



clever • consistent • complete

2022

Jabeco's complete management system to optimise
the use of water resources

PRODUCT CATALOGUE

www.jabeco.co.za



CONTENT

1	➤ Introduction	3
2	➤ Integrated Solutions	4
3	➤ Applications	6
	Overview	6
	3.1 Irrigation Control	8
	3.2 Fertigation Control	11
	3.3 Dam Level Control	13
	3.4 Climate Tunnel/Green House Control	15
	3.5 Borehole Monitoring	16
	3.6 Pivot Control	18
	3.7 Soil Moisture Measurements	19
	3.8 Stand-Alone Solutions	21
	3.9 Power Management	23
4	➤ Products	26
	4.1 Modem	28
	4.2 Meerkat Field Module	26
	4.3 Field Module	30
	4.4 Dassie	32
	4.5 JIO and JFERT	34
	4.6 Charge Module	36
	4.7 Relay Card	37
	4.8 Water Level Controller	38
	4.9 Water Level Probe	39
	4.10 Base Module	40
5	➤ Accessories	43
6	➤ Pump House Controller	52
7	➤ Control System Architecture	54
8	➤ EcoWeb Automation Software	57





COMPANY

1 INTRODUCTION

Customized Solutions, Reliable Networks and Trusted Service

Jabeco's wireless automation effectively controls irrigation infrastructure, thereby enabling farmers to shift their focus from water management to the actual business of farming.

Jabeco provides a complete management system to optimise the use of water resources:

- Each farm is unique. This requires a system engineering approach to cater for the individual and the specific architecture of each user.
- Our hardware and software are purpose developed for water management.
- We use wireless communication to all control units and sensors.

The EcoWeb management software provides as a completely automated and integrated control system. It is developed by South African engineers and provides an unique automation interface with the Jabeco control modules in the field, allowing the user to control variety of irrigation, fertigation, and other water related functions.

- The scheduler handles all planned activities such as irrigation, borehole control, fertigation etc.
- The EcoWeb SCADA graphical user interface module allows the user to view an onscreen representation of the infrastructure and the current status of each field device.
- EcoWeb collects and stores all operational information from a variety of sensors in the field and provides a set of reports for analyzing this data.
- Customized alarms that monitor fail safes for the entire system creates total peace of mind for the user.

It is our strategy to form partnerships with local expert representatives in all regions. Jabeco is committed to ensure 100% customer satisfaction with complete engineering support.

Jabeco's Head office is in Pretoria, Gauteng, South Africa at the CSIR (Centre of Scientific and Industrial Research) **Tel: +27 (12) 349 1100.**



2 INTEGRATED SOLUTIONS



Information Management System

Jabeco provides a complete integrated Information Management System, for the effective utilization of water and related resources. This fully automated solution allows for real-time monitoring and control of a diverse infrastructure of elements. System data is captured and maintained in a database and is presented on graphical displays and available for reporting.

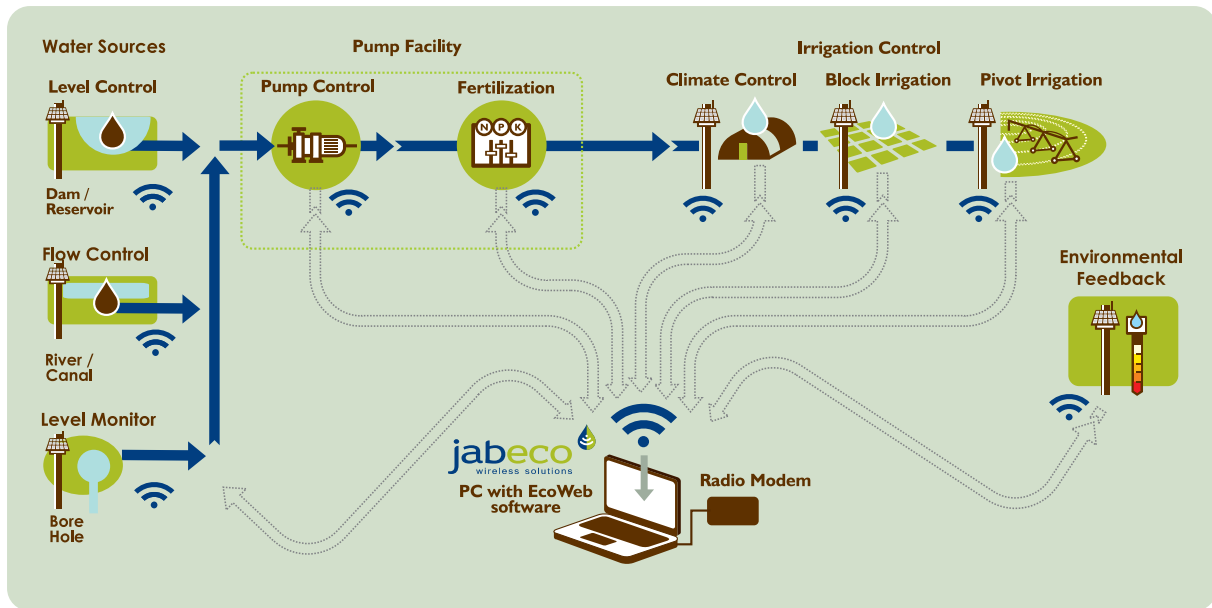
Wireless Communication

By applying wireless communication technology Jabeco allows data acquisition and infrastructure control over vast rural areas where other communication technologies are not viable.

- Wireless equipment operates in a license free band between 433MHz and 868MHz.
- Standard range is up to 3km, with extended ranges of up to 10km being achieved with directional Yagi antennas and good line of sight.
- All communication modules can be configured as repeaters.
- Supports bi-directional communication, which is essential for command acknowledgment between control modules and remote field systems.

Control Equipment

Jabeco provides robust, self-sustaining control equipment for the management of a variety of analogue and digital inputs from devices in the field. These devices are specifically designed for reliability and ease of maintenance.



»» IRRIGATION CONTROL

The EcoWeb Irrigation Control module can be configured to support a variety of different irrigation main line arrangements, and effectively provides irrigation control through its flexible scheduling function. This module includes a variety of digital and analogue input monitoring functions, as well as filter control.



»» FERTIGATION CONTROL

Integrates with the Irrigation Control module by adding preset amounts of fertilizer, from one or more fertilizer tanks, to the scheduled irrigation programs. The injection of fertilizer into the main water line may be once off per irrigation program or regulated for each water pulse received from the main water meter.



»» DAM LEVEL CONTROL

EcoWeb regulates dam or reservoir water levels by taking regular level readings and controlling pumps according to preset water level requirements. Pump control may be scheduled by the operator or completely autonomous as specified by preset pump start and stop water level rules.



»» CLIMATE TUNNEL CONTROL

EcoWeb incorporates a comprehensive autonomous rule based climate control module for horticulture hothouses. Control is based upon digital and analogue inputs from a variety of input sensors such as temperature, wind speed and humidity sensors, ensuring that ideal climatic conditions are maintained within the hothouse.



»» PIVOT CONTROL

EcoWeb offers an integrated management system for pivot irrigation systems. The control equipment interfaces with the control panel at each pivot, and control and monitoring functions are extended to the EcoWeb SCADA. The pivot irrigation schedules, fertilization and pump control are managed by the Ecoweb control software.



»» STAND-ALONE SOLUTIONS

The simplest most cost effective type of water management system, utilizing stand-alone Jabeco products that directly control devices in the field without any user or other control system interaction.





APPLICATIONS

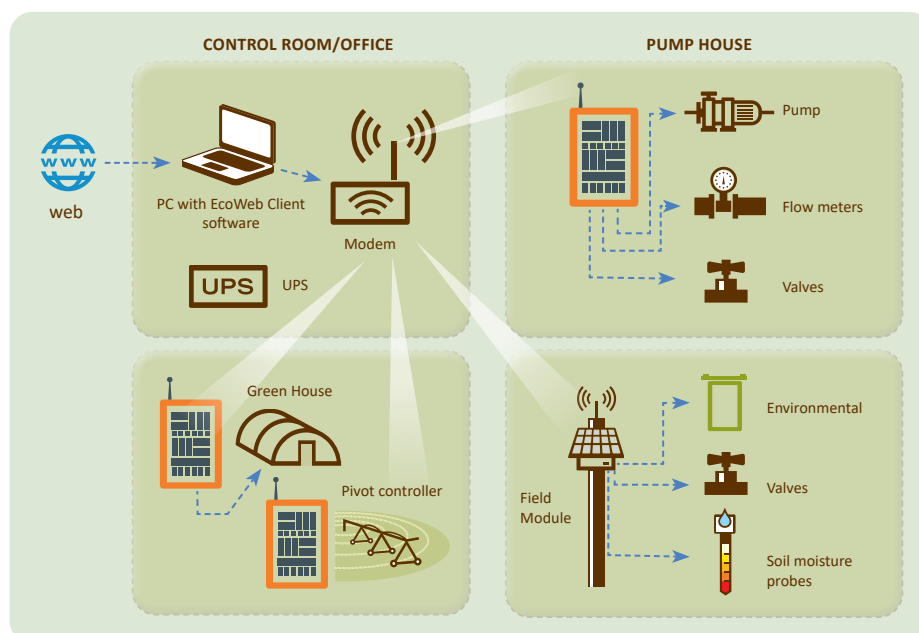
3 OVERVIEW

Jabeco provides a complete management system to optimise the use of water resources:

- **Irrigation Control**
- **Fertigation Control**
- **Dam Level Control**
- **Climate Tunnel/Green House Control**
- **Pivot Control**
- **Soil Moisture Measurements**
- **Stand-Alone Solutions**

All integrated Jabeco water management systems share the following characteristics:

- They are realised with the deployment of microprocessor based radio control modules.
- The application specific software is hosted on a personal computer at the user's control centre or office.
- Any setup may comprise multiple systems of the same type of application or a combination of them.
- The EcoWeb management software provides the following:
 - SCADA: Real-time graphical representations of all system devices indicating their current statuses (On/Off, Open/Closed, flow rate, pressure readings etc).
 - Real-time alarm notifications of exceptions or error conditions occurring within the system. A SMS module may be incorporated sending priority alarms via SMS to configured users.
 - Automatic device control using preset system rules or recurring schedules.
 - A variety of reporting and graphing functions, which provide an overview of the scheduled programs and tasks, which have been performed by the system. These reports include: precipitation trends, fertigation trends and status graphs for devices in the system.



3.1 IRRIGATION CONTROL

The EcoWeb Irrigation Control module can be configured to support a variety of different irrigation main line arrangements, and effectively provides irrigation control through its flexible scheduling module. By making use of preset time or volume based water delivery schedules EcoWeb automatically delivers the required amounts of water to designated target areas.

The irrigation scheduling module is responsible for the following:

- Schedules will control when pumps are started or stopped, which field valves are opened or closed, filter control, and a variety of additional functions.
- All schedules consist of a number of back to back programs each running a preset amount of time, or delivering a preset amount of water, while controlling one or more target field valves.
- An unlimited number of schedules may be created and activated and deactivated as required.
- Schedules may be set to repeat at preset intervals during a day, execute only on certain days of the week, or only during a specified period.
- The individual programs within a schedule may be configured to provide water only or added fertilizer, as required.

A number of additional measurement devices may be added for monitoring and control purposes, these include the following:

- Flow and pressure meters.
- Temperature, wind speed and humidity sensors.
- EC and pH sensors.
- Soil moisture probes may be incorporated into the respective target areas, which will enable the farmer to optimise the irrigation schedules according to the recommendations of an agronomist.

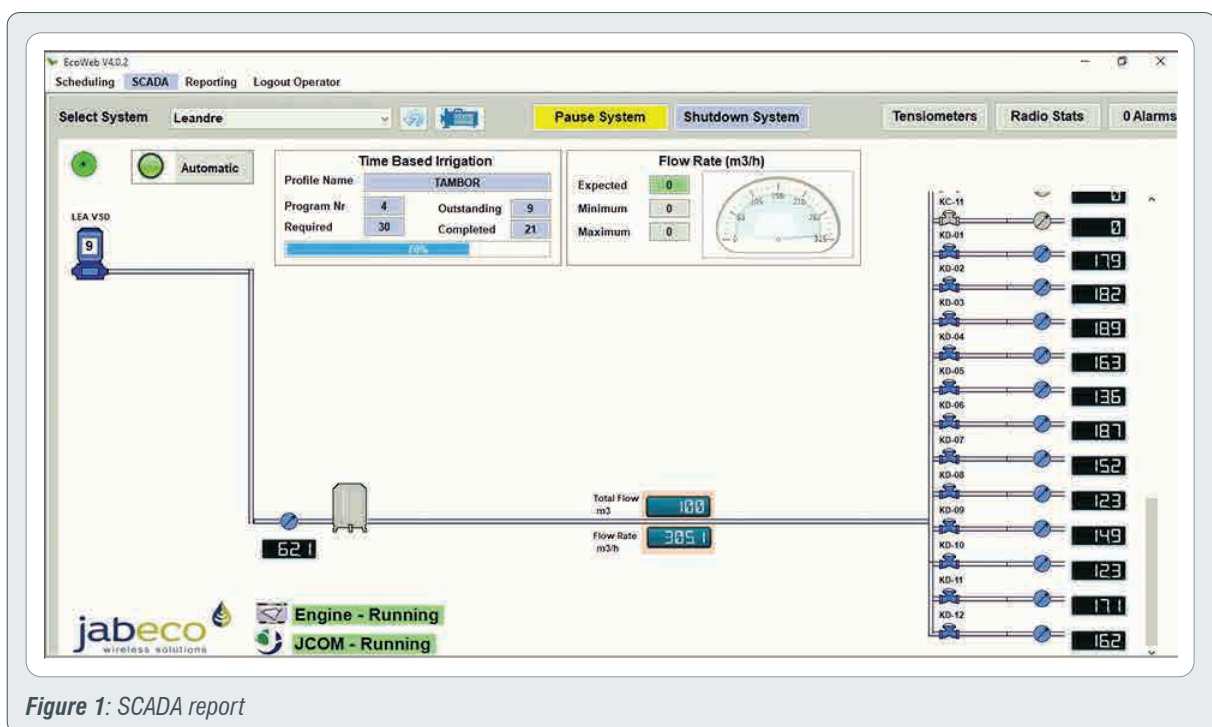


Figure 1: SCADA report



Real-time monitoring features:

- The SCADA display provides real-time status monitoring of all active devices, and allows for certain manual control functionality.
- All system failures and exceptions are logged to the alarm list for the user's attention. A SMS module may be incorporated sending priority alarms via SMS to configured users.
- Comprehensive reporting features are available, allowing the user access to the necessary data required to optimise the irrigation system.

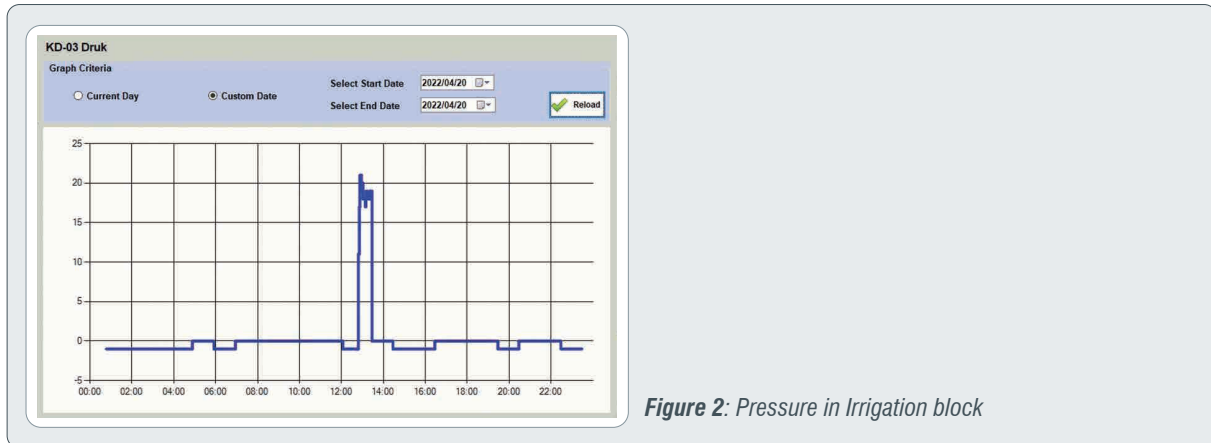


Figure 2: Pressure in Irrigation block

AUTOMATED TEMPERATURE TRIGGERED IRRIGATION (ATTI)

1. Overview

Automated temperature triggered irrigation (ATTI) systems are used within irrigation systems where temperature is critical. Temperature sensors (thermocouples or thermistors) are integrated with Jabeco field equipment (JIO, FM or Meerkat). EcoWeb reads the temperature at regular intervals. Trigger temperatures are defined within the system setup and when temperatures measure above or below the defined temperature, outputs will be autonomously triggered.

