



# G-Set Irrigation

The Ultimate Variable Rate Irrigation Solution



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by aliaxis

# K-Line™ G-Set™ Irrigation



## K-Line™ G-Set™ Range

Perfect for use on awkward-shaped terrains, pivot corners and steep hills, the K-Line G-Set is a smarter solution to solid set irrigation.

The system is capable of operating in many environments where terrain or field shape create issues for traditional irrigators and can also work in conjunction with an existing irrigation installations, e.g. pivots, linear etc.



Bottom Entry



Side Entry



Post Installation

## G-Set was designed taking into account:

- » Minimization of operating system pressure, effectively minimizing operating costs.
- » Protection of valve, control and sprinklers from livestock.
- » Efficient use of water.
- » Individual, variable rate application, permitting irrigation where it is needed most.

## How does it work?

The G-Set Pod or G-Set Post install is started with a polythene sub-lateral (ring main) pipe, which is trenched into the ground with G-Sets attached by a tapping saddle. Buried G-Set Pods maintain excellent hold and stability thanks to the unique ribbing on the pod's surface.

The G-Set Pod is high enough above the soil surface to get good performance from the sprinklers, but low enough so as not to have damage from livestock rubbing yet high enough that they don't step into the G-Set pod, assuring protection of your investment.

The G-Set Posts place the control system, sprinklers and valves above animal height minimizing potential damage.

## Features and Benefits

- Individual variable irrigation depths make G-Set a full variable rate system with every unit able to irrigate to precise and individual depths.
- Variable installation depth minimizes installation labor.
- No shifting required, significantly decreasing labor costs.
- Perfect for irrigating steeply contoured ground (G-Set Pod).
- Operation can be adjusted daily to account for seasonal requirements, stock location, fertilizer application etc.
- Pods are low to the ground and visually less obstructive than other fixed irrigation systems.
- Pods and Posts are at wide spacings - 130 ft. apart - making for a less intrusive system.
- Permanent irrigation assets enhance land value and returns.
- Custom system design and installation available from irrigation design companies.
- Can be designed to work with almost all terrain, shape or geographic obstacles. Pods are more suitable for steeper land.
- Single nozzle sprinklers create large droplets and are placed as low as possible to ground to minimize losses to the atmosphere.
- Emphasis has been placed on selecting a high-performance, low-pressure sprinkler. This maximizes production of large water droplets that are less wind affected. Low pressure output also minimizes on-farm energy use.
- Customizable (Pod or Post) and completely scalable.
- Low maintenance.
- Able to fertigate through the system as all components are constructed of non-corrosive materials.
- Low operational risks. If a controller fails, it does not cause total-system failure, limiting vulnerability.
- Irrigates almost all shaped areas including pivot corners.
- Pods are low to the ground minimizing the distance droplets have to fall to ground, increasing effective application.
- Can apply yesterdays ET back to the soil today, making return periods as short as 1 day.
- Every part of an installation can be varied to suit the requirements of the property.
- Frequency of watering can be increased or decreased as required, depending on moisture levels and climatic conditions.
- Application depth can be increased at the top of a slope to account for greater exposure to sun and wind drying effects.
- At the bottom of the same slope where it is wetter, application depth can be reduced.
- Roadways and other non-irrigated areas can be avoided by half or part circle sprinklers with Pods or Posts.

# Cost and Installation

## What is the Cost of a G-Set System?

Cost varies significantly based on a number of variables, however a typical installed cost can range from \$2,200 to \$5,500 per acre, depending on some of the factors listed below.

### Variables of System Costs

- Topography and terrain
- Presence of existing infrastructure (pumps, pipe, etc.) and how much new pipe needs to be laid
- Degree of difficulty for overall project
- Pipe sizing requirements for water availability
- Ability of farmer or staff to carry out some of the installation work themselves

## Pod vs Post Mounting

### Considerations

- Post systems can be placed at slightly wider spacings but will be more prone to wind disruption as the sprinkler stream is higher in the air.
- Pod systems can be placed to the land's contour without performance reduction (post systems cannot).
- Both Posts and Pods can be user installed minimizing installation costs.
- Pods and Posts can be used in combination with one another, when and where appropriate.

