

Englo LLC

Civil and Road Construction Product Overview



**Civil and Road
Construction**



We develop, design and manufacture quality products since 1991



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Light Weight Deflectometers

Englo develops, designs and manufactures light weight deflectometers that are portable falling weight deflectometers (LWD) for measuring the ground elastic modulus, maximum deformation, compaction factor, elastic deflection and deformation time. The deflectometers are ideal for testing in regular as well as difficult to access areas.

The deflectometers are highly versatile, and can be used in design, construction, maintenance and quality control of buildings, subdivisions, roads, railways and other environments to measure elastic modulus of unbound or partially bound material, including asphalt, granular aggregation base, base layers, soil, concrete etc.

Englo's deflectometers are portable, compact and can easily be used by a single operator. The device's intelligent built-in electronic unit calculates and displays the results immediately after the series of measurements is completed. All measured data is stored and can be downloaded to a computer via USB or Bluetooth connection. The latest model also allows the results to be read to the user's mobile phone and forwarded via e-mail to off-site staff for real-time verification against expected results.

The deflectometers come with a full suite of control and monitoring features. A separate GPS unit is available to determine and store the exact location of the measurement, which can later be graphically displayed in Google Maps.

All Englo's light falling weight deflectometers are rated IP65 under the international IEC 60529 standard and are splash and dust proof.

INSPECTOR-3: Light Falling Weight Deflectometer

- Compact and easy to set up and use
- Real-time calculation and display of measurement results
- Results stored in device memory
- Computer connection with USB or Bluetooth
- Display for alarms and monitoring
- Separate GPS unit to determine and store measurement locations

INSPECTOR-4M: Light Falling Weight Deflectometer

- INSPECTOR-4 with built-in GPS module

INSPECTOR-4: Light Falling Weight Deflectometer

- Compact and easy to set up and use
- Real-time calculation and display of measurement results
- Results stored in device memory
- Computer connection with USB or Bluetooth
- Data can be sent to user’s mobile phone
- Display for alarms and monitoring
- Separate GPS unit to determine and store measurement locations
- Electronic unit can be detached for separate shipment if needed

INSPECTOR-5: Light Falling Weight Deflectometer

- Smaller and lighter than previous Inspector models
- Compact and easy to set up and use
- Real-time calculation and display of measurement results
- Results stored in device memory
- Computer connection with USB or Bluetooth
- Data can be sent to user’s mobile phone
- Built-in GPS module

| Product | Total Weight (kg) | Falling Weight at Drop Height | Loading Force (kN) | E-Modulus Range (MPa) | Size (mm) |
|--|-------------------|-------------------------------|--------------------|-----------------------|----------------------------|
| INSPECTOR-3 INSPECTOR-4 INSPECTOR-4M | 16 | 10kg at 800mm | 23 | 5 - 900 | 1150 x 110 x 110 |
| INSPECTOR-5 | 10,8 | 6kg at 670 mm | 11 | 5 - 300 | 1030 x 80 x 80 (110 x 110) |

Profilometers

Englo designs and manufactures a wide array of profilometers. These road roughness and profile measuring devices range from simple hand-held products to measure surface unevenness, to intelligent road roughness measuring systems that display the various profile parameters, for example, the average angle of inclination, the rut depth of a road and International Roughness Index (IRI) and more.

Handheld, walking and vehicle-mounted profilometers are available.

ENGLO's profilometers are rated IP65 under the international IEC 60529 standard and are splash and dust proof.

Handheld Profilometers

Englo's handheld profilometers are easy to use by a single operator. They include an aluminum bar and a wedge for measuring both dips and bumps on a surface. For transport the wedge is placed inside the bar. The bar is conveniently marked as a ruler with decimeter (dm) scale to help determine the precise location of the dip or bump from a reference point. The wedge is used to measure the height of the actual dip or bump.

The latest models include an intelligent electronics unit with built-in inclinometer and can additionally be used for surface slope measurement. The LCD display can rotate to 180° for slope measurement of walls and ceilings. A sound signal is available to help determine the 0-slope of the surface.

The surface roughness measuring method corresponds to the building standard of Finland RT 14-10373.

