

## 6-6 Socket Service Status

### 6-6-1 CIO Area Allocations

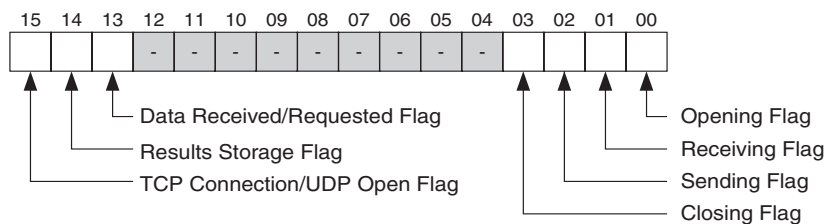
The following CIO Area words are allocated in the CPU Bus Unit Area in the CIO Area starting at word n+ 1. The value of n can be calculated from the unit number as follows:

$$\text{Beginning word } n = \text{CIO } 1500 + (25 \times \text{unit number})$$

■ **UDP/TCP Socket Status (Ethernet Unit to CPU Unit)**

The status of the UDP and TCP sockets is provided in the socket status words shown in the following diagram. There is a status word for each socket for both UDP and TCP.

	15	08	07	00
n+1	UDP Socket No. 1 Status			
n+2	UDP Socket No. 2 Status			
n+3	UDP Socket No. 3 Status			
n+4	UDP Socket No. 4 Status			
n+5	UDP Socket No. 5 Status			
n+6	UDP Socket No. 6 Status			
n+7	UDP Socket No. 7 Status			
n+8	UDP Socket No. 8 Status			
n+9	TCP Socket No. 1 Status			
n+10	TCP Socket No. 2 Status			
n+11	TCP Socket No. 3 Status			
n+12	TCP Socket No. 4 Status			
n+13	TCP Socket No. 5 Status			
n+14	TCP Socket No. 6 Status			
n+15	TCP Socket No. 7 Status			
n+16	TCP Socket No. 8 Status			



Bit	Switch	Status	Manipulated by	Unit operation
0	Opening Flag	ON	Unit	Turns ON when an open request is received.
		OFF		Turns OFF when open processing has been completed.
1	Receiving Flag	ON		Turns ON when a receive request is received.
		OFF		Turns OFF when receive processing has been completed.
2	Sending Flag	ON		Turns ON when a send request is received.
		OFF		Turns OFF when send processing has been completed.
3	Closing Flag	ON		Turns ON when an close request is received.
		OFF		Turns OFF when close processing has been completed.
13	Data Received Flag	ON		Turns ON when data from a remote node has been received at an open TCP socket.
		OFF		Turns OFF when receive processing has been requested for an open TCP socket.
14	Results Storage Error Flag	ON		Turns ON if there is an error in the Results Storage Area specified for the socket service request command to the Ethernet Unit. This flag turns ON at the same time as any of the services request processing flags (bits 0 to 3) turn ON again (i.e, at completion of processing).
		OFF		Turns OFF when the next request is received.
15	TCP Connection/UDP Open Flag	ON		Turns ON when UDP open processing has been completed or when a TCP connection is made.
		OFF		Turns OFF when close processing has been completed. (Will remain OFF when open processing ends in an error.)

### 6-6-2 DM Area Allocations

The following DM Area words are allocated in the CPU Bus Unit Area in the DM Area. The beginning word m is calculated by the following equation.

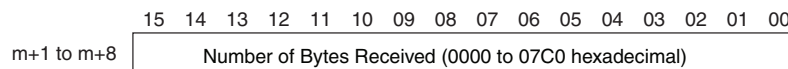
$$\text{Beginning word } m = D30000 + (100 \times \text{unit number})$$

#### ■ Number of Bytes Received at TCP Socket (Ethernet Unit to CPU Unit)

The number of bytes of data saved in the reception buffer at the TCP socket is stored in the TCP Connection Status words. The Data Received Flag in the CIO Area turns ON/OFF in response to the status of these words. When the dedicated control bits (switches) are manipulated or the receive request is sent by executing the CMND(490) instruction, the values of these words are temporarily set to 0000 hexadecimal.

If any data remains in the reception buffer after the receive request processing is complete, the number of bytes is stored in the Number of Bytes Received at TCP Socket and the Data Received Flag turns ON again.

Receive requests should be executed after confirming that the required data is contained in the number of bytes received.



Up to 4,096 bytes of data are stored in the reception buffer, but the value stored is within the range (maximum: 1,984 bytes) that can be set by manipulating the control bits or sending the receive request in the CMND(490) instruction.

