VS-900
Security Intercom Systems

Remote Control and Monitoring
Programmer's Guide

TOA Electronics, Inc.
601 Gateway Blvd., Ste. 300
So. San Francisco, CA 94080
1-800-733-4750

Table of Contents

Overview

Security system installations often require integration of the VS-900 Security Intercom systems with touch-screen control systems, graphic annunciator panels, and camera controllers. TOA offers two options for meeting this requirement:

1. The VS-900DI and VS-910DI interface products offer a hardware solution—they provide the call LED outputs and select switch inputs required for graphic annunciator panels. They also provide relay outputs for camera switcher integration. Using this off-the-shelf method requires no knowledge of computer programming or serial communication.

2. The VS-900MF Mainframe has two integral serial ports for integration with a microprocessor-based product (usually a PC or PLC) for remote control and monitoring of VS-900 activity. Serial communication with the VS-900MF eliminates the need for installing VS-900DI and VS-910DI cards and elevates the programmer's level of control.

This document targets programmers who need an understanding of how they can remote control and monitor the VS-900 by communicating through its RS-232 ports.

Note: Descriptions of the protocol and all examples are written in hexadecimal (H). Appendix B includes a chart for hex to decimal and ASCII conversion.

VS-900 Documentation

Please refer to the following VS-900 documents, shipped with the VS-900MF or available by request.

- VS-900 Installation Manual
- VS-900 Operating Instructions
- VS-900 Software Manual

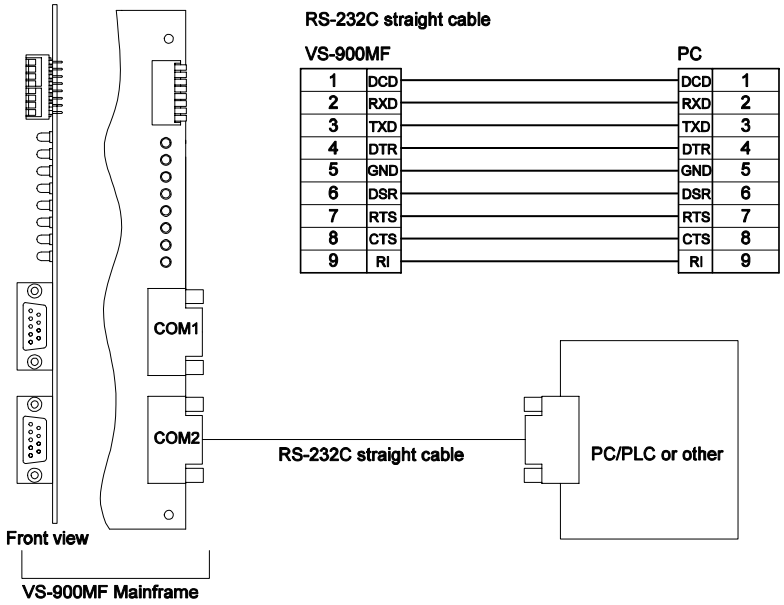
Useful Software Tools

- MS Windows Calculator, usually located under Program Files\Accessories
- Symantec, Procomm Plus terminal emulator. Available from http://www.symantec.com
- ComLite32 Serial Com Port Monitor software. Available from http://www.rtcomm.com