Implemented applications:

Temperature Reduction

- Thermocouples had been placed within the buds of a cherry tree. Said tree is located amongst the orchard. Every thermocouple is constantly at the set update interval. These values are averaged to avoid outlying values. Once the average temperature exceeds the trigger temperature, an irrigation cycle is triggered.

Frost Prevention

- Thermocouples are placed in the area where frost is undesirable. Temperatures are checked at selected interval. Then the temperature of anyone of the sensors falls beneath the set temperature an output is triggered leading to irrigation initiation.

2. Features

The main features of the system are as follows:

- An ATTI irrigation profile will be created and the profile will start when the defined trigger temperature is reached.
- Multiple temperature sensors or will be deployed at critical locations and monitored for temperature calculations. Trigger rules are based on average or individual sensor temperature readings.
- A minimum or maximum temperature trigger level is selectable.



- A digital output, which is linked to the ATTI cycle may be configured for external control.
- Temperature trend reports with selectable averaging windows and graphs are available on the EcoWeb SCADA. Reports can be exported as “.csv” files.
- ATTI schedules executed, with measured water flow are recorded and available in reports.

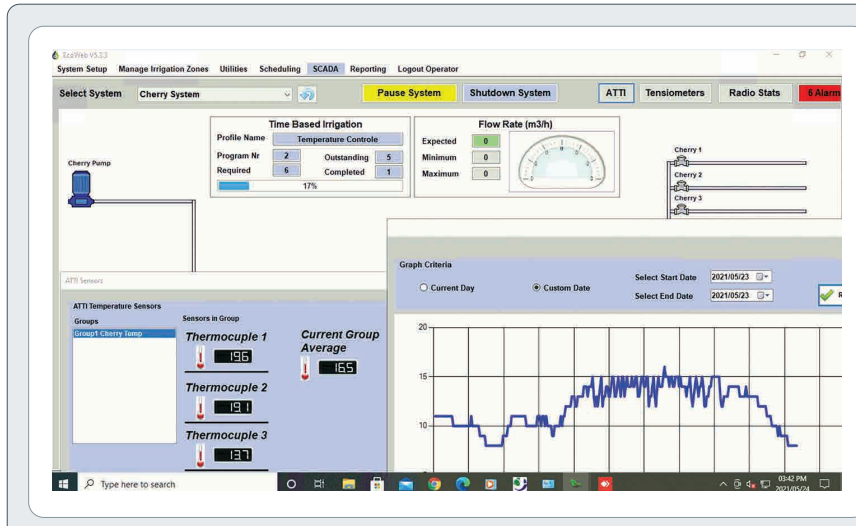


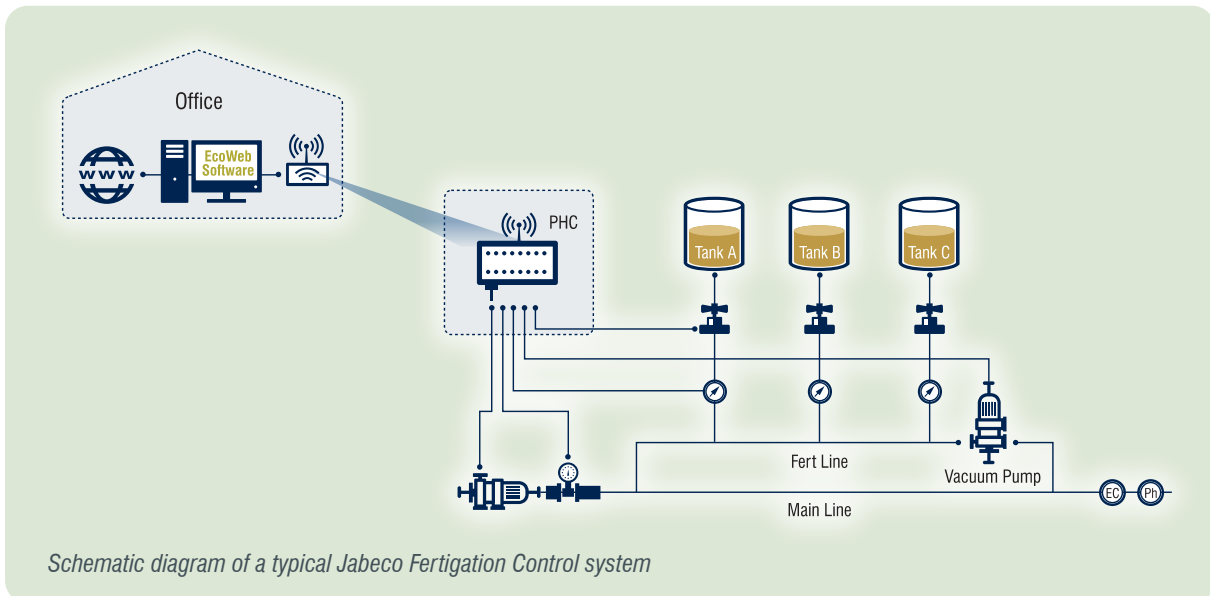
Figure 3:
SCADA Display wit Trend
Graph – temperature not
exceeding a set value



Figure 2: Thermocouple installed in tree

3.2 FERTIGATION CONTROL

The Jabeco Fertigation Control module integrates with the Jabeco Irrigation Control module, allowing the user to regulate the amounts of fertilizer added to the main water line. It can be configured to control most fertigation subsystems, a typical configuration is shown in the figure below.



The EcoWeb control software, which is hosted on a PC in the control room or office, connects via the Jabeco radio network to the JFERT control module in the pump house.

- Measure flow in the main water line and fertilizer lines.
- Control fertilizer valves or pumps for up to seven fertilizer lines.
- Control vacuum pumps as required.

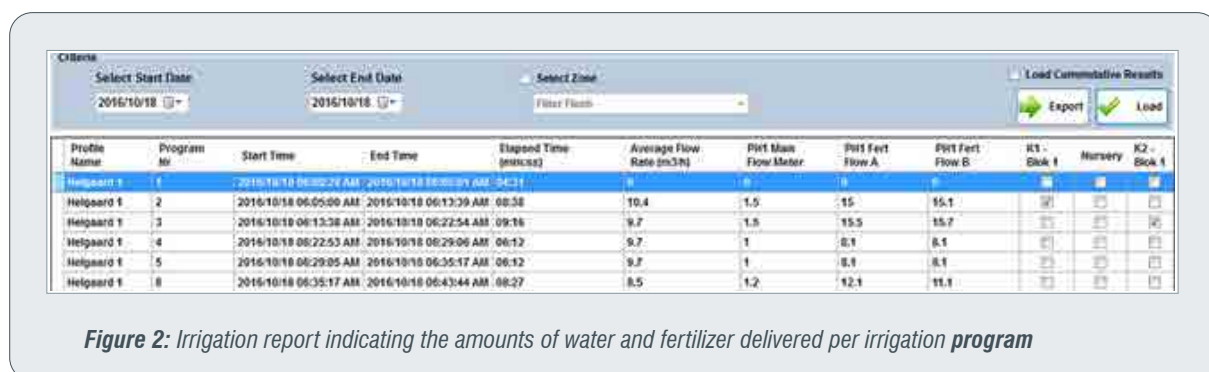
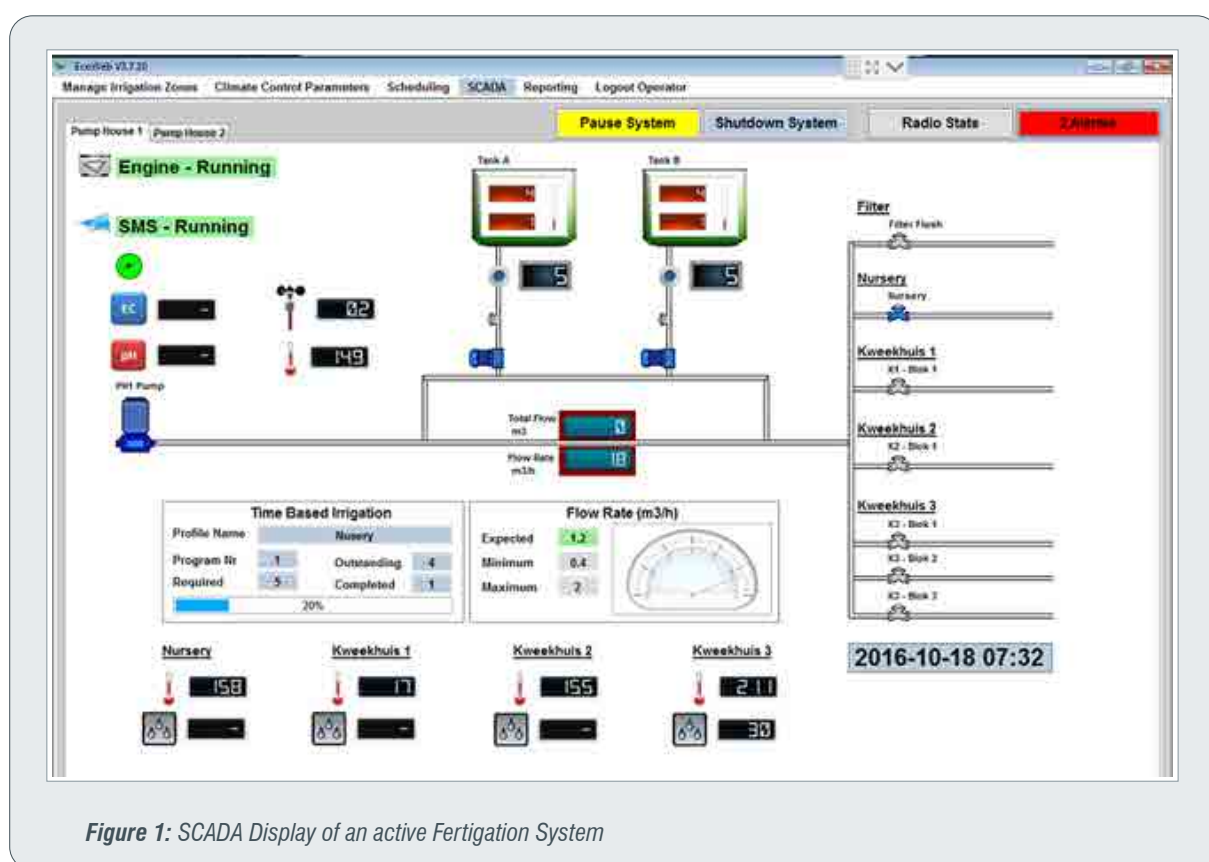
The EcoWeb Software supports the following fertigation functions:

- Volume Based fertigation:
 - ≈ A preset amount of fertilizer is injected from each fertilizer line into the system for each scheduled fertigation program.
 - ≈ Once the preset amount for each fertilizer line is delivered fertilization stops for the specific program.
- Volume/Volume (Rate) Based fertigation:
 - ≈ A preset amount of fertilizer is injected into the system for each preset amount of water that is measured by the main line flow meter.
 - ≈ The JFERT monitors the main line water flow count, and opens the scheduled fertilization line valves to count down the specified amount of fertilizer for each water cycle.
 - ≈ Once the required amount of fertilizer has been delivered the fertilizer line valve is closed. This process will repeat once the preset unit of water has been measured on the main line, thus a water cycle has concluded. Fertilization continues for the entire span of the fertigation program.

Real-time monitoring features:

- The SCADA display provides real-time status monitoring of all active devices, and allows for certain manual control functionality.
- All system failures and exceptions are logged to the alarm list for the user's attention. A SMS module may be incorporated sending priority alarms via SMS to configured users.
- Comprehensive reporting features are available, allowing the user access to the necessary data required to optimise the fertigation system.

The Jabeco Fertigation Control System is fully integrated with the other EcoWeb management functions, i.e. irrigation scheduling, dam level control, and tunnel climate control. The SCADA display provides real-time status monitoring and control functionality. Comprehensive reporting features are available.





3.3 DAM LEVEL CONTROL

The EcoWeb Dam Level Control module allows the user to regulate water levels through scheduled or rule based pump control functions.

The Dam Level Control module supports the following functions:

- Water level monitoring and pump control on each individual dam or reservoir.
- Measurement devices such as flow and pressure meters may be associated with pumps for monitoring and control purposes.
- Scheduled and automatic pump control options are available:
 - ≈ Scheduled:
 - › Schedules are time based consisting of a number of back to back programs each running a preset amount of time while controlling one or more target pumps.
 - › An unlimited number of schedules may be created and activated and deactivated as required.
 - › Schedules may be set to repeat at preset intervals during a day if required.
 - › Water levels may influence schedules, for instance schedules will stop if target dams reach their preset maximum levels, or if a source dam reaches its preset minimum level.
 - ≈ Automatic:
 - › Completely autonomous rule based system, no user interaction required.
 - › All pumps are configured to start when their target dam reaches its preset minimum level, and stop when it reaches its preset maximum level.
 - › Manual override functions are available in the case that pumps need to be controlled outside the boundaries of the preset rules.

Real-time monitoring features:

- The SCADA display provides real-time status monitoring of all active devices, and allows for certain manual control functionality.
- All system failures and exceptions are logged to the alarm list for the user's attention. A SMS module may be incorporated sending priority alarms via SMS to configured users.
- Comprehensive reporting features are available, allowing the user access to the necessary data required to optimise the water management system.



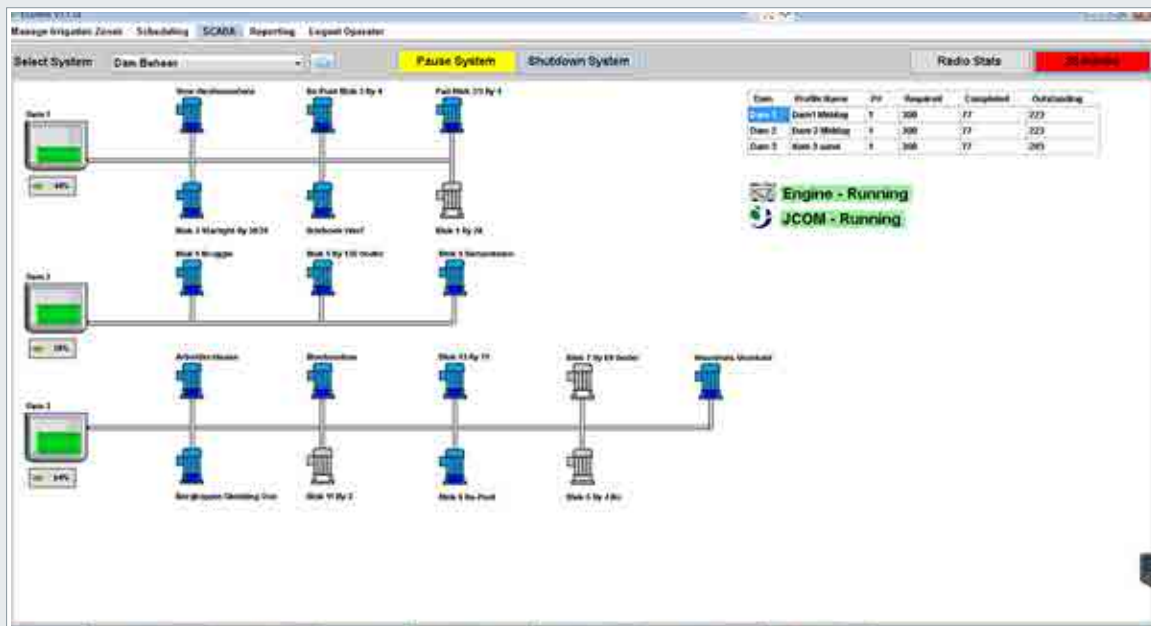


Figure 1: SCADA Display of an active Dam Control System

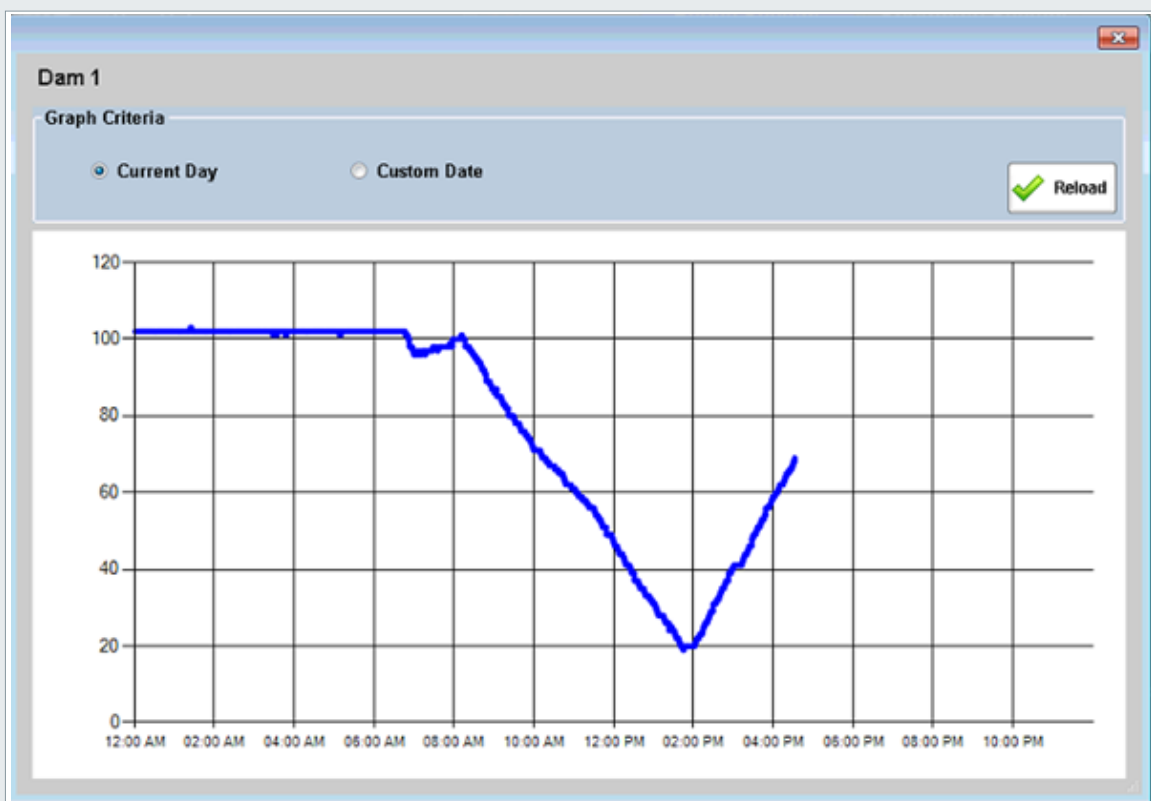


Figure 2: Daily trend graph indicating % dam levels over time



3.4 CLIMATE TUNNEL OR GREEN HOUSE CONTROL

The EcoWeb Climate Tunnel Control module allows comprehensive control of the climatic conditions contained within horticulture hothouses.

