EASON TECHNOLOGY

MODEL 900X
INDUSTRIAL TERMINAL

Revision 3.3
p/n 50-00900X-01

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- **COM PORTS ARE OPTICALLY ISOLATED**
- **8 LINE BY 40 CHARACTER BACK-LIT LCD DISPLAY WITH GRAPHICS**
- **LARGE FULL-TRAVEL 30 KEY WATERPROOF KEYPAD**
  - **6 SOFT KEYS**
  - **TACTILE FEEDBACK**

The MODEL 900X Operator Interface is a rugged device capable of transferring data to and from Compumotor products . It can also be used by many types of computers and industrial control equipment. The MODEL 900X is an ideal choice for an operator interface in an industrial environment where the machine, process, or motion controller will contain all of the "intelligence" of the system. The motion controller will send information and prompts to the operator via the MODEL 900X's display. Data entered on the keypad of the MODEL 900X is transmitted directly to the host controller.

With a MODEL 900X, an operator can view and change machine parameters, or follow instructions to perform operations. Users no longer have to fumble about with clumsy switches, thumbwheels, and indicator lights. Instead, a back-lit 8 line by 40 character black and white LCD display, and a large full-travel 30 key waterproof keypad prompts and "listens" to the operator through machine operations.

1.1 Functional Description

The MODEL 900X is housed in a rugged cast housing which is meant to be flush mounted in an equipment panel. A full gasket and a rigid mounting system form a water tight seal about the opening. The display is sealed, and the keypad is constructed of a water tight silicone rubber. If being water tight is not critical to your application, the MODEL 900X can be wall mounted with supplied brackets.

The keypad on the front of the MODEL 900X is organized into three color coded groups:

WHITE	- NUMERIC ENTRY
BLUE	- MENU - CURSOR, ENTER, C/E, PAUSE
YELLOW	- FUNCTION KEYS, STOP

The bottom of the MODEL 900X incorporates the entire connector system for power and serial I/O.

Figure 1.1 diagrams the internal components of the MODEL 900X. The heart of the unit is a high speed 64180, 8 bit high integration CPU chip. The CPU communicates with the UART (serial port), ROM, and RAM. Battery backed-up RAM stores configuration data even if the power is removed. It can hold data for over 5 years without power applied. The opto-isolation circuitry is designed to provide a barrier between the outside world and the CPU. This eliminates CPU errors in high noise environments.

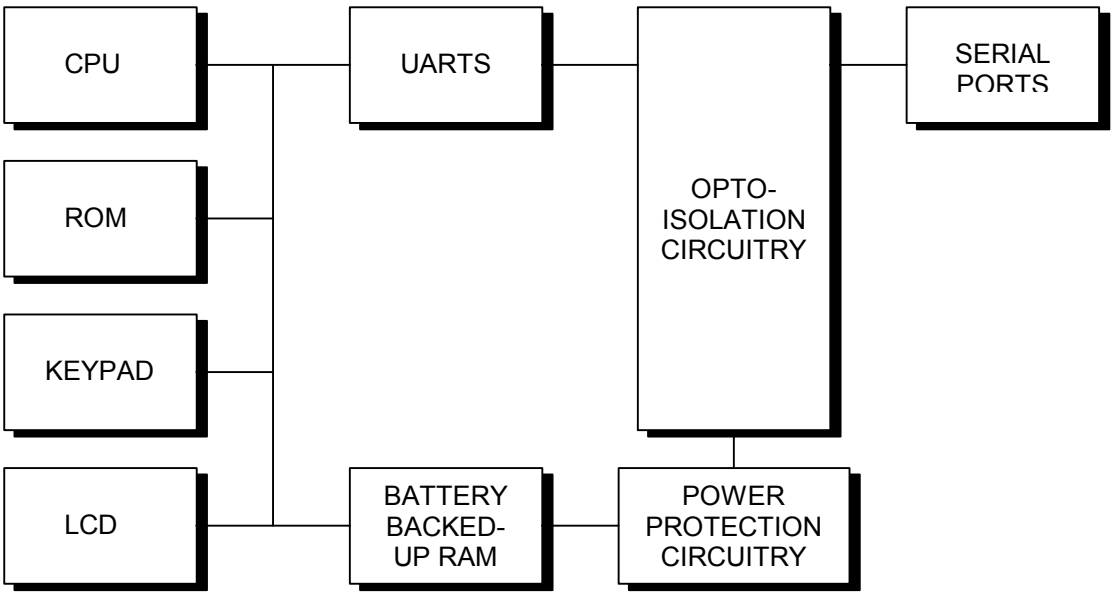


FIGURE CHAPTER 1. .1 MODEL 900X BLOCK DIAGRAM

CHAPTER 2. INSTALLATION

This chapter focuses on the steps necessary to unpack and install the MODEL 900X. Read this section before attempting to apply the MODEL 900X. System installers should read this chapter before attempting to install the unit into a cabinet, or before connecting any electrical power to the MODEL 900X.

2.1 Unpacking and Inspection

Inspect the MODEL 900X's shipping container. Is there evidence of damage or mishandling? If damage exists contact your shipping carrier immediately. Eason Technology cannot be held responsible for damage in shipment.

Compare the contents of the container with the packing list which is attached to the exterior of the shipping container. Your MODEL 900X shipping container should include the following:

1. MODEL 900X
2. This manual
3. Mounting clips (four)
4. 1/4" 8-32 Screws (four)
5. Mounting template

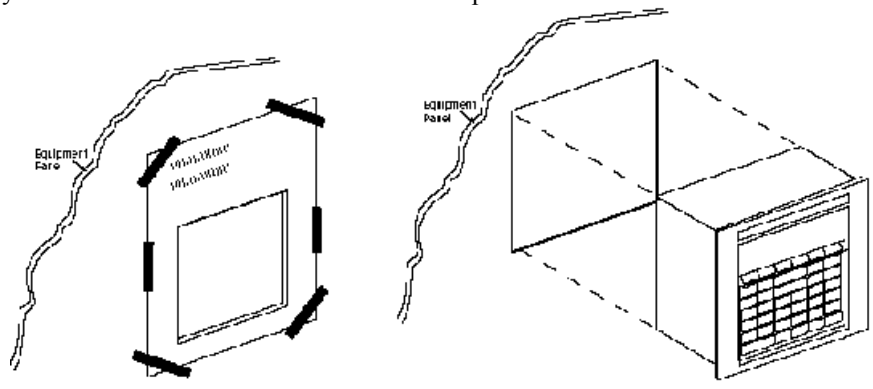
If any items are missing or damaged, contact Eason Technology immediately.

