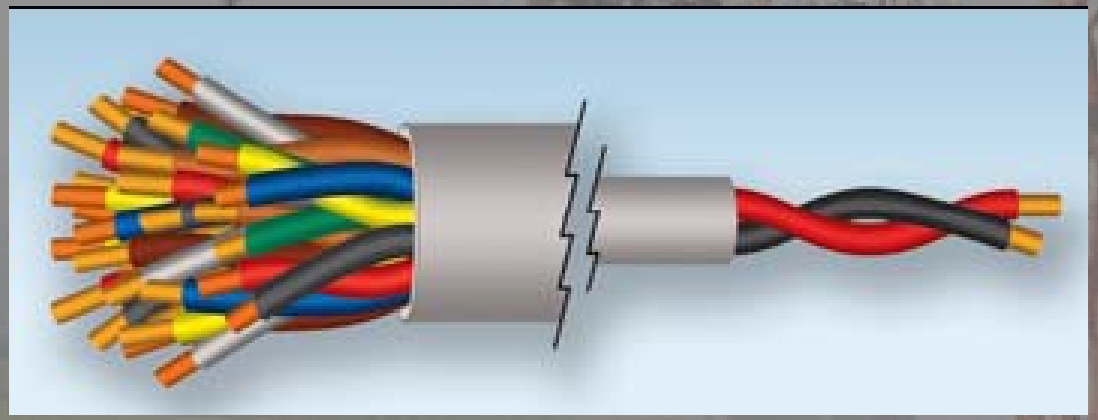
NHP
Wire reducing systems

# Where can wire reducing systems be used

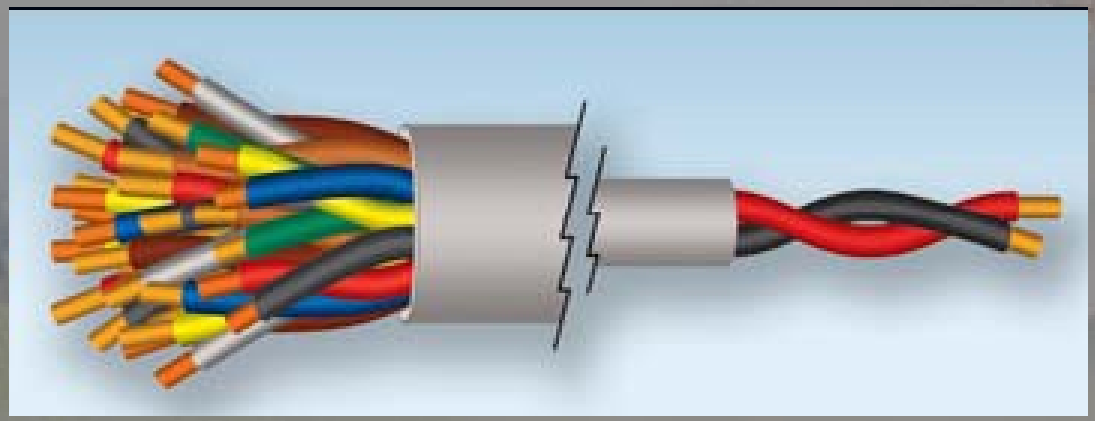
Irrigation
Building Controls
Conveyor controls
Mechanical Services
Energy Management
PFC Monitoring
Lighting Control
Winery Tank Levels
Golf Courses
Car Park Guidance System
Sewage/Water Controls



**Any application needing many control and data signals spread over long distances.**

# What is a wire reducing system

An electronic system to measure, monitor, control and in some cases power equipment over 2 wires.



# Dupline® - HiLine Irrigation Control over 2 Wires

- 4 Basic Elements of the system:
  - Valve I/O module
  - Master controller
  - Dupline booster
  - Test unit

