$ Y

| +5V | +5V | +5V | GND | GND | GND | GND | GND | GND | +12V | +12V | +12V |

$\downarrow$ X

<STX>n	;put printer in inches mode
<STX>P0050	;set label length to 0.5"
<STX>S0000	;set spacing to zero
<STX>C	;disable feed to cut after print
<STX>L	;enter label format mode
490000700450004+12V<CR>	;place +12V, rotated 270 degrees at
	;location X=0.04", Y=0.45"
X<CR>	;exit label format mode
<STX>E0003	;set quantity to 3
<STX>G	;print 3 copies of this label
<STX>L	;enter label format mode
490000700400004GND<CR>	;place GND, rotated 270 degrees at
	;location X=0.04", Y=0.40"
X<CR>	;exit label format mode
<STX>E0006	;set quantity to 6
<STX>G	;print 6 copies of this label
<STX>L	;enter label format mode
490000700400004+5V<CR>	;place +5V, rotated 270 degrees at
	;location X=0.4", Y=0.40"
X<CR>	;exit label format mode
<STX>E0003	;set quantity to 3

<STX>G	;print 3 copies of this label
<STX>c	;feed to cut position

Troubleshooting

Common Problems and Corrective Action

The best method for troubleshooting development with the TLS PC Link Programming Language is to use feedback characters. When these are enabled, all System Level and Label Formatting Commands have a feedback character sent after them. Looking at these feedback characters is very helpful in determining where an error has occurred. If a command's response is an ASCII '2', this means that a bad command was sent. If a command replies with an ASCII '1', then a serial timeout has occurred. This means the printer was expecting more data with the command. If the command replies with multiple characters, such as multiple '2's, this is because the command was bad somewhere in the middle. All characters that were sent after the invalid character in the command respond with an error.

The following table lists common programming problems and suggested corrective action.

If you are having problems with the hardware, refer to the *TLS PC Link User's Manual.*

Problem	Possible Cause/Corrective Action
The printer acts sporadically when downloading an image file.	**Possible Cause:** If downloading an 8-bit image, it is likely that Immediate commands are enabled. Immediate commands will be detected within the image data. This will corrupt the data, causing the printer to see bad information. **Corrective Action:** Make sure immediate commands are disabled whenever downloading an 8-bit data file.
Unable to read printer status information while printing.	**Possible Cause:** If immediate commands were turned off to download an image file, they must be turned back on before printing an image if it is desired to send immediate commands (request status) during the print job. If the enable immediate commands is sent after the print command, it will not

Problem	Possible Cause/Corrective Action
	be processed until the print job is complete.
	Corrective Action: When disabling and enabling immediate commands, it is best to use feedback characters. With feedback characters enabled, wait until an Immediate Commands Enabled response is sent by the printer before sending an immediate command. If it is not desired to have feedback from all commands, it is possible to enable and disable feedback characters around the command you desire a response from.
Reading Status String does not correctly reflect the printer errors.	**Possible Cause:** The printer errors Printhead Open, Out of Labels, Out of Ribbon and Touch Cell Error are detected when the printer performs an operation such as printing. The status is set during that operation. When a status is requested, it does not actually test for these conditions. It just sends the status from the last print or feed operation.
	Corrective Action: Test the printer status after a print or feed operation to see if an error occurred.
When sending multiple labels consecutively to the printer, the printer acts sporadically.	**Possible Cause:** When sending data to the printer, it is stored in a serial buffer until it can be processed. If the printer is printing a label, it cannot process the serial buffer. The serial buffer will overflow.

Problem	Possible Cause/Corrective Action
	Corrective Action: Use hardware flow control. When the serial buffer fills up, the printer will stop the host from sending more data. It will re-enable the serial flow when it catches up.
Unable to store an image even though there is enough memory available.	**Possible Cause:** If trying to store an image that already exists, the printer will only overwrite that image if it is the only image that exists. **Corrective Action:** To overwrite an image that already exists, first delete the image so it can be re-written. Also, pack image memory to regain usage of the memory space that was used by that file.
Rotation of images does not work.	**Possible Cause:** Printer does not rotate images, only bar codes and text. **Corrective Action:** Rotate the image with image software.
Receive Label Building Error.	**Possible Cause:** If a label format calls out an image, but that image is not stored, a label building error will be given.
Printer does not print.	**Possible Cause:** Com port settings are not correct. **Corrective Action:** Correct com port settings. Refer to *COM Port Settings* on page 6 of this document.

