DCF® 道川傳感器
Dao Chuan Sensor

DC-051 SERIES OPTICAL FIBER SENSOR

OPERATION MANUAL

DC-051□ (英文版)

Thank you very much for purchasing Daochuan optical fiber sensor
Before use, please read this manual carefully and use it according to the correct best method.
Please take good care of this manual after reading.
Please read the precautions in the instruction manual and understand the relevant precautions before using the product.

SAFETY INSTRUCTIONS

The following are safety related precautions.
The precautions here relate to personal safety and property safety, so please observe them.

⚠WARNING

- Do not use this product for human protection testing equipment.
- When using human protection equipment, relevant laws or standards that meet human protectionequipment of various regions or countries shall be used, such as OSHA,ANSI or IEC, etc.

⚠BE CAREFUL

- Please turn off the power supply immediately in case of cable wiring or connector fallin off. failure or electric shock may result.
  Do not use in the transition state (about 100ms preheating) when the power supply is just connected.
  Please do not parallel with high voltage line or power line. Otherwise, it may cause malfunction and damage of the product due to electromagnetic induction.
  When it is not necessary to connect them in parallel, please use conductor such as wire pipe for shielding.
- Do not bend the cable at freezing point. Avoid damaging the product.
- Do not impact the product strongly or fall from a high place. Avoid damaging the product.
- When wiring this product or related special controller, please conduct correct wiring according to the relevant instructions in this manual or specified manual. Wrong connection
- When the relevant connector is exposed, do not touch the pin in the connector port, and foreign matters are not allowed to enter the port.
- The product or relevant special controller may malfunction or malfunction during the line operation.
- Keep away from noise sources such as high-voltage electrical equipment, power equipment, equipment with large surge, welding machine, inverter motor, etc

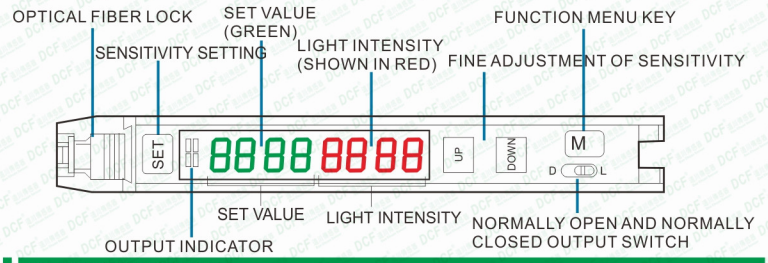
OPERATION PRECAUTIONS

Please confirm the use purpose, specification requirements and use conditions in detail in advance, and set the use cording to the specification range in this manual.
The hardware, software and system related information recorded in this manual may be updated and iterated with the progress of technology. Subject to change without notice.
In order to avoid personal injury, property loss and other accidents caused by malfunction of this product when using this product, please use the customer's design in hardware, software and related systems with safety protection function.
This product can not be used for security, military industry, or other military related purposes. In addition, when exporting, please abide by the foreign exchange and foreign trade law, the United States export management rules and other export related laws and regulations.
This product complies with ROHS "management method for restricted use of harmful substances in electrical and electronic products".
The company will not be responsible for any damage caused by non-compliance with relevant laws and regulations.
There may be differences in each product, and test characteristics may vary depending on the state of the test object.

