

MICREX-SX How-to Guide

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Fuji Electric Co., Ltd.

FTK Analog Output (4CH) to SPH Analog Output Replacement Guide (Ver. 2)

1. Overview

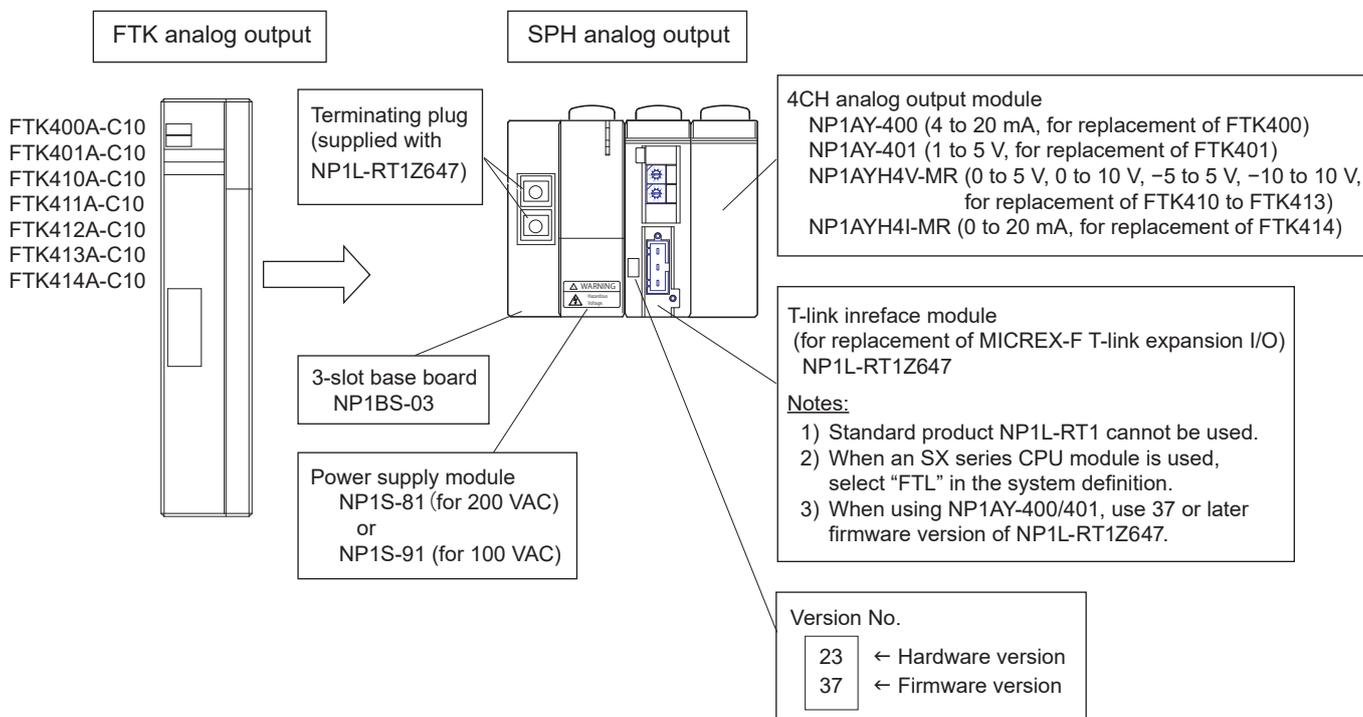
This guide describes how to replace the MICREX-F series FTK analog output (4CH) (Target type: FTK400A-C10, FTK401A-C10, FTK410A-C10, FTK411A-C10, FTK412A-C10, FTK413A-C10, FTK414A-C10) with the MICREX-SX SPH analog output. The similar replacement guide already issued (document No. GE0162) also describes the replacement procedure, however, which requires PLC program change after replacement due to differences in the number of occupied words and D/A conversion characteristics. **This How-to Guide offers a procedure for replacing the FTK analog output without changing the PLC program (Note 2)** by using a T-link interface module (**Type: NP1L-RT1Z647**) developed for replacement of MICREX-F with SPH, which provides the same number of occupied words and D/A conversion characteristics as the FTK analog output.

Notes:

- 1) The SPH analog output does not support main power 110 VDC. To use the FTK analog output at 110 VDC main power, prepare 100 VAC or 200 VAC main power separately.
- 2) When you replace FTK412 with an SPH analog output, the program needs to be changed. For details, see Note 1 of "4. D/A Conversion."

2. Replacement Configuration

The SPH analog output consists of a 3-slot base board, a power supply module, a T-link interface module, and an analog output module.