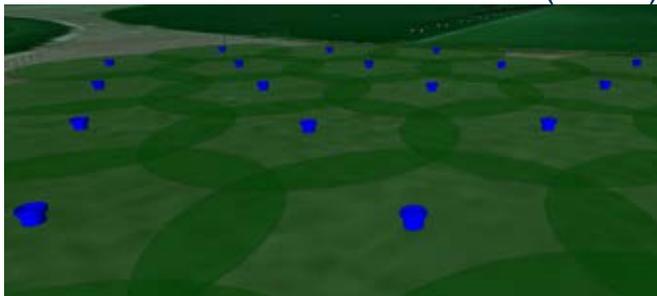
## Installation and Water Distribution



Note: The G-Set Post (above) is not to scale.

- G-Set Post is generally installed on 2.5" MD ring-main pipe.

## Installation and Water Distribution (cont'd)



Note: The G-Set Pods (above) are not to scale.

- G-Set Pods are generally installed on 2.5" MD ring-main pipe.



(bottom entry)

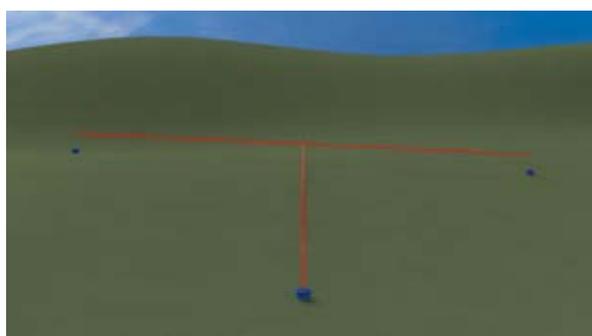


(side entry)

- A ring-main allows small diameter 2.5" Polyethylene pipe to be used.
- 2.5" MD pipe suits trench installation.
- G-Set Pods are generally installed directly above mainline pipe.
- Pods and stockguards protect the control system and valves from animals..



- Individually control each sprinkler and operate one after another on the ring-main.
- Apply water where required.
- Can achieve DU and CU (uniformities) in excess of 90%.



- 115 - 140 ft. ring-main head spacing (130 ft. average).
- 95 - 115 ft triangular offset row spacing (115 ft. average).

# Control Systems

## The Irrigation Management System

The K-Line G-Set Irrigation Management System is based on solar assisted, battery powered control units that sit in each pod/post. These operate low power latching solenoids to control the irrigation sprinkler inside the G-Set pod. These units are independent: meaning that when given information (ex: run for 30 minutes at 10:00 AM) they will continue to do this until given a new instruction. RX Plastics offers two main ranges of control devices for the pods.

### 1. Baccara Pod and Post Controller (KLG.S.C-1013)

The C-1013 is a specially manufactured controller from Baccara, custom built for G-Set. It has a high accuracy clock, maintaining synchronicity between devices over periods of greater than a year, ensuring optimal use of pump resources. I.e. not putting too much load on the water pump or spreading out the time that the pump is required to supply water. The system operates on a simple basis of up to two separate durations per day, every day, minimizing programming and set-up time. Ultimate control is afforded by being able to turn the pump or supply on or off depending on weather conditions. No harm will occur to the controller or the G-Set in this situation.

#### Baccara Applications

The Baccara solution is particularly suited to properties with smaller G-Set installations. For example, when the number of units are around 70 or less.

#### Features

- Solar panel and 9V NiMH battery
- Electronics and battery sealed behind silicone seals
- Latch solenoid operation (Baccara 3way only 4  $\Omega$  -12V)
- Real time clock on board - high accuracy
- Maximum of 99 minutes per irrigation and 2 start times

#### Benefits

- Low maintenance
  - Electronic components are sealed
- Low running costs
  - Connected to a renewable power source
- Many independent controllers
  - No risk of one device causing an entire system to fail

Baccara Pod  
Controller  
(KLG.S.C-1013)



The Baccara controller (above) is fully independent, whereas the QTech controller (right) can be updated from a distance. The QTech uses a sophisticated mesh network which enables updates over difficult terrain to all G-Set units from a single location.

### 2. QTech Irrigation Pod and Post Controller (IPC) (KLG.S.RX2000)

The QTech management system provides a low cost wireless controller (IPC) at each G-Set unit. The IPC is self-contained, powered from an on-board lithium battery, with an attached solar cell. All of the IPCs can, should you require, communicate via a 900Mhz mesh radio network, allowing watering schedules to be centrally managed. The management of this system is by use of a hardware and software suite. These are used to configure (schedule) and control the G-Set installation making this the ultimate in variable rate irrigation. Each IPC is autonomous in operation.

