

APPENDIX A CONFIGURATION

Before the 584L PC can be programmed, it must be configured for the user's system requirements. Configuring the 584L PC sets maximum values for inputs, outputs, registers, I/O Channels, RS-232-C ports, etc. This organizes the user's programming elements for greater efficiency.

To configure the 584L PC, a P190 Programmer and a T584-004 Configurator Tape are required. Insert the tape into the P190 tape drive and press the red INIT and INIT LOCK keys on the P190 panel simultaneously to load the tape. Once the tape is loaded, the user can start configuring the controller. Figure A-1 is a flow chart of all the software labels available with the Configurator Tape.

When the P190 has finished loading the configurator tape, the user is presented with the option of selecting "584 Config" or "584L Config". When using a 584L, press the 584L Config. The software labels 584L CONFIG and ATTACH UNIT # are displayed on the P190 Screen. Before either one is pressed, a unit number within the range of 1 to 247, must be entered into the assembly register (AR). The unit number refers to the location of the 584L in the data line communicating with the P190. Press the 584L CONFIG software label key to start entering information. To attach the P190 to the 584L PC, press the ATTACH UNIT # software label key; the RELEASE 584L software label appears on the screen. This software label key is pressed to detach the 584L PC.

When the 584L CONFIG software label key is pressed, the following software labels are displayed:



A.1 NO SKIPS/SKIPS

Toggle this software label key to select SKIPS or NO SKIPS. The selection is indicated by the UP or DOWN arrows in the software label.

The choice of SKIPS or NO SKIPS is dependent on whether or not the SKIP function will be used in the program.

On the initial configuration the controller defaults to SKIPS.

A.2 SET SIZE

When this software label key is pressed, the following software labels are displayed:



These software label keys are used to insert the maximum number of references and I/O channels available for the user's program.

A.2.1 # of 0XXXX

Enter into the AR the total number of logic coils that will be available for the program, a value divisible by 16, and press this software label key.

On the initial configuration, the controller defaults to the value 16.

A.2.2 # of 1XXXX

Enter into the AR the total number of discrete inputs that will be available for the program, a value divisible by 16, and press this software label key.

On the initial configuration, the controller defaults to the value 16.

A.2.3 # of 30XXX

Enter into the AR the total number of input registers that will be available for the program, a maximum of three digits, and press this software label key.

On the initial configuration of the 584L, the controller defaults to the value 1.

A.2.4 # of 4XXXX

Enter into the AR the total number of output/holding registers that will be available for the program and press this software label key.

On the initial configuration, the controller defaults to the value 1.

A.2.5 # of CHANNELS

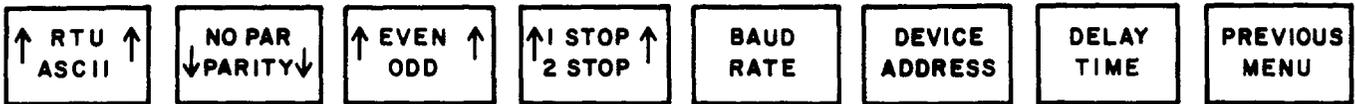
Enter into the AR the number of I/O channels that will be available for the program, a maximum value of 16, and press this software label key. This must be an even number between 2 and 32 which is determined by taking the number of coils divided by 128, or by taking the number of discrete inputs divided by 128 plus the number of input registers divided by 8. The larger of the two values is the number of I/O channels.

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On the initial configuration the controller defaults to 2 I/O channels. Remember, 584L offers a choice of all remote (32) or 4 local and 28 remote I/O channels.

A.3 PORT 1

Press this software label key to set the parameters for PORT 1 on the 584L PC. When this key is pressed, the following software labels appear on the screen:



This selection is made by pressing the “specials” soft label key on the P190.

A.3.1 RTU/ASCII

Toggle this software label key to select the Modbus communication mode — RTU or ASCII. The selection is indicated by UP or DOWN arrows in the software label.

RTU (Remote Terminal Unit) mode is generally used to communicate between the 584L PC and the P190 programmer. It can also be used for Modbus communications.

ASCII (American Standard Code for Information Interchange) mode is used for Modbus communications, it is more complex than RTU but it is easier to implement.

On the initial configuration, the controller defaults to RTU.

A.3.2 No Par/Parity

Toggle this software label key to select PARITY or NO PARITY. The selection is indicated by UP or DOWN arrows in the software label.

On the initial configuration, the controller defaults to even PARITY.

A.3.3 Even/Odd

This software label key is only used if PARITY is selected. Toggle the EVEN/ODD software label key to select EVEN parity or ODD parity. The selection is indicated by UP or DOWN arrows in the software label.

When communicating between the P190 and the 584L PC, EVEN parity is selected. On the initial configuration, the controller defaults to EVEN parity.

A.3.4 1 Stop/2 Stop

Toggle this software label key to select 1 STOP bit or 2 STOP bits. The selection is indicated by UP or DOWN arrows in the software label.

One stop bit is selected if the 584L PC is communicating with other Modicon equipment. On the initial configuration, the controller defaults to 1 STOP BIT.

A.3.5 Baud Rate

Enter one of the following baud rates into the AR:

50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, or 19200.

When communicating between the P190 and the 584L PC, the baud rate is 9600. Press the BAUD RATE software label key to enter the value.

On the initial configuration, the controller defaults to a baud rate of 9600.

A.3.6 Device Address

Enter into the AR the address of the 584L PC which is currently communicating with the P190, a maximum value of 247, and press this software label key.

The P190 is capable of communicating, through a modem, with 247 devices in a line. The address of the device is determined by its location in the line. If only one device, a 584L PC, is communicating with the P190, enter a device address of 1.

On the initial configuration, the controller defaults to a device address of 001.