2.2 Through Panel Mounting

The MODEL 900X is designed to be mounted either through an equipment panel (in a panel cut-out) or on a flat surface. The through-panel mounting will allow the MODEL 900X to meet NEMA4 specifications for water resistance, and will also resist dust, dirt and non corrosive chemicals. Improper installation could result in damage to the MODEL 900X and other equipment installed in or adjacent to the panel containing the MODEL 900X. For safety reasons please follow these instructions closely.

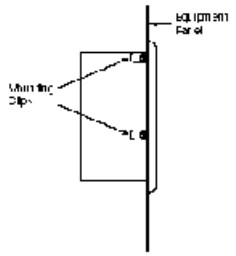
Through Panel Mounting

1. Prepare the opening in the panel.
   a. Tape the enclosed mounting template to the front of the panel in the desired location.
   b. Drill 3/8 " inside the cutout to facilitate cutting.
   c. Use a saber saw or some other type of sheet metal cutting device to cut out along the "cut here" line.
   d. Using a file, carefully remove any burrs or rough edges that may cut or scratch during the remainder of the installation.
   e. Remove the paper template and discard.
2. Carefully insert the Model 900x into the hole in the panel from the front side.



3. Hold the Model 900x to the panel, and insert the mounting pins.
   a. If the Model 900x is to be used in continuously wet applications, apply a silicone sealer to the gasket prior to installation.
4. Tighten the mounting pins to secure the Model 900x to the front panel.

5. Ensure that the Model 900x fits snugly against the front panel, and that there are no gaps or holes that may allow water or dirt to enter the cabinet.

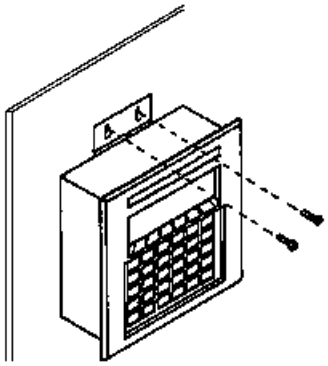


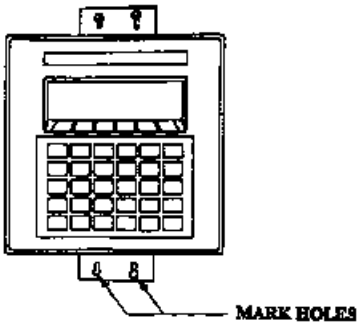
Flat Surface Mounting

The Model 900x can be mounted on a flat surface in applications which do not require water-tight or dust proof operation. Examples of this type of environment are inside equipment cabinets, control rooms, or in "clean" factory environments. If you need to obtain NEMA 12 or NEMA 4 mounting, refer to *Through-Panel Mounting*. Locate the two mounting brackets. Attach them to the rear of the Model 900x with the four, 1/4" 8-32 screws.

Find a mounting location for the Model 900x that will allow eye-level viewing of the screen, unobstructed access to the keypad, and room for cables and connectors to exit at the bottom. The Model 900x should be installed away from moisture, oil, dust, and other flying debris.

1. Drill two holes at the top of the mounting location spaced 2" apart.
2. Insert two screws (#8 or #10 size) into the holes. Temporarily mount the Model 900x on these fasteners and mark the bottom holes.





3. Remove the Model 900x and drill the holes.
4. Re-install the Model 900x

2.4 System Interconnect

Wiring the MODEL 900X is a relatively simple task. All you have to hook up are power and communications. This section will describe each individual connector on the MODEL 900X and how to apply it.

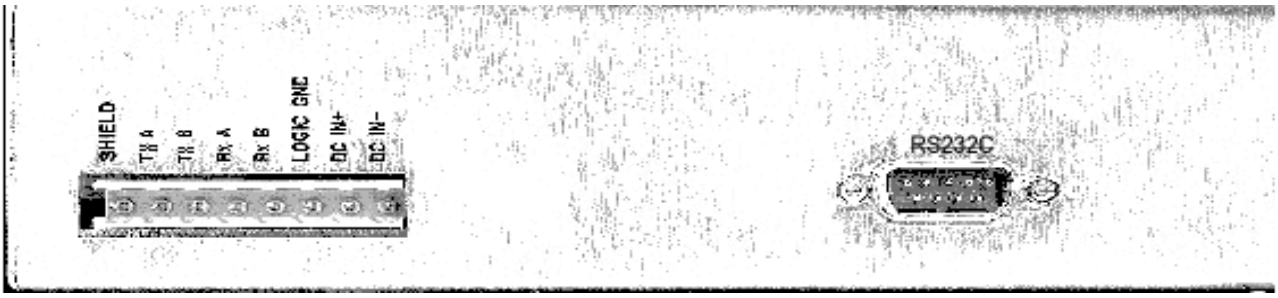


FIGURE 2.8 MODEL 900X BOTTOM PANEL

2.4.1 Power Connector (Connecting Power)

The Power Connector is an 8 pin screw terminal type connector which provides the DC input power connections. The sheet metal shows lettering for RS422 connections , these are not used with the model 900X . The MODEL 900X can accept from 10V to 30V DC at 7.5 watts. The MODEL 900X actually tries to begin working as soon as the power source passes 4.5 V. This means that at start-up the current requirements from the DC power source can exceed 1.7 Amps. This current surge may cause some power sources to enter current limit rather than to begin working. For this reason it is recommended that the MODEL 900X be used with a power source which is unaffected by this type of current surge. Unregulated supplies, linear power supplies, or high current (2 Amp) switching supplies are recommended.

Only connect the DC power source to the DC IN + and the DC IN -. These inputs are reverse protected. DO NOT connect the DC power ground to LOGIC GROUND. Logic Ground, as with all I/O, is optically isolated from the chassis (earth ground). Connecting Logic Ground to DC IN - will result in lower noise immunity.

