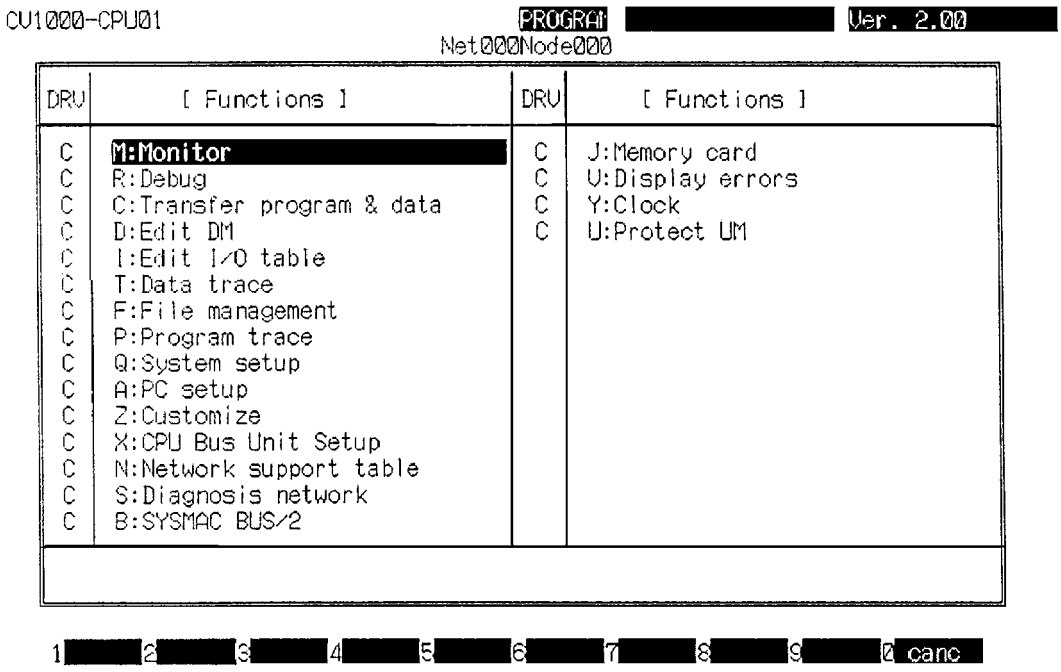
The CV Series
Getting Started Guidebook

Revised March 1993



Notice:

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify warnings in this manual. Always heed the information provided with them.

Caution Indicates information that, if not heeded, could result in minor injury or damage to the product.

DANGER! Indicates information that, if not heeded, could result in loss of life or serious injury.

OMRON Product References

All OMRON products are capitalized in this manual. The word "Unit" is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

The abbreviation "Ch," which appears in some displays and on some OMRON products, often means "word" and is abbreviated "Wd" in documentation in this sense.

The abbreviation "PC" means Programmable Controller and is not used as an abbreviation for anything else.

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Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

Note Indicates information of particular interest for efficient and convenient operation of the product.

1, 2, 3... 1. Indicates lists of one sort or another, such as procedures, checklists, etc.

TABLE OF CONTENTS

About this Guidebook:

This guidebook introduces the settings and operations performed on the new CVSS Version 2 (CV Support Software Version 2) that are necessary to set up and start operation of the new CV Series of Programmable Controllers (PCs) and includes the sections described below. The new CV Series of PCs use the CV500-CPU01-E, CV1000-CPU01-E, CV2000-CPU01-E, and CVM1-CPU01-E/11-E CPUs. This guidebook is intended as an introduction and overview only and is not intended as a replacement for the CV Support Software Version 2 Operation Manuals (*Basics*, *Online*, and *Offline*).

Section 1 provides information about how to use this guidebook, lists the manuals available for the CV Series, describes the differences between the C Series and the CV Series, and introduces basic terms required for understanding CV Series features.

Section 2 describes CVSS installation and the basic settings required for all PC systems.

Section 3 describes settings requires for SYSMAC NET and SYSMAC LINK Systems.

Section 4 describes network troubleshooting and error histories for SYSMAC NET and SYSMAC LINK Systems.

Section 5 presents an overview of the steps necessary to set up and start operation for specific system examples.

Section 6 describes some of the more convenient features of CV-series PCs.

SECTION 1
Introduction

This section explains the nature of this guidebook, lists the manuals where detailed information on CV-series products are available, and introduces some basics about the new CV-series PCs.

1-1 Using this Guidebook

This guidebook provides an overview of some of the operations performed on the CVSS (CV Support Software Version 2). It shows only some of the main displays that appear and is not designed as a complete operation manual.

Selecting Items from Menus

When a menu appears on the display screen, there are two ways to make a selection. One way is to move the cursor with the Cursor Keys to the desired item and press the Enter Key.

A faster way is to use the letters that appear at the beginning of each line. If a letter appearing at the beginning of a line is input from the keyboard, the item will automatically be selected without moving the cursor or pressing the Enter Key. Either method can be used as preferred by the operator.

Moving through Menus

To move forward through the menus, just continue to select the appropriate items as described above. To move backward through the menus, use either the Esc Key or the Shift+Esc Keys as described below.

Key(s)	Operation
Esc	Moves backward one menu or display at a time.
Shift + Esc	Moves backward one operation at a time. This is the fastest way to move backward through the menus when you have a ways to go.

1-2 CV Manuals

The following manuals are available for use with the CV-series products. Refer to these manuals for details and actual operating procedures.

Product	Manual	Cat. No.
CV500/CV1000/CV2000/CVM1 PC	CV500/CV1000/CV2000/CVM1 Installation Guide	W195-E1
	CV500/CV1000/CV2000/CVM1 Operation Manual: SFC	W194-E1
	CV500/CV1000/CV2000/CVM1 Operation Manual: Ladder Diagrams	W202-E1
	CV500/CV1000/CV2000/CVM1 Operation Manual: Host Interface	W205-E1
CV Support Software Version 2	CV Support Software Version 2 Operation Manual: Basics	W196-E1
	CV Support Software Version 2 Operation Manual: Offline	W201-E1
	CV Support Software Version 2 Operation Manual: Online	W200-E1
SYSMAC NET Link System	SYSMAC NET Link System Manual	W213-E1
SYSMAC LINK System	SYSMAC LINK System Manual	W212-E1
SYSMAC BUS/2 Remote I/O System	SYSMAC BUS/2 Remote I/O System Manual	W204-E1
BASIC Unit	BASIC Unit Operation Manual	W207-E1
	BASIC Unit Reference Manual	W206-E1
C-to-CV Program Conversion Utility	C-to-CV Program Conversion Utility Operation Manual	W208-E1
Optical Fiber Cable	Optical Fiber Cable Installation Guide	W156-E1-3

1-3 New CV-series Features

There are a lot of new features provided in the CV-series PCs and Units that make them faster, more powerful, and easier to use. Some of these new features mean changes in terminology and basic processing. The most important of these are described below.

Cycle Time

In C-series PCs, the time required to execute the program and perform peripheral servicing was call the scan time. The introduction of SFC has required that this

term be changed to cycle time with CV-series PCs. The cycle time is the time required to process all active steps and perform peripheral servicing.

Although exceeding set scan time limit in C-series PCs is a non-fatal error, exceeding the cycle time limit in CV-series PCs is a fatal error. Because the cycle time limit is a user-set parameter, the cycle time can be set according to the needs of the application.

Timers and the Cycle Time With CV-series PCs, timers will still operate accurately even if the cycle time exceeds 100 ms.

Subroutines With CV-series PCs, the same subroutines number can be used at two different locations in the program without creating an error. When a subroutine call is executed, the next subroutine with the called number in the program will be executed.

Flag Processing The timing for turning off flags is different between the C-series and CV-series PCs.

Online Processing The CVSS can change DM data online, eliminating the need to transfer modified DM data to the PC. (If DM data is transferred, the unmodified DM data in CVSS memory will overwrite the modified data in the PC.)

PC Access With CV-series PCs, each PC can be accessed from Programming Devices (CVSS) connected to in networks to which the PC belongs. This means that the data in a PC can not only be read from several locations at once, but it can also be written from various locations, requiring proper data management. To aid in data management and system protection, access rights can be set for PCs so that data from non-designated Programming Devices will not be accepted.

Special I/O Units Up to eight Special I/O Units can be mounted to a CV-series Rack.

CPU Bus Units A new classification of Units called CPU Bus Units are available for CV-series PCs. These Units connect directly to the CPU bus. When CPU Bus Units are added, removed, or given new unit numbers, the I/O table must be re-registered.

Network Reads/Writes With C-series PCs, only 1 network read/write operation could be executed at a time through the SEND and RECV instructions (2 with the C200H). With CV-series PCs, up to 8 read/write operations can be executed simultaneously as long as they are not in C mode. (Care must therefore be taken when changing the communications mode to be sure that read/write operations are not disrupted.)

Timers and Counters The CV-series PC provide separate areas for timers and counters so that timer/counter numbers are easier to handle. It is thus possible to assign both T001 (timer 1) and C001 (counter 1).

First Scan Flag When SFC programming is used, the Fist Scan Flag will be ON during the first execution of each action program, rather than first execution of the entire program as it is for C-series PCs.

Mode Changes and Timers Although timers are always reset for mode changes with C-series PCs, the present value of timers can be maintained for mode changes with the CV-series PCs by turning ON the IOM Hold Bit.

Data Links

SYSMAC NET Link Systems The data link areas for CV-series PCs must all be continuous. Gaps between data link areas are not allowed as they were for C-series PCs.

SYSMAC LINK Systems The data link areas for both C-series and CV-series PCs must all be continuous. The data link areas can be in any order and do not necessarily have to be in order of the node addresses.

1-4 CV-series Data Areas

The default data areas for the CV-series PCs are shown in the following tables. The Data Link Area and Holding Area can be changed via the PC Setup. If data links are created with C-series PCs, the C-series LR area will correspond to words 1000 to 1199 in the CV-series PCs.

Area	PC	Words	Function
I/O Area	CV500-CPU01/ CVM1-CPU01	0000 to 0031	Used to control I/O points.
	CV1000-CPU01/ CVM1-CPU11	0000 to 0063	
	CV2000-CPU01	0000 to 0127	
Work Area	CV500-CPU01/ CVM1-CPU01	0032 to 0199	Used in the program to manipulate or store data.
	CV1000-CPU01/ CVM1-CPU11	0064 to 0199	
	CV2000-CPU01	0128 to 0199	
SYSMAC BUS/2 Area	CV500-CPU01/ CVM1-CPU01	0200 to 0599	Used for SYSMAC BUS/2 Remote I/O System.
	CV1000-CPU01/ CV2000-CPU01/ CVM1-CPU11	0200 to 0999	
Link Area	All	1000 to 1199	**Corresponds to the LR Area in C-series PCs.** These bits can be set as holding bits via the PC Setup.
Holding Area	All	1200 to 1499	**Corresponds to the HR area in C-series PCs.**
CPU Bus Unit Area	All	1500 to 1899	Used to store the I/O status of CPU Bus Units. These bits can be set as holding bits via the PC Setup.
Work Area	All	1900 to 2299	Used in the program to manipulate or store data. These bits can be set as holding bits via the PC Setup.
SYSMAC BUS Area	CV500-CPU01/ CVM1-CPU01	2300 to 2427	Used for SYSMAC BUS Remote I/O System. Up to word 2399 can be set as holding bits via the PC Setup.
	CV1000-CPU01/ CV2000-CPU01/ CVM1-CPU11	2300 to 2555	
Temporary Relay Area	All	TR 0 to TR 7 (bits only)	Used to temporarily store execution conditions.
CPU Bus Link Area	All	G 000 to G 255	G 000 is the PC Status Area; G 001 to G 004, the Clock Area. G 008 to G 127 contain PC output bits; G 128 to G 255, CPU Bus Unit output bits.
Auxiliary Area	All	A 000 to A 511	Contains flags and bits with special functions.
Transition Area	CV500-CPU01/ CVM1-CPU01	TN 0000 to TN 0511 (flags)	Transition flags for the SFC program.
	CV1000-CPU01/ CV2000-CPU01/ CVM1-CPU11	TN 0000 to TN 1023 (flags)	
Step Area	CV500-CPU01/ CVM1-CPU01	ST 0000 to ST 0511 (flags)	Step flags for the SFC program.
	CV1000-CPU01/ CV2000-CPU01/ CVM1-CPU11	ST 0000 to ST 1023 (flags)	

Area	PC	Words	Function
Timer Area	CV500-CPU01/ CVM1-CPU01	T 0000 to T 0511 (flags and PV)	Used for timers (normal, high-speed, and totalizing).
	CV1000-CPU01/ CV2000-CPU01/ CVM1-CPU11	T 0000 to T 1023 (flags and PV)	
Counter Area	CV500-CPU01/ CVM1-CPU01	C 0000 to C 0511 (flags and PV)	Used for counters (normal, reversible, and transition).
	CV1000-CPU01/ CV2000-CPU01/ CVM1-CPU11	C 0000 to C 1023 (flags and PV)	
DM Area	CV500-CPU01/ CVM1-CPU01	D 00000 to D 08191	Used for internal data storage and manipulation.
	CV1000-CPU01/ CV2000-CPU01/ CVM1-CPU11	D 00000 to D 24575	
EM Area	CV1000-CPU01/ CV2000-CPU01/ CVM1-CPU11	E 00000 to E 32765 for each bank; 2, 4, or 8 banks	EM functions just like DM. An Extended Data Memory Unit must be installed.
Index registers	All	IR 0 to IR 2	Used for indirect addressing.
Data registers	All	DR 0 to DR 2	Generally used for indirect addressing.

1-5 Basic Terminology

The following terms are used in this and other CV-series documents. Some of these terms vary from those used in C-series documents.

Node

Each Unit that is part of a network is called a node. A node is one location on a communications path that has the ability to send and/or receive data.

Node Address

Each node is assigned a number that identifies it on the network. This number is called the node address. Each node must have a unique address to differentiate it from the other nodes.

Polling Unit

One of the Units at a node in a SYSMAC LINK System manages and controls data transfer. This Unit is called the polling unit. When compared to all other nodes in the SYSMAC LINK System, the polling unit is generally the node with the lowest node addresses. When power is applied to the System, the polling unit transfers the network parameters recorded in it to all the polled units so that each node in the network contains an identical copy of the network parameters.

The polling unit controls data communications according to the following network parameters.

The **Maximum Node Address** is the highest node address that can participate in the network. If any network exists with a higher node address, it will not be able to join data links or use message services.

The **Number of Frames per Communication Cycle** is the maximum number of data transmissions that can simultaneously occur during a single communications cycle.

The **Number of Frames per Polled Unit** is the number of nodes participating in the network during each communications cycle. This parameter affects the timing of node recovery when a node has been separated from the network.

Polled Units

All Units in a SYSMAC LINK System other than the polling unit are polled units. The node with the smallest unit number is generally the polling unit. If a Unit is to be added to an existing network, its node address should be set high enough so that it will enter as a polled unit. (Any node added to an existing network will have its network parameters overwritten by those already being used by the network.)

Master

"Master" is both a functional designation in a SYSMAC NET Link System as well as an abbreviation for a Remote I/O Master Unit in a SYSMAC BUS or SYSMAC BUS/2 Remote I/O System. In a SYSMAC NET Link System, the master is the functional equivalent of the polling unit in a SYSMAC LINK System, the major difference being that the master is a fixed Unit that contains the data link tables and does not change as is possible in SYSMAC LINK Systems. The Remote I/O Master Unit is the Unit through which a Remote I/O System is controlled.

Cycle Time

The cycle time is the time required for the CPU to complete all processing, including program execution, once.

Watch Cycle Time

A maximum cycle time can be set to stop operation if the limit is exceeded.

Minimum Cycle Time

A minimum cycle time can also be set. If processing is completed before the minimum cycle time is reached, the CPU will go on standby for the remainder of the set time.

I/O Table

The I/O table is a record in the CPU that identifies which I/O words are being used by what Units and where these Units are in the System. The CPU will not be able to process I/O without an I/O table and will generate an error if operation is attempted without an I/O table.

System Setup

The System Setup is the parameters that determine how the CVSS will operate. These parameters include designation of the PC to which the CVSS will connect when it goes into online operation.

PC Setup

The PC Setup are used to customize the PC according to user needs. Among other things, the following can be set:

- The Holding Area size.
- The Error History Area.
- The initial operating mode when power is applied.
- Addresses.
- The I/O refresh method.

Routing Tables

Routing tables register the paths to be taken to send data from one network to another, i.e., which nodes the data has to be sent through to get to another network. Each node contains two routing tables: one for the local network and one for remote networks.

Local Network Routing Table

The local network routing table defines the network(s) to which the node belongs. If the node belongs to more than one network, the table will list all the network addresses for that node.

Remote Network Routing Table

The remote network routing tables tell which nodes data has to be sent to in order to reach nodes on other networks. Both the node address and the network address of the node that relays the data are recorded.

Data Links

PCs that belong to the same network can be grouped to create common data areas. By creating these data links, data is automatically passed back and forth between the PCs so that the individual application programs can use data from another PC without having to program data transfers.

Data Link Table

Data link tables are required to create data links. In SYSMAC LINK Systems, there are actually two data link tables: the common link parameters, which are the same for all the PCs in the same data link; and refresh parameters, which tell each PC the words to which data is written.

Common Link Parameters

The common link parameters tell which words are being transferred by each node in a data link. All nodes in the data link have the same common link parameters.

Refresh Parameters

The refresh parameters tell a node where in the Data Link Area to write the data it receives from other nodes. For example, the refresh parameters in node 1 may tell it to write data received from node 2 to words beginning at word 0020 and to write data received from node 3 to words beginning at word 0035. Data received from a node cannot be written by a PC unless the location for the data is specified in the refresh parameters. Only data links in the SYSMAC LINK System use refresh parameters.

System Switches

The system switches on the PC are used to specify operating parameters for the CPU Bus Units. These parameters include such settings as the operating modes for data links.

Software Switches

There are also various bits in the PC data areas used to control the operation of CPU Bus Units. These are called software switches and include bits that start and stop data links, control inter-node transmission tests, etc.

SECTION 2
Basic Procedures

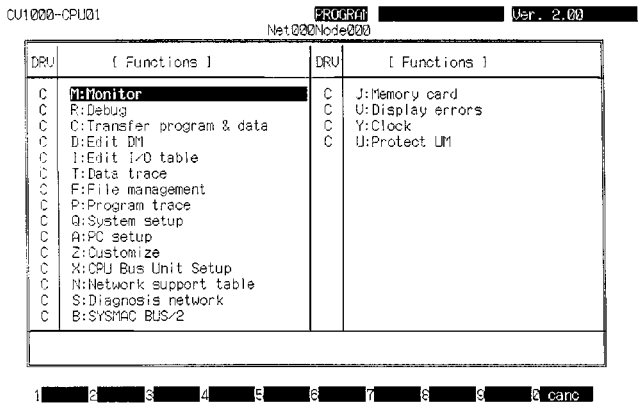
This section describes information required for any System, including basic operating modes, installation, CVSS settings, the PC Setup, and I/O tables.

2-1 CVSS Modes

There are two basic CVSS operating modes: online and offline. In the offline mode, the CVSS is operated independently from the PC. In the online mode, the CVSS is operated while communicating with the PC. The operations that are possible vary with the operating mode.

To switch between online and offline mode, go the main menu for the mode you are in, hold down the Shift Key and press the F1 Key. The mode and menu display will change. **You must be connected to the PC to enter online mode.**

When you enter online mode, the CVSS will connect with the PC specified in the CVSS settings (as described later in this guidebook) and the model of PC will be displayed in the upper center portion of the screen.



2-2 Changing PC Modes

When the CVSS is in online mode, the operating mode of the PC to which the CVSS is connected can be changed by holding down the Shift Key and pressing one of the function keys F7 through F10 as shown below. Confirmation messages will appear when you change from RUN or MONITOR mode to PROGRAM or DEBUG mode. The mode will not change until confirmation (the Y Key followed by the Enter Key) is received.

Keys	PC Mode
Shift + F7	RUN
Shift + F8	MONITOR
Shift + F9	DEBUG
Shift + F10	PROGRAM

2-3 Node Designations

There are two ways to designate the destination node when sending data to other nodes. One is by designating the network and node addresses of the destination node. (The local network and node can be designated with network and node addresses of 000 as long as there is only one local network, e.g., the node will be part of two local networks if there are two Link Units mounted to it.) This method is used in the remainder of this guidebook.