The EcoWeb Climate Tunnel Control module supports the following functions:

- Completely autonomous rule based system.
- Inputs are received from a number of monitoring devices such as wind speed, temperature and humidity sensors.
- Rules are configured based upon the above mentioned inputs in order to control among others curtains, fans and misters.
- Fine tuning of these rules allows for optimal conditions to be maintained at all times within the climate tunnels.
- Integrates seamlessly with the EcoWeb Irrigation and Fertigation Control modules to provide a turnkey solution for all climate tunnel control requirements.

Real-time monitoring features:

- The SCADA display provides real-time status monitoring of all active devices, and allows for certain manual control functionality.
- All system failures and exceptions are logged to the alarm list for the user's attention. A SMS module may be incorporated sending priority alarms via SMS to configured users.
- Comprehensive reporting features are available, allowing the user access to the necessary data required to optimise the control of the horticulture hothouse.

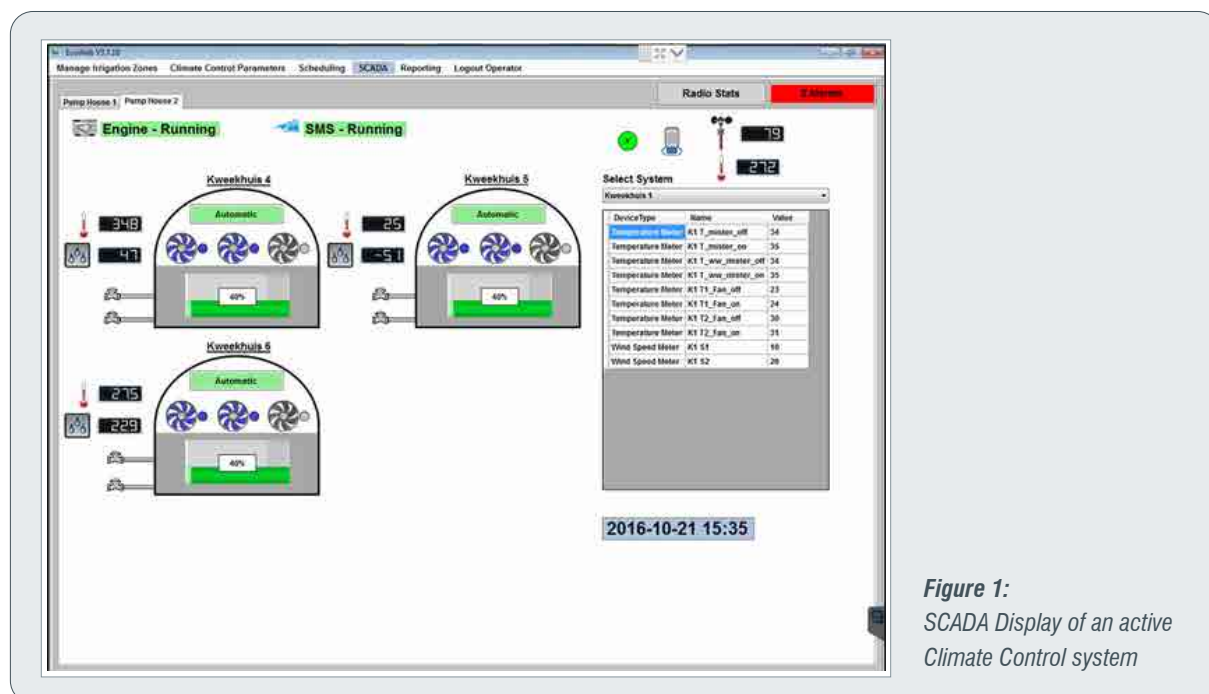


Figure 1:
SCADA Display of an active
Climate Control system



3.5 BOREHOLE MONITORING

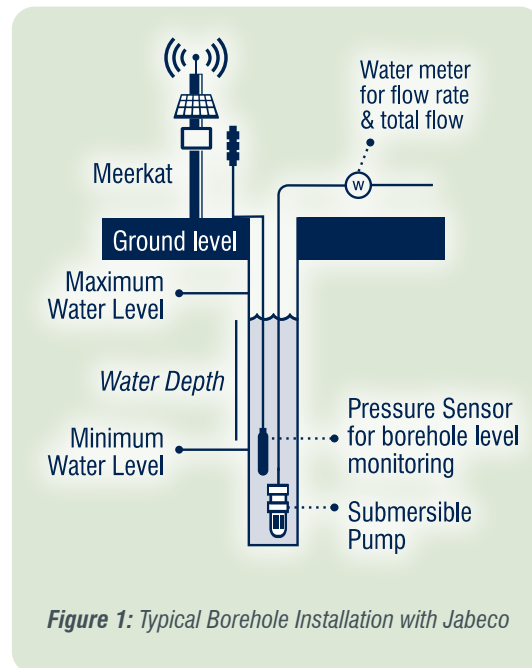
1. Overview

Climate change has become more noticeable in recent years, with water supply bearing the brunt of its negative effects.

Ground water has come to the forefront as a more reliable source of water, and with it more advanced monitoring technique. Monitoring boreholes has become essential due to their nature and preserves their expected reliability and performance.

Jabeco offers a solution that offers **remote, continuous borehole monitoring and control**, that is not limited to:

- Basic Pump Control
- Scheduled and Conditional Pumping Control
- Yield Monitoring
- Borehole Recovery Times
- Communication to Remote Locations



This allows the discovery of the borehole capability and properties, which can be used to optimize the borehole use. Such as instantaneous water capacity, long term borehole depletion, recovery period required and maximum continuous water flow rate.

2. Borehole Level and Flow Monitoring

A borehole level sensor is typically placed a few meters from the bottom of the borehole, or at the lowest desired level. The flow meter would be placed at the top of the hole, and both will be connected to the Jabeco Control Unit.

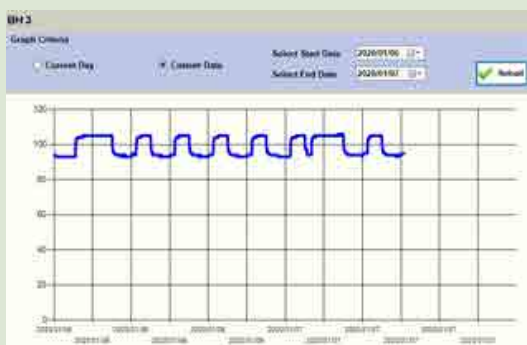


Figure 2: Example Graph of Borehole Level Over Time

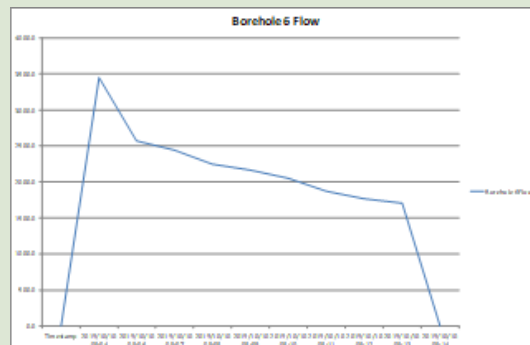


Figure 3: Example Graph of Borehole Water Flow Rate Over Time

3. Integrated Solutions

Jabeco offers an integrated solution for a system, for example:

1. **Real-time monitoring** and display of the status of the borehole system on a SCADA display.
2. **Scheduled and or rule-based control** of borehole pumps.
3. Implements rules to prevent exhaustion of boreholes, overflow of reservoirs and water losses in pump lines.
4. Initiate and alert of alarm conditions,
5. **Maintain history** of water usage and devices actions.

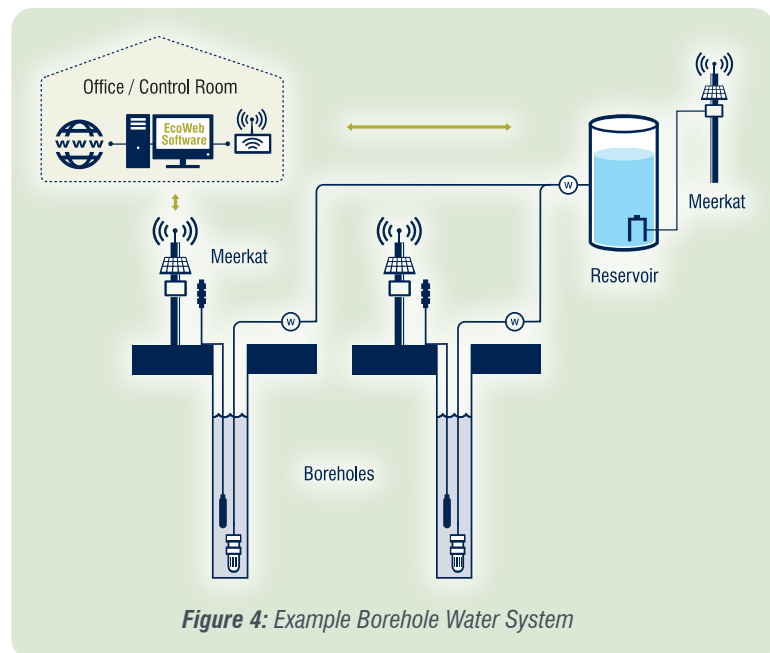


Figure 4: Example Borehole Water System

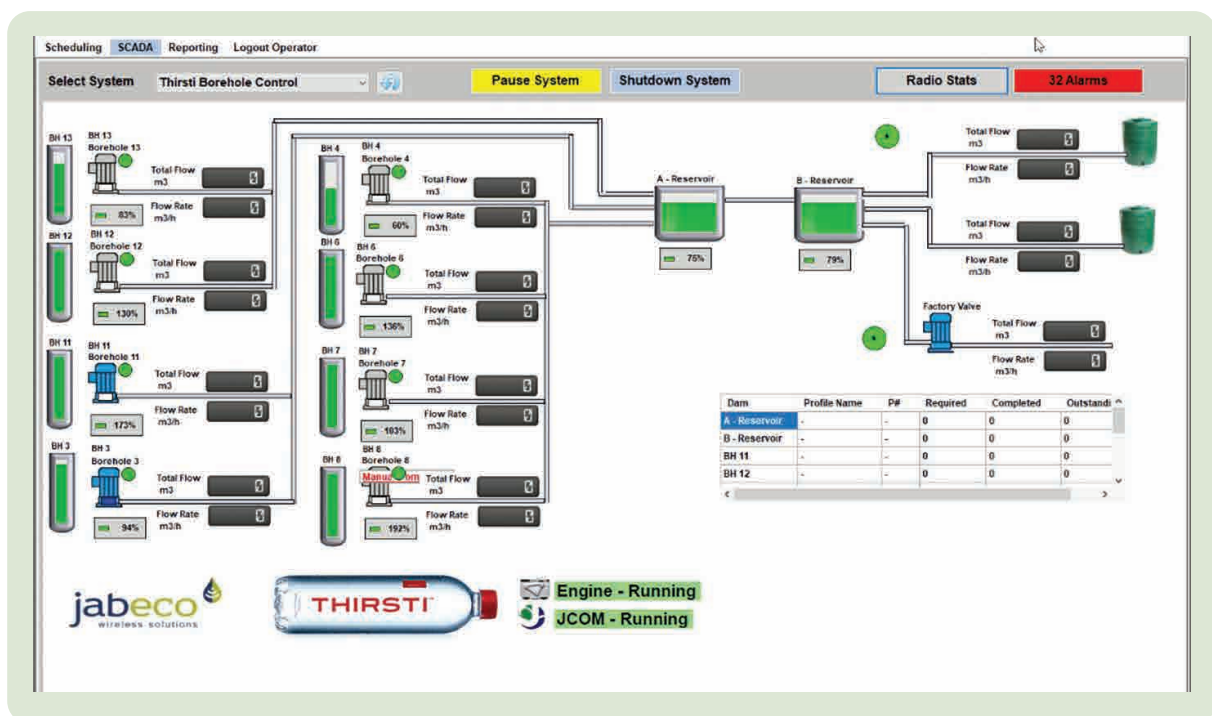
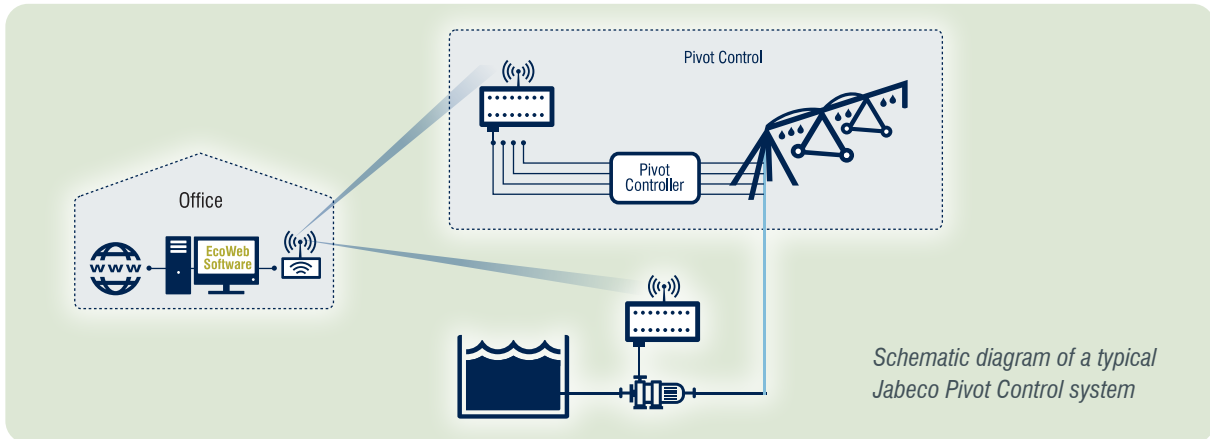


Figure 5: Example SCADA Display of Borehole Water System

3.6 PIVOT CONTROL

EcoWeb offers an integrated management system for pivot irrigation systems. A typical pivot control system is shown in the figure below.



The control equipment interfaces with the control panel at each pivot, and control and monitoring functions are extended to the EcoWeb SCADA. The pivot irrigation schedules, fertilization and pump control are managed by the Ecoweb control software.

Moisture readings from soil moisture probes in the respective soil types are received so that the operator can optimise the pivot's speed according to the specific soil moisture requirements in the different sectors. If a pivot operates on an incline, EcoWeb can regulate water pressure by controlling the variable speed drive.

Real-time monitoring and control features:

- All control functions which are available on the pivot control panel are extended to the SCADA display.
- The SCADA display provides real-time status monitoring of all active devices, and allows for certain manual control functionality.
- If rotary encoders are available on the pivot the position of the pivot can be displayed in real time.
- All system failures and exceptions are logged to the alarm list for the user's attention. A SMS module may be incorporated sending priority alarms via SMS to configured users.
- Comprehensive reporting features are available, allowing the user access to the necessary data required to optimise the control of the pivot system.



Figure 1:
SCADA Display of a Pivot Control system

3.7 SOIL MOISTURE MEASUREMENTS

Jabeco integrates with the AquaCheck soil moisture probe, which offers capacitance based soil moisture measurement, offering up to fifteen moisture and temperature sensors per probe.

