

Hunter[®]
The Irrigation Innovators

SURVEYOR

Simple, Powerful Central
Irrigation Control for Golf



Hunter[®]



Surveyor™ is the irrigation management tool that combines simplicity and high-tech accuracy into a golf maintenance professional's dream system. A computerized, central irrigation control system that can start small and simple, Surveyor has the ability to grow into a full-fledged, weather-driven, flow-balanced, interactive map that harnesses all the power of the modern computer. With Surveyor in place, you can work the way you want. Surveyor requires minimal set up, yet contains the most advanced tools available for flow, weather, and sensor input. And the choice of how to use this arsenal is up to you: turn all of them on when you're ready or keep it clean and simple when these advanced features are not needed.



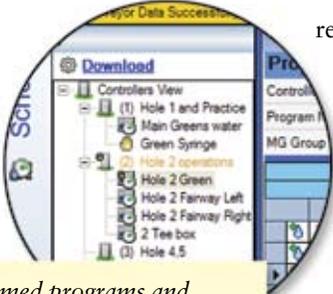
Precision irrigation by plant type...automatically or in real time.

Program Management has Never Been Simpler

Name your programs (and the stations) for what they water, group them by the types of turf they manage, and flow- or time-graph the results. Save perfect watering scenarios under different names and recall them as needed, when those conditions

reoccur. If you prefer the flexibility of true individual station control, Surveyor can group heads by plant type and station-level flow balancing. Just input where more or less irrigation is needed (greens, tees, fairways, etc.), and let the computer do the rest. Resched-

uling start times, flow optimizing, and downloading are fully automated.

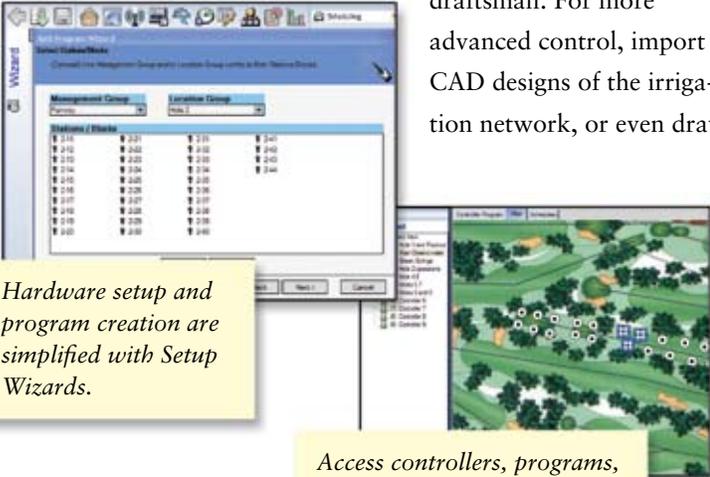


Named programs and stations clearly identify every rotor and program.

Fast and Easy Start Up

The built-in wizard will walk you through start up—from out-of-the-box to ready to water—with very little preparation. From there, you'll find Surveyor is completely capable of full-featured operation with no graphics at all. Simple click-and-drag hydraulic modeling lets you build a pipe network without being a computer

draftsman. For more advanced control, import CAD designs of the irrigation network, or even draw



Hardware setup and program creation are simplified with Setup Wizards.

Access controllers, programs, and individual stations with Surveyor's advanced graphical tools...drawn on scans or aerial photos of your course!

your own with Surveyor's built-in graphical tools. You can build an advanced database as you go, or import one from your system design.

Create and Edit Programs Out on the Course

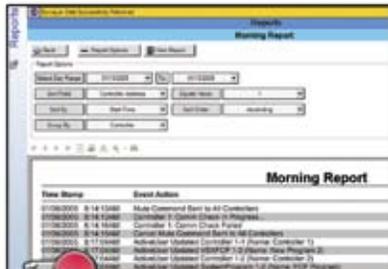
With Surveyor, critical irrigation isn't dependent on the whims and availability of a computer or communications link. Surveyor creates schedules and sends them to the field, where controllers do the actual irrigating. And because Hunter field controllers are packed with intelligence, you can even create and edit irrigation programs right out on the course. Surveyor then keeps a watchful eye on flow, weather, and other real-world conditions. All the while, true two-way communications verify that your irrigation schedules are reaching the landscapes that rely on them!