A.3.7 Delay Time

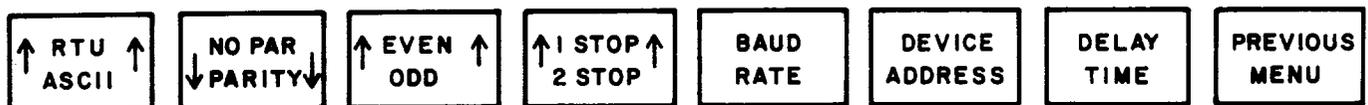
Enter the desired delay time into the AR, a maximum value of 20, and press this software label key. This value represents one tenth of the desired delay time (e.g., a value of 20 is 200 milliseconds).

The delay time is the time lapse between sending a message and receiving an answer. If there is no time lapse between sending and receiving, it is possible that the answer to a message will be lost because a device is not ready to receive.

The delay time for communications between Modicon equipment is 10 milliseconds; enter a 1 for delay time. On initial configuration, the controller defaults to a delay time of 01.

A.4 PORT 2

Press this software label key to set the parameters for PORT 2 on the 584L PC. When this key is pressed, it brings up the same set of software labels as the PORT 1 software label key:

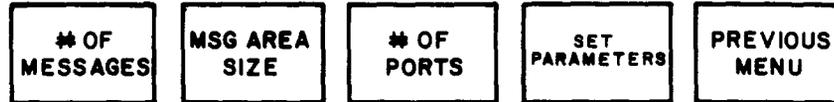


See sections A.3.1 through A.3.7 for descriptions of these software labels. The function of each software label is the same for PORT 1 or PORT 2.

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A.5 ASCII

Press this software label key to set the limits and parameters for ASCII functions. When this key is pressed, the following software labels appear on the screen:



NOTE

There is no error reported for an ASCII write to a disconnected ASCII port.

A.5.1 # of Messages

Enter into the AR the number of ASCII messages, format statements, which will be stored in memory. The maximum is 9999 messages.

Each 584L PC message has a code number ranging from 1 to 9999. The value entered for # OF MESSAGES reflects the total number of messages and not this code number.

On the initial configuration, the controller defaults to zero.

A.5.2 MSG Area Size

Enter a value into the AR (maximum 9999) and press the MSG AREA SIZE software label key to enter the total words of memory (TOTAL MESSAGE WORDS) to be set aside for the storage of ASCII messages.

One word of memory equals two ASCII characters. A message area of at least ten words is needed to adequately cover the average message length of seventeen characters.

On the initial configuration, the controller defaults to zero.

A.5.3 # of Ports

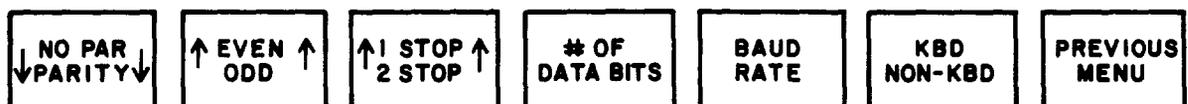
Enter into the AR the number of RS-232-C ports included in the system for ASCII communications, a maximum value of 32, and press this software label key.

The system consists of a 584L PC communicating, through a P453 Remote I/O Interface, with up to thirty-two devices.

On the initial configuration, the controller defaults to zero.

A.5.4 Set Parameters

Press this software label key to set the ASCII port parameters. When this software label key is pressed, the following set of software labels appear on the screen:



<u>PORT</u>	<u>PARITY</u>	<u>STOPS</u>	<u>#BIT</u>	<u>BAUD RATE</u>	<u>KBD</u>	<u>PORT</u>	<u>PARITY</u>	<u>STOPS</u>	<u>#BIT</u>	<u>BAUD RATE</u>	<u>KBD</u>
01	EVEN	1	8	01200	Y	02	ODD	1	8	01200	Y
03	NONE	2	7	09600	N						

Figure A-2. ASCII Parameter Table

Figure A-2 is an example parameter table for three ASCII ports. To change the parameters for any of the ports, position the cursor to the left of the port number and press the appropriate software label keys. Move the cursor with the arrow keys on the P190 panel. The software label keys are explained in the next six sections (A.5.4.1 through A.5.4.6).

A.5.4.1 No Par/Parity

Toggle this software label key to select PARITY or NO PARITY. The selection is indicated by UP or DOWN arrows in the software label.

On the initial configuration, the controller defaults to even PARITY.

A.5.4.2 Even/Odd

Toggle this software label key to select EVEN parity or ODD parity. The selection is indicated by UP or DOWN arrows in the software label.

When communicating between the P190 and the 584L PC, EVEN parity is selected. On the initial configuration, the controller defaults to EVEN parity.

A.5.4.3 1 Stop/2 Stop

Toggle this software label key to select 1 STOP bit or 2 STOP bits. The selection is indicated by UP or DOWN arrows in the software label.

One stop bit is selected if the 584L PC is communicating with other Modicon equipment. On the initial configuration, the controller defaults to 1 STOP bit.

A.5.4.4 # of Data Bits

Enter into the AR the number of data bits to be passed through a specific port (a value of 5, 6, 7, or 8), and press the # OF DATA BITS software label key.

ASCII communications require seven data bits, and RTU communications require eight data bits. Five or six data bits are rarely used.

On the initial configuration, the controller defaults to 8 data bits.

A.5.4.5 Baud Rate

Enter one of the following baud rates into the AR:

50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, or 19200.

Press the BAUD RATE software label key to enter this value. When communicating between the P190 and the 584L PC, the baud rate is 9600.

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On the initial configuration, there is no 584L that defaults to 1200; the 584L PC defaults to a baud rate of 9600.

A.5.4.6 KBD/NON-KBD

Toggle this software label key to select keyboard (KBD) or no keyboard (NON-KBD). The selection is indicated by UP or DOWN arrows in the software label.

The choice of KBD or NON-KBD is dependent on the type of device connected to the ASCII port. If the device does not have a keyboard (i.e., a bar code reader, or a microprocessor), NON-KBD is selected. If the device is a CRT or printer terminal, KBD is usually selected although NON-KBD is allowed.

A selection of KBD allows backspace and rubout keys to be used if a mistake is made in entering data. The field terminator for a data entry is an escape (ESC) key. The end of message indicator is a carriage return.

