Ultrasonic Level Transmitter

Operating Instruction

Model: MDLA6

1.Product Overview

1.1 Principle

The working principle of ultrasonic level meter is that the ultrasonic pulse emitted by the transducer (probe)is reflected back after contacting the surface of measured medium, and part of the echo reflected back is received by the transducer and converted into an electrical signal.

The ultrasonic pulse propagates at the speed of sound waves, and the time from emission to reception is in direct proportion to the distance between the transducer to the medium surface. The relation between the distance D, the sound speed C and the time T can be expressed by the following formula:

$$D=Vc\times T/2$$

Since the transmitted ultrasonic pulse has a certain width, the reflected wave in the short region near the transducer overlaps with the transmitted wave, and it cannot be identified, and the distance value cannot be measured. This area is called measurement dead zone, and the size of near blanking area is related to the frequency of ultrasonic level meter.

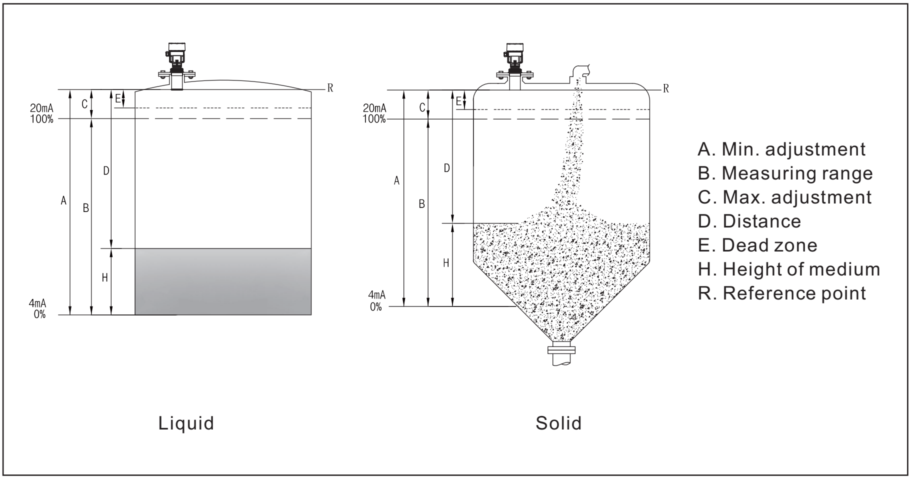


Figure 1

1.2 Applications

The meters are suitable for liquid and solid granules in various industries, especially the industry of water treatment.

1.3 Characteristics

- Adopting the advanced microprocessors
- Unique echo processing technology
- False echo storage function
- Built-in temperature compensation
- Small beam
- Simple scaling and calibration
- Aluminum and plastic cases are optional

2.Introduction to Instrument

MDLA61

Measuring range:

Standard transducer	Anti-corrosion sealed transducer
liquid (0.25～5) m	liquid (0.25～4) m
solid (0.25～2) m	solid (0.25～2) m

Process fitting:G1½"A thread or flange, support

Transducer housing material:PA66+GF30/PVDF

Process temperature:-40～80℃

Process pressure:-0.02～0.1MPa

Accuracy:±0.25%(full range)

Output signal:4~20mA/HART 24V DC (two-wire/four-wire)
4~20mA/HART 220V AC (four-wire)
RS485/Modbus 6~26V DC

Explosion-proof rating:Exia IIB T6 Ga
Exd IIC T6 Gb

Protection rating:IP68

MDLA62

Measuring range:

Standard transducer	Anti-corrosion sealed transducer
liquid (0.3～10) m	liquid (0.3～8) m
solid (0.3～4) m	solid (0.3～4) m

Process fitting:G2"A thread or flange, support

Transducer housing material:PA66+GF30/PVDF

Process temperature:-40～80℃

Process pressure:-0.02～0.1MPa

Accuracy:±0.25%(full range)

Output signal:4~20mA/HART 24V DC (two-wire/four-wire)
4~20mA/HART 220V AC (four-wire)
RS485/Modbus 6~26V DC

Explosion-proof rating:Exia IIB T6 Ga
Exd IIC T6 Gb

Protection rating:IP68

MDLA63

Measuring range:

Standard transducer	Anti-corrosion sealed transducer
liquid (0.4～15) m	liquid (0.4～10) m
solid (0.4～6) m	solid (0.4～6) m

Process fitting:M66X2 thread or flange, support

Transducer housing material:PA66+GF30/PVDF

Process temperature:-40～80℃

Process pressure:-0.02～0.1MPa

Accuracy:±0.25%(full range)

Output signal:4~20mA/HART 24V DC (two-wire/four-wire)
4~20mA/HART 220V AC (four-wire)
RS485/Modbus 6~26V DC

Explosion-proof rating:Exia IIB T6 Ga
Exd IIC T6 Gb

Protection rating:IP68

MDLA64

Measuring range:

Standard transducer	Anti-corrosion sealed transducer
liquid (0.5～20) m	liquid (0.5～15) m
solid (0.5～8) m	solid (0.5～8) m

Process fitting:M95X2 thread or flange, support

Transducer housing material:PA66+GF30

Process temperature:-40～80℃

Process pressure:-0.02～0.1MPa

Accuracy:±0.25%(full range)

Output signal:4~20mA/HART 24V DC (two-wire/four-wire)
4~20mA/HART 220V AC (four-wire)
RS485/Modbus 6~26V DC

Explosion-proof rating:Exia IIB T6 Ga
Exd IIC T6 Gb

Protection rating:IP68

3.Mounting Instructions

The installation position of the instrument should be 1/6 or 1/4 of the diameter of the storage tank.

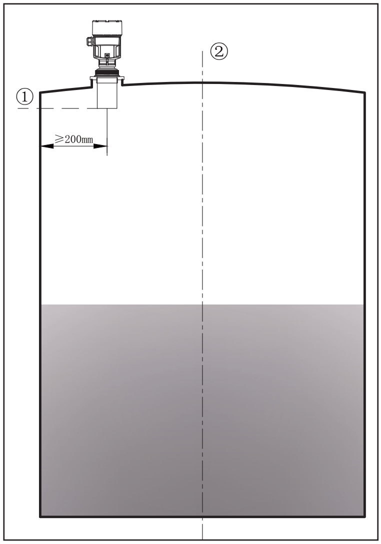


Figure 2

3.1 Description of mounting position

- If the tank diameter is small, the minimum installation distance is ≥200mm.
- When installing MDLA61, MDLA62, MDLA63, the distanceVV between the instrument and the container wall should be at least 200mm, and more than 500mm is recommended. 1 transducer bottom (acoustic emission surface)2 tank centerline

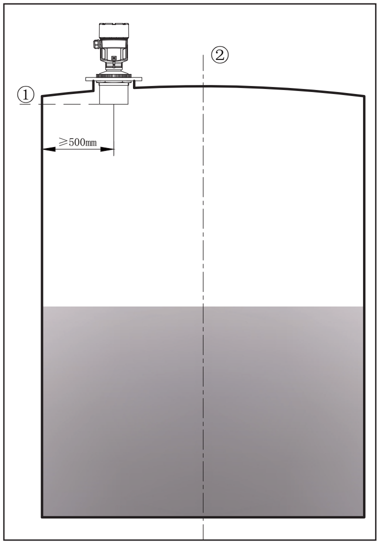


Figure 3

- Installation of MDLA64
  Pay attention to the distance between instrument and vessel wall at least 500mm when installing. 1 transducer bottom (acoustic emission surface)2 tank centerline

3.2 Mounting
3.2.1 Mounting requirements

A certain distance must be kept from instrument and tank wall (see page 3 for the description of installation location). When the transducer emits ultrasonic pulses, a certain beam angle will be generated.Obstacles should be avoided as much as possible from the bottom of transducer to the surface of medium tobe measured, including: ladders, level switches, heating coils, diversion trenches, etc.

Note:

(1) The ultrasonic beam shall not intersect with the feeding material flow; the highest level shall not enter the dead zone when the instrument is installed ; the emission direction of transducer shall be perpendicular to the liquid surface as far as possible when the instrument is installed; the instrument installed in the explosion-proof area must comply with the national installation regulations for explosion-proof hazardous area. The Exia enclosure is made of aluminum. The Exia instruments can be installed in places with explosion-proof requirements, and the instruments must be connected to the ground;

(2) When the flange is adopted in instrument mounting: It is recommended to use PP, PTFE, PA and other plastic flanges for instrument installation at the site. The inner hole of flange can be machined according to the thread size of the ordered instrument or directly processed into a through-hole. The flange should be locked using the threaded nut provided by the manufacturer. When stainless steel flanges are required for on-site installation due to on-site demands, it is strongly recommended to machine the meter mounting holes of stainless steel flange into through-holes (without internal threads). The instrument and flange should be locked using the nut provided by the manufacturer. Flange conversion parts can also be ordered from the manufacturer when stainless steel flanges are used for installation. Please consult the manufacturer for the installation on special working conditions.

3.2.2 Typical error mounting

Do not install the meter above the feeding in let ; otherwise, the actual level will not be detected.

Note: Protection measures should be taken for sun-shading and rain during outdoor installation.

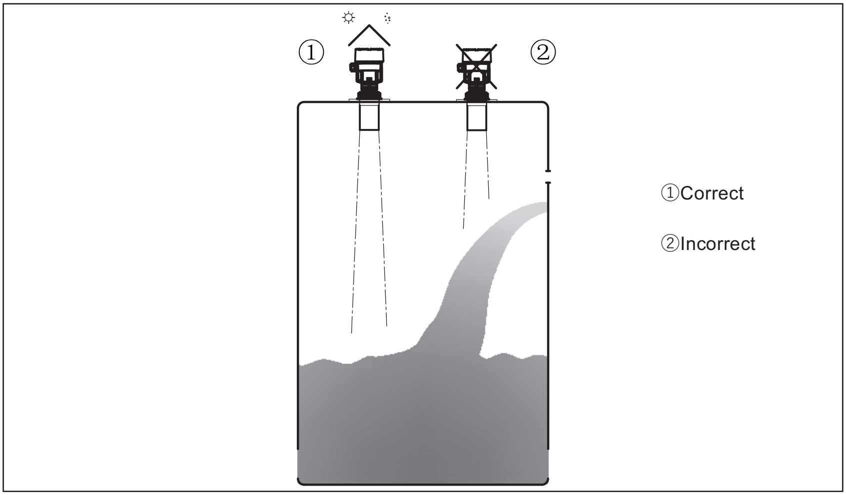


Figure 4

The transducer shall be perpendicular to the surface of the medium to be measured; the instrument shall not be installed in the middle of the arched tank roof to avoid multiple reflections (see Figure 5) .
The instrument shall be installed to avoid obstacles a and B (see Figure 6)

