MICREX-SX How-to Guide

Issue No.	GE0165b	Issue date	June 2018	Distribution class	General

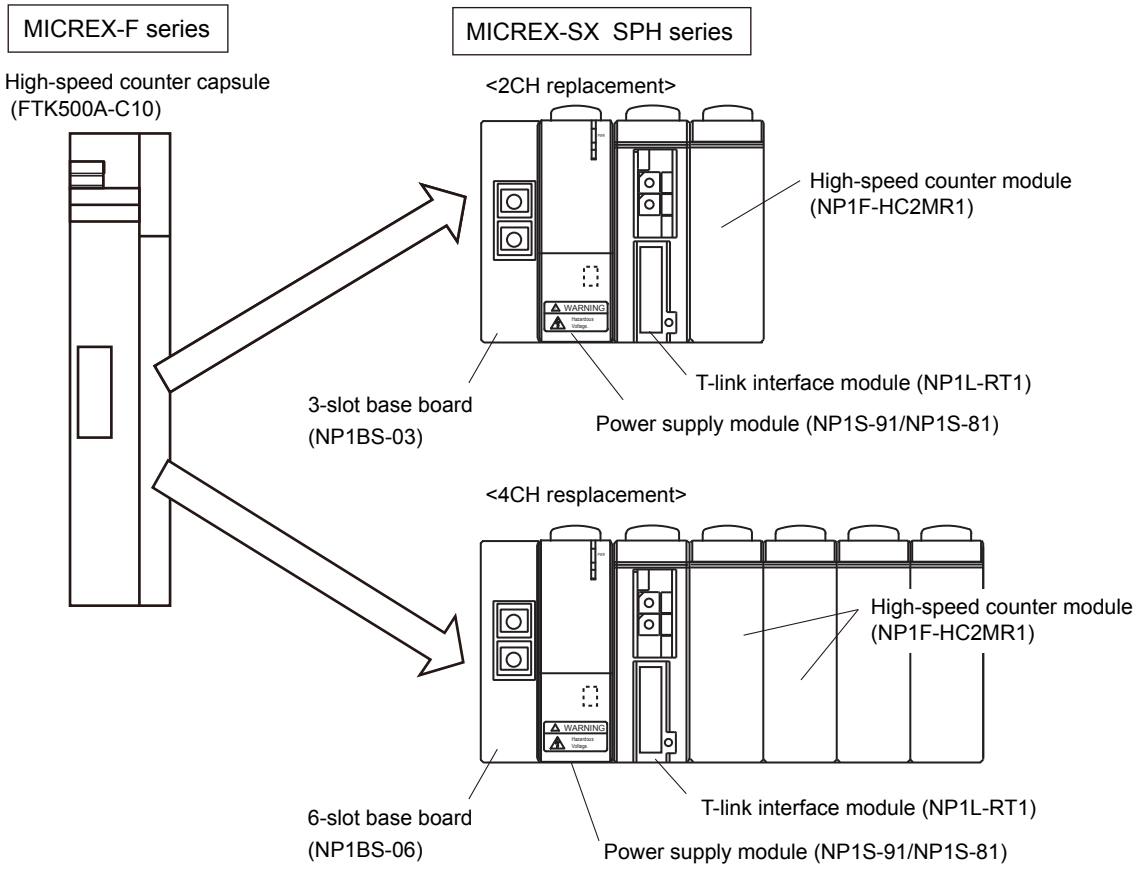
Fuji Electric Co., Ltd.

How to Replace FTK500 High-speed Counter Capsule with SPH High-speed Counter Module

This guide describes the procedure for replacing a MICREX-F series high-speed counter capsule (Type:FTK500A-C10) with a MICREX-SX series high-speed counter module (Type: NP1F-HC2MR1).

1. Overview of replacement

For replacement, mount a power supply module, a T-link interface module, and high-speed counter modules on a base board in the MICREX-SX series.



2. Cost comparison

The following table shows costs before and after the replacement.

MICREX-F series	2CH replacement	4CH replacement	MICREX-SX SPH series	2CH replacement	4CH replacement
High-speed counter capsule FTK500A-C10	133,000 yen ×1	133,000 yen ×2	3-slot base board NP1BS-03	12,700 yen × 1	–
			6-slot base board NP1BS-06	–	13,100 yen × 1
			Power supply module NP1S-91/81	14,300yen × 1	14,300 yen × 1
			T-link Interface module NP1L-RT1 *	50,000yen × 1	50,000 yen × 1
			High-speed counter module NP1F-HC2MR1	78,700yen × 1	78,700 yen × 2
Total cost:	133,000 yen	266,000 yen	Total cost:	165,700 yen	234,800 yen
			Cost reduction	-32,700 yen	31,200 yen

* To perform above replacement, use V2334 or later version of T-link interface module (Type: NP1L-RT1).

