FS-N40 Series Field Manual

Unit Overview

Display/control unit
Expansion connector*¹
Fiber lock lever
Expansion connector*¹*²
Dust cover
Connection cable*³ (FS-N4∗N/N4∗P)
Fiber insertion sign
Fiber connection ports
M8 connector (FS-N41C)
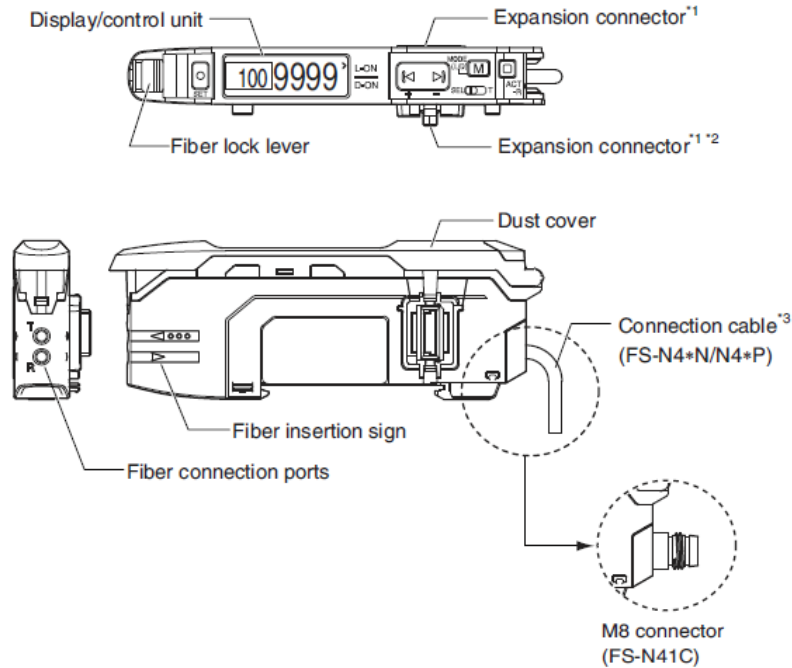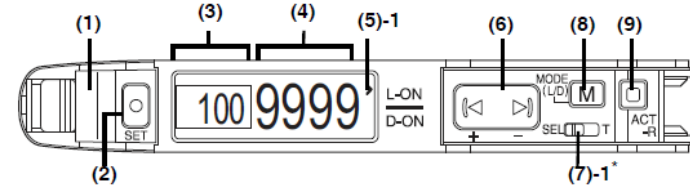
*1 A protective cover is installed over the expansion connector prior to shipment.
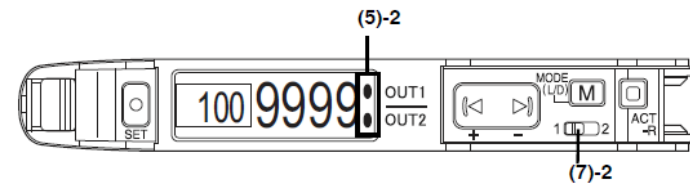*2 Not available on the main unit type.
*3 There is no connection cable on the zero line type (FS-N40).

■ Display/control unit

Single output/zero line: FS-N41N/N42N/N41P/N42P/N40


Dual output: FS-N41C/N43N/N44N/N43P/N44P

Item		Description
(1)	Output indicator	Indicates the current output (detection) status. On dual output types (including the FS-N41C), the indicator operates according to the output channel selected with the output channel selection switch.
(2)	SET button	Used to perform calibration. 📖 "3-5 Setting the Sensitivity" (page 5)
(3)	Setting value display	Displays the setting value (detection threshold).
(4)	Current value display	Displays the current value (received light intensity).
(5)-1	L/D ON setting status indicator	Indicates whether light ON (L-ON) or dark ON (D-ON) is selected.
(5)-2	Output indicators	Indicates the output (detection) status of channel 1 (output 1) and channel 2 (output 2).
(6)	Manual adjustment button	Used to adjust the setting value or select an option.
(7)-1	Output channel selection switch*	Changes the power mode. SEL: Eight power modes are selectable. 📖 "Power Modes" (page 10) T: Fixes the power mode to "TERA mode". 📖 "3-9 Locking in TERA Mode" (page 6)
(7)-2	Channel selection switch	Toggles between channels 1 and 2 (outputs 1 and 2) for configuring the received light intensity display or sensitivity setting.
(8)	MODE button	Used for toggling light ON/dark ON, switching the language, proceeding to advanced settings, or confirming selections.
(9)	ACT-R button	Used to set the active receiver (ACT-R) function.