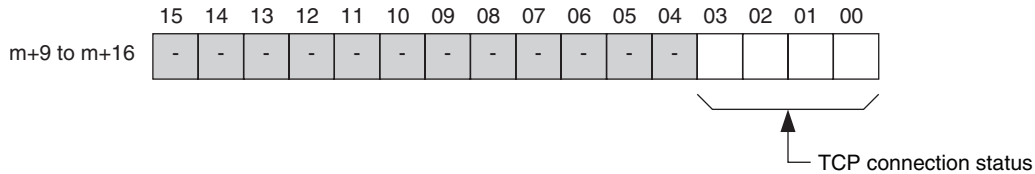
0000 hexadecimal: 0 bytes

07C0 hexadecimal: 1,984 bytes

■ **TCP Connection Status (Ethernet Unit to CPU Unit)**

The TCP Connection Status shows the status of a port that has been opened using the TCP socket. This port status is stored even after the port is closed, and remains until the socket is used to open the port again.

The TCP Connection Status Bits are not synchronized with the Socket Status words, however, so the status conversion timing is slightly different.



The status is shown in bits 0 to 3 (1-digit hexadecimal), as follows:

Number	Status	Meaning
00000000	CLOSED	Connection closed.
00000001	LISTEN	Waiting for connection.
00000002	SYN SENT	SYN sent in active status.
00000003	SYN RECEIVED	SYN received and sent.
00000004	ESTABLISHED	Already established.
00000005	CLOSE WAIT	FIN received and waiting for completion.
00000006	FIN WAIT1	Completed and FIN sent.
00000007	CLOSING	Completed and exchanged FIN. Awaiting ACK.
00000008	LAST ACK	FIN sent and completed. Awaiting ACK.
00000009	FIN WAIT2	Completed and ACK received. Awaiting FIN.
0000000A	TIME WAIT	After closing, pauses twice the maximum segment life (2MSL).

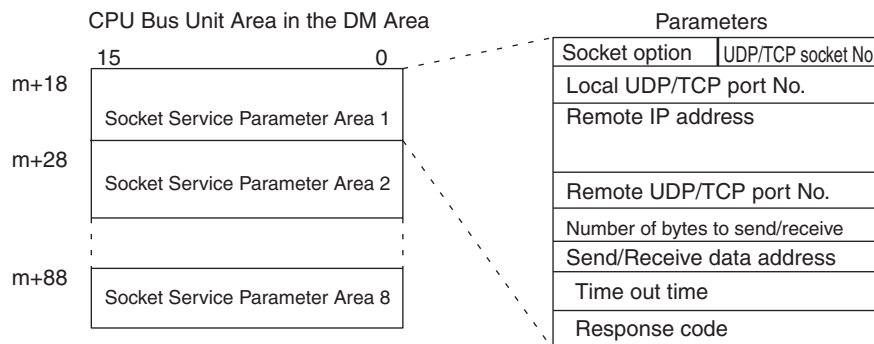
# 6-7 Using Socket Services by Manipulating Dedicated Control Bits

## 6-7-1 Application Procedure

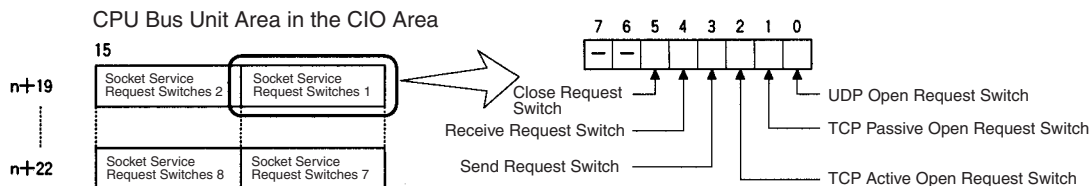
### Procedure

- 1,2,3... 1. Set the socket service parameters in the CPU Bus Unit Area in the DM Area.

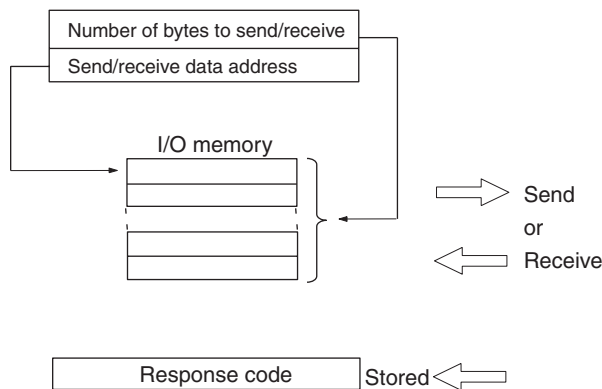
$$m = D30000 + (100 \times \text{unit number})$$



2. Turn ON the Socket Service Request Switches in the CPU Bus Unit Area in the CIO Area.



3. When a send or receive request is made, the data will be automatically sent or received according to the send/receive data address in the Socket Service Parameter Area. When processing has been completed, a response code will be automatically stored in the Socket Service Parameters.