Note You cannot communicate with other networks until a routing table is registered. When there is only one local network, communications with it are possible without a routing table designated by a network address of 000.

The other way to designate a node is by designating the PC name. If a PC name is registered in advance, it can be used in place of network and node addresses

to simplify designations. Refer to the *CV Support Software Version 2 Operation Manual: Offline* for details.

Note You will not be able to input from the keyboard for a while if communications are attempted with a undefined node address. The system will usually recover faster if you input the Esc Key.

2-4 CVSS Installation

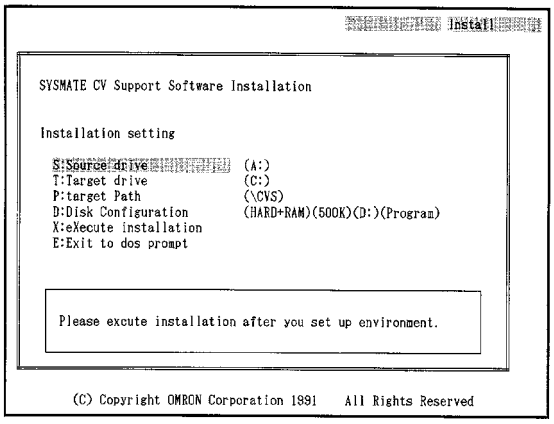
To use the CVSS, it must first be installed on a DOS hard disk with a minimum of 5 megabytes of free space. Basically speaking, this means copying the CVSS from the system disks it is supplied on to the hard disk using the installation utility provided on the system disk. You will thus need a computer with a floppy disk drive and a formatted hard disk running DOS.

The CVSS needs to be installed only once unless the data on your hard disk is damaged or requires reformatting. Once you have installed the CVSS, store the system disks in a safe place. You may want to make an additional copy for extra protection.

The basic installation procedure is outlined below. Refer to the *CV Support Software Version 2 Operation Manual: Basics* for details.

1, 2, 3...

1. Turn on the computer and startup DOS from the hard disk.
2. Insert install disk 1 into the floppy disk, change the current drive to the floppy disk drive, and type “INSTALL” to activate the installation utility. The following display will appear.



3. Select and specify each of the first four items on the display. These are outlined briefly below with possible values given in parentheses.

Item	Meaning
S:Source drive	The floppy drive containing the install disk. (A to Z)
T:Target drive	The hard disk drive onto which the CVSS is to be installed. (A to Z)
P:Target path	The directory path name where the CVSS is to be installed. (Any legal DOS directory name; avoid long names.)
D:Disk Configuration	Whether the hard disk is being used alone or together with a RAM disk. (HARD or HARD+RAM)
X:eXecute Installation	Installation is executed.
E:Exit to dos prompt	Installation is cancelled and the procedure returns to DOS.

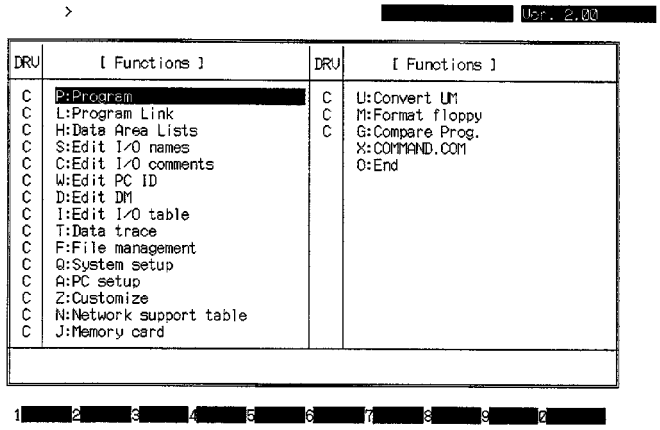
4. If a RAM disk is specified for the disk configuration, you will also be asked the size of the RAM disk, the disk drive name of the RAM disk, and which parts of the software is to be placed in the RAM disk first (if the RAM disk is

large enough, it makes no difference which part is selected). Input the request data.

5. When the above settings have been completed, the initial display will return and actual installation can begin. To install, select X:eXecute installation and then confirm installation.
6. Once installation has been confirmed, you will be asked if CONFIG.SYS and AUTOEXEC.BAT should be updated. If they are updated, the extensions of the old files will be changed to CVS and new files will be created. If they are not updated, sample files with CVS extensions for CVSS will be copied to the target directory. Input Y or N and press the Enter Key to start actual installation.
7. You will be asked to change the install disk as installation proceeds. Once the last disk has been inserted and installation completed, you will be asked to reboot the computer.

2-5 Starting CVSS

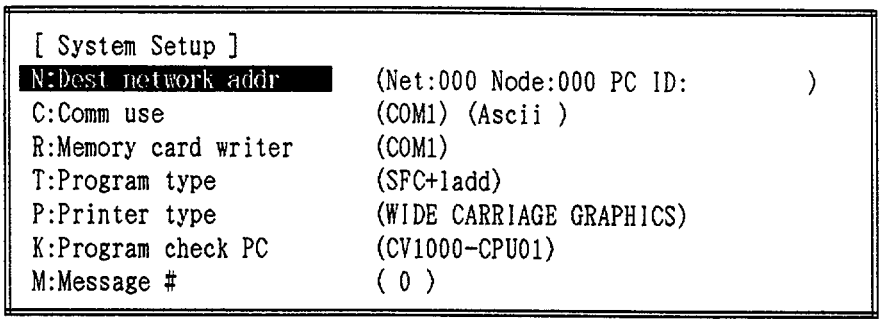
Once the computer has been rebooted after installation, the CVSS can be started by changing to the directory into which CVSS is installed and entering CVS. The main offline mode menu will appear when the CVSS has started.



2-6 System Setup

The System Setup contains the operating parameters for the CVSS. Although different settings are available in online mode, the System Setup must first be input in offline mode to determine how the CVSS will operate in online mode, e.g., the PC to which it will connect in online mode.

When the main offline menu appears, the first step is to check the System Setup. Select “Q:System setup” from the main offline menu. The following list of settings will appear.



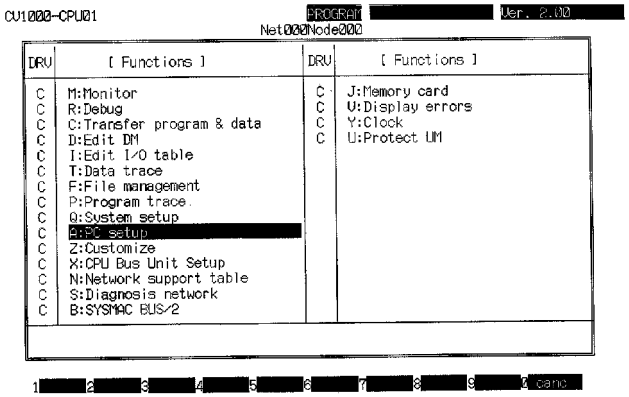
Some of the most important settings in the System Setup are described in the following table.

Setting	Meaning
N:Dest network addr	Specifies the network, node, and name of the PC to which the CVSS will connect when it goes online.
C:Comm Use	Specifies the type of communications data for the PC and the computer to be connected via CV500-CIF01 type dedicated cable. Select binary to connect the PC's tool bus port and the computer. To connect the PC's host link bus port and the computer, select ASCII. After selecting the type of communications, specify the communications mode.
R:Memory card writer	Specifies the computer's communications port to which the Memory Card Writer is connected.
T:Program type	Specifies the type of program to be created on the CVSS (ladder only or SFC+ladder).
P:Printer type	Specifies the type of printer connected to the CVSS.
K:Prog check PC	Specifies the model of PC for which the program is being written.
M:Message #	Specifies which one of the messages of FUN No. 195 is displayed on the screen.

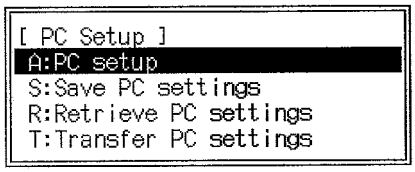
2-7 PC Setup

The PC Setup can be used to specify operating parameters for the PC. The PC Setup can be changed either from online to write changes directly to the PC from the keyboard or from settings stored on floppy disks, or the PC Setup can be changed offline to store settings on disk.

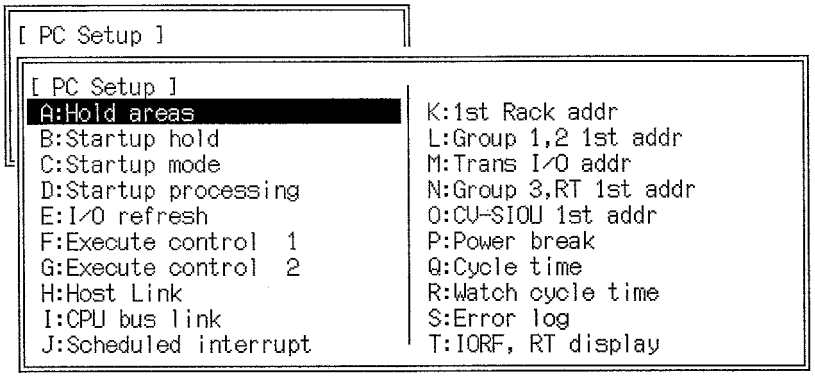
To set the PC Setup online, make sure the PC is connected to the CVSS and input the Shift and F1 Keys from the main offline menu. The CVSS will go online with the PC and the main online menu will appear as shown below.



Select "A:PC setup" and the following menu will appear.



Select “A:PC setup” again and the PC Setup will appear as shown below.



Each of these settings can be selected and set according to the displays that will appear. Some of the most important settings in the PC Setup are described in the following table.

Setting	Meaning
A:Hold areas	Specifies the words whose status is held when power is interrupted or when the PC mode is changed. The words allocated to CPU Bus Units in the CPU Bus Area must be specified as part of the Holding Area for data links to work properly.
C:Startup mode	Specifies the operating mode that the PC is to enter when power is applied. The startup mode is generally set to RUN after all settings have been made and the PC System is ready for normal operation.
E:I/O refresh	Specifies the method to be used to refresh I/O status (cyclic, zero-cross, or scheduled). When data communications are to occur at a specified interval, a scheduled refresh should be used.
F:Execute control 1	Provides four settings: low battery detection (yes/no), error for power interruptions (yes/no), CPU standby setting (yes/no), and measurement of CPU Bus Unit service cycle (yes/no).
G:Execute control 2	Provides nine settings: the execution process, I/O interrupt treatment, power off interrupt processing, duplicate action processing, step timer setting, startup trace setting, indirect DM specification (binary/BCD), use of more than one JMP 000 instruction, and I/O table comparison error processing. The execution process specifies whether or not the program execution CPU is synchronized with the communications CPU. I/O table comparison error processing determines whether or not operation can continue when the I/O table does not agree with the actual system configuration. Unless there is a specific reason to do otherwise, operation should be disabled for I/O comparison errors to prevent I/O errors and facilitate safe operation.
H:Host Link	Specifies the communications settings for the PC’s host interface, e.g., the baud rate, number of stop bits, unit number, etc.
Q:Cycle time	Specifies whether the cycle time is to be variable or constant. If a constant cycle time is specified, the minimum cycle time is input.

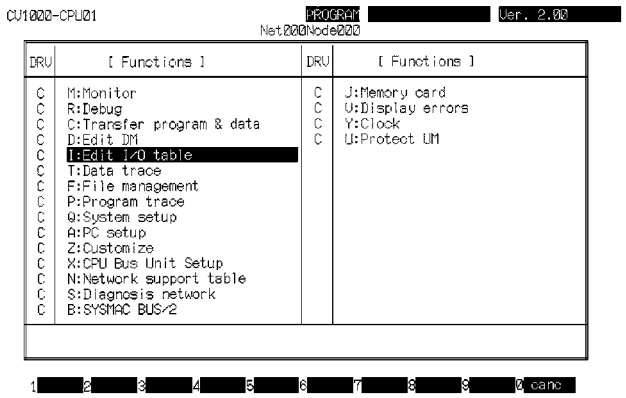
2-8 I/O Table Registration

An I/O table must be registered in each PC for the PCs to properly process I/O. The I/O table tells the PC how I/O words are registered to Units in the System.

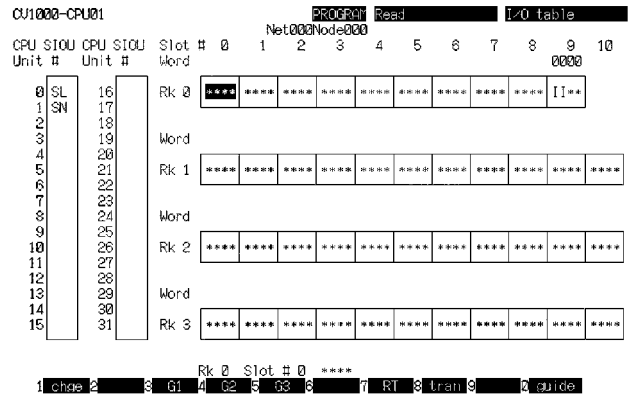
There are two ways to create an I/O table: manually input the I/O table in the offline mode and then transfer the I/O table to the PC or automatically generate the I/O table in the online mode. When the I/O table is automatically generated, the PC's CPU will check all Units actually connected to the PC and create an I/O table accordingly. This method is outlined below.

1, 2, 3...

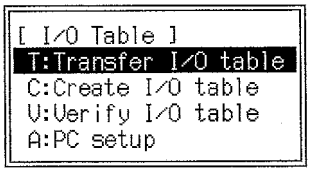
1. Place the CVSS in online mode by connecting the PC and entering the Shift and F1 Keys. The main online mode menu will appear as shown below.



2. If the PC is not already in PROGRAM mode, enter the Shift and F10 Keys to switch it to PROGRAM mode.
3. If the PC was in MONITOR or RUN mode, you will be asked if it is okay to stop operation. Input the Y and Enter Keys to stop operation and enter PROGRAM mode.
4. Select "I:Edit I/O table" from the menu. The I/O table currently registered in the PC will be displayed. An example is shown below.



5. Press the End Key to access the following menu.



6. Select "C:Create I/O table." A confirmation display will appear.

7. Press the Enter Key to actually create the I/O table.

When the I/O table has been generated, a message telling you that it has been created will appear and the new I/O table in the PC will now agree exactly with the actual Units detected in the System by the PC.

SECTION 3
Network Settings

This section describes the settings required to use SYSMAC NET Link Systems and/or SYSMAC LINK Systems to enable network communications. The last part of this section also shows the steps necessary to add C-series PCs to an existing data link in a SYSMAC LINK System.

3-1 SYSMAC NET Link Systems

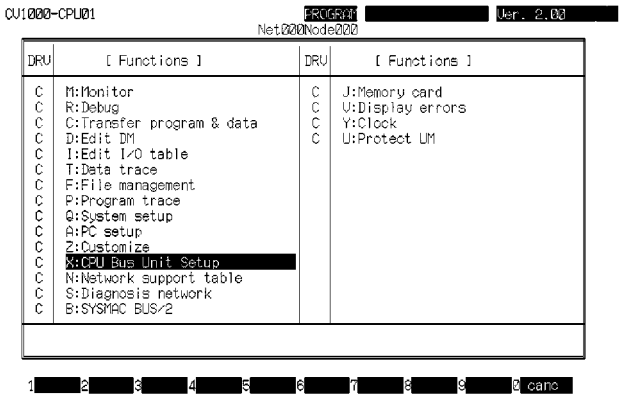
There are various settings for SYSMAC NET Link Systems including communications settings, routing tables, data link tables, etc. The CVSS also provides diagnostic functions for SYSMAC NET Link System communications.

Similar settings and diagnostic functions for the SYSMAC LINK System are described in *3-2 SYSMAC LINK Systems*. Although most of these are slightly different for the two systems, the same routing tables are used by both.

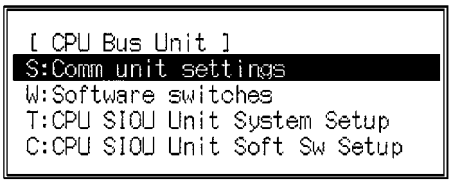
3-1-1 Communications

Communications settings must be performed online. Some of the main communications settings are outlined below.

1, 2, 3... 1. Place the CVSS in online mode by connecting the PC and entering the Shift and F1 Keys. The main online mode menu will appear as shown below.



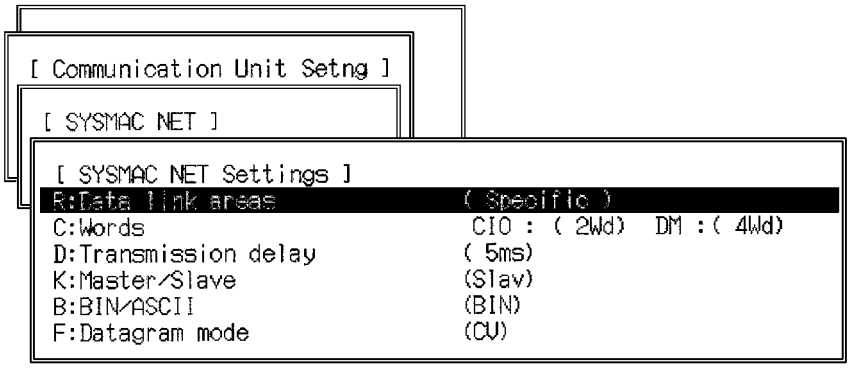
2. Select “X:CPU Bus Unit Setup” from the menu. The following menu will appear.



3. There are four sets of communications settings: Communications Unit Settings, Software Switches, CPU Bus Unit System Setup, and CPU Bus Unit Software Switches. Select Communications Unit Settings and Software Switches in turn and set as explained in the following descriptions. CPU Bus Unit System Setup and CPU Bus Unit Software Switches will support CPU Bus Units that OMRON will develop in the future.

Communications Unit Settings

When communications unit settings is selected, specify SYSMAC NET and then the unit number of the SYSMAC NET Link Unit will appear. When the unit number has been input, the following settings will appear.

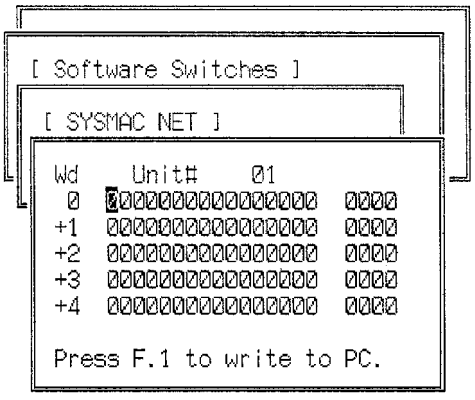


The system settings for SYSMAC NET Link communications are outlined in the following table.

Setting	Meaning
R:Data link areas	Specifies whether data link words will be automatically allocated from designated areas (nltp:check areas in messages) or manually input by the user. If manual input is specified, the user can specify data links with greater freedom but must register all of the data link tables. This setting is valid in the master only.
C:Words	Specifies the number of words to be linked per node. This setting is valid in the master only and is not valid if data link tables are input manually.
D:Transmission delay	This setting is valid in the master only.
K:Master/Slave	Specifies whether the Unit is the master or a slave.
B:BIN/ASCII	Specifies whether communications are to be sent in binary code or ASCII. The same code must be set for all nodes in the same network.
F:Datagram mode	Specifies the communications mode. If the network contains any C-series PCs, the C mode must be selected. If the network contains only CV-series PCs, the CV mode must be selected.

Software Switches

To edit the software switches, specify SYSMAC NET and then the unit number of the SYSMAC NET Link Unit will appear. When the unit number has been input, the following display will appear.



The above display is a map of the software switches contained in the data areas of the PC for the SYSMAC NET Link Unit. Software switches are used to control

various aspects of System operations, such as data links and communications tests. For example, the rightmost bit in the top word is the Data Link Start Switch. If this bit is set to 1 and then the F1 Key is pressed to write the setting to the PC, the data link will start.

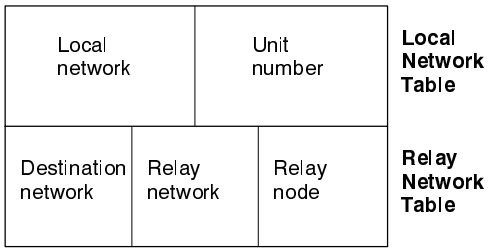
If the word containing the Data Link Start Switch is set as part of the Holding Area and the Switch is set to 1, then the data link will automatically start when the PC is turned on. If the word is not set as part of the Holding Area, the data link will not start automatically and will stop whenever the PC mode is changed from PROGRAM or DEBUG mode to RUN or MONITOR mode. The other software switches are described in the *SYSMAC NET Link System Manual*.