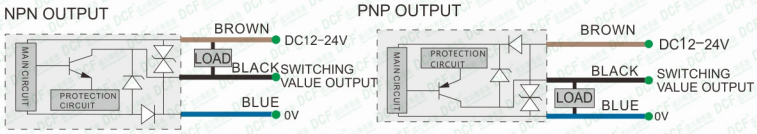
PRODUCT PARAMETERS

OUTPUT FORM			NPN	PNP
MODEL			DC-051	DC-051P
LIGHT SOURCE			Red LED	
RESPONSE TIME			100US in E-1 mode 200us in E-2 mode	
OUTPUT SELECTION			LIGHT-ON/DARK-ON(Switch selection）	
TPI DAR			Turn off delay / turn on delay timer / unit timer, timer duration can be selected	
CONTROL OUTPUT	NPN OUTPUT		CONTROL OUTPUT NPN OPEN COLLECTOR 24V, MAX 100MA, RESIDUAL VOLTAGE: MAX 1V	
	PNP OUTPUT		PNP output PNP open collector 24V, Max 100mA, residual voltage: Max 1V	
PROTECTION CIRCUIT			Reverse power connection protection, output over-current protection, output over-voltage protection	
RATING	SUPPLY VOLTAGE		12 to 24VDC ± 10%, floating ratio (P-P): max. 10% grade 2	
	POWER WASTE	NPN	In E-1 mode: 480mw maximum (32mA at 24V; 39mA at 12V) In E-2 mode: maximum 580mw (36ma at 24V; 48mA at 12V)	
		PNP	E-1 mode: 530mw (35mA at 24V; 44ma at 12V) In E-2 mode: 630MW maximum (39mA at 24V; 52ma at 12V)	
ENVIRONMENTAL TOLERANCE	WORKING ENVIRONMENT BRIGHTNESS		Incandescent lamp: maximum: 20000lux. Sunlight: maximum: 30000 Lux	
	WORKING ENVIRONMENT TEMPERATURE		−10 to + 55 °, no freezing	
	WORKING ENVIRONMENT HUMIDITY		35 to 85%, no condensation	
	VIBRATION RESISTANCE		35 to 85%, no condensation 10 to 55Hz, double amplitude: 1.5mm, x, y, Z axis for 2 hours respectively	
	SEISMIC RESISTANCE		10. 500m / S² In Y and Z directions, 3 times each	
SHELL MATERIAL			polycarbonate	
SIZE			Size 34.0mm (H) × 11.5mm (W) × 80.0mm (d)	
WEIGHT			Amplifier (including accessories + instructions + outer package) about 86g	
ENCLOSURE			Installation bracket dc-l01 (1) + instructions	

PRODUCT PARTS DESCRIPTION



WIRING DIAGRAM

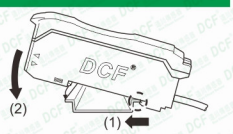


Warm prompt: NPN output is low level, i.e. 0V; when connecting PLC, PLC common terminal is high level, and normal connection is 24V.
PNP output is high level, i.e. 24V; when PLC is connected, PLC common terminal is low level, conventional connection is 0V.

INSTALLATION METHOD

INSTALLED ON THE CARD TRACK (FIGURE 1)

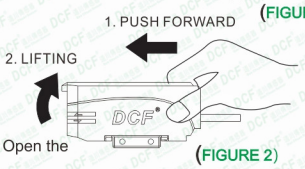
1. Align the card part at the bottom of the host with the edge of the card rail,Push the main engine in the direction of arrow 1 and make it Press down and hold in the direction of arrow 2.



(FIGURE 1)

DISASSEMBLY METHOD (FIGURE 2)

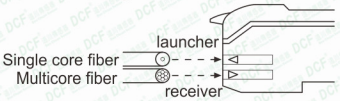
1. Grasp the product and push forward;
2. As long as the front part is lifted, it can be removed.



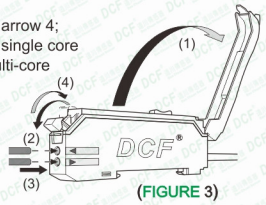
(FIGURE 2)

CONNECTING OPTICAL FIBER (FIGURE 3)

1. Grasp the product and push forward;
2. As long as the front part is lifted, it can be removed. 1. Open the dust cover in the direction indicated by arrow 1;
2. Open the optical fiber lock downward in the direction indicated by arrow 2;
3. Insert the tail of the optical fiber into the optical fiber hole in the direction indicated by arrow 3;
4. Fasten the optical fiber lock upward in the direction indicated by arrow 4;
5. If the coaxial reflection optical fiber is connected to the host, the single core The optical fiber is connected to the transmitting hole, while the multi-core optical fiber is connected to the
On the host receiving hole, as shown in Figure 4.



