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**INFRARED TRANSMISSION PROBES FOR
CNC MACHINE TOOLS
(CAN BE USED IN COMBINATION WITH ZERO
SETTER WITH INFRARED TRANSMISSION)
OPERATION MANUAL**



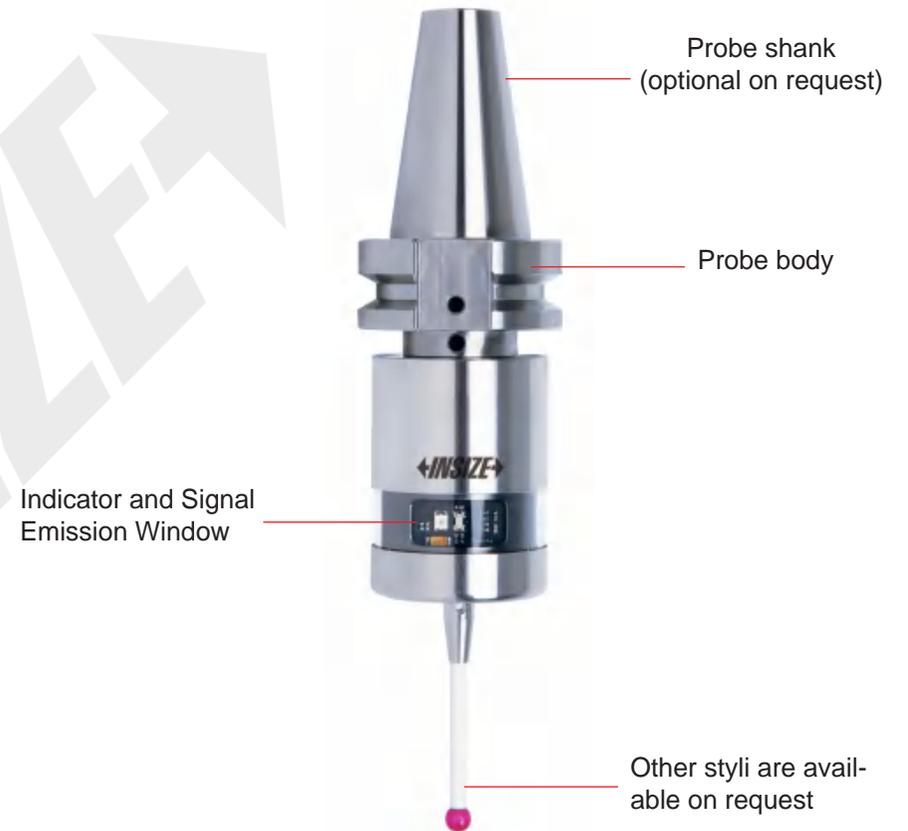
Basic Introduction

The 9414 SERIES are infrared communicating machine tool probes for small to medium sized machining centres and mill-turn centres.

The probe ID can be defined in normal mode, and if working in a two probe system, the two probes can be defined as probe 1 and probe 2 to work in separate times.

The working process on the CNC machine: the machine operator uses the measurement software to write the measurement programme; when the measurement programme is executed, the tool probe moves on the machine spindle according to the programme, detects the contact with the workpiece and sends out an infrared coded signal; the receiver receives the infrared signals from the probe and transmits the signals to the CNC system via a cable; finally, the measurement programme calculates the co-ordinates of the points being measured on the workpiece and obtains the measurement results. Finally, the measuring programme calculates the coordinates of the measured points of the workpiece to obtain the measurement results.

