



**9413**  
**INFRARED TRANSMISSION PROBES**  
**FOR CNC MACHINE TOOLS**  
**OPERATION MANUAL**

PLEASE SCAN QR CODE TO  
WATCH THE OPERATION  
VIDEO OF PRODUCTS.



VIDEO



### Safety Notice

- The installation position of any interface must be away from any potential electrical noise, such as transformers, servo system drives, etc.
- It is very important that all ground wire connections should be connected to ground of the machine, and failure to comply with this rule will result in a potential difference between the ground.
- All shielding devices must be connected as described in the instruction manual.
- Cable lines should not be parallel to high current sources such as motor power cables or near high-speed data transmission lines.
- Cable length should always be kept to a minimum.

### Description

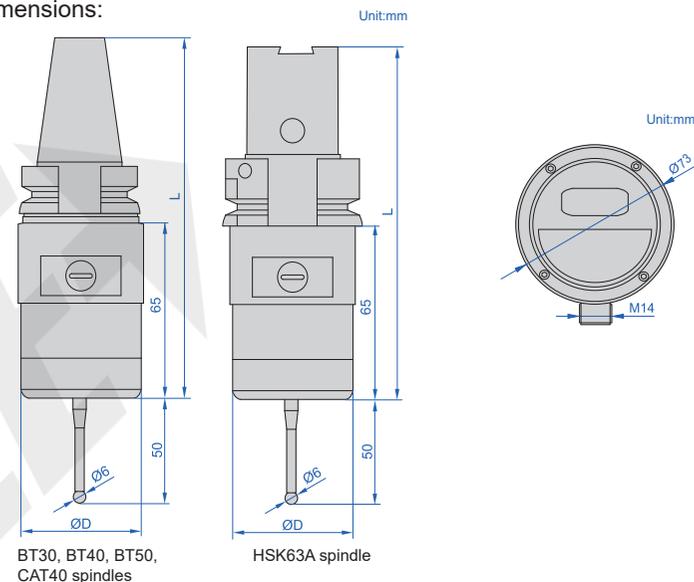
1. 9413 infrared communication machine tool probe system is composed of probe, receiver and measurement software, it is mainly used for a variety of small and medium size machining center, CNC boring, milling machine and five-axis CNC machine measurement;

2. The working process of probe system on CNC machine tool:

The machine operator uses the measuring software to write the measuring program; When the measuring program is executed, the probe moves on the spindle of machine tool according to the program, detects the workpiece contact and sends out the infrared coded signal; The receiver receives the infrared signal of probe and transmits the signal to the numerical control system through the cable; Finally, the coordinates of measured point of workpiece are calculated by the measuring program, and the measuring results are obtained.

### Specification

Product dimensions:



#### PROBE SPECIFICATION

Code	9413-1	9413-2	9413-3	9413-4	9413-5
Probe length (L)	140mm	166mm	216mm	168mm	136mm
Probe diameter (ØD)	48mm	48mm	48mm	48mm	48mm
Applicable spindle *	BT30	BT40	BT50	CAT40	HSK63A
Trigger accuracy of styli in any direction	1µm				
Protection stroke triggered by styli in all directions	X and Y axis stroke: ±12.5°, Z axis stroke: 5mm				
Trigger force of styli in all directions	X and Y axis: 1-1.6N, Z axis: 5-10N				
Dust/waterproof	IP68				
Power supply	2xLS14250 lithium battery				