The powerful AGC controller can be customized with plug-in modules that add stations and add central control communication capability.

Know What Happened... And What's Happening Now

An attractive, readable, and printable account after each irrigation period, Surveyor's innovative **Morning Report** can be customized for the items that matter most. Itemize each irrigation event over the water window or just



First thing each morning, Surveyor presents a customized briefing of last night's events.

note exceptions and alarms for immediate attention. Measure flow, keep an eye on the wind, and prevent wasteful irrigation during the rain with

Surveyor's **Data Retrieval** module that collects information from

sensors in the field, while the computer stands by to issue any protective shutdown commands. And use the color-coded **Flow Graph** to show how much water is going where. Graph irrigation scenarios in advance, track what happened while you were gone, or view in real time what is flowing right now.

An Invisible Assistant on Your Staff

Surveyor's incredible Task Manager can be programmed in advance to perform timed tasks throughout the year. Anything from a simple pop-up reminder window (fertilization schedules, tournament events...even important birthdays), to pre-programming downloads of named programs on a future day. Task Manager can be set to check the weather station, get and apply the ET, monitor the sensors, and even to suspend irrigation for important events in the future. Best of all, you don't have to be at the office to change schedules...just tell Task Manager to change and the switch will be made according to your pre-programmed instructions.

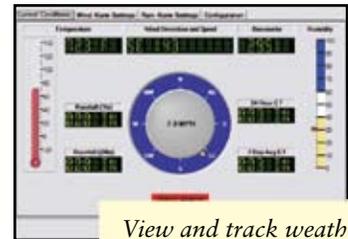


Schedule automatic downloads, new programs, even pop-up reminders for meetings and appointments, with the Task Scheduler.

Tie Your Irrigation to the Weather

Progressive water saving and climate-sensitive automation features, including weather tracking and automatic evapo-transpiration (ET) calculations, provide the

ultimate in scientific turf management. The spectacular weather interface displays the (optional) weather station's sensor readings on demand, with historical recording. You can apply the weather conditions to the next irrigation application automatically, in any proportions you like! Surveyor can schedule irrigation in run times, application amounts, or percentages of ET (by plant type or course area).



View and track weather in real time, and automatically adjust irrigation to ET, with the weather interface.

Feature-Filled (Of Course, it's from Hunter)



Full two-way communications. Industrial-grade surge protection. The peace of mind of a downloaded schedule. On-board event recorders. And feedback from an entire family of sensors. Plus, Hunter's Maintenance Radio provides instant control of stations, blocks, and programs from your portable radio, with fewer buttons to push and instant audio confirmation of commands.

Radio field controllers include Hunter's famous StraightTalk™ technology that allows wireless remote control at ranges up to two miles whether or not the computer central is turned on. Two-mile range subject to terrain and requires a site survey; FCC or Industry Canada license required.

AGC Controllers

An Unconventional Approach to Conventional Control

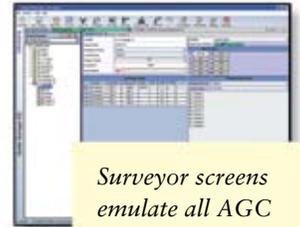
The all-new AGC controller brings a fresh new approach to the traditional golf field controller—an information-packed, video-like display with powerful backlighting, as well as a user-friendly dial that walks you through programs, records, manual operations, and diagnostics. Plus, it's completely programmable from a convenient, removable facepack.



Completely self-sufficient, the AGC is never dependent on distant objects for instructions. But in unison with a central computer and Surveyor software's flow-optimized true independent station control, its capability is maximized.

In essence, you get two controllers for the price of one, featuring both traditional day/start/run time sequences, and a huge memory for computerized downloads.

Providing all the strength and protection you need in a field controller, the AGC boasts a 14-solenoid capacity and automatic circuit protection. Simple snap-in output modules expand your controller as your system changes, and feature a unique see-through design that showcases individual diagnostic station LEDs. Together with industrial grade lightning protection components, it makes AGC the ideal choice for standalone applications, new construction grow-in conditions, or as a building block to a full Surveyor central system.



