



TKK17133

Optical Fiber Identifier ID-H/R

Instruction Manual

(Model No. AI21H)

Thank you for purchasing our Optical Fiber Identifier ID-H /R for live optical fiber detection.
Please read this manual carefully before using this identifier. After reading this instruction manual, keep it close to unit or place it inside the case for further reference.





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1. Safety


Please read this instruction manual carefully before using the Optical Fiber Identifier ID-H/R. After reading, please keep for furthermore reference.


This instruction manual describes how to operate the identifier safely in order to avoid accidents such as potentially fatal injuries and property damages. Each symbol shown below specifies a level of caution. Please keep these in mind when you read the manual.

 WARNING	Possible fatal injury if warning is ignored.
 ATTENTION	Possible failure in the optimal performance or function of the identifier.
	Tips for better operation of the identifier.
	Clause and /or page number where the detailed explanation is written.

Although we take all possible measures in providing you with a complete description of the identifier in this manual, please do not hesitate to contact Furukawa Electric Co., Ltd. or your local representative whenever you have any questions or problems. In no case will Furukawa Electric Co., Ltd. be liable to the buyer, or to any third parties, for any consequential or indirect damage which is caused by product failure, malfunction or any other problems.

Furukawa Electric Co., Ltd. reserves the rights to improve, enhance and modify the contents of this instruction manual without prior notification.

 WARNING	
●	Keep out of moisture. Please contact Furukawa Electric Co., Ltd. or your local representative in the event water or any other substance comes in contact with the identifier. Otherwise it may cause a fire, electric shock and/or mechanical failure.
●	DO NOT use when the identifier is out of service. Otherwise it may cause a fire, electric shock and/or mechanical failure. In case when the identifier is out of order, remove the batteries from the main unit and contact Furukawa Electric Co., Ltd. or your local representative.
●	DO NOT insert or drop any metal pieces or foreign substances such as flammable items into the open inner space of the identifier. Otherwise it may cause a fire, electric shock and/or mechanical failure.
●	DO NOT disassemble, overhaul or modify the identifier. Otherwise it may cause a fire, electric shock and/or mechanical failure. Please contact Furukawa Electric Co., Ltd for repair.

 ATTENTION	
●	DO NOT strike or drop the device to the ground. Otherwise it may cause the mechanical failure.
●	Please remove the batteries from the unit if it will not be used for a long period of time. The liquid from the battery may leak out, and may cause mechanical failure.
●	Ensure that light sensor elements are kept away from liquid and dirt. In the event the elements are stained, use alcohol-moistened cotton stick to clean it up.

2. Abstract

The objective of this Optical Fiber Identifier ID-H/R is to identify by launching tone signal into optical fiber one by one. In case of inserting the live fiber, one could use this identifier with confidence due to the low insertion loss. Also this identifier has a function to indicate the optical power and the direction of optical signal as well.

The following is the example of practical use.

At the Frame

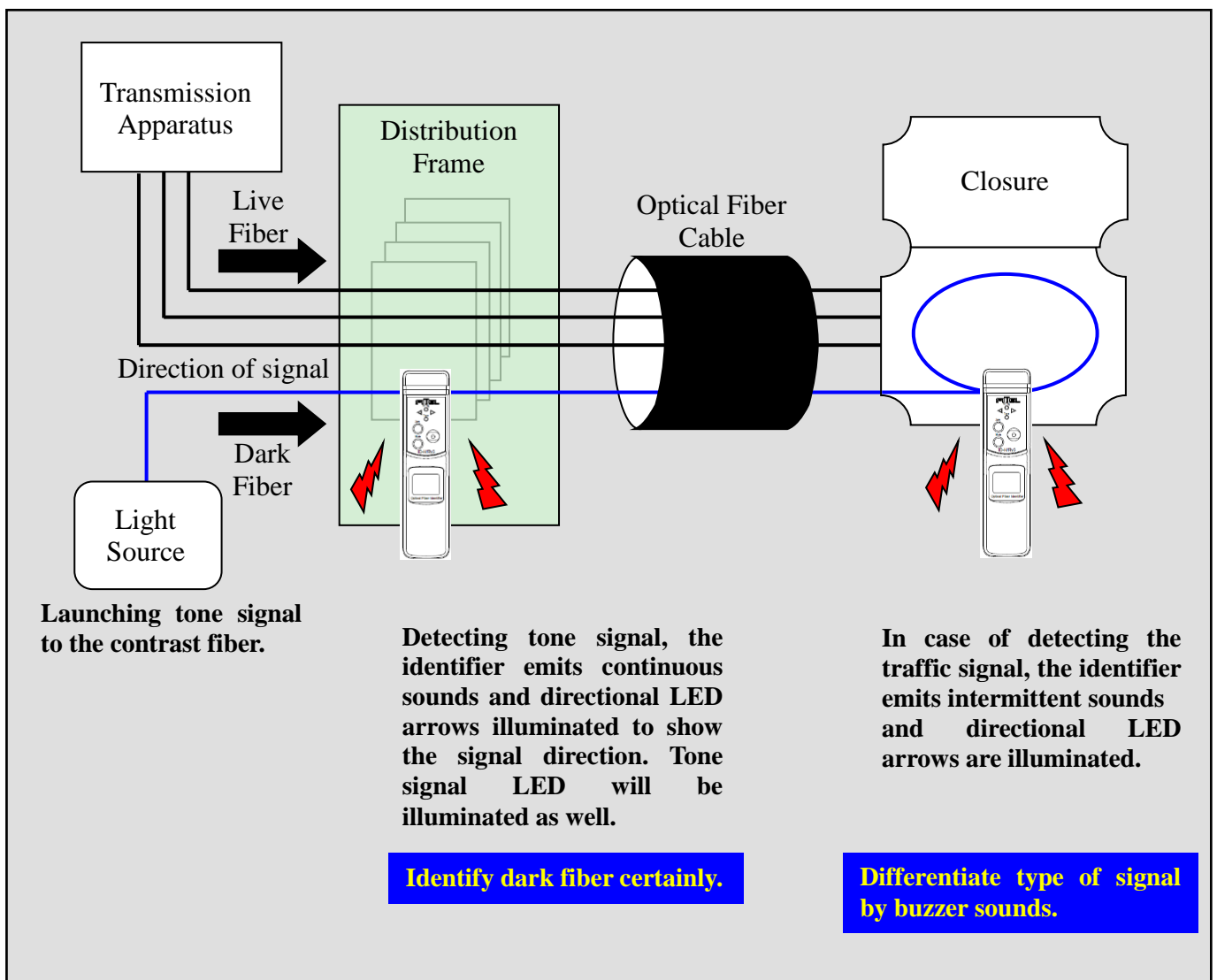
Confirm whether that fiber is dark or not by ID-H/R. And then disconnect the fiber.
(To avoid the miss disconnection)