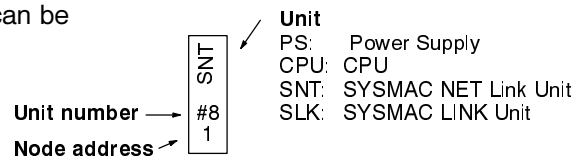
This page has been left blank to allow for the routing table illustration which follows.

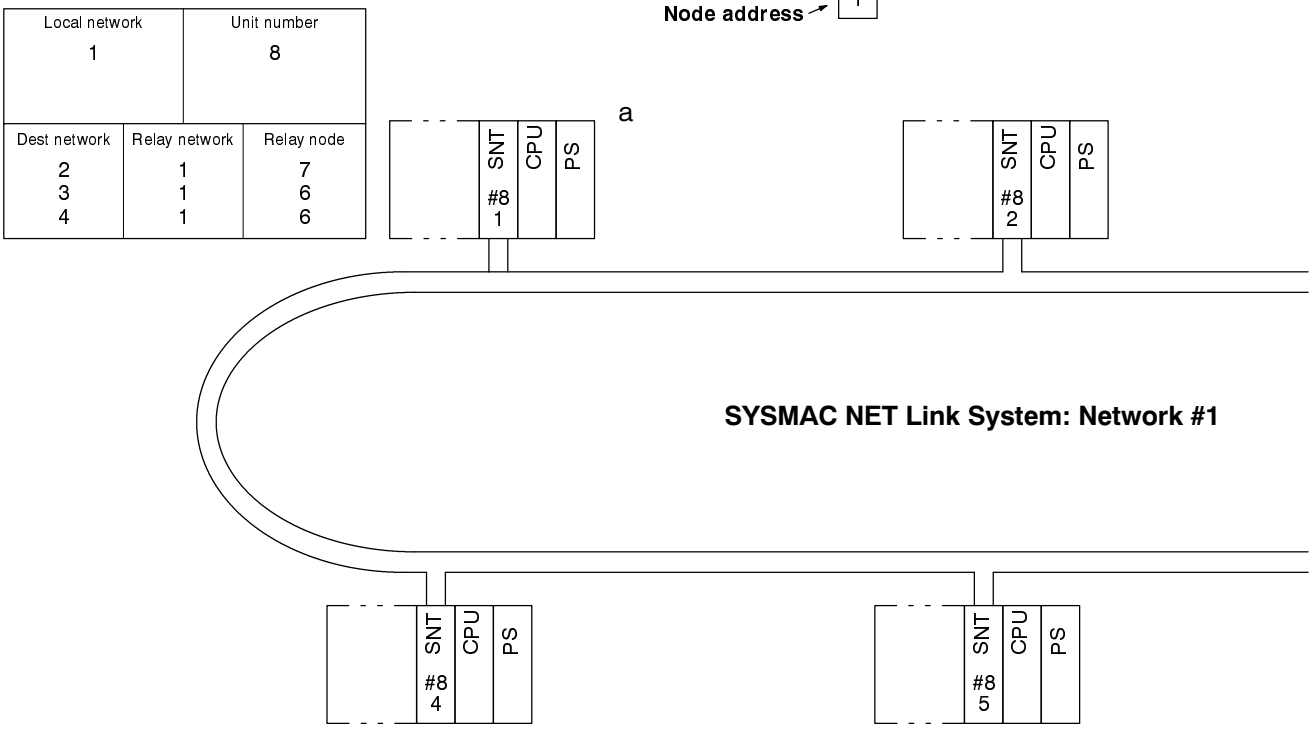
3-1-2 Routing Tables

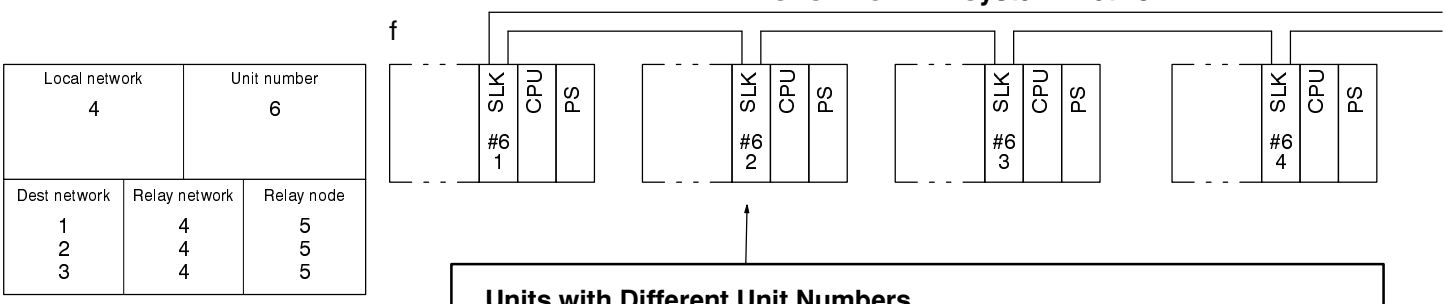
When multiple networks are connected, routing tables must be registered to enable communications. Routing tables consist of a local network table, which identifies the local network address and unit number, and a relay network table, which tells which node to go through to get to any other network.

The example on this and the facing page show four networks connected through PCs. The unit numbers for each Unit in the same network have been set to the same number for convenience. These numbers can be different (see explanation at the bottom of this page).









Units with Different Unit Numbers

If all Units in the same network have the same unit number, their routing tables will be the same in all PCs that belong to only that network.

Local network	Unit number
4	**5**

Dest network	Relay network	Relay node
1	4	5
2	4	5
3	4	5

If a Unit in the same network has a different unit number, then only the unit number information in the routing table will be different. The routing table at the left would be used for node #2 in network #4 if the unit number were changed to"5."

Setting Routing Tables

To set routing tables, the CVSS must be connected to a PC in each network. The CVSS cannot be connected to a PC to which more than one CPU Bus Unit is mounted because doing so will prevent transfer of routing tables.

To specify the PC to which the CVSS is connected, specify a network address of 0 and a node address of 0. To specify other PCs on the same local network, specify a network address of 0. An outline of the steps to set up routing tables is provided starting on the next page.

Setting Ranges

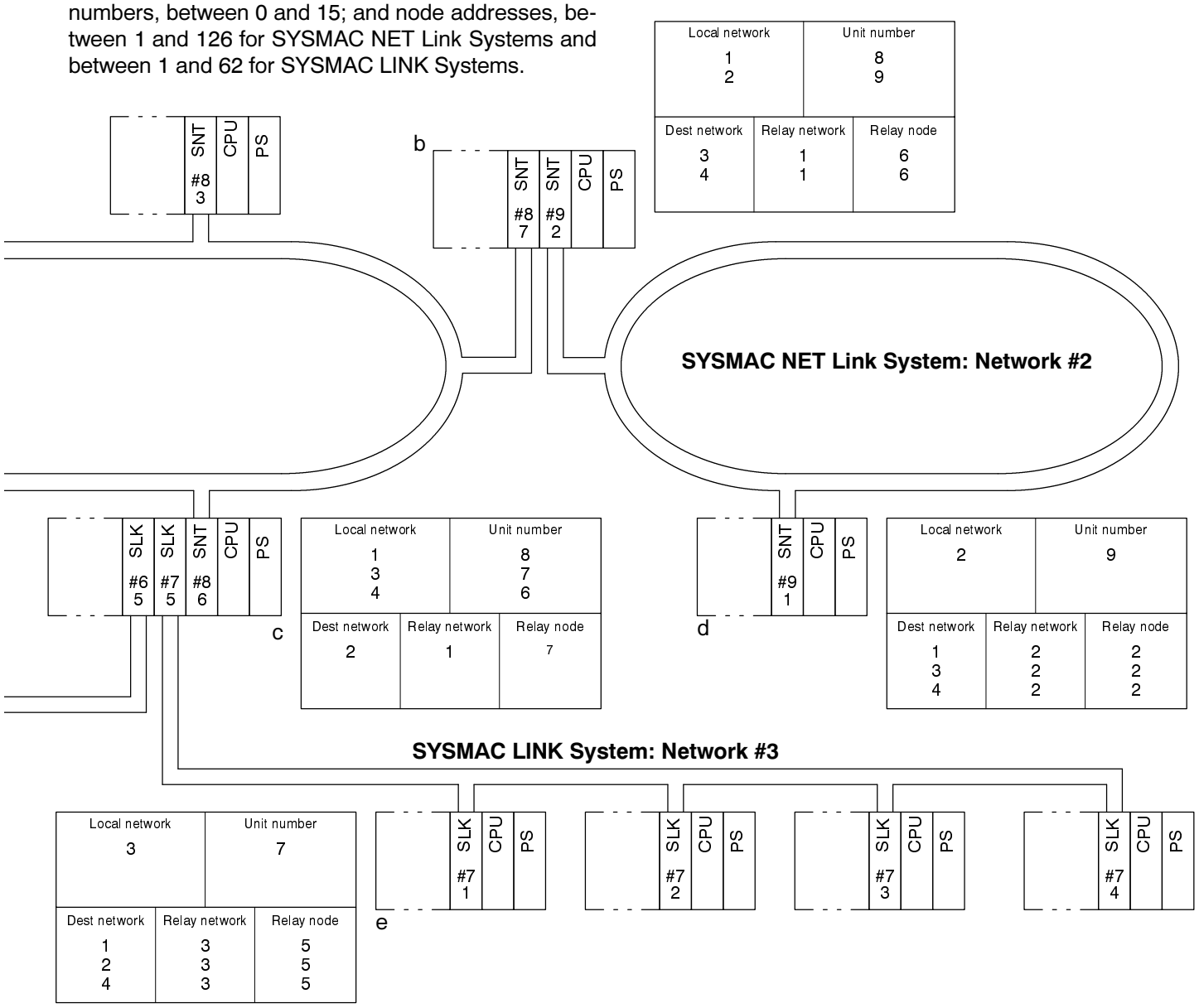
Network addresses must be between 1 and 127; unit numbers, between 0 and 15; and node addresses, between 1 and 126 for SYSMAC NET Link Systems and between 1 and 62 for SYSMAC LINK Systems.

Precautions

The same node address cannot be used twice in the same network.

The same unit number cannot be used twice for CPU Bus Units mounted to the same PC.

Communications can made to PCs up to two networks away (three, if you count the local network). For example, if the PC labeled f in network #4 below was connected to another network (#5), it would not be possible to communicate from network #5 to a PC in network #2.



Reading Routing Tables

The routing table for PC “a” indicates the following. The local network table says there is a network unit mounted that is assigned unit number 8 and connected to network #1. The relay network table says to reach network #2, go through node #7 (PC “b”) on network #1; to reach network #3, go through node #6 (PC “c”) on network #1; and to reach network #4, go through node #6 (PC “c”) on network #1.

When data from PC “a” that is bound for network #3 reaches PC “c,” PC “c” can tell from its local routing table that the data should be sent through unit #7. Thus the relay routing tables always tell which network and node to send data through until it reaches a PC on the destination network, at which point the local routing tables tells which Unit to send the data through.

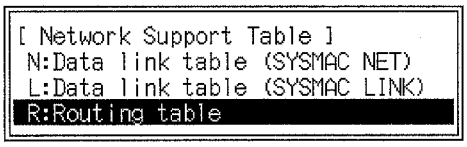
Setting Up Routing Tables

Routing tables are first set and checked offline and then transferred to the PCs online using the following procedure.

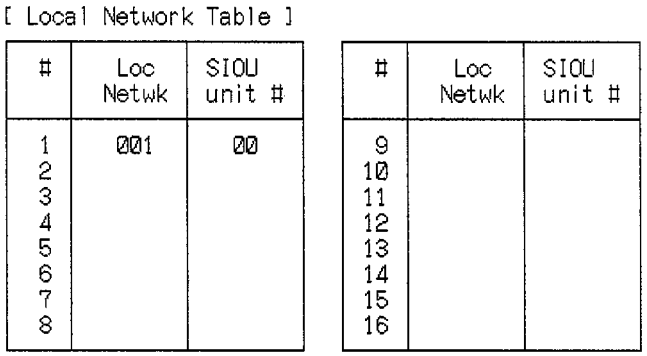
Caution The CVSS should be connected to a PC that has only one CPU Bus Unit mounted to it. If the PC to which the CVSS is connected has more than one CPU Bus Unit, you will not be able to transfer the routing tables.

1, 2, 3...

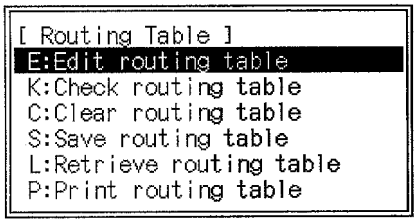
1. Select “N:Network support table” from the main offline menu. The following menu will appear.



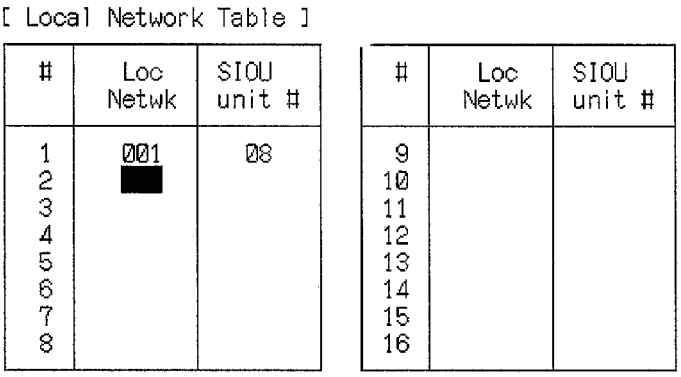
2. Select “R:Routing table.” The routing table stored in the CVSS will be displayed.



3. Press the End Key to access the following menu.



4. Select “E:Edit routing table.” This will enable editing of the local routing table. Here we will create the local routing table for PC “a” shown in the previous example.
5. Type in “001” and press the Enter Key; then type in “08” and press the Enter Key again. The table should appear as shown below.



6. Press the PgUp or PgDn Key to access the relay routing table and input the data shown in the following example (i.e., the table for PC "a"), following each input with the Enter Key. The Home Key can be used to input 0 into the current field and the Delete Key can be used to delete data from the current field. To skip a field, press the Right Arrow Key. (Skip the PC ID column for this example.)

   Note If a relay routing table is not to be created, call up the relay routing table edit display anyway and enter the F1 Key, 0, and the Enter Key to set the number of networks to zero.

[Relay Network Table]

#	End Netwk	Relay PC ID	Relay Netwk	Relay node
1	002		001	007
2	003		001	006
3	004		001	006
4				
5				
6				
7				
8				
9				
10				

#	End Netwk	Relay PC ID	Relay Netwk	Relay node
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

7. When the relay routing table has been completed, press the F10 Key. The routing tables will be saved in memory, and the tables and a menu will be displayed.
8. Select "K:Check routing table." If there are no detectable errors in the display, a message will indicate that the tables are okay.
9. Press the End Key to access the menu and select "S:Save routing table."
10. You will be asked for a file name and heading. Input these, following each with the Enter Key. (The heading can be left blank.)
11. Press the End Key and repeat the above procedure until you have created routing tables for all PCs on the network.
12. When all the routing tables have been created, press the Shift and Esc Keys twice to return to the main offline menu.
13. Press the Shift and F1 Keys to go online with the PC. The main online menu will appear.
14. Select "N:Network support table." The following menu will be displayed.

```
[ Network support table ]
 N:Data link (SYSMAC NET)
 L:Data link (SYSMAC LINK)
 R:Routing table
```

15. Select “R:Routing table.” The routing tables registered in the CVSS will be displayed.

[Local Network Table]

#	Loc Netwk	SIOU unit #
1	001	00
2		
3		
4		
5		
6		
7		
8		

#	Loc Netwk	SIOU unit #
9		
10		
11		
12		
13		
14		
15		
16		

16. Press the End Key to access the following menu.

17. Select “L:Retrieve routing table.”
18. Input the name of the file to be loaded. If you do not know the name of the file, press the End Key to select the name from a file list.

    When the specified routing tables have been loaded, they will be displayed.
19. Press the End Key to access the following menu.

20. Select “T:Transfer routing table.”
21. If this is the first time routing tables have been transferred to a PC in the network, leave the default settings (network #0, node #0) and press the Enter Key. For all other PCs, specify the node address of the PC to receive the routing tables, and press the Enter Key. The transfer will begin.

    Note Routing tables can be transferred only to the local network, i.e., the network address must always be 0. When transferring to other nodes, specify only the node address of the target node. When transferring to another network, reconnect the CVSS to a PC in that network (making sure that only one CPU Bus Unit is mounted to it).
22. A message will be displayed to tell you when the transfer has finished. Press the Shift and Esc Keys and repeat the operation for all PCs in the network.

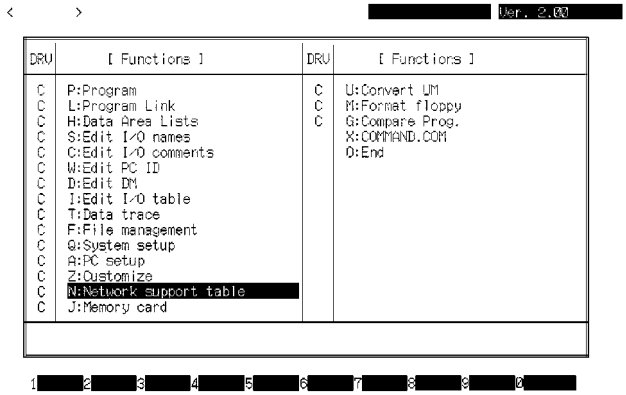
3-1-3 Data Link Tables

With SYSMAC NET Link Systems, data links can be allocated in memory either automatically or manually. Although manually allocating words for data links allows much greater freedom in the nature of the links that can be set, a data link table must be set up in the master designated for each network. The procedure for setting up data link tables is outlined in this section.

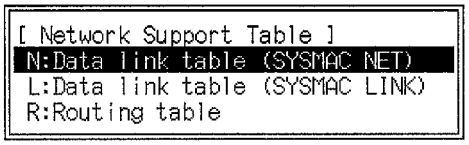
Before setting the data link tables, one of the nodes participating in the data link must be set as the master using "S:Comm unit settings" under "X:Communication Unit Setup" on the main online menu. Then precede as follows:

1, 2, 3...

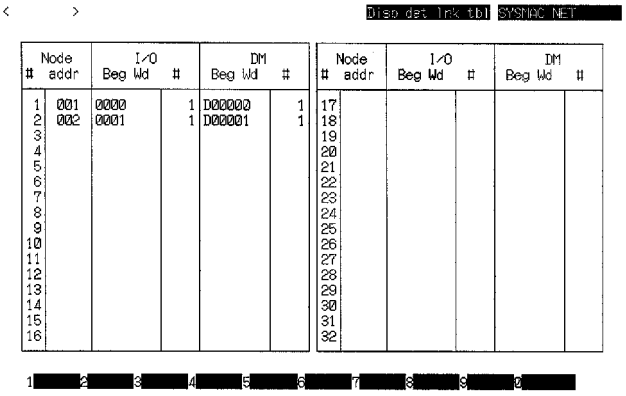
1. Place the CVSS offline with the PC by pressing the Shift and F1 Keys. The main offline menu will be displayed.



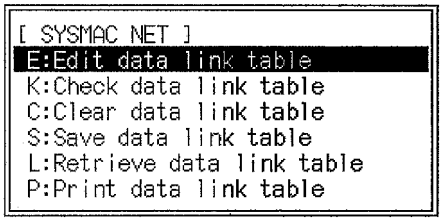
2. Select "N:Network support table" to access the following menu.



3. Select "N:Data link table (SYSMAC NET)." The data link table current registered in the CVSS will be displayed. An example is shown below.