### Precautions

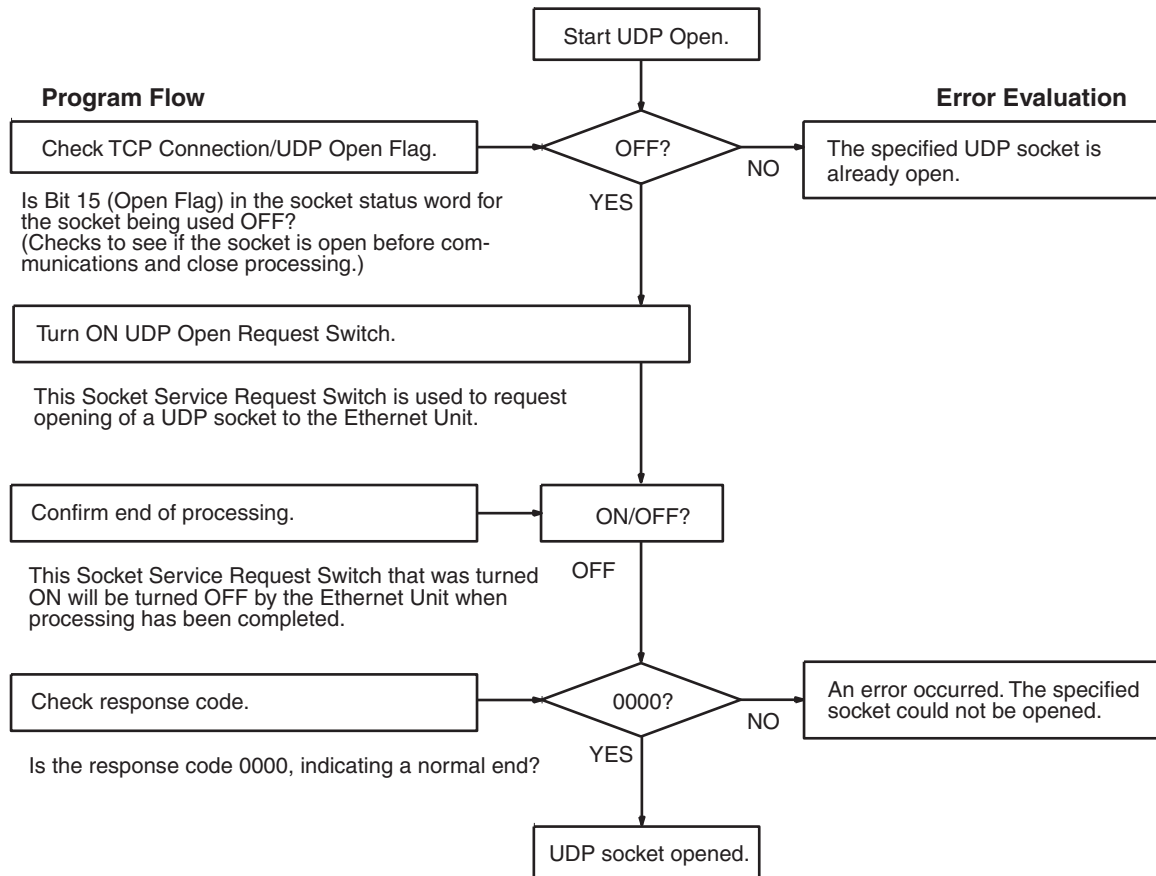
A Socket Service Parameter Area cannot be used for other sockets once open processing has been successfully completed for it. Check the socket

status before attempting to open a socket. TCP socket status is provided in words m+9 to m+16 in the DM Area for sockets 1 to 8.

Starting from unit version 1.5, the performance of sending and receiving has been improved using optional settings for the TCP or UDP socket services using specific bits. Also, a linger socket option has been added to the TCP socket services. Selecting this option enables immediate open processing using the same ports without having to wait (approximately 1 min.) until the port number opens after the socket closes.

### 6-7-2 Socket Services and Socket Status

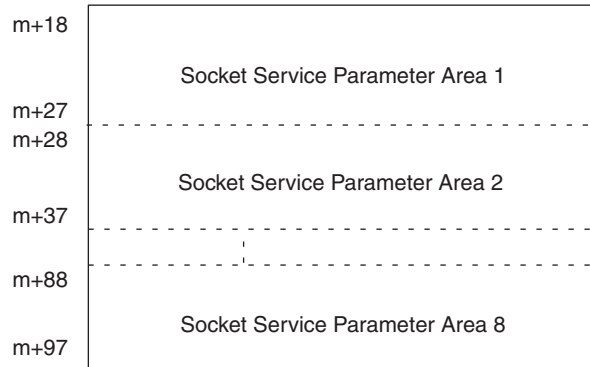
When using socket services, it is important to consider the timing of the status changes in the Socket Status Area. The diagram below shows a flowchart for opening UDP. The flow is similar for other socket services. Replace the names of the appropriate flags in the flowchart to adapt it to other socket services.



### 6-7-3 Socket Service Parameters

The Socket Service Parameter Areas in which parameters are set to request socket services are in the CPU Bus Unit Area in the DM Area of the CPU Unit. The Socket Service Parameter Areas are allocated as shown in the following diagrams. The first word of in the DM Area allocated to the Ethernet Unit as a CPU Bus Unit is referred to as “m” and is calculated as follows:

$$m = D30000 + (100 \times \text{unit number})$$



The configuration of each of the Socket Service Parameter Areas is shown in the following diagram.

