

TORO

Count on it.

SENTINEL[®]

Two-Wire Control Systems

Engineered to the highest quality and reliability, yet designed to save significant amounts of money on installation and wire prices, the Sentinel Two-Wire Control System is ideal for controlling single or multiple irrigation sites with diverse landscapes and varied watering requirements.

CENTRAL CONTROL



SIMPLICITY

Installing and setting up irrigation control over an entire system from a laptop or central computer has never been simpler. Access to screens controlling automatic and manual watering, rain shutdown, flow optimization, alarms and reports is accomplished with a simple click.

FLEXIBILITY

The Sentinel Two-Wire Control system extends the already powerful satellite offering which provides the utmost in flexibility for designers, contractors, and end users. Sentinel Two-Wire controllers are manufactured to operate over several different communication protocols. Each Two-Wire controller ships with Sentinel WMS Software and a serial cable for entering and modifying data within the controller. Save the database to a local PC so decoder information never gets lost.

PERFORMANCE

Sentinel Two-Wire Controllers are shipped from the factory flow sensor and handheld remote ready. In addition, the system is compatible with a variety of weather-sensing devices such as Weather Stations and Rain Sensors which allow the user to control watering more precisely.

Sentinel® Central Control

Sentinel Central Control from Toro® is a powerful system that literally “stands guard” over large irrigation sites. With the ability to control up to 999 field satellites (two-wire or standard outputs) from one location, users have a water management tool that provides reliability, accuracy and water savings. Sentinel’s innovative Distributed Intelligence means all irrigation program data is stored at both the central computer and in field satellites. Programming changes are made easy as true two-way communication allows irrigation programs to be changed in the field and uploaded back to the computer. As a “smart” irrigation system, Sentinel comes standard with flow monitoring and the ability to connect to weather stations for auto-adjust of station run times by ET. When it comes to safeguarding landscapes and streamlining water management practices, Toro’s Sentinel System has raised the bar.



Model	Sentinel Central Control
Maximum Number Of Satellites	999 (total)
Maximum Stations Per Satellite	96
Number Of Programs	16 per Satellite
Ability To Make Program Changes In Field	X
Programming By Time	X
Automatic ET-Based Runtime Adjustment	X
Programmable Valve Sequence	X
Flow Optimization	X
Alarms & Reports	X
Station Operation Recording	X
Water Use Recording	X
Historical Water Use Comparison	Daily, Weekly, Yearly
Interactive Map	X
Software Only Option	X
Software + Computer Option	X
Windows® Compatible	X
Toro NSN® Support Included When System Is Centrally Controlled	Two years

Communication Options
Narrowband Radio (450-470 MHz)
Ethernet/Internet
Cellular-enabled Data Modems
Cellular Telephone
Landline Telephone
Spread Spectrum Radio (900 MHz)
Fiber Optics

Model	Small Metal Wall Mount	Stainless Steel Wall Mount	Stainless Steel Pedestal	Plastic Pedestal
Number Of Stations	96	96	96	96
ET-Adjust	X	X	X	X
Flow Sensing	X	X	X	X
Remote (SHHR) Ready	X	X	X	X
RainSensor Connection	X	X	X	X
Number Of Programs	16	16	16	16
Simultaneous Program Operation	Up to 16	Up to 16	Up to 16	Up to 16
Number Of Start Times	8 per Program	8 per Program	8 per Program	8 per Program
Max Station Runtime	4 Hours 15 Minutes	4 Hours 15 Minutes	4 Hours 15 Minutes	4 Hours 15 Minutes
Days Of The Week Programming	X	X	X	X
Odd/Even Programming	X	X	X	X
Interval Programming	X	X	X	X
Flow Monitoring	X	X	X	X
Water Use Logging	X	X	X	X
Warranty	Five years	Five years	Five years	Five years

* Water Management Feature

Features & Benefits

• Simple To Use

- Microsoft® Windows-based software – daily operations and scheduling are made quick and easy.

• Features For Water Management

- ET-based watering, flow sensing and optimization, water usage report with historical comparison.

• Multiple Communication Options

- Communication options like radio, telephone, cellular, and Ethernet can be mixed and matched to meet system requirements.

• Distributed Programming

- Stores irrigation programs in the computer while allowing irrigation control at the satellite level, ensuring the loss of a component does not result in the loss of irrigation across the system.

• Toro NSN® Support

- All centrally controlled systems come with a minimum of two years of NSN support – unlimited 24-hour toll-free support with 24/7/365 emergency paging. Standalone two-wire controllers do not receive NSN support. Support is provided by Toro at 877-345-8676.