TM-1: Handheld Profilometer

- Lightweight
- Compact
- Bar and wedge

TM-2: Handheld Digital Profilometer and Inclinometer

- Lightweight
- Compact
- Includes built-in inclinometer
- LCD with slope measurement results
- Bar and wedge

| Product | Weight (kg) | Ruler Bar Length (m) | Measuring Range (mm) | Measuring Accuracy (mm) | Size (cm) |
|---------|-------------|----------------------|----------------------|-------------------------|--|
| TM-1 | 1.56 | 2 | +/-10 | 1+/- 0.5 | 2050 x 120 x 18 bar + 360 x 36 x 16 wedge |
| TM-2 | 2.38 | 2 | +/-10 | 1+/- 0.5 | 2050 x 120 x 18 bar + 360 x 36 x 16 wedge |

Walking Profilometers

In addition to standard profile measurements, Englo's walking profilometers include a mode for IRI measurement. In this mode the profilometers display the average IRI value of the last covered surface meter.

The portable walking profilometers include a control and a sensor module that are connected by an adjustable length handle. The device is on wheels and can easily be rolled across the measured surface by a single operator.

The control module includes a number of setup and control options, and displays the recent measurement results. Different measuring modes can be selected to determine how to calculate the value and position of the maximum deviation for the profile.

These profilometers come with an integrated GPS module that stores the coordinates of each measurement location. All measured data is stored and can be downloaded to a computer via USB or Bluetooth connection.

GAPMAN: Walking Profilometer

- Lightweight
- Wheeled across a measured surface by a single operator
- Selectable setup and control options
- IRI measurement mode
- Real-time calculation and display of surface profile parameters
- Integrated GPS unit determines and stores measurement locations
- USB or Bluetooth computer connection

| Product | Total Weight (kg) | Data Storage Capacity (km) | Profile Measuring Step (mm) | Profile Height Measuring Resolution (mm) | Maximum Slope (°) | Size (cm) |
|---------------|-------------------|----------------------------|-----------------------------|--|-------------------|-----------------------|
| GAPMAN | 3 | 40 | 100 | 0.1 | +/-30 | 70 x 40 x 20 + handle |

Vehicle-Mounted Profilometers

Englo’s vehicle-mounted road roughness measuring devices measure the International Roughness Index (IRI) of different road surfaces.

These vehicle mounted profilometers include a control unit with graphic LCD display, one or two wireless inertial sensors and a roof magnet-mounted GPS antenna. The inertial sensors are mounted to MacPherson type front suspension of the vehicle. Depending on the model, the connectivity of the sensors to the rest of the system is made via cables or is wireless.

The products can be used on paved or unpaved roads. Wet, snowy or dusty road surface do not influence the accuracy of measurement.

All measured data together with measurement location is stored and can be downloaded to a computer via USB connection and can be viewed as graphs, tables and maps. Software is provided for easy processing and display of the data.

The sensor bodies of the devices are rated IP67 under the international IEC 60529 standard and are splash and dust proof.

IRIMETER-1: Vehicle Mounted IRI Measurement System

- Compact and easy to set up and use
- Real-time calculation and display of measurement results on LCD
- GPS unit to determine and store measurement location
- Control, central and sensor units
- Sensor unit(s) connected with cable
- Optional crossfall inclination sensor

IRIMETER-2: Vehicle Mounted IRI Measurement System

- Compact and easy to set up and use
- Real-time calculation and display of measurement results on LCD
- GPS unit to determine and store measurement location
- Control and sensor units
- Wireless connection to sensor unit(s)
- Optional crossfall inclination sensor

| Product | Total Weight (kg) | Data Storage Capacity (km) | Average IRI Calculation Setting (m) | Allowed Vehicle Speed (km/h) | Size of Control and Sensor Units (mm) |
|------------|-------------------|----------------------------|-------------------------------------|------------------------------|--|
| IRIMETER-1 | 2 | 1,100 | 5, 20, 100 | 20 - 100 | 90 x 120 x 60 (control) 90 x 160 x 60 (central) 100 x 55 x 50 (sensor) |
| IRIMETER-2 | 2 | 15,000 | 5, 20, 25, 100 | 20 - 100 | 90 x 120 x 60 (control) 100 x 55 x 50 (sensor) |

Digital Inclinometers

Englo’s product portfolio includes a number of different surface slope measuring devices or digital inclinometers to measure the slope or angle of roads, floors, pipes and other objects or surfaces with inclination.

The inclinometers are compact and easy to use. Handheld products, and products mounted to graders and bulldozers are available.

Englo’s digital inclinometers are rated IP65 under the international IEC 60529 standard and are splash and dust proof.