2.4.2 RS232 Communications

The Model 900X comes ready to communicate via RS232. The settings are:

9600 Baud
No Parity
8 Data Bits
1 Stop Bit

The RS232 connector provides for serial communications between the Model 900X and a variety of devices. These types of connections are most commonly referred to as SERIAL PORTS. Examine your application carefully and make sure that you have TRANSMIT on the Model 900X connected to the RECEIVE of your controller, and RECEIVE of the Model 900X connected to the TRANSMIT of the device under control. The pinouts are shown below. The controller port you connect to should be documented in the Compumotor manual as the RP240 Connection.

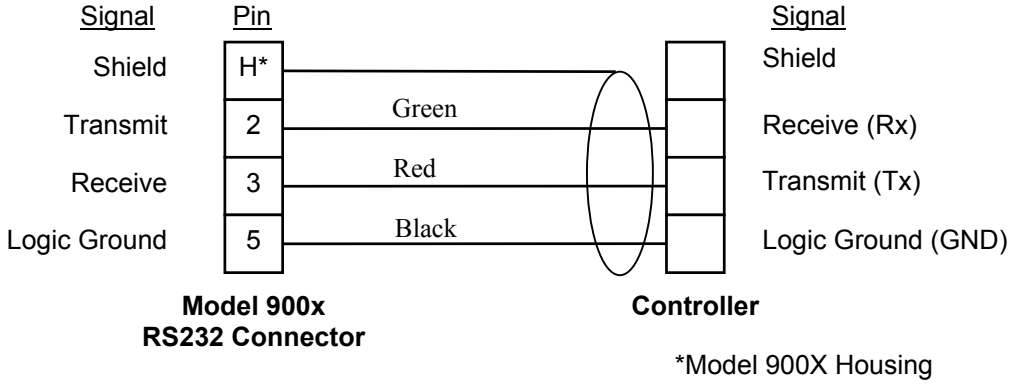


FIGURE 2.9 RS232 CONNECTION

CHAPTER 3. COMMUNICATING WITH THE 900X

Communicating with the MODEL 900X is fairly straightforward. Data is transferred between the MODEL 900X and the motion controller via an RS232 serial communication link. The data transferred between the two devices follows Compumotor's RP240 standard with some enhancements detailed in Chapter 4 - MODEL 900X COMMANDS.

3.1 Getting Started

Using the MODEL 900X is quite simple. First you must connect the MODEL 900X to your controller. Connect one end of the communications cable to the RS232 connector on the MODEL 900X and the other end to the serial port on the Compumotor X language product or the RP240 port on a Compumotor 6000 Series product.

Note: The Model 900X defaults upon power-up to Compumotor SX mode.

In order to use the Model 900X with a 6000 Series product, the 6000 device *must* send a $B (using the 6000 command DWRITE"$B") to the Model 900X prior to any other communication. Recycling power will return the unit to SX mode.

If you are using the Model 900X with a Compumotor 6K, the DRPCHK command needs to be issued in the 6K program. This tells the 6K to look for an RP240 (Model 900X) display on its ports, and enable RP240 commands.

3.2 Configuring the MODEL 900X

No configuration is necessary or possible. The communication parameters are preset to the following values:

Baud Rate:	9600,
Parity:	NONE
Data Bits:	8
Stop Bits:	1
XON/XOFF:	OFF(software handshaking)
Key Repeat:	NONE
Backlight:	AUTO
Mode:	RS232

3.3 Trouble-Shooting Communications

If you have problems communicating with your MODEL 900X, check the serial port connections between the MODEL 900 and the motion controller. Look for the following things:

1. Is power applied to the MODEL 900X?
2. Is one end of the communications cable connected to the RS232 connector on the MODEL 900X?
3. Is the Model 900X connected to the appropriate port on the motion controller? (Some controllers have multiple serial ports.)
4. Are the communication cable connectors securely seated into their respective sockets? Try tightening the hold-down screws on the communication cable.

5. Is the Host device capable of communicating with the 900X ? Is the program loaded into the host , correct?
6. If using a Compumotor 6K, make sure you are using the DRPCHK command to put the 6K into RP240 mode.

CHAPTER 4. MODEL 900X COMMANDS

Eason Technology's Model 900X Operator Interface is fully compatible as a display interface for Compumotor X and 6000 series products . It will also interface to other industrial controllers as a display interface.

Since Compumotor products normally talk to a two line display, command enhancements have been added to support the 900X's multi-line graphics capability.

Additional features include the ability to specify the scrolling range. That is to say that if you only want lines 3-7 to scroll while the others remain stationary, you may do so easily. Also, the Model 900X's large Banner characters are supported with printable command sequences.

4.1 Syntax

This chapter contains a description of all control sequences. These sequences are inserted into a program in the host controller and sent to the Model 900 via an RS232 serial port. Each command consists of the following format:

$ COMMAND parameters

Where:

$	is the 1 byte ASCII code for $ (24H).
COMMAND	An alpha string that represents the command. It is case specific.
parameters	are ASCII numeric values separated by commas.

For example:

```
1"$CP1,2
```

is a Compumotor "quote" command with the 900X ; $CPr,c command, places the cursor at row 1 , column 2.

4.2 Command Summary

Enable 6000 Series Mode $B

Purpose:

This command puts the 900x into 6000 series mode. This command should be the first one in your program.

Syntax:

$B

Example:

```
DWRITE"$B"
DWRITE"$CM0"
DWRITE"$ED"
DWRITE"$CP1,14"
DWRITE"PROGRAMMED BY"
DWRITE"$TL2,2,EASON TECHNOLOGY"
```

Cursor Mode $CMm

Purpose:

Specifies whether cursor positioning will be specified by DPCUR commands or $CPr,c commands. To use $CPr,c commands, issue a $CM0 command; before using DPCUR commands, issue a $CM1 command. This command need only be issued once. You may switch cursor modes at any time in your program.

Syntax:

$CMn

Comments:

n- 0 $CPr,c mode, otherwise known as Enhanced mode, use this to access the full screen
1 DPCUR mode (default), otherwise known as RP240 mode

Example:

1”$CM0 - This command issued by an X series Compumotor product will put the 900x into $CPr,c mode.

See also:

$CPr,c

$TMm

Cursor Position $CPr,c

Purpose:

Moves the cursor to the position specified by the parameters. The first parameter specifies the row number and the second parameter specifies the column number. **A $CM0 command must be issued for this command to work properly.**

Syntax:

$CPr,c

Comments:

r- Specifies the display row position (1-8).

c- Specifies the display column position(0-39).