\*SK and ISO spindle probes also can be customized

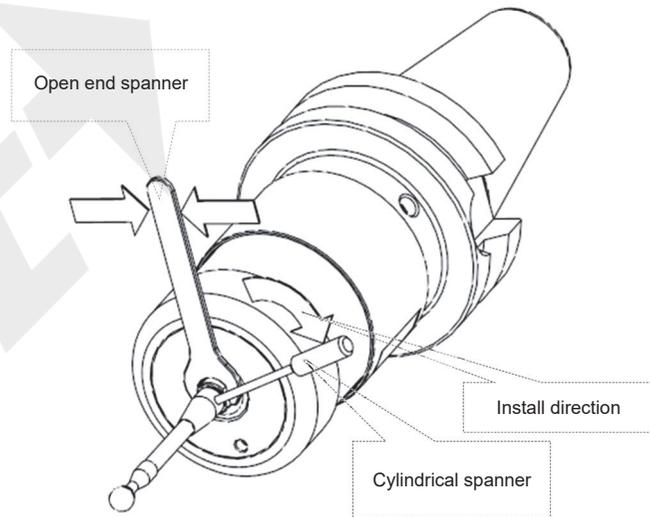
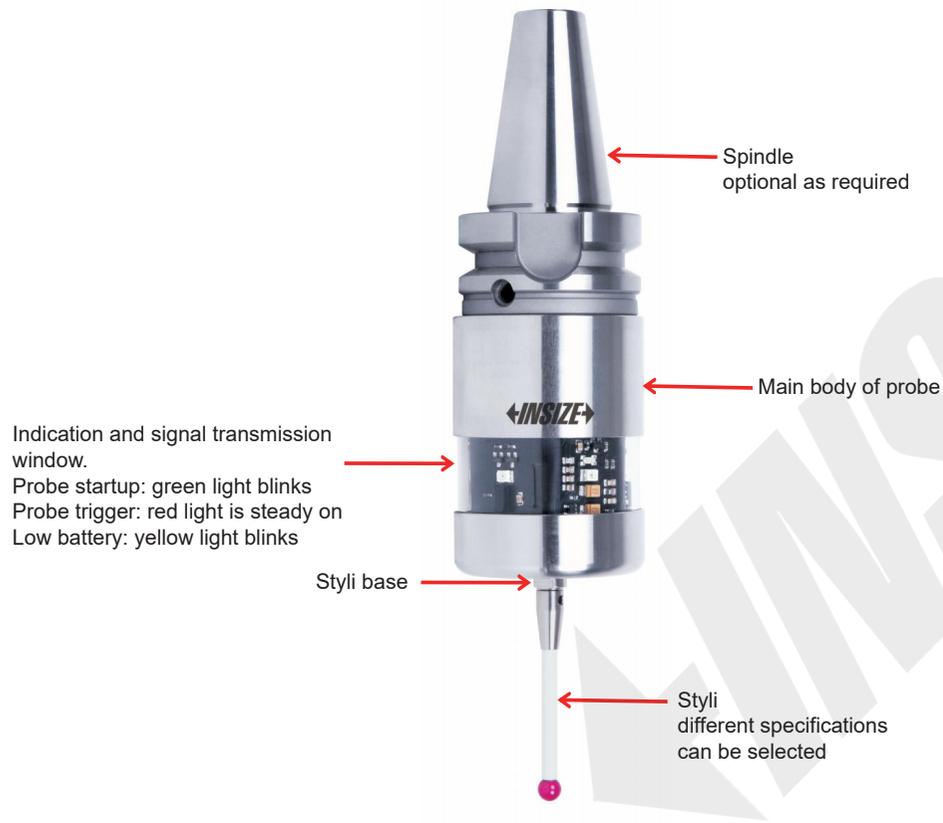
#### RECEIVER SPECIFICATION

Code	9413-A
Protection function	low battery voltage or probe transmitting signal all the time**
Applicable probe	code 9413-1, 9413-2, 9413-3, 9413-4, 9413-5
Cable length	8m
Dust/waterproof	IP68
Power supply	input voltage: 24V±10%(DC), load current: 50mA

\*\*When battery voltage is low or probe is in wrong state, receiver sends a signal to CNC machine to stop working

