PHYWE
excellence in science

Cobra SMARTlink

12999-99
12999-99E

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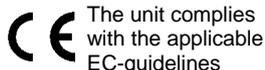Internet   www.phywe.com

Operating instructions

CE The unit complies with the applicable EC-guidelines

Fig. 1: 12999-99 Cobra SMARTlink

TABLE OF CONTENTS

1   SAFETY PRECAUTIONS

⚠ **Caution!**

- Carefully read these operating instructions completely before operating this device. This is necessary to avoid damage to it, as well as for user-safety.
- Use the unit only for its intended purpose.
- Protect the device from dust, moisture and vapours. Clean the unit with a slightly damp, lint-free cloth. Sharp cleaning agents or solvents are unsuitable.
- Make sure that no liquid enters the housing openings.
- Do not open the device.
- The voltage measurement input of the unit is intended for signals in the range of max. ±30V. To avoid risk of electric shock, do not measure voltages outside this range.
- The current measurement input is protected by a self-resetting fuse. However, avoid short-circuit currents greater than 20A. This can lead to the destruction of the unit.

2   PURPOSE AND CHARACTERISTICS

The device is a full-featured 10.1" tablet with Android operating system. A total of 7 integrated sensors expand the device to carry out a variety of experiments for science lessons.

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3   FUNCTIONAL AND OPERATING ELEMENTS
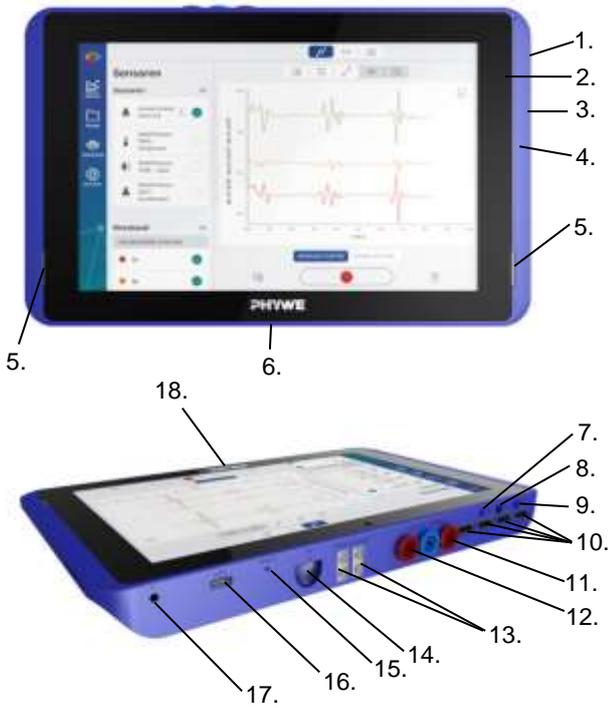
1. **Switch-on button.**
   To switch the appliance on and off, press the switch for longer than 3 seconds.

2. **Charging LED.**

Flashes red	Battery charge capacity < 10%
Red luminous	Battery is charging
Glowing green	Battery is fully charged

3. **Volume control.**
   Increase volume +, decrease volume -

4. **Microphone.**

5. **Stereo loudspeaker**

6. **Connection of an external keyboard**

7. **Integrated light sensor**

8. **Integrated UV sensor**

9. **Integrated humidity sensor**

10. **4x USB port for connecting Cobra SMART-sense sensors or USB memory.**

11. **Integrated voltage sensor**

12. **Integrated current sensor**

13. **2x Integrated temperature sensor (NiCrNi)**

14. Micro SD slot for memory expansion. Memory cards up to 64 GB or 32 GB for TF cards are supported.

15. Reset button. Pressing the button resets the unit and switches it off. Only use this if the unit no longer responds.

16. USB port type C for connecting a PC for data exchange or for charging the device using the USB charging adapter included in the scope of delivery.

