Allen-Bradley

PLC–2 Family Report Generation Module

(Cat. No. 1770-RG)

User Manual

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Chapter 1

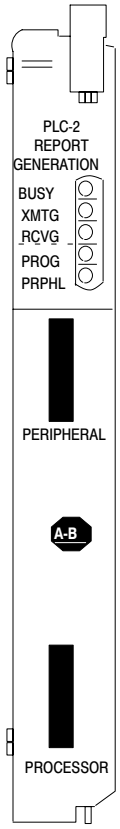
Introduction

General

The PLC-2 Family Report Generation Module (cat. no. 1770-RG) provides bidirectional communication for report generation between a PLC-2 family processor and an EIA RS-232-C peripheral device. This allows you to store, delete, edit, report and display messages in PC processor memory (Figure 1.1).

You can use the report generation (RG) module with any PLC-2 family processor with any EIZ RS-232-C peripheral device.

Figure 1.1
PLC-2 Family Report Generation Module



Report Generation

Allen-Bradley report generation has the capability to display a message or report when required. Up to 198 messages can be stored in PC processor memory. When using delimiters, messages can use the current status of data table bits, bytes or words to report the on/off condition of input or output devices, analog values, timer/counter accumulated values, real time or calendar values.

You can initiate the display of stored messages from the keyboard of a peripheral device when the RG module is in the manual mode of report generation. Or, stored messages can be displayed automatically when the RG module is in the automatic report generation mode. In this mode, program logic initiates the display of a message.

Messages are stored in the area of memory following the user program. The number of memory words available for messages is equal to the amount of memory remaining after the user program has been fully developed. Messages are stored and displayed in a free-form format, generally in the same format they are entered. Messages can be accessed when the PC processor keyswitch is in any position. However, automatic report generation (auto report mode) is operational only when the processor keyswitch is in the RUN/PROG, RUN or TEST position. Report generation manual mode is operational when the PC processor keyswitch is in any position if the RG module is configured for manual mode.

Module Features

The RG module is compatible with existing report generation programming and messages stored using the industrial terminal (cat. no. 1770-T1,-T2,-T3). The RG module has additional features, as well. The RG module's features include:

- Up to 198 messages - you can choose the number of messages to be stored.
- On-Line message store, edit or delete - you can store, edit or delete a message while the PC processor is executing its program
- Message protection - the RG module guards against inadvertent deletion of a message
- Simple programming - only 2 or 3 rungs of programming are required to display a message by program logic
- Real time-clock - you can enter and display the time, and use the time in a message. Time format is the 24 hour (military) format, 4:15 PM is 16:15 hours

- Real time calendar - you can enter and display the date, and use the date in a message. Date format is month/day/year, November 25, 1983 is 11/25/83
- Intelligent printer interface - the RG module can monitor a busy/ready signal from the printer
- Peripheral fault detection - the RG module can set bit 027/06 in the PC processor data table when the module detects a fault in the peripheral device
- Module re-configuration - you can reconfigure the module's operational configuration (internal switch settings) from the peripheral device keyboard
- Selectable communications configuration - you can select EIZ RS-232-C communication (up to 50 feet), or A-B long line communication (up to 5,000 feet) with the RG module
- Selectable communication rates - you can choose from eight communication rates: 110, 300, 600, 1200, 2400, 4800, 9600 or 19,200 bits per second (baud)
- Selectable number of data bits - you can choose either seven or eight data bits per character
- Selectable parity bit - you can choose odd, even or no parity

Report Generation Functions

When you enter the correct commands, the RG module performs or lets you perform the following functions:

- MS, 0 message control word file - lets you organize messages in the PC processor data table
- MS message store - lets you create and store a message in PC processor memory
- ME message edit - lets you edit a message in the RG module's edit buffer.
- MP message print - displays a message in a format as entered
- MD message delete - deletes a message
- MI message index - displays an index of all messages (or an individual message) stored in PC processor memory
- MR message report - displays a message using current data in report format
- MT message time - lets you enter a time in the RG module's clock
- MC message calendar - lets you enter a date in the RG module's calendar
- MW Manipulate Word - lets you display and/or change the current value of a data table word in 4 -digit hex
- MB Manipulate Byte - lets you display and/or change the current value of a data table byte in 8-bit binary

- MOD module configuration - lets you reconfigure the RG modules operational configurations (internal switch settings) from the peripheral device keyboard

Chapter 2

Assembly and Installation

General

This chapter outlines procedures for preparation, installation and connection of the RG module. Specifications are also listed.

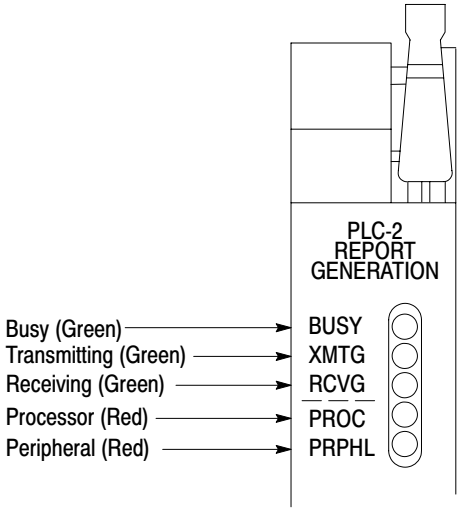
Module Hardware

The RG module is a single slot module with five LED indicators and two cable connectors on the front panel. Inside the module are five switch assemblies which you use to select various options.

Status Indicators

The five LED indicators on the front of the module (Figure 2.1) are useful for troubleshooting and monitoring module activity. The three green indicators show module status when receiving and transmitting messages. The two red indicators show fault status. The five indicators are:

Figure 2.1
Status Indicators



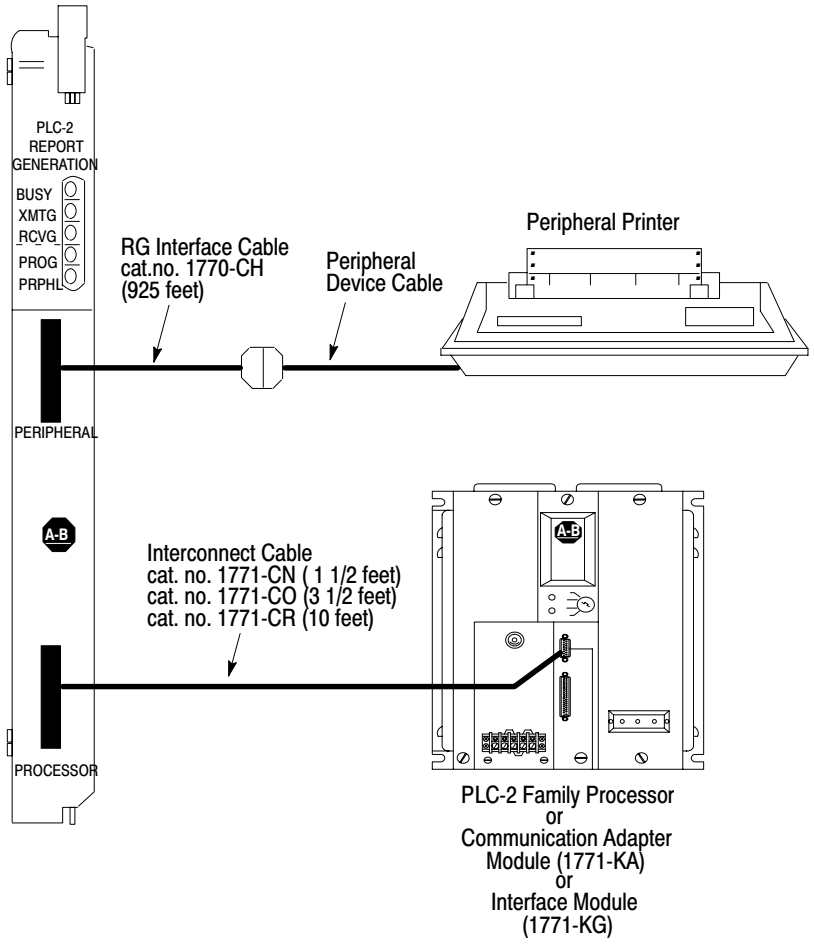
- BUSY – illuminates when the module has temporarily stopped transmitting data to the peripheral device because the peripheral device's receive buffer is full. This LED blinks during module initialization, message edit initialization, message edit store, and message delete.

- XMTG – illuminates when the module is transmitting data to the peripheral device.
- RCVG – illuminates when the module is receiving data from the peripheral device.
- PROC – illuminates when a processor fault has occurred or when the processor is not connected to the RG module.
- PRPHL – illuminates when the RG module detects a fault in the peripheral device.

Cable Connections

The front panel of the RG module has two cable connectors. The upper connector is labeled PERIPHERAL, the lower connector is labeled PROCESSOR. Typical connections to the peripheral device and processor are shown in Figure 2.2.

Figure 2.2
Typical Connections



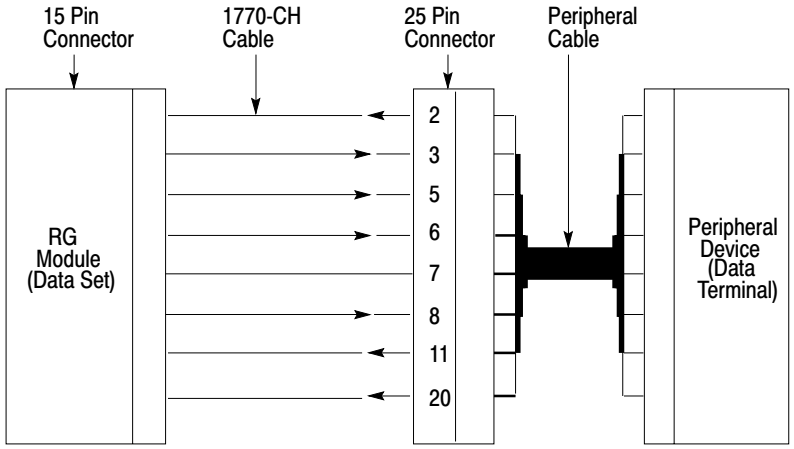
Peripheral Connector

The RG module can be connected to either an RS–232–C peripheral device (50 cable ft max) or to an industrial terminal (cat. no. 1770–T1, –T2, –T3) using the A–B long line cable (5000 cable ft max). If using the industrial terminal, set it to alphanumeric mode.