Handheld Digital Inclinometers

The handheld digital inclinometers are lightweight, portable and can be used by a single operator. The inclinometers include an aluminum bar with a ruler an electronic unit with an LCD display that is fastened to the ruler bar, and a separate optional wedge to help with the measurement. The slope is

measured in degrees, percentages or inches per foot. A sound signal is available to help determine the 0- slope of the surface.

KM-1: Handheld Digital Inclinometer

- Wide slope measuring range
- LCD with measurement results
- 1.2m ruler bar included, 3m bar available
- 20mm or 50mm wedge available

KM-3: Handheld Digital Inclinometer

- Wide slope measuring range
- LCD with measurement results
- 3m foldable bar for easy transportation
- 20mm or 50mm wedge available

| Product | Total Weight (kg) | Operating Angle (°) | Accuracy (°) | Bar Length (m) | Size when folded (cm) |
|-------------|-------------------|---------------------|--------------|----------------|-----------------------|
| KM-1 | 3.15 | 0 to 90 | 0.1 | 1.2 | 1200 x 70 x 210 |
| KM-3 | 5.9 | | | 3 | 1500 x 70 x 220 |

Grader and Bulldozer Slope Meters

Englo offers products for a wide range of graders and bulldozers to regulate and control surface slope.

The devices come with two separate units – slope sensor with signal precision amplifier and slope measuring and control unit – that are connected by a flexible cable. The slope sensor unit is connected to the grader blade or bulldozer bucket and the slope measuring and control unit is attached to the window of the cabin, allowing the operator to view the measurement results and alarms directly from the cabin.

The products allow the operator to keep the blade or bucket slope at a desired angle with the aid of sound and light signals. Additionally, the devices allow the operator to measure slope of an existing surface by lowering the blade of the grader or the bucket of the bulldozer to the desired surface location and then taking the measurement.

Englo’s grader and bulldozer slope meters are rated IP65 under the international IEC 60529 standard and are splash and dust proof. The sensor units are rated IP68.

GRADER WATCHMAN-2: Grader Slope Meter

- Wide slope measuring range
- Alarms and signals to help keep the blade slope at desired angle
- Measurement with display
- Measurement results and alarms can be viewed directly from the cabin during operation
- Can be used during construction or to measure slope of existing surfaces

DOZER WATCHMAN: Bulldozer Slope Meter

- Wide slope measuring range
- Alarms and signals to help keep the bucket slope at desired angle
- Measurement with display
- Measurement results and alarms can be viewed directly from the cabin during operation
- Can be used during construction or to measure slope of existing surfaces

| Product | Operating Angle (°) | Digital Display Max Angle (°) | Accuracy (°) | Sensitivity to longitudinal slope | Impact Resistance (g) |
|-------------------|---------------------|-------------------------------|--------------|-----------------------------------|-----------------------|
| GRADER WATCHMAN-2 | +/- 30 | +/- 10 | +/-0.1 | 0.1% slope to 45° | 10,000 |
| DOZER WATCHMAN | +/- 30 | +/- 10 | +/-0.1 | 0.1% slope to 45° | 10,000 |

Surface Hole Depth Gauges

Englo designs and manufactures devices to measure depth of surface holes. These devices can be used to conveniently and quickly determine the depth of holes or ruts in pavement, gravel, soil and other surfaces.

The surface hole depth measuring devices include a vertical measuring rod with scale and base and two bubble levels to properly position the device on the horizontal surface. 0.95m and 1.95m measuring bar help optimize the device for different measurement conditions.

AM-1: Surface Hole Depth Gauge

- Measure hole depth of surface
- Accurate and easy to use
- Includes 2 bubble levels
- Comes with 0.95m or 1.95m measuring bars

| Product | Total Weight (kg) | Bar Length (m) | Max Measuring Range (cm) | Accuracy (cm) | Measuring Rod Base Diameter (cm) |
|---------|-------------------|----------------|--------------------------|---------------|----------------------------------|
| AM-1 | 1.48 4.33 | 0.95 1.95 | 20 | 0.5 | 3.2 |

Penetrometers

ENGLO's dynamic penetrometers can be used to effectively and easily evaluate the fine particle soil density.

The penetrometers are durable and easy to use. To perform the measurement, the conical tip of the penetrometer is pounded into the ground by dropping the falling weight of the device. A table is provided that correlates the number of the weight drops to the compaction coefficient.