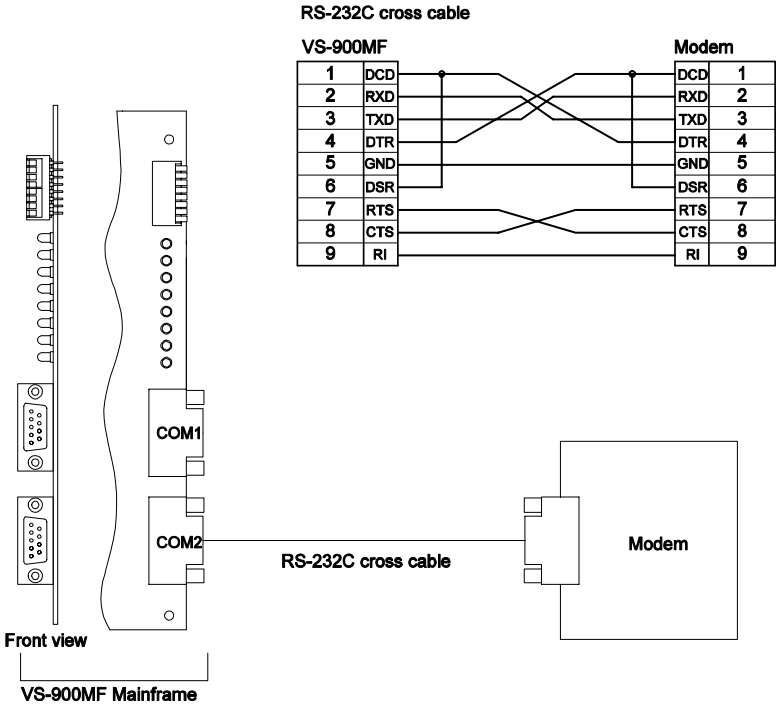
Connecting to the VS-900MF Mainframe

The VS-900MF Mainframe includes two RS-232 serial communication connectors for operation, monitoring, and programming of the system. Connect to either communication ports with the settings described on page 5. You can control multiple exchanges from a single serial connection.

Direct Connection



Connection Via Modem



Communication Specifications

Transmission System: Half-duplex
Baud Rate: 19,200 Bps
Transmission Format: <1 Start Bit> <8 Data bits> <1 Even Parity Bit> <1 Stop Bit>

Message Packaging

Field Name	Value	Description	Direction
DLE	10H	Delimiter	VS-900 to PC or PC to VS-900
ENQ	05H	Enquiry	
DLE	10H	Delimiter	VS-900 to PC or PC to VS-900
ACK	06H	Acknowledge	
DLE	10H	Delimiter	VS-900 to PC or PC to VS-900
STX	02H	Start of Text	
Message*	Varies	Remote Dial, Data Log Request or Data Log	
DLE	10H	Delimiter	
ETX	03H	End of Text	
BCC**	Varies	Block Check Character	
DLE	10H	Delimiter	VS-900 to PC or PC to VS-900
ACK	06H	Acknowledge	
DLE	10H	Delimiter	VS-900 to PC or PC to VS-900
EOT	04H	End of Transmission	

***** See the Remote Dial, Log Data Request or Log Data sections for more information.

****** To calculate **BCC**, take the XOR of the combined Message, DLE, and ETX. (Refer to the shaded area below). MS Windows Calculator (Scientific mode) is a useful tool for this function.

DLE	STX	MESSAGE	DLE	ETX	BCC

Remote Dial Command

With the protocol below, you can remote dial and perform functions of individual Master Stations in specific exchanges. To terminate any current functions, precede remote dialing content with "CC" (Clear function x2).

Note: Remote Dial only applies to control of the MS-900 master station or VS-900DI control card and will not work with the VS-900AL (DTMF telephones).

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	PC to VS-900MF
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledgement	
DLE	1	10H	Delimiter	
STX	1	02H	Start Of Text	
Command "Remote Dial"	1	4EH	Remote Dialing Command	
Exchange #	2	xxH, xxH	Add 30H to each digit of the exchange number. Example: Exchange #01 = (30H, 31H)	
Master Station #	1	xxH	Master Station #2 = (32H)	
Dialing Contents*	32 Bytes Total		*MS-900 Master Station Dialing Functions:*	
		30H	0	
		31H	1	
		32H	2	
		33H	3	
		34H	4	
		35H	5	
		36H	6	
		37H	7	
		38H	8	
		39H	9	
		2AH	*	
		23H	#	
		43H	C (Clear)	
		57H	Off-hook	
		51H	On-hook	
		45H	PTT On	
		52H	PTT Off	
		54H	Register Switch On	
		59H	Register Switch Off	
		58H	Transfer	
		2DH	3 Second dial pause (For C/O lines)	
		4FH	Disable Master Station	
		50H	Enable Master Station	
			Note: Add "20H" after the designated dialing contents until the total is 32 bytes	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	xxH	Block Check Character	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	PC to VS-900MF
EOT	1	04H	End of Transmission	

