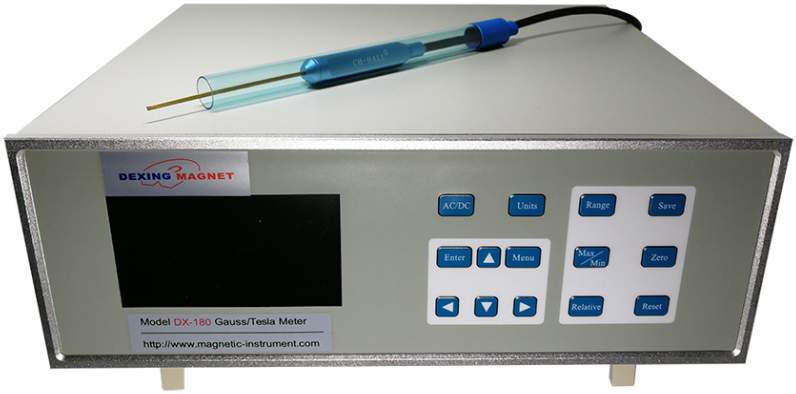
User's Manual
Model DX-180
Digital Gaussmeter



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LIMITED WARRANTY STATEMENT

Dexing warrants that this Dexing product (the "Product") will be free from defects in materials and workmanship for the Warranty Period specified as 12 months from the date of delivery of the Product. If Dexing receives notice of any such defects during the Warranty Period and the Product is shipped freight prepaid, Dexing will, at its option, either repair or replace the Product if it is so defective without charge to the owner for parts, service labor or associated customary return shipping cost. Replacement or repaired parts will be warranted for only the unexpired portion of the original warranty. This limited warranty does not apply to defects in the Product resulting from improper or inadequate maintenance, repair or calibration.
Dexing Magnet Tech.Co.,Ltd. can provide maintenance services to the product out of the warranty period with charge to the owner for parts, service labor or associated customary return shipping cost. Replacement or repaired parts will be warranted for 90 days.
In any circumstances, Dexing Magnet Tech.Co.,Ltd. has the right to refuse to provide any form of warranty, repair or maintenance services if this product has been unauthorized modified or misused.

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CHAPTER 1 INTRODUCTION

1.0 GENERAL

This chapter provides an introduction to the Dexing Model 180 Gauss/Tesla meter. The Model DX-180 was designed and manufactured in BeiJing of China by Dexing Magnet Tech.Co.,Ltd. The Model DX-180 is a extremely highly accurate and high resulation intellectualized gaussmeter well suited for field work. It features:

Resolution to 5¾ Digits VGA
Basic accuracy of measurement: readings×±0.05% ± range×±0.005%
A maximum / minimum value/ peak values/ gorge value hold / screen locked
Basic resolution: 0.00001mT
Data storage (Auto / Manual) / stored data read
Auto-zero, automatic, manual selecting range
Probe auto calibration/ auto memory operation mode
RS232 Serial Interface/ USB data communication/ BNC Interface
Display unit can be gauss, tesla, A/M or Oe
Zero setting/Relative measurement mode/ The sampling rate can be changed from 20Hz-300Hz
Measurement graphical display, Local self-mapping, Communication baud rate adjustable
Threshold settings and alarm
Date, time, temperature Settings/ brightness display
Dozens of basic Optional Probe or custom probe (Standard 0.80mm ultra-thin consistency probe)

If you have just received your new Model 180, please proceed to Chapter 2 and become familiar with the installation instructions. Complete and detailed instrument and probe operational information is contained in Chapter 3. Chapter 4 contains details on remote operation using the Serial Interface. Details on accessories and probes are provided in Chapter 5. Optional parts are contained in Chapter 6. maintenance is contained in Chapter 7. Appendix A is a glossary of terminology. Appendix B provides units for magnetic properties.
It is welcome to annotate this manual. Though we have done our best to maintain the correctness of the manual, there is a possibility to have errors. When you report a specifically error, please give out a brief description dedicate the Chapter, illustration, table, Paragraph. We will appreciate that you send this annotation to Dexing Magnet Tech.Co.,Ltd.

Figure 1-1 DX-180Gauss/Tesla meter Front Panel

1.1 PRODUCT DESCRIPTION

The Fully Digital Model 180 Gauss/Tesla meter is well suited to meet these requirements with extremely high accuracy and very high resolution in the magnet testing application. It integrates varieties of the latest high-tech digital technology, with measuring range from DC to the AC magnetic field 50KHZ. it can auto zero, and auto range. Hold Mode is selectable from maximum value, minimum value, and peak and valley values. Instrument can simultaneously measure and display six kinds of parameters. Units of measure is selectable from Gauss, Tesla, A / M or Oe. The Guass Meter takes with RS-232C interface and it is standard designed and produced in accordance with ISO-9000. Bright VGA color graphics, excellent self-mapping function, full menu operation, 5 ¾-bit readings, high-resolution of 1 / 600000 make your measurements in high magnetic fields aware of 0.0001mT weak outlook changes. The guass meter gets the largest range of 300KG (30T) and has large-capacity data storage and storage-data storage reading and querying in time-sequence. The sampling rate can be changed from 20Hz-300Hz. Professional graphics software can draw the chart, according to the magnetic field strength. The Guass Meter equipped with optional remote control systems. Our products are mainly sold in institutes of measurement, research institutes, universities and research departments of major companies.

High accuracy, high resolution

Combined with high accuracy digital instrument and high accuracy digital hall probe, DX-180 Gaussmeter makes its accuracy up to ±0.05% of reading ±0.005% of range，basic resolution to 0.00001mT, and then it comes up to the top level of the field measuring world.