PM-1: Penetrometer

- Durable and easy use
- Whole design made from stainless steel

| Product | Weight (kg) | Falling Weight Drop Height (cm) | Falling Weight (kg) | Device Length (cm) |
|---------|-------------|---------------------------------|---------------------|--------------------|
| PM-1 | 3.3 | 30 | 2.5 | 80 |

Water Level Meters

Englo provides portable groundwater level meters to determine the groundwater level in bores and wells.

The water level meters are compact, lightweight and easy to use. The body of the device includes the electronics. The body is fastened to a measuring tape with a connector. A 30m measuring tape is included with the product but any measuring tape or cable can be used. Once the sensor reaches the water level, it sounds a signal to notify the user.

The groundwater level measuring devices are rated IP65 under the international IEC 60529 standard and are splash and dust proof.

SOND-2M: Groundwater Level Meter

- Compact
- Measures any groundwater level depth (for >30m a different measuring tape is needed)
- Audible notification signal

| Product | Weight (g) | Measurement Unit (cm) | Measurement Accuracy (cm) | Dimensions (mm) |
|---------|------------|-----------------------|---------------------------|-----------------|
| SOND-2M | 151 | 1 | +/-1 | 32 x 235 |

Blasting Machines and Line Testers

Englo develops, designs and manufactures a wide range of blasting machines and digital line testers for use in mining, military, civil and road construction and other applications.

Many Englo's blasting machines come with built-in line testers that eliminate the need for a stand-alone ohmmeter, but stand-alone line testers are available as well. Both integrated and separate line testers verify the detonator line resistance to identify short circuits, breaks in the blasting line or circuits with excessive resistance prior to the blast. This technology virtually eliminates misfires caused by detonator wiring problems, which is one of the leading causes of blast related injuries. For safety reasons, the line tester current is limited to 1mA.

Most of the products include output pulse tail cutting to limit the impulse to 4ms and quench the remaining capacitor charge. These safety features are necessary to eliminate potential secondary explosions of the flammable dust generated during the blast.

The blasting machines are portable, compact and lightweight, and can easily be operated by a single person.

The blasting machines can include hand generators or can be battery powered.

All Englo's blasting machines are rated IP65 under the international IEC 60529 standard and are splash and dust proof.

Blasting Machines with Hand Generators

By using hand generators the operator does not have to consider the quality and shelf life of a battery.

The blasting machines with hand generators support various firing voltages and come with various feature sets.

As a new feature there is the digital ohmmeter used in ERNA-5.

PONGO: Push-Button Blasting Machine

- Low energy blasting machine
- Push-button immediate firing impulse generation
- Supports blasting of up to two Class 1 detonators in series, with up to 120m total line length
- Ultra-lightweight

ERNA-3: Hand Cranked Blasting Machine With Line Continuity Tester

- Medium energy blasting machine
- Built-in line tester with two color LED

BART-1: Hand Cranked Blasting Machine With Line Continuity Tester

- Medium energy blasting machine
- Built-in line tester with two color LED
- Short 4ms output pulse
- Certified according to EN 13763-26

ERNA-4: Hand Cranked Blasting Machine With Line Tester

- Medium energy blasting machine
- Built-in line tester with selectable Class 1, 2 or 3 line resistance settings
- 3 two color LEDs for line resistance
- Short 4ms output pulse

ERNA-5: Hand Cranked Blasting Machine With Digital Ohmmeter

- Medium energy blasting machine
- Built-in ohmmeter with digital 0-999 Ω reader
- Short 4ms output pulse

BART-2 and BART-2AS: Hand Cranked High Energy Blasting Machine

- High-energy blasting machine
- Mechanical safety block engaged during connecting and loading the line
- Plastic details manufactured from antistatic plastics to avoid static electrical charge accumulation (BART-2AS)
- Removable crank handle
- Certified according to EN 13763-26

| Product | Weight (kg) | Voltage (V) | Energy (J) | Line (Ω) | Size (mm) |
|-----------------|-------------|-------------|------------|-------------------|-------------------------|
| PONGO | 0.15 | 11.5 | 0.03 | 11 | \varnothing 32, L= 95 |
| ERNA-3 | 0.8 | 440 | 6.6 | 380 | 142 x 125 x 45 |
| ERNA-4 | | 560 | 12.8 | 500 | |
| ERNA-5 | | 560 | 12.8 | 500 | |
| BART-1 | 1.3 | 900 | 9.3 | 700 | 200 x 143 x 55 |
| BART-2 | 1.4 | 1250 | 88.0 | 1000 | |
| BART-2AS | 1.4 | 1250 | 88.0 | 1000 | |

Battery Powered Blasting Machines

Englo's battery powered blasting machines are compact and ultra-lightweight and come with built-in line testers.