The Jabeco JIO or Meerkat FM interfaces with the soil moisture probes, and transmits the soil moisture data to a PC hosting the EcoWeb management software. A data logging module, called JLog, retrieves the data at regular intervals. Refer to Step 1 shown in both Figure 1 and Figure 2.



Two options are available to present the data to the user:

- Desktop application, as shown in Figure 1:
 - The data is uploaded directly to the Desktop Software application, which allows the user to view multi-layer soil moisture dynamics for the entire root zone.
 - The application can export of data for further analysis.
- Web Based application, as shown in Figure 2:
 - Step 2: The data is uploaded to the Aquaweb Server at regular intervals.
 - Step 3: The Aquacheck server offers the user easy access to the data via internet browser, and allows the user to view multi-layer soil moisture dynamics for the entire root zone. Plots of probe data is available for easy interpretation, as shown in Figure 3.

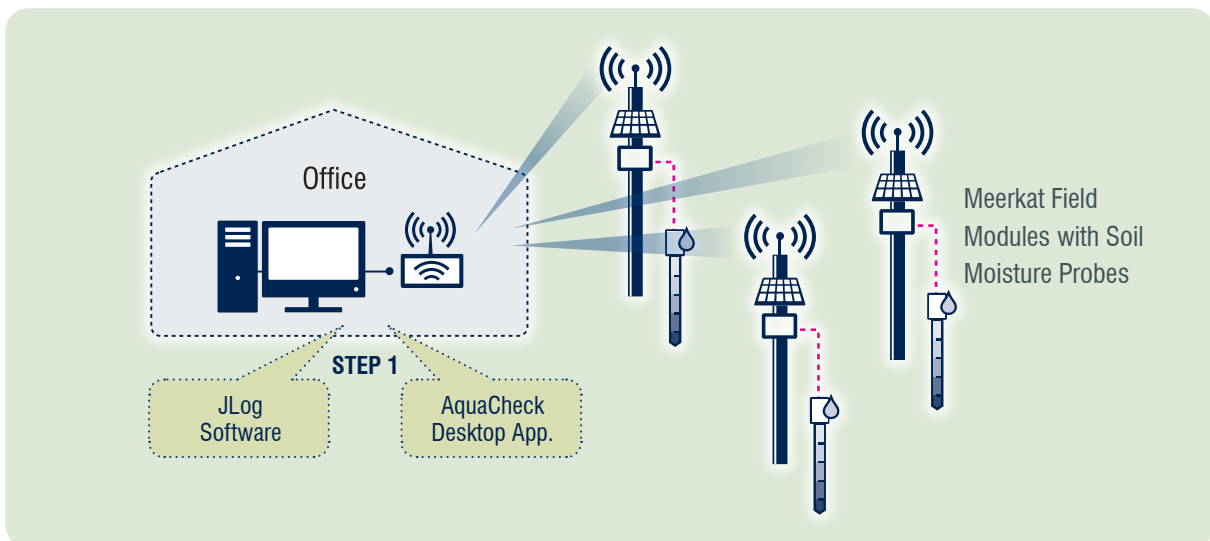
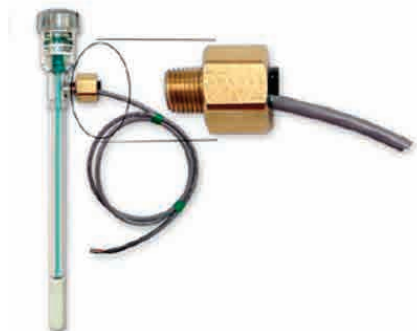


Figure 1: Jabeco Moisture Monitoring System - Desktop Application

Tensiometer

Tensiometers can be used as an alternative to soil moisture probes. Tensiometers are used in irrigation scheduling to help farmers and other irrigation managers to determine when to water. In conjunction with a water retention curve, tensiometers can be used to determine how much to water.



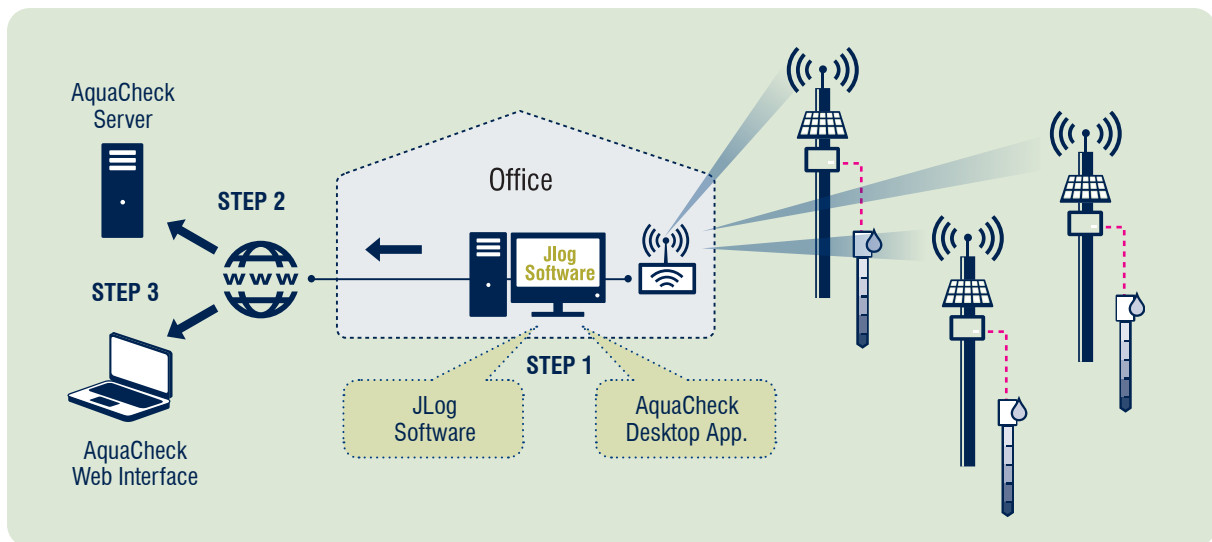


Figure2: Jabeco Moisture Monitoring System - Web Application

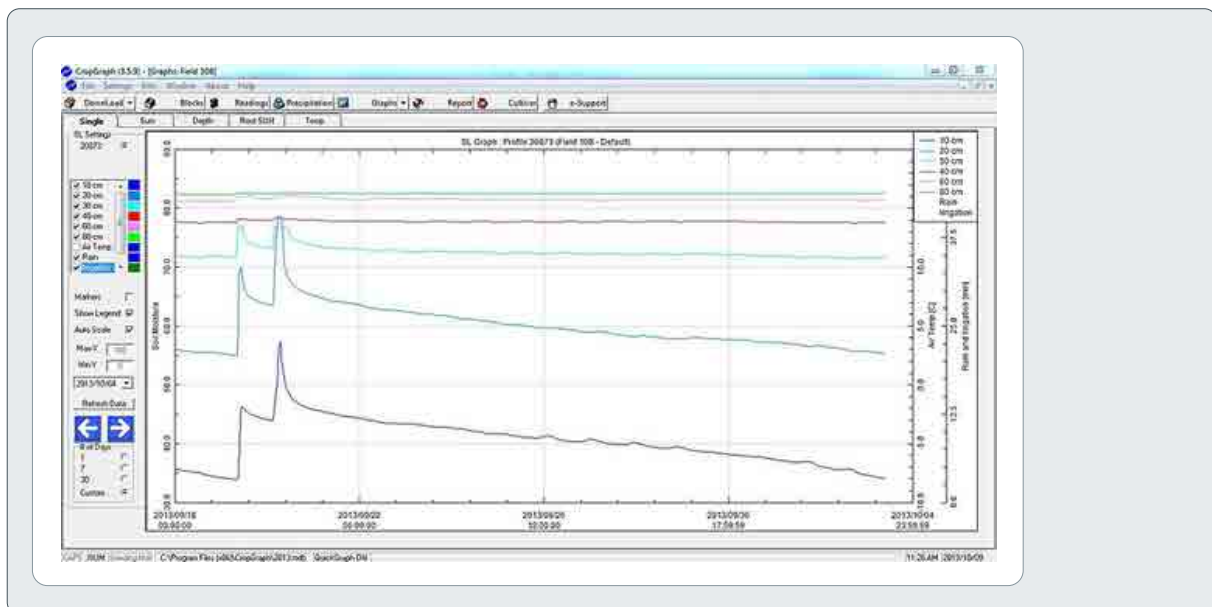


Figure 3: AquaCheck CropGraph example

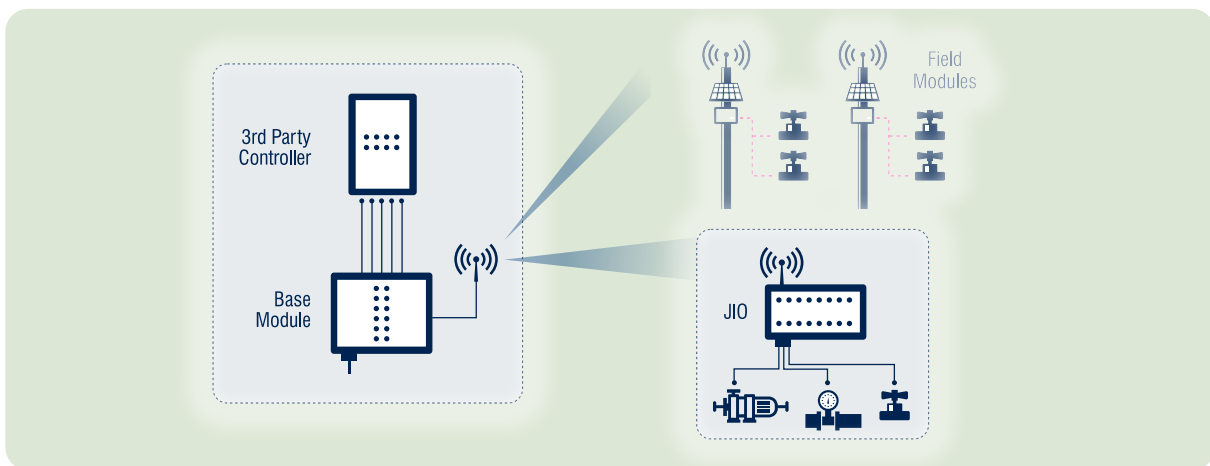
3.8 STAND-ALONE SOLUTIONS

The simplest most cost effective type of water management system, utilizing stand-alone Jabeco products that directly control devices in the field without any user or other control system interaction.

Examples of stand-alone systems include the following:

IRRIGATION SYSTEM WITH A STAND-ALONE CONTROL UNIT

- Configure a Jabeco Base Module to provide wireless irrigation control.
- The Base Module interfaces with inputs and outputs from a third party controller and provides wireless communication to Jabeco Input-Output unit (JIO) and Field Module (FM) communication devices.
- These communication devices interface with, and allow control of the devices in the field.



WIRELESS LINK

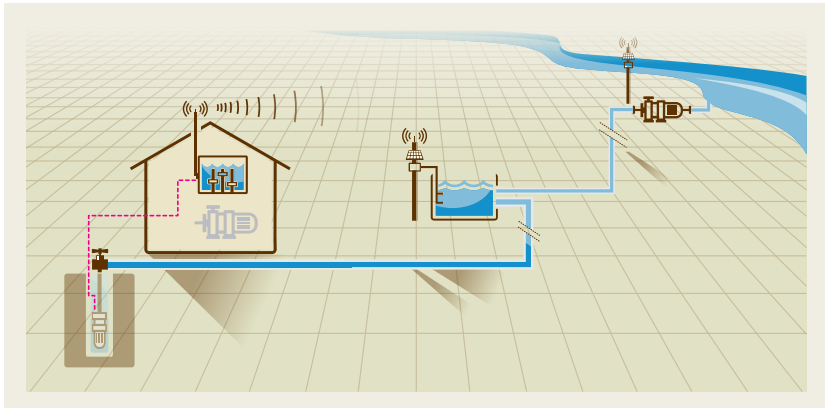
- Jabeco Input-Output units (JIO) can be configured to provide stand-alone wireless control between devices.

WATER LEVEL CONTROL SYSTEM

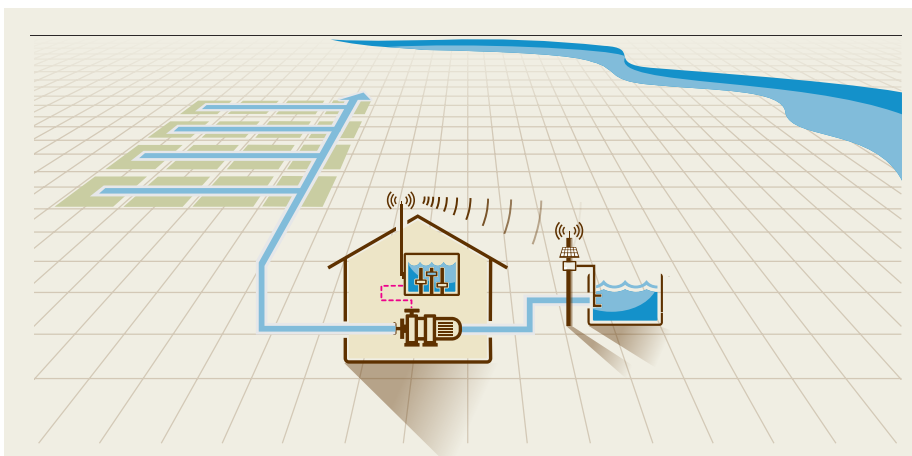
- A Jabeco Water Level Controller (WLC) is configured to keep the water levels of reservoirs or dams at consistent levels.
- A WLC system consists out of the following main system components:
 - ≈ Water Level Base Module (WLBM)
 - ≈ Field Module (FM) and/or JIO
 - ≈ Water Level Probe (WLP)
- The WLBM is fitted in a pump house and is responsible for displaying the current water level and for controlling the pumps.
- A FM is fitted at the dam or reservoir and connected to a WLP. The measured levels are transmitted to the WLBM.

Operation:

The WLC is programmed with separate pump-start and pump-stop values for the main pump and the auxiliary pump. The controller polls the FM (polling interval programmable) for level readings from the WLP inside the reservoir or dam. If the level reading is lower than that of one of the pump-start settings the pump will start. Once the level has reached a reading greater than that of the pump-stop reading the respective pumps will be switched off.

Possible Applications:**Source Control**

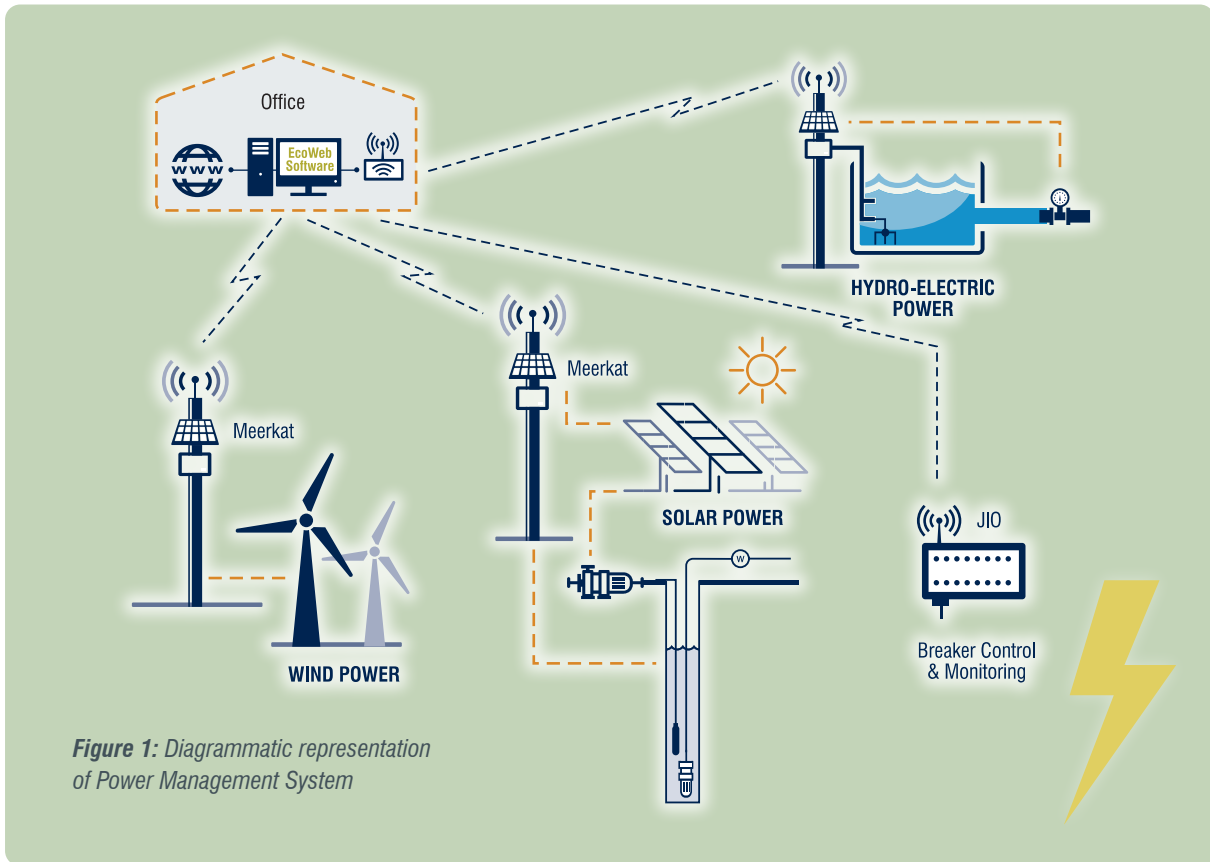
The WLC receives water level readings from a water reservoir. Depending on the pre-programmed critical limits, the controller will activate a main supply pump to fill the reservoir, and deactivate this pump once the reservoir is full. In the event that the reservoir gets depleted faster than it can be supplied by the main supply pump, an auxiliary pump can be directly or wirelessly activated to replenish the reservoir.