High Intelligence, multifunction

DX-180 Gaussmeter has multifunctions such as measuring the direct current and AC Magnetic Field, max /min / peak/valley values hold on / locking layout, and data storage (manual /automatic) / data reading, excellent graphics and self-test pattern display function, probe autocorrection, automatically memorize the operation mode, auto-zero,

automatic / manual adjust range, threshold setting and alarm-reporting, show temperature and time and brightness self-setting, display unit optional: Gauss/Tesla, A/M or Oe.

Automation

The DX-180 has a variety of interface features that are compatible with automated test configurations. The RS-232C Serial Interface can perform nearly every function of the instrument front panel. Two analog voltages and an alarm relay facilitate automation without a computer. At the same time, DX-180's monitoring analog output cases to provide supplementary automation capabilities and an optional remote control system without the use of PC.

Conformity

The DX-180 has strong stability and conformity. The conformity can reach 0.1% (stable magnetic field).

Probe

The DX-180 is delivered with Dexing all serial one-dimensional transverse and axial probe. Probes are factory calibrated for accuracy and interchangeability. Calibration data is loaded into a PROM located in the probe connector so that it does not have to be entered by the user.

1.2 SPECIFICATIONS

1.2.1 General Measurement

Number of Input: 1
Update Rate: 3 readings per second on display; up to 18 readings with serial interface
Probe Compatibility: Dexing serial probes,
Probe Features: linearity correction, Auto zero
Connector: 15 pin D style

1.2.2 DC Measurement

DC Accuracy: ±0.05% of reading ±0.015% of range
DC Range: 0-30T (300kG)
DC Temp. Coefficient: ±0.02% of reading /°C
DC measurement Resolution: 0.001G (0.0001mT)

1.2.3 AC Measurement

DC Accuracy: ±1% of reading ±0. 5% of range
Frequency Measurement Range: 2Hz-50 kHz
Frequency Dsiplay Range: 2Hz-2.5kHz
DC Range: 0-3T (30kG)
DC Temp. Coefficient: ±0.03% of reading /°C
DC Measurement Resolution: 0. 01G (0.001mT)

CAUTION: measuring in the maximal or minimal-scale needs to replace new probe!!!

1.2.4 Front Panel

Display Type: 320 * 240 Color LCD Screen
Display Units: Gauss (G), Tesla (T), Oster (Oe), Meter/Amps(M/A)
Keypad: 14 key membrane
Front Panel Features: keypad direct operation, display prompts

Figure 1-2 line 3,46 displays the peak Readings

1.2.5 Interfaces functions

RS-232C Capabilities:
Baud: 19200, 57600, 115200
Connector: 9 pin D style (DB9), DCE configuration (direct connected to PC)
Monitoring Analog Output (BNC):
The output stage: real-time analog voltage output
Output range: ± 3V
Output ratio: ± 3V corresponding to ± 3T (30kG)/ ± 3V corresponding to ± 30T (300kG)
Accuracy: depend on probe
Load capacity: minimum load resistance 1k (short-circuit protected)
Connector: coaxial cable connector (BNC)

1.2.6 General

Ambient Temperature: 15 – 35 °C at rated accuracy. 0 °C – 40 °C with reduced accuracy.
Power Requirement: 220 VAC (+5%, -10%), 50 or 60 Hz, 20 W
Size: W×H×D= 320mm × 110 mm × 287 mm, (12.5 × 4.3 × 11.3 inches)
Weight: 4kg

1.2.7 Ordering Information

Part Number	Description
Instrument	
DX-180	the Model DX-180 Gauss/Tesla meter

Accessories Included:

Model HCHD801F	one regular digital slim transverse hall probe with range of 0-10T (0-10kG)
220-10	one 220VAC power wire
Man-DX-180	one user manual for DX-180 gauss/tesla meter
RS232-DCE9	one 9 pin RS232 direct communication cable
Calibration certification	one
Warranty	one

Accessories Optional:

RS232-USB	one RS232 TO USB 2.0 interface transfer or IEEE485
Dexing	one zero gauss chamber
Dexing	one professional drawing software
Dexing	one remote control system

1.3 SAFETY SUMMARY

Observe the following general safety precautions during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Dexing Magnet Tech.Co.,Ltd. assumes no liability for customer failure to comply with these requirements.

Please read carefully the following general safety precautions during all phases of operation, service, and repair of this instrument. The instrument should be operated by Professional who are familiar with **shock hazard** and can deal with the damage made by **shock hazard**. When the instrument is in function of all phases of measuring or control, any other circuit may carry with danger voltage what means that r.m.s values of AC voltage is greater than 30V, and that peak voltage is greater than 42.4V, or that AC voltage is greater than 60V, and may cause the **shock hazard** accident. The danger voltage can appear on the box of DX-180, the cable plug, the cable receptacle, sensor

metal shell, measuring fixture, or any place of any instruments that connect to DX-180. The Model DX-180 protects the operator and surrounding area from electric shock or burn, mechanical hazards, excessive temperature, and spread of fire from the instrument. Environmental conditions outside of the conditions below may pose a hazard to the operator and surrounding area.

• Temperature: 5 – 40 °C.
• Maximum Relative Humidity: 80% for temperatures below 31 °C.
• Power Supply Voltage Fluctuations: under ±10% of the nominal voltage.

Ground The Instrument

To minimize shock hazard, connect instrument chassis and cabinet to an electrical ground. The instrument is equipped with a three-conductor AC power cable; either plug it into an approved three-contact outlet or use a three-contact adapter with the grounding wire (green) firmly connected to a ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet safety standards of the state.