Log Data Output Request

The VS-900 Log Data Output allows you to monitor most station and system activity. Send the string below to initiate Log Data flow from individual or multiple exchanges simultaneously. Once the data stream has been initiated, the VS-900MF will continue to send the log data without re-sending the request.

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	PC to VS-900MF
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledgement	
DLE	1	10H	Delimiter	
STX	1	02H	Start Of Text	
Log Data Request	1	4FH	Log Data Output Request command	
Exchanges	2	30H 30H		
ON/OFF Status Exchange #01 – 16	16	30H or 31H	OFF = 30H ON = 31H	PC to VS-900MF
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	xxH	Block Check Character	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	
EOT	1	04H	End of Transmission	

After the initial Log Data Request, the VS-900MF will send an enquiry (DLE & ENQ, 10H & 05H) to the PC when log data is available in the queue. The PC should then respond with an acknowledgement (DLE & ACK, 10H & 06H) so the log data will be sent from the VS-900MF. This process will repeat until there is no information left in log data queue.

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	VS-900MF to PC
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	PC to VS-900MF
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	
STX	1	02H	Start Of Text	
Log Data Sent	1	6F	Log data	
Exchange #	2	xxH xxH	Exchange #01 – 16	
Time (HH:MM:SS)	6		Hours, Minutes, and Seconds	
Line #1	6		Varies, Refer to Appendix A	
Line #2	6		Varies, Refer to Appendix A	VS-90MF to PC
Line #3	6		Varies, Refer to Appendix A	
Line #4	6		Varies, Refer to Appendix A	
***Status #**	2	xxH xxH	Varies, Refer to Appendix A	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	xxH	Block Check Character	
DLE	1	10H	Delimiter	PC to VS-900MF
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
EOT	1	04H	End of Transmission	

Examples

1. Remote Dialing

The data sequence below will remote dial Master Station #1 in Exchange #1 to dial Sub-Station #105 and initiate communication. The "CC" (Clear) is included to terminate any current Master Station functions.
Note: The total Dialing Contents must be 32 bytes.

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	PC to VS-900MF
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	PC to VS-900MF
STX	1	02H	Start Of Text	
Remote Dial	1	4EH	Remote Dialing Command	
Exchange #	2	30H 31H	EXCHANGE # "01"	
Master Station #	1	31H	MASTER # "1"	
Dialing Contents	32 Bytes	43H 43H 31H 30H 35H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H	"CC105"	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	79H	Block Check Character	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	PC to VS-900MF
EOT	1	04H	End of Transmission	

2. Remote Dialing – All Call Paging

The data sequence below will remote dial Master Station #2 in Exchange #3 to initiate All-Call Paging by dialing *800#. Again, the "CC" (Clear) is included to terminate any current Master Station functions.
Note: The total Dialing Contents must be 32 bytes.

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	PC to VS-900MF
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	
STX	1	02H	Start Of Text	
Remote Dial	1	4EH	Remote Dialing Request	
Exchange #	2	30H 33H	EXCHANGE # "03"	
Master Station #	1	32H	MASTER # "2"	
Dialing Contents	32 Bytes	43H 43H 2AH 38H 30H 30H 23H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H 20H	"CC*800#"	PC to VS-900MF
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	7DH	Block Check Character*	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	PC to VS-900MF
EOT	1	04H	End of Transmission	

3. Log Data Request

The data string below requests Log Data from Exchange #1 (only). After the Log Data Request has been sent, the Log Data string will be sent to the PC in the format shown on the next page (Example 4. Log Data Format).

