Optimal Insight Solution
On and Off Your Turf

POGO Pro+

PROPER DECISIONS

POGO TurfPRO Mobile

POGO TurfPRO Cloud

POGO Pro+ and other inputs

The POGO Pro uniquely measures all key factors that influence turf performance through a patented sensor and scientific analysis. POGO employs a advanced array of calculations that measures exactly what the turf feels, and does not require calibration. Equipped with sub-meter GPS accuracy for precise identification of stress areas and GIS mapping. *Page 4*

POGO TurfPRO mobile

POGO's robust iOS / Android application leverages the POGO Turfpro cloud platform to efficiently connect data from POGO hardware. It provides immediate analysis and insights to users that are predictive, relevant, and actionable for various applications at each location of interest. Synchronization is with all account users. *Page 6*

POGO TurfPRO Cloud

POGO TurfPRO analyzes data collected through the app, weather, and more to instantly present various analyses in a clear, automated, and visual format. This visual representation of information highlights trends and provides insights into potential issues before they manifest, enabling proactive measures to be taken to prevent costly remediation. *Page 8*

POGO is a comprehensive, professional system that provides valuable insights into course conditions, enabling informed decision-making to achieve optimal course performance within any budget.

The POGO system utilizes comprehensive measurements and mapping approaches to assess and analyze the key factors that influence course quality and turf performance. Its patented technology offers exceptional precision and accuracy, backed by extensive global research, and enables your entire team to operate based on informed conditions prior to the onset of any symptoms.

POGO sets the INDUSTRY STANDARD for course monitoring, mapping, and analysis.

POGO Weather

POGO Weather is a comprehensive weather system that measures and calculates the key variables related to ambient conditions. It features advanced sunlight monitoring, stress models, and degree days, along with integrated analysis that combines turf and ambient monitoring, all facilitated through the Turfpro.com platform. *Page 14*
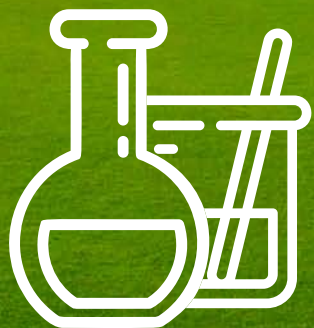
POGO Lab Analytics

Gain valuable insights into the chemical and physical properties of your turf, soil systems, and water sources through a USDA-certified laboratory. Identify the salts influencing electrical conductivity (EC), and discover the ideal moisture and EC conditions as well as the comprehensive nutritional composition of your turf system. Enhance your understanding of the entire rootzone profile and the effects of water sources on turf performance and other relevant factors. *Page 15*

POGO Support

24/7 online helpdesk support to all users around the globe

POGO Mapper

The Turfpro.com platform includes an integrated Geographic Information System (GIS) mapping feature for geographic and asset positioning purposes. Users can utilize the POGO Mapper or PRO+ for mapping such as compound curve measurement, as-built images for irrigation, drainage systems, sprinklers, catch basins, paths, pin placements, and various other applications. *Page 11*

Unmatched precision.
Better decisions... In Only Minutes per Day

The POGO PRO+ simultaneously measures all key factors influencing turf performance, utilizing a patented sensor that requires NO CALIBRATION at any time. Each unit is housed in a durable casing and features a multi-day battery pack, a professional-grade GPS receiver, and Bluetooth connectivity for seamless communication with your smartphone.

The POGO system is designed to be reliable and durable, effectively meeting the requirements of the Superintendent. The POGO features and benefits ensure a strong return on investment with minimal downtime and consistent accuracy.

The POGO PRO + hardware is an integral component of a comprehensive system designed to capture, analyze, and deliver instant feedback regarding the overall condition of your turf, enabling you to make informed decisions with confidence.

Proven reliability and research-grade accuracy you can trust

POGO's patented sensor is relied upon for scientific-grade precision by the USDA, NOAA, International Soil Moisture Network, leading irrigation companies, and numerous universities for over 30 years.

POGO Pro+: A Handheld SIMPLE to USE Supertool!
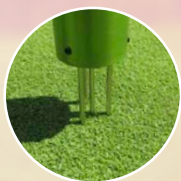
Turf remains virtually undisturbed

4 small-diameter, strong, long-lasting marine-grade stainless steel probes (3.1 mm / ⅛ in.) diameter.

Industry-leading warranty

Under its 2 year warranty, the entire system, even the wearing of the sensor tines (with POGO Boost option) is covered.*

* Max. replacement is once per year under POGO Boost. Significantly discounted repairs for all others. Standard 2-year warranty without an active TurfPro Cloud account.

