

- Absolute/incremental command

When bit 4 (MAB) of parameter No. 3401 is set to 1, the absolute/incremental programming of MDI operation does not depend on G90/G91. In this case, the incremental programming is set when bit 5 (ABS) of parameter No. 3401 is set to 0, and the absolute programming is set when bit 5 (ABS) of parameter No. 3401 is set to 1.

| Parameter MAB (No.3401#4)=0 | Parameter MAB (No.3401#4)=1 | |
|--|---|--|
| Absolute mode operation with G90 command, and incremental programming operation with G91 command | Parameter ABS (No.3401#5)=0 | Parameter ABS (No.3401#5)=1 |
| | Incremental mode operation at all times, independent of G90/G91 command | Absolute mode operation at all times, independent of G90/G91 command |

NOTE

When G code system A is used on a T series, the parameters MAB and ABS are invalid.

Limitation

- Program registration

Programs created in MDI mode cannot be registered.

- Number of characters in a program

A created program can consist of up to 511 characters including "O0000" automatically inserted.

- Subprogram nesting

The subprogram call command (M98) can be described in a program created in MDI mode. That is, programs that are registered in memory through MDI operation can be called and executed. The level of subprogram call nesting is the same as in MEM operation.

- Macro call

When the custom macro function is enabled (bit 5 (NMC) of parameter No. 8135 is 0), a macro program can be created and executed even in the MDI mode. Moreover, a macro program can be called for execution.

NOTE

The GOTO statement, WHILE statement, and DO statement cannot be executed in a program created in the MDI mode. An alarm PS0377 is issued. When a program including those statements is to be executed, register the program in the program memory then call the program for execution.

4.3 DNC OPERATION

By activating automatic operation during the DNC operation mode (RMT), it is possible to perform machining (DNC operation) while a program is being read in via reader/puncher interface.

To use the DNC operation function, it is necessary to set the parameters related to the reader/punch interface in advance.

The procedure described below is just an example. For actual operation, refer to the relevant manual of the machine tool builder.

DNC operation

Procedure

- 1 Press the REMOTE switch on the machine operator's panel to enter the RMT mode.

- 2 Select the program to be executed.
 - Selecting a DNC operation file
Enter the number of the file to be subjected to DNC operation is performed on the memory card (or floppy cassette) list screen with the keyboard and press soft key [DNC SET] (or [DNC SET] for the 10.4-inch display unit) to select the file to be subjected to DNC operation. (The selected file is marked with "D".)
 - Releasing a DNC operation file
Press soft key [DNC CLR] (or [DNC CLR] for the 10.4-inch display unit) on the memory card (or floppy cassette) list screen to release the DNC operation file. (The "D" mark for the file is removed.)

| MEMORY CARD | | N00000 | |
|-----------------|-----------|--------------|------------|
| DNC FILE | 00123 | | |
| | REG NUM | 60 | |
| DEVICE : M_CARD | | | |
| NO. | FILE NAME | SIZE (KBYTE) | UPDATE |
| D0017 | 00123 | 1 | 2008/01/23 |
| 0018 | 00567 | 1 | 2008/02/06 |
| 0019 | 01000 | 1 | 2008/01/30 |
| 0020 | 01001 | 1 | 2008/01/31 |
| 0021 | 01002 | 1 | 2008/01/31 |
| 0022 | 01003 | 1 | 2008/01/31 |
| 0023 | 01234 | 1 | 2008/02/19 |
| 0024 | 02222 | 1 | 2008/01/28 |
| A) _ | | | |
| RMT | **** ** * | 10:07:34 | |
| [DEVICE] | [REFRESH] | [DNC SET] | [DNC CLR] |

- 3 Press the cycle start switch to execute the selected file. For details on the REMOTE switch, refer to the manual provided by the machine tool builder.
- 4 During DNC operation, executed programs are listed on the program check screen and program screen.

| PROGRAM | | 00123 N00456 | |
|--------------|--------------|--------------|--------------|
| BC:000000002 | | | |
| 00123 ; | | | |
| N456 | G90 | G00 | X-554378.000 |
| | Y-154363.000 | Z150000.000 | ; |
| X-554370.000 | Y-154363.000 | | ; |
| Z5357 | | | ; |
| N622 | G01 | X-55378 | Y-1543632 |
| | F150 | | ; |
| X-553484 | Y-153996 | Z-14724 | F4000 ; |
| Z-14824 | | | ; |
| Y-151521 | Z-14945 | | ; |
| Y-150696 | Z-11579 | | ; |
| A) _ | | | |
| RMT | STRT MTN *** | 10:08:37 | |
| [PROGRAM] | [CHECK] | [CURRENT] | [NEXT] |
| | | (OPRT) | [+] |