GUERILLA: Blasting Machine With Line Continuity Tester

- Lightweight
- Medium energy blasting machine
- Built-in line tester with two color LED
- Battery level indicator LED

MARS-3: Blasting Machine With Digital Line Tester

- Built-in line tester with digital 0-999 Ω reader
 - Capacity level indicator LED
- Short 4ms output pulse

MARS-2: Blasting Machine with Digital Line Tester

- Lightweight
- Medium energy blasting machine
- Built-in line tester with digital 0-1999 Ω reader
- Battery level indicator LED
- Short 4ms output pulse

| Product | Weight (kg) | Voltage (V) | Energy (J) | Line (Ω) | Size (mm) |
|-----------------|-------------|-------------|------------|-------------------|----------------|
| GUERILLA | 0.3 | 250 | 2.1 | 150 | 170 x 82 x 34 |
| MARS-2 | 0.5 | 440 | 6.6 | 380 | 200 x 100 x 50 |
| MARS-3 | 0,34 | 500 | 8,5 | 450/180/36 | 170 x 88 x 33 |

Blasting Machine Testers

The blasting machine tester VIGOR is designed for testing the impulse energy of Englo's blasting machines. The tester can be used in both indoor and outdoor conditions.

VIGOR can be customized for the specific blasting machine or blasting machine family that is being tested.

VIGOR doesn't need any batteries and is ready for immediate operation.

| Product | Weight (kg) | Power supply | Protection level of tester case | Operating temperature (°C) | Size (mm) |
|---------|-------------|---------------------|---------------------------------|--|---------------|
| VIGOR | 0.26 | No batteries needed | IP67 | -15 to +50, at 100 % relative humidity | 170 x 88 x 33 |

Digital Line Testers

Englo's digital line testers can be used in conjunction with the blasting machines that do not already include a built-in line tester. The line testers are designed for safe testing of electric detonator lines or sections and the connecting cables.

The line tester accurately measures the line resistance over the full range between 0 to 1999 Ω and includes an LCD screen that displays the readout. Momentary and also continuous measurement modes are available.

The continuous mode is initiated releasing the TEST button after 10 seconds and it lasts indefinitely. This is useful in situations where the detonator line can be affected for some time prior to the actual blasting moment, such as intentional covering of blasting charges.

For safety reasons, the line tester current is limited to 1mA. The products are battery powered.

Englo's digital line testers are rated IP65 under the international IEC 60529 standard and are splash and dust proof.

OOM-4: Digital Line Tester

- Highly accurate
- Full-range numeric line resistance measurement with display
- Continuous and button-based measurement modes

| Product | Weight (kg) | Range (Ω) | Resolution (%) | Max line resistance current (mA) | Size (mm) |
|---------|-------------|--------------------|----------------|----------------------------------|---------------|
| OOM-4 | 0.23 | 0-1999 | +/-0.5 | 1 | 140 x 69 x 34 |

Metal Detectors

Englo develops, designs and manufactures lightweight handheld metal detectors.

These detectors can be used as metal detectors for accurate search of people and hand luggage control in the airports, ports and other public institutions. They can also be used for precise positioning of

cables, wires and pipes in walls and concrete, or to search for metal objects lost in sand and other materials. Different types of metals can be detected.

All Englo’s metal detectors are rated IP65 under the international IEC 60529 standard and are splash and dust proof.