(FIGURE 4)

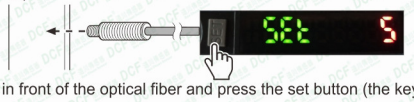


(FIGURE 3)

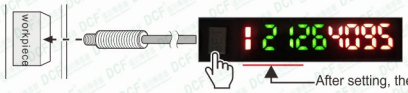
INTELLIGENT SETTING METHOD

TWO POINT CALIBRATION

In this mode, the PV used will be the average of the two sensing values obtained with or without the workpiece.
1. When no workpiece is placed in front of the optical fiber head, press the set button (the key time shall not exceed 2 seconds)



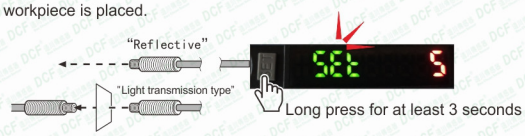
2. Place a workpiece in front of the optical fiber and press the set button (the key time shall not exceed 2 seconds)



3. The values measured in the two steps will be displayed on the screen and stored automatically
Tip: if the difference between the two measured sensitivities is too small, the "—" will flash for 2 seconds after the measurement,
This state needs to be solved by another mode described later, but the value will still be memorized and saved automatically

SET MAXIMUM SENSITIVITY

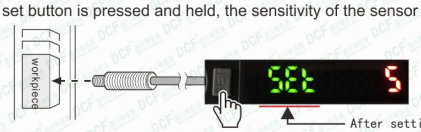
If it is a reflective workpiece, set the sensitivity without placing the workpiece; if it is a light permeable workpiece, Set when the workpiece is placed.



In the state shown above, press the set button for 3 seconds. (release button when set flashes on the panel)
When setting sensitivity, the set value should be slightly higher than the received light intensity.

FULL AUTOMATIC CALIBRATION

In this mode, PV will be set to the average of the maximum and minimum correlation values measured in a given time. Use this Mode detects the moving workpiece.
1. Press and hold the set button for at least 3 seconds when the workpiece passes through the optical fiber detection area.
When the set button is pressed and held, the sensitivity of the sensor is set according to the associated value.