When you connect the RG module to an industrial terminal, you can use either the 3 ft IT/DH Adapter Cable (cat. no. 1770–CB). Or you can use up to 5000 ft of A–B Long Line Cable (cat. no. 1770–CR). Connect either cable to channel B.

RS–232–C Peripheral Device – Connect the peripheral device to the RG module using the 25 ft RG Interface Cable (cat. no. 1770–CH) supplied with the module and the peripheral device interconnect cable supplied with the peripheral device. Connect the cables in series (Figure 2.2). The RG interface cable conforms to the EIA standard for RS–232–C cables (Figure 2.3).

Figure 2.3
Pin Functions of Peripheral Cable (cat. no. 1770–CH)



Pin No.	Function (Referred to the RG Module)
2	Receives data from the peripheral device
3	Transmits data to the peripheral device
5	Clear to send, set high (+12V dc)
6	Data set ready, set high (+12V dc)
7	Signal ground, common for all data signals
8	Received line signal detector, set high (+12V dc)
11	Secondary request to send, control line for busy/ready signal from peripheral device
20	Data terminal ready, tells RG module when the peripheral device is readdy to receive or transmit data

A–B Long Line Operation – Connect the industrial terminal (use in the alphanumeric mode) to the RG module using an assembled cable. Assemble the cable from the required length of double twisted pair 22 gauge bulk cable (cat. no. 1770–CR), a male 15 pin and a male 25 pin D–shell connector such as Cannon type DB–15P and DB–25P, respectively, or equivalent (Figure 2.4). Connect the 15 pin end of the cable to the upper connector labeled PERIPHERAL on the RG module, and the 25 pin end to the connector labeled CHANNEL B DATA TERMINAL on the back of the industrial terminal.

Note: The maximum usable length of an A–B long line cable depends on the communication rate of data transmitted (Table 2.A).

Figure 2.4
Assembled Long–Line Cable

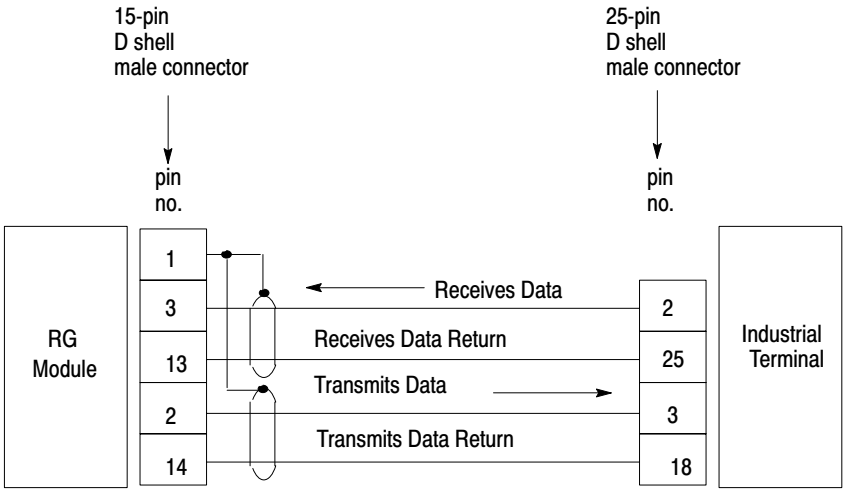


Table 2.A
A–B Long Line Communication Rate/Distance

Distance (feet)	Maximum Rate (baud)
1000	19,200
3000	9,600
5000	4,800 or less

Processor Connector

Connect the RG module to the processor using interconnect cable (cat. no. 1771– CN,–CO, or –CR). These cables are 1.5 ft., 3.5 ft., and 10 ft., respectively. Connect one end to the lower connector labeled PROCESSOR on the RG module and the other end to the connector labeled INTERFACE on the front panel of a Mini– PLC–2 or –2/15 controller, or to the connector labeled PROGRAM PANEL on the front panel of a PLC–2/20, or –2/30 controller.

Note: When connecting previous revision RG modules (revision D, discontinued June 1984) to the current Mini–PLC–2/15 processor cat. no. 1772–LV series B, released September 1983), you must use a new 1772–TC cable or the equivalent, use the new 1772–TC cable in place of the 1771–CN, –CO, –CR cable. You can identify the new version of the 1772–TC cable by the absence of pins 10 thru 15, or modify the old version by removing them.

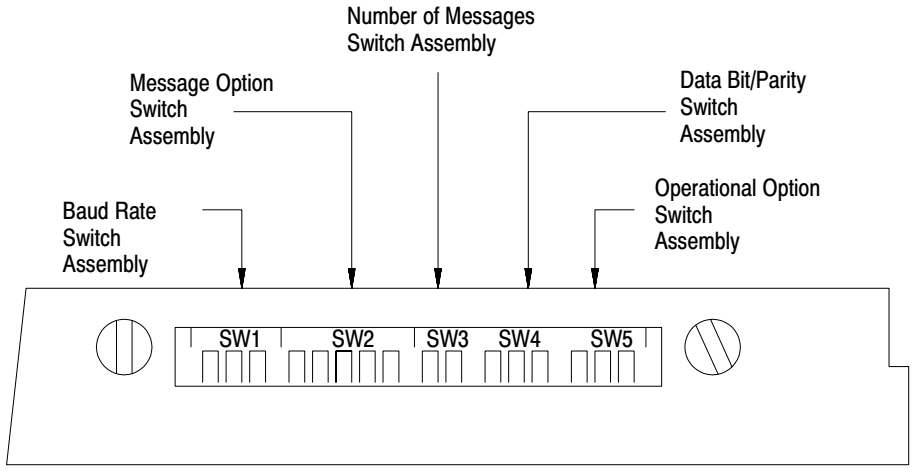
The RG module can also be connected to either of two special bulletin 1771 modules when the PC processor is operating over a modem or on the data highway. When the PLC–2 Family/RS–232–C Interface Module (cat. no. 1771–KG) or the Communication Adapter Module (cat. no. 1771–KA) is used with the PC processor, connect the RG module to the middle connector labeled PROGRAM INTERFACE on either module using the interconnect cable (cat. no. 1771–CN,–CO, or –CR).

Option Switch Assemblies

Five switch assemblies on the module's printed circuit board (Figure 2.5) allow you to select various options. The switch assemblies are:

- SW1 baud rate
- SW2 message option
- SW3 number of messages
- SW4 data bit/parity
- SW5 operational option

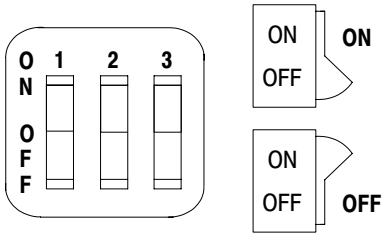
Figure 2.5
Switch Assembly Location



Baud Rate Switch Assembly, SW1

These switches make the module compatible with the communications rate of the peripheral device (Figure 2.6).

Figure 2.6
Baud Rate Switch Assembly (SW–1)



Baud Rate Switch Settings

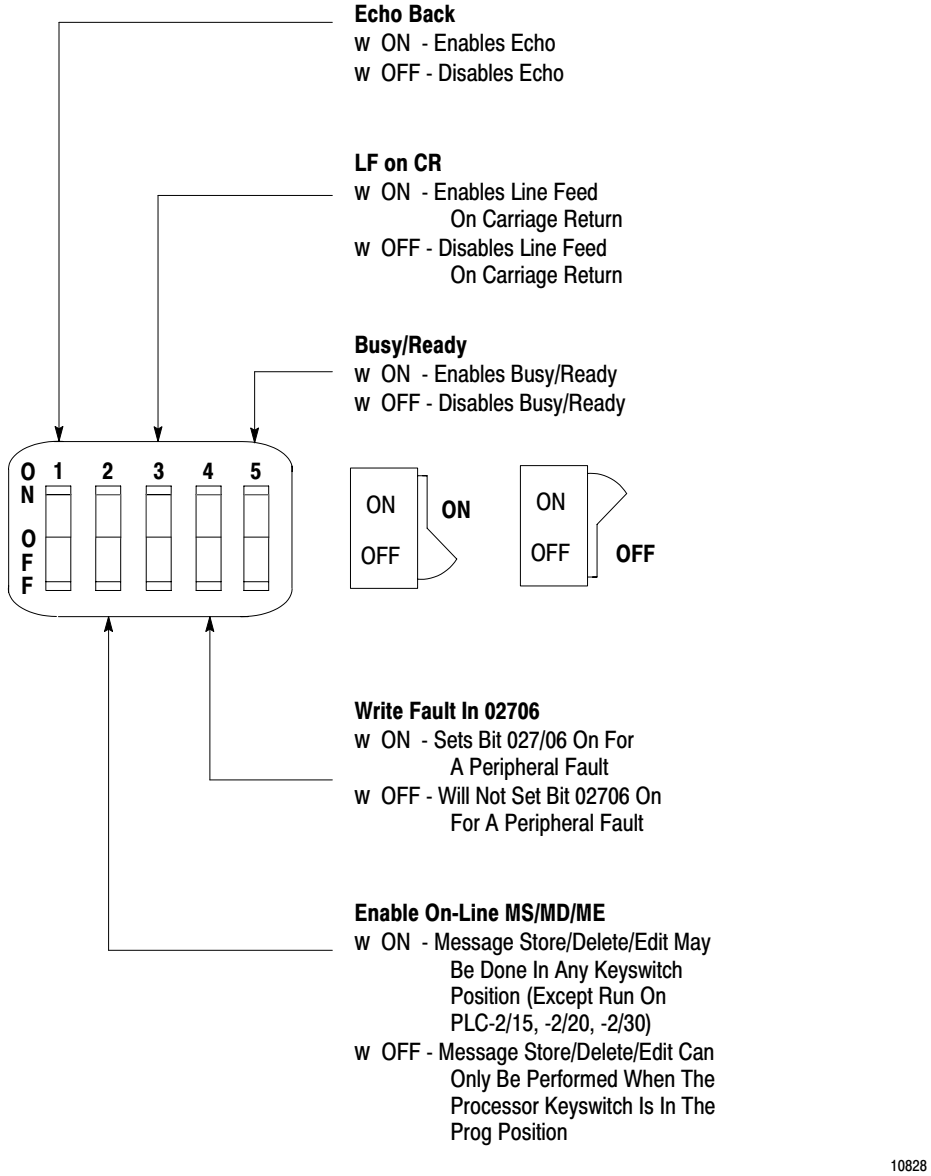
Baud Rate	Switch		
	1	2	3
110	Off	Off	Off
300	Off	Off	On
600	Off	On	Off
1200	Off	On	On
2400	On	Off	Off
4800	On	Off	On
9600	On	On	Off
19200	On	On	On