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	PC to VS-900MF
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	PC to VS-900MF
STX	1	02H	Start Of Text	
Log Data	1	4FH	Log Data Request	
All Exchanges	2	30H 30H		
ON/OFF Status	16	31H 30H 30H 30H 30H 30H 30H 30H 30H 30H 30H 30H 30H 30H 30H 30H	Exchange #1 Log Data **31H = "On" 30H="Off"**	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	5DH	Block Check Character*	
DLE	1	10H	Delimiter	VS-900MF to PC
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	PC to VS-900MF
EOT	1	04H	End of Transmission	

4. Log Data Output Format

This example illustrates five data strings that occur when "Normal" priority Sub-station #105 initiates a call to Master Station #200 at 16:37:23.

Call From Normal Sub-station

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	VS-900 to PC
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
STX	1	02H	Start Of Text	
Log Data	1	6FH	Log Data	
Exchange #	2	30H 31H	Exchange # "01"	
Time (HH:MM:SS)	6	31H 36H 33H 37H 32H 33H	Time: "16:37:23"	
Line #1	6	31H 30H 35H 20H 20H 20H	Calling Station # "105"	
Line #2	6	32H 30H 30H 20H 20H 20H	Called Station # "200"	
Line #3	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Line #4	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Status #	2	30H 31H	**"01" (Call from Normal Sub-station)**	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	78H	Block Check Character	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
EOT	1	04H	End of Transmission	

Station Call Reception

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	VS-900 to PC
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
STX	1	02H	Start Of Text	
Log Data	1	6FH	Log Data	
Exchange #	2	30H 31H	Exchange # "01"	
Time (HH:MM:SS)	6	31H 36H 33H 37H 32H 33H	Time: "16:37:23"	
Line #1	6	32H 30H 30H 20H 20H 20H	Master Station # "200"	
Line #2	6	20H 20H 20H 20H 20H 20H	First Waiting station # (Blank)	
Line #3	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Line #4	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Status #	2	30H 35H	**"05" (Station call reception)**	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	68H	Block Check Character	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
EOT	1	04H	End of Transmission	

Call Operation Completion

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	VS-900 to PC
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
STX	1	02H	Start Of Text	
Log Data	1	6FH	Log Data	
Exchange #	2	30H 31H	Exchange # "01"	
Time (HH:MM:SS)	6	31H 36H 33H 37H 32H 37H	Time: "16:37:27"	
Line #1	6	32H 30H 30H 20H 20H 20H	Master Station # "200"	
Line #2	6	31H 30H 35H 20H 20H 20H	Called Station # "105"	
Line #3	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Line #4	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Status #	2	30H 39H	**"09" (Call operation completion)**	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	74H	Block Check Character	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
EOT	1	04H	End of Transmission	

Start of Normal Conversation

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	VS-900 to PC
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
STX	1	02H	Start Of Text	
Log Data	1	6FH	Log Data	
Exchange #	2	30H 31H	Exchange # "01"	
Time (HH:MM:SS)	6	31H 36H 33H 37H 32H 37H	Time: "16:37:27"	
Line #1	6	32H 30H 30H 20H 20H 20H	Calling Station # "200"	
Line #2	6	31H 30H 35H 20H 20H 20H	Called Station # "105"	
Line #3	6	20H 20H 20H 20H 20H 20H	Hold Station # (Blank)	
Line #4	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Status #	2	31H 30H	**"10" (Start of normal conversation)**	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	74H	Block Check Character	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
EOT	1	04H	End of Transmission	