Offset	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
+0	Socket option								UDP/TCP socket number							
+1	Local UDP/TCP port number (0000 to FFFF Hex)															
+2	Remote IP address (00000000 to FFFFFFFF Hex)															
+3																
+4	Remote UDP/TCP port number (0000 to FFFF Hex)															
+5	Number of bytes to send/receive (0000 to 07C0 Hex)															
+6	Send/receive data address															
+7																
+8	Timeout value (0000 to FFFF Hex)															
+9	Response code															

**Parameter Settings**

The following table shows the parameters that are required for each service and the use of the parameters by the socket service.

**UDP Socket Services**

Parameter	No. of words	Range (decimal values in parentheses)	Socket service			
			UDP open	UDP receive	UDP send	UDP close
Socket option	1	Specified bit	---	---	---	---
UDP/TCP socket No.		0001 to 0008 hexadecimal (1 to 8)	W	W	W	W
Local UDP/TCP port No.	1	0000 to FFFF hexadecimal (0 to 65,535)	W	---	---	---
Remote IP address	2	00000000 to FFFFFFFF hexadecimal (0.0.0.0 to 255.255.255.255)	---	R	W	---
Remote UDP/TCP port No.	1	0000 to FFFF hexadecimal (0 to 65,535)	---	R	W	---
Number of bytes to send/receive	1	0000 to 07C0 hexadecimal (0 to 1,984 bytes)	---	RW	RW	---
Send/Receive data address	2	Memory area address	---	W	W	---
Time out time (Unit: 100 ms)	1	0000 to FFFF hexadecimal (0 to 65,535) (0: No limit, 0.1 to 6,553.5 s)	---	W	---	---
Response code	1	---	R	R	R	R

**Note** W: Written by user  
 RW: Written by user at execution and then read for results at completion  
 R: Read by user for results at completion  
 ---: Not used.

**TCP Socket Services**

Parameter	No. of words	Range (decimal values in parentheses)	Socket service				
			TCP passive open	TCP active open	TCP receive	TCP send	TCP close
Socket option	1	Specified bit	W	W	---	---	---
UDP/TCP socket No.		0001 to 0008 hexadecimal (1 to 8)	W	W	W	W	W
Local UDP/TCP port No.	1	0000 to FFFF hexadecimal (0 to 65,535)	W	RW	---	---	---
Remote IP address	2	00000000 to FFFFFFFF hexadecimal (0.0.0.0 to 255.255.255.255)	RW	W	---	---	---
Remote UDP/TCP port No.	1	0000 to FFFF hexadecimal (0 to 65,535)	RW	W	---	---	---
Number of bytes to send/receive	1	0000 to 07C0 hexadecimal (0 to 1,984 bytes)	---	---	RW	RW	---
Send/Receive data address	2	Memory area address	---	---	W	W	---
Time out time (Unit: 100 ms)	1	0000 to FFFF hexadecimal (0 to 65,535) (0: No limit, 0.1 to 6,553.5 s)	W	---	W	---	---
Response code	1	---	R	R	R	R	R

**Note** W: Written by user  
 RW: Written by user at execution and then read for results at completion

R: Read by user for results at completion  
 ---: Not used.

## 6-7-4 Parameters

### ■ Socket Option

For the TCP OPEN REQUEST (ACTIVE or PASSIVE) command, specifies whether or not the keep-alive function is to be used. When the keep-alive function is used, bit 8 is ON (set to 1).

Turn ON bit 9 (set to 1) to use the linger function.

### ■ UDP/TCP Socket No.

Specify the number of the UDP or TCP socket to open.

### ■ Local UDP/TCP Port No.

Specify the number of the UDP or TCP port for the socket to use for communications.

- Do not specify the port being used as the FINS UDP port (default: 9600) in an open request for a UDP socket.
- Do not specify FTP server TCP port numbers 20 and 21 in an open request for a TCP port.
- Do not specify mail communications TCP port number 25.
- As a rule, use port numbers 1,024 and higher.

If port number 0 is specified when for an active TCP open, the TCP port number will be automatically allocated and the number of the port that was opened will be stored in the local UDP/TCP port number in the Socket Service Parameter Area (i.e., the actual port number will be overwritten on the value of 0 set by the user).

### ■ Remote IP Address

Specify the IP address of the remote device.

- Offset +2 in the Socket Service Parameter Area contains the upper bytes of the Remote IP Address, and offset +3 contains the lower bytes.  
 Example: The contents of offsets +2 and +3 would be as shown below when the Remote IP Address is 196.36.32.55 (C4.24.20.37 hexadecimal).

+2: C424

+3: 2037

- This parameter is not used when making a receive request for a UDP socket. The remote IP address will be stored with the response data and will be written as the Remote IP Address in the Socket Service Parameter Area.
- When opening a passive TCP socket, the combination of the remote IP address and the remote TCP port number can be used to affect processing as shown in the following table.