10827

Message Option Switch Assembly, SW2

Select a message option by turning the appropriate switch on or off (Figure 2.7). The options are:

Figure 2.7
Message Option Switch Assembly (SW–2)



Echo Back (Switch 1)

ON – The RG module returns to the peripheral device eery character that it receives. The peripheral device displays every character received from the module. Set the device for full duplex.

OFF – The RG module does not echo back characters. The peripheral device will display every character that it transmits only if it is configured for half duplex.

Enable On–Line MS/MD/ME (switch 2)

ON – The RG module lets you to store (MS), delete (MD), or edit (ME) a message when the processor is executing its program. The processor's keyswitch can be in any position (except RUN on the Mini–PLC–2/15, PLC–2/20 and PLC–2/30 controllers).

OFF – Message store, delete, or edit can only be performed when the processor's keyswitch is in the PROG position.

LF on CR (switch 3)

ON – The RG module enables automatic line feed (LF) on carriage return (CR) when transmitting to the peripheral device.

OFF – The RG module disables automatic line feed on carriage return.

Write Fault in 027/06 (switch 4)

ON – The RG module sets bit 06 of word 027 on when it detects a peripheral fault. The RG module resets bit 06 off when the peripheral fault is corrected.

OFF – Setting the fault bit is disabled.

Busy/Ready (switch 5)

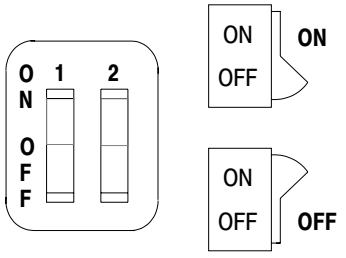
ON – If configured for RS–232–C operation (SW5, switch 1 is off), the module monitors pin 11 of the peripheral connector. If pin 11 is high, the module transmits to the peripheral device. If pin 11 is low, the module stops transmitting to the peripheral device.

OFF – The module does not monitor pin 11.
If configured for Allen–Bradley long line operation (SW5, switch 1 is on), set this switch off.

Number of Messages Switch Assembly, SW3

These switches select the maximum number of messages that can be reported automatically. You can select up to 6, 70, 134 or 198 messages. Refer to Figure 2.8.

Figure 2.8
Number of Messages Switch Assembly (SW–3)



Number of Messages Switch Assembly (SW-3) Settings

Number of Messages	Switch 1	Switch 2
Up to 6	Off	Off
Up to 70	Off	On
Up to 134	On	Off
Up to 198	On	On

10829

Data Bit/Parity Switch Assembly, SW4

These switches select the number of data bits and parity per message character (Figure 2.9).

Number of Data Bits (switch 1)

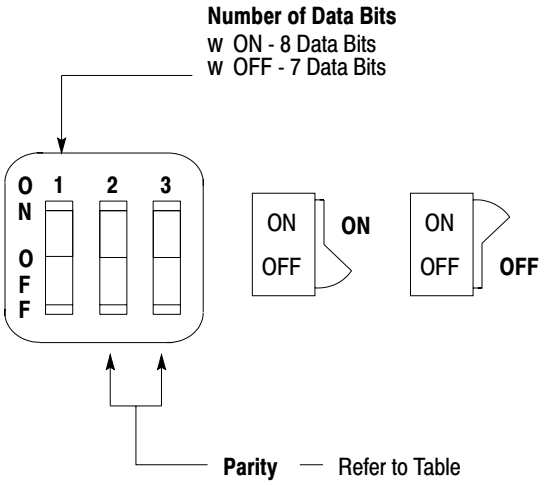
ON – The number of data bits is eight.

OFF – The number of data bits is seven.

Parity (switches 2 and 3)

These switches establish the type of parity used by the RG module as required by the peripheral device. The selections are none, odd or even (Figure 2.9).

Figure 2.9
Data Bit/Parity Switch Assembly (SW–4)



Parity Switch Settings

Parity	Switch	
	2	3
None	Off	Off
Odd	On	Off
Even	Off	On
[1]	On	On

[1] Disables the module.
For factory use only.

1083

Operational Option Switch Assembly, SW5

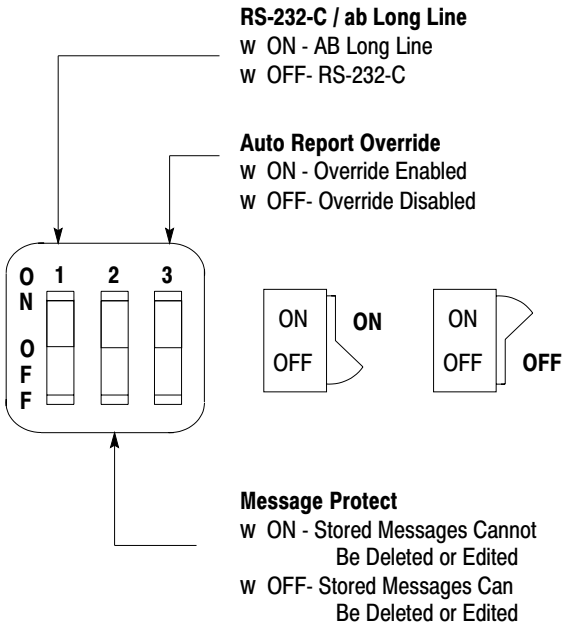
The operating conditions of the RG module are determined by these switches (Figure 2.10).

RS–232–C/A–B Long Line (switch 1)

ON – Allen–Bradley long line is selected for use with an industrial terminal used in the alphanumeric mode only.

OFF – EIZ RS–232–C is selected.

Figure 2.10
Operational Option Switch Assembly (SW–5)



Message Protect (switch 2)

ON – The RG module will not allow you to delete or edit a stored message.

OFF – The RG module will allow you to delete or edit a stored message.

Auto Report Override (switch 3)

ON – The mode of operation (automatic or manual report generation) is determined by the position of the processor's keyswitch but can be overridden from the keyboard of the peripheral device (Table 2.B).

OFF – The mode of operation (auto or manual) is determined by the position of the processor's keyswitch, only (Table 2.B).

Table 2.B
Switch Positions for Module Modes

Processor Keyswitch Position	Auto Report Override Switch 3	Rg Module Mode
PROG	ON or OFF	manual
TEST, RUN, RUN/PROG	ON	manual or auto [1]
TEST, RUN, RUN/PROG	OFF	auto
[1] as determined from the peripheral device keyboard		

Power Supply Requirements

The RG module receives all of its power from the I/O chassis backplane. The module draws 1.0A at +5V DC. When planning system power requirements, the current required for all modules in an I/O chassis must not exceed the 6.5A maximum rating of the I/O chassis backplane and power supply.

Module Keying

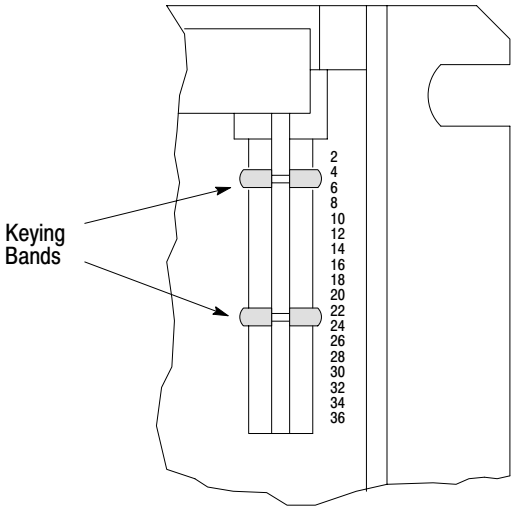
Plastic keying bands, shipped with each I/O chassis, provide an easy method for keying and I/O slot to accept only one type of module. Use of these keying bands is strongly recommended.

The module is slotted in two places on its rear edge. The position of the keying bands on the backplane connector must correspond to these slots to allow insertion of the module. You can key the I/O chassis backplane connectors to accept the RG module.

Snap the keying bands on the upper backplane connectors between these numbers printed on the backplane (figure 2.11).

