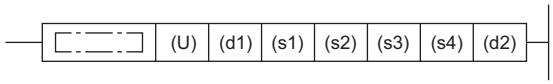
Copying the specified file

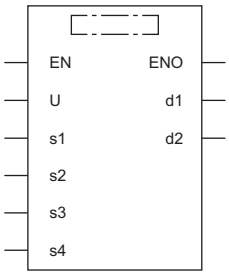
SP.FCOPY

FX5S FX5UJ FX5U FX5UC

This instruction copies the specified file or folder in an SD memory card. When a folder is specified, the specified folder is copied in its entirety, or all the files and subfolders in the specified folder are copied.

Ladder	ST
	ENO:=SP_FCOPY(EN,U,s1,s2,s3,s4,d1,d2);

FBD/LD



Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(U)	Dummy	■FX5S CPU module U1 ■FX5UJ CPU module U1 to U8 ■FX5U/FX5UC CPU module U1 to U10	Device name	ANY16
(d1)	Start device where the control data is stored	☞ Page 544 Control data (d1)	Word	ANY16_ARRAY (Number of elements: 2)
(s1)	Copy source drive	2 (fixed)*1	16-bit signed binary	ANY16
(s2)	Start device where the file name or folder name of the copy source is stored	☞ Page 546 Copy source file name/folder name (s2)	Unicode string	ANYSTRING_DOUBLE
(s3)	Copy destination drive	2 (fixed)*1	16-bit signed binary	ANY16
(s4)	Start device for storing the copy destination folder path	☞ Page 547 Copy destination folder path (s4)	Unicode string	ANYSTRING_DOUBLE
(d2)	Bit device that turns on upon completion of the processing	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

*1 Only drive 2 (for the SD memory card) can be set.

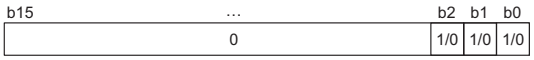
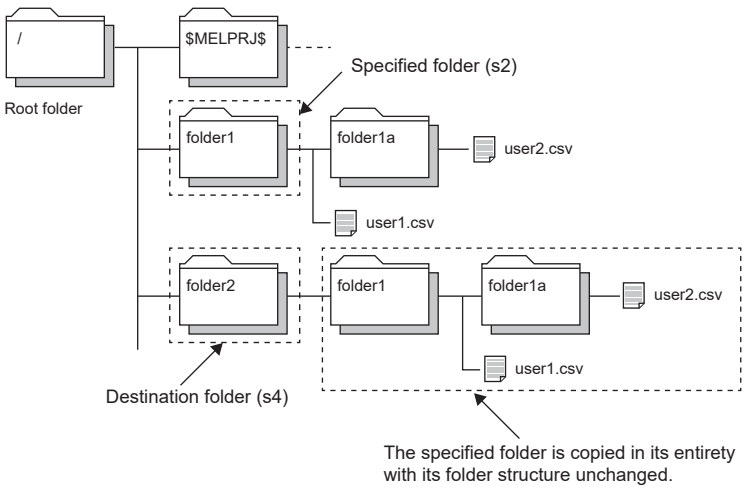
■Applicable devices