Remote IP Address	Remote TCP Port No.	Processing
0	0	All connection requests accepted.
0	Not 0	Connection requests accepted only for the same port number.
Not 0	0	Connection requests accepted only for the same IP address.
Not 0	Not 0	Connection requests accepted only for the same port number and IP address.



If the Remote IP Address is set to 0, a connection can be made to any remote node and the remote IP address of the node that is connected will be stored as the Remote IP Address in the Socket Service Parameter Area. If a specific remote I/O address is set, then a connection can be made only to the node with the specified address.

If the Remote TCP Port No. is set to 0, a connection can be made to any remote node regardless of the TCP port number it is using. If a specific remote TCP port number is set, then a connection can be made only to a node using the specified TCP port number.

■ **Remote UDP/TCP Port No.**

Specify the UDP or TCP port number used by the remote device.

- This parameter is not used when making a receive request for a UDP socket. The remote UDP/TCP port number will be stored with the response data and will be written as the Remote UDP/TCP Port No. in the Socket Service Parameter Area.
- When opening a passive TCP socket, the combination of the remote IP address and the remote TCP port number can be used to affect processing as shown in the table for the Remote IP Address, above. If the Remote UDP/TCP Port No. is set to 0, the UDP/TCP port number of the remote device will be written as the Remote UDP/TCP Port No. in the Socket Service Parameter Area.

■ **Time Out Time**

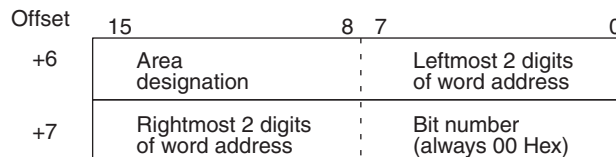
Set the time limit in units of 0.1 s for completion of communications from the time that the Receive Request Switch (TCP or UDP) or the TCP Passive Open Request Switch is turned ON. A response code of 0080 hexadecimal (timeout) will be stored if communications time out. If 0 is set, the requested service will not be timed.

■ **Number of Bytes to Send/Receive**

Send the number of bytes to be sent or the number of bytes to receive. When the transfer has been completed, the actual number of bytes that have been sent or received will be written here.

■ **Send/Receive Data Address**

Specify the address of the first word to send or the address of the first word where data is to be received. Always set the bit number to 00 hexadecimal.



The following specifications can be used.

Area		Word address	Area designation (hexadecimal)	Word address (hexadecimal)
CIO, HR, and AR Areas	CIO	0000 to 6143	B0	0000 to 17FF
	HR	H000 to H511	B2	0000 to 01FF
	AR	A448 to A959	B3	01C0 to 03BF
DM Area	DM	D00000 to D32767	82	0000 to 7FFF
EM Area	Bank 0	E0_00000 to E0_32767	A0	0000 to 7FFF
	:	:	:	:
	Bank C	EC_00000 to EC_32767	AC	0000 to 7FFF

### 6-7-5 Socket Service Request Switches

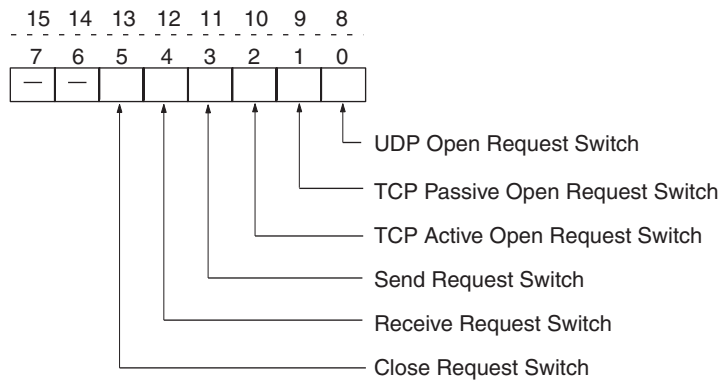
Dedicated control bits can be manipulated to request socket services. These bits are called Socket Service Request Switches, and are turned ON in the CPU Unit to request socket services through the Ethernet Unit.

The Socket Service Request Switches are allocated in the CPU Bus Unit Area in the CIO Area starting at the word  $n + 19$ . The value of  $n$  can be calculated from the unit number as follows:

$$n = \text{CIO } 1500 + (25 \times \text{unit number})$$

Offset	15	08	07	00
n+19	Socket Service Request Switches 2		Socket Service Request Switches 1	
n+20	Socket Service Request Switches 4		Socket Service Request Switches 3	
n+21	Socket Service Request Switches 6		Socket Service Request Switches 5	
n+22	Socket Service Request Switches 8		Socket Service Request Switches 7	

The configuration of each set of Socket Service Request Switches is shown in the following diagram.