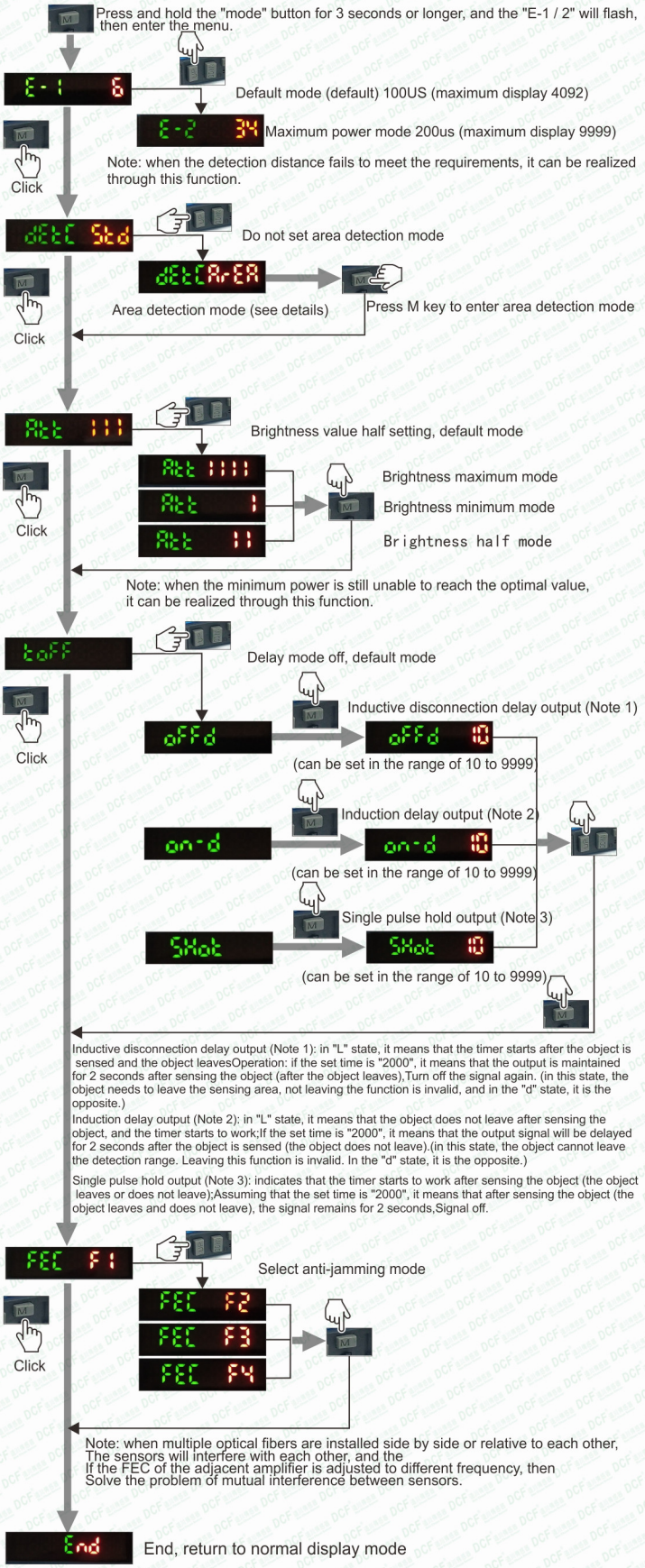
POSITIONING CALIBRATION

1. When no workpiece is placed in front of the optical fiber module, press the set button once; (key time not more than 2 seconds)

2. Place the workpiece in the position where you want to perform the positioning.

3. Press the set button again (the key time shall not exceed 2 seconds) until the display flashes.

FUNCTION MENU SETTING



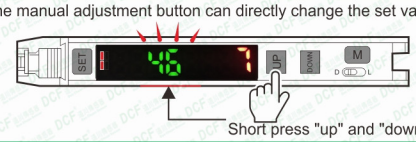
Inductive disconnection delay output (Note 1): in "L" state, it means that the timer starts after the object is sensed and the object leavesOperation: if the set time is "2000", it means that the output is maintained for 2 seconds after sensing the object (after the object leaves),Turn off the signal again. (in this state, the object needs to leave the sensing area, not leaving the function is invalid, and in the "d" state, it is the opposite.)

Induction delay output (Note 2): in "L" state, it means that the object does not leave after sensing the object, and the timer starts to work;If the set time is "2000", it means that the output signal will be delayed for 2 seconds after the object is sensed (the object does not leave).(in this state, the object cannot leave the detection range. Leaving this function is invalid. In the "d" state, it is the opposite.)

Single pulse hold output (Note 3): indicates that the timer starts to work after sensing the object (the object leaves or does not leave);Assuming that the set time is "2000", it means that after sensing the object (the object leaves and does not leave), the signal remains for 2 seconds,Signal off.

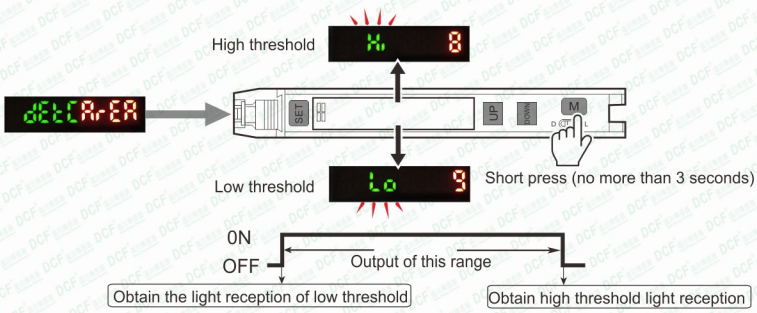
MANUAL SETTING METHOD

The manual adjustment button can directly change the set value.



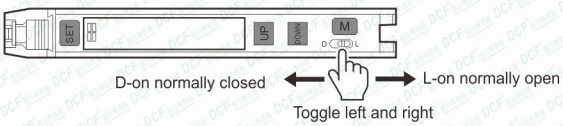
AREA DETECTION MODE

In this mode, the sensor has two thresholds, one is hi, the other is lo, hi or Lo can be connected to "up" or "Down" adjustment can also be set through "set" key self-learning.
In the display mode, hi or Lo will bounce back and forth between the set values. During the flashing process, press the "set" key briefly,You can switch between hi or lo to select or set.