Normal Call Termination

Field Name	Length (Bytes)	Value	Description	Direction
DLE	1	10H	Delimiter	VS-900 to PC
ENQ	1	05H	Enquiry	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
STX	1	02H	Start Of Text	
Log Data	1	6FH	Log Data	
Exchange #	2	30H 31H	Exchange # "01"	
Time (HH:MM:SS)	6	31H 36H 33H 37H 32H 38H	Time: "16:37:28"	
Line #1	6	32H 30H 30H 20H 20H 20H	Calling Station # "200"	
Line #2	6	31H 30H 35H 20H 20H 20H	Called Station # "105"	
Line #3	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Line #4	6	20H 20H 20H 20H 20H 20H	Not Used (Blank)	
Status #	2	33H 32H	**"32" (Normal call termination)**	
DLE	1	10H	Delimiter	
ETX	1	03H	End Of Text	
BCC	1	73H	Block Check Character	
DLE	1	10H	Delimiter	PC to VS-900
ACK	1	06H	Acknowledge	
DLE	1	10H	Delimiter	VS-900MF to PC
EOT	1	04H	End of Transmission	

Summarized version of the above Log Data Format example:
(Shaded areas represent responses required from the PC, all numbers are in Hex)

Call From Normal Sub-station
10 05 10 06 10 02 6F 30 31 31 36 33 37 32 33 31 30 35 20 20 20 32 30 30
20 20 20 20 20 20 20 20 20 20 20 20 20 20 30 31 10 03 78 10 06 10 04

Station Call Reception
10 05 10 06 10 02 6F 30 31 31 36 33 37 32 33 32 30 30 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 30 35 10 03 68 10 06 10 04

Call Operation Completion
10 05 10 06 10 02 6F 30 31 31 36 33 37 32 37 32 30 30 20 20 20 31 30 35
20 20 20 20 20 20 20 20 20 20 20 20 20 20 30 39 10 03 74 10 06 10 04

Start of Normal Conversation
10 05 10 06 10 02 6F 30 31 31 36 33 37 32 37 32 30 30 20 20 20 31 30 35
20 20 20 20 20 20 20 20 20 20 20 20 20 20 31 30 10 03 7C 10 06 10 04

Normal Call Termination
10 05 10 06 10 02 6F 30 31 31 36 33 37 32 38 32 30 30 20 20 20 31 30 35
20 20 20 20 20 20 20 20 20 20 20 20 20 20 33 32 10 03 73 10 06 10 04

Decimal equivalent of above:

Call From Normal Sub-station
016 005 016 006 016 002 111 048 049 049 054 051 055 050 051 049
048 053 032 032 032 050 048 048 032 032 032 032 032 032 032 032
032 032 032 032 032 032 032 048 049 016 003 120 016 006 016 004

Station Call Reception
016 005 016 006 016 002 111 048 049 049 054 051 055 050 051 050
048 048 032 032 032 032 032 032 032 032 032 032 032 032 032 032
032 032 032 032 032 032 032 048 053 016 003 104 016 006 016 004

Call Operation Completion
016 005 016 006 016 002 111 048 049 049 054 051 055 050 055 050
048 048 032 032 032 049 048 053 032 032 032 032 032 032 032 032
032 032 032 032 032 032 032 048 057 016 003 116 016 006 016 004

Start of Normal Conversation
016 005 016 006 016 002 111 048 049 049 054 051 055 050 055 050
048 048 032 032 032 049 048 053 032 032 032 032 032 032 032 032
032 032 032 032 032 032 032 049 048 016 003 124 016 006 016 004

Normal Call Termination
016 005 016 006 016 002 111 048 049 049 054 051 055 050 056 050
048 048 032 032 032 049 048 053 032 032 032 032 032 032 032 032
032 032 032 032 032 032 032 051 050 016 003 115 016 006 016 004

