



HOSKIN
SCIENTIFIC

PLANT SCIENCE

SAMPLING AND MONITORING



hoskin.ca

Supplying Testing & Monitoring Instruments Since 1946

For over seventy years, Hoskin Scientific has been a supplier of testing and monitoring instrumentation to the Canadian market. With offices in Vancouver, Edmonton, Oakville and Montréal our customers are able to receive local sales and technical support in our three major departments.

Our Environmental Department provides solutions for monitoring and sampling biological and chemical parameters in the environment. Our team of environmental sales representatives and diverse product range guarantee that you will find the right products for your application. Specific areas include: water quality, water quantity, soil moisture, plant science, weather stations, indoor air quality, aquatic sampling, and oceanography.

Our Materials Testing Department offers testing equipment for soil, asphalt, petroleum, concrete and cement. Our qualified sales associates focus on providing a sophisticated range of testing equipment complying with the various test methods, ensuring that accurate and consistent test results are always obtained.

Our Instrumentation Department focuses on a wide range of products including optical camera systems, transducers and transmitters, data acquisitions and loggers, signal conditioners and indicators, automation sensors and measurement systems. We have technical sales associates that are trained in various areas and willing to help you with your instrumentation requirements.

RENTALS

We offer high quality, proven equipment that will provide the user with valuable data as well as numerous ways of retrieving, filtering and viewing that data. We carry a wide range of instrumentation, including: water quality, portable gas monitors, soil sampling instruments and more.

Rental Equipment:

- Single and multi-parameter instruments that can be setup for spot checks or extended deployment/data logging
- Water sampling instruments
- Water velocity and stream profiling instruments
- Soil sampling instruments
- Soil vapour sampling instruments
- Portable gas monitoring instruments

Customer satisfaction is our goal and we make an effort to ensure that all our customers are satisfied with their rental. All rental instruments are cleaned and calibrated before being sent to the user (please note that we also require equipment to be returned clean). If a rental instrument requires recalibration, please return the instrument to us and we will recalibrate at no charge. Any instrument not functioning properly can be exchanged at no cost.

Hoskin Scientific offers technical support over the phone and can also provide hands on demonstrations.

We are constantly expanding and looking for new equipment to add to the rental inventory and welcome all suggestions.

Check our website www.hoskin.ca for current offerings.

Daily, weekly and monthly rental rates available – please call for a quote.

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HemiView Canopy System



The HemiView is a tried and tested tool for the analysis of hemispherical photographs. Ideal for tall, irregular canopies, it gives researchers the hardware and software they need to calculate canopy structure parameters and solar radiation indices.

Photographs are taken looking upwards through the forest canopy using a 180° fisheye lens and a high resolution digital camera. To ensure it is held horizontally and is correctly orientated, the camera is held in a self-leveling Mount. The mount automatically places north/south orientation markers at the edge of each image taken.

SunScan Canopy Analysis System



This system uses field measurements of Photosynthetically Active Radiation (PAR) in crop canopies to provide valuable information about Leaf Area Index (LAI) and biomass production.

The SunScan Canopy Analysis System is optimised for low regular canopies such as most agricultural crops. The 1m probe enables rapid spatial averaging of large areas, and PAR mapping for non-uniform crops such as vineyards and orchards. With the unique BF5 reference PAR sunshine sensor, SunScan can be used in most weather conditions.

BF5 Sunshine Sensor



The improved BF5 Sunshine Sensor is a versatile, multi-purpose solar radiation sensor. It uses an array of photodiodes with a unique computer-generated shading pattern to measure incident solar radiation. A microprocessor calculates the global and diffuse components of the radiation and determines the sunshine state.

Two analogue voltage outputs give global and diffuse radiation, from which direct and diffuse radiation are derived. The sunshine state is represented by a digital output. The three outputs can be connected to appropriate channels on the GP1 or DL2e data loggers, or other loggers commonly used for environmental monitoring.

Photochemical Reflectance Index (PRI) Sensors



Cost-effective remote measurement of Photochemical Reflectance Index (PRI). The domed shaped sensor head (diffuser and body) facilitates runoff of dew and rain to keep the sensor clean and minimizes errors caused by dust blocking the radiation path. Sensors are housed in a rugged, anodized aluminum body and electronics are fully-potted. 532 nm with 10 nm full-width half-maximum and 570 nm with 10 nm full-width half-maximum. Available in digital SDI-12 or with an analog output.



Normalized Difference Vegetation Index (NDVI) Sensors

Cost-effective remote measurement of incident or reflected NDVI radiation bands. The NDVI Sensors have the spectral ranges of $650 \text{ nm} \pm 5 \text{ nm}$ with 65 full-width half-maximum and $810 \text{ nm} \pm 5 \text{ nm}$ with 65 full-width half-maximum (NIR). Available with an analog output. Featuring an IP68, marine-grade stainless-steel cable connectors built directly into the sensor head to simplify sensor removal for maintenance and recalibration. UV stable and flexibility in cold conditions.



CI-110 Plant Canopy Imager

Fast, portable canopy analysis for environmental & crop research. The new Digital Plant Imager comes with updated GPS accuracy with access to four different satellite constellations and the ability to interchange lens filters for more specific measurements.

