

Greenkeeper Special



Golf course irrigation

In the era of climate change greenkeeping faces new challenges in terms of course maintenance and watering systems, with extremely arid phases following immediately after periods of very heavy rainfall and vice versa. Since as far back as 1926, Perrot has been the only European brand to devote itself exclusively to innovative irrigation technology.

This 'Greenkeeper Special' brochure gives you an overview of our range of irrigation systems for golf courses. Rather than the usual uniform products that are frequently none too suitable for European courses and lead to high on-going costs, this brochure shows you a number of targeted solutions tailored ideally to your location and also to your budget.

We start with pop-up sprinklers. In terms of drive system we give you a choice between the extremely robust and grey water compatible impact lever sprinklers and the ultramodern range of gear sprinklers that have been developed in conjunction with greenkeepers.

The pop-up sprinklers are controlled by easy-to-use decoder systems so that you really can leave your sprinkler system to work on its own.

For areas without any permanently installed sprinklers, we exclusively offer above-ground systems that provide great flexibility of use.

We would now like to give you a brief, basic overview of one of the most important tools of golf course maintenance and thus to arm you in future better against the whims of the weather.



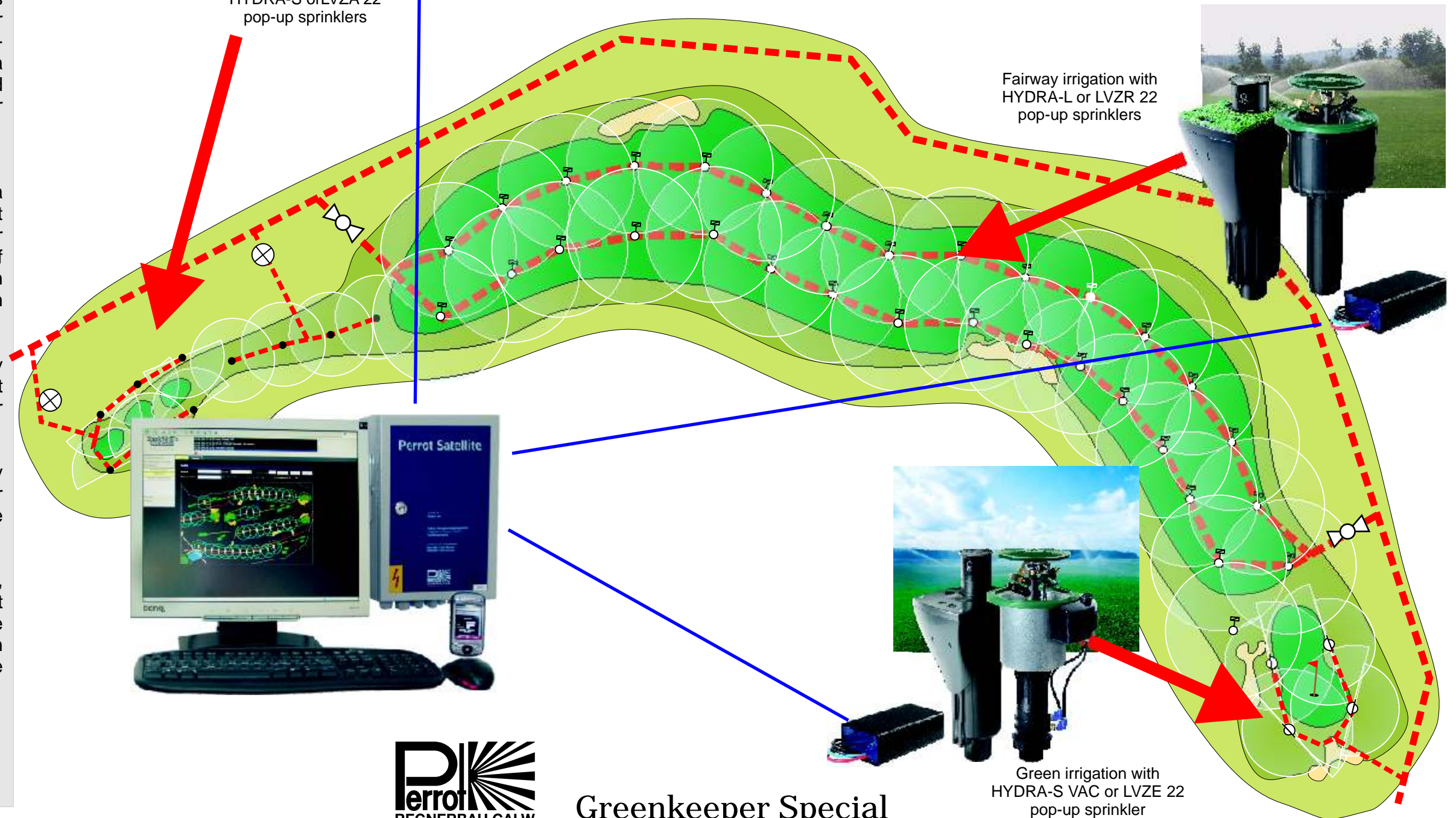
Tee irrigation with HYDRA-S or LVZA 22 pop-up sprinklers