Between 4 and 6
Between 22 and 24

Figure 2.11
Keying Diagram



Module Installation

The RG module can be placed in any I/O chassis slot except the leftmost slot. Follow these procedures to install the module:

1. Set the module switches for the appropriate options.

2. Remove I/O chassis power.

3. Insert the keying bands as described in Module Keying.

4. Insert the module into its designated slot. Plastic tracks on the top and bottom of the slot guide the module into position. Do not force the module into its backplane connectors. Rather, apply a firm, even pressure on the module to seat it in its slot.

5. Snap the I/O chassis latch over the module. This secures the module firmly in the I/O chassis.

6. Install the RG interface cable and connect the peripheral device. Connect the processor to the module using the appropriate processor interconnect cable.

7. Re–apply I/O chassis power.

The busy LED will blink indicating the module initialization is in progress. When the busy LED stops blinking (none of the red fault LED is on), the module has passed internal diagnostics and is ready for use.

Specifications

This section lists the specifications of the RG module

Function	Interfaces a PLC–2 family processor to an EIA RS–232–C peripheral device
Application	PLC–2 family report generation
Peripheral Channel Communication Rate (user selectable)	110, 300, 600, 1200, 2400, 4800, 9600, 19.2K baud
Maximum Distance From Processor	10 cable feet
Module Location	Any slot except the left–most slot of a bulletin 1771 I/O chassis
Power Requirement	1.0A I/O chassis backplane current
Ambient Temperature Range	Operational 0ºC to +60ºC, +32ºF to +140ºF Storage –40ºC to +85ºC, –40ºF to +185ºF
Relative Humidity	5% to 95% (without condensation)
Keying	Between 4 and 6, 22 and 24

Chapter 3

Module Operation

General

This chapter contains a description of module initialization, the relationship between the processor keyswitch position and module's mode of operation, and an operational overview.

Module Initialization

At initial power-up, the RG module will display the prompt INITIALIZATION IN PROGRESS. During module initialization, the busy LED will blink. When initialization has been completed the prompt COMMAND or AUTOMATIC REPORT GENERATION is displayed indicating that the module is in manual mode or auto report mode, respectively. The Module will read its internal switches and configure itself according to the switch settings.

Processor Keyswitch/Module Mode of Operation

The RG module will go into automatic report generation if the processor keyswitch is in the TEST, RUN or RUN/PROG position. However, the module will go into the manual (command) mode if the keyswitch is in the PROG position.

If the processor keyswitch is changed to the PROG position, the module will automatically change from automatic to manual report generation mode. Also, if the processor keyswitch is changed from the PROG to RUN/PROG or TEST position, the module will automatically change from manual to automatic report generation mode.

Every time the mode of operation is changed, the peripheral device displays a prompt to indicate the current operating mode of the module.

Table 3.A summarizes the settings of the processor keyswitch, on-line MS/MD/ME switch, auto report override switch, and message protect switch for each of the report generation commands that you can enter from the peripheral device keyboard.

Table 3.A
Switch Position for Report Generation

Function	Key Switch Position	Function Allowed	On-Line MS/MD/ME SW2-2	Message Protect SW5-2	Auto Report Override SW5-3
MS	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	On	-	On
	RUN	No	N/A	N/A	N/A
MP	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	-	-	On
	RUN	Yes	-	-	On
MD	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	On	Off	On
	RUN	No	N/A	N/A	N/A
MI	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	-	-	-
	RUN	Yes	-	-	-
MR	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	-	-	-
	RUN	Yes	-	-	-
ME	PROG	Yes	-	Off	Off
	TEST, RUN/PROG	Yes	On	Off	Off
	RUN	No	N/A	N/A	N/A
MC	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	-	-	-
	RUN	Yes	-	-	-
MT	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	-	-	-
	RUN	Yes	-	-	-
MB	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	-	-	-
	RUN	No	N/A	N/A	N/A
MW	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	-	-	-
	RUN	No	N/A	N/A	N/A
MOD	PROG	Yes	-	-	-
	TEST, RUN/PROG	Yes	-	-	On
	RUN	Yes	-	-	On

Note: The dash (-) indicates a dipswitch setting of on or off. N/A indicates not applicable. For PLC-2 and Mini-PLC-2 Controllers having a 3-position mode select keyswitch, disregard the RUN entry and substitute RUN for the RUN/PROG entry.

Operational Overview

You must decide what input conditions are necessary to cause a given message to be displayed. Program these conditions in the message request rung so that when true, the rung will cause the message's request bit to be latched on. Message request bits are found in the upper byte of message control words (described later). When the RG module detects a message request bit going from off to on, it causes the peripheral device to display the requested message. After the message has been displayed, another rung in the program is used to unlatch (reset) the message request bit.

Chapter 4

Programming

General

With the RG module and a peripheral device you can format, store, edit or delete messages in PC processor memory. this chapter describes the commands for organizing, storing, displaying, deleting, indexing and programming messages in PC processor memory. Editing is discussed in Chapter 5.

Notational Conventions

The text of this chapter uses the following notational conventions to aid you when entering commands through the keyboard of the peripheral device.

- A word in brackets represents a single key you would press such as [ESC] or [RETURN}.
- Capital letters not in brackets would be entered as shown.
- Punctuation such as commas and arithmetic symbols such as = would be entered as shown.
- These brackets <> define copy that must be entered in proper form, not as printed. For example <message number> means that you enter the desired number, not the words, message number.

The peripheral device responds to your commands, either by displaying prompts or by displaying information resulting from your commands. Examples of displayed information are shown the way they would be displayed by a peripheral device.

Commands

The following report generation commands let you assign control words, store, print, delete, index, and report messages, override switch settings, enter and display the time and date.

Message Control Word File - MS,0

This command lets you assign message control words. Message control words are 8, 16, or 24 consecutive data table addresses that you select to control the display of your messages.

Assign message control words as follows:

1. The processor keyswitch can be in any position (except RUN on 4-position keyswitches) if auto report override and on-line MS/MD/ME switches are on. If the auto report override or on-line MS/MD/ME switch is off, the processor keyswitch must be in the PROG position.

2. Press the following keys on the peripheral device:
MS, 0 [RETURN]

At this point, you are required to enter a word address which determines the starting address of the control word file. The display will prompt the number of digits required. All digits must be entered including leading zeros. The RG module will calculate the file length required and display the message control words and message numbers.

If word addresses have already been assigned for control words, the peripheral device will display the prompt MESSAGE ALREADY EXISTS. If this occurs, use the message print command MP,0 (described later) to display the current control word file. if changes are required, delete the unwanted file using the delete command MD, 0 (described later) and re=-enter the control word file using the message store command MS,0.

For example, select word address 00200 as the beginning address of the file. Five address digits must be entered in this example.

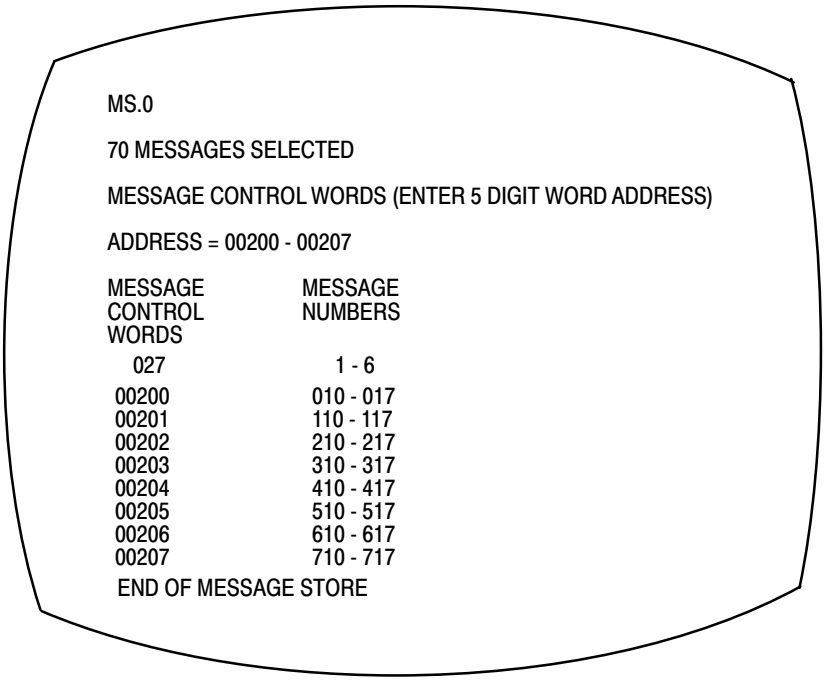
3. Enter 00200

WARNING: Message control words should not be used for any other purpose. Message control words also must not be used in output image table locations when output or block transfer modules are placed in corresponding slots. Damage to equipment and/or personal injury could result.

For up to 6 or up to 70 messages, the peripheral device will display the data in two columns (Figure 4.1), one column for message control words, the other column for message numbers. For up to 134 or up to 198 messages, the peripheral device will display the data in four columns (Figure 4.2) and in six columns (Figure 4.3), respectively.