MINION-1 and MINION-2: All-Purpose Handheld Metal Detector

- Handheld
- Highly accurate
- Lightweight
- 3 sensitivity ranges with automatic adjust
- LED, vibration or sound-based detection indicator
- LED-based battery charge indicator

METO-7: Ground Search Handheld Metal Detector

- Handheld
- 3 sensitivity ranges with range regulator
- LED, vibration or sound-based detection indicator
- Coil to cover larger surface area
- Short or long handle

| Product | Weight (g) | Detection distance for 3g gold ring (cm) | Detection distance for 8x8cm metal plate (cm) | Metals Detected | Size (mm) |
|------------------------------------|------------|--|---|---------------------------|---------------------|
| MINION-1 MINION-2 | 319 300 | 9.5 | 19 | Magnetic and non-magnetic | 375 x 55 x 30 |
| METO-7 | 720 | 8 | 31 | Magnetic and non-magnetic | Ø 250 coil diameter |

Dosimeters and Radiation Detectors

Englo develops, designs and manufactures a wide range of digital dosimeters and radiation detectors that can be used to detect alpha (α) and beta (β) particles, gamma (γ) rays and X-rays and radon (Rn).

Even though γ rays can be most prevalent in the contaminated environment, as they have tremendous penetrating power and would require several inches of dense material (like lead) to shield them, α and β particles can be equally, or even more, harmful to the human body, especially when inhaled or taken in with food and water. Therefore, depending on the situation and source of the radioactivity, the capability to measure all three types of radiation is important and lifesaving.

Englo radiation detectors can also detect radon (Rn). Rn is gaseous under normal conditions and can easily be inhaled. It is often the single largest contributor to an individual's background radiation dose.

Englo’s dosimeters and radiation detectors can be used in professional applications for survey and monitoring, including construction, mining, military, oil and gas exploration, nuclear sites and hospital radiology departments, and they are also ideal for personal use to determine whether there are hazardous materials in cellars, walls, or anywhere in the surrounding environment.

Englo's products are easy to use and are they are highly radiation sensitive. Depending on the product, different types of radiation can be monitored and detected. Clip-on and handheld devices, or systems that can be mounted to doorframes, indoor/outdoor walls or vehicles are available.

The versatility of the product portfolio makes them suitable for different customer requirements. For instance, Englo's products were widely used in Japan after the 2011 Fukushima nuclear disaster, but they can also be used by civilians or professionals to determine levels of radioactivity in user's everyday or work environment.

Handheld Dosimeters

Englo's handheld personal dosimeters include a clip to fasten the device to the user's clothing and allow the measurement to be taken over a longer period of time, for instance for a duration of the time spent in a potentially hazardous environment.

The dose equivalent (dose) and dose equivalent rate (dose rate) with corresponding time and date are displayed on the device's LCD display. A silent and/or audible alarm alerts the user if the radiation dose or rate exceeds the programmable threshold level. An additional alarm indicates if the device battery is running low.

The measurement data is stored in the device memory and can later be transferred to a computer via Bluetooth interface.

NOVA-3b: Personal Gamma, X-Ray Radiation Dosimeter and Radiation Detector

- Handheld or clip-on
- Lightweight
- Monitors and detects γ or X-Ray dose equivalent and dose equivalent rate
- Audible alarm with adjustable radiation dose and level threshold
- Stores data separately for individual users
- Data displayed as easy to read graphs
- Bluetooth interface

| Product | Weight (g) | Type of Radiation | Max Dose (μSv) | Dose Accuracy (μSv) | Max Dose Rate ($\mu\text{Sv/h}$) | Dose Rate Accuracy ($\mu\text{Sv/h}$) | Size (mm) |
|----------------|------------|-------------------|-----------------------------|----------------------------------|------------------------------------|---|---------------|
| NOVA-3b | 105 | γ | 9,999,999 | 1 | 99,999.9 | 0.1 | 195 x 58 x 18 |

Handheld Radiation Detectors

Englo's handheld radiation detectors are lightweight and easy to use. They are good companions when visiting areas with possible threat of radiation. The devices are very sensitive and can detect even small sources of radiation.

Visual and audible alarms alert the user immediately if the radiation dose rate exceeds the programmable threshold level. Each detected event is accompanied by a beep sound; a full alarm is sound for higher radiation levels. An LCD display is programmed to display the dose equivalent rate or number of radiation pulses in CPM.

The handheld radiation detectors have a precision mode for longer and more accurate measurement per location.

For some devices the collected data is stored in the device memory and can later be transferred to a computer via USB interface.

Both personal and professional devices are available.