Powerfull, reliable and offering unsurpassed cost-efficiency: PERROT pop-up sprinkler

Impact or turbine drive? Only at Perrot you can get both from a single source! For every element of the game, i.e. tees, fairways and greens, we offer you the choice of special gear sprinklers from the new Hydra range or LVZ-class impact sprinklers.

Both types of drive system have special characteristics that respectively make them the number 1 choice for your course. Grey water compatibility, fast rotation, extreme ease of use and durability are typical qualities of our impact sprinklers, while key features of Perrot gear sprinklers include easy assembly, hermetically sealed casing, minimal frictional loss and variable rotation speed.

A 5-year guarantee and the fact that in each case they are the best product in their class testify to the quality of our pop-up sprinklers, as does our precision German engineering. Which type of sprinkler best suits you and your course can be seen from the following pages or by a face-to-face meeting on site.



Fairway irrigation with HYDRA-L or LVZR 22 pop-up sprinklers

Green irrigation with HYDRA-S VAC or LVZE 22 pop-up sprinkler



Greenkeeper Special

Gear drive pop-up sprinkler



“HYDRA“ - The state-of-the-art pop-up sprinkler!

Long lasting and powerful: extremely robust turbine drive system with central flow system and ball-bearing mounted sprinkler head for outstanding casting range and minimal wear. The lowest pressure loss for products of its class reduces energy costs significantly. Inlet made of brass.

Easy to use and maintain: left and right sprinkling sectors are adjustable. Sector adjustment possible even when sprinkler is not in operation. Integrated, easily accessible protective housing for solenoid and pressure regulator. All of the components, including dirt filter and valve, can be taken out from above with no need for any digging.

Dynamic and flexible: rotation time just 90 seconds. If necessary, this can be changed, e.g. after reseeding.

Available models: All models available both as full and part circle sprinklers as well as with stop or solenoid valve.

HYDRA S

Application: Tees and greens
Recommended pressure range:
3.5 - 7 bar
Nozzle sizes: 4 - 9mm
Flow rate: 2.5 - 11m³/h
Casting range: 14 - 25m
Inlet: 1" female
Special features: Version available with reverse nozzle for watering green approaches.
Casting range: 8m

HYDRA M

Application: Greens and fairways
Recommended pressure range:
4 - 7 bar
Nozzle sizes: 5.2 - 8 mm
Flow rate: 3.5 - 8.7 m³/h
Casting range: 18 - 27m
Inlet: 1" female
Special features:
The section setting is displayed on a rotary scale on the sprinkler head. A slip clutch avoids gear damage in the event of vandalism and has the sprinkler return automatically to the selected sector.

HYDRA L

Application: Fairways
Recommended pressure range:
4 - 7 bar
Nozzle sizes: 5.2 - 14mm
Flow rate: 3.5 - 24m³/h
Casting range: 18 - 32m
Inlet: 1 1/2" female
Special features:
As Hydra M, plus: The electronic housing provides space to fit a decoder straight into it. The sprinkler cover is topped with artificial grass for harmonious integration into the course and provides an additional spot for a distance marker.

Impact Pop-up Sprinkler



Proven technology with the lowest running costs

Economic and enduring: the oscillating arm provides the longest life of all drive systems. Ongoing costs are lower than those of any competing system. All of the parts are replaceable and the inserts can be inexpensively overhauled. Inlet made of brass. **Tough and ecological:** insusceptible to frost or sand. Ideal for grey water irrigation. The drive of the sprinklers begins only once water is coming out of the nozzle. Consequently pressure loss is minimal and less pumping is required. **Extremely easy to use and maintain:** left and right sprinkling sectors are adjustable without tools. Integrated protective housing for solenoid and pressure regulator. All of the components, including dirt filter and solenoid, can be taken out from above with no need for any digging. **Powerful:** LVZ-class sprinklers have fast rotation, a long casting range and are barely troubled by wind.

Available models: All models available both as full and part circle sprinklers. LVZE and LVZR also available with solenoid valve.