On the initial configuration, the controller defaults to KBD.

A.6 SPECIALS

Press this software label key to reach software labels BATTERY COIL 0XXXX and TIMER REG 4XXXX. Battery coil and timer reg do not have to be configured for the 584L PC to run properly; they are available if the user needs them. The user can now select the desired remote I/O configuration by selecting the desired number of channels.

A.6.1 Battery Coil 0XXXX

Enter a 0XXXX reference number into the AR and press the BATTERY COIL 0XXXX software label key to enter the coil number. When this coil is used in the user's program, it reflects the status of the battery back-up system.

On the initial configuration, the controller defaults to zero; no battery coil is available.

NOTES

1. Changing certain configuration options, ASCII parameters, skip, 584 baud rates, does not clear 584 memory, but does affect coil and register tables (history disable, state).
2. Once a battery coil has been configured during the configuration process, it cannot be released, even if another coil is configured as the battery coil. Immediately after configuring the battery coil (before the 584 has started) the coil can be programmed in user logic.

A.6.2 Timer Reg 4XXXX

Enter a 4XXXX reference number into the AR. Press the TIMER REG 4XXXX software label key to enter the holding register number. This holding register is set aside to hold the number of 10 millisecond clock cycles.

On the initial configuration, the controller defaults to zero; no timer register is available.

A.7 WRITE CONFIG

When all the configuration information has been entered into the configuration table, press this software label key to insert the table into the 584L PC.

If changes are made to the table and the WRITE CONFIG software label key is not pressed, the changes to the table are not acknowledged by the 584L PC. The 584L PC must be STOPPED in order to implement the WRITE CONFIG function.

A.8 NEXT MENU

Press this software label key to enter module information. The software labels MODULES, WRITE CONFIG, and PREVIOUS MENU appear on the screen.

A.8.1 Modules

When this software label key is pressed, the software labels LOAD MODULES, DELETE MODULES, and PREVIOUS MENU are displayed on the screen.

A.8.1.1 Load Modules

Press this software label key in order to load a 584L Modules Program Tape. When this software label key is pressed, the software labels PROCEED and CANCEL appear on the screen along with the message "Insert 584L Modules Program Tape". The 584L can have multiple loadable modules. The 584L Modules Program Tapes are not part of the Configurator Tape package.

A.8.1.2 Delete Modules

Press this software label key in order to delete part or all of a 584L Modules Program Tape from the 584L memory. The software labels DELETE ALL, DELETE PROGRAM, and PREVIOUS MENU appear on the screen. The heading "584L Controller Directory" appears with a list of the modules in the 584L PC.

To delete all the modules in the 584L, press DELETE ALL. To delete individual modules, enter the module/program name beside "Enter Program Name:" on the screen and press DELETE PROGRAM.

A.8.2 Write Config

This function is explained in Section A.7.

A.9 MOVE SEGMENT AND TRAFFIC COP

When the Configurator Tape (T584-004) is loaded into the P190, the software labels 584L CONFIG and ATTACH UNIT # appear on the screen. To reach the MOVE SEGMENT and TRAFFIC COP functions, do the following:

