

Advanced Control Technologies

Rain Bird® Advanced Control Technologies are designed with ease of use in mind. From soil sensing to pump management with our powerful central control, we offer a full range of solutions that integrate advanced technologies and optional software. With their help, you can manage water responsibly, save money and reduce utility costs, while continually enhancing course appearance and improving playability.



The Rain Bird® Integrated Sensor System™ (ISS) gives you absolute control over your turf

Every golf course is its own complex ecosystem. To provide a consistent, playable environment, you need an accurate understanding of turf health. The Rain Bird® Integrated Sensor System™ offers a snapshot of soil conditions to help you to understand what is happening below ground. It is also the only system in the industry to deliver easy-to-install absolute soil sensing and full integration with the central control system. As a result, you'll save more time, water and money with Rain Bird.

ISDL-2400 Wireless Data Logger:
The data logger receives soil data from the sensors and sends it through the wireless network to the central control.



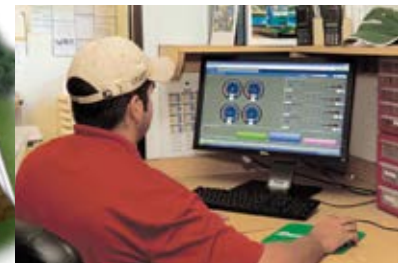
ISR-2400 Wireless Repeater: *Strategically place multiple repeaters around your course to create a wireless mesh network.*



TSM-3 Soil Sensor: *Rain Bird® ISS offers an easy-to-install absolute sensor that provides accurate soil readings without calibration.*



ISG-2400 Gateway: *Located at the computer, the gateway is the link between data loggers and repeaters in the field and the Soil Manager™ software.*



ISS Soil Manager: *From the convenience of your computer, receive accurate, real-time information on soil conditions, as well as manually or automatically adjust run times based on soil moisture, with Rain Bird's state-of-the-art Soil Manager software.*

Integrated Sensor System™ (ISS)

FEATURES AND BENEFITS

- Dynamic integration. Fully automatic.**
 When paired with a Rain Bird Central Control System, the Integrated Sensor System can automatically adjust sprinkler run times to reach or maintain moisture levels, minimizing water consumption, resulting in healthier turf and better playing conditions.
- Intelligent monitoring.** As a standalone system, the ISS analyzes soil moisture and calculates water budget recommendations for any golf course.
- Maximum accuracy. Zero calibration.**
 The ISS uses research-grade soil sensors backed by years of field experience. The ISS takes highly accurate real-time readings of soil moisture, salinity and temperature immediately following installation and without calibration — for easy installation and immediate accuracy.
- Adjustable soil sensing rate.** With the Rain Bird ISS, the frequency of soil sensing measurements can be adjusted to match course needs.
- Dependable results.** Sensor readings are automatically stored by the data logger on Secure Digital High Capacity (SDHC) storage cards. Data is not lost due to power outages or wireless communication issues.
- Dependable communication.** The ISS uses a proven wireless mesh network which ensures the necessary range of transmission and a secured traffic from the data logger to the Soil Manager™ software.
- Simple installation.** Network devices (data loggers and repeaters) are battery-powered and easy to install. There is no AC power source to worry about.
- Improves turf health, course consistency and playability.** The ISS can help deliver more consistent turf quality, anticipate plant stress, weed germination, pest infestations and other factors. You can use less water to flush salts from the soil profile.

