## Thank you for choosing a NIVELCO instrument!

# 1. APPLICATION

NIRED infrared non-contact sensors can be used as a sensing element in industrial automation applications and other areas (e.g., life and property protection, safety devices, etc.). The NIRED, operating in the infrared range, consists of a transmitter and a receiver. The NIRED diffuse reflective and retroreflective devices are integrated, while the NIRED through-beam is a separate transmitter and receiver. The modulated light from the transmitter is transmitted to the receiver, detected by the receiver, selectively amplified, and converted into a suitable output. If an object gets in the way of the light beam, the light path is blocked and a logic level change occurs at the output. In diffuse reflective mode, the light is reflected from the object, in retroreflective mode, from the mirror back to the receiver. Switching between light (NO, Normally Open) and dark (NC, Normally Closed) switching mode is done by wiring and mode switch.

# 2. TECHNICAL DATA GENERAL DATA

	Rectangular housing					
Туре	IR	ISD-				
	226	256				
Mode	Diffuse reflective	Retroreflective (with MS2 mirror)	Through-beam			
Detection distance	0.7 m	5 m 10 m				
Detection distance modifying factors	white matte paper 80% black matte paper 40% aluminum 120% shiny metal 350%, wood 40%		-			
Sensitivity adjustment	Potentiometer					
Switching between Light ON or Dark ON mode	With a switch					
Setting indicator	Yes					
Other indication	Power supply, output					
Supply Voltage	24240 V AC / DC ±10%					
Maximum current consumption	3 VA					
Operating frequency	max. 50 Hz					
Output		Relay contact output 250 VAC, 3 A AC1 NO/NC				
Electrical connection	Terminal block Pg11 c cable glands					
Ambient temperature	-20+55 °C					
Ambient humidity	max. 85% relative humidity					
Electrical protection	Class II					
Ingress protection	IP66					
Mechanical design	Injection molded plastic housing with spacer					
Weight	115 g	115 g 130 g 225 g				



NIRFD

CE

# **2.1 ACCESSORIES**

- User's manual
- Warranty card
- EU declaration of conformity
- 2 or 4 mounting nuts M18x1
- 1 MS2 mirror (only for retroreflective devices)

	Cylindrical housing												
Туре		IRV- IRF- IRV- IRF-				ISV-		ISF-					
	111	112	111	112	131	132	131	132	153	154	153	154	
Mada		Diffuse	reflective			Retroreflective (with MS2 mirror) <sup>(1)</sup>			Through-beam				
WIDDE	St	raight	90° ar	igled	Si	traight	90° ar	ngled	Stra	aight	90° a	90° angled	
Detection distance		0,4 m			0.4 m Diffuse reflective, 0.42 m Retroreflective (with Mirror MS2)			10 m					
Detection distance modifying factors		KODAK whi white mat aluminum glossy blac black mat	te paper 100% e paper 80% i 120150% ck paper 50% e paper 20%					-	-				
Sensitivity adjustment						With a po	otentiometer						
Switching between Light ON or Dark ON mode		by wiring											
Setting indicator							No						
Other indication						Power su	ipply, output						
Supply Voltage						10	30 V DC						
Maximum current consumption						2	5 mA						
Operating frequency				150	Hz			30Hz					
	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	
Output				NO max. 30 VI	/ NC DC 200 mA					NO-I max. 30 VD	NC <u>C 100 mA</u>		
Electrical connection				3-wire	cable				Transmitter: Receiver:	2-wire cable, 4-wire cable	Transmitter: Receiver: 3	2-wire cable, 3-wire cable	
						Cable l	ength: 2 m						
Ambient temperature						-10	.+50 °C						
Ambient humidity		Max. 70% relative humidity											
Electrical protection						CI	ass II						
Ingress protection							P65						
Mechanical design		Plastic housing M18 x 1 mm external thread with 2 mounting nuts											
Weight	90 g 180 g												

(1) IRV / IRF-131-es variants = IRV / IRF-111 + MS2 mirror, IRV / IRF-132-es variants = IRV / IRF-112 + MS2 mirror