CONFIGURATION

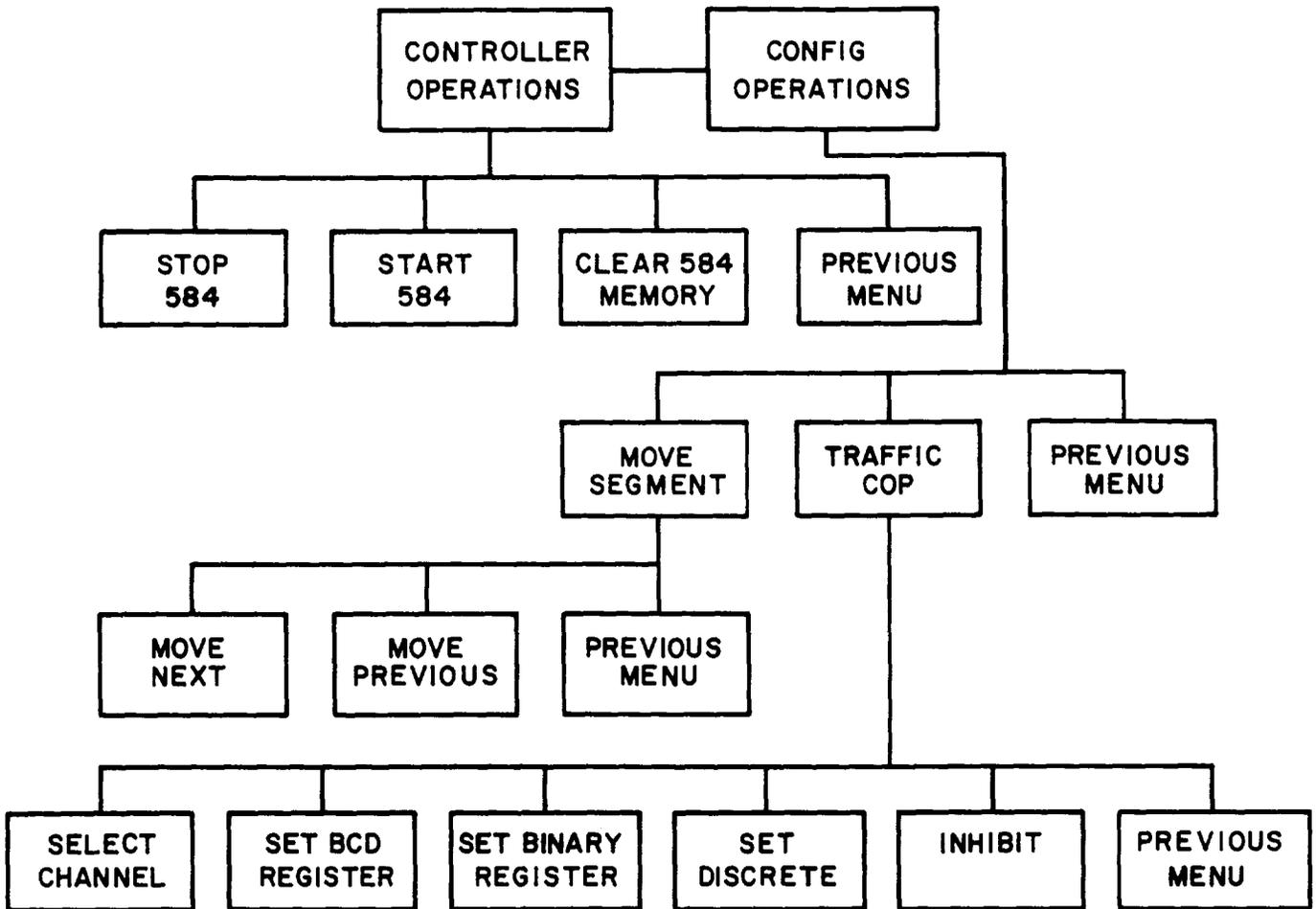


Figure A-3. Flow Chart of Traffic Cop Software Labels

1. Enter a unit number into AR (e.g., 00001).
2. Press the ATTACH UNIT # software label key.

The RELEASE 584L software label appears on the screen.

3. Press the RESET/EXIT key on the P190 panel.
The software labels CONTROLLER OPERATIONS and CONFIG OPERATIONS appear on the screen.
4. Stop the controller if it is running. To do this:
 - 1) Press the CONTROLLER OPERATIONS software label key.
 - 2) Press the STOP 584L software label key.
 - 3) Press the PROCEED software label key.
5. Press the CONFIG OPERATIONS software label key.

The software labels MOVE SEGMENT, TRAFFIC COP, and PREVIOUS MENU appear on the screen.

A.9.1 Move Segment

The MOVE SEGMENT functions allow whole or partial segments to be moved into adjacent segments.

When this software label key is pressed, the following software labels are displayed on the screen:



A.9.1.1 Move Next

Enter a network number into the AR (e.g., 28) and press this software label key. All the networks, starting at the number entered (e.g., 28) and continuing to the end of the segment (e.g., segment 2), are moved into the next segment (e.g., segment 3).

NOTE

When moving a portion of a segment to the next segment, remember that only the networks from a specific network to the end of the segment can be moved. A group of networks in the middle of a segment or from the beginning to middle of a segment cannot be moved using this software label key.

A.9.1.2 Move Previous

Enter a network number into the AR (e.g., 35) and press this software label key. All the networks, from the beginning of the segment (e.g., segment 2) to the network number entered minus one (e.g., 34), are moved to the previous segment (e.g., segment 1).

NOTE

When moving a portion of a segment to the previous segment, remember that only the networks from the beginning of a segment to a specific network in the segment can be moved. A group of networks in the middle of a segment or from the middle to the end of a segment cannot be moved using this software label key. Also, the last network in a segment cannot be moved.

A.9.2 Traffic Cop

The Traffic Cop is used to direct the flow of data between the various I/O modules and the logic program. It is the tie between the references used in the logic program and the I/O module connection points.

The Traffic Cop table is constructed by specifying the references to be associated with I/O modules mounted in particular channels and slots, and specifying the type of data — Discrete, BCD, or Binary. Figure A-4 is a typical Traffic Cop for Channel 1.

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CHANNEL: 01

SLOT	INPUT REF#	TYPE	OUTPUT REF#	TYPE
1	30001	BCD	40001	BIN
2	10001	DIS	40002	BCD
3	30002	BIN	00001	DIS
4	30003	BIN	00033	DIS
5	10017	DIS	00801	DIS
6	10033	DIS	40105	BIN
7	10065	DIS	40106	BIN
8	10801	DIS	40108	BCD

Figure A-4. Typical Traffic Cop

When the TRAFFIC COP software label key is pressed, the following software labels are displayed on the screen:



Position the cursor to the left of the REF# column in the row desired to enter information. The cursor position is changed using the arrow keys on the P190 panel.

The SLOT numbers refer to the address on the I/O Rack. There are REF# and TYPE columns for both INPUT and OUTPUT. INPUT includes 1XXXX discrete input references and 30XXX input register references. OUTPUT includes 0XXXX logic coil references and 4XXXX holding/output register references. The following is a summary of the options for each reference:

Reference	Options
0XXXX	OUTPUT; DISCRETE
1XXXX	INPUT; DISCRETE
30XXX	INPUT; BCD REGISTER or BINARY REGISTER
4XXXX	OUTPUT; BCD REGISTER or BINARY REGISTER

A.9.2.1 Select Channel

Enter a channel number into the AR, a maximum value of 32, and press this software label key. The TRAFFIC COP table is displayed for the specified channel.

On the initial configuration of the Traffic Cop, the controller defaults to the Traffic Cop Table for Channel 1.

A.9.2.2 Set BCD Register

Enter a 30XXX or 4XXXX reference into the AR and press this software label key. This register is entered into the Traffic Cop as a Binary Coded Decimal (BCD) register and the cursor moves down one position.

NOTE

I/O modules wired to numerical devices (i.e., thumbwheel switches, digital LED displays, etc.) should be defined as BCD registers.

A.9.2.3 Set Binary Register

Enter a 30XXX or 4XXXX reference into the AR and press this software label key. This register is entered into the Traffic Cop as a Binary register and the cursor moves down one position.

NOTE

I/O Modules wired to analog transducers, and module slots which use the 584L PC's matrix logic capabilities, should be defined as Binary registers.

A.9.2.4 Set Discrete

Enter a 0XXXX or IXXXX reference into the AR, a value divisible by 16 with a remainder of 1 (i.e., 00017, 00033, 10049, 10065, etc.), and press this software label key. The reference represents 16 discrettes (i.e., 00017-00032, 10065-10080). The cursor moves down one position after this software label key is pressed.

A.9.2.5 Inhibit

Position the cursor to the left of the reference to be inhibited and press this software label key. This clears the reference number and its type. The word INHIBIT is placed in the TYPE column and the cursor moves down one position.