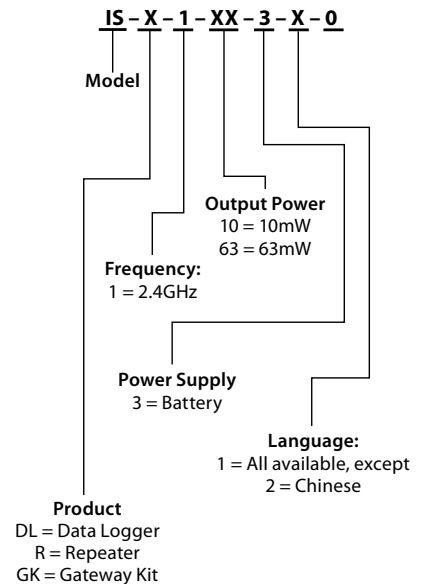
SPECIFICATIONS

- System capacity:** 200 sensors, 20 ISDL-2400 data loggers, 40 ISR-2400 repeaters per ISG-2400 gateway.
- Frequency of sensor readings can be adjusted between 2 and 120 minutes.
- Electrical Input:**
 - ISDL-2400 and ISR-2400 repeater:** Four (4) D-cell alkaline batteries
 - Minimum battery life:** 12 months at 20°C (68°F) assuming 100 sensor readings per day (every 15 minutes)
 - ISG-2400 gateway:** Powered via PC USB port
- Each gateway and repeater communicate directly with up to eight (8) network devices (data loggers and repeaters) to enable wireless mesh capability and ensure optimum radio communication.



● Integrated Sensor System

HOW TO SPECIFY



Note: Check country of use output power regulations before ordering.

Wireless Network:

- **General**
 - 2.4 GHz ISM DSSS (Digital Sequencing Spread Spectrum) unlicensed frequency
 - Power output 10mW and 63mW per country of use regulations
 - Protocol: DigiMesh™ proprietary mesh network
 - Communication Range: Unobstructed line of sight 800 yards min.
- **Data Logger**
 - **Capacity:** 18 Rain Bird specified TSM-3 Soil Sensors that use SDI-12 protocol. Nine (9) sensors per channel on two (2) channels.
 - **Electrical input:** 4.1-6.5V using four (4) D-cell alkaline batteries
 - **Data storage:** Sensor data stored on 4GB or higher capacity SDHC card (card included)
 - **Upgrades:** Firmware can be upgraded using SD card
 - **Display:** Backlit with 10-position menu and four (4) soft keys for automatic and manual operation including system settings, (language, date, time, units), automatic and manual sensor operation, sensor setup and special features
 - **Languages:**
 - English • French • Spanish
 - German • Chinese • Portuguese
 - Swedish • Italian
 - External antenna tuned for 2.4 GHz communication
 - **Operating temperature:** -10°C to 54°C (14°F to 130°F)
 - **Storage temperature:** -40°C to 66°C (-40°F to 150°F)
- **Repeater**
 - **Electrical input:** 4.1-6.5V using four (4) D-cell alkaline batteries
 - **Languages:** Same as Data Logger
 - **Display:** Backlit with four (4) soft keys
 - Firmware upgrade using SDHC card (card not included)
 - **Operating temperature:** 14°F to 140°F (-10°C to 60°C)
 - **Battery operating temperature:** -4°F to 130°F (-20°C to 54°C)
 - **Storage temperature:** -40°F to 150°F (-40°C to 66°C)
- **Gateway**
 - USB to serial to USB

Sensors:

- **TSM-3 Soil Sensors**
 - Sensor connects to a Rain Bird ISDL-2400 Wireless Data Logger and provide soil moisture, salinity and temperature readings
 - Sensor takes accurate readings immediately following installation and without calibration
 - Sensor measures and reports:
 - Soil temperature
 - Absolute water fraction by volume (WFV) in % with loam calibration
 - 0.1 to 15 dS/m in-soil electro conductivity
 - 1% stable WFV readings over the following conditions:
 - » -22°F to 131°F (-30°C to 55°C) (non-frozen soil)
 - » 0.1 to 4 dS/m EC
 - Robust, long life materials and construction
 - Industry standard SDI-12 interface
 - Sensor connects to a data logger through an 18-gauge three-wire cable that is at most 500 feet (152 meters) long. Sensor itself shall have a 25 ft (7,6 meters) long 18-gauge three-wire cable. Additional cable, not provided, is required to reach 500 feet.
 - Low power operation:
 - 9 to 20 VDC
 - <1 mA typical standby mode
 - 30 mA moisture read mode

Software:

- **Hardware requirements, same as Rain Bird central**
 - Microsoft Windows® 7 or higher
 - PC with 2.2GHz or higher processor
 - Minimum of 2GB RAM memory
 - 3 GB of available hard disk space
 - Power Profile of computer configured to not sleep
 - DirectX 9.0 c-compatible display driver (Windows® XP Mode under - Windows® 7 and later not supported)
- **Languages**
 - English • French • Spanish
 - German • Chinese • Portuguese
 - Swedish • Italian

Soil Manager™:

- **Monitoring**
 - Dashboard view
 - Sensor graph view with annotation capability
 - Sensor table view with annotation and export to Excel capabilities
 - Communication, power and sensor alerts
 - Diagnostics including network device battery level and signal strength status (RSSI)
 - User-defined email alerts for out-of-range soil moisture, salinity and temperature values, communication and power status
 - Water budget recommendations available when one sensor is linked to a particular irrigation program
- **Monitoring with dynamic central integration enabled**
 - Same as monitoring version
 - Full integration with any Rain Bird irrigation central control software version 7 or higher
 - Sprinkler runtime adjustment based on soil moisture measurements and water budget predictions

MI Series Mobile Controllers

Remote access to your central control is now as convenient as the Internet, with mobile control. This software runs on your central control computer to provide remote irrigation control via a web-enabled device or smart phone.

Rain Bird® MI series mobile controllers are designed to work on a smartphone or tablet with Internet connectivity and offer far more remote options than anything else available.

Once connected to the Internet, up to nine (9) remote users can simultaneously control sprinklers and programs, review system activity or directly change settings on both sprinklers and irrigation programs. All activity is logged at the central control for convenient review.

MI series mobile controllers now also include MI FREEDOM user interfaces. MI FREEDOM provides two smartphone interfaces for users to implement traditional The FREEDOM System™ commands: 1) Handheld radio keypad for users with years of handheld radio keypad experience. 2) Soft keyboard interface for use of The FREEDOM System commands on a standard smartphone virtual keyboard.

SYSTEM REQUIREMENTS

- Designed for Windows® 7 or higher.
- Requires an Internet connection to the central control computer.
- Requires a smart phone or tablet.

Feature Comparison

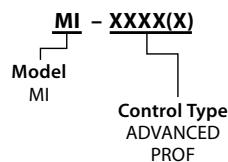
Link Name	Advanced	Professional
Satellites (Areas)/Stations	X	X
Programs/Schedules	X	X
Diagnostics		X
Accessories		X
Alarm Log		X
Cancel All	X	X

Accessories

Link Name	Advanced	Professional
Water Budget		X
Demand Flow	X	X
Smart Pump™		X
Smart Weather™		X
Activity Log	X	X
Online Users	X	X

● MI Series Mobile Controller (Software License only)*

HOW TO SPECIFY



*Phone not included.

The FREEDOM System™

The FREEDOM handheld provides reliable, two-way communication with your Rain Bird system. Use it to choose from command-based or schedule-based operations, making irrigation adjustments a snap. Either way, The FREEDOM System puts you in control of your irrigation management system wherever you are.

System Features and Benefits

- **Two-way Communication with Rain Bird Centrals.** Audio response at radio indicates command received by central.
- **Station- and Program-based Commands.** Provides the flexibility to turn ON or OFF any station or an entire area with the click of a few buttons.
- **FREEDOM-based Commands Recorded at Central.** Irrigation activity logged at the central whether stations turned ON with FREEDOM System or with central.
- **Optional Flo-Manager® Bypass.** Permits FREEDOM user to bypass Flo-Manager.
- **Optional Operating Window.** Allows user to define FREEDOM usage hours, which helps superintendents to control irrigation activity.
- **Two-Way Voice Communication**
- **Telephone Operation.** All FREEDOM commands can be activated using a telephone connection.

Radio Features and Benefits

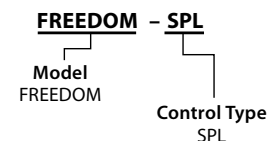
Weather-resistant and reliable. The TK 3180 handheld radio is built to survive the drops, hard-knocks and weather environments of its users. The TK 3180 meets or exceeds the demanding MIL-STD "driven rain" standard, which guarantees water-resistant performance even in wet weather.