OUTPUT SWITCHING

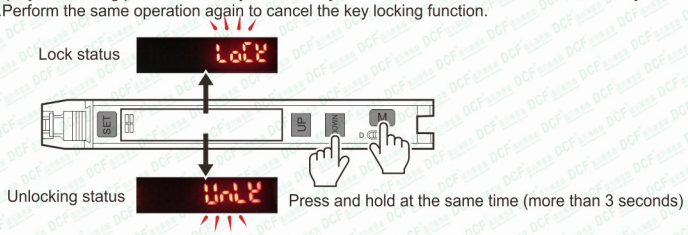
The optional modes are light in action (l-on) or light blocking action (d-on)



KEYBOARD LOCK FUNCTION

After the key locking function is enabled, the key is forbidden to operate to prevent misoperation, etc.

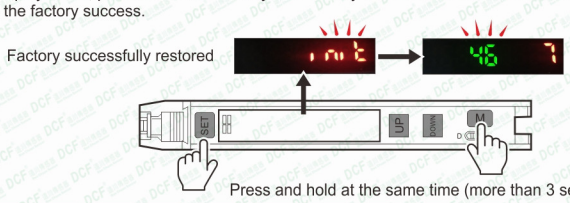
In the display mode, long press "down" key and "m" key for more than 3 seconds to turn on the key locking function.Perform the same operation again to cancel the key locking function.



RESTORE FACTORY SETTINGS

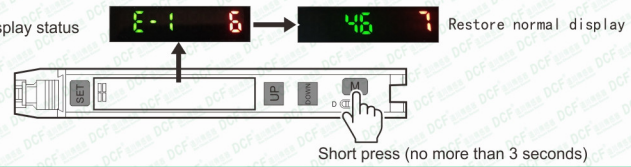
The set value is restored to the factory default state..

In the display mode, press and hold "set" key and "m" key for more than 3 seconds at the same time to restore the factory success.



SCREEN DISPLAY SETTINGS

When the display screen is always on, "E-1" or "E-2" (not flashing, if flashing, press the menu setting Exit) then press the "m" key once to display the normal value interface



USE WARNING

Our products are designed and manufactured as general industrial products. Therefore, it is not applicable to the following purposes. When the company's products are used for the following purposes, the company does not make any guarantee. However, if the company specially designs for the following purposes or has special negotiation, it can be used for the following purposes.

A. Uses requiring high safety (e.g. for atomic energy control equipment, incineration equipment, aviation and space equipment, railway equipment, lifting equipment, entertainment equipment, medical machinery, safety devices, or other uses that may endanger life and personal safety)

B. Use requiring high reliability (e.g. supply system of gas, water, electricity, etc., 24-hour continuous operation system, decision system, or other use involving rights and property)

C. Use under harsh conditions or environment (e.g. outdoor equipment, equipment susceptible to chemical pollution, equipment susceptible to electromagnetic interference, equipment susceptible to vibration and impact, etc.)

D. Use under conditions or environment not recorded in the product manual

In addition to the items in a) to b) above, the products recorded in this product manual are not applicable to motor vehicles including two wheeled vehicles, and the following are the same). Do not use it on a motor vehicle.

The right of final interpretation belongs to the company.

- PRODUCT SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.
- PLEASE CONTACT US FOR PRODUCT DETAILS OR COMMENTS.

FOR MORE PRODUCT INFORMATION, PLEASE VISIT OUR WEBSITE.
WEBSITE: WWW.DGDCF.COM

MANUFACTURER:DONGGUANDAOCHUANSENSORTECHNOLOGYCO.,LTD
http://www.dgdcf.com/
CHINA PRODUCTION AND SALES DEPARTMENT (HEAD OFFICE)
ADDRESS: FLOOR 4-5, SICHUAN INDUSTRIAL PARK, NO. 243, XIASHASHIHENG AVENUE, SHIPAI TOWN, DONGGUAN CITY, GUANGDONG PROVINCE
TEL: +86-0769-89870304
FAX: +86-0769-86520013