On the initial configuration of the Traffic Cop, the controller defaults to INHIBIT for all the slots.

APPENDIX B SOLVE TIME SPECIFICATIONS

<u>Function</u>	<u>Level 1 or 2 584L Minimum Solve Time</u>	<u>Level 1 or 2 584L Maximum Solve Time</u>
UCTR	13.09 microseconds	13.97 microseconds
DCTR	13.09 microseconds	13.97 microseconds
TIMER	8.05 microseconds	9.56 microseconds
ADD	9.59 microseconds	10.85 microseconds
SUB	9.59 microseconds	11.10 microseconds
MUL	9.59 microseconds	63.58 microseconds
DIV	9.59 microseconds	116.50 microseconds
<hr/>		
R→T	12.50 microseconds	15.75 microseconds
T→R	13.00 microseconds	16.50 microseconds
T→T	13.25 microseconds	17.00 microseconds
BLKM	9.75 microseconds	137.50 microseconds
FIN	14.25 microseconds	19.25 microseconds
FOUT	16.00 microseconds	17.25 microseconds
SRCH	13.25 microseconds	163.50 microseconds
STAT	10.75 microseconds	241.50 microseconds
<hr/>		
AND	9.75 microseconds	210.00 microseconds
OR	10.25 microseconds	210.50 microseconds
XOR	12.00 microseconds	212.25 microseconds
COMP	11.75 microseconds	212.00 microseconds
CMPR	10.75 microseconds	284.00 microseconds

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<u>Function</u>	<u>Level 1 or 2 584L Minimum Solve Time</u>	<u>Level 1 or 2 584L Maximum Solve Time</u>
MBIT	10.50 microseconds	31.50 microseconds
SENS	13.00 microseconds	25.00 microseconds
BROT	11.75 microseconds	216.25 microseconds (right)
		215.75 microseconds (left)
<hr/>		
READ	3 milliseconds	6 milliseconds
WRIT	3 milliseconds	6 milliseconds

APPENDIX C INFORMATION AND ERROR MESSAGES

Information messages and error messages appear on the error line of the P190 screen. The message can either be supplying instructions or information to the user, or alerting the user to errors in programming or operation. The messages in this appendix are listed alphabetically along with a description of the message. When a certain action should be taken, the action is listed in the far right, SUGGESTED ACTION, column.

Most messages can be cleared by pressing the CLEAR ERROR key. The AR is cleared by pressing the CLEAR AR key.

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
Address limit	The number of I/O addresses assigned exceed the available space.	Reassess I/O allocations. Reduce the number of I/O addresses.
AR not decimal	The information being entered must be decimal, as in the case of reference numbers.	Clear the AR and enter decimal data.
Bad length received	Communications error in message received from 584L PC.	CLEAR ERROR, RESET, and reattempt operation.
Cannot login-unit has programmer attached	Only one P190 programmer at a time may be attached to a 584L PC as a programmer (i.e., with P190 keylock unlocked).	Attach to 584L PC as a monitor (i.e., with keylock locked) or wait until other programmer logs out or detaches.
Coil not disabled	The coil can not be forced because it has not been disabled.	Disable the coil. It can then be forced.
Coil not in a network	The requested coil has not yet been used.	
Coil used	The requested coil has already been programmed and may not be used again.	Select a new coil number.
Coils not allowed here	A coil may not be placed in this position, such as between two contacts.	Move cursor to appropriate area and coil.

INFORMATION AND ERROR MESSAGES

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
Compress not allowed	There are no nodes beneath the cursor to compress horizontally or vertically.	
Controller in dim awareness, attach not allowed.	The controller has not been configured and cannot fully communicate with the P190 programmer.	Configure controller using 584L Configuration Tape and retry. Make sure the correct controller has been addressed.
Controller running	The attempted action (i.e., trying to clear memory) cannot be performed because the controller is running.	Stop controller, then perform action.
CRC failure	Indicates a communications error picked up by the error checking. CRC = cyclical redundancy check.	CLEAR ERROR, RESET and reattempt operation.
End of logic memory	There are no more networks started or programmed into logic memory.	If another network is desired, press START NETWORK.
Expand not allowed	Network expansion, either vertical or horizontal is not allowed due to space.	
Fatal I/O error must initiate reset sequence	Communications error message has been cleared from screen. RESET must be pressed to be able to reinstate communications.	RESET, and reattempt operation.
Function not allowed	The requested function may not be performed at this time.	
Illegal baud rate	Occurs when configuring a 584L PC. The baud rate selected (i.e., 5000) is not allowed.	Select a legal baud rate.

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<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
Illegal channel number	Occurs during traffic cop operations. The number entered is not legal number for a channel (1-4 local, 5-31 odd numbers only for remote).	Clear the AR and enter legal channel number.
Illegal configuration	Displayed when attempt is made to program a 584L PC when the configuration has not been properly set.	Check configuration and assure that it is complete and accurate.
Illegal device address	The device address given is less than 1 or greater than 255 decimal. This message appears during configuration.	Select legal device address (from 1 to 255 inclusive).
Illegal replacement	This message is displayed if the user attempts to replace one type of node with another type which is not legal at that position. An example would be attempting to replace a contact with a coil.	Select legal replacement.
Illegal 584L memory configuration	The 584L configuration, at time of start-up is not valid.	Reload tape. If error reoccurs obtain new dump tape and reload.
Invalid address	Communications error. Message not received correctly due to invalid field.	CLEAR ERROR, and reattempt operation.
Invalid command		
Invalid date		
Invalid network number	The network number given does not correspond to any network in the controller.	