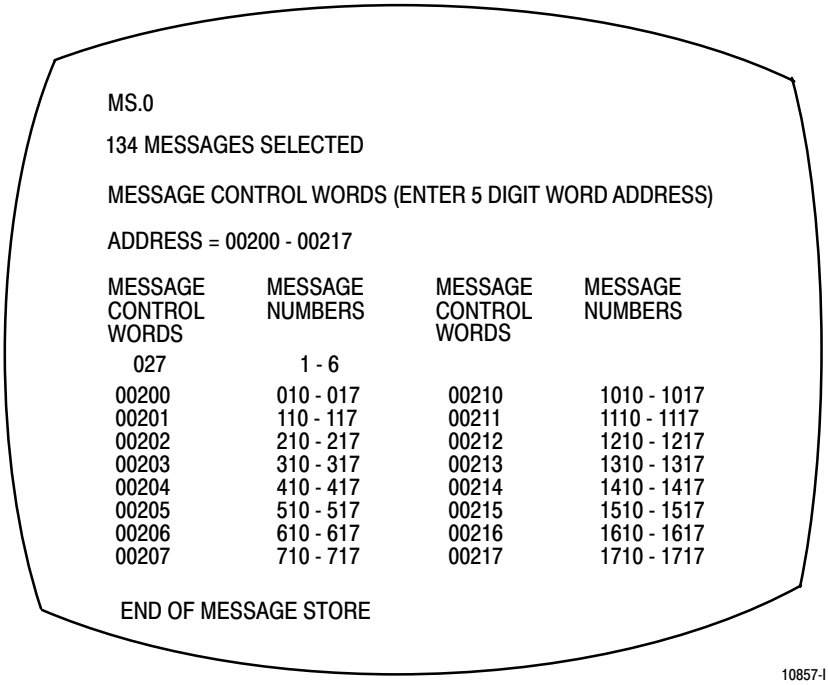
When entering an address, if you should enter a key other than 0 thru 7, the industrial terminal will display the prompt INVALID KEY. Correct the entry and continue. If you should enter an invalid address (027, processor word area, or an address outside the boundary of the data table), the industrial terminal will terminate your entry at that point by displaying the prompt INVALID ADDRESS. Enter a valid address in its place.

Figure 4.1
Control Word Format for 70 Messages



10856-I

Figure 4.2
Control Word Format for 134 Messages



MS.0

134 MESSAGES SELECTED

MESSAGE CONTROL WORDS (ENTER 5 DIGIT WORD ADDRESS)

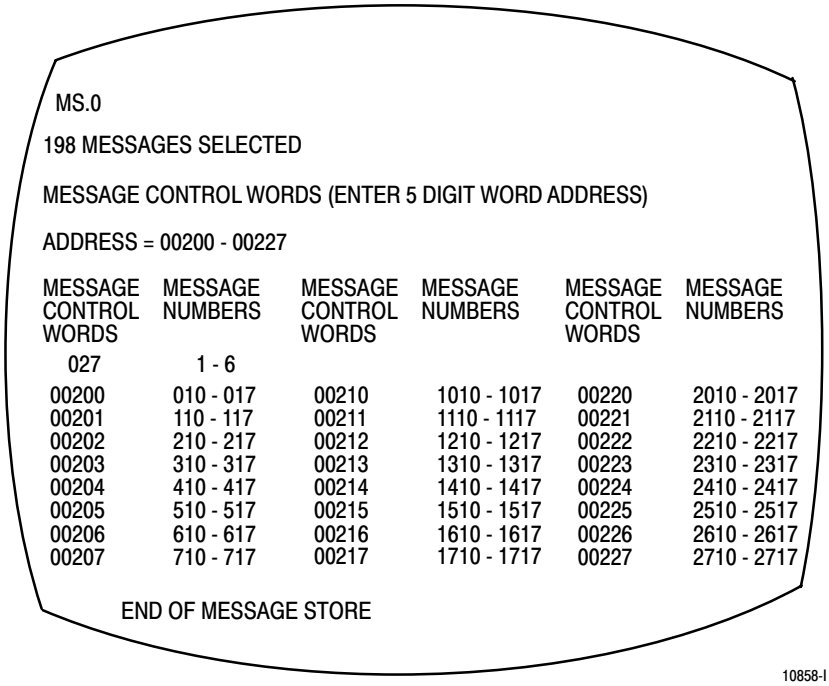
ADDRESS = 00200 - 00217

MESSAGE CONTROL WORDS	MESSAGE NUMBERS	MESSAGE CONTROL WORDS	MESSAGE NUMBERS
027	1 - 6		
00200	010 - 017	00210	1010 - 1017
00201	110 - 117	00211	1110 - 1117
00202	210 - 217	00212	1210 - 1217
00203	310 - 317	00213	1310 - 1317
00204	410 - 417	00214	1410 - 1417
00205	510 - 517	00215	1510 - 1517
00206	610 - 617	00216	1610 - 1617
00207	710 - 717	00217	1710 - 1717

END OF MESSAGE STORE

10857-I

Figure 4.3
Control Word Format for 198 Messages



MS.0

198 MESSAGES SELECTED

MESSAGE CONTROL WORDS (ENTER 5 DIGIT WORD ADDRESS)

ADDRESS = 00200 - 00227

MESSAGE CONTROL WORDS	MESSAGE NUMBERS	MESSAGE CONTROL WORDS	MESSAGE NUMBERS	MESSAGE CONTROL WORDS	MESSAGE NUMBERS
027	1 - 6				
00200	010 - 017	00210	1010 - 1017	00220	2010 - 2017
00201	110 - 117	00211	1110 - 1117	00221	2110 - 2117
00202	210 - 217	00212	1210 - 1217	00222	2210 - 2217
00203	310 - 317	00213	1310 - 1317	00223	2310 - 2317
00204	410 - 417	00214	1410 - 1417	00224	2410 - 2417
00205	510 - 517	00215	1510 - 1517	00225	2510 - 2517
00206	610 - 617	00216	1610 - 1617	00226	2610 - 2617
00207	710 - 717	00217	1710 - 1717	00227	2710 - 2717

END OF MESSAGE STORE

10858-I

The assignment of message control word addresses terminated automatically when completed.

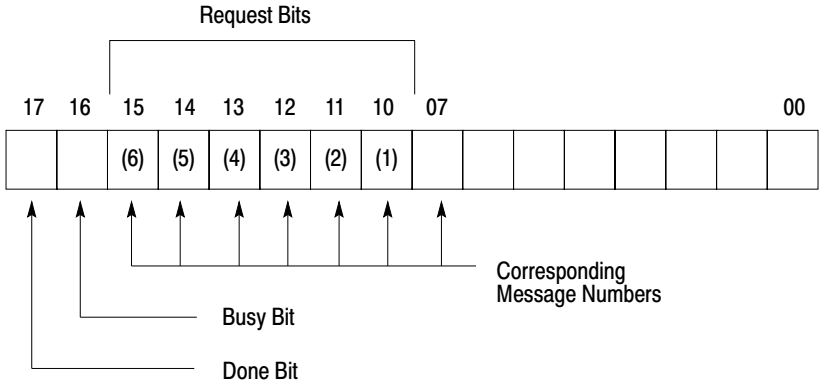
Control Word - Bit Relationship

To enable the automatic display of messages, a user defined sequence of events must occur. The programming format to generate messages 1 to 6 is different from that used for more than six messages.

Messages 1 to 6

The upper byte of word 027 is used to control messages 1 to 6 (Figure 4.4). Bit 027/10 is the request bit for message number 1, bit 027/11 is the request bit for message number 2 and so on. Bit 027/16, the busy bit, is set when any of messages 1 to 6 are requested and will remain set until all requested messages have been displayed. Once all messages have been displayed, bit 027/17 will remain set for 300ms. It will reset automatically.

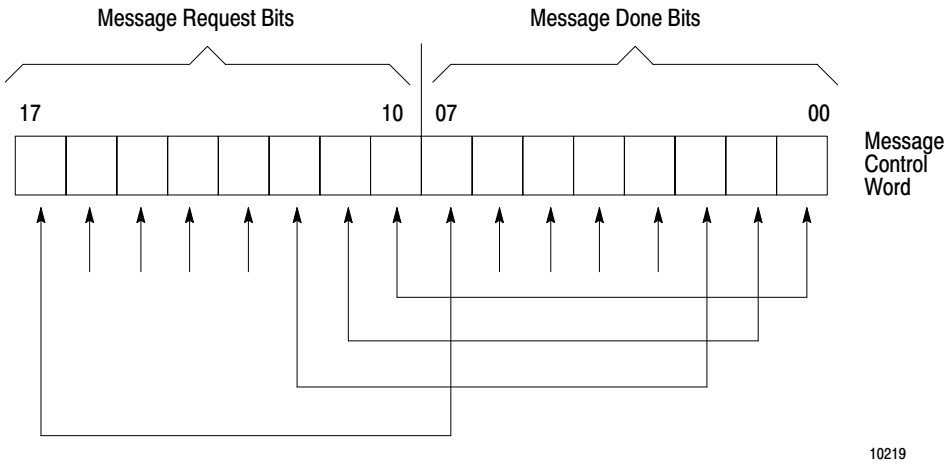
Figure 4.4
Control Word 027 for Messages 1 to 6



Additional Messages

Message numbers 010-27178 each have a request bit and a done bit in a message control word that controls eight messages. Message request bits are located in the upper byte and are set through program logic. The corresponding done bits are located in the lower byte and are set when the message is completed or terminated (Figure 4.5).

Figure 4.5
Extended Message Control Word



Latch and unlatch instructions are used in the ladder diagram program to initiate the display of a message. In a given scan of the message control word file by the RG module, requested messages will be displayed in a given order: the lower the message number, the higher the priority.

The message number indicates the position of the control word in the message control word file and the number of the associated request bit in that word.

Example One: Message number 312 (table 4.A)

3 **12**-request bit in the control word

control word position in the message control word file (table 4.A). It is word 203.

Example Two: Message number 1312 (table 4.A)

13 **12**-request bit in the control word

control word position in the message control word file (table 4.A). It is word 213.

Table 4.A
Message Control Word File for 198 Messages

Position in Control Word File	Control Word Address	Message Number
0	200	010 - 017
1	201	110 - 117
2	202	210 - 217
→ 3	203	310 - 317 ← Example One
4	204	410 - 417
5	205	510 - 517
6	206	610 - 617
7	207	710 - 717
10	210	1010 - 1017
11	211	1110 - 1117
12	212	1210 - 1217
→ 13	213	1310 - 1317 ← Example Two
14	214	1410 - 1417
15	215	1510 - 1517
16	216	1610 - 1617
17	217	1710 - 1717
20	220	2010 - 2017
21	221	2110 - 2117
22	222	2210 - 2217
23	223	2310 - 2317
24	224	2410 - 2417
25	225	2510 - 2517
26	226	2610 - 2617
27	227	2710 - 2717

Message Store - MS

This command lets you enter and store a message as follows:

1. The processor keyswitch can be in any position (except RUN on 4-position keyswitches) if auto report override and on-line MS/MD/ME switches are on. If the auto report override or on-line MS/MD/ME switch is off, the processor keyswitch must be in the PROG position.