Example:

```
1DTXT$ED
1DTXT$CM0
1DTXT$TM1
1DTXT$CP1,0
VAR1=NUM
1DTXT$CP2,0
1DVO1,3,2,1
```

This series of commands clears the 900x screen, sets the cursor mode to $CP mode, sets the text size to large, gets a number from the operator in large text, then displays that number in large text on the next row down. Note that cursor position 8,39 is the lower right corner of the display, and if the cursor is moved to that position, any text written to that position will wrap around, and cause the display to scroll up.

See also:

$CMm

$TMm

Cursor Up $UC

Purpose:

Moves the cursor up one row without changing the column position. This sequence is ignored if the cursor is already on the top line.

Syntax:

$UC

Cursor Down $DC

Purpose:

Moves the cursor down one row without changing the column position. This sequence is ignored if the cursor is already on the bottom line.

Syntax:

$DC

Cursor Forward $FC

Purpose:

Moves the cursor forward one column without changing the row position. This sequence is ignored if the cursor is already in the rightmost column.

Syntax:

$FC

Cursor Backward $BC

Purpose:

Moves the cursor backward one column without changing the row position. This sequence is ignored if the cursor is already in the leftmost column.

Syntax:

$BC

Save Cursor Position $SC

Purpose:

The current cursor position is saved. This cursor position can be restored with the Restore Cursor Position command sequence. You can perform a maximum of 31 saves.

Syntax:

$SC

Restore Cursor Position $RC

Purpose:

Restores the cursor to the value it had when the Model 900X received the Save Cursor Position command sequence. Note: the $SC command must be used prior to the $RC command.

Syntax:

$RC

Print Small Text $TSr,c,text

Purpose:

To print small text on the screen. This command is essentially the same as a standard DWRITE command, in combination with the DPCUR command to set cursor position. ***r*** sets the beginning row position (1-4) for the specified string. ***c*** sets the beginning column position (0-39) for the specified string. The string does not wrap no matter what is specified for standard text.

Syntax:

$TSr,c,text

Comments:

Certain characters cannot be printed in the text . The characters '*' and '$" , ASCII, 02AH and 024H respectively, are reserved for command parsing and cannot be used. This is also true of the Compumotor commands: QUOTE, "; DWRITE, and DTXT.

Example:

This command would be used to control the 900X from a 6000 series product:

DWRITE" $TS1,1,HELLO WORLD"

This command prints small text starting at row 1, column 1. Notice spaces can be used in the text for the 6000 command DWRITE.

Print Large Text $TLr,c,text

Purpose:

To print large text on the screen. This effectively increases the text size to print four rows of twenty characters instead of the normal eight rows by forty characters. ***r*** sets the beginning row position (1-4) for the specified string. ***c*** sets the beginning column position (0-19) for the specified string. The string does not wrap no matter what is specified for standard text.

Syntax:

$TLr,c,text

Comments:

Certain characters cannot be printed in the text . The characters '*' and '$" , ASCII, 02AH and 024H respectively, are reserved for command parsing and cannot be used. This is also true of the Compumotor commands: QUOTE, "; DWRITE, and DTXT.

Example:

This command would be used to control the 900X from a 6000 series product:

DWRITE" $TL1,1,HELLO WORLD"

This command prints large text starting at row 1, column 1. Notice spaces can be used in the text for the 6000 command DWRITE.

Print Huge Text $THr,c,text

Purpose:

To print "huge" text on the screen. This effectively increases the text size to print two rows of ten characters instead of the normal eight rows by forty characters. ***r*** sets the beginning row position (1 or 2) for the specified string. ***c*** sets the beginning column position (0-9) for the specified string. The string does not wrap no matter what is specified for standard text.

Syntax:

$THr,c,text

Comments:

(See the comments for PRINT LARGE TEXT above.)

Example:

DTXT$TH1,1,HELLO_WORLD

This command ,used with X series products , prints Huge text "HELLO WORLD" at cursor position row 1, column 1. Notice spaces are treated as a terminator for X series products.

Specify Text Mode $TMm

Purpose:

This command allows display of variables and text entry in large and huge text. After issuing this command, the 900x will print all text in the size specified by this command (Print Large Text and Print Huge Text will still operate as before, regardless of the Text Mode). Please use the $CPr,c command for proper placement of the text. A $CM0 command must be issued for proper large and huge text placement.

Syntax:

$TMm

Comments:

m- 0 Normal text size (default). Character (cursor) grid is 1-8, 0-39
1 Large text size. Character (cursor) grid is 1-4, 0-19 (Enhanced mode only)
2 Huge text size. Character (cursor) grid is 1-2, 0-9 (Enhanced mode only)

Example:

```
1DTXT$ED
1DTXT$CM0
1DTXT$TM1
1DTXT$CP1,0
VAR1=NUM
1DTXT$CP2,0
1DVO1,3,2,1
```

This series of commands clears the 900x screen, sets the cursor mode to $CP mode, sets the text size to large, gets a number from the operator in large text, then displays that number in large text on the next row down.

See also:

$CMm

$CPr,c

Erase in Display $ED

Purpose:

Erases all of the screen and the cursor goes to the home position.

Syntax:

$ED

Erase in Line $EL

Purpose:

Erases from the cursor to the end of the line, including the cursor position.

Syntax:

$EL

Set Display Attribute $DAattr1,...,attrn

Purpose:

Sets the character attribute specified by the parameters. All of the following characters have the attribute according to the parameters until the next occurrence of Set Display Attribute. Up to a maximum of seven display attributes can be set at a time.

Syntax:

$DAattr,...,attrn

Parameter (#)	Meaning
0	All Attributes Off (normal)
5	Blink On
7	Reverse Video On
30	White Foreground
31-37	Black Foreground
40-46	White Background
47	Black Background

See also:

$TMm

Enable Line Wrap $EW

Purpose:

Sets the terminal into automatic line wrap mode.

Syntax:

$EW

Disable Line Wrap $DW

Purpose:

Resets the terminal to not line wrap. Characters past the end of the line are thrown away.