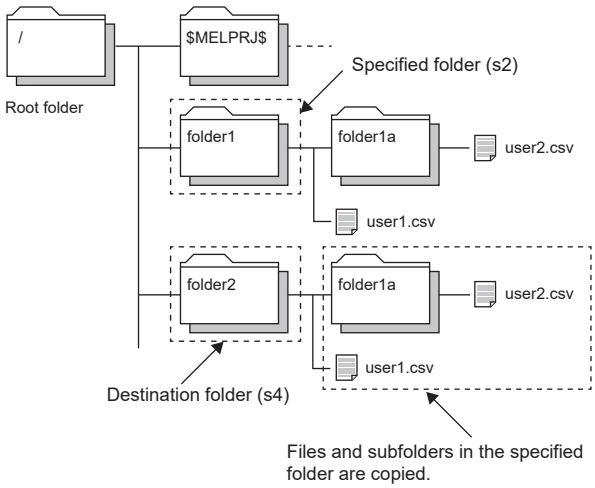
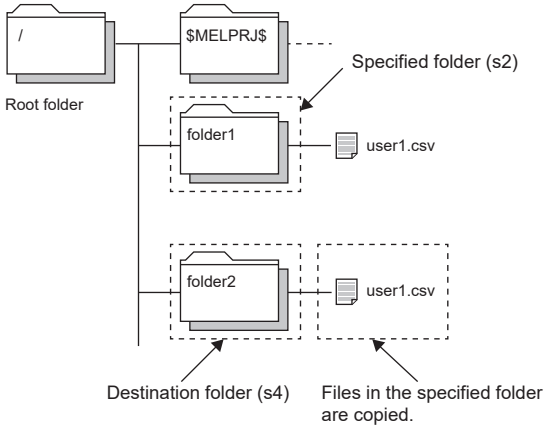
Operand	Bit	Word			Double word		Indirect specification	Constant			Others (U)
	X, Y, M, L, SM, F, B, SB, S	T, ST, C, D, W, SD, SW, R	U□\G□	Z	LC	LZ		K, H	E	$	
(U)	—	—	—	—	—	—	—	—	—	—	○
(d1)	—	○	—	—	—	—	○	—	—	—	—
(s1)	○	○	—	—	—	—	○	○	—	—	—
(s2)	—	○	—	—	—	—	○	—	—	○	—
(s3)	○	○	—	—	—	—	○	○	—	—	—
(s4)	—	○	—	—	—	—	○	—	—	○	—
(d2)	○*1	○*2	—	—	—	—	—	—	—	—	—

*1 S cannot be used.

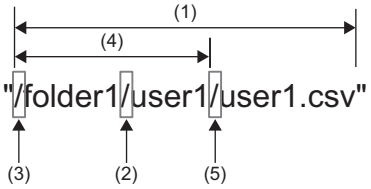
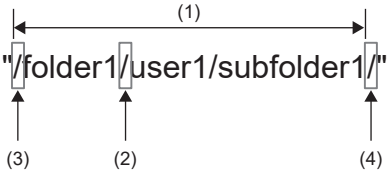
*2 T, ST, and C cannot be used.
Only bit specification of word device is applicable.

■Control data (d1)

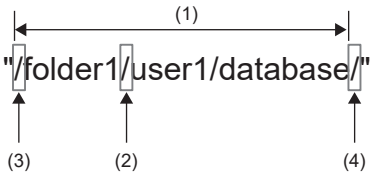
Operand: (d1)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0	Application setting area	 ■b0, b2: Target type setting b0: Specify the type of data (file or folder) to copy. • 0: File • 1: Folder b2: Specify how the data is copied. (This bit is valid when b0 is set to 1 (Folder).) • 0: Copy the folder in its entirety. • 1: Copy all the files and subfolders in the folder. [Operation when b2 is set to 0 (Copy the folder in its entirety)] The specified folder (including all files and subfolders in it) is copied in its entirety. 	Refer to the "Description" column.	User

Operand: (d1)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0	Application setting area	[Operation when b2 is set to 1 (Copy all the files and subfolders in the folder), and the specified folder includes files and a subfolder] All the files and subfolders in the specified folder are copied.  [Operation when b2 is set to 1 (Copy all the files and subfolders in the folder), and the specified folder includes only files (no subfolder)] All the files in the specified folder are copied.  ■b1: Overwrite setting Specify whether to overwrite a file or a folder if one with the same name as the copy source already exists in the copy destination. • 0: Do not overwrite the file or folder. • 1: Overwrite the file or folder. When b0 is set to 1 (Folder) or b1 is set to 0 (Do not overwrite the file or folder), the instruction skips copying a file or a folder having the same name with the one in the copy destination. (The instruction is completed and no error occurs.) However, even if the folder copy is skipped, the instruction does not skip copying a file/subfolder existing directly under the folder having the same name.	Refer to the "Description" column.	User
+1	Completion status	The completion status is stored upon completion of the instruction. • 0000H: Completed successfully • Other than 0000H: Completed with an error (error code) (☞ Page 579 Error codes generated for file operation instructions)	—	System

