

# User's Manual of Axial Hall Probe CYAP98

The CYAP98 is an axial Hall probe, which can be used to measure DC/AC magnetic field strength of permanent magnet materials, electromagnets, motors, loudspeakers, magnetic sensors/ transducer and other machines and instruments etc.

It needs a power supply voltage of +5VDC to give an output voltage of 2.5VDC±2VAC/DC in different magnetic measuring ranges from 0- 50mT to 0-2000mT. The probe has a high linearity of ±0.5%~±1.0% and a measuring accuracy of ±1.0% ~ ±2.0%.

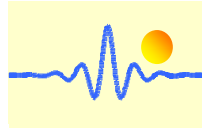


## 1. Characteristics

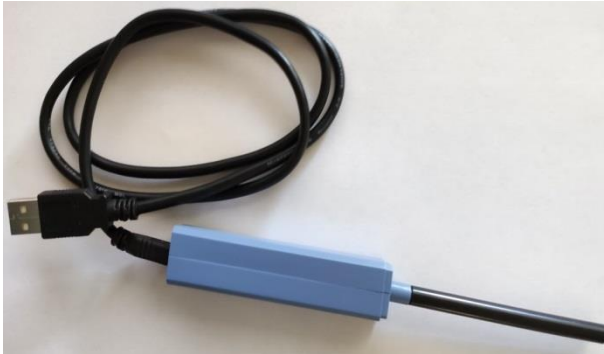
- The Hall probe gives an analog voltage output of 2.5VDC±2VAC/DC. It can be integrated in different measuring and controlling systems for magnetic field measurement.
- The Hall probe is powered with a single voltage source +5VDC that can be provided in the most microprocessor controlled systems through USB Cable.
- A low-cost measuring device, which is easy to operate and convenient to handle and store.
- Ideal for quick quality checks and comparative measurements

## 2. Technical Data

Measuring range:	0-50mT to 0-2000mT (for AC/DC magnetic field, measuring rang can be adjusted according to requirements of customer. Part number is CYAP98-xxxmT, for instance, CYAP98-200mT for measuring range 0-200mT)
Voltage output:	2.5VDC ± 2VAC/DC (calibrated with DC magnet field as Standard)
Power supply:	+5VDC (± 5%)
Linearity:	±0.5% for DC Measurement, ±1.0% for AC Measurement
Hysteresis:	±0.25%
Accuracy:	±1.0% for DC Measurement, ±2.0% for AC Measurement
Frequency range:	DC, 10Hz ~ 10 kHz
Operation temperature range:	-25°C ~ +70°C
Relative humidity:	20% ~ 80%
Dimensions (without cable):	180 x 18 x 20mm (probe dimensions: Ø7 x 80mm)
Weight (without cable):	30g



### 3. Connection



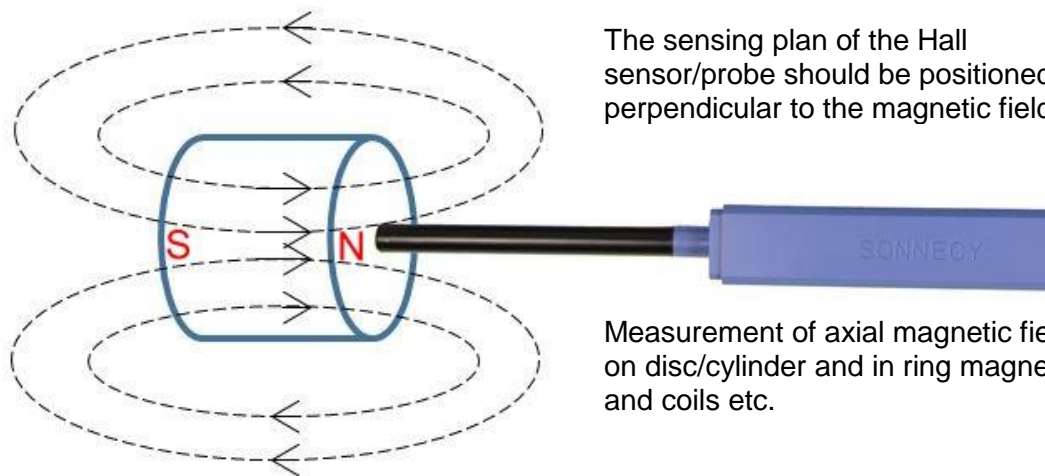
The Hall probe is connected to the measuring station with a USB-A to USB-B-micro cable..