2. Enter MS, <message number> [RETURN] from the keyboard of the peripheral device. The prompt READY FOR INPUT, will be displayed. Enter your message. If you try to use a message number that already exists, the peripheral device will display the prompt MESSAGE ALREADY EXISTS.

You can use delimiters in your message to display the contents of a data table word, byte, or bit. The delimiter causes the module to interpret the contents according to the delimiter chosen (Table 4.B). You use a different delimiter according to the type of interpretation desired (binary, ASCII, octal, BCD, or hex) and according to the type of address (bit, byte, or word). When formatting your message, place the proper delimiter before and after the address containing the contents that you want displayed. For example, the message *035* PARTS REJECTED uses the asterisk(*) as the delimiter to display the BCD value of a counter accumulated value at address 035.

3. To terminate and store the message, press [ESC][ESC] on the peripheral device.

Table 4.B
Message Delimiters

Delimiter Symbol	Description
X X X	BCD value of 3-digit word address
X X X B	Octal value of byte at 3-digit word address
X X X X X	On/off status of 5-digit bit address
#X X X X X #	BCD value of 3, 4, or 5-digit word address
!X X X X X!	Hex value of 3, 4, or 5-digit word address
&X X X X X B&	Octal value of byte at 3, 4, or 5-digit word address
/X X X X X/	ASCII equivalent of byte at 3,4,or 5-digit word address

@X X X X X B@	Hex value of byte at 3, 4, or 5-digit word address
^X X X X X X X^	On/off status of 5, 6, or 7-digit bit address
T	Display time
C	Display calendar (date)
Note: B = 0 or 1 for lower or upper byte respectively at word address XXX...X = word, byte, or bit address	

Message Print - MP

This command lets you print (display) the contents of a message exactly as it is stored. Delimited addresses are displayed as entered. Display the contents of a message as follows:

1. The processor keyswitch can be in any position if auto report override switch is on. If the auto report override switch is off, the processor keyswitch must be in the PROG position.

2. Enter MP, <message number>[RETURN]

If you enter a message number that is not stored, the prompt MESSAGE NOT FOUND will be displayed. If you enter an invalid message number, the prompt INVALID COMMAND will be displayed.

3. Press [ESC] if you want to stop displaying the message before completion. The prompt FUNCTION ABORTED will be displayed. Otherwise, the message print command is self-terminating.

Message Delete - MD

This command lets you delete a message from memory without disturbing another message. Initiate message delete as follows:

1. The processor keyswitch can be in any position (except RUN on 4-position keyswitches) if the auto report override switch is on. The on-line MS/MD/ME switch must be on and the message protect switch must be off. If auto report override switch is off, the processor keyswitch must be in the PROG position and the message protect switch must be off.

CAUTION: Be careful to identify the correct message number to be deleted. Once the [RETURN] key is pressed, the message will be deleted. There is no way to stop the message delete function once initiated.

2. Enter MD, <message number>[RETURN]

The peripheral device will display DELETION IN PROGRESS while the message is being deleted, and the module's busy LED will blink. When the message has been deleted, the prompt MESSAGE DELETED will be displayed. The deleted message number can be re-used to store another message.

If you enter a message number that is not stored, the prompt MESSAGE NOT FOUND will be displayed. if you enter an invalid message number, the prompt INVALID COMMAND will be displayed.

Message Index - MI

This command lets you display an index of all message numbers stored with the corresponding number of memory words used by each message. Initiate the message index as follows:

1. The processor keyswitch can be in any position if auto report override switch is on. If the auto report override switch is off, the processor keyswitch must be in the PROG position.

2. Enter MI [RETURN]

The peripheral device displays the message numbers, the number of words in memory used for each message, and the number of words remaining in memory.

You can also display the amount of memory used to store a particular message by entering the following command:

MI, <message number>[RETURN]

If you enter a message number that is not stored, the prompt MESSAGE NOT FOUND, will be displayed. If you enter an invalid message number, the prompt INVALID COMMAND will be displayed.

Message Report - MR

This command lets you display the message in the same format as it would be displayed in auto report mode. Delimited addresses are replaced by data table values. Initiate message report as follows:

1. The processor keyswitch can be in any position if the auto report override switch is on. If auto report override switch is off, the processor keyswitch must be in the PROG position.

2. Enter MR,<message number>[RETURN]

If you enter a message number that is not stored, the prompt MESSAGE NOT FOUND will be displayed. If you enter an invalid message number, the prompt INVALID COMMAND will be displayed.

3. To stop displaying the message prior to completion, press [ESC] on the peripheral device. The prompt FUNCTION ABORTED will be displayed. Otherwise, the function will self-terminate at completion.

Note: Message number 0 cannot be reported. If attempted, the prompt FUNCTION NOT ALLOWED will be displayed

Message Time - MT

This command lets you enter the current time so it can be displayed in a message. The RG module records the time at the moment the message is requested and enters the time in the message when displayed.

Enter the current time of day in the RG module's clock using the 24 hour (military) format as follows:

1. The processor keyswitch can be in any position (except RUN on 4-position keyswitches) if the auto report override switch is on. If the auto report override switch is off, the processor keyswitch must be in the PROG position.

2. Enter MT[RETURN]

3. Enter the time. For example, 2:45:50 pm is 14:45:50 and is entered:

144550

4. Press [ESC] to store the current time.

The following prompts and commands will assist you when entering the time and date (Table 4.C).

Table 4.C
Additional Commands and Prompts for Entering Time and Date

Command	Purpose or Description	Prompt
[RETURN]	Start over if you make a mistake before completing the entry.	ENTER DATE NEW TIME (DATE)
[ESC]	Store a correctly entered time (date).	--
[ESC]	You pressed this key before the entry was complete or after making a mistake. Start over by entering MT (MC) [RETURN].	FUNCTION ABORTED
--	You pressed an invalid key.	INVALID KEY
--	You used an invalid format.	INVALID ENTRY ENTER NEW TIME (DATE)
--	Enter current time using steps 1 thru 4 above when you see this prompt.	X X:X X:X X
--	Enter date using steps 1 thru 4 in Message Calendar - MC when you see this prompt.	X X/X X/X X

Note: Loss of power to the RG module terminates the time and calendar functions. They must be re-entered after power is restored. When initially setting the time or when the time is lost due to a power failure, the prompt XX:XX:XX will be displayed.

When you want to display the time in a message, enter the time reference using the elimiter in the key sequence T. For example, when formatting and storing your message, enter the heading “Time:T.”

Message Calendar - MC

This command lets you enter the date so it can be displayed in a message. The RG module enters the date when the message is displayed.

Enter the current date in the RG module's calendar in the month/day/year format as follows:

1. The processor keyswitch can be in any position if the auto report override switch is on. If auto report override switch is off, the processor keyswitch must be in the PROG position.

2. Enter MC[RETURN]

3. Enter the date. For example, July 16, 1982, is entered:

4. 071682

5. Press [ESC] to store the date.

Use the prompts and commands in table 4.C as needed.

Note: Loss of power to the RG module terminates the time and calendar functions. They must be re-entered after power is restored. When initially setting the date or when the date is lost due to a power failure, the prompt XX/XX/XX will be displayed.

When you want to display the date in a message, enter the date reference using the elimiter in the key sequence, C. For example, when formatting and storing your message, enter the header "DATE:C."

Manipulate Word - MW

This new command lets you display and/or manipulate the current value of a data table word in 4-digit hex.

1. The processor keyswitch can be in any position if the auto report override switch is on. If the auto report override switch is off, the processor keyswitch must be in the PROG position.

2. Enter MW[RETURN]

The peripheral device displays the prompt DATA CHANGE (ENTER 3 DIGIT WORD ADDRESS).

3. Enter the 3, 4, or 5-digit word address.

After you enter the word address, the peripheral device displays the data stored at that address in 4-digit hex. If you know binary/hex conversions, you can read and/or change any of the 16 bits of the word by reading and/or changing one or more of the four hex characters. For example, 5 in hex is 0101 in binary.

4. Enter or change the value at that address.

If you enter a digit that is out of range (larger than F), the peripheral device will display the prompt INVALID KEY, terminate the entry, and ask for a new address.

5. Store the value.

After you enter the value, the peripheral device will display the prompt DO YOU WANT TO STORE (Y/N)? and then display the prompt NEW DATA STORED, accordingly.

6. To terminate the function, press [ESC] on the peripheral device. The prompt FUNCTION ABORTED will be displayed.

Manipulate Byte - MB

This new command lets you display and/or manipulate the current value of a data table byte in 8-bit binary.

The procedure for using this function is similar to that of Manipulate Word above, except that you read and/or change byte data at the address one bit at a time.

Module Configuration - MOD

This command lets you override a module configuration switch setting (except message protection and auto report override) by reconfiguring the module through a command from the peripheral device. Override switch settings as follows:

1. The processor keyswitch can be in any position if auto report override switch is on. If the auto report override switch is off, the processor keyswitch must be in PROG position.

2. enter MOD[RETURN]

At this point, the current RG module switch configuration is displayed with the prompt SELECT LETTER OF OPTION TO BE CHANGED. You will be prompted through the procedure by the peripheral device.

CAUTION: If you change the baud rate to a rate higher than your peripheral device can operate, you will have to either

a. momentarily remove power from the module to revert to the baud rate determined by switch setting SW1. All configuration switches default to their physical settings. You will have to reset the clock and calendar.

b. reset the baud rate using a peripheral device capable of the higher rate.