#### QTech Applications

The QTech IPC option is ideally suited to larger installations of G-Set on a variety of terrains as maintenance and management of the entire system can be handled from the centralized Irrigation Network Controller. QTech installations can typically range from 70 - 1000+ G-Set units (although in certain situations, they can be an ideal option for both less or more units).

#### Features

- Solar panel and lithium polymer storage battery (1500mAh)
- Fully encapsulated electronics making it fully waterproof
- ARM integrated controller CPU
- Latch solenoid operation (Baccara 3way only 4  $\Omega$ -12V)
- Real time clock on board - high accuracy
- Maximum of 255 minutes per irrigation and up to 16 operational slots per cycle
- Encapsulated battery separate from the electronics
- Optional SMS (cellular texting) control

#### Benefits

- Low maintenance
  - Electronic components are encapsulated
- Low running costs
- Connected to a renewable power source
- Many independent IPC's - reduces the risk of one device causing a complete system failure
- Farm ID inhibits cross-system/property interference
- Encapsulated battery is field serviceable
- Simple installation
- Remote management



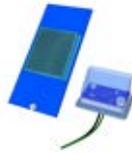
QTech Wireless  
Irrigation Pod  
Controller  
(KLG.S.RX2000-G)

# IPC Mounting Options

## G-Set Pod IPC

(KLG.S.RX2000-G)

This product is specifically built for the G-Set pod. The controller is placed in the cooler body of the G-Set with a large solar panel and aerial placed on the lid of the G-Set between the lid and the curved top.



G-Set™ pod Controller (IPC) (KLG.S.RX2000-G)

## G-Set Post IPC

(KLG.S.RX2000-P)

The G-Set Post unit IPC is mounted on a stainless steel plate for easy connection to the post.



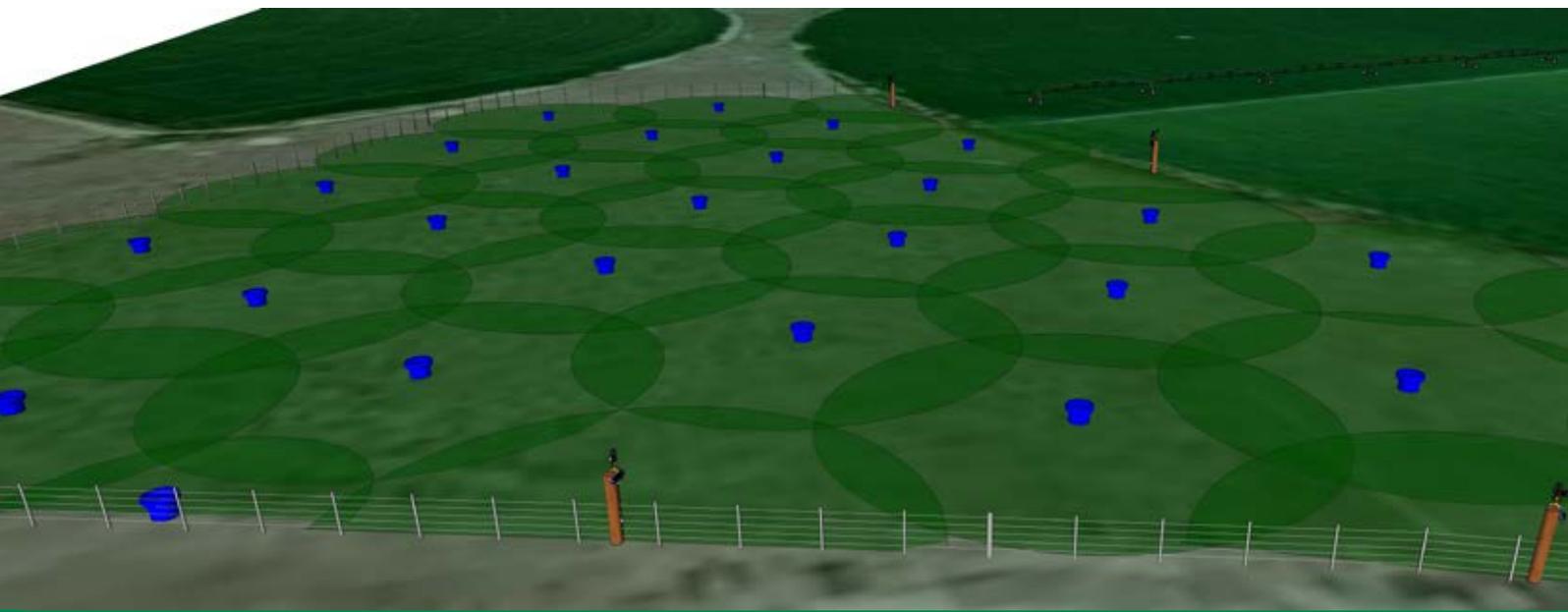
Post Irrigation Pod Controller (IPC) (KLG.S.RX2000-P) for G-Set™ Post Control