Fig. 4.3 (a) PROGRAM screen

```

PROGRAM( CHECK ) O0123 N00456
O0123 ;
N456 G90 G00 X-554378.000
Y-154363.000 Z150000.000 ;
X-554370.000 Y-154363.000 ;
ABSOLUTE DISTANCE G00 G94 G80
X -4578.133 -549799.867 G17 G21 G98
Y -1274.752 -153088.248 G90 G40 G50
Z 1238.722 148761.278 G23 G49 G67
H M
T D
F S
ACT. F 8582MM/MINSACT 0/MIN
A) _
RMT STRTMTN *** 10:08:52
< ABS REL (OPRT)

```

Fig. 4.3 (b) PROGRAM CHECK screen

NOTE

- 1 Before selecting a DNC operation file, be sure to release all schedule data. DNC operation and schedule operation cannot be specified at the same time.
- 2 A DNC operation file cannot be released during DNC operation.
- 3 To switch between devices when DNC settings are made, release the settings and then make the settings again.

Explanation

During DNC operation, subprograms and macro programs stored in memory can be called.

Limitation

- **M198 (command for calling a program from within an external input/output unit)**

In DNC operation, M198 cannot be executed. If M198 is executed, alarm PS0210 is issued.

- **Custom macro**

In DNC operation, custom macros can be specified, but no repeat instruction and branch instruction can be programmed. If a repeat instruction or branch instruction is executed, alarm PS0123 is issued.

- **M99**

For returning from a subprogram or macro program to the calling program during DNC operation, the specification of a return command (M99P...) with a sequence number specified is not allowed.

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- **2-path concurrent operation**

DNC operation cannot be performed concurrently on two paths.

DNC operation can be performed on one path at a time.

4.4 SCHEDULE OPERATION

To perform schedule operation, select files (programs) registered in a memory card and specify the sequence of execution and the repetition count of each program.

Schedule operation

Procedure

- 1 Press the REMOTE switch on the machine operator's panel to enter the RMT mode.
- 2 Select the program to be subjected to schedule operation.
 - Selecting a schedule
Select the file to be subjected to schedule operation. After selecting the file, press soft key [SCHDL] to display the schedule list screen.

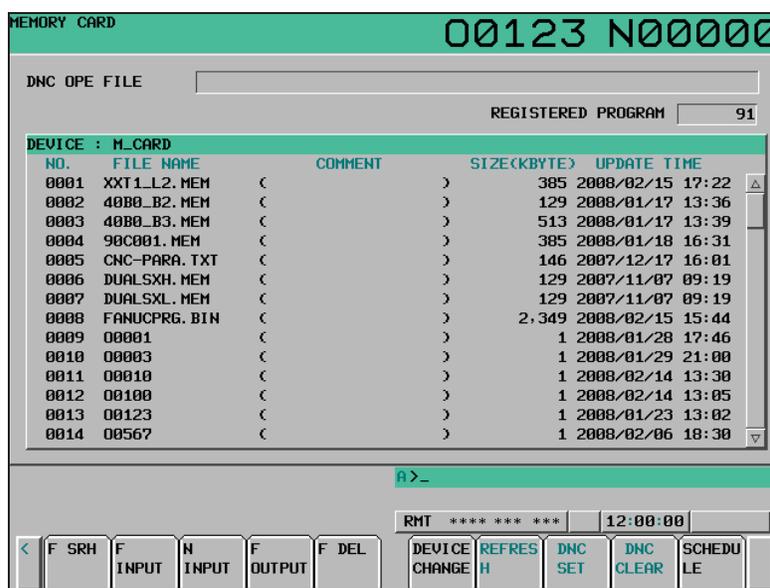


Fig. 4.4 (a) Program list screen (10.4-inch)

[SCHDL]

Lists the settings of schedule data to edit the repetition count or the like (see the next page for details).

