

**Technical Bulletin # 970520**

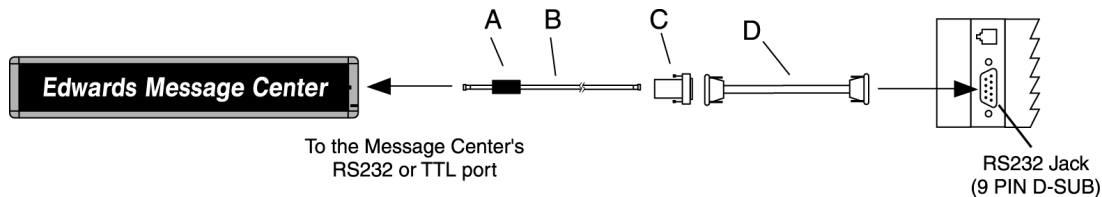
**Date:** July 19, 1999  
**Product:** Message Centers  
**Product Category:** PLC Activation

**Subject: How to display text messages using a PLC**

All Edwards Message Centers are capable of displaying messages using an ASCII Text string. This bulletin will describe the steps necessary to use a PLC to display basic messages on any Edwards Message Center. The PLC needs to be capable of sending an ASCII Text String to either an RS232 or RS485 output. The text string must be in the proper format; otherwise the message will not be displayed. Any Experienced Ladder Logic Programmer will understand these basic instructions and will be able to integrate these commands into more complex Ladder Logic Functions.

**SECTION I: Hardware Connections**

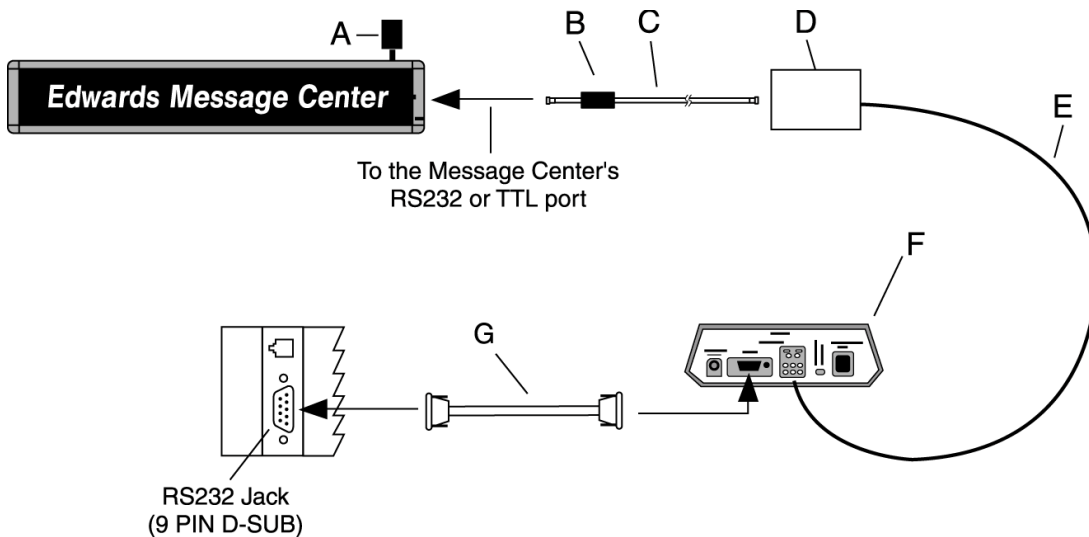
The PLC Software must be capable of sending an ASCII Text String to an RS232 Serial Port. For single Message Center operation use an adapter and straight through RS-232 cable as shown in diagram 1. Or for multiple Message Centers or RS485 operation you should follow the wiring employed in diagram 2.



