Flex Network
Single Axis Positioning Unit
Installation Guide

Thank you for purchasing Pro-face's "Flex Network Single Axis Positioning Unit" (FN-PC10SK41). To ensure correct use of this unit's functions and features, be sure to carefully read both this Installation Guide and the Flex Network Single Axis Positioning Unit User Manual.

Safety Precautions

⚠ DANGER

- An emergency stop circuit and an interlock circuit should be constructed outside of this unit. Constructing these circuits inside this unit may cause a runaway situation, system failure, or an accident due to unit failure.
- Systems using this unit should be designed so that output signals which could cause a serious accident are monitored from outside the unit.
- This unit is designed to be a general-purpose device for general industries, and is neither designed nor produced to be used with equipment or systems in potentially life-threatening conditions. If you are considering using this unit for special uses, including nuclear power control devices, electric power devices, aerospace equipment, medical life support equipment, or transportation vehicles, please contact your local Flex Network distributor.

⚠ WARNING

- Whenever installing, dismantling, wiring, and conducting maintenance or inspections, be sure to disconnect power to this unit to prevent the possibility of electric shock or fire.
- Do not disassemble or modify this unit, since it may lead to an electric shock or fire.
- Do not use this unit in an environment that contains flammable gases since it may cause an explosion.
- Do not use this unit in an environment with conditions outside of the ranges specified in this Installation Guide and in the User Manual. Otherwise, an electric shock, fire, malfunction or other failure may occur.
- Because of the possibility of an electric shock or malfunction, do not touch the power terminals while the unit is operating.

⚠ CAUTION

- Communication cables or I/O signal lines must be wired separately from the main circuit (high-voltage, high-current) line, high-frequency lines such as inverter lines, and the power cord. Otherwise, a malfunction may occur due to noise.
- This unit must be properly installed according to directions in the Installation Guide and User Manual. Improper installation may cause the unit to malfunction, or operate incorrectly.
- This unit must be properly wired according to directions in the Installation Guide and User Manual. Improper wiring may cause a unit malfunction, failure or electric shock.
- Do not allow foreign substances, including chips, wire pieces, water, or liquids to enter inside this unit's case. Otherwise, a malfunction, failure, electric shock, or fire may occur.
- When disposing of this unit, it should be disposed of according to your country's industrial waste disposal laws.

■ To Prevent Unit Damage

- Do not store or operate this unit in direct sunlight or extremely dusty or dirty areas.
- Since this unit is a precision instrument, do not store or use it in locations where excessive shocks or vibration may occur.
- Do not block this unit's ventilation holes, or operate it where it may overheat.
- Do not operate this unit in locations where sudden temperature changes can cause condensation to form inside the unit.
- Do not use paint thinner or organic solvents to clean this unit.

Package Contents

■ Single-Axis Positioning Unit (FN-PC10SK41)

■ Flex Network Single-Axis Positioning Unit Installation Guide (this guide)

Installation Guide

Optional Items (sold separately)

■ Single-Axis Positioning Unit Teaching Loader (FN-PC10LD41)

■ Motor Driver Connection Cable (PC10CB01)

Safety Standards

UL/c-UL (CSA)

The FN-PC10SK41 is a UL/c-UL (CSA) listed product. (UL file No. E220851)

This unit conforms to the following standards:

■ UL 508 **Industrial Control Equipment**

■ CAN/CSA C22.2 No.1010-1 MEASUREMENT AND CONTROL EQUIPMENT (Safety requirements for electrical equipment for measurement and laboratory use)

FN-PC10SK41 **(UL Registration Model: 2980051-02)**
<Cautions>

• The FN-PC must be a built-in component of an end-use product.

• The power unit attached to the FN-PC should be a UL/c-UL (CSA) approved Class 2 power unit, or a Class 2 transformer. *1

If a single power supply is used to power the GLC/LT/GP3000, or multiple Flex Network units, design the wiring so the sum of the Flex Network unit's consumption current and the total load current does not exceed the Class 2 power unit or the Class 2 transformer's rating.

**1 A Class 2 power unit/Class 2 transformer provides 30V output at 8A or less, at 100VA or less.*

CE Marking

The FN-PC10SK41 is a CE marked product that conform to EMC directives EN55011 class A and EN61000-6-2. For detailed CE Marking information, please contact your Flex Network distributor.

Driver & Manual

The driver for the Flex Network Unit is required in order to use the unit.

For GLC2000 Series and LT Series,

You can select the Flex Network Driver via GP-PRO/PBIII C-Package (Pro-Control Editor) or LT Editor.

If the selection of the appropriate unit's name does not appear in the [I/O Configuration] - [I/O Unit Settings] area, you will need to update the driver file.

You can download the latest driver from Pro-face's Home Page.