- Setting and editing a schedule (for the 10.4-inch display unit)
Move the cursor to the FILE NUMBER field or FILE NAME field of the desired number, enter the file number or file name with the keyboard, and press edit key  to schedule the file. Schedule operation is performed in ascending order of the number. When a schedule is set in this procedure, the file execution repeat count is set to 1. The repeat count and the order of schedule operation can be edited on this screen.

| SCHEDULE LIST | | | | | 00001 N00001 | |
|---------------|---------|-----------|------|------|--------------|--|
| NO. | FILE NO | FILE NAME | REQ. | CUR. | | |
| 1 | 0009 | 00001 | 1 | 0 | | |
| 2 | 0013 | 00123 | 1 | 0 | | |
| 3 | | | 0 | 0 | | |
| 4 | | | 0 | 0 | | |
| 5 | | | 0 | 0 | | |
| 6 | | | 0 | 0 | | |
| 7 | | | 0 | 0 | | |
| 8 | | | 0 | 0 | | |
| 9 | | | 0 | 0 | | |
| 10 | | | 0 | 0 | | |
| 11 | | | 0 | 0 | | |
| 12 | | | 0 | 0 | | |
| 13 | | | 0 | 0 | | |
| 14 | | | 0 | 0 | | |
| 15 | | | 0 | 0 | | |
| 16 | | | 0 | 0 | | |

A>_

RMT ***** ** 16:31:12

< FILE UP FILE DOWN DELETE INSERT ALL DELETE

Fig. 4.4 (b) Schedule list screen (10.4-inch)

[FILE UP]

Moves the file at the cursor position up one line and moves the replaced file down one line.

[FILE DOWN]

Moves the file at the cursor position down one line and moves the replaced file up one line.

[DELETE]

Deletes the file at the cursor position and moves the files below the cursor up one line.

[INSERT]

Moves the files below the cursor down one line.

[ALL DELETE]

Deletes all records.

- Setting and editing a schedule (for the 8.4-inch display unit)

There are two schedule list screens for the 8.4-inch display unit: the file number screen for setting file numbers and the file name screen for setting file names. On the schedule list screen, press continuous menu key  and press soft key [F-NAME] or [F-NO] to select one of the two screen.

(When the file number screen is displayed, soft key [F-NAME] appears. When the file name screen is displayed, soft key [F-NO] appears.)

Move the cursor to the FILE NUMBER field or FILE NAME field of the desired number, enter the

file number or file name with the keyboard, and press edit key  to schedule the file. Schedule

operation is performed in ascending order of the number. When a schedule is set in this procedure, the file execution repeat count is set to 1. The repeat count and the order of schedule operation can be edited on this screen.

| SCHEDULE LIST | | | | N00000 | |
|---------------|---------|------|------|--------|--|
| NO. | FILE NO | REQ. | CUR. | | |
| 1 | 0013 | 1 | 0 | | |
| 2 | 0017 | 1 | 0 | | |
| 3 | | 0 | 0 | | |
| 4 | | 0 | 0 | | |
| 5 | | 0 | 0 | | |
| 6 | | 0 | 0 | | |
| 7 | | 0 | 0 | | |
| 8 | | 0 | 0 | | |
| 9 | | 0 | 0 | | |
| 10 | | 0 | 0 | | |
| 11 | | 0 | 0 | | |

A) _

RMT ***** ** 10:17:07

[F-UP] [F-DOWN] [DELETE] [INSERT] [ALLDEL] +

Fig. 4.4 (c) File number screen (schedule list screen)(8.4-inch)

| SCHEDULE LIST | | | | N00000 | |
|---------------|-----------|------|------|--------|--|
| NO. | FILE NAME | REQ. | CUR. | | |
| 1 | 00001 | 1 | 0 | | |
| 2 | 00123 | 1 | 0 | | |
| 3 | | 0 | 0 | | |
| 4 | | 0 | 0 | | |
| 5 | | 0 | 0 | | |
| 6 | | 0 | 0 | | |
| 7 | | 0 | 0 | | |
| 8 | | 0 | 0 | | |
| 9 | | 0 | 0 | | |
| 10 | | 0 | 0 | | |
| 11 | | 0 | 0 | | |

A) _

RMT ***** ** 10:17:33

[F-UP] [F-DOWN] [DELETE] [INSERT] [ALLDEL] +

Fig. 4.4 (d) File name screen (schedule list screen) (8.4-inch display unit)



Fig. 4.4 (e) Soft key [F-NO] (8.4-inch display unit)



Fig. 4.4 (f) Soft key [F-NAME] (8.4-inch display unit)

- [F-UP] Replaces the file at the cursor position with the file located one line above.
- [F-DOWN] Replaces the file at the cursor position with the file located one line below.
- [DELETE] Deletes the file at the cursor position and moves the files at the lower positions up one line.
- [INST] Moves the files at the cursor and lower positions down one line.
- [ALLDEL] Deletes all records.
- [F-NO] Displays the file number screen.