Do Not Operate In an Explosive Atmosphere

Do not operate the instrument in the presence of flammable gases or fumes. It is a safety hazard.

Keep Away From Live Circuits inside the Instrument

Operating personnel must not remove instrument covers. Refer component replacement and internal adjustments to qualified maintenance personnel. Do not replace components with power cable connected. To avoid injuries, always disconnect power and discharge circuits before touching them.

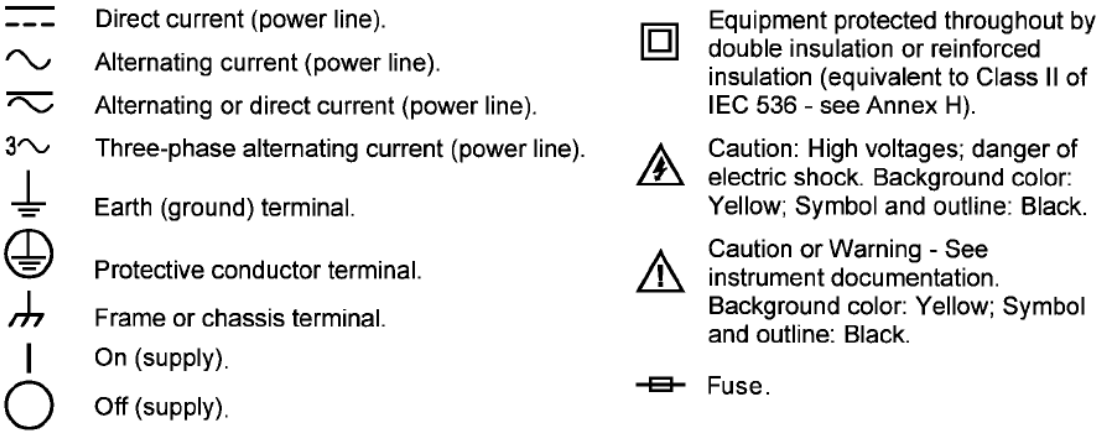
Do Not Substitute Parts or Modify Instrument

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to an authorized Dexing Magnet Tech.Co.,Ltd. representative for service and repair to ensure that safety features are maintained.

Do Not Place Conductive Probes against Exposed Electrical Circuits

Some Gauss/Tesla meter probes are equipped with conductive sheaths. Keep these probes away from live electrical circuits.

1.4 SAFETY SYMBOLS



CHAPTER 2 INSTALLATION

2.0 GENERAL

This chapter provides general installation instructions for the Model DX-180 Gauss/Tesla meter. Inspection and unpacking instructions are provided in Paragraph 2.1. Repackaging for shipment instructions are provided in Paragraph 2.2. An definition of rear panel controls is provided in Paragraph 2.3-2.7. Finally, an initial setup and system checkout procedure is provided in Paragraph 2.8.

2.1 INSPECTION AND UNPACKING

Inspect shipping containers for external damage, and damage (apparent or concealed) or partial loss of shipment. If damage or loss is apparent, please notify the shipping agent immediately.
Open the shipping containers. A packing list is included with the system to simplify checking that the instrument, probe(s), accessories, and manual were received. Please use the packing list and the spaces provided to check off each item as the instrument is unpacked. Inspect for damage. Be sure to inventory all components supplied before discarding any shipping materials. If there is damage to the instrument in transit, be sure to file proper claims promptly with the carrier and insurance company. Please advise Dexing Electronic devices of such filings. In case of parts or accessory shortages, advise Dexing immediately. Dexing cannot be responsible for any missing parts unless notified within 10 days of shipment.

2.2 REPACKAGING FOR SHIPMENT

If it is necessary to return the Model DX-180, probe(s), or accessories for repair or replacement,
The original packing material should be retained for reshipment. Please packet the instrument with protecting bag, and use the original packing filler to protect, repackage them in original packing box, and tied up with nylon belts, and paste the shipping label and “FRAGILE” label.
Because of their fragility, Dexing probes are shipped in special cardboard and foam boxes. These boxes should be retained for storage of probes while the Gauss/Tesla meter is not in use. The same box can be used to return probes to Dexing for recalibration or repair.

2.3 REAR PANEL DEFINITION

This paragraph provides a description of the Model DX-180 rear panel connections. The rear panel consists of: 1) the line input assembly, safe subassembly, 2) RS232 Connector, 3) Monitor the analog output BNC connector, 4) Probe Input Connector. Please read paragraph2.3-2.7 then proceed to Paragraph 2.8 for the initial setup and system checkout procedure. Rear panel connector pin-out details are provided in Chapter 7 – Service.

WARING: Verify AC Line Voltage shown in the fuse holder window is appropriate for the intended AC power input. Also remove and verify the proper fuse is installed before plugging in and turning on the instrument.

WARING: Always turn off the instrument before making any rear panel connections. This is especially critical when making probe to instrument connections.

Figure 2-1 Dexing DX-180 Gauss/Tesla Meter 's Rear panel

2.4 Line Voltage and Fuse Verification

To verify proper line voltage selection look at the indicator in the window on the fuse drawer of the line input assembly. Line voltage should be in the range shown in the specifications listed on the back of the instrument. See Figure 2-2. The Model DX-180 includes a three-conductor power cord. Line voltage is present across the outer two conductors. The center conductor is a safety ground and connects to the instrument metal chassis.

For safety, plug the cord into a properly grounded three-pronged receptacle or adapter that meets the safe standard of the state.

The fuse must be removed to verify its value, refer to the procedure. Use slow-blow fuses of the value specified on back of the instrument.

The power switch turns the instrument On and Off and is located in the line input assembly on the instrument rear. When l is raised, the instrument is On. When O is raised, the instrument is Off.