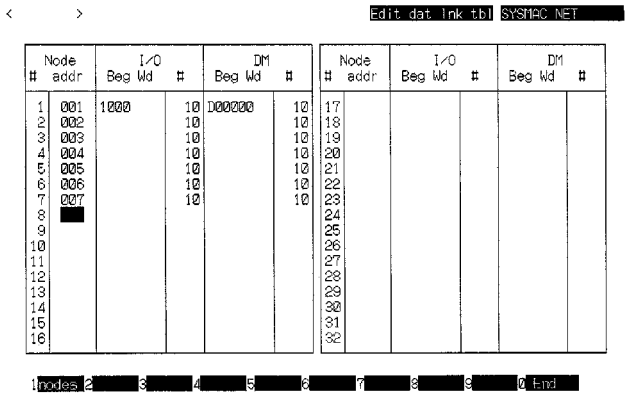
4. Press the End Key to access the following menu.



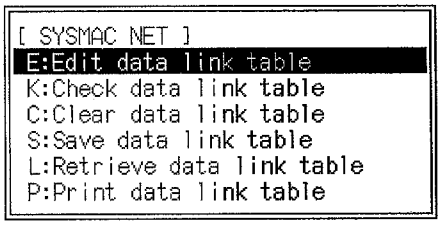
5. Select "E:Edit data link table," and input the words that are to be in the data link for each node that is to participate in the link. An example is shown below for network #1 on page 20. Input the value for each column in the table followed by the Enter Key. Be sure to input the upper case "D" prefix for ad-

dresses in the DM Area. It is necessary to input the first word addresses in the CIO (I/O) and DM Areas only for the first node in the table.

Note If the node numbers run consecutively from node #1, you can start by inputting the F1 Key and designating number of nodes to input all of the node numbers at once.

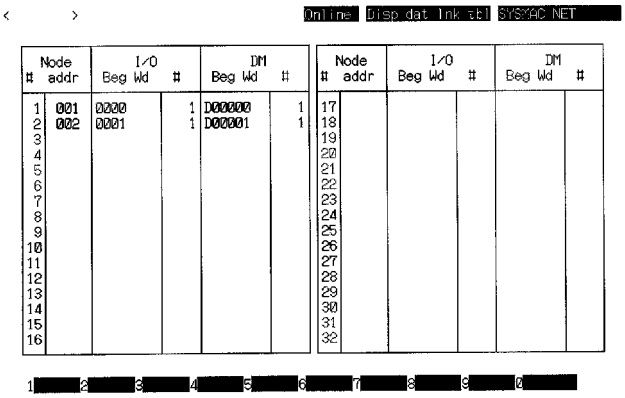


6. When all the required data has been input, press the F10 Key. The data link table will be saved to disk and the menu will appear.
7. To check the data link table, select "K:Check data link table." A message will appear when the check has been completed and should say that the table is okay.
8. Press the End Key to access the following menu.



9. Select "S:Save data link table," input the name of the file to which the table is to be saved, and press the Enter Key.
10. Input the heading, if one is desired, and press the Enter Key again.
11. When the save has finished, press the Shift and Esc Keys twice to return to the main offline menu.
12. Press the Shift and F1 Keys to place the CVSS online with the PC. The main online menu will appear.

13. Select “N:Network support table” and then select “N:Data link (SYSMAC NET).” The original data link table will be displayed. An example is shown below.



14. Press the End Key to access the menu and select “L:Retrieve data link table.”
15. Input the name of the file to load. If you do not know the name, press the End Key and select the name from the list that appears. The specified data link table will be loaded and displayed.
16. Press the End Key to access the menu and select “T:Transfer data link table.” Specify the network address and node address (or just the PC name) of the master node, using the Down Key to move between fields and press the Enter Key after inputting the last field.

    Note If routing tables have not been set, the network address must be set to 0 to specify the local network.

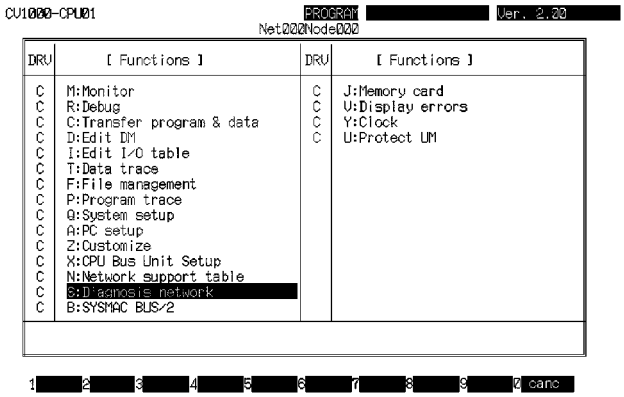
17. Select “W:Computer –> SYSMAC NET.” The data link table will be transferred.
18. When a message appears to indicate the transfer has been completed, press the Shift and Esc Keys and repeat the above procedure to transfer data link tables to any other networks requiring them.

3-1-4 Network Diagnostics

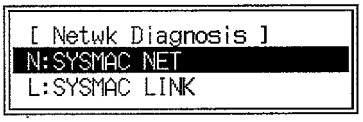
The following can be performed online to check the operation of the SYSMAC NET Link System: internode tests, node status displays, and error history displays. The following procedure outlines the steps required.

1, 2, 3... 1. Connect the CVSS to the PC and place it online by pressing the Shift and F1 Keys. The main online menu will appear.

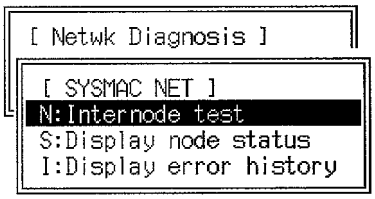
Note If routing tables have not yet been registered, be sure to connect the CVSS to a PC to which only one CPU Bus Unit is mounted to enable communicating with the network.



2. Select “S:Diagnosis network” to access the following menu.



3. Select “N:SYSMAC NET” to access the following menu. This is the SYSMAC NET diagnosis menu.

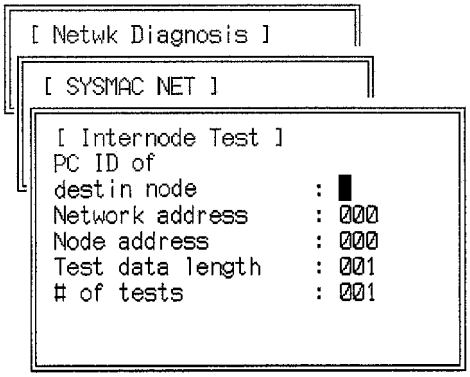


4. Select the desired test or display.

Note In the following procedures, input a network address of 0 to specify the local network if routing tables have not been registered.

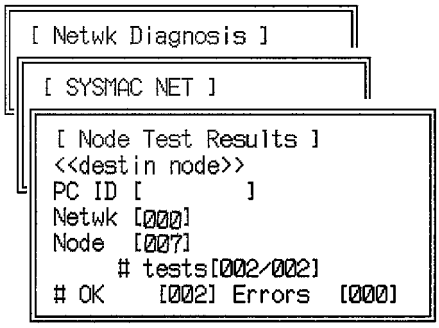
Internode Test

The internode test is a communications test conducted with a specified node on a specified network. When this test is selected, the following display will appear.



Input the PC ID (skipped here) or the network and node addresses, the test data length, and the number of tests, using the Down Key to move between fields and pressing the Enter Key after the last field has been entered. Then press the Enter Key when confirmation is requested.

When the test has been completed, results will be displayed.



Node Status Display

When the PC name or network and node addresses are specified, the following display will appear showing the status of the node. Here node #7 on network #0 has been designated.

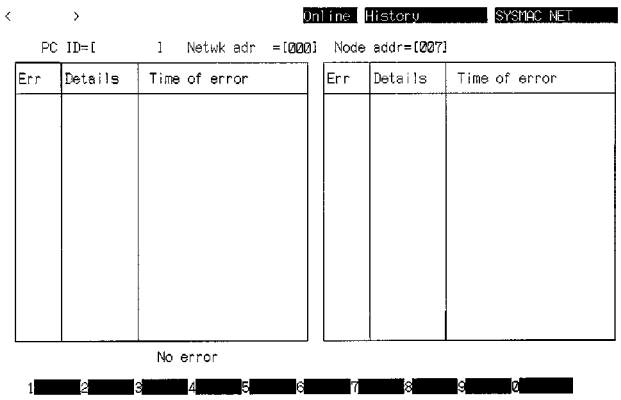
PC ID=[ ] Netwk adr =[000] Node addr=[007]

Operation status	
Data link	STOP
Internode test	STOP
Center power	No
Loop stat	Normal
Insert status	Rec OK

Error status

Unit Error History

When the PC name or network and node addresses are specified, the following display will appear showing the error history of the specified node. Here node #7 on network #0 has been designated.



Here, the F1 Key can be pressed to clear all errors from the Unit.

3-2 SYSMAC LINK Systems

There are various settings for SYSMAC LINK Systems including communications settings, routing tables, data link tables, network parameters, etc. The CVSS also provides diagnostic functions for SYSMAC LINK System communications.

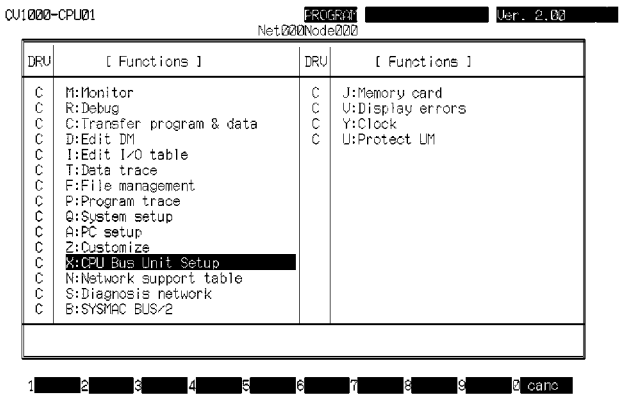
Similar settings and diagnostic functions for the SYSMAC NET Link System are described in *3-1 SYSMAC NET Link Systems*. Although most of these are slightly different for the two systems, the same routing tables are used by both. If the PC is connected to more than one network, routing tables will need to be set up before executing the following procedures.

3-2-1 Communications

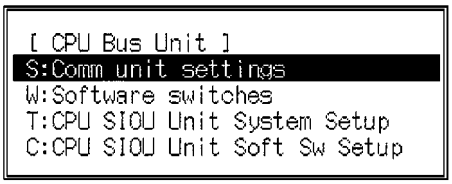
Communications settings must be performed online. Some of the main communications settings are outlined below.

1, 2, 3...

1. Place the CVSS in online mode by connecting the PC and entering the Shift and F1 Keys. The main online mode menu will appear as shown below.



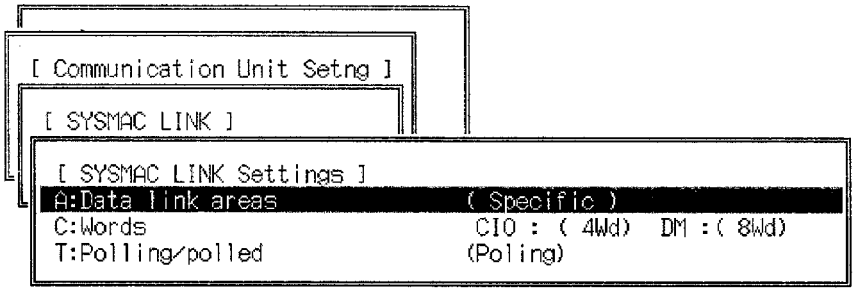
2. Select “X:CPU Bus Unit Setup” from the menu. The following menu will appear.



3. There are four sets of communications settings: Communications Unit Settings, Software Switches, CPU Bus Unit System Setup, and CPU Bus Unit Software Switches. Select Communications Unit Settings and Software Switches in turn and set as explained in the following descriptions. CPU Bus Unit System Setup and CPU Bus Unit Software Switches will support CPU Bus Units that OMRON will develop in the future.

Communications Unit Settings

When Communications Unit Settings is selected, specify SYSMAC LINK and then the unit number of the SYSMAC LINK Unit on the displays that will appear. When the unit number has been input, the following settings will appear.

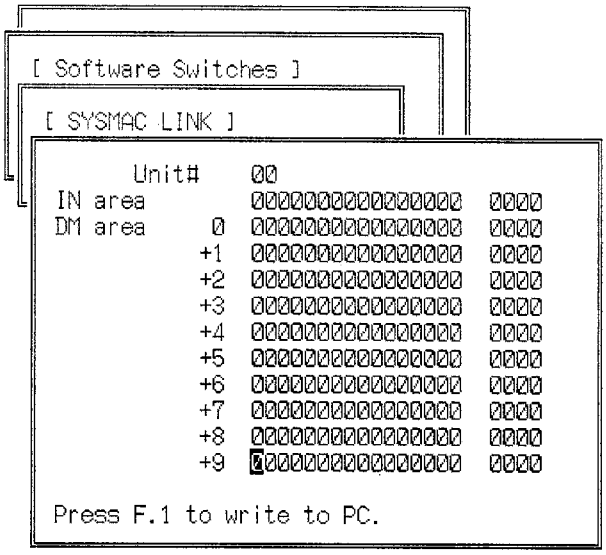


The system settings for SYSMAC LINK communications are outlined in the following table.

Setting	Meaning
A:Data link areas	Specifies whether data link words will be automatically allocated from designated areas (nltp:check areas in messages) or manually input by the user. If manual input is specified, the user can specify data links with greater freedom but must register all of the data link tables.
C:Words	Specifies the number of words to be linked per node. This setting is not valid if data link tables are input manually.
T:Polling/polled	Specifies whether the Unit can become the polling unit.

Software Switches

When software switches is selected, specify SYSMAC LINK and then the unit number of the SYSMAC LINK Unit on the displays that will appear. When the unit number has been input, the following display will appear.



The above display is a map of the software switches contained in the data areas of the PC for the SYSMAC LINK Unit. Software switches are used to control various aspects of System operations, such as data links and communications tests. For example, the rightmost bit in word 0 is the Data Link Start Switch. If this bit is set to 1 and then the F1 Key is pressed to write the setting to the PC, the data link will start.

If the word containing the Data Link Start Switch is set as part of the Holding Area and the Switch is set to 1, then the data link will automatically start when the PC is turned on. If the word is not set as part of the Holding Area, the data link will not start automatically and will stop whenever the PC mode is changed from PROGRAM or DEBUG mode to RUN or MONITOR mode. The other software switches are described in the *SYSMAC LINK System Manual*.

3-2-2 Routing Tables

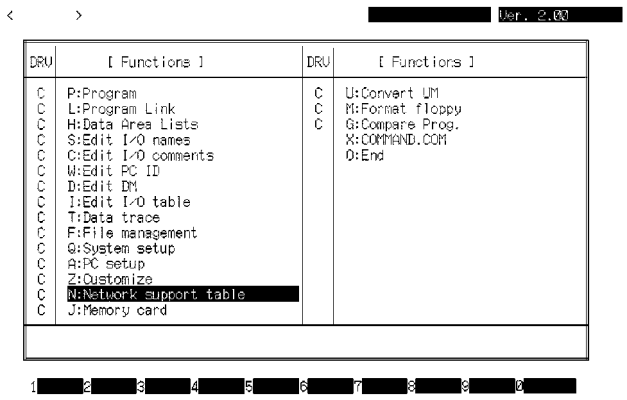
The same routing tables are used by both the SYSMAC LINK and SYSMAC NET Link Systems. Refer to *3-1-2 Routing Tables* for details.

3-2-3 Data Link Tables

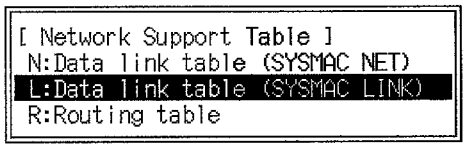
With SYSMAC LINK Systems, data links can be allocated in memory either automatically or manually. Although manually allocating words for data links allows much greater freedom in the nature of the links that can be set, data link tables must be set up in each node in the data link. There are two data link tables: common parameters and refresh parameters. The same common parameters must be set in each node that is a member of the same data link. The procedure for setting up data link tables is outlined in this section.

Before setting the data link tables, one of the nodes participating in the data link must be set for manual input of data link tables using “S:Comm unit settings” under “X:Communication Unit setup” on the main online menu. This node will be used to start the data link. Then precede as follows:

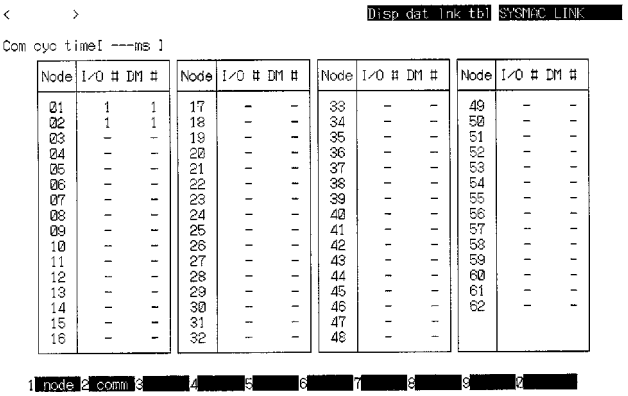
1, 2, 3... 1. Place the CVSS offline with the PC by pressing the Shift and F1 Keys. The main offline menu will be displayed.



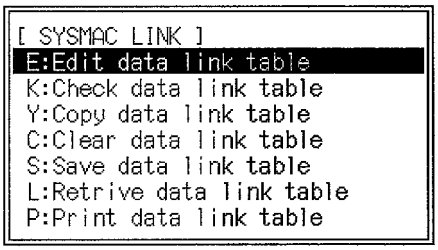
2. Select “N:Network support table” to access the following menu.



3. Select “L:Data link table (SYSMAC LINK).” The data link table current registered in the CVSS will be displayed. An example is shown below.

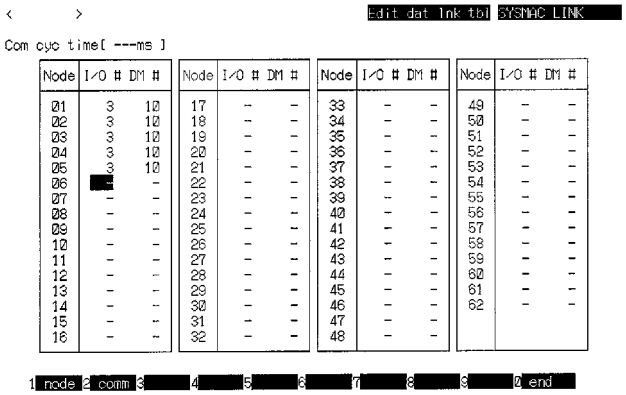


4. Press the End Key to access the following menu.

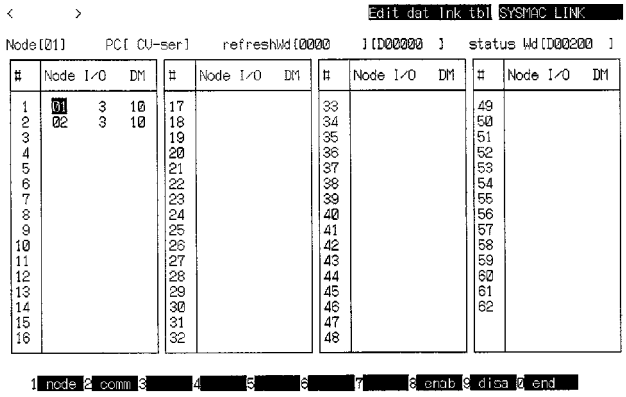


5. Select “E:Edit data link table,” and input the number of CIO (I/O) and DM Area words that are to be in the data link for each node, following each value with the Enter Key. These are the common parameters, which indicate the

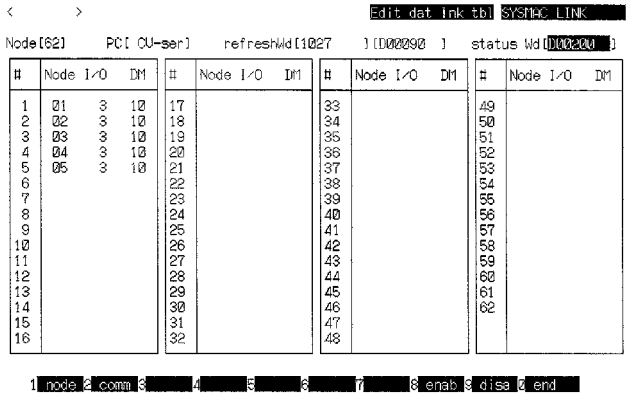
number of words sent by each node. An example is shown below for network #4 on page 22.



6. When all data has been input, press the PgDn Key to display the refresh parameter table for the first node. The node address will be displayed in the upper left corner.