3. Specification comparison

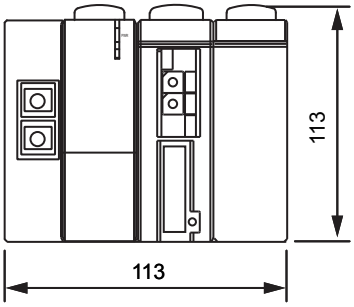
3.1 Performance specifications

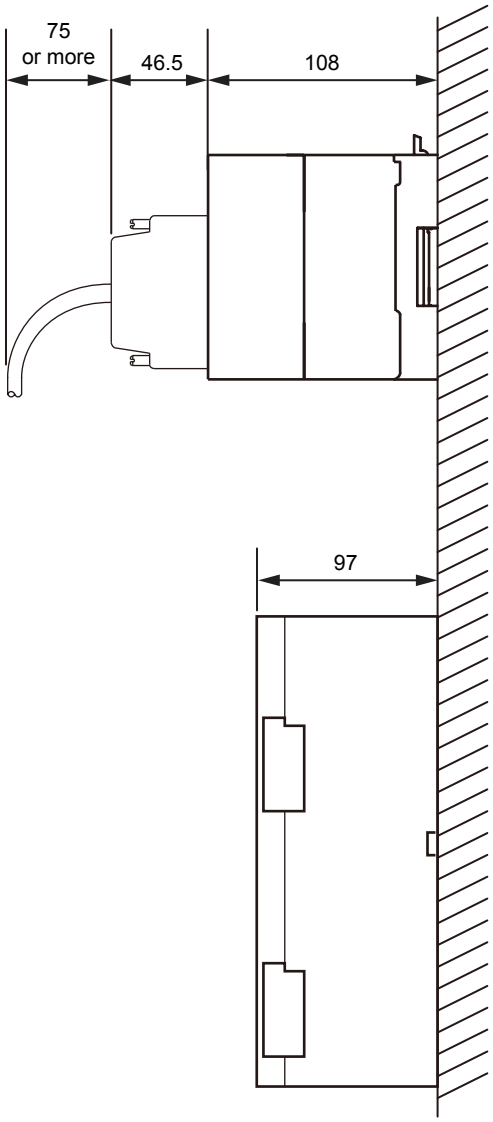
Item	MICREX-F series	MICREX-SX SPH series
Type	FTK500A-C10	NP1F-HC2MR1
Number of channels	2CH	2CH
Max. counting frequency	50kHz	50kHz
24V DC	Applicable	Applicable
12V DC	Applicable	Applicable
5V DC	Not applicable	Applicable
Rated input current	3.3mA	11mA
Counting range	-32768 to 32768 (5-digit singed BCD)	-2,147,483,648 to 2,147,483,647 (32-bit binary)
Isolation method	Pulse transformer	Photocoupler

3.2 Dimensions

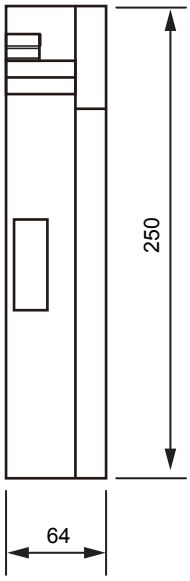
(Unit: mm)