• True Two-Way Communication

- Allows for program changes in the field to be uploaded to the central computer and for hand held to satellite communication in stand-alone mode. All communications are visually or audibly confirmed.

Flow Sensing

- Reads, displays and reacts to under and over flow situations and tracks water usage. No additional circuit boards are required.

• Weather Based Irrigation

- Sentinel waters according to ET values by using one or a number of onsite weather stations.

• Manual Station Outputs

- Flip the toggle switch to manually operate stations.

Sentinel® Two-Wire Controllers

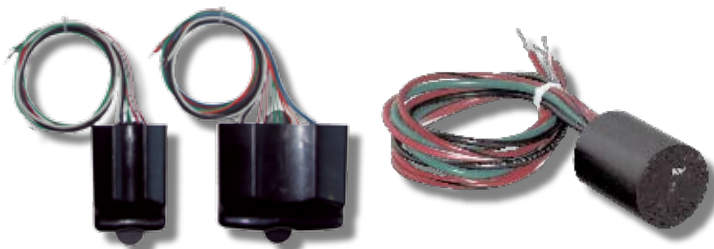
Sentinel Two-Wire Controllers



Specifying Information—Sentinel Two-Wire Controllers

ESBTW-XXX-XXX-XXX			
Configuration	Communication Method	Cabinet Type	Antenna Selection
ESBTW	XXX	XXX	XXX
ESBTW—EICON Special Build Two-Wire (96 Stations)	DSC—Direct Serial Connection- Not Available As Central/Satellite Connection U2—UHF Two-Way Radio EN—Ethernet WEN—Wireless Ethernet PM—Phone Modem CDM—Cellular Modem SS—Spread Spectrum FIB—Fiber Optic	WS3—Small Metal Cabinet WS2—Stainless Steel Wall Mount PS1—Stainless Steel Pedestal PP2—Plastic Pedestal	ATX—Antenna For WS3 VRA—Antenna For WS2, PS1, PP1

Decoders and Surge Protectors



Specifying Information—Flow Sensors

Model	Description
CDEC-ISP-1	Single Station Decoder
CDEC-ISP-2	Two Station Decoder

Specifying Information—Flow Sensors

Model	Description
DEC-SG-LINE	Decoder, Line Surge Protector

Accessories



Specifying Information—TWRFS

Model	Description
TWRFS	Toro Wireless Rain/Freeze Sensor

Specifying Information—SHHR

Model	Description
SHHR	Sentinel Hand Held Remote

Specifying Information—Flow Sensors



Model	Description
TFS-050	1/2", Sch-40, PVC-Tee Flow Sensor
TFS-075	3/4", Sch-40, PVC-Tee Flow Sensor
TFS-100	1", Sch-40, PVC-Tee Flow Sensor
TFS-150	1.5", Sch-80, PVC-Tee Flow Sensor
TFS-200	2", Sch-80, PVC-Tee Flow Sensor
TFS-300	3", Sch-80, PVC-Tee Flow Sensor
TFS-400	4", Sch-80, PVC-Tee Flow Sensor

TPV Valves with Pre-Installed Latching Solenoid



Specifying Information—TPV Valve w/ Latching Solenoid

Model	Description
TPVF100DC	1" FxF, NPT, w/FC and DC Latching Solenoid
TPVF100SDC	1" SxS, w/FC and Glue Stop™ and DC Latching Solenoid
TPVF100MBDC	1" Male x Barb, w/FC and DC Latching Solenoid
TPVF100MDC	1" Male x Male, w/FC and DC Latching Solenoid

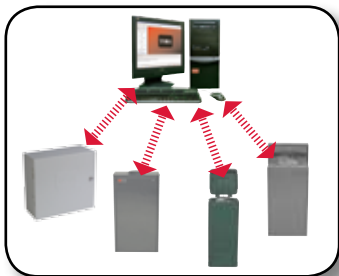
P-220 Valves with Pre-Installed Latching Solenoid



Specifying Information—P220 Valve w/ Latching Solenoid

Model	Description
P220-26-94	1", Electric, In-line, Angle and DCLS-P
P220-26-96	1 1/2", Electric, In-line, Angle and DCLS-P
P220-26-98	2", Electric, In-line, Angle and DCLS-P
P220-26-90	3", Electric, In-line, Angle and DCLS-P
DCLS-P	Potted Latching Solenoid

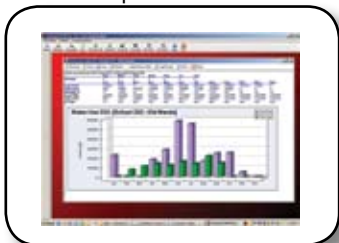
Sentinel® Central Software and Computer



DISTRIBUTED INTELLIGENCE

Each Sentinel® controller is a fully intelligent unit with program data stored at both the field satellite and within the central computer. Loss of communication does not result in loss of irrigation. True two-way communication allows programming changes to occur at the on-site field controller and be uploaded to the

central computer. Protection from unauthorized changes is ensured as the controller program can be easily compared to the program saved in the central computer.