G-Set Post options

## Layout

With the use of the range of options G-Set provide it is possible to cover almost all of the area of most parcels. Below is a center pivot corner where a combination of Full and Part Circle and G-Set Pod and Post units completely cover the area.



# Additional Components Available for QTech Control

## EP3 Handheld Program Device

EP3 Data Manager is a wireless configuration device for configuring K-Line™ G-Set™ Irrigation Pod controllers (IPCs). Configuration files (for IPC lists, schedules and firmware upgrades) can be transferred to the individual IPC devices using the SD card and integrated radio.

### Features

- Enables easy firmware upgrade either over the air or directly
- The display is a touch sensitive mono-color LCD
- Its various screens and functions are accessible through softkeys on the display
- The device is supplied with a stylus for responsive operation
- Includes the ability to manually operate
- Includes the ability to 'inhibit' devices

### Benefits

- Quick and effortless irrigation schedule updates
- IPC status easily checked in the field
- Operation by Mesh enables the system to update IPC's that are not directly visible to the EP3
- Fault find tool
- Can manually start/stop any IPC
- Inhibiting stops a device from running its assigned schedule, enabling areas or entire paddocks to be turned off.
- Can easily upgrade devices to most recent firmware

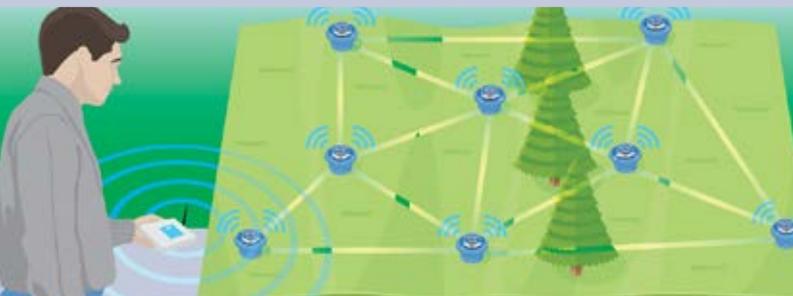


KLGS.RX2100



Irrigation Pod Controller (IPC)  
(KLGS.RX2000-P)

EP3  
(KLGS.RX2100)



## INC Network Unit

- Stand Alone

### Features

- Unit can be upgraded to PC connected mode in the future.
- Provides the state of the IPC network.

### Benefits

- Ease of system configuration.
- Data collection and records of system function.
- Easy update of each IPC via a polling process.



## INC Network Unit

- PC Connected (Internet Capable)

### Features

- The INC can be linked to a NUC PC providing greater functionality with direct connection to the scheduling software. Connection to the internet will then allow external network interrogation of each IPC.



NUC and INC in a cabinet

### Benefits

- The NUC connects to the internet using enabling remote activation, adjustment of scheduling, fault finding and direct communication to the IPC Network.
- QIMS provides an intelligent, smart way of monitoring and controlling the application of water across small or large scale agriculture.

## Repeater

As the size of application increases or terrain becomes more undulating, the use of repeaters becomes critical. The repeater acts to distribute information from the network controller (INC) to the local area to improve network coverage and speed.