# Dupline® - HiLine Irrigation Control over 2 Wires

## Valve I/O Modules

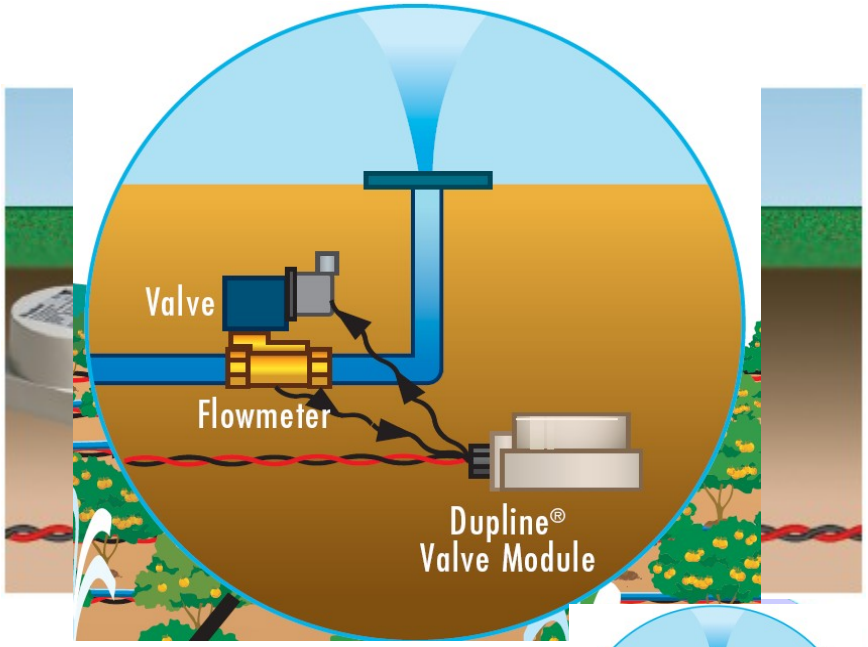
Powered by two wire bus

Underground installation IP68

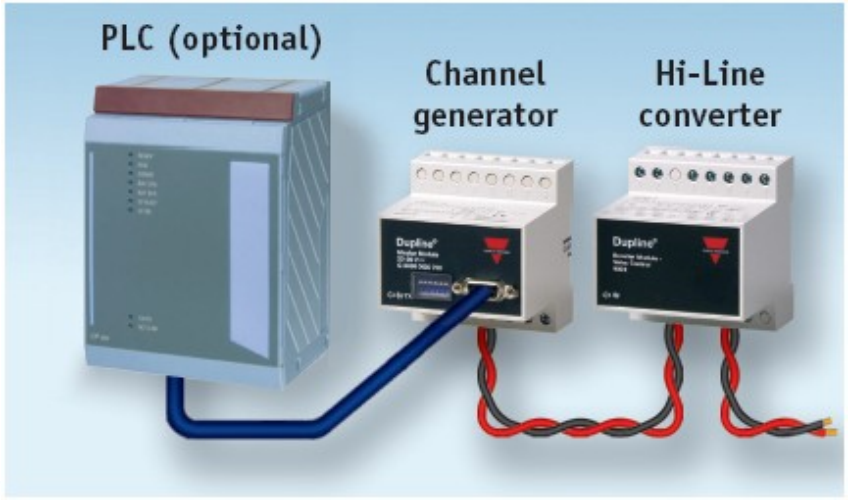
Valve open/close

2 inputs – pulses from flow meters

Safe low voltage - 28 Volts



# Dupline® - HiLine Irrigation Control over 2 Wires



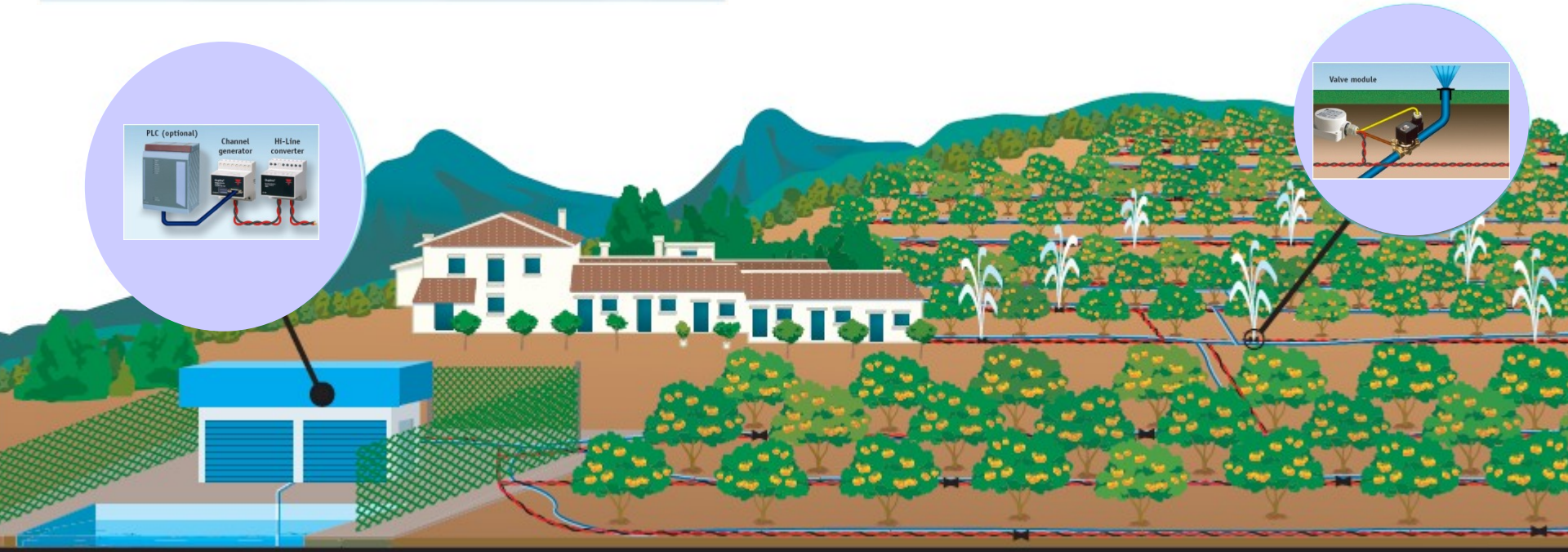

## Master Module/booster/tester

Generates Dupline carrier signal

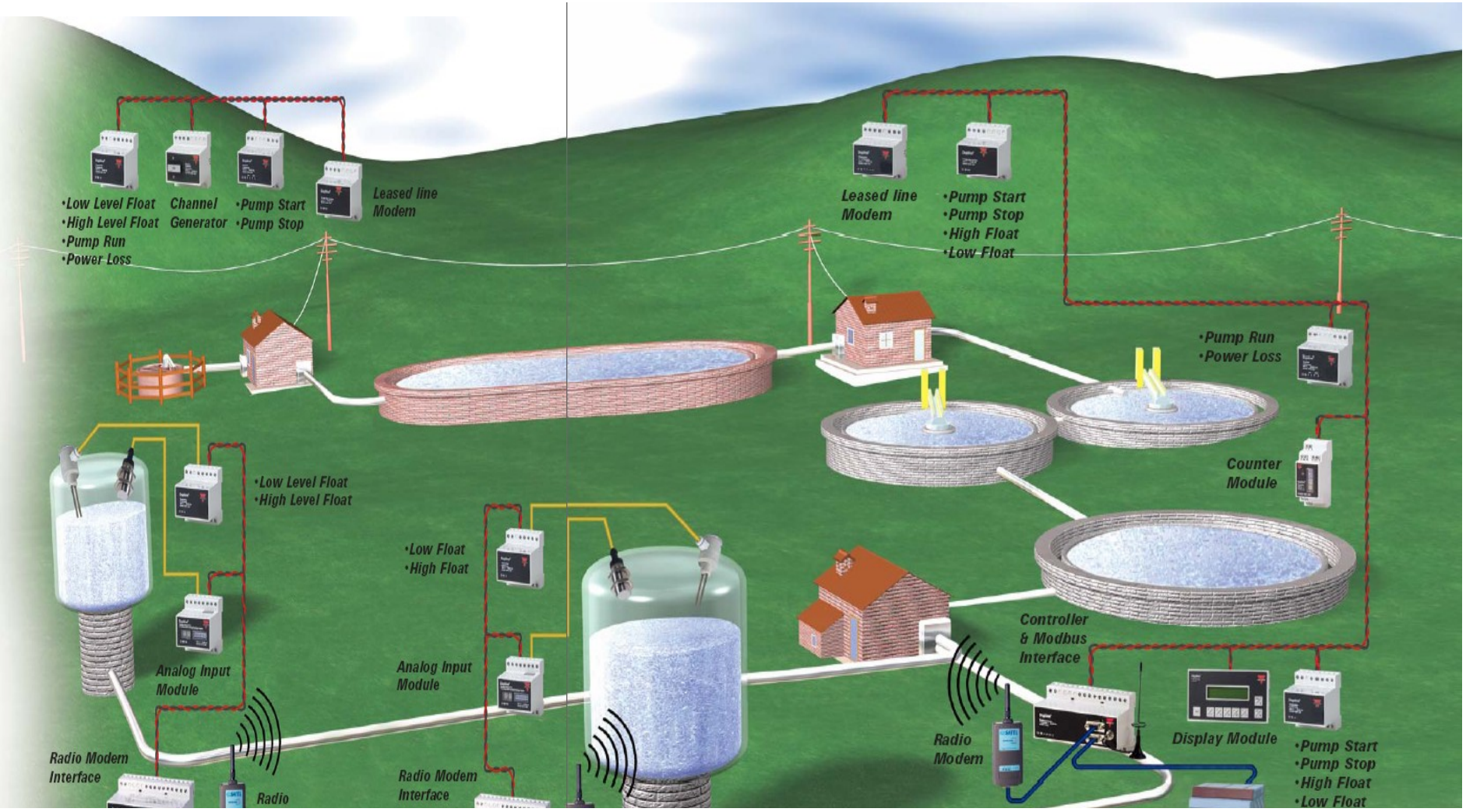
Interface to PLC or Irrigation controller

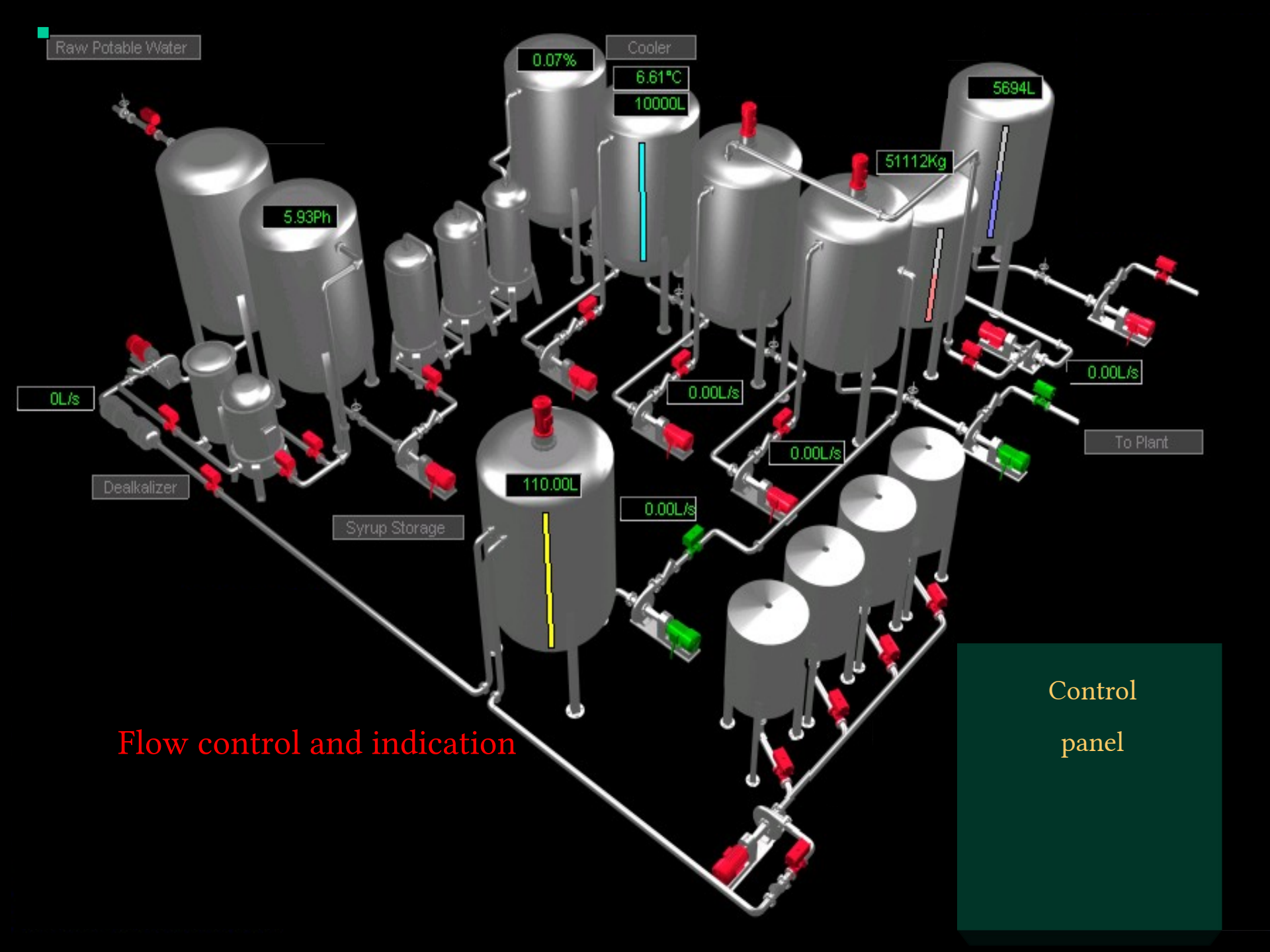
Boost voltage to 28 volt to activate valves