- Self-leveling high-resolution camera
- Instantaneous, in-field calculation
- LAI, PAR, sunflecks



Spherical Densimeter

These Convex and Concave Spherical Densimeters allow accurate, one-person measurement of tree canopies. Measure forest overstory density from unobstructed sighting positions. Instruments use a spherical-shaped reflector mirror engraved with a crosshaped grid of twenty-four $1/4"$ squares. Units are housed in a $3"H \times 3"W \times 1"D$ walnut case with operating instructions permanently affixed to the lid. A leveling bubble is also included for accurate positioning.

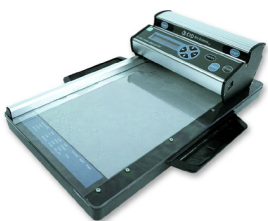
LEAF AREA INDEX & IMAGE ANALYSIS



AccuPAR LP-80 Ceptometer

The AccuPAR is a lightweight, portable photosynthetically active radiation (PAR) sensor wand that lets you measure canopy PAR interception at any location within a crop or forest canopy.

PAR data can be used with other climate data to estimate biomass production without destroying the crop. PAR is also important in determining other canopy processes, like radiation interception, energy conversion, momentum, gas exchange, precipitation interception, and evapotranspiration.



CI-202 Portable Laser Leaf Area Meter

Rapid, high-resolution leaf area measurements for plant research. Highly precise laser scanner measurements, on-board data logger, and simple USB transfer make the CI-202 a must-have for researchers who want to work confidently and efficiently



CI-203 Handheld Laser Leaf Area Meter

Fast & intuitive leaf area measurements for in situ plant research. The super light-weight Handheld Laser Leaf Area Meter yields 7 measurement parameters in a single sweep of the wand, as well as GPS tagging for precise measurement location tracking.



WinDIAS 3 Image Analysis System

The recently upgraded WinDIAS 3 Leaf Image Analysis System provides fast, accurate measurement of leaf area and leaf features – making it ideal for plant pathology and phenotyping applications. WinDIAS's analysis features are well suited to applications where precise colour discrimination is critical.

Recent enhancements

- Lower prices for conveyor belt systems
- LED lighting with adjustable brightness
- Improved seed counting capability
- Enhanced Area of Interest drawing tool

INFRARED RADIOMETERS

Infrared Radiometers (IRRs)

High-accuracy, non-contact surface temperature measurements for environmental applications in harsh condition. Depending on the accuracy required for your application, Apogee offers several Research-Grade sensors with ± 0.2 C uncertainty and a lower-priced Commercial-Grade sensor with ± 0.5 C uncertainty.

All Apogee IR sensors are NIST traceable and include a calibration certificate. Sensors are calibrated to a custom blackbody cone. The Research-Grade sensors feature a measurement uncertainty of ± 0.2 C from -30 to 65 C when the sensor (detector) temperature is within 20 C of the surface (target) being measured. Commercial-Grade sensors have a measurement uncertainty of ± 0.5 C from 0 to 50 C when the sensor is within 20 C of the surface. Radiometers are only sensitive from 8 to 14 μm (atmospheric window) to minimize the influence of water vapor and CO_2 on the measurement.



Field of View Options

Research-Grade sensors come in five fields of view, which includes three circular and two horizontal apertures. The Commercial-Grade sensor comes in a single 22° half-angle field of view options.

Analog & Digital Models

Both radiometers can be used to measure plant canopy temperature for use in plant water status estimation. The radiometers are also used in phenotyping and phenomics of different plants. They can additionally be utilized to measure road surface temperature to determine icing conditions and to measure terrestrial surface (soil, vegetation, water, snow) temperature in energy balance studies.





CCM-300 Chlorophyll Content Meter

The CCM-300 uses a proven fluorescence ratio technique for chlorophyll content measurement at an affordable price. This system works when other systems won't! With this technology, chlorophyll content can now be measured from germination through maturity. This nondestructive technique provides reliable results regardless of leaf size, thickness or shape. High degree of correlation with chemical tests, even at high chlorophyll content levels.

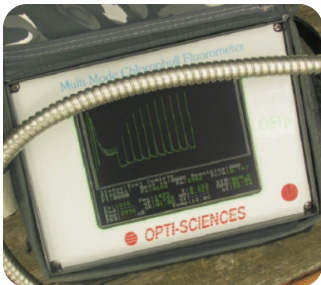
Conifer Needles, Immature Wheat, Immature Rice, Rice, Turf Grass, Arabidopsis, Small Leaf Grains and more!



CCM-200 Plus Chlorophyll Meter

The CCM-200 plus provides fast, reliable, nondestructive chlorophyll content measurement.

- Measure Chlorophyll Content Reliably and Nondestructively
- Great for Nitrogen and Fertilizer Management Programs
- Used for Determination of Optimal Harvesting Time
- Comparative Measurement for Plant Health and Plant Breeding
- Anthocyanin Content Version Available



OS1p Chlorophyll Fluorometer

The OS1p is a highly portable and cost effective modulated chlorophyll fluorometer ideal for fast measurements and stress evaluation. Designed for light adapted yield and ETR measurements as well as dark adapted Fv/Fm plant stress measurement. When there is a great deal of field work to be done, this comprehensive yet portable workhorse is an excellent choice.

Advanced photosynthesis and stress testing. Direct read out of Fv/Fm, Fo, Fm, Ft, PAR, Leaf temperature, Yield of ($\Delta F/Fm'$), ETR, Fs or (F), Fms or (Fm'). For fast dark adapted and light adapted work.