Syntax:

$DW

Set Cursor Type $CTtype

Purpose:

Sets the type of cursor visible on the Model 900X screen. The cursor can be off, insert type, or overtype type

Syntax:

$CTtype

type	Meaning
0	Cursor off
1	Insert type cursor
2	Overtype cursor

Set Scrolling Region $SRtr,br

Purpose:

This allows you to set a specific region on the screen as a scrolling region. **tr** specifies the top row that will scroll and **br** specifies the bottom scrolling row. **br** must be greater than the first. The rows can range from 1-8.

Syntax:

$SRtr,br

Example:

1”$CP2,1

1”$SR2,3

The second command ,used with and X series product , sets the scrolling region to be rows 2 and 3. The first command moves the cursor to row 2, column 1, into the new scrolling region.

1”$CP3,39

1”

This second set of commands scrolls the region up. This is accomplished by putting a character at the end of the bottom line of the scrolling region.

Clear Scrolling Region $CR

Purpose:

This command clears any scrolling region settings and returns to the default. Scroll 1-8. (See the command above $SR for details)

Syntax:

$CR

Set Backlight Function $BFtype

Purpose:

To configure the desired operation of the backlight. The backlight can always be off (type=2), always be on (type=1), or be in auto mode (type=0). In auto mode, the backlight goes off after ten minutes of inactivity. The backlight comes back on the first time a key is pressed.

Syntax:

$BFtype

type	Meaning
0	Backlight auto
1	Backlight on
2	Backlight off

Draw Graphic Line $DLx1,y1,...,xn,yn

Purpose:

This command allows you to use the graphic capability of the Model 900X to draw a line on the display. Facing the display; y axis is the row axis, vertical dimension.; x axis is the column axis, horizontal dimension. The upper left corner of the display is (x,y)= (0,0).

Syntax:

$DLx1,y1,...,xn,yn

Comments:

The format of the command is

$DLx1,y1,x2,y2

to draw a single line, or:

$DLx1,y1,x2,y2,x3,y3

to draw a two connected lines end to end, or:

$DLx1,y1,x2,y2,x3,y3,x4,y4

to draw three connect lines end to end, etc.

y1 is the starting y pixel location (0-63) for the line.
x1 is the starting x pixel location (0-239) for the line.
y2 is the ending y pixel location (0-63) for the line.
x2 is the ending x pixel location (0-239) for the line.
y3 is the ending y pixel location (0-63) for the second line.
x3 is the ending x pixel location (0-239) for the second line.
etc.

When drawing multiple lines, the ending point of the previous line becomes the starting point for the next line.

Erase the line with the command

$CLy1,x1,y2,x2 or $CLy1,x1,y2,x2,...yn,xn

Example:

1"$DL1,10,1,50,80,50

This command ,used with X series products, draws two lines in the form of an x-y coordinate system. The first line is from the top left of the display at (x,y) = (1,10) to (x,y)=(1,50). The second line is from (1,50) to (80,50).

Erase Graphic Line $CLx1,y1,...,xn,yn

Purpose:

This command allows you to use the graphic capability of the Model 900X to erase a line previously drawn on the display. It is also useful for drawing a "white" line on a "blue" filled box.

Syntax:

$CLx1,y1,x2,y2 **or** **$CLx1,y1,...,xn,yn**

Comments:

The format of the command is

$CLx1,y1,x2,y2

to erase a single line, or:

$CLx1,y1,x2,y2,x3,y3

to erase a two connected lines end to end, or:

$CLx1,y1,x2,y2,x3,y3,x4,y4

to erase three connect lines end to end, etc.

y1 is the starting y pixel location (0-63) for the line.
x1 is the starting x pixel location (0-239) for the line.
y2 is the ending y pixel location (0-63) for the line.
x2 is the ending x pixel location (0-239) for the line.
y3 is the ending y pixel location (0-63) for the second line.

x3 is the ending x pixel location (0-239) for the second line.
etc.

When erasing multiple lines, the ending point of the previous line becomes the starting point for the next line.

Draw the line with the command

$Dlx1,y1,x2,y2

or **$Dlx1,y1,...xn,yn**

Example:

```
1"$CL1,10,1,50,80,50
```

This command erases the x-y coordinate graph that was drawn in the example above for the $DL, draw line command.

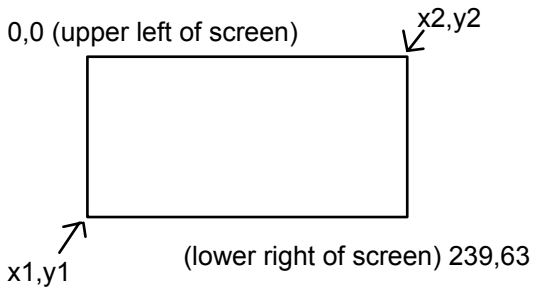
Draw Graphic Box $DBx1,y1,...xn,yn

Purpose:

This command allows you to use the graphic capability of the Model 900X to draw an outline box on the display.

Syntax:

$DBx1,y1,x2,y2 **or** ***$DBx1,y1,...xn,yn***



Comments:

The format of the command to draw a single box is

```
$DBx1,y1,x2,y2
```

x1 is the lower left corner x pixel location (0-239) for the box.
y1 is the lower left corner y pixel location (0-63) for the box.
x2 is the upper right corner x pixel location (0-239) for the box.
y2 is the upper right corner y pixel location (0-63) for the box.

The format of the command to draw two boxes is

```
$DBx1,y1,x2,y2,x3,y3,x4,y4
```

x1 is the lower left corner x pixel location (0-239) for the first box.
y1 is the lower left corner y pixel location (0-63) for the first box.
x2 is the upper right corner x pixel location (0-239) for the first box.
y2 is the upper right corner y pixel location (0-63) for the first box.
x3 is the lower left corner x pixel location (0-239) for the second box.
*y3*is the lower left corner y pixel location (0-63) for the second box.
x4 is the upper right corner x pixel location (0-239) for the second box.
y4 is the upper right corner y pixel location (0-63) for the second box.

You can draw at least three boxes at a time in this manner.

Erase the box with the command

$CBx1,y1,x2,y2

Example:

```
DWRITE"$DB20,20,30,30,40,20,80,60"
```

This 6000 series command makes two graphic boxes. One has its lower left hand corner at (x,y)=(20,20). The other box has its lower left corner at (40,20).