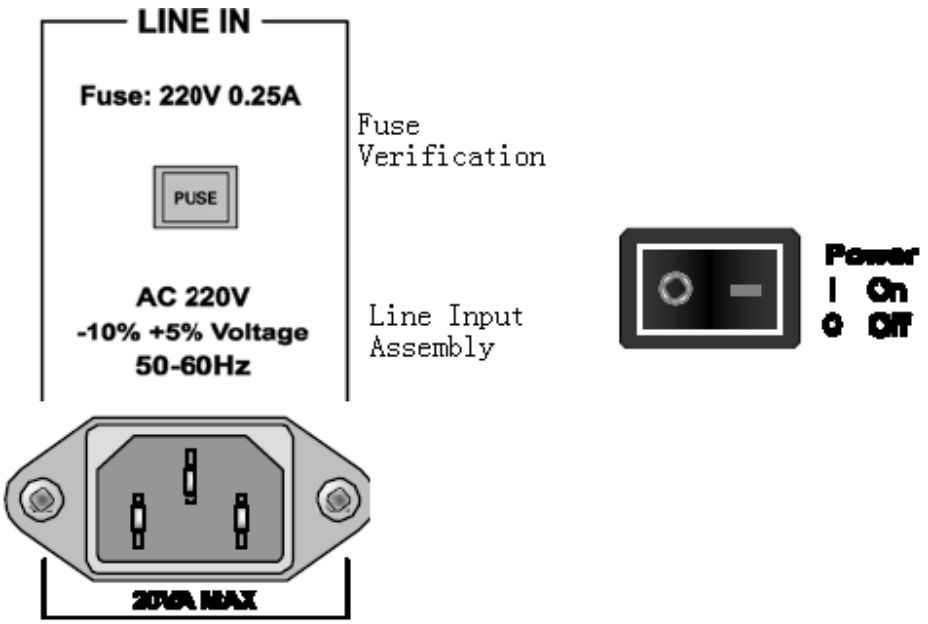


Figure 2-2 A:Line Input Assembly and Fuse Verification(Left rear panel)
B:Power Switch (low left of the front panel)

2.5 PROBE INPUT CONNECTION

WARNING: Some probes used with the Gauss/Tesla meter have conductive parts. Never probe near exposed live voltage. Personal injury and damage to the instrument may result.
WARING: Always turn off the instrument before making any rear panel Probe Input connections.
Dexing instrument should always go with the Dexing serial Hall probes. Never use any other kind of probes in order of avoiding instrument and probe damage. Dexing probes plug into the 15 pin D-style connector on the Model DX-180 rear panel. Turn the instrument off and plug the power cord out of the power input receptacle before attaching a probe. Avoiding bending the contact pin, straightly and gently insert the probe input connecter into the rear panel connector. For reliability, please use thumbscrews attached to the probe connector to tighten connector to unit on the rear panel. Thumbscrews can ensure cable safe and avoid disturbance.
When power is turned on, the instrument reads parameters from probe memory. The probe is ready to use. No parameters need to be entered into the Model DX-180. However, the Zero Probe function should be performed the first time a probe is used with the instrument and periodically during use.

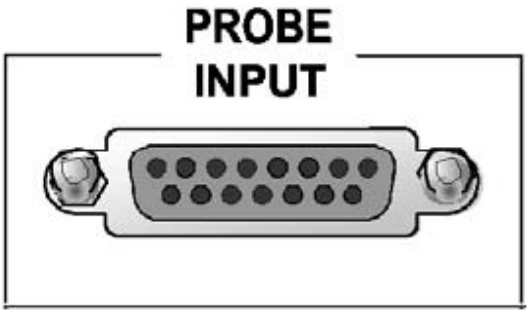


Figure 2-3 PROBE INPUT Connector

2.6 Monitoring Analog Output(BNC)

DX-180 using the BNC jack provides analog output with signals in the center conductor and land as shell. Monitor the analog output is proportional to the magnetic field strength of the analog signal; refer to Chapter 3 for more information to monitor the operation of the analog output.

Figure 2-4 Monitor analog output BNC Connector

2.7 RS-232C CONNECTION

The Model DX-180 has a 9 pin D-Subminiature plug on the rear panel for serial communication, and DCE configuration. it can connect to PC by 9 pin serial port through the direct cable, or by 25 pin serial port through the 9 pin to 25 pin cable. Find more information about Serial cable connection in chapter 7.
DX-180 has as optional accessory RS232 to USB 2.0 interface transfer that will transfer the DX-180 serial port to USB, along with it the windows driver in the installation disk. For more information please see in chapter 5.

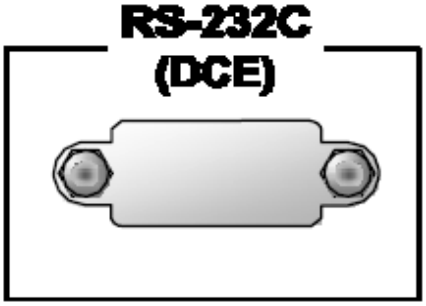


Figure 2-4 RS-232 (DTC) Connector

2.8 INITIAL SETUP AND SYSTEM CHECKOUT PROCEDURE

The following procedure is an initial instrument setup and checkout procedure. The intent of this procedure is to verify basic operation of the unit before beginning use for measurements.