Rechargeable battery

Provides more than a week of use between charges (18 days standby power). Standard USB-C charging port. Charger included.

Precisely measures the <u>correct</u> depth

The predominant moisture and salinity exchange of all types of turf and rootzone systems occurs in the top 2.4" (~6cm)*. Measuring this region maximizes true insight into surface and sub-surface influences.

Agronomy Management Solutions, 2011

Depth-adjustable soil temperature probe

Suggested depth, 2" (5cm) for most soil temp influences and IPM applications. Instant soil temperature insight.

Modular sensor connector

Provides for additional sensor add-ons without the need to replace the Pro+ to measure additional variables.

MOISTURE **SALINITY (EC)** **CANOPY TEMPERATURE** **SOIL TEMPERATURE** **POGO'S UNIQUE SALINITY INDEX** **+** **PRO-GRADE GPS**

POGO's patented sensor measures moisture, electrical conductivity (EC), and salinity levels, while two supplementary sensors assess the true heat index at the surface and soil temperature below ground. Collectively, POGO captures the most critical variables that impact turf performance. The interaction of the parameters measured by POGO plus weather conditions contributes to the accuracy and precision of its prescriptive solutions.

For example, low moisture content does not automatically indicate that water should be applied, or electrical conductivity (EC) varies among different salts. It is important to understand the appropriate actions to take and the timing of those actions. POGO provides valuable insights to help you excel in creating an exceptional player experience under optimal conditions.

POGO provides for custom and additional variable inputs, enabling a comprehensive analysis of your turfgrass system. These inputs include ball speed, color, clipping yield, shear strength, firmness, and more!

The precise location of each sample is recorded using an integrated, professional-grade GPS receiver. This location data enables POGO to visually represent the analysis on a map, allowing for clear identification of focus areas and the rationale behind them. Consequently, decision-making regarding the application of water, nutrients, and cultural practices has reached unprecedented levels of precision.

Infrared turf canopy heat index sensor

Instantly captures true surface heat index with extreme precision.

No need for calibration, ever

Patented sensing technology results in consistent accuracy and precision in all turf and soil types with no maintenance.

Ergonomic handle

Detachable and height adjustable for exceptional comfort.

Integrated wireless

The best user interface for POGO is the one already in your pocket. POGO connects easily via Bluetooth to any Apple or Android device for powerful on-the-fly sampling, analysis and decisions.

Integrated, professional-grade GPS receiver - Makes Analysis SIMPLE

Adds an extra dimension—precise location—to all measurements for geospatial condition analysis, hole location setup, sprinkler positions and patterns, area measurements, custom asset mapping and much more.

Optimal turfgrass performance requires optimal, timely decisions.

The POGO TurfPRO Mobile application transforms your smartphone or tablet into a comprehensive data acquisition and logging system, enabling the collection, display, and recording of turf conditions measured by the Bluetooth connected POGO device.

The app provides real-time turf analytics and assessments of soil moisture, EC, salinity, temperature, and heat index as well as several customizable spec logs (ball speed, firmness, clipping yield, and more), This will facilitate prompt responses to conditions that could lead to costly issues.

Critical alerts will inform you of measurements that require immediate attention while you are on the field and can be synchronized with as many staff members and centralized management as you designate.

The POGO Turfpro Cloud seamlessly synchronizes with Turfpro Mobile, providing unparalleled insights and analysis that are readily accessible to your entire team as soon as data is collected. **By utilizing POGO insights, all users will be empowered to make informed decisions collectively.**

Mobile Reports Delivered in Seconds

Reports featuring comprehensive analysis are generated automatically as new data collected through the app is synchronized in seconds with POGO TurfPRO Cloud. These reports are accessible to all team members within both the app and POGO TurfPRO.com Cloud.

Reports such as zone trends, visual insights, critical alerts, and turf performance evaluations provide insights that would typically require consultants, traditional reports, or extensive research.

This enables you to evaluate the conditions of your course in real-time, facilitating informed and prompt decision-making. Additionally, by efficiently sharing POGO insights with your team, you **ensure that optimal decisions are made consistently** across the board.

To utilize the POGO System, simply insert the POGO Pro+ sensor tines into the turf and tap the "Sample" button in the POGO TurfPRO Mobile app. Each measurement by POGO records the precise location, accurate to within one meter, enabling the exact identification of areas experiencing stress during data analysis.