■Copy source file name/folder name (s2)

Operand: (s2)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0 to +☐	File name character string	When specifying a file, specify the folder path where the copy source file is stored and the file name. • When the file name has an extension, specify the name without omitting the extension. • The folder path and file name (including an extension) must be within 253 characters in total. • The folder path must be within 244 characters. (Delimiters are not included.) • Specify one character or more for the file name or folder path in addition to a delimiter. • Do not add a delimiter at the end of a string. • Do not specify a half-width space at the end of the character string or just before each delimiter. • Do not put a period (one-byte) at the end of a string or directly before each delimiter. • Do not specify the system folder ($MELPRJ$) or any file in the system folder. • The number of folder path hierarchies must be within 10 levels.  (1): Up to 253 characters (2): Use "/" or "\" as delimiters for the folder path and file. (3): Can be omitted. When it is omitted, (1) is up to 252 characters. (4): The folder path is up to 244 characters long (243 characters long when (3) is omitted). (5): The delimiter between the folder path and the file name is not included in the number of characters of the folder path.	Unicode string	User
	Folder name character string	When specifying a folder, specify the copy source folder path. • The folder path must be within 244 characters. (Delimiters at the end of the folder path are not included.) • Specify one character or more for the folder path in addition to a delimiter. • Do not specify a half-width space at the end of the character string or just before each delimiter. • Do not put a period (one-byte) at the end of a string or directly before each delimiter. • Do not specify the system folder ($MELPRJ$) or any file in the system folder. • The number of folder path hierarchies must be within 10 levels.  (1): Up to 244 characters (2): Use "/" or "\" as delimiters for the folder path. (3): Can be omitted. When it is omitted, (1) is up to 243 characters. (4): Can be omitted.		

■Copy destination folder path (s4)

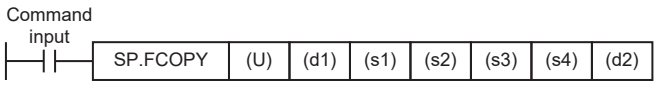
Operand: (s4)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0 to +☐	Folder path	Specify the copy destination folder path. • The folder path must be within 244 characters. (Delimiters at the end of the folder path are not included.) • Specify one character or more for the folder path in addition to a delimiter. • Do not specify a half-width space at the end of the character string or just before each delimiter. • Do not put a period (one-byte) at the end of a string or directly before each delimiter. • Do not specify the system folder ($MELPRJ$) or any file in the system folder. • The number of folder path hierarchies must be within 10 levels.  (1): Up to 244 characters (2): Use "/" or "\" as delimiters for the folder path. (3): Can be omitted. When it is omitted, (1) is up to 243 characters. (4): Can be omitted.	Unicode string	User

Processing details

- This instruction copies the file or folder specified by (s2) in the drive specified by (s1) to the folder specified by (s4) in the drive specified by (s3). When a folder is specified by (s2), a file and subfolder with the same names may exist in the copy destination. In this case, the instruction is not completed with an error even if the value of bit 1 (overwrite setting) of (d1) is 0. (Copying is skipped.)
- If the folder specified by (s4) does not exist in the copy destination, the folder is created automatically.
- SM753 (File being accessed) turns on while the SP.FCOPY instruction is being executed. While SM753 is on, the SP.FCOPY instruction cannot be executed. (If the instruction is executed, no processing is performed.)
- The processing completion bit device (d2) automatically turns on at the execution of the END instruction in the scan in which the completion of processing of the SP.FCOPY instruction is detected. The bit device (d2) turns off at the execution of the END instruction in the next scan. If the SP.FCOPY instruction completes with an error, the error completion device (d2)+1 turns on or off in synchronization with (d2). If the processing completion bit device (d2) is ON, it will automatically turn OFF when the SP.FCOPY instruction is executed.
- If an operation error is detected during the execution of the instruction, (d2) and (d2)+1 do not turn on.