1. Ensure the power switch is in the off (**O**) position.

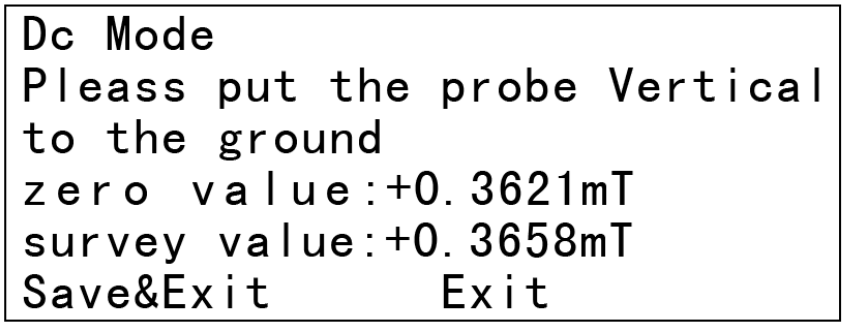
WARING: The probe must be connected to the rear of the unit before applying power to the Gauss/Tesla meter. Damage to the probe may occur if connected with power on.

2. Plug in the probe connector to 15 pin PROBE INPUT. Use thumbscrews to tighten connector to unit.
3. Ensure any other rear panel connections (SERIAL I/O or ANALOG OUTPUTS) are connected before applying power to the unit.
4. Check window in fuse drawer for proper voltage setting.
5. Plug line cord into receptacle. Plug the other end of the line cord into an approved three-contact outlet or use a three-contact adapter with the grounding wire (green) firmly connected to a ground (safety ground) at the power outlet.

NOTE: For best results, the instrument and probe should warm up for at least 15 minutes before
zeroing the probe, and at least 30 minutes for rated accuracy.

6. DX-180 provides two zeroing mode:

Relative zero-field mode: Place the probe in the zero gauss chamber and press the front panel **MENU** key, and through the up/down key to entry the check-zero-interface. The display below appears:



Adjust till the **Sav&Exit** turns yellow, and press the front panel **Enter**, and that will accomplish the zero-check automatic.

Eliminating geomagnetism mode: put the probe horizontal, perpendicular to geomagnetic field, and press the front panel **MENU** key, and through the up/down key to entry the check-zero-interface. Adjust till the **Sav&Exit** turns yellow, and press the front panel Enter, and that will accomplish the zero-check automatic.

Never move the probe in the process of check-zero which followed by a return to the normal display.

NOTE: If the unit has performed well to this point, the unit is functioning properly. The thickness of the probe has little influence to testing accuracy while testing the uniform magnetic field, however while testing non-uniform magnetic field, because of magnetic field loss, the measurement will be more accuracy when the hull instrument is closer to the material surface. Using the thin probe is suggested.

Once this abbreviated checkout procedure is successfully completed, the unit is ready for normal operation. Please proceed to Chapter 3 for further operational information.

CHAPTER 3 OPERATION

3.0 GENERAL

This chapter describes Model DX-180 Gauss/Tesla meter operation. The front panel controls are described in Paragraph 3.1. Paragraphs 3.2 thru 3.9 describe the various front panel functions in detail. Finally, Paragraph 3.10 provides probe handling considerations.

3.1 DEFINITION OF FRONT PANEL CONTROLS

This paragraph provides a description of the front panel controls on the Model DX-180.

Figure 3-1 DX-180 Gauss/Tesla Meter's Front Panel

3.1.1 Front Panel Keypad

The keys on the front panel are defined as follows. Note the following are abbreviated descriptions of each key. A more detailed description of each function is provided in subsequent paragraphs.

Ac/Dc: Selects AC magnetic field and DC magnetic field

Units: Changes display units among gauss, tesla, A/M, Oe. Gauss (G) is used in the cgs system, tesla(T) is used in the SI system, where 1 T = 104 G. A/M as Amps per Meter, Oe means Oster.

Range: Selects a manual field measurement Autorange or three-range.

Save: Used to store the data through the set way.

▲ ▼: Shifts between various settings shown in the display and increments / decrements a numerical display. It can display as up, down key, and also left, right key.

Menu: Used to open the menu.

Max/Min: turns the peak reading measuring feature on and off. Capture and display the

highest or lowest field readings, and hold on the interface.
Zero: Used to zero or eliminate effects of ambient low level fields from the probe.
Enter: Accepts changes to parameter setting.
Relative: Relative mode button, recording the relative value.
Reset: Peak reading resets. Clears current peak reading.

3.1.2 Front Panel Display

In normal operation, with graphic display, color LED provides current magnetic reading Range, AC and DC magnetic field selection, zero-trigger and relative value-trigger, peak-reset on the top row and current magnetic readings, unit as well as N/S polarity (indicated by plus or minus) on the 2nd row with wide highlight attribute and maximum on the third row and minimum m on the fourth row and date, temperatures in the instrument and probe point(needed to be probe with temperature sensor).

Figure 3-2 DX-180 Gauss/Telsa Meter Front Panel Display Definition

3.1.3 General Keypad Operation

Human interface with the instrument is provided by the 10 buttons that comprise the front panel keypad. Most operations can be performed through the front-panel keypad and monitored by watching the color front panel display.
There are three basic keypad operations:
1. **Direct Operation:** The following key functions occurs upon pressing the key: **AC/DC**, **Menu**, **Zero**, **Enter**, **Relative**, **Reset**.
2. **Itinerant Operation:** The following functions will display a selection of settings immediately upon **Units**, **Range**, **Save** and **Max/Min**.
3. **Setting Selection:** Pressing the **Menu** key will enter the menu interface.