Bit		Switch	Status	Manipulated by	Unit operation
08	00	UDP Open Request Switch	ON	User	UDP socket opened when switch is turned ON.
			OFF	Unit	Unit turns OFF switch when open processing has been completed (i.e., when a connection has been made).
09	01	TCP Passive Open Request Switch	ON	User	Passive TCP socket opened when switch is turned ON.
			OFF	Unit	Unit turns OFF switch when open processing has been completed (i.e., when a connection has been made).
10	02	TCP Active Open Request Switch	ON	User	Active TCP socket opened when switch is turned ON.
			OFF	Unit	Unit turns OFF switch when open processing has been completed (i.e., when a connection has been made).
11	03	Send Request Switch	ON	User	Send processing executed when switch is turned ON. (The protocol (TCP/UDP) is determined when the socket is opened.)
			OFF	Unit	Unit turns OFF switch when send processing has been completed.
12	04	Receive Request Switch	ON	User	Receive processing executed when switch is turned ON. (The protocol (TCP/UDP) is determined when the socket is opened.)
			OFF	Unit	Unit turns OFF switch when receive processing has been completed.

Bit		Switch	Status	Manipulated by	Unit operation
13	05	Close Request Switch	ON	User	Close processing executed when switch is turned ON. (The protocol (TCP/UDP) is determined when the socket is opened.)
			OFF	Unit	Unit turns OFF switch when close processing has been completed.

As shown in the above table, the Request Switches are turned OFF by the Ethernet Unit when the requested processes has been completed.

**Note** There is also a Socket Force-close Switch in bit 2 of the first word allocated to the Ethernet Unit in the CPU Bus Unit Area in the CIO Area. When the Socket Force-close Switch is turned ON, all sockets that are open will be force-closed. Refer to *Section 4 Ethernet Unit Memory Allocations* in the *Operation Manual, Construction of Networks* for details.

When using socket services with the Socket Service Request Switches, the ladder diagram should be programmed to check the response codes when Socket Service Request Switches are turned OFF.

## 6-7-6 Response Codes

When processing of a request has been completed for socket services executed using Socket Service Request Switches, a response code will be stored in the Response Code word in the Socket Service Parameter Area. The following response codes will be stored depending on the service that was requested.

### UDP Socket Open Request

Response code	Meaning
0000	Normal end
0105	Local IP address setting error.
0302	CPU Unit error; cannot execute.
1100	UDP socket number is not 1 to 8 or local UDP port number is 0.
110C	Request Switch turned ON during other processing.
220F	Specified socket is already open.
2211	Unit is busy; cannot execute.
2606	Specified socket is already open as TCP socket; cannot open UDP socket.
2607	Specified Socket Service Parameter Area is already being used for another socket.
003E	Internal buffer cannot be obtained due to high reception traffic (ENOBUFS).
0049	The same UDP port number has been specified more than once (EADDRINUSE).
0081	The specified socket was closed during open processing.

### UDP Socket Receive Request

Response code	Meaning
0000	Normal end
0302	CPU Unit error; cannot execute.
1100	Number of bytes to receive is not in allowable range.
1101	The area designation of the Send/Receive Data Address is not in allowable range.

Response code	Meaning
1103	The bit number in the Send/Receive Data Address is not 00.
110C	Request Switch turned ON during other processing.
220F	Specified socket is already processing a receive request.
2210	The specified socket is not open.
2211	Unit is busy; cannot execute service.
2607	Specified Socket Service Parameter Area is already being used for another socket.
003E	Internal buffer cannot be obtained due to high reception traffic (ENOBUFS).
0066	Internal memory cannot be obtained; cannot execute service.
0080	Receive request timed out.
0081	The specified socket was closed during reception processing.

**UDP Socket Send Request**

Response code	Meaning
0000	Normal end
0302	CPU Unit error; cannot execute.
1100	Number of bytes to send is not in allowable range or the remote IP address is 0.
1101	The area designation of the Send/Receive Data Address is not in allowable range.
1103	The bit number in the Send/Receive Data Address is not 00.
110C	Request Switch turned ON during other processing.
220F	Specified socket is already processing a send request.
2210	The specified socket is not open.
2211	Unit is busy; cannot execute.
2607	Specified Socket Service Parameter Area is already being used for another socket.
003E	Internal buffer cannot be obtained due to high reception traffic (ENOBUFS).
0042	The remote IP address is a broadcast address and the number of bytes to send is greater than 1,472 bytes (EMSGSIZE).
004C	The network ID is incorrect or the remote IP address is incorrect (EADDRNOTAVAIL)
004E	The network ID is not in the IP router table, router settings are incorrect, or the remote IP address is incorrect (ENETUNREACH).
0051	The router settings are incorrect or the remote IP address is incorrect (EHOSTUNREACH).
0081	The specified socket was closed during send processing.

**UDP Socket Close Request**

Response code	Meaning
0000	Normal end
0302	CPU Unit error; cannot execute.
2210	The specified socket is not open.
2211	Unit is busy; cannot execute.
2607	Specified Socket Service Parameter Area is already being used for another socket.