■Timing chart

The operation specifications of the file copy function are shown below.

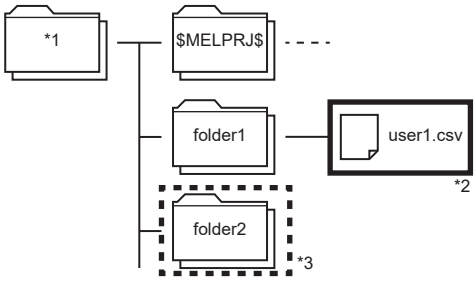


Application setting area (d1)+0	File name/folder name of the copy source (s2)	Copy destination folder path (s4)
0H, 1H, 5H, 7H	[When a file is specified] user1.csv [When a folder is specified] folder1	folder2

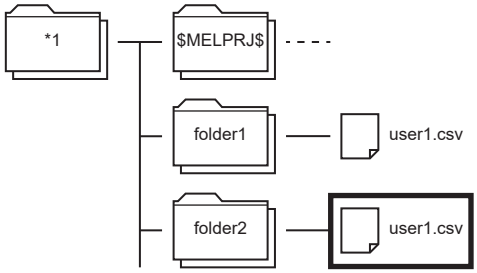
[In SD memory card]

■When application setting area is 0H (File)

Before execution of instruction



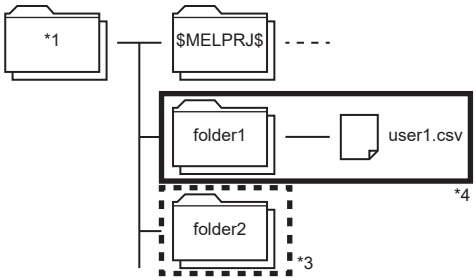
After execution of instruction



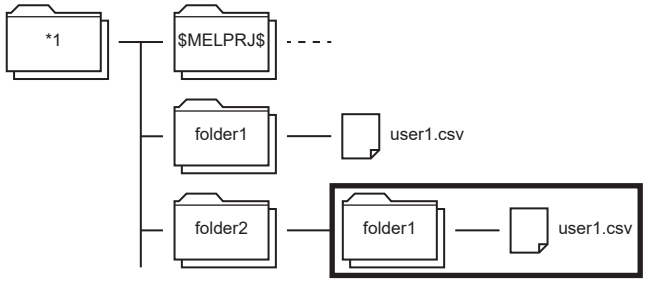
The folder1/user1.csv file is copied into folder2.

■When application setting area is 1H ("Folder", "Copy the folder in its entirety.")

Before execution of instruction



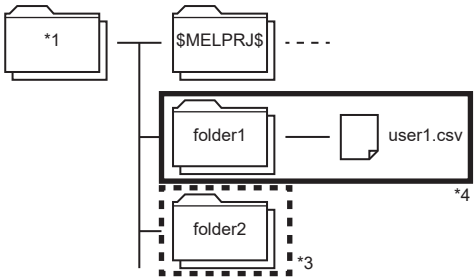
After execution of instruction



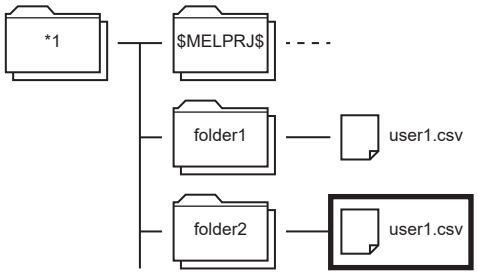
The folder configuration of the copy source is copied into folder2.