3.2 AC/DC key

AC/DC is used for shift mode among DC, ACL and ACH. In AC mode, it displays the RMS

and frequency values (Hz) of AC magnetic field.
The measurement range of ACH is 20Hz to 50KHz. Measurement interface is shown in Figure 3-3. In ACH mode, when the RMS is fixed in 50mT, the relation between measure error(%) and frequency(Hz) is shown in Figure 3-4; when the frequency is fixed in 1kHz, the relation between measure error(%) and RMS(mT) is shown in Figure 3-5.

Figure 3-3 Measurement interface of ACH

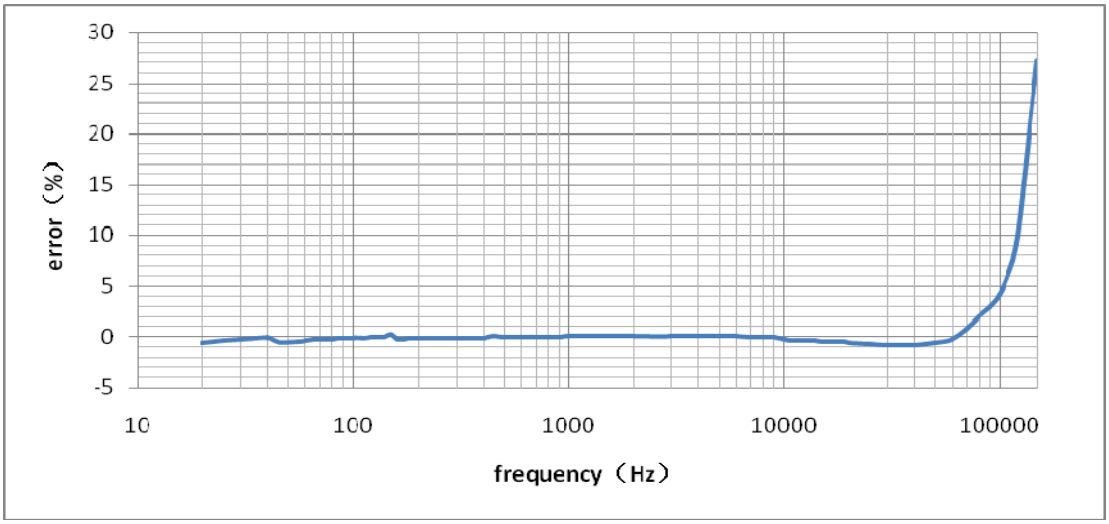


Figure 3-4 The relation between measure error(%) and frequency(Hz)

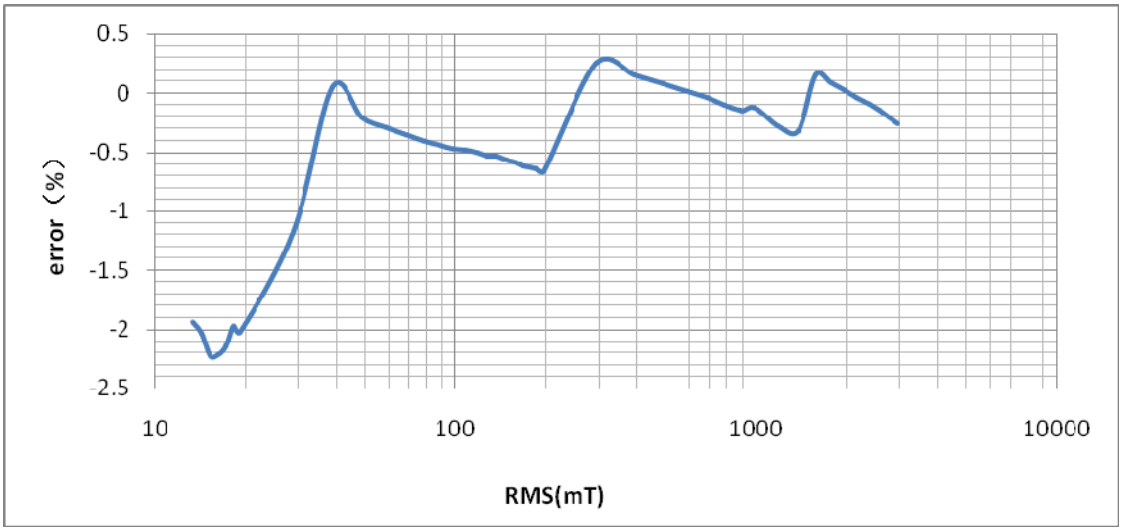


Figure 3-5 The relation between measure error(%) and RMS(mT)

The measurement range of ACL is 2Hz to 40Hz. Measurement interface of sine wave is shown in Figure 3-6.

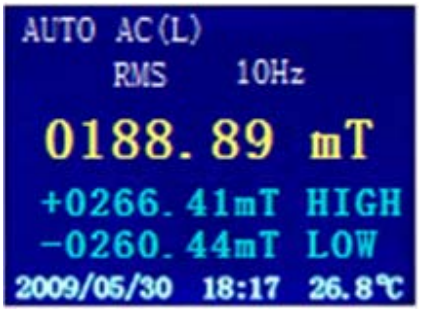


Figure 3-6 Measurement interface of sine wave in ACL mode

3.3 Units

The Model DX-180 displays magnetic field values in gauss (G), tesla (T), Amps/Meter(A/M) or Oster(Oe).

3.4 Range

Pressing the **Range** key toggles the range between the Auto Range mode and the three Handle mode.

DX-180 Gaussmeter(ranges)	*0-30G	0-300G	0-3kG	0-30kG	*0-300kG
resolution	0.0001G	0.001G	0.01G	0.1G	1G

*represents auto identified range

3.5 Save

Pressing the **Save** key stores the data. Gaussmeter can store and send to PC 500 testing items of data, and when it exceeds, deletes the previous data. Data was inquired in a group of 50 items. Data Storage mode can be random (save once press the **Save** key) or auto-save interval in a setting time. Mode-setting is determinate in Menu ->Save option.