Erase Graphic Box $CBx1,y1,...xn,yn

Purpose:

This command allows you to use the graphic capability of the Model 900 to erase an outline box previously drawn on the display. It is also useful for drawing a "white" outline box in a "blue" filled box.

Syntax:

$CBx1,y1,x2,y2 **or** ***$CBx1,y1,...xn,yn***

Comments:

The format of the command to erase a single box is

```
$CBx1,y1,x2,y2
```

x1 is the lower left corner x pixel location (0-239) for the box.
y1 is the lower left corner y pixel location (0-63) for the box.
x2 is the upper right corner x pixel location (0-239) for the box.
y2 is the upper right corner y pixel location (0-63) for the box.

The format of the command to erase two boxes is

```
$CBx1,y1,x2,y2,x3,y3,x4,y4
```

x1 is the lower left corner x pixel location (0-239) for the first box.
y1 is the lower left corner y pixel location (0-63) for the first box.
x2 is the upper right corner x pixel location (0-239) for the first box.
y2 is the upper right corner y pixel location (0-63) for the first box.
x3 is the lower left corner x pixel location (0-239) for the second box.
*y3*is the lower left corner y pixel location (0-63) for the second box.
x4 is the upper right corner x pixel location (0-239) for the second box.
y4 is the upper right corner y pixel location (0-63) for the second box.

You can erase at least three boxes at a time in this manner.

Erase the box with the command

$CBx1,y1,x2,y2

Example:

```
DWRITE"$CB20,20,30,30,40,20,80,60"
```

This 6000 series command erases two graphic boxes. One has its lower left hand corner at (x,y)=(20,20). The other box has its lower left corner at (40,20).

Draw Graphic Box Filled $DFx1,y1,...,xn,yn

Purpose:

This command allows you to use the graphic capability of the Model 900 to draw a filled box on the display.

Syntax:

$DFx1,y1,x2,y2 **or** ***$DFx1,y1,...xn,yn***

Comments:

The format of the command to draw a single filled box is

`$DFx1,y1,x2,y2`

x1 is the lower left corner x pixel location (0-239) for the box.
y1 is the lower left corner y pixel location (0-63) for the box.
x2 is the upper right corner x pixel location (0-239) for the box.
y2 is the upper right corner y pixel location (0-63) for the box.

The format of the command to draw two filled boxes is

$DFx1,y1,x2,y2,x3,y3,x4,y4

x1 is the lower left corner x pixel location (0-239) for the first box.
y1 is the lower left corner y pixel location (0-63) for the first box.
x2 is the upper right corner x pixel location (0-239) for the first box.
y2 is the upper right corner y pixel location (0-63) for the first box.
x3 is the lower left corner x pixel location (0-239) for the second box.
*y3*is the lower left corner y pixel location (0-63) for the second box.
x4 is the upper right corner x pixel location (0-239) for the second box.
y4 is the upper right corner y pixel location (0-63) for the second box.

You can draw at least three filled boxes at a time in this manner.

Erase the box with the command

$CFx1,y1,x2,y2

Example:

```
DWRITE"$DF20,20,30,30,40,20,80,60"
```

This 6000 series command makes two filled graphic boxes. One has its lower left hand corner at (x,y)=(20,20). The other box has its lower left corner at (40,20).

Erase Graphic Box Filled $CFx1,y1,...,xn,yn "

Purpose:

This command allows you to use the graphic capability of the Model 900 to erase a filled box on the display.

Syntax:

$CFx1,y1,x2,y2 **or** ***$CFx1,y1,...xn,yn***

Comments:

The format of the command to draw a single filled box is

```
$CFx1,y1,x2,y2
```

x1 is the lower left corner x pixel location (0-239) for the box.
y1 is the lower left corner y pixel location (0-63) for the box.
x2 is the upper right corner x pixel location (0-239) for the box.
y2 is the upper right corner y pixel location (0-63) for the box.

The format of the command to draw two filled boxes is

```
$CFx1,y1,x2,y2,x3,y3,x4,y4
```

x1 is the lower left corner x pixel location (0-239) for the first box.
y1 is the lower left corner y pixel location (0-63) for the first box.
x2 is the upper right corner x pixel location (0-239) for the first box.
y2 is the upper right corner y pixel location (0-63) for the first box.
x3 is the lower left corner x pixel location (0-239) for the second box.
*y3*is the lower left corner y pixel location (0-63) for the second box.
x4 is the upper right corner x pixel location (0-239) for the second box.
y4 is the upper right corner y pixel location (0-63) for the second box.

You can draw at least three filled boxes at a time in this manner.

Example:

```
DWRITE"$CF20,20,30,30,40,20,80,60"
```

This 6000 series command erases two filled graphic boxes. One has its lower left hand corner at (x,y)=(20,20). The other box has its lower left corner at (40,20). (Erases boxes drawn in the $DF example.)

Display Startup Screen $DS

Purpose:

This command causes the main 900X startup screen to be displayed.

Syntax:

$DS

Example:

```
DWRITE"$DS"
```

Reset Display $RS

Purpose:

This command resets the Model 900X.

Syntax:

$RS

Example:

```
DWRITE”$RS”
```

APPENDIX A - COMPUMOTOR COMMANDS

6000 SERIES SUPPORTED COMMANDS:

DJOGdata- Data can have the values of 1 for enable jog mode or 0 for disable jog mode.

EXAMPLE:

DJOG1

This command enables jog mode.

DCLEARdata-Data can have the values of 0- clear all display lines; 1- clear line number 1 or 2- clear line 2.

This command will not clear graphics, large or huge text off the screen.

EXAMPLE:

DCLEAR0

This command clears the entire display. and places the cursor at row 1, column 1.

DPASSdata-This command changes the password . Data can have the value of 1-9999.

EXAMPLE:

DPASS1234

This command changes the password to 1234.

DPCURr,c- This command positions the cursor at row -**r** or column **c**. Row may be 1 or 2. Column may be 0-39.

EXAMPLE:

DPCUR1,0

This command places the cursor in the home position . Row 1 column 0.

DREAD- This is the read data command. The Host stops the program and waits for a numeric input from the 900X.

EXAMPLE:

VAR1=DREAD

This command reads the 900X's numeric keypad after a number and the enter key is pressed. The value is read and stored in variable VAR1.

DREADF- This command reads a function key from the 900X. The command stops the program and waits for a function key entry.