Each multi-parameter measurement, along with any specifications you log, is color-coded to visually facilitate straightforward comparisons of conditions against your customized target range, while also **predicting where conditions are headed.**

Once enough measurements for a zone have been collected, any team member can access the analysis and make informed decisions regarding the appropriate applications and their locations. An average-sized green gets in-depth analysis with only 10-15 samples randomly logged with GPS location in under two minutes. Taking 3-4 samples per 1,000 square Feet (93 square meters) should statistically represent the zone. The POGO system provides the area of each defined zone.
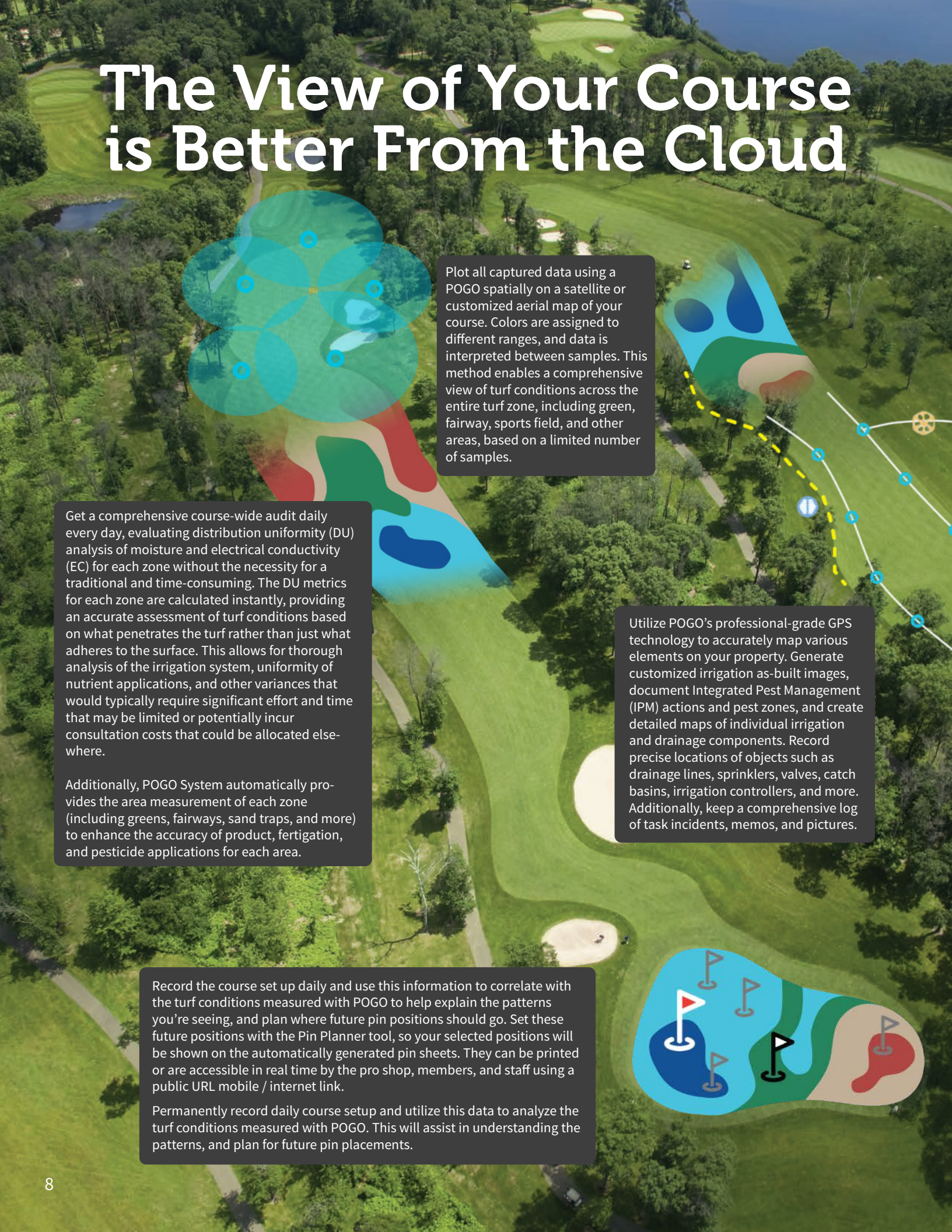
View your current location and measurements captured in real-time on a satellite map or aerial drone imagery of your property. Multiple images may be utilized.

Attach a photo or memo to any measurement or data set. For example, document the mowing setup, roll/no roll, detail hand watering events, recent product applications, and more.

Tap to instantly capture a new measurement.

Data and configurations are accessible to all designated users, facilitating a property to be split among multiple individuals while maintaining standardized measurement.