At the Closure

Contrast two fibers, dark fiber at central office and fiber at the closure whether these two fibers are same.

(To avoid the miss splicing / disconnection)

Example)



3. Construction

The construction of Optical Fiber Identifier ID-H/R is listed in Table 1.

Table 1 Construction of Optical Fiber Identifier ID-H/R

Product Name	Unit Name	Model No.	Remarks
Optical Fiber Identifier (ID-H/R)	Main unit	AI21H	Accessory * Batteries * Strap * Soft case * Instruction manual * “Safety Information and Instructions” Sheet

4. Features

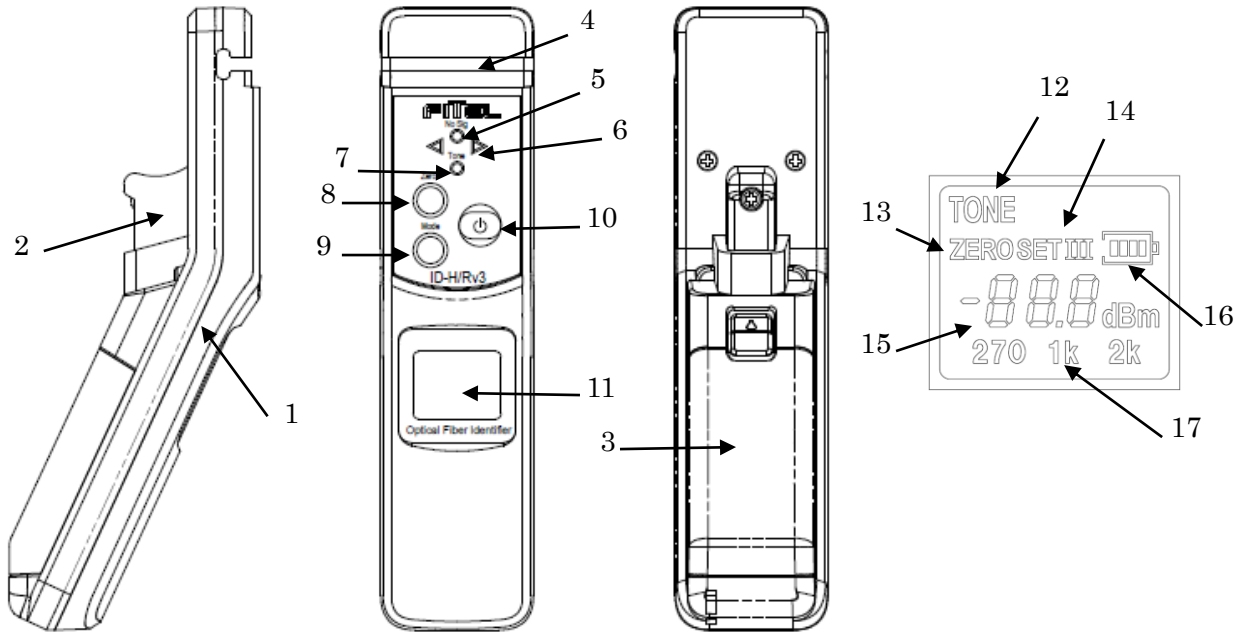


Table 2 Name and functions

Name	Functions
1 Main unit	Main unit of Optical Fiber Identifier.
2 Lever	Use when you apply bending to identify the fiber.
3 Battery storage	To insert batteries remove this cover.
4 Detectable unit	The fiber is placed the groove for operation. It has the adapter head and the photo detectors.
5 No sig. LED lamp (Yellow)	Yellow LED lamp will be illuminated when the identifier does not detect a signal during operation.
6 Directional LED lamp (Red)	Red LED lamp illuminates in either direction when the identifier detects a traffic signal or a tone signal.
7 Tone LED lamp (Yellow)	Yellow LED lamp will be illuminated when the identifier detects the 270Hz, 1kHz and 2kHz tone signal.
8 Zero switch	This switch will be used for zeroing the unit.
9 Mode switch	This switch will be used to set the detection mode, Also used to adjust the Offset and Threshold.
10 Power switch	The power will be turned ON and OFF by pressing the switch for 1 second. The unit will automatically turn OFF when the identifier is not in use for 10 minutes.
11 LCD	The screen displays a state of this Identifier and the information obtained by the unit during the test.
12 Measurement mode	This message will be displayed a current measurement mode,
13 Zero	This message will be displayed during zeroing the unit.
14 Set	This message will be displayed during adjusting the Offset and Threshold.