2.2 ORDER CODES (NOT ALL COMBINATIONS ARE POSSIBLE!) NIRED L

VERSION

delay (4)

Straight head layout (3)

Terminal block connection, time

90° angled layout (3)

CODE

٧

F

D

HOUSING

Cylinders

house (2)

Square

housing

1

2

FUNCTION	CODE
Retroreflective	R
Separate	S
transmitter and	
receiver unit (1)	

DETECTION SUPPLY Ουτρυτ CODE CODE CODE CODE DISTANCE VOLTAGE 400 mm 1 NPN NO/NC (3) 1 24...240 V (4) AC/DC PNP NO/NC (3) 700 mm 2 2 3 2 m NPN NO and NC (3 3 10...30 V DC (3) 5 m 4 PNP NO and NC (3) 4 10 m Relay (4) 5 6

(1) only with a detection distance of 10 m

(2) 18 mm diameter

<sup>(3)</sup> only with cylindrical housing

(4) only with square housing

## **2.3 DIMENSIONS**



## 3. INSTALLING

In the case of a cylindrical device (IRV / IRF / ISV / ISF), drill a Ø19 mm (Ø 0.748") hole in the mounting bracket, and fix the device with the supplied nut. It is recommended to place a vibration-damping rubber plate under the nuts in areas subject to vibration. Square housing devices (IRD / ISD) are mounted using the supplied mounting plate. The mounting position of through-beam devices is arbitrary but must be perpendicular to the detected object's surface and the direction of its movement.

If a mirror is used, the optimal reflectance must be set by shifting the plane bidirectionally or rotating the mirror axially, and then the sensitivity can be adjusted. A similar procedure must be followed in the case of a through-beam device. For diffuse reflective applications, the device is positioned to the expected position of the object.

# 4. WIRING

## **4.1 CYLINDRICAL HOUSING TYPES**



## **4.2 SQUARE HOUSING TYPES**

Az IRD / ISD devices do not have output overcurrent protection. If the relay output terminals are shorted or the supply voltage exceeds the specified value, it may damage the device.

1

4



# 5. OPERATING MODES

• Diffuse reflective: Integrated transmitter and receiver. The receiver uses the light reflected from the object. If no object is in the path of the light beam, the light is not reflected. The color, surface, etc. of the object has a direct effect on the sensing distance (see Table 2, Technical data). The sensitivity is adjusted by a potentiometer on the back. The detected object is indicated by an LED on the back panel.

• Retroreflective: integrated transmitter and receiver. The receiver works by reflecting light from the reflector, the object interrupts the light. The sensitivity is adjusted by the potentiometer on the back. The detected object is indicated by the blackout LED on the back panel.

• Through-beam: separate transmitter and receiver. The receiver receives light directly from the transmitter. The object interrupts the light path. The transmitter power can be adjusted with the potentiometer on the back. A lower transmitter power is required for short distances. The LED's on the back indicate when the transmitter is switched on and the object is detected.

## 5.1 OUTPUT MODES

Switch on light (NO, Normally Open): the receiver output turns on when it detects the object.

· Switch on dark (NC, Normally Closed): The receiver output is switched off when it detects the object.

In Retroreflective mode, the NO, NC mode is reversed from the Diffuse reflective mode.

## 6. MAINTENANCE AND REPAIR

The device does not require regular maintenance. The warranty card contains the terms and conditions. Before returning the device for repairs, it must be cleaned thoroughly. The parts in contact with the medium may contain harmful substances; therefore, they must be decontaminated. Our official form (Returned Equipment Handling Form) must be filled and enclosed in the parcel. Download it from our website www.nivelco.com. The device must be sent back with a declaration of decontamination. A statement must be provided in the declaration that the decontamination process was successfully completed and that the device is clean from any hazardous substances.

## 7. STORAGE CONDITIONS

Storage temperature: -25°C...+60°C.

irv1114a0600h 04 June 2021

NIVELCO reserves the right to change anything in this manual without notice!