

## User's manual for Hall probe CYTP98

The CYTP98 is a transversal Hall probe that can be used to measure the magnetic field strength of permanent magnet materials, electromagnets, motors, speakers, magnetic sensors and transducers as well as other machines and instruments.

It requires a voltage supply of +5V DC to provide an output voltage of  $2.5\text{VDC} \pm 2\text{VAC/DC}$  in a measuring range from 0-50mT to 0-2000mT. The probe has got a high linearity of  $\pm 0.5\% \sim \pm 1.0\%$  and a measuring accuracy of  $\pm 1.0\% \sim \pm 2.0\%$ .

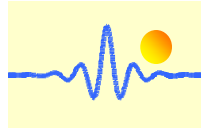


### 1. Features

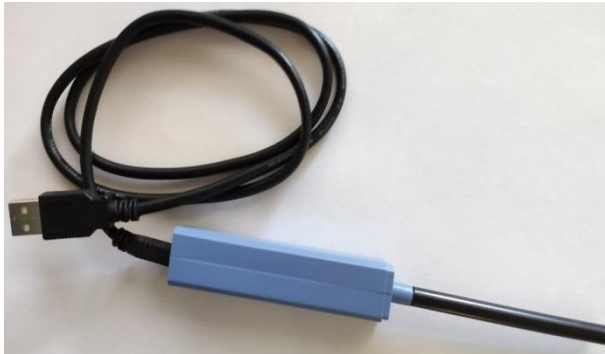
- The Hall probe provides an analogue output voltage of  $2.5\text{VDC} \pm 2\text{VAC/DC}$ , which can be integrated into various measurement and control systems for magnetic field measurements.
- The Hall probe is powered by a single +5VDC power supply, which can be provided by a microprocessor-based system via a USB cable.
- A cost-effective measuring device that is easy to operate and practical to handle and store.
- Ideal for fast quality control and comparative measurements.

### 2. Technical data

Measuring range:	0-50mT to 0-2000mT (for AC/DC magnetic field, the measuring range can be adjusted to the customer's requirements. Part number is CYTP98-xxmT, e.g., CYTP98-200mT for measuring range 0-200mT)
Output voltage:	$2,5\text{VDC} \pm 2,0\text{V AC/DC}$ (calibrated with DC magnetic field)
Supply voltage:	+5VDC ( $\pm 5\%$ )
Linearity:	$\pm 0.5\% \sim \pm 1.0\%$
Hysteresis:	$\pm 0,25\%$
Typical accuracy:	$\pm 1.0\%$ for DC measurement, $\pm 2.0\%$ for AC measurement
Operating temperature range:	$-25^{\circ}\text{C} \sim +70^{\circ}\text{C}$
Relative humidity:	20% ~ 80%
Size (without cable):	180 x 20 x 18mm (probe dimensions: 1,5x4x65mm)
Weight (without cable):	24g



### 3. Connection to measuring station



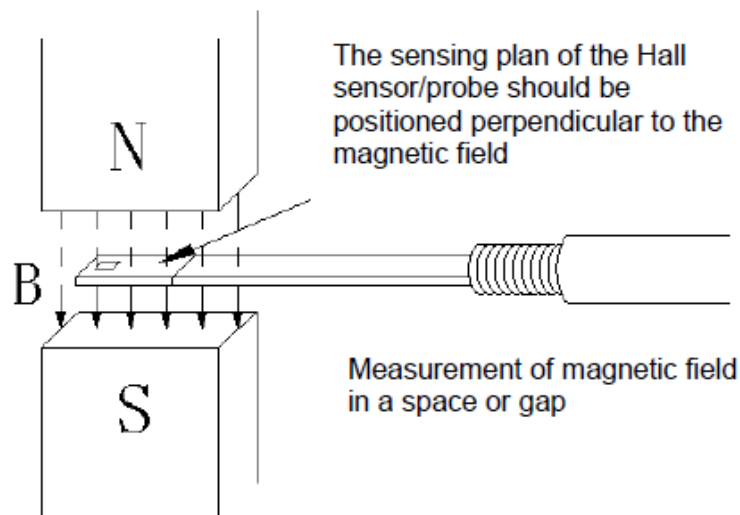
The connection to a measuring station is established via a USB-A to USB-B-micro cable.