Item	Cat. No.	Description
A	—	Ferrite (ferrite end towards Message Center)
B	MCN232-RJ11-25	25 foot, 6-conductor RS-232 cable
	MCN232-RJ11-50	50 foot, 6-conductor RS-232 cable
C	MCN2329FRJ11	9 Pin D-Sub/to 6 pos RJ11 adapter
D	MCN485CB232A9	10 foot 9 pin-to-9pin type A9 RS232 cable

**NOTE: Set internal message center jumper to RS232**

Diagram 1



Item	Cat. No.	Description
A	MCN485EOLTCB	EOL Termination
B	—	Ferrite (ferrite end towards Message Center)
C	MCN232-RJ11-8	8 foot, 4-conductor RS-485 cable
	MCN485-RJ11-1	1 foot, 4-conductor RS-485 cable
D	MCNMNARJ11485	Modular network adapter
E	MCN485-1000	1000 foot spool of RS485 cable
F	MCN485CB2EOLT	Converter box w/2 EOL terminators
G	MCN485CB232A9	10 foot 9 pin-to-9 pin type A9 RS232 cable

**NOTE: Set internal message center jumper to RS485**

Diagram 2

## **SECTION II: Software Configuration**

To configure any software for communications with the Message Center, the following parameters need to be established by the user:

Mode: ASCII  
 Baud: 9600  
 Parity: None  
 Stop Bits: 1  
 Start Bits: 8

## **SECTION III: Message Center Setup**

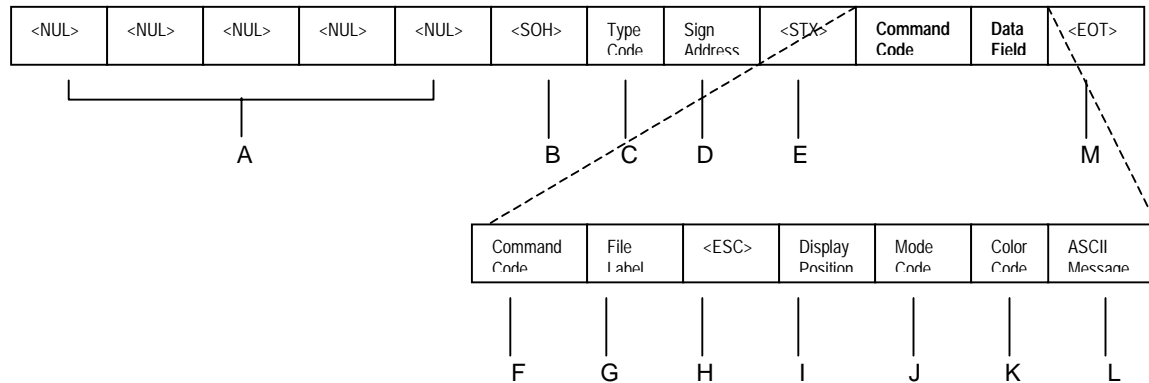
There are only a few things needed to set up the Message Center to receive text strings from the PLC. First, set the internal jumper to RS-232 or RS-485 position as needed. Next, Clear the Message Center's memory and setup the desired serial address using the remote control.

The serial string to clear memory is: <NUL><NUL><NUL><NUL><NUL><SOH>Z01<STX>E\$AAU0100FF00<EOT> This string sets the Message Center's memory configuration for File Label A, Write a Text File, Unlocked (File is accessible using Remote Control), File Size 0100h (256 bytes, 4 byte format), Start Time = FF (Run always, two byte format), and Stop Time = 00 (Stop time is ignored when message is set to run always, two byte format).

## SECTION IV: Text String Format

A message can easily be constructed by typing directly in ASCII to the appropriate data source file. Listed below is a sample string that tells an Edward's Message Center to display the following text and format: **"Electrician and Supervisor report to cell #3"** with Fill text, Red text color, normal font, in hold text mode. The Message Center serial address in this example is 01.