Test unit checks signal any were in system



# System can be as simple or as complex as you need

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10000L
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Dealkalizer
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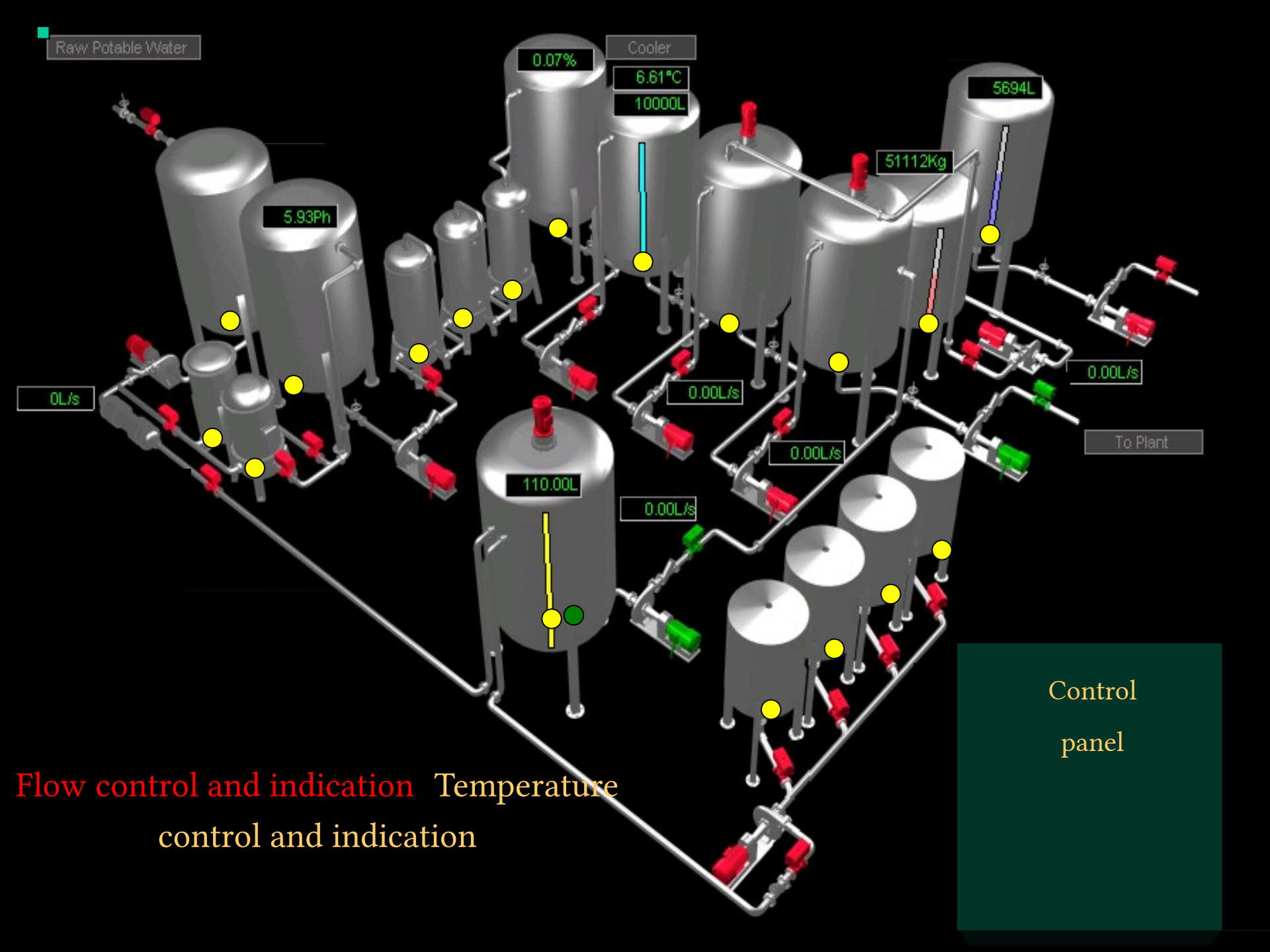
Syrup Storage