Irrigation Control

The main irrigation pump draws water from a reservoir through irrigation lines. If the water level readings are within a certain range, the WLC will activate the main irrigation pump. The pump will stop when the preset low level is reached. The auxiliary pump can be activated to assist the main pump in a booster configuration.

3.9 POWER MANAGEMENT

OVERVIEW



Jabeco has developed a Power Management and monitoring system to be utilized in medium size municipalities and management of electrical provisioning for farms, including:

- In coming ESCOM power
- Emergency generators
- EV solar systems
- Hydro electrical systems.

The Power Management Module provides for the following monitoring and control functionality:

- AC and DC voltage monitoring
- Current monitoring
- Power meters
- Integration of power analyzer.
- Breaker control.

Figure 1 displays the SCADA screen currently used to view and control the status of each distribution board within the substation.

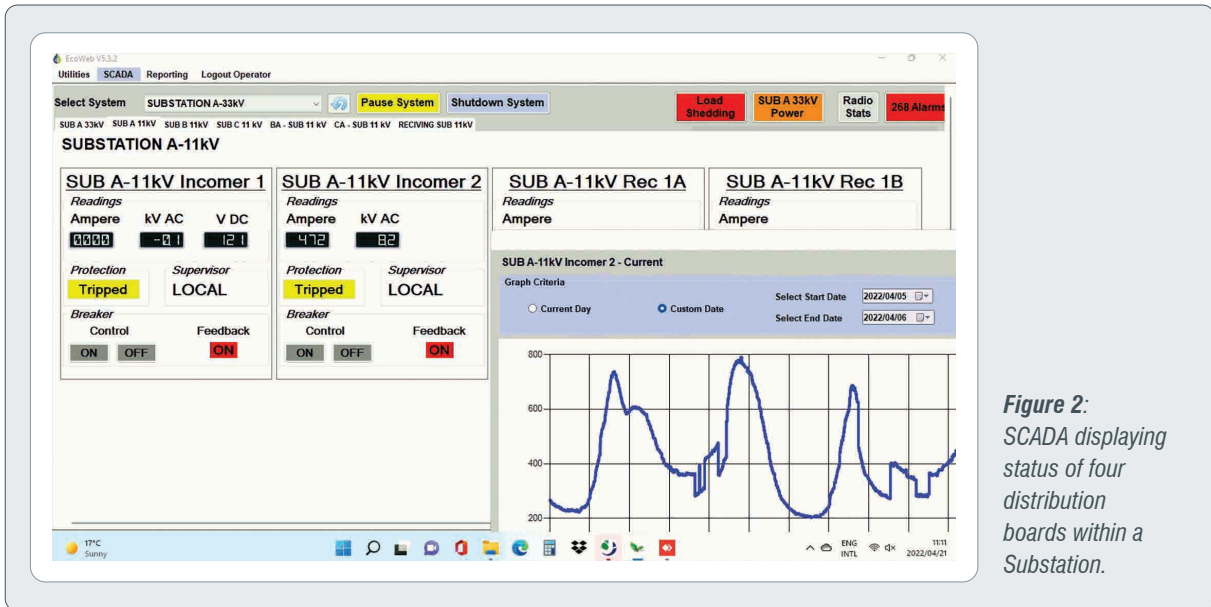


Figure 2: SCADA displaying status of four distribution boards within a Substation.

Load Shedding: This power module supplied by Jabeco may very easily be integrated with different methods of power generation, monitoring and control, such as PV systems, power to pumps/motors and power quality. Additionally whatsapp, sms and emails may be sent to alert the operator of selected events.

Load Shedding Module

A Load Shedding Module monitors power utilization and can be configured to switch off breakers when the total power usage exceeds a selected value. This system has been implemented at municipalities where it monitors the voltages and current of incoming and outgoing lines at substations. A Load Shedding Setup screen allows for

An automated load shedding module is required which automatically switches off selected breakers, when the total load exceeds a defined current level.

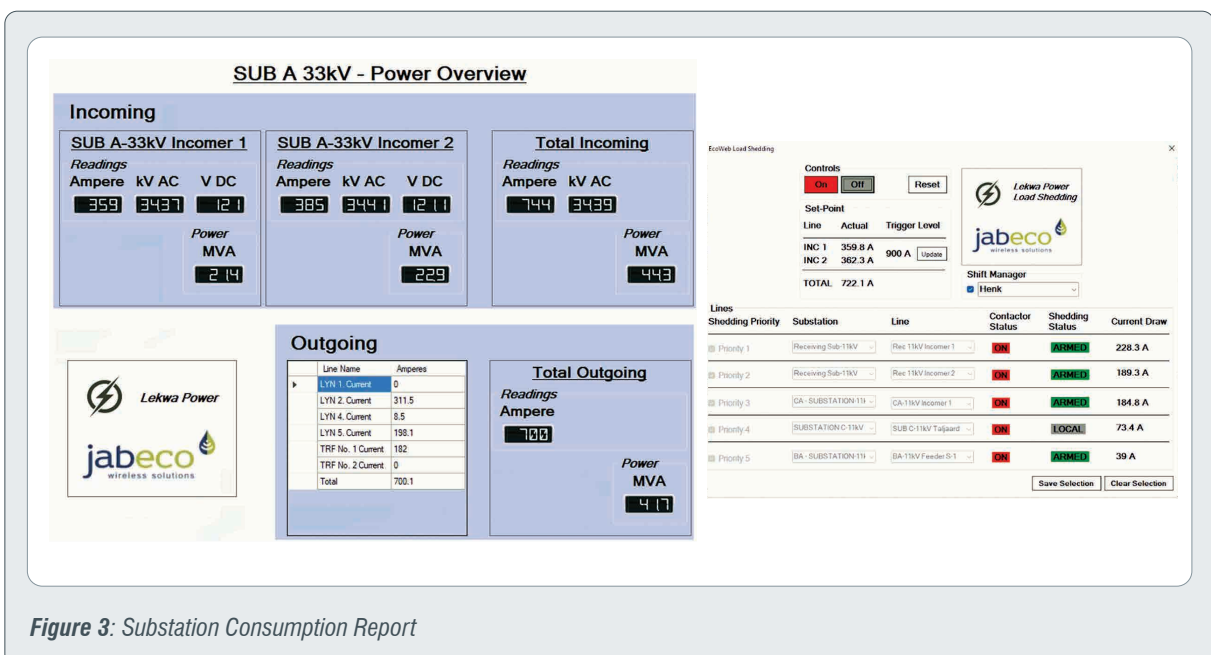


Figure 3: Substation Consumption Report





4.1 MODEM

Wireless Network Communication Interface



jabeco
wireless solutions

- 433MHz or 868MHz.
- USB connection to PC.
- Adjustable power output up to 10dBm.

PRODUCT INFORMATION

The Jabeco Modem serves as the communication interface between the Jabeco EcoWeb Software Suite and the wireless control infrastructure in the integrated network. It connects to a PC via USB serial interface, and provides transparent wireless communication to the remote Jabeco field units by utilizing the JCOM radio network management software.

SPECIFICATIONS

POWER

- 6 – 6.8 VDC @ < 200mA.

RADIO COMMUNICATION

- **Frequency:** 433MHz or 868MHz, on factory order.
- **RF Power:** 10mW max.
- **RF Connector :** SMA Jack Female.
- **Antenna:**
 - Dipole, standard ex-factory.
 - Optional: Single element Yagi.
- **Reach:**
 - **Dipole:** + 3Km with good LOS.
 - **Yagi:** up to 10Km with good LOS.

LOCAL COMMS INTERFACE

- USB connection to the PC.

APPLICATION NOTES

- **Baud rate:** 9600bps.

LED INDICATORS

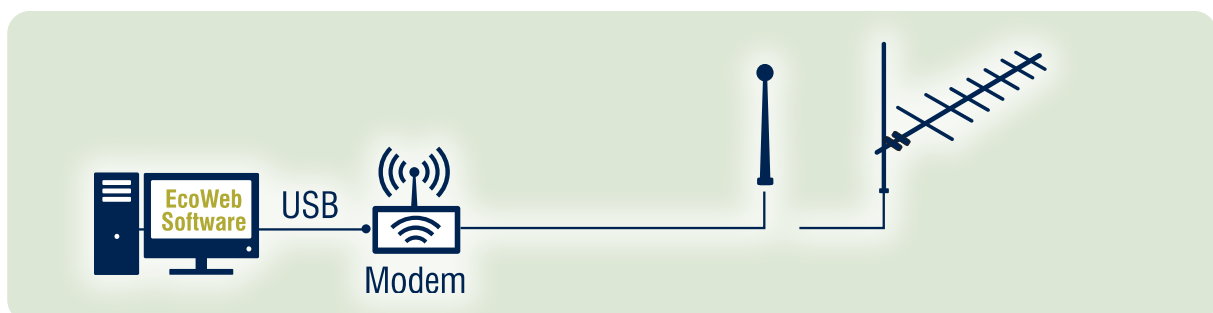
Power In, Power Out, Transmit, and Signal Strength is displayed.

PHYSICAL

- **Weight:** approx. 0,3kg.
- **Dimensions:** 150mm x 120mm x 100mm.

ENVIRONMENTAL

- This unit is designed to operate in an office environment.



4.2 MEERKAT FIELD MODULE

Solar Powered Wireless Remote I/O Module



jabeco
wireless solutions

- 443MHz ISM band radio communication:
 - Adjustable power output up to 10dBm.
 - Low noise receiver narrowband filter.
 - Repeater capability.
- Bi-directional communication.
- Controls latching outputs to actuate hydraulic valves.
- Digital and analogue inputs.
- RS485 interface.
- Status monitoring e.g. battery and solar voltage levels and radio.
- Remote setup of device parameters.
- Solar powered with more than 100 hrs battery backup.
- Extend I/O's RS485 interface modules.
- Up to 12 VDC (definable) auxiliary output power.

PRODUCT INFORMATION

The Meerkat Field Module (FM) is a basic building block of any Jabeco system, providing a communication and actuation channel between control units and remote devices. It can control digital outputs, such as valves, receive analogue and digital inputs from measurement devices in the field, and wirelessly communicate over a range of more than three kilometres. An interconnected network of the Meerkat FM's can be used to provide full wireless control over a distributed water management system.

SPECIFICATIONS

POWER

- **Battery:** 3.6V, 4.5Ah, over 5 days charge life.
- **Solar:** 6.5Vnom, 1.2W.
- **Life expectancy** is >3y battery, >5y solar panel.

COMMUNICATION

- **Frequency:** 433MHz or 868MHz, on factory order.
- **RF Power:** 10mW max.
- **RF Connector:** SMA Jack Female.
- **Antenna:**
 - Dipole, standard ex-factory.
 - Optional: Single element Yagi.
- **Reach:** Dipole: + 3Km with good LOS.
Yagi: up to 10Km with good LOS.

LOCAL COMMS INTERFACE

- **Hardware:** RS485, RS232, TTL.
- **Protocol:** SDI-12, Modbus.

INPUTS

- **Digital:**
 - High impedance, resistive load.
 - On/Off or Counter, >100ms pulse.
- **Analogue:** 5VDC max, switched at 100ms live period.
- Auxiliary output power.

OUTPUTS

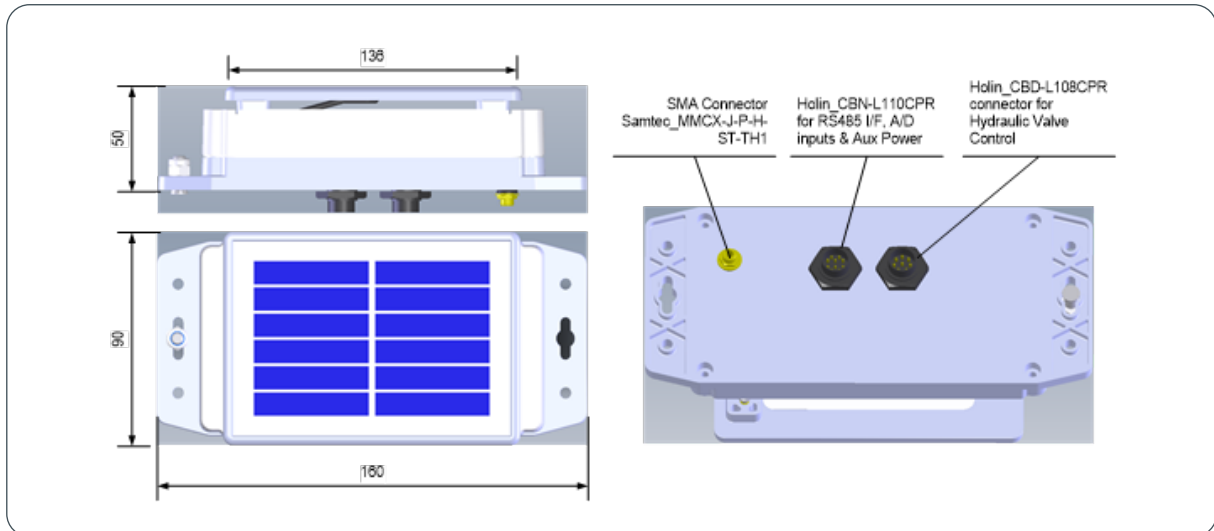
- **Number:** 4.
- **Type:** Pulse, for latching load (e.g. solenoid).
- **Magnitude:** <23V @ 30ms max Width.
- **Source:** 2200mF capacitive.

PROGRAMMING

- System firmware via TTL (OEM suite).
- User parameters via TTL or wireless (JCOM radio management software).

PHYSICAL

- **Weight:** approx. 1kg.
- **Dimensions:** 160mm x 90mm x 50mm.



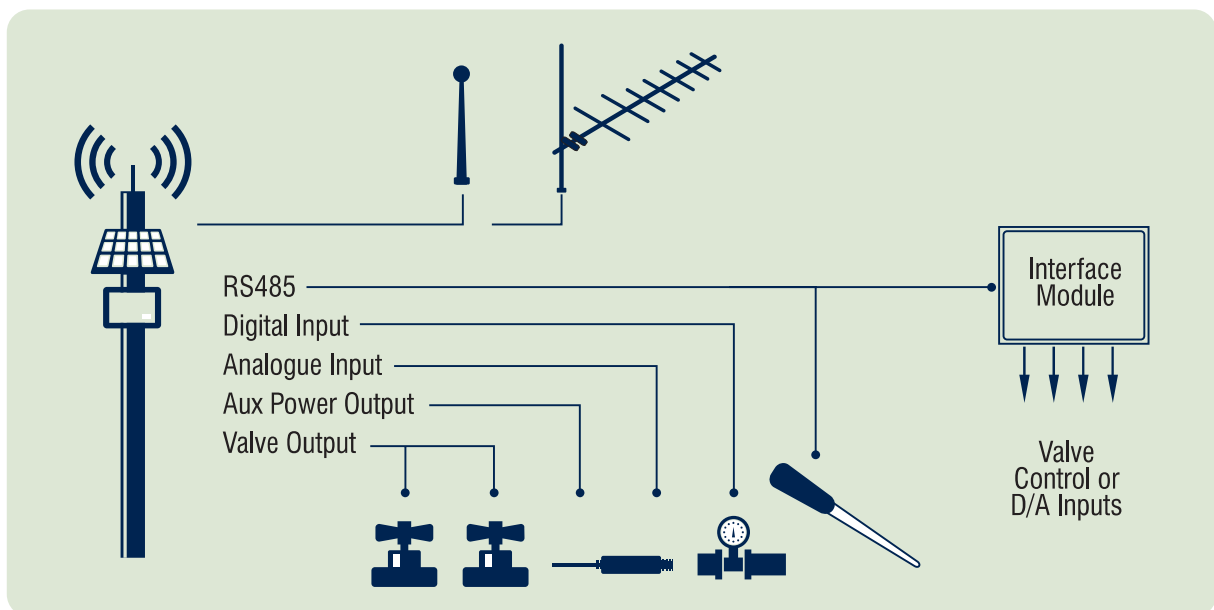
ENVIRONMENTAL

- **Operating ambient:** -20°C to 50°C.
- IP65.