### Message example 1:



<NUL><NUL><NUL><NUL><NUL><SOH>Z01<STX>AA<ESC>0b<FS>1Electrician and Supervisor please report to cell #3<EOT>

Where:

Item	Name		ASCII	HEX Value		Description	
A	<NUL>		^@	00h		Five consecutive <NUL> for sync & auto-baud detect of the message.	
B	<SOH>		^A	01h		<SOH> "Start of Header" character	
C	Type Code		Z	5Ah		ASCII Type Code for All Signs in network	
D	Sign Address		01	30h	31h	2 Byte ASCII-Hex Sign Address (see note 1)	
E	<STX>		^B	02h		<STX> "Start of Text" character	
F	Command Code		A	41h		Command code A, Write a TEXT File to the sign	
G	File Label		A	41h		File Label A name	
H	Data Field	Text File Format	Mode Field	<ESC>	^[	1Bh	The <ESC> sequence character that denotes start of Mode Field
I				Display Position	0	30h	Display position. (see note 2)
J				Mode Code	b	62h	A control character that denotes holding the text in place
K				Color Code (<FS> + "color")	^ \ + 1	1Ch	31h
L	Text Message		ASCII Message	"Electrician and Supervisor report to cell #3"		The text that will appear on the sign	
M	<EOT>		^D	04h		The <EOT> end of transmission character. Must follow the end of every message string.	

### Notes:

- (1) The serial address of the sign is represented by two ASCII digits as a number between "00" to "FF" (0 to 255) If 00 is the desired serial address, the two byte ASCII representation would be 30h for the first digit

and 30h for the second digit. It is important to remember to treat the serial address as a two-digit code. (All signs on the network will respond to the string when the serial address is 00.)

- (2) On one-line Message Centers, the Display Position is irrelevant, but must be included. The following ASCII characters can be used for the Display Position:

ASCII	HEX Value	Description
0	30h	Fill the sign with all available lines centered vertically
<Space>	20h	Start the text in the middle
"	22h	Start the text on the top line
&	26h	Start the text on the bottom line

- (3) The following control characters can be used for text color: **The control characters for the Color Codes are in a two-byte format.**

ASCII Code	Hex Value	Description
<FS> + 1	1Ch 31h	Red
<FS> + 2	1Ch 32h	Green
<FS> + 3	1Ch 33h	Amber
<FS> + 4	1Ch 34h	Dim Red
<FS> + 5	1Ch 35h	Dim Green
<FS> + 6	1Ch 36h	Brown
<FS> + 7	1Ch 37h	Orange
<FS> + 8	1Ch 38h	Yellow
<FS> + 9	1Ch 39h	Rainbow 1
<FS> + A	1Ch 41h	Rainbow 2
<FS> + B	1Ch 42h	Color Mix
<FS> + C	1Ch 43h	Auto-Color

## **SECTION V: Sample Strings**

Message Action	String Required
Flash Red Message	<NUL><NUL><NUL><NUL><NUL><SOH>Z01<STX>AA<ESC>0c<FS>1Hard Hats Required<EOT>
Flash Green Message	<NUL><NUL><NUL><NUL><NUL><SOH>Z01<STX>AA<ESC>0c<FS>2Hard Hats Required<EOT>
Steady Red Message	<NUL><NUL><NUL><NUL><NUL><SOH>Z01<STX>AA<ESC>0b<FS>1Hard Hats Required<EOT>
Steady Green Message	<NUL><NUL><NUL><NUL><NUL><SOH>Z01<STX>AA<ESC>0b<FS>2Hard Hats Required<EOT>

**NOTE:** In order for text “**hold**” or other features to properly work, Message Centers should have the “Auto-mode” disabled. This can be done one time, directly from the remote control, in “Program” mode.

## **SECTION VI: Additional Support**

For questions please call our Technical Support @ 203-699-3300 or visit our web-site [www.edwards-signals.com](http://www.edwards-signals.com) . Additional codes are available for controlling message center text strings in our Communications Protocol available from your local Edwards Signaling representative.