Flow control and indication
Control
panel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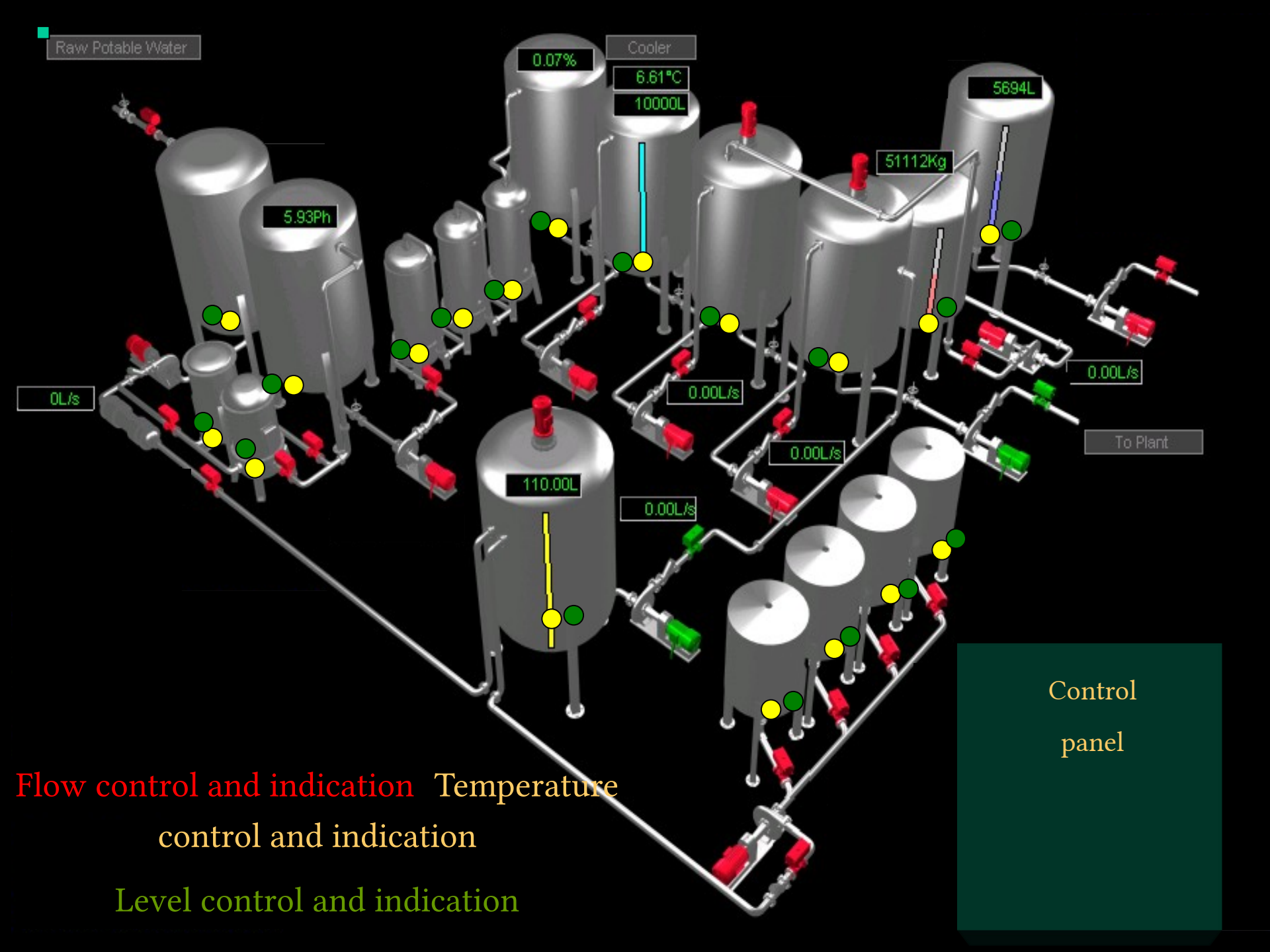
Temperature control and indication
Control panel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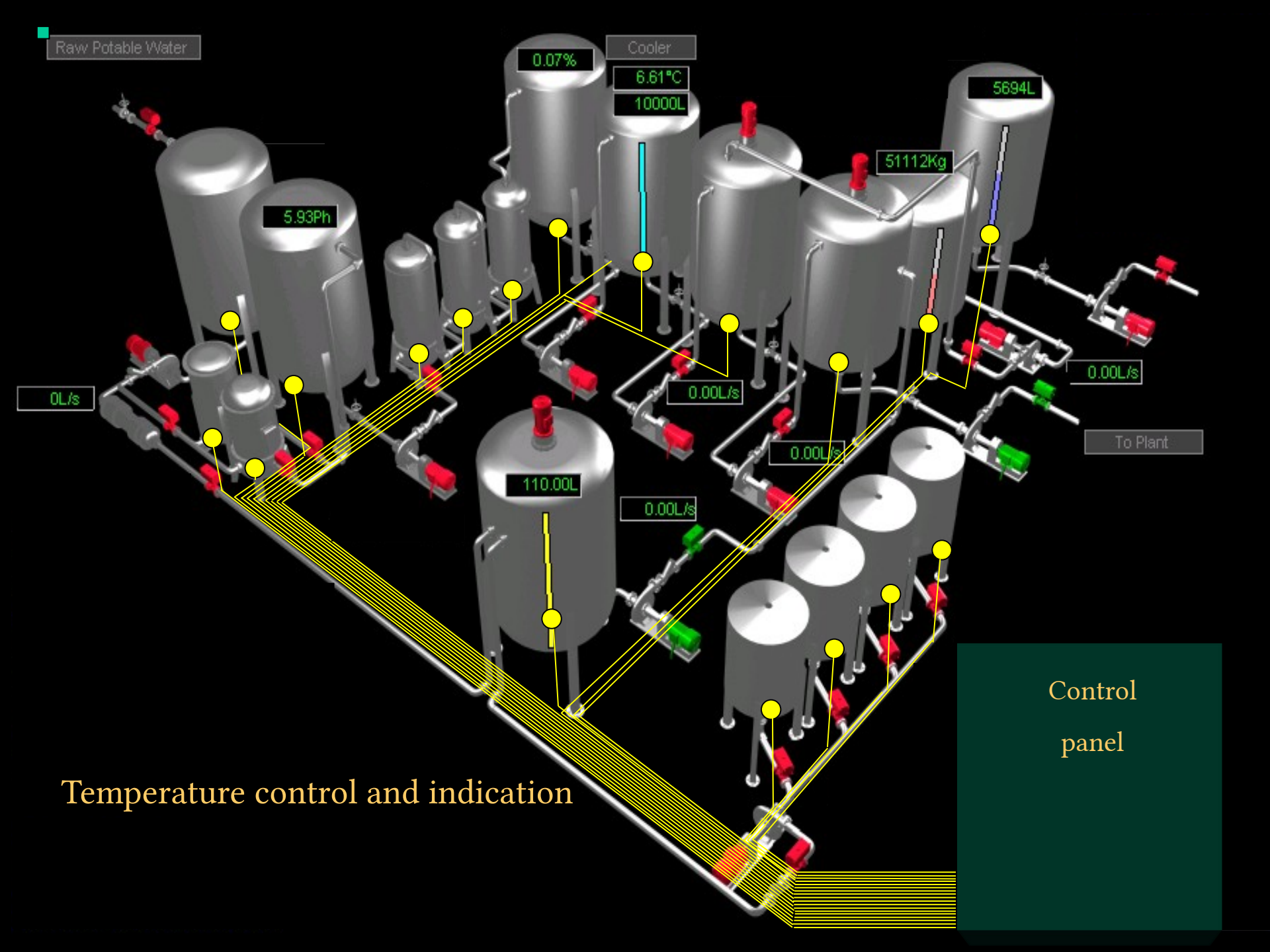
Flow control and indication
Temperature
control and indication