LVZA 22

Application: Tees
Recommended pressure range:
2.5 - 6 bar
Nozzle sizes: 4 and 4.5 mm
Flow rate: 0.9 - 1.8m³/h
Casting range: 12 - 14,5 m
Inlet: 1" female

LVZE 22

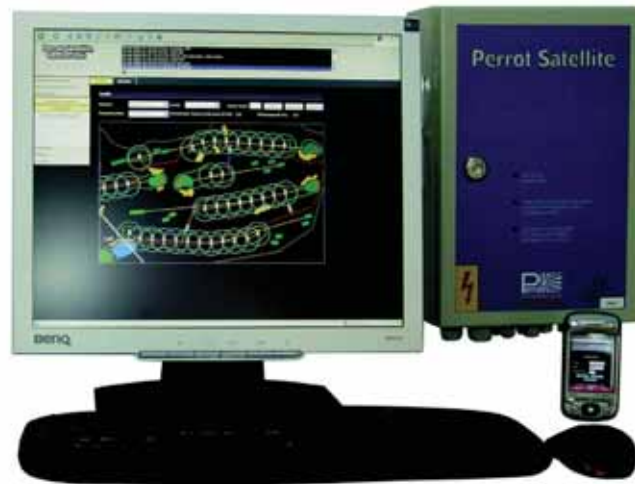
Application: Greens and fairways
Recommended pressure range:
3 - 7 bar
Nozzle sizes: 4,2 - 8 mm
Flow rate: 2 - 8,9 m³/h
Casting range: 14 - 21,6 m
Inlet: 1" female
Special feature: Version available with reverse nozzle for watering green approaches. Casting range: 8m

LVZR 22

Application: Fairways
Recommended pressure range:
3 - 7 bar
Nozzle sizes: 7 - 17,5 mm
Flow rate: 4 - 27 m³/h
Casting range: 19 - 36,5 m
Inlet: 1 1/2" female
Special features: The electronic housing provides space to fit a decoder. The sprinkler can be supplied with artificial grass for harmonious integration into the course. Distance marker are possible.

PERROT

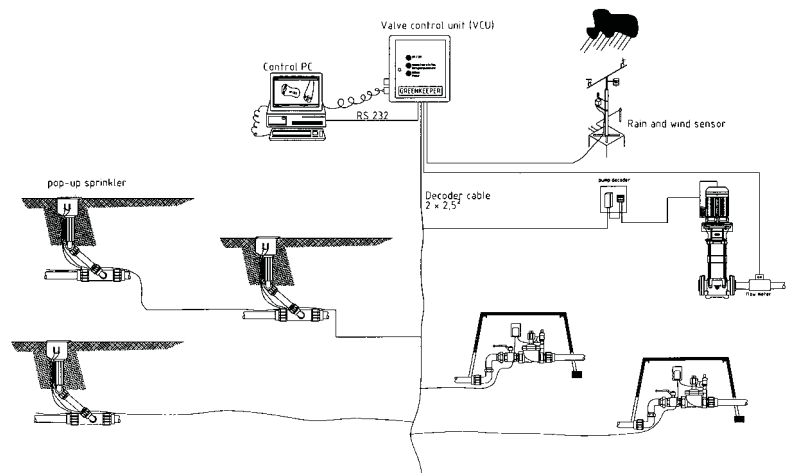
Satellite Two wire decoder control system



1. Fields of application

Control system for irrigation systems

The control system is particularly suitable for the fully automatic irrigation of e.g. golf courses and large public parks, open air swimming pools, amusement parks but also for irrigation systems in agriculture. The control system “Perrot Satellite” works as a bus system, on which the decoders are controlled by a two wire decoder cable. The decoders open the connected solenoid valves at the time set in the computer program.



Advantages of the decoder control system

- ↪ less work, as only a two wire cable for up to 240 stations is necessary
- The two wire cable (decoder cable) is responsible for the electric power supply of the valves as well as for the communication with the decoders
- ↪ System is expandable without any additional earth work, as further stations can be connected at any place of the decoder cable
- ↪ Simple trouble shooting as cabling is easy to overlook
- ↪ Due to the little cable quantity the danger of a lightning strike is very small