15 Optical Power [dBm]	Optical power is displayed when detected by the photo detector of the unit. The optical power is the power that is stripped from the fiber, not the actual signal power being transmitted in the fiber. This power level is adjusted by the offset value entered in the menu.
16 Battery Level	A 4 bar battery life display.
17 Frequency	Tone signal frequency is displayed when detected.

5. Power supply

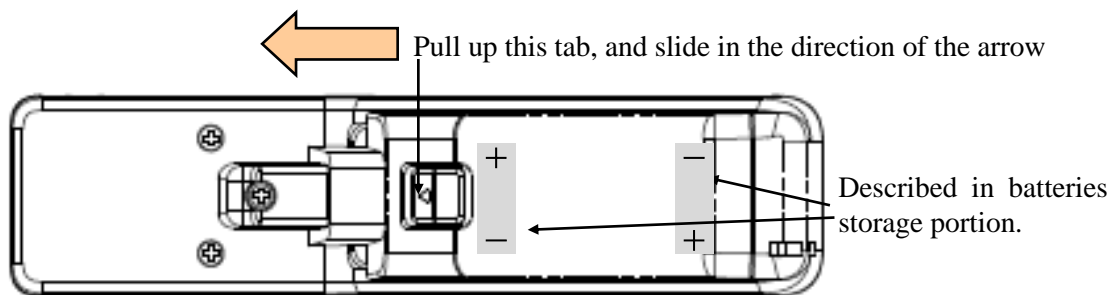
The recommended battery is an LR6 alkaline dry battery (standard AA alkaline battery×2). It is possible to use for 8 hours at room temperature (In case of continuous operation). Battery life may vary.


 ATTENTION
Please use alkaline battery type.

5.1. Replacing the Battery

For replacement of the batteries, follow the procedure described below.

- (1) Remove the battery storage cover from main unit. When the cover is removed, you will see the batteries storage.
- (2) Replace the batteries. Pay attention to the direction of the batteries.
- (3) After replacing the batteries, put the cover back on the unit.



 ATTENTION
When battery Level is zero, please make sure the battery is replaced with a new battery. Otherwise the identifier may not function properly.
Place the batteries according to the indication described in storage portion. Inserting the batteries incorrectly may cause malfunction, mechanical failure and liquid leakage.

6. Detectable signal and LED illumination

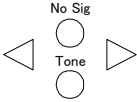
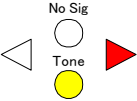
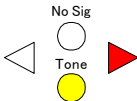


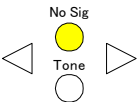
The followings are detectable signals.

Table 3 Detectable signal

Type of signal	Full mode	Tone mode
Traffic signal	Detects traffic signal.	Not detects traffic signal.
Tone signal	Detects following tone signals. 270Hz, 1kHz and 2kHz	Detects 270Hz tone signal.

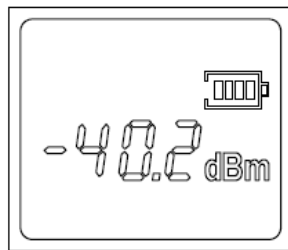
The device action (LED illuminations, Buzzer sound and the indication of LCD screen) during the operation will be shown in Table 4.