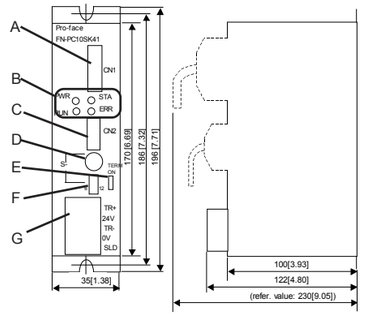
For GP3000 Series,

You can select the Flex Network Driver via GP-Pro EX as an I/O driver.

Also, you can download the driver and the Flex Network Single Axix Positioning Unit User Manual from Pro-face's web site. (http://www.pro-face.com/)

1 External Dimensions / Part Names

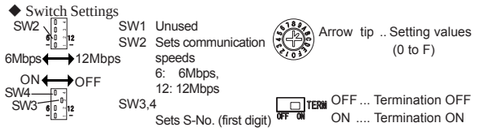
This section shows the FN-PC unit's dimensions and part names.



(Units:mm[in.])

A: Control Input Connector ..... Connects the Motor Driver Connection Cable
B: Status LED ..... Indicates the unit's current operation status.
C: Teaching Loader Connector .... Connects the Teaching loader Cable
D: S-No. (station no.) Switch ..... Sets the S-No. (last digit).
E: Terminal Switch ..... Switches termination ON/OFF. Turns ON the units at both ends of the communication cable.
F: Dip Switches ..... Set communication speeds and S-No. (first digit).
G: Flex Network Communication Terminals/Power Terminals .. Connects the Comm. cable and power supply.

◆ Switch Settings



◆Examples of S-No. (station no.) settings (Setting Range:1-60)

S-No.	Dip Switches SW3	Dip Switches SW4	S-No.(Sta.) Switch
10h(16)	OFF(0)	ON(1)	0
3Ch(60)	ON(1)	ON(1)	C

Note: One Single-Axis Positioning unit uses 4 stations. Thus, the next unit will start 4 stations higher (+4). Be sure to confirm all station numbers prior to use, to prevent operation mistakes.

2 Specifications

■ Electrical (Control Section)

Rated Voltage	DC24V
Rated Voltage Range	DC20.4 to DC28.8V
Allowable Voltage Drop	Up to 10ms (power supply: DC24V)
In-Rush Current	15A or less
Power Consumption	2.5W or less
Voltage Endurance	AC500V 20mA 1 minute (between input/output and FG terminals)
Insulation Resistance (via noise simulator)	10MΩ or more at DC500V (between input/output and FG terminals)

■ Environmental

Ambient Operating Temperature	0°C to 55°C
Ambient Storage Temperature	-25°C to +70°C
Ambient Humidity	30% RH to 95% RH (no condensation)
Rating	IP30

■ Input/Output Specifications

Control Input	Rated Input Voltage		DC24V
	Maximum Allowable Input Voltage		DC26.4V
	No. of Input Points		5 points (1 common)
	Input ON Voltage		DC19V or higher
	Input OFF Voltage		DC5V or less
	Input Impedance		3.9kΩ
	Input Delay	OFF-ON	1.5ms or less
		ON-OFF	1.5ms or less
Z Phase Input	Rated Input Voltage		DC5V
	Maximum Allowable Input Voltage		DC5.5V
	No. of Input Points		1 point
	Input ON Voltage		330Ω
	Input OFF Voltage		DC4V or higher
	Input Impedance		DC1V or lower
	Input Delay	OFF-ON	1.5ms or less
		ON-OFF	1.5ms or less
Control Output	Rated Output Voltage		DC24V
	Maximum Allowable Output Voltage		DC24V(+/-10%)
	No. Of Output Points		1 point
	Output Voltage		50mA or less
	Short Circuit Protection		None
	Voltage Drop (ON Voltage)		DC1.5V or less
	Clamp Voltage		DC39V +/-1V
	Current Leakage		0.1mA or less
	Output Delay Time	OFF-ON	1ms or less
		ON-OFF	1ms or less
Pulse Output — **Open Collector**	Rated Output Voltage		DC5V
	Maximum Allowable Output Voltage		DC4.5V to DC5.5V
	No. Of Output Points		2 points (CW/CCW)
	Output Voltage		50mA or less
	Short Circuit Protection		None
	Voltage Drop (ON Voltage)		DC0.8V or less
Line Driver (non-isolated)	Differential Output		Equivalent to TI Corp. SN75158
	Short Circuit Protection		None

■ Flex Network Communication

No. of Monopolized Stations	4

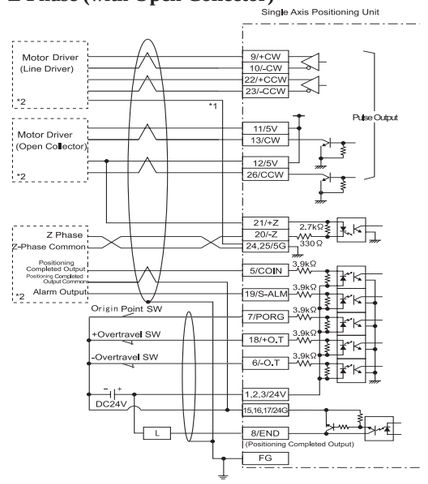
3 Flex Network System Design

The following diagram shows a standard Flex Network Single-Axis Positioning Unit system design.