OS-30p+ Chlorophyll Fluorometer

The OS-30p has been one of the most cited research chlorophyll fluorometers in the world. This latest version, called the OS30p+ offers even greater capability at the same great price. The OS30p + has added a special automated routine. Using a rolling 8 point average that ensures that only the highest 25 milliseconds of maximum fluorescence is used, so that saturation duration time is never an issue for land plants, or for algae. Rugged field instrument designed for hand held use.



OS5p+ Portable Chlorophyll Fluorometer

Test for stress caused by drought, lack of nutrients, light, heat, cold, herbicides, pesticides, CO2 levels, and disease. Direct read out and graphic display of Fv/Fm, Fo, Fm, Fod or (Fo'), qP, qN, NPQ, qT, qE, qI, qL, Y(NPQ), Y(NO), PAR, Leaf Temperature, ETR, Yield of ($\Delta F/Fm'$), Fs of (F), Fms or (Fm'), advanced Lake and Puddle modes and user scripted protocols. Designed for today's most comprehensive stress measuring capability and user scripted protocols. For the most comprehensive stress measuring capability.



GFPIII Meter General Fluorescence Probe

The GFPIII is a general purpose fluorescence probe designed for a wide variety of measurement applications. It's flexible fiber optic probe enables highly sensitive detection for both in-situ and in-vitro environments. Detection is capable down to at least 10 ppb of fluorescein in pure water.

This is compact, hand-held, instrument includes on-board data logging and is capable of single and continuous measuring modes. User changeable modules are available to detect most fluorescent markers and dyes including; GFP & other Fluorescent Proteins, Fluorescein, Rhodamine, Chlorophyll, Brighteners and much more.



Light Adapted Y(II) & ETR Measuring Instrument

Y(II) or F/FM' or (FM' - FS) / FM') is a time tested light adapted parameter that is more sensitive to more types of plant stress than FV/FM. A survey of existing research strongly supports this statement. While FV/FM is an excellent way to test for many kinds of plant stress and the health of Photosystem II, Quantum Yield of PSII or Y(II) is a test that allows the measurement of the efficiency of photosystem II under actual light adapted environmental and physiological conditions.



Integrated Fluorometer and Gas Exchange System

The iFL integrated fluorometer, the world's most advanced, combined, gas exchange and chlorophyll fluorescence system available. The iFL offers researchers new levels of automation, accuracy and versatility in a compact and lightweight unit.

Despite it's diminutive size, the iFL gives plant scientists a research grade photosynthesis system combined with a uniquely powerful, pulse modulated fluorometer.



SC-1 Leaf Porometer

The SC-1's breakthrough steady-state technology makes getting accurate stomatal conductance measurements affordable and practical for everyday research. The steady state design means that it has no moving parts. It leaves the environment alone, and instead determines stomatal conductance by measuring the actual vapor flux from the leaf through the stomates and out to the environment.

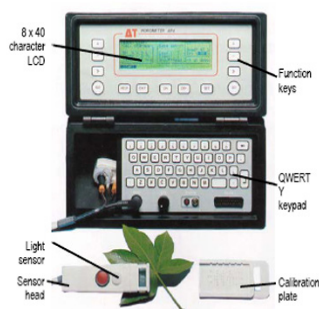
Readings can be displayed as either conductance or resistance and saved for downloading later (RS232 cable and download utility software included).



EGA60p Multi-Channel Gas Exchange System

The EGA60p is a multi-channel CO₂ and H₂O measuring system. A single EGA60p system is able to measure up to 24 gas exchange cuvettes.

The operator can program the system to measure each channel for a desired period of time before the multiplexer switches to the next sample. Just before switching, the CO₂ and H₂O concentrations are measured by infra red gas analyser and laser trimmed humidity sensors, along with the flow rate and the output of any other sensors connected to the 7 analogue inputs.



AP4 Diffusion Porometer

The AP4 Leaf Porometer measures diffusion conductance by comparing the precise rate of humidification within a small cuvette to readings obtained with a calibration plate. The plate has 6 diffusion conductance settings whose values have been accurately determined by finite element analysis.

- Direct readout of stomatal conductance or stomatal resistance of leaves
- Simple absolute calibration in the field
- Minimises leaf stress during measurement



GMP343 Carbon Dioxide Probe for Demanding Measurements

The CARBOCAP® Carbon Dioxide Probe GMP343 is an accurate and rugged probe-type instrument for ecological measurements. Typical applications include CO₂ soil respiration, ambient CO₂ monitoring, plant growth chambers, and OEM applications.

- Excellent accuracy and stability
- Diffusion and flow-through models
- Wide operating temperature and humidity ranges
- Compensation options for temperature, pressure, humidity and oxygen
- Low power consumption and heat emission
- Short warm-up time
- Compact and light

CARBOCAP® CO₂ Probes

- Intelligent, stand-alone probes with analog (V, mA) and digital outputs (RS485 with Vaisala protocol or Modbus)
- Superior long-term stability with the 2nd-gen proprietary CARBOCAP® technology
- Wide operating temperature range -40 ... +60 °C
- IP65 classified housing
- Full temperature and pressure compensations
- Compensations for background gases: O₂, and humidity
- Sensor head heated to prevent condensation



GMP251 - life science, cold storage

The GMP251 is an intelligent, stand-alone, %-level probe for measuring carbon dioxide in life science incubators, cold storages, fruit and vegetable transportation, and in all demanding applications where stable and accurate %-level CO₂ measurements are needed.