## TCP Socket Passive Open Request

Response code	Meaning
0000	Normal end
0105	Local IP address setting error.
0302	CPU Unit error; cannot execute.
1100	TCP socket number is not 1 to 8 or local TCP port number is 0.
110C	Request Switch turned ON during other processing.
220F	Specified socket is already open or already processing an open request.
2211	Unit is busy; cannot execute.
2606	Specified socket is already open as UDP socket; cannot open TCP socket.
2607	Specified Socket Service Parameter Area is already being used for another socket.
003E	Internal buffer cannot be obtained due to high reception traffic (ENOBUFS).
0042 (See note.)	An error occurred. (EMSGSIZE).
0045	Error in communications with remote node (ECONNABORTED).
0049	The same TCP port number has been specified more than once (EADDRINUSE).
004A (See note.)	Error (ECONNREFUSED).
004B (See note.)	Error in communications with remote node (ECONNRESET).
004E (See note.)	Remote IP address parameter error (ENETUNREACH).
0051 (See note.)	Remote IP address parameter error (EHOSTUNREACH).
0053	Error in communications with remote node (ETIMEDOUT) or remote node does not exist.
0066	Internal memory cannot be obtained; cannot execute.
0080	Open request timed out.
0081	The specified socket was closed during open processing.
0082	Connection could not be established with specified remote node.

**Note** These response codes will be returned only on large, multilevel networks.

## TCP Socket Active Open Request

Response code	Meaning
0000	Normal end
0105	Local IP address setting error.
0302	CPU Unit error; cannot execute.
1100	TCP socket number is not 1 to 8 or local TCP port number is 0.
110C	Request Switch turned ON during other processing.
220F	Specified socket is already open or already processing an open request.
2211	Unit is busy; cannot execute.
2606	Specified socket is already open as UDP socket; cannot open TCP socket.
2607	Specified Socket Service Parameter Area is already being used for another socket.

Response code	Meaning
000D	Remote IP address parameter error (EACCES).
003E	Internal buffer cannot be obtained due to high reception traffic (ENOBUFS).
0042 (See note.)	Error (EMSGSIZE).
0044	ICMP data received (ENOPROTOOPT).
0045	Error in communications with remote node (ECONNABORTED).
0049	The same port number has been specified more than once (EADDRINUSE).
004A	Error (ECONNREFUSED) or the remote node has not been opened as passive socket.
004B (See note.)	Error in communications with remote node (ECONNRESET).
004C	Remote IP address parameter error (EADDRNOTAVAIL). Wrong parameter designation. An attempt was made to set the local TCP port of the local node to Active Open.
004E	Remote IP address parameter error (ENETUNREACH). The network ID is not in the IP router table or router settings are incorrect.
0051	Remote IP address parameter error (EHOSTUNREACH). The router settings are incorrect.
0053	Communications error with remote node (ETIMEDOUT). No remote node.
0081	The specified socket was closed during open processing.

**Note** These response codes will be returned only on large, multilevel networks.

### TCP Socket Receive Request

Response code	Meaning
0000	Normal end
0302	CPU Unit error; cannot execute.
1100	Number of receive bytes not in allowable range.
1101	The area designation of the Send/Receive Data Address is not in allowable range.
1103	The bit number in the Send/Receive Data Address is not 00.
110C	Request Switch turned ON during other processing.
220F	Specified socket is already processing a receive request.
2210	Specified socket has not been connected.
2211	Unit is busy; cannot execute.
2607	Specified Socket Service Parameter Area is already being used for another socket.
003E	Internal buffer cannot be obtained due to high reception traffic (ENOBUFS).
0042 (See note.)	ICMP data received (EMSGSIZE).
0044 (See note.)	ICMP data received (ENOPROTOOPT).
0045 (See note.)	Error in communications with remote node (ECONNABORTED).
004B	Error in communications with remote node (ECONNRESET).
004E (See note.)	ICMP data received (ENETUNREACH).

Response code	Meaning
004F (See note.)	ICMP data received (EHOSTDOWN).
0051 (See note.)	ICMP data received (EHOSTUNREACH).
0053	Error in communications with remote host (ETIMEDOUT).
0066	Internal memory cannot be obtained; cannot execute.
0080	Receive request timed out.
0081	The specified socket was closed during receive processing.

**Note** These response codes will be returned only on large, multilevel networks.

### TCP Socket Send Request

Response code	Meaning
0000	Normal end
0302	CPU Unit error; cannot execute.
1100	Number of bytes to send not in allowable range.
1101	The area designation of the Send/Receive Data Address is not in allowable range.
1103	The bit number in the Send/Receive Data Address is not 00.
110C	Request Switch turned ON during other processing.
220F	Specified socket is already processing a send request.
2210	The specified socket is not been connected.
2211	Unit is busy; cannot execute.
2607	Specified Socket Service Parameter Area is already being used for another socket.
0020	Connection with remote socket broken during send (EPIPE).
003E	Internal buffer cannot be obtained due to high reception traffic (ENOBUFS).
0042 (See note.)	The remote IP address is a broadcast address and the number of bytes to send is greater than 1,472 bytes (EMSGSIZE).
0044 (See note.)	ICMP data received (ENOPROTOOPT).
0045 (See note.)	Error in communications with remote node (ECONNABORTED).
004A	Error in communications with remote node (ECONNREFUSED).
004B (See note.)	Error in communications with remote node (ECONNRESET).
004E (See note.)	Remote IP address parameter error (ENETUNREACH).
004F (See note.)	ICMP data received (EHOSTDOWN).
0051 (See note.)	Remote IP address parameter error (EHOSTUNREACH).
0053 (See note.)	Error in communications with remote node (ETIMEDOUT).
0081	The specified socket was closed during send processing.