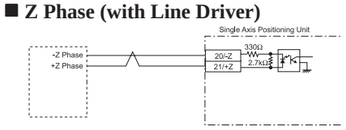
4 Connection Drawing

The following drawing shows a connection example and provides terminal names.

■ Z Phase (with Open Collector)



■ Z Phase (with Line Driver)



**1 The FN-PC unit's live line is not isolated. If it is connected to a non-isolated servo driver, be sure to connect the signal ground (5G) to prevent an over-current accident.*

**2 For motor driver connection details, refer to "Flex Network Single Axis Positioning Unit User Manual appendix1".*

Pin No.	Signal No.	Type	Description
1			
2	24V	Input Voltage	Controller Input Voltage DC24V
3			
4	NC		
5	COIN	Control Input	Positioning completed input signal from Motor Driver
6	-O.T		CCW direction overtravel signa (a contact/b contact)
7	PORG*1		Origin point switch (a contact)
8	END	Control Output	Positioning completed output
9	+CW	Pulse Output	CW direction pulse output (Line Driver)
10	-CW		
11	+5V	Output Voltage	Pulse output voltage (for Open collector)
12			
13	CW	Pulse Output	CW direction pulse output (non-logical Open Collector)
14	NC		
15	24G	Input Voltage	Controller Input Voltage DC0V
16			
17			
18	+O.T	Control Input	CW direction overtravel signal (a contact, b contact)
19	S-ALM		Motor Driver Alarm Input
20	-Z (ORG)	Z Phase Input	Encoder origin point signal
21	+Z (ORG)		
22	+CCW	Pulse Output	CCW direction pulse output (Line Driver)
23	-CCW		
24	5G	Output Voltage	Pulse output voltage (for Open collector)
25			
26	CCW	Pulse Output	CCW direction pulse output (non-logical Open Collector)

**1 PORG should be used for a transistor output's sensor (proximity switch, etc.)*

5 Installation

Create screw holes with M4 size screws. Screw torque should be from 1.0N•m to 1.3N•m.

6 Wiring

This section describes both the cables and crimp terminals used for wiring each type of cable. The terminal screw torque should be 0.3 to 0.5 N•m. Up to 2 terminals can be attached.

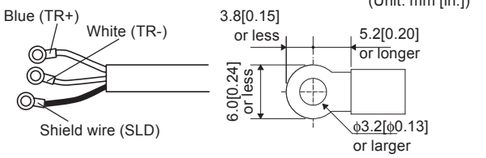
■ Communication Cable

The Flex Network interface and the Flex Network unit, or all distributed Flex Network units, are connected using a cross wiring system. (T-type systems cannot be used.)
Pro-face suggests the following communication cables.

Distributor	Order Code	Length
Pro-face	FN-CABLE2010-31-MS	10m
	FN-CABLE2050-31-MS	50m
	FN-CABLE2200-31-MS	200m

When preparing the cable wire ends:
- Cover shielded wires with shield tape or with an insulation tube.
- Use insulated crimp terminal.
- If you use a pressure connection terminal without insulation, cover it with a shield tape or an insulation tube. Cover uninsulated crimp termials with shield tape or a tube-type insulation.
- Be sure to tighten all unused terminal screws.

(Unit: mm [in.])



■ Power Cable

- Cable diameter can be up to 1.25 mm²(AWG18) . Be sure to twist all wire ends before attaching crimp terminals. All wiring should be UL1015 or UL1007 compliant.
- Use the same type crimp terminals as used for the communication cable.

■ Motor Driver Connection Cable

This cable connects the Motor Driver to the Flex Single Axis Positioning unit, and to the Flex Network I/O units. The following Motor Driver cable is available from Digital.

Distributor	Model No.	Length
Pro-face	FN-PC10CB01	1m

When creating your own cable, the thickness should be from 0.75 to 1.25mm².

Connector :10226-5202JL (FN-PC side)<Sumitomo/3M Corp.>
:10126-3000VE (Cable side)<Sumitomo/3M Corp.>
Cover :10326-50A0-008 <Sumitomo/3M Corp.>

Note
Please be aware that Digital Electronics Corporation shall not be held liable by the user for any damages, losses,or third party claims arising from the uses of this product.

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