- Measurement range 0 ... 20 %CO₂



GMP252 - agriculture, refrigeration & HVAC

The GMP252 is an intelligent, stand-alone, ppm-level probe for measuring CO₂ in agriculture, refrigeration, greenhouses and demanding HVAC applications. It is suitable for harsh and humid CO₂ measurement environments where stable and accurate ppm-level CO₂ measurements are needed.

- Measurement range 0 ... 10 000 ppmCO₂
- Can be used for measurement even up to 30 000 ppmCO₂ with reduced accuracy

Indigo 201 Analog Output Transmitter-host Device for GMP Probes

Vaisala Indigo 200 Series host devices are intended for Vaisala's intelligent, stand-alone CO₂ probes, GMP251 and GMP252.

Indigo 200 allows for easy evaluation and visualization of data, also wirelessly. The installation is uncomplicated, which saves time. Also the probe types are interchangeable reducing downtime. The enclosure with an IP65 classification is safe for harsh environments and resistant to dust and most chemicals. The smooth surface of the enclosure makes cleaning easy.



PHOTOSYNTHESIS

LCpro-SD Advanced Photosynthesis Measurement System

The LCpro-SD builds on its predecessor, the LCpro+ with improved data storage, measurement range, portability, microprocessor and other benefits to create a new generation of photosynthesis systems.

The LCpro-SD can be adapted for the widest range of applications due to new chamber heads. The LCpro-SD can be fitted with a soil chamber with detachable collar for measuring soil flux, and can be fitted with the fluorometer adapter chamber for simultaneous gas exchange/chlorophyll fluorescence studies. An extended CO₂ measurement range allows the analyzer to showcase the same high resolution and accuracy of the LCpro+ while measuring 0-3000ppm CO₂, compared to 0-2000ppm.





LCi-SD Ultra Compact Photosynthesis System

Weighing just 2kg, the LCI-SD is our smallest, lightest and most compact portable photosynthesis measurement system ever. Full functionality, graphical display, flow control and flexible data logging, to modern SD cards, are all contained within the software controlled LCI-SD console.

Powered by a small 12volt rechargeable battery and incorporating the latest in low power technology, the LCI-SD will operate fully for up to 10 hours from a single charge.



CI-340 Handheld Photosynthesis System

Portable gas exchange measurement for ecology, agronomy & horticulture. Real-time photosynthesis measurement of photosynthesis, respiration, transpiration, stomatal conductance, PAR & internal CO₂.

With 10 available chamber options designed to accommodate any leaf size, including conifer needles and cacti, the CI-340 can be applied effectively in virtually any photosynthesis study.



CI-710s SpectraVue Leaf Spectrometer

Leaf spectroscopy for rapid non-destructive plant stress measurement. The SpectraVue Leaf Spectrometer measures transmission, absorption, and reflection, along with many other plant stress and pigment indicators using built-in indices.

The newly redesigned SpectraVue Leaf Spectrometer has been upgraded with a powerful new spectrometer, handheld form factor, touchscreen display, and analysis software.



MC-100 Chlorophyll Concentration Meter

The MC-100 Chlorophyll Concentration Meter directly measures and displays chlorophyll concentration from intact leaf samples without damaging the plant material. This data can be used to monitor environmental stress, evaluate the demand and efficacy of fertilizer treatments and optimize harvest schedules throughout the growing season.

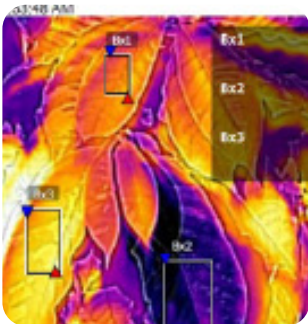
Radiation Frost Detector



The SF-110 is a combination of two temperature sensors (precision thermistors) in a single housing. One sensor is designed to mimic a plant leaf and the other a flower bud. The SF-110 provides close approximations to leaf and bud temperatures and can be used for prediction of frost on leaves and buds.

The temperature measurement range of the SF-110 is -40 to +70 °C with an accuracy of ± 0.1 °C from 0 to +70 °C. However, the sensor is intended for applications in cropped fields and orchards when temperatures will be near freezing, and where air temperature measurements are not a good predictor of frost formation

FLIR Thermal Imaging Technology



Portable, ergonomic, and easy-to-use, FLIR's T-Series infrared cameras provide excellent infrared image quality at an affordable cost and are packed with innovative features that make them perfect choices for your research and scientific needs.

- 320 × 240 LWIR Resolution w/ Interchangeable Lenses & Up to 8x E-Zoom
- Integrated Daylight Camera
- On-Camera Measurement Tools & Analytics
- Ergonomic Design w/Rotating Optical Block

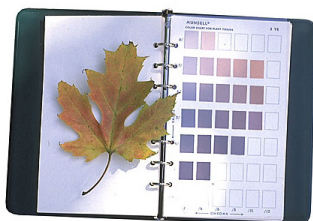
Master Hand-Held Refractometer



This new type of Hand-held Refractometer is the first to be equipped with Automatic Temperature Compensation and Water Resistant (IP65) at the same time. While featuring functions such as Easy-to-Read, Easy-to-Hold, Smooth sampling, Easy disposal of sample from the edge, the improvement of hygiene aspect by employing the new type of grip, and well balanced structure.