Table 4 Device action

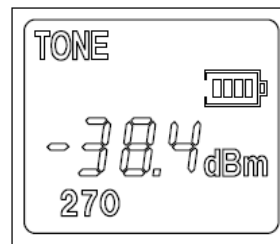
Detecting Conditions	LED illuminations, Buzzer sound and the indication of LCD screen		
	Full mode	Tone mode	
Standby		LED: No illumination Buzzer: No sounds LCD: No indication	
270Hz tone signal (Direction: Right)		LED: Direction and Tone Illuminates Buzzer: Continuous sound LCD : 270 and Power Level#	
1kHz tone signal (Direction: Right)		LED: Direction and Tone Illuminates Buzzer: Continuous sound LCD : 1k and Power Level#	Same as No signal
2kHz tone signal (Direction: Right)		LED: Direction and Tone Illuminates Buzzer: Continuous sound LCD : 2k and Power Level#	Same as No signal
Traffic signal (Direction: Right)		LED: Direction Illuminates Buzzer: Intermittent sound LCD : Power Level#	Same as No signal
No signal		LED: No signal Illuminates Buzzer: No sounds LCD : ---	

The power level is the measurement of the illuminated direction LED side.

LCD Screen Examples)



Traffic detected
(Full mode)



270Hz detected
(Tone mode)

 **ATTENTION**

The identifier of Tone mode detects only 270 Hz tone signal.

 **ATTENTION**

Although the condition was defined as “No signal detection”, there is a slight possibility the fiber you have inserted into the identifier is not a dark fiber (The illumination of “No signal detection” will appears when the identifier could not detect tone signal or traffic signal).

Optical power displayed on the LCD screen is power leaked from bending the optical fiber not the total absolute power (dBm) of the signal in the optical fiber. Therefore, the power level measurement changes greatly with different types of cable construction (cordage color, thickness etc.). Please regard power level as reference data only.

The power level measurement can be modified by an offset value. The offset value is added to the power measurement and then displayed on the LCD screen.



To set Detection Mode, please refer to Section 9.1 “Detection Mode setting” (Page 13).

To check and adjust Offset, please refer to Section 10.1 “Offset Adjustment” (Page 14).

7. Operation

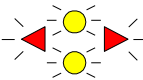
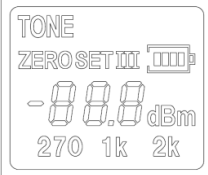
7.1. Turn ON the Power

(1) Press the power switch button for 1 second. Then the power will be turned ON.



(2) Approximately 2 seconds after pressing the power switch, the unit will execute a self-check test. At this point, Table 5 below shows what the LEDs and the LCD screen will show. Make sure that all the LED are functioning and all the content display on the LCD screen. Make sure that you also hear the buzzer sound.

Table 5 Action at self-check

Condition	LED illumination	LCD screen	Buzzer sound
Self-Check	All LED blink 	All contents display 	Intermittent buzzer sound

(3) After the self-check has been executed, the condition for identifier will be “Standby”. Make sure of detection mode on LCD as shown below.

Table 6 Condition at stand-by

Condition	Full mode	Tone mode
Standby	LCD: Only Battery Level	LCD: TONE, Battery Level, 270

ATTENTION

In the event the sequence of the self-check test is different from Table 5 or the “Er 1” is displayed on LCD screen, the identifier may not be functioning properly.



To set Detection Mode, please refer to Section 9.1 “Detection Mode setting” (Page 13).

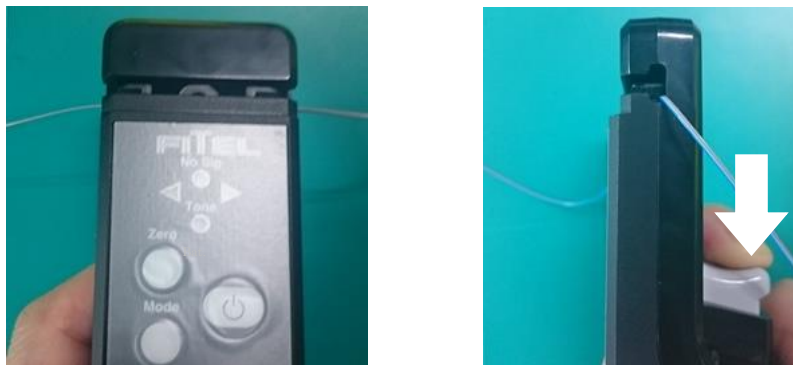
7.2. Method for Detection

Set the fiber into the groove of the detection unit as shown below. Detection will begin when you pull the lever in the direction of the arrow as shown in the figures below. There will be a beeping sound when the detection starts.

Set the fiber here!



Condition for fiber setting



Condition for fiber detecting

 **ATTENTION**

Be careful not to twist or bend the fiber when you set the fiber into the identifier.

7.3. LED illumination during the Detection



For LED illumination during the detection, please refer to Chapter 6 “Detectable signal and LED illumination” for details (Table 4 on Page 6)

7.4. Turn OFF the Power

Press the switch button for 1 second. The power will be turned OFF after the buzzer beep (beeps once). It will automatically be turned OFF when you leave the identifier for 10 minutes without any operation.