INFORMATION AND ERROR MESSAGES

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
Invalid node	Communications error in the area indicated.	CLEAR ERROR, and reattempt operation.
Invalid parameter		
Invalid reference number	The reference number (e.g., 0XXXX, 30XXX, 4XXXX) is not valid for the type of node or operation used. (Such as trying to place a 1XXXX reference in the bottom of a timer.)	Enter valid reference number: For example, 0XXXX for a coil, 0XXXX or 1XXXX for a contact, or 4XXXX for a DX destination.
Invalid unit number	The unit number (device address) is not in the valid range, 1 through 246 inclusive.	Enter a unit number from 1 to 246.
Memory full	The limit for user logic space has been reached.	Review program for best use of memory.
Memory protect ON	The desired action may not be performed because the 584L memory protect is ON.	Memory protect must be unlocked to perform desired action.
Network not found highest # - - - - -	The requested network was not found in user logic. The last network number found is given.	
Network not found	The 584L PC user logic has been altered by another device.	Logout and reattach.
No. DX's in this controller	The 584L PC has "Basic Level" capabilities rather than "Advanced." There are no data transfer functions available.	
No element at cursor	To perform the operation requested, the cursor must be placed on an element.	Place cursor on appropriate element and perform operation.

INFORMATION AND ERROR MESSAGES

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
No element to compress	The compress function vertical or horizontal, cannot be performed because the cursor is not on any elements.	Place cursor on appropriate element and perform operation.
No empty spaces	Occurs during TRACE/ RETRCE function. Indicates that there is no more room for displaying traced references in the reference area.	ERASE displayed references to make room, or CHANGE SCREEN to allow display on alternate screen.
No function attached to key	The selected key does not have a valid function at this stage of operation. For example, pressing a key with no software label has no valid function.	Select another key.
No network in controller	The controller has no networks programmed into user logic.	
No network on screen	The selected operation cannot be performed because no network is displayed.	
No other disabled coil	Appears during search procedures when all disabled coils have been found and another search is given.	
No reference present	Occurs when ERASE, GET PREVIOUS, or GET NEXT is pressed but no reference is present at the cursor.	Reposition cursor to be on desired reference.
No search parameters	This message appears when SEARCH is pressed when no parameters (type of node, reference number) have been set.	Move cursor to set search area of CRT screen and choose parameters.

INFORMATION AND ERROR MESSAGES

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
Not attached to the controller	The selected operation cannot be performed because the P190 programmer is not attached to the controller.	Attach to controller, and perform operation.
Not enough memory	This message appears during configuration, indicating that the memory size of the machine cannot support the configuration parameter chosen.	Choose parameter within system capabilities.
Not enough room	Occurs when attempt is made to insert a two or three node function block into the last row of a network.	Redesign network or go to next network.
Not enough room to compress	This message indicates that the network cannot be compressed, vertically or horizontally, due to lack of space.	
Not in program mode	The selected function or key (i.e., START NEXT, DELETE, ENTER) is only operative when the P190 is acting as a programmer, P190 keylock unlocked.	Unlock P190 keylock and perform operation.
Not logged in	The selected function or key is not operative because the P190 Programmer is not attached to the 584L PC.	Attach P190 Programmer to 584L PC and perform operation.
Not logic screen	The function selected (i.e., START NEXT) can only be performed on the logic screen.	Access logic screen.
Only decimal or hexadecimal characters allowed in AR	Special characters (i.e., /, ?, ;) are not allowed in the AR. Only decimal (0-9) and hexadecimal (0-9, A-F) are allowed.	Re-enter valid data.

INFORMATION AND ERROR MESSAGES

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
Port empty or unattached	Communication is not possible through the selected port because there is no connection, either to a printer or a 584L PC.	Check connections at P190 and at peripheral device. Check to assure that correct cable is used.
Port 2 not connected	Peripheral port 2 (used to communicate with the 584L PC) is not connected; communications are not possible.	Check connections at P190 port 2 and at peripheral device.
Port 2 transmit timeout	Occurs during print operations. Indicates that communications have been interrupted.	CLEAR ERROR, retry operation.
Port 2 UART status error	Communications error.	CLEAR ERROR, retry operation.
Power display invalid — network skipped	The network displayed has been bypassed using the SKIP function. Disregard the power flow display.	
Programming going on	This message indicates to a P190 being used as a monitor that changes have been made to memory by another P190 programmer.	To make sure display of memory is current. LOGOUT and then reattach.
P190 UART status error	Communications error.	CLEAR ERROR, RESET.
Reference on alternate screen	This message alerts the user that a reference retrieved by the TRACE function is on the alternate screen. This message only appears if the reference area is full.	Change to alternate screen, if desired.
Running 584L	The 584L PC attached to the P190 programmer is running.	

INFORMATION AND ERROR MESSAGES

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>										
Search failed	No node and/or reference number as specified in the search parameters was found in the data base.											
Segment boundary crossed	This message informs the user that a segment boundary has been crossed, either forwards or backwards.											
Start of logic memory	The first network is shown. GET PREVIOUS is invalid.											
Stopped 584L	The 584L PC connected to the P190 programmer is not running.											
System Error: XXXX	<p>Four digit number may indicate a single error or the hexadecimal, no-carry sum of several errors. For example</p> <table border="0"> <tr> <td>Peripheral port "Stop"</td> <td>8000</td> </tr> <tr> <td>CPU diagnostic failure</td> <td>0020</td> </tr> <tr> <td>Invalid node type</td> <td>0008</td> </tr> <tr> <td>Logic checksum error</td> <td><u>0004</u></td> </tr> <tr> <td>System error:</td> <td>802C</td> </tr> </table>	Peripheral port "Stop"	8000	CPU diagnostic failure	0020	Invalid node type	0008	Logic checksum error	<u>0004</u>	System error:	802C	Error codes may appear after a tape is loaded and before the 584L PC is configured. In most cases, these are caused by loading and may be ignored. But if communications appear to be interrupted, reload the tape.
Peripheral port "Stop"	8000											
CPU diagnostic failure	0020											
Invalid node type	0008											
Logic checksum error	<u>0004</u>											
System error:	802C											
System Error Code Number	Since there is no carry, each set of errors produces a unique system error code.											
0001	Illegal configuration.											
0002	Backup checksum error.											
0004	Logic checksum error.											
0008	Invalid note type.											
0010	Invalid traffic cop type.											
0020	CPU diagnostic failure.											
0040	Realtime clock failure.											