*Verification with 10% Sucrose Solution (RE-110010), 20% Sucrose Solution (RE-110020) or 30% Sucrose Solution (RE-110030)

Munsell Plant Tissue Charts



Colour Charts provide a handy colour reference. They have been used throughout the world for years to help scientist research growth rates, nutrient deficiencies, diseases and other plant processes. Small, protective binder makes it ideal for field use.

- 17 hue-based colour charts including (2.5R, 5R, 10R, 2.5YR, 5YR, 7.5YR, 2.5Y, 5Y, 2.5GY, 5GY, 7.5GY, 2.5G, 5G, 7.5G, 5BG, 2.5B and 5RP)
- 320 matte color chips, permanently mounted

**replace your charts every two (2) years to ensure accurate colour comparison.*



Plant Tissue Kits

Plant tissue testing provides essential information concerning plant use of nutrients vital to their growth. These simplified field tests for green plant tissue indicate whether growing plants are receiving adequate amounts of available nutrients from the soil. All tests give qualitative results for the specific nutrients. By comparing test results from healthy and problem plants, it is possible to pinpoint deficiencies or excessive nutrient conditions. Includes tests for ferrous and ferric iron, zinc, copper, manganese, and boron.



ACM-200 PLUS Anthocyanin Content Meter

This meter provides fast, reliable, nondestructive anthocyanin content measurement.

- Up to 160,000 measurement storage
- Display Anthocyanin Content Index and Calculated Sample Averages
- USB output
- Lightweight, Hand-Held Design Optimized for Field Work
- Built-in Data-Logging

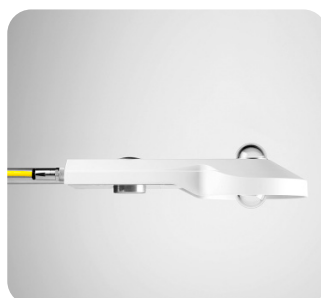
NET RADIATION



NR Lite2 Net Radiometer

NR Lite2 is designed for routine measurement of net radiation which is the balance between incoming and outgoing radiation under outdoor conditions.

The design of the NR Lite2 is unique. The double-sided detector has black conical absorbers with an anti-stick weather resistant protective coating. In contrast to other sensor designs, NR Lite2 requires no fragile plastic domes. This results in a virtually maintenance free design. The vertical stick prevents birds from affecting the output signal.



CNR4 Net Radiometer

The CNR4 net radiometer measures the energy balance between incoming short-wave and long-wave Far Infrared (FIR) radiation versus surface-reflected short-wave and outgoing long-wave radiation.

The design is very light in weight and has an integrated sun shield that reduces thermal effects on both long-wave and short-wave measurements. The cables are yellow with waterproof connectors as used with all our new radiometers. The mounting rod can be unscrewed for transport.

SN-500 Net Radiometer



Four-component measurement of net radiation with black-body pyranometers and pyrgeometers. Each of the four sensors includes a 0.2 W heater that keeps water (liquid and frozen) off the sensors and minimizes errors caused when dew, frost, rain, or snow block the radiation path.

An on-board 24-bit A to D converter makes measurements and provides a digital SDI-12 output, eliminating the need for multiple analog datalogger channels to measure each of the four components of net radiation. Provides separate measurements of each of the components of net radiation, resulting in impressive accuracy.

AM-500 - Net Radiometer Mounting Bracket

QUANTUM (PAR) METERS

MQ-500 Full Spectrum Quantum Meter



The MQ-500 is a full spectrum quantum sensor with a spectral range of 389 to 692 nm \pm 5 nm, which can be seen in the graph below. This improved spectral response increases the accuracy of LED measurements.

The improved spectral response of the MQ-500 increases the accuracy of LED measurements making it ideal for use with both natural and electric light sources. The MQ-500 is used to measure incoming PPFD measurements in outdoor environments, greenhouses, growth chambers, and aquariums.

SQ-500 Full Spectrum Quantum Sensor



The SQ-500 is a full spectrum quantum sensor with a spectral range of 389 to 692 nm \pm 5 nm, which can be seen in the graph below. This improved spectral response increases the accuracy of LED measurements.

The SQ-500 is used to measure incoming PPFD measurements in outdoor environments, greenhouses, growth chambers, and aquariums. The improved spectral response of the SQ-500 increases the accuracy of LED measurements making it ideal for use with both natural and electric light sources.

PAR, Daily Light Integral, and Photoperiod Meters



Apogee's rugged new meters make it easier than ever to take research-grade spot measurements of PPFD, while also recording daily light integral (DLI) and photoperiod in one simple to use device.

- DLI-400: Lowest-cost option is accurate for measuring 400-700 nm only in sunlight and under some broadband light sources.
- DLI-500: Full-spectrum is accurate for measuring 400-700 nm under all light sources including LEDs.
- DLI-600: ePAR is accurate for measuring the newly discovered extended PAR (ePAR) 400-750 nm range under all light sources.

Full-spectrum Quantum PAR Meters and Sensors



Accurately measure photosynthetically active radiation in $\mu\text{mol m}^{-2} \text{s}^{-1}$. Apogee Instruments' Full-Spectrum Quantum PAR sensors and PAR meters are the industry standard for accurately measuring photosynthetically active radiation (PAR or PPFD) from all light sources used to grow plants and corals.