7

The View of Your Course is Better From the Cloud

Plot all captured data using a POGO spatially on a satellite or customized aerial map of your course. Colors are assigned to different ranges, and data is interpreted between samples. This method enables a comprehensive view of turf conditions across the entire turf zone, including green, fairway, sports field, and other areas, based on a limited number of samples.

Get a comprehensive course-wide audit daily every day, evaluating distribution uniformity (DU) analysis of moisture and electrical conductivity (EC) for each zone without the necessity for a traditional and time-consuming. The DU metrics for each zone are calculated instantly, providing an accurate assessment of turf conditions based on what penetrates the turf rather than just what adheres to the surface. This allows for thorough analysis of the irrigation system, uniformity of nutrient applications, and other variances that would typically require significant effort and time that may be limited or potentially incur consultation costs that could be allocated else-where.

Additionally, POGO System automatically pro-vides the area measurement of each zone (including greens, fairways, sand traps, and more) to enhance the accuracy of product, fertigation, and pesticide applications for each area.

Utilize POGO's professional-grade GPS technology to accurately map various elements on your property. Generate customized irrigation as-built images, document Integrated Pest Management (IPM) actions and pest zones, and create detailed maps of individual irrigation and drainage components. Record precise locations of objects such as drainage lines, sprinklers, valves, catch basins, irrigation controllers, and more. Additionally, keep a comprehensive log of task incidents, memos, and pictures.

Record the course set up daily and use this information to correlate with the turf conditions measured with POGO to help explain the patterns you're seeing, and plan where future pin positions should go. Set these future positions with the Pin Planner tool, so your selected positions will be shown on the automatically generated pin sheets. They can be printed or are accessible in real time by the pro shop, members, and staff using a public URL mobile / internet link.
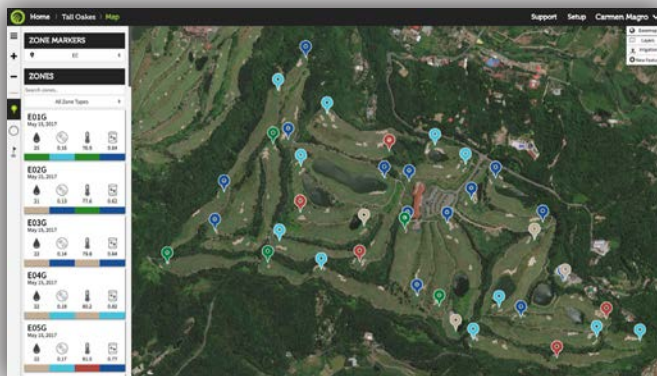
Permanently record daily course setup and utilize this data to analyze the turf conditions measured with POGO. This will assist in understanding the patterns, and plan for future pin placements.

Visual Insight

Every measurement obtained with POGO includes the essential variables along with the accurate location provided by the integrated professional-grade GPS system. Additionally, it supports custom inputs. This capability enables POGO TurfPRO Cloud, when connected to TurfPro Mobile, to spatially represent the data on a detailed map of your course.

Colors are assigned to specific zones that can be accurately defined. The data is automatically interpreted across the areas where measurements were taken, providing a comprehensive overview of turf conditions for the entire turf zone based on a limited number of quick samples.

You'll make better decisions when you can see WHAT your turf sees, and WHERE.

The POGO system offers more than just the capability to record and display raw data; it also provides timely analysis to meet your needs efficiently.

Ensure a clear understanding of the data and the most informed decision-making actions.

You'll get an enormous amount of insight at a glance, from just minutes a day during your morning rounds.

- Hot spot identification for site-specific hand watering
- Nutritional stress identification
- Traffic influences on the turf conditions
- Changing rootzone conditions and influences
- Positive and negative trends from employed practices (ex. Aerification analysis, irrigation changes)
- Before/after analysis of product performance (ex. surfactants, disease control, rolling ball speed changes, resilience, shear strength, others)
- And MUCH more!

Visual Insight sees problems like black layer forming before you do.