Power Switch

Clean the adapter head and the Photo Detector when it is stained.



How to clean Photo Detector

Try to avoid contaminating the Photo Detector, in case it was contaminated, remove the head cover and the bending head and clean it up with an alcohol-moistened cotton swab. Then use a dry cotton swab to remove the remaining alcohol.

Head Cover



Head Cover Removal



Two Photo Detectors

8. Understanding the Results

Please refer to followings section to understand the results from the unit.

8.1. Cautions before Operation

Please set ZERO calibration. Please check Offset and Threshold settings. When the value does not match the measurement condition, please adjust it. Please check the detection mode.



To set ZERO calibration, please refer to Section 9.2 “ZERO calibration setting” (Page 13).

To check and adjust the Offset and Threshold, please refer to Chapter 10 “Parameter Setting” (Page 14).

To set Detection Mode, please refer to Section 9.1 “Detection Mode setting” (Page 13).

Please be aware of the next page before you begin operation.

 **ATTENTION**

In case when you launch the light into the fiber, make sure to launch tone signal.
Determine whether the fiber is live or not before operation. Handle with care if the fiber is live.
In case of the ribbon fiber, confirm whether there is both live and dark fiber inside the ribbon.
In the case where there is damage or a dent on the curved surface of the adapter head or photo detectors, DO NOT insert the fiber into the identifier. The fiber could be damaged. (Please contact Furukawa Electric Co., Ltd. or your local representative)
There is sponge in the detectable unit. DO NOT use this identifier when the sponge comes off, there is possibility that it will not operate properly. (Please contact Furukawa Electric Co., Ltd. or your local representative.)



It is recommended that the frequency of the tone signal is 270Hz.
We highly recommend using 1550nm or 1650nm for light source. In case of using 1310nm, please be careful that it minimizes the detection level.

8.2. Cautions during Operation

Please be careful of the following during operation (Inserting the fiber into the identifier).

 **ATTENTION**

DO NOT insert the fiber for long period of time. There is possibility of degradation or damage to the fiber.

Please be aware with the followings during the operation (disconnection or rewiring the fiber).

 **ATTENTION**

Make sure to launch the tone signal before disconnection or rewiring the fiber.
(DO NOT disconnect or rewire based only on the traffic signal detection)
Confirm the indication on LCD screen for detected tone signal with launching light source whether these two signals are same.
Furthermore, turn ON and OFF the light source and make sure that illumination and buzzer sound of identifier corresponds to these actions.

If using this identifier in the outside plant, below are cautions and tips for better operation.

 **ATTENTION**

This identifier may react to external light (especially sunlight) due to high sensitivity of the photo detector; it will detect external light as traffic signal.



Please keep the identifier out of direct light
In case the identifier will detect external light, please keep out it as much as possible by covering the whole identifier and the fiber
There is possibility that the effect of external light is reduced by the increasing Threshold. Please try to adjust the Threshold.