17. Headphone jack. 3.5 mm jack socket for connecting external headphones.

18. Touch sensitive home button. Touching the **PHYWE** symbol takes you to the start screen (see chapter 5.3.1).

4   NOTES ON OPERATION

This device fulfils all of the technical requirements that are compiled in current EC guidelines. The characteristics of this product qualify it for the CE mark.

This device is only to be put into operation under specialist supervision in a controlled electromagnetic environment in research, educational and training facilities (schools, universities, institutes and laboratories).

The individual connected lines must not be longer than 2m. Electrostatic charges or similar electromagnetic phenomena (HF, burst, indirect lightning discharges, etc.) may affect the unit so that it no longer operates within the specified data.

If possible, the unit should not be used during the charging process, as interference signals from a connected charging adapter can lead to incorrect measurements or interference with the unit.

The following measures reduce or eliminate the disturbing influence:

Avoid carpeting; ensure equipotential bonding; experiment on a conductive, earthed base, use shielding, shielded cables.

5   HANDLING

This section describes how to set up the tablet for the first time, how to operate the device and how to use sensors. Please read this section carefully to avoid failure or incorrect operation.

5.1 Charging process

Using a USB-C connection cable included in the scope of delivery, connect the device (16.) to the enclosed USB charging adapter.

During the charging process, the charging LED (2.) lights up red. After the charging process is completed, the charging LED lights up green. The charging time of an empty battery is a maximum of 3 hours.

⚠️ Remove the charger no later than 4 hours after the charging process has been completed. Otherwise, the battery life may be shortened.

If the SMARTlink is switched on during the charging process, the charging time will increase significantly.

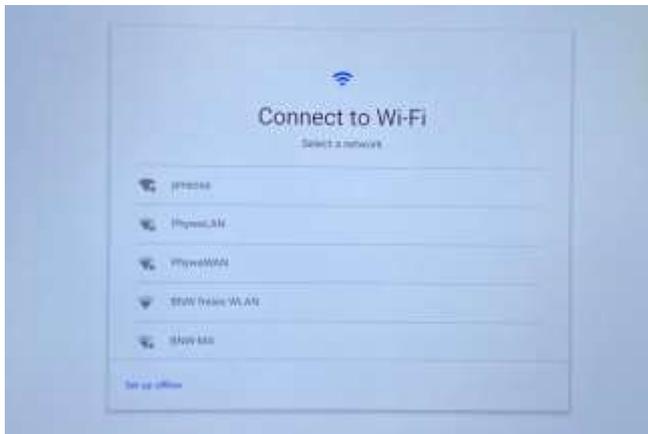## 5.2 Start-Up

5.2.1 Switching on the device
Switch on the unit by pressing and holding the power button for more than 3s.
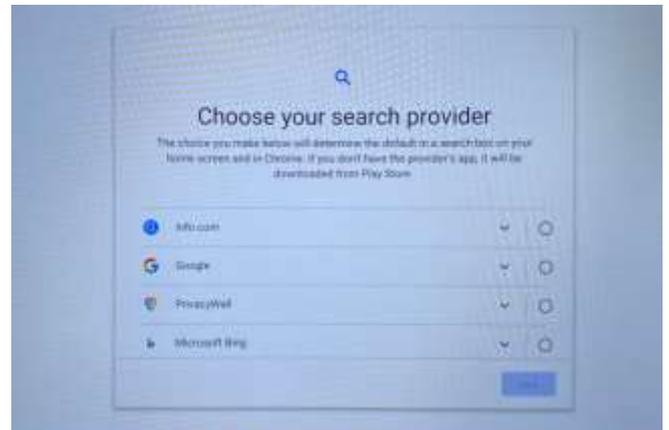
### 5.2.2 Initial Setup
The "Welcome" screen appears.

Now select a language and click the "Start" button to proceed with the initial setup.

Select the appropriate Wi-Fi network to which you want to connect the tablet. If you click the "Set up offline" option, some Google services cannot be set up.


