



OPERATOR INTERFACE

**I.O.P. M20 SERIES
SCREEN UTILITY
Manual**



I.O.P. M20 SERIES SCREEN UTILITY Manual
ACG-M0043-2 '92.8

Matsushita Electric Works, Ltd.

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Introduction

The I.O.P. 20 Series Screen Utility version 1.0 is a software specifically written for the Intelligent Operating System(I.O.P.) 20 series.

It allows you to edit screens that will be displayed on the I.O.P. and also to transfer data to the I.O.P. An IBM Personal Computer AT or an IBM compatible personal computer are required to use this software. With it you can create any kind of screen suitable for your factory automation system as easily as using a word processor.

This manual explains how this software is organized, how to install it, how to transfer the edited screens to the I.O.P., and how to transfer them from the I.O.P. to a ROM programmer. For the hardware details of the I.O.P., you may refer to the "I.O.P. Hardware Manual". For the method to burn the data into ROM, see the manual of your ROM programmer.

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What's in each Chapter

Chapter 1 describes how the I.O.P. 20 Series Screen Utility is organized, and what kinds of screens you use to edit and display the Primary Screen, Secondary Screen, and Manual Key Access Screen(Manual Screen). It also explains how to assign Fixed Keys.

It is recommended that you read this chapter before you try to design screens.

Chapter 2 tells you how to install the I.O.P. 20 Series Screen Utility on your personal computer and how to start and exit it.

Chapter 3 tells you how to edit an I.O.P. Message Screen, and how to assign Key Codes to Function keys, Manual keys, and Fixed keys.

The screens for displaying messages, displaying External Data, entering External Data, superimposed screens, and displaying Function Keys are edited on an "I.O.P. Message Screen". The Key Codes for the Function Keys are set in the "Function Key" area.

The Key Codes for the Manual Keys are assigned using the "Manual Access Screen". Fixed Keys are assigned using the "Fixed Key" area.

Chapter 4 tells you how to transfer the data from the screens you have edited to the I.O.P..

Chapter 5 tells you how to transfer the data from the I.O.P. to the ROM programmer.

When you want to burn the data into ROM, refer to the manual for your ROM programmer.

Overview of Steps

1. Designing screens

IOP Message Screen

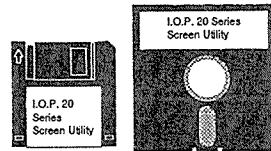
```
Tighten the valve
<Valve No. 1>
F1:Tighten
F2:Loosen
<Valve No. 2>
F3:Tighten
F4:Loosen
```

Prim. No.	01
Sec. No.	01
ATB.	1

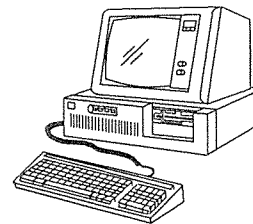
2. Installing the I.O.P. 20 Series Screen Utility

I.O.P. 20 Series Screen Utility

3.5-inch disk or 5.25-inch disk



IBM AT Personal Computer manufactured by IBM
or an IBM compatible personal computer.



3. Editing screens

IOP Message Screen

File Name
[.DAT]

1

Prim. No.	
Sec. No.	
ATB.	

Function Key

F1	F2	F3	F4

Character Size

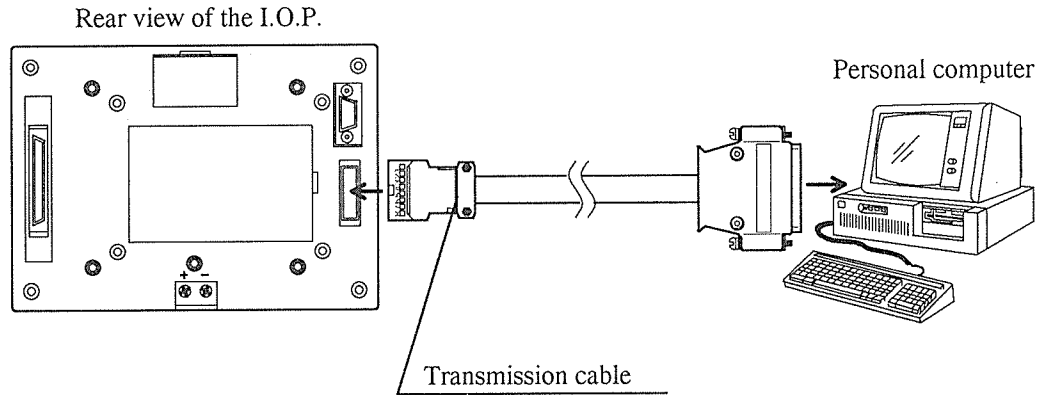
* A

A

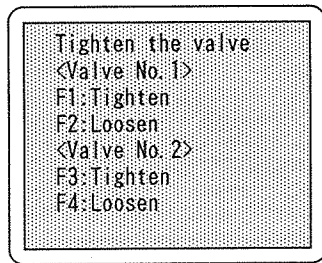
A

f1 f2 f3 f4 f5 f6 f7 f8 f9 f10
LOADSAVEEXITISENDIMS IMAS IFIX IPREVINEXTISIZE

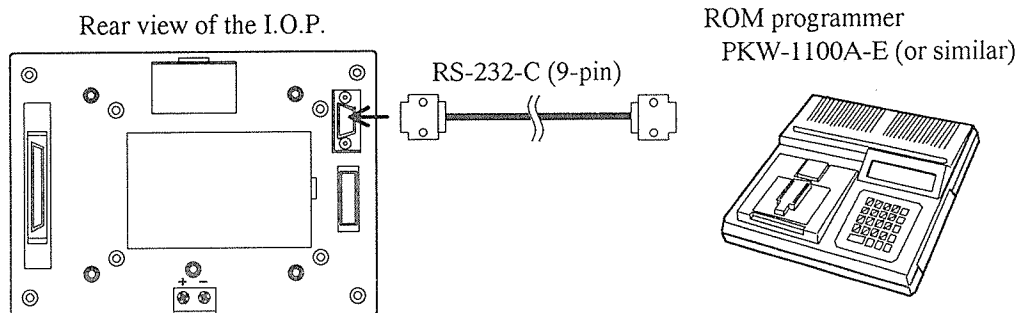
4. Preparation for transferring data to I.O.P.



5. Transferring data to the I.O.P.



6. Burning data into ROM, if needed

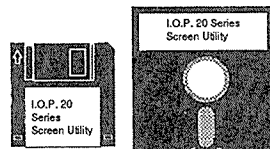


Before Using I.O.P. 20 Series Screen Utility

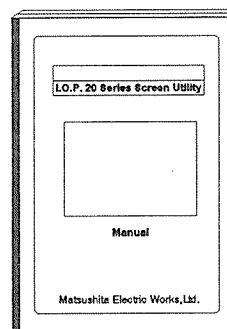
Packing List

I.O.P. 20 Series Screen Utility
(part number AIP8304)

3.5-inch disk or 5.25-inch disk



I.O.P. 20 Series Screen Utility Manual



Symbols used in the manual

<i>Example:</i>	Indicates an example of an operation or a configuration.
<i>Notes</i>	Indicates limits to be observed.
<i>Caution</i>	Indicates a precaution to be followed.
“ ”	Indicates a word which appears on the screen or a value which you enter.

Chapter 1

Outline of

I.O.P. 20 Series Screen Utility

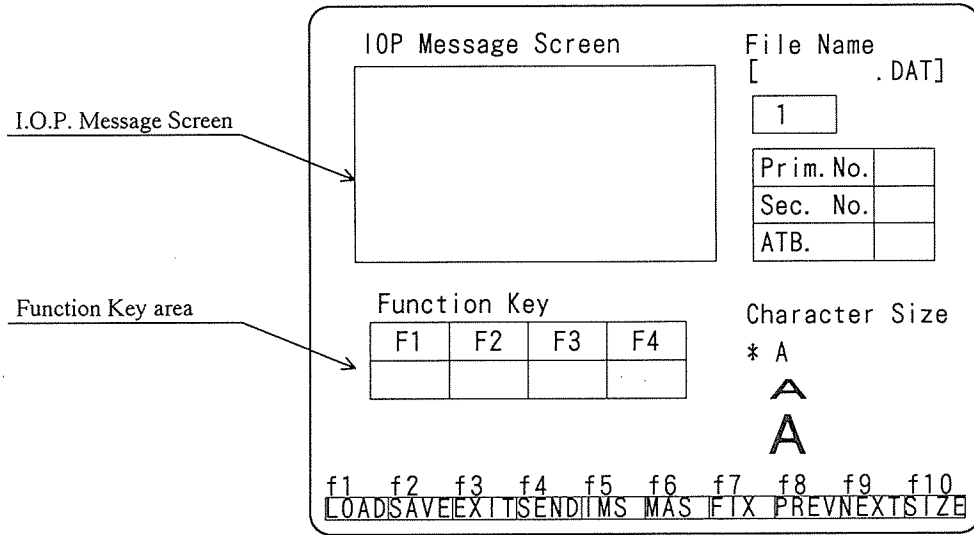
1-1 I.O.P. Message Screen and Function Key

The I.O.P. 20 Series Screen Utility has two main screens; the "I.O.P. Message Screen" and the "Manual Access Screen". This section describes the "I.O.P. Message Screen".

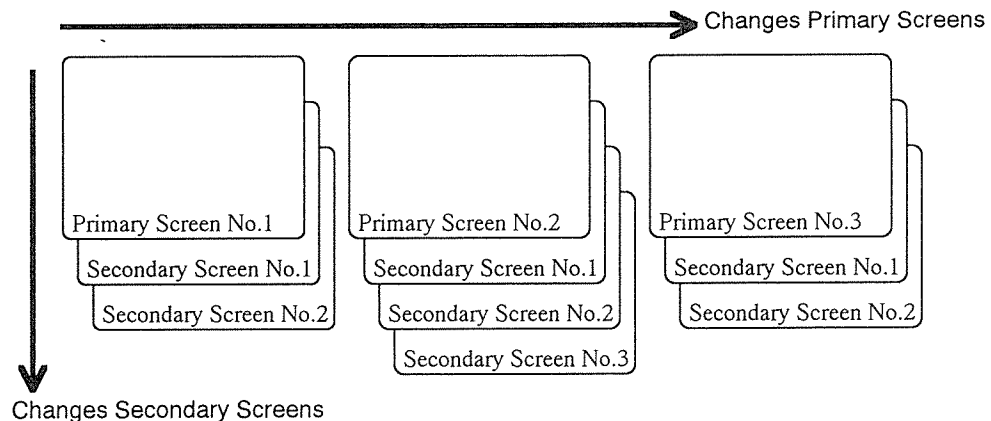
The "I.O.P. Message Screen" is a form for editing the Primary Screens and the Secondary Screens which will be displayed on the I.O.P..

The application of a particular screen will be determined by its attribute number. Possible applications include: displaying messages; displaying External data; entering External Data; superimposing screens; and, displaying Function Key uses.

The "Function Key" area appears at the bottom of the I.O.P. Message Screen. You can assign Key Codes for the Function Keys.



You can organize Primary Screens and Secondary Screens hierarchically in order to display them sequentially on the I.O.P.. The Primary Screen displayed on the I.O.P. is determined by a programmable controller. The Secondary Screens can be displayed by pressing the arrow keys (▲ and ▼) on the I.O.P..



Example

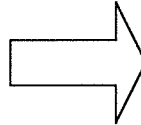
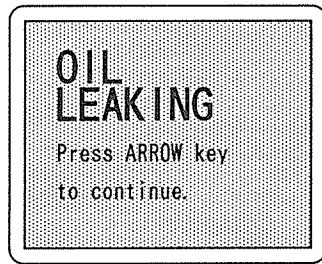
- You can use the I.O.P. like an operation manual, taking advantage of the hierarchically organized screens.

When equipment requires attention or has a problem, you can receive error messages on the Primary Screen. By pressing the Arrow key (▼) on the I.O.P., the display will change to Secondary Screen which will tell you how to proceed to correct the error.

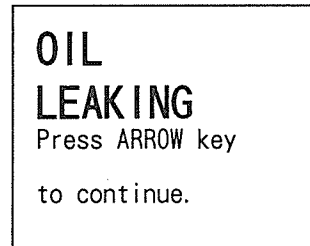
I.O.P. screen

Edit as below.

Primary Screen



IOP Message Screen

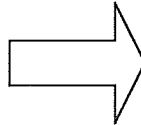
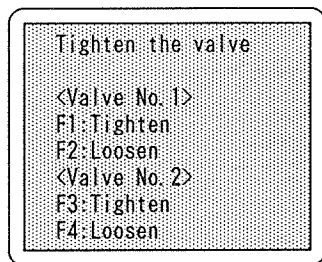


Prim. No.	01
Sec. No.	
ATB.	0

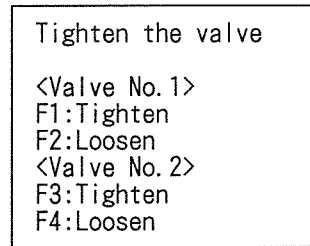
Error messages appear via a programmable controller.



Secondary Screen



IOP Message Screen



Prim. No.	01
Sec. No.	01
ATB.	1

By pressing the arrow key (▼), sequential instructions are displayed.

Function Key

F1	F2	F3	F4
56	57	58	59

Notes

- Superimposed or highlighted characters in serial communication are controlled by the program being run by the programmable controller. You cannot control these functions from the I.O.P. Message Screen.

The following table shows how many I.O.P. Message Screens the I.O.P. can contain. It varies depending on the I.O.P. model and the amount of RAM or ROM that is installed.

	M 20/21	M 22	
		Relay Communication	Data Register Communication
256kb RAM or ROM	63	63	63
1024kb RAM or ROM	255	160	255

256 kb RAM is installed in the I.O.P. when shipped.
If you need more than 63 screens, add additional memory.

Memory lineup	Part number
256 kb RAM	AIP8402
1024 kb RAM	AIP8401
254 kb ROM	AIP8412
1024 kb ROM	AIP8411

Displaying Messages

By programming the programmable controller, the I.O.P. can display messages which you have edited on the I.O.P. Message Screen.

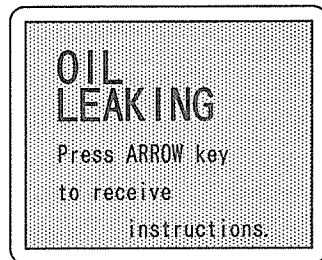
Displaying an error message when a machine is out of order, is an example.

Example

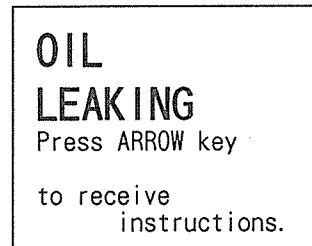
I.O.P. screen

Edit as below.

Primary Screen



IOP Message Screen



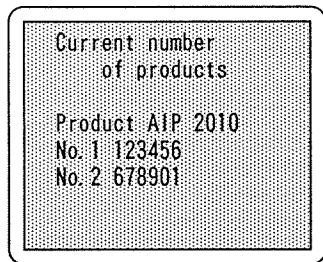
Prim. No.	01
Sec. No.	
ATB.	0

Displaying External Data

The I.O.P. can display the External Data - numeric data from programmable controller - such as the elapsed value of a Timer or Counter, or the current number of products. You can monitor up to 16 External Data buffers, each of which can contain a number with 4 to 10 digits.

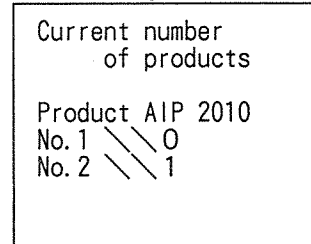
Example

I.O.P. screen



Edit as below.

IOP Message Screen



Prim. No.	04
Sec. No.	
ATB.	2

In this case, the Attribute number (ATB.) must be "2", "3", or "5".

Entering External Data

You can enter External Data for use by connected devices directly onto the I.O.P. screen. These numbers can be the value of Timer, the value for a Positioning Control System, or the number of products which are to be produced that day.

Up to 16 External Data buffers, each of which can contain a 4 to 10 digits number, can be set.

Example

I.O.P. screen

Enter the number of products for today
Product AIP 2010
No. 1
No. 2

Edit as below.

IOP Message Screen

Enter the number of products for today
Product AIP 2010
No. 1 \$ \$ 0
No. 2 \$ \$ 1

Prim. No.	05
Sec. No.	
ATB.	4

In this case, the Attribute number (ATB.) must be "4" or "5".

Superimposed Screen

The programmable controller can superimpose one Primary Screen with a maximum of 10 other Primary Screens all of which will be displayed as one screen on the I.O.P..
You cannot edit superimposed Secondary Screens.

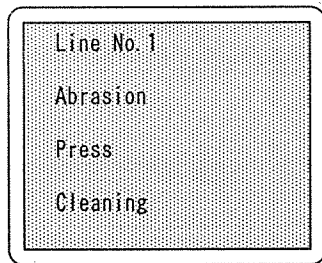
Notes

- Superimposed screens are controlled by the programmable controller.