Level control and indication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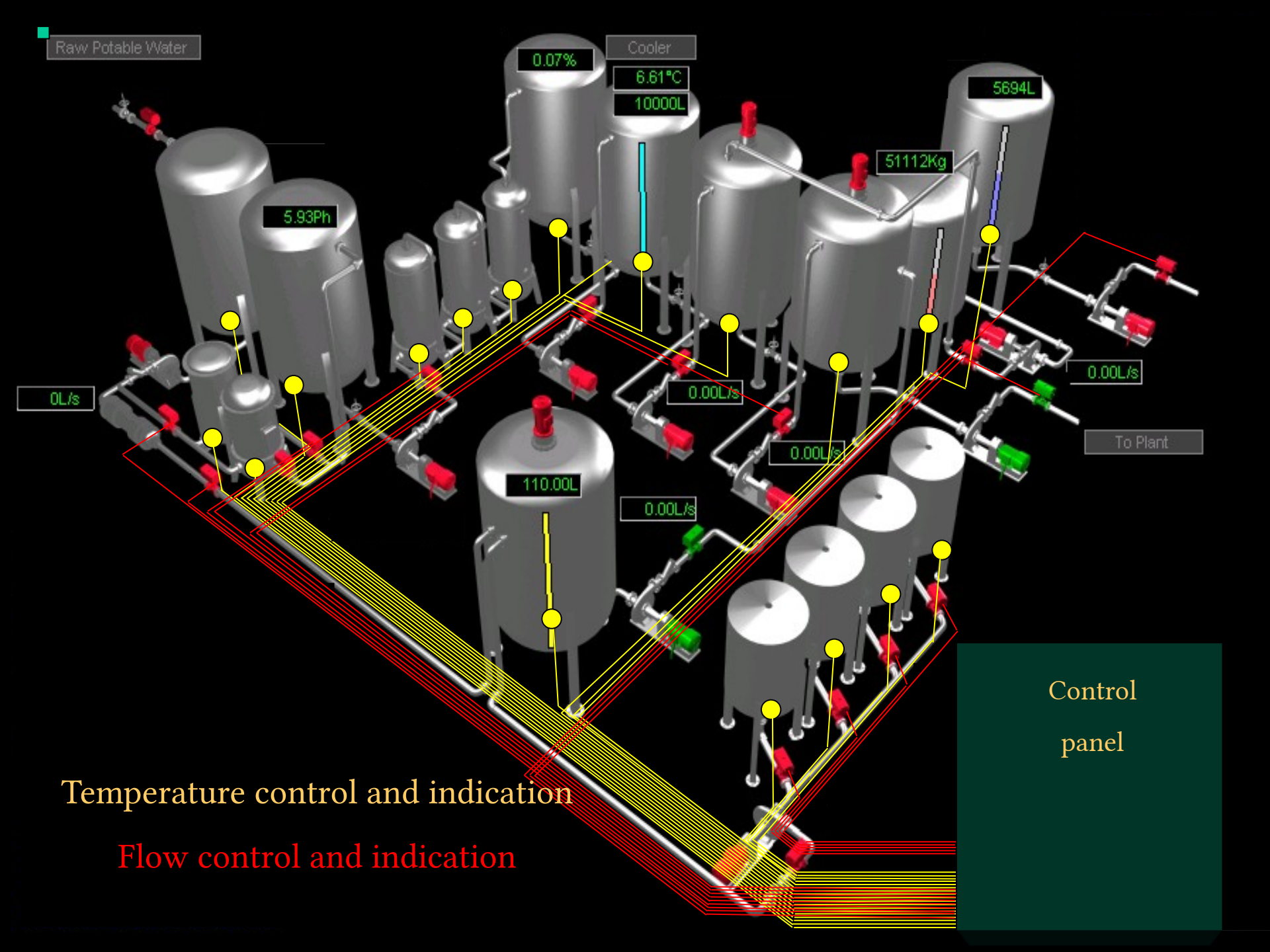
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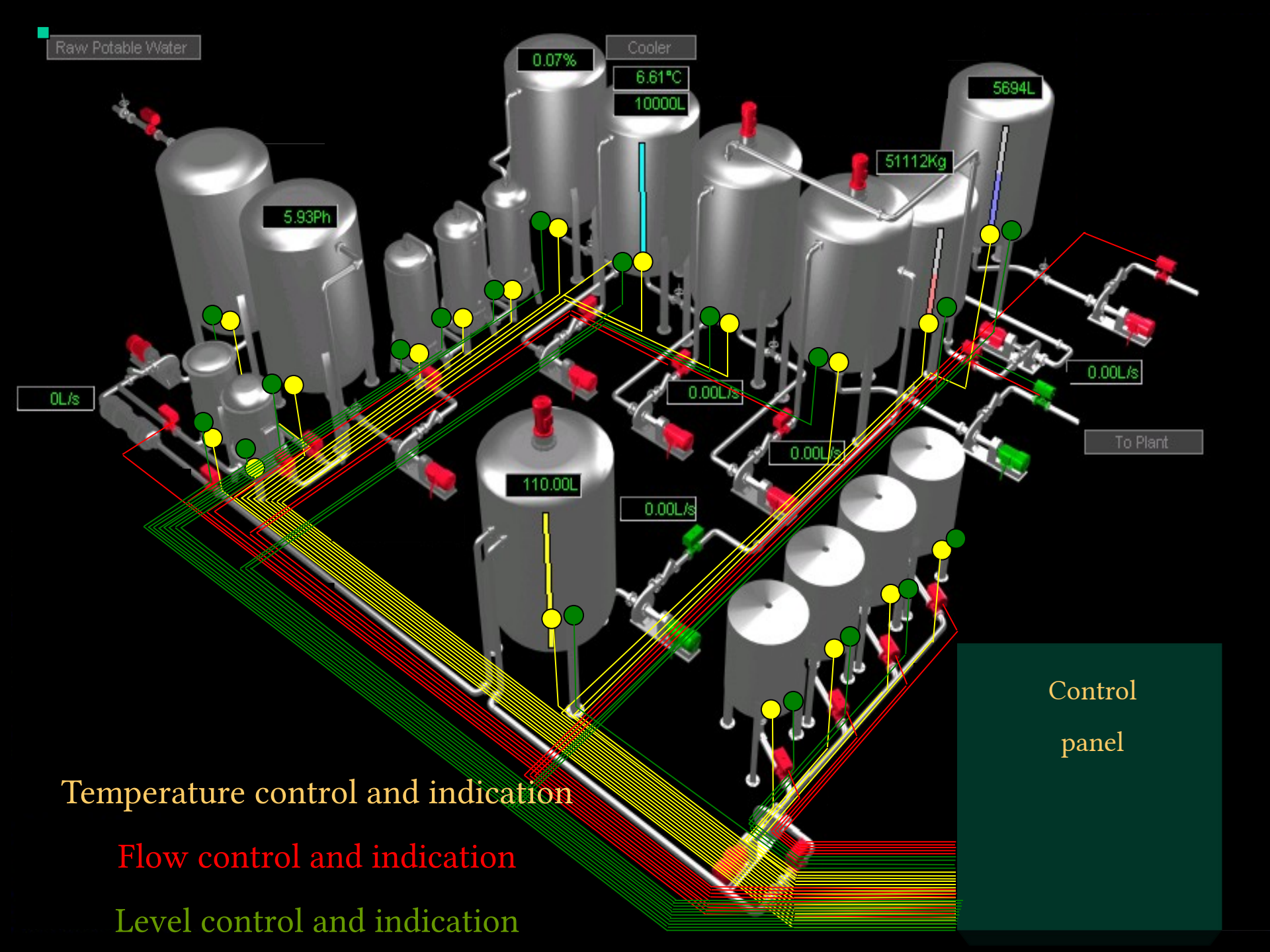
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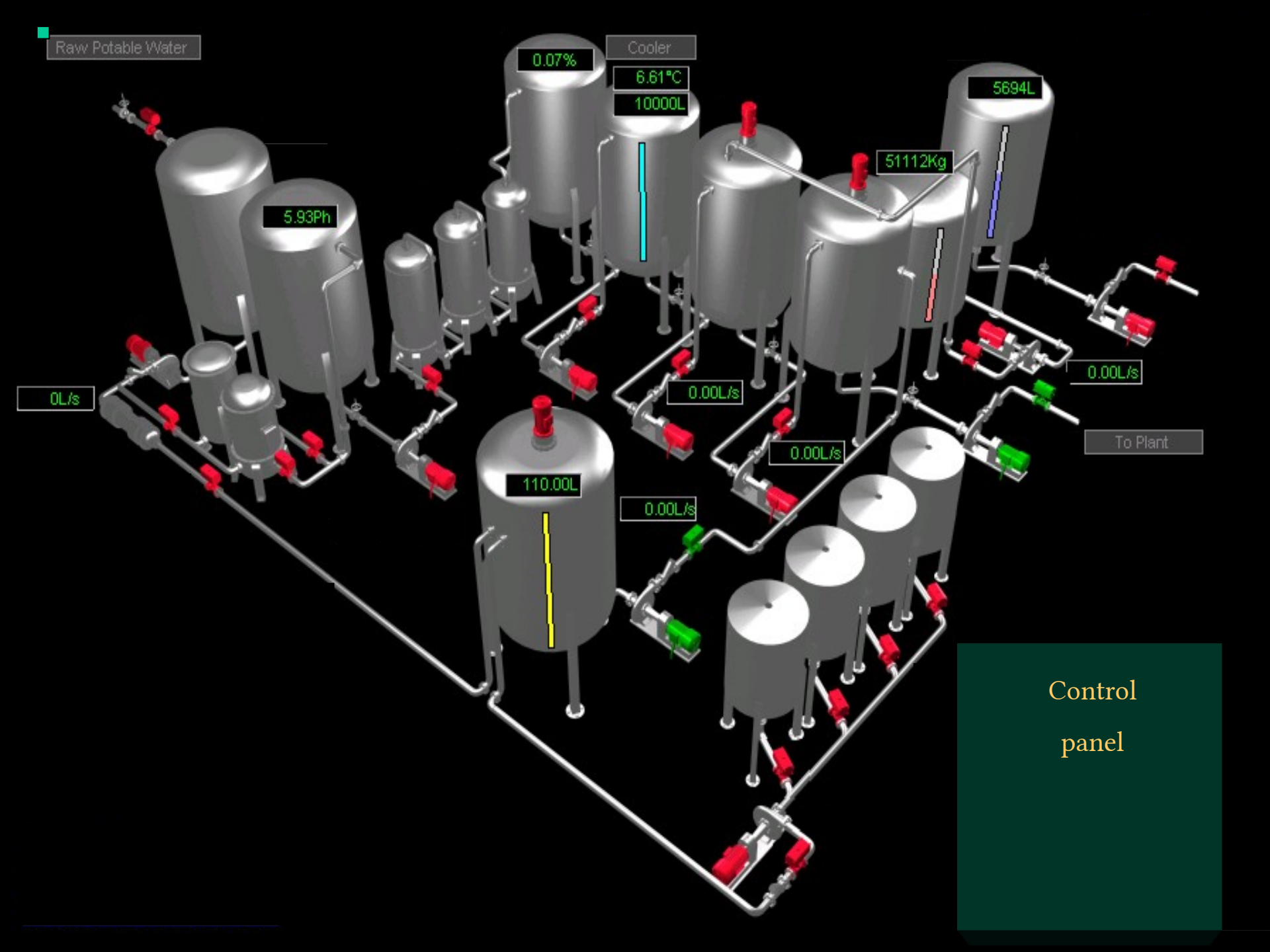
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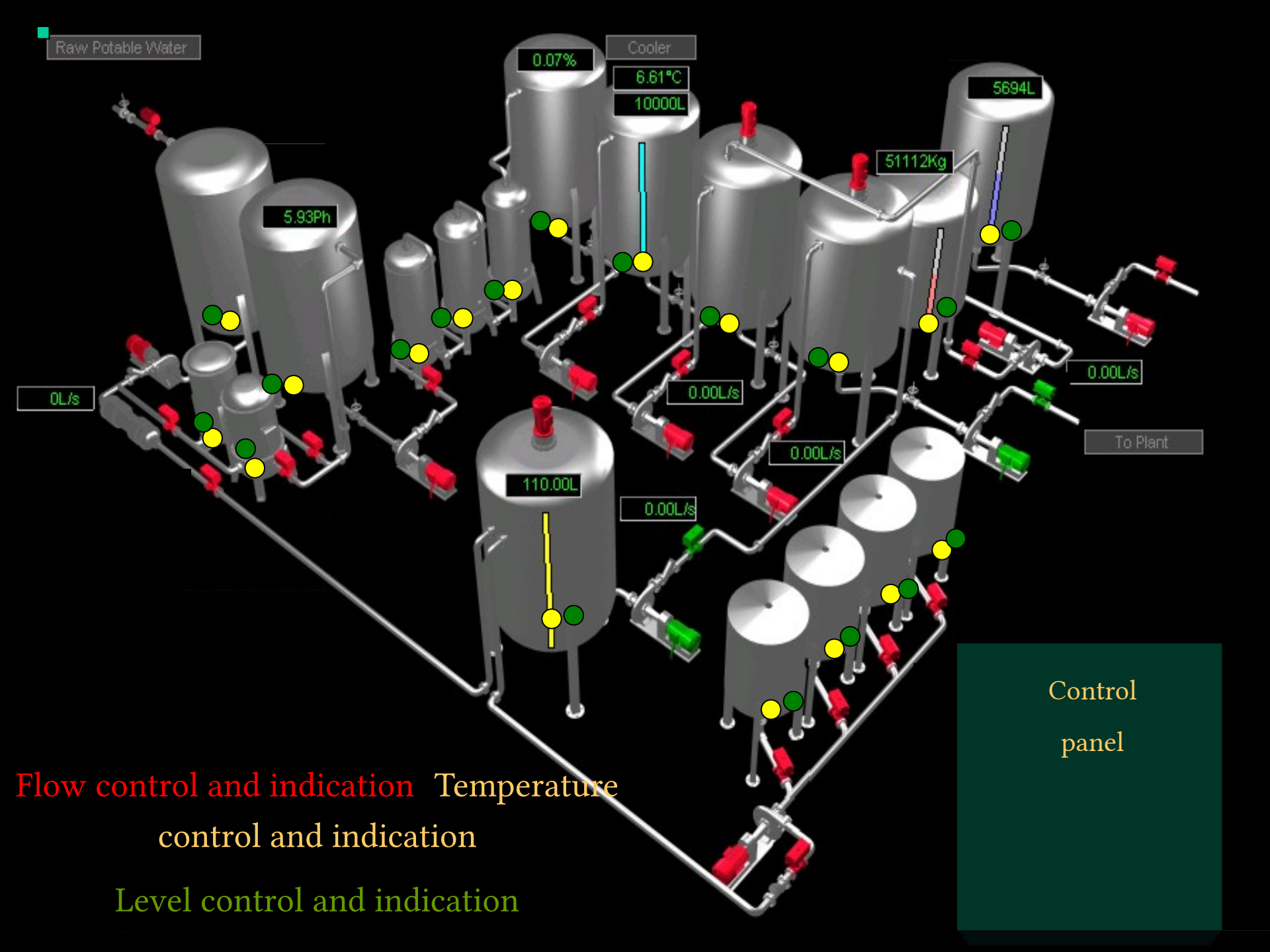