3. Enter the letter for the switch to be changed.

If you enter a wrong but valid letter by mistake, complete the enter or press [ESC]. Then start over. Pressing [ESC] terminates the entry without changing the switch configuration.

4. Enter the number as required to change the status. The entry is complete as soon as you enter a valid number.

If you enter a wrong but valid number by mistake, you must repeat steps 3 and 4 to correct it.

5. Press [ESC] on the peripheral device to exit this function..

Note: Invalid letters or numbers will not be accepted. you will be prompted to re-enter.

Note: You can display the menu showing the current module switch configuration values by pressing the letter M.

Programming

Automatic report generation can be programmed to handle multiple or simultaneous message requests using latch and unlatch instructions. Only 0-to- 1 transitions of the request bits are detected as requested to display messages. If a message has been requested and displayed, it will not be

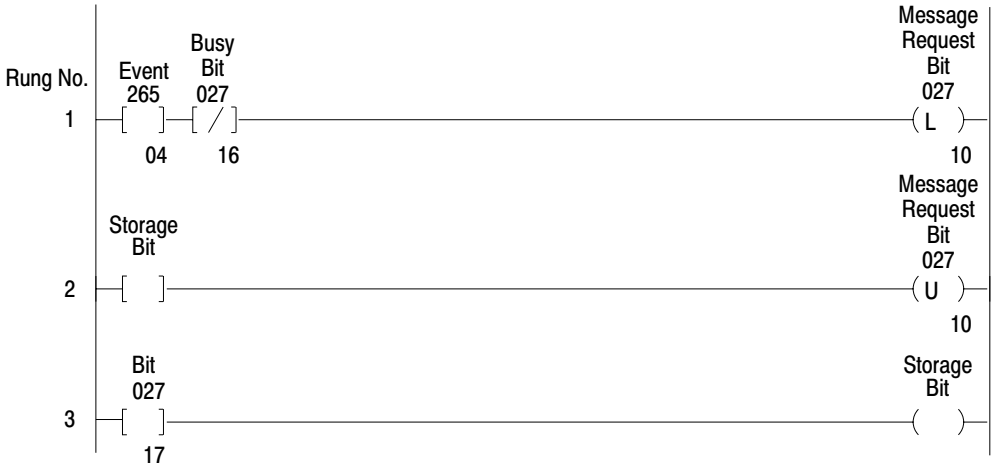
displayed again until the request bit goes from 0 to 1 again. Only one message can be displayed at a time. Simultaneous requests are handled by priority-the lower the message number, the higher the priority. The remaining message requests must remain enabled until their message is displayed or the request will go unnoticed.

Programming messages 1 to 6 and extended messages requires two separate programming techniques. The following paragraphs describe each technique.

Messages 1 to 6

When the RG module is in auto report mode, any one of six messages can be displayed automatically when any one of the corresponding bits 10 thru 15 in word 027 is latched on. Three programming rungs are required to display each stored message (Figure 4.6). The rungs must be programmed in the order shown.

Figure 4.6
Sample Program, Messages 1 to 6



Messages 010-2717$_8$

The upper byte of each message control word contains the request bits for eight messages, the lower byte contains the done bits. Refer to Message Control Word File - MS, 0 for a description of the message number/control word relationship. Figure 4.7 shows a sample program

that can be used to display each message. Table 4.D presents a description of the sample program.

Figure 4.7
Sample Program, Messages 010-27178

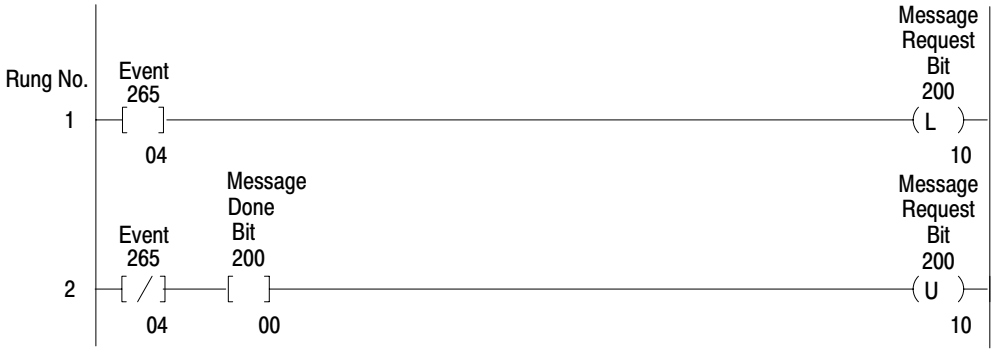


Table 4.D
Program Description

Rung	Description
1	When bit 265/04 is on, the rung is true and bit 200/10 is latched on. Bit 200/10 will remain latched on even when its rung is false until it is reset by rung 2. For this example, bit 200/10 controls the generation of message number 010.
2	When message number 010 has been completed, its done bit (200/00) is set on. This causes rung 2 to be true and unlatches the message request bit 200/10. When a 1 to 0 transition of the message request bit is detected, the done bit (200/00) is reset to 0.

Chapter 5

Editor Function

General

The RG module allows you to edit messages already stored in PLC-2 family processor memory. You can edit, insert, or remove the wording of existing messages one line at a time using a peripheral device. you can also go directly to the beginning or end of the message, quite the edit procedure and leave the message unchanged, or store the edited message.

To edit a message you copy it into the module's edit buffer, perform the edit, then store the edited message in memory. The procedure will be described later in Editing Commands.

Edit Buffer

The RG module's edit buffer stores up to 2300[1] characters. A character is defined as a single letter, digit, punctuation mark or space. When the edit buffer is full, you cannot add characters to an existing line nor add additional lines unless you first remove existing lines to make room for new characters or lines. If you attempt to enter more than 2300 characters, the peripheral device will display the prompt BUFFER FULL and the edit buffer will not store additional characters.

If it is necessary to edit a message that exceeds 2300 characters, you must create an new message(s) for the balance of characters exceeding 2300 because the original message is erased when you (re)store the edit buffer contents in PC processor memory. The prompt BUFFER LIMIT EXCEEDED is displayed when you attempt to copy a message larger than 2300 characters into the edit buffer.

You can terminate the edit function at this point without erasing the message in PC processor memory using the quit command. Or, you can divide the original message into two (or more) messages. Retain the original message number for the first part of the message. Assign a higher message number to the balance of the message. Then when these messages are requested, they can be displayed in correct order.

[1] The buffer size was 2400 characters in revision A-E.

Line Numbering

You must designate the end of each line when entering characters into the edit buffer. Press the [RETURN] or [RETURN][LINE FEED] keys to designate the end of each line. All characters entered between two successive [RETURN] keys are the text for that line.

The edit buffer assigns a number to each line in consecutive order. The ranges of available line numbers are 000 thru 999 and 1000 thru 2300. You can access any assigned line number using the commands described later by entering the line number using leading zeros where necessary. For example, use leading zeros for line seven, entered as 007.

Protect Messages

The message protect configuration switch, SW5 position 2, must be off to use the message edit function. If this switch is on, the peripheral device will prompt you with RG MESSAGE PROTECT ENABLED and the module will prevent you from using the edit function.

Switch 5 position 2 can be switched on by removing the module from the I/O chassis, opening the switch cover plate and locating the switch on the top of the circuit board. Refer to Operational Option Switch Assembly, for additional information on locating and setting this switch.

Processor Keyswitch Position

You can use the RG module's editing function when the processor is in an operating mode that allows programming changes including on-line data change (table 3.A)

You can use the editing commands on-line while the processor is operating, provided the RG module's on-line MS/MD/ME switch and the auto report override switch (SW2-2 and SW5-3 respectively) are both on.

If either switch (SW2-2 or SW5-3) is off, the processor keyswitch must be switched to the PROG position in order to use the edit function.

Editing Commands

You can edit messages stored in PC processor memory using an RS-232-C peripheral device connected to the RG module. This section describes the following edit commands:

- Message Edit
- Message Print
- Line Print
- Change
- Insert
- Remove
- Expanded Message Print
- Expanded Line Print
- Up
- Down
- Top
- Bottom
- Quit
- Store

Because the response between you and the peripheral device is interactive, the text that follows will prompt your entry using the word “enter:”.

The word “response:” is used to designate the displayed response of the peripheral device. Also, the peripheral device displays a>(greater than) symbol at the beginning of a line to prompt your next entry of a command. When the word “module:” is used, observe the illuminated LED.

The following message, number 010, is used to illustrate edit command examples.

- Station 27
- Cycle time XX.XX min
- Tool wear .XXXX in
- Tool life XXX.X hr
- Duty cycle XX.X%

Message Edit Command

Use the message edit command, ME, <message number 4 3/8[RETURN], to copy a message from PC processor memory into the RG module’s edit buffer. The peripheral device tells you that the message is being copied by the prompt INITIALIZING EDITOR FUNCTION. The RG module’s busy LED will blink. After the message is copied, the peripheral device automatically displays the first line of the message.

Example: Copy message 010 into the edit buffer.

- enter: ME,010[RETURN]
  module: BUSY LED is blinking
  response: INITIALIZING EDITOR FUNCTION

```
response: 000:
          Station 27
          >
```

The remaining ten edit commands can now be used.

Print Command

Four print commands are available, print multiple lines, expanded message print, print a line, and expanded line print.

Print Multiple Lines Command

The print multiple lines command, P[RETURN], allows you to display (print) the entire message in the edit buffer from the current line to the last line in the edit buffer with one command.