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Appendix A: Feedback Characters

Definition	Hex Value	Decimal	ASCII
No error	0x30	48	0
Serial timeout error	0x31	49	1
Command error	0x32	50	2
Memory full error	0x33	51	3
Image already exists so it was not stored	0x34	52	4
Immediate commands enabled	0x35	53	5
Out of labels	0x36	54	6
Printhead open	0x37	55	7
Out of ribbon	0x38	56	8
Battery cell is shorted	0x41	65	A
Low battery	0x42	66	B
Printing is complete	0x43	67	C
Did not print because no label format has been given	0x44	68	D
Error reading memory touch cell on media	0x45	69	E
Media has changed	0x46	70	F
Printhead is too hot	0x47	71	G
Error Building Label	0x48	72	H
Field Error	0x49	73	I
Feed to cut complete	0x4A	74	J

Appendix B: Image File Definitions

Image Type U:

Record Types:

Dot-Row Record

This record defines the pixel data for one dot-row. After each Dot-Row record, the Y cursor is incremented so that the next Dot-Row is on the next line.

0x80 ndd...d

where:

n	**number of data bytes dd...d**
dd...d	**data**

Repeat Record

This record will repeat the last Dot-Row Record sent.

0x00 0x00 0xFF n

where: n   number of duplicates

X Cursor Record

This record will place the X cursor at an absolute location. All Dot-Row Records following this command will begin at this X location until a new X Cursor Record is sent. This pixel location must be a multiple of 8.

0x58 pp

where: pp   number of pixels from left edge represented as 16 bits with low byte sent first

Y Cursor Record

This record will place the Y cursor at an absolute location to position the next Dot-Row Record.

0x59 pp

where: pp   number of pixels from top edge represented as 16 bits with low byte

sent first

Terminator

This record must be at the end of the file.

0xFF 0xFF <CR>

Data Format

This image file can be sent as 8-bit data or 7-bit ASCII Hex. The 7-bit version sends the same data as the 8-bit version, but each byte is sent as two ASCII Hex characters.

Example:

A 50-pixel by 50-pixel box located 10 pixels down and 10 pixels to the right of the origin. Note that the X-Cursor is set to pixel 8, and the data starts with the first two bits equal to zero so the box starts at column 10.

As 8-bit data:

Command	Description
0x58 0x08 0x00	X-Cursor at pixel 8
0x59 0x0A 0x00	Y-Cursor at pixel 10
0x80 0x07 0x3F 0xFF 0xFF 0xFF 0xFF 0xFF 0xF0	First line of box
0x80 0x07 0x20 0x00 0x00 0x00 0x00 0x00 0x10	Second line of box
0x00 0x00 0xFF 0x2F	Repeat second line 47 times
0x80 0x07 0x3F 0xFF 0xFF 0xFF 0xFF 0xFF 0xF0	Last line of box
0xFF 0xFF 0x0D	Terminator

As 7-bit ASCII:

Command	Description
580800	X-Cursor at pixel 8
590A00	Y-Cursor at pixel 10

80073FFFFFFFFFFFF0	First line of box
800720000000000010	Second line of box
0000FF2F	Repeat second line 47 times
80073FFFFFFFFFFFF0	Last line of box
FFFF 0x0D	Terminator

Appendix C: ASCII Control Chart

ASCII Control Chart

	Char	Dec	Hex	Char	Dec	Hex
Ctrl @	NUL	0	00		32	20
Ctrl A	SOH	1	01	!	33	21
Ctrl B	STX	2	02	"	34	22
Ctrl C	EXT	3	03	#	35	23
Ctrl D	EOT	4	04	$	36	24
Ctrl E	ENQ	5	05	%	37	25
Ctrl F	ACK	6	06	&	38	26
Ctrl G	BEL	7	07	Ô	39	27
Ctrl H	BS	8	08	(	40	28
Ctrl I	HT	9	09	)	41	29
Ctrl J	LF	10	0A	*	42	2A
Ctrl K	VT	11	0B	+	43	2B
Ctrl L	FF	12	0C	,	44	2C
Ctrl M	CR	13	0D	-	45	2D
Ctrl N	SO	14	0E	.	46	2E
Ctrl O	SI	15	0F	/	47	2F
Ctrl P	DLE	16	10	0	48	30
Ctrl Q	DC1	17	11	1	49	31
Ctrl R	DC2	18	12	2	50	32
Ctrl S	DC3	19	13	3	51	33
Ctrl T	DC4	20	14	4	52	34
Ctrl U	NAK	21	15	5	53	35
Ctrl V	SYN	22	16	6	54	36
Ctrl W	ETB	23	17	7	55	37
Ctrl X	CAN	24	18	8	56	38
Ctrl Y	EM	25	19	9	57	39
Ctrl Z	SUB	26	1A	:	58	3A
Ctrl [	ESC	27	1B	;	59	3B
Ctrl \	FS	28	1C	<	60	3C
Ctrl]	GS	29	1D	=	61	3D
Ctrl ^	RS	30	1E	>	62	3E
Ctrl _	US	31	1F	?	63	3F

(Continued on next page.)