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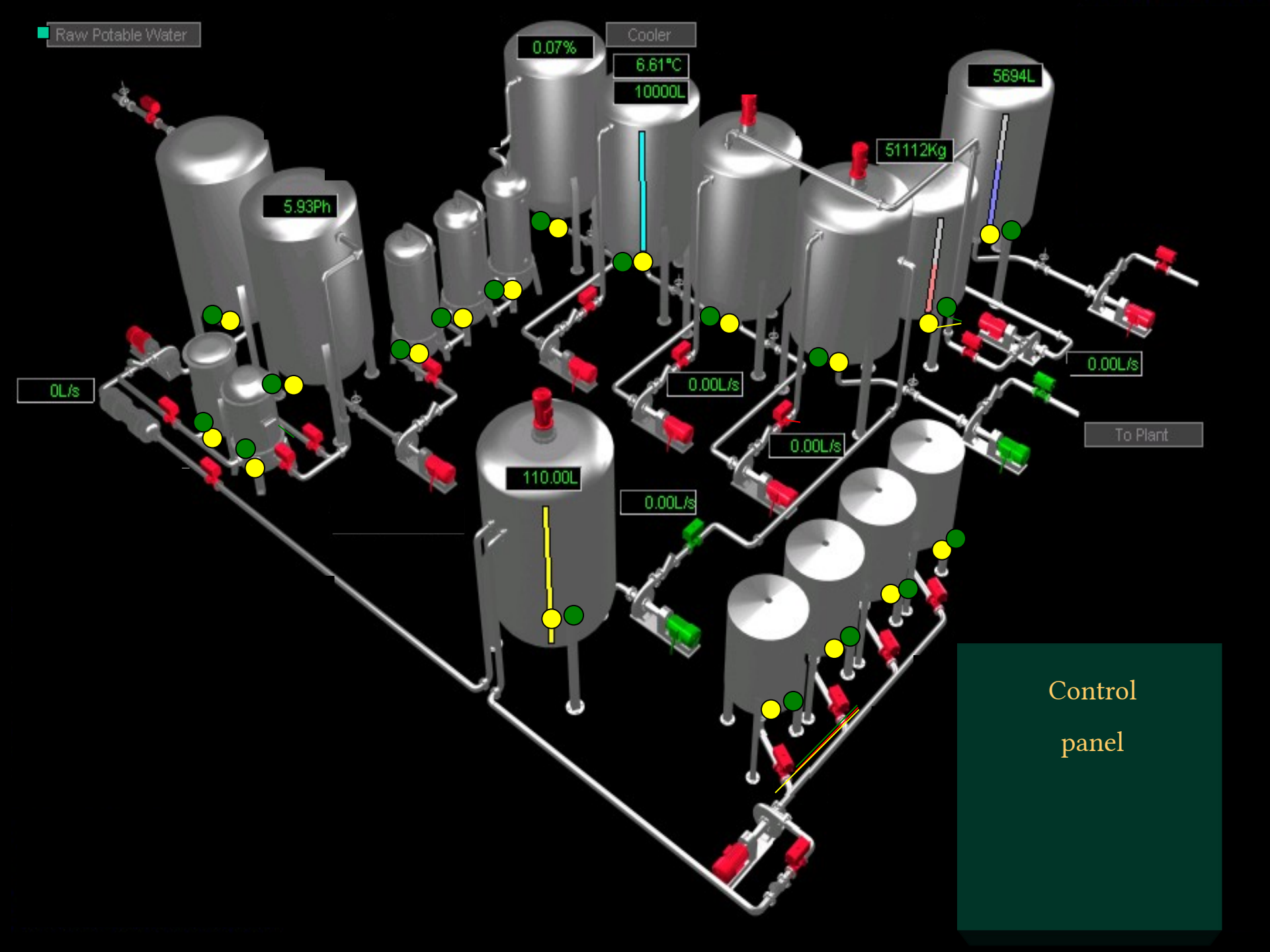
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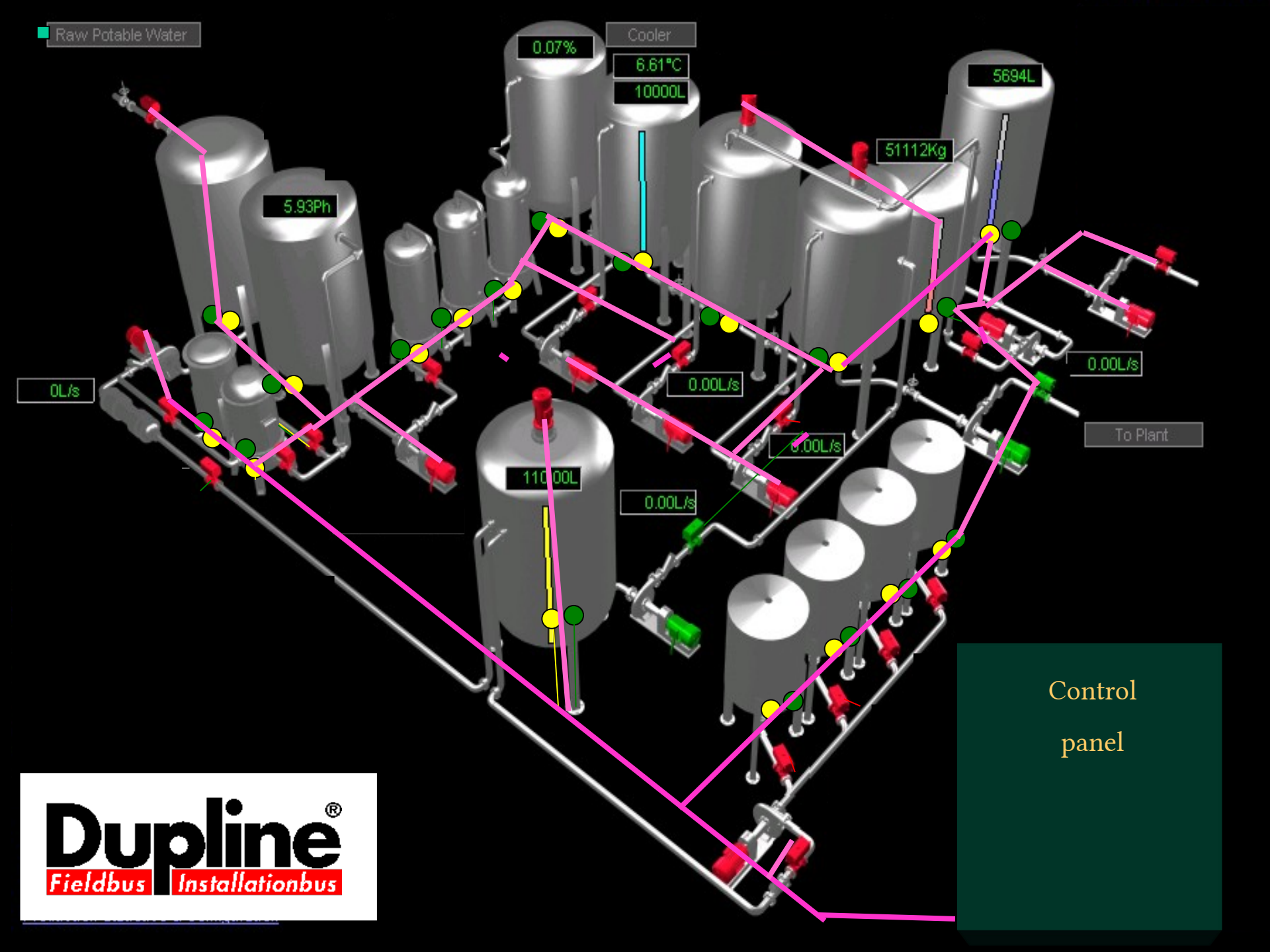
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To Plant
Control