■When application setting area is 5H ("Folder", "Copy all the files and subfolders in the folder.")

Before execution of instruction



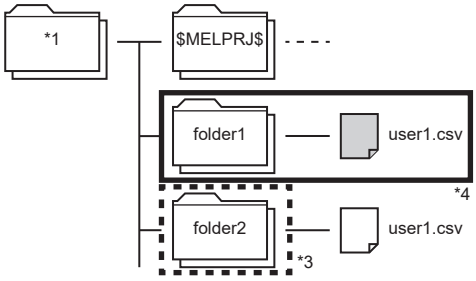
After execution of instruction



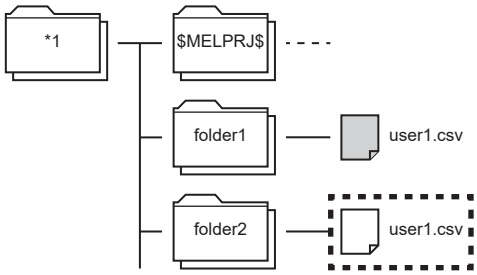
Only the file in the copy source folder is copied into folder2.

■When application setting area is 5H ("Folder", "Copy all the files and subfolders in the folder.", "Do not overwrite the file or folder.")

Before execution of instruction



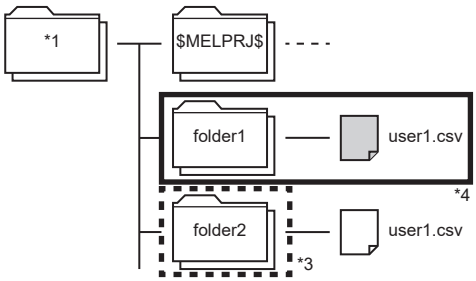
After execution of instruction



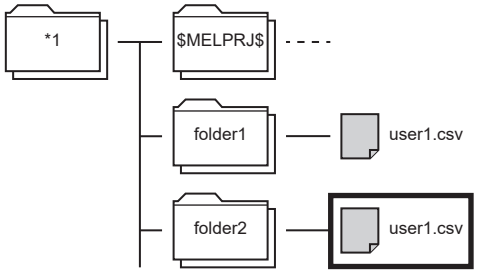
Since the copy destination contains a file with the same name, the file is not copied. The SP.FCOPY instruction is completed normally.
When the copy destination does not contain a file with the same name, the file is copied.

■When application setting area is 7H ("Folder", "Copy all the files and subfolders in the folder.", "Overwrite the file or folder.")

Before execution of instruction



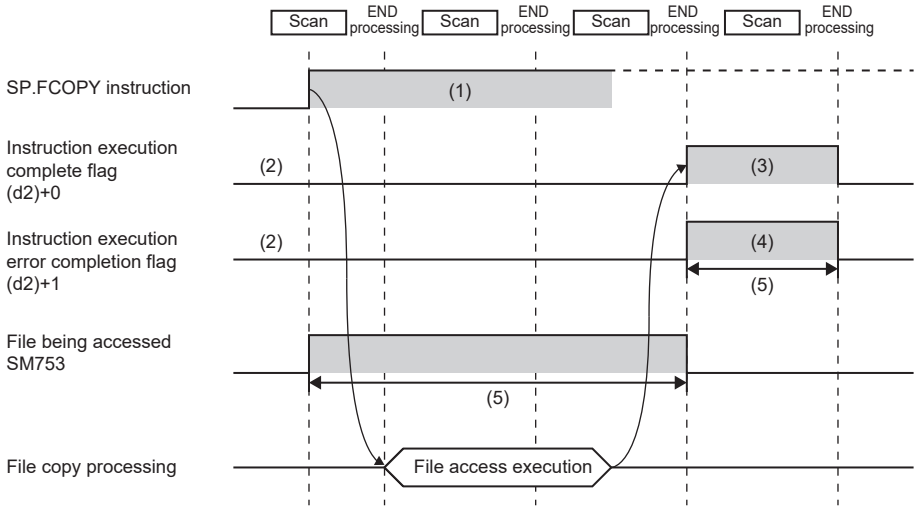
After execution of instruction



folder2/user1.csv is copied overwriting the folder1/user1.csv file.