Example

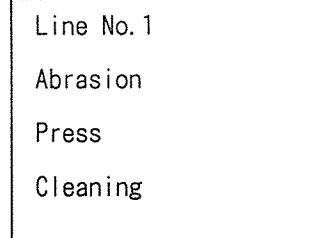
I.O.P. screen

Primary Screen



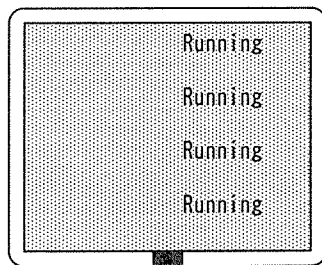
Edit as below.

IOP Message Screen

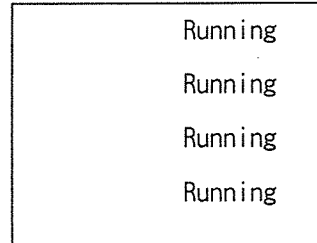


Prim. No.	02
Sec. No.	
ATB.	0

Primary Screen to be superimposed



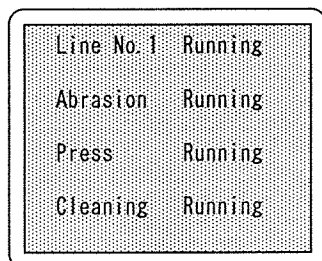
IOP Message Screen



Prim. No.	03
Sec. No.	
ATB.	6

In this case, the Attribute number (ATB.) must be "6".

Superimposed Primary Screens



Function Key

On the "I.O.P. Message Screen", you can assign values to up to four Function Keys for each screen. These will correspond to the function keys on the front panel of the I.O.P..

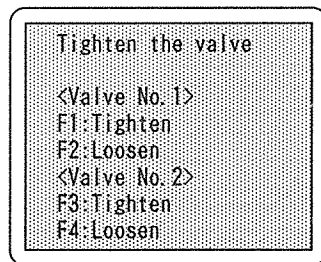
Then, you have to assign the Key Codes in the "Function Key" area which is at the bottom of the "I.O.P. Message Screen".

Example

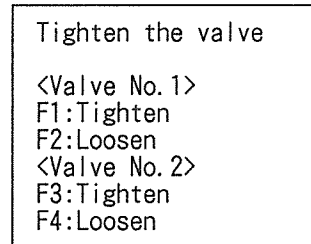
I.O.P. screen

Edit as below.

Secondary Screen



IOP Message Screen



Prim. No.	01
Sec. No.	01
ATB.	1

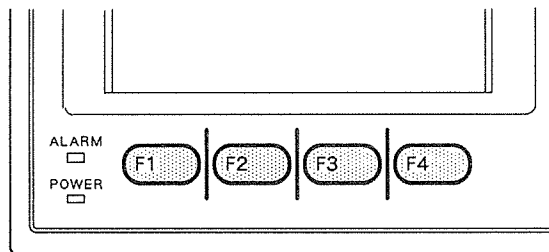
By pressing the arrow key (▼), instructions will be displayed.

Function key

F1	F2	F3	F4
56	57	58	59

In this case, the Attribute (ATB.) number must be "1" or "3".

function keys on the I.O.P.



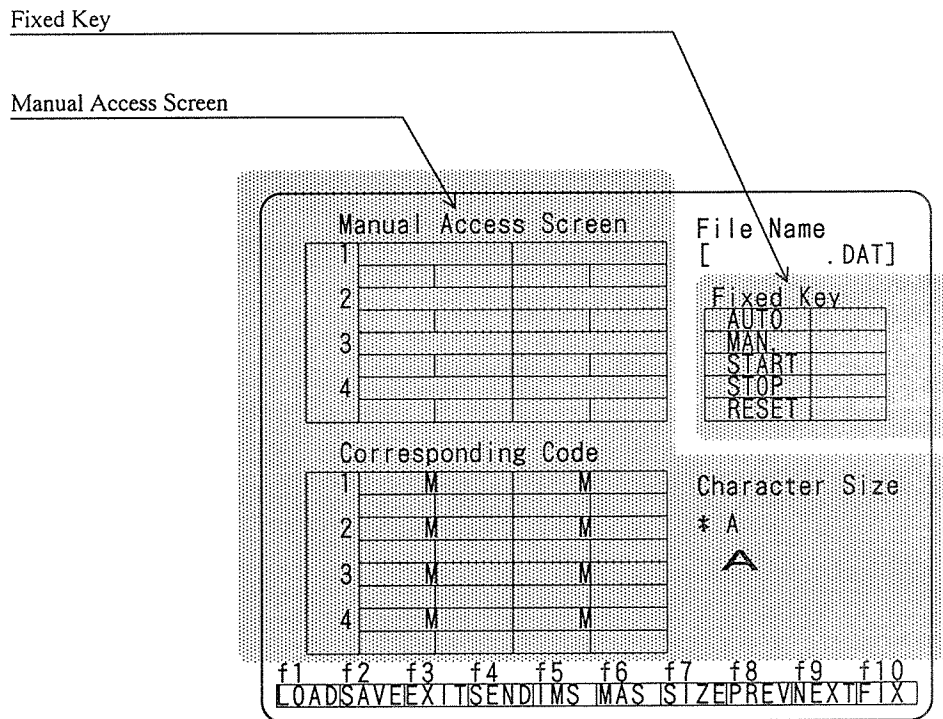
1-2 Manual Access Screen and Fixed Key

The "Manual Access Screen" is a form entering information about the Manual Keys. There are 80 Manual Keys(40 sets) in the "Manual Access Screen"area, you can assign Key Codes to each Manual Key.

In "Fixed Key" area you can assign Key Codes to the Fixed Keys which are found on the front panel of the I.O.P..

Both of the forms appear on the same screen.

A total of 255 Key Codes can be assigned including the codes for Function keys.

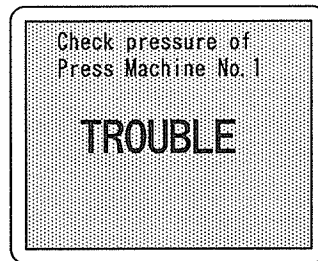


Manual Keys

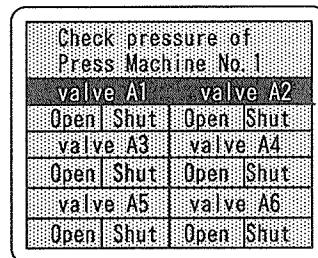
Manual Keys are the keys on the Manual Key Access Screen. Each of them can be linked to the function keys on the front panel of the I.O.P..

You can assign any Key Code to the Manual keys shown on the “Manual Access Screen”.

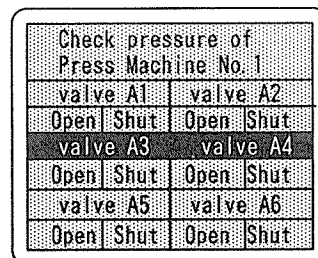
Example



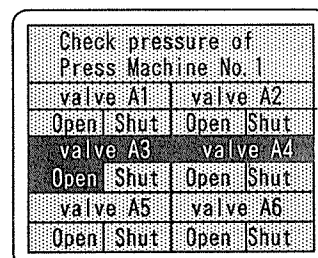
A Primary Screen appears.



Superimposed over the Primary Screen, the Manual Key Access Screen is displayed.



Press the arrow key (▼) to choose “valve A3”.



Press the F1 key to choose “Open”.

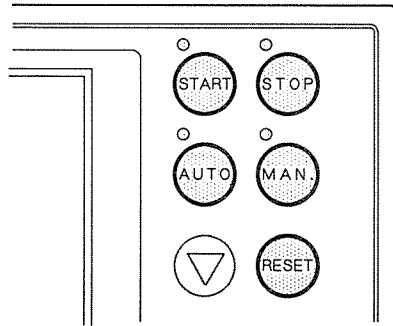


Fixed keys

The Fixed Keys consist of the START key, STOP key, AUTO key, MAN.(Manual) key and RESET key which are on the front panel of the I.O.P..

Each key has been already assigned a default Key Code and you can change it to different Key Code if you like. However, it is recommended that you do not change them because they are the basic Key Codes.

Fixed keys on the I.O.P.



Notes

- The following table shows the default value of the Key Codes for the Fixed keys.

Fixed key	AUTO	MAN.	START	STOP	RESET
Key Code	01	02	03	04	05

Chapter 2

Installing

I.O.P. 20 Series Screen Utility

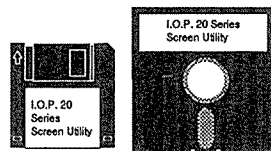
2-1 Before You Start

To install the I.O.P. 20 Series Screen Utility, the following software and hardware are required.

Software

I.O.P. 20 Series Screen Utility manufactured by MATSUSHITA ELECTRIC WORKS, Ltd.

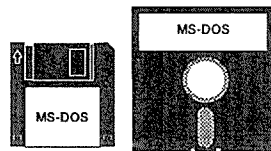
3.5-inch disk or 5.25-inch disk



Disk Operating System

MS-DOS System Disk manufactured by Microsoft Corporation or PC DOS System Disk manufactured by International Business Machines Corporation. (Ver. 3.3)

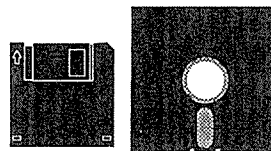
3.5-inch disk or 5.25-inch disk



A standard blank disk

Two disks are required if you install the system on the floppy disks.

3.5-inch disk or 5.25-inch disk

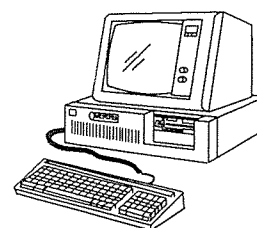


- The MS-DOS System Disk, PC DOS System Disk and blank disks are not provided with the I.O.P. 20 Series Screen Utility. You must purchase them separately.

Hardware

Personal computer

IBM AT Personal Computer manufactured by the International Business Machines Corporation, or an IBM compatible personal computer.



2-2 Making Backup Disks

Before you use the I.O.P. 20 Series Screen Utility for the first time, you should copy all the files for backup. The file on the working copy cannot be restored once they are damaged.

This software includes the following files.

CONFIG.SYS	MANUAL.EXE
AUTOEXEC.BAT	HCP.EXE
WLD.EXE	SEND.EXE
IOP20.BAT	GETE.PTN
IOP20H.EXE	GETR.PTN
IOP20F.EXE	FONT.TBL
HANYOU.EXE	

Procedure

The instructions assume you have only one floppy drive in your personal computer.

Starting DOS.

1. Turn on your personal computer, or press the Ctrl + Alt + Delete keys at the same time to reset it.
The DOS prompt(e.g. A> or C>) will appear.

Formatting a blank disk.

Blank disks cannot be used as purchased.
Before using them, you have to format them as described below.

2. Type the following:

```
FORMAT A:
```

3. Insert a blank disk into drive A.
4. Press the Enter key.
When the format is completed, "Format another?" will appear.
5. Type "N", and press the Enter key.

Copying the files to the formatted disk.

Copy all the files on the original I.O.P. 20 Series Screen Utility disk to a disk you have formatted.

6. Type the following:

DISKCOPY A: B:

Then press the Enter key.

“Insert SOURCE diskette in drive A” will appear.

7. Insert the original I.O.P. 20 Series Screen Utility disk into drive A. Then press the Enter key.

After a while, “Insert TARGET diskette in drive B” will appear.

8. Remove the original I.O.P. 20 Series Screen Utility disk from drive A.

9. Insert the formatted disk into drive A.

Then press the Enter key.

The computer will act as though this is now drive B.

Following the messages on the screen, repeat the same operations several times until “Copy another diskette(Y/N)?” appears.

10. Type “N”, and press the Enter key.

All of the files on the original I.O.P. 20 Series Screen Utility will have been copied to the new disk. This new disk is called the “backup disk”.

2-3 Installing I.O.P. 20 Series Screen Utility

The Installation method depends on your personal computer type.

If your personal computer has a fixed disk, it is recommended that you install the I.O.P. 20 Series Screen Utility on it. Once you install it on the fixed disk, you will not need a floppy disk to run this software. Refer to "Installing on Fixed Disk(Hard Drive)" on this page.

If the personal computer does not have a fixed disk but it has one or two floppy disk drives, install the software on a floppy disk drive. Refer to "Installing on Floppy Disk Drive" on page 22.

Installing on Fixed Disk(Hard Drive)

When you install the I.O.P. 20 Series Screen Utility on a fixed disk, you will need;

The backup disk of I.O.P. 20 Series Screen Utility(See 2-2.)

The disk operating system(DOS) Ver. 3.3

The following files are needed to start this software from the fixed disk. You will need to copy the ANSI.SYS and GRAPHICS.COM files from the DOS disk and the other files are copied from the backup disk.

In the hard disk root directory you should copy;

ANSI.SYS

In the directory you will make for the I.O.P. 20 Series Screen Utility you should copy;

WLD.EXE	SEND.EXE
IOP20.BAT	GETE.PTN
IOP20H.EXE	GETR.PTN
HANYOU.EXE	FONT.TBL
MANUAL.EXE	GRAPHICS.COM
HCPL.EXE	

We assume that you have already installed DOS on the fixed disk.

Note

- If other programs have already been installed on your fixed disk, make a new subdirectory for I.O.P. 20 Series Screen Utility.

For example, to make a new subdirectory "IOP", type "MD IOP" next to the DOS prompt(C>).

```
root directory
├── CONFIG.SYS
├── VDISK.SYS
├── Other files
├── <IOP>(Subdirectory)
│   └── I.O.P. 20 Series Screen Utility files
├── <Other directory>
│   └── Other programs
```

Procedure

Starting the DOS.

1. Turn on your personal computer, or press the Ctrl + Alt + Delete keys at the same time to reset it.

A DOS prompt will appear.

```
C>
```

Setting the CONFIG.SYS file.

First, you have to customize DOS to match the I.O.P. 20 Series Screen Utility.

2. Type the following to see the contents of the CONFIG.SYS file:

```
TYPE CONFIG.SYS
```

Then press the Enter key.

The device names in the CONFIG.SYS will be displayed. If you see;

```
DEVICE=ANSI.SYS
```

go to step 6. If you do not find this entry, go to the next step.

3. Type the following to change the CONFIG.SYS file:

```
COPY CONFIG.SYS+CON CONFIG.SYS
```

Then press the Enter key.

Now you can enter the necessary lines in the CONFIG.SYS file.

4. When "DEVICE=ANSI.SYS" has not been found, type the following:

```
DEVICE=ANSI.SYS
```

Press the Enter key.

5. Press the Ctrl + Z keys at the same time.
Then press the Enter key.

The CONFIG.SYS file will now contain the new lines. The DOS prompt will appear again. If you want to check the contents of the changed CONFIG.SYS file, repeat step 2.

Copying ANSI.SYS file

Next, you may need copy the ANSI.SYS file to the root directory of your fixed disk.

6. Type the following to see if the ANSI.SYS file exists on your fixed disk:

```
DIR ANSI.SYS
```

Then press the Enter key.

If you see the listing "ANSI.SYS", go to step 8. If you do not see it, go to the next step.

7. Make sure that the DOS disk is in drive A, and type the following:

```
COPY A:ANSI.SYS C:
```

Then press the Enter key.

The ANSI.SYS file will be copied to your fixed disk.

Deleting unnecessary files on the backup disk.

When you install this software on a fixed disk, the CONFIG.SYS, AUTOEXEC.BAT, and IOP20F.EXE files should be deleted from the backup disk. They are used only for the floppy disk installation.

Caution

- If you do not delete these files and you are going to install the software in the root directory of your fixed disk, the CONFIG.SYS and AUTOEXEC.BAT files in the root directory of the hard disk will be replaced by the files with the same names from the backup disk.

8. Remove the DOS disk from drive A.
9. Insert the backup disk, with the I.O.P. 20 Series Screen Utility on it, into drive A.
10. Delete the CONFIG.SYS, AUTOEXEC.BAT and IOP20F.EXE files from the backup disk by typing following. Press the Enter key after typing each command.

```
DEL A:CONFIG.SYS  
DEL A:AUTOEXEC.BAT  
DEL A:IOP20F.EXE
```

Making a directory for the I.O.P. 20 Series Screen Utility

If other programs have already been installed on your personal computer, it is recommend you to make an exclusive directory for the I.O.P. 20 Series Screen Utility.

11. For example, to make a directory called "IOP", type the following:

```
MD IOP
```

Then press the Enter key.

Copying the files from the I.O.P. 20 Series Screen Utility.

Copy all of the files from the backup disk to the directory you have created.

12. If the directory name for the I.O.P. 20 Series Screen Utility is "IOP", type the following:

```
COPY A:*.* C:\IOP\
```

Then press the Enter key.

Copying GRAPHICS.COM file to the new directory you just made

13. Remove the backup disk from the drive A.
14. Insert the DOS disk in to drive A.
15. To copy the GRAPHICS.COM from the DOS disk to the new directory you made, type the following:

```
COPY A:GRAPHICS.COM C:\IOP\
```

Press the Enter key.

The GRAPHICS.COM file will be copied to your fixed disk.

When all of the files including GRAPHICS.COM file have been copied, the I.O.P. 20 Series Screen Utility will be installed on the fixed disk.