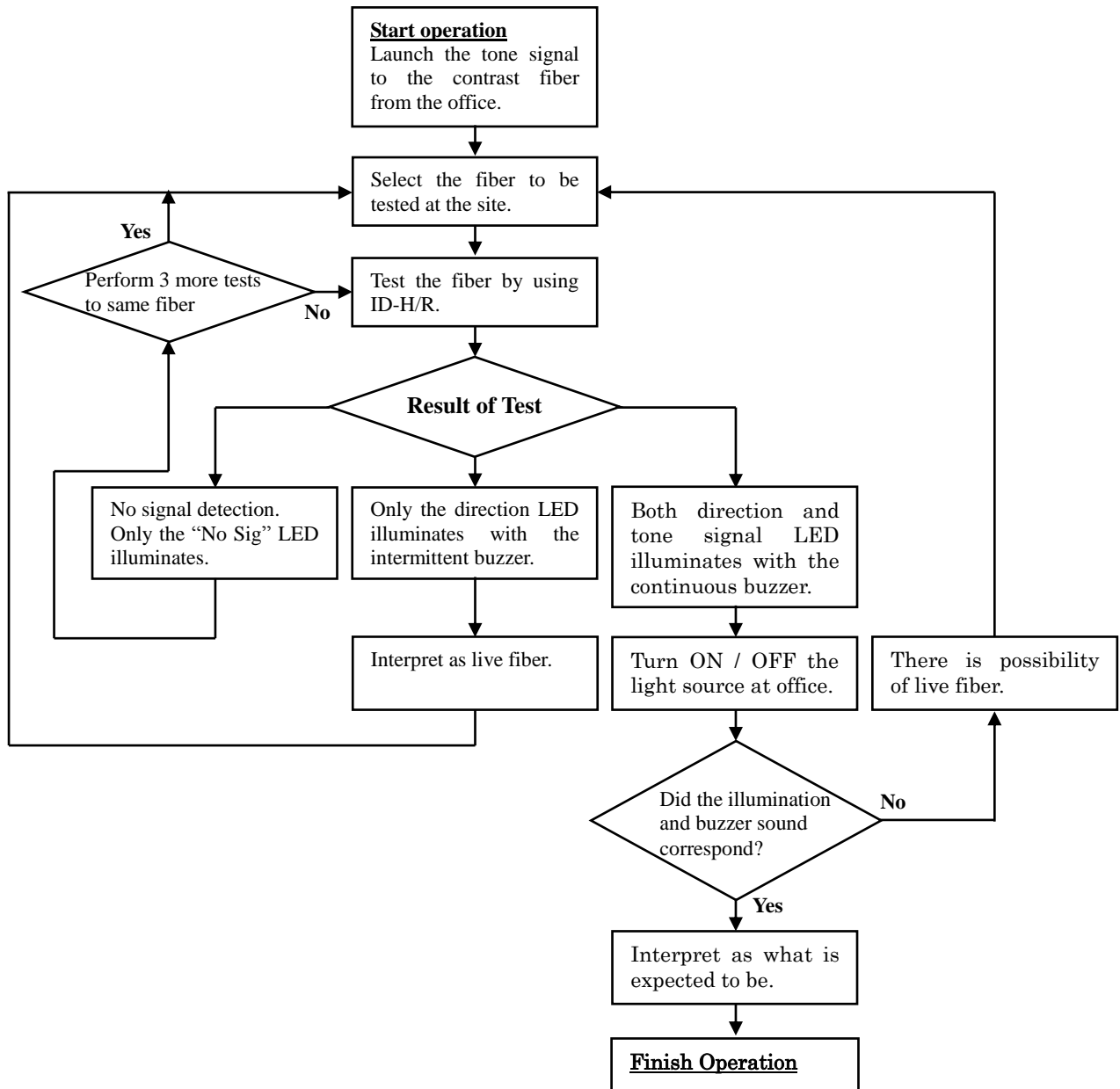


To adjust the Threshold, please refer to Section 10.2 “Threshold Adjustment” (Page15).

We will introduce our recommended procedure for judgment from next page.

8.3. Recommended Procedure for Testing the Single Fiber

We highly recommend executing the procedure according to the followings. Following workflow is for single fiber with **Full mode**.