MICREX-SX SPH series





MICREX-F series



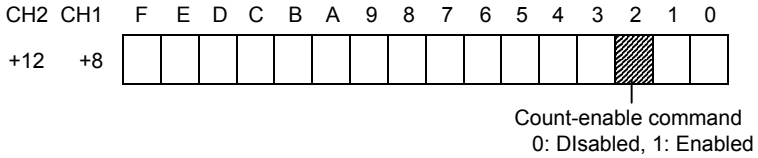
4. User interface

MICREX-F series FTK500A-C10			MICREX-SX SPH series NP1F-HC2MR1		
Address F		0	Address F		0
+0	0CH Count register	(High-word)	+0	CH1 Bit information signal 1	
+1	(Sign + 5-digit BCD)	(Low-word)	+1	CH1 Bit information signal 2	
+2			+2	CH1 Counter current value	(Low-word)
+3	0CH Status register		+3	(Binary)	(High-word)
+4	1CH Count register	(High-word)	+4	CH2 Bit information signal 1	
+5	(Sign + 5-digit BCD)	(Low-word)	+5	CH2 Bit information signal 2	
+6			+6	CH2 Counter current value	(Low-word)
+7	1CH Status register		+7	(Binary)	(High-word)
+8	Command register		+8	CH1 Bit command signal 1	
+9	Mode setting register		+9	CH1 Bit command signal 2	
+10	0CH Preset data register	(High-word)	+10	CH1 Write data	(Low-word)
+11	(Sign + 5-digit BCD)	(Low-word)	+11	(Binary)	(High-word)
+12	1CH Preset data register	(High-word)	+12	CH2 Bit command signal 1	
+13	(Sign + 5-digit BCD)	(Low-word)	+13	CH2 Bit command signal 2	
+14	Comparison data register	(High-word)	+14	CH2 Write data	(Low-word)
+15	(Sign + 5-digit BCD)	(Low-word)	+15	(Binary)	(High-word)

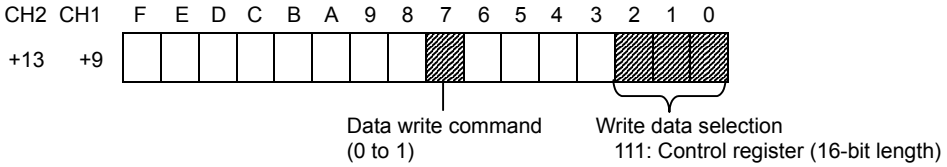
Notes:

1) The number of occupied words of the I/O areas does not change after replacing the FTK high-speed counter with the SPH high-speed counter. (16 words / 2 CH) Change the T-link station No. of the SPH high-speed counter if necessary.
2) Set “Pulse input format selection” and “Count-enable command” of the SPH high-speed in the following registers.

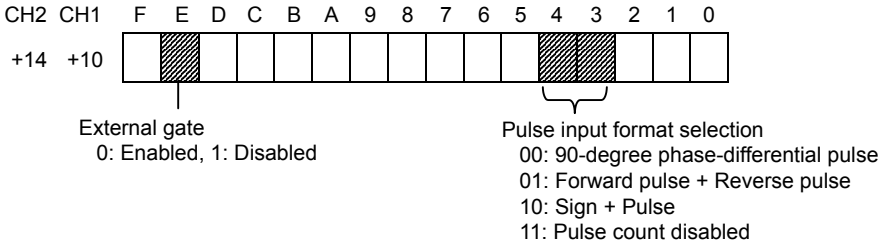
• Bit command signal 1



• Bit command signal 2



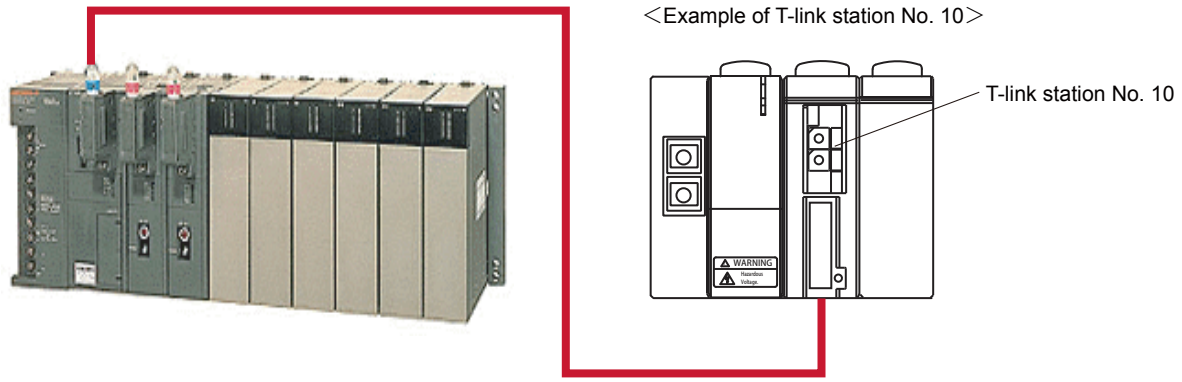
• Write data (Control REG assignment)