Structural

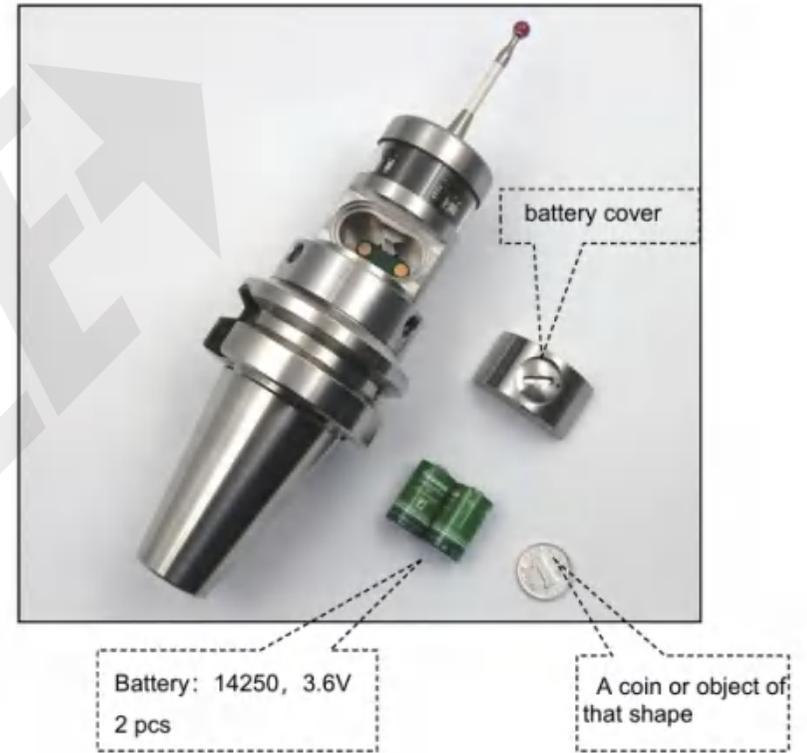


Stylus installation



Note: When removing or installing the stylus, please use a special cylinder wrench to avoid damage to the trigger mechanism inside the probe caused by excessive torque.

Battery installation



Note: The battery compartment cover can be opened or locked by pressing the knob indicated on the cover. When replacing the batteries, be careful to clean the battery compartment to avoid damage to the probe from chips or foreign objects.

Taper shank installation and adjustment

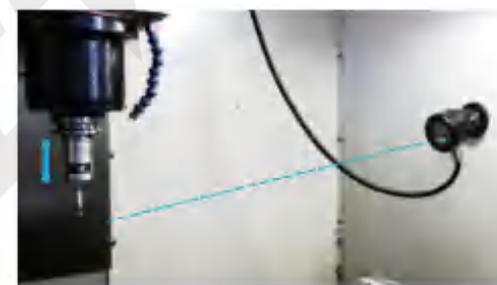
Before the product leaves the factory, the coaxiality between the stylus and the probe taper shank has been preliminarily adjusted, and it can be used after calibration. If the user has special requirements, the probe can be installed on the main shaft or high-precision rotary shaft, coaxiality can be adjusted to 0.002-0.003mm using a micrometer.



Note: Loosen the locking peg appropriately before adjustment and retain some of the locking force (0.5Nm-1.5Nm) to prevent the probe from dropping.