* Not present on zero line types (FS-N40).

Wiring Amplifiers

Main Amplifier (M8 Connection)

Sensor pin layout
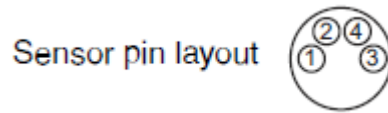
Pin Number	Wire Color	Function
1	Brown	+24 Vdc
2	White	Output #2 or Input
3	Blue	-0 Vdc
4	Black	Output #1

Sub Amplifier (cable type)

| Wire Color	Function
Black	Output #1

Fiber Installation

■ Using a fiber cutter

1 Insert the fiber into the cutter hole.

2 Bring down the blade in a single, swift motion to cut the fiber.
(Do not use a hole that has already been used.)

Always insert fiber from the side with writing
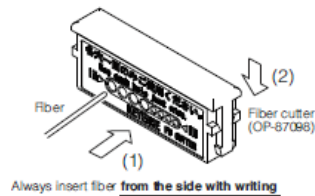
■ Connecting to the amplifier unit

1 Open the cover (1), and then lower the lever in the direction indicated by (2).

2 Insert the fiber unit into the installation holes (approximately 14 mm). (3)

3 Move the lever back in the direction indicated by (4).

Fiber insertion sign
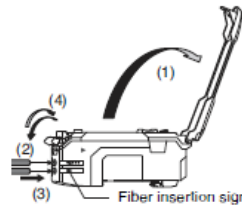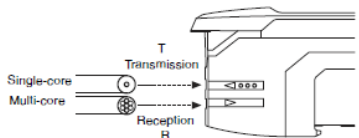
NOTICE
• If a thin fiber unit is used, an adapter provided with the fiber unit will be required.
Make sure to use the adapter that matches the fiber unit.

| Cable outer diameter	Adapter	Appearance
ø1.3	Adapter A (OP-26500)	
ø1.0	Adapter B (OP-26501)	

• When installing a coaxial reflective fiber in the main unit, install the single-core fiber in the transmission (T) installation hole and the multi-core fiber in the reception (R) installation hole.

T Transmission
Single-core
Multi-core
Reception R

Initial Settings (FS-N41C Only)

When turning ON the FS-N41C for the first time or after initialization, select the initial settings below

1. Select PNP or NPN output using the arrow keys. [◁ ▷]

2. Press the Mode Key. [M]

3. Select the I/O combination using the arrow keys. [◁ ▷]
   a. OUT1 + OUT2 provides two outputs
   b. OUT1 + INPUT provides one input and one output

4. Press the Mode Key. [M]

5. Select the option [END] using the arrow keys. [◁ ▷]

6. Press the Mode Key [M] to complete initial settings.
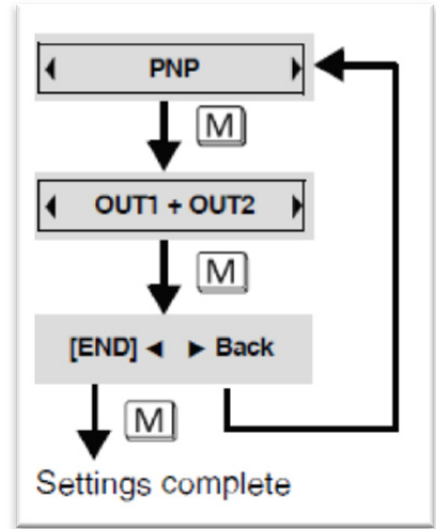
If these initial settings need to be changed, an initialization will need to be performed. See Keyence manual sec. 3-8 for instructions.