5. Programming of MICREX-F series

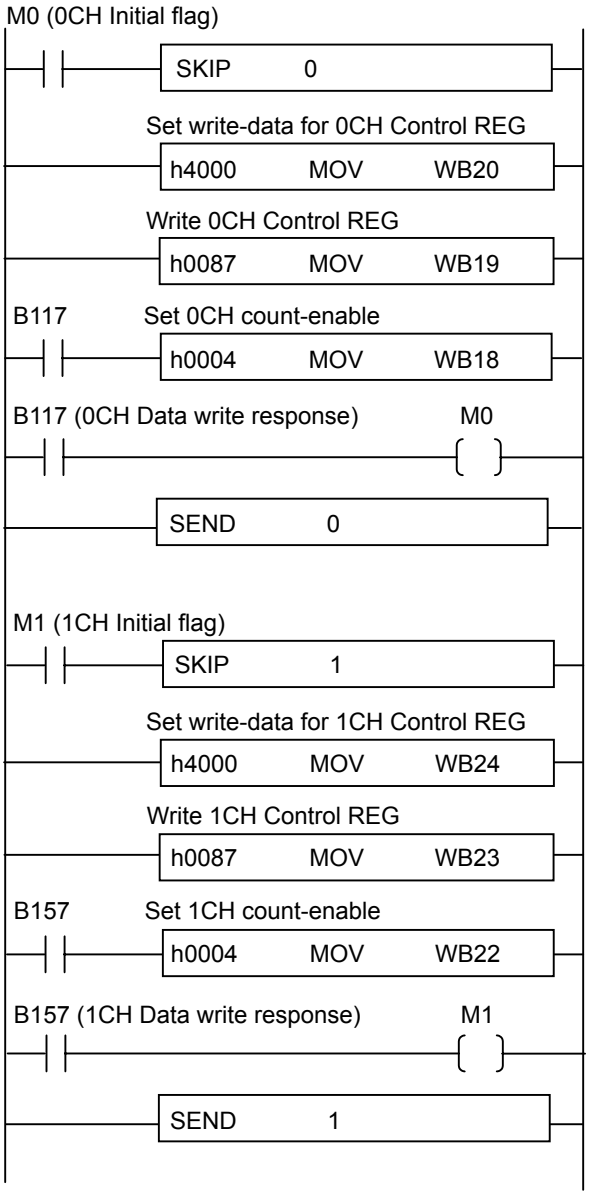
Since the count value of SPH high-speed counter modules is a 32-bit binary (-2,147,483,648 to +2,147,483,647), a BCD conversion instruction is necessary for the MICREX-F series program.

Example of T-link station No. 10

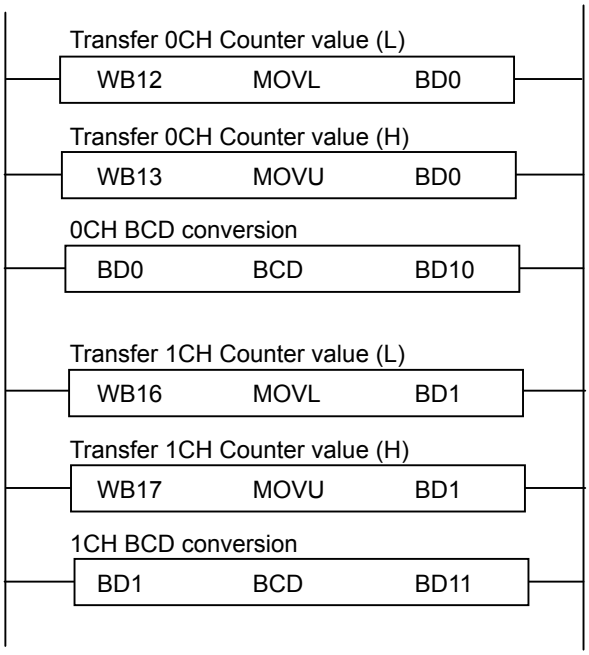


Example programming:

• Setting pulse input format (initial processing)