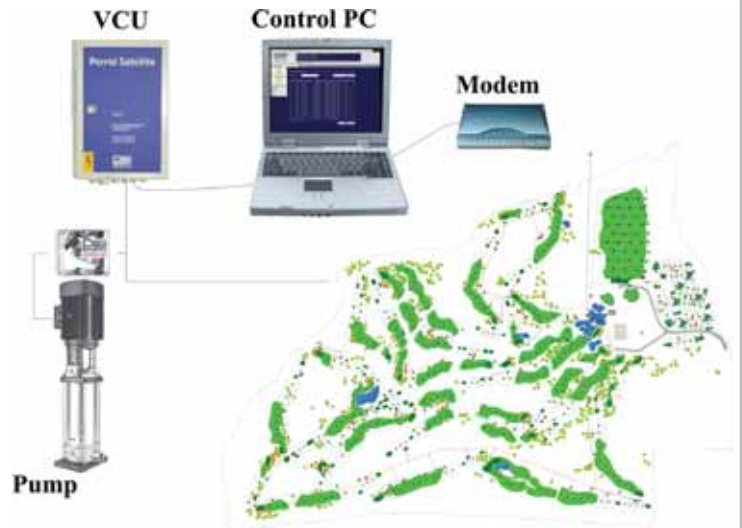
Particular advantages of the “Perrot Satellite” System

- ↪ Irrigation system for several independently working irrigation schemes e.g. for two hydraulic systems as it is often needed at extensions of a 9 hole to a 18-hole course
- ↪ Irrigation control system for several decentralized installations
- The Web-based structure of the irrigation program allows the simple operation within a Browser (e.g. Internet Explorer) and consequently an independent access through the Internet is possible

2. Structure of Decoder Control System “Perrot Satellite”

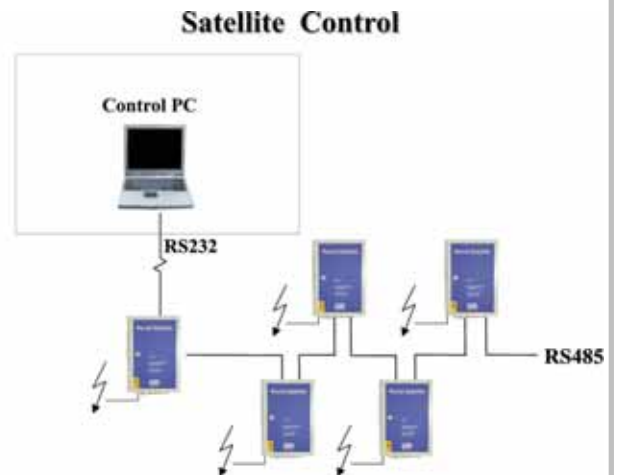
for max. 240 stations

- ↪ Same structure as the proved „Greenkeeper Win”
- ↪ The „Greenkeeper Win” System can be upgraded to a “Perrot Satellite”
- ↪ The PC is connected with RS232 interface to the VCU
- ↪ With one VCU up to 240 stations and 3 pump stations can be controlled
Furthermore signal inputs are processed by weather and plant sensors



for max. 1920 stations

- ↪ For installation with more than 240 stations, further VCU's (up to 8 pieces) can be connected serially. Communication is carried out by RS 485 interface



3. Ways of communication with „Perrot Satellite”

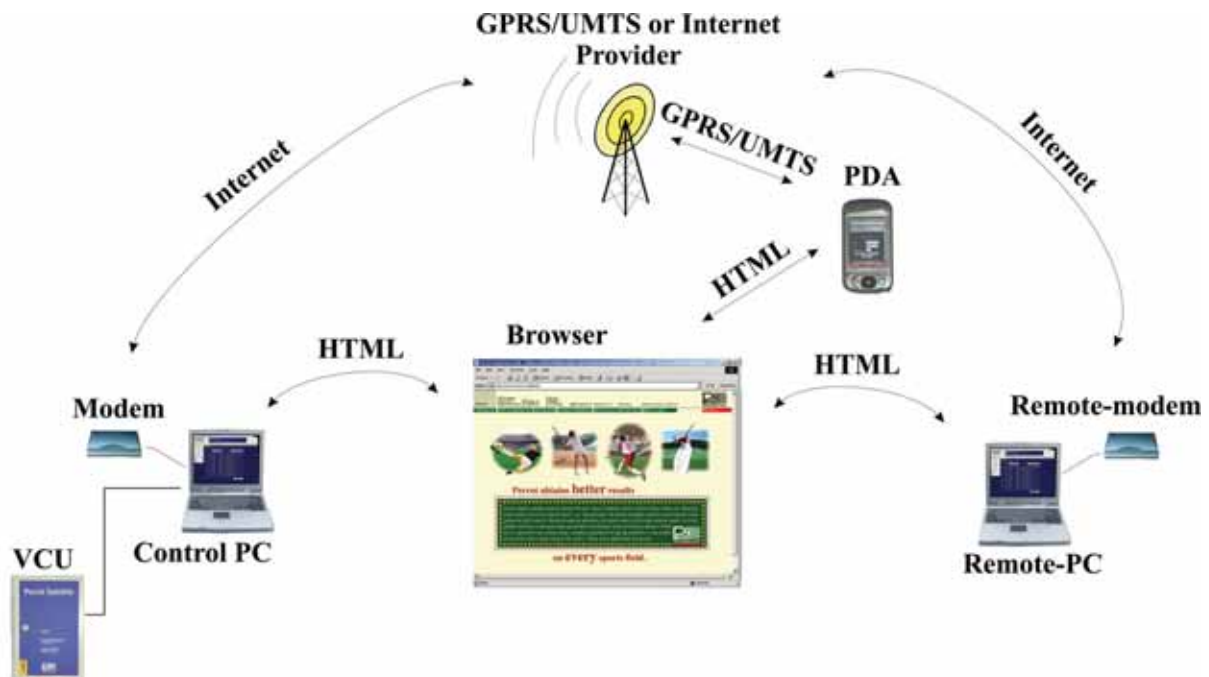
“Perrot Satellite” is the first irrigation program on WEB basis. Due to this program structure a simple operation within a browser (e.g. Internet Explorer) and thus any access from outside is possible (Remote Access). The irrigation program is installed on the control PC, which acts as a server.