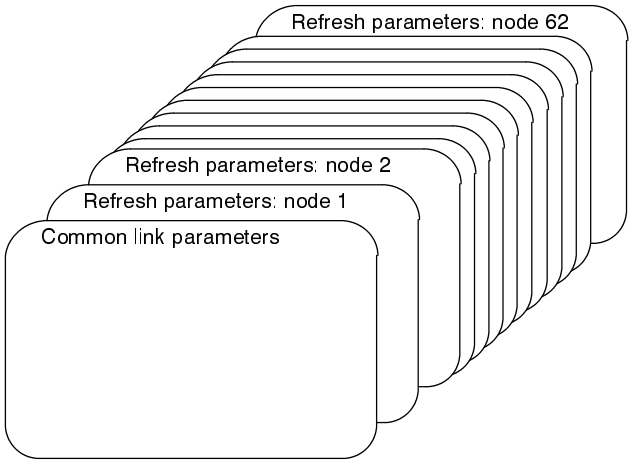
7. Press the F8 Key and input the highest node address that is to participate in the data link. Data for all nodes up to the specified node will be automatically transferred from the common parameter table to the refresh parameter table. “5” has been input for the example shown in step 8, below.
8. Move the cursor to the top line of the display and input the first I/O and DM Area words for the data link, using an uppercase D prefix for the DM Area address.



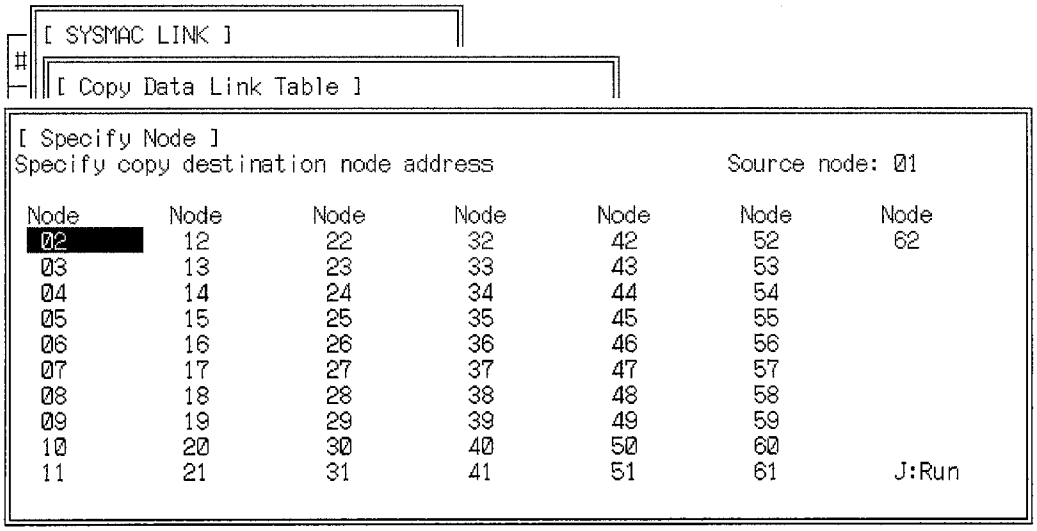
9. Move the cursor to each node that is not to be linked to the current node and press the Del Key to delete them from the refresh parameters. Do not delete the current node.

10. When all the refresh parameter table has been finished, press the F10 Key. The data link table will be saved to disk and the menu will appear.
11. Here, you can either copy the refresh parameter table from the node that already has one to the other nodes or you can press the PgDn Key to move to the refresh parameters for the next node and create it using the above procedure. This procedure is written to copy the tables.

    Note The data link tables are structured as continuous pages starting with the common link parameter table and continuing with the refresh parameter table for each node, as shown below. You can scroll through these pages with the PgUp and PgDn Keys.

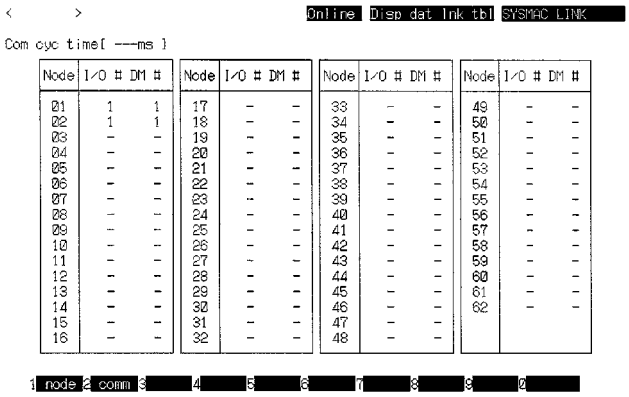


12. To copy refresh parameters for other nodes, select "Y:Copy data link table," and input the node address of the table to be copied. The following display will appear.



13. Move the cursor to the addresses of the nodes for which the data link table is to be copied and press the Enter Key. The "Yes" display will toggle when the Enter Key is pressed.
14. When all of the nodes for which copies are to be made have been designated, select "J:Run" from the lower right of the display. The table will be copied and the data link table will be displayed.
15. To check the data link tables, press the End Key to access the menu and select "K:Check data link table." A message will appear when the check has been completed and should say that the tables are okay.

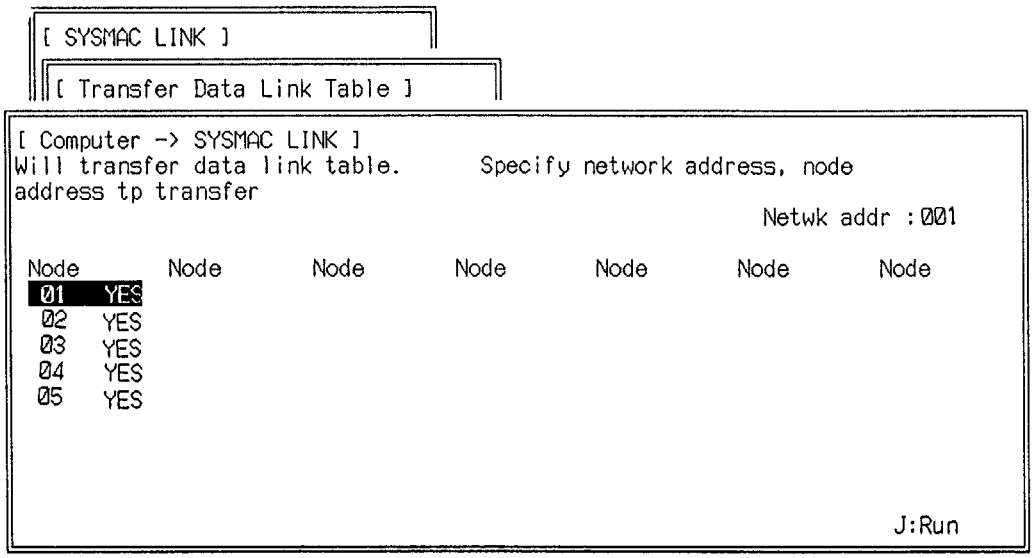
16. To save the data link tables, press the End Key to access the menu, select "S:Save data link table," input the name of the file to which the tables are to be saved, and press the Enter Key.
17. Input the heading, if one is desired, and press the Enter Key again.
18. When the save has finished, press the Shift and Esc Keys twice to return to the main offline menu.
19. Press the Shift and F1 Keys to place the CVSS online with the PC. The main online menu will appear.
20. Select "N:Network support table" and then select "L:Data link table (SYSMAC LINK)." The data link table registered in the CVSS will be displayed. An example is shown below.



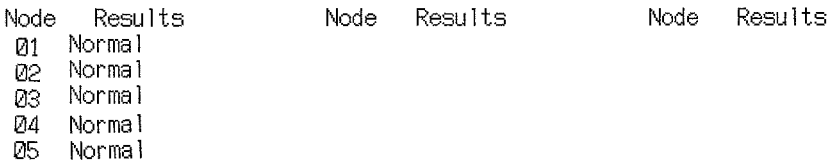
21. Press the End Key to access the menu and select "L:Retrieve data link table."
22. Input the name of the file to load. If you do not know the name, press the End Key and select the name from the list that appears. The specified data link table will be loaded and displayed.
23. Press the End Key to access the menu and select "T:Transfer data link table."
24. Select "W:Computer –> SYSMAC LINK," and specify the address of the network to which the transfer is being made.

    Note If routing tables have not been set, the network address must be set to 0 to specify the local network.

25. When the network address is specified, “Yes” will be displayed for every node in the network, as shown in the following example for network #3.



26. Move the cursor to the addresses of the nodes to which the data link tables are not to be transferred and press the Enter Key. The “Yes” display will toggle when the Enter Key is pressed.
27. When only the nodes for the transfer say “o,” select “J:Run” from the lower right of the display. The table will be transferred as a display showing the progress of the transfer for each node will be displayed as shown below.

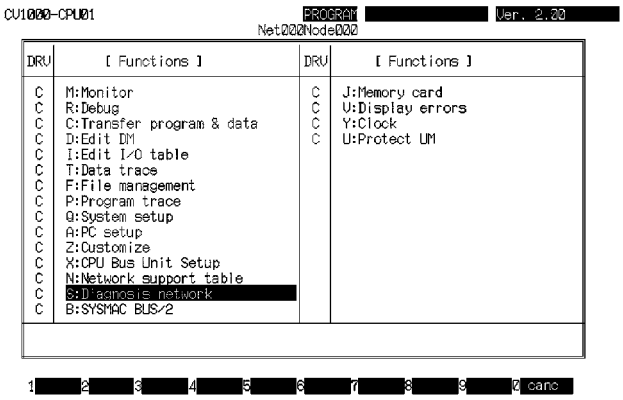


28. When a message appears to indicate the transfer has been completed, press the Shift and Esc Keys and repeat the above procedure to transfer data link tables to any other networks requiring them.

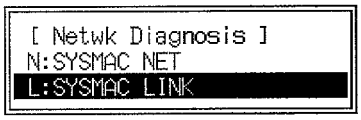
3-2-4 Network Parameters

Network parameters must be set for SYSMAC LINK Systems to enable network communications. These parameters control network communications and include the communications cycle time, number of Units polled during each cycle, etc. The procedure for setting network parameters is outlined in the following.

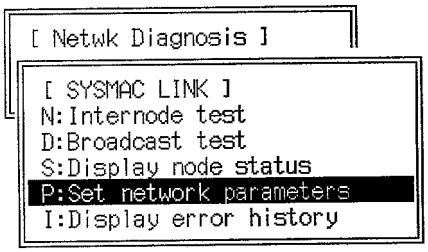
1, 2, 3... 1. Connect the CVSS to the PC and place it online with the PC by pressing the Shift and F1 Keys. The main online menu will appear.



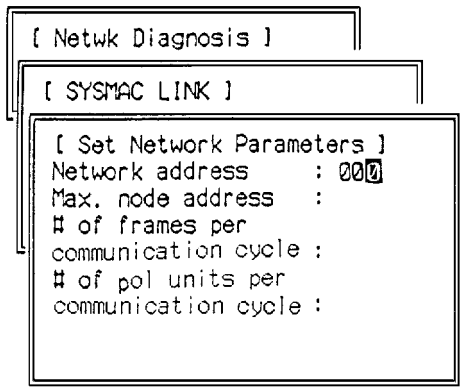
2. Select “S:Diagnosis network.” The following menu will be displayed.



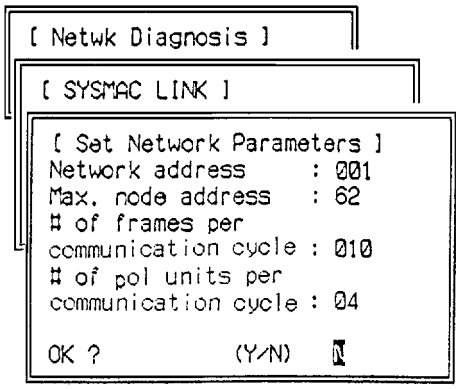
3. Select “L:SYSMAC LINK.” The following menu will be displayed.



4. Select “P:Set network parameters.” The following list of parameters will be displayed.



5. Input the address of the node for which network parameters are to be set and press the Enter Key. The current settings for the specified network will be displayed. An example is shown below.



6. Move the cursor with the Up and Down Keys and input the setting for any parameter that requires changing. You must input all leading zeros. The parameters are described in the following table.

Parameter	Meaning
Maximum node address	The highest node address that can be part of the network. This parameter is used to eliminate time polling non-existing Units.
Number of frames per communications cycle	The maximum number of communications that can be simultaneously processed during the same communications cycle. Increasing the number of frames will cause longer communications cycles, but reducing it too much will result in communications errors.
Number of polled units per communications cycle	The number of Units (nodes) that are checked for proper polling during each communications cycle. If the number of Units is increased, the communications cycle will be longer but Units that are separated from network communications will be recovered faster.

7. When all parameters have been set, press the Enter Key and then press the Y and Enter Keys to confirm.

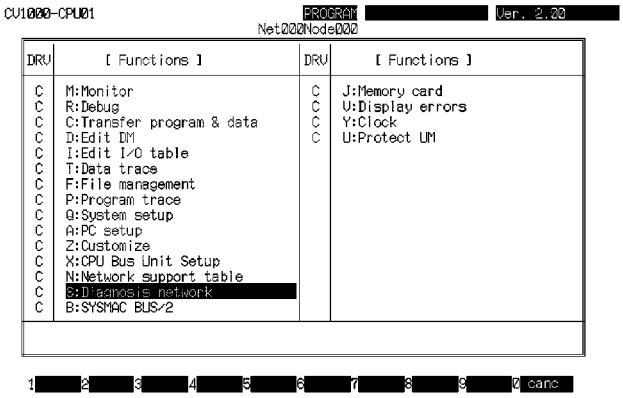
3-2-5 Network Diagnostics

The following can be performed online to check the operation of the SYSMAC LINK System: internode tests, broadcast test, node status displays, and error history displays. The following procedure outlines the steps required.

1, 2, 3...

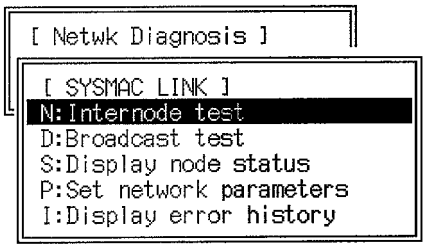
1. Connect the CVSS to the PC and place it online by pressing the Shift and F1 Keys. The main online menu will appear.

Note If routing tables have not yet been registered, be sure to connect the CVSS to a PC to which only one CPU Bus Unit is mounted to enable communicating with the network.



2. Select “S:Diagnosis network” to access the following menu.

3. Select “L:SYSMAC LINK” to access the following menu. This is the SYSMAC LINK diagnosis menu.

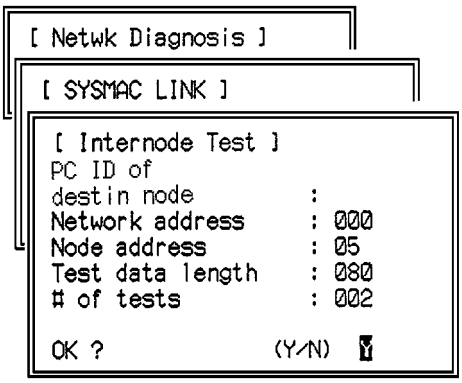


4. Select the desired test or display.

Note In the following procedures, input a network address of 0 to specify the local network if routing tables have not been registered.

Internode Test

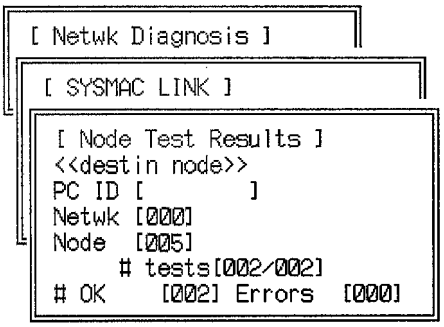
The internode test is a communications test conducted with a specified node on a specified network. When this test is selected, the following display will appear.



Input the PC ID (skipped here) or the network and node addresses, the test data length, and the number of tests, using the Down Key to move between fields and

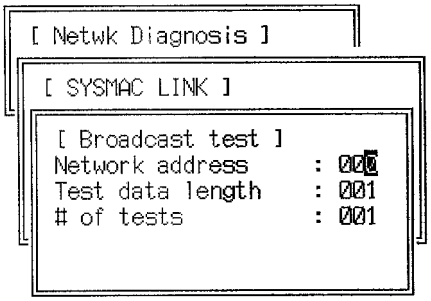
pressing the Enter Key after the last field has been entered. Then press the Enter Key when confirmation is requested.

When the test has been completed, results will be displayed.



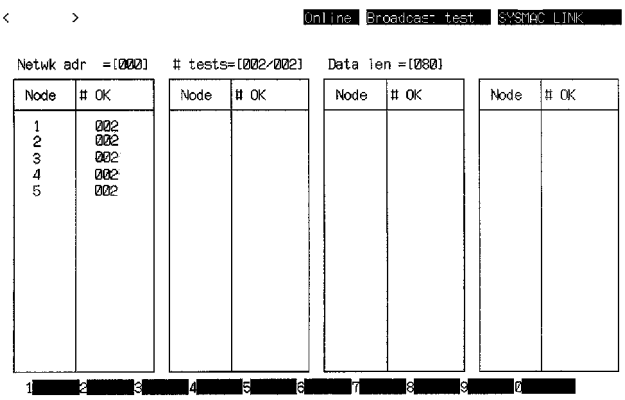
Broadcast Test

The broadcast test is a communications test conducted with all nodes on a specified network. When this test is selected, the following display will appear.



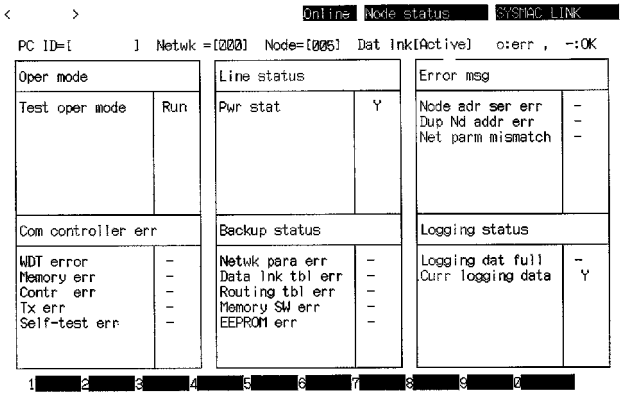
Input the network addresses, the test data length, and the number of tests, using the Down Key to move between fields and pressing the Enter Key after the last field has been entered. Then press the Enter Key when confirmation is requested.

When the test has been completed, results will be displayed.



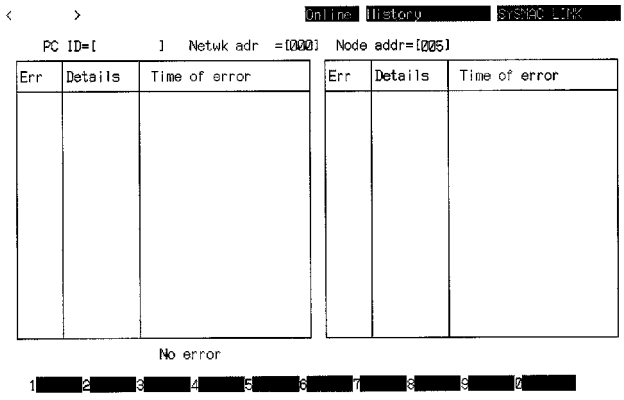
Node Status Display

When the PC name or network and node addresses are specified, the following display will appear showing the status of the node. Here node #5 on network #0 has been designated.



Unit Error History

When the PC name or network and node addresses are specified, the following display will appear showing the error history of the specified node. Here node #5 on network #0 has been designated.



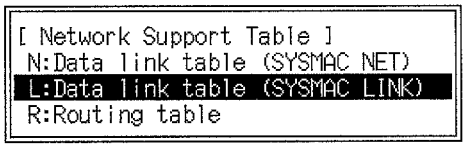
Here, the F1 Key can be pressed to clear all errors from the Unit.

3-3 Adding C-series PCs to SYSMAC LINK Systems

The following procedure shows how to add a C-series PC to a SYSMAC LINK System by modifying and retransferring the data link tables.