A form of the repeater.  
Other types are also available

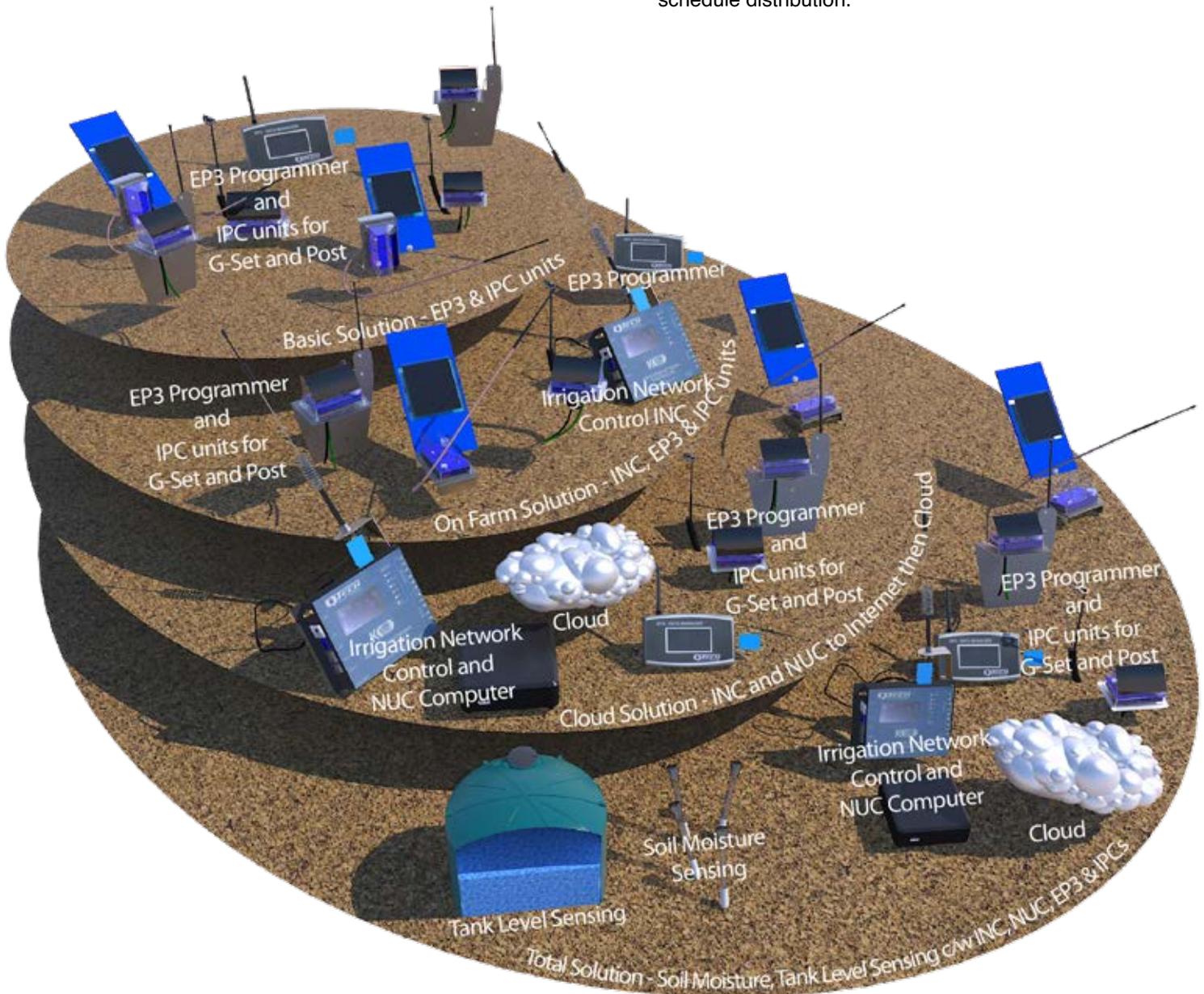
# IPC Ecosystem Platform Options

## 1. Basic Solution

G-Set, Post or Standard type of IPC at basic level can be operated with as little as an EP3 to provide schedule updates and firmware updates .

## 2. On Farm Solution

With the addition of an INC the network can be centrally managed. This unit has tools to view battery status, schedule adherence, manual operation and the ability to inhibit areas from operating. This unit also automates schedule distribution.



## 3. Cloud Solution

With the addition of a NUC computer, correct software and connection to the internet, the IPC system can be centrally managed from the cloud. This enables all operations to be carried out from a Mobile Phone, Tablet or PC. The cloud has many tools to view battery status, schedule adherence, manual operation and the ability to inhibit areas from operating. This unit also automates schedule distribution through the INC.

## 4. Total Solution

Once cloud service is established, soil moisture monitoring and supply tank level information become optional features and a breeze to manage.