3. Relevant Documents

For the details of the SPH analog output, refer to the following documents. You can download them from the “Fe Library,” the technical information page in the Fuji Electric website. On “Fe Library,” enter the following document No. in the “Full-text search” box and click the [Search] button. To perform full-text search and download the document, you need to log in as a Member.

- Instruction Manual “SPH Analog Output Modules”: INC-TN405897
- User’s Manual “High-speed Multi-range Analog Module”: FEH206

4. D/A Conversion

The table below shows D/A conversion characteristics of analog output.

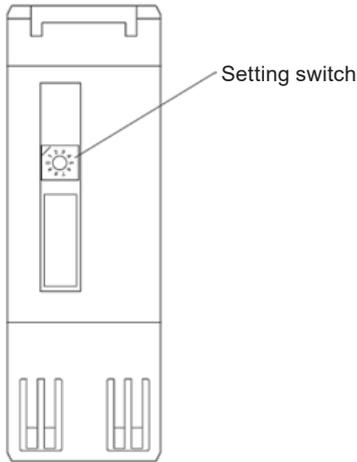
FTK analog type	SPH analog type	Analog output value	Digital input value	Number of occupied words
FTK400A-C10	NP1AY-400	4 to 20mA	0 to 10000 (BCD 8 digits)	8
FTK401A-C10	NP1AY-401	1 to 5V	0 to 10000 (BCD 8 digits)	8
FTK410A-C10	NP1AYH4V-MR	0 to 5V	0 to 4000 (BCD 4 digits)	4
FTK411A-C10	NP1AYH4V-MR	0 to 10V	0 to 4000 (BCD 4 digits)	4
FTK412A-C10	NP1AYH4V-MR	-5 to 5V	-2000 to 2000 (BCD 4 digits) (Note 1)	4
FTK413A-C10	NP1AYH4V-MR	-10 to 10V	-2000 to 2000 (BCD 4 digits)	4
FTK414A-C10	NP1AYH4I-MR	0 to 20mA	0 to 4000 (BCD 4 digits)	4

Note:

- 1) NP1AYH4V-MR does not support “-5 to 5V” range for the range setting mode by the switch. Use “-10 to 10V” range (-2000 to 2000 BCD input value) instead.
In this case, the digital input value for “-5 to 5V” output is -1000 to 1000 (BCD).
When replacing FTK412 with an SX analog, halve the digital input value on the PLC program side since the digital input value of FTK412 is -2000 to 2000.

5. Switch Setting of SPH Analog Output Module

The SPH analog output module has the setting switch on the back surface. Set it as follows.



5.1 Setting of NP1AYH4V-MR and NP1AYH4I-MR

The setting switch is used to switch the output range.

Switch No.	Output range	Digital input value	Remark
1	0 to 5 V	0 to 4000 (BCD 4 digits)	Replacement of FTK410
0	0 to 10 V	0 to 4000 (BCD 4 digits)	Replacement of FTK411
3	-5 to 5 V	-2000 to 2000 (BCD 4 digits) (Note 1)	Replacement of FTK412
3	-10 to 10 V	-2000 to 2000 (BCD 4 digits)	Replacement of FTK413
1	0 to 20 mA	0 to 4000 (BCD 4 digits)	Replacement of FTK414

Note:

- NP1AYH4V-MR does not support “-5 to 5V” range for the range setting mode by the switch. Use “-10 to 10V” range (-2000 to 2000 BCD input value) instead.
In this case, the digital input value for “-5 to 5V” output is -1000 to 1000 (BCD).
When replacing FTK412 with an SX analog, halve the digital input value on the PLC program side since the digital input value of FTK412 is -2000 to 2000.

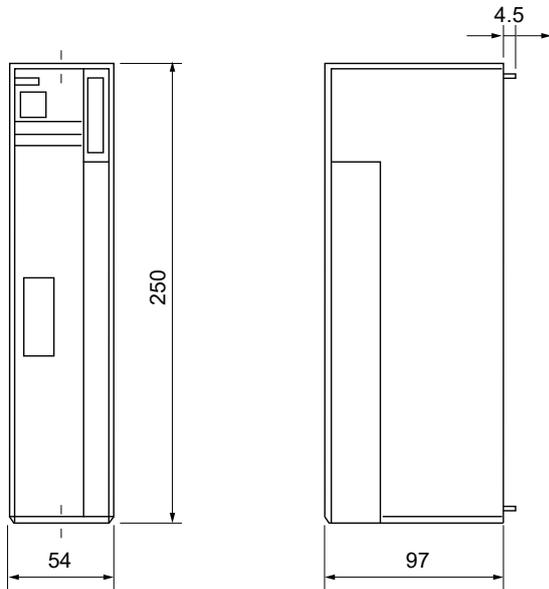
5.2 Setting of NP1AY-400 and NP1AY-401

To set the same memory assignment as the FTK, set the setting switch of NP1AY-400/NP1AY-401 to “0.”
NP1AY-400 is for replacement of FTK400 and NP1AY-401 is for replacement of FTK401.