RADON-3: Handheld Alpha, Beta, Gamma, X-Ray Radiation Detector

- Highly accurate
- Lightweight
- Measures and detects α , β , γ and X-ray radiation
- LCD displays alarms and dose equivalent rate ($\mu\text{Sv/h}$) or pulse frequency (CPM)
- Audible beeps for radiation detection events with full alarm for $>10 \mu\text{Sv/h}$ dose equivalent rate
- Precision measurement mode
- Setup and control by a single button

RADON-4: Handheld Alpha, Beta, Gamma, X-Ray Radiation and Radon Detector

- Highly accurate
- Lightweight
- Measures and detects α , β , γ and X-Ray radiation and Rn
- LCD displays alarms and equivalent dose rate ($\mu\text{Sv/h}$) or number of pulse frequency (CPM)
- Audible beeps for radiation detection events with full alarm for $>10 \mu\text{Sv/h}$ dose equivalent rate
- Precision measurement mode
- Setup and control by a single button

PAKRI-E and PAKRI-EM: Professional Handheld Alpha, Beta, Gamma, X-Ray Radiation and Radon Detector

- Highly accurate
- Very fast radiation detection time
- Measures and detects α , β , γ and X-Ray radiation and Rn
- Large active area helps determine source of α and β radiation
- LCD displays alarms and equivalent dose rate ($\mu\text{Sv/h}$) or pulse frequency (CPM)
- Audible beeps for radiation detection events with full alarm for $>10 \mu\text{Sv/h}$ dose equivalent rate
- Precision measurement mode
- Data can be stored (PAKRI-EM only)
- USB interface (PAKRI-EM)

| Product | Weight (g) | Type of Radiation | Max Dose Rate ($\mu\text{Sv/h}$) | Dose Rate Resolution ($\mu\text{Sv/h}$) | Size (mm) |
|-----------------------------|------------|---|------------------------------------|---|----------------|
| RADON-3 | 122 | $\alpha, \beta, \gamma, \text{X-ray}$ | 999 | 0.01 | 96 x 60 x 26 |
| RADON-4 | 122 | $\alpha, \beta, \gamma, \text{Rn, X-ray}$ | 999 | 0.01 | 96 x 60 x 26 |
| PAKRI-E PAKRI-EM | 1,060 | $\alpha, \beta, \gamma, \text{Rn, X-ray}$ | 99.99 | 0.01 | 240 x 128 x 80 |

Vehicle mounted radiation measuring system

SPECTATOR-2 is a vehicle mounted measuring system for measuring the radiation level in areas with radioactive contamination and mapping the surveyed areas. The SPECTATOR-2 measuring system is placed in a special case.

The SPECTATOR-2 measuring system can be installed on a passenger car, SUV or minibus. The system consists of a sensitive radiation sensor and a control unit located in the cabin. The radiation sensor is attached to the front part of the vehicle using a bracket, the control unit is attached to the windshield of the vehicle with a suction cup from the inside.

During measurement, radiation level is shown on the control unit display. Results are also saved to device memory. If the dose rate value exceeds the alarm level, an audible and visual alarm is triggered.

The measurement data is read to the computer via a USB cable. The computer software included with the device allows to prepare measurement reports, view graphs of measurement results and show measurement results on a map.

SPECTATOR-2: Vehicle mounted radiation measuring system

- Compact, easy to set up and use
- Measures both gamma and beta radiation
- Real-time calculation and display of measurement results on LCD display
- GPS unit to determine and store measurement location
- Different measurement modes: dose rate ($\mu\text{Sv/h}$) and pulses per second (CPS)
- Selectable averaging modes: fast (4 s), slow (16 s) average and precision (continuous average) mode
- Visual and audible dose rate alarm, alarm level can be changed

| Product | Type of Radiation | Measurement range | Memory capacity (recording once per second) | Speed of the car when measuring |
|--------------------|-------------------|---|---|---------------------------------|
| SPECTATOR-2 | β, γ | 0,05 – 100 $\mu\text{Sv/h}$ 1 – 1800 CPS | at least 240 hours | Maximum 60 km/h recommended |

Digital Distance Measuring Devices

Englo develops, designs and manufactures various high precision digital distance measuring devices that are perfect for use in civil and road construction, land surveys and many other personal and professional applications.

The distance measuring instruments include handheld distance measuring wheels or surveyor's wheels and bicycle-mounted distance measuring devices. The products are easy to use and provide quick and accurate results.

The distance meters can be used to measure the total covered distance and view length of individual segments by including both odometer and segment length readings. Rectangular area can be calculated by a simple push of a button. When the user has exceeded the intended target endpoint, and wants to remove part of the recently covered distance from the measurements, he or she simply has to walk the digital distance measuring device backwards, and the reversed distance will be subtracted from the original results.