3.6 Menu (single direction movement)

DX-180 provides flexible human-machine interaction. It contains powerful functions and easy accessibility in the menu. When setting Time, threshold, just move the cursor keys transversely.

3.7 Max/Min

turns the peak reading measuring feature on and off. Capture and display the highest or lowest field readings, and hold on the interface.
Gear 1: Maximum/Minimum/Peak values/Gorge value Holding.
Gear 2: interface locked.
Gear 3: interface unlocked.

3.8 Zero

Zero key. Put currect magnetic field to Zero. (not count into the system).It is general used at the beginning of the test.
Note: check-zero mode in the menu will be count into the system.

3.9 Enter

Ensure operation key. Accepts changes to parameter setting.

3.10 Relative

Relative mode button to record the relative values (the value before zero + the current test value)

3.11 Reset

The **Max/Min Reset** key clears the hold value. The hold value is also reset upon power up of DX-180.

3.12 ▼▲ ◀▶

Toggles between various settings shown in the display and increments/decrements a numerical display.

Figure 3-7 DX-180 Gauss/Tels Meter menu sketch

3.13 Menu function-describing

3.13.1 Time setting

Press **Enter**, and use ◀▶ to move the Red cursor from left to right, and through the ▼▲ key to adjust the date and time. After confirmation move the cursor to Exit and press Enter to exit, that will finish the time setting.

3.13.2 Cal check

Only for the manufactory (with password to enter)

3.13.3 Threshold value setting

Press ◀▶ to move the Red cursor from left to right, and through the ▼▲ key to select the input data. It is accurate to 0.01mT. After setting the Range, move the cursor to Exit and press Enter to exit, that will finish the Threshold setting. Out of range will cause the alarm.

3.13.4 Brightness settings

Press Enter to enter, press the ▼▲ key regulator box values to achieve the desired brightness, press Enter to withdraw.

3.13.5 Save setting

Save Timing: Press **Enter** key to enter the interface, then use the ▼▲ key to set time interval of 1-60s for save data. The time interval is adjustable in 1-60s. Press **Enter** to exit.
Random Save: Press **Enter** key to ensure, every time pressing the **Save** key on the front panel will cause a one time data save operation.
Review: It will display the latest 70 items it got. The fiftieth item is the last item DX-180 saved. The items are arranged by its time. Press Enter to exit.
Note: when less than 70 items, it can consecutively saves the data and provides view. After finishing 70 items it will start a new group of item saving. Last group items will be cleaned from the display. Last group items are stored in the memory system. It can be send to PC to inquiry or draw, or to professional Drawing software developed by Dexing to inquiry or draw pictures.

3.13.6 UART baud rate select and send data.

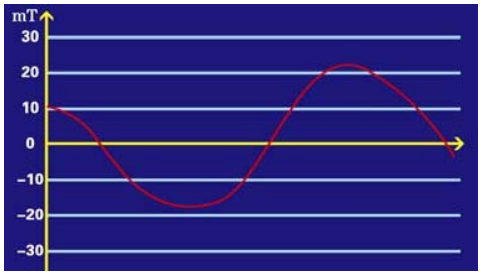
Press **Enter**, and through the ▼▲ key to select the baud rate(the baud rate should be the same with the PC serial port's baud rate). Press **Enter** to start sending data. Ending the transmitting will cause a hint: transmit over. Press Enter to exit.

3.13.7 Zero-check mode

As described in 2.8.

3.13.8 Graph Drawing Mode

Unique Gauss Meter storage auto-mapping mode, Ahead of world-class, DX-8can be observed through the graphical interface, trends in the magnetic field, change the situation. Sub-real-time mapping and historical drawing two modes selectable magnetic field is divided into three ranges (30mT, 300mT, 3000mT).



Real-time Drawing: After selecting the range, it displays changes in the magnetic field real time, press Enter to exit.
Historical drawing: After selecting the range, it mapping according to the previous 70 items.
Monitor analog output
DX-180 used BNC connector to provide Monitor analog output in the post-panel. The BNC connector take the signal as the core line, the grand as shell. Monitor analog output voltage range is of ± 3.0V, and corresponding, the magnetic field range is of ± 3.0T (± 30kG). Monitor analog output voltage are not affected by display units. BNC connector body shell and chassis electrical have connection, but may range potentials, short-circuit between the BNC connector body shell and chassis may affect the analog output accuracy, or cause equipment damage.

3.14 PROBE CONSIDERATIONS

To avoid damage and for best results during use, the probes have a number of handling and accuracy requirements that must be observed. Changing probes is discussed in Paragraph 3.10.1. Probe handling is discussed in Paragraph 3.10.2. Probe operation is discussed in Paragraph 3.10.3. Finally, accuracy considerations are provided in Paragraph 3.10.4.

3.14.1 Changing Probes

DX-180 use Dexing series thin digital probes. A 512-byte Electrically Erasable Programmable Read Only Memory (EEPROM) is included in each probe. The EEPROM stores specific information that the Gaussmeter requires for operation. The information includes serial number, probe sensitivity, and field compensation data. DEXING has been checked before delivery, so there is no need to check again after a new DEXING probe with the same type has been plugged in. in other words, the probe has replaceability.
WARING: The probe must be connected to the rear of the instrument before applying power to the Gaussmeter. Probe memory may be erased if connected with power on. To change probes, first turn power off, remove the existing probe, and then plug in the new probe. When power is restored, the characteristics of the new probe are downloaded to the gaussmeter memory. Normal operation may continue after the new probe offset is nulled using the Zero Probe operation.
If the instrument is powered up with no probe attached, the following message is displayed.