Trends are visualized, enabling proactive identification of potential issues before symptoms arise, thereby allowing for timely intervention to prevent costly consequences.
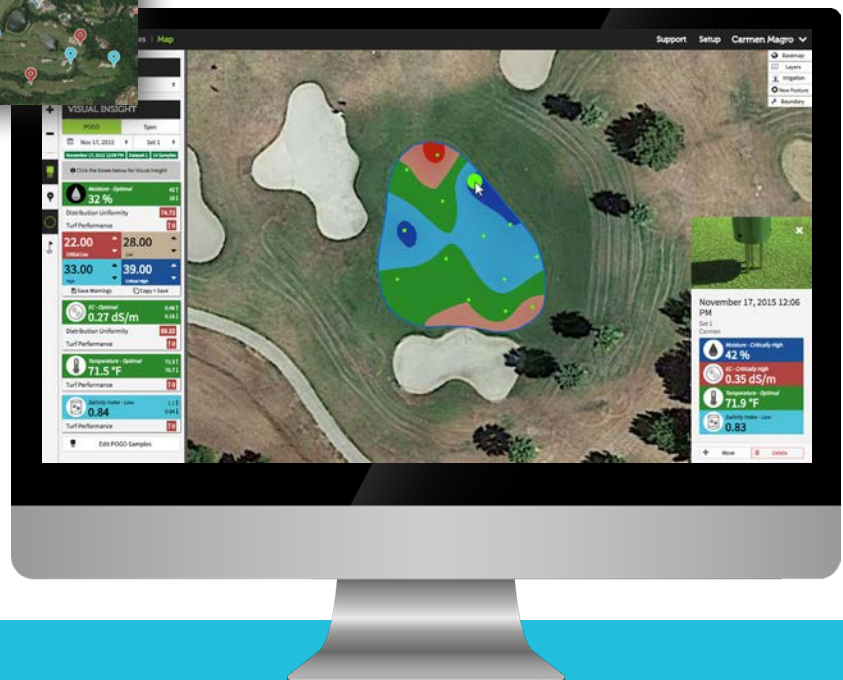
This is just one practical application of many.

POGO TurfPRO Cloud goes beyond merely presenting raw data by providing a detailed analysis of your information, which is visually accessible and seamlessly synchronized with TurfPro Mobile. Users can observe variations in moisture, salinity, temperature, ball speed, firmness, and more across all zones of your turf, gaining insights into how these factors interact. This functionality enables you and your team to **efficiently implement Best Management Practices (BMPs) by precisely determining what to apply, when to apply it, and where it is needed.**

Reports

## *From only minutes per day, to much insight right "out of the box"!*

Collecting data from your course requires just a few minutes each day. Each measurement encompasses all key factors that affect turf performance, along with specific GPS location details. This comprehensive dataset can be leveraged to enhance understanding of the various elements that influence turf performance.

Sample Reports (all accessible seconds after sampling):

Trend reports

Generate plots for various combinations of zones, turf parameters, and date ranges to facilitate the identification of trends and guide adjustments to your practices. **Enhance decision-making confidence and provide predictability.** Additionally, track metrics such as ball speed, firmness, custom logs, and other specifications using POGO's spec features. Tasks, photos, and notes will be displayed in the analysis at the exact relevant time.
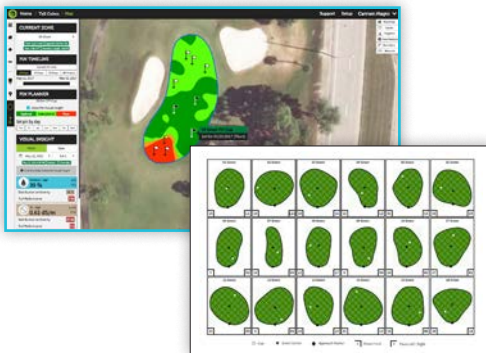
Pin planning

POGO's patented pin location system **correlates pin location decisions with turf conditions measured with POGO** that provides insights into the observed stress patterns. You can establish future positions using the Pin Planner tool, which will display your selected locations on the automatically generated pin sheets. These pin sheets can be shared via URL or printed as required. Gain not only an understanding of pin locations but also an insight into the quality of putting.

Distribution uniformity

POGO's patented Distribution Uniformity (DU) analysis enables daily audits across the course in just minutes per zone, eliminating the need for traditional, time-intensive DU assessments. **The DU of moisture and EC for each zone is calculated instantaneously, providing an accurate representation of water the turf sees,** rather than what lands on the surface. Utilize DU to evaluate aerification, surfactant applications, and various other practices effectively.


Turf performance indicator (TPI) report

POGO's patented TPI analysis offers valuable insights into various conditions using a standardized scale, thereby delivering a unique performance score for your turf. Additionally, it identifies potential factors contributing to the score and offers recommendations for improvement. Enhanced stress predictability models can be accessed when integrating with POGO Weather (refer to options on page 14).

Mapping

Utilize POGO's advanced integrated GPS technology to **effectively map various features on your property.** Generate detailed irrigation as-built images, document IPM problem areas, and map individual irrigation and drainage components, among other capabilities.

Layer any feature or mapped condition or object that you wish.