• Reading out counted value

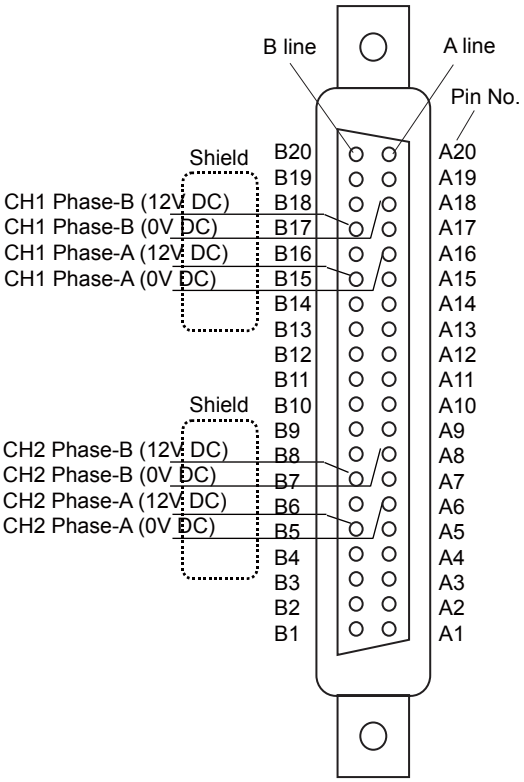


6. Signal assignment and wiring

6.1 Signal assignment

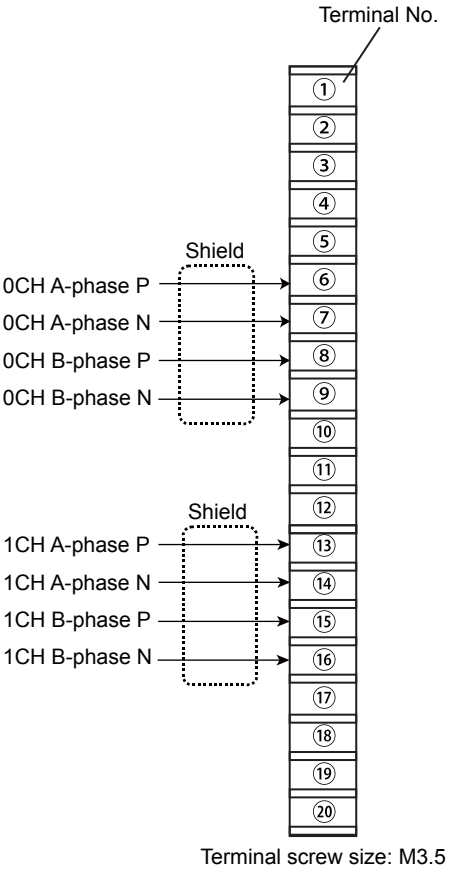
MICREX-SX SPH series NP1F-HC2MR1

	Pin No.	B line	Pin No.	A line
CH1	B20	CH1 Phase-Z (24V DC)	A20	CH1 Phase-Z (0V DC)
	B19	CH1 Phase-Z (12V DC)	A19	CH1 Phase-Z (5V DC)
	B18	CH1 Phase-B (24V DC)	A18	CH1 Phase-B (0V DC)
	B17	CH1 Phase-B (12V DC)	A17	CH1 Phase-B (5V DC)
	B16	CH1 Phase-A (24V DC)	A16	CH1 Phase-A (0V DC)
	B15	CH1 Phase-A (12V DC)	A15	CH1 Phase-A (5V DC)
	B14	CH1 For output: 24V DC	A14	CH1 Output COM
	B13	CH1 Comparison output	A13	CH1 Output COM
	B12	CH1 Origin LS input	A12	CH1 Input COM1
	B11	CH1 Preset input	A11	CH1 Gate input
CH2	B10	CH2 Phase-Z (24V DC)	A20	CH2 Phase-Z (0V DC)
	B9	CH2 Phase-Z (12V DC)	A19	CH2 Phase-Z (5V DC)
	B8	CH2 Phase-B (24V DC)	A18	CH2 Phase-B (0V DC)
	B7	CH2 Phase-B (12V DC)	A17	CH2 Phase-B (5V DC)
	B6	CH2 Phase-A (24V DC)	A16	CH2 Phase-A (0V DC)
	B5	CH2 Phase-A (12V DC)	A15	CH2 Phase-A (5V DC)
	B4	CH2 For output: 24V DC	A14	CH2 Ootput COM
	B3	CH2 Comparison output	A13	CH2 Ootput COM
	B2	CH2 Origin LS input	A12	CH2 Input COM1
	B1	CH2 Preset input	A11	CH2 Gate input