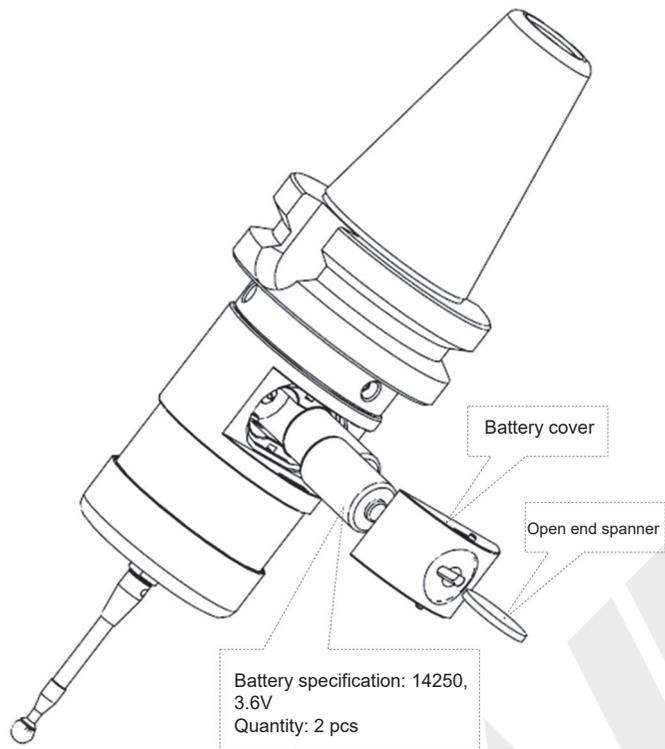
Probe profile

Install styli



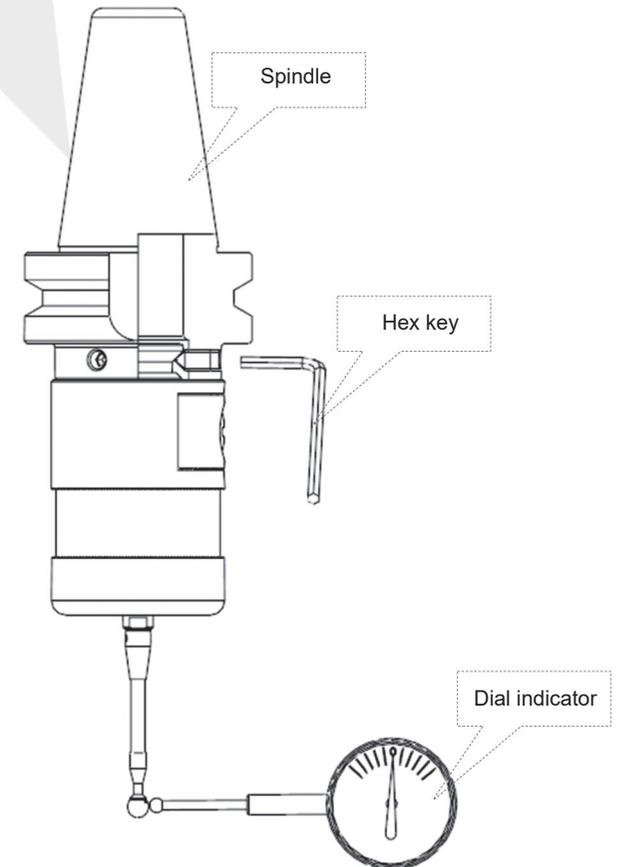
Note: When installing or removing the styli, use an open spanner to fix the styli base, and then use a cylindrical spanner to rotate the styli. If you do not use an open spanner to fix the styli base, use a cylindrical spanner to remove the styli directly, which may affect the probe Internal trigger mechanism causing damage.