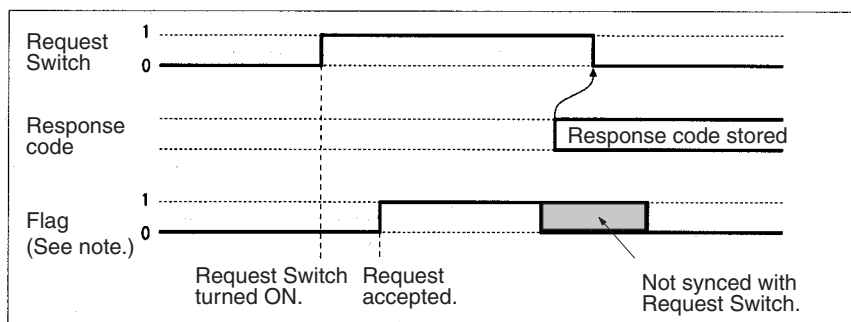
**Note** These response codes will be returned only on large, multilevel networks.

TCP Socket Close Request

Response code	Meaning
0000	Normal end
0302	CPU Unit error; cannot execute.
2210	The specified socket is not been connected.
2211	Unit is busy; cannot execute.
2607	Specified Socket Service Parameter Area is already being used for another socket.

6-7-7 Timing Charts

The timing of flags for socket services (Opening, Receiving, Sending, or Closing Flag) when the Request Switches are used and the changes in the response code are shown in the following chart.



Note Starting with unit version 1.5, the Sending Flag and Receiving Flag will not turn ON if the high-speed socket service option is selected. Therefore, the program can be controlled only by setting the Send Request Switch and Receive Request Switch to OFF.

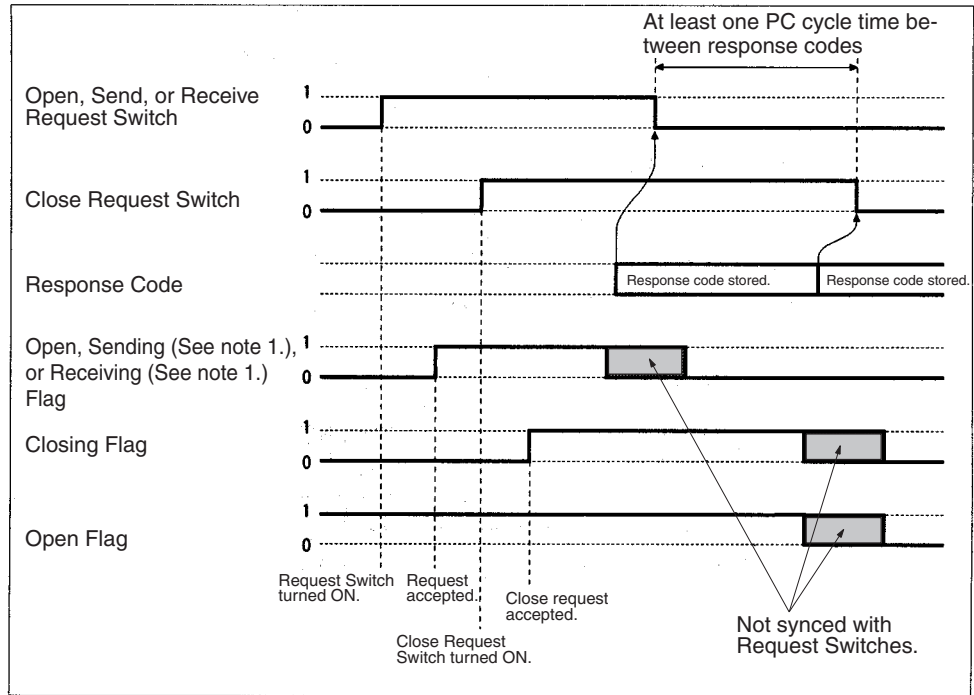
Closing during Other Processes

The Close Request Switch or Force-close Switch can be used to close a socket even when open, receive, or send processing is being executed. Closing is the only other process that is possible during other processes.



**Close Request Switch**

The processing results are stored as the response code when the Close Request Switch is used. There will always be one PLC cycle time between turning OFF the Request Switch for the canceled process and turning of the Close Request Switch, allowing time for the response code to be read.



- Note**
1. Starting with unit version 1.5, the Sending Flag and Receiving Flag will not turn ON if the high-speed socket service option is selected.
  2. The Open Flag will not turn ON at all if a close request is made during open processing.

**Force-close Switch**

The requested processes are canceled and an response code is stored when the Force-close Switch is used.