Appendix A - Log Status Messages

Status # (2 Bytes) Dec	Hex		Description	Line 1	Line 2	Line 3	Line 4
01	30H	31H	Call from Normal sub-station.	Calling station #	Called station #	-	-
02	30H	32H	Call from Emergency sub-station.	Calling station #	Called station #	-	-
03	30H	33H	Call from Master Station (Telephone Master)	Calling station #	Called station #	-	-
04	30H	34H	Call from C/O line “Axxy " ("xx" is exchange #, and "y" is C/O line # 1 – 2	C/O line #	Called station #	-	-
05	30H	35H	Master Station (Telephone Master) reception of a call from Normal sub-station	Master Station #	First waiting station #	-	-
06	30H	36H	Master Station (Telephone Master) reception of a call from Emergency sub-station	Master Station #	First waiting station #	-	-
07	30H	37H	Master Station (Telephone Master) reception of a call from other Master Station (Telephone Master)	Master Station #	First waiting station #	-	-
08	30H	38H	Master Station (Telephone Master) reception of a C/O line call	Master Station #	First waiting station #	-	-
09	30H	39H	Call operation completion at Master Station (Telephone Master)	Master Station #	Called station #	-	-
10	31H	30H	Start of Normal conversation	Calling station #	Called station #	Hold station #	-
11	31H	31H	Start of Emergency conversation	Calling station #	Called station #	Hold station #	-
12	31H	32H	Start of C/O line conversation	Calling station #	Called station #	Hold station #	-
13	31H	33H	Automatic response to an incoming C/O line call (direct-in dial) “Axxy " ("xx" is exchange #, and "y" is C/O line # 1 – 2	C/O line #	-	-	-
14	31H	34H	Start of Individual-zone or All-zone Paging "pagxx " ("xx" is paging zone #01 - 19)	Calling station #	Paging #	-	-
15	31H	35H	Start of Emergency All-zone Paging "pagxx " ("xx" is paging zone #01 - 19)	Calling station #	Paging #	-	-
16	31H	36H	Start of External Broadcast activation "chx " ("x" is the external line # 1 - 4)	Activated input #	Paging #	-	-
17	31H	37H	Connection of Scan Monitor	Operating station #	Monitored station #	-	-
18			Not used				
19	31H	39H	Start of Conference call	Call originating station #	-	-	-
20	32H	30H	Connection of Conference call	Call originating station #	Participant station #	Participant station #	-
21	32H	31H	Start of Emergency Conference call	Call originating station #	-	-	-

22	32H	32H	Connection of Emergency Conference call	Call originating station #	Participant station #	Participant station #	Participant station #
23	32H	33H	Automatic Call Forward log	Station # to transfer a call	Station # a call is transferred to	-	-
24 - 29			Not Used				
30	33H	30H	Call termination by disappearance of waiting stations. Displayed when reception mode is switched to standby mode.	Master Station #	-	-	-
31	33H	31H	Call termination before dialing completion	Operating station #	Called station #	-	-
32	33H	32H	Normal call termination	Calling station #	Called station #	Hold station #	-
33	33H	33H	Receiving C/O line call interruption “Axxy " ("xx" is exchange #, and "y" is C/O line # 1 - 2	C/O line #	-	-	-
34	33H	34H	Paging termination	Calling station #	Paging #	-	-
35	33H	35H	Emergency Paging termination	Calling station #	Paging #	-	-
36	33H	36H	Termination of external input broadcast. "chx " ("x" is the external line # 1 - 4)	Activated input #	Paging #	-	-
37	33H	37H	Termination of Scan Monitor	Operating station #	Monitored station #	-	-
38	33H	38H	Termination of Conference	Call originating station #	Participant station #	Participant station #	-
39	33H	39H	Termination of Emergency Conference	Call originating station #	Participant station #	Participant station #	Participant station #
40	34H	30H	Line disconnection. Displayed when only a single line for call transfer or call-back is disconnected.	Disconnected station #	-	-	-
41	34H	31H	Call termination due to the ringing repetition limit (No-Answer)	Calling station #	-	-	-
42	34H	32H	Call termination due to the time limit (conversation, C/O and Paging)	Calling station #	Called party station #	Hold station #	-
43	34H	33H	Call termination (at the called station). Displayed when a received call disappears.	Calling station #	Called party station #	-	-
44	34H	34H	Forced call termination (Priority)	Calling station #	Called party station #	Hold station #	-