All Apogee quantum sensor heads are waterproof. Most sensors are calibrated to make absolute PPFD measurements in air, while some are specially calibrated to make measurements underwater by applying an immersion correction factor.

ePAR Sensors



Apogee's newest 400-750 nm Extended Photosynthetically Active Radiation (ePAR) sensor is designed for making total photon flux intensity measurements of wider ranges than traditional PAR sensors that measure 400-700 nm.

To ensure accuracy each sensor is carefully calibrated in controlled conditions and traceable to NIST reference standards. ePAR sensors are pre-calibrated for all light sources.

Quantum Light Pollution Sensor



Designed to detect photons from 340-1040 nm that are below the sensitivity level of a typical quantum sensor. Detecting stray photons that disrupt dark periods can be important in researching and preventing morphogenic effects such as hermaphroditism, stem elongation, and poor flowering in certain sensitive plants. These photons can even come from unexpected sources like street lights, signs, and IR security cameras.

Red - Far-Red Sensors



Two-channel sensor for measuring the Red / Far-red ratio (RFR) for ecological applications, including the effect of spectral quality on phytochrome. The RF ratio influences plant height, leaf expansion rates, and other photobiology and plant morphogenic responses.

This sensor is a research-grade, cost-effective two-channel sensor for monitoring plant light environments, including calculation of the red to far-red ratio (red photon flux density / far-red photon flux density) and far-red fraction (far-red photon flux density / sum of red and far-red photon flux densities).

PAR-FAR Sensors



The new Apogee PAR-FAR sensor is a research-grade tool for measuring both the traditional PPFd photosynthetic photon flux and separately quantifying the photon flux of far-red photons (700-760 nm). The outputs include the traditional quantum flux, the far-red photon flux, and the far-red fraction (far-red photon flux density / sum of PPFd and far-red photon flux density).

This sensor quantifies far-red photons, and for many applications it reduces the need for a more complex measurement with a spectroradiometer.

F-750 Produce Quality Meter



Rapid, non-destructive measurement of key produce quality traits. On-demand NIR spectroscopy for your needs. Portable and intuitive, harness the power of predictive models for virtually any commodity.

- Integrated crop mapping
- Scans in seconds
- All-day battery life

F-751 Specific Fruit Quality Meters



Rapid, non-destructive measurement. Lightweight and heavy duty.

Available models:

- Avocado - measure dry matter in avocados
- Melon - measure melon maturity
- Kiwifruit - assess kiwifruit maturity and eliminate the need for preemptive laboratory testing
- Mango - scalable solutions for mango quality assessment

F-900 Portable Ethylene Analyzer



Accurate, efficient ethylene management for research and QA. Control and measure key ripening gasses in research and industry applications.

- Rugged and portable
- Non-Destructive measurement
- CO₂ and O₂ sensing
- Internal data logging and storage



Portable Gas Analyzers

The Felix portable gas analyzers are built with backlit LCD screens, all-day battery life and painless data transfer with bluetooth and WIFI capabilities.

- F-920 Check It! Gas Analyzer - portable, intuitive measurement of CO2 and O2 concentrations
- F-940 Store It! Gas Analyzer - High resolution ethylene measurement from 0-10ppm
- F-950 Three Gas Analyzer - Gather ethylene, CO2 and O2 data in seconds
- F-960 Ripen It! Gas Analyzer - Real-time ripening gas monitoring

REMOTE WEATHER MONITORING



HOBOnet® Field Monitoring System

The award-winning HOBOnet Field Monitoring System from Onset provides a cost-effective and scalable solution for web-enabled monitoring of field conditions for applications such as crop management, research, and greenhouse operations.

Choose either the easy-to-deploy HOBO MicroRX Station or the highly flexible HOBO RX3000 Station as the basis of your HOBOnet System. Easily configure systems for your specific applications with HOBOnet wireless sensors or Onset’s plug-and-play sensors.

Key Advantages

- Wide coverage with 900 MHz wireless mesh technology provides a stronger, more reliable signal that can communicate through vegetation
- Scalable, with up to 50 wireless sensors streaming back to a central, cloud-based weather station
- Remote access to data and current conditions with a customizable dashboard for analysis
- Alarm notifications when conditions reach user-set thresholds
- Data access through Onset’s cloud-based HOBOLink software

Hoskin Scientific carries a wide variety of Onset Data Loggers which can be purchased online at <https://shoponset.hoskin.ca/>

PLANT WATER POTENTIAL



Visible to Near Infrared Range Spectroradiometer

Apogee spectroradiometers come in a complete package ready to connect to your computer and begin making measurements. Measure incoming light irradiance as well as reflectance and transmittance spectra from 350 to 1000 nanometers.

Portable Plant Water Status Console



The 3000 and 3005 Series Plant Water Status Consoles provide a means of quickly and accurately measuring the water status of plant leaves. A leaf or small branch is placed in the sample chamber with the cut end protruding from the specimen holder. Pressure is built up inside the chamber until the pressure exceeds the tension inside the plant material, and xylem sap begins to flow from the cut end. The tension can then be read directly from the pressure gauge.