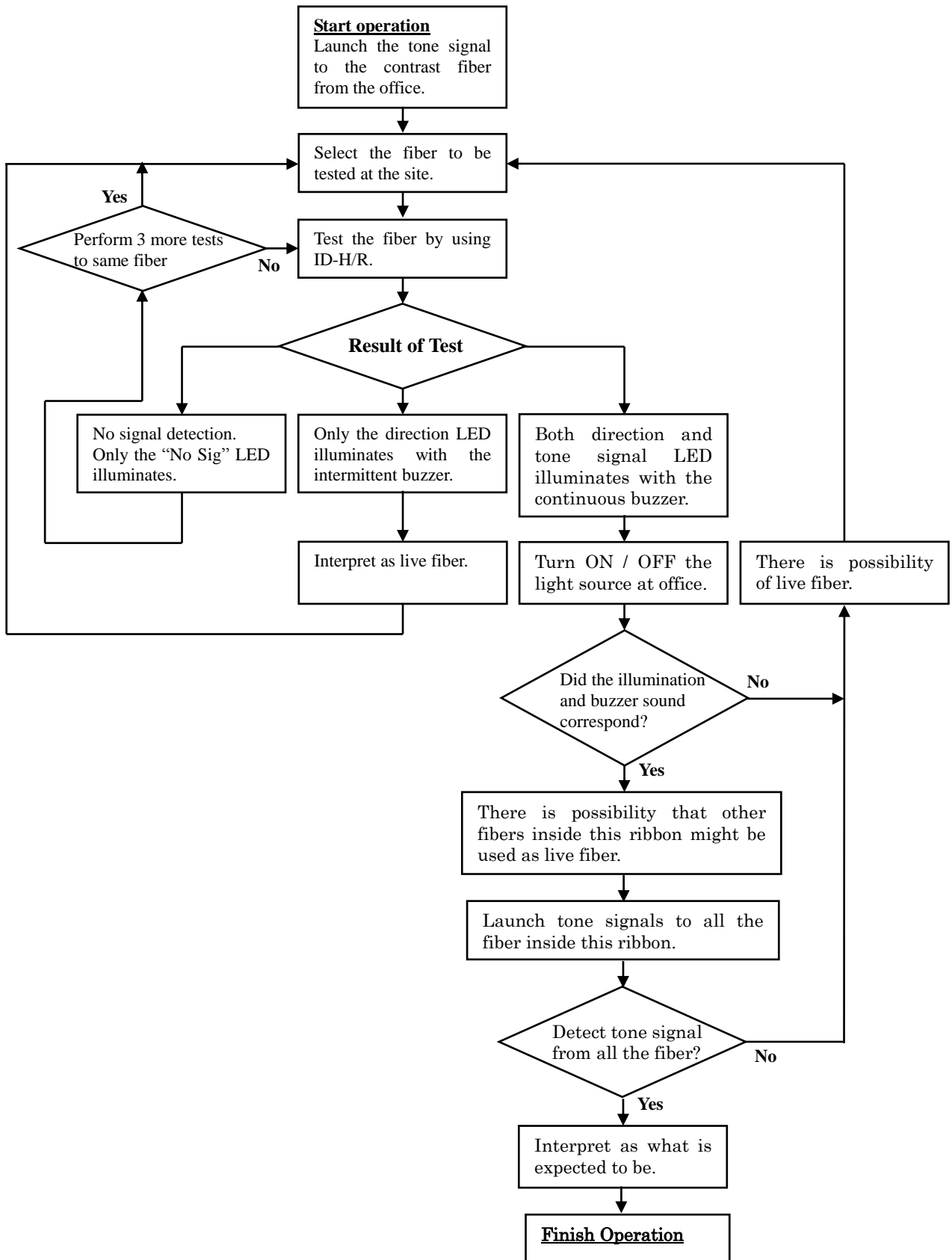
ATTENTION

In case the result was “No detection”, perform 3 more tests on same fiber.

In case you still do not detect the signal or you interpret as live fiber after procedure mentioned above, then insert the identifier to other fiber, and repeat these procedures until you detect the tone signal.

8.4. Recommended Procedure for Testing of Ribbon

We highly recommend executing the procedure according to the followings. Following workflow is for ribbon fiber (Up to 12-fibers) with **Full mode**.





ATTENTION

In case the result was “No detection”, perform 3 more tests on same fiber.

In case you still do not detect the signal or you interpret as live fiber after procedure mentioned above, then insert the identifier to other fiber, and repeat these procedures until you detect the tone signal.

In case the traffic signal and tone signal are launched in same ribbon and the traffic signal is more than 10dB stronger than the tone signal, there is possibility that this identifier will not detect the tone signal. Then launch the 270Hz signal light into the fiber, set the identifier to **Tone mode** and test again.

In case the live and dark fiber are mixed in same ribbon, please handle with care after the judgment.

In case the fiber is transmitting the signal to both directions (upstream and downstream), there is possibility that direction LED will not operate normally.

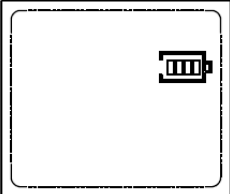
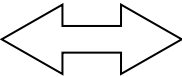
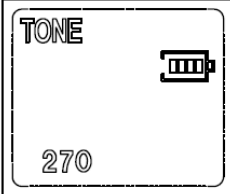
9. Detection Mode and ZERO setting

9.1. Detection Mode setting

The procedure of the detection mode setting is shown as bellow. Before starting operation, the detection mode may be checked or set.

- (1) Press the mode switch button on standby.
- (2) The detection mode and the indication of the LCD will be changed. Whenever it is pressed, the mode is changed as in the Table 7

Table 7 Detection mode setting

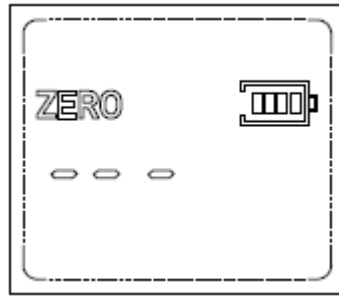
Mode	FULL mode		Tone mode
LCD screen			

- (3) The detection mode is stored in the internal memory.

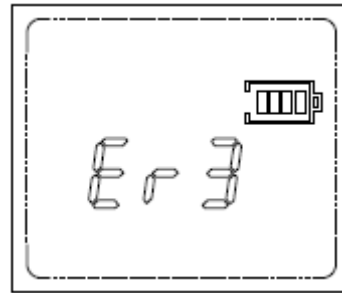
9.2. ZERO Calibration Setting

The procedure of zero calibration or “zeroing out” is shown below. Before starting operation, the ZERO calibration may be set.

- (1) Pull the lever in standby without inserting a jumper. There is no light in the detector space of the identifier. Please keep these conditions constant throughout the entire operation.
- (2) Press the Zero switch button after about 1 second, the word “ZERO” will appear on screen signaling the beginning of the process.
- (3) During the calibration, zeroes appear across the screen with the process finishing about 10 seconds later. If no error occurs, the buzzer sounds once and the display shown to the left below is onscreen. If one releases the lever during the process, the zeroing will be stopped and the identifier will return to the standby conditions.
- (4) When an error occurs during this operation, the buzzer will sound three times and the “Er 3” will be displayed onscreen. To reset and start over, press mode switch button once and try again.



Normal



Error

- (5) The result is stored in the internal memory.