WATER SAVINGS – ET-BASED (multiple weather station options)

Effective ET-based system management can lead to water savings of 25% to 30% per year. As an additional source of savings, pipeline breaks, malfunctioning valves, and missing heads are automatically detected and shut down, preventing excessive water loss.

Specifying Information— Sentinel Central

SGIS-X-X	
Description	Optional
SGIS	-X-X
SGIS—Sentinel Central Control Irrigation System	1-T—Software Only w/2 Years of NSN Telephone Support for Software 0-1—Software, Peripheral Hardware w/2 Years of NSN Telephone Support 1-0—Software, Computer Equipment, Peripheral Hardware w/2 Years of NSN Telephone Support (with computer warranty)

Specifying Information— NSN/Sentinel Support Extensions

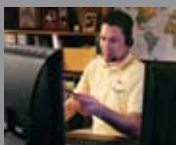
SSE-X-X	
Description	Optional
SSE	-X-X
SSE—Toro NSN Support for Sentinel Subscription Extensions*	T-1— 1-year Extension for SGIS-0-1 or SGIS-1-T T-3— 3-year Extension for SGIS-0-1 or SGIS-1-T C-1— 1-year Extension for SGIS-1-0 (w/computer warranty) C-3— 3-year Extension for SGIS-1-0 (w/computer warranty)

*1- and 3-year NSN extensions can be purchased up-front in conjunction with SGIS packages to provide the end-user with an additional one or three years of NSN support. For example, a customer can order the SGIS-1-0 and the SSE-C-3 which would equal five years of NSN support. These extensions are for original purchases only; existing plan renewals are still purchased through Toro NSN.



Specifications and Features

- Control up to 999 field satellites
- Group controllers into “systems” for system-wide adjustments:
 - Rain Days
 - Percent Adjust
 - ET-Adjustment from shared weather source
- Field changes to controller programs can be uploaded to computer
- Support for the System Administration
 - Set system, program and satellite descriptions
 - Map valve positions on site maps
 - Group related Satellites into Systems sharing common functions
- Alarm reporting of any system component failure, including communications, over/under-flow conditions, electrical problems or power failure
- Extensive reporting features:
 - Run time reports
 - Water usage
 - Alarms
 - Logging of system changes
- Water use, rain and ET accumulation
- Flow optimizing to maintain optimum flow and shorten water window
- Ability to redefine valve sequence without physically changing wire terminations in field satellite
- Information overview by group and satellite
- System status indications for individual field satellite
- Map-based feedback on system status
- Standard telephone modem or internet connection allows for remote access to central software via pcAnywhere™ or other remote access software



Toro NSN® Support – There when you need them. Every Sentinel Two-Wire Controller which is centrally controlled (non-standalone) comes standard with two years of Toro NSN Support. Whether you have an operational issue that requires quick remedy, you need advice on water conservation and time-saving techniques, or you need education and training for operators and field technicians, Toro NSN is just a phone call away, 24 hours a day, every day.

- **24-hour, seven-day, 365 support.**
 - Worldwide, Toro NSN is always available to answer your questions, troubleshoot your system and solve your problems. And if needed, our 24-hour central component replacement service ensures minimal disruption to the operation of your irrigation system (U.S.).
- **Industry-best training — classroom and computer-based.**
 - NSN offers curriculum tailored to meet the range of user experience and proficiency.
- **Total operational confidence**
 - If your central hardware goes down, our TORO central control component replacements arrive at your facility Toro-tested, ready to keep you up and running.
- **The confidence of working with the best in the business.**
 - Toro NSN is a Microsoft® Certified Partner. Our support technicians are licensed irrigators, and our hardware technicians are A+ certified. NSN has a diagnostic lab on-site for Sentinel to duplicate field issues and investigate causes and solutions.



The Toro Company • Irrigation Division • www.toro.com • 5825 Jasmine St. Riverside, CA 92504 • 877.345.8676
P/N 08-1013-IRC Rev. 2 Specifications subject to change without notice. For more information, contact your local Toro distributor.
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