POGO Turf Pro Mobile simplifies the process of recording the location and various attributes of sprinklers, catch basins, hydrants, drain lines, pathways, and more. Simply position the POGO Pro+ or POGO Mapper over the item of interest or walk along the designated route.
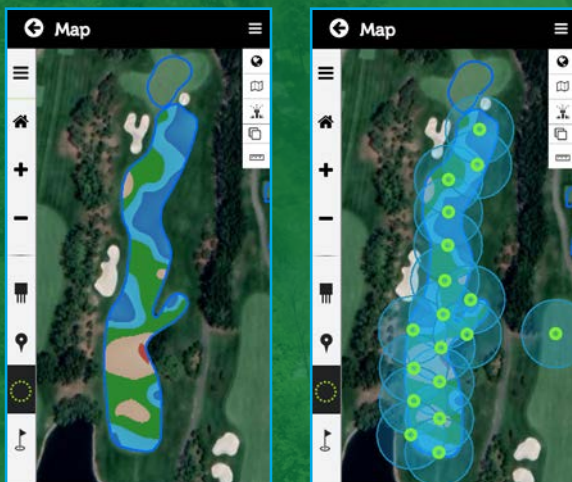
Overlay sprinkler patterns on Visual Insight to analyze the relationship between sprinkler patterns and traffic flow and their impact on the measured conditions. **Optimize your irrigation system effectively.** POGO identifies the conditions associated with each station and provides clear recommendations for adjustments to ensure uniform irrigation applications while maximizing efficiency and cost savings.

POGO Mapper

Optional add-on to allow mapping/ logging without Pro+ in hand
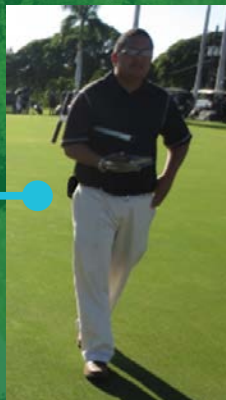
Clips on your belt for operating all POGO mapping + logging functions, using the same TurfPro mobile app and active TurfPro subscription.
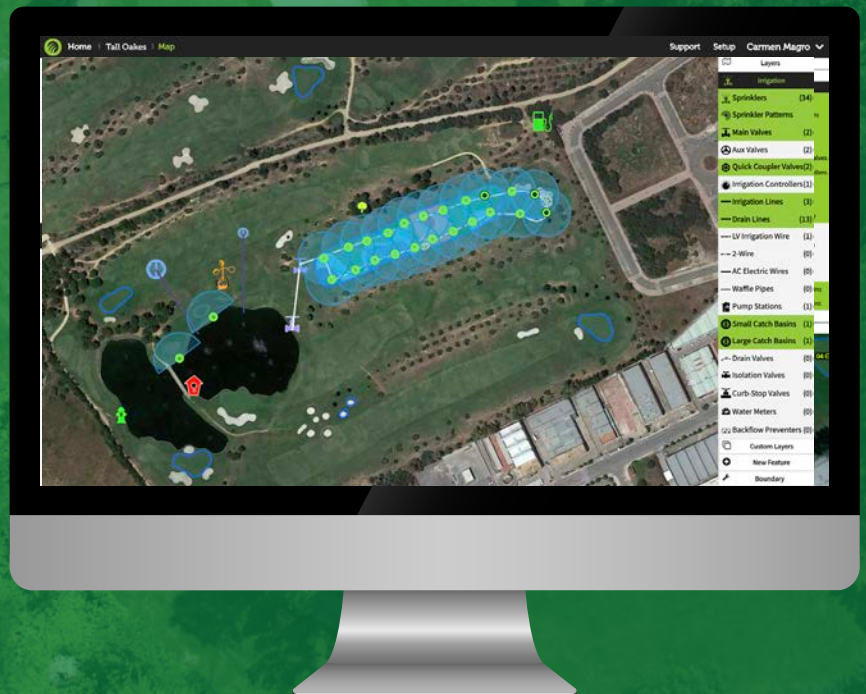
SAMPLE, LOG, ANALYZE & MAP

In minutes a day, view the life pulse of your entire property.

POGO's unique all-in-one design replaces multiple pieces of equipment and software, analyses tools and manual reports. It provides massive efficiency gains and requires minimal training. POGO is the most cost-effective way of gaining this level of course insight.