[F-NAME] Displays file name screen.

The files registered as schedule data are marked with "S" to the left of their file names on the program list screen.

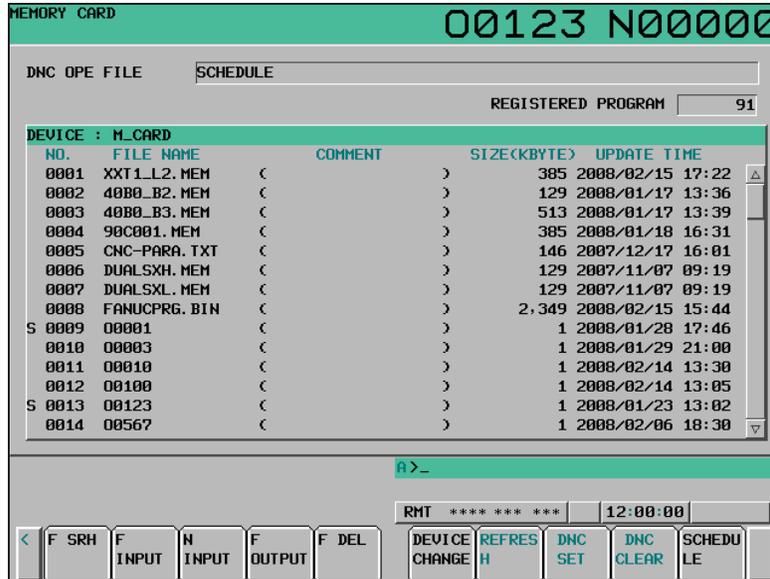


Fig. 4.4 (g) Program list screen (after setting schedule data) (10.4-inch display unit)

- 3 Press the cycle start switch to execute the selected files. For details on the REMOTE switch, refer to the manual provided by the machine tool builder.

NOTE

- 1 Before setting schedule operation, release DNC operation files in the MDI mode. DNC operation and schedule operation cannot be specified at the same time.
- 2 Before starting schedule operation, confirm that schedule data is set correctly on the schedule list screen.
- 3 Schedule data cannot be changed or edited during schedule operation. Before changing schedule data, make a reset to stop operation.

Restrictions

- Repetition count

The maximum repetition count during schedule operation is 9999. When a negative value is specified, an endless loop (LOOP display) is assumed. The file for which 0 is set is skipped and processing proceeds to the next file.

- Number of registered files

The maximum number of programs that can be registered as schedule setting data is 20.

- Selectable files

The files to be selected as schedule setting data must be registered in the same directory. (Files in the different directories cannot be selected.)

- M code

Even if a code other than M02 and M30 in the execution program is executed, the current count on the schedule execution status screen is not increased.

- **Floppy disk directory display during execution of a file**
During schedule operation, directories in a floppy disk cannot be displayed in a background edit.
- **Intervention during automatic operation**
Intervention in schedule operation cannot be performed during automatic operation.

| |
|----------|
| T |
|----------|

- **During 2-path control**
The scheduling function cannot be used by two paths at the same time.

4.5 EXTERNAL SUBPROGRAM CALL (M198)

During memory operation, you can call and execute a subprogram registered in an external device (such as a Memory Card, Handy File, or Data Server) connected to the CNC.

Format

| |
|---|
| <p>M198 Pxxxxxxx Lyyyyyyy ;</p> <p style="text-align: center;"> ↑ ↑ </p> <p>Pxxxxxxx : Program number (or file number) Lyyyyyyy : Number of repetitive calls When address L is omitted, the number of repetitive calls is assumed to be 1.</p> |
| <p>FS0i-C compatible command format</p> <p>M198 Pxxxx yyy ;</p> <p style="text-align: center;"> ↑ ↑ </p> <p><u>xxxx</u> : Number of repetitive calls <u>yyy</u> : Program number (or file number) When the number of repetitive calls is omitted, it is assumed to be 1.</p> |

Explanation

M code M198 specifies an external subprogram call. You can also call an external subprogram using an M code set in parameter No. 6030. (When an M code other than M198 is set as an M code for calling an external subprogram, M198 is executed as a normal M code.)

Specify a program number (file number) registered in an external device at address P. If the specified program number (file number) is not registered in the connected external device, an alarm (PS1079) is issued. (When the memory card is used as external device, alarm (SR1966) is issued.)