ORDER INFORMATION

Part No	Description	Packing list
JB-FX-11	Meerkat Valve Control only	All models come with a Meerkat Module, mounting bracket, antenna and cable harness.
JB-FX-12	Meerkat Input Module only	
JB-FX-13	Meerkat Multifunction	

APPLICATION NOTES



4.3 FIELD MODULE

Solar Powered Wireless Remote I/O Module



- **Solar Powered**
- **Latching Outputs**
Up to four DC pulse outputs for latching appropriate pilot valve solenoids to actuate hydraulic valves.
- **Bi-directional Communication**
Radio command acknowledgement and data interrogation replied back.
- **Status Monitoring**
Upon interrogation the FM reports vital data such as battery and solar voltage levels, device ID, transmit and receive signal levels.
- **FM Setup Control**
All setup parameters can be read remotely and certain key setup parameters can be programmed remotely.
- **Input Capability**
By adding the appropriate add-on module(s), up to four digital inputs and four analogue inputs can be added to monitor sensors that provide various irrigation network parameters.
- **Configurable Digital / Analogue Inputs**
 - (D) Dry inputs, monitor On/Off condition.
 - (D) Counter inputs, monitor quantity and/or rate.
 - (A) Analogue voltage monitoring.
 - (A) 4-20mA current monitoring.
- **Extended communication**
All Jabeco radio units possess transparent repeater capabilities. This allows for a broad communications reach.
- **Field Communication**
By adding the appropriate add-on module, local Modbus and SDI-12 communication with processor based sensors is enabled. Sensor data is assembled locally and transmitted packet-sized to central control.
- **Sensor Interfacing**
Temperature, humidity, pressure, flow, wind speed, soil moisture etc.

jabeco
wireless solutions



PRODUCT INFORMATION

Jabeco's FMs are designed to provide autonomous and maintenance free operation. The internal battery is backed up with solar power, and can be used to control digital outputs, such as valves, receive analogue and digital inputs from measurement devices in the field, and wirelessly communicate over a range of more than three kilometers. Status and I/O information is transmitted and confirmed back to central control upon interrogation.

FM's can be used to connect a single remote site to a controller, but are typically deployed as an interconnected wireless control network.



SPECIFICATIONS

POWER

- **Battery:** 6V at 4.5Ah, over 5 days charge life.
- **Solar:** 8.5Vnom, 1.5W.
- **Life expectancy** is >3y battery, >5y solar panel.

COMMUNICATION

- **Frequency:** 433MHz or 868MHz, on factory order.
- **RF Power:** 10mW max.
- **RF Connector:** SMA Jack Female.
- **Antenna:**
 - Dipole, standard ex-factory.
 - Optional: Single element Yagi.
- **Reach:** Dipole: + 3Km with good LOS.
Yagi: up to 10Km with good LOS.

LOCAL COMMS INTERFACE

- **Hardware:** RS485, RS232, TTL.
- **Protocol:** SDI-12, Modbus.

INPUTS

- **Digital:**
 - High impedance, resistive load.
 - On/Off or Counter, >100ms pulse.
- **Analogue:** 5VDC max, switched at 100ms live period.
- Up to 4 digital and 4 analogue.

OUTPUTS

- **Number:** 2 or 4 outputs, on factory order.
- **Type:** Pulse, for latching load (e.g. solenoid).
- **Magnitude:** <23V @ 30ms max Width.
- **Source:** 2200mF capacitive.

PROGRAMMING

- System firmware via TTL (OEM suite).
- User parameters via TTL or wireless (JCOM radio management software).

PHYSICAL

- **Weight:** approx. 2kg.
- **Dimensions:** 250mm x 200mm x 180mm.

ENVIRONMENTAL

- **Operating Ambient:** -20°C to 50°C.
- IP65.



ORDER INFORMATION

Part No	Description	Packing list
JB-FA-00-42	Field Module – 433MHz 2 output channels	All modules come with an integrated mounting bracket, dipole antenna and solar panel, and a valve connection box with cable. Dipole antenna can be replaced by a separate Yagi antenna.
JB-FA-00-82	Field Module - 868/2ch/Omni	
JB-FA-00-44	Field Module – 433MHz 4 output channels	
JB-FA-00-84	Field Module - 868/4ch/Omni	
Add-on Modules		
JB-GA-06	RS485 Serial Convertor Module	Fitted Internally
JB-GA-02	4 x Analogue Input Module	
JB-GA-01	4 x Digital Input Module	

4.4 DASSIE

Digital / Analogue Sensor Interface Unit



- RS485 Interface
- 4 x Digital or Analogue Inputs
- Lightning resistant
- Multiple units can be connected in RS485 daisy chain to extend I/O's
- 5V DC auxiliary output power

jabeco
wireless solutions



PRODUCT INFORMATION

The DASSIE Digital/Analogue Sensor Interface Unit connects to the Meerkat Field Module (FM) to extend the number of digital or analogue sensors, which can be connected to the FM. Multiple DASSIE's can be connected via a RS485 daisy chain, thus not limiting the number of sensors that can be connected to a FM.



SPECIFICATIONS

POWER

- **Battery:** 5V at 4.5Ah, over 5 days charge life.

COMMUNICATION

- **Frequency:** RS485

INPUTS

- **Digital:**
 - High impedance, resistive load.
 - On/Off or Counter, >100ms pulse.
- **Analogue:** 5VDC max, switched at 100ms live period.
- Auxiliary Output Power

PROGRAMMING

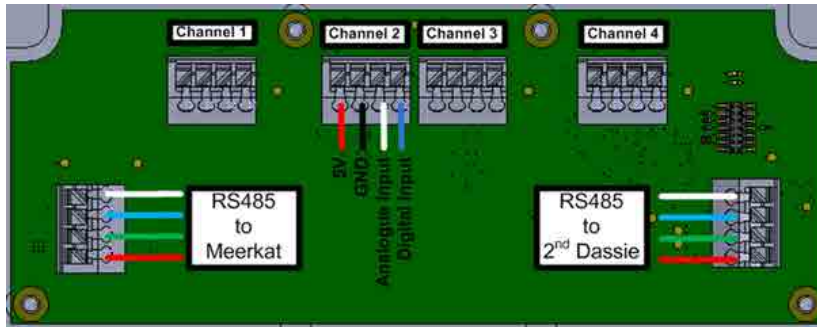
- System firmware via TTL (OEM suite).
- User parameters via TTL or wireless (JCOM program).

PHYSICAL

- **Weight:** approx. 1kg.
- **Dimensions:** 160mm x 90mm x 50mm.

ENVIRONMENTAL

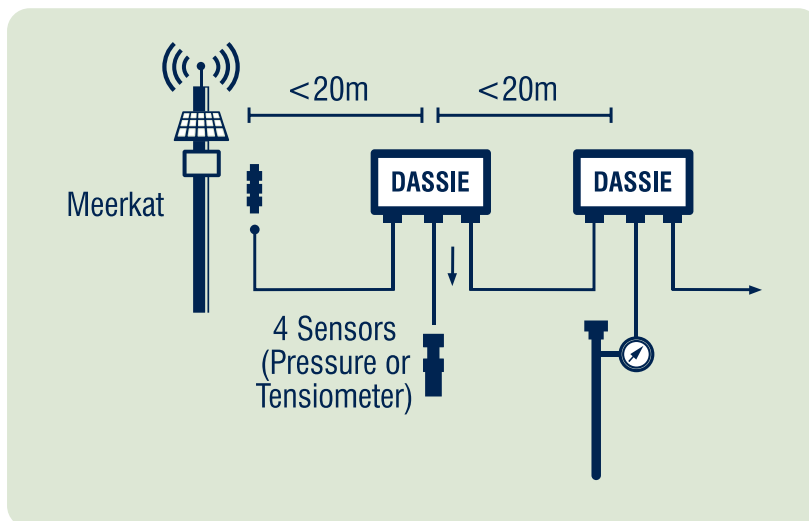
- **Operating Ambient:** -20°C to 50°C.
- IP65.



ORDER INFORMATION

Part No	Description	Packing list
JB-FX-02	Digital/Analogue Sensor Interface Unit (DASSIE)	Supplied with Dassie Unit with mounting bracket and cable harness

APPLICATION NOTES



4.5 JIO and JFERT Wireless I/O Module



- **Outputs**
8 continuous DC open collector outputs for driving appropriate relays and/or Jabeco Relay PCB.
- **Bi-directional Communication**
Radio command acknowledgement and data interrogation replied back.
- **Status Monitoring**
Upon interrogation the unit reports vital data such as battery voltage levels, device ID, transmit and receive signal levels.
- **JIO Setup Control**
All setup parameters can be read remotely and certain key setup parameters can be programmed remotely.
- **Input Capability**
8 Digital inputs and 8 analogue inputs can monitor sensors and functions that provide various irrigation network parameters.
- **Configurable Digital/Analogue Inputs**
 - (D) Dry inputs, monitor On/Off condition.
 - (D) Counter inputs, monitor quantity and/or rate.
 - (A) Analogue voltage monitoring.
 - (A) 4-20mA current monitoring.
- **Extended communication**
All Jabeco radio units possess transparent repeater capabilities. This allows for a broad communications reach.
- **Field Communication**
RS485 capability allows JIOs to be chained to extend I/O counts and capabilities. The RS485 can also be developed to communicate with third party equipment, typical protocols being SDI-12 and Modbus.
- **Sensor Interfacing**
Temperature, humidity, pressure, flow, wind speed, soil moisture etc.
- **Ease of installation**
JIO's and JFERT's are DIN-rail mountable and can be installed in any type of DB or Control Panel.
- **Display**
There are 16 LEDS on the front panel of the JIO or JFERT, which indicate the digital input and output statuses.



PRODUCT INFORMATION

The Jabeco Input-Output module (JIO) is generally installed in pump stations, and allows inputs and outputs to be connected to various control system functions. Inputs are configured to monitor digital On/Off or Counter functions. A separate set of analogue inputs perform continuous monitoring. Status and I/O information is transmitted and confirmed back to central control upon interrogation. The JIO typically receives all irrigation control system status inputs and actuates valves, switches and pumps. The JIO performs similar functions as the FM. The primary difference is that whereas the FM is dedicated battery driven, the JIO is powered by available utility supply.



The JFERT is a firmware derivative of the JIO to control fertigation processes. The JFERT autonomously controls fertigation dosing once the parameters for correct volumetric mixing of fertigation is set through Jabeco's EcoWeb control software.



SPECIFICATIONS

POWER

- **Primary:** 6V – 24V at 500mA max.

COMMUNICATION

- **Frequency:** 433MHz or 868MHz, on factory order.
- **RF Power:** 10mW max.
- **RF Connector:** F-Type Jack (Female).
- **Antenna:**
 - Dipole, standard ex-factory.
 - Optional: Single element Yagi.
- **Reach:** Dipole: + 3Km with good LOS.
Yagi: up to 10Km with good LOS.

LOCAL COMMS INTERFACE

- **Hardware:** RS485, RS232, TTL.
- **Protocol:** SDI-12, Modbus.
- **Multiple JIO** RS485 link-up, 10 units max

INPUTS

- **Digital:**
 - **8 Digital Inputs:** Ohmic source (e.g. dry contact).
 - Impedance >100kΩ, active low, 5VDC referenced.
 - Counter pulse width >100ms @ 10% duty.
- **Analogue:**
 - **8 analogue Inputs:** 0-5VDC, scalable downward.

- Impedance >6kΩ.
- 5Vdc source available at 120mA max.

OUTPUTS

- 8 Digital outputs, continuous DC, resistive.
- **Output characteristics:** Open Collector to ground.
- 30VDC max, up to 100mA.
- Inductive load requires fly-back diode.

PROGRAMMING

- System firmware via TTL (OEM suite).
- User parameters via TTL or wireless (JCOM radio management software).

PHYSICAL

- **Weight:** approx. 0.5kg.
- **Dimensions:** 100mm x 75mm x 60mm.

ENVIRONMENTAL

- **Operating ambient:** -20°C to 50°C.
- Designed for typical pump house conditions.



ORDER INFORMATION

Part No	Description	Packing list
JB-JA-00-00	JIO - no radio	None
JB-JA-00-01	JFERT - no radio	
JB-JA-00-40	JIO – 443MHz Radio	
JB-JA-00-80	JIO – 868MHz Radio	

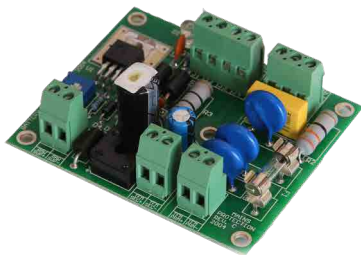
APPLICATION NOTES

Water level measurement with switches



4.6 CHARGE MODULE

Regulated Power Supply



jabeco
wireless solutions

- **Primary:** 220VAC with transorb protection.
- **Secondary Input:** 12VAC or 12VDC.
- **Output:** 12VDC and 6VDC.



PRODUCT INFORMATION

The Charge Module provides power to Jabeco equipment and is a standard product which is supplied with the Jabeco Pump House Controllers.

The Charge Module offers two power lines:

- **Primary line:**
Provides surge protection on the AC incoming line feeding the Pump House Controller power transformer.
- **Secondary line:**
Converts incoming 12VAC (from the power transformer) to a 12VDC and 6VDC output and 6VDC battery output.



SPECIFICATIONS

POWER

- **Primary Line:**
 - 220VAC, 12VDC nominal.
 - Max 10W power consumption.
- **Secondary Line Input:** 12VAC.

OUTPUTS

- 12VDC 1000mA max.
- 6VDC 1000mA max.
- 6VDC battery charge output.
- **Output characteristics:** TTL switched to ground; open collector, switching 30VDC.

PHYSICAL

- **Weight:** approx. 0.2kg.
- **Dimensions:** 100mm x 75mm x 10mm.

ENVIRONMENTAL

- **Operating ambient:** -20°C to 50°C.
- Designed for typical pump house conditions.

4.7 RELAY CARD

Digital Relay Output



- 4 x TTL input channels.
- 4 x Relay outputs.
- Up 50VDC or 30VAC control.



PRODUCT INFORMATION

The Relay Card provides four relay outputs for the control of equipment, and is a standard product which is supplied with the Jabeco Pump House Controllers.



SPECIFICATIONS

POWER

- 12VDC nominal.
- Max 10W power consumption.

INPUTS

- 4 Digital TTL Input.

OUTPUTS

- 4 Digital outputs.
- Output characteristics: TTL switched to ground; open collector, switching 50VDC max, or 30VAC, up to 100mA.
- The outputs can drive on-off switching through a relay.

PHYSICAL

- **Weight:** approx. 0.2kg.
- **Dimensions:** 100mm x 75mm x 10mm.

ENVIRONMENTAL

- **Operating ambient:** -20°C to 50°C.
- Designed for typical pump house conditions.

4.8 WATER LEVEL CONTROLLER

Stand-Alone Wireless Water Level Control System



jabeco
wireless solutions

- Operates as a stand-alone system.
- Automatically regulates the level of a dam or reservoir in order to maintain pre-programmed water levels.
- Interfaces with a pressure sensor that accurately measures the water level.
- Wireless communications via FM or J10.
- Two separate pump control channels (main and auxiliary).
- Operations alarms for pump failure, communications failure, and low field module battery.
- Analogue output for controlling a third device, such as VSD on a pump.
- Indicates water levels and operational conditions on the faceplate of the module, and can also be remotely monitored by PC.
- Can be integrated into more complex real-time monitoring systems.



SPECIFICATIONS

POWER

- Requires a connection to 220VAC mains.
- Max 12W power consumption.

COMMUNICATION

- **Frequency:** 433MHz or 868MHz, on factory order.
- **RF Power:** 10mW max.
- **RF Connector:** F-Type.
- **Antenna:**
 - Dipole, standard ex-factory.
 - Optional: Single element Yagi.
- **Reach:** Dipole: + 3Km with good LOS.
Yagi: up to 10Km with good LOS.

LOCAL COMMS INTERFACE

- **Hardware:** RS485, RS232, TTL.
- **Protocol:** SDI-12, Modbus.

PHYSICAL

- **Weight:** approx. 2kg.
- **Dimensions:** 250mm x 200mm x 180mm.

