TESS | PHYWE
Student experiments

Student experiments TESS and Cobra SMARTsense –
Using digital devices to acquire practical skills in student labs

The ideal combination:

Classical experiment (hands-on competence) + **Digital data logging (media competence)**

- Individual teaching styles: Your choice of measurement device – classical and digital
- Future-proof: Prepare today for the transition from classical to digital education
- Fast and efficient learning: The use of everyday digital devices increases the motivation of students
- More than 110 PHYWE experiments from all fields of natural sciences:

Phy Che Bio STEM

Any more questions? Please feel free to contact us by sending an e-mail to digital-education@phywe.de

curricuLAB® | PHYWE

Cobra SMARTsense and curricuLAB® –
Your universal solution for digital education in natural sciences

With the learning and teaching solution curricuLAB® PHYWE offers a unique universal solution for interconnected digital education in the field of natural sciences.

curricuLAB® is intuitive and easy to use, increases motivation and offers digital content for physics, chemistry, biology and STEM. No matter if you use tablet or personal computers, no matter if you prefer lecturing or group work teaching styles - PHYWE curricuLAB® is your foundation for modern and future-oriented digital education.

curricuLAB® | PHYWE
Excellent **E**xperimentation Network.
Digital teaching and learning platform for natural sciences!

curricuLAB® ActivityManager | PHYWE
Excellent lessons.
Print, edit or create experiments and worksheets online according to your curriculum.

curricuLAB® measureAPP | PHYWE
Excellent results.
Modern data logging with tablet via Bluetooth or network.

curricuLAB® measureLAB | PHYWE
Excellent results.
Precise measurements with all PCs of your network.

curricuLAB® LabManager | PHYWE
Excellent preparation.
Equipment inventory well organized.

curricuLAB® module	Item number
curricuLAB® LabManager	
■ School license (online)	14590-61
curricuLAB® ActivityManager	
■ School license (online), for teachers	14575-62
curricuLAB® measureLAB	
■ School license	14580-61
curricuLAB® measureAPP	
■ Free APP for Cobra4 and SMARTsense sensors	14581-61

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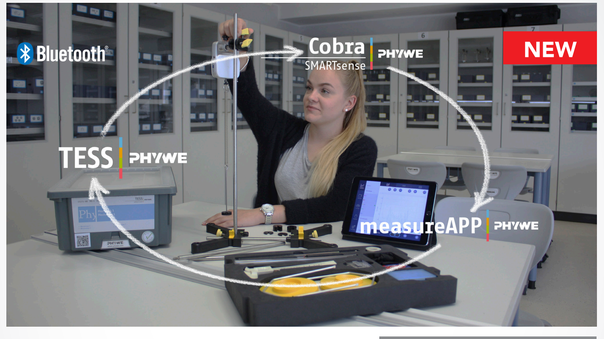
www.phywe.de/smartsense

Cobra SMARTsense | PHYWE

PHYWE excellence in science

Cobra SMARTsense and curricuLAB® –
Taking student experiments to the next level



Cobra SMARTsense and measureAPP – the simple and intuitive way to measure in student experiments

- Digital education in natural sciences is directly linked to data logging
- Up to 60% less expensive than standard interface systems
- Didactic application of tablet computers and smartphones, especially in student experiments
- Higher motivation of students by utilizing everyday mobile devices
- Basic hands-on method of learning scientific concepts

Benefits for teachers and students

- All-in-one device / no interface necessary
- Unrivalled price-performance ratio
- Switch on and start measuring
- New technology: Bluetooth 4
- Designed for TESS student experiments
- Fully automated detection of sensors in the PHYWE measureAPP

Physics Phy | Chemistry Che | Biology Bio | STEM STEM

PHYWE excellence in science www.phywe.com/smartsense

Cobra SMARTsense and measureAPP –
Your digital data logger for all curricular topics

Your easy entry into digital education

measureAPP | PHYWE

- High performance
- Intuitive and easy to use / designed for students
- Modern and attractive design
- Compatible with all Cobra SMARTsense sensors
- Document your measurements and file digital media in your personal experiments folder
- Sophisticated, curriculum-based experiment guides

Free download:

Download on the App Store

ANDROID APP ON Google play

PHYWE excellence in science

Cobra SMARTsense Sensors for Physics, Chemistry and Biology –
everything at a glance!