- 1 – Vin: 5VDC
- 2 – Output voltage  $V_{out}$
- 3 – NC
- 4 – Ground

### 4. Functions

The CYAP98 can be used to measure the magnetic field by putting the head of the Hall probe on the surface of the measured magnet or at the measuring point of a magnetic field. The magnetic lines of the measured magnetic field should perpendicularly pass through the Hall Effect element of the Hall probe.

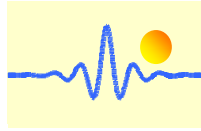


The sensing plan of the Hall sensor/probe should be positioned perpendicular to the magnetic field

Measurement of axial magnetic field on disc/cylinder and in ring magnets and coils etc.

By increasing the magnetic field, a linear behavior at the voltage output should be visible.





The front of the Hall probe is marked with a sticker on which, in addition to the ChenYang logo, the type designation and serial number of the probe and its measuring range can be read.

## 5. Application

This Hall probe is used to measure the field density of magnetic fields in permanent magnets, electromagnets, motors, loudspeakers, magnetic sensors and transducers, as well as other machines and instruments in use with a digital voltage meter. The measured magnetic flux density  $B$  can be easily calculated from the voltage signal of the Hall probe:

$$B = \frac{B_{\text{Max}}}{2} * (V_{\text{out}} - 2.5) \quad (\text{mT})$$

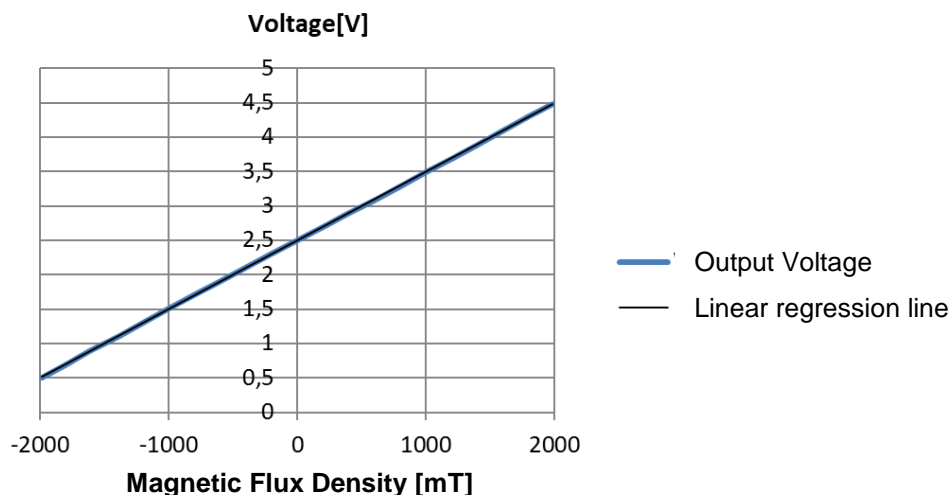
where  $V_{\text{out}}$  (in V) is the output voltage of the Hall probe and  $B_{\text{Max}}$  (in mT) is the maximum value of the measuring range of the Hall probe.

### Notes:

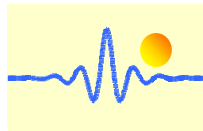
Please use the sensor head of the Hall probe carefully. Use the Protective cap after use to avoid damage to the sensor head.

## 6. Calibration data

The calibration is processed with a reference Gaugmeter type FH54 for measuring the magnetic field strength of an electromagnet and with an Agilent 34401A multimeter for measuring the output voltage of the Hall probe (e.B. CYAP98-2000mT). Here is the calibration characteristic in the measuring range -2000mT x 2000mT:



Dependence of the output voltage on the measured magnetic flux density and linearity matching with the ideal characteristic curve



### Calibration results by using magnetic field generated by an electromagnet

DC Magnetic flux density (mT)	Output voltage of the Hall probe (V)	Reference voltage (V)	Linearity of the Hall probe (%)
-1988	0,507	0,512	0,2
-1798	0,694	0,702	0,32
-1619	0,888	0,881	-0,28
-1389	1,114	1,111	-0,12
-1205	1,304	1,295	-0,36
-1001	1,509	1,499	-0,4
-795	1,716	1,705	-0,44
-602	1,909	1,898	-0,44
-404	2,105	2,096	-0,36
-205	2,302	2,295	-0,28
0	2,500	2,500	0
210	2,705	2,710	0,2
390	2,881	2,890	0,36
604	3,095	3,104	0,36
795	3,285	3,295	0,4
999	3,488	3,499	0,44
1211	3,703	3,711	0,32
1389	3,882	3,889	0,28
1587	4,079	4,087	0,32
1801	4,299	4,301	0,08
1985	4,486	4,485	-0,05

## 7. Warranty

ChenYang 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 unauthorised repair/modification of the products shall render this warranty null and void.