Installing on Floppy Disk Drive

When you install the software on a floppy disk you will need;

The backup disk with the I.O.P. 20 Series Screen Utility(See 2-2.)

The disk operating system(DOS) disk Ver. 3.3

A blank floppy disk

The following files are needed to start this software from the floppy disk drive. You will need to copy the VDISK.SYS, ANSI.SYS and GRAPHICS.COM files from the DOS disk and the other files are copied from the backup disk.

VDISK.SYS	HANYOU.EXE
ANSI.SYS	MANUAL.EXE
GRAPHICS.COM	HCPL.EXE
CONFIG.SYS	SEND.EXE
AUTOEXEC.BAT	GETE.PTN
WLD.EXE	GETR.PTN
IOP20F.EXE	FONT.TBL

Procedure

Starting the DOS.

1. Insert the DOS disk into drive A.
2. Turn your personal computer on, or press the Ctrl + Alt + Delete keys at the same time to reset it.
"Enter new date" appears.
3. Enter the date, if needed. If not, press the Enter key.
"Enter new time" appears.
4. Enter the time, if needed. If not, press the Enter key.
A DOS prompt will appear.

A>

Formatting a blank disk.

5. Type the following to format a blank disk.
By adding “/S”, the operating system from the DOS disk is automatically copied to the new disk when it is formatted.

```
FORMAT B:/S
```

Then press the Enter key.

“Insert new diskette for drive B:” will appear.

6. Remove the DOS disk from drive A.
7. Insert the blank disk into drive A.
The computer will treat drive A as though it is now drive B.
8. Press the Enter key to start formatting.
Formatting will start. When the format is completed “Format complete” and “Format another(Y/N)?” will appear.
9. Type N, and press the Enter key.
10. Remove the formatted disk from drive A.

Copying the VDISK.SYS file.

Copy the VDISK.SYS file from the DOS disk to the formatted disk.

11. Insert the DOS disk into drive A.
12. Type the following to copy the VDISK.SYS file:

```
COPY A:VDISK.SYS B:
```

Then press the Enter key.

“Insert diskette for drive B:” will appear.

13. Remove the DOS disk from drive A.

14. Insert the newly formatted disk into drive A.
15. Press any key.
“1 File(s) copied” will appear, when the VDISK.SYS file has been copied.
16. Remove the disk which you copied the VDISK.SYS file onto from drive A.

Copying the ANSI.SYS file.

Copy the ANSI.SYS file in the DOS disk to the formatted disk.

17. Insert the DOS disk into drive A.
18. Type the following to copy the ANSI.SYS file:

```
COPY A:ANSI.SYS B:
```

Then press the Enter key.
"Insert diskette for drive B:" will appear.

19. Remove the DOS disk from drive A.
20. Insert the newly formatted disk into drive A.
21. Press any key.
“1 File(s) copied” will appear, when the ANSI.SYS file has been copied.
22. Remove the disk which you copied the ANSI.SYS file onto from drive A.

Copying the GRAPHICS.COM file.

Copy the GRAPHICS.COM file from the DOS disk to the formatted disk.

23. Insert the DOS disk into drive A.

24. Type the following to copy the GRAPHICS.COM:

```
COPY A:GRAPHICS.COM B:
```

Then press the Enter key.

“Insert diskette for drive B:” will appear.

25. Remove the DOS disk from drive A.

26. Insert the newly formatted disk into drive A.

27. Press any key.

“1 File(s) copied” will appear, when the GRAPHICS.COM file has been copied.

28. Remove the disk which you copied the GRAPHICS.COM file onto from drive A.

Copying the files from the I.O.P. 20 Series Screen Utility.

Copy all the files from the backup disk to the disk onto which you copied VDISK.SYS, ANSI.SYS, and GRAPHICS.COM files. This will be called the working disk.

29. Insert the backup disk into drive A.

30. Type the following:

```
COPY A:*. *: B:
```

Then press the Enter key.

After a while, “Insert diskette for drive B” will appear.

31. Remove the backup disk from drive A.

32. Insert the working disk into drive A.

33. Press any key.

After a while, "Insert diskette for drive A" will appear.

Following the messages, repeat the same operations several times until "13 file(s) copied" appears.

Deleting unnecessary files

When you install this software on a floppy disk, it is recommended that you delete the IOP20.BAT and IOP20H.EXE files from the floppy disk to which you have just copied the files in step 32. They are used for the fixed disk installation.

34. Type the following to delete the IOP20.BAT and IOP20H.EXE files. Press the Enter key after typing each command.

```
DEL A: IOP20. BAT
```

```
DEL A: IOP20H. EXE
```

The I.O.P. 20 Series Screen Utility will have been installed on the working floppy disk.

2-4 Starting and Exiting the I.O.P. 20 Series Screen Utility

Starting I.O.P. 20 Series Screen Utility from Fixed Disk

When you install the I.O.P. 20 Series Screen Utility on a fixed disk, start it as described below.

Procedure

1. Turn on your personal computer, or press Ctrl + Alt + Delete keys at the same time to reset it.
DOS prompt will appear.

```
C>
```

2. Change to the directory where the I.O.P. 20 Series Screen Utility is installed. For example, if the directory name is "IOP", type the following:

```
CD IOP
```

Then press the Enter key.

3. Type the following to start the I.O.P. 20 Series Screen Utility:

```
IOP20
```

Press the Enter key.

"I.O.P. Message Screen" will appear.

The cursor will be blinking in "File Name" area.

The diagram illustrates the I.O.P. Message Screen interface. It features a window with a title bar. Inside the window, there are several input fields. The top field is labeled "File Name" and contains a cursor (represented by a small square) and the text ". DAT]". Below this field is a smaller input field containing the number "1". At the bottom of the window, there is a table with two columns and one row. The first column is labeled "Prim. No." and is empty. The second column is also empty.

4. Enter a file name.

A maximum of eight characters can be entered.

The extension “.DAT” will be automatically added to the file name. It indicates this file was made with the I.O.P. 20 Series Screen Utility.

5. Press the Enter key.

“Processing...” will be displayed. After a while, the cursor will move to “Prim.No.”.

To learn how to edit the screens, refer to Chapter 3.

Starting I.O.P. 20 Series Screen Utility from Floppy Disk Drive

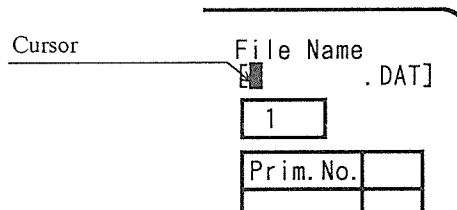
When you have installed the I.O.P. 20 Series Screen Utility on a floppy disk drive, start it as described below. Prepare a disk with this software copied on it.

Procedure

1. Insert the working disk, with the I.O.P. 20 Series Screen Utility copied on it, into drive A.
2. Turn on your personal computer, or press Ctrl + Alt + Delete keys at the same time to reset it.

The I.O.P. 20 Series Screen Utility will start and "I.O.P. Message Screen" will appear.

The cursor will be blinking in "File Name" area.



3. Enter a file name.
A maximum of eight characters can be entered.
The extension ".DAT" will be automatically added to the file name. It indicates this file was made with the I.O.P. 20 Series Screen Utility.
4. Press the Enter key.
"Processing..." will be displayed. After a while, the cursor will move to "Prim.No."

To learn how to edit the screens, refer to Chapter 3.

Note

- If you have just exited other software and the DOS prompt has been already displayed, you can start the I.O.P. 20 Series Screen Utility by typing "IOP20F" and pressing the Enter key.

Exiting I.O.P. 20 Series Screen Utility

When you are through editing screens, you can exit the I.O.P. 20 Series Screen Utility as shown below.

The screen will return to the DOS prompt.

Caution

- If you exit the I.O.P. series Software without saving, the edited screens will be erased and cannot be recovered. To save screens, refer to 3-7. "Saving Screens".

Procedure

1. Press the F3(EXIT) key.
"Exit ? (Y/N)" will appear.
2. Type Y.
3. Press the Enter key.

You will exit the I.O.P. 20 Series Screen Utility.

Chapter 3

Editing Screens

3-1 Designing I.O.P. Message Screen

Before you begin to edit, it is recommended that you design the screens on paper to match your factory automation system.

It will make it easier for you to edit them in this I.O.P. 20 Series Screen Utility.

You can refer to the following sections in the Appendix.

Appendix A Sample I.O.P. Message Screens

Illustrates some samples of I.O.P. Message Screen.

Appendix B Design Sheet

Blank I.O.P. Message Screen and Manual Access Screen forms which are the same as the ones displayed by the I.O.P. 20 Series Screen Utility.

Copy them so that you can draw your designs on them.

Appendix C Corresponding Key Code Sheet

A blank sheet on which you can note the used Key Code and the corresponding equipment in designing.

3-2 Editing

I.O.P. Message Screens and Function Keys

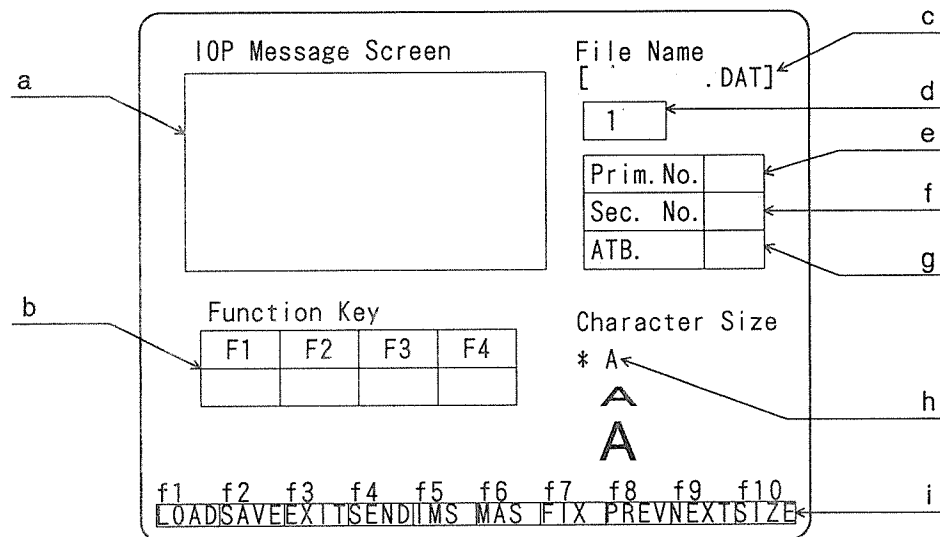
This section explains how to edit the Primary Screens and Secondary Screen on the "I.O.P. Message Screen" and how to assign Keys Codes to the Function Keys in the "Function Key" area.

You can select from 3 character sizes; half width characters, normal size characters, and double height characters.

The attribute numbers determine the type of screen that will be edited. (e.g. message screen, displaying External Data, entering External Data, superimposed screen, Function Key assignment)

It is recommended that you read "Editing Message" on page 37 first, since it describes the basic editing method.

After starting the I.O.P. 20 Series Screen Utility, you will find the cursor is blinking at "Prim.No." on the "I.O.P. Message Screen". If it is in [.DAT], you may not enter a filename. Then, enter a filename by referring to 2-4. "Starting and Exiting the I.O.P. 20 Series Screen Utility".



- a. Edit a screen to be displayed on the I.O.P..
- b. Enter Key Codes for Function Keys.
- c. current filename
- d. current page number
- e. Enter a Primary Screen number.
- f. Enter a Secondary Screen number.
- g. Enter an Attribute number.
- h. current character size
- i. function keys

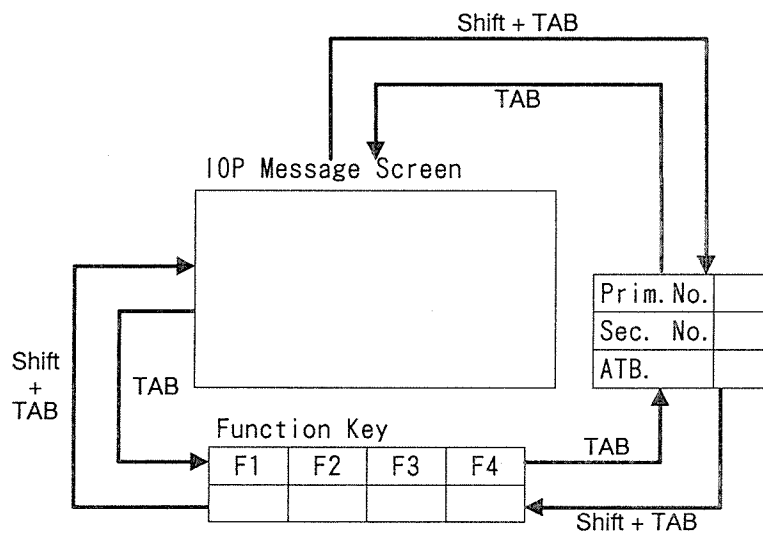
Cursor Movement

After you enter the Primary Screen number, the Secondary Screen number, and the Attribute number(ATB.), you can move the cursor from one block to another. To move it clockwise, press the Shift + TAB keys at the same time. To move it counterclockwise, press the TAB key.

Inside of each block, the cursor is moved by pressing the arrow key. To move the cursor to the next line on the I.O.P. Message Screen, press the down arrow key or the Enter key.

Note

- You cannot move the cursor with the Shift or TAB keys, if you have not entered a Primary Screen number and an Attribute number(ATB.).



Function Keys

The following table shows the function keys displayed at the bottom of the "I.O.P. Message Screen" and their functions.

F1	LOAD	Loads a set of screens. See page 67.
F2	SAVE	Saves a set of screens. See page 66.
F3	EXIT	Exits the I.O.P. 20 series Screen Utility. See page 30.
F4	SEND	Transfers the data to the I.O.P.. See Chapter 4.
F5	IMS	Invalid
F6	MAS	Displays the "Manual Access Screen".
F7	FIX	Displays the "Fixed Key".
F8	PREV	Displays the previous "I.O.P. Message Screen".
F9	NEXT	Displays the next "I.O.P. Message Screen".
F10	SIZE	Changes the character size. See page 40.

While you are holding down the Shift key, the function key operations are changed and are described below. Refer to 3-3 "Utilities for Manipulating I.O.P. Message Screen" for the operating details.

Shift + F1	COPY	Stores the screen being displayed in the copy buffer. See page 53.
Shift + F2	PST	Pastes the contents of the copy buffer into the screen being displaying screen. See page 53.
Shift + F3	JUMP	Jumps to the specified screen. See page 52.
Shift + F4	PRT	Prints out the I.O.P. Message Screens, Manual Access Screen, and Fixed Key area. See page 69.
Shift + F5	DELF	Deletes a file. See page 68.
Shift + F6	_____	_____
Shift + F7	_____	_____
Shift + F8	DELP	Deletes a screen(page). See page 53.
Shift + F9	INSP	Inserts a new screen(page). See page 52.
Shift + F10	SRCH	Searches for a screen by specifying a Primary Screen number and a Secondary Screen number. See page 54.

Caution

- After pressing a function key, it will take a little time to execute the function. Do not press a function key repeatedly and do not press any other key while "Processing..." is displayed.

Outline

1. Enter a Primary Screen number.
2. Enter a Secondary Screen number, if needed.
3. Enter an Attribute number.
4. Edit the "I.O.P. Message Screen".
5. Enter the Key codes for Function Keys, if needed.
6. Save the changes to the disk.

Notes

- The following table shows how many I.O.P. Message Screens the I.O.P. can contain. The number will vary depending on the I.O.P. model and the amount of RAM or ROM that is installed.

	M 20/21	M 22	
		Relay Communication	Data Register Communication
256kb RAM or ROM	63	63	63
1024kb RAM or ROM	255	160	255

Editing Messages

Procedure

Entering a Primary Screen number.

First, enter a Primary Screen number in the "Prim.No." box.

The Primary Screen displayed will depend on the Primary Screen number being sent by the programmable controller. The range of the Primary Screen numbers is always 00 thru FE specified as a hexadecimal number. For the model 22 in Relay Communication mode, the range is limited to 00 thru 9F. It should be entered a two-digit numbers. For example "1" is entered as "01". When the screens will be controlled with an Encode command by the programmable controller, it is recommended that you use sequential numbers such as "00", "01", "02".

After you enter the Primary Screen number, press the Enter key.

Notes

- "Hexadecimal" is a base-16 number system which consists of the digits 0 to 9 and characters A to F.

decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20...
hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	10	11	12	13	14...

- Enter "00" for the first Primary Screen. When the I.O.P. does not receive a signal from the programmable controller, Primary Screen No.00 is displayed.
- In the boxes for entering the Primary Screen number, the Secondary Screen number, and the Attribute number(ATB.):
 - to move the cursor to the next box, press the down arrow key or the right arrow key.
 - to move the cursor to the previous box, press the up arrow key or the left arrow key.
- When you want to delete the number you entered, press the space key twice and then press the Enter key.

Example

- The following example shows how to enter "5" as the Primary Screen number.

Prim. No.	05
-----------	----

Entering a Secondary Screen number.

When you want to create a Secondary Screen, enter a Secondary Screen number in the "Sec.No." box. Every Secondary Screen belongs to a Primary Screen. You cannot register a Secondary Screen to a Primary Screen that does not exist.

The range of the Secondary Screen number is 01 thru FF in hexadecimal. The Secondary Screen numbers should be specified sequentially as two-digit numbers, e. g. "01", "02", "03".

After you enter the Secondary Screen number, press the Enter key.

Note

- When you want to delete the number you entered, press the space key twice and then press the Enter key.

Example

- The following example shows how to create Secondary Screens No.1 and No.2 which belong to Primary Screen No.5.

Primary Screen No.5		Secondary Screen No.1		Secondary Screen No.2	
Prim. No.	05	Prim. No.	05	Prim. No.	05
Sec. No.		Sec. No.	01	Sec. No.	02

Entering an Attribute number (ATB.).

Enter the Attribute number (ATB.).

The Attribute number determines what the Primary Screen and the Secondary Screen will be used for. For example they can be used to display messages, display External Data etc.

Attribute number 3 and 5 allow the I.O.P. screen to be used for two different functions at the same time.

After you enter the Attribute number(ATB.), press the Enter key.

Descriptions	ATB.No.
Displaying messages	0
Function Key	1
Displaying External Data	2
Function Key and displaying External Data	3
Entering External Data	4
Displaying External Data and entering External Data	5
Superimposed screens	6

Note

- When you want to delete the number you entered, press the space key twice and then press the Enter key.

Example

- The following example shows how to edit display messages(Attribute number 0) on Secondary Screen No.1 belonging to Primary Screen No.5.

Prim. No.	05
Sec. No.	01
ATB.	0

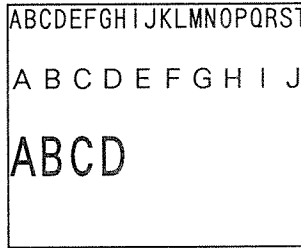
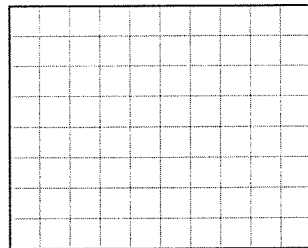
Editing an I.O.P. Message Screen.

Enter the characters to be displayed by the I.O.P. on the I.O.P. Message Screen.

If the cursor is still in the "ATB." box, press the Enter key. Then the cursor will move to the "I.O.P. Message Screen".

You can use three kind of characters; half width character, normal size character, and double height character. To change the character size, position "*" on the screen next to the character size you want by pressing the F10(SIZE) key. The following table shows the number of characters you can enter on a single I.O.P. Message Screen. "|", "@(normal size)", "~ (normal and double height)" are invalid characters.

size	horizontal	vertical
half width characters	20	8
normal size characters	10	8
double height characters	10	4



half width character

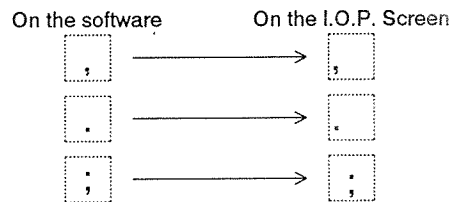
normal size character

double height character

□ represents one normal size character.

Note

- To display the previous screen, press the F8(PREV) key.
- To display the next screen, press the F9(NEXT) key.
- Note that ",", ".", and ":" you enter on the personal computer will be changed as shown below when displayed on the actual I.O.P. screen.



Caution

- The screen is only stored in the computer's memory along with I.O.P. 20 Series Screen Utility, not on the disk. So, before you exit the I.O.P. 20 Series Screen Utility, be sure to save your work on the disk. Refer to 3-7. "Saving Screens".

Editing Screens for Displaying External Data

Up to 16 pieces of External Data can be displayed on the screen.

A piece of data consists of 1 to 10 digits. A number with more than 10 digits can also be displayed by using two or more buffers on the same line.

But even if you only want to display 1, 2, or 3 digits of data, at least 4 digits of memory will be used. Therefore, to display 1, 2, or 3 digits of data, you have to control the display the program for the programmable controller by suppressing any leading zeros so as not to display the unnecessary digits. For details, refer to the I.O.P. Hardware Manual.

Procedure

Entering a Primary Screen number and a Secondary Screen number.

Refer to "Entering a Primary Screen number" on page 37 and "Entering a Secondary Screen number" on page 38.

Entering the attribute number(ATB.).

Enter 2, 3 or 5 as the Attribute number (ATB.).

When you want to use the screen only for displaying External Data, enter 2. To use it for both displaying External data and assigning function keys, enter 3, and to use it for both displaying and entering External Data, enter 5.

Editing the I.O.P. Message Screen.

Enter "\ " (normal size) in the area where the External Data will be displayed on the I.O.P.. On the actual I.O.P. screen, the "\ " will be replaced with the value stored in the External Data buffer.

Note

- About the number of the "\ " to be entered, refer to the table on the next page.
- Do not use "\ "(normal size) as a character to be displayed on the screen of the I.O.P., when you edit the screen for displaying External Data.

Enter a buffer number next to the “\” in hexadecimal. The range is 0 thru F. It must be a normal size character and an upper case.

The External Data from the programmable controller will be stored in the corresponding buffers. An individual buffer number(0-F) should only appear in one place on a particular screen.

The table shows the entry you must make for a given number of digits.

For example, if you want to show a 6 digits number using buffer number 0, enter “\\0”.

Digits	What you input	buffer(0-F)
4	\\	n
6	\\\	n
8	\\\	n
10	\\\	n

Caution

- The screen is only stored in the computer’s memory along with I.O.P. 20 Series Screen Utility, not on the disk. So, before you exit the I.O.P. 20 Series Screen Utility, be sure to save your work on the disk. Refer to 3-7. “Saving Screens”.

Example

- The example shows the actual I.O.P. screen appearance and how to create such a screen with the editor.

I.O.P. screen

Current number of products Product AIP 2010	
No. 1	1234
No. 2	123456
No. 3	12345678
No. 4	1234567890

Edit as below.

IOP Message Screen

Current number of products Product AIP 2010	
No. 1	0
No. 2	1
No. 3	2
No. 4	3

Prim. No.	07
Sec. No.	
ATB.	2

Editing Screens for Entering External Data

You can enter up to 16 pieces of External Data from the I.O.P..

A piece of data consists of 1 to 10 digits. A number with more than 10 digits can also be entered by using two or more buffers on the same line.

But even if you only want to enter 1, 2, or 3 digits of data, at least 4 digits of memory will be used. Therefore, to enter 1, 2, or 3 digits of data, you have to control the display with the program for the programmable controller by suppressing any leading zeros so as not to enter the unnecessary digits.

For details, refer to the I.O.P. Hardware Manual.

Notes

- External Data cannot be entered when your I.O.P. is in Custom mode on the M20.

Procedure

Entering a Primary Screen number and a Secondary Screen number.

Refer to “Entering a Primary Screen number” on page 37 and “Entering a Secondary Screen number” on page 38.

Entering the attribute number(ATB.).

Enter 4 or 5 as the Attribute number(ATB.).

When you only want to use the screen for entering External Data, enter 4. To both enter External Data and display External Data, enter 5.

Editing the I.O.P. Message Screen.

Place a dollar sign (normal size) at the location where you want to be able to enter a number when using the I.O.P..

On the actual I.O.P. screen, the dollar sign will be replaced by the number you enter using the I.O.P. keys.

Note

- About the number of the dollar signs to be entered, refer to the table on the next page.
- Do not use the dollar sign(normal size) as a character to be displayed on the screen of the I.O.P., when you edit the screen for entering External Data.

Enter a buffer number next to the dollar signs in hexadecimal. The range is 0 thru F. It must be a normal size character and a upper case.

Any number you enter from the I.O.P. keys is stored in a buffer. An individual buffer number(0-F) should only appear in one place on a particular screen.

The table shows the entry you must make for a given number of digits.

For example, if you want to enter a 6 digits number using buffer number 0, enter “ \$ \$ 0”.

Digits	What you input	buffer(0-F)
4	\$	n
6	\$ \$	n
8	\$ \$ \$	n
10	\$ \$ \$ \$	n

Caution

- The screen is only stored in the computer’s memory along with I.O.P. 20 Series Screen Utility, not on the disk. So, before you exit the I.O.P. 20 Series Screen Utility, be sure to save your work on the disk. Refer to 3-7. “Saving Screens”.

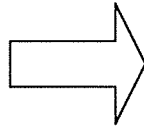
Example

- The example shows the actual I.O.P. screen appearance and how to create such a screen with the editor.

I.O.P. screen

```

Input number of
product for today.
Product AIP 2010
No. 1
No. 2
No. 3
No. 4
    
```



Edit as below.

IOP Message Screen

```

Input number of
product for today.
Product AIP 2010
No. 1      $ 0
No. 2      $ $ 1
No. 3      $ $ $ 2
No. 4      $ $ $ $ 3
    
```

Prim. No.	08
Sec. No.	
ATB.	4

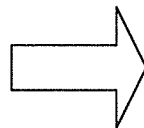
Example

- The following example shows how to edit the screen for displaying External Data and for entering External Data using the I.O.P.. Enter 5 as the Attribute(ATB.) number.

I.O.P. screen

```

Product AIP 2010
Scheduled number
20000000
Current number
12345678
    
```



Edit as below.

IOP Message Screen

```

Product AIP 2010
Scheduled number
$ $ $ 1
Current number
  \ \ 3
    
```

Prim. No.	09
Sec. No.	
ATB.	5

Editing Superimposed Screen

One Primary Screen can have up to 10 Primary Screen superimposed on it.

Note

- You can only create superimposed screens as Primary Screens not as Secondary Screens. It is impossible to superimpose new information in the area used for displaying or entering External Data.

Procedure

Entering a Primary Screen number.

Refer to “Entering a Primary Screen number” on page 37.

Entering the attribute number(ATB.).

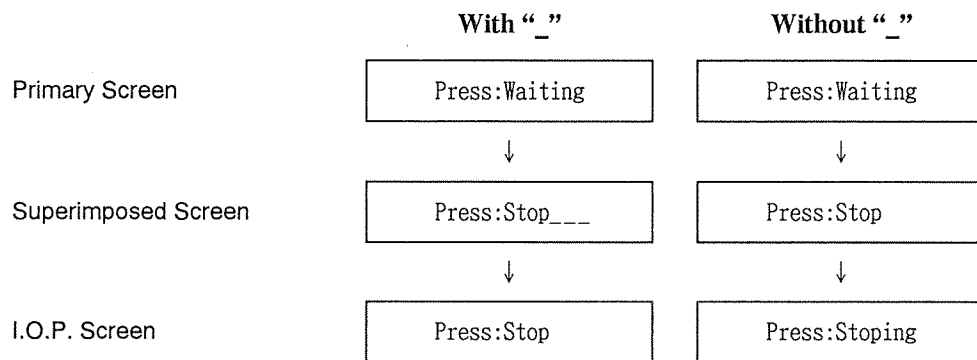
Enter 6 as the Attribute number(ATB.).

Editing the I.O.P. Message Screen.

Enter characters so that they will fit exactly over the characters on the Primary Screen.

Caution

- Double height characters cannot be entered.
- When the characters of a superimposed screen take less space than the characters on other Primary Screens, use an underscore character “_”(half width) in place of a space as shown below. This use of the half width underscore character, means that you should not use it in ordinary text for a screen.



- The screen is only stored in the computer’s memory along with I.O.P. 20 Series Screen Utility, not on the disk. So, before you exit the I.O.P. 20 Series Screen Utility, be sure to save your work on the disk. Refer to 3-7. “Saving Screens”.

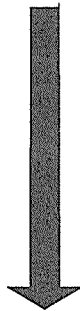
Example

I.O.P. screen

before superimposing

Primary Screen No.1

Line No. 1
Abrasion:
Press :



after superimposing

Primary Screen No.1
superimposed with screen
No.A and No.B.

Line No. 1
Abrasion: Running
Press : Stop

Edit as below.

Primary Screen No.1

IOP Message Screen

Line No. 1
Abrasion:
Press :

Prim. No.	01
Sec. No.	
ATB.	0

Screen to display "Running"

Running

Prim. No.	0A
Sec. No.	
ATB.	6

Screen to display "Stop"

Stop

Prim. No.	0B
Sec. No.	
ATB.	6

Function Key Assignment

This section explains how to edit the Function Key assignments and how to enter Key Codes in the "Function Key" area below the "I.O.P. Message Screen".

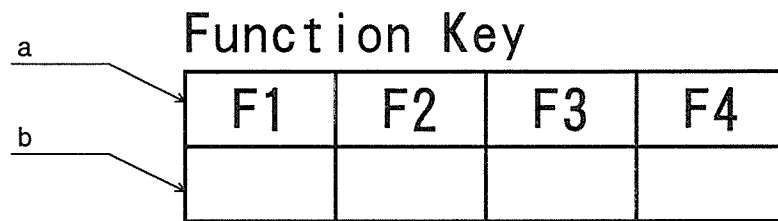
You can assign up to four Key Codes per screen, and you can have a total of 255 Key Codes assigned to a set of screens.

When the screen will be controlled with the Decode command in the programmable controller's program, sequential Key Codes such as "06", "07", "08" should be used.

Notes

- When you want to use the function keys as latched switches, control them by a program of the programmable controller.

Function Key area displayed below the I.O.P. Message Screen



- a. Function key number
- b. Enter the Key Code here.

Procedure

Entering a Primary Screen number and a Secondary Screen number.

Refer to the "Entering a Primary Screen number" on page 37 and "Entering a Secondary Screen number" on page 38.

Entering the Attribute number(ATB.).

Enter 1 or 3 as the Attribute number(ATB.).

When you only want to use the screen for assigning Function Keys, enter 1. To use it assigning Function Keys and displaying External Data, enter 3.

Editing the I.O.P. Message Screen.

Edit message and Function Keys assignments in the "I.O.P. Message Screen" area.

Entering the Key Codes.

Enter the Key Codes for each function key in the "Function Key" area.

If the cursor is still in the "I.O.P. Message Screen", press the TAB key. Then the cursor will move to the "Function Key" area.

The Key Code must be two-digit number and the range is 01 thru FF in hexadecimal. This means that a maximum of 255 Key Codes can be assigned. For the model 22 in Relay Communication mode, the range is 01 thru 9F – a maximum of 160 codes. Any Key Code can be assigned, including the ones used for the Manual keys and Fixed keys.

Note

- To move the cursor to the next box, press the right arrow key.
- To move the cursor to the previous box, press the left arrow key.

Example

Edit as below.

IOP Message Screen

Select F1 or F2.
F1:Automation
F2:Manual operation

Prim. No.	06
Sec. No.	
ATB.	1

Function Key

F1	F2	F3	F4
56	57		

Caution

- The screen is only stored in the computer's memory along with I.O.P. 20 Series Screen Utility, not on the disk. So, before you exit the I.O.P. 20 Series Screen Utility, be sure to save your work on the disk. Refer to 3-7. "Saving Screens".

3-3 Utilities for Manipulating I.O.P. Message Screen

This section explains how to insert, jump, copy, delete, and search a screen.

Inserting Screen

You can insert a new screen before the screen currently being displayed.

Caution

- When you insert a new screen, screen page 255 will be deleted.

Procedure

1. Press the Shift + F9(INSP) keys at the same time.

A new screen will be inserted.

Jumping to New Screen

You can view a specific screen by specifying the page number.

Procedure

1. Press the Shift + F3(JUMP) keys at the same time.
"Jump Page No " will appear.
2. Enter the page number of the screen you want to display.
The range is pages 1 thru 255.
3. Press the Enter key.
The screen you have selected will appear.

Copying Screen

You can copy the entire contents of the screen to another screen with the copy buffer. The contents stored in the buffer can be copied repeatedly, until the screen in the buffer is replaced by a new screen.

Procedure

1. Press the Shift + F1(COPY) keys at the same time.
The contents of the screen will be stored in the buffer.
2. Press the Shift + F3(JUMP) keys at the same time.
"Jump Page No. " will appear.
3. Enter the page number.
The range is pages 1 thru 256.
4. Press the Enter key.
The screen you have selected will appear.
5. Press the Shift + F2(PST) keys at the same time.
The screen contents stored in the buffer will be copied to the screen.

Note

- Instead of the Shift + F3(JUMP) keys, the Shift + F10(SRCH) keys, F8(PREV) key, or F9(NEXT) key can be also used to specify a screen.

Deleting Screen

When there is a screen you want to delete, do the following.

Caution

- Once a screen is deleted, the data cannot be recovered.

Procedure

1. Press the Shift + F8(DELP) keys at the same time.
The current screen will be deleted. The page numbers of the screens after the current one will be reduced by one.

Searching for Screen

By specifying the Primary Screen number and the Secondary Screen number, you can search for a desired screen.

The search will start from the next screen number and will stop when the first screen which has the specified number is found.

Procedure

1. Press the Shift + F10(SRCH) keys at the same time.
“Search Primary Screen No.?” and “Secondary Screen No.” will appear.
2. Enter the Primary Screen number and the Secondary Screen number to be searched for.
3. Press the Enter key.
The specified screen will appear.
If the specified screen is not found, the former screen will appear again.

Note

- To quit the search, press the ESC key.

3-4 **Designing Manual Access Screen**

It is recommended that you design the Manual Screens to match your factory automation system.

It will make it easier for you to edit them with this I.O.P. 20 Series Screen Utility.

You can refer to the following sections of the Appendix.

Appendix B Design Sheet

Blank I.O.P. Message Screen and Manual Access Screen forms which are the same as the ones displayed by the I.O.P. 20 Series Screen Utility.

Copy them, so that you can layout your designs on them.

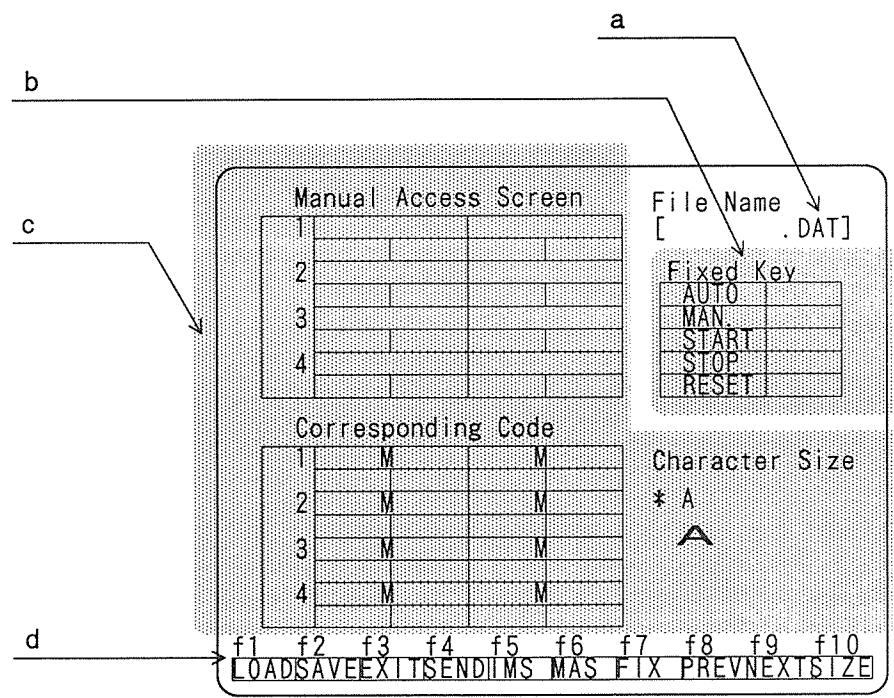
Appendix C Corresponding Key Code Sheet

A blank sheet on which you can note the used Key Code and the corresponding equipment in designing.

3-5 Editing Manual Access Screen and Fixed Keys

The "Manual Access Screen" and "Fixed Key" assignments are displayed on the same screen. You can assign Key Codes to the Manual Keys and to the Fixed Keys .

Display this screen by pressing the F6(MAS) key. The cursor will appear on the left part of the screen in the "Manual Access Screen" area. When you press the F7(FIX) key, the cursor will be moved to the right part of the screen and you can edit the "Fixed Key" area.



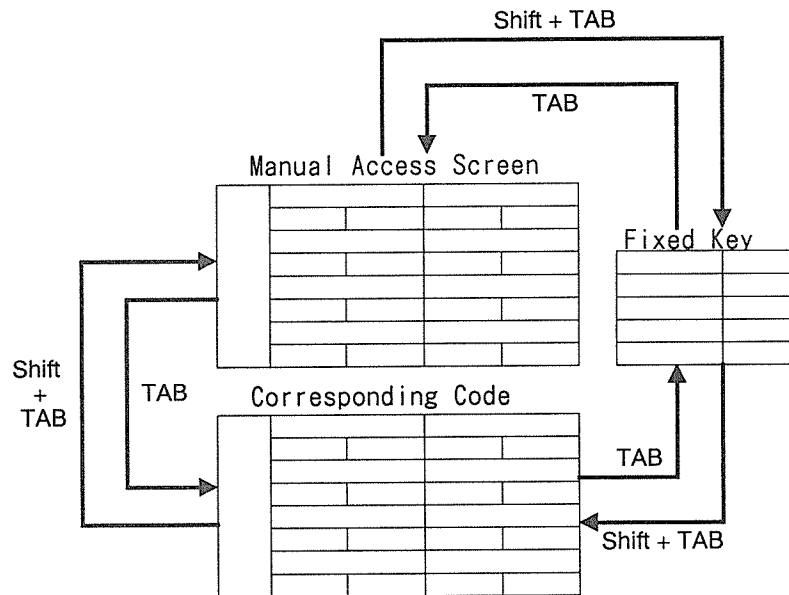
- a. current filename
- b. Fixed Key area
- c. Manual Access Screen
- d. function key

Cursor Movement

You can move the cursor from one block to another. To move it clockwise, press the Shift + TAB keys at the same time. To move it counterclockwise, press the TAB key. Inside of each block, the cursor can be moved by pressing the arrow keys.

Note

When the screen is displayed by pressing the F7(FIX) key, the TAB key will not work.



Function keys

The following table shows the function keys displayed at the bottom of the “I.O.P. Message Screen” and their functions.

F1	LOAD	Loads a set of screens. See page 67
F2	SAVE	Saves a set of screens. See page 66.
F3	EXIT	Exits the I.O.P. 20 series Software. See page 30.
F4	SEND	Transfers the data to the I.O.P.. See Chapter 4.
F5	IMS	Displays the “I.O.P. Message Screen”.
F6	MAS	Displays the “Manual Access Screen”.
F7	FIX	Displays the “Fixed Key”.
F8	PREV	Displays the previous four lines on the “Manual Access Screen”.
F9	NEXT	Displays the next four lines on “Manual Access Screen”.
F10	SIZE	Changes the character size.

When you hold down the Shift key, the function keys are changed as described below. Refer to the 3-6 “Utilities for Manual Access Screen” for operation details.

Shift + F1	COPY	Stores the line which the cursor is on in the Manual Access Screen copy buffer. See page 65.
Shift + F2	PST	Pastes the line which is stored in the copy buffer onto the line which the cursor is on. See page 65.
Shift + F3	JUMP	Jumps to the specified line. See page 65.
Shift + F4	PRT	Prints out the I.O.P. Message Screen, Manual Access Screen, and Fixed Keys. See page 69.
Shift + F5	DEL	Deletes a file. See page 68.

Caution

- After pressing a function key, it will take a little time to execute the function. Do not press a function key repeatedly and do not press any other key while “Processing...” is displayed.

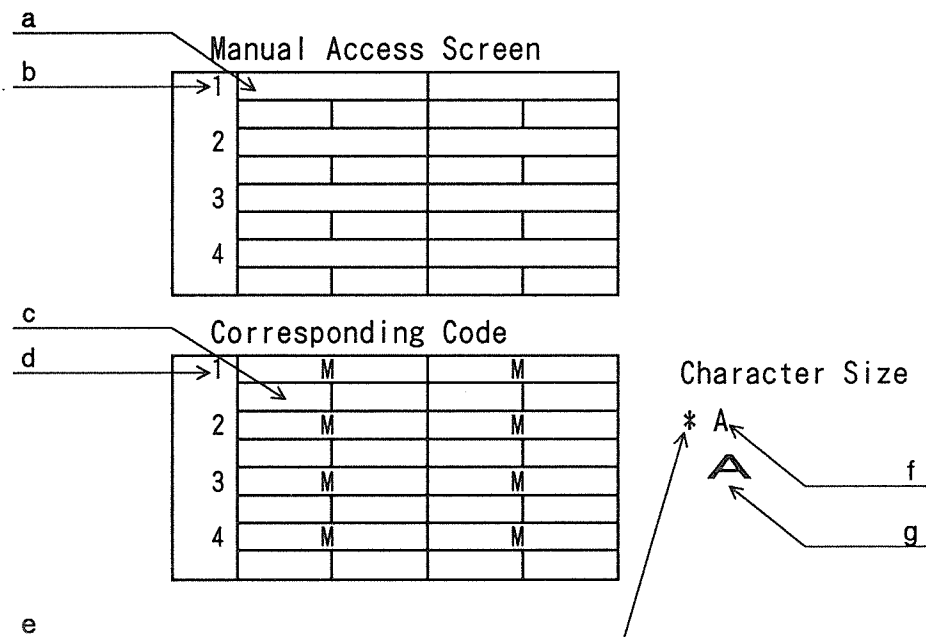
Assigning Manual keys

The "Manual Access Screen" can be displayed by pressing F6(MAS) key on the "I.O.P. Message Screen".

Two sizes of characters, the half width and normal size characters can be used for the Manual Key names.

Note

- To returns to the "I.O.P. Message Screen", press the F5(IMS) key.



- a. Enter a Manual Key name.
- b. line number
- c. Enter the Key Codes for the Manual Keys.
- d. line number
- e. indicates current character size
- f. half width character
- g. normal size character

Outline

1. Display "Manual Access Screen".
2. Enter the names for the Manual keys.
3. Enter the Key Codes.
4. Save them on the disk. (See 3-7 "Saving Screens".)

Procedure

Displaying the "Manual Access Screen".

Press the F6(MAS) key while the "I.O.P. Message Screen" is being displayed. The "Manual Access Screen" will appear. The cursor will be on the first cell, where you can enter a Manual Key name.

Entering Manual key names.

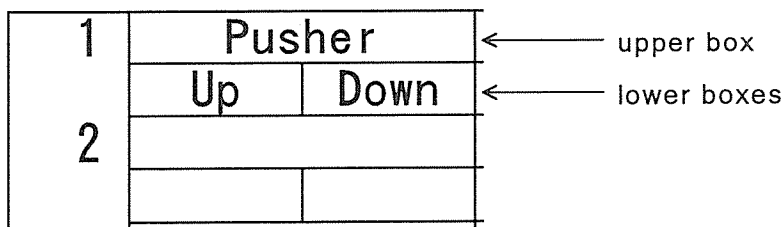
Enter Manual key names in the "Manual Access Screen".

In the upper boxes, a maximum of 10 half width characters can be entered, or 5 normal size characters.

In the lower boxes, a maximum of 4 half width characters can be entered, or 2 normal size characters.

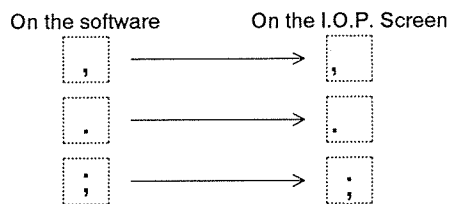
"|", "@ (normal size)", "~ (normal and double height)" are invalid characters.

For example, enter the name of a machine in the upper box, and enter the words for the actions in the lower two boxes so that you can control the action of the machine.



Note

- To change the character size, position the "*" next to the character size you want by pressing the F10(SIZE) key.
- Note that ",", ".", and ":" you enter on the personal computer will be changed as shown below when displayed on the actual I.O.P. screen.



Entering Key Codes.

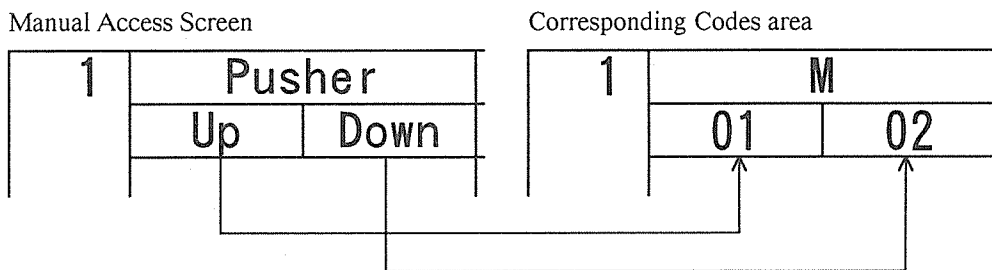
Enter Key Codes in hexadecimal in the “Corresponding Codes” area.

If the cursor is still in the “Manual Access Screen”, press the TAB key. Then the cursor will move to the “Corresponding Codes” area.

Use two-digit numbers, for example “1” is entered as “01”.

The range of the Key Codes is 01 thru FF. This means that a maximum of 255 Key Codes can be entered. For the model 22 in Relay Communication mode, the range is from 01 thru 9F – a maximum of 160 Key Codes. Any Key Code can be assigned, including the ones used for the Function keys and Fixed keys.

Each box in the “Corresponding Codes” area corresponds to the box in the “Manual Access Screen” which has same line number.



Note

- To display the previous four lines, press the F8(PREV) key.
- To display the next four lines, press the F9(NEXT) key.

Caution

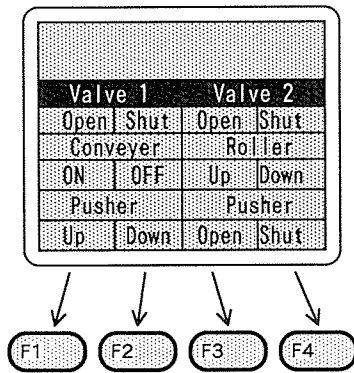
- The screen is only stored in the computer’s memory along with I.O.P. 20 Series Screen Utility, not on the disk. So, before you exit the I.O.P. 20 Series Screen Utility, be sure to save your work on the disk. Refer to 3-7. “Saving Screens”.

Example

- The following example shows how to assign names and Key Codes to Manual keys.

I.O.P. screen

Edit as below.



Manual Access Screen

1	Valve 1	Valve 2
	Open Shut	Open Shut
2	Conveyer	Roller
	ON OFF	Up Down
3	Pusher	Pusher
	Up Down	Open Shut

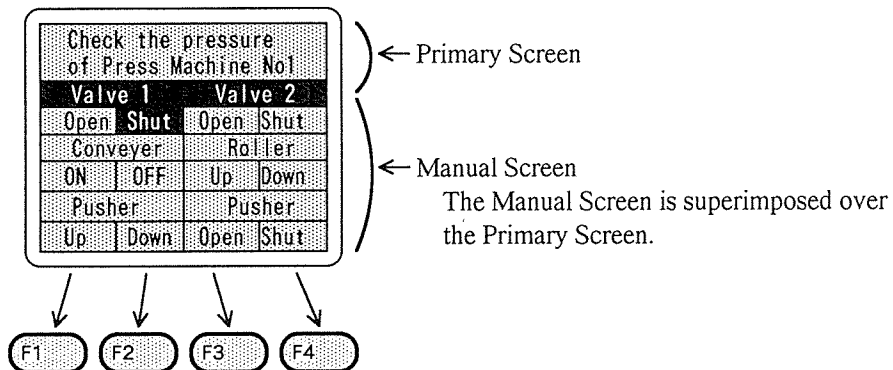
Corresponding Code

1	M	M
	06 07	08 09
2	M	M
	0A 0B	0C 0D
3	M	M
	0E 0F	10 11

Notes

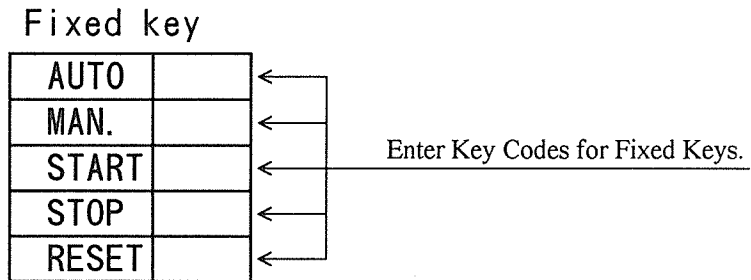
- The following example explains how to shut valve 1. with a Manual key on the I.O.P..

1. Press the arrow key (▲ or ▼) on the I.O.P. to move the cursor to the line “Valve 1”.
2. Press the F2 key, which corresponds to the “Shut” instruction for valve 1.



Assigning Fixed Keys

The "Fixed key" area can be displayed by pressing the F7(FIX) key.
 Default values have already been assigned to each Fixed key.



Note

- To return to the "I.O.P. Message Screen", press the F5(IMS) key.
- While you are editing the "Manual Access Screen", you can move the cursor to the "Fixed Key" area by pressing the TAB key or the Shift + TAB keys and change the Key Codes for the Fixed Keys. But, when you display the "Fixed Key" area by pressing the F7(FIX) key, you cannot move the cursor to the "Manual Access Screen" by pressing the TAB key or Shift + TAB keys. To return to the Manual Access Screen area, press the F6(MAS) key.
- The following table shows the default value of the Key Codes for the Fixed keys.

Fixed key	AUTO	MAN.	START	STOP	RESET
Key Code	01	02	03	04	05

Outline

1. Move the cursor to the "Fixed Key" area.
2. Enter the Key Codes.
3. Save them on the disk(See 3-7. "Saving Screen".)

Procedure

Displaying the “Fixed Key” area.

Press the F7(FIX) key while the “I.O.P. Message Screen” is being displayed. The “Fixed Key” area will appear on the right side of the screen. The cursor will be in the cell for assigning a Key Code to “AUTO”.

Entering the Key Codes.

Enter a Key Code in hexadecimal. It must be a two-digit number, e. g. “01”. The range of Key Codes is from 01 thru FF. This means a maximum of 255 Key Codes can be assigned. For the model 22 in Relay Communication mode, the range is 01 thru 9F - a maximum of 160 codes. Any Key Code can be assigned, including the ones used for the Function Keys and Manual Keys.