If content is to be transferred from a previously used device, the "Next" button must be pressed here, otherwise please select "Do not copy".
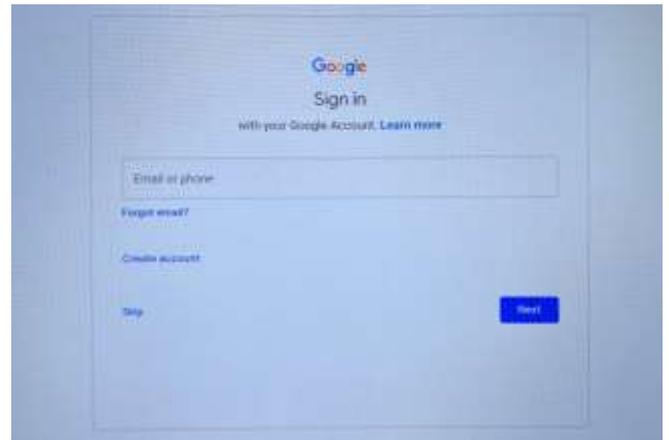

If you have a Google account, you can now sign in to Google. Please note that if you do not sign in ("Skip"), some Google services such as Google Playstore cannot be used.
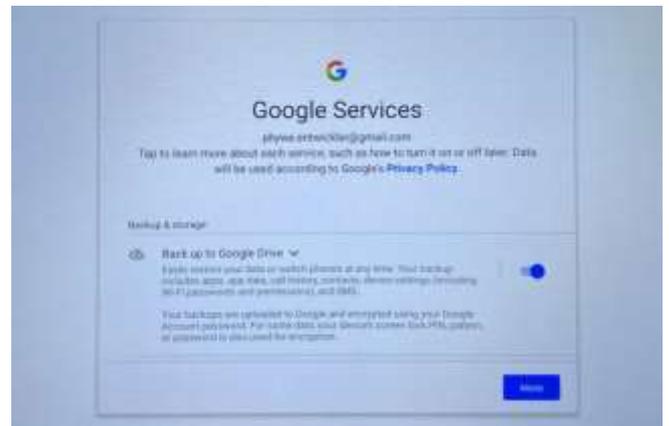