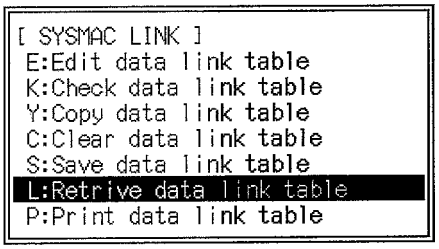
1, 2, 3...

1. Place the CVSS offline with the PC by pressing the Shift and F1 Keys. The main offline menu will be displayed.
2. Select “N:Network support table” to access the following menu.

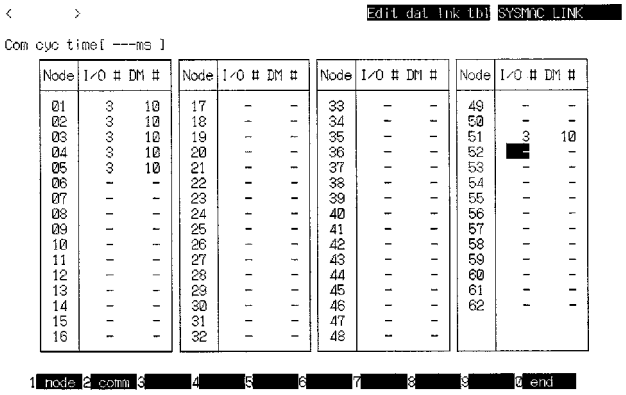


3. Select “L:Data link table (SYSMAC LINK).” The data link table current registered in the CVSS will be displayed.

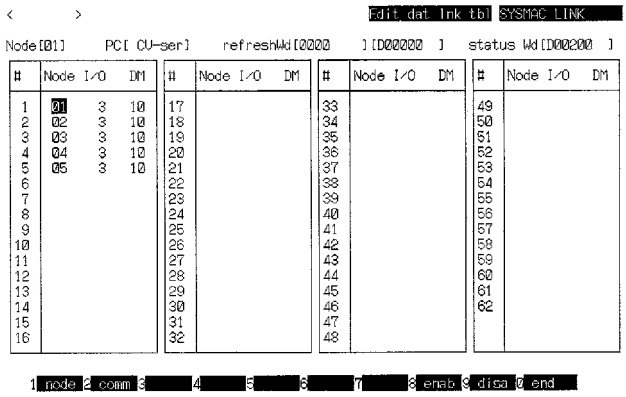
4. Press the End Key to access the following menu.



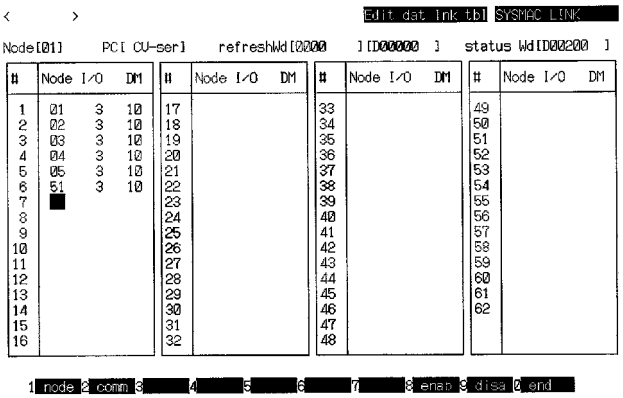
5. Select “L:Retrieve data link table.”
6. Input the name of the file to load. If you do not know the name, press the End Key and select the name from the list that appears. The specified data link tables will be loaded and displayed. Here we’ll use LK3, the data link tables saved in *3–2–3 Data Link Tables* (network #4 on page 20).
7. When the common parameter table appears, press the End Key to access the menu and select “E:Edit data link table.”
8. Move the cursor to the position of the node that needs to be added and input the number of I/O and DM Area words. The example shows 3 I/O words and 10 DM Area words for node #51.



9. Press the PgDn Key to display the refresh parameters for node #1.

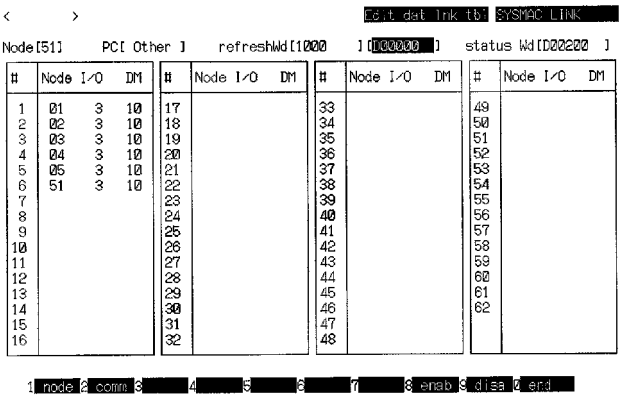


10. Move the cursor to #6, input “51,” and press the Enter Key to add node #51.



11. Return to item 10. on page 37 and following the procedure to copy the refresh parameter table for all nodes in the network, but don’t forget to add node 51 as one of the nodes for which the table is to be copied. You can also create refresh parameters individually for each node.
12. The common link parameter table should be displayed. The next step is to correct the refresh parameter table for the C-series PC at node 51. Press the End Key to access the menu and select “E:Edit data link table.”
13. Press the F1 Key and specify node #51. The refresh parameter table for node #51 will be displayed.
14. Move the cursor to the top of the table and change the PC specification to “Other” (not a CV-series PC) and change the first word specifications to anything but 0000. Word 1000 has been used in the following example.

    Note Data links are not possible for C-series PCs if the first refresh word is set to 0. Data links must be set between word 1000 and word 1999 for C-series PCs.



15. Press the F10 Key when the above inputs have been completed.

You can now check, save, reload (online), and transfer the data link tables to the nodes. These procedure is the same as for other SYSMAC LINK Systems. Refer to steps 15. on, starting on page 37.

SECTION 4
Startup Examples

The section provides example startup procedures for various PC Systems. The first group of examples is for CV-series Systems that do not include a SYSMAC LINK System or SYSMAC NET Link System, the second group of examples is for CV-series Systems that include a SYSMAC LINK System and/or SYSMAC NET Link System, and the third group of examples is for mixed C-series–CV-series Systems that include a SYSMAC LINK System or SYSMAC NET Link System. The information in the very first example (*4-1-1 PCs with Basic I/O Units Only*) is relevant to starting up any PC System, and it is assumed that this procedure will be followed for any PC System before proceeding to set up a SYSMAC NET Link or SYSMAC LINK System.

The examples in this section are designed as overviews only and assume that communications settings are used as close to their default settings as possible. Please refer to the earlier portions of this guidebook for further general information on SYSMAC LINK and SYSMAC NET Link Systems and on CVSS operations. Please refer to the CVSS operation manuals for details.

All of the examples in this section assume that you have the required PC System components, the CVSS running on a compatible computer, and a cable for connecting the computer and the PC.

4-1 Basic CV-series Systems

The first part of this section shows the basic steps necessary to install, set up, program, and start a basic system that includes only basic I/O Units. The second part goes on to show the additional steps that can be taken to control I/O word allocation when setting up the same type of System with the addition of a SYSMAC BUS/2 Remote I/O System.

4-1-1 PCs with Basic I/O Units Only

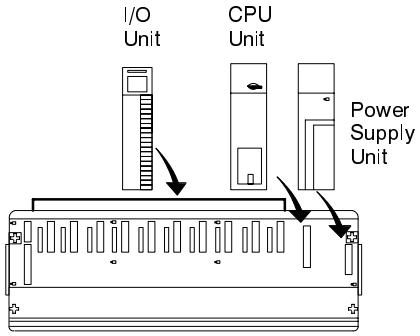
The following information is necessary to start up any PC System.

Preparations

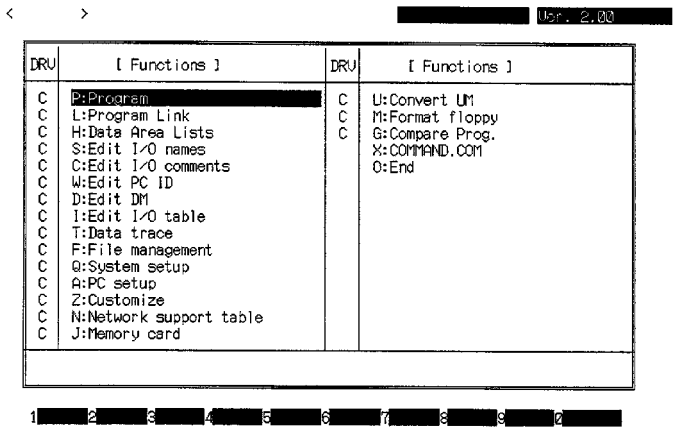
The following steps are necessary to set up the PC System and CVSS.

1, 2, 3...

1. Set up the following PC.



2. Make backup copies of the System Disks containing the CVSS and then install the CVSS onto the hard disk of the computer.
3. When the main offline menu appears, set up the operating environment for the CVSS. The main offline menu is shown below.



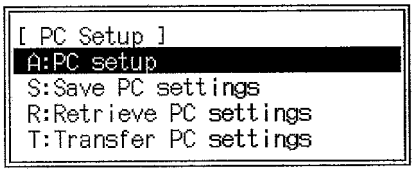
4. Connect the computer to the PC and turn on power to the PC.
5. Turn the key switch on the CPU to “NORMAL.”
6. Place the CVSS online with the PC by entering the Shift and F1 Keys. The main online menu should appear on the screen and you should be ready to actually start setting up the PC System.

PC Setup

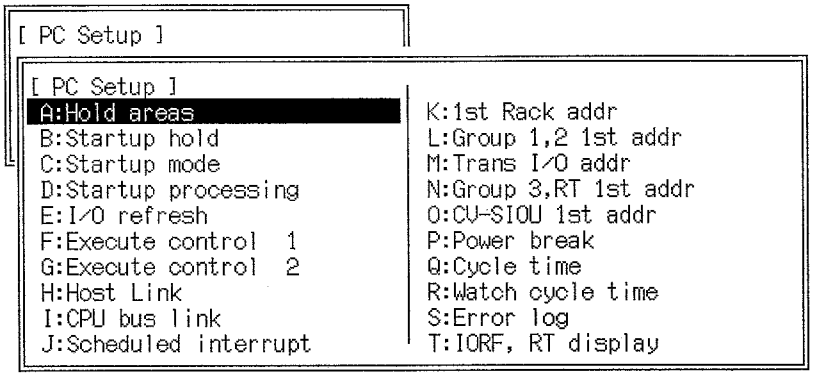
Before programming the PC, the operating parameters in the PC Setup must first be changed if different from the default settings.

1, 2, 3...

1. Select "A:PC setup" from the main online menu. The following menu will appear.



2. When "A:PC setup" is selected from the above menu. A list of the PC settings will appear as shown below.



3. Change any PC settings that need to be different from the default settings.

Note Any of the settings in the PC Setup that are changed online are changed directly in the memory of the PC. These settings will affect PC operation from the next time that PC power is applied. If you change any settings, be sure to turn the PC power off and then back on before preceding.

I/O Table Registration

Before the PC can operate, an I/O table must be created and registered to allocate I/O words to the Units in the System.

1, 2, 3...

1. Return to the main online menu and select "I:Edit I/O table." The current I/O table will be displayed.
2. Press the End Key to access the menu shown below.

3. Select "C:Create I/O table" and then confirm I/O table creation on the messages that will appear. An I/O table will be created from all the I/O Units detected by the CPU.

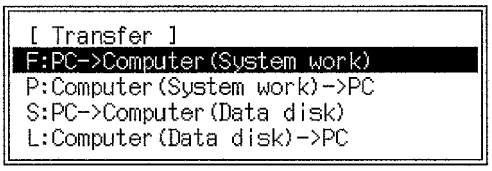
Program Transfer

Once the I/O table has been registered, the program can be transferred to the PC and trial operation and debugging can begin. The program would be input using the CVSS. The following procedure outlines how to transfer a program that has already be input and checked on the CVSS.

1, 2, 3...

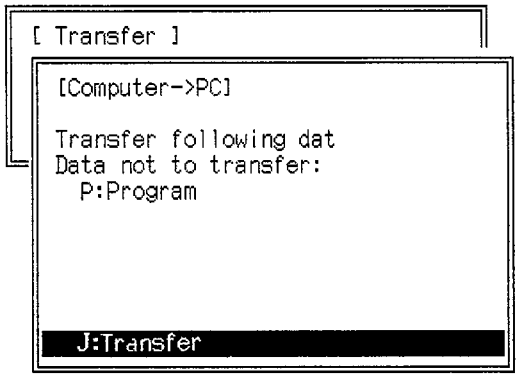
1. In offline mode, convert the program using the "U:Convert UM" operation from the main offline menu on the CVSS. This operation will convert the SFC/ladder program to executable code and create a copy on the disk.

2. Switch back to online mode and select "C:Transfer program & data" from the main online menu. The following menu will appear.



3. Select "L:Computer (Data disk)–> PC" from the above menu and then delete everything but "P:Program" from the display that appears so that it looks like the following.

Note Data in the PC will be overwritten if the transfer operation is executed with any items other than the program left on the display.



Starting Operation

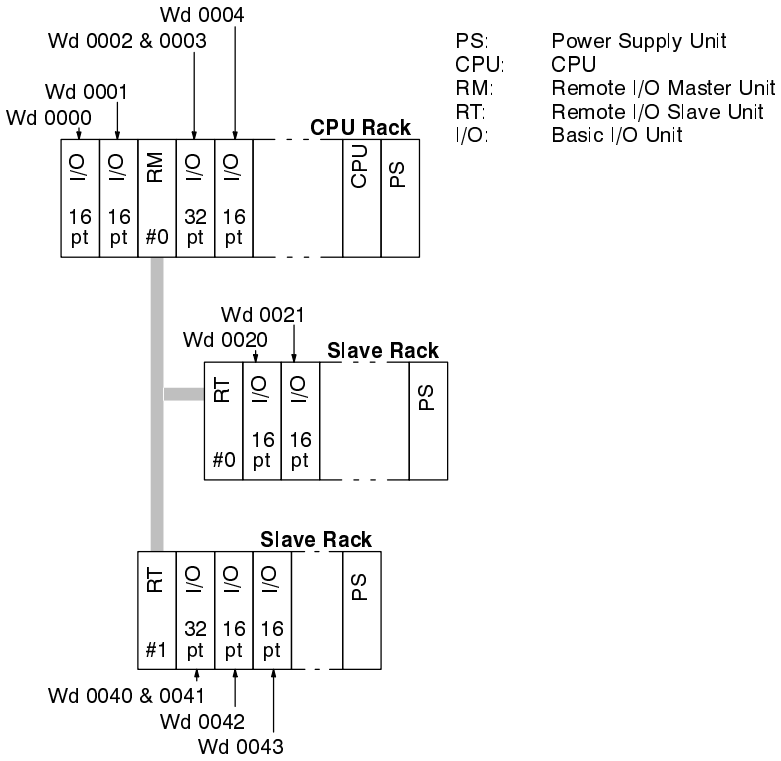
Once the program has been transferred, PC operation can be started by switching the PC to MONITOR or RUN mode. Press the Shift and F7 Keys to switch the PC to RUN mode. Press the Shift and F8 Keys to switch the PC to MONITOR mode.

4-1-2 PCs with a SYSMAC BUS/2 Remote I/O System

The following information outlines the additional steps that can be incorporated to control I/O word allocation when adding a SYSMAC BUS/2 Remote I/O System to the basic System shown in *4-1-1 PCs with Basic I/O Units* only.

System Configuration and I/O Word Allocation

The following system configuration shows the type of I/O word allocation that is possible with Remote I/O Systems. The allocations can be determined in advance as shown and then controlled using the PC Setup.



Note Remote I/O Master Units have both unit numbers, which are set by the user, and master numbers, which are automatically allocated to the Masters by the System from 0 and in order of the unit numbers set for them. The master numbers are shown in the system configuration. The numbers for the Remote I/O Slave Units are not the unit numbers set on the Slaves, but numbers automatically allocated to the Slaves by the System from 0 and in order of the unit numbers set for them.

Changing I/O Allocations Offline

The first I/O word allocated to each Slave Rack can be set in the PC Setup. This can either be done offline and then the settings transferred to the PC, or the settings can be done online in one step.

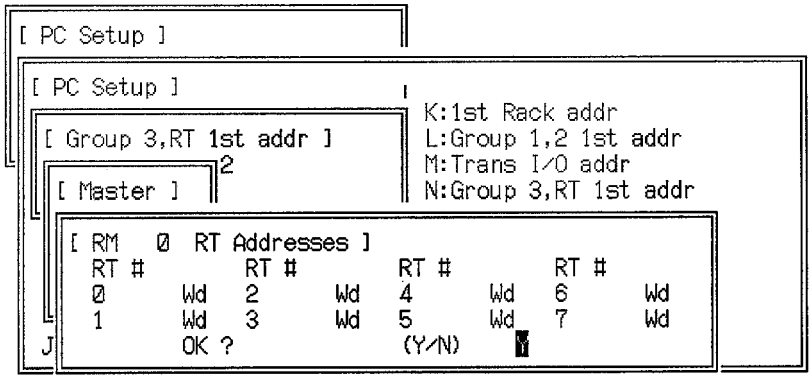
Changing I/O Allocations

The first word allocated to each Slave Rack can be changed on disk by changing the PC Setup offline.

1, 2, 3...

1. Select “A:PC setup” from the main offline menu.
2. Select “A:PC setup” again.
3. Select “N:Group 3,RT 1st addr” and then “A:SYSMAC BUS/2.”

4. Input the master number; the following display will appear. This display can be used to specify the first word allocated to each Slave Rack.



Saving PC Settings

Once the above settings have been set, the new PC System Settings are saved.

1, 2, 3...

1. Select "A:PC setup" from the main offline menu.
2. Select "S:Save PC Settings."
3. Input the file name and heading.

Transferring I/O Allocations

Once the desired PC Setup has been saved on disk, they can be transferred to the PC.

1, 2, 3...

1. Place the CVSS online.
2. Select "A:PC setup" followed by "R:Retrieve PC Settings."
3. When the PC System Setting have been loaded, select "T:Transfer PC settings" followed by "C:Computer –> PC."

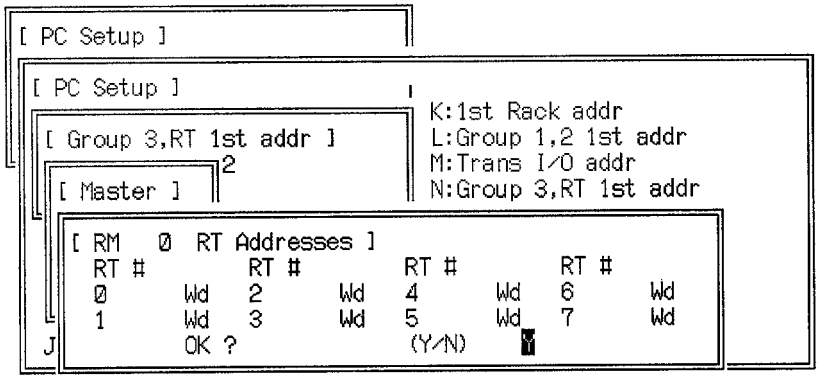
Note The power to the PC must be turned off and then back on before the new PC Setup will be enabled.

Changing I/O Allocations Online

The first word allocated to each Slave Rack can be changed directly in the PC by changing the PC Setup online as outlined below.

1, 2, 3...

1. Select "A:PC setup" from the main online menu.
2. Select "A:PC setup" again.
3. Select "N:Group 3,RT 1st addr" and then "A:SYSMAC BUS/2."
4. Input the master number; the following display will appear. This display can be used to specify the first word allocated to each Slave Rack.



Note The power to the PC must be turned off and then back on before the new PC Setup will be enabled.

4-2 CV-series Systems with Networks

This section outlines the startup procedures for networks within the PC System.

4-2-1 SYSMAC NET Link Systems

The first of the following examples shows how to set up a basic SYSMAC NET Link System, including data links. The second example shows how to set up a SYSMAC NET Link System with multiple networks so that communications can take place between the various networks.

The following procedures assume that the basic PC System and CVSS are already set up and ready to use. If the PC is connected to more than one network, routing tables will need to be set up before executing the following procedures.