Surveyor screens emulate all AGC keypad functions, for full remote programming.

Press the Info button at any dial position, and receive a screen full of tips, instructions, and even records for that dial position!



Programs, stations, even our unique SSGs (simultaneous station groups) can be named so you'll never need a "cheat sheet" just to water the grass.

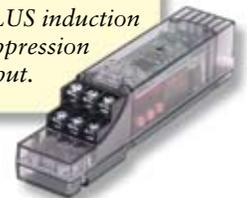
Add communications with snap-in modules that have their own display and buttons for setup and testing. Requires only a screwdriver to install!



Choose from Maintenance Radio remote control (UHF-based, no computer required) with StraightTalk™ technology, or our low cost, license-free ICR remote (up to two-mile range).

Field-selectable dual-voltage transformer (115V/230V) features heavy-duty surge protection with double fuses and test terminal.

Spark gap PLUS induction coil surge suppression on every output.



AGC: The Two-Wire Option

Our Complete Family of Decoders Use Less Wires

Decoder installations continue to be one of the fastest growing forms of technology in irrigation control. A key advantage over conventional systems is that decoder systems use less wire for an overall irrigation system. That in turn means lower cost as well as quicker installation times and easier system diagnosis and repair if needed. Systems can be easily expanded—with minimal digging and disruption of landscaping—by adding in more decoders rather than running additional wires.

Surveyor and AGC allow you to take advantage of this cost-efficient approach with the two-wire decoder version of the controller.



The new ICD Series is available in a choice of 1-, 2-, 4-, or 6-station outputs, making it possible to run each

head on an entire green with a single decoder. In all, decoders let you operate up to 99 stations out to 15,000 feet (4.5 km) from a single controller, with reduced costs



Multiple two-wire paths to the field allow you to select the most cost-efficient installation for your site. Up to six paths are available (two shown here).

and only two total wires to troubleshoot. Plus, you can even mix decoder controllers in with your conventional controllers, so they're ideal for retrofit or partial re-dos.

ICD decoders include built-in surge suppression, color-coded wire connections, true independent station control, integrated earth grounding, programmable station addresses, two-way feedback to the controller with confirmation and status indication, and internal thermal circuit breakers. There's even a two-way sensor decoder (ICD-SEN) that permits remote monitoring of distant rain, flow, and other sensors over the two-wire path.



Controller Specifications

General Controller:

- Memory: non-volatile RAM (internal lithium battery for real time clock only)
- Battery: 9VDC (for remote programming only)
- Display: backlit, high temperature
- 6 Automatic programs, with 4 Custom Manual (auxiliary) programs
- Up to 10 Start Times per automatic program.
- System Event buffer for flow optimized downloads
- Programmable Overlap or SmartStack™ by Program
- Up to 20 Simultaneous Station Groups (SSGs) of up to 4 stations each.
- % adjustments, either by Program or by controller, 0 to 300% in 1% increments
- Station run times up to 6 hours (in 1 second increments) with programmable delay between stations (up to 6 hours)
- Programmable Automatic Cycle and Soak, by station
- Non-volatile memory and 366-day calendar
- Self-diagnostic circuit breaker skips shorted stations and continues watering
- On-board event recorder
- SmartPort® equipped for wireless remote control
- Flash programmable for field updates
- Dual Pump/Master Valve outputs programmable by station (NO or NC selectable)
- Internal local flow meter connection and up to 4 Klik™-type sensor inputs (programmable to Program level)
- Dual-wall outdoor plastic pedestal with key locks

Specifications

Surveyor Software Requirements and Specifications

- Operating Systems: Windows 2000 or XP (Pro or Home Editions)
- Max System Programs: Unlimited
- Stored, named adjustments: Unlimited
- Contingency Programs: Unlimited
- Maximum Field Controllers: 999
- Maximum stations: 102,897
- Scheduling: Manually entered or ET-based
- Flow Management: To station level; automated and graphed
- Graphics: Custom; raster (scan, photo) or vector (DXF import) or both
- Full functionality without graphics: Yes
- Selectable Layers with toggled visibility: Yes, unlimited
- Built-in Map Editor with customizable Drawing Objects
- Built-in Task Scheduler: 100-year + advanced scheduling with pop-up notification
- Stored Historical Reports: 5 years minimum

AGC Hub™ Central Interface:

- Communications: Radio, Hardwire, and Modem (can be mixed in system)
- Enclosure: Powder-coated steel (outdoor/indoor)
- Connection: DB-9 Serial port
- Primary Input: 105-125VAC, 0.5A max., or 205-230VAC, .25A max.