- Direct communication via Bluetooth
- Compatible with the free PHYWE measureAPP - available for tablet computers and smartphones (iOS and Android 5.0+)
- 29 different Cobra SMARTsense sensors
- Perform more than 110 PHYWE experiments
- Full coverage of the curriculum for all fields of natural sciences

59 Experiments in Physics

Sensor	Voltage	Current	Force	Temperature	Photogate	Pressure	Acceleration	Motion	Magnetic field	Light	Radioactivity	Surface Temperature	Rotary Motion
Figure													
Measured value	voltage	current	force	temperature	time	pressure	acceleration	distance	magnetic flux	brightness	radioactivity	surface temperature	angle
Measurement range	± 30 V	± 1 A	± 50 N	- 40...120 °C	0 ... ∞ s	20...400 kPa	± 8 g	0.20...2 m	± 64 mT	1...128 klx	0...40000 c/min	- 25...125 °C	30 rps
Resolution	0.02 V	0.5 mA	30 mN	0.01 °C	0.01 ms	0.1 kPa	0.01 g	1 mm	0.04 mT	1 lx	1 c/min	0,04 °C	0,125°
Sampling rate	1000 Hz	1000 Hz	1000 Hz	10 Hz	1000 Hz	500 Hz	100 Hz	50 Hz	500 Hz	10 Hz	-	100 Hz	-
Item number	12901-00	12902-00	12904-00	12903-00	12909-00	12905-00	12907-00	12908-00	12911-00	12906-00	12937-00	12917-00	12918-00

40 Experiments in Biology

Sensor	Humidity	EKG	CO_2	Spirometer	Heart Rate	Oxygen
Figure						
Measured value	humidity	voltage	CO_2 concentration	volume flow	heart rate	O_2 concentration
Measurement range	0...100 %rH	0...4.5 mV	0...100,000ppm	± 10 l/s	30...200 bpm	0...20 mg/l 0...100 %
Resolution	0.1 %rH	4.5 µV	2 ppm	0.01 l/s	1 bpm	0.01 mg/l, 0.1 %
Sampling rate	10 Hz	1000 Hz	1 Hz	1000 Hz	10 Hz	100 Hz
Item number	12931-00	12934-00	12932-00	12936-00	12935-00	12933-00

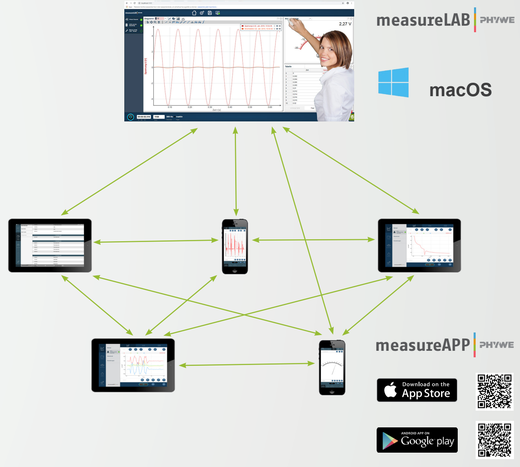
16 Experiments in Chemistry

Sensor	pH	Conductivity	Dropcounter	Colorimeter	Thermocouple	Nitrate Ion	Ammonium Ion	Chloride Ion	Calcium Ion	Potassium Ion
Figure										
Measured value	pH	conductivity	drop count	transmission	temperature	nitrate concentration	ammonium concentration	chloride concentration	calcium concentration	potassium concentration
Measurement range	0...14	0...20,000 µS/cm 0...100 °C	0...∞ Imp	0...100 %, 0...3 abs, 0...400 NTU	-200...1200 °C	0.6...6200 ppm	0.9...1800 ppm	1.8...3550 ppm	0.4...4000 ppm	0.4...3900 ppm
Resolution	0.01	1 µS/cm, 0.1 °C	30 Imp/s	0.1%, 0.01 abs	0.1 °C	2 ppm	0.5 ppm	1 ppm	1 ppm	1 ppm
Sampling rate	100 Hz	10 Hz	50 Hz	1 Hz	10 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
Item number	12921-00	12922-00	12923-00	12924-00	12938-00	12912-00	12913-00	12914-00	12915-00	12916-00

Cobra SMARTsense | PHYWE

Platform independent networked measurement –
with Cobra SMARTsense, measureAPP and measureLAB!

- Share data directly via WLAN
- Sending and evaluating from the mobile device directly to measureLAB
- Direct data exchange to Excel/OpenOffice/Numbers



Questions about digital education, our new Cobra SMARTsense sensors, measureAPP or measureLAB?
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