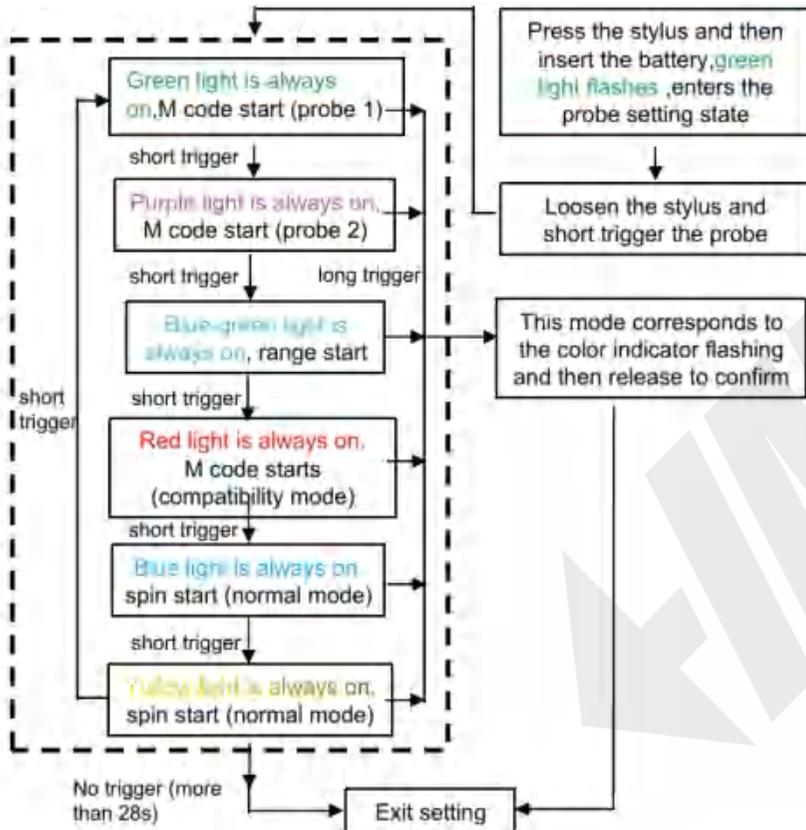
System installation

Work distance of the probe:
9414 series works with 9414-A in normal mode. The natural reflective surface on the machine tool may affect the signal transmission range. When installing 9414-A, the centerline of 9414-A should be directed near the midpoint of the probe moving path.



Change probe Settings

9414 series probe can work in normal mode and compatible mode, the probe start method can be changed through the probe setting. If you need to change the probe setting, press the stylus and then insert the battery or if the battery is already installed, remove it for 5 seconds and then install it again, keep the stylus deflected until the LED flashes, it enters probe setting status:



Explain: short trigger: The trigger time is less than 7 seconds
 long trigger: The trigger time is more than 8 seconds

Attentions

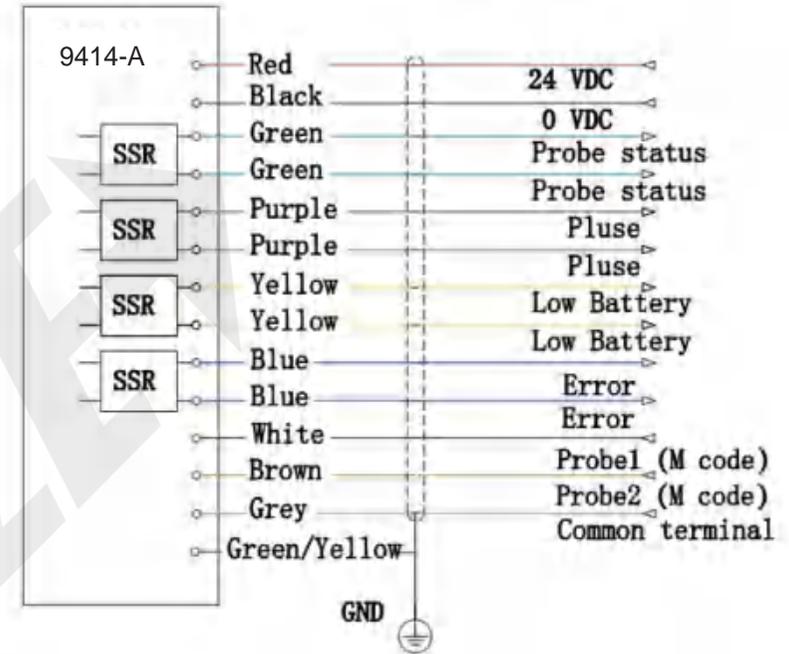
- ◆ The suitable working distance between 9414series and 9414-A is within 3 meters.
- ◆ When installing 9414-A, the centerline of 9414-A should be directed near the midpoint of the probe's moving path.
- ◆ When installing 9414-A, you should choose a location that meets the following conditions as much as possible: the least interference from ambient light; the closest to the probe; there is no obstruction between the receiver glass window and the probe glass window.
- ◆ After the probe is turned off, wait at least 6 seconds before turning it on again.
- ◆ After confirming that the signals and machine response are normal, Then install it.
- ◆ The probe need to calibrate when first use, replace the stylus, replace probe taper shank, it is recommended to perform regular calibration to ensure measurement accuracy.
- ◆ Ensure that the stylus ball is clean and avoid measurement errors caused by adhesion on the measuring end.
- ◆ The incandescent lamp or fluorescent lamp used in the machine tool may interfere with the transmission of the measurement signal. It is recommended to use the LED machine tool lamp for illumination.
- ◆ Clean the probe regularly.