Communications:

- Remote-ready for Hunter ICR no-license remote control (via integrated SmartPort®)
- Optional plug-in comm module with self-contained user controls
- Up to 999 field controllers per system (over 40,000 stations, conventional, or 98,000 stations, decoder, per system)
- True two-way communications via hardwire, or UHF Radio, with built-in status, surge suppression, and diagnostics
- Hardwire, 4-20 mA loop up to 10,000 ft/3 km between each device via GCBL cable
 - GCBL: Shielded 2 twisted pair, 18AWG (armored Cable available)
- UHF Radio, narrowband (FCC license required) to approx. 2 mi/3.6 km radius (optional antenna in lid)
 - Radio: 2 Watts, UHF (450 - 470 MHz)
- Hardwire, radio, conventional, and decoder may be mixed within same system
- Surveyor Golf software compatible

True Two-Way Communications Range:

- Radio Versions: 2 miles (approximate, depends on terrain)
- Hardwire Versions: Up to 10,000 m/3,000 ft to first field controller, up to 10,000 m/3,000 ft between each additional field controller
- AGC Hub™ technology allows Radio, Hardwire, and Telephone Modem communications to be combined in the same system

Options & Accessories:

- RA5M: Base Antenna
- TW Series Weather Station - high efficiency weather station with wireless and solar power options

Electrical Specifications, Controllers

- Transformer Input: 120/230VAC, 50/60 Hz, 2A max. at 120V, 1A max. at 230V
- Transformer output: 24VAC, 4A, at 120VAC
- UL, c-UL, CE, and C-tick listings and approvals

Conventional Output versions (AGC1200PP)

- AGM600 Six-output modules with screw terminals and integrated heavy-duty lightning protection
- Two AGM600 (12 stations) included in base package, expansion up to 42 stations, max.
- Each output, 24VAC .56A max. with individual green/red LED status indicators (includes Pump/Master valve outputs)

Decoder versions (AGC99DPP)

- Decoder Line (path) output: 34V peak-to-peak
- Decoder Power draw: 3 mA (standby), 40 mA per active output
- Solenoid capacity: 2 standard 24 VAC Hunter solenoids per output within spec wire runs, up to 14 solenoids max. simultaneous (includes dual P/MV outputs)
- Two-way confirmation of decoder activation
- Two-way monitoring of sensor connections (ICD-SEN)
- Diagnostic LEDs with line status, signal activity, decoder and solenoid status
- Programmable decoder station IDs (from controller panel)
- UL, c-UL, CE, and C-tick listings and approvals

Decoder Wiring:

- 6 individual two-wire output paths to field decoders (use any number of paths from 1 to 6 to connect up to 99 decoder stations)
- IDWIRE1, Red/Blue twisted pair 14 AWG/1.5 mm diameter to 10,000 ft/3 km
- IDWIRE2, Red/Blue twisted pair 12 AWG/2 mm diameter to 15,000 ft/4.5 km
- Wiring, Decoder to solenoid: standard pair 18 AWG/1 mm to 100 ft/30 m (twisted improves surge resistance)

Dimensions:

Height: 40" (101 cm) Width: 22" (56 cm)
Depth: 16" (41 cm) Weight: 50 lbs. (22.5 kg)

Signal Output

- Hardwire: 4 – 20 milliamp loop
- Radio: 2 watts UHF (450-470 MHz), narrow band

Options & Accessories:

- TRNR: Handheld Radio for or StraightTalk™ communications
- TW Series weather stations with optional wireless or hardwired communications and solar power



Weather station for Surveyor is only an "option" until you've tried one... wireless, solar-powered, affordable, with automatic ET.

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