The measurement results can be viewed on the LCD screen of the product's electronic unit. The measurement data is stored in the device memory and can later be transferred to a computer via Bluetooth interface.

The electronic unit of the distance meters is very energy efficient and one battery will generally last the user through a whole season, which reduces need for regular maintenance of the device. To further save energy, the electronic unit will automatically turn off after the device has not been used for a certain amount of time.

Englo's digital distance measuring devices are rated IP65 under the international IEC 60529 standard and are splash and dust proof, and as such can be used in rainy weather or go through puddles.

MR-3MT and MR-4MT: Digital Measuring Wheel

- Handheld with wheel
- Lightweight
- Segment length and odometer readings
- Area calculation for rectangular surfaces
- Correction for exceeded target measurement endpoints
- Energy efficient
- Electronic unit with LCD screen
- Computer connection via Bluetooth

BR-1: Bicycle-Mounted Digital Distance Measuring Device

- Bicycle-mounted
- Lightweight
- Segment length and odometer readings
- Area calculation for rectangular surfaces
- Correction for exceeded target measurement endpoints
- Energy efficient
- Electronic unit with LCD screen
- Computer connection via Bluetooth

| Product | Weight (kg) | Wheel Diameter (cm) | Measuring Unit (cm) | Accuracy (%) | Max Distance or Area (m) | Max Speed (km/h) | Height (cm) |
|---------|-------------|---------------------|---------------------|--------------|--------------------------|------------------|-------------|
| MR-3MT | 2.2 | 54 | 5 | +/-1 | 19,999 | 10 | 760 – 1135 |
| MR-4MT | 2 | 34 | 5 | +/-1 | 19,999 | 10 | 690 – 1035 |
| BR-1 | n/a | – | 5 | n/a | 19,999 | 50 | n/a |

Material and Cable Length Measuring Devices

Englo product portfolio includes high precision mechanical material and cable length measuring devices for the measurement of length of cable, rubber and plastic pipes or fabric and ribbons. These devices are highly accurate and greatly speed up the measurement process.

The material and cable length meters are handheld or stationary that can be mounted to tables or other support structures. Stationary digital length measuring system KMS-1 also includes a work desk and coil winder to measure out the required length of cable or wire and loop it for easy handling or shipment.

The length meters include both segment and odometer reading, and can be used to measure the material total length and/or view length of individual segments. When the user has exceeded the intended material length endpoint, and wants to remove part of the recently measured length from the measurements, he or she simply has to pull the measured material through the digital length measuring device backwards, and the reversed length will be subtracted from the original results.

The measurement results can be viewed on the product's digital mechanical display.

Englo's digital length measuring devices are rated IP65 under the international IEC 60529 standard. MS-2, MS-5 and KMS-1 include type certificates.

MS-1: Digital Material Length Measuring Module

- Fabric and ribbon length meter
- Highly accurate and lightweight
- Correction for exceeded target measurement endpoints
- Narrow wheel with rubber coating or wide riffled surface aluminum wheel

MS-2: Handheld Digital Cable Length Meter

- Wire and cable length meter
- Highly accurate and lightweight
- Correction for exceeded target measurement endpoints
- Lever for reset to zero
- Type certificate # SI 14-01-003 MID

MS-5: Stationary Digital Cable Length Meter

- Fastened to table or support leg
- Wire and cable length meter
- Correction for exceeded target measurement endpoints
- Lever for reset to zero
- Type certificate # SI 14-01-004 MID

KMS-1: Stationary Digital Cable Length Measuring Device with Work Desk and Coil Winder

- Comes with a working table, coil winder and MS-5
- Wire and cable length meter
- Correction for exceeded target measurement endpoints
- Lever for reset to zero
- MS-5 type certificate # SI 14-01-004 MID

| Product | Weight (g) | Measuring unit (cm) | Counter Accuracy (%) | Max Distance Range (m) | Max Measuring Speed (m/min) |
|--------------|------------|---------------------|----------------------|------------------------|-----------------------------|
| MS-1 | 153 | 1 | +/-1 | 999.99 | 60 |
| MS-2 | 673 | 1 | +/-1 | 999.99 | 60 |
| MS-5 | 689 | 1 | +/-1 | 999.99 | 60 |
| KMS-1 | n/a | 1 | +/-1 | 999.99 | 60 |



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