Select the Google services you need. Please note that in order to use the Cobra SMARTsense sensors via Bluetooth, location usage must be allowed, otherwise the sensors will not be recognised.
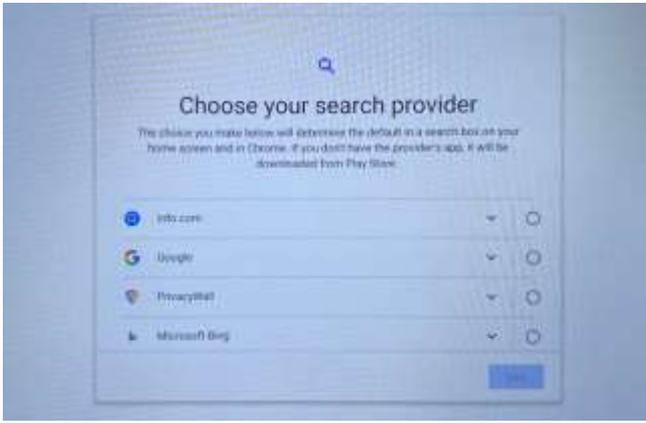
Then select a search provider that you want to use in the browser as well as on the home screen.
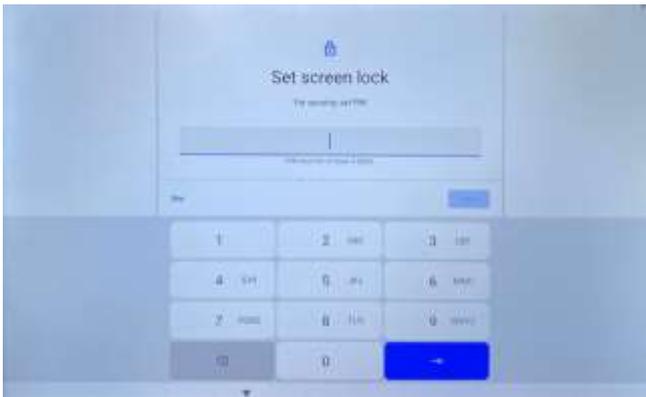
Activate the display lock to prevent unauthorised access to the tablet. **Caution:** a display lock is for your own security and should always be activated.
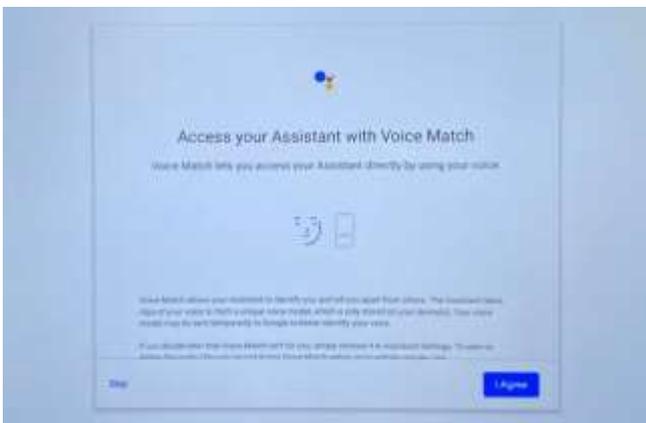
If you allow Google Voice Match to accept voice commands and forward them to Assistant devices such as the tablet, you can agree to this below, otherwise click "Skip".
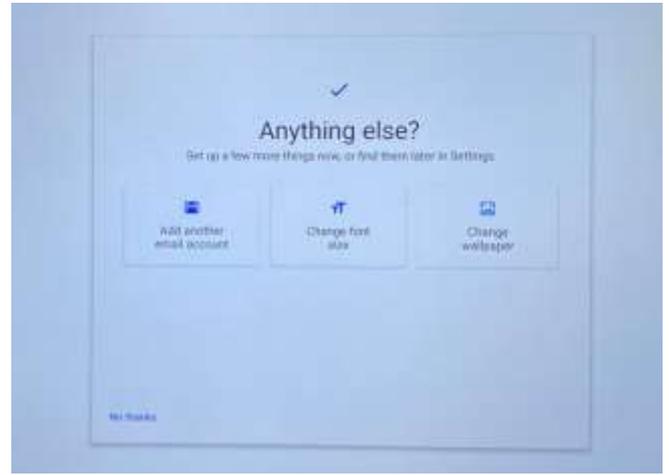
At the end of the initial setup, you have the option of making further adjustments and settings. However, you can also make these settings at a later time

### 5.2.3   Switch off the device.
Press the switch-on button for longer than 3s. Now you will see a selection window on the right-hand side for switching off the unit or restarting the device.
If you press the power button only briefly, you only switch off the display.

5.3 Using Android
The following section deals with the basic use and settings of Android. Due to the large number of settings and commands, only the areas that ensure smooth use of the PHYWE apps are described here. For further information on Android, various instructions are available on the Internet, or use our video descriptions at
www.youtube.com/c/phywesysteme.

5.3.1 The start screen
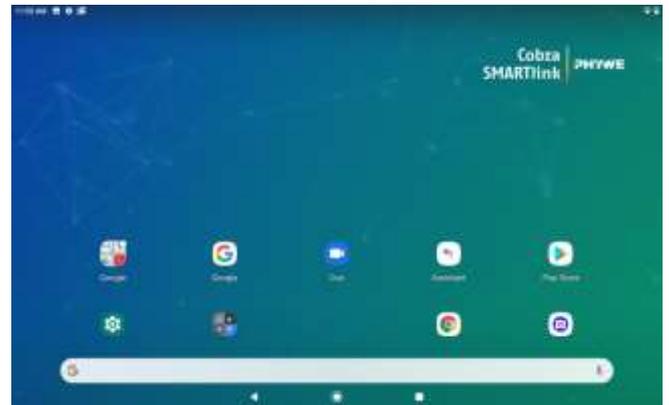
Information line top left and top right:

Time   Messages   Network   Battery status
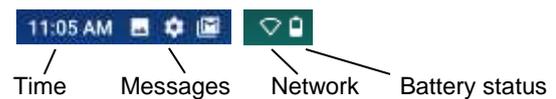
Navigation elements below:

Back   Google Assistant   Quit

By swiping from the right edge to the left, further screens with possibly installed apps are shown. Now you can switch between the screens by swiping right and left.
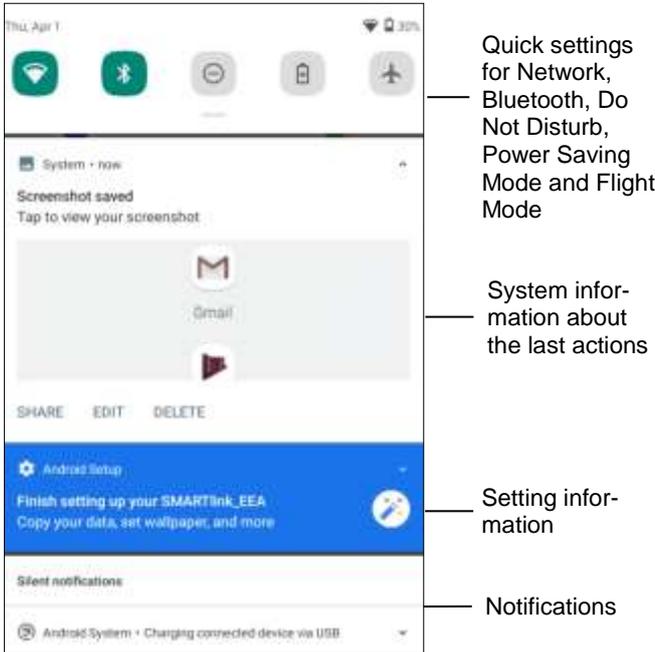
5.3.2 Message Centre and Quick Settings
Swipe your finger from the top of the screen downwards.

Quick settings for Network, Bluetooth, Do Not Disturb, Power Saving Mode and Flight Mode
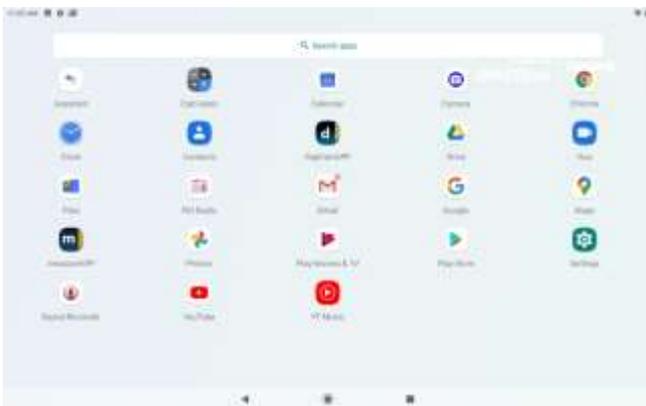
System information about the last actions

Setting information

Notifications

5.3.3 App screen
Swipe your finger upwards from the bottom of the screen.

After initial commissioning, the Phywe APPs measureAPP and DigiCartAPP can be found here.

If you want to move apps to the start screen or another screen, tap the icon for longer than 3s. You can then move the icon.

5.3.4 Using the Phywe Apps
The two APPs measureAPP and DigiCartApp are already installed on the SMARTlink and therefore do not need to be installed separately. Please check that the APP is up to date before using it.

If an update is necessary, it can be carried out via the Google Playstore.

Start Google Playstore on the start screen. Then click on the three-dash ≡ Choose My apps & games. If updates are available it's marked with [Update] elect measureAPP or Digi-CartAPP and click [Update]

After starting the Phywe Apps for the first time, you will receive a message that the location must be released for the Apps. This is necessary so that connected Cobra SMARTsense sensors or Cobra DigiCart can communicate via Bluetooth Low Energy. Please confirm the release.

If location sharing is rejected, neither Cobra SMARTsense sensors nor DigiCart can be detected.

At measureAPP all connected sensors as well as the internal sensors are displayed on the left under "Devices".