**Install battery**



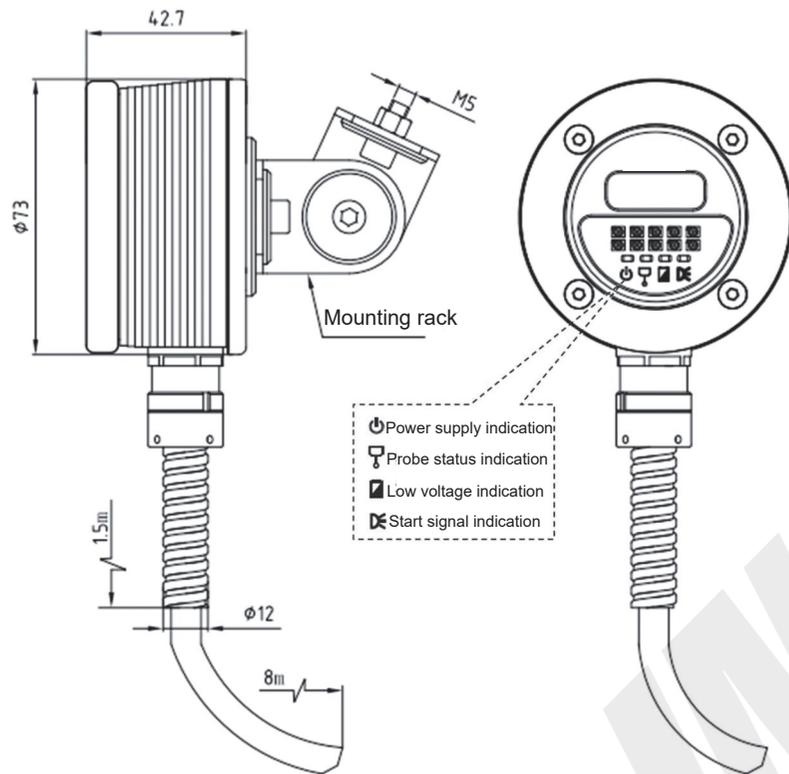
**Connection and adjustment**

Before the product leaves the factory, coaxiality of styli and spindle has been preliminarily adjusted, and it can usually be used after calibration. If the user has special requirements, the probe can be installed on the spindle or high-precision rotary shaft, and the coaxiality can be adjusted to 0.002-0.003mm by referring to the diagram.



Note: Adjusting the screw is also tightening the screw, in the adjustment process can not be completely loosened, need to gradually adjust the screw to gradually achieve the ideal coaxial state. After the adjustment, ensure that the three screws are fully tightened.

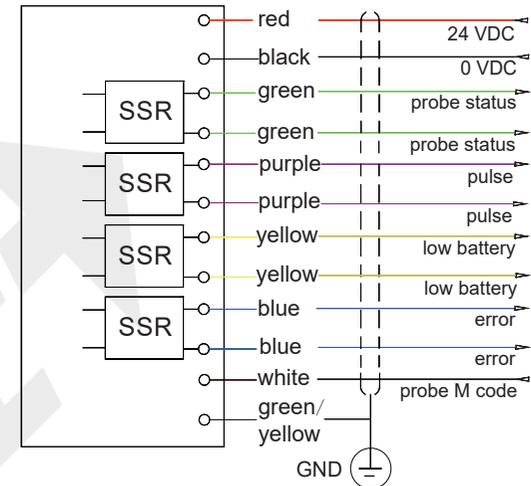
Receiver profile



- The power indicator is on, green: The receiver is powered on.
- Probe status indicator light on, green: probe start and receiver signal contact is normal, red: probe trigger.
- The probe low voltage indicator is on. Yellow: The probe is low, prompting you to replace the battery.
- Start signal indicator light on: launch probe start signal.

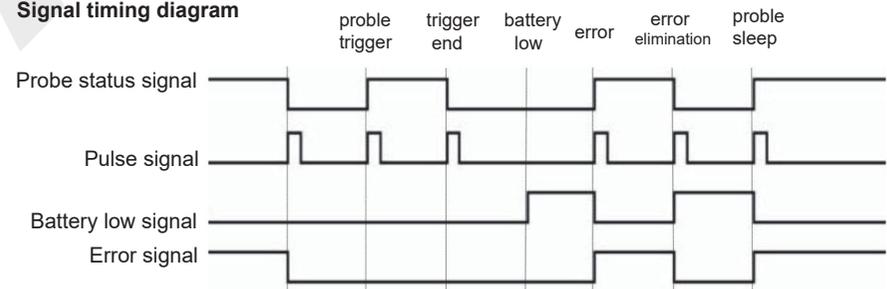
Wiring and signal

Receiver and CNC machine wiring diagram



Note: The probe M code is connected to 24V, and the receiver sends the start signal, this 24V is the same power source as the receiver.