3.14.2 Probe Handling

Although every attempt has been made to make the probes as sturdy as possible, the probes are still fragile. This is especially true for the exposed sensor tip of some transverse probes. Care should be taken during measurements that no pressure is

placed on the tip of the probe. The probe should only be held in place by securing at the handle. The probe stem should never have force applied. Any strain on the sensor may alter the probe calibration, and excessive force may destroy the Hall generator.
CAUTION: Care must be exercised when handling the probe. The tip of the probe is very fragile. Stressing the Hall sensor can alter its calibration. Any excess force can easily break the sensor. Broken sensors are not repairable.
Avoid repeated flexing of the stem of a flexible probe. As a rule, the stem should not be bent more than 45° from the base. Force should never be applied to the tip of the probe. On all probes, do not pinch or allow cables to be struck by any heavy or sharp objects. Although damaged or severed cables can be repaired, please understand that probes are not always repairable.
When probes are installed on the gaussmeter but not in use, the protective tubes provided with many probes should be placed over the probe handle and stem in order to protect the tip. When the gaussmeter is not in use, the probes should be stored separately in some type of rigid container.

3.14.3 Probe Operation

In the DC mode of operation, the orientation of the probe affects the polarity reading of the gaussmeter.
NOTE: For best results, the instrument and probe should warm up for at least 5 minutes before zeroing the probe, and at least 30 minutes for rated accuracy. The probe and the zero gauss chamber should be at the same temperature.
If the exact direction of the magnetic field is unknown, the proper magnitude is determined by turning on **Max Hold** and slowly adjusting the probe. As the probe turns and the measured field rises and falls, its maximum value is held on the display. Make note of the probe orientation at the maximum reading to identify the field orientation.
N pole: + (display) S pole :-(display)

3.14.4 Probe Accuracy Considerations

NOTE: Probe readings are dependent upon the angle of the sensor in relation to the magnetic field. The farther from 90° the angle between the probe and the field, the greater the percentage of error.
NOTE: For best results, the instrument and probe should warm up for at least 5 minutes before zeroing the probe, and at least 30 minutes for rated accuracy. The probe and the zero gauss chamber should be at the same temperature. The user must consider all the possible contributors to the accuracy of the reading. Both the probe and gaussmeter have accuracy specifications that may impact the actual reading. The probe should be zeroed before making critical measurements. The zero probe function is used to null (cancel) out the zero offset of the probe or small magnetic fields. Probe temperature can also affect readings. Please keep it in the temperature of 20°C while it is functioning. Probe readings are dependent on the angle of the sensor (Hall sensor) in relation to the magnetic field. Maximum output occurs when the flux vector is perpendicular to the plane of the sensor. This is the condition that exists during factory calibration. The greater the deviation from orthogonality (from right angles in either of three axes), the larger the error of the reading. See Figure 3-8. Tolerance of instrument, probe, and magnet must be considered for making critical measurements. The accuracy of the gaussmeter reading is better than

±0.05% of reading. Absolute accuracy readings for gaussmeters and Hall probes is a difficult specification to give, because all the variables of the measurement are difficult to reproduce. For example, a 1° error in alignment to the magnetic field causes a 0.15% reading error. Finally, the best probes have an accuracy of ±0.15%. This implies that the absolute accuracy measurement of a magnetic field is not going to reliably be better than ±0.05% under the best of circumstances, and more likely to be 0.15% to 0.20%.

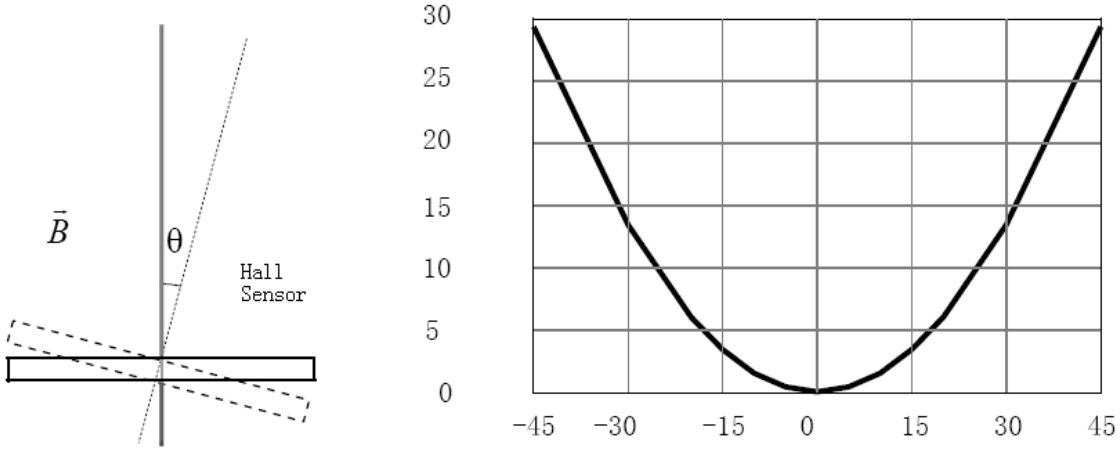


Figure 3-8 Effect Of Angle On Measurements

Note:
1) The high-precision measurement of the magnetic should consider the environment interference, and the stability of laboratory power supplies.
2) If test the objects in multi-point magnetic intensity, you should keep the probe fixed, measured things moving.

3.14.5 Operation chart for transverse probe and axial probe

Using of transverse probe:

(a)the best measurement (b)normal measurement (c)wrong measurement