If you want to use the internal SMARTlink sensors (7.-13.), click on the round circle. For the first selection, you must confirm the release for the virtual COM port. This is necessary to retrieve measurement data.

If all approvals have been given correctly, you can measure with the internal and external (Cobra SMARTsense) sensors as you wish. The approvals only have to be granted once and will not be requested again until the app is reinstalled. Location approvals can be subsequently granted or blocked. See chapter 5.3.5.
After plugging USB-enabled Cobra SMARTsense sensors into the 4 USB ports (10.), a permission prompt appears for each USB port, which must be confirmed accordingly.

5.3.5 App permissions
Click the Settings icon on the Home screen and then select Apps and Notifications.
Now select the corresponding app and click on "Advanced" and then on "Permissions".

Now you can select the media to which the App should have access under "Denied". You then only have to allow access afterwards.

### 5.3.6 Establishing a USB connection to a PC.

If you want to transfer data such as pictures, videos or measured value files to a connected PC, you must first activate the USB connection and then release it for file transfer.

Click on the ⚙ settings icon on the home screen and then select 🔆 Display.

Activate the "USB Device" switch here.
Now establish the connection to the PC. To do this, use the USB-C socket (16.) on the SMARTlink.

In the message centre (see 5.3.2) you will now see the information that the device is being charged via USB. Click on this message to change it.
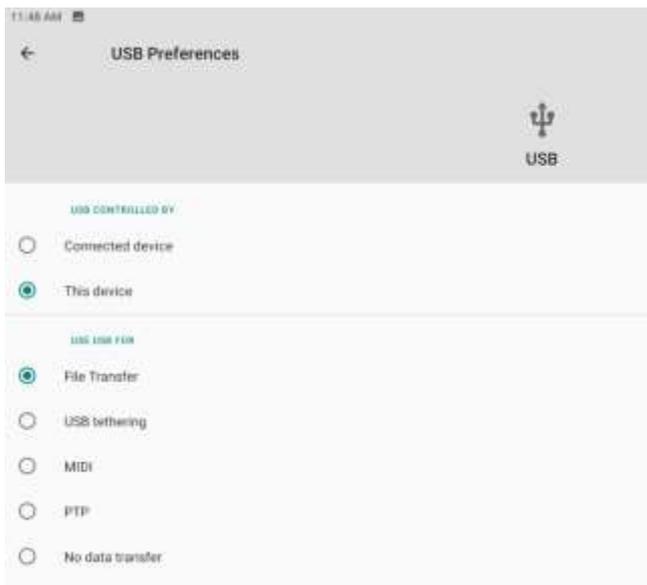

Now select "File Transfer" for "This device".

On the PC, the unit is now displayed to them as "SMARTlink" and they can access the directories and files of the SMARTlink.

⚠ If the SMARTlink is configured as a USB device, the internal sensors cannot be accessed in measureAPP. Therefore, terminate the USB connection after each data transfer.

5.4 Use of internal and external sensors

Cobra SMARTlink has 7 internal sensors for a variety of experiments.
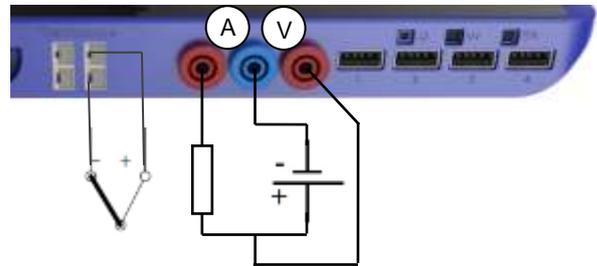
5.4.1 ☀ Light 1…128 kLx

5.4.2 ☀ UV 0...400 W/m²

5.4.3 ☁ Relative Humidity 0...100 %

5.4.4 🌡 Thermocouple -200...1200°C

Connect the NiCrNi temperature sensors (type K) included in the scope of delivery here. Make sure the polarity is correct (the negative pole is wider). See picture above.