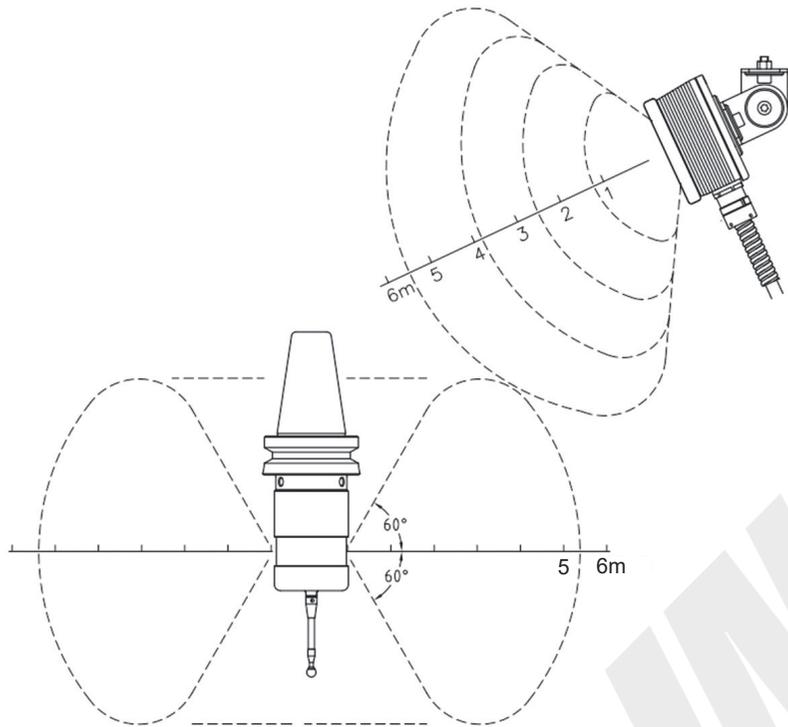
Signal timing diagram



Attention:

1. All output signals are set to normally closed signal (the probe is in contact state after starting, and the receiver output signal is normally closed signal).
2. Set the probe status signal through the power cable: when the red line is connected to +24V, 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.
3. If you need to change other signal status, you can disassemble the 9413-A back cover and adjust the position of the internal jumper under the guidance of our technical personnel.