INFORMATION AND ERROR MESSAGES

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
0080	Watchdog timer (WDT) failure.	
0100	No end-of-logic (EOL) or bad number of segments.	
0200	State RAM test failure.	
0400	Start-of-network (SON) Node did not start segment.	
0800	Bad multi-rate table.	
1000	Illegal panel or host CPU intervention.	
2000	Illegal mini-code instruction.	
4000	(Reserved).	
8000	Peripheral port "Stop."	
Timeout error-communications down	Communications error in message 584L PC.	CLEAR ERROR, RESET.
Too many DX's-loading	All data transfer functions (DX's) cannot be loaded due to lack of available memory.	Reload tape. Reconfigure if necessary.
Total # of segments = 0 or	584L PC appears to have illegal number of 16	Check configuration, reload tape. segments.
Trace stack empty	The user has traced back to the original network in the operation.	
Verticals not allowed	Appears when attempt is made to insert vertical in row 7.	

INFORMATION AND ERROR MESSAGES

<u>Message</u>	<u>Description</u>	<u>Suggested Action</u>
9999 Overflow	Value in register is too large to display in decimal with four digits. This message appears in the reference area, next to the reference number.	
# of coils must be multiples of 16 accepted	Coils may be specified only in multiples of 16. No other numbers are	Enter correct number.

APPENDIX D GLOSSARY

A

Address:

A numeric value used to identify a specific I/O channel and/or module.

AND (Logical):

A mathematical operation between two bits. The result of the logical AND will be a one (ON) bit only if both bits are one bits; otherwise, the result will be a zero (OFF) bit. This operation can be performed between bits with each pair of bits, one from each, examined by their relative location within each.

Arithmetic Function:

A type of logic used to add, subtract, multiply, or divide two numeric values. The status of the output is governed by the result of the arithmetic operation: additional overflow; comparisons (greater than, equal to, or less than); and illegal division.

ASCII:

A 7-bit digital coding of standard alphanumeric characters as established by the American National Standards Institute. ASCII stands for the American Standard Code for Information Interchange.

B

Baud:

A unit of data transmission speed equal to the number of code elements (bits) per second.

BCD (Binary-Coded Decimal):

A system of numbers representing decimal digits (0-9) using four binary digits (1 or 0). BCD is a recognized industrial standard; BCD input (e.g., thumbwheels) and output (e.g., numerical displays) are readily available.

Binary:

A numeric system wherein values are represented only by numbers 1 and 0 (ON/OFF). Also called "base 2". This system is commonly employed in modern electronic hardware since circuits can be economically designed for ON/OFF status.

Bit:

Contraction of binary digit. A single number whose value can be either a ONE or a ZERO. The smallest division of a PC word.

Bit Modify Function:

This function allows individual bits in a matrix to be altered. Only one bit per scan can be affected by this function; all other bits retain their state. Bits can be either set to a one (ON) condition or cleared to a zero (OFF) condition.

GLOSSARY

Bit Rotate Function:

This function allows a series of bits to be rotated or shifted through a matrix. If the function is enabled for a number of scans (e.g., five), all bits in the matrix will be rotated the same number of bit locations (e.g., five). Provisions are made to select the direction of rotation, left or right.

Bit Sense Function:

This function allows individual bits in a matrix to be examined, but not altered. An output is used to indicate a one (ON) bit with power flow and a zero (OFF) bit without power flow. The status of only one bit can be obtained each scan.

C

Cascade Function:

Connecting two or more functions together to control one output. For example, timers and counters can be cascaded to produce results that cannot be achieved by one counter or one timer.

Channel:

A group of I/O modules that are separately connected to the mainframe. For example, a channel of I/O can contain up to 128 input points and 128 output points.

Coil:

A discrete logical conclusion to a series of logical operations performed by the programmable controller. The results can be output to the real world via an output module to activate motor starters, solenoids, relays or pilot lamps. Coils are turned OFF when power is removed from the mainframe. (See Latch.)

Compare Function:

This function causes two matrices to be compared on a bit-by-bit basis to find all the bit locations which differ, and save the result for later use; their contents are not altered, but only examined.

Complement Function:

This function causes the content of one matrix to be complemented (all ones replaced by zeros, and zeros by ones) and placed in another matrix for reference by any other function.

Counter:

A type of logic that is used to simulate the operation of external counters. In relay panel hardware, an electromechanical device which can be wired and preset to control other devices according to the total cycle of one ON or OFF function. In a PC, a counter is internal to the processor, which is to say it is an electronic function controlled by a user programmed instruction.

Cursor:

Visual movable pointer used on a CRT or programming panel by the programmer to indicate where an instruction is to be added to the ladder diagram. The cursor is also used for editing functions.

D

- Data Transfer Block:**
A PC function block used in data transfer (DX) programming.
- Data Transfer (DX) Function:**
A technique of moving and manipulating data within the controller under control of DX logic.
- Data Transfer Line:**
A line of ladder logic containing data transfer (DX) functions.
- Digital:**
Having discrete states. Digital logic can have up to 16 states. However, most digital logic is binary logic with two states, ON or OFF.
- Disable:**
The capability to disconnect a logic coil or a discrete input from its normal control, and force it unconditionally ON or OFF. (See Force.)
- Discrete Reference:**
A reference that can be either ON or OFF. A discrete reference can be an input, output, or internal logic element.
- Double Precision Function:**
The technique of storing a single numerical value in two consecutive registers. Since each register can store up to four digits (maximum value 9,999), double precision allows magnitudes of up to 99,999,999 to be stored.

E

- Edit:**
To deliberately modify the user program.
- Element:**
The basic building block of the PC ladder logic. An element can be a relay contact, horizontal short, vertical short, fixed numeric value, register reference, coil, or function block. Sometimes referred to as a logic element.
- Enable:**
To reconnect a logic coil or discrete input after it has been disabled. The opposite of "Disable."
- Exclusive OR (XOR):**
A mathematical operation between two bits. The result of the exclusive OR will be a one (ON) bit only if either bit is a one bit. Only if they are both zeros (OFF) or both ones (ON) will the result be a zero.