SAMPLE

- After completing a simply one-time setup process, insert the POGO Pro+ into the turf, select "Sample" on the Turfpro Mobile app, and then proceed to the next location.
- Captures moisture, EC, surface heat index, soil temperature and salinity index with POGO Pro+ integrated sensor **precisely positioned in the most influential component of the turf system.**

LOG

- Captured data is stored in the app.
- Using integrated precision GPS, log: sprinkler locations, cup placement, ball speed, boundary (and more) of any zone (greens, fairways, bunkers, ponds, sports fie lds, etc.)
- Permanently document notes and capture photos. Eliminate paper records and share easily. Access information at any time.
- **The user-friendly, integrated system consolidates multiple pieces of equipment and manual processes, delivering exceptional efficiency.**

ANALYZE

- Instant analysis is performed during sample collection, enabling timely decision-making in the palm of you hand. A comprehensive analysis of all data is subsequently performed automatically once synced with TurfPRO Cloud.
- Our innovative Visual Insight provides detailed analysis of the data you collected automatically, eliminating the need for you to manually sift through numbers or charts.
- Real-time assessments of irrigation, nutrition, and uniformity deliver a comprehensive understanding of turf and soil conditions, enabling the optimization of water and fertilizer management and the identification of stress factors.
- Enhance the efficiency of water, nutrient, turf improvement, and IPM applications by gaining a comprehensive understanding the related impact on turfgrass performance. Eliminate uncertainties and make informed decisions based on precise conditions and POGO's predictive analysis.
- **Actionable conclusions to maximize turfgrass health using scientific insight, with minimal effort.**

MAP

- Map sprinkler patterns and uniformity assessments.
- Assess area measurements precisely.
- Pin planning & placement
- Map features unique to your property**…easily.**

Maximize turf performance, minimize water and nutrient requirements, ensure most efficient use of product applications

OPTIMAL TURF PERFORMANCE
For minimal effort

- **OPTIMIZE** turf health and conditioning, root growth and soil conditions, irrigation distribution, and overall turf performance
- **MINIMIZE** water and fertilizer consumption
- **KNOW** the effects of your nutritional and chemical applications. Adjust their timing more effectively and proactively
- **IMPROVE** playing conditions and stress tolerance

- **INCREASE** effectiveness of maintenance practices:
  - Validate aerification practices (air/water improvements)
  - Build degree days and POGO performance indicators accurately and specific to your property
  - Optimize nutritional and salinity management practices

SCIENTIFIC ANALYSIS
Done for you

- **UNDERSTAND** reasons for turf decline: Moisture, nutrients, stress, or the combined impact of moisture, salinity and temperature. Know if a 'dry' spot is hydrophobic or if the discolored condition is the result of elevated salinity or other measured conditions. **Gain actionable insight!**

- **MAXIMIZE** nutrient release longevity
- **PREDICT** future stress: Analyze trends to identify negative conditions before symptoms develop
- **MEASURE** the most influential factors for turf performance, above and below ground to make the very best decisions in turfgrass management

MAXIMIZE EFFICIENCY
Do more in less time

- **AUTOMATE** paperwork and manual notes:
  - Log timestamp and GPS location with every turf sample taken automatically
  - Permanent log of sprinkler and cup positions
  - Record notes and photos with each sample. Share with users who all sync through the POGO TurfPro cloud
  - Correlate POGO lab analysis reports (turf/soil, water, and more)

- **ELIMINATE** spreadsheets and manual analysis: let the POGO system advanced data processing using sophisticated algorithms. Use map-based Visual Insight to understand, predict and optimize your turfgrass. Make your best decisions with **CONFIDENCE!**

> *POGO has allowed my operation to be uber more efficient in so many ways. We talk about return on investment in all we do for our superiors but often neglect to consider the negative result of not making the best decisions in a timely manner. The cost of having to do something again or recover from a setback is huge! If we gain one more player due to our conditioning efforts, that more than pays for the system…and we have gained many. Losing players is something we wish to avoid entirely. Thank you POGO!*

Justin Daigle
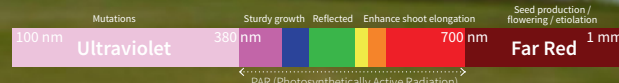Golf Course Superintendent, Perry Park Country Club, Larkspur CO

POGO®
Weather Pro+

Wireless, autonomous, "set-it-and-forget-it" weather station delivers local and real-time insight into current and future turf conditions and playing environment.