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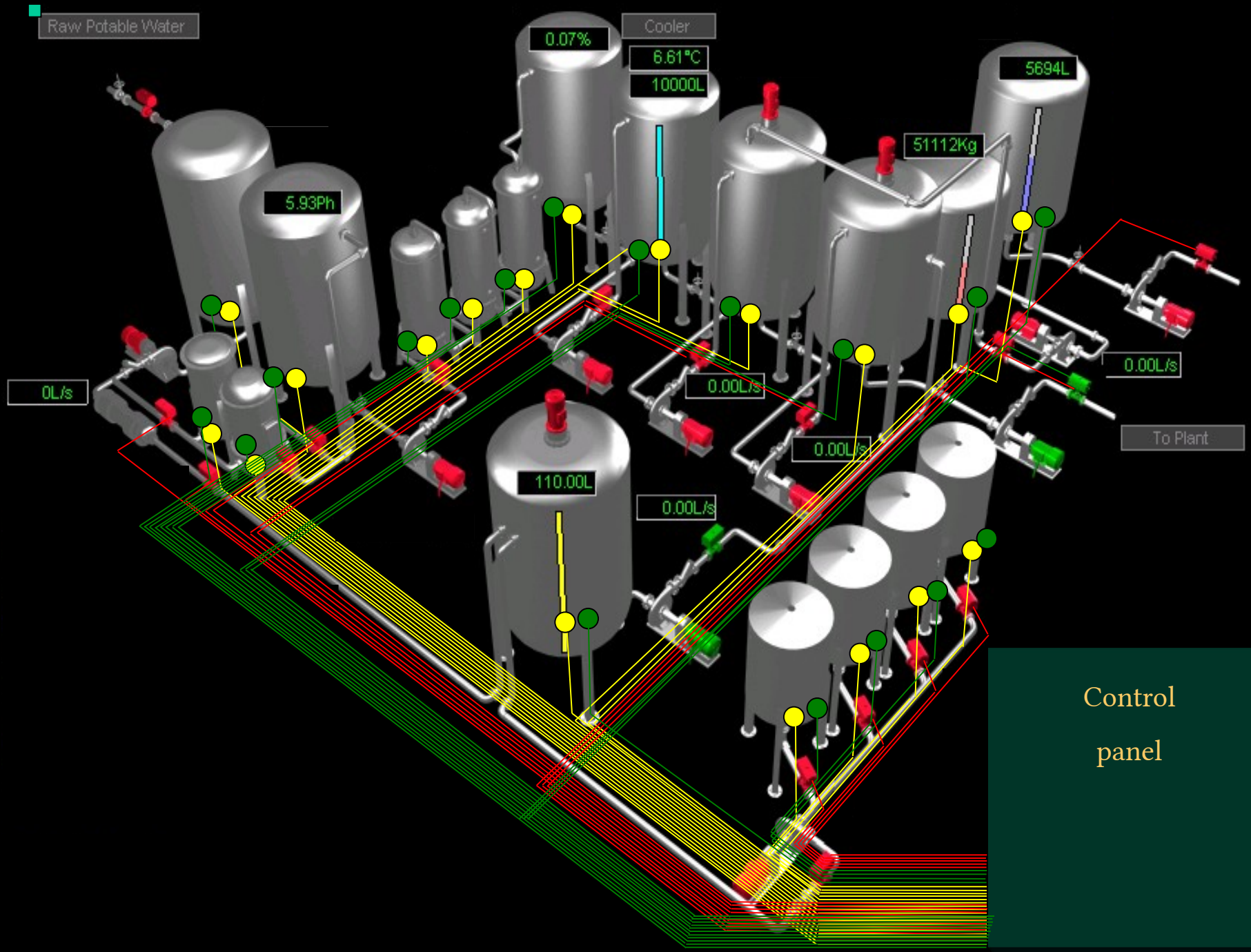
Dupline®
Fieldbus
Installationbus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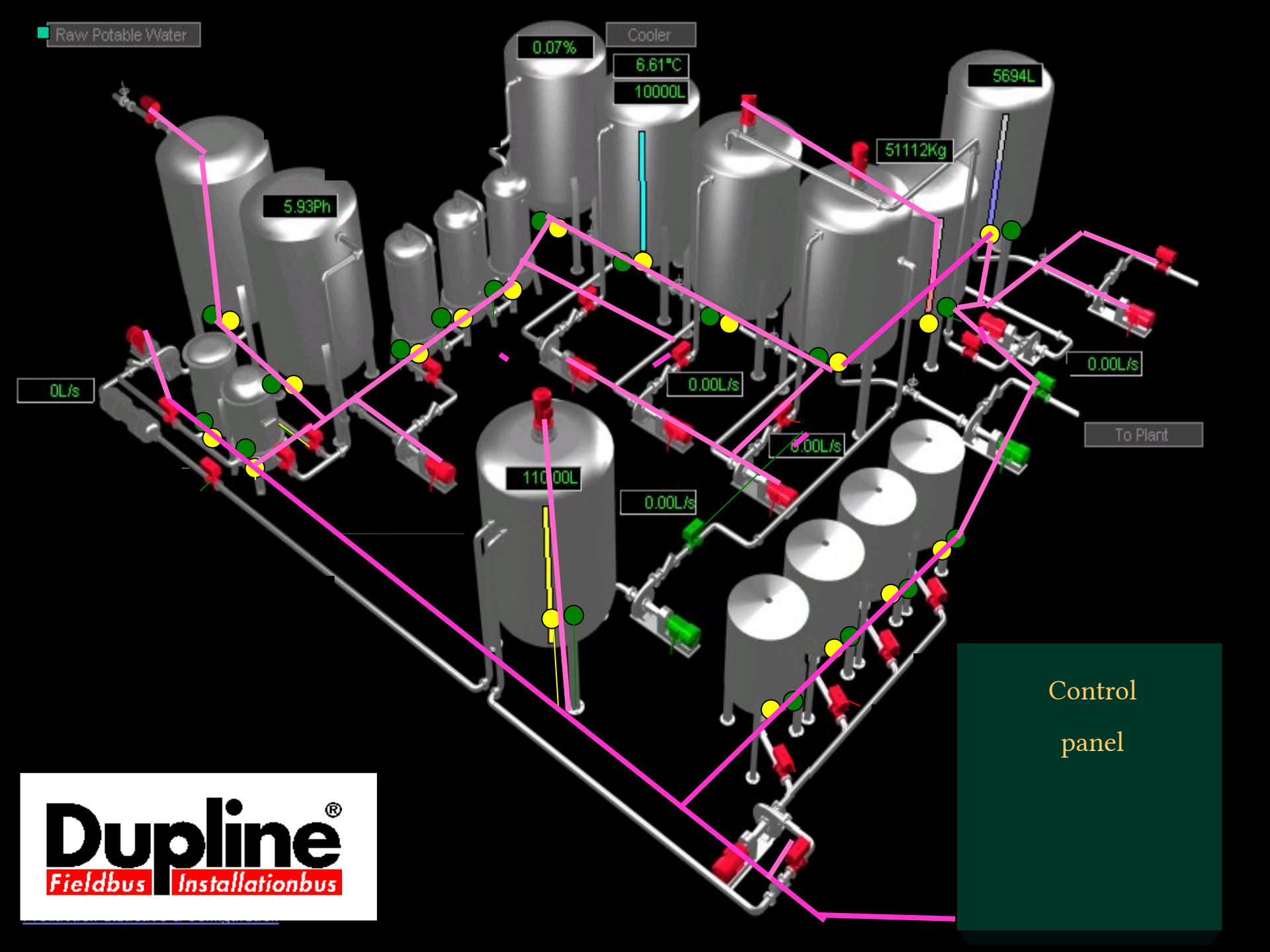
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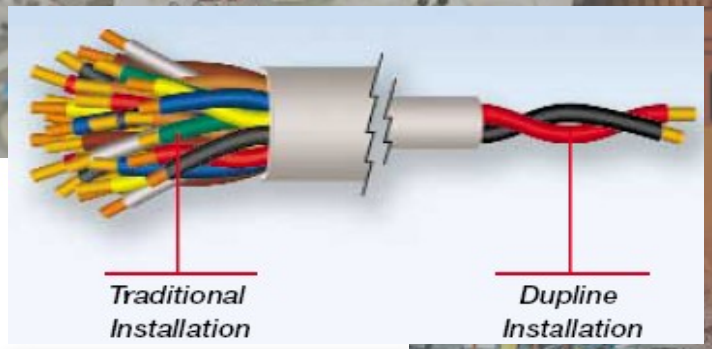
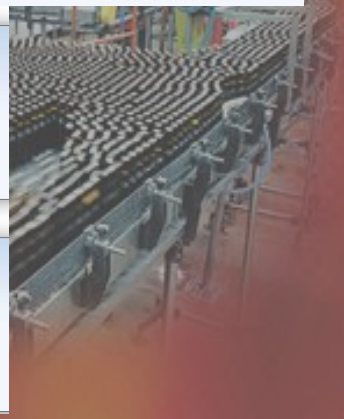
Dupline®
Fieldbus
Installationbus