Appendix B - ASCII Character Codes

Binary	Dec	Hex	Char	Binary	Dec	Hex	Char	Binary	Dec	Hex	Char	Binary	Dec	Hex	Char
00000000	0	00H	null	01000000	64	40H	@	10000000	128	80H	Ç	11000000	192	C0H	└
00000001	1	01H	☺	01000001	65	41H	A	10000001	129	81H	ü	11000001	193	C1H	┴
00000010	2	02H	☻	01000010	66	42H	B	10000010	130	82H	é	11000010	194	C2H	┬
00000011	3	03H	♥	01000011	67	43H	C	10000011	131	83H	â	11000011	195	C3H	├
00000100	4	04H	♦	01000100	68	44H	D	10000100	132	84H	ä	11000100	196	C4H	─
00000101	5	05H	♣	01000101	69	45H	E	10000101	133	85H	à	11000101	197	C5H	┼
00000110	6	06H	♠	01000110	70	46H	F	10000110	134	86H	å	11000110	198	C6H	╞
00000111	7	07H	•	01000111	71	47H	G	10000111	135	87H	ç	11000111	199	C7H	╟
00001000	8	08H	◘	01001000	72	48H	H	10001000	136	88H	ê	11001000	200	C8H	╚
00001001	9	09H	○	01001001	73	49H	I	10001001	137	89H	ë	11001001	201	C9H	╔
00001010	10	0AH	◙	01001010	74	4AH	J	10001010	138	8AH	è	11001010	202	CAH	╩
00001011	11	0BH	♂	01001011	75	4BH	K	10001011	139	8BH	ï	11001011	203	CBH	╦
00001100	12	0CH	♀	01001100	76	4CH	L	10001100	140	8CH	î	11001100	204	CCH	╠
00001101	13	0DH	♪	01001101	77	4DH	M	10001101	141	8DH	ì	11001101	205	CDH	═
00001110	14	0EH	♫	01001110	78	4EH	N	10001110	142	8EH	Ä	11001110	206	CEH	╬
00001111	15	0FH	☼	01001111	79	4FH	O	10001111	143	8FH	Å	11001111	207	CFH	╧
00010000	16	10H	►	01010000	80	50H	P	10010000	144	90H	É	11010000	208	D0H	╨
00010001	17	11H	◄	01010001	81	51H	Q	10010001	145	91H	æ	11010001	209	D1H	╤
00010010	18	12H	↕	01010010	82	52H	R	10010010	146	92H	Æ	11010010	210	D2H	╥
00010011	19	13H	‼	01010011	83	53H	S	10010011	147	93H	ô	11010011	211	D3H	╙
00010100	20	14H	¶	01010100	84	54H	T	10010100	148	94H	ö	11010100	212	D4H	╘
00010101	21	15H	§	01010101	85	55H	U	10010101	149	95H	ò	11010101	213	D5H	╒
00010110	22	16H	▬	01010110	86	56H	V	10010110	150	96H	û	11010110	214	D6H	╓
00010111	23	17H	↨	01010111	87	57H	W	10010111	151	97H	ù	11010111	215	D7H	╫
00011000	24	18H	↑	01011000	88	58H	X	10011000	152	98H	ÿ	11011000	216	D8H	╪
00011001	25	19H	↓	01011001	89	59H	Y	10011001	153	99H	Ö	11011001	217	D9H	┘
00011010	26	1AH	→	01011010	90	5AH	Z	10011010	154	9AH	Ü	11011010	218	DAH	┌
00011011	27	1BH	←	01011011	91	5BH	[	10011011	155	9BH	¢	11011011	219	DBH	▉
00011100	28	1CH	∟	01011100	92	5CH	\	10011100	156	9CH	£	11011100	220	DCH	▄
00011101	29	1DH	↔	01011101	93	5DH	]	10011101	157	9DH	¥	11011101	221	DDH	▌
00011110	30	1EH	▲	01011110	94	5EH	^	10011110	158	9EH	₧	11011110	222	DEH	▐