ENVIRONMENTAL

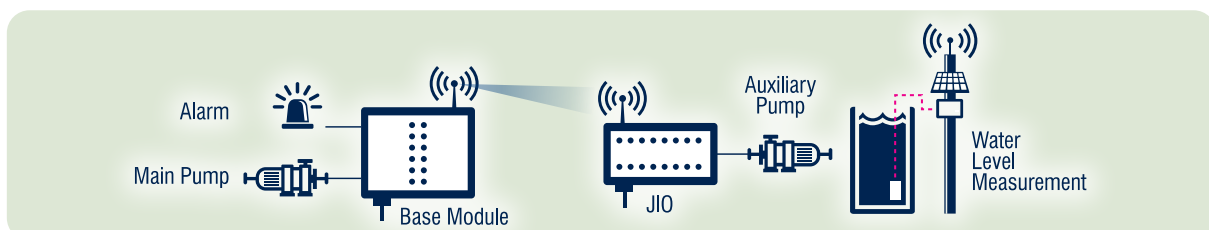
- **Operating ambient:** -20°C to 50°C.
- Designed for typical pump house conditions.



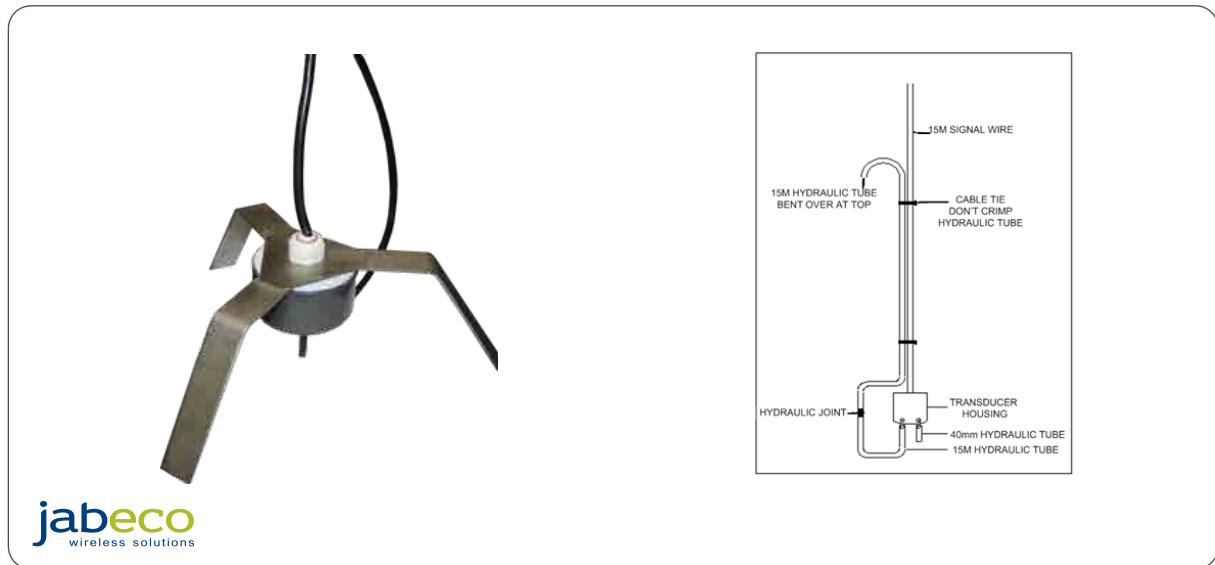
ORDER INFORMATION

Part No	Description	Packing list
JB-WA-00-40	Water Level Controller – 433MHz	WLC unit only. Antenna, Field module, JIO and Water Level Probe not included.
JB-WA-00-80	Water Level Controller – 868MHz	
Add-on Modules		
JB-GA-07	Analogue Output Module	Fitted Internally

APPLICATION NOTES



4.9 WATER LEVEL PROBE



PRODUCT INFORMATION

The Water Level Probe (WLP) is installed in dams and reservoirs to measure pressure which relates to the depth of the water level. Water level readings from these sensors are used to control dam and reservoir levels.

SPECIFICATIONS

SENSOR CHARACTERISTICS

- **Pressure:** 0 – 100KPa.
- **Accuracy:** 2.5% Max

ELECTRICAL

- **Supply voltage:** 5VDC.
- **Signal output:** 0.2 – 4.7VDC.

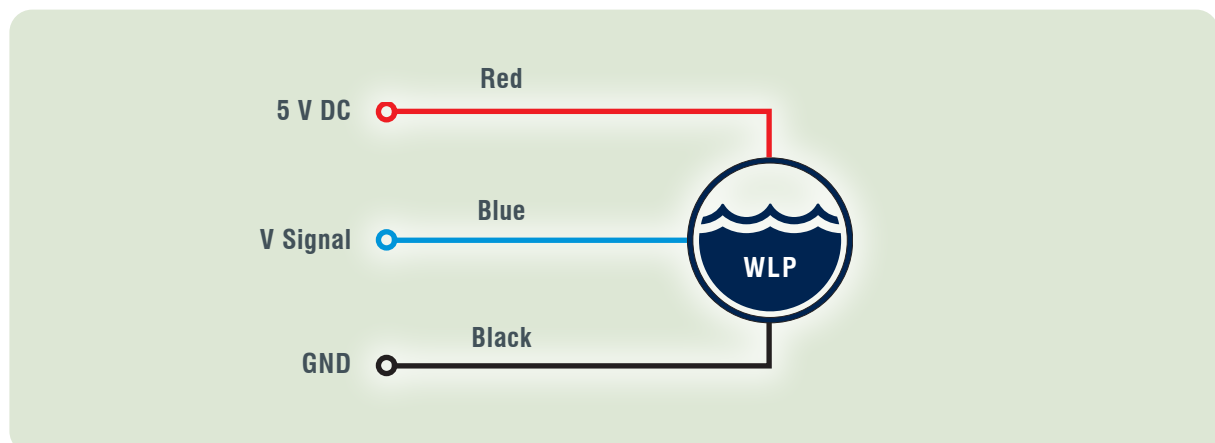
PHYSICAL

- The sensor is mounted on a stainless steel tripod at height of 200mm.
- Tripod leg spacing is 250mm.
- **Weight:** approx. 1kg.

ENVIRONMENTAL

- Suitable to be installed at water depth of 10m.

APPLICATION NOTES



4.10 BASE MODULE

Wireless I/O Controller



- **Configuration:**
 - Each input channel is mapped to an address and port in the wireless network.
 - On-site configuration via serial interface.
 - Remote configuration via wireless interface.
- **Functionality:**
 - Hard reset facility.
 - Signal surge protection on input channels.
 - Signal strength for every connection can be monitored through the software interface.
- **LED Indicators:**
 - Power On.
 - Signal Strength.
 - Per channel Input Active: Green.
 - Communication Input Fault: Red.
 - Input active flashing Red: allocated FM battery low.
- **Options:**
 - Expandable in groups of 8 input channels.
 - Maximum 32 Input channels.
 - Base Module can communicate with Jabeco network PC.

jabeco
wireless solutions



PRODUCT INFORMATION

The Base Module is used to provide wireless control from an existing wired-in irrigation controller. It replaces communication cables of existing infrastructure by converting existing units into wireless controllers. The Base Module interfaces with the inputs and outputs from the controller, and provides wireless communication to JIO's and FM's, which interface with field devices.



SPECIFICATIONS

POWER

- Requires a connection to 220VAC mains.
- Max 10W power consumption.

COMMUNICATION

- **Frequency:** 433MHz or 868MHz, on factory order.
- **RF Power:** 10mW max.
- **RF Connector:** F-Type.
- **Antenna:**
 - Dipole, standard ex-factory.
 - Optional: Single element Yagi.
- **Reach:** Dipole: + 3Km with good LOS.
Yagi: up to 10Km with good LOS.

SERIAL COMMS INTERFACE

- RS-232 (DB9 Connector).
- **Baud rate:** 9600 bps.

INPUTS

- 0-30VDC.
- 0-24VAC.
- Internal 5VDC available for dry contact inputs.
- Common ground (internal 0V).

PHYSICAL

- **Weight:** approx. 2kg.
- **Dimensions:** 250mm x 200mm x 180mm.

ENVIRONMENTAL

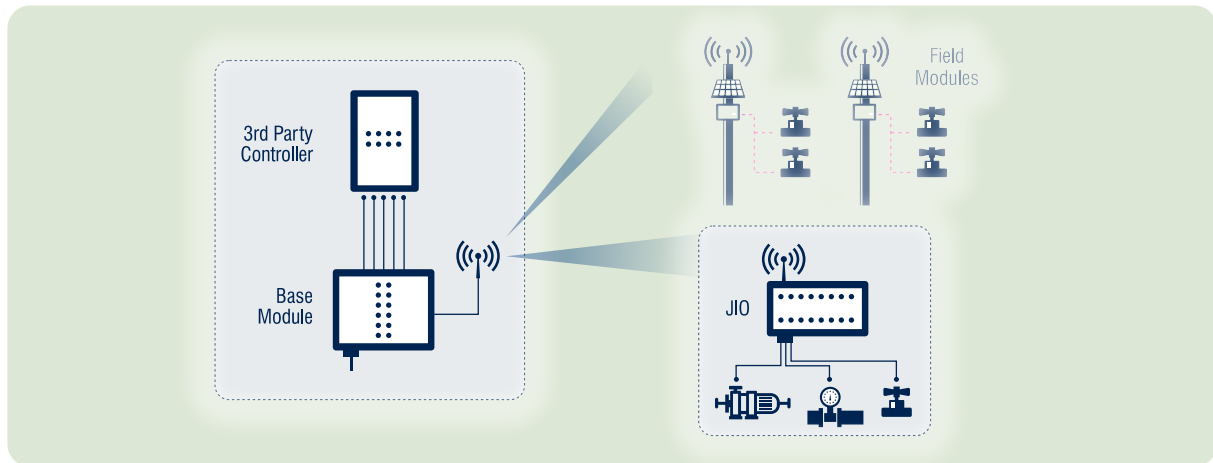
- **Operating ambient:** -20°C to 50°C.
- IP 56 housing.
- Designed for typical pump house conditions.

**ORDER INFORMATION**

Part No	Description	Packing list
JB-BA-00-40	Stand Alone Base Module – 433MHz	Base module unit only. Antenna, Field module, JIO and Water Level Probe not included.
JB-BA-00-80	Stand Alone Base Module – 868MHz	

OPERATION

- Sending wireless signals:**
 The Base Module receives input signals from the outputs of the existing controller, and relays it as a radio signal. Every input into the Base Module is allocated to a specific address and port within the wireless network, so that it can actuate a specific device in the infrastructure.
- Verifying communications:**
 Every signal sent to a specific FM is acknowledged back to the Base Module. Should acknowledgement not occur, the signal will be resent two more times. In the event that there is no acknowledgement from the FM after three communication attempts, the respective channel on the Base Module will light up with a red alarm light to indicate a fault with the unit output in the field.
- Vital signs check:**
 If the Base Module sends a signal and a flickering red light appears on the module's display for that station, it indicates that the corresponding FM's battery is low.

APPLICATION NOTES





ACCESSORIES

5 INFORMATION

Part No	Description	Product Information
JB-AZ-03	Antenna - 868MHz Wireless	Frequency(MHz): 868 ± 5 Bandwidth(MHz): 10 VSWR ≤ 1.5 Gain(dBi): 3 Max Input power(W): 20 Input Impedance(Ω): 50 Polarization: Vertical Antenna Length(mm): 250 Cable Length(m): 2, 3, 5 etc. Cable Type: RG174 Connector: SMA Plug (Male) Mounting: Screw
		
JB-AZ-01	Antenna - BY-433-07 433MHz Wireless	Frequency(MHz): 433 ± 5 Bandwidth(MHz): 10 VSWR ≤ 1.5 Gain(dBi): 3 Max Input power(W): 20 Input Impedance(Ω): 50 Polarization: Vertical Antenna Length(mm): 250 Cable Length(m): 2, 3, 5 etc. Cable Type: RG174 Connector: SMA Plug (Male) Mounting: Screw
		
JB-AZ-02	Antenna - Yagi Cell002 Security Band Ant 433MHz	Frequency: 433 ± 5 MHz Bandwidth: 10MHz VSWR ≤ 1.5 Gain: 6Dbi Input Impedance: 50 Ω Polarization: Vertical Antenna Height: 500mm Width: 650mm Connector: None Mounting: 50mm clamp
		



Part No	Description	Product Information
JB-ZE-01	GT-64 GSM Modem Terminal	Includes: • Power Supply and Power Cable • USB to mini USB cable • Microfit to TS232 Serial Cable (Option) • TG22.02 Taoglas Antenna
		
JB-PM-01	35W Single Output With Battery Charger Enclosed	Output Voltage: 12V Rated Power: 35W Voltage Adjustable Range: 10.8V-13.2V Rated Current: 2.4A
		
JB-PM-02	60W Single Output With Battery Charger Enclosed	Output Voltage: 12V Rated Power: 60W Voltage Adjustable Range: 10.8V-13.2V Rated Current: 4A
		
JB-EB-01	Battery - BATT/23 6V 4.5AH Lead Acid	Nominal Voltage: 6.0V Nominal Capacity: 4.5Ah, 4500mAh Max Charging Current: 1.35A Max Discharging Current: 67.5A Dimensions: 70mm x 47mm x 101mm Weight: 910g
		
JB-EB-02	Battery - BATT 12V 4.5AH Lead Acid	Nominal Voltage: 12.0V Nominal Capacity: 4.5Ah, 4500mAh Max Charging Current: 1.35A Max Discharging Current: 67.5A Dimensions: 90mm x 70mm x 101mm Weight: 1814g
		



Part No	Description	Product Information
JB-EZ-08	Relay - D2/N 230VAC 10A	
		55 Series miniature industrial relay Dimensions: 37.2mm x 21mm x 28mm Part Nr: 553282300040 Current: 10A Contact: 2 changeover Coil voltage: 240VAC Rated power AC/DC VA (50 Hz)/W: 1.5/1
JB-EZ-09	Relay - D2/N 24VAC 10A 2PDT Miniature	
		55 Series miniature industrial relay Dimensions: 37.2mm x 21mm x 28mm Part Nr: 553280240040 Current: 10A Contact: 2 changeover Coil voltage: 24VAC Rated power AC/DC VA (50 Hz)/W: 1.5/1
JB-OZ-14	Solenoid BERMAD S-402-3W-BB	
		Connections: 1/8m" NPT 1- Vent 2- Valve Control Chamber (Common) 3- Pressure Electrical Data: Voltage Range: 12 - 50 VDC Coil Resistance: 4.2Ω Pulse Width: 20 - 100 Msec Required Capacitor: 4700μf
JB-OZ-15	Solenoid BERMAD S-400-D-3W-BB	
		Connections: 1/8m" NPT 1- Vent 2- Valve Control Chamber (Common) 3- Pressure Electrical Data per actuator type: S-400-24VAC-D-NC S-400-24VAC-D-NO S-400-24VDC-NO S-400-12VDC-NO
JB-EZ-16	Transformer TRF MT909-1 1N 240V to 9VAC 1A	
		Model: TX-20M909 Input: 240VAC, 50Hz Output: 9-0-9VAC, 1A

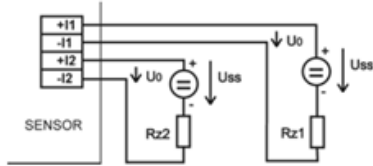
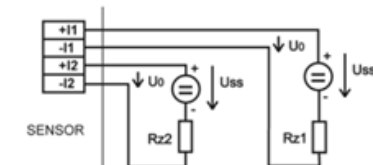


Part No	Description	Product Information
JB-EZ-21	Transformer TRF MT909-2 1N 240V to 9VAC 2A	
		Model: TX-20M909 Input: 240VAC, 50Hz Output: 9-0-9VAC, 2A
JB-OZ-22 JB-OZ-23	Transformer Single Phase 220V to 24VAC	
		Primary: 240VAC Secondary: 24VAC Ratings: T-25VA M1 T-50VA M1 T100VA M1
JB-SP-01	0 To 5V Ratiometric Pressure Sensor- SPKT*R*	
		Power Supply: 4.5 - 5.5VDC Output: 0.5 - 4.5VDC Pressure Range: SPKT0013R3: -1- 9.3 Bar SPKT0033R0: 0 to 34.5 Bar SPKT0053R0: -1 to 4.2 Bar SPKT00B6R0: 0 to 45 Bar Connections: - The black cable receives the power supply (5VDC). - The white cable is the output signal relevant to the read pressure. - The green cable refers to the power supply ground.
JB-AZ-11	SMA-F Crimp	
		Crimp Connector for 195, RG-58 Series Cable SMA Jack (Female)
JB-AZ-14	F-Type Connector - Crimp	
		Crimp Connector for 195, RG-58 Series Cable F-Type Plug (Male)

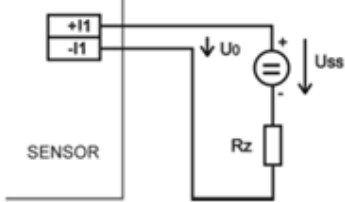
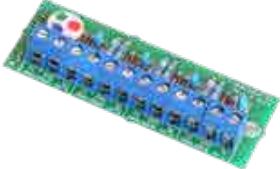