F

- FIFO Function:**
A special DX table that maintains the order of data entered into the table, First In, First Out.

GLOSSARY

Force:

The function that can be used to change the state of a disabled reference. The reference can be changed from OFF to ON or ON to OFF. This allows the user to energize or de-energize any input or output by means of the program panel independent of the PC program.

H

Hexadecimal:

The numbering system that represents all possible ON/OFF combinations of four bits with sixteen unique digits (0-9 then A-F).

I

Inclusive OR:

A mathematical operation between two bits. The result of the inclusive OR will be a one (ON) bit if either bit is a one bit or both bits are ones; only if both bits are zeros (OFF) will the result be a zero. This operation can be performed between groups of bits with each pair of bits examined by their relative location within each.

Input:

A signal that provides information to the controller; can be either discrete input (pushbutton, relay contacts, limit switches, etc.) or numeric input (thumbwheel, external solid-state device, etc.)

Input Devices:

Devices such as limit switches, pressure switches, push buttons, etc., that supply data to a programmable controller. These discrete inputs can have a common return or an individual return (referred to as isolated inputs). Other inputs include analog devices and digital encoders.

L

Ladder Diagram:

An industry standard for representing control logic relay systems with logic lines representing rungs on a ladder. It expresses the user programmed logic of the controller in relay equivalent symbology.

Latch:

The type of coil that is retentive upon power failure. Can be used similar to a latching relay. Normally, coils are reset to OFF conditions upon powerup; those coils selected by the user as latched (L) will not be altered and thus retain their previous condition (ON or OFF).

Logic:

A systematic interconnection of digital switching functions, circuits, or devices, as in electronic digital computers.

Logic Diagram:

A graphic description of logic functions and conditions. It is used to find the result of an addition of the contents of two registers; a logical compare of two matrices; as well as other arithmetic operations.

Logic Element:

Any one of the elements that can be used in a ladder logic diagram. The elements include relays, coils, shunts, timers, counters, arithmetic functions, and DX functions.

Logic Line:

A line of user logic used to construct the unique logic for the application.

M**Matrix Function:**

Matrices are defined as sequential registers, each as 16 bits, up to a maximum of 99 registers (1584 bits). A group of consecutive registers referred to by logic, such that individual bits can be utilized in lieu of numerical values. Bit operations that can be performed include: AND, OR (inclusive), XOR (exclusive), COMPARE, MODIFY, SENSE, COMPLEMENT, and ROTATE.

Memory:

Storage area for binary data and programs.

Memory Protect:

The hardware capability to prevent a portion of the memory from being altered by an external device. This hardware feature is under keylock control.

Move Function:

A DX capability which allows data to be transferred without modification within the controller. Data can be transferred from a register to a table, from a table to a register, from a table to a table, into a FIFO stack, or out of a FIFO stack.

N**Network:**

A group of logic elements that are connected together to perform a specific function (e.g., a motor starter control circuit).

Node:

The smallest possible programming increment in a ladder logic diagram. (Most logic elements require only one node, others require two or more nodes.)

O**One-Shot:**

A discrete reference, typically a logic coil, that is energized (valid) for exactly one scan of the controller's logic.

Output:

A signal provided from the Controller to the "real world"; can be either discrete output (e.g., solenoid valve, relay, motor starter, indicator lamp, etc.) or numeric output (e.g. display of values stored within the controller).

Output Devices:

Devices such as solenoids, motor starters, etc., that receive signals from the programmable controller.

GLOSSARY

P

- Parity:** Method of verifying the accuracy of recorded data.
- Parity Bit:** An additional bit added to a memory word to make the sum of the number of "1's" in a word always "even parity" or "odd parity."
- Port:** An I/O connection on a processor or peripheral device.
- Preset:** The upper limit specified for a counter or timer function. When the specified preset value is reached, an output is energized indicating the status of a counter or timer.
- Programmable Controller (PC):**
A solid-state control system which has a user programmable memory for storage of instructions to implement specific functions such as: I/O control logic, timing, counting, arithmetic and data manipulation. A PC consists of a central processor, an input/output interface, memory, and a programming device that typically uses relay equipment symbols. PC is purposely designed as an industrial control system that can perform functions equivalent to a relay panel or a wired solid-state logic control system.
- Programming Panel (Programmer):**
Device for inserting, monitoring, and editing a program in a PC.

R

- Reference Numbers:** Numbers which identify the elements of the relay ladder logic. References can be either discrete (logic coils, inputs, or sequencer steps) or register (input or holding).
- Register:** A location within the controller allocated to the storage of numerical values. All holding registers are retentive on power failure. There are three types of registers: input whose contents are controlled by the "real world" outside the controller; holding registers whose contents are controlled from within the controller; and output registers, which are special holding registers since their contents can also be provided to the "real world".
- Relay:** An electromagnetic device operated by a variation in conditions of an electric circuit. When so operated, it controls other devices such as switches.
- Relay Element:** A logic symbol used to simulate the effect of a relay. Contacts can be normally open, normally closed, or transitional contacts.

S

Scan:

The technique of examining or solving logic networks one at a time in their numeric order. After the last logic network is solved, the next scan begins at network one; logic is always solved in this fixed cyclic process.

Skip Function:

This function allows a group of consecutive networks to be skipped or omitted in the scanned logic solution. The status (ON/OFF) of all coils and the contents of registers controlled by these networks are not altered when they are skipped.

T

Table:

A group of consecutive registers used to store numerical values.

Table Search Operation (SRCH):

This function searches a table of registers for a specified value. The source is not altered, only examined. The SRCH function uses a pointer to indicate the location(s) within the table of registers which contain the desired value. This pointer is the only register whose value is altered by the SRCH function.

Timer:

PC logic used to measure and record the time of an event or sequence of events. Timers can accumulate time in either seconds, tenths of seconds, or hundredths of seconds depending on the PC.

Traffic Cop:

A portion of the PC executive that controls how input and output data is interpreted relative to its channel number and address index position.