NHP

# DUPLINE

CARLO GAVAZZI





**Building Automation**

**Energy management**

# Building Automation

- Office lighting control
- Air conditioning control
- Ware house lighting control
- Energy management
- Garden irrigation
- Security
- Fire alarms

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# Metroplex Main Menu

## General Menu

Ground Floor Offices | First Floor Offices

Workshop

All Areas Temperature | All Areas Security

Sales Urgent Dispatch

**Access to Building Control**

Please Enter Password

Enter

Main Menu

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# First Floor Offices

NHP

| Building Area | Temperature | Air-Con |
|---|---|---|
| Practical Training Room | 22.9 | On |
| Board Room | 21.2 | Economy |
| Board Room Bar | 21.2 | Economy |
| Wine Store | 15.9 | On |
| National Projects John | 21.5 | On |
| National PA Joneen | 21.5 | On |
| National Sales Rod | 21.5 | On |
| Presentation Room | 21.9 | On |
| Training Room | 22.9 | Economy |
| Staff Room | 22.2 | On |
| Sales Reps Office Chris, Trevor | 22.2 | On |
| Sales Supervisors Bryan, Mal | 22.2 | On |
| Comms Room | 21.9 | On |

Main Menu

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# All Temperatures

NHP

Ground Floor

| Building Area | Temperature |
|---|---|
| Trade Display | 23.29 |
| Front Offices (Amanda and Bek) | 22.59 |
| Engineering (Kevin Marley) | 22.94 |
| Accounts (Bob Pearce) | 22.59 |
| Internal Sales | 22.94 |

First Floor

| Building Area | Temperature |
|---|---|
| Practical Training Room | 22.94 |
| Board Room | 21.18 |
| First Floor (Joneen Tilse) | 21.53 |
| Sales Reps Office | 22.24 |
| Presentation Room | 21.88 |
| Training Room | 22.94 |
| Wine Store | 15.88 |
| Comms Room | 21.88 |

Warehouse

| Building Area | Temperature |
|---|---|
| Workshop | 21.18 |
| Warehouse Office (Trevor Archer) | 19.41 |

External

| Building Area | Temperature |
|---|---|
| Outside State Manager (Shade) | Not Connected |

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NHP

## Security Overview

NHP

| Building Area | Door | Status |
|---|---|---|
| Office <> Warehouse | Trade Display Door Open | OK (Closed) |
| Office <> Warehouse | Trade Counter Door Open | OK (Closed) |
| Office <> Warehouse | estimating (Rear) Door Open | OK (Closed) |
| Office <> Warehouse | 1st Floor Front Door Open | OK (Closed) |
| Office <> Warehouse | 1st Floor Rear Door Open | OK (Closed) |
| Boardroom Balcony | Right Balcony Door Open | OK (Closed) |
| Boardroom Balcony | Left Balcony Door Open | OK (Closed) |
| National Balcony | John Kirklands Balcony Door Open | OK (Closed) |
| National Balcony | Rod Edwards Balcony Door Open | OK (Closed) |
| National Balcony | Corridor Door Open | OK (Closed) |
| Rear Balcony | Balcony Door Open | OK (Closed) |
| Warehouse | North East Door Open | Alarm (Open) |
| Warehouse | South East Door Open | OK (Closed) |
| Warehouse | Roller Door 1 | Alarm (Open) |
| Warehouse | Roller Door 2 | Alarm (Open) |
| Warehouse | Roller Door 3 | Alarm (Open) |
| Warehouse | Roller Door 4 | Alarm (Open) |
| Warehouse | