Instruction Manual

Teaching Pendant PC000AT

for FINESERV Mk II /PC100 & PA series

YOKOGAWA
Yokogawa MAT Corporation

IM B922-E
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1. OUTLINE

1.1 Features

The purpose of this teaching pendant is to execution of each kind of operation and display with the connection of FINESERV and RS232C cable.

1.2 Model symbles

(1) Main parts
PC000AT
(2) Connection cable
Standard 1.5m fixed

1.3 Rated use

(1) Environmental conditions

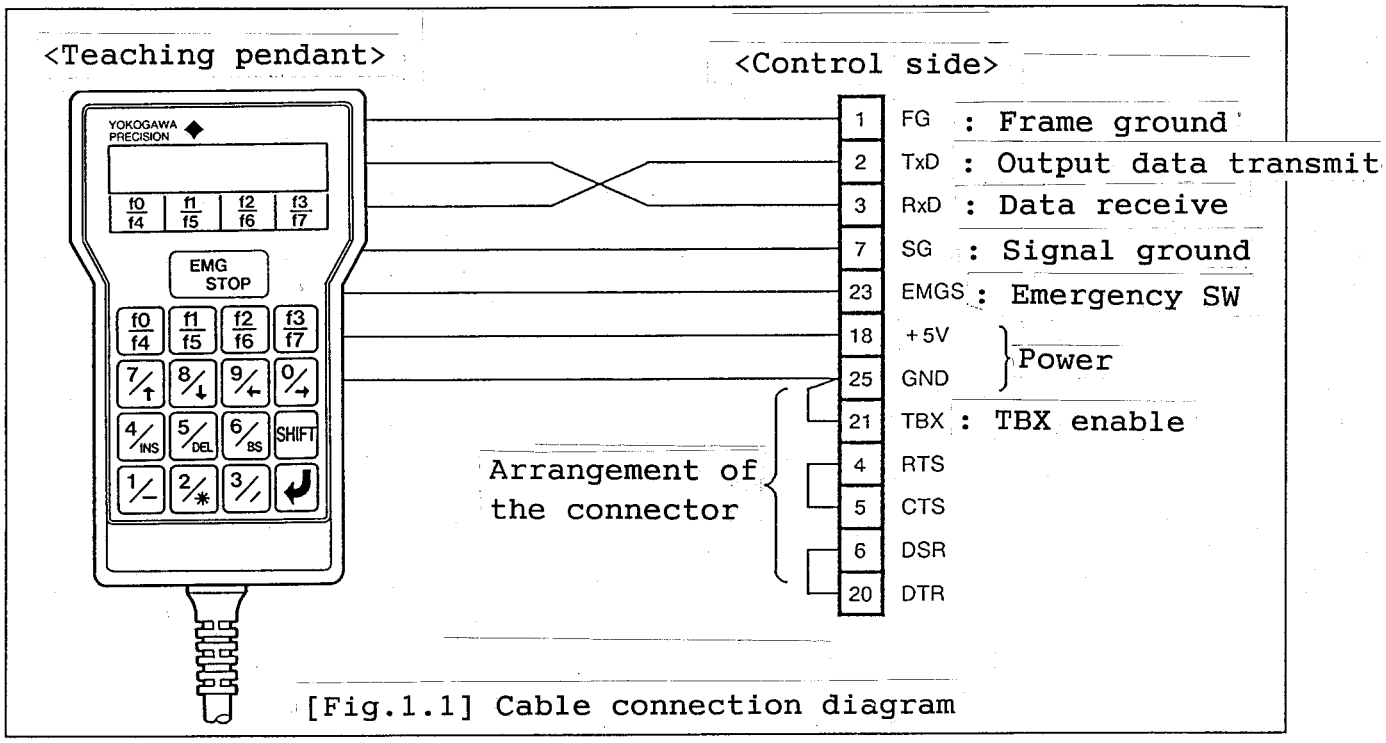
ITEM	UNIT	SPEC.
Rated voltage	V	DC5± 3%
Rated current	A	0.15 Max.
Operation temp./humid.		0～ 50℃ /20 ～ 90%RH
Storage temp./humid.		-20～ 80℃ /20 ～ 90%RH
Shock rating		10G/5msec
Switch rating		500,000 times
Weight	g	350

(2) Display parts
LCD 16× 2 characters

(3) Communication specifications

Communication method	RS232C
Communication rate	9600baud
Data length	8 bit
Stop bit	1 bit
Parity	none

1.4 Cable connection



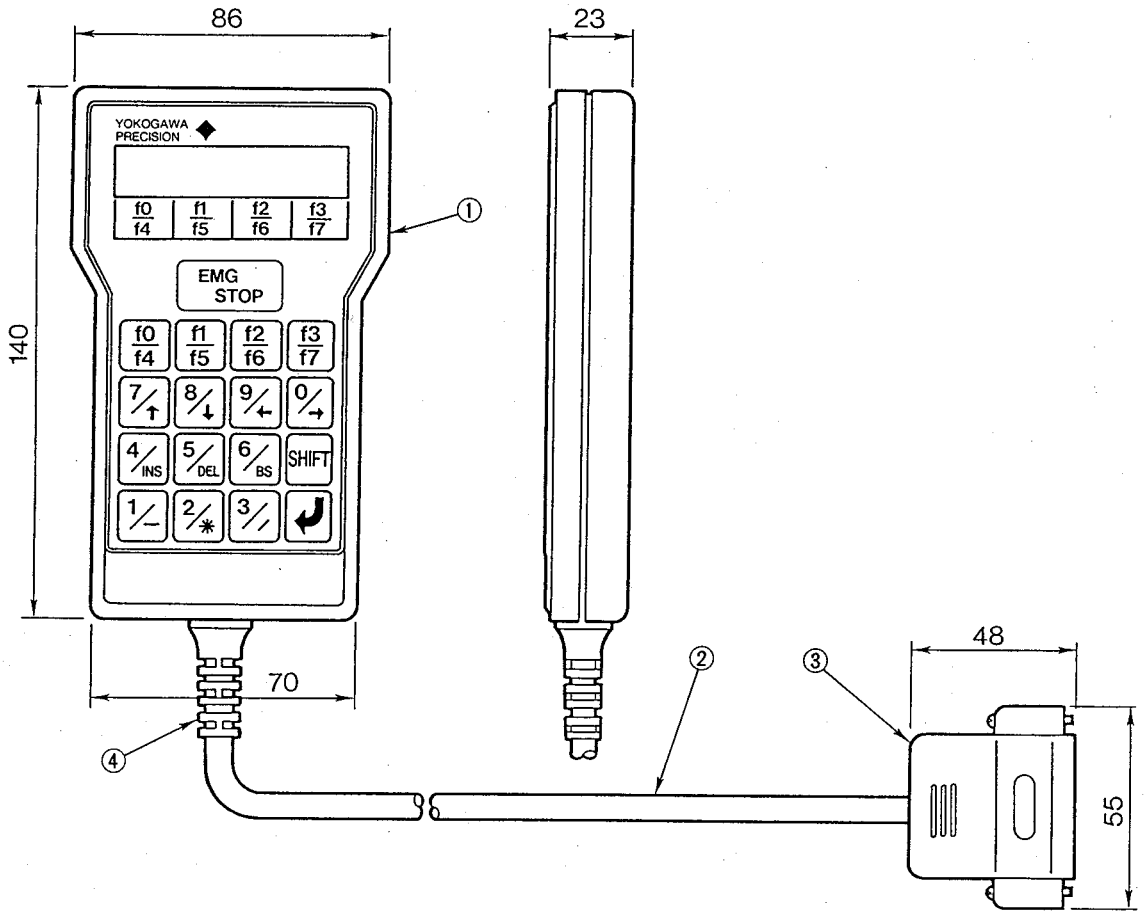
[Fig.1.1] Cable connection diagram

CAUSION !

After connecting the PLC to the controller and when the controller is under operation via the PLC control, during the programmed operation mode, DO NOT use the TEACHING PENDANT. In the situation described above the commands, sent via the TEACHING PENDANT for a program change are same times disregarded.

1.5 Specification

Unit(mm)



	Parts name	Qu'y
①	Teaching pendant	1
②	Cable	1.5m
③	Connector	1
④	Cable cramp	1

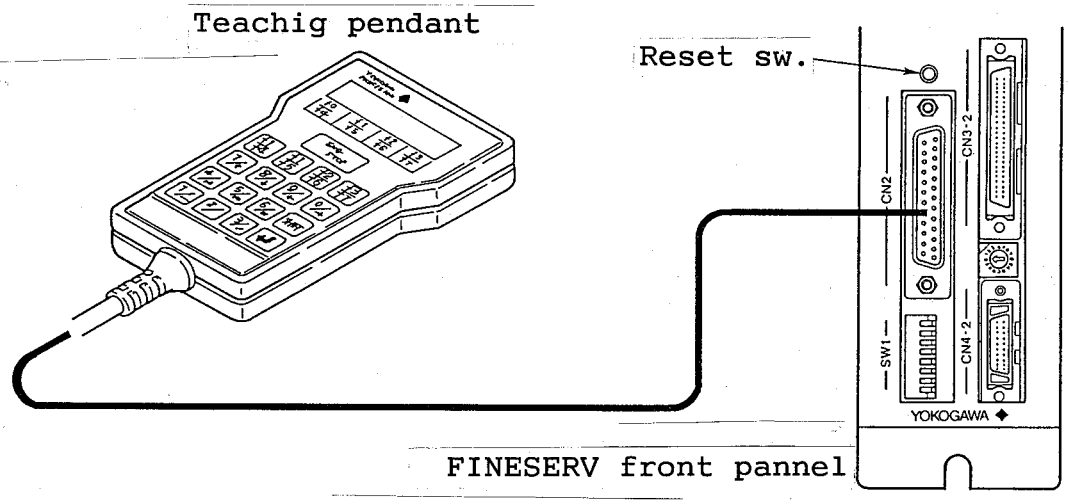
2. INSTALLATION/MOUNTING

2.1 Installation conditions

Temp.	0 ～ 50℃
Humidity	20～ 90%RH no condensation
Atomospheric condition	Avoid installing the unit in places,such as outdoors,in direct sunlight and where subject to corrosive/explosive gases,steam, dust,polishing liquids and metal powders.
Vibration/Shock	Avoid installing the unit in places subject to physical shock

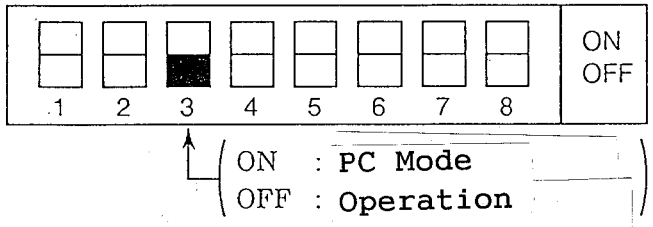
2.2 Connection

(1) Connection to the FINESERV



[Fig.2.1] Connection to the FINESERV

(2) <SW 1> Setting

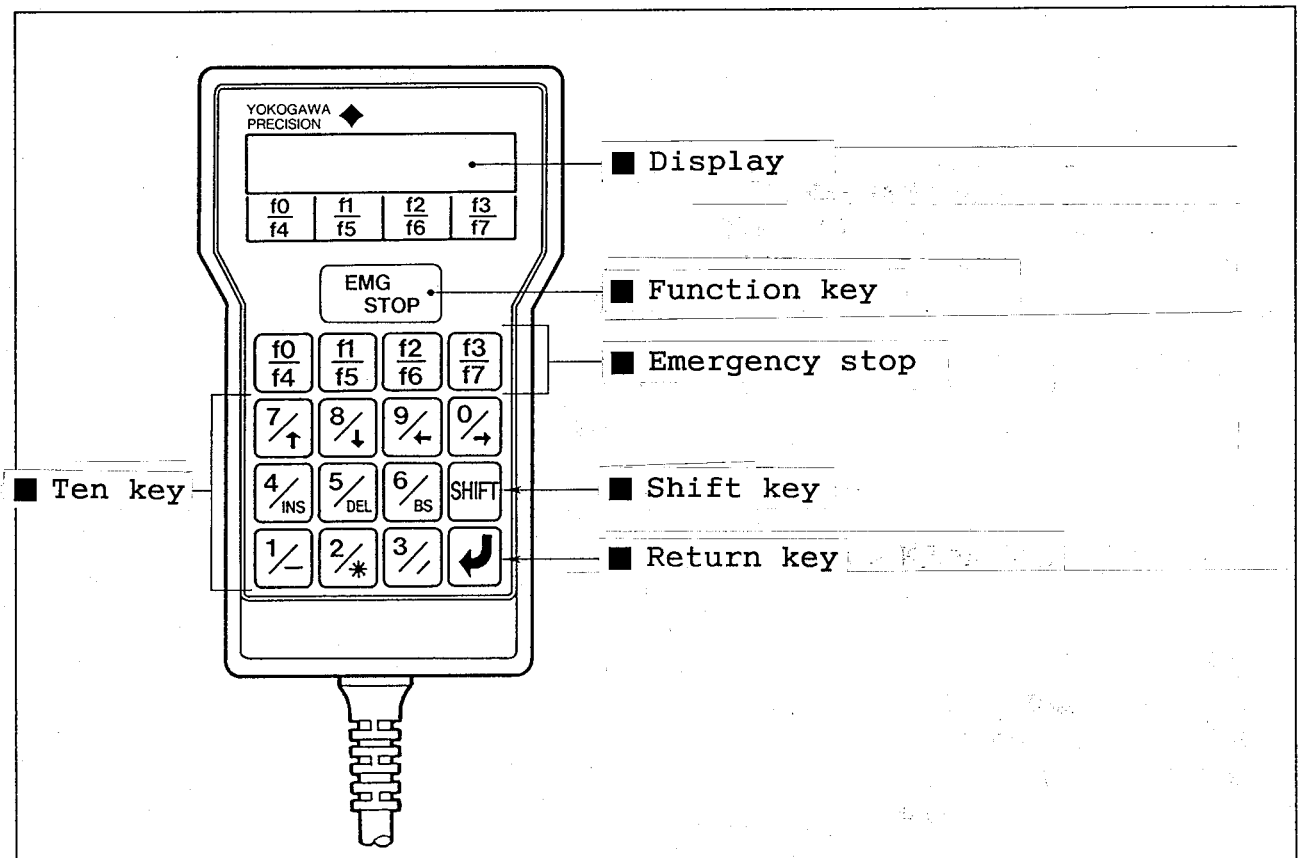


After the unit connection kindly recycle power or reset FINESERV

[Fig.2.2] Setting of the <SW 1>

3. OPERATION

3.1 Teaching pendant parts & function



9 ← / 0 → — Cursor

7 ↑ / 8 ↓ — Scroll key

1 _ — Minus key

4 INS — Insert key

Ex. [X5000····]
[INS 12]
[X125000····]

6 BS — Backspace key

Ex. [X15000····]
[BSJ]
[X1000····]

5 DEL — Delete key

Ex. [X15000····]
[DEL]
[X1000····]

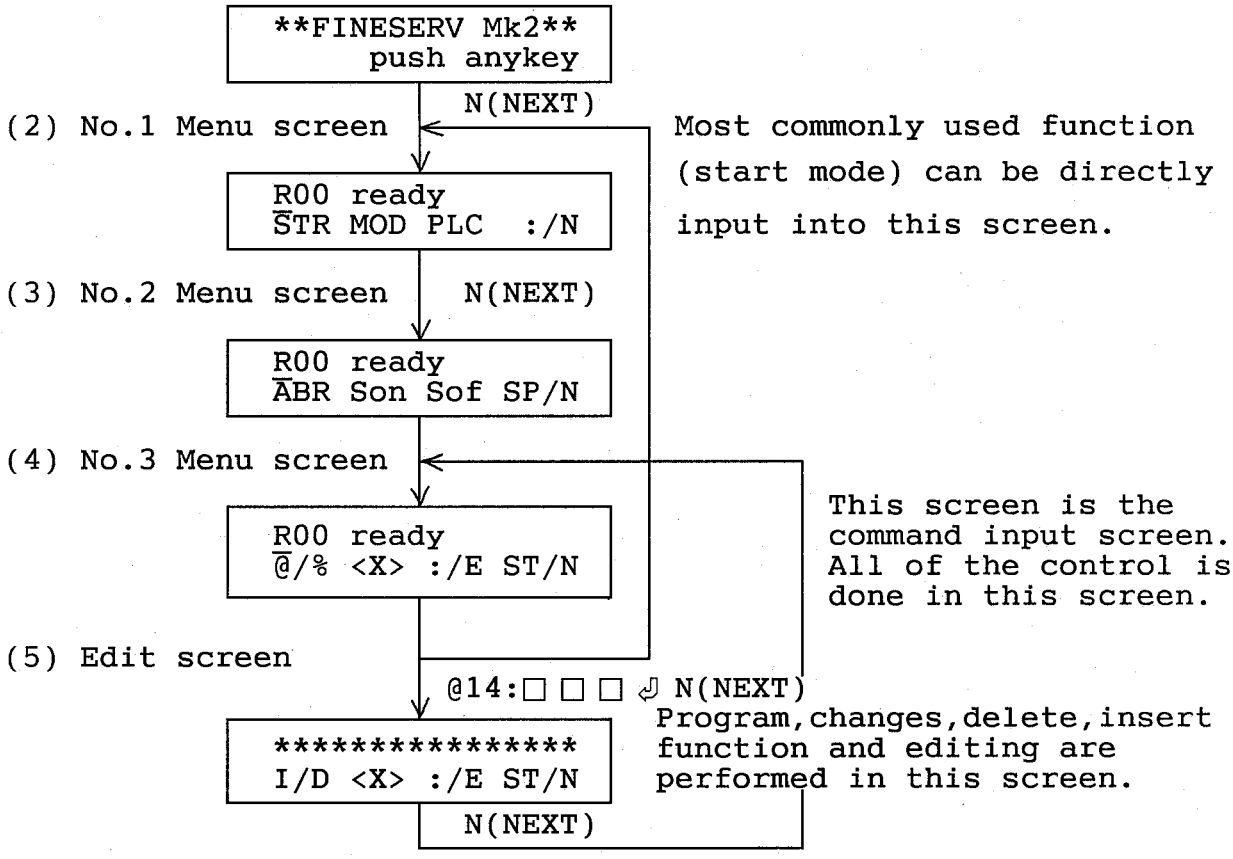
2 * / 3 / — Currently not in use

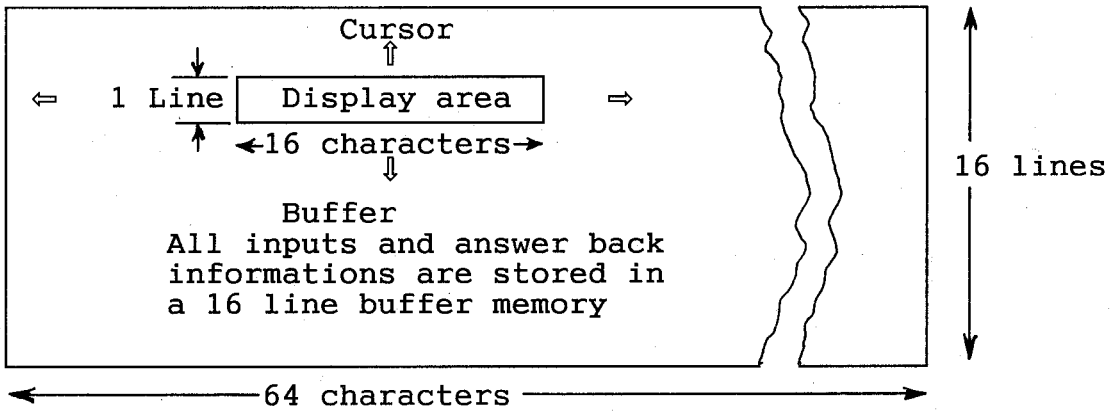
[Fig.3.1] Teaching pendant parts & functions

3.2

Items indicated in the display screen sequentially starts with the opening screen, followed by direct input screen(No.1-2 menu screen), Program, parameter input screen(No.3 menu screen), and the edit screen(No.4 menu)

(1) Opening screen





3.3 Direct input screen

Most commonly used @ command is converted into function.
Which is equivalent to the No.1 & No.2 menu.

No.1 menu

```
STR MOD PLC   :/N
```

STR･･･Start
MOD･･･Input the operation mode
PLC･･･Input the RS232C/sequencer switch over
:　･･･Input the parameter delimiter
N　･･･Screen change

● STR(Start)

Starts under the operation mode.
Set by the modo.

Key operation	Screen display
1.Enter f0 (f4)	@3: STR MOD PLC :/N
2.Enter the value to be set at the cursor prompt (in the given operation mode) Ex. at rigth/ Assuming that the operation mode is PROGRAMMED AUTO, start program No.2.	@3:2 STR MOD PLC :/N
3.Enter the return ↵ key to start the operation on completion of the operation, the screen displays the following massage on the right	R00 ready STR MOD PLC :/N

● MDO(operation input mode)

Enter the operation mode
Please refer to the FINESERV users guide command (@ 6)

Key operation	Screen display
1.Enter f1 (f5)	@6: STR MOD PLC :/N
2.Enter the operation mode No. into the Ex.･･･10 is the MDI mode	@6:10 STR MOD PLC :/N
3.Hit the return ↵ key, to begin the operation on completion of the operation, the screen displays the following massage on the right	R00 ready STR MOD PLC :/N

No.2 menu

```
ABR Son Sof SP/N
```

ABR･･･Abort(reset)
Son･･･Servo on
Sof･･･Servo off
SP････Program stop
N･････Screen change

● ABR

It is control reset
Same as the @ command @ 1
Press the f0(f4)

● Son

Servo on : Turns on all the servo axis
Same as the @ command @ 20
Press the f1(f5)

● Sof

Servo off : Turns on all the servo axis
Same as the @ command @ 20
Press the f2(f6)
Note: Servo on/off pin function has priority over the Son, Sof

● SP

Stops a program
Same as the @ command @ 2
Press the f3(f7)

3.4 Program parameter input screen

The No.3 screen(program input screen), all possible controls are accesible.
On this screen, as seen in the previous exsmple direct input of each command is also possible.

No.3 menu

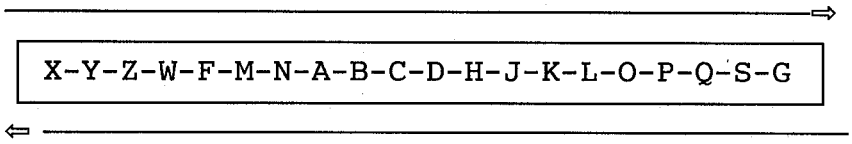
```
@/% <X> :/E ST/N
```

@･････Enters the @
%･････Enters the %
< >･･･Enters the alphabet contained in the <> using ST (XYZWFMNABC DHJKLOPQSG)
:･････Enters the:
E･････Enters the end
ST････Enters the alphabet with in the <>
N･････Screen change

(note)Changes of the alphabets with in the < >

f1[f1/f5] Move from left to right

f5[SHIFT + f1/f5] Move from right to left



3.5 Edit screen

This teaching pendant has the edit function.
Select the @ 14 command from the No.3 menu(program,parameter input screen) then enter the screen change key to this screen.

No.4 menu

I/D <X> :/E ST/N	I(f0)·(Insert) Inserts a line in the program D(f4)·(Delete) Deletes a line in the program < >···Enters the alphabet contained (f1/f5) in the <> using ST (XYZWFMNABC DHJKLOPQSG) :(f2)·Input the: E(f6)·Input the end ST(f3)·Enters the alphabet with in the <> N(f7)·Screen change(Edit complete)

(note) Changes of the alphabets with in the < > is same as the No.3 menu.

Key operation	Screen display
1.Display the No.3 menu on the screen	R00 ready @/% <X> :/E ST/N
2.Extracts the file No. which required changes to extract the No.1 file press [f0][1] [4][f2][1]	@14:1 @/% <X̄> :/E ST/N
3.Enter the return ↵ key	R00 ready @/% <X> :/E ST/N
4.Enter the [SHIFT] + [f3/f7] to open the edit screen. It will display the first block of the file. Each time the[SHIFT]+ [8/↓] is entered the program controls are displayed,line at a time.	********** I/D <X> :/E ST/N

(1) Program revision

Key operation	Screen display
1.It display the block which requirs changes for example revise [X20000] to [X10000M05]	X20000_ I/D <X> :/E ST/N
2.Change [2] to [1] using the cursor, delete, insert. Next press [f1] until the M appears with in the <>, then press [f3], Next enter [0][5]	X10000M05 I/D <X> :/E ST/N
3.Press the return↵ key, to complete the revision.	R00 ready I/D <X> :/E ST/N

(2) Program insert

Ex. X10000M05
M30 ⇒ X10000M05
X0
M30

In order to insert a block in the program, move to the line next to the desired place (for ex. M30) and enter [X][0] at that place. Next enter [f0](I:INSERT) in order to insert [X][0] at that place. On completion of this step, the next block(M30) appears on the screen.

(3) Program delete

To delete a program go to the line(block) you would like to delete.

Press [SHIFT] + [f0/f4](D:delete line) to delete the spcified program line when the program deletion is completed the next line(block) appears o the screen.

(4) End program edit

After the program editing is completed press [SHIFT]+ [f3/f7] (N:screen change).

No.3 menu appears on the screen and it will end the program edit screen.

3.6 Operation procedure (Quiek reference)

So let's go through these in order starting from the menu screens.

Key operations	Display
At power ON or reset return, the following opening screen appears.	** FINESERV MkII ** push anykey
Press any key except [EMG] or [SHIFT]. Menu 1 will come up. The first character will be flashing, indicating the current entry area. The bottom line shows the function key assignments: [f0] -STR (start) [f1] -MOD (operation mode) [f2] -PLC (RS232C mode) [f3] - : [SHIFT] + [f3/7] -N (Next: Go to next menu)	R00 ready STR MOD PLC :/N
Press [SHIFT] + [f3/7]. Menu 2 will appear. The function key assignments on this menu are: [f0] -ABR (abort emergency stop) [f1] -Son (servo ON) [f2] -Sof (servo OFF) [f3] -SP (program stop) [SHIFT] + [f3/7] -N (Next: Go to next menu)	R00 ready ABR Son Sof SP /N
Press [SHIFT] + [f3/7]. Menu 3 will appear. The function key assignments on this menu are: [f0] -@ (key in @ command character) [SHIFT] + [F0/4] -% (key in % character) [f1] -< (select command character.) [SHIFT] + [F1/5] -> (select command character.)	R00 ready @/% <X> :/E ST/N

[f2] -: (key in delimiting colon) [SHIFT] + [F2/6] -E (key in END) [f3] -ST (ST: set) [SHIFT] + [f3/7] -N (Next: Go to next menu.) If you press [SHIFT] + [f3/7] at this point, you will return to menu 1. As this has shown, with the Teaching Box you give commands to the FINESERV using the three menus above.	

Next we will drive the motor with an actual program.

Key operations	Display
Call up Menu 3.	R00 ready @/% <X> :/E ST/N
Press [f0].	@_ @/% </> :/E ST/N
Press [3] [1] [f2] [0]	@31:0 @/% <X> :/E ST/N
Press [↵]. (The command [@31:0] is sent to the FINESERV, and the display shows that an answer was returned. This command disables axis 1 overtravel (−). As shown here, on the program entry screen, when you key in a command on the top line and press [↵], the command is sent to the FINESERV, and if an "OK" answer comes back the screen displays "R00 ready".)	R00 ready @/% <X> :/E ST/N

Press [f0] [9] [f2] [0]	@9 @/% <X> :/E ST/N
Press [↵]. The command [@9:0] was sent to the FINESERV, and the display shows that an answer was returned. This command disables M output as a condition for program execution.	R00 ready @/% <X> :/E ST/N
Press [f0] [3] [2] [f2] [0]	@32:0 @/% <X> :/E ST/N
Press [↵]. The command [@32:0] was sent to the FINESERV, and the display shows that an answer returned. This command disables the direction of overtravel(+)	R00 ready @/% <X> :/E ST/N
Next, press [f0] [7] [f2] [f2] [0]	@7::0 @/% <X> :/E ST/N
Press [↵]. The servo ON command [@7::0] is sent out and the display shows that an answer returned. This command disables origin return as a condition for program execution.	R00 ready @/% <X> :/E ST/N
Next, press [f0] [2] [0] [f2] [1]	@20:1:1_ @/% <X> :/E ST/N
Press [↵]. (The servo ON command [@20:1] is sent out and the display shows that an answer returned.)	R00 ready @/% <X> :/E ST/N
Next press [f0] [6] [f2] [1] [0]	@6:10 @/% <X> :/E ST/N

Press [↵]. (The command [@6:10] was sent and an answer returned. This command selects the MDI/ manual data input mode.)	R00 ready @/% <X> :/E ST/N
Next press [f1]. Each time you press [f1], the letter between the < > brackets on the bottom line will change in sequence: X→Y→Z→W→F→M→N→A→B→C→D→H→ J→K→L→O→P→Q→S→G→X (Pressing 20 times in all will bring you back to X.) Next press [SHIFT] + [f1/5]. The letter between the < > brackets will change in the reverse order. Return the displayed letter to X.	_ @/% <Y> :/E ST/N
Next press [f3]. ("X" is keyed in and the cursor moves right one position.)	X_ @/% <X> :/E ST/N
Key in [1] [0] [0] [0] [0] [0].	X100000_ @/% <X> :/E ST/N
Next press [f1] four times, changing < > to F. Press [f3] to select it.	X100000F @/% <F> :/E ST/N
Continue pressing [1] [0] [0]	X100000F100 @/% <F> :/E ST/N
Press [↵]. The cursor returns to the starting position, and simultaneously the motor turns clockwise an amount equal to 100,000 pulses. If the unit is connected to a B phase motor, 1/6 turn 1 rps, if to an A phase motor 1/10 turn 0.7 rps (if set up for B phase).	X100000F100 @/% <X> :/E ST/N

When the motor stops turning the display will change as shown.	R00 ready @/% <X> :/E ST/N

Now let's create a program file.

Key operations	Display
Key in [f1] [1] [5] [f2] [1].	L15:1_ @/% <X> :/E ST/N
Press [↵]. The unit is now ready for you to enter file 1.	R data @/% <X> :/E ST/N
Press [SHIFT] + [f1/5] once, changing the letter in < > from X to G. Next press [f3] to select G.	G_ @/% <G> :/E ST/N
Continue on pressing [9] [1] [f1] (< > goes to X) [f3] [1] [0] [0] [0] [0].	G91X100000_ @/% <X> :/E ST/N
Next press [f1] four times, changing < > to F. Press [f3] to select it.	G91X100000F_ @/% <F> :/E ST/N
Continue pressing [5] [0] .	G91X100000F50_ @/% <F> :/E ST/N
Press [↵]. This will enter the command G91X100000F50. This command means: G91 = incremental mode; X100000 = positive X-axis rotation 100,000 pulses; F50 = speed 50K pulse/sec. Since at this point we are in program entry, the motor does not move.	R data @/% <F> :/E ST/N

Again, press [SHIFT] + [f1/5] four times to return < > to X. Then press [f3] to enter.	X_ @/% <X> :/E ST/N
Key in [SHIFT] + [1/-] [1] [0] [0] [0] [0] [0], [f1] four times, [f3] [2] [0] [↵]. The program means: X-100000 = reverse (CCW) X-axis rotation 100,000 pulses; F20 = speed 20K pulse/sec. (Make sure that < > went to F.)	X-100000F20_ @/% <F> :/E ST/N R data @/% <F> :/E ST/N
Next press [f1] once to change < > to M. Select with [f3].	M_ @/% <M> :/E ST/N
Press [3] [0].	M30_ @/% <M> :/E ST/N
Press [↵].	R data @/% <M> :/E ST/N
Press [SHIFT] + [f2/6] to select END.	END_ @/% <M> :/E ST/N
Press [↵]. END is entered, ending file creation.	R00 ready @/% <M> :/E ST/N

Now let's check the program we just entered.

Key operations	Display
Press [f0] [1] [4] [f2] [1].	L14:1_ @/% <M> :/E ST/N
Press [↵].	R00 ready @/% <M> :/E ST/N

Press [SHIFT] + [f3/7] to change to the Edit Screen. Pressing [SHIFT] + [8/↓] displays the program one block at a time. Verify that the three program blocks, G91X100000F50, X-100000F20, and M30, are entered correctly.	G91X100000F50 I/D <M> :/E ST/N X-100000F20 I/D <M> :/E ST/N M30 I/D <M> :/E ST/N

Now let's execute this program.

Press [SHIFT] + [f3/7] to change to Menu 1.	R00 ready STR MOD PLC /N
Press [f1] [1] to select Program 1 which we just filed.	@6:1 STR MOD PLC /N
Press [f0] [1] to select Program 1 which we just filed.	@3:1 STR MOD PLC /N
Now when we press [↵], the motor will begin to move exactly as we programmed.	@3:1 STR MOD PLC /N
When the motor stops, the R00 answer appears, program ending.	R00 ready STR MOD PLC /N