*1 Root folder
*2 File name of the copy source
*3 Copy destination folder
*4 Folder name of the copy source

Below is shown the timing chart (flag updating timing) from the execution of the SP.FCOPY instruction to the completion.



(1) No processing during scanning except when the instruction is turned OFF and ON
(2) Updating to OFF when the instruction is turned OFF and ON
(3) Turning ON upon normal/error completion*5
(4) Turning OFF upon normal completion and turning ON upon error completion*5
(5) Turning ON only during 1 scan after instruction execution
(6) Turning OFF when instruction execution complete flag is turned ON

*5 The complete flag is not turned ON when an error is detected during instruction execution.

Program example

When X0 is turned ON, the “sample.bin” file stored in the SD memory card is copied into the “sample1” folder.

[Program operation]

1. Control data is created during RUN.
2. The drive contact of X0 is held in M0. When the drive contact is turned ON, the instruction execution complete flag and instruction error completion flag are initialized.
3. The SP.FCOPY instruction is executed.*1
4. Since the instruction execution complete flag and instruction error completion flag are ON only during 1 scan, they are held in the M150 and M151 devices to identify the normal/abnormal completion.

*1 The instruction is executed after confirming that the following special devices are OFF to prevent simultaneous execution of another file operation instruction.
- SM606 (Memory card disable request)
- SM753 (File being accessed)

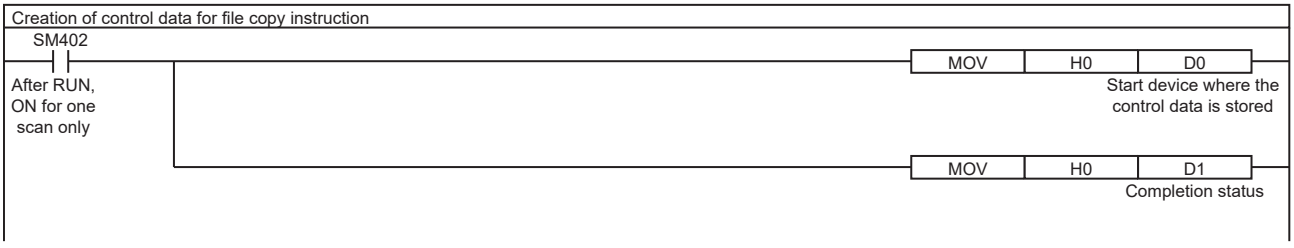
[Devices used]