00011111	31	1FH	▼	01011111	95	5FH	_	10011111	159	9FH	ƒ	11011111	223	DFH	▀
00100000	32	20H		01100000	96	60H	`	10100000	160	A0H	á	11100000	224	E0H	α
00100001	33	21H	!	01100001	97	61H	a	10100001	161	A1H	í	11100001	225	E1H	ß
00100010	34	22H	"	01100010	98	62H	b	10100010	162	A2H	ó	11100010	226	E2H	Γ
00100011	35	23H	#	01100011	99	63H	c	10100011	163	A3H	ú	11100011	227	E3H	π
00100100	36	24H	$	01100100	100	64H	d	10100100	164	A4H	ñ	11100100	228	E4H	Σ
00100101	37	25H	%	01100101	101	65H	e	10100101	165	A5H	Ñ	11100101	229	E5H	σ
00100110	38	26H	&	01100110	102	66H	f	10100110	166	A6H	ª	11100110	230	E6H	µ
00100111	39	27H	'	01100111	103	67H	g	10100111	167	A7H	º	11100111	231	E7H	τ
00101000	40	28H	(	01101000	104	68H	h	10101000	168	A8H	¿	11101000	232	E8H	Θ
00101001	41	29H	)	01101001	105	69H	i	10101001	169	A9H	⌐	11101001	233	E9H	Θ
00101010	42	2AH	*	01101010	106	6AH	j	10101010	170	AAH	¬	11101010	234	EAH	Ω
00101011	43	2BH	+	01101011	107	6BH	k	10101011	171	ABH	½	11101011	235	EBH	δ
00101100	44	2CH	,	01101100	108	6CH	l	10101100	172	ACH	¼	11101100	236	ECH	∞
00101101	45	2DH	-	01101101	109	6DH	m	10101101	173	ADH	¡	11101101	237	EDH	φ
00101110	46	2EH	.	01101110	110	6EH	n	10101110	174	AEH	«	11101110	238	EEH	ε
00101111	47	2FH	/	01101111	111	6FH	o	10101111	175	AFH	»	11101111	239	EFH	∩
00110000	48	30H	0	01110000	112	70H	p	10110000	176	B0H	░	11110000	240	F0H	≡
00110001	49	31H	1	01110001	113	71H	q	10110001	177	B1H	▒	11110001	241	F1H	±
00110010	50	32H	2	01110010	114	72H	r	10110010	178	B2H	▓	11110010	242	F2H	≥
00110011	51	33H	3	01110011	115	73H	s	10110011	179	B3H	│	11110011	243	F3H	≤
00110100	52	34H	4	01110100	116	74H	t	10110100	180	B4H	┤	11110100	244	F4H	⌠
00110101	53	35H	5	01110101	117	75H	u	10110101	181	B5H	╡	11110101	245	F5H	⌡
00110110	54	36H	6	01110110	118	76H	v	10110110	182	B6H	╢	11110110	246	F6H	÷
00110111	55	37H	7	01110111	119	77H	w	10110111	183	B7H	╖	11110111	247	F7H	≈
00111000	56	38H	8	01111000	120	78H	x	10111000	184	B8H	╕	11111000	248	F8H	°
00111001	57	39H	9	01111001	121	79H	y	10111001	185	B9H	╣	11111001	249	F9H	∙
00111010	58	3AH	:	01111010	122	7AH	z	10111010	186	BAH	║	11111010	250	FAH	·
00111011	59	3BH	;	01111011	123	7BH	{	10111011	187	BBH	╗	11111011	251	FBH	√
00111100	60	3CH	<	01111100	124	7CH	|	10111100	188	BCH	╝	11111100	252	FCH	ⁿ
00111101	61	3DH	=	01111101	125	7DH	}	10111101	189	BDH	╜	11111101	253	FDH	²
00111110	62	3EH	>	01111110	126	7EH	~	10111110	190	BEH	╛	11111110	254	FEH	■
00111111	63	3FH	?	01111111	127	7FH	⌂	10111111	191	BFH	┐	11111111	255	FFG	