Top Display Transitions

Each time that the Mode Key [M] is pressed, the top display will switch as shown below:
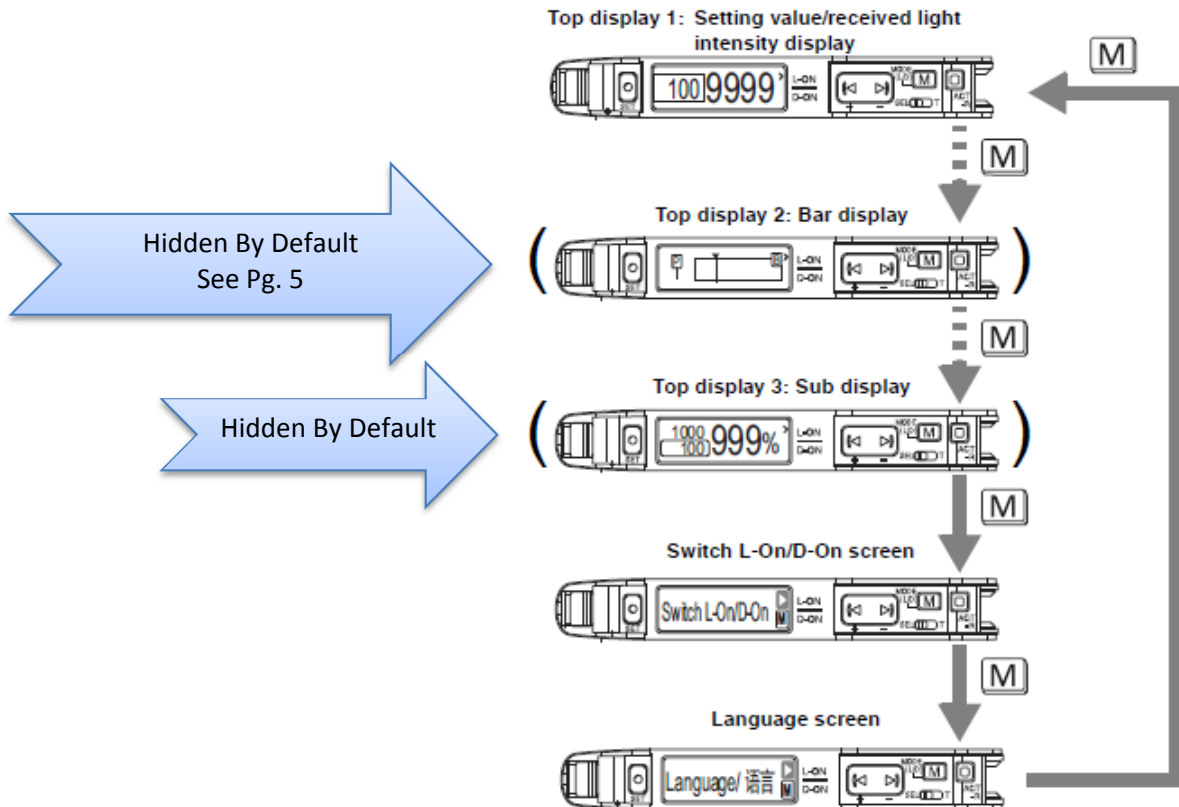
## Switching the Output Style (Light ON/Dark ON)

Select whether to send a signal when the receiver is lit (Light ON) or is dark (Dark ON).

1. Press the Mode Key [M] until "Switch L-On/D-On" is displayed.

2. Use the arrow keys [◁ ▷] to switch between "Light ON" and "Dark ON".

3. Press the Mode Key [M] until top display 1 is visible.

Methods of Part Detection

Preset Function

To enable the Preset Function, follow the steps below:

1. Hold the Mode Key [M] for 3 or more seconds.

2. Press the Mode Key [M] three times.

3. Use the arrow keys [◁ ▷] to select "ADVANCE", then press the Mode Key. [M]

4. Use the arrow keys [◁ ▷] to select "Preset" detection mode.

5. Hold down the Mode Key [M] for 3 second or more to complete the settings.

Work-Preset Calibration

Reflective Fiber Unit

1. Press Set [SET] with the part to detect present/gripped.
   i. Display value is set to "100.0", setting value becomes "50.0".
2. With the part removed and the EOAT in a state of "missing the part", press the
   ACT-R [ACT-R] and arrow key [◁ ▷] simultaneously.
   i. Display value is set to "0.0".