ATTENTION

Please perform zero calibration in the environment in which the test will be performed, and keep the identifier out of direct light in case of performing in the outside plant.

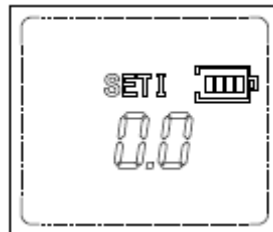
10. Parameter Setting

The offset and threshold adjustment procedure is shown as below. The offset function adds value to each measurement. The threshold function indicates signal transmission in one direction or both directions. If the difference in powers measured by the right and left photo detectors is less than the threshold, signal transmission is indicated in both directions.

Before operating the identifier, the offset and threshold values may be checked or adjusted as follows.

10.1. Offset Adjustment

- (1) Press the mode switch button for 5 second in standby to display “SET I ” and the current offset value. The offset value (the unit is dB) is indicated on the LCD screen and the offset adjustment will start.



Offset adjustment (The default is 0.0)

- (2) The displayed offset value is increased by pressing the Zero switch button.
- (3) The offset value is adjusted in ranges from 0.0 to 50.0 dB (1 dB step). When the display exceeds 50.0, it returns to 0.0.
- (4) After checking or adjusting the display, the offset value is stored in the internal memory by pressing the mode switch button for 5 second again. Then the threshold value is indicated on the LCD screen.



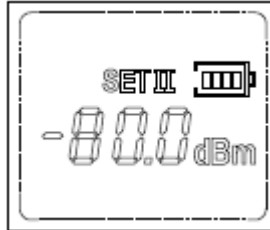
ATTENTION

The power level which is modified by the offset value is not exact measurement of the power level in the fiber. Please regard power level as reference data only.

The suitable offset value depends on the kind of fiber and cordage (color, thickness, and material). It is recommended that the offset value is confirmed and adjusted by the same fiber before testing.

10.2. Threshold Adjustment

- (1) Next, "SET II" and the threshold value (the unit is dB) is indicated on the LCD screen, the threshold adjustment will start.



Threshold Adjustment (the default is -80.0)

- (2) The displayed threshold value is increased by pressing the Zero switch button.
- (3) The threshold value is adjusted in ranges from -80.0 to -50.0 dBm (10 dB step). When the display exceeds -50.0, it returns to -80.0.
- (4) After checking or adjusting the display, the threshold value is stored in the internal memory by pressing the mode switch button for 5 second again.
- (5) The display returns to standby and the adjustment is finished.



ATTENTION

In case the "Er 2" is displayed onscreen, there is possibility that the adjustment value is not stored in the internal memory exactly. To reset and start over, press mode switch button once and try again.

When the threshold is increased, minimum detecting level (sensitivity) gets worse.

11. Specification

Environmental characteristics

Item	Specification
Storage temperature	-20 to 60 °C (humidity 0 to 95%)
Operating temperature	-10 to 50 °C (humidity 0 to 95%)
Applicable fiber type	Single Mode Fiber
Applicable fiber	0.25mm single fiber, 2 to 12 ribbon fiber and up to 3mm cordage fiber (built-in 0.25mm fiber)

Optical characteristics

Item	Unit	Specification		
Applicable wavelength	nm	900 to 1700 nm		
Detectable frequency for tone signal	Hz	270, 1k and 2k * ¹		
Detectable range for optical power* ²	dBm	0 to -80		
Maximum Insertion Loss * ³ (Typical)	-	1310nm	1550nm	1650nm
250µm single fiber	dB	0.1	1.0	2.5
2 to 12 fiber ribbon				
1.1/1.5mm cordage				
1.7/2.0mm cordage		0.5	2.0	3.0
3.0mm cordage				
900µm tight buffer				
Minimum Detecting Level in fiber* ³ (Typical)	-	1310nm	1550nm	1650nm
250µm single fiber	dBm	-40	-50	-50
2 to 12 fiber ribbon				
1.1/1.5mm cordage				
1.7/2.0mm cordage		-30	-40	-40
3.0mm cordage				
900µm tight buffer				

*1: Square wave and duty ratio 50%

*2: This is the leak power from the optical fiber not the signal power in the optical fiber.

*3: These specifications are based on our optical fiber with our test method.

Additional characteristics

Item	Unit	Specification
Indication for traffic signal	-	Direction LED illuminates + Intermittent buzzer sound + Displayed an optical power measurement range by LCD
Indication for tone signal	-	Direction LED and Tone signal LED illuminates + Continuous buzzer sound + Displayed an optical power measurement range and Frequency by LCD
Operation time	hours	8 (Using brand-new alkaline batteries under room temperature)
Dimensions(W*D*H)	mm	40 * 65 * 163
Weight	g	170 (Including battery)

NOTE:

*For sales and service information,
contact FURUKAWA ELECTRIC CO.,LTD.
or your local representative.*

Furukawa Electric reserves the right to improve, enhance and modify the features and specifications of this product without prior notification.

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