The remote control (Remote Access) with a PC (desktop or laptop) can be carried out through:

- ↪ Internet with firm IP-address of the control PC or by the help of the service „dyndns.org”

Remote control (Remote Access) with a PDA can be carried out through:

- ↪ Internet (e.g. GPRS/UMTS)



Hydraulic optimization

- ↵ Minimization of the pipe friction losses by splitting into hydraulic groups and hydraulic sectors
- ↵ Flow manager for balancing the system demand at the max. capacity of the pump station
- ↵ Adjustable interval times for the valve circuit facilitate a low-wear function of the system
- ↵ User-defined limit value designation for hydraulic parameters to protect the system
- ↵ Phone alarm after breakdown of the system

“Perrot Satellite” supports service technicians

- ↵ Test program examines consumption of electricity for selected decoders
- ↵ Detailed reports give valuable information for error tracing
- ↵ Detailed problem report with dates

5. Hardware



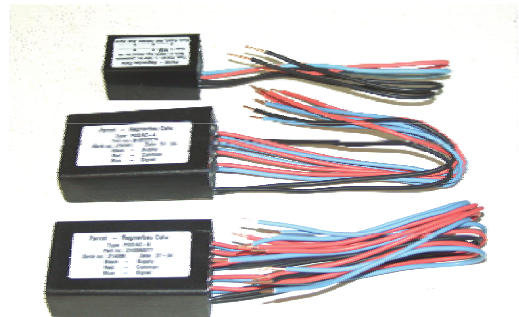
- ↵ AMD Athlon 64 or Intel Pentium 4, min. 1GHz
- ↵ Operating system Windows XP Professional SP2 with Net Framework and IIS
- ↵ Serial interface RS 232 (COM1) for connection of valve control unit
- ↵ VGA colour monitor, resolution 1024 x 768

Valve control unit (VCU)

- ↵ Housing in IP 55 design
- ↵ All Inputs/Outputs of the VCU are over voltage resistant up to 8 KV min.
- ↵ Following status information is shown by LED:
 - * POWER SUPPLY ON/OFF
 - * IRRIGATION ACTIVE/PASSIV/WAITING
 - * STATUS OF THE DECODER LINE

Decoder

- ↵ The address of the decoder is **arbitrarily programmable**
- ↵ Holding and pull-in current delivered by the decoder are to be defined for each decoder individually
- ↵ Multi-station decoder for the control of 4 or 6 stations
- ↵ **Over voltage resistance** up to 2KV
- ↵ Each station has a LED – display
- ↵ **Waterproof** encapsulation in IP 66



Wireless remote control by mobile phone



- ↵ Wireless remote control of “Perrot Satellite” with the communicator PDA (Personal Digital Assistant) e.g. MDA Vario II from T-Mobile
- ↵ PDA must support at least Microsoft Windows Mobile 2003
- ↵ Irrigation programs or single vales can be activated by the PDA



Programming unit

- ↵ Programming unit is connected to the VCU
- ↵ LED with function display for decoder

Solenoid valve



Valve Typ MVR

Robust solenoid valve made of brass for applications in irrigation systems, in particular on golf courses. Suitable for high pressures up to 12,5 bar. Set up for connection to PERROT computer control system with feedback "Greenkeeper-Feedback".