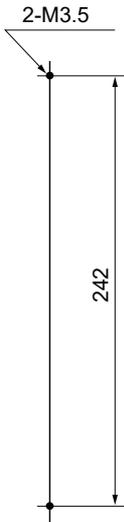
6. External Dimensions

When an FTK analog is replaced with an SPH analog, the external dimensions greatly change. The depth and width especially become large. Check the installation space on the control panel.

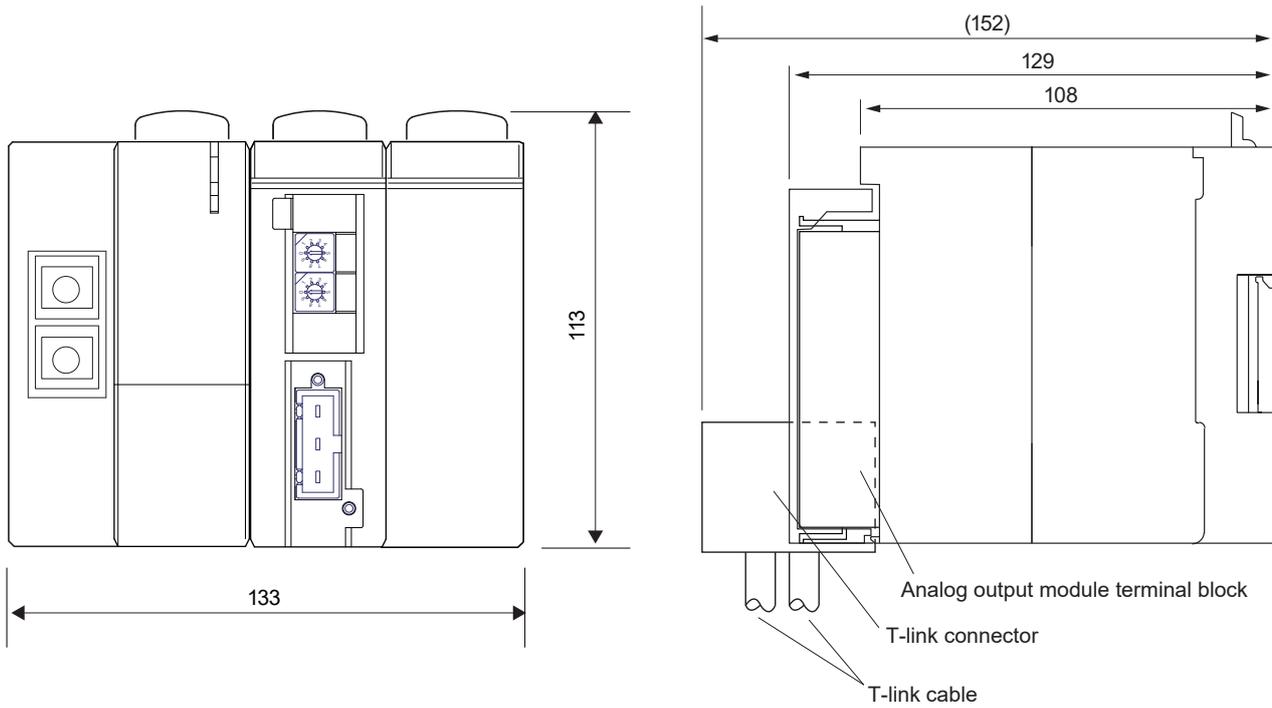
6.1 FTK analog output



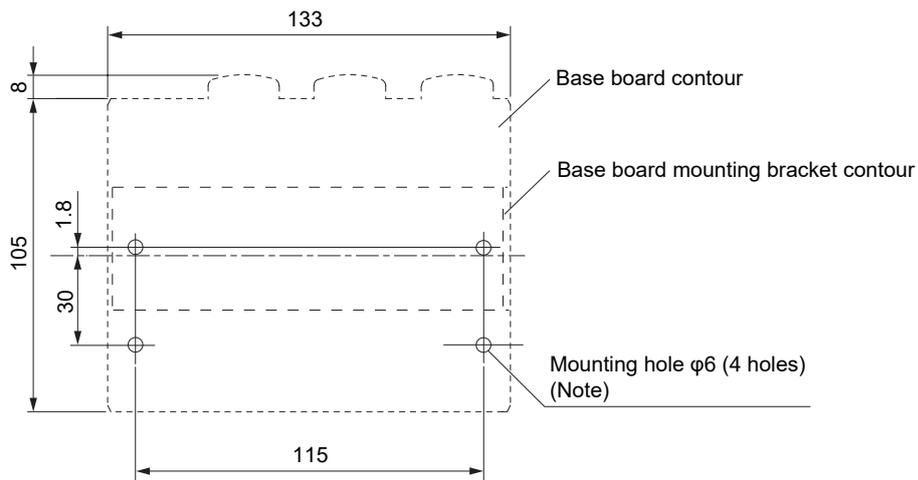
Dimension of mounting hole



6.2 SPH analog output



Dimension of mounting hole

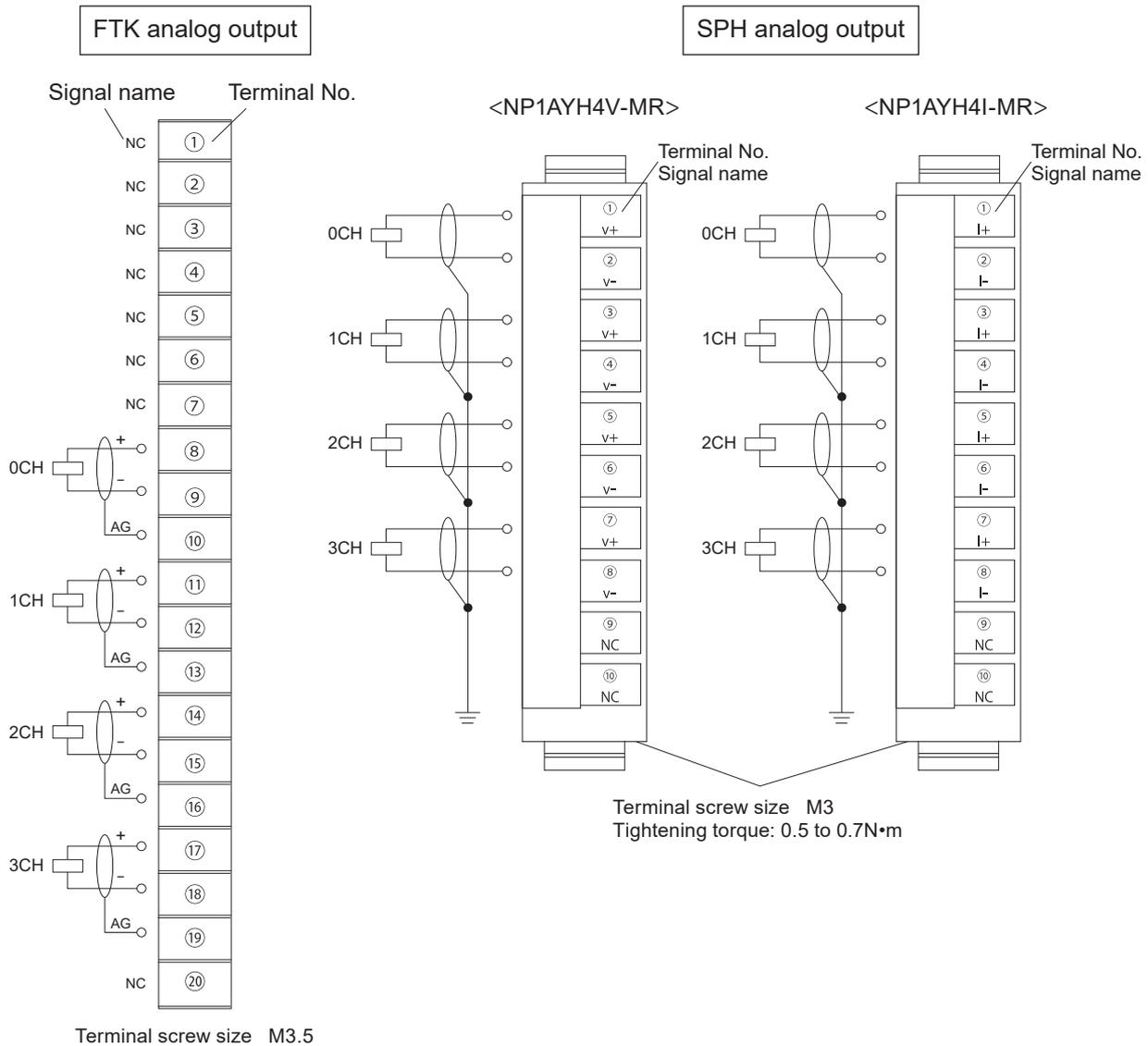


Note:

The hole size shown in the above figure is the size of the holes on the base board and mounting bracket. The base board mounting bracket is supplied with the base board.