Example: Display the message in the edit buffer.

```
enter: P[RETURN]
response:>P
                    000:
                    Station 27

                    001:
                    Cycle time XX.XX min

                    002:
                    Tool wear .XXXX in

                    003:
                    Tool life XXX.X hr

                    004:
                    Duty cycle XX.X%

                    005:
                    EOB
                    >
```

You can press [ESC] to stop the display on any line before the last line. The peripheral device will finish displaying the line and present the > prompt, indicating it is ready for your next command.

Print a Line Command

The print a line command, P<line number>[RETURN], allows you to display any line of the message in the edit buffer. If you request a line beyond the last line of the message, the peripheral device will display the last line, EOB (end of buffer).

Example: Display line 003.

enter: P003[RETURN]
response: >P003:
003:
Tool life XXX.X hr
>

Expanded Print Commands

The expanded message print command operates similar to the print multiple lines command, and the expanded line print command operates similar to the print a line command, with this one exception. The alpha equivalent of control codes that you stored in hex are displayed between <> symbols (Table 5.A). For example, the control code BEL, stored as 07 hex, would be displayed as <G>.

Table 5.A
Control Codes

Control Code	Hex Value	Display	Control Code	Hex Value	Display
NUL	00	<@>	DLE	10	<P>
SOH	01	<A>	DC1	11	<Q>
STX	02	<B>	DC2	12	<R>
ETX	03	<C>	DC3	13	<S>
EOT	04	<D>	DC4	14	<T>
ENQ	05	<E>	NAK	15	<U>
ACK	06	<F>	SYN	16	<V>
BEL	07	<G>	ETB	17	<W>
BS	08	<H>	CAN	18	<X>
HT	09	<I>	EM	19	<Y>

Control Code	Hex Value	Display	Control Code	Hex Value	Display
LF	0A	<J>	SUB	1A	<Z>
VT	0B	<K>	ESC	1B	<[>
FF	0C	<L>	FS	1C	<®>
CR	0D	<M>	GS	1D	<]>
SO	0E	<N>	RS	1E	<©>
SI	0F	<O>	US	1F	<_>

Change Command

The change command, C[RETURN], allows you to change a line of a message. You must first display the line to be changed using the print a line, up, or down command.

At the completion of the change, you must make two entries:

- {RETURN] or [RETURN][LINE FEED] to designate the end of the line.
- [ESCAPE][ESCAPE] to designate the end of the change.

If you do not press the [ESCAPE] key twice in succession, the RG module will consider subsequent entries as part of the change.

When changing a line, you can replace as many characters as necessary provided you do not exceed the 2300 character limit of the edit buffer.

The peripheral device displays the next line in the edit buffer after you complete the change.

Example: Change line 003 to “Life of machine tool #1 XXX.X hr”

Assume line 003 is the last response displayed on the peripheral device.

```
enter: C[RETURN]
enter: Life of machine tool #1 XXX.X hr
[RETURN][LINE FEED][ESCAPE][ESCAPE]
RESPONSE: >C
          Life of machine tool # 1 XXX.X hr
          004:
          Duty cycle XX.X%
          >
```

If you should make a mistake while entering a line change, use the [DELETE] or [RUBOUT] key. Each time you press either key, it deletes the previous character from the edit buffer. Either key can be used to delete an entire line if necessary. (The deletion may or may not be displayed depending on the type of peripheral device.)

Insert Command

The insert command, I[RETURN], allows you to insert one or more new lines ahead of the current line displayed by the peripheral device. A line can be inserted ahead of the first line, 000. When you insert a new line (or several new lines), the RG module automatically adjusts the numbering or all subsequent lines. The peripheral device then displays the next line in the edit buffer

After you have inserted the needed line(s), you must make two entries:

- [RETURN] or [RETURN][LINEFEED] to designate the end of the line.
- [ESCAPE][ESCAPE] to designate completion of the insert.

If you do not press the [ESCAPE]key twice in succession, the RG module will consider subsequent entries as part of the insert.

You can insert as many lines as necessary provided you do not exceed the 2300 character limit of the edit buffer.

Example: Insert “Number of machining operations, XXX” ahead of line 004 currently displayed on the peripheral device

enter: I[RETURN]
enter: Number of machining operations, XXX[RETURN][LINE FEED][ESCAPE][ESCAPE]
response: >I
Number of machining operations, XXX
005:
Duty cycle XX.X%
>

Remove Command

Use the remove command, R[RETURN] to remove (delete) an existing line of a message. First display the line to be removed, then use the remove command. After the line has been removed, the RG module automatically adjusts the numbering of all subsequent lines. The peripheral device then displays the next line in the edit buffer:

Example: Remove line 004, “Number of machining operations, XXX.”

enter: P004[RETURN]
response: 004:
Number of machining operations, XXX
enter: R[RETURN}
response: >R
004:
Duty cycle XX.X%
>

Up Command

Use the up command, U[RETURN], to back up one line at a time and display the previous line. You cannot back up past line 000.

Example: Back up from line 004 and display line 003.
enter: U[RETURN}
response: >U
003:
Life of machine tool #1 XXX.X hr
>

Down Command

Use the down command, D[RETURN], to move down one line at a time and display the next line in the edit buffer. You cannot go beyond the last line, EOB.

Example: Move from line 003 to display line 004.
enter: D[RETURN}
response: >D
004:
Duty Cycle XX.X%
>

Note: If you wish to move several lines in either direction use the print a line command, P<line number>[RETURN}.

Top Command

Use the top command T[RETURN], to return to the first line of the message, line 000, and display it.

Example: Return to line 000.
enter: T[RETURN]
response: >T
000:
Station 27
>

Bottom Command

Use the bottom command, B[RETURN], to go to the last line of the message, EOB, and display it.

Example: Go to EOB
enter: B[RETURN]
response: >B
005
EOB
>

Quite Command

Use the quit command, Q[RETURN], to terminate the edit function without storing the contents of the edit buffer. when the quite command is used, the contents of the edit buffer are erased and the original message in PC processor memory remains unchanged.

As a safeguard, you will be prompted to confirm your quite command by pressing the Y key, or to cancel your quite command and resume editing by pressing the N key (or any other key except Y).

Example: Quite the edit function and erase the message in the edit buffer.

enter: Q[RETURN]
response: DO YOU WANT TO QUIT (Y/N)?

If your answer is no, enter N after the ? symbol. The peripheral device will be ready for your next command. If your answer is yes, enter Y after the ? symbol. The peripheral device responds with FUNCTION ABORTED.

Store Command

Use the store command, S[RETURN}, to store the edit buffer contents (edited message) in PC processor memory and terminate the edit function.

As a safeguard, you will be asked to confirm your store command by pressing the Y key, or to cancel your store command and resume editing by pressing the N key (or any other key except Y).

Example: Store the edited message in processor memory.

enter: S[RETURN]
response: DO YOU WANT TO STORE (Y/N)?

If your answer is no, enter N after the ? symbol. The peripheral device will be ready for your next command. If your answer is yes, enter Y after the ? symbol.

response: MESSAGE TRANSFER IN PROGRESS
module: BUSY LED is blinking
response: END OF MESSAGE EDIT

The previous content of the message is erased and the edited message is stored.

Summary of Edit Commands

Table 5.B
Edit Commands

Title	Command Entry	Description
Message Edit ME,	<message #> [RET]	Copies message from processor memory into module so you can edit its contents
Print Multiple Lines	P [RET]	Displays current line to last line
Expanded Massage Print	E [RET]	Displays current lint to last line displaying control codes
Print a Line	P <line #> [RET]	Displays the designated line
Expanded Line Print	E<line #> [RET]	Displays the designated line displaying control codes
Change	C [RET]	Allows you to change a line
Insert	I [RET]	Allows you to insert a line
Remove	R [RET]	Removes the current line
Up	U [RET]	Backs up one line
Down	D [RET]	Moves down one line
Top	T [RET]	Moves to top (first line)
Bottom	B [RET]	Moves to bottom (last line)
Quit	Q [RET]	Allows you to stop editing without changing a message
Store	S [RET]	Stores edited message in processor memory and terminates the function

Chapter 6

Troubleshooting

General

By observing the LEDs on the front of the report generation module, many module or module related malfunctions can be located and corrected. Refer to Table 6.A. If the module appears to be malfunctioning, consult with your nearest Allen–Bradley Customer Support Services or Sales Office.

Table 6.A
Troubleshooting Chart

Indication	Description	Recommended Action
During Power–up with no cables attached		
BUSY ◌ XMTG ◌ RCVG ◌ PROC ◌ PRPHL ◌	ALL LEDS except RCVG blink on and off once	None, normal operation
BUSY ○ XMTG ○ RCVG ○ PROC ● PRPHL ○	PROC LED turns on and stays on. Module has passed internal diagnostics	None, normal operation
BUSY ◌ XMTG ◌ RCVG ◌ PROC ◌ PRPHL ◌	All LEDs except RCVG remain flashing. Module has failed internal diagnostics	Replace module
After power–up diagnostics and with cables connected		
BUSY ○ XMTG ○ RCVG ○ PROC ● PRPHL ○	PROC FAULT indicated processor fault [1] COMM FAULT indicates communication fault[1] NOISE FAULT indicates electrical noise[1]	Check cables for proper connection between processor and report generation module, or check processor for fault.

After power-up diagnostics and with cables connected		
BUSY ○ XMTG ○ RCVG ○ PROC ○ PRPHL ●	Fault detectd by oeripheal device	Check peripheral device cablr connection t report generation module. Peripheral device has an internal fault.
BUSY ● XMTG ○ RCVG ○ PROC ○ PRPHL ○	Module does not work: • Parity switch setting is invalid • Busy/Ready switch is on when peripheral device has no busy/ready signal	Change parity switches 2 and 3 to valid setting. Turn off Busy/Ready switch 5.

Legend

○ = not illuminated

☼ = flashing

● = illuminated

[1]The RG module generates these prompts and transmit them to the peripheral device for display.

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