Technical Data

- Solenoid valve made of brass
- Available in three sizes - 1"; 1 ½"; 2"
- Power supply 24V AC / 4 watt
- Insensitive to dirt through self cleaning and backwash filter, with internal bleed
- Manual control
- Optionally with pressure compensated pressure regulation
- Available also with flow sensor for bi-directional computer control system "Greenkeeper-Feedback"
- Weight: 1": 2,2 kg; 1 ½": 2,5 kg; 2": 3,2 kg



Valve Typ MVR 3"

Robust solenoid valve made of cast iron for applications in irrigation systems, in particular on sports fields with artificial lawn. Suitable for high pressures up to 10 bar. For water with little contamination. Set up for connection to PERROT control system **WaterControl**.

Technical Data

- Solenoid valve made of cast iron, varnished
- Available in the size 3" female
- Power supply 24 VAC
- Separate filter for control water
- Manual On/Off and Auto
- Drainage valve on secondary side
- Any installation position is possible
- Operating pressure 10 bar
- Static pressure 16 bar
- Kv-value 80 m³/h
- Medium temperature up to 45 C

Valve boxes

Valve boxes protect the solenoid valves, ball valves and decoders installed underground, so that these control elements are accessible from above. Housing made of glass-fiber reinforced plastic, green cover, housing cover with screw plugs, two holes each for cables and pipe lines, extensions possible upon request.

Dimension see on the drawings

Typ VBB



Diameter 20,5 cm
Height 23 cm

Typ VBR



Diameter 33 cm
Height 26 cm

Typ VBS



Dim: 40 x 53 cm
Height 29,4 cm

Typ VBJ



Dim: 48 x 65 cm
Height 29,4 cm

Swing Joint

- with three elbows joints for a flexible height adjustment of pop-up sprinklers. A double sealing ring protects each elbow joint against dirt. Low friction loss also at high flow rates. All parts manufactured of compression-proof and chemically stable POM.



Swing Joint 3/4"
Length 305 mm
up to 12,5 bar pressure



Swing Joint 1"
Length 305 mm
up to 12,5 bar pressure



Swing Joint 1 1/2"
Length 305 mm
up to 12,5 bar pressure

RollcarT-V

**Mit hydraulischer
Abschaltung!**
**With hydraulic
shut-off device!**



Der PERROT-RollcarT-V

Der PERROT-RollcarT-V fährt und regnet selbständig. Für den Einsatz auf großen Grünflächen, Sportanlagen, in Baumschulen und Gärtnereien.

Nach dem Öffnen des Wasserhahnes zieht sich der RollcarT-V an dem vorher ausgelegten Stahlseil über die zu beregnende Fläche. Am Ende der Fläche stellt der RollcarT-V das Wasser automatisch ab und stoppt die Beregnung. Der wasserführende Schlauch mit einem Durchmesser von 1" und einer Länge von mindestens 60 Metern (bei Sportanlagen) wird hinterher gezogen. Der Schlauch gehört nicht zum Lieferumfang.

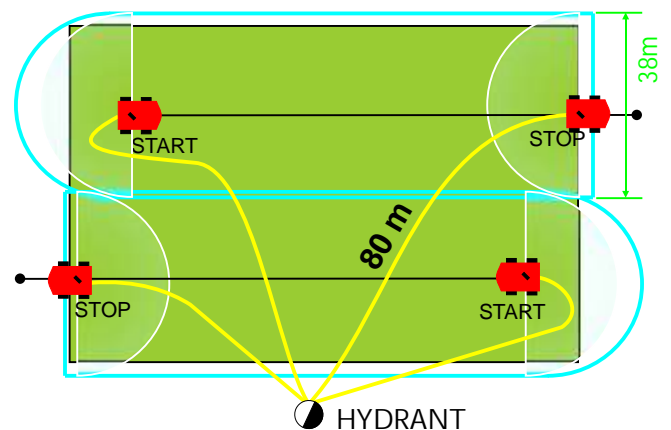


The PERROT-RollcarT-V

The PERROT-RollcarT-V travels and irrigates on its own. Used mainly for large sized green areas, sport fields, nurseries and gardens.

The RollcarT-V starts moving as soon as the water supply is turned on and is slowly drawn along the lawn, along the previously layed out steel cable. At the end of the designated area the RollcarT-V automatically stops waterflow and irrigation.

The water supply hose with a diametre of 1" and a length of minimum 60 m is drawn behind the cart (The hose is not included with the sprinkler cart RollcarT-V).