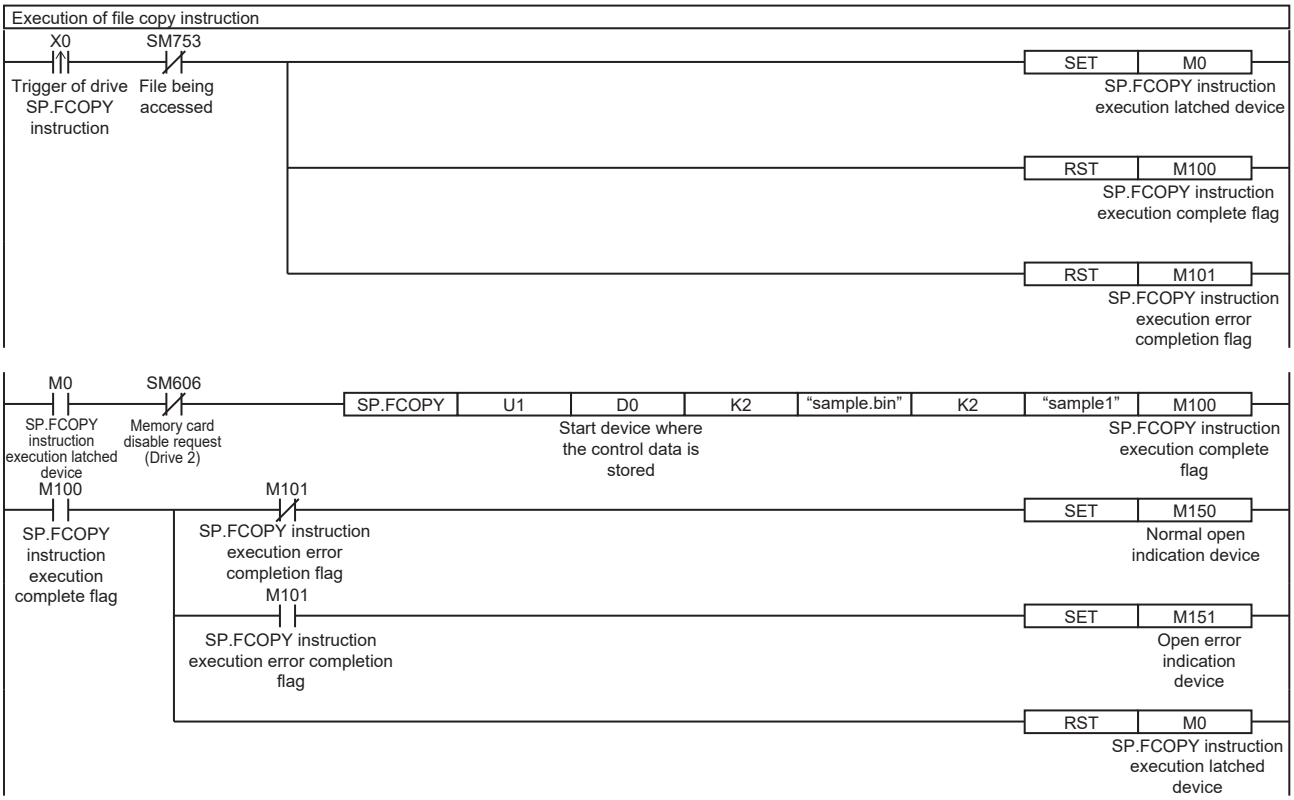
Device	Description
X0	Trigger of drive SP.FCOPY instruction
D0	Start device where the control data is stored • D0: Application setting area • D1: Completion status
M0	SP.FCOPY instruction execution latched device
M100	SP.FCOPY instruction execution complete flag
M101	SP.FCOPY instruction execution error completion flag
M150	Normal open indication device
M151	Open error indication device

[SP.FCOPY instruction operand setting]

Operand	Description	Set value
(U)	Dummy	U1
(d1)	Start device where the control data is stored	D0: 0H (File) D1: 0H (Completed successfully)
(s1)	Copy source drive	K2 (SD memory card)
(s2)	Start device where the file name of the copy source is stored	“sample.bin”
(s3)	Copy destination drive	K2 (SD memory card)
(s4)	Start device for storing the copy destination folder path	“sample1”
(d2)	Bit device that turns on upon completion of the processing	M100: Execution complete flag M101: Execution error completion flag

[Ladder program]