ASCII Control Chart, Continued

Char	Dec	Hex	Char	Dec	Hex
@	64	40	`	96	60
A	65	41	a	97	61
B	66	42	b	98	62
C	67	43	c	99	63
D	68	44	d	100	64
E	69	45	e	101	65
F	70	46	f	102	66
G	71	47	g	103	67
H	72	48	h	104	68
I	73	49	i	105	69
J	74	4A	j	106	6A
K	75	4B	k	107	6B
L	76	4C	l	108	6C
M	77	4D	m	109	6D
N	78	4E	n	110	6E
O	79	4F	o	111	6F
P	80	50	p	112	70
Q	81	51	q	113	71
R	82	52	r	114	72
S	83	53	s	115	73
T	84	54	t	116	74
U	85	55	u	117	75
V	86	56	v	118	76
W	87	57	w	119	77
X	88	58	x	120	78
Y	89	59	y	121	79
Z	90	5A	z	122	7A
[	91	5B	{	123	7B
\	92	5C	|	124	7C
]	93	5D	}	125	7D
^	94	5E	~	126	7E
_	95	5F		127	7F

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Appendix D: List of Commands

The following table lists all of the commands found in the guide, along with their description. Refer to the page number listed to the right for detailed information on each command.

Description	Command	Page
Reset	SOH #	7
Send ASCII Status String	SOH A	8
Toggle Pause	SOH B	9
Cancel	SOH C	10
Disable SOH	SOH D	10
Send Batch Quantity	SOH E	10
Disable Feedback Characters	STX A	12
Enable Feedback Characters	STX a	12
Enter Heat Setting Offset	STX b	13
Disable Feeding to Cut Position after Print	STX C	13
Enable Feeding to Cut Position after Print and Perform a Feed to Cut	STX c	14
Set Quantity for Stored Label	STX E	14
Form Feed	STX F	15
Set Form Stop Position	STX f	15
Print Last Label Format	STX G	16
Enable SOH Commands	STX H	16
Input Image Data	STX I	17
Extended System Commands	STX K	18
Enter Label Formatting Command	STX L	18
Set Printer to Metric	STX m	18
Set Printer to Inches	STX n	19
Set Start of Print Offset	STX O	19

Description	Command	Page
Horizontal Alignment Offset	STX o	20
Clear All Memory	STX Q	20
Printhead Dot Pattern Test Label	STX T	21
Send Binary Touch Cell Data	STX t	22
Label Format Field Replacement	STX U	24
Send ASCII Touch Cell Data	STX V	25
Printer's Firmware Version Information	STX v	25
Request Memory Information	STX W	25
Delete File	STX x	26
Pack Memory	STX z	26
Sets format attribute	A	30
Sets column offset amount	C	31
Terminates label formatting mode and print label	E	31
Sets row offset amount	R	31
Terminates label formatting mode	X	32
Make Last Field Entered Increment (Decrement) Numeric	+ (-)	33
Make Last Field Entered Increment (Decrement) Alphanumeric	> (<)	34
Sets count by amount	^	35

Appendix E: Fonts

TLS PC Link^{TM} Printer Fonts

The following fonts are available on the TLS PC Link printer:

FONT NUMBER	POINT SIZE	PRINT SAMPLE
1	4	BRADY 12345
2	5	BRADY 12345
3	6	BRADY 12345
4	7	BRADY 12345
5	9	BRADY 12345
6	10	BRADY 12345
7	11	BRADY 12345
8	13	BRADY 12345
9	14	BRADY 12345
10	17	BRADY 12345
11	20	BRADY 12345
12	23	BRADY 12345
13	26	BRADY 12345
14	28	BRADY 12345
15	36	BRADY 123

FONT NUMBER	POINT SIZE	PRINT SAMPLE
16	45	BRADY 1
17	51	BRADY
18	56	BRADY
19	72	BRAD

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Font Symbol Set

The following characters are supported in all fonts.

	Ø	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00																
10																
20		!	A	#	$	%	&	⊕	(	)	*	+	,	-	.	/
30	Ø	1	2	3	4	5	6	7	8	9	:			=		
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z			\		_
60		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z					
80											↓	↑	←	↔	→	
90									™							
A0					⛬			⟨f	⟨	©	≑	▱		∼	®	
B0	°	±	²		β											
C0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D0		Ñ	Ò	Ó	Ô		Ö		Ø	Ù	Ú	Û	Ü			
E0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F0		ñ	ò	ó	ô		ö		ø	ù	ú	û	ü			

Appendix F: Barcodes Summary

Font	Type	Length	Checksum	Valid ASCII Characters, decimal value
a	Code 39	Varies	No	32,36,37,42, 43,45-57, 65-90
b	Code 39 with check character	Varies	Yes	32,36,37,42, 43,45-57, 65-90
c	Code 128	Varies	Yes	32-127

Appendix G: Mini-DIN 6-Pin to 9-Pin Cable Pinouts

**Mini-DIN-6S
Connector to Printer**

**DB-9S Connector to
PC**

RXD	1		No Connection	1
CTS	2			2
+5V	3	No Connection		3
GND	4			4
TXD	5			5
RTS	6			6
				7
				8
			No Connection	9
SHELL				SHELL