Brief introduction of 9414-A

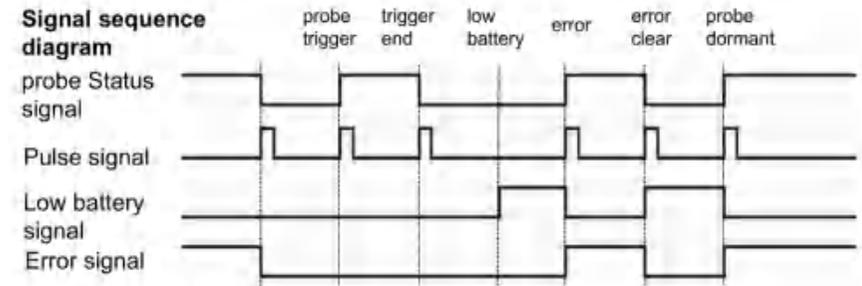


- ◆ M1 start indicator light:
Green/Blue—Emit probe start signal
- ◆ Power light:
Green—normal mode
Red—compatible mode
Purple—range start (100%)
Blue—range start (66%)
Yellow—range start (33%)
- ◆ Probe status indicator light:
Green—Probe start
Red—Probe trigger
- ◆ M2 start indicator light:
Green/Blue—Emit probe start signal
- ◆ Probe low voltage indicator
Yellow—probe battery voltage is low

Wiring Instructions



Note: The common terminal is connected to 0V, probe M code is connected to 24V, or common terminal is connected to 24V, probe M code is connected to 0V, the receivers all transmit start signals.

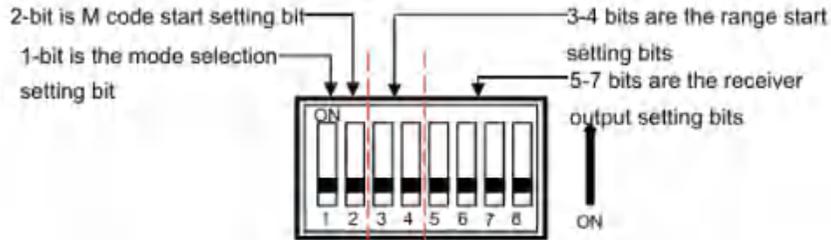


Note: All output signals are factory-set as normally closed (the probe is in contact after starting, and the signal output by the receiver is normally closed). Set the probe status signal through the power cord: when the red line is connected to +24V and the black line is connected to 0V, the probe status signal is normally closed; when the red line is connected to 0V and the black line is connected to +24V, the probe status signal is normally open.

Receiver setting

If the user needs to flip other signal states, follow the instructions below, remove the front cover of the 9414-A and adjust the internal DIP switch.

The receiver setting is realized by using an 8-bit DIP switch. The following picture shows the setting status of the DIP switch. When this bit is ON, the corresponding LED red light will light up, meaning as follows:



	ON	OFF
DIP switch 1 bit	compatible mode	normal mode
DIP switch 2 bit	M code pulse start	M code level start

DIP switch 3 bit	DIP switch 4 bit	
ON	ON	Range start 100%
ON	OFF	Range start 66%
OFF	ON	Range start 33%
OFF	OFF	Cancel range start

	ON	OFF
DIP switch 5 bit	Probe status normally open	Probe status normally closed
DIP switch 6 bit	Pulse signal normally open	Pulse signal normally closed
DIP switch 7 bit	Low battery signal normally open	Low battery signal normally closed
DIP switch 8 bit	Error signal normally open	Error signal normally closed

Note: The priority of the range start setting is higher than the normal/compatible mode setting. When the range start is cancelled, the normal/compatible mode setting can take effect; 1-4 bits of the DIP switch setting need to be in the state that the probe is turned off. Otherwise, it will not take effect immediately.

Remove the front cover of 9414-A: As shown in the figure, there is no need to remove 9414-A from the machine when setting the DIP switch. Use the LW2.5 wrench to remove the 4 screws on the front cover of the receiver.



Install the 9414-A front cover: insert the long screw into the hole (in the red circle) and tighten it, and insert the short screw into the hole (in the blue circle) and tighten it.

Note: Keep the environment and windows clean during disassembly and installation. Do not touch the circuit board or other components!

Install 9414-A