[ST program]

```
//(1) Creation of control data for file copy instruction
IF SM402 THEN
D0:=H0; //Application setting area (File)
D1:=H0; //Completion status
END_IF;

//(2) Processing to start up the drive contact (X0)
IF LDP(TRUE,X0) THEN;
//Checking that the file being accessed flag is OFF
IF (SM753 <> TRUE) THEN
SET(TRUE,M0); //Holds drive contact
RST(TRUE,M100); //Initialize instruction execution complete flag
RST(TRUE,M101); //Initialize instruction execution error complete flag
END_IF;
END_IF;

//(3) Execution of file copy instruction
IF M0 THEN
//Checking that the memory card disable request is OFF
IF (SM606 <> TRUE) THEN;
//EN = TRUE (Enable Input, always execute)
//U = U1 (Dummy)
//S1 = 2 (Drive specification, 2 fixed)
//S2 = "sample.bin" (Start device where the file name of the copy source is stored)
//S3 = 2 (Drive specification, 2 fixed)
//S4 = "sample1" (Start device for storing the copy destination folder path)
//D1 = D0 (Start device where the control data is stored)
//D2 = M100 (Bit device that turns on upon completion of the processing)
SP_FCOPY (TRUE, U1, 2, "sample.bin", 2, "sample1", D0, M100);
END_IF;
END_IF;

//(4) Checking the instruction execution complete flag
IF M100 THEN
SET((M101 <> TRUE), M150); //Holds instruction execution complete flag
SET(M101, M151); //Holds instruction execution error complete flag
RST(TRUE, M0); //Releasing the drive contact
END_IF;
```

Precautions

- Do not execute the SP.FCOPY instruction in an interrupt program. Doing so may cause malfunction of the module.
- The SP.FCOPY instruction cannot be executed while SM606 (Memory card disable request) is ON. If SM606 is turned ON after the completion of the initial END processing during execution of the instruction, the program will terminate abnormally upon detection of turning ON. (The data copied before SM606 is turned ON are copied.)
- The SP.FCOPY instruction specifying the system folder ($MELPRJ$) or a file in the system folder cannot be executed. If the SP.FCOPY instruction is executed, a calculation error (3405H) will occur.
- Even though the operating status of the CPU module is switched from RUN to STOP during instruction execution, the CPU module continues the processing of the instruction.
- Ensure that the number of characters in a folder path or in the total of a folder path and a file name after copying does not exceed its limit. (The file may be inaccessible or an error may occur.)
- If the instruction is completed with an error during processing, the file or folder may remain under processing.
- When the size of a file to be copied or the number of files to be copied becomes larger, the instruction will take more time to complete.
- Do not access the file being processed by the SP.FCOPY instruction from other functions. (The file may be corrupt or an error may occur.)
- Do not operate files or folders being accessed from other functions. (8001H is stored in (d1)+1.)
- The SP.FCOPY instruction cannot be executed simultaneously with the SP.DEVST instruction, the SP.FTPPUT instruction, and the SP.FTPGET.
- Do not disconnect the power or remove the SD memory card during execution of the SP.FCOPY instruction. (The file may be damaged, or an error may occur.)

Operation error

Error code (SD0/SD8067)	Description
2820H	The storage device of the control data (d1) exceeds the end of the device range.
	The bit label digits specified in (s2) and (s4) are unacceptable settings (the number of digits is not K4).
	The size of the read data exceeds the read device size.
3405H	The drive specified by (s1) or (s3) is not the one for the SD memory card.
	The file name/folder name string specified by (s2) cannot be read. • The specified file name string contains no character. • The specified file name string contains 254 characters or more. • The specified folder path contains 245 characters or more. • The set value is unusable. • The specified folder path hierarchies contains 11 levels or more. • When a file is specified, the file name string ends with a delimiter. • The specified file name string has a period (one-byte) at its end or directly before each delimiter.
	The folder path string specified by (s4) cannot be read. • The specified file path string contains no character. • The specified folder path string contains 245 characters or more. • The specified folder path hierarchies contains 11 levels or more. • The specified folder path string has a period (one-byte) at its end or directly before each delimiter.
	A system folder ($MELPRJ$) which is directly under the root folder is in the folder path specified by (s2) or (s4).
3582H	The SP.FCOPY instruction is executed in an interrupt program.

If the SP.FCOPY instruction completes with an error, an error code is stored in the device specified by (d1)+1. (Note that an error code is not stored if the instruction results in an operation error.)

For the error code stored in (d1)+1, refer to the following.

☞ Page 579 Error codes generated for file operation instructions