

# Wireless = less Problems

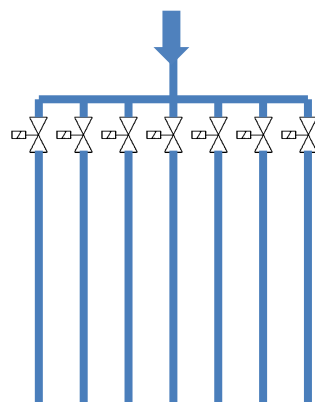
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Irrigation facilities for agricultural often have to be able to cover quite large areas, which naturally generates a number of technical challenges. In addition to long water supply lines with corresponding large cross sections, the placement of the solenoid valves can also be a problem. Particular, when several irrigation sectors have to be irrigated, either the tubing is very complex, or the control lines can be very long and, principally, cables routed on agricultural grounds constitute a reliability risk. In addition, in many cases valves should be repositioned from one to the other year, causing additional problems.

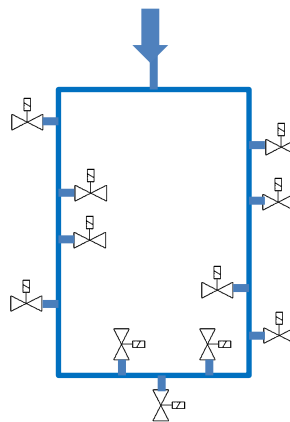
To resolve this problems PlantCare has developed a radio controller for solenoid valves (Remote Valve Control: RVC) (Figure 1), which is fully compatible with the already worldwide deployed intelligent irrigation control system - the Plant Control CX. This allows a completely free placement of valves and new possibilities for the piping. The main water supply can be provided in the form of a loop or stub line and radio controlled solenoids can be integrated at arbitrary positions. Valves can also be easily repositioned without having to lay new cables. This greatly reduces installation costs(Figure 2).



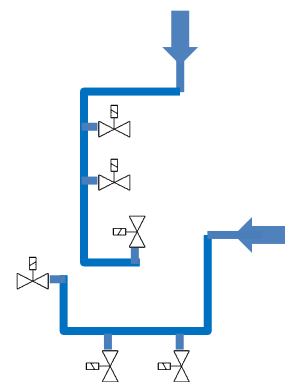
Fig1. Transceiver for 8 solenoid valves



Layout without radio controlled valves



Layout with radio controlled valves



Layout with radio controlled valves with 2 separate water supplies

Fig2. Radio controlled solenoid valves allow much simpler water distribution systems

For very large area and complex landscape irrigation systems, such as at golf courses, often several hundred to a thousand valves are not controlled by analog control cables, but via a digital bus with decoders. This method reduces wiring costs considerably but is associated with significant additional costs and programming effort. Cables are also required for this method and repositioning a valve also need rewiring.

Valves controlled via radio are also connected by a digital "radio-bus", i.e. the control information is available for all receiving stations located within an area limited by the wireless coverage. By using PlantCare repeaters with a range of 3 km, in theory the range be extended to a radius of 30 km.

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The receiver electronics decodes the signal, decides whether it is the intended recipient and receives the commands. It should be noted that the receiver electronics can also have their own intelligence. Thus, for example, the central station not only sends the command when to open the valve but also the information, when the valve has to be closed again. However, the valve electronics can also detect malfunctions, monitor the battery status etc. and send the information back to the central station.

In principle, one could assign a separate receiver for each valve. However, this would require considerable additional costs. The practice shows that often the valves are arranged in groups. PlantCare has therefore decided to develop a radio receiver that can operate 8 valves simultaneously, thereby reducing the cost / valve by a factor of 8. Also, just one solar cell for power supply is necessary instead of one solar cell for each valve. Since normally no 230/115 VAC is available, only pulse-controlled 9V DC valves can be used.

In addition, the functionality of the Plant Control CX system is further expanded. In the previous version up to 32 valves can be controlled analogously. The RVC system now allows to connect 40 solenoid valves of which 8 have to be controlled by wires, the rest can be either 24 wired or remotely controlled.

All functions available in the analog mode are also active in the RVC system, i.e. one can manually turn on and off valves, the valves can operated in the timer mode, in semi-automatic as well as in the fully-automatic mode.

Since the PlantControl CX - System is capable to start an electrically, or diesel powered pump automatically via SMS command before an irrigation and then also turn off the pump again after irrigation, even installations can be realized with several independent water supplies.

With this enhancement, already ordered by several customers, PlantCare is expanding its global technological leadership in the field of intelligent irrigation control even further.

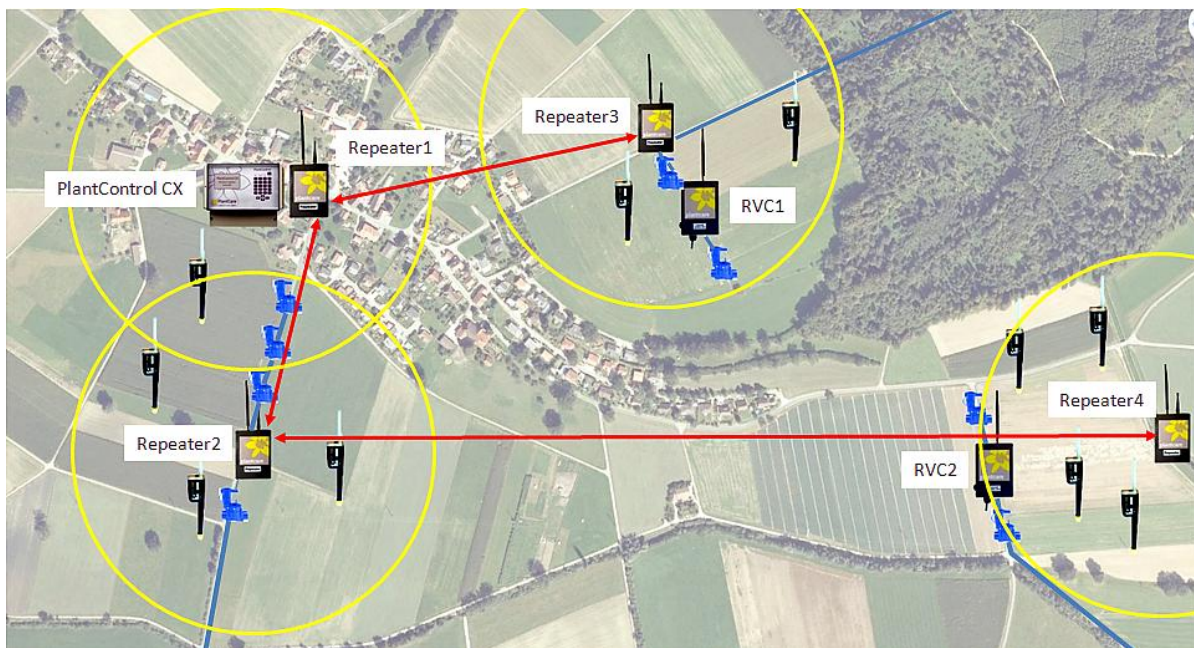


Fig3: Example of a layout with 3 different water supplies