EXAMPLE:

VAR1=DREADF

This command reads a function key entered from the 900X and stores it in the variable VAR1.

DREADI- This is the read data immediate command. The Host reads a numeric input from the 900x while the program is running.

EXAMPLE:

VAR1=DREADI

This command reads the 900X's numeric keypad after a number key is pressed. The value is read and stored in variable VAR1.

6000 SERIES SUPPORTED COMMANDS:

DVARa,b,c,d-This command displays a formatted variable on the 900X. The value **a**- is the variable number 1-150; the value **b** , is the number of digits to the left of the decimal point to be displayed; the value **c**, is the number of fractional digits to the right of the decimal point.; the value **d**, is 0 for no sign bit displayed and 1 to display a sign bit.

EXAMPLE:

VAR1=1.234

DVAR1,1,3,1

These statements would load VAR1 with 1.234 , and the next line would display the variable VAR1 on the 900X display as it is shown.

DWRITE"text"- This command prints the string "text" to the current cursor position. The characters '*' and '$' are not allowed to be printed as they are command control characters.

EXAMPLE:

DWRITE"HELLO WORLD"

DWRITE"$ED"

The first line prints HELLO WORLD to the current cursor location.

The second line uses the $ control character to clear the display with the $ED command.

$B-This command is a 6000 series command to change to the 6000 mode . It should always be at the top of the program for a 6000 series application.

EXAMPLE:

DWRITE"$B"

This command changes the current mode to 6000 mode. The 900X defaults on power up to the X series mode.

X SERIES SUPPORTED COMMANDS:

DVOa,b,c,d - This command displays a variable on the 900X. The value, **a,** is the variable number , it can be from 1-50. The value, **b,** is the number of whole digits displayed (0-15). The value, **c,** is the number of fractional digits displayed(0-5). The value, **d,** is 0 for no sign displayed or 1 to display the sign bit.

EXAMPLE:

VAR1=1.234

DVO1,1,3,1

These statements would load VAR1 with 1.234 , and the next line would display the variable VAR1 on the 900X display as it is shown.

FUN- This command is the receive function key command. The program is halted until a function key is received from the 900X.

EXAMPLE:

VAR1= FUN

This command stores the value of the 900X function key in the variable VAR1.

NUM-This command reads a number from the 900X numeric keypad . The number must also be stored in a variable location.

EXAMPLE:

VAR1= NUM

This command stops the Host program. and waits for a number to be sent from the 900X keypad and stores it in variable VAR1

DCLRdata-This command clears the 900X display. If data is 0, the entire display is cleared. If data is 1, then line 1 of the display is cleared. If data is 2 , line 2 is cleared. This command will not clear graphics, large or huge text.

EXAMPLE:

DCLR1

This command clears line 1 of the 900X display.

DPCrc-This command positions the cursor at row, **r,** row can be 1 or 2. The column, **c,** can be 0-39.

EXAMPLE:

DPC110

This command places the cursor at row 1 ,column 10.

QUOTE- This command is used to send text or commands to the 900X. The command is preceded with the device number you are talking to. This will typically be 1. The characters '*' and $ cannot be printed, as they are control characters, to designate a command.

EXAMPLE:

1"HELLO_WORLD

1"$ED

The first line prints HELLO WORLD at the current cursor position on the 900X. The second line Sends the low level command, $ED, to the 900X, which erases the display.

DTXTtext- This command is used , similar to the QUOTE command. The sequence **text** is sent to the 900X display at the current cursor position. The space character cannot be sent in text , as it will terminate the message as will carriage return. The '*' and the '$' characters also cannot be printed as they are command control characters.

EXAMPLE:

DTXTHELLO_WORLD

DTXT$CP2,1

The command on the first line would display HELLO WORLD at the current cursor position. The command on the second line uses the command control sequence ,$CP2,1 , to position the cursor at row 2 , column 1.

DCNTdata-This command enables (data = 1) or disables(data=0) , the PAUSE and CONTINUE keys.

EXAMPLE:

DCNT1

This command enables the PAUSE and CONTINUE keys.

DSTPdata-This command enables(data=1) or disables (data=0) the STOP key.

EXAMPLE:

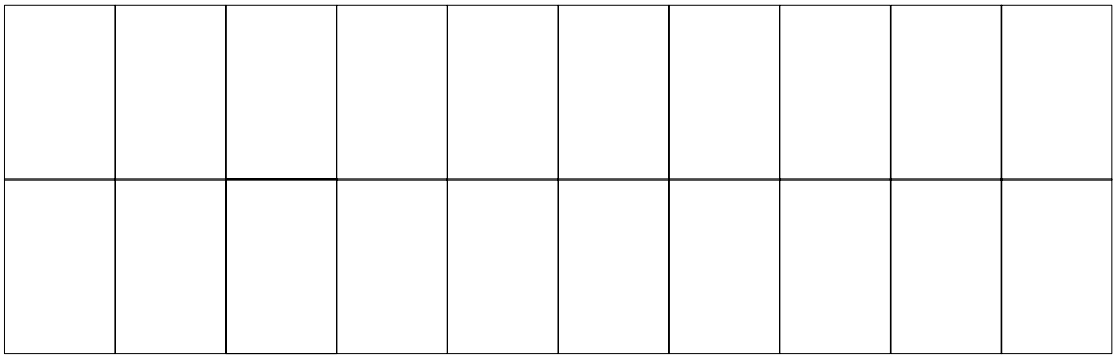
DSTP0

This command disables the STOP key

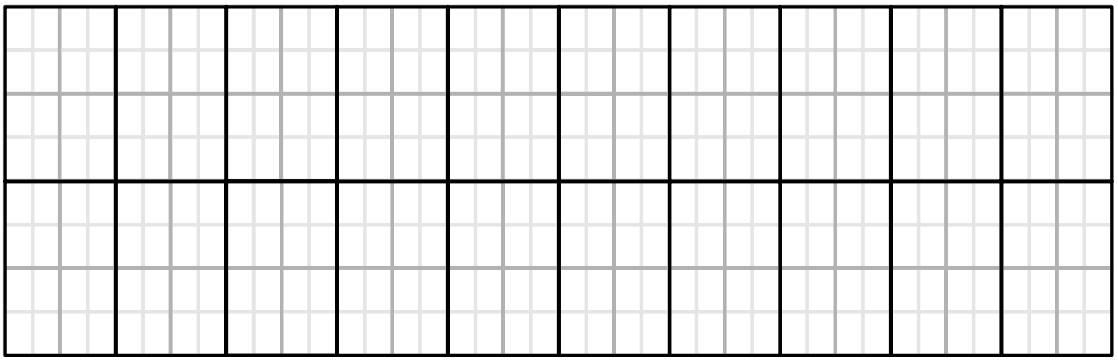
Unfortunately, products using 6000 language have no software commands that allow the activation or de-activation of buttons on the 900X front panel.