- **LCD Display.** The backlit, high-resolution dot matrix 12-character display furnishes the user with a simple easy-to-read interface.
- **High-Quality Audio Output.** Equipped with an extra-large 1.58-inch speaker that delivers a half-watt of audio power for robust clarity.
- **Extra-Long Battery Life.** 1100 mAh batteries deliver more than nine (9) hours of operating time on a single charge (5-5-90 duty).
- **Wide/Narrow Channel Bandwidth.** Each channel can be programmed for wide or narrow bandwidth operation.
- **Radio Warranty.** One-year warranty.
- **MIL-STD 810 C/D/E/F Environmental Tests.** Meets or exceeds the stringent IP/54/55 dust and water intrusion standards and a full range of tough MIL-STD 810 C, D, E and F environmental standards in categories such as vibration, shock, dust, humidity, rain, temperature, solar radiation and atmospheric pressure.



● The FREEDOM System™

HOW TO SPECIFY



SPECIFICATIONS

Frequency: 450 – 470 MHz
(Narrowband)

Note: Site survey and license required

Power:
100 V/110 V: 60 Hz
230 V: 50/60 Hz

Pump Manager 2

Rain Bird® Pump Manager 2 is engineered for the golf course professional looking to simplify pump control, monitoring and data reporting. This powerful software application gives you full control of your pump station from your computer or central control.

FEATURES AND BENEFITS

- Pump Manager 2 provides a direct link to the pump station touchscreen so you can view and modify pump operations from your computer or tablet as though you were standing right in front of it.
- Since all pump operation data is contained on your computer, Pump Manager 2 and its built-in reporting capabilities can keep you apprised of operations, flow, water use and other key information.
- Pump Manager 2 includes common reports for future review or regulatory reporting.
- For customized reporting, data can be exported in a file compatible with common spreadsheet applications such as Microsoft® Excel®.
- Pump Manager 2 is standard with ten different language options.
- Pump Manager 2 can be used with any computer or fully integrated with Rain Bird's many central control systems.
- Best of all, Pump Manager 2 is fully integrated with Rain Bird's exclusive central control feature, Smart Pump™.



Pump Manager 2 monitor



Pump Manager 2 customized reports



Pump Manager 2's touchscreen interface

Smart Pump™

FEATURES AND BENEFITS

Rain Bird's Smart Pump™ is a powerful central control software tool that improves pump station performance more than any comparable product on the market. It integrates your irrigation system from Reservoir to Rotor, constantly comparing actual flow to expected flow. By making smart, real-time decisions based on this information, it optimizes your system — saving water, conserving electricity and reducing wear and tear on your valuable pumping system.

ACTUAL FLOW MEASUREMENT

Unlike other irrigation central control software, Smart Pump bases its decisions on actual flow, not estimated flow. By using accurate information — in real time — Smart Pump automatically balances supply with system demand. That means greater efficiency and an end to wasted water and electricity.

24-HOUR PUMP SUPERVISION

With Smart Pump, you can relax knowing your system will instantly respond to actual field conditions with the right decisions. For instance, if a pipe breaks, Smart Pump will stop water flow to the pipe to prevent turf damage. Or if the pump station fails, Smart Pump will make immediate water demand adjustments to keep the system from shutting down permanently. It's like having your own irrigation supervisor at every sprinkler, 24/7.

INTEGRATION MEETS INTELLIGENCE

Smart Pump seamlessly integrates your entire irrigation system. It automatically starts waiting sprinklers or pauses active sprinklers to reduce flow or increase demand, keeping your irrigation system running at peak efficiency at all times.



● Smart Pump™

HOW TO SPECIFY

SMARTPUMPM

Model
Smart Pump

Weather Stations

Rain Bird offers two Weather Station options to help meet your course's unique irrigation management needs. Both WS-PRO2 and the WS-PRO LT provide evapotranspiration (ET) management and reporting capabilities; while only the WS-PRO2 offers optional intelligent alarm and irrigation control responses through Rain Bird's powerful Smart Weather™ software.