Wind Speed
Wind Direction

(Optional) Globe Temperature Sensor
Calculate wet-bulb globe temperature (WBGT) associated with human body heat stress in direct sunlight

Pyranometer (solar radiation) measures the full spectrum of sunlight and also separates (optional) PAR (Photosynthetically Active Radiation) light for additional insight

Mutations		Sturdy growth	Reflected	Enhance shoot elongation	Seed production / flowering / etiolation	
100 nm Ultraviolet	380 nm			700 nm	Far Red	1 mm

PAR (Photosynthetically Active Radiation)

8" Rain Gauge
Accumulated rain count
(today, yesterday, month, season)

IP68 Waterproof Enclosure
Built-in rechargeable battery
4G LTE cellular modem

Air Temperature
Relative humidity
Barometric pressure

**Sturdy
5-Segment
Aluminum
Tripod**
(2.9m/9.6ft)

Solar Panel (12W)

**(Optional) Soil
Moisture Sensor**
The same sensor used in the Pro / Pro+ measures moisture, salinity (EC), and soil temperature.
(up to 3 sensors per station)

- Measurements from anywhere on the property
- Single or multiple station setups
- Compatible with POGO TurfPro mobile app
- Customized degree-days (growing, heating and cooling)
- Digital Light Integral calculator using PAR sensor
- Stress indicators based on soil moisture, EC, canopy heat index and ambient temperature
- General Ambient Stress Index

Sports Turf
Template Sampling and Analysis

The sportsturf industry has engaged the POGO System worldwide in diverse applications including football, soccer, baseball, polo, cricket, horse race tracks, and tennis. One specific challenge encountered is obtaining a precise GPS fix, especially in indoor environments.

The POGO System now includes the POGO Template sampling platform, enabling users to establish a sampling zone using a template system. This feature allows users to select specific points on the template for sampling, facilitating access to POGO's visual insight analysis, even in situations where GPS signals may be suboptimal.
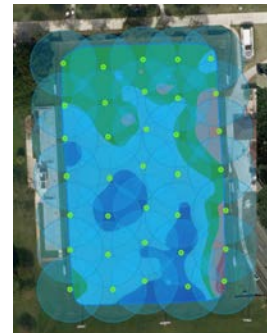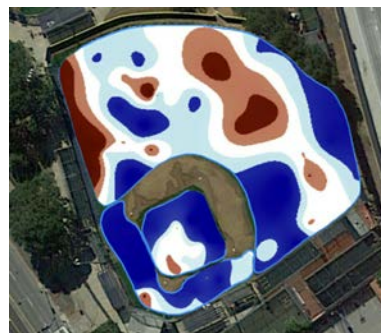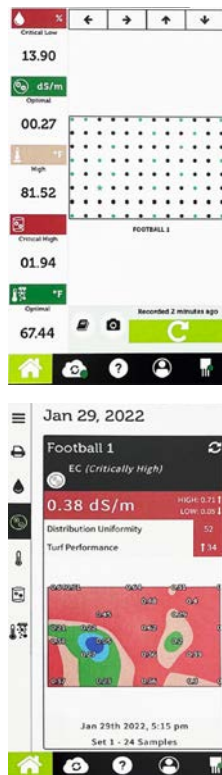
POGO
Lab Analytics

Integrating the POGO measurements with laboratory analysis from POGO's independent USDA-certified laboratory allows for the evaluation of key attributes related to soil, water, tissue, and microbiology. This approach facilitates the identification influences of physical and chemical variables, and enhances the understanding of their impact on the turf conditions evaluated by POGO. In addition to the standard POGO System, performing lab tests for water, turf, and soil offers valuable insights that empowers you to prevent problems and achieve optimal conditions.

What our customers are saying:

> If I move to another golf club, the first thing that I would buy would be another POGO. Or two. Every golf club should have POGO.

John Blanch
General Manager, Thai Country Club, Bangkok, Thailand

> There have been two significant revolutions in golf course management…Primo® and POGO®.

Jeremy Adkins
Senior Director of Agronomy, West Region, ClubCorp, Nevada

> I have become a huge fan of the POGO. It is easily one of the best value for money investments I have ever made.

Sean Kinsley
Golf Course Superintendent, The Address Montgomerie Dubai

> The POGO is an incredible tool. I can take samples in the morning and my entire team has instant access to the results in real time on their phones. I have the option to print out the visual map of conditions if necessary so our team knows what to do and where. Awesome!

Ken Lochridge
Golf Course Superintendent, Glen Head Country Club, Long Island, New York

> POGO provides so much more than managing moisture. when used to its full potential, it's the most valuable product a turf manager can use today. It's precision, accuracy and complete solution system has elevated our practices and knowledge without a doubt!

Craig Haldane
Golf Course Manager, Gleneagles, The Gleneagles Hotel, Scotland

POGO®

Superior insight | Better decisions | Healthier turf

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POGO

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