The **Model 3000** must be connected to an external source such as a compressed gas cylinder. Sample chambers are available in several different lengths, ranging from 7" (18 cm) to 20" (51 cm). Two operating pressure ranges, 0 to 40 bars and 0 to 80 bars, are available. Two specimen holders are available, one for use with round-stem materials, and one for blade-type plant materials. A number of differently sized and shaped sealing sleeves and grommets assure that the plant material of interest is safely sealed in the specimen holder, allowing measurements to be made.

Model 3005 is supplied with a pressurized gas tank, making it suitable for portable, field use. A hardwood sample preparation board is mounted to the heavy-duty aluminum chassis. Sample chambers are available in several different lengths, ranging from 7" (18 cm) to 20" (51 cm). Two operating pressure ranges, 0 to 40 bars and 0 to 80 bars, are available. Two specimen holders are available, one for use with round-stem materials, and one for blade-type plant materials. A number of differently sized and shaped sealing sleeves and grommets assure that the plant material of interest is safely sealed in the specimen holder, allowing measurements to be made.

WP4-C Dewpoint Potentiometer



Fast, Accurate Water Potential Measurements - Use the WP4 to measure water potential in 5 to 10 minutes. Range: 0 to -300 MPa with a resolution of 0.1 MPa.

The WP4 is a bench-top instrument with a lexan sample drawer. To make a reading, set a cup in the chamber and close and latch the drawer. Soil suction data can be stored internally or transferred to a computer or printer with the included serial RS232 interface cable.

Sample cups are 4 cm in diameter and 1 cm tall. They have a 15 ml capacity, but to protect the sensor from contamination we recommend that you fill them only half full.

CI-600 In-Situ Root Imager



In-Situ Root Imager makes high-resolution observation of root growth and behavior simple. Tracking changes to root systems is vital to understanding overall plant health, and with the In-Situ Root Imager, this data can be gathered consistently & non-destructively.

- Included tablet computer
- One instrument, unlimited locations
- Live-updating, 360° scans

CI-602 Narrow Gauge Root Imager



Miniaturized, non-destructive root imaging for plant and crop research. With the Narrow Gauge Root Imager, vital root research can be carried out non-destructively in virtually any 2" diameter root tube installation.

- Lightweight and portable
- Double the resolution
- Scan 5x faster

Peat and Root Samples



Root research is executed to improve the insight in the possibilities for root growth (depth and concentration) of the root system of trees and plants. In general it is important to all plants to have a dense and extensive root system in the soil. An extensive root system allows the plant to benefit from a large volume of soil. If sufficient quantities of nutrients and water are present the absorption will be larger if the root system is more extensive. Measuring the root system also is a useful means of localizing physical and/or chemical barriers in the soil profile.

- Flag/Russian Peat Sampler, Standard Set
- Peat Profile Sampler - Wardenaar Type
- Vrijwit Auger
- Single Root Auger
- Surface Profile Sampler

Tree Dendrometer



Permanent tree-girth tape-measure with diameter scale

- Easy and quick, non-invasive installation
- Scale already shows diameter
- Vernier for accurate readings
- Minimised friction
- Low thermal expansion
- For larger trunks two bands can be connected
- Printed "Do not touch" warning in several languages

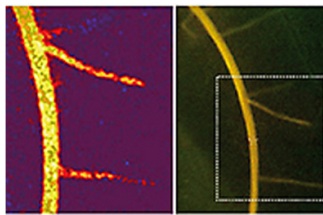


Auger Heads, Handles and Extensions

For soils with a large gravel content. The auger body for stony soils consists of a heavy steel strip, vaulted all along, which is bent double by forging. The pointed cutting bits of the strip are bent outward, thus creating a hole some-what wider than the average body diameter. The stony soil auger is used when the Riverside auger is not yielding adequate results in coarse gravel soils.

Please contact us for a complete listing of Augers and Accessories.

O₂, pH, and CO₂ Dynamics in the Rhizosphere of Roots



Measure and Visualize Oxygen, pH or Carbon Dioxide Distributions in 2D for Biological Research.

Fluorescent chemical optical sensor foils combined with imaging technology allow easy 2D visualization of oxygen, pH or carbon dioxide distributions in heterogeneous samples. For measurement the sample surface is covered with the sensor film, which translates the analyte content into a light signal. The sensor response is recorded pixel by pixel with a digital camera. With VisiSens™ spatial and temporal changes of oxygen, carbon dioxide concentration or pH can be monitored.

Prospecting Kit for Geological Surveys



The kit can be used for augerings in heterogeneous soils (agricultural and environmental soil research), to improve the mobility it comprises less different auger types. In this way it can be transported in a carrying bag. All augers, handles and extension rods are packed in a backpack. With this standard kit it is possible to execute manual augerings to a depth of 7 metres, without great physical effort.

The set is also used to drill shotholes by hand in areas with difficult access. Each seismic field crew should have a set available for scouting and drilling purposes. The backpack ensures quick mobilization and quicker tracking in the bush.

Grass Plot Samplers



These stainless steel gouge augers with different dimensions consist of a steel auger pipe, a collecting bucket and a stick with a steel handle. The auger pipe is filled by pressing the collecting bucket with your foot. Because of the conical shape of this pipe the sample is easily pushed toward the collecting trough when the next sample is taken. It is possible to take samples of the top 5 cm (resp. 10 cm) of grass covered areas, for root- and/or fertilization research, quickly with these types of augers. The grass plot sampler is particularly suitable for research in grassland farming but also in horticulture and for the Parks and Public Gardens Department. Gouge auger set for top layers Grass plot samplers.