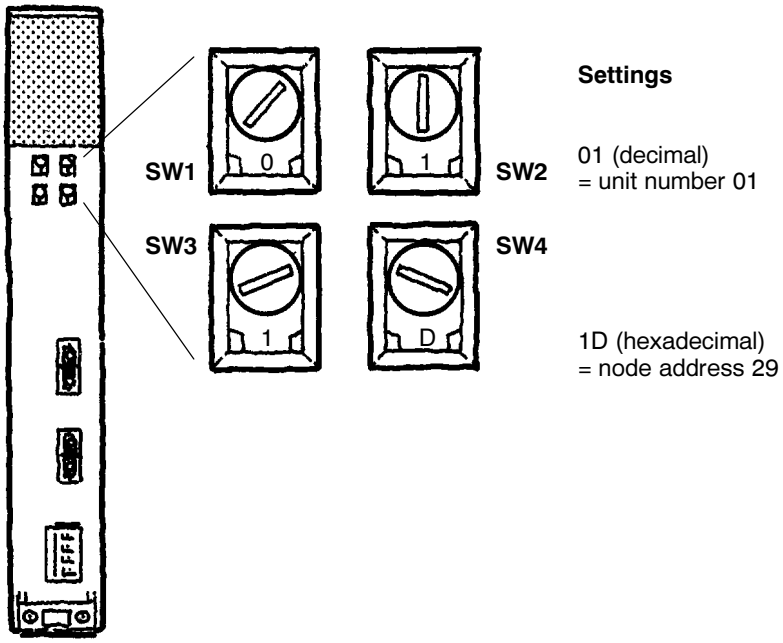
Single-level Systems

Preparations

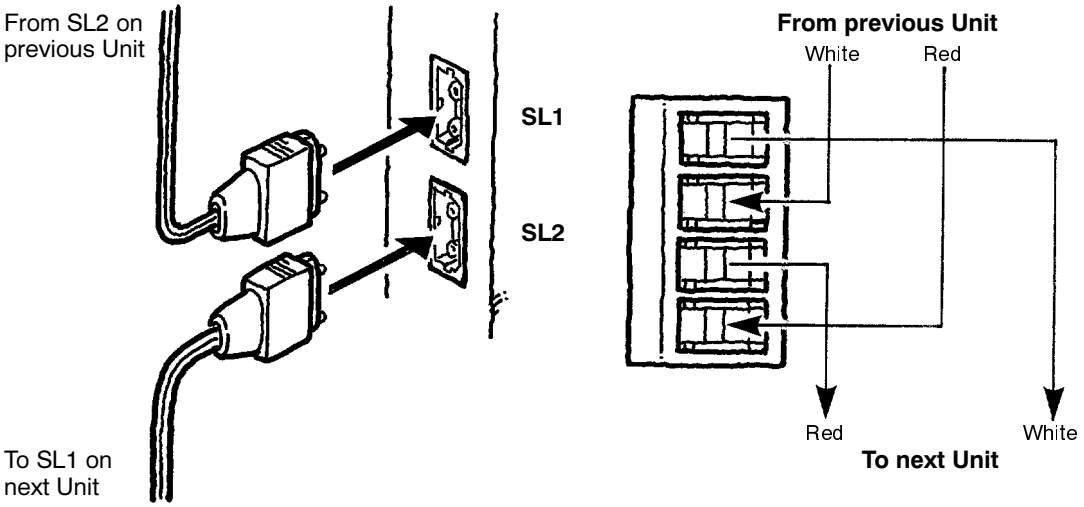
Perform the following steps before turning on power to the System.

1, 2, 3...

1. Mount the SYSMAC NET Link Units.
2. Set the unit number on the top two switches (SW1 and SW2) and the node address on the bottom two switches (SW3 and SW4) on each Unit. The unit number is set as a decimal number and must be between 00 and 15. The node address is set as a hexadecimal number and must be between 01 and 7E (01 and 126). The locations of these switches and setting examples are shown below.



3. Connect each Unit to the previous node and the next node in the network using optical communications cables as shown below. Be sure that connectors are oriented properly before inserting them.



4. Check the communications path to be sure that there are no breaks in it.

Basic System Setup

If you have not already done so, refer to the procedures given in *4-1 Basic CV-series Systems* and do the following:

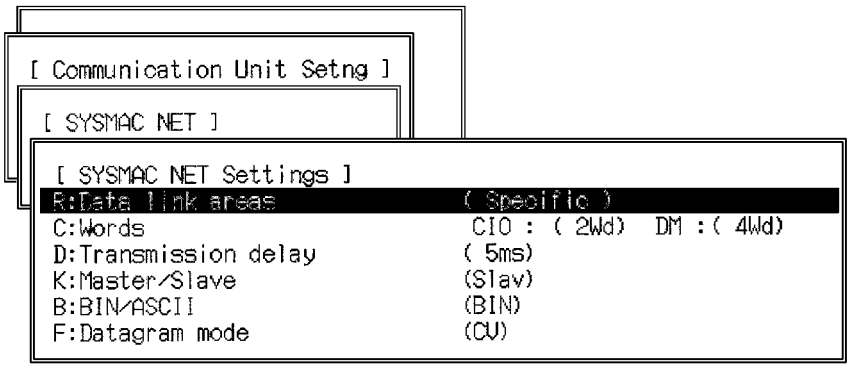
- Set up the CVSS.
- Turn ON power.
- Check the setting for the CVSS.
- Check the PC Setup.
- Create and transfer the I/O tables.

Communications Settings

The following procedure can be used to set the parameters that will control network communications.

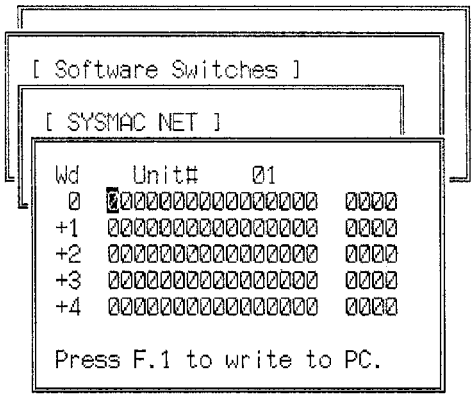
1, 2, 3...

1. Place the CVSS in online mode and select "X:CPU Bus Unit Setup" from the menu.
2. Select "S:Comm unit settings" and then "N:SYSMAC NET."
3. Input the unit number of the SYSMAC NET Link Unit on the displays that will appear. When the unit number has been input, the following settings will appear. Check the settings and change any that should be different.



4. If you are using data links, return to the menu that appears when "X:CPU Bus Unit Setup" is selected, and select "W:Software switches" and then "N:SYSMAC NET."

5. Input the unit number of the SYSMAC NET Link Unit that has been set as the master. When the unit number has been input, the following display will appear. Check the settings and change any that should be different.



The above display is a map of the software switches contained in the data areas of the PC for the SYSMAC NET Link Unit. Software switches are used to control various aspects of System operations, such as data links and communications tests. For example, the rightmost bit in the top word is the Data Link Start Switch. If this bit is set to 1 and then the F1 Key is pressed to write the setting to the PC, the data link will start.

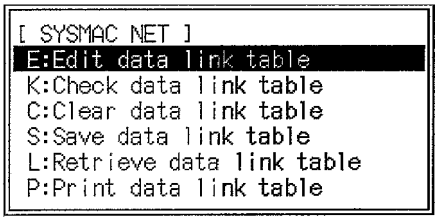
If the word containing the Data Link Start Switch is set as part of the Holding Area and the Switch is set to 1, then the data link will automatically start when the PC is turned on. If the word is not set as part of the Holding Area, the data link will not start automatically and will stop whenever the PC mode is changed from PROGRAM or DEBUG mode to RUN or MONITOR mode. The other software switches are described in the *SYSMAC NET Link System Manual*.

Creating Data Link Tables

The following procedure can be used to manually specify data links. If you are not going to use data links or are going to have them automatically generated, the following procedure is not necessary.

1, 2, 3...

1. Place the CVSS offline and select "N:Network support table" from the menu.
2. Select "N:Data link table (SYSMAC NET)" from the next menu. The data link table currently registered in the CVSS will be displayed.
3. Press the End Key to access the following menu.



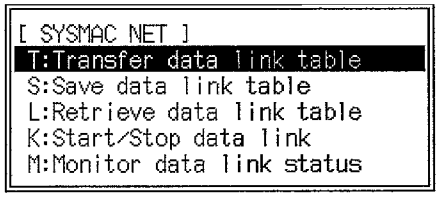
4. Select "E:Edit data link table," and input the words that are to be in the data link for each node that is to participate in the link.
5. Press the F10 Key. The data link table will be saved to disk and the menu will appear.
6. To check the data link table, select "K:Check data link table."
7. Press the End Key to access the menu.
8. Select "S:Save data link table," input the name of the file to which the table is to be saved, and press the Enter Key.
9. Input the heading, if one is desired, and press the Enter Key again.

10. When the save has finished, press the Shift and Esc Keys twice to return to the main offline menu.

Transferring Data Link Tables The following procedure can be used to transfer data link tables to the PCs. If you are not going to use data links or are going to have them automatically generated, the following procedure is not necessary.

1, 2, 3...

1. Place the CVSS online with the PC, select "N:Network support table" and then select "N:Data link (SYSMAC NET)." The data link table registered in the CVSS will be displayed.
2. Press the End Key to access the following menu.



3. Select "L:Retrieve data link table."
4. Input the name of the file to load.
5. Press the End Key to access the menu and select "T:Transfer data link table."
6. Specify the node to which the data link table is to be transferred and press the Enter Key.
7. Select "W:Computer –> SYSMAC NET." The data link table will be transferred.
8. When a message appears to indicate the transfer has been completed, press the Shift and Esc Keys and repeat the above procedure to transfer data link tables to any other networks requiring them.

Multilevel Systems

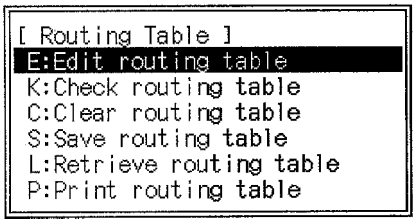
The following procedures show how to set routing tables so that data can be transferred between multiple networks. Before starting, complete the procedures for Single-level Systems through *Basic System Setup* on page 54. If data links are to be designated manually, they should also be set as described for Single-level Systems.

Communications Settings Use the same procedures as those given for Single-level Systems to set communications parameters.

Setting Up Routing Tables Routing tables are first set and checked offline using the following procedure.

1, 2, 3...

1. Select "N:Network support table" from the main offline menu.
2. Select "R:Routing table" and then press the End Key to access the following menu.



3. Select "E:Edit routing table" and create the local routing table.
4. Press the PgUp or PgDn Key to access the relay routing table and input the required data.

5. When the relay routing table has been completed, press the F10 Key. The routing tables will be saved in memory, and the table and a menu will be displayed.
6. Select "K:Check routing table." If there are no detectable errors in the display, a message will indicate that the tables are okay.
7. Press the End Key to access the menu and select "S:Save routing table."
8. You will be asked for a file name and heading. Input these, following each with the Enter Key. (The heading can be left blank.)
9. Press the End Key and repeat the above procedure until you have created routing tables for all PCs on the network.
10. When all the routing tables have been created, press the Shift and Esc Keys twice to return to the main offline menu.
11. Press the Shift and F1 Keys to go online with the PC. The main online menu will appear.

Transferring Routing Tables

Routing tables are transferred to the PCs online using the following procedure.

1, 2, 3...

1. Select "N:Network support table" from the main online menu.
2. Select "R:Routing table." The routing tables registered in the CVSS will be displayed.
3. Press the End Key to access the following menu.

4. Select "L:Retrieve routing table."
5. Input the name of the file to be loaded.
6. Press the End Key to access the menu.
7. Select "T:Transfer routing table."
8. Specify the node address of the PC to receive the routing tables and press the Enter Key. Transfer the routing table to the PC to which the CVSS is connected first.
9. Select "W:Computer –> PC." The transfer will begin.
10. A message will be displayed to tell you when the transfer has finished. Press the Shift and Esc Keys and repeat the operation for all PCs in the network.
11. To transfer routing tables to PCs in other networks, reconnect the CVSS to a PC in the target network and repeat the above procedure.

4-2-2 SYSMAC LINK Systems

The first of the following examples shows how to set up a basic SYSMAC LINK System, including data links. The second example shows how to set up a SYSMAC LINK System with multiple networks so that communications can take place between the various networks.

The following procedures assume that the basic PC System and CVSS are already set up and ready to use. If the PC is connected to more than one network, routing tables will need to be set up before executing the following procedures.

Single-level Systems

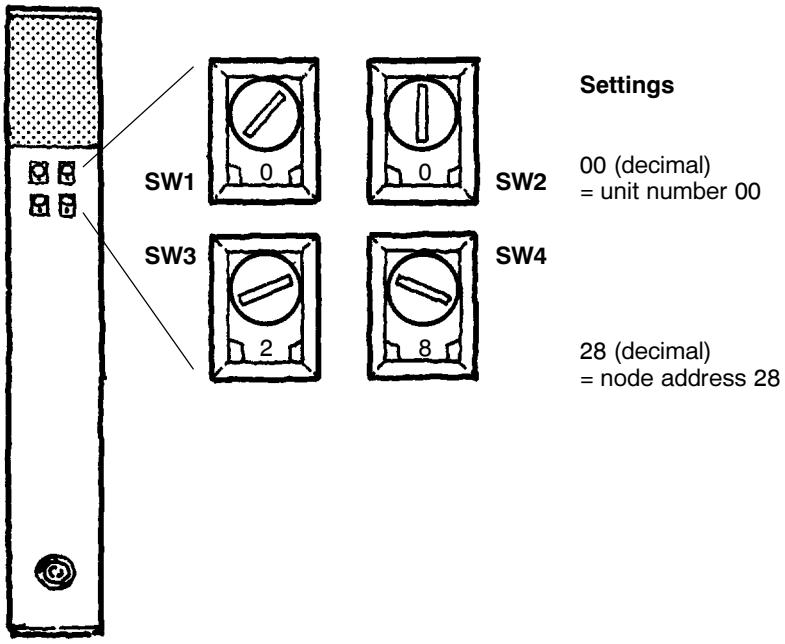
Preparations

Perform the following steps before turning on power to the System.

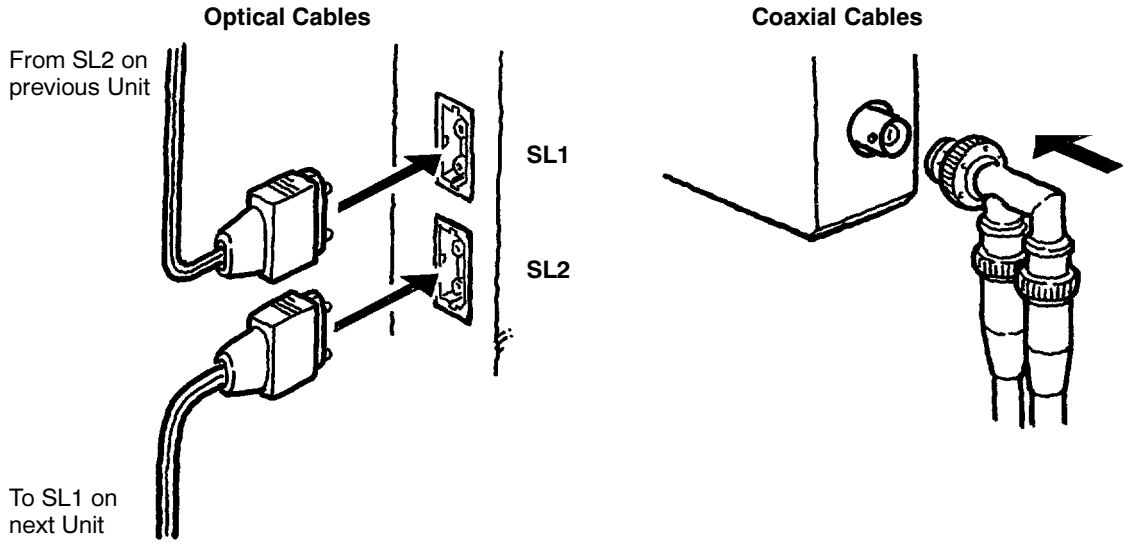
1, 2, 3...

1. Mount the SYSMAC LINK Units.
2. Set the unit number on the top two switches (SW1 and SW2) and the node address on the bottom two switches (SW3 and SW4) on each Unit. Both the

unit number and the node address are set as decimal numbers. The unit number must be between 00 and 15, and the node address must be between 01 and 62. The locations of these switches and setting examples are shown below.



3. Connect each Unit to the previous node and the next node in the network using either optical or coaxial communications cables as shown below. Be sure that connectors are oriented properly before inserting them.



4. If you are using optical communications cables and a Power Supply Unit, connect each Unit to the Power Supply Unit.
5. If you are using coaxial communications cables, connect termination resistors to the last Unit at each end of the network.
6. Check the communications path to be sure that there are no breaks in it.

Basic System Setup

If you have not already done so, refer to the procedures given in *4-1 Basic CV-series Systems* and do the following:

- Set up the CVSS.
- Turn ON power.

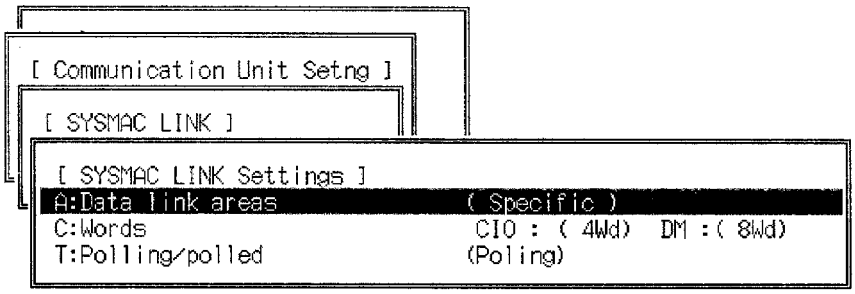
- Check the setting for the CVSS.
- Check the PC Setup.
- Create and transfer the I/O tables.

Communications Settings

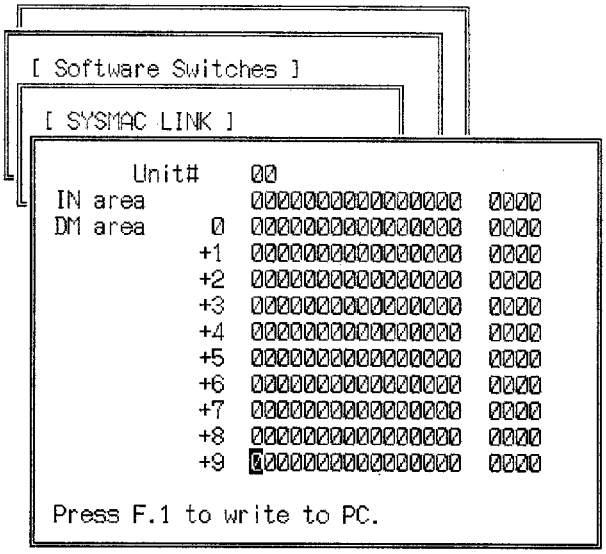
The following procedure can be used to set the parameters that will control network communications.

1, 2, 3...

1. Place the CVSS in online mode and select "X:CPU Bus Unit Setup" from the menu.
2. Select "S:Comm unit settings" and then "L:SYSMAC LINK."
3. Input the unit number of the SYSMAC LINK Unit on the displays that will appear. When the unit number has been input, the following settings will appear. Check the settings and change any that should be different.



4. If you are using data links, return to the menu that appears when "X:CPU Bus Unit Setup" is selected, and select "W:Software switches" and then "L:SYSMAC LINK."
5. Input the unit number of the SYSMAC LINK Unit. When the unit number has been input, the following display will appear. Check the settings and change any that should be different.



The above display is a map of the software switches contained in the data areas of the PC for the SYSMAC LINK Unit. Software switches are used to control various aspects of System operations, such as data links and communications tests. For example, the rightmost bit in the top word is the Data Link Start Switch. If this bit is set to 1 and then the F1 Key is pressed to write the setting to the PC, the data link will start.

If the word containing the Data Link Start Switch is set as part of the Holding Area and the Switch is set to 1, then the data link will automatically start when the PC is

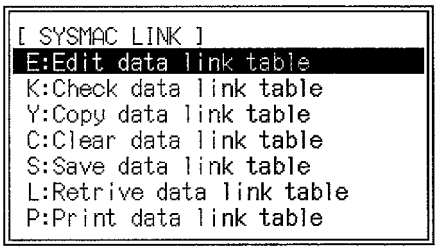
turned on. If the word is not set as part of the Holding Area, the data link will not start automatically and will stop whenever the PC mode is changed from PROGRAM or DEBUG mode to RUN or MONITOR mode. The other software switches are described in the *SYSMAC LINK System Manual*.