①Correct ②Incorrect ③Incorrect

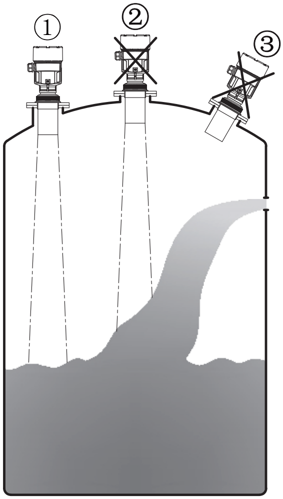


Figure 5

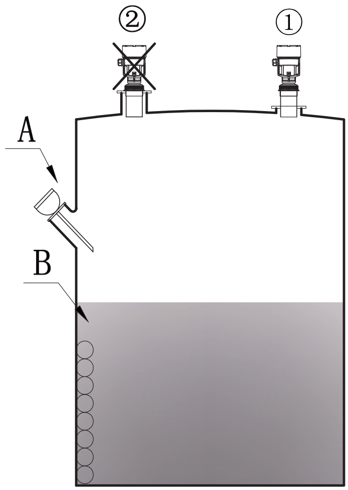
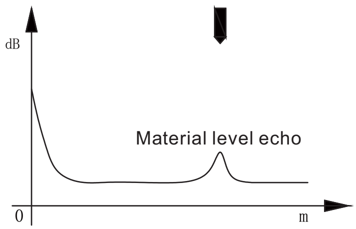


Figure 6



normal echo curve chart

Figure 7

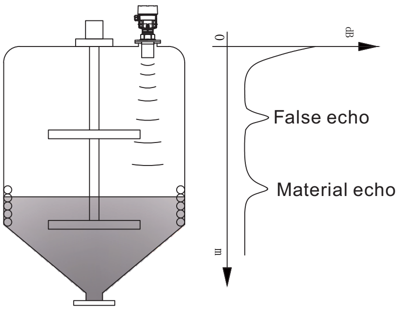
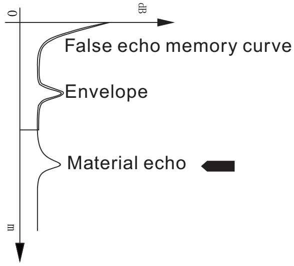


Figure 8

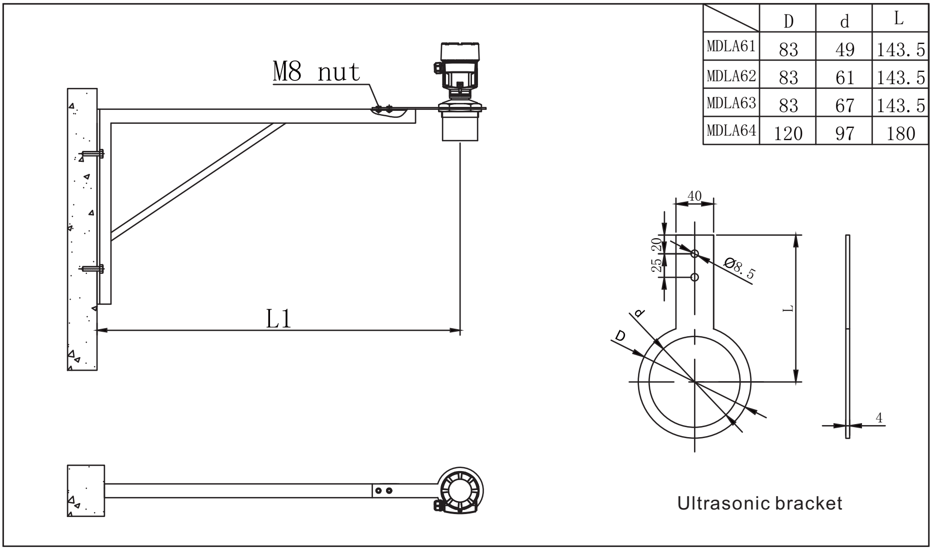


The false echo storage function can eliminate the interference caused by false waves.

Figure 9

3.2.3 Mounting with bracket

Mounting diagram of bracket



	D	d	L
MDLA61	83	49	143.5
MDLA62	83	61	143.5
MDLA63	83	67	143.5
MDLA64	120	97	180

Figure 10

3.2.4 Flange mounting

Mounting diagram of flange

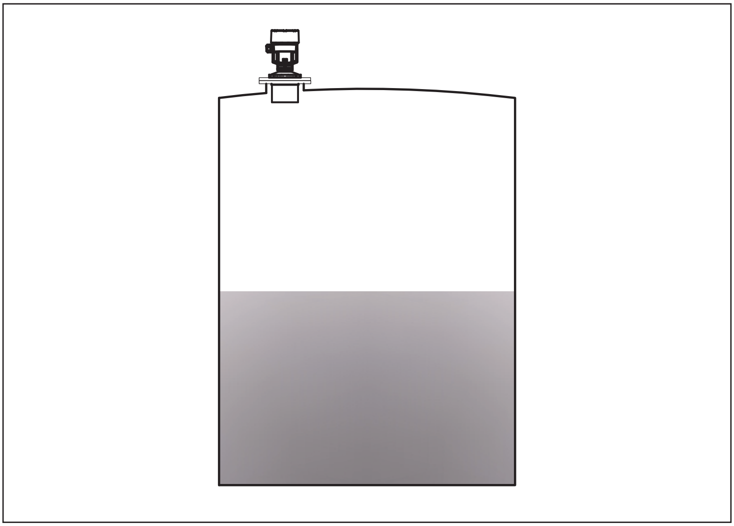


Figure 11

3.2.5 Moisture protection

If the meter is mounted outdoors or in a wet surrounding, the sealing case of the cable should be tightened and bend the cable down as a U-shape at the inlet. As shown below:

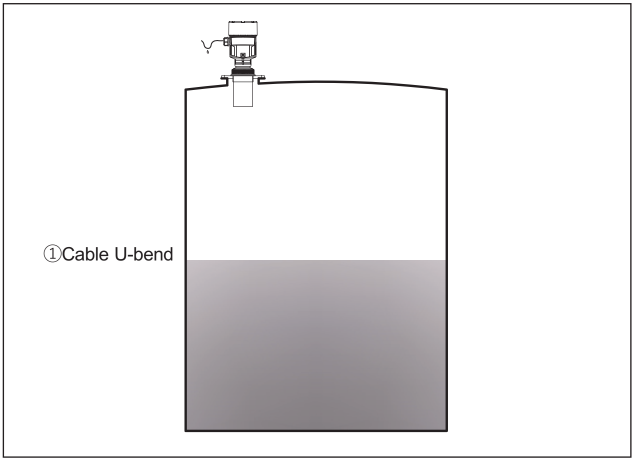


Figure 12

3.2.6 Connecting pipe on the container

The connecting pipe should be long enough to ensure that the transducer sticks out by at least 10mm.

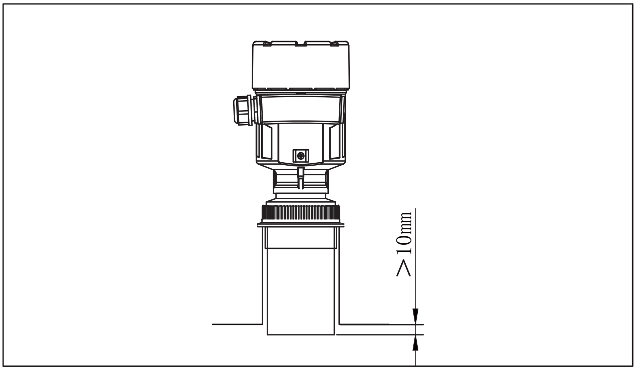


Figure 13

3.2.7 Foam

Foam may be generated on the surface of some liquid media due to feeding, stirring or other process treatment in the container, thus attenuating the emission signal. If any measurement errors are caused due to foam, the transducer should be installed in a guided wave pipe or a guided wave radar level meter shall be used. The measurement of guided wave radar level meter is not affected by foam, so it is the best choice for this application.

3.2.8 Stirring

When stirring operation is required in the tank, the instrument shall be kept away from the stirrer. If foam or wave is generated due to stirring, guide wave pipe shall be used for installation.

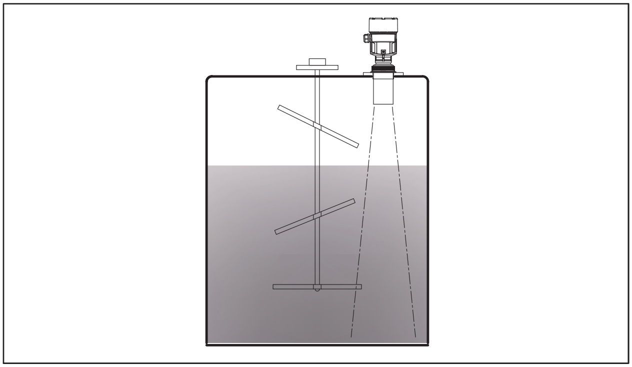


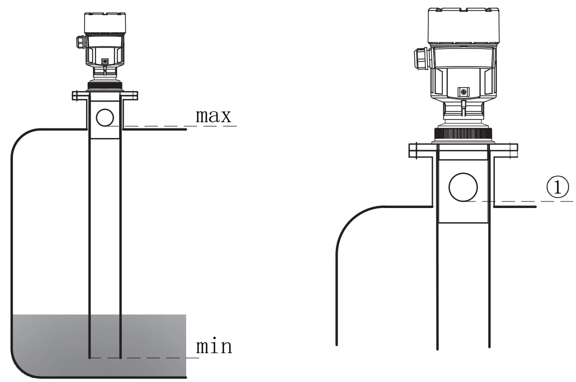
Figure 14

3.2.9 Air flow

If a strong current of air flows in the container. E.g., when the meter is mounted outdoors where the wind is strong or air vortexes are present in the tank. It is recommended to install the transducer in the guide wave pipe, you can also choose the pulse radar level meter or the guided wave radar level meter.

3.2.10 Guided wave pipe mounting

The impact of obstacle, foam and air eddy in the containers could be eliminated by using a guided wave pipe (or bypass pipe) with an isobaric hole diameter of 5-10mm.



Note: the guided wave pipe should not be used in viscous material

Figure 15

4.Connecting to Power Supply

4.1 Power supply mode

DC24V (two-wire system) power supply and 4-20 mA/HART output current signal share the same two-wire cable. See the technical data for the specific supply voltage range. For intrinsically safe type, a safety barrier must be added between the power supply and the meter.

220V AC/24V DC (four-wire system) power supply and 4-20 mA/HART current signal are using a two-wire cable separately. See the technical data for the specific supply voltage range.

The standard meter current can be output in the form of grounding. Explosion-proof meter current must be output in the form of floating in the air. The meter and grounding terminal should be grounded properly.And generally, they can be connected to the grounding points of tank; for plastic tanks, they should beconnected to the near ground.

4.2 Installation of connecting cable

①General introduction

Two-wire cable can be used as the power cable. The outer diameter of cable should be 6-9 mm, to ensure that the cable inlet is sealed.

If there is any electromagnetic interference, it is recommended to use shielded cable.

②4-20mA/HART (two-wire system)

Shielded cable should be used as the power cable.