MICREX-F series FTK500A-C10

Terminal No.	Signal	Terminal No.	Signal
1	(Not connected)	11	0CH C-phase N
2	(Not connected)	12	1CH SG
3	(Not connected)	13	1CH A-phase P
4	(Not connected)	14	1CH A-phase N
5	(Not connected)	15	1CH B-phase P
6	0CH A-phase P	16	1CH B-phase N
7	0CH A-phase N	17	1CH C-phase P
8	0CH B-phase P	18	1CH C-phase N
9	0CH B-phase N	19	1CH SG()
10	0CH C-phase P	20	(Not connected)

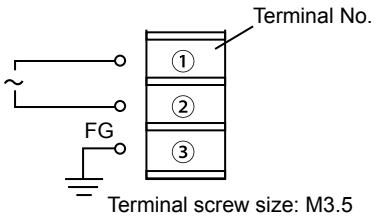


Terminal screw size: M3.5

6.2 Power supply terminal assignment

MICREX-F series

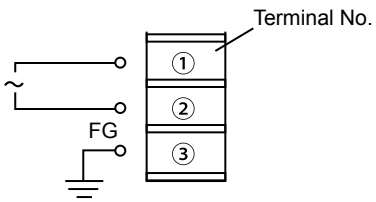
FTK500A-C10



Terminal screw size: M3.5

MICREX-SX SPH series

NP1S-91/81

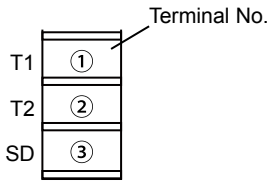


Terminal screw size: M4
Tightening torque: 1.2N•m

6.3 T-link terminal assignment

MICREX-F series

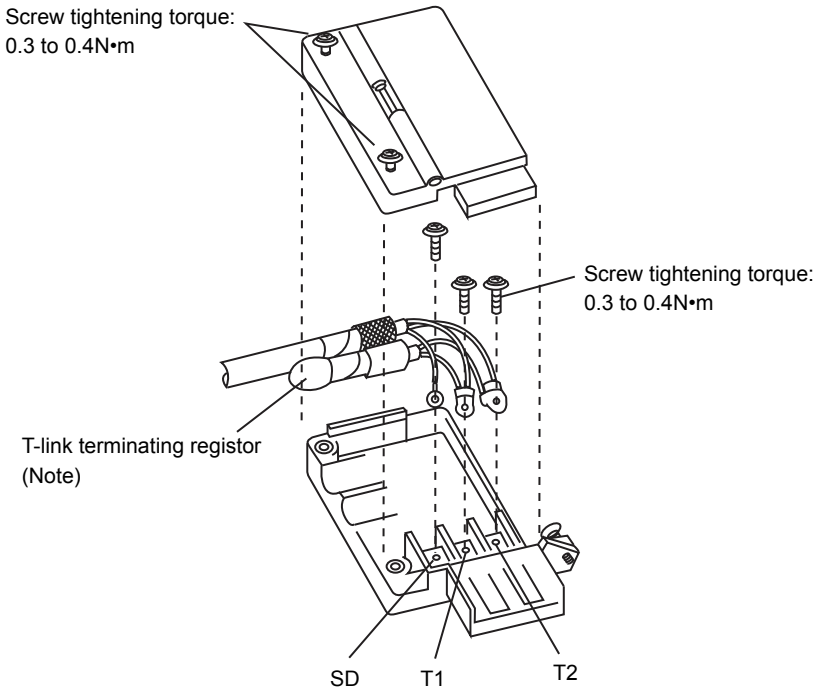
FTK500A-C10



Terminal screw size: M3.5

MICREX-SX SPH series

A connector is used to connect to T-link.
Assemble the connector as shown below, and attach it to the T-link interface module (Type: NP1L-RT1).