- 1 – Vin: 5VDC
- 2 – ignore
- 3 – output signal
- 4 – Ground

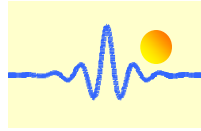
### 4. Functionality

The Hall probe CYTP98 is used to measure the magnetic field strength by placing the probe's head into the airgap of the magnetic field to be measured. The magnetic field lines of the magnetic field to be measured should pass perpendicularly through the Hall element of the Hall probe.



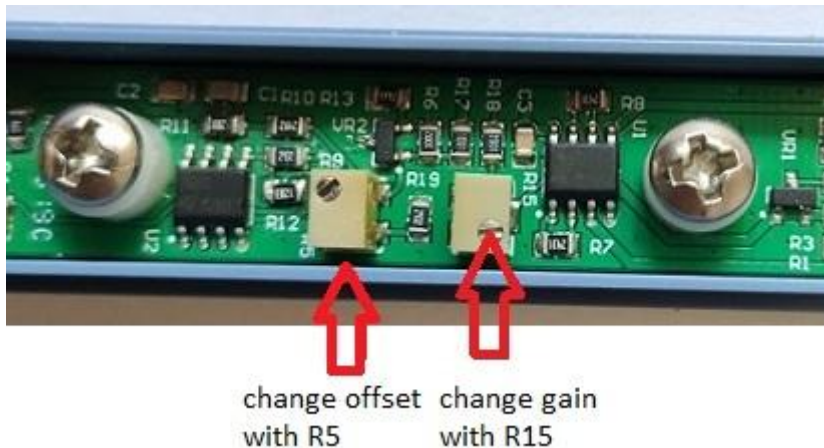
A higher magnetic field strength causes a linear, proportional behaviour of the output signal's voltage level.





The front of the Hall probe shows a sticker where the device's serial number and its measuring range is to be found next to Chen Yang's logo.

On the inside of the potentiometer there are two potentiometers which can be used to calibrate the signal in terms of offset and gain.



Using R5 to set the offset to 2.5VDC enables a symmetrical, proportional output signal from 0.5V to 4.5V.

In some cases, the gain of the signal has to be adapted for a magnetic field. Then, R15 can be used to achieve this adaptation.

## 5. Applications

- Measurement of magnetic field strength in permanent magnets, electromagnets, motors, speakers, magnetic sensors and transducers in combination with a digital measurement system.
- Ideal for quality control and quick comparative measurements.
- The measured magnetic density can be easily calculated from the voltage signal of the Hall probe:

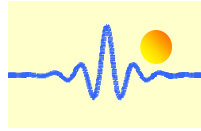
$$B(mT) = \frac{Range}{2V} * (V_{out} - V_{offs})$$

With:

Symbol	Meaning	Unit
$V_{cc}$	Supply voltage	mV
$V_{offs}$	Offset voltage of the output signal	mV
$V_{out}$	Output signal of the Hall probe	mV
Range	Maximum measurement range of the Hall probe	mT

### Notice

Please use caution when handling the sensor head. Use the protective cap after handling the Hall probe to avoid damage to the sensor head. Do not submerge the probe in any fluids.



## 6. Calibration data

Calibration was done using a calibrated FH-54 Gaussmeter for measuring the magnetic field strength of a electromagnet as a reference and an Agilent 34401A Multimeter for measuring the output voltage of the CYTP98-1000mT with the serial number: **AP98210628-01**.