③4-20mA/HART (four-wire system)

Both ends of shielded cable should be grounded. Inside the meter, the shielded end must be connected directly to the internal ground terminal. The external ground terminal on the enclosure must be connected to ground.

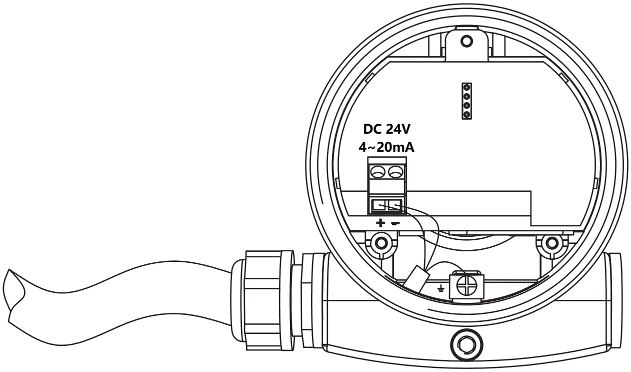
④Shielding and connection of cable

If there is grounding current, the shielded terminal of cable, which is far away from the meter, must be grounded through a ceramic capacitor (E.g., InF 1500V), so as to isolate and bypass high frequency signals.

4.3 Wiring Mode

①Single Chamber Wiring Diagram

24V DC power supply, 4-20mA output bypass high frequency signals.

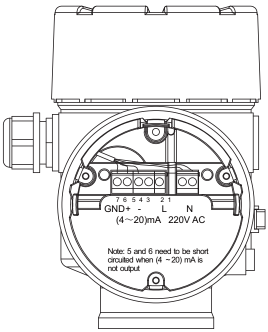


Two-wire wiring diagram

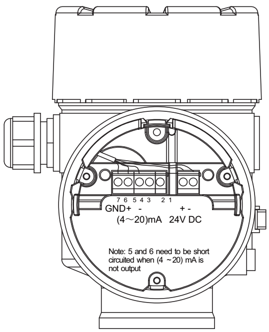
Figure 16

②Double Chamber Wiring Diagram

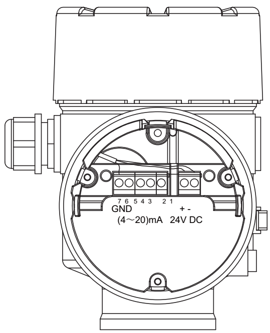
220V AC/50HZ or 24V DC power supply(12V DC power supply is optional)4-20mA output



220V four wire system



24V four wire system



24V two wire system

Figure 17

4.4 Explosion-proof connection

The explosion-proof type of this product is essentially safe. Explosion-proof mark: Exia IIB T 6GA. The intrinsically safe ultrasonic liquid level meter is made of aluminum shell material and glue-sealed structure to ensure that the spark will not leak out when the transducer and the circuit fail. The product is suitable for Exiaiibt6 GA.. Continuous measurement of the level of combustible medium below explosion-proof grade.

This product must be used in explosion-proof occasions with safety grid power supply. All cables shall be shielded cable, the maximum length of 600m. Distributed capacitance ≤0.1 μf/km distributed inductor ≤1mH/km. The ultrasonic level meter must be connected to Earth when it is installed.

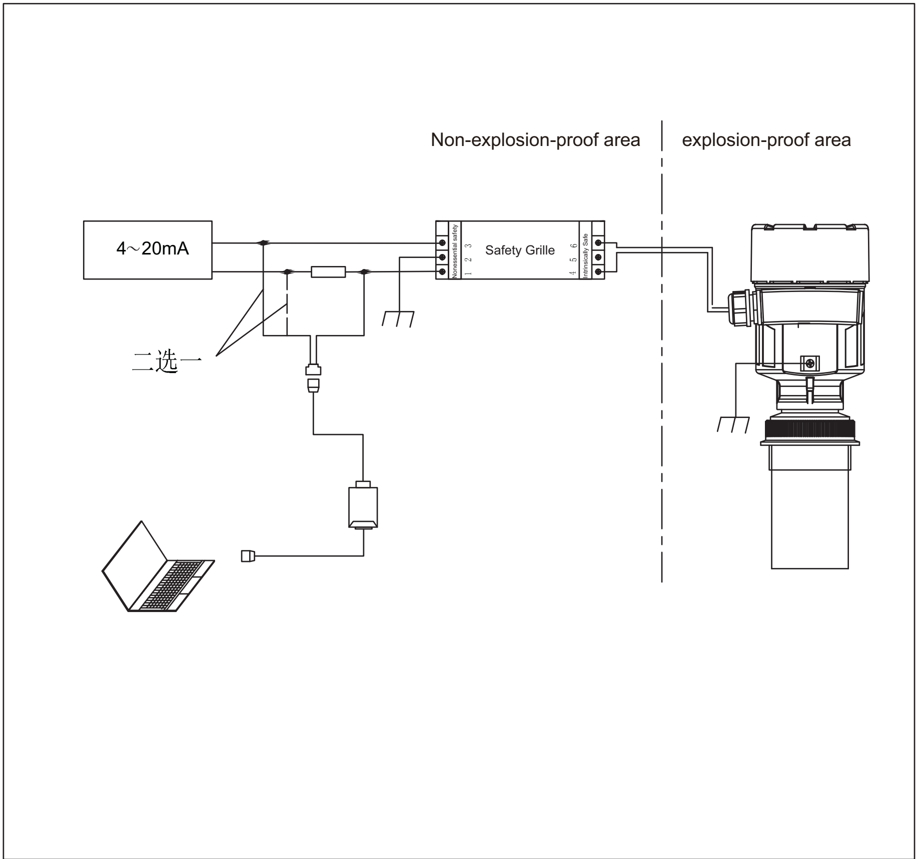


Figure 18

5.Technical Parameters

5.1 General data

Product model	MDLA61	MDLA62	MDLA63	MDLA64
Process fitting	Thread G1½"A	Thread G2"A	Thread M66×2	Thread M95×2
	Flange or bracket	Flange or bracket	Flange or bracket	Flange or bracket
Transducer material	PA66+GF30/PVDF	PA66+GF30/PVDF	PA66+GF30/PVDF	PA66+GF30
Transducer sealing	Fluoride	Fluoride	Fluoride	Fluoride
Weight (depending on process fitting)	1.3KG	1.4KG	1.5KG	1.9KG

Supply Voltage	Two wire system	Standard type	24V DC
		Intrinsic Safety type	21.5~26.5V DC
		Power consumption	Max. 22.5mA,0.54W
		Allowable ripple	-<100Hz Uss<1V -(100~100k)Hz Uss<10mV
	Four wire system	Standard type	24V DC/220V AC
		Power consumption	max. 1VA,1W
Cable parameter	Cable inlets		1 M20 × 1.5 cable inlet (cable diameter 6~9 mm) 1 Blind Block M20 × 1.5
Output parameter	Output Signal		(4~20mA)/HART；RS485/Modbus
	Resolution		1.6μA
	Fault output		20.5mA；22mA；3.9mA
	Damping time		0~30s Adjustable
Outer Shell	Shell material		Aluminum/Plastics（ABS）
	Enclosure seal		Fluoroadhesive
	Top Window		PC
	Ground Terminal		Stainless steel

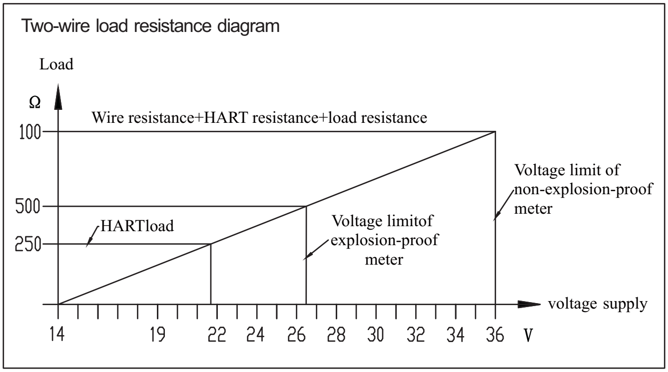


Figure 19

5.2 Feature parameters

P		MDLA61	MDLA62	MDLA63	MDLA64
Near blanking area		0.25m	0.3m	0.4m	0.5m
Max. measuring distance	Liquid standard transducer	5m	10m	15m	20m
	Liquid sealed transducer	4m	8m	10m	15m
	Solid standard transducer	2m	4m	6m	8m
	Solid sealed transducer	2m	4m	6m	8m
Ultrasonic frequency		55kHz	50kHz	40kHz	28kHz
Beam divergence angle		5°			
Commonality		Measurement interval		>2s(Depending on parameter setting)	
		Adjustment time		>3s(Depending on parameter setting)	
		Accuracy		±0.25%(fullrange)	
		Process temperature		-40-80℃	
		Relative humidity		＜95%	
		Pressure		<0.1MPa	
		Vibration tolerance		Mechanical vibration10m/ m²	

6.Debugging

6.1 Programmer debugging

6.1.1 Key function

Debug the instrument through the 4 buttons on the programming module. The language of the debug menu is selectable. After debugging, it is generally only used for display, and the measured value can be read out very clearly through the glass window.

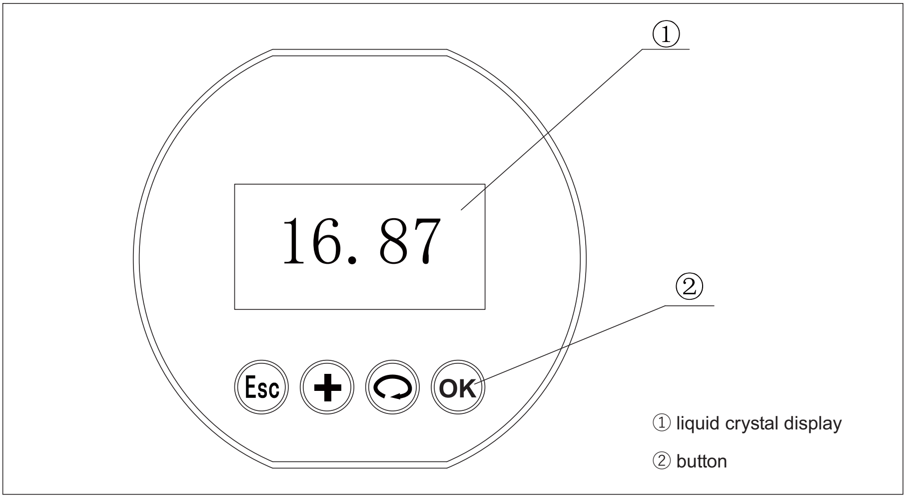
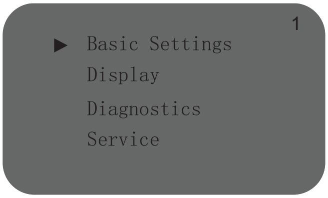


Figure 20 The main interface of the glass window

ESC Keys	- Exit the programming state or return to the previous menu - Switch between display value and echo curve interface (on the home page)
+ Keys	- Modify parameter value, 0~9 infinite loop - Switch curve display mode or home page display mode
↻ Keys	- toggle menu item - change cursor position
OK Keys	- Enter programming state - Confirm programming item - Confirm parameter modification

6.1.2 Commissioning Steps

Instrument in the running state press OK key into the state of programming, show the main menu of programming. After each parameter has been edited, the OK key is required to confirm otherwise the editing is invalid. After editing, press ESC to exit the programming state and return to the running state. At any time of programming, you can press ESC key to give up programming, exit parameter item programming state.

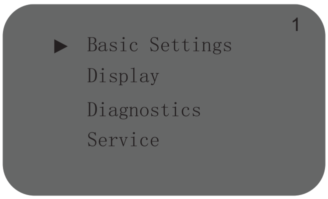


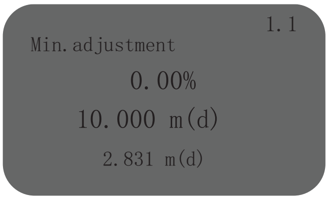
Note: the number in the upper right corner is the menu number

(1) Basic Settings

1.1Min.adjustment

Low adjustment is used for range setting. Together with the high-level adjustment, it determines the proportion of the linear correspondence of the current output. In the main menu, when the menu number is 1(top right corner of the screen) , press OK to enter the basic settings submenu.



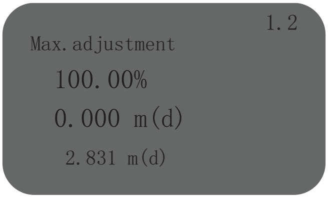


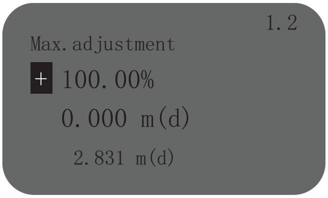
Press OK key, enter the programming low adjustment, see the above parameter editing method of character/number parameter programming method, edit low adjustment. After editing, press OK to confirm, press ESC to give up programming.

Note: low adjustment means the distance from flange bottom to tank bottom is 4mA, high adjustment means the distance from flange bottom to full range is 20mA.

1.2Max.adjustment

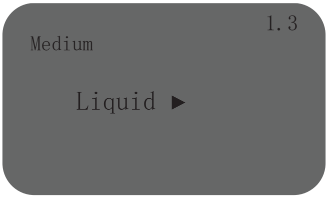
The high adjustment is used for range setting. Together with the low-level adjustment, it determines the proportion of the linear correspondence of the current output. In the main menu, when the menu number is 1.1, press key, enter the high adjustment, at this time, press OK key to edit the high adjustment.

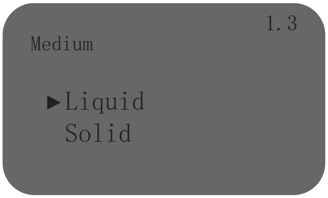




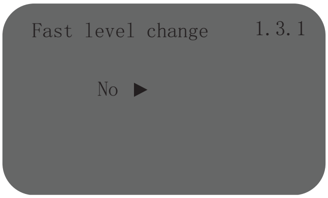
1.3Medium

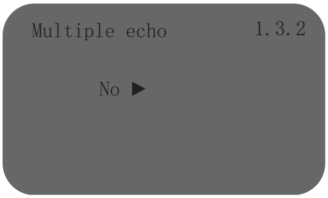
The material properties includes two kinds of medium type, which can enter the function of rapid change of material level and first wave selection by selecting corresponding medium type.





Press OK key to enter the parameter selection state, key to select the desired, edit completed press OK key, then enter the next sub-menu, including fast level chang and first echo and other functions.





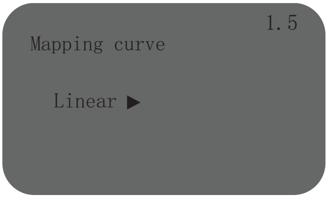
1.4Damping time

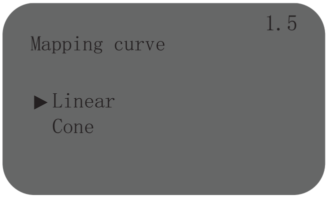
When the LCD menu number is 1.3, press to enter the damping time.

Press the OK key to enter the parameter editing state, use the + key to set the number, and use the key to select the digit to be edited, and press the OK key to confirm after editing.

1.5Mapping curve

When the LCD menu number is 1.4, press to enter the output map.

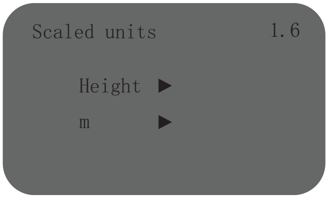


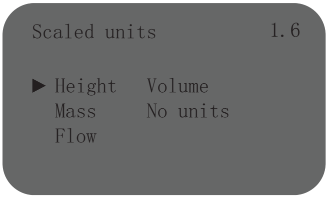


Press key to enter the state of parameter editing, press key to select, and then press key to confirm.

1.6Scaled units

When the LCD menu number is 1.5, press the button to enter the scaled units.

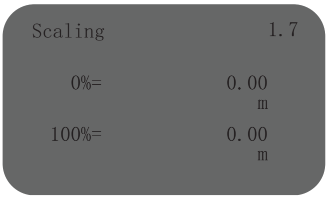


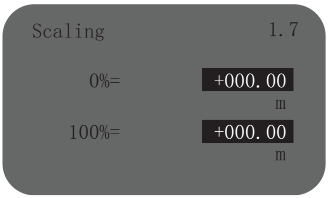


Press key to enter the state of editing scalar units, press key to select, after comple - tion press key to confirm.

1.7Scaling

When the LCD menu number is 1.6, press to enter the calibration.

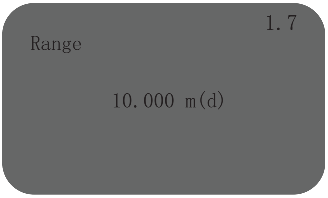


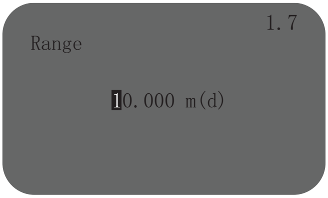


Press key to enter the state of calibration editing, press key to set the number, press key to edit the number bit, edit completed press key to confirm.

1.8Range setting

In order to get the correct measurement results, it is necessary to set the range of the instru - ment. Press to enter the range setting menu when the menu number is 1.7.

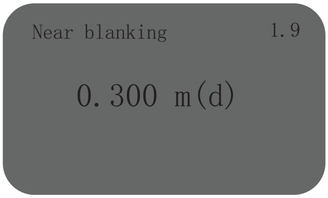


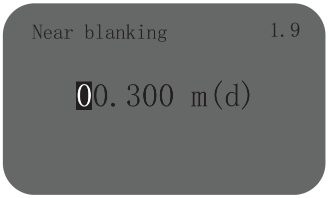


Press the OK key to enter the parameter editing state, use the + key to set the number, and use the key to select the digit to be edited, and press the OK key to confirm after editing.

1.9Near blanking

When there is a fixed obstacle near the surface of the sensor, and the maximum material height can not reach the obstacle, it can be used to set the blind area to avoid measure - ment errors. When the LCD menu number 1.8, press , enter the blind area settings menu.

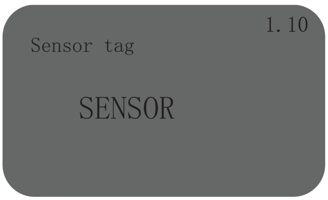




Press OK key, the corresponding parameter field anti-black, + or key to set parameters, press OK key to confirm.

1.10Sensor tag

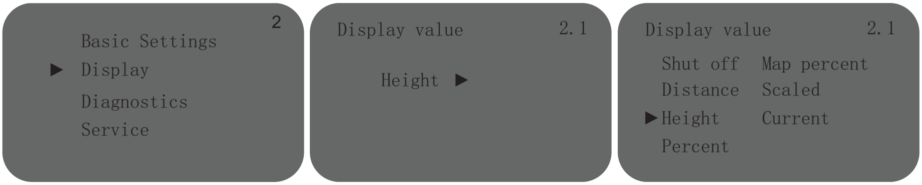
When the LCD menu number is 1 -9, press key to enter the sensor label interface, press OK key to edit, edit completed press OK key to confirm.



(2) Sets the display content

2.1Display value

When you enter the display menu, the first submenu is display content. After setting the options, the instrument programmer will display the corresponding content. Factory default value is generally high material, that is, the programmer does not enter any menu panel display, indicating the height of the material level.



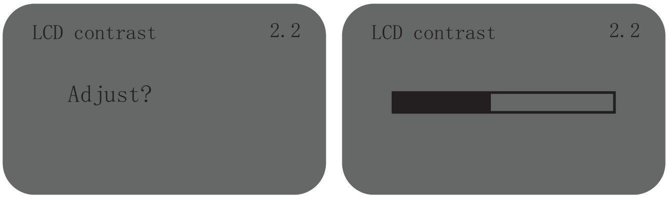
Explanation of display content:

① Distanc: measure the distance from the reference point to the surface of the medium;

② Height: material level height, its value is equal to "low adjustment" minus "distance"-(empty height);

2.2LCD contrast

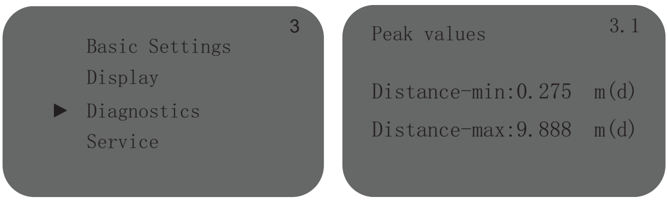
When the LCD menu number is 2.1, press key, enter the LCD contrast interface, LCD display.



(3) Diagnostics

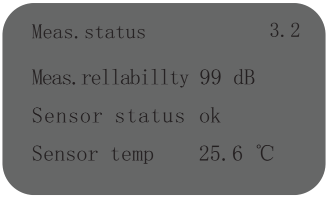
3.1Peak values

When you go to the diagnostic menu, the first submenu contains maximum and minimum height values for peak measurements.



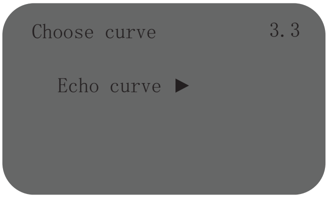
3.2Meas.status

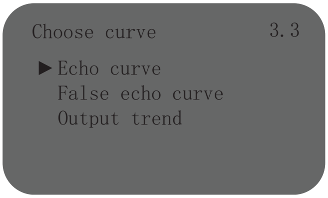
When the LCD menu number is 3.1, press to enter the measurement state.



3.3Choose curve

When the LCD menu number is 3.2, press to enter the selection curve interface.

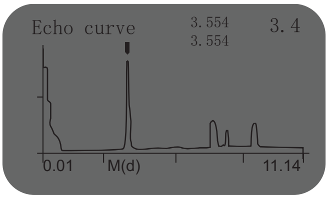




Press OK key to enter the curve selection interface, press key to select the desired curve type, press OK key to confirm, press key again to appear the desired curve wave form diagram.

3.4Echo curve

When the LCD menu number is 3.3, press to enter the echo curve.



3.5Simulation

When the LCD menu number is 3.4, press to enter the simulation

```
Simulation              3.5

   Start simulation ▶
```

```
Simulation              3.5

  ▶Percent
   Curent
   Distance
```

"Start simulation" includes percentage, current, air height, according to the needs of the corresponding simulation, calibration error. Press OK key, enter parameter edit interface, set the number with + key, select edit digit with ⟲ key, press OK key to confirm.

(4) Service

4.1False echo memory

Enter the"Service" menu, the first sub-menu for"False Echo", press OK to enter the settings interface, display three options. Liquid crystal display.

```
                      2
     Basic Settings
     Display
     Diagnostics
  ▶  Service
```

```
False echo memory     4.1

     Change?
```

```
False echo memory     4.1
  ▶Delete
   Update
   Create new
```

If create false echo, select"New" press OK key enter and enter the range, press OK key, set successfully.

4.2Current output

After setting false echo, press ⟲ to display current output.

```
Current output              4.2

Output mode: 4~20mA         ▶
Failure mode: No change     ▶
Min.current: 4 mA           ▶
```

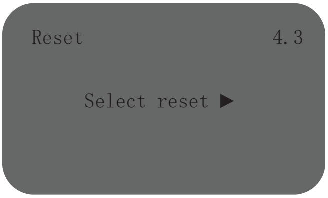
```
Current output              4.2

   ▶ Output mode
     Failure mode
     Min.current
```

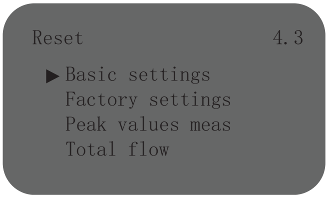
The output mode can select the output direction of the current when the meter is working. The factory default setting is 4-20mA, and the output current is proportional to the material height; after selecting 20-4mA, the output current is inversely proportional to the material height, that is, the output current is proportional to the distance.

"Fault mode" sets the fault output current, which can set the value of the actual output current when the instrument encounters a fault.

4.3 Reset

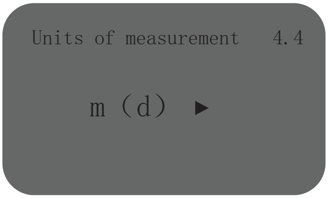
Press OK button to select reset, including basic settings, factory settings, and peak measurement. The basic setting resets functions such as range, dead zone, and damping time to the factory settings; the factory setting resets all functions to the factory settings. Press the button to reset the selection

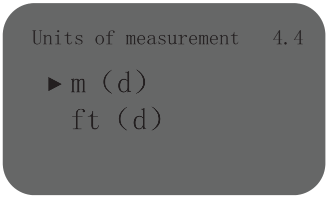




4.4 Units of measurement

Measurement units provide the user with the choice of using different measurement units. Press the OK key to enter the measurement unit selection menu, and you can use the key to select the two measurement units of m(d) and ft(d) as required.

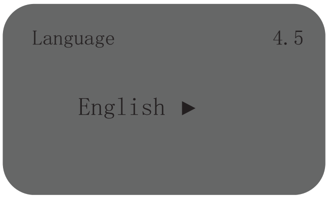




4.5 Language

Language to provide users with English and other two language mode selection function.

Press OK , go to the language selection menu, press to select a language category.

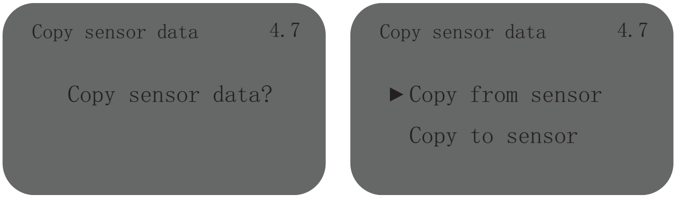


4.6 HART operation mode

When the LCD menu number is 4.5, press to enter the select Hart working mode interface.

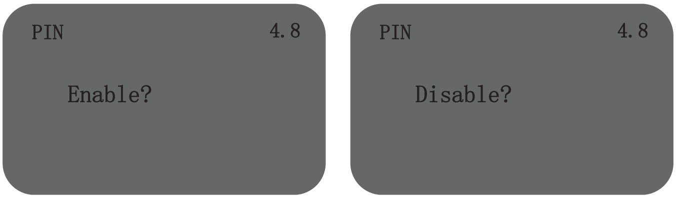
4.7 Copy sensor data

Copying sensor data includes two functions: copying and copying from the sensor to the sensor. Press OK key to enter the copy sensor data selection menu, according to the need to press key to select from the sensor copy and copy to the sensor.



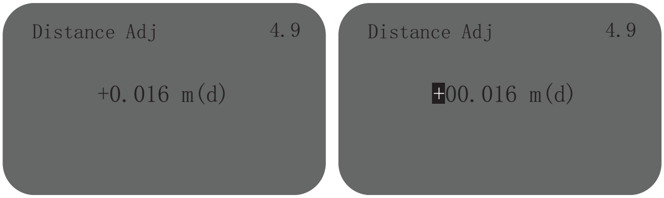
4.8 PIN

The password is used for parameter protection under the instrument advanced settings menu. Once the password function is enabled, you need to enter the password when you change any advanced settings interface parameters. Once you enter the correct password, the password protection function is canceled and the parameters can be modified. Press the OK button to enable the password function and set the password or disable the password function.



4.9 Distance Adj

The distance adj setting is used to modify the instrument measurement error, which is the difference between the actual air height and the displayed air height. Enter the distance bias menu settings, press OK key, enter the parameters edit interface, set the number with + Key, key to select the edit digit, press OK key to confirm.



4.10 Threshold

Threshold setting is used to set the threshold width and height of the effective echo. The larger the threshold setting is, the stronger the amplitude is, and the better it is to eliminate the small signal clutter But be careful: if the modified threshold is greater than the effective echo, the amplitude of the wave, will cause the result of false echo.

When the LCD menu number is 4.9, press key, enter the threshold setting interface, LCD display. Press OK key, enter parameter edit interface, set the number with + key, select edit digit with key, press OK key to confirm.

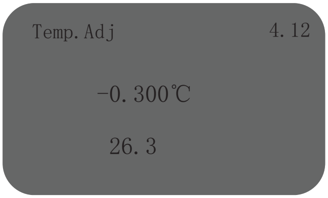
4.11 Current Adj

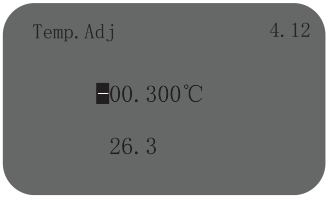
The current adj setting is used to calibrate the error value of the current output, to calibrate the current of 4mA and 20mA, to adjust the current deviation, and to realize the linear change of the current of 4-20mA.

When the LCD menu for the adv/set interface, press OK key and enter the password into the current adj sub-menu, press OK key, enter the parameters edit interface, set the number with + key, select edit digit with key, press OK to confirm.

4.12 Temp.Adj

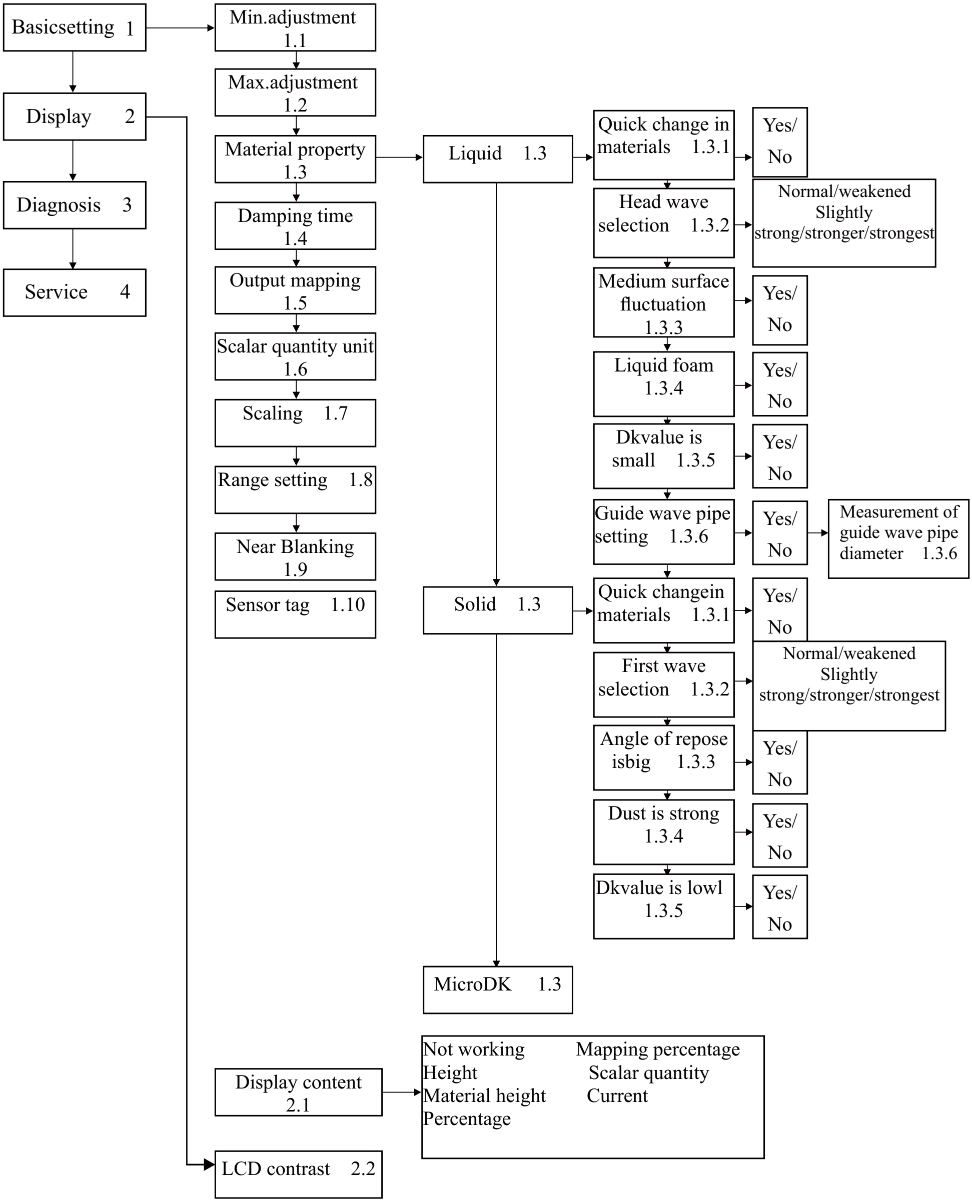
The temperature deviation setting is used to calibrate the temperature error value, which has been set before leaving the factory. Press (OK) key, enter parameter edit interface, set the number with (+) key, select edit digit with key, press (OK) key to confirm.

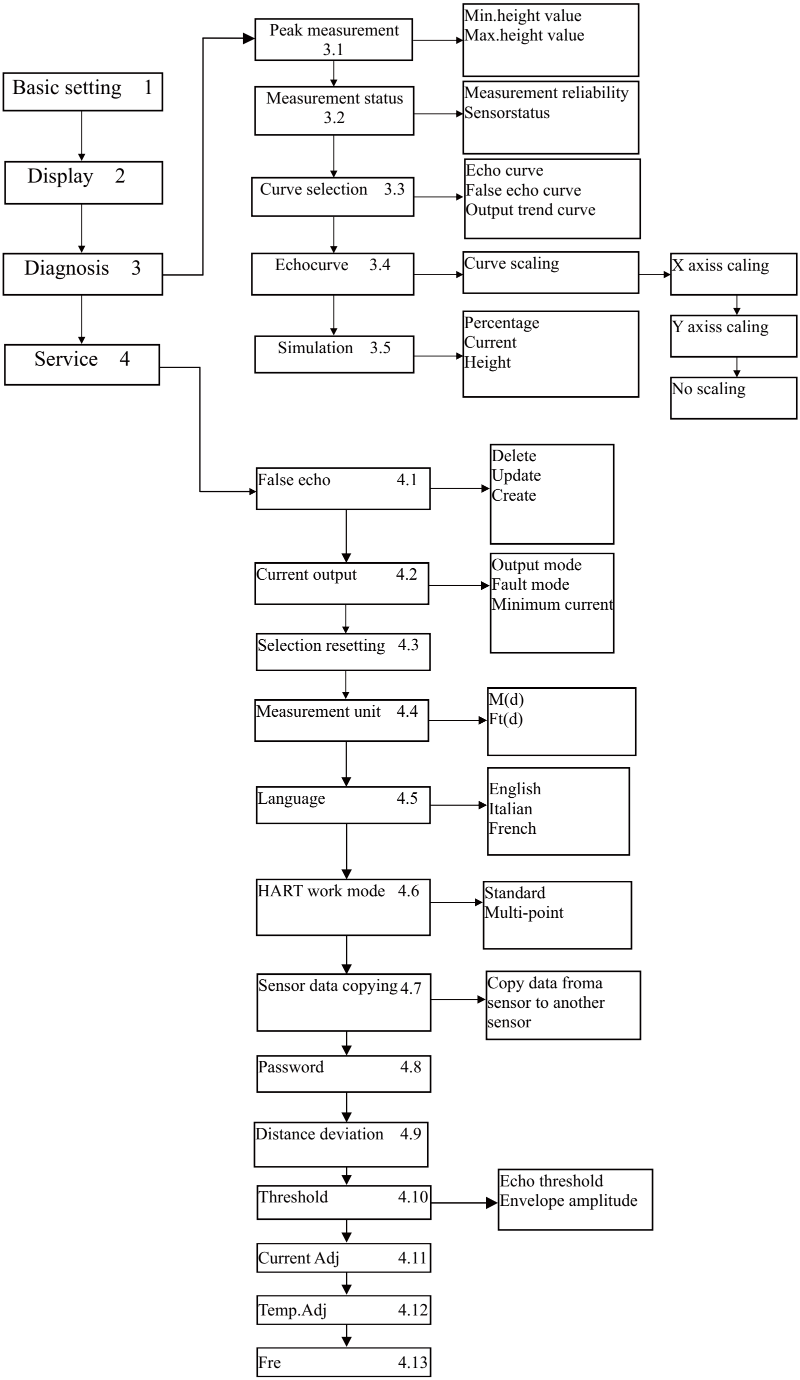




4.13 Fre

Press (OK) key, enter parameter edit interface, set the number with (+) key, select edit digit with key, press (OK) key to confirm.


Basicsetting 1
Display 2
Diagnosis 3
Service 4
Min.adjustment 1.1
Max.adjustment 1.2
Material property 1.3
Damping time 1.4
Output mapping 1.5
Scalar quantity unit 1.6
Scaling 1.7
Range setting 1.8
Near Blanking 1.9
Sensor tag 1.10
Liquid 1.3
Quick change in materials 1.3.1
Yes/ No
Head wave selection 1.3.2
Normal/weakened Slightly strong/stronger/strongest
Medium surface fluctuation 1.3.3
Yes/ No
Liquid foam 1.3.4
Yes/ No
Dkvalue is small 1.3.5
Yes/ No
Guide wave pipe setting 1.3.6
Yes/ No
Measurement of guide wave pipe diameter 1.3.6
Solid 1.3
Quick changein materials 1.3.1
Yes/ No
First wave selection 1.3.2
Normal/weakened Slightly strong/stronger/strongest
Angle of repose isbig 1.3.3
Yes/ No
Dust is strong 1.3.4
Yes/ No
Dkvalue is lowl 1.3.5
Yes/ No
MicroDK 1.3
Display content 2.1
Not working
Height
Material height
Percentage
Mapping percentage
Scalar quantity
Current
LCD contrast 2.2


Basic setting 1
Display 2
Diagnosis 3
Service 4
Peak measurement 3.1
Min.height value
Max.height value
Measurement status 3.2
Measurement reliability
Sensorstatus
Curve selection 3.3
Echo curve
False echo curve
Output trend curve
Echocurve 3.4
Curve scaling
X axiss caling
Y axiss caling
No scaling
Simulation 3.5
Percentage
Current
Height
False echo 4.1
Delete
Update
Create
Current output 4.2
Output mode
Fault mode
Minimum current
Selection resetting 4.3
Measurement unit 4.4
M(d)
Ft(d)
Language 4.5
English
Italian
French
HART work mode 4.6
Standard
Multi-point
Sensor data copying 4.7
Copy data froma sensor to another sensor
Password 4.8
Distance deviation 4.9
Threshold 4.10
Echo threshold
Envelope amplitude
Current Adj 4.11
Temp.Adj 4.12
Fre 4.13

6.2 PC software debugging

Connect with host computer via HART

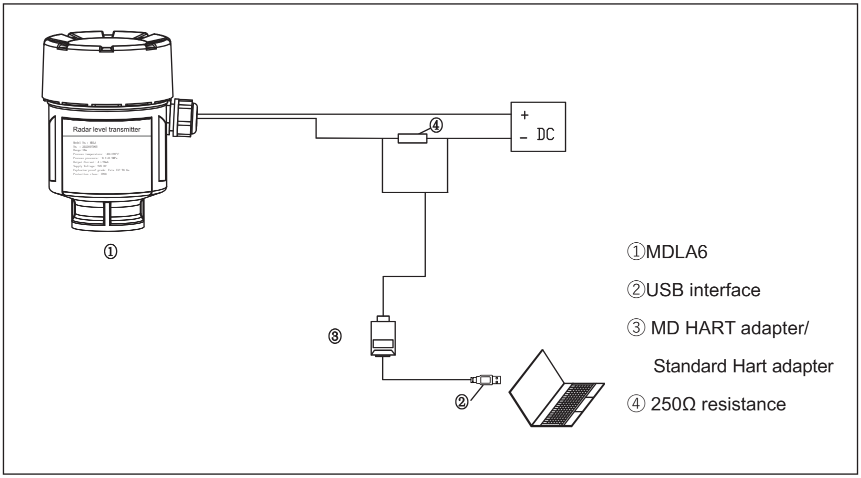


Figure 21 HART connection

(1) Login page

The login page of MDLA6-Hart V3.0 software consists of seven parts: parameter selection, serial port, address, language, user name, password and company basic information.

Figure 22 Login interface

(2) Home page

The login page of MADECO-Hart V3.0 software consists of seven parts: parameter selection, serial port, address, language, user name, password and company basic information.

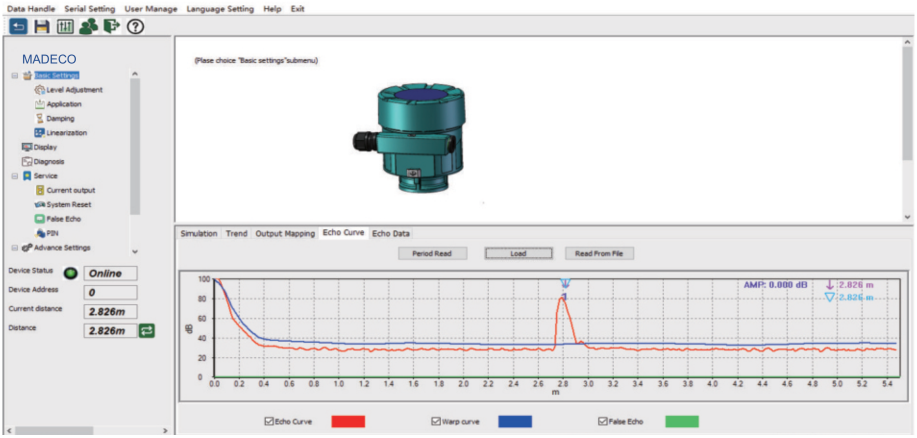


Figure 23 The main interface

(3) Real-time data

The basic parameters of MDLA6 series mainly include instrument status, instrument address, current distance, empty height/distance, material height, percentage and output current. Basic parameters are all read-only and read cyclically.

The address of the instrument is the same as the address on the login page, the material height is the difference between the measurement range and distance, and the percentage is the ratio of the material height to the low adjustment.

Figure 24 Real-time data

(4) Directory, parameter setting

①Level adjustment

The level adjustment includes seven functions: Blind area, high level adjustment, low level adjustment, range, high level adjustment percentage, low level adjustment percentage and echo data list. Low adjustment and range data written should not exceed the maximum range for the selected model.

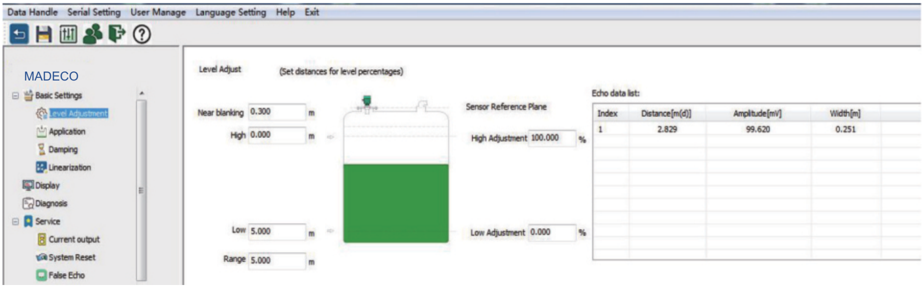


Figure 25 Level adjustment interface

②Material properties

The material property includes four functions: the medium type, the first wave, the rapid change of material level and the list of Echo Data. You can set this feature by selecting the desired feature and clicking“Save”, but the list of echo data can not be changed manually.

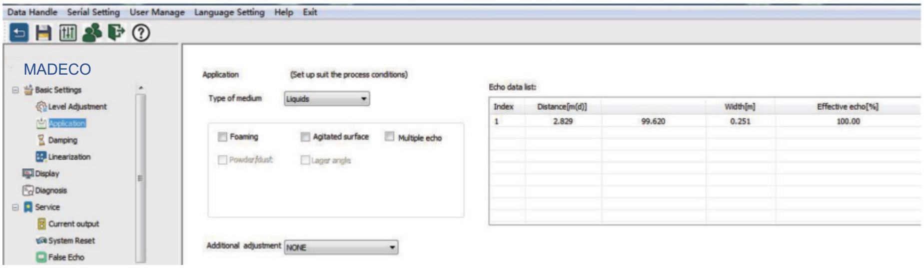


Figure 26 Material property interface

③Damping time

Damping time includes a function of damping time. The damping time is mainly to set a larger damping time to realize the stability of the measured value and enhance the anti-interference function.

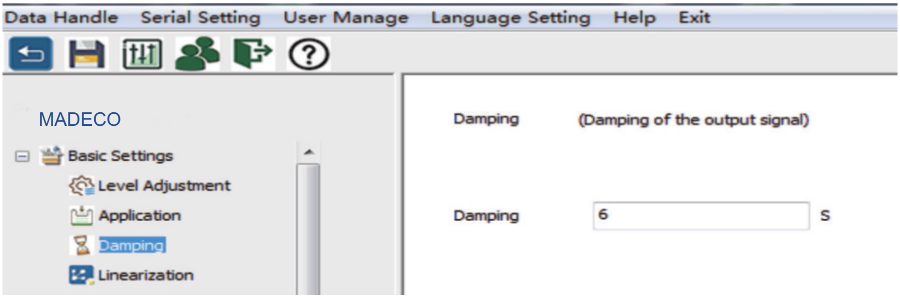


Figure 27 Damping time interface

④Output mapping

The output mapping includes a feature for output mapping that can be set by modifying the desired container type feature and clicking save.

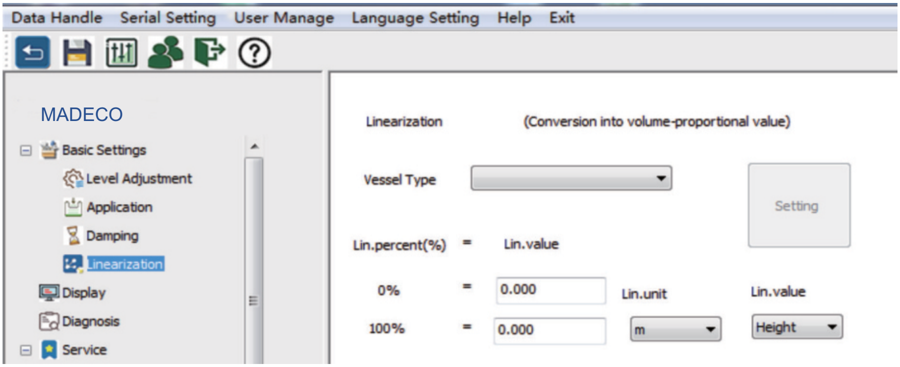


Figure 28 Output mapping interface

⑤Display

Display includes a function for displaying content. Display content contains air height and material height two options, you can modify the display content to change the instrument screen home page display content.

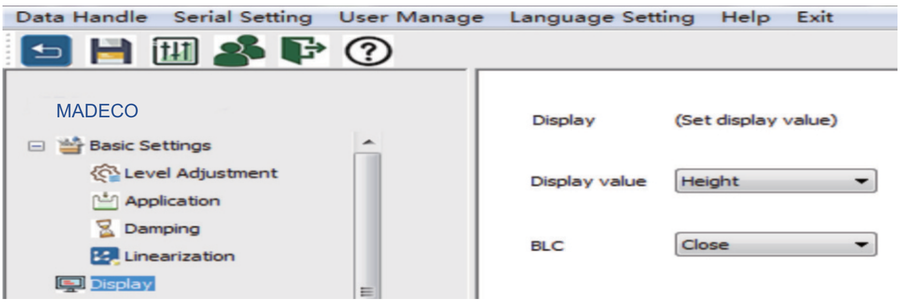


Figure 29 Display the content interface

⑥Diagnosis
Diagnosis includes four functions: maximum, minimum, sensor state and output current. The diagnostic page functionality is all read-only.

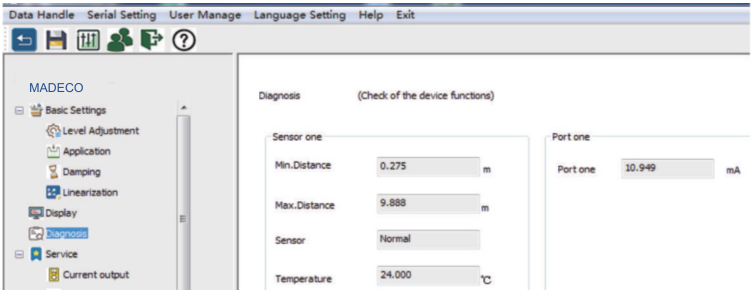


Figure 30 Diagnostic interface

⑦Output Current
The output current includes three functions: Fault mode, output mode and minimum current. You can set this feature by selecting the desired feature and clicking“Save”.

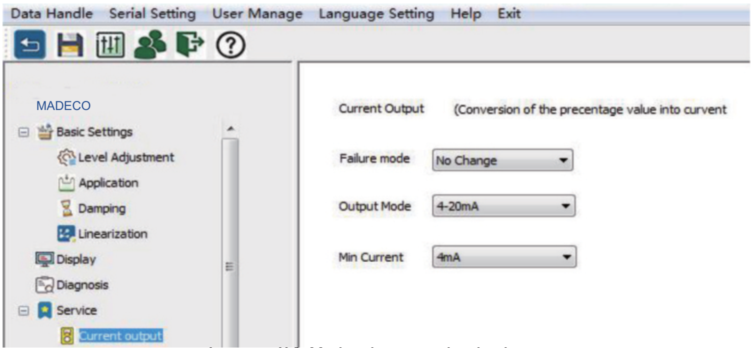
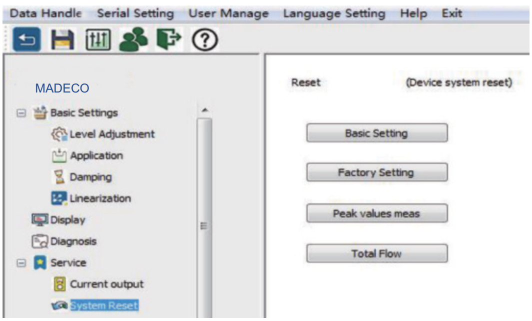


Figure 31 Output current interface

⑧System reset
The system reset includes four functions: basic setup, plant setup, peak measurement and cumulative flow. The basic settings restore the basic parameters to the original state, while the factory settings restore the parameters other than the basic parameters to the original state.



⑨False Echo

False echo includes creating false echo, updating false echo and deleting all three functions.

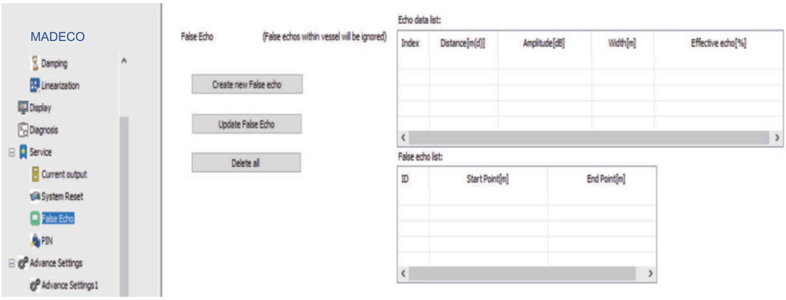


Figure 33 False Echo interface

⑩Password

Password includes three functions: cancel password, enable password and change password.

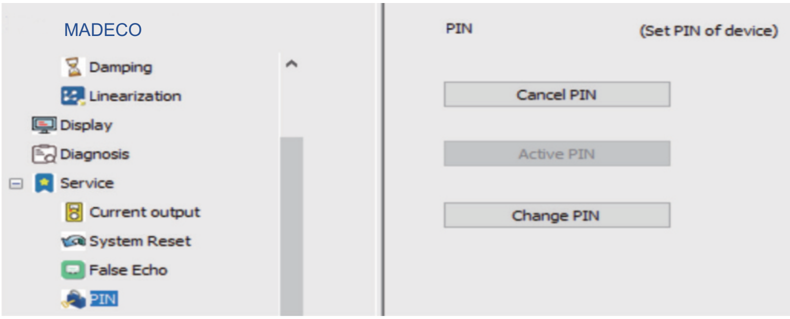


Figure 34 Password interface

⑪Advanced Settings 1

Advanced Setting 1 includes two functions: Calibration Point number and factory learning. The equipment should be calibrated before leaving the factory. Select the number of points to be calibrated in the drop-down box and click the“Calibrate” button, input the measured value and the calibrated value in the pop-up frame (the measured value is the distance value measured by the instrument, and the calibrated value is the distance measured by the manual practice) , click“OK” button to write measurements and calibration values, exit the pop-up window, click“Save” button and write calibration points.

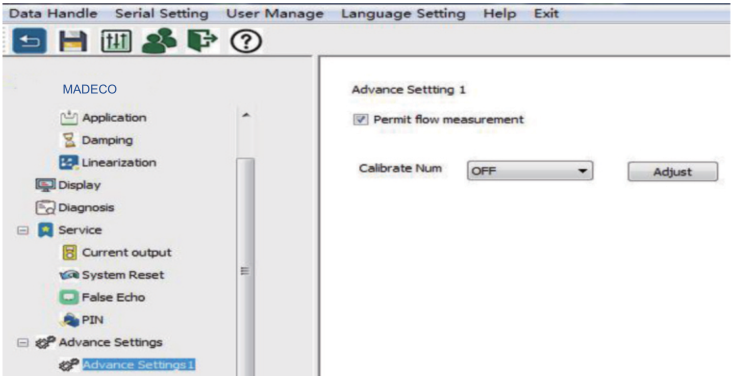


Figure 35 Advanced Settings 1 interface

⑫Advanced Settings 2

Advanced Setup 2 includes other features such as transmit frequency, 4mA offset, 20mA offset, and zero echo.

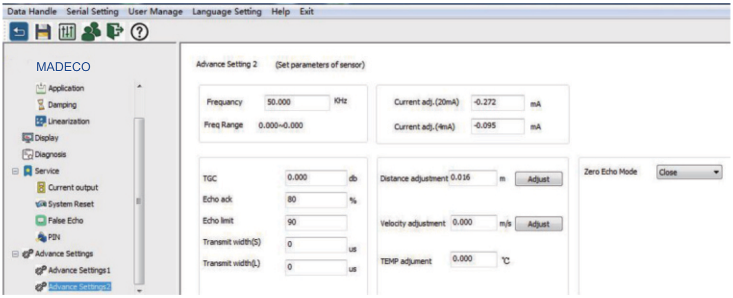


Figure 36 Advanced Settings 2 interface

⑬Curve

The curve contains echo curve, envelope curve and false echo three curves, the upper right corner of the curve contains signal strength, arrow data and inverted triangle data three data. Where the position indicated by the arrow represents the position of the object selected by the instrument. The curve can be read circularly by periodic reading. Click the left mouse button and drag to the lower right corner to enlarge the image, drag any distance to the upper left corner to restore the initial interface.

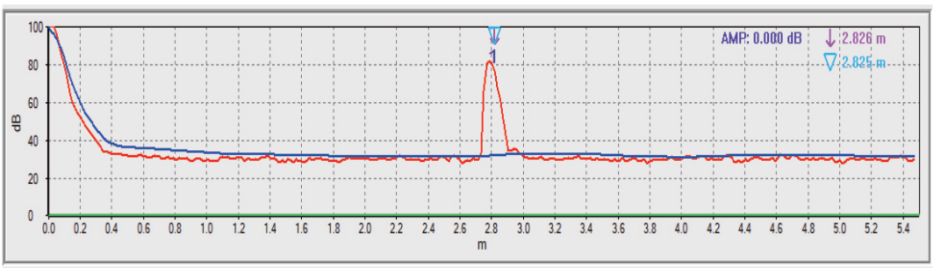


Figure 37 Curved interface

(5) False echo storage function

①Edit false echoes

Click on the new false echo, create a new false echo with 0 as the starting point, in the pop-up window input, the desired end value, in the same position in the false echo curve shows a convex curve.

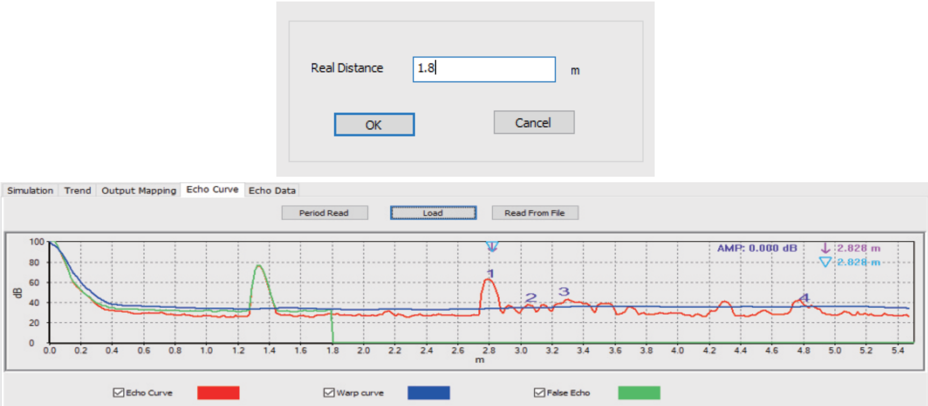


Figure 38 Edit false echoes interface

②New and update false echoes

Update can set false echo again on the basis of new data.

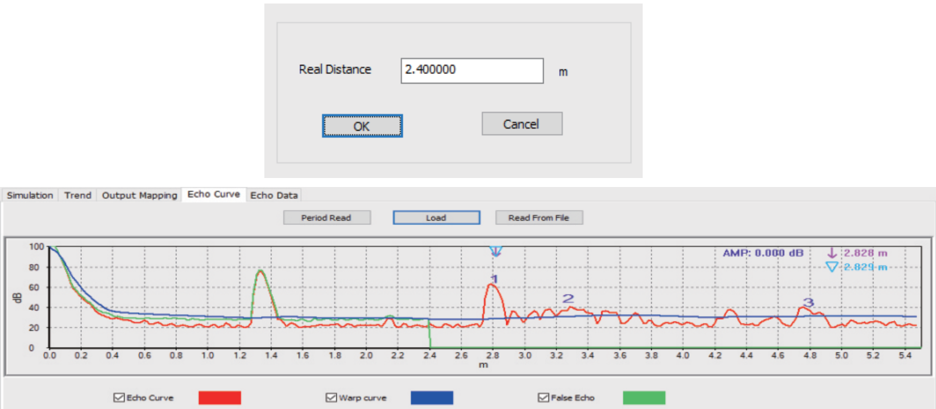


Figure 39 New false echo function interface

③Delete all

Delete all new false echoes. Press delete all, press“OK” in the bullet box to remove all false echoes.

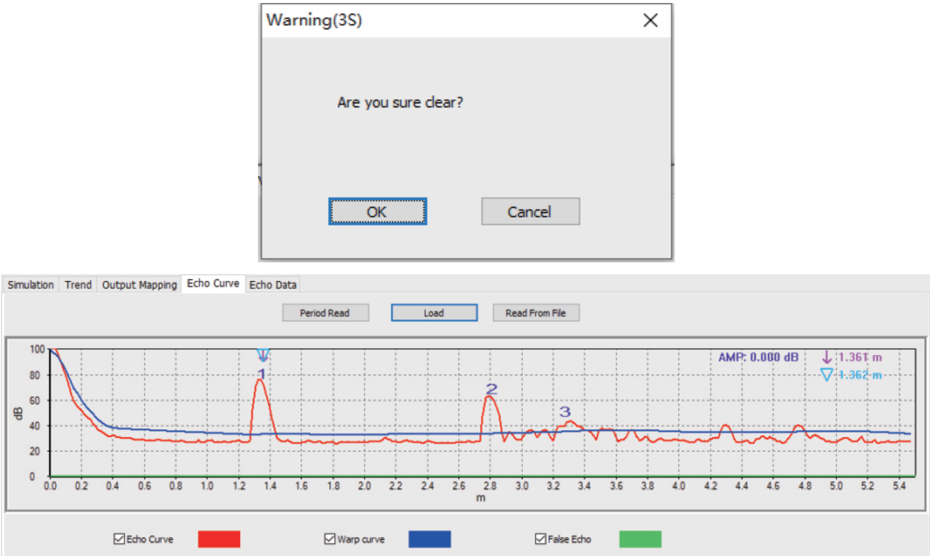


Figure 40 Remove all functionality interface

6.3 HART handheld programmer debugging

MDLA6 can be programmed with HART handheld programmer

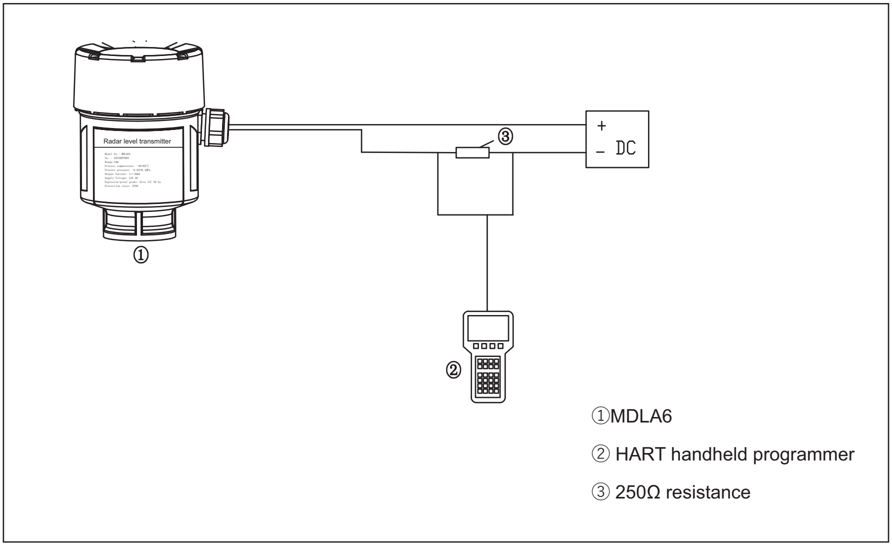
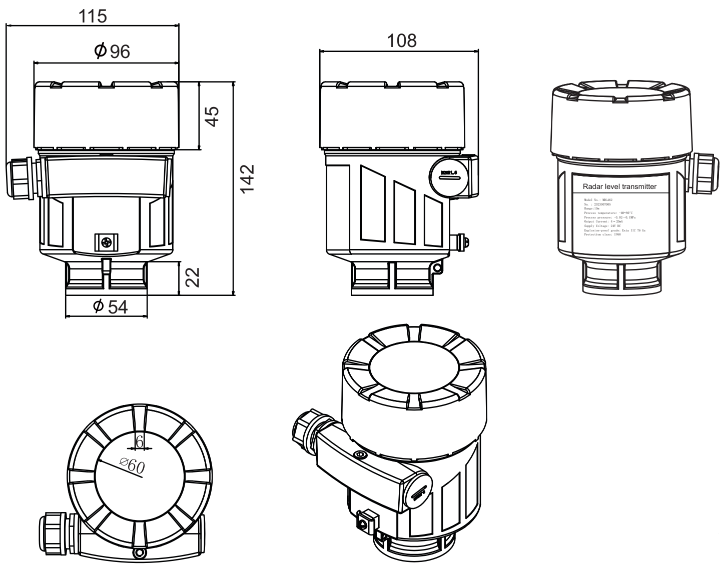
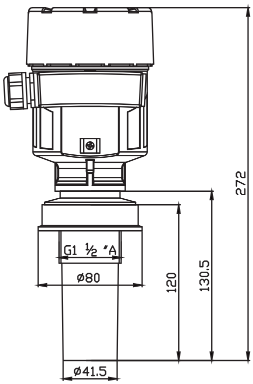


Figure 41 HART handheld programmer

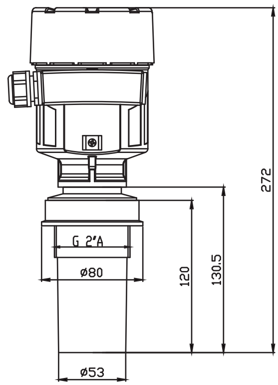
7. MDLA6 Series Dimensions (unit: mm)

shell material: AL

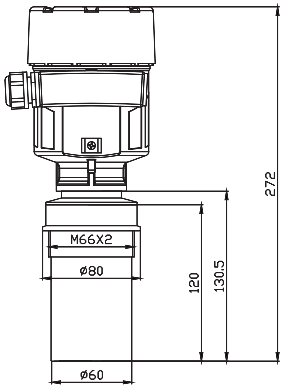




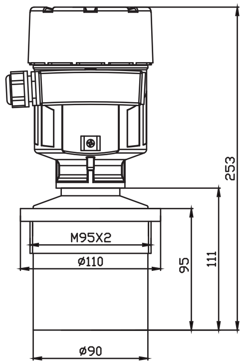
MDLA61



MDLA62



MDLA63



MDLA64

8. Transportation and Storage

The following conditions should be met when the meter is transported or stored:

1.The level transmitter should be transported in strict accordance with the features of the product and requirements from the specifications.

2.The level transmitter should be stored in a dry and well ventilated room of (0-40) ℃, with relative humidity ≤80%. Remember not to store it with corrosive substances. The long-stored instruments shall be calibrated and checked before use or sale.

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