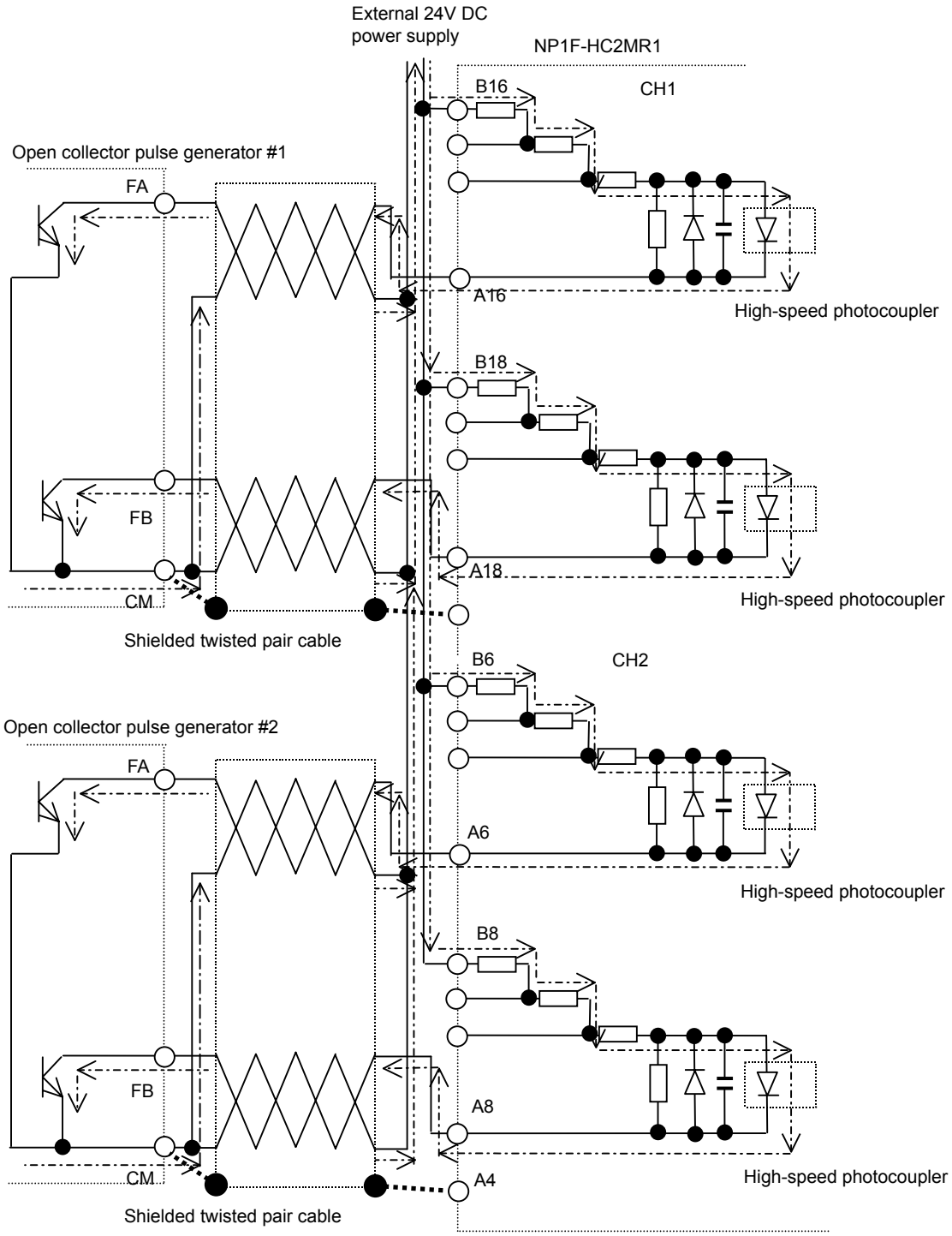


Notes:

To terminate T-link, connect the T-link terminating resistor that is supplied with the T-link interface module.

6.4 Wiring of pulse signal input part

For wiring, use shielded twisted pair cables. (Maximum length: 10m)
In addition, do the following shielding.



* Reference manual
SPH User's Manual "High-Speed Counter Module Type:NP1F-HC2/HC2MR/HC2MR1/HC8" (FEH210).

7. Notes on Use

In this guide, to minimize the replacement operation of the programming, the MICREX-F series CPU module is not replaced with that of MICREX-SX series. Only the MICREX-F series high-speed counter capsule (Type: FTK500A-C10) is replaced with the MICREX-SX series high-speed counter module (Type: NP1F-HC2MR1) on T-link expansion base board.

When you replace the MICREX-F series CPU module with that of MICREX-SX series, observe the following conditions.

(1) The SPH300/SPH2000 series can use high-speed counter modules (Type: NP1F-HC2/HC2MR/HC2MR1) on a T-link expansion base board. (SPH200 series cannot use them on a T-link expansion base board.)
    * T-link interface module (Type: NP1L-RT1): V2334 or later

(2) Supported programming support tool
    SX-Programmer Expert (D300win): V3.4.1.0 or later
    SX-Programmer Standard: V2.3.2.0 or later