FEATURES AND BENEFITS

Superior ET Model. Rain Bird's Central Control Systems use weather sensor input to determine ET rates based upon a field-proven proprietary equation for ET.

Automatic ET Download/Selective Usage. Automatically download weather data daily and calculate ET to determine irrigation times for the entire system or by specific areas, holes or stations.

ET Override. Allows you to easily set certain programs to ignore ET values when determining run times.

Rain Bucket. Allows rainfall from one day to be carried over to the following day(s) for more accurate ET calculations.

Multiple Station Capacity. Connect up to five (5) weather stations to one central control system for more precise ET values based upon different weather conditions and micro climates around the golf course.

Max Rainfall. User-defined maximum rainfall can be set to limit the amount of acceptable rainfall for specific soil types or other areas that are subject to high run-off.

Weather Data Reports. Generate reports to show current or past weather conditions by the hour, day, week, month or year.

Unlimited Data Storage. Store unlimited weather data at the central control.

Multiple Languages. Choose from 10 different languages (English, French, German, Italian, Japanese, Korean, Portuguese, Spanish, Swedish or Chinese).

English or Metric Measurement Units. Easily select between English or Metric units of measure.

The WS-PRO2 Weather Station along with Rain Bird's Smart Weather Software supports alarms when thresholds are exceeded in:

- Rain
- High or Low Ambient Temperatures
- High Winds
- Rainfall Intensity

When any of these alarms exceed user-defined thresholds in a programmed time period, the system will initiate an alarm condition. The alarms will automatically reset when temperature, rain or wind conditions are again within acceptable ranges for irrigation.

Automatic Shut Off/Turn On. Rain Bird Central Control Systems automatically shut OFF irrigation operation for the entire system or in specific areas of the course (tee box, fairway, green, etc.) when alarm conditions are detected at the weather station. They also automatically turn ON irrigation when weather conditions return to the acceptable range for irrigation.

Automatic Pause/Resume. Rain Bird Central Control Systems automatically suspend irrigation to the entire system or specific areas (tee box, fairway, greens, etc.) when alarm conditions are detected. They also automatically resume irrigation when weather conditions return to the acceptable range for irrigation.

Automatic Notification. The WS-PRO2 Weather Station, using Rain Bird® Messenger™, can automatically notify you wherever you are, at the central control or via text messaging or e-mail when alarm conditions exist.



The WS-PRO2 sensor array records vital weather information and sends it to your computer.