Caution

- The screen is only stored in the computer’s memory along with I.O.P. 20 Series Screen Utility, not on the disk. So, before you exit the I.O.P. 20 Series Screen Utility, be sure to save your work on the disk. Refer to 3-7. “Saving Screens”.

3-6 Utilities for Manual Access Screen

This section explains how to specify a line and how to copy the contents of a line already on the Manual Access Screen.

Specifying Line

By specifying the line number, you can display the desired line. The lines are displayed four lines at a time. For example, if you specify line number "7", lines 5 to 8 will appear.

Procedure

1. Press the Shift + F3(JUMP) keys at the same time.
"Jump Line No " will appear.
2. Enter the line number.
The range is 1 thru 20.
3. Press the Enter key.
The cell you have selected will appear.

Copying Line

You can copy Manual key names and Key Codes from one line to another line with the line buffer. The contents are stored in the line buffer so that they can be copied repeatedly, until the contents of the line buffer are replaced by a new line.

Procedure

1. Place the cursor on the line you want to copy.
2. Press the Shift + F1(COPY) keys at the same time.
The Manual Key names and the Key Codes that you have specified will be stored in the line buffer.
3. Press the Shift + F3(JUMP) keys at the same time.
"Jump Line No. " will appear.
4. Enter the line number.
The range is 1 thru 20.
5. Press the Enter key.
The line you have specified will appear.
6. Press the Shift + F2(PST) keys at the same time.
The Manual Key names and the Key Codes in the line buffer will be copied to the screen.

Note

- Instead of the Shift + F3(JUMP)keys, F8(PREV) key or F9(NEXT) key can be also used to specify a line.

3-7 Saving Screens

After you finish editing screens and setting the Key Codes, you must save them on the disk.

Caution

- If you exit the I.O.P. 20 Series Screen Utility without saving, the edited screens will be erased and cannot be recovered.

Procedure

1. Press the F2(SAVE) key.
"Save to Drive x" will appear. "x" is the current drive.
2. To change the drive, type the new drive letter.
3. Press the Enter key.
When the same name, shown in "File Name" on the screen, is found on the disk, you will see "Replace existing file? (Y/N)". If you see this message, go to step 4.
When the file name is not found, "Processing..." will appear and the screens will be saved on the disk.
4. When you want to replace the file, type Y.
The file will be replaced and saved.
When you want to save the file as a new file, type N and press the Enter key.
"Change your file name? (Y/N)" will appear.
5. Type Y.
6. Press the Enter key.
"Input your file name. [_ .DAT]" will appear.
7. Enter a new file name with no more than eight characters.
8. Press the Enter key.
"Processing..." will appear. The screens will be saved.

To quit, press ESC key except Y or N.

Note

- If you see "0 File(s) copied", the screens were not saved because the disk you selected is full. In this case, change the drive or the floppy disk to one which has enough room save the file, and retry.

3-8 Loading Screens

When you want to load screens from the fixed disk or the floppy disk, do the following.

Procedure

1. Press the F1(LOAD) key.
"Load from Drive = x;" will appear. "x" is the current drive.

Caution

- If you press the F1(LOAD) key while you are editing screens, "Save changes you edited?" will appear. When you want to save them, type Y and press the Enter key.(See 3-7 "Saving Screens" for the details.) If you type N and press the Enter key, you will lose the changes when the other screens are loaded.

2. Enter the new drive letter when you want to change the drive.
3. Press the Enter key.
The file names will be displayed.
Nothing will appear if there are no files on the disk.
To quit, press the ESC key.
4. Place the cursor on a file name.
5. Press the Enter key.
The screens from the file you have selected will be displayed.

3-9 Deleting File

Only files with the filename extension "DAT" can be deleted.

Caution

- Once a file is deleted, the data can not recovered.

Procedure

1. Press the Shift +F5 key at the same time.
"DELETE DRIVE = A" will appear.
2. Enter the new drive letter, when you want to change the drive.
3. Press the Enter key.
Only the file names with the extension "DAT" will appear.
You can select any file from up to 252 files. If the file you are looking for is not shown, use the down arrow key to scroll the screen.
4. Place the cursor on the file name you want to delete.
5. Press the Enter key.
"Delete File = × × × × " will appear.
6. If it is the right file to be deleted, type Y. To quit, press the ESC key.
7. Press the Enter key.
The file you have selected will be deleted.

3-10 Printing Out Screens

The screens you edited can be output as hard copies from the IBM Personal Graphics Printer or similar.

One of the screens you want to print out should have been displayed.

Prepare your printer before beginning.

Procedure

1. Press the Shift + F4 (PRT) keys at the same time.
The "Hard Copy" screen will appear.
2. Enter the number which is next to the description you want.
If you want hard copies of:
 - all screens including the I.O.P. Message Screens, the Manual Access Screen, and the Fixed Key area, enter 1.
 - all I.O.P. Message Screens, enter 2.
 - some pieces of I.O.P. Message Screen, enter 3 and the range of the pages.
 - only Manual Access Screen, enter 4.
 - only Fixed Key, enter 5.
3. Press the Enter key.
The screens you have selected will be printed out.
4. To return to the I.O.P. Message Screen, enter 6 in the "Hard Copy" screen.

Note

- To quit printing, press the ESC key.

Chapter 4

Transferring Data to the I.O.P.

4-1 Preparing to Transfer

After you have finished editing screens, you can transfer the data to the I.O.P. where it will be stored in RAM.

The data to be transferred is all of the data from the "I.O.P. Message Screen", the "Manual Access Screen" and the "Fixed Key" area.

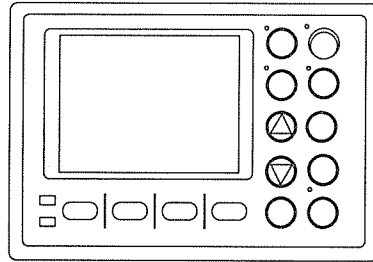
Outline

1. Connect the I.O.P. to the personal computer.
2. Install RAM in the I.O.P..
3. Set jumpers.
4. Place the I.O.P. in Register mode.
5. Transfer the data to the I.O.P.

Before You Start

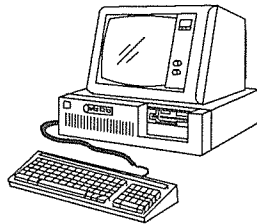
Before you begin, you will need the following devices.

I.O.P.



Personal computer

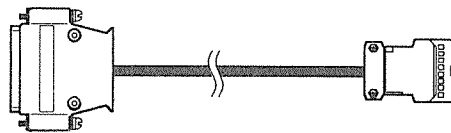
An IBM AT Personal Computer manufactured by the International Business Machines Corporation. Or an IBM compatible.



Cable

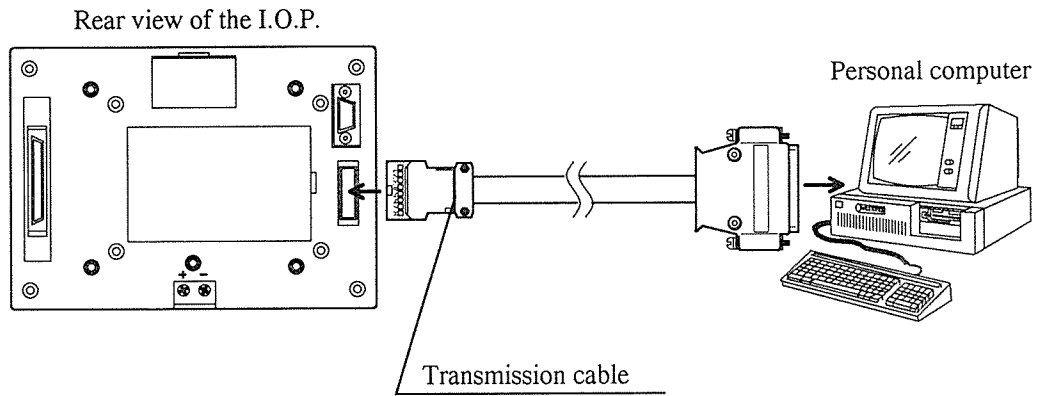
Transmission cable

For the details, refer to Appendix D.



Connecting I.O.P. to your Personal Computer

Connect the I.O.P. to your personal computer as shown below.



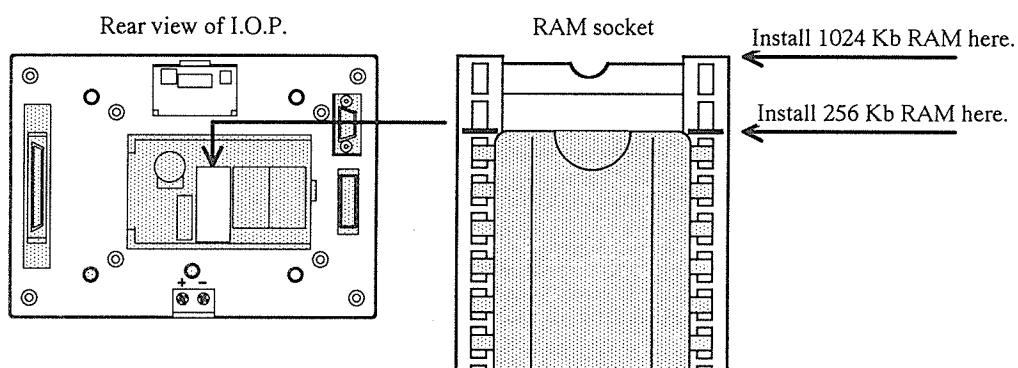
Installing RAM

If ROM is installed in your I.O.P., replace it with RAM.

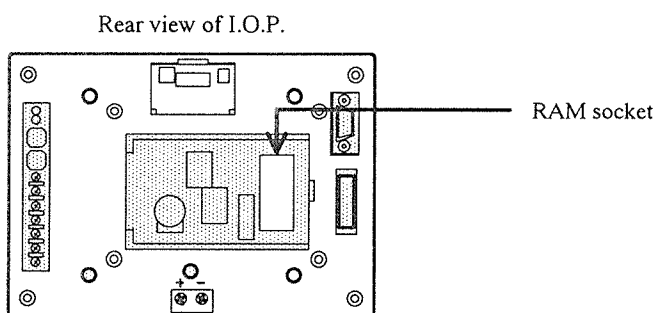
When you use the I.O.P. for the first time, 256 Kb of RAM will have been installed in it.

The installation position of the RAM chip depends on the number of pins on the chip. The 256 Kb RAM chips has 28 pins, while the 1024 Kb RAM chips has 32 pins.

M20, M22



M21



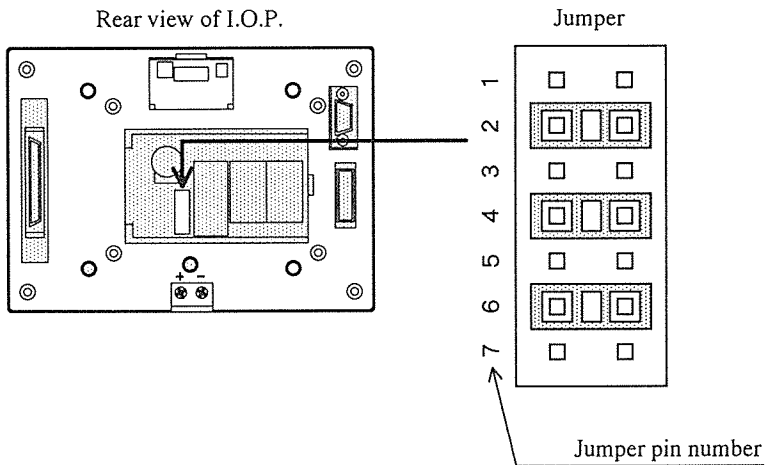
Caution

- The I.O.P. requires a backup battery even when ROM is installed.

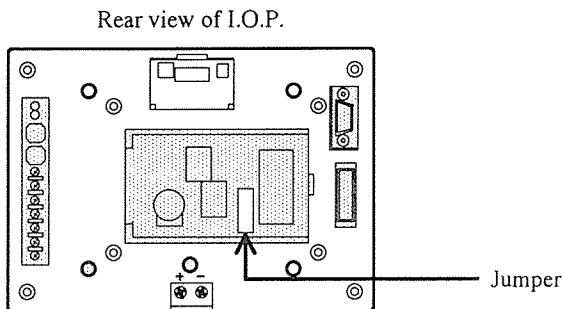
Setting Jumpers

When you use a RAM the jumpers pins No.2, 4 and 6 should be installed. When using 256Kb ROM, jumpers should be installed on pins No. 3, 5 and 7. When using 1024Kb ROM, jumpers should be installed on pins No.1, 5, and 7. Use a JEDEC standard 32-pin DIP memory chip type for 1024Kb ROM.

M20, M22



M21



4-2 Transferring Data to I.O.P.

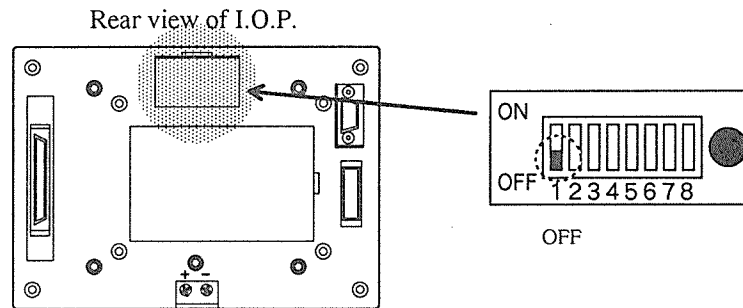
After you have finished editing screens, you can transfer the data from the "I.O.P. Message Screen", the "Manual Access Screen" and the "Fixed Key" to the I.O.P.. The screens you have edited are displayed on the I.O.P..

You may refer to "Flow Chart", at the end of this chapter for an outline of the steps required to transfer data.

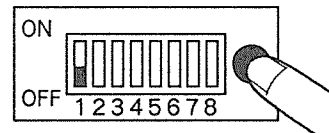
Procedure

Setting the conditions of the I.O.P.

1. Set DIP switch No.1 on the rear panel of the I.O.P., to the OFF position.
For the model 22, set the DIP switches No.1 and No.2 to the OFF position.



2. Press the System Reset button located to the right of the DIP switches.



You will see the following messages on the I.O.P.:

Register Mode
Transfer Mode

F1:Receive data from
personal computer
F2:Transfer to
ROM programmer

3. Press the F1 key(Receive data from personal computer) key on the front panel of the I.O.P..
The I.O.P. will enter the Register mode.
You will see:

Register Mode

F1:Clear RAM
and transfer
F2:Overwrite
on RAM

4. To clear the existing data in the RAM before transferring the new data, press the F1 key.
You will see:

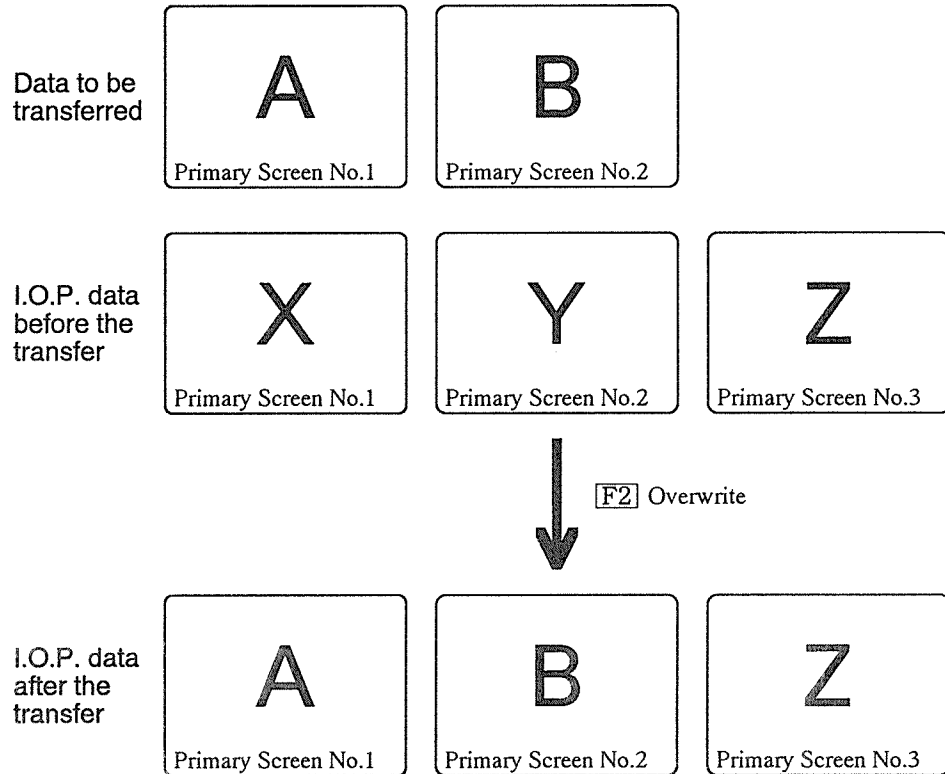
Data Clear Mode

F1:IOP Message
Screen
F2:Manual Access
Screen
F3:Fixed key

To overwrite the new data on the existing data, press the F2 key.
You will see the same message as that of step 7. Go to step 8.