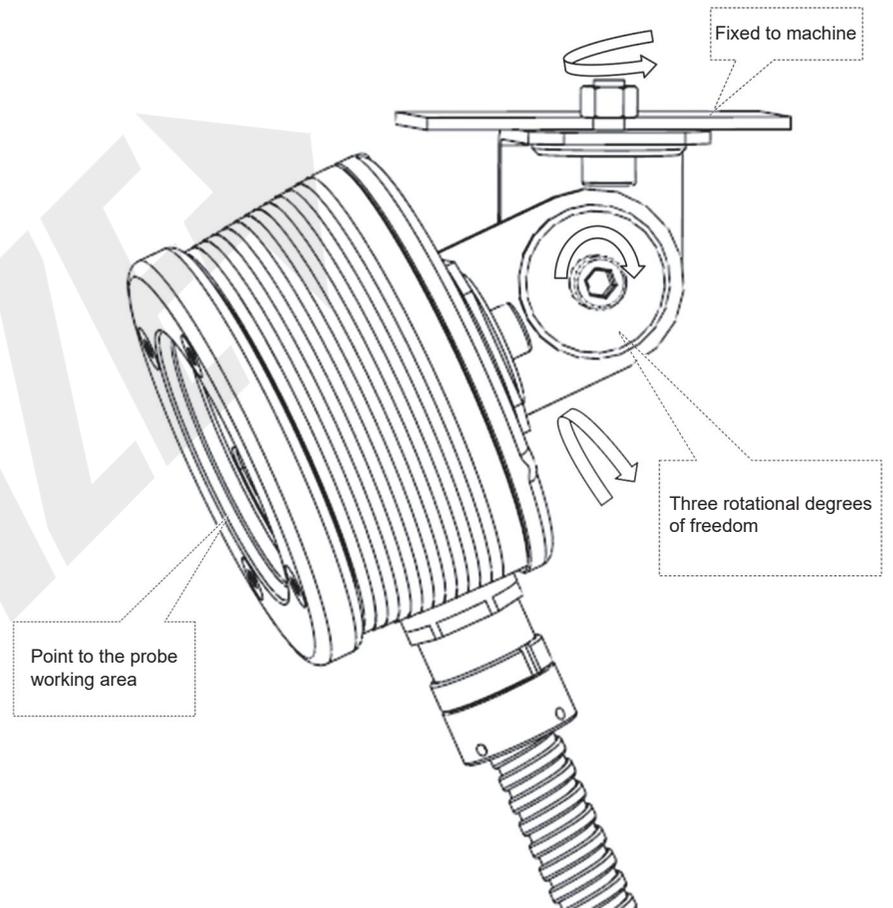
Signal transmission range



Note:

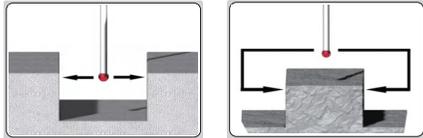
1. The suitable working distance between the probe and the receiver is within 5m.
2. There should be no object blocking on the straight distance between the front of receiver and the probe.

Install receiver

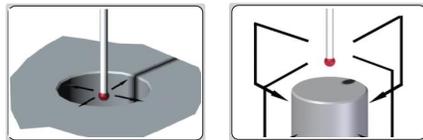


## Introduction to measurement software

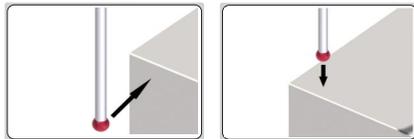
1. Stylus automatic calibration
2. Protection of stylus during probe movement (avoid collision)
3. Groove and boss measurement



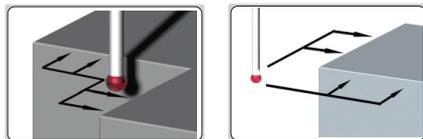
4. Bore and axis measurement



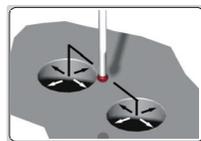
5. X or Y single-surface measurement



6. Internal and external corner measurement



7. 4th axis measurement
8. Angle on X and Y plane measurement
9. Three points measurement of arc
10. Measure the distance between two holes



## Precautions for installation and use

1. 9413 The suitable working distance between the machine probe and the receiver is within 5m.
2. Confirm that the signals and machine response are normal before installation.
3. The installation position of the receiver should meet the following conditions as far as possible: the least interference from the ambient light, the closest distance from the probe, and no objects on the linear distance between the receiver glass and the probe window.
4. When the receiver is installed, the center line of the receiver should point near the center point of the probe moving path.
5. After the probe is closed, wait at least 6s before starting again.
6. In addition to the calibration of the measuring ball for the first time, replacing the styli or replacing the spindle, the calibration should also be carried out regularly to ensure the measurement accuracy.
7. Clean the probe regularly to avoid measurement errors caused by sticking debris at the measuring end.
8. Incandescent or fluorescent lamps used in the machine tool may interfere with the transmission of the measurement signal, it is recommended to use LED machine tool working lights for lighting.