Anwendungsbeispiel – example of use

Produktvorteile

1. Vielfältige Anwendungsmöglichkeiten

Der eingesetzte Sektorenregner gestattet die Begrenzung von Beregnungsflächen. Beispielsweise kann eine Beregnung links oder rechts vom Regnerwagen ausgeschlossen werden.

2. Variable Wassermenge

Die stufenlose Geschwindigkeitsregulierung ermöglicht eine Anpassung der Beregnungsdichte an den tatsächlichen Bedarf.

3. Gleichmäßige Wasserverteilung

Die Verteilungsgenauigkeit des ZE-Regners und der Gleichlauf des **RollcarT-V** Regnerwagens garantieren eine optimale Wasserverteilung.

4. Wartungsfreie Betriebssicherheit

Das gekapselte Getriebe ist besonders reibungsarm und praktisch wartungsfrei.

5. Handlichkeit

Die kompakte, geschlossene Bauweise macht das Arbeiten mit dem **RollcarT-V** zum Kinderspiel.

6. Rasenschonend

Bei entsprechender Einstellung des Beregnungssektors fährt der **RollcarT-V** stets über den trockenen Rasen.

Product-advantages

1. Multiuse

The part circle sprinkler allows the operator to define the area to be irrigated. For example irrigation right or left of the sprinkler cart or any sector of a circle can be achieved.

2. Variable waterflow

Through the infinite speed regulation the waterflow can be adjusted to suit each application.

3. Uniform water distribution

The precise distribution of the ZE sprinkler and the constant speed of the **RollcarT-V** guarantees an optimal water distribution.

4. Maintenance free

The sealed gears have a very low friction factor and are therefore practically maintenance free.

5. Convenience

The compact self contained design makes work with the **RollcarT-V** mere child's play.

6. Lawn friendly

Using a part circle sprinkler the **RollcarT-V** always travels on dry lawn.

Technische Daten

- ▶ Arbeitstempo: 10 bis 20 m/Std.
- ▶ Wasserdruck: mind. 3,5 bar am Gerät
- ▶ Wasserverbrauch: 3,0 m³/Std.
- ▶ Beregnungsbreite: 28 bis 36 m
- ▶ Beregnungslänge: 120 m
- ▶ Material: Alu, Messing, Kunststoff
- ▶ Abmessung: 77 x 47 x 40 cm
- ▶ Gewicht: 33,0 kg

Technical Data

- ▶ Travelling speed: 10 to 20 m/h
- ▶ Operating pressure: min 3,5 bar at unit
- ▶ Water consumption: 3,0 m³/h
- ▶ Width of irrigation: 28 to 36 m
- ▶ Length of irrigation: 120 m
- ▶ Material: Alu, brass, ABS
- ▶ Overall measurements: 77 x 47 x 40 cm
- ▶ Total weight: 33,0 kg

HoseCar



Schlauchwagen

Um den Schlauch sauber zu lagern und sicher zu transportieren:

Der robuste Schlauchwagen aus Metall, ein PERROT-Qualitätsprodukt, kunststoffbeschichtet schwarz/rot.

Mit abnehmbarem Bügel (geringerer Platzbedarf bei Versand und Aufbewahrung).

Wasseranschluß mit Messingkupplung 1".

Haspelbreite 390 mm mit Wasserdurchlauf.

Anschluß an der Haspel Messingkupplung 1".

Maximales Fassungsvermögen 100 Meter 1"- Schlauch, lagenweise gerollt.

Zwei Kunststoffräder mit Luftbereifung.

Gewicht leer: ca. 24,0 kg

Gewicht mit 100 m Schlauch 1": ca. 69,0 kg

Gewicht mit Schlauch 1" gefüllt: ca. 117,0 kg

Abmessung: 75 x 75 x 80 cm

Einsatzgebiete: private Gärten, Parkanlagen, Gartenbaubetriebe und auf Sportanlagen.

Hose reel

For a proper storage and safe transport of the hose:

The robust hose reel, a PERROT quality product, made of steel, plastic coated in red and black colour.

Removable handle (smaller volume for storage and transport).

Connection with 1" brass coupling.

Width of the reel 390 mm with water passage.

Connection at the reel with 1" brass coupling.

Max. capacity 100 m 1" hose, reeled in layers.

Two pneumatic plastic tyres.

Net weight: approx. 24,0 kg

Weight with 100 m 1" hose: approx. 69,0 kg

Weight with filled 1" hose: approx. 117,0 kg

Dimensions: 75x75x80 cm

Application: private gardens, parks, sports facilities and horticulture.