7. Terminal Arrangement and Wiring

7.1 Terminal arrangement of analog output

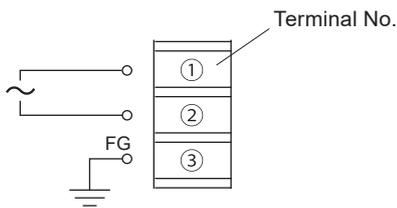


Notes on wiring of SPH analog output:

- 1) Unused channels shall basically be opened for voltage output or short-circuited for current output.
- 2) The SPH analog output has no AG terminals. Ground shielded cables at one point on the external device side (grounding resistance of 100Ω or less). However, it may be better to ground the shielded cables on the analog output module side depending on the condition of external noise.
When grounded on the analog output module side, NC terminals can be used as relay terminals for shielded cables. However, they must not be used as relay terminals for other control signal cables or power cables.

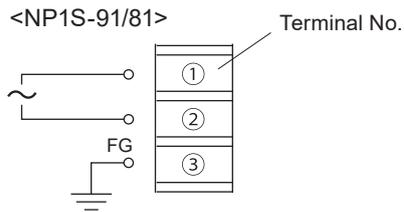
7.2 Terminal arrangement of power supply

FTK analog output



Terminal screw size M3.5

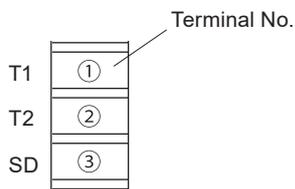
SPH analog output



Terminal screw size M4
Tightening torque: 1.2N•m

7.3 Terminal arrangement of T-link

FTK analog output

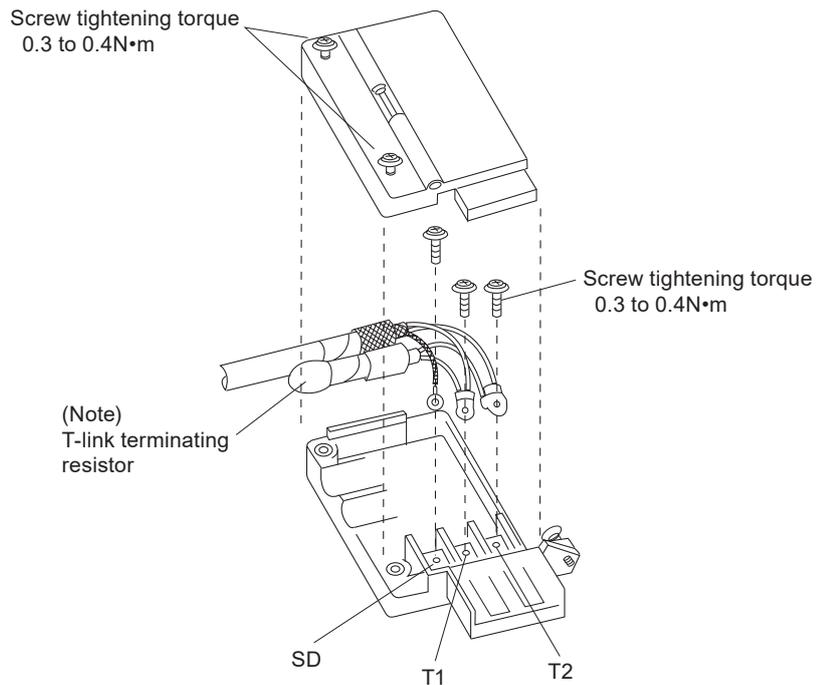


Terminal screw size M3.5

SPH analog output

The SPH analog output connects to T-link using a connector. A T-link connector is supplied with NP1L-RT1Z647.

Assemble the connector as shown below, and then attach it to the T-link interface module (Type: NP1L-RT1Z647).



(Note)
T-link terminating resistor

Note:

When the T-link interface module is located at the end of T-link, attach the T-link terminating resistor supplied with the T-link interface module.