Notes

- For example, if you overwrite fresh data to the I.O.P., and if the new data does not have a Primary Screen No.3, the existing Primary Screen No.3 in I.O.P. will remain.



5. To clear the existing data of I.O.P. Message Screen, press the F1 key.
To clear the existing data of Manual Access Screen, press the F2 key.
To clear the existing data of Fixed Key, press the F3 key.
You will see:

Data clear completed

Continue: ARROW key

Exit : ESC key

6. When you want to clear other edited data, press one of the arrow keys (▲ or ▼) and then select the next data to clear by pressing the F1, F2, or F3 key.

7. When you are through clearing data, press the ESC key.
You will see:

Register Mode

Transfer data from
personal computer

Transferring the screens.

Transfer the screens on the personal computer as described below. You should see a screen from the file you want to transfer.

8. Press the F4(SEND) key.
“Send your data to IOP? (Y/N)” will appear on the display of your personal computer.
To quit, press N key or ESC key on the personal computer.
9. Type Y, and press the Enter key.
“Send I.O.P. Message Screen data? (Y/N)” will appear.
10. When you want to transfer the data of I.O.P. Message Screen, type Y key, and press the Enter key.
Transfer will start. You will see the following messages on the I.O.P..

PAGEx

Transferring
IOP Message Screen

“PAGE” is the number of pages which is being transferred.

When the transfer is complete, “Transfer Completed” will be displayed on the I.O.P. screen and “Send Manual Access Screen data?(Y/N)” will appear on the personal computer.

When you want to skip the I.O.P. Message Screen transfer, type N key.

“Send Manual Access Screen data? (Y/N)” will appear on the personal computer.

11. When you want to transfer the data of Manual Access Screen, first press the arrow key (▲ or ▼) on the I.O.P..
Make sure that the same screen as that of step 7 will be displayed on the I.O.P. screen, then type Y on the personal computer.
Transfer will start. You will see the following messages on the I.O.P..

Transferring Manual Access Screen

When the transfer is complete, "Transfer Completed" will be displayed on the I.O.P. screen and "Send Fixed Key data?(Y/N)" will appear on the personal computer.

When you want to skip the Manual Access Screen transfer, type N key.
"Send Fixed Key data? (Y/N)" will appear on the I.O.P..

12. When you want to transfer the data of Fixed Key, first press the arrow key(▲ or ▼) on the I.O.P..
Make sure that the same screen as that of step 7 will be displayed on the I.O.P. screen, then type Y on the personal computer.
Transfer will start. You will see the following messages on the I.O.P..

Transferring Fixed key

When you want to skip it, type N key.

When the transfer is complete, "Transfer completed" will appear on the I.O.P..

13. To continue to transfer data, press one of the arrow keys (▲ or ▼) on the I.O.P..
The screen will return to the step 7.

Notes

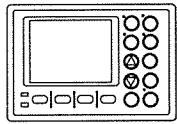
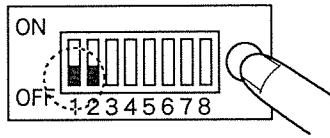
- If you get the error message, press the RESET key on the I.O.P. and retry starting from the step 8.

```
PC→IOP  
TRANSFER ERROR  
Press RESET key  
and retransfer
```

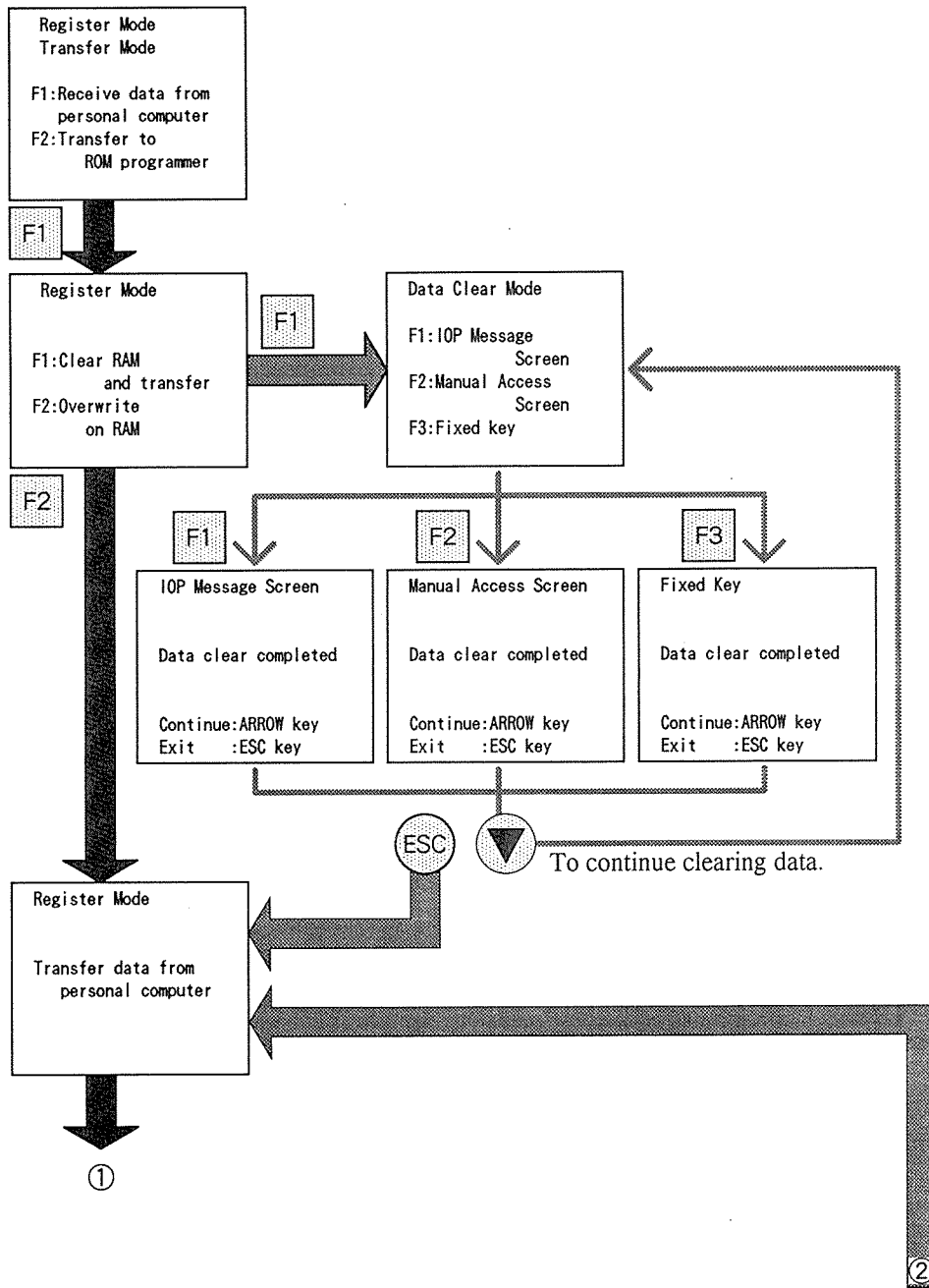
Resetting the I.O.P.

14. Set the DIP switches on the rear panel of the I.O.P. for your next operation.
15. Press the System Reset button.
The Register mode will be cancelled.

4-3 Flow Chart

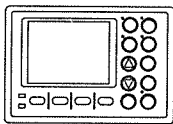


Steps on the I.O.P.

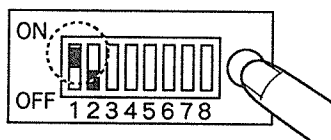
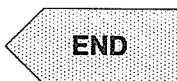
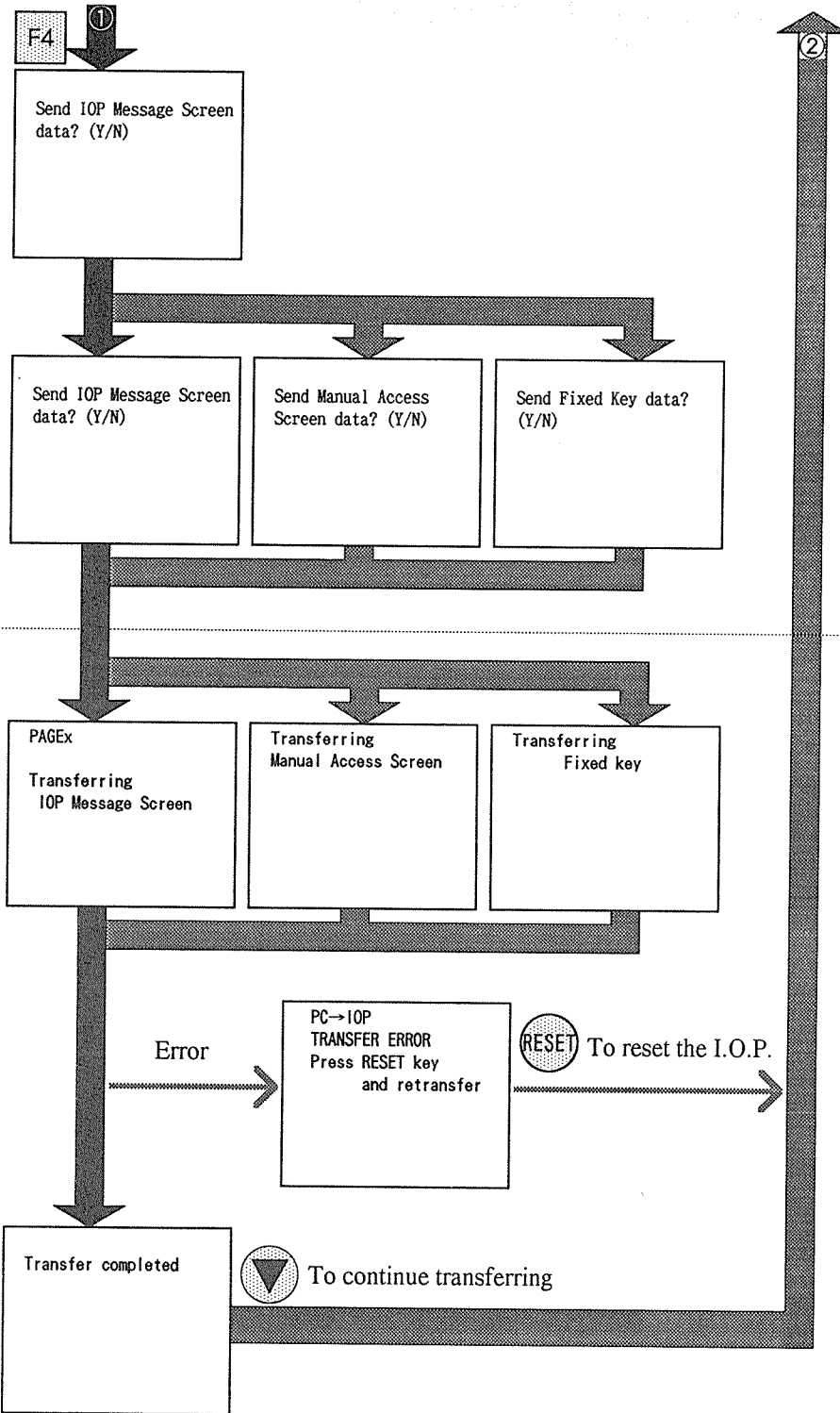




Steps on the personal computer



Steps on the I.O.P.



ON

4-4 Checking Transferred Data

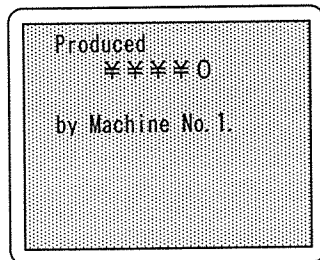
After transferring data to the I.O.P., you can check it.

1. Set DIP switches No.1 and No.2 on the rear panel of the I.O.P. to the ON position.
2. Press the System Reset button.
The I.O.P. will enter the Monitor mode.
3. To see the Primary Screens, press the ESC + arrow key (▲).
To see the Secondary Screens, press the arrow keys (▲ or ▼).
To see the Manual Screen, press the MAN. key.

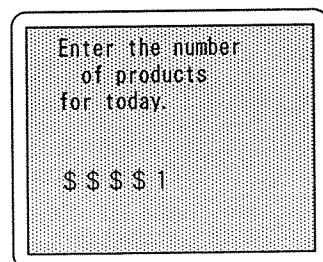
Notes

- The screens for displaying External Data and entering External Data will be displayed as below.

Displaying External Data



Entering External Data



Chapter 5

Chapter 5

Transferring Data to ROM

5-1 Preparing to Transfer

First, transfer the data to the I.O.P. so that it can be sent to the ROM programmer. Data to be transferred is the data from the "I.O.P. Message Screen", the "Manual Access Screen" and the "Fixed Screen".

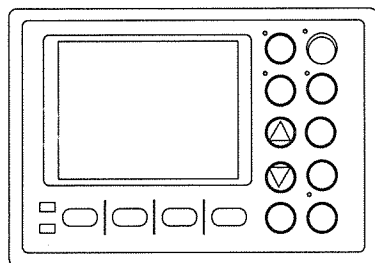
Outline

1. Transfer the data from the personal computer to the I.O.P.. (See chapter 4.)
2. Connect the ROM programmer to the I.O.P.
3. Set the conditions of the ROM programmer.
4. Transfer the data from the I.O.P. to the ROM programmer.
5. Burn the data into a ROM

Before You Start

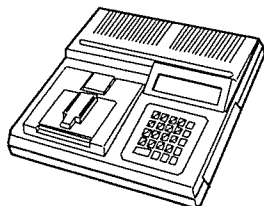
Before you begin, prepare the equipment shown below.

I.O.P.



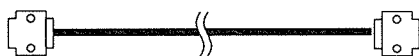
ROM programmer

PKW-1100A-E manufactured by AVALDATA CORPORATION or similar. Use AX-1 for the adapter.



Cable

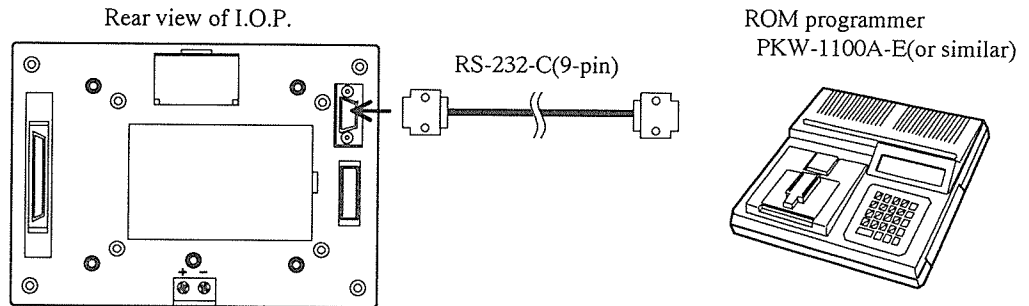
Serial connect cable (RS-232-C)



Make sure the serial connect cable is configured as shown in the Appendix E "ROM Programmer Cable".

Connecting ROM Programmer and I.O.P.

Connect your ROM programmer to the I.O.P. as below.
The data will be transferred in Intel HEX mode.



Setting ROM Programmer Conditions

Transferring format	Intel HEX format, when using a 256 Kb ROM Intel extension HEX format, when using a 1024 Kb ROM
Byte form	Data length 7 bit Stop bit 1 bit Parity Even parity Baud rate 4800 baud Transmit control RTS/CTS control

5-2 Transferring Data to ROM Programmer

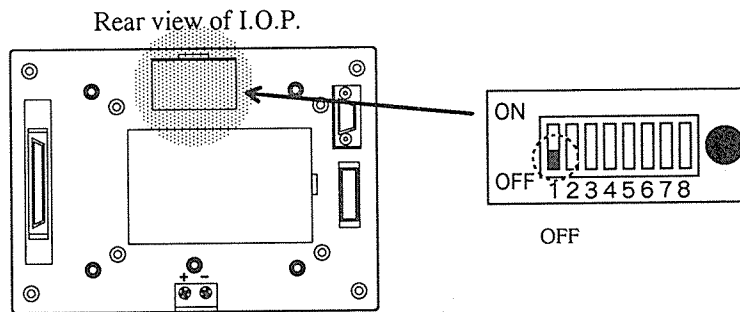
Transfer the data of "I.O.P. Message Screen", "Manual Access Screen" and "Fixed Key" to the ROM programmer.

You may refer to "Flow Chart", at the end of this chapter to review the steps required in transferring.

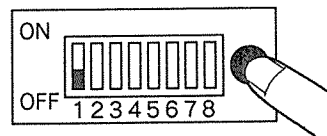
To set the condition of the ROM programmer and to burn the data into the ROM, refer to the manual for your ROM programmer.

Procedure

1. Transfer the data from your personal computer to the I.O.P..
Refer to Chapter 4.
2. Set the DIP switch No.1 on the rear panel of the I.O.P., to the OFF position.
For the model 22, set the DIP switches No.1 and No.2 to the OFF position.