Part No	Description	Product Information
JB-AZ-15	SMA-F-Type Adapter	
		A-Side: SMA Jack (Female) B-Side: F-Type Jack (Female)
JB-AZ-12	SMA-M Crimp Connector	
		SMA Plug (Male) For 195, RG-58 Series Cable
JB-AZ-20	Dipole Antenna Bracket	
		Dimensions: 105mm x 105mm x 25mm
JB-OZ-01	Solenoid Bracket	
		Dimensions: 150mm x 150mm x 30mm
JB-AZ-22	Mounting Pole	
		Outer Diameter: 40mm Thickness: 2mm Length: 4m
JB-AZ-21	Stand-Off Bracket (Tripod) for 35mm Mounting Pole	
		Dimensions: 350mm x 250mm x 35mm Bend Height: 100mm (Stand-off from wall)



Part No	Description	Product Information
JB-OH-06	LMR-195 Coaxial Cable	 Resistance: 50Ω Outer Diameter: 4.95mm Cable Group: C Attenuation: 0.25dB/m
JB-TH-00	COMET P3110E Economy Humidity and Temperature Transmitter with 4-20mA Outputs	 Output: 4-20mA Measured Value: Temperature + Relative Humidity Construction Type: Ambient Air Temperature Measuring Range: -30 To 80 °C Relative Humidity Range: 0 To 100% Accuracy: Relative Humidity ±3.0% Accuracy Of Temperature Output: ±0.6°C 
JB-TH-01	COMET T3110 Economy Humidity and Temperature Transmitter with 4-20mA Outputs	 Output: 4-20mA Measured Value: Temperature + Relative Humidity Construction Type: Ambient Air Temperature Measuring Range: -30 To 80 °C Relative Humidity Range: 0 To 100% LCD Display: Yes Accuracy Of Relative Humidity Measurement: ±2.5% Accuracy Of Temperature Output: ±0.4°C 



Part No	Description	Product Information
JB-TH-02	COMET P0120 Remote Temperature Sensor with 4-20mA Output	 Output: 4-20mA Measured Value: Temperature Construction Type: Ambient Air Temperature Measuring Range: -30 To 80 °C Accuracy: $\pm 0.4^{\circ}\text{C}$  Typical application wiring
JB-AP-0x	Aquacheck Classic Probe	 A capacitance based continuous logging probe Probe lengths from 400mm to 1200mm. Up to 6 soil moisture and 6 soil temperature sensors depending on the probe length. Shaft Diameter: 32mm Communication Interface Options: Analog, SDI-12 (Serial Data Interface, 1200bd), MODBUS, 2400bd
JB-GA-02	Analogue Add On PCB Assembly	 Analogue Channels: 4 Auxiliary Power Output: 5VDC Input: 0-5VDC
JB-GA-01	Digital Input Add On PCB Assembly	 Digital Channels: 4 Input: TTL
JB-GA-05	Analogue Output (0-5V) PCB Assembly	 Analogue Channel: 1 Output: 0-5VDC



Part No	Description	Product Information
JB-WS-100	Tempest Weather System	 Solar powered • Wind speed & direction • Temperature/humidity • Haptic Rain Sensor • Pressure sensor • Lighting sensor
JB-IZ-xx	TR28 Isolating Transformer	 25/50 VA 220:110 AC Transformer xx = VA Rating
JB-TH-01	COMET T3110 Economy Humidity and Temperature Transmitter with 4-20mA Outputs	 1.5/8V solar panel for Field Module. xx = 13 Panel only xx = 14 Panel, cable & connector 5 Watt





PUMP HOUSE CONTROLLER

6 PUMP HOUSE CONTROLLER ASSEMBLY

The Jabeco equipment deployed at a pump house are mounted in a Jabeco Pump House Controller (PHC). The typical PHC comprises an assembly of Jabeco and 3rd party products, such as:

- **JIO with built-in radio module**
- **JFERT module**
- **Meanwell Power Supply**
- **Charge Module**
- **Back-up battery**
- **Relay cards**
- **Relays**

The PHC comprises an IP65 housing, which is internally wired and all incoming and outgoing cable connections are terminated on a terminal strip on the bottom of the panel. External cabling to the PHC enters the PHC via cable glands, which are mounted on a mounting plate, fitted to the bottom of the panel.



- JIO**
- Charge Module**
- Relay Card**
- Power Supply (optional)**
- Relays**
- Terminal Strip**
- Battery**

Typical PHC Layout



The following inputs and outputs types are available on the PHC:

Input/Output Type	Code	Internal Device	Type	Typical Application
Digital Input Dry Contact	DD	JIO Digital Input	Dry Contact	Counter, pressure sensor
Digital Input Wet Contact	DW	Relay	DC or AC Coil Input	Power monitoring
Analogue Inputs - 5VDC	AV	JIO Analogue Input	0-5VDC	Pressure sensor, temperature, humidity
Analogue Input - 4-20mA	AI	JIO Analogue Input	12VDC Source 2-and 3-wire	Pressure sensor, temperature, humidity
Digital Outputs (low voltage)	CL	Relay Card	24VDC/AC Relay Output	Pump start, valve control
Digital Output (high voltage)	CH	Relay	220VAC Relay Output	Pump Start
5VDC Out	V5	Charge Module	5VDC 100mA max	Sensor Power
12VDC Out	VX	PSU	12VDC 100mA max	Sensor Power



ORDER INFORMATION

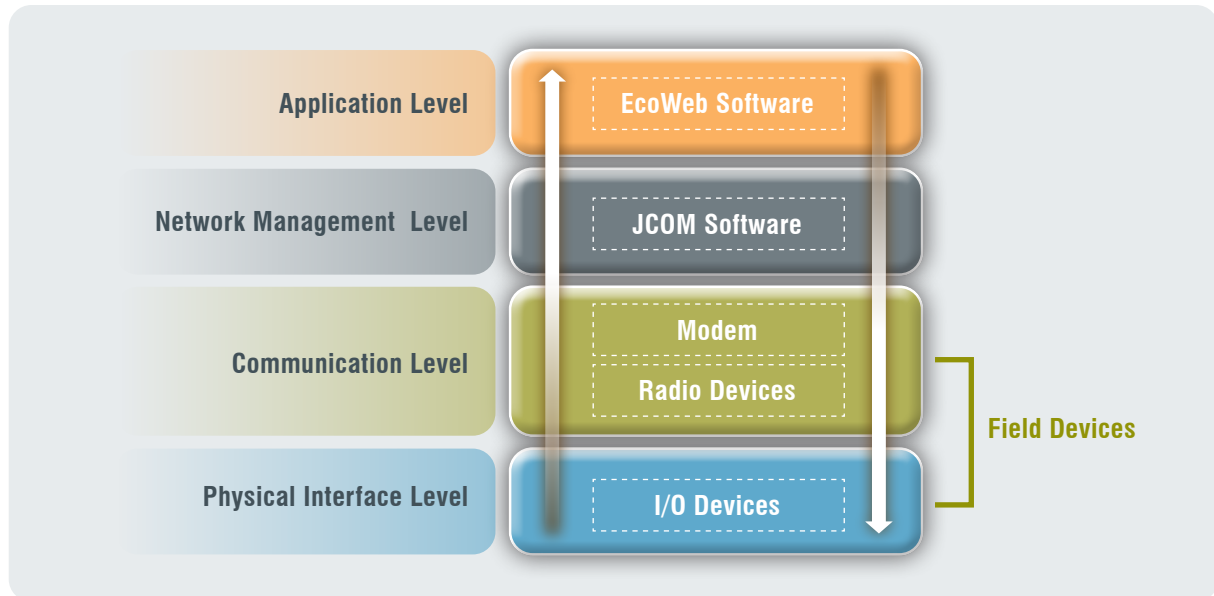
Model Number				Order Options									
Jabeco PHC				DD	DW	AV	AI	CL	CH	V5	VX	BB	
Number of JIO/JFERTS	1	2	2	3	0	1	0	6	0	1	0	12	
Number of Relay Cards	2												
Number of Relays	2												
IP 65 Panel Size													
300 x 200mm Panel													
400 x 300mm Panel													
500 x 400mm Panel													
600 x 450mm Panel													
Number of Digital Input Dry Contacts				3									
Number of Digital Input Wet Contacts					0								
Number of Analogue Inputs: 5VDC						1							
Number of Analogue Inputs: 4-20mA							0						
Number of Digital Outputs (Low Voltage)								6					
Number of Digital Outputs (High Voltage)									0				
Number of 5VDC Output Terminals										1			
Number of 12VDC Output Terminals											0		
Battery													
No Batteries												0	
6V 4.5Ah												6V	
12V 4.5Ah												12V	



CONTROL SYSTEM ARCHITECTURE

7 JABECO INTEGRATED CONTROL SYSTEM

The Jabeco Integrated Control System consists out of the following elements:



The main components of each level is described below.

1 PHYSICAL INTERFACE LEVEL

Input and Output (I/O) devices:

- Digital Input and output devices.
- Analog input devices.
- Examples: Pumps, valves, fertigation devices, flow meters, filters etc.

2 COMMUNICATION LEVEL

Radio devices:

- JIO, JFERT, FM, WLC etc.
- Each type of radio device contains an onboard microcontroller running the appropriate firmware for the specified radio type.
- Each radio device is allocated an unique radio ID which identifies it on the communications network.
- Each radio device comprises a number of digital and analogue input and output ports to which the field devices are physically connected and through which they receive control signals.
- Each field device is thus identified through one or more sets of radio addresses and I/O ports.

Modem:

- All radio devices wirelessly connect to the modem.
- The modem is physically connected to the control PC via USB and is responsible for passing along control signals to the radio devices.



1

NETWORK MANAGEMENT LEVEL

- The JCOM network management software is installed on the host PC and connects to the Jabeco modem.
- It is responsible for handling all communications between the EcoWeb control software and the field devices.
- All network communication is controlled and routed using the JCOM network manager.
- Field devices on the control network are uniquely identified by their System ID, radio address and port number, which are used by JCOM to communicate with the devices.

2

APPLICATION LEVEL

- The EcoWeb Application software is installed on the host PC and connects to the JCOM network manager.
- The EcoWeb software consists of three elements:

SQL database:

- All data pertaining to the integrated automation system is stored in this database.
- Both EcoWeb applications connect to this database and are in constant communication with it.
- JCOM may be setup to connect to this database in order to provide EcoWeb with its current active status.

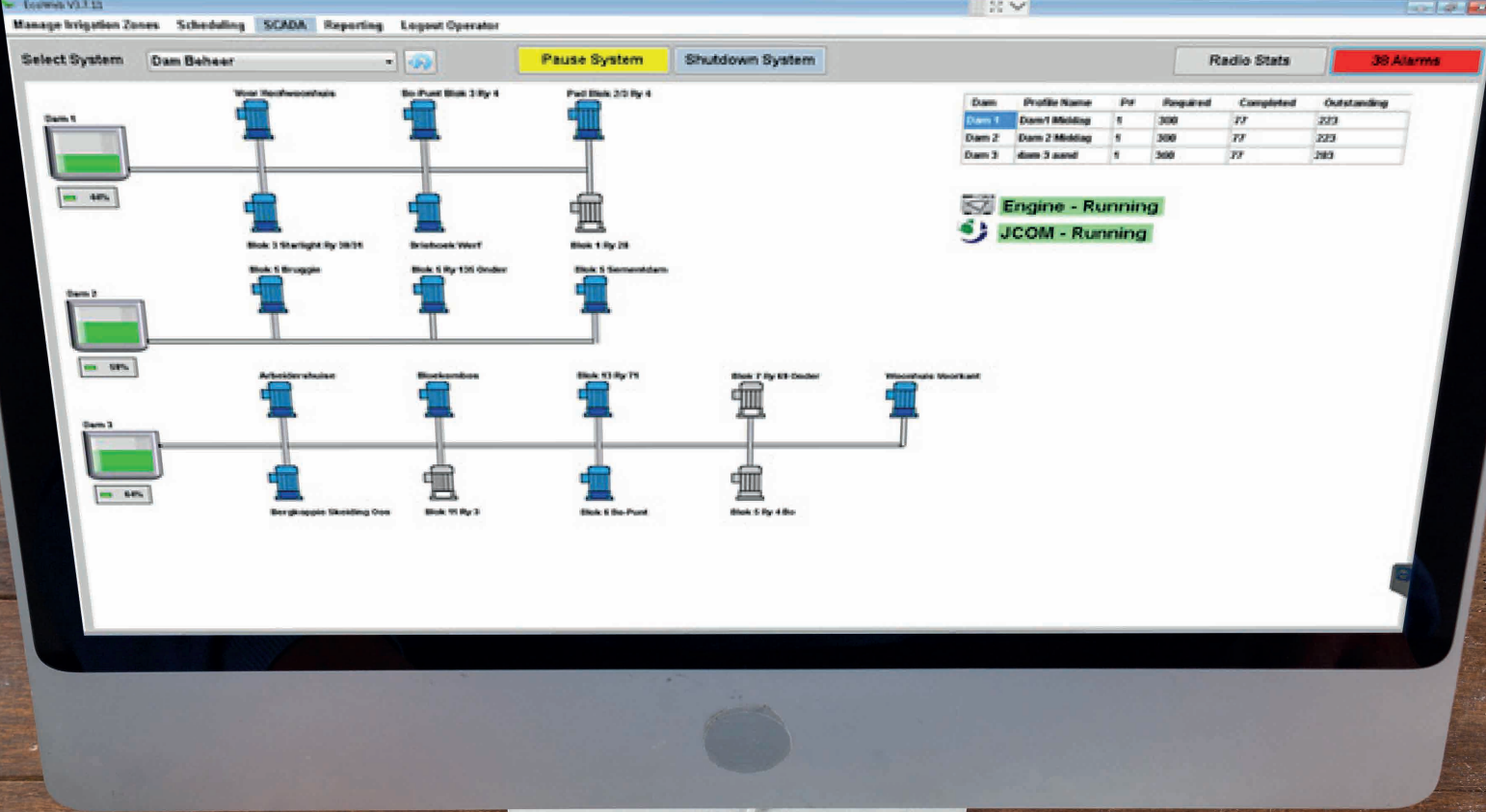
EcoWeb SCADA:

- The physical device network is setup and configured within this software application, with each field device being allocated a set of parameters unique to the field device type. These include I/O addresses and port numbers as well as other parameters used in the control of the specific device.
- Irrigation and fertigation scheduling.
- Real-time monitoring and control of field devices.
- Reporting functions.

EcoWeb Engine:

- The EcoWeb engine is responsible for the execution of scheduling and monitoring functions configured within the EcoWeb SCADA.
- All control commands originate from here.





ECOWEB AUTOMATION SOFTWARE

8 THE ECOWEB SOFTWARE

The EcoWeb control software forms the heart of Jabeco's integrated control and monitoring solution. The software provides various management and automation options, allowing scheduled as well as fully autonomous rule-based control functions.

EcoWeb allows operators to manage several systems simultaneously, and by use of a real-time SCADA (Supervisory Control and Data Acquisition) graphical user interface, operators are given a complete oversight of each system.

If the host PC is connected to the Internet, users are also able to remotely control and view the system using smart mobile devices.

FEATURES

- **Hardware Interface**
EcoWeb provides an automation interface with the Jabeco control modules in the field, which allows the user to control a variety of irrigation, fertigation, climate tunnel, dam level, and other water management related functions.
- **Pump and water level control**
Pumps can be configured to respond automatically to irrigation or water storage needs based on parameters that are defined by the system operator.
- **Irrigation & fertigation Scheduling**
EcoWeb has flexible options for the automation and scheduling of irrigation and fertigation cycles. Schedules can be set up according to time duration or the volume of water required for each target area. The respective schedules can be set to execute daily, weekly or on specific calendar dates. These schedules can be saved and reused as required.
- **Filter Management**
Filters can be configured to automatically flush on preset intervals or with the occurrence of specific events, such as line pressure triggers.
- **SCADA**
The SCADA display provides real-time status monitoring of all active devices, and allows for certain manual control functionality.
- **Monitor input devices**
Collects operational information from a variety of probes and sensors in the field.
- **Alarms and SMS Notifications**
A wide variety of alarm notifications can be configured to alert the operator of exceptions within the systems. The option is available for alarm notifications to be sent via SMS.
- **Reporting**
EcoWeb has a variety of reporting and graphing functions available, which provide an overview of the programs and tasks which have been performed by the system, as well as a log of all measurement that are made.

MINIMUM SYSTEM REQUIREMENTS

- MS Windows 7 or later.
- MS SQL Server Express 2014.
- 4-8GB RAM.
- Reliable internet connection.
- For mobile connections: Remote access software such as *Team Viewer*.



measurement
communications
control

Tel: +27 12 349 1100 | Cell: +27 83 679 2102
Email: sales@jabeco.co.za | chris@jabeco.co.za | www.jabeco.co.za

FOR COMPLETE LIST OF SPECIFICATIONS FOR EACH PRODUCT, PLEASE VISIT OUR WEBSITE :

www.jabeco.co.za