Thrubeam Fiber Unit

1. Press Set [SET] with the part removed and the EOAT in a state of "missing the part".
   i. Display value is set to "100.0", setting value becomes "50.0".

2. With the part present/gripped, press the ACT-R [ACT-R] and arrow key [◁ ▷] simultaneously.
   i. Display value is set to "0.0".

Displaying the Bar Graph

To enable the Bar Graph Display, follow the steps below:

1. Press and hold the Mode Key [M] for three or more seconds.

2. Press the Mode Key [M] two times.

3. Use the arrow keys [◁ ▷] to select "ON"

4. Hold down the Mode Key [M] to complete the settings.

5. Press the mode key [M] once to display the bar graph.

The bar graph limits are set based on the table below:

Calibration, etc.	Upper limit (maximum value)	Lower limit (minimum value)
Not set	1000	0
2-point calibration	The point at which the received light intensity was largest during calibration	The point at which the received light intensity was smallest during calibration
Maximum sensitivity calibration	Received light intensity during calibration + (setting value - received light intensity during calibration) × 2	Received light intensity during calibration
Full auto calibration	Maximum received light intensity during calibration	Minimum received light intensity during calibration
Positioning calibration	The point at which the received light intensity was largest during calibration	The point at which the received light intensity was smallest during calibration
Percentage calibration	Twice the light intensity during calibration	0
Edge detection calibration	Not supported	Not supported
Preset Work-preset Maximum sensitivity preset Full auto preset DATUM mode	Value that makes the preset value 100.0	Value that makes the preset value 0

When using zero shift calibration, the lower limit is shifted to 0.

Flip Display Option

The display on the FS-N40 Series can be flipped if needed. To flip the display, follow these steps:

1. Press and hold the Mode Key [M] for three or more seconds.

2. Press the Mode Key [M] three times, then use the arrow keys [◁ ▷] to select "ADVANCE"

3. Press the Mode Key [M] 11 times, "Flip Display" should appear.

4. Use the arrow keys [◁ ▷] to select desired orientation.

5. Hold down the Mode Key [M] to complete the settings.

Active Receiver Function (ACT-R)

The active receiver is the green light that exits the receiver, given specific conditions. The active receiver is used to indicate sensor output state, fiber-amplifier pair, and thrubeam optical axis alignment.

Cycle thru active receiver functions by pressing the ACT-R ⬛ [ACT-R] button.

ACT-R Blinking (Pairing Mode)

Pairing mode will cause the fiber connected to the amplifier to blink green, a convenient way to isolate the fiber-amplifier pair in question. To enable this function, follow these steps:

1. Press ACT-R ⬛ [ACT-R] until "ACT-R Blinking" is displayed.
2. Press the arrow keys [◄ ►] to start the blinking operation.
3. Press ACT-R ⬛ [ACT-R] to stop the blinking operation.

### Optical Axis Alignment Assist Mode (for thrubeam fibers only)

This mode helps to assist in alignment of the transmitter-receiver pair of a thrubeam fiber unit. The receiver will illuminate green when the pair is aligned on the optical axis. To enable this function, follow these steps:

1. Press ACT-R ⬛ [ACT-R] until "Opt Axis Assist" is displayed.
2. Press the arrow keys [◄ ►] to switch to alignment assist mode.
3. Press ACT-R ⬛ [ACT-R] to end alignment assist mode.

NOTE: If the thrubeam pair is operating outside of the applicable distance range for the fiber unit, this function may not work properly. Move pair closer or adjust power mode.

Active Receiver Setting

This function allows the user to determine what condition will activate the active receiver. To change the settings, follow these steps:

1. Press ACT-R ⬛ [ACT-R] until "Active Rec. Set" is displayed.
2. Use arrow keys [◄ ►] to select one of the following options:
   a. Output Link (Default): The receiver illuminates green when the output is ON.
   b. Reversed OP: The receiver illuminates green when the output is OFF
   c. Always On: The receiver will always be lit.
   d. Disable: The receiver will always be unlit.
3. Press ACT-R ⬛ [ACT-R] twice to return to normal operation.