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Operating and Installation Instructions
Digital weighing platform

KERN KDP

Version 1.0
2017-11
GB

KDP-BA_IA-e-1710

GB

KERN KDP

Version 1.0 2017-11

Operating and installation instructions
Digital weighing platform

English

Contents

1 Technical data

KERN (type)	KDP 300-3	KDP 3000-2
Readability (d)	0.001 g	0.01 g
Weighing range (max)	350 g	3.5 kg
Reproducibility	0.002 g	0.02 g
Linearity	± 0.005 g	± 0.05 g
Recommended adjusting weight not supplied (class)	350 g (F1)	3 kg (F1)
Warm-up time	120 min	120 min
Net weight (kg)	1,2	1,6
Glass wind screen	yes	no
Dimensions fully mounted (W x D x H) mm	165 x 166 x 140 mm	165 x 166 x 75 mm
Dimensions (W x D x H) mm	outside: 157 x 157 x 80	-
	inside: 146 x 146 x 80	-
Weighing surface, stainless steel	105 mm	165 x 165 mm
Permissible ambient condition	+5° C to +35° C	
Humidity of air	80 % relative (not condensing)	
Electric Supply	USB	
Interfaces	USB-Host/Master (Standard)	
	WLAN (factory option; KERN KDP-A01)	
	Ethernet (factory option; KERN KDP-A02)	
	Bluetooth 4.0 (factory option; KERN KDP-A03)	

English

KERN (type)	KDP 10K-3	KDP 10K-4
Readability (d)	0.1 g	1 g
Weighing range (max)	10 kg	10 kg
Reproducibility	0.1 g	1 g
Linearity	0.3 g	3 g
Recommended adjusting weight not supplied (class)	10 kg (M1)	10 kg (F1)
Warm-up time	30min	120 min
Net weight (kg)	1.4	1.4
Glass wind screen	no	
Dimensions fully mounted (W x D x H) mm	165 x 166 x 75 mm	
Weighing surface, stainless steel	165 x 165 mm	
Permissible ambient condition	+5° C to +35° C	
Humidity of air	80 % relative (not condensing)	
Electric Supply	USB	
Interfaces	USB-Host/Master (Standard)	
	WLAN (factory option; KERN KDP-A01)	
	Ethernet (factory option; KERN KDP-A02)	
	Bluetooth 4.0 (factory option; KERN KDP-A03)	

English

2 Declaration of conformity

The current EC/EU Conformity declaration can be found online in:

www.kern-sohn.com/ce

3 Appliance overview

Model d = 0.001 g

Models d ≥ 0.01 g

Pos.	Description
1	Glass wind screen
2	Weighing plate
3	Footscrews
4	Connections
5	Spirit level (for models d ≥ 0.01 g under the weighing plate)

English

4 Basic Information (General)

4.1 Proper use

The weighing platform you purchased is intended to determine the weight value of material to be weighed. It is intended to be used as a “non-automatic weighing system”, i.e. the material to be weighed is manually and carefully placed in the centre of the weighing plate. As soon as a stable weight value is reached the weight value can be read.

4.2 Improper Use

Do not use the digital weighing platform for dynamic weighing. In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the “stability compensation“ in the display unit. (Example: Slowly draining fluids from a container on the balance.)
Do not leave permanent load on the weighing plate. This may damage the measuring system.
Impacts and overloading exceeding the stated maximum load (max) of the weighing plate, minus a possibly existing tare load, must be strictly avoided. This may damage the weighing plate or the digital weighing platform.
The digital weighing platform should never be operated in area where there is a risk of explosion. The serial version is not explosion protected.
The construction of the digital weighing platform may not be changed. This may lead to incorrect weighing results, safety-related faults and destruction of the display unit.
The digital weighing platform may only be used as specified here. Other areas of use must be released by KERN in writing.

4.3 Warranty

Warranty claims shall be voided in case

- Our conditions in the operation manual are ignored
- The appliance is used outside the described uses
- The appliance is modified or opened
- Mechanical damage or damage by media, liquids, natural wear and tear
- The appliance is improperly set up or incorrectly electrically connected
- The measuring system is overloaded

4.4 Monitoring of Test Resources

In the framework of quality assurance the measuring-related properties of the digital platform and, if applicable, the testing weight, must be checked regularly. The responsible user must define a suitable interval as well as type and scope of this test. Information is available on KERN's home page (www.kern-sohn.com with regard to the monitoring of display units' test substances and the test weights required for this. In KERN's accredited DKD calibration laboratory test weights and digital weighing platforms may be calibrated (return to the national standard) fast and at moderate cost.

5 Basic Safety Precautions

5.1 Pay attention to the instructions in the Operation Manual

- ⇨ Carefully read this operation manual before setup and commissioning, even if you are already familiar with KERN balances.
- ⇨ All language versions contain a non-binding translation. The original German is binding.

5.2 Personnel training

The appliance may only be operated and maintained by trained personnel.

6 Transport and storage

6.1 Testing upon acceptance

When receiving the appliance, please check packaging immediately, and the appliance itself when unpacking for possible visible damage.

6.2 Packaging / return transport

- ⇨ Keep all parts of the original packaging for a possibly required return.
- ⇨ Only use original packaging for returning.
- ⇨ Prior to dispatch disconnect all cables and remove loose/mobile parts.
- ⇨ Reattach possibly supplied transport securing devices.
- ⇨ Secure all parts such as the glass wind screen, the weighing plate, power unit etc. against shifting and damage.

English

7 Unpacking and placing

7.1 Installation Site, Location of Use

The digital weighing platforms are designed in a way that reliable weighing results are achieved in common conditions of use.
Precise and fast work is achieved by selecting the right place for your digital weighing platform and your weighing plate.

On the installation site observe the following:

- Place the weighing platform on a firm, level surface;
- Avoid extreme heat as well as temperature fluctuation caused by installing next to a radiator or in the direct sunlight;
- Protect the digital weighing platform from direct draughts from open windows and doors;
- Avoid jarring during weighing;
- Protect the digital weighing platform from high air humidity, fumes and dust;
- Do not expose the digital weighing platform to strong humidity for extended periods. Non-permitted condensation (condensation of air humidity on the appliance) may occur if a cold appliance is taken to a considerably warmer environment. In this case, acclimatize the disconnected appliance for ca. 2 hours at room temperature.
- Avoid static charge of goods to be weighed or weighing container.

Major display deviations (incorrect weighing results) may be experienced should electromagnetic fields (e.g. due to mobile phones or radio equipment), static electricity accumulations or instable power supply occur. Change location or remove source of interference.

7.2 Unpacking and checking

Take the digital weighing platform out of the packaging, remove the packaging material and install at the designated workstation. Check if that there has been no damage and that all packing items are present.

Scope of delivery / serial accessories:

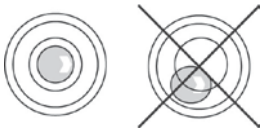
- Digital weighing platform, see chapter. 3
- Mains adapter
- USB A to USB B cable
- These installation instructions
- Description of interfaces (KCP-ZB)
- KERN BalanceConnection software (online operating instructions)

7.3 Assembly and installation

The correct location is a key factor in the accuracy of the weighing results.

⇨ **Levelling**

Exact alignment and stable installation are an essential requirement for repeatable results. You can compensate for minor unevenness or tilts of the footprint by levelling the weighing balance.



Level balance with foot screws until the air bubble of the water balance is in the prescribed circle.

Check levelling regularly.

⇨ **Installation of weighing plate**

⇨ **Connection to the power supply (USB)**
using the enclosed power pack or the USB host (e.g. computer)

In order to obtain exact results with the electronic balances, the digital weighing platform must have reached the operating temperature (see warming up time chap. 1). The digital weighing platform must be connected to the power supply during this warming up period.
The accuracy of the digital weighing platform is dependent on the local acceleration due to gravity.
Strictly observe hints in chapter Adjustment.

⇨ **Connection to your system (configuration) as described in the chapter 8**

⇨ **Carry out adjustment as described in the chapter 0**

⇨ **Communication and using the balance via the interface protocol** (see interface protocol description)

The chapter 10.1 describes the ideal way to use the balance using the BalanceConnection software.

English

8 Connection to your system

The digital weighing platform is configured and operated using the **KCP** communication protocol and the built-in interfaces. KCP is described in the additional KCP-ZB interface description (enclosed and available online). The following sections describe how to connect the weighing platform to your system using your preferred communications interface.

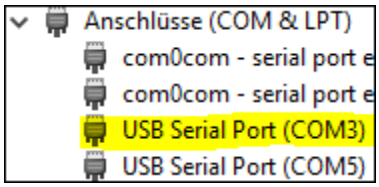
KCP (KERN Communications Protocol):

KCP is a standardized set of interface commands for KERN balances and other appliances, which allows all of the relevant parameters and functions to be called up and controlled. KERN devices that have KCP can use it to connect easily to computers, industrial control systems and other digital systems.

8.1 USB

Connect the device to the host computer using the enclosed USB cable. It will be recognized as a virtual COM port and will be assigned a corresponding numbered connection.

Example (Microsoft Windows Device Manager):



In modern devices the USB driver required for the weighing platform has already been pre-installed. If the system is not recognized automatically, you can obtain the correct driver from the Downloads area at http://www.kern-sohn.com.

8.2 Bluetooth

The weighing platform is optionally available with **Bluetooth Low Energy** (BLE) and will then be visible to Bluetooth Master devices using its serial number.

To access this, please use an appropriate software programme / app which supports Bluetooth Low Energy (BLE). Applications using Bluetooth Classic (BLC) will not work.

8.3 Ethernet

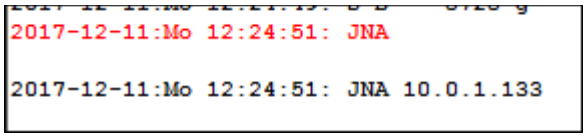
The weighing platform's factory setting uses DHCP, i.e. it connects automatically to your network. The system can communicate using the UDP protocol (Port 187) and also the Telnet protocol (Port 23).

In standard configuration the weighing platform uses the DHCP mechanism to log onto the network. In DNS the scale registers using its serial number, so it can also be accessed using its name.

To request or configure the weighing platform's IP address, connect it to the computer using the USB cable (see "USB" chapter) and use the following commands to request or set the network configuration:

- **JNA**: Query / set network address (IP)
- **JNK**: Query / set network mask
- **JNG**: Query / set gateway address

Example:



The weighing platform can then be accessed through the following ports:

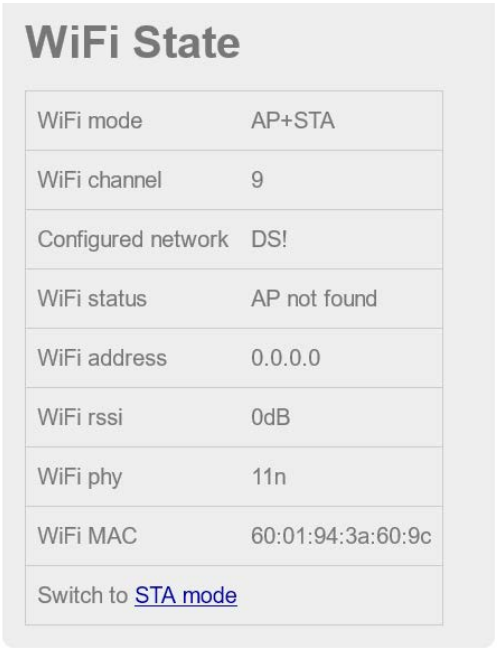
- TCP:23 (Telnet)
- UDP:187 (Raw)

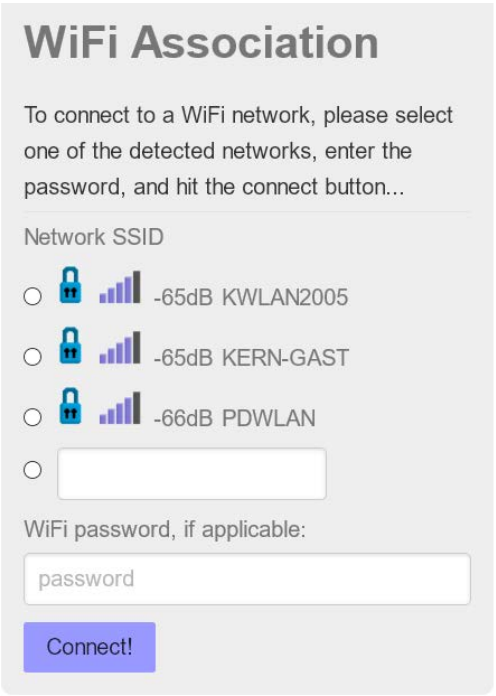
English

8.4 WLAN

If there are no configuration settings when it is turned on, the device will initially create a WiFi access point using the name "ESP_...".
Use your computer to connect to this access point. Your computer will receive one via DHCP and then use a web browser to go to the IP address 192.168.4.1 (the configuration website).

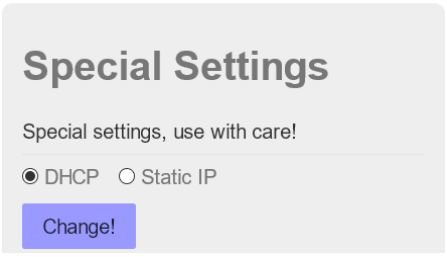
Select your network under "WiFi Association" and enter your password.





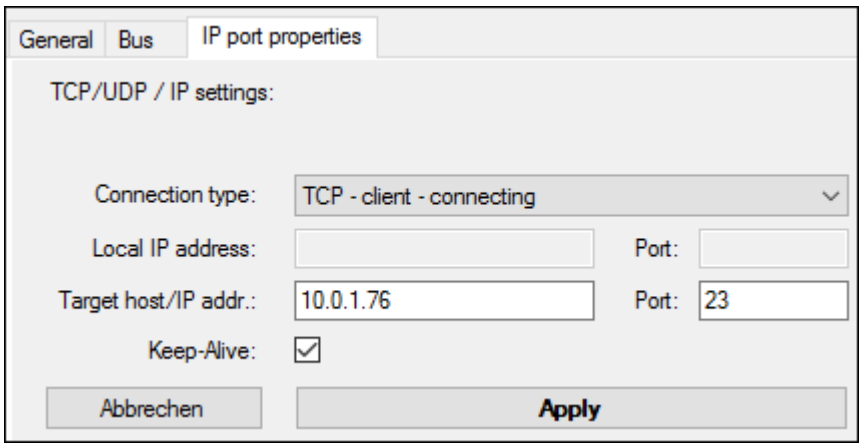
After saving, the weighing platform logs on to the selected network and is available at the new IP address (see corresponding report on the web interface).

Enter a static IP address if required:

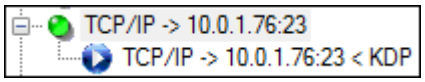


The weighing platform can now be accessed in your target software using the assigned IP address at port 23 (e.g. using "Telnet" software).

Example configuration KERN BalanceConnection:



The connection must be shown in green:



English

9 Adjustment

As the acceleration value due to gravity is not the same at every location on earth, every digital weighing platform must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the weighing system has not already been adjusted to the location in the factory). This adjustment process must be carried out for the first commissioning, after each change of location as well as in case of fluctuating environment temperature. To receive accurate measuring values it is also recommended to adjust the digital weighing platform in weighing operation.

i	• Prepare the required adjustment weight. The adjustment weight to be used depends on the capacity of the weighing system. Carry out adjustment as near as possible to the weighing system's maximum weight. Info about test weights can be found on the Internet at: http://www.kern-sohn.com. • Observe stable environmental conditions. Stabilisation requires a certain warm-up time.

Performance of adjustment

Adjustment can be initiated using the commands "JZ", "JG" as well as "JS" in the KCP protocol.

1) Emptying the weighing pan.

2) Sending the command to adjust the zero point ("JZ").
   The balance sends a confirmation ("JZ A").

3) Place the adjustment weight specified in chapter 1 on the balance.
   (query the adjustment weight using the command "JDC")

4) Send the command to accept the adjustment load ("JG").
   The balance sends a confirmation ("JG A").

5) Save the adjustment using the command "JS".

i This chapter 10.1 describes the ideal way to adjust the balance using the BalanceConnection software.

10 Carrying out measurements

10.1 Using your own software

Measurements may be requested using various KCP protocol commands.

10.1.1 Request weight values

Central commands for the request are:

- „S“: Transmit the next stable value
- „SI“: Transmit the current value
- „SIR“: Transmit the current net weight value continuously

10.1.2 Zeroing and taring

The device can be zeroed and tared using the following commands:

- „Z“: Zeroing the display on the balance
- „T“: Taring the balance
- „TA“: Setting or requesting the current tare value

10.2 Using the BalanceConnection software

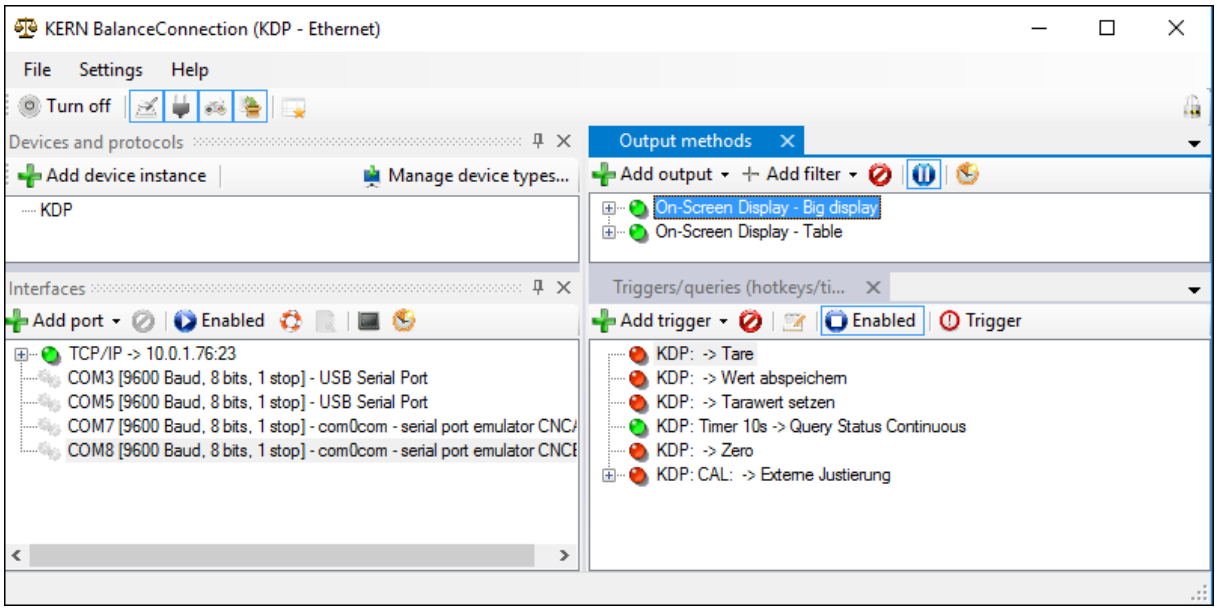
The enclosed "KERN BalanceConnection" software includes an example configuration for working with the KDP weighing platform. The example configuration switches the balance to continuous transmission, displays the current weight value on-screen and includes the most important commands (adjustment, zeroing, taring, printing).

To activate the example configuration, please select the "KDP" model from the list of models.

After confirmation the software loads the example configuration and restarts.
You will see the following items (two windows):

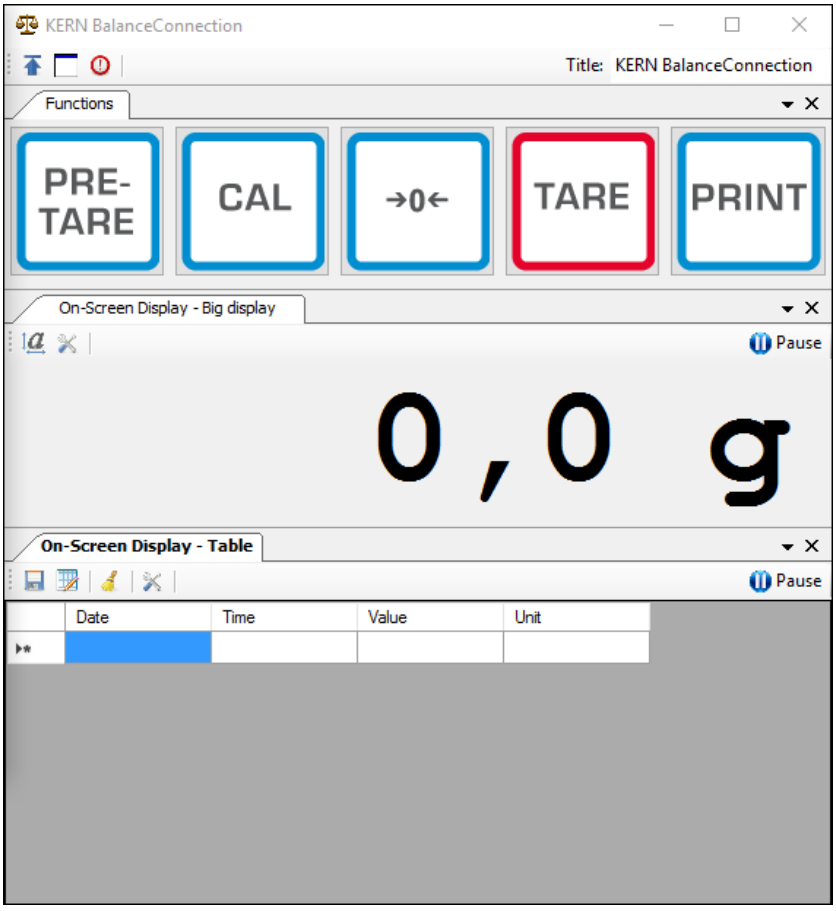
English

1) Main window BalanceConnection:



2) On-screen display window with three areas:

a. Main functions
b. Current weight value
c. Table listing weight values, which can be requested using "PRINT".



English

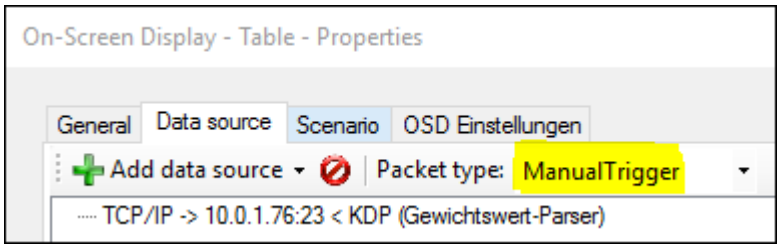
Important:

In the standard configuration COM1 is selected as the interface. Please adjust this on your balance. For access through Ethernet, WLAN or Bluetooth, please enter the relevant port in the software.

For details on changing the configuration please refer to the instructions for the BalanceConnection software.

In the example configuration the weighing platform sends data constantly. The weight values would normally all be forwarded to the output methods.

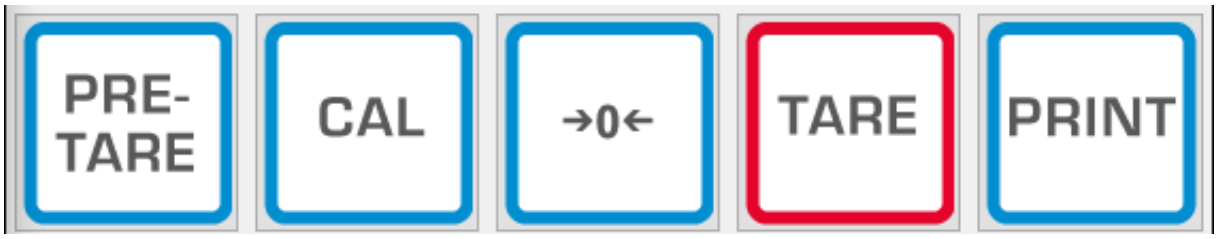
If you only want to keep the current value, then please use the operation "Save value" to accept the value. In the output method, the package type must be set to manual trigger.



English

10.2.1 Functions

In the example configuration the following functions are pre-configured:



⇨ **Zeroing (->0<-):**

The display on the balance is set to zero, the full weighing range is available.

⇨ **Taring (TARE):**

The current weight value is adopted as the tare value. The new net value is displayed.

⇨ **Pre-TARE:**

You can define a tare value (please specify in and with the weighing unit).

⇨ **PRINT:**

The current weight displayed on the balance is adopted as a value into the assigned output methods.

⇨ **Adjustment (CAL):**

Adjustment of the platform is illustrated in the example configuration by a sequence of commands, which corresponds to the adjustment procedure in the chapter 9. Please follow the instruction displayed on the screen.