● WS-PRO2 Weather Station

HOW TO SPECIFY

WS - XXXX-XX - XX - X

Connection
SH = Short Haul
PH = Phone Modem†
WL = Wireless*

Model
PRO2 = Professional Series
PRO LT = Professional Light Series

Power
Blank = User Supplied
S = Solar Powered

*Only available on WS-PRO LT
† Only available on WS-PRO2



● WS-PRO LT

Weather Stations

	WS-PRO LT	WS-PRO2
Specifications		
Compatible Modules	<ul style="list-style-type: none"> Automatic ET Multiple Weather Station 	<ul style="list-style-type: none"> Automatic ET Multiple Weather Station Smart Weather™ Alarms Smart Messenger Module
Communication Options	<ul style="list-style-type: none"> Wireless (900 MHz SS Radio or 2.4 GHz Radio) Short Haul 	<ul style="list-style-type: none"> Telephone Short Haul
Transmission Range	<ul style="list-style-type: none"> Wireless 900 MHz <ul style="list-style-type: none"> ½ mile (805 m) Wireless 2.4 GHz <ul style="list-style-type: none"> ¼ mile (402 m) Short Haul – 20,000 ft (6.096 m) 	<ul style="list-style-type: none"> Telephone – no limit Short Haul – 20,000 ft (6.096 m)
Power Supply Required	• 16 to 22 VDC	• 9.5 to 16 VDC
Optional Power Supplies	• Solar Panel	• Solar Panel
Temperature Range	• -40° to 122° F (-40° to 50° C)	• -13° to 122° F (-25° to 50° C)
Air Temperature Sensor Operating Range	• -40° to 122° F (-40° to 50° C)	• -13° to 122° F (-25° to 50° C)
Accuracy	• ± 0.9° F (±0.5° C)	• ±2.7° F (±1.5° C)
Relative Humidity Sensor Operating Range	• 0 – 100%	• 0 – 100%
Accuracy	• ±5% – 90% to 100% RH	• ±6% – 90% to 100% RH
	• ±3% – 10% to 95% RH	• ±3% – 0% to 90% RH
Rain Gauge Sensor Resolution	• 0.04" (1 mm)	• 0.01" (0.25 mm)
Solar Radiation Sensor Accuracy	• ±2.5%	• ±3%
Wind Direction Sensor Range	• 360° mechanical, 352° electrical	• 360° mechanical, 356° electrical
Accuracy	—	• ±4°
Wind Speed Sensor Starting Threshold	• 0.78 ms ⁻¹ (1.75 mph)	• 0.4 ms ⁻¹ (0.9 mph)

	Automatic ET Module	Alarms Module
Smart Weather Features		
Compatible Weather Stations	WS-PRO LT, WS-PRO2	WS-PRO2
Generate Alarms <i>(rain, ambient temperature, wind, rain intensity and soil temperature)</i>	–	X
Reset Alarms	–	X
Automatic Shut Off/Turn On	–	X
Automatic Pause/Resume	–	X
Automatic Notification*	–	X
Superior ET Model	X	X
Automatic ET Download	X	X
ET Override	X	X
Cost Savings	X	X
Rain Bucket	X	X
Multiple Station Capacity**	X	X
Max Rain Fall	X	X
Reliable Sensor Input	X	X
Weather Data Reports	X	X
Unlimited Data Storage	X	X
Multiple Languages	X	X
English or Metric Units of Measure	X	X
Cirrus™ Central Control	X	X
Nimbus™ II Central Control	Optional	Optional
Stratus™ II Central Control	Optional	Optional
Stratus LT™	Optional	

* Requires Smart Messenger Module.

** Requires Multiple Weather Station Module.

Rain Watch™

Patented Rain Bird® Rain Watch™ technology maximizes water efficiency, while minimizing system wear and tear, through intelligent, real-time decision-making based accurate rainfall measurement.

FEATURES AND BENEFITS

- The industry's first active rainfall monitoring and response system.
- The only system designed to automatically react to rainfall and adjust sprinkler application rates to take full advantage of natural rain, thereby eliminating over-watering.
- Saves water and electricity, while keeping the course drier and more playable, by pausing, adjusting or canceling irrigation in the event of rainfall.
- Results in reduced wear and tear on irrigation system components.
- An integral part of Rain Bird® Central Control Software versions 4.0 and higher.

HOW RAIN WATCH MANAGES RAINFALL

- Stationed throughout the course, up to four (4) high-resolution Rain Watch rain cans collect environmental data.
- A rotor can be set to react to any of the rain cans.
- The central control system continuously polls each rain can.

Rainfall data received by the system is used to make intelligent decisions based on user-defined responses:

System Response: For course-wide reactions

Program Response: For program-specific responses

No-Action Response: For monitoring only

Intelligent responses include:



- Pause
- Resume
- Adjust runtimes and resume
- Cancel



● Rain Can

AN EXAMPLE OF RAIN WATCH IN ACTION

- Your daily irrigation schedule calls for 0.20 inches (0.51 cm) of precipitation.
- A storm begins and once accumulated rainfall reaches your desired 0.04-inch (0.10 cm) threshold, Rain Watch suspends irrigation.
- The storm passes after putting down 0.11 inches (0.28 cm) of rain.
- Rain Bird software automatically adjusts remaining runtimes for active stations, as well as those stations yet to run.
- Natural precipitation is seamlessly integrated into scheduled irrigation, resulting in a water savings of 0.11 inches (0.28 cm).