Peat Profile Sampler

The peat profile sampler, type Wardenaar, is an apparatus for sampling intact, undisturbed peat profiles in peat lands up to a depth of 1 meter. The peat profile sampler consists of a rectangular stainless steel box casing, divided lengthwise into two halves, with very sharp specially shaped cutting edges at the base.



Piston Sampler Set

The set is very suitable for sampling less cohesive soil layers below the (ground) water table to a depth up to 5 metres. The samples show little disturbance and therefore are suitable for very accurate profile description.



Soil Profile and Column Samplers

The soil column cylinder auger has been developed to take undisturbed soil samples. This allows for a fast insight in the built-up of the soil profile, the possibilities for a root system, etc. The more insight in these matters, the more effective fertilization and treatment of the soil can be done.



Split Tube Sampler

The split tube sampler is an apparatus for rapid undisturbed sampling at the surface. The apparatus is very suitable for research on root systems, fertilizing and soil biology. The set consists of a split tube sampler with a handle with beating head, hammer with nylon heads (shock-absorbing), sample liners, storage containers and a steel lifting jack with lever and chain. The split tube sampler consists of two stainless steel tube halves with a working length of 40 cm.



Core Samplers

Samples are taken in stainless steel sampling tubes in auger holes or casing tubes (above as well as under the groundwater level, casing tubes with minimal diameter 100 mm) up to a maximum depth of 50 m. The core sampler is used in combination with a tripod and hand winch. After sampling the sampling tube can be sealed off with the PE covers. A sample on the split sample tube can be prepared for transport by covering it with another split tube and sealing the seams and closing both ends with covers.

SMZ445/SMZ460 Zoom Stereomicroscope



Premium performance in a compact body

The SMZ445 and SMZ460 deliver the outstanding optical performance you expect from Nikon's cutting-edge series of stereoscopic zoom microscopes. Porro prisms enable a lightweight, compact design. With 0.8x - 3.5x zoom magnification (SMZ445) and 0.7x - 3.0x zoom magnification (SMZ460), and diascopic/episcopic LED Stand, the SMZ445 and SMZ460 let you observe a wide range of specimens, from Petri dishes to plants, insects, small animals and minerals.

SMZ745/745T Zoom Stereomicroscope



Powerful imaging capabilities at an economical price

Featuring a zoom magnification of 7.5X and a long working distance of 115mm, Nikon SMZ745 microscopes are well suited for both industrial and biomedical applications. The adoption of a new total reflection prism produces brighter images with higher contrast, and the anti-mold design allows the microscope to be used in environments where the temperature and humidity are high. The SMZ-745T trinocular model comes equipped with a microscope camera port and a built-in 0.55x c-mount adapter, permitting direct mounting of Nikon DS Series Digital Cameras.

SMZ1270/1270i SMZ800N Zoom Stereomicroscopes



Incredible sharpness throughout a wide magnification range

These versatile stereo microscopes provide both excellent optical performance, such as high-magnification, high-zoom ratio and high-resolution images, and advanced operability. The expandability of parallel optics makes these models suitable for a wide range of applications.

SMZ1270 - Standard stereo microscope with the highest-in-class zooming ratio

SMZ1270i - The same as the SMZ1270 but equipped with intelligent function found in superior models

SMZ800N - Affordable model with improved operability and basic performance

Eclipse E100-LED Upright Microscope



A microscope with LED illumination and exclusive CFI infinity optics delivering clear, bright images at every magnification.

Designed for years of high quality use, the Eclipse E100-LED is an upright microscope with outstanding optical performance combined with elegant ergonomic touches. The E100-LED, ideal as an educational or student microscope, incorporates Nikon's exclusive CFI infinity optical system and an high-intensity LED eco-illumination system that is IR-free, virtually eliminating eyestrain for users. In addition, advanced Nikon BE Plan Achromat objectives have been designed especially for the E100 with excellent optical corrections and very flat optical performance. This means clear, bright images at every magnification.

* Halogen version also available



Eclipse E200-LED - A routine/educational microscope featuring renowned Nikon CFI60 optics and LED illumination*.

The Eclipse E200-LED is a built-to-last, top-quality biological microscope ideal for basic laboratory use or as a student microscope for educational purposes. With its newly developed LED Eco-Illumination system, the laboratory microscope produces brighter, sharper, crisper, and clearer images for a noticeably enhanced view. Best of all, the Eclipse E200-LED maintains the same operational ease and rigidity common to all Nikon microscopes and is compatible with many accessories for higher-grade Eclipse series microscopes.

** Halogen version also available*



ShuttlePix - Digital. Powerful. And best of all, portable.

The ShuttlePix P-400Rv Digital Microscope from Nikon Metrology is a portable digital microscope that has a sleek, compact design well suited for onsite use. This new concept in digital microscopy allows for much simpler remote inspection of large samples that previously had been too challenging.

Operators can use the ShuttlePix for inspection, observation, simple measurement and recording of high-resolution images in industrial applications, as well as other practical imaging applications where an object needs to be inspected on site and in its correct position without risk of damage.

Hoskin Scientific Limited has been supplying testing and monitoring instruments since 1946. Although our range is broad, we focus on three major markets including:

Geotechnical & Materials Testing
Environmental Monitoring
Test & Measurement Instrumentation

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