Creating Data Link Tables

The following procedure can be used to manually specify data links. If you are not going to use data links or are going to have them automatically generated, the following procedure is not necessary.

1, 2, 3...

1. Place the CVSS offline with the PC and select "N:Network support table."
2. Select "L:Data link table (SYSMAC LINK)." The data link table current registered in the CVSS will be displayed.
3. Press the End Key to access the following menu.



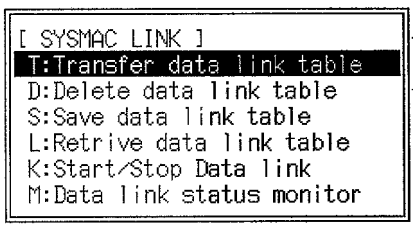
4. Select "E:Edit data link table," and input the common parameters, which indicate the number of words sent by each node.
5. When all data has been input, press the PgDn Key to display the refresh parameter table for the first node, input the data link table for it, and then continue using the PgDn Key to switch to the data link tables for the other node until tables have been input for all the nodes that are to be in the data link.
6. When all of the refresh parameter table has been finished, press the F10 Key. The data link table will be saved to disk and the menu will appear.
7. To check the data link tables, select "K:Check data link table."
8. To save the data link tables, press the End Key to access the menu, select "S:Save data link table," input the name of the file to which the tables are to be saved, and press the Enter Key.
9. Input the heading, if one is desired, and press the Enter Key again.
10. When the save has finished, press the Shift and Esc Keys twice to return to the main offline menu.
11. Press the Shift and F1 Keys to place the CVSS online with the PC.

Transferring Data Link Tables

The following procedure can be used to transfer data link tables to the PCs. If you are not going to use data links or are going to have them automatically generated, the following procedure is not necessary.

1, 2, 3...

1. Select "N:Network support table" and then select "L:Data link (SYSMAC LINK)." The data link table registered in the CVSS will be displayed.
2. Press the End Key to access the following menu.



3. Select "L:Retrieve data link table" and input the name of the file to load.

4. Press the End Key to access the menu and select "T:Transfer data link table."
5. Select "W:Computer –> SYSMAC LINK," and specify the address of the network to which the transfer is being made.
6. Specify the nodes to which data tables are to be transferred.
7. When the nodes for the transfer have been designated, select "J:Run." The table will be transferred and a display showing the progress of the transfer for each node will be displayed.

Multilevel Systems

Setting routing tables is the only procedure that is necessary for Multilevel Systems other than those performed for Single-level Systems. The same routing tables are used as those for SYSMAC NET Link Systems and the procedure is naturally the same. If you have not already set up routing tables, refer to the procedure starting on page 56.

4-2-3 SYSMAC NET Link and SYSMAC LINK Systems

Nothing extra is needed to be able to use a SYSMAC NET Link System and a SYSMAC LINK System together. The same routing tables are used and the data links operate independently of each other. If you are using a combined system, simply follow the procedures given above for each system.

4-3 Mixed C-series–CV-series Networks

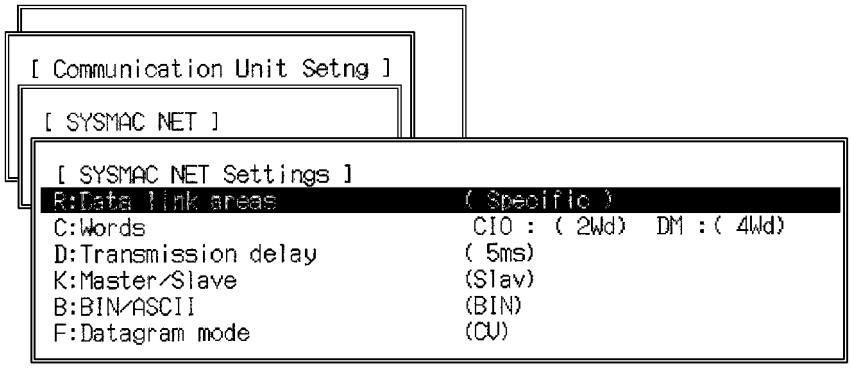
SYSMAC LINK Systems C-series and CV-series PCs can be linked via a SYSMAC LINK System using the same procedures as used for Systems containing only CV-series PCs.

SYSMAC NET Link Systems

Communications Settings When setting up a SYSMAC NET Link System that links C-series and CV-series PCs, communications settings must be made according to the C-series standards. To do this, you must make sure that none of the CV-series PCs are set as the master and that the datagram format is set to C mode. Both of these settings can be checked using the following procedure.

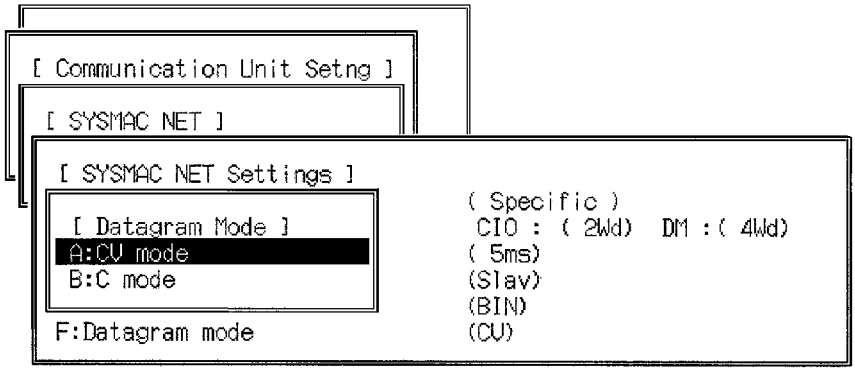
1, 2, 3...

1. Place the CVSS in online mode and select "X:CPU Bus Unit Setup" from the menu.
2. Select "S:Comm unit settings" and then "N:SYSMAC NET."
3. Input the unit number of the SYSMAC NET Link Unit on the display that will appear. When the unit number has been input, the following settings will appear.



4. Check to be sure that no CV-series PC has been set as a master.

5. Select “F:Datagram mode” to access the following setting.



6. Select “B:C mode” and then continue on with the normal setting procedure.

Data Link Tables

Because a CV-series PC cannot be the master in the data link, the data link tables cannot be set using the CVSS and must be set in the C-series PC designated as the master. Set the data link tables according to instructions in the *LSS Operation Manual*.

Note The data areas vary between C-series and CV-series PCs. Refer to page 4 for details.

Activating Data Links

Data links in SYSMAC NET Link Systems using both C-series and CV-series PCs cannot be started from any of the CV-series PCs. Start the data link from the C-series PC designated as the master according to instructions in the *LSS Operation Manual*.

SECTION 5
Convenient Features

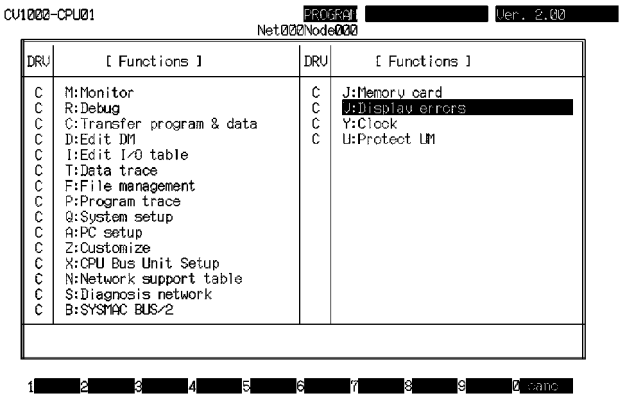
This section describes a few of the convenient features provided by the CV-series PCs.

5-1 Error Histories

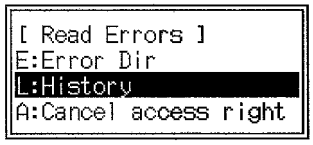
Each PC keeps records of errors that occur during operation. These records are collectively called an error history. The error history can be read online from the PC using the following procedure.

1, 2, 3...

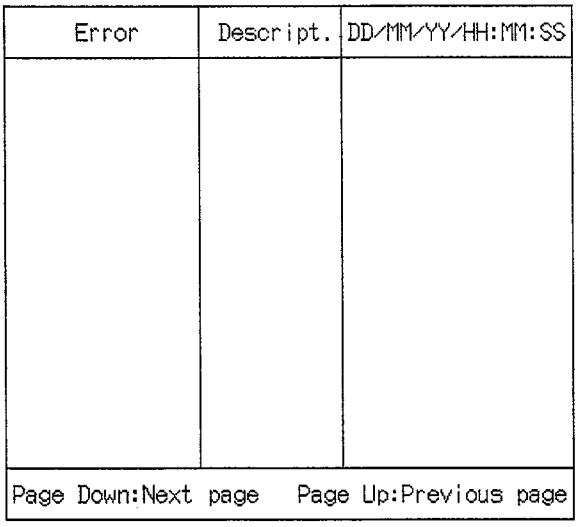
1. Connect the CVSS to the PC and place it online with the PC by pressing the Shift and F1 Keys. The main online menu will appear.



2. Select “V:Display errors” to access the following menu.



3. Select “L:History.” The error history recorded in the PC connected to the CVSS will be displayed as shown below. If the display runs for more than one page, use the PgUp and PgDn Keys to scroll through it.



Clearing Error Histories

The entire error history can be deleted from the PC while it is being displayed on the CVSS by pressing the F1 Key and then pressing the Y and Enter Keys to confirm.

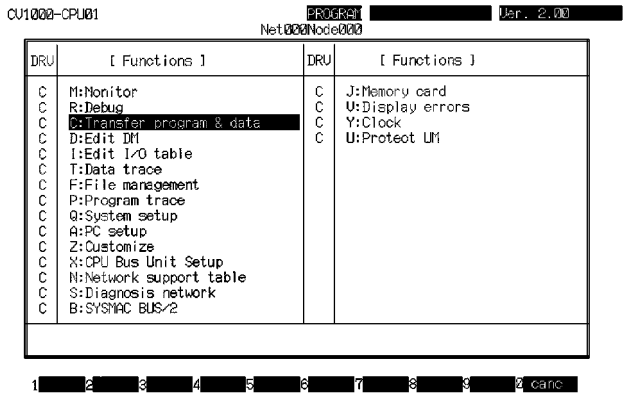
Note If the cause of an error is not removed before the error history is cleared, the error will be recorded back into the history immediately.

5-2 Online Editing

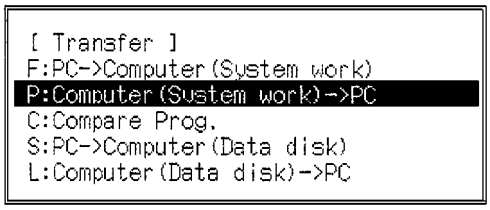
The program in the PC can be edited online from the CVSS when the PC is in PROGRAM, DEBUG, or MONITOR mode. The following example outlines the editing procedure when programming with ladder diagrams only.

1, 2, 3...

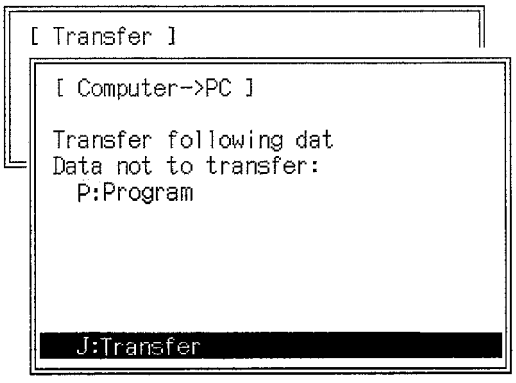
1. Load the program into the CVSS in offline mode.
2. Connect the CVSS to the PC and place it online with the PC by press the Shift and F1 Keys. The main online menu will appear.



3. Select “C:Transfer program & data” to access the following menu.

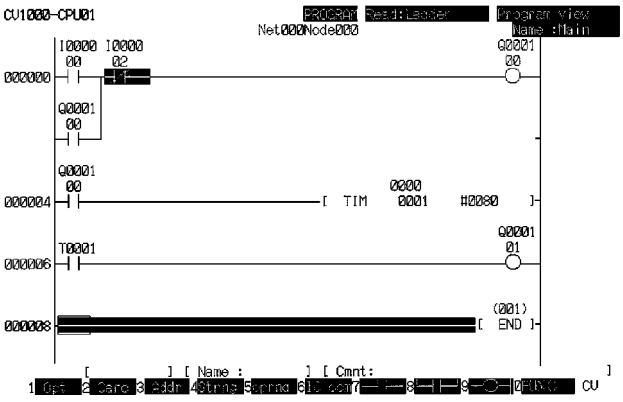


4. Select “P:Computer (System work) –> PC.”
5. Move the cursors to all items but “P:Program” and press the Enter Key to eliminate them and produce the following display.

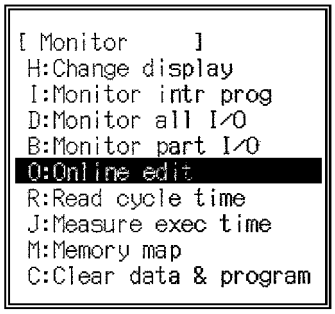


6. Select “J:Transfer” at the bottom of the screen and then confirm the transfer by pressing the Y and Enter Keys. The progress of the transfer will be displayed on a bar graph.
7. When a message appears to indicate that the transfer has been completed, press the Shift and Esc Keys twice to return to the main online menu.

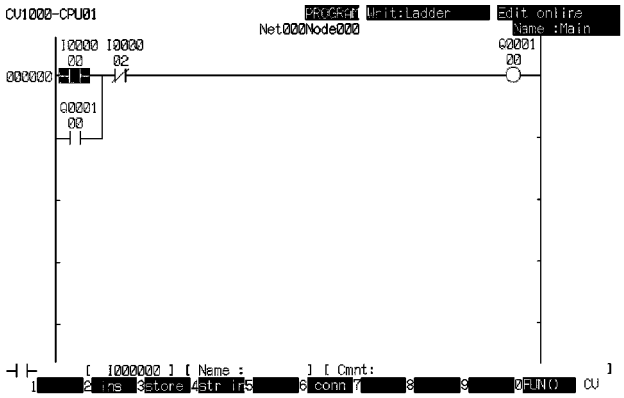
8. Select “M:Monitor.” The ladder program will be displayed.



9. Use the PgUp and PgDn Keys to locate the portion of the program to be changed and display it on the screen. You will be able to change only the portion of the program that is read out at this point.
10. Press the End Key to access the following menu.



11. Select “O:Online edit,” use the Up and Down Keys to move the cursor to the beginning address of the instruction line to be changed, and press the Enter Key. The following display will appear if program address 000000 is designated.



12. Use the Left and Right Arrow Keys to move the cursor to the location to be changed and overwrite the program to change it using the normal ladder programming methods.
13. When the program has been changed, press the F3 and Enter Keys to store the new program and transfer it to the PC. The CVSS will return to normal monitoring status.

    Note If the F3 Key is not pressed first to store the program, the program will not be transferred to the PC.

14. To change other locations in the program, use the PgUp and PgDn Keys to move to the desired location and then re-enter the online editing operation.

    If there are no more changes to be made, press the Shift and Esc Keys to return to the main online menu.

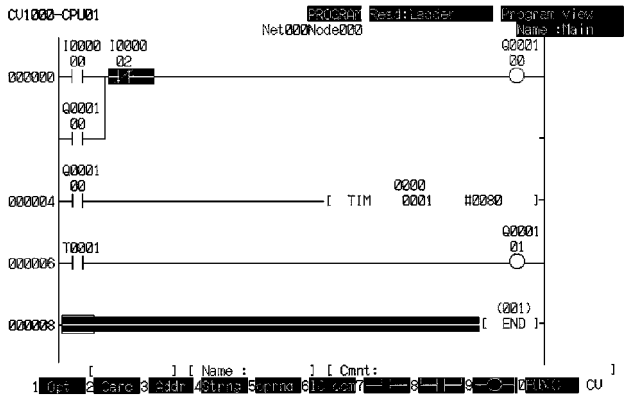
5-3 Part I/O Monitoring

Monitoring operations can be used to access the status of part of the program or the status of specific words or bits. It can also be used to control the status of up to 10 words and/or bits.

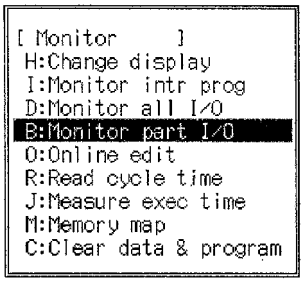
With the "part I/O monitoring" operation, the top of the display is used to monitor the program, while the bottom part of the display is used to display and control word/bit status. The following procedure shows these operations when programming with ladder diagrams only.

1, 2, 3...

1. Connect the CVSS to the PC, place it online with the PC, and transfer the program to the PC.
2. Select "M:Monitor" from the main online menu. The program will be displayed.



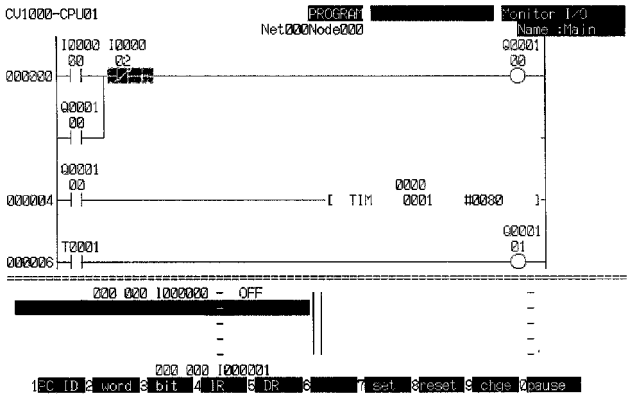
3. Use the PgUp and PgDn Keys to stroll the screen to the part of the program to be monitored, and then press the End Key to access the following menu.



4. Select "B:Monitor part I/O" and specify the bits, words, or present values that are to be monitored on the bottom half of the display using the following key sequences. An example for input bit 000000 is shown below.

    Word: F2 Key, *word_address*, Enter Key
    Bits: F3 Key, *bit_address*, Enter Key
    Timer PV: F3 Key, F3 Key, *timer_number*, Enter Key

To specify consecutive addresses or numbers, continue pressing the Enter Key once for each.



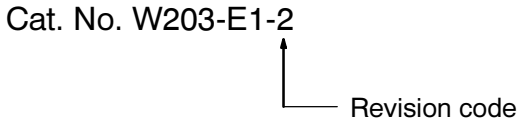
5. While the above display is on-screen, bit, word, or PV data can be changed using the operations shown in the following table. The program monitored on the top half of the screen will also change accordingly.

Operation	Procedure
Changing word contents	Use the Up and Down Keys to move the cursor to the word to be changed and press the F9 Key. Then input the desired value in hexadecimal and press the Enter Key. You cannot change the contents of an input word.
Controlling bit status	Use the Up and Down Keys to move the cursor to the bit to be controlled and press the F7 Key to turn the bit ON or the F8 Key to turn the bit OFF. Bits that have been forced ON will be displayed with an "-S ON" suffix; bits that have been forced OFF, with an "-R OFF" suffix. To release the status of a bit that has been forced ON or OFF, move the cursor to it, and press the Shift and F4 Keys.
Changing a timer PV	Use the Up and Down Keys to move the cursor to the timer to be changed and press the F9 Key. Then input the desired value in decimal and press the Enter Key. The PV displayed for the timer on the top half of the screen will be changed to the specified value. The SV (the value prefixed with "#") will not change and the Completion Flag operation will not be affected.

6. When all monitoring operations have been completed, press the Shift and Esc Keys to return to the normal program display.

Revision History

A manual revision code appears as a suffix to the catalog number on the front cover of the manual.



The following table outlines the changes made to the manual during each revision. Page numbers refer to the previous version.

Revision code	Date	Revised content
1	May 1992	Original production
2	March 1993	The manual was revised accompany release of version 2 of the software and the addition of the new CV2000 and CVM1 CPUs. Major changes are outlined on page 3 of the *CV Support Software:Version 2 Basics Operation Manual*. Other changes are as follows: **Page 3:** Jumps description has been eliminated from the page. **Page 11:** K:Prog check PC description has been corrected in the table. **Page 12:** JMP 000 setting has been added to G:Execute control 2 in the table. **Pages 51, 56:** Setting examples have been corrected.