APPENDIX B - CHARACTER LAYOUT GRIDS

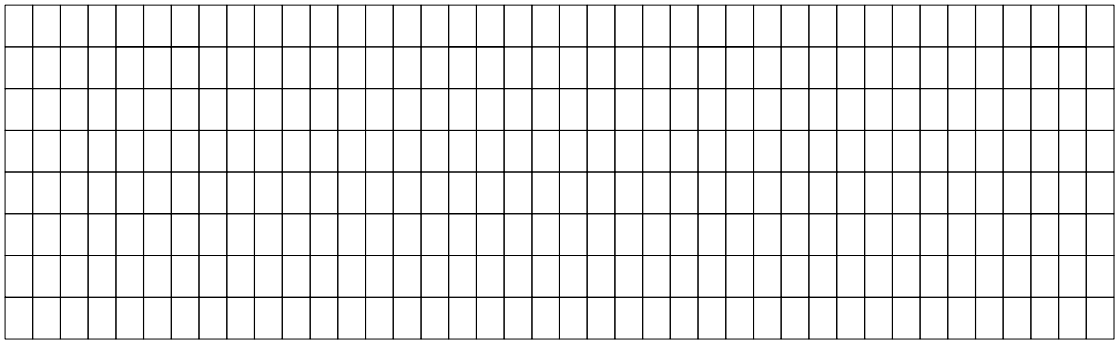
On this page are some grids to help you lay out your screens in small, large, and huge characters.



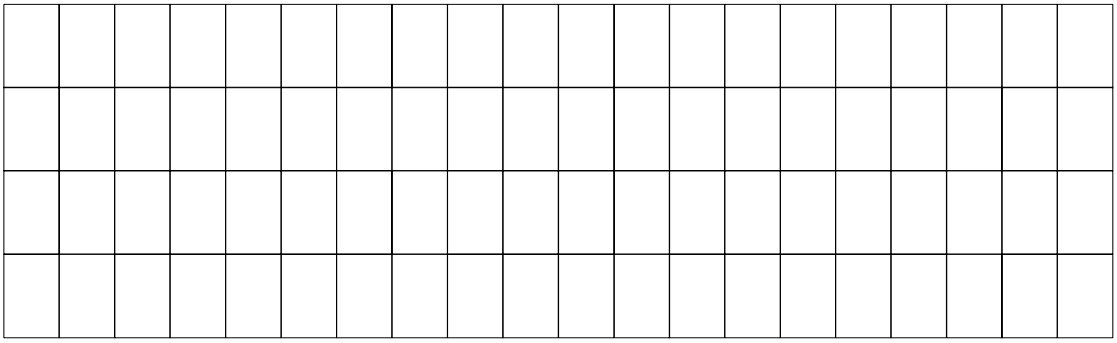
Huge Text (10x2)



Combined Grid



Regular Text (40x8)



Large Text (20x4)

APPENDIX C - WARRANTY INFORMATION

Congratulations and thank you for purchasing one of Eason Technology's operator interface products. We strive to provide customers with unparalleled service and support. Your feedback and suggestions are crucial to our success.

Please take a few minutes to complete the Warranty and Product Registration Form so that we may better serve your needs. Completing and returning this form within 30 days registers and validates your warranty. Upon receipt of this form, we will ensure that you receive information about product and documentation updates.

Thank you for your response.

THIS EASON TECHNOLOGY, INC. PRODUCT IS WARRANTED AGAINST DEFECTIVE MATERIALS OR WORKMANSHIP FOR A PERIOD OF 365 DAYS FROM THE DATE OF ORIGINAL SHIPMENT.

PRODUCTS COVERED BY THIS WARRANTY WILL BE REPAIRED WITHOUT CHARGE EXCEPT FOR SHIPPING. BEFORE RETURNING PRODUCT FOR WARRANTY SERVICE, CALL OUR CUSTOMER SERVICE DEPARTMENT AT (707) 433-2854 TO OBTAIN AN RMA # (RETURNED MERCHANDISE AUTHORIZATION NUMBER). WHEN RETURNING YOUR EQUIPMENT FOR WARRANTY SERVICE, THE SHIPPING CHARGES MUST BE PREPAID AND THE RMA # MUST BE CLEARLY MARKED ON THE BOX. SEND THE EQUIPMENT TO EASON TECHNOLOGY, INC., 241 B CENTER STREET, HEALDSBURG, CA 95448, ALONG WITH A DESCRIPTION OF THE PROBLEM. WE WILL PAY NORMAL GROUND SHIPPING CHARGES TO SEND THE PRODUCT BACK TO YOU. IF OTHER MEANS OF SHIPPING ARE REQUESTED, YOU WILL BE BILLED AT COST FOR ADDITIONAL SHIPPING FEES.

THIS WARRANTY ONLY COVERS DEFECTS IN MATERIALS OR WORKMANSHIP WHICH OCCUR DURING NORMAL USE. IT DOES NOT COVER DAMAGE WHICH OCCURS IN SHIPMENT OR FAILURES WHICH ARE CAUSED BY PRODUCTS NOT SUPPLIED BY EASON TECHNOLOGY OR FAILURES WHICH RESULT FROM ACCIDENT, MISUSE, ABUSE, NEGLECT, MISHANDLING, MISAPPLICATION, FAULTY INSTALLATION, IMPROPER MAINTENANCE, ALTERATION, MODIFICATION, LINE POWER OR SERVICE BY ANYONE OTHER THAN A FACTORY AUTHORIZED TECHNICIAN.

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RETAIN THIS WARRANTY SHEET FOR YOUR REFERENCE.

MODEL 900X_____ Date Purchased:_____

Serial Number_____:_____ Purchased From:_____