### - Calibration results with the magnetic field of an electromagnet

Field Density[mT]	Voltage[V]	Ideal Voltage[V]	Linearity (%)
979	4,2158	4,2080	0,390
646	3,5320	3,5420	-0,500
365	2,9733	2,9800	-0,335
177,4	2,5979	2,6048	-0,345
0	2,2501	2,2500	0,005
-177,4	1,9031	1,8952	0,395
-365	1,5258	1,5200	0,290
-646	0,9673	0,9580	0,465
-979	0,2921	0,2920	0,005

Table: Calibration data of the Hall probe

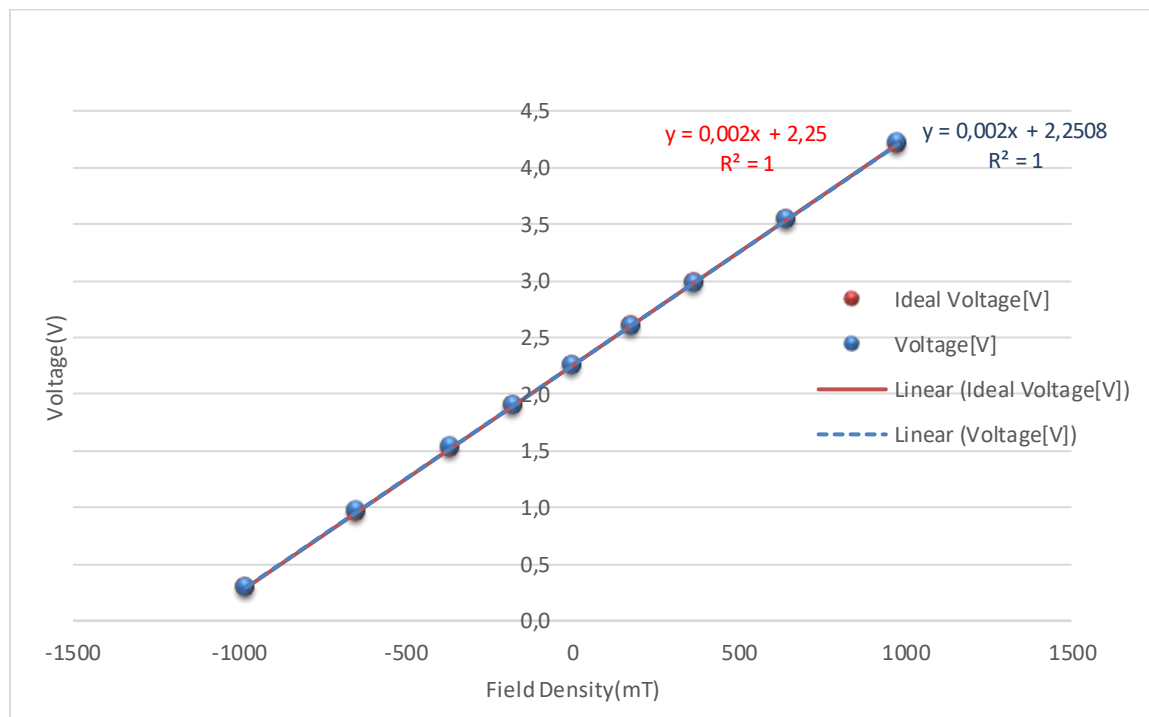
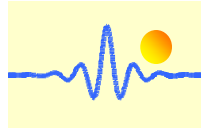


Table: Dependence of the output signal on the measured magnetic field density and linearity comparison with the ideal line



## 7. Warranty

Chen Yang Technologies GmbH & Co. KG warrants its products against defects in workmanship and materials under normal use and service for a period of 12 months from the shipping date. **All obligations and liabilities under this warranty are limited to repairing or replacing at our option.**

The warranty is extended only to the original purchaser. The warranty shall not apply to any products or parts which have been damaged on account of improper installation, improper connections, misuse, neglect, accident or abnormal conditions of operation. Any attempt to tamper with the products as evidenced by disruption of warranty sticker and/or unauthorized repair/modification of the products shall render this warranty null and void.