Regner auf Dreifuß und Schlitten Sprinkler on tripod and sledge

TV 2000



Viereckregner

100.000-fach bewährt. Düsenzahl einstellbar (9/15). Bereichswähler für Links-, Rechts-, Mitte- und Vollbe-
regnung. Pumpenbetrieb möglich.

- ▶ Wasserdruck: 1,5 - 5 bar
- ▶ Wasserverbrauch: 0,6 - 1,3 m³/h
- ▶ Berechnete Fläche: max. 18 x 14 m
- ▶ Material: Aluguß, Kunststoff
- ▶ Anschluß: Steckkupplung
- ▶ Ausführung: mit SchlittenTV 2000 mit Dreifuß TV 2000 F

Quadrangle sprinkler

A quality product from PERROT. The number of spraying jets can be adjusted (9/15). Range selector (left, right, center, full).

- ▶ operating pressure: 1,5 - 5 bar
- ▶ water consumption: 0,6 - 1,3 m³/h
- ▶ irrigated area: max. 18 x 14 m
- ▶ material: Alu cast, ABS
- ▶ connection: quick coupling
- ▶ execution: with sledge TV 2000 with tripod TV 2000 F

ZA 22 WF



Kreis- und Teilkreisregner

der Profiregner für den Privatgarten. Spritzwasserfreier Schwinghebel, Strahlstörschraube, Teilkreise stufenlos einstellbar.

- ▶ Wasserdruck: 2,5 - 5 bar
- ▶ Wasserverbrauch: 0,8 - 1,2 m³/h
- ▶ Wurfweite: 9 - 13 m
- ▶ Material: Messing, Kunststoff
- ▶ Anschluß: Steckkupplung
- ▶ Ausführungen: Dreifuß ZA 22 WF

Full and part circle sprinkler

The professional sprinkler for private gardens. Splash water free impact lever. With jetdeflector. Sectors can be infinitely adjusted.

- ▶ operating pressure: 2,5 - 5 bar
- ▶ water consumption: 0,8 - 1,2 m³/h
- ▶ casting range: 9 - 13 m
- ▶ material: brass, high quality plastic
- ▶ connection: quick coupling
- ▶ execution: with tripod ZA 22 WF

ZE 30 WF



Kreis- und Teilkreisregner

schmutzresistent, optimale Wasser-
verteilung. Strahlstörschraube, Teil-
kreise stufenlos einstellbar.

- ▶ Wasserdruck: 2,5 - 8,0 bar
- ▶ Wasserverbrauch: 1,5 - 2,5 m³/h
- ▶ Wurfweite: 12 - 18 m
- ▶ Material: Messing, Aluguß
- ▶ Anschluß: ¾ " Innengewinde
- ▶ Ausführung: m. Dreifuß ZE 30 WF

Full and part circle sprinkler

Dirt resistant, excellent water
distribution. With jetdeflector. Sectors
can be infinitely adjusted.

- ▶ operating pressure: 2,5 - 8,0 bar
- ▶ water consumption: 1,5 - 2,5 m³/h
- ▶ casting range: 12 - 18 m
- ▶ material: brass, alu cast
- ▶ connection: ¾ " female thread
- ▶ execution: with tripod ZE 30 WF

Extract of References

- Argentina** - Villa Mercedes Golf Club, San Luis
- Austria** - Linzer Golfclub, Luftenberg
- Cuba** - Golf Club La Habana
- Czech Republik** - BKK Trinec
- Finland** - Anola Golf, Pieksämäki
- France** - Golf de Metz Cherisey, Cherisey
- Germany** - Golf Club München Nord Eichenried
- Germany** - Ostsee Golf Club Wittenbeck, Wittenbeck
- Iceland** - Golfklubbur Reykjavikur, Reykjavik
- Iran** - Engelhab Golf, Teheran
- Ireland** - Strandhill Golf Club, County Sligo
- Italy** - Golfclub Kastelruth-Schlern, Seis-St. Vigel
- Kazakhstan** - Golf Alma Ata
- Netherland** - Heelsumse Veld Goldclub, Renkum
- Poland** - Royal Krakow Golf & Country Club, Ochmanow
- Russia** - Golf Club Dunes, St. Petersburg
- Slovenia** - Golf Club Kobilarna, Lipica
- South Afrika** - Golf Club Stilbay, Cape Town
- Spain** - Campo de Golf Almerimar, Almeria
- Sri Lanka** - Water's Edge Golf & Country Club, Colombo
- Sweden** - Nynäshamns Golf Klub, Stockholm
- Switzerland** - Golf Club Interlaken-Unterseen
- Uruguay** - Golf Club de Lago, Punta del Este

For more information
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