3. Press the System Reset button located to the right of the DIP switches.



You will see the following message on the front panel of the I.O.P. :

Register Mode

Transfer Mode

F1:Receive data from
personal computer


F2:Transfer to
ROM programmer

4. Press the F2 key on the front panel of the I.O.P.
The I.O.P. will enter the Transfer mode. You will see:

Transfer Mode

Start:START key

5. Press the START key on the front panel of the I.O.P.
The transfer start. You will see:

blinking  IOP→ROM programmer
Transferring

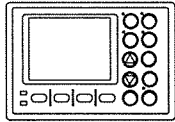
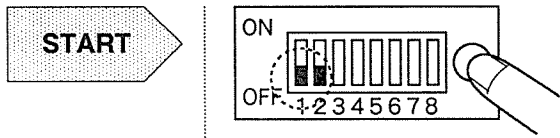
When the transfer is completed, "Transfer completed" will appear.

6. After you see this message, set DIP switch No.1 to the ON position.
7. Press the System Reset button.
The Transfer mode will be cancelled.

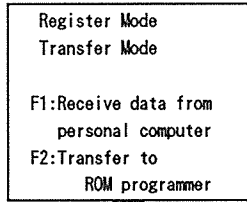
Notes

- Check the transfer errors on your ROM programmer. If there are any errors, press the System Reset button and restart from step 4.

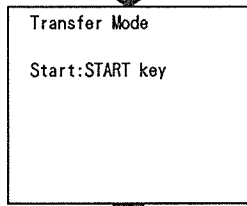
5-3 Flow Chart



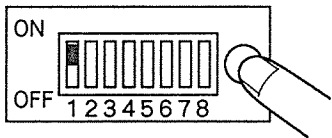
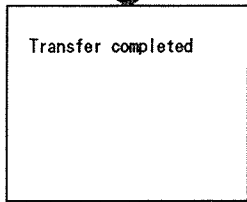
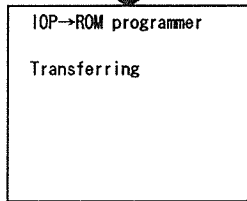
Steps on the I.O.P.



F2



START



Appendix

Appendix A Sample I.O.P. Message Screens

Editing messages

IOP Message Screen

TROUBLE OIL IS LEAKING (Press ARROW key.)

Prim. No.	01
Sec. No.	
ATB.	0

Primary Screen No.1

When the I.O.P. receives a request for Primary Screen No.1 from the programmable controller, this screen will appear.

Function key

F1	F2	F3	F4

IOP Message Screen

Tighten the valve. <Valve No. 1> F1:Tighten F2:Loose <Valve No. 2> F3:Tighten F4:Loosen

Prim. No.	01
Sec. No.	01
ATB.	1

Secondary Screen No.1 with Function Keys

By pressing the down arrow key(▼) on Primary Screen No.1 above, this Secondary Screen will appear. It belongs to Primary Screen No.1. The Function Keys are output as the Key Codes assigned to them.
56 → F1, 57 → F2, 58 → F3, 59 → F4

Function key

F1	F2	F3	F4
56	57	58	59

IOP Message Screen

Valve No. 1 to open cylinder Valve No. 2 to close cylinder

Prim. No.	01
Sec. No.	02
ATB.	0

Secondary Screen No.2

By pressing the down arrow key(▼) two times at Primary Screen No.1, this Secondary Screen will appear. This is also the second Secondary Screen that also belong to Primary Screen No.1. If you press the up arrow key(▲), Secondary Screen No.1 will appear.

Function key

F1	F2	F3	F4

Editing to be able to display External Data

IOP Message Screen

Current number of product
Machine No. 1 \\ \\ \\ 0
Press ARROW key.

Prim. No.	02
Sec. No.	
ATB.	2

Function key

F1	F2	F3	F4

Primary Screen No.2 for displaying External Data

When the I.O.P. receives a request for Primary Screen No.2 from the programmable controller, this screen will appear. The External Data to be displayed is stored in buffer No.0 and replaced with “\\ \\ \\ 0” on the I.O.P. screen.

IOP Message Screen

Stop No. 1, when remainder 0.
Machine No. 1 \\ \\ \\ 1
F1:Stop Machine No. 1

Prim. No.	02
Sec. No.	01
ATB.	3

Function key

F1	F2	F3	F4
6A			

Secondary Screen for displaying External Data and assigning Function key

By pressing the down arrow key(▼) on Primary Screen No.2, this Secondary Screen will appear. External Data from the programmable controller is stored in buffer No.1, and replaced with “\\ \\ \\ 1” on the I.O.P. screen. The F1 key will output Key Code 6A.

Editing to be able to enter External Data

IOP Message Screen

Set number of product for today No.1 \$\$\$\$ 0 No.2 \$\$\$\$ 1 No.3 \$\$\$\$ 2 No.4 \$\$\$\$ 3 Press ARROW key for No. 4-7.

Prim. No.	03
Sec. No.	
ATB.	4

Primary Screen No.3 for entering External Data

This screen allows the number of products to be produced today to be set from the I.O.P..

The External Data you enter is stored in buffers (0-3), and will be output to the connected programmable controller.

Function key

F1	F2	F3	F4

IOP Message Screen

Set number of product for today No.5 \$\$\$\$ 4 No.6 \$\$\$\$ 5 No.7 \$\$\$\$ 6 No.8 \$\$\$\$ 7 Press ARROW key for No. 0-3.

Prim. No.	03
Sec. No.	01
ATB.	4

Secondary Screen No.1 for entering External Data

This Secondary Screen belongs to Primary Screen No.3.

It will be used to enter the number of products which are to be produced today.

The External Data you enter are stored in buffers (4-7), and output to the connected external devices.

Function key

F1	F2	F3	F4

Editing to be able to display and enter External Data

IOP Message Screen

```

Supplying parts
Parts No. A0-3007

Shortage  \ \ \ 2
Supplying $ $ $ 8

Press ARROW key for
help.
    
```

Prim. No.	10
Sec. No.	
ATB.	5

Function key

F1	F2	F3	F4

Primary Screen for displaying External Data and entering External Data.

When the I.O.P. receive a request Primary Screen No.10 from the programmable controller, this screen will appear.

You can check the amount of product shortage and enter the number you want to supply at the same time.

IOP Message Screen

```

Parts No. A0-3007
Screw for stand and
lid

Resin screw:M3
Color :Black
Length:1 inch
Form :Flat screw
    
```

Prim. No.	10
Sec. No.	01
ATB.	0

Function key

F1	F2	F3	F4

Secondary Screen

By pressing the down arrow key (▼) on Primary Screen No.10, this Secondary Screen will appear.

Appendix B Design Sheet

The following forms will be useful in helping you design I.O.P. Message Screens and Manual Access Screens. Make copies of these forms to practice with.

IOP Message Screen

Prim. No.	
Sec. No.	
ATB.	

IOP Message Screen

Prim. No.	
Sec. No.	
ATB.	

Function key

F1	F2	F3	F4

Function key

F1	F2	F3	F4

IOP Message Screen

Prim. No.	
Sec. No.	
ATB.	

IOP Message Screen

Prim. No.	
Sec. No.	
ATB.	

Function key

F1	F2	F3	F4

Function key

F1	F2	F3	F4

Manual Access Screen

Manual Key names

01	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																								
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Key Codes

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Appendix C Corresponding Key Code Sheet

Fixed Key

key	default	Key Code	corresponding device
AUTO	01		
MAN	02		
START	03		
STOP	04		
RESET	05		

Manual Key

line No.	key	Key Code	corresponding device
line 1	F1		
	F2		
	F3		
	F4		
line 2	F1		
	F2		
	F3		
	F4		
line 3	F1		
	F2		
	F3		
	F4		
line 4	F1		
	F2		
	F3		
	F4		
line 5	F1		
	F2		
	F3		
	F4		

line No.	key	Key Code	corresponding device
line 6		F1	
		F2	
		F3	
		F4	
line 7		F1	
		F2	
		F3	
		F4	
line 8		F1	
		F2	
		F3	
		F4	
line 9		F1	
		F2	
		F3	
		F4	
line 10		F1	
		F2	
		F3	
		F4	
line 11		F1	
		F2	
		F3	
		F4	
line 12		F1	
		F2	
		F3	
		F4	

line No.	key	Key Code	corresponding device
line 13	F1		
	F2		
	F3		
	F4		
line 14	F1		
	F2		
	F3		
	F4		
line 15	F1		
	F2		
	F3		
	F4		
line 16	F1		
	F2		
	F3		
	F4		
line 17	F1		
	F2		
	F3		
	F4		
line 18	F1		
	F2		
	F3		
	F4		
line 19	F1		
	F2		
	F3		
	F4		
line 20	F1		
	F2		
	F3		
	F4		

Function Key

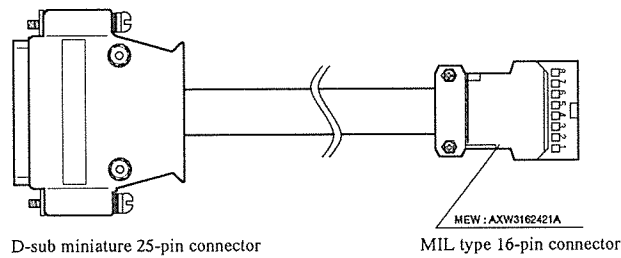
Screen No.	key	Key Code	corresponding device
line 1	F1		
	F2		
	F3		
	F4		
line 2	F1		
	F2		
	F3		
	F4		
line 3	F1		
	F2		
	F3		
	F4		
line 4	F1		
	F2		
	F3		
	F4		
line 5	F1		
	F2		
	F3		
	F4		

Appendix D Transmission Cable

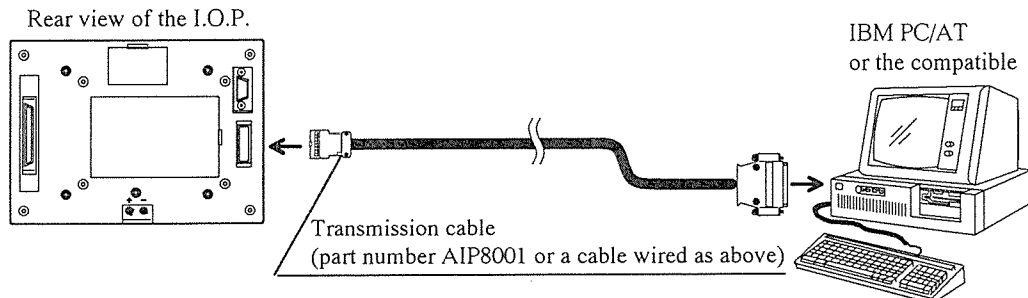
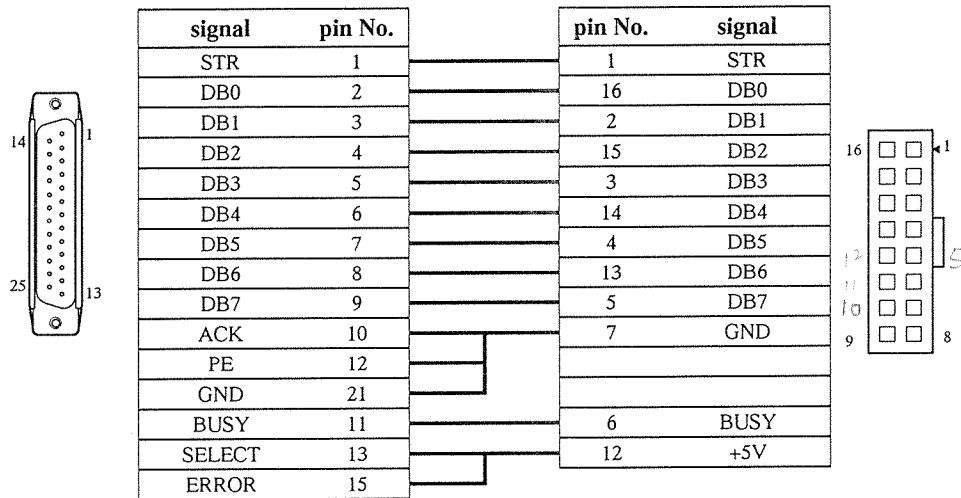
When you want to transfer the data edited with a personal computer to the I.O.P., use a transmission cable. You may use one manufactured by Matsushita Electric Works, Ltd.(part number AIP8001), or make a cable yourself by referring to the following.

Cable

The connector at the I.O.P. end should be MIL type 16-pin connector(female connector). The connector to the personal computer end should be a D-sub miniature 25-pin connector(male connector).



Temporary Specification



Appendix E ROM Programmer Cable

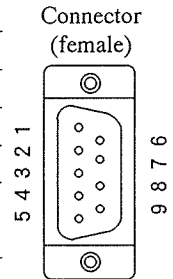
When you want to transfer the contents of RAM (the screen data previously transferred from a personal computer) to ROM, make a ROM programmer cable using a single-ended connector cable (Part number AIP81841 to AIP81845). The connector with the cable is mated to the I.O.P. RS-232-C port and the other connector which you have to connect by yourself is mated to the ROM programmer.

You can also make the ROM programmer cable referring to the following:

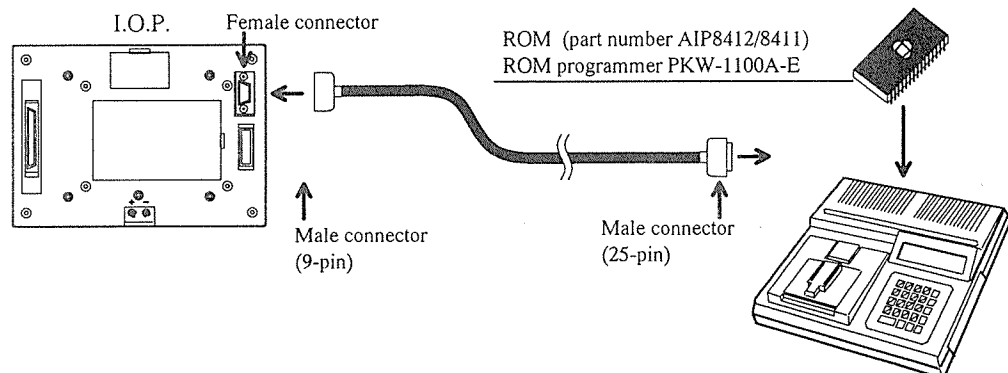
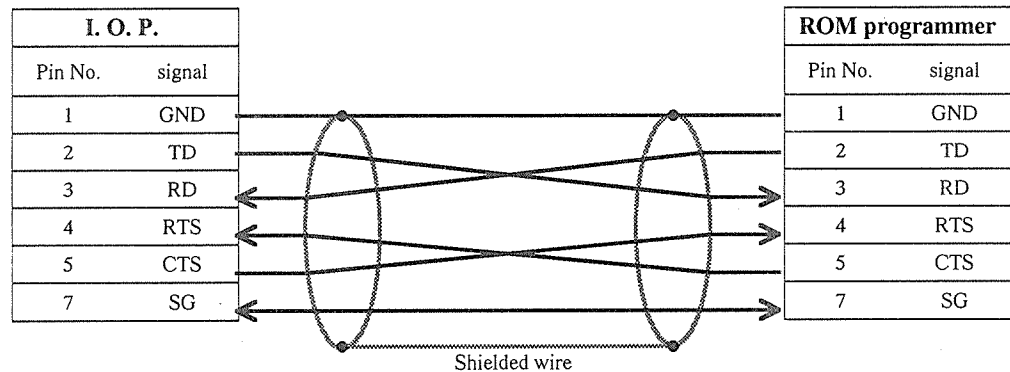
Use the PKW-1100A-E ROM programmer manufactured by AVALDATA CORPORATION. (transferring data in Intel HEX format.)

I.O.P. RS-232-C port

Pin No.	CCITT	EIA	Description	Abbrev.	DTC	DCE
1	101	AA	Protective Ground (Shield)	GND	—	—
2	103	BA	Transmitted Data	TD	→	→
3	104	BB	Received Data	RD	←	←
4	105	CA	Request to Send	RTS	→	→
5	106	CB	Clear to Send	CTS	←	←
6	—	—	(Not used)	—	—	—
7	102	AB	Signal Ground	SG	—	—
8	—	—	(Not used)	—	—	—
9	—	—	(Not used)	—	—	—



Wiring



Appendix F Troubleshooting

PROBLEM

You are not able to assign Fixed Keys though the "Fixed Key" is displayed on the screen.

SOLUTION

Press the F7(FIX) key, and retry.

PROBLEM

You are not able to assign Manual Keys though the "Manual Access Screen" is displayed on the screen.

SOLUTION

Press the F6(MAS) key, and retry.

PROBLEM

When you type any key, the personal computer beeps.

SOLUTION

You may be pressing a wrong key. Press the correct key. Otherwise, press it as a capital letter.

PROBLEM

The "\ " which you entered to display External Data appears on the I.O.P. screen.

SOLUTION

If you are checking the transferred screens in Monitor mode, this is not an error.

Otherwise, make sure:

- the attribute number is set to "2", "3" or "5".

- you enter the "\ " on the screen as a normal size character.

PROBLEM

The " \$ " which you entered to enable External Data to be entered with the I.O.P. appears on the I.O.P. screen.

SOLUTION

If you are checking the transferred screens in Monitor mode, this is not a problem.

Otherwise, make sure:

- the attribute number is set to "4" or "5".

- you enter the " \$ " on the screen as a normal size character.

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