5.4.5 Ⓥ Voltage ± 30V

Measure the voltage using the 4mm test leads included in the delivery. The exemplary connection of a voltage source with load is shown above.

⚠ Do not measure voltage above 30V or below -30V. This can lead to the destruction of the measuring electronics.

5.4.6. Ⓐ Current ±1A

Measure the current using the 4mm test leads included in the delivery. The exemplary connection of a voltage source with load is shown above.

⚠ Do not measure currents above 1A or below -1A. Although the measuring input is protected by a self-resetting fuse, very high currents (e.g. due to a short circuit) can destroy the unit.

5.4.7 Using the USB ports (10.)

Connect USB-capable Cobra SMARTsense sensors to USB ports 1-4. In measureAPP, you still have to allow access to the USB port for the app after plugging in the sensors. Once this is done, you can connect directly to the sensors. A SMARTsense sensor does not need to be switched on to connect to the USB.

5.4.8 Using Bluetooth sensors

Using Bluetooth-enabled sensors such as SMARTsense or DigiCart is very easy. Just switch on the sensors and start measureAPP when using SMARTsense sensors or DigiCartAPP when using the DigiCart. In measureAPP the Cobra SMARTsense sensors are directly available and can be selected. In DigiCartAPP, the DigiCart can also be selected and connected directly.

⚠ Bluetooth sensors require "location sharing" both for the app and globally in the operating system. See chapter 5.3.4.

6 TECHNICAL DATA

Operating temperature range: 5 - 40°C
Rel. humidity < 80%

Display	10.1" LCD touch
Resolution	WUXGA 1200 x 1920
CPU	Quad-core CPU 2.0 GHz
Main memory	4 GB RAM DDR3
Internal memory	64 GB
	Expandable to 128 GB
	(with TF Card max. 64GB)
Bluetooth	5.0
WiFi	Standard 802.11
	a/b/g/n/ac
Battery	Li-Po 10.000mAh
Camera	
Main	5 MP
Front	2 MP
Microphone	Internal /3.5mm socket
Temperature	Thermocouple type K
Range	-200 ... 1200 °C
Resolution	0,4 °C
Accuracy	+/- 3 %
Max. Data rate	10 Hz
Voltage	
Range	±30 V
Resolution	20 mV
Accuracy*	± 1 %
Max. Data rate	1 kHz
Current	
Range	±1 A
Resolution	2 mA
Accuracy*	± 1 %
Max. Data rate	1 kHz
Light	
Range	1 ... 128 kLx
Resolution	1 Lx
Accuracy*	± 4 %
Max. Data rate	10 Hz
Relative humidity	
Range	0 … 100 %
Resolution	0,1 %
Accuracy*	±4 % (at 0-80 %)
Max. Data rate	10 Hz
UV	
Range	0 ... 400 W/m²
Resolution	0.1 W/m²
Accuracy*	± 4 %
Max. Data rate	10 Hz
AC/DC adapter	100...240 V~/ 50...60 Hz
	5V / 2A Output
Dimensions (LxWxH)	277 x 175 x 25 mm
Weight	830 g

* full scale

7 SCOPE OF DELIVERY

The scope of delivery includes:

- Cobra SMARTlink 12999-99
- USB connection cable type C
- USB charging adapter 5V/2A
- 2x NiCrNi temperature sensor type K
- 2x connection cable red, 4mm, l=50cm
- 1x connection cable blue, 4mm, l=50cm
- Operating instructions

8 ACCESSORIES

The following accessories are available:

- USB connection cable type C07935-00
- Software measureLAB 14580-61

9 CONFORMITY

CE PHYWE Systeme GmbH & Co.KG hereby declares that the radio system type 12999-99 complies with the 2014/53/EU directive. The complete text of the EC Declaration of Conformity is available at the following Internet address:

www.phywe.com/en/ec-declaration

10 DISPOSAL

The packaging mainly consists of environmentally-friendly materials that should be returned to the local recycling stations.

Do not dispose of this product with normal household waste. If this unit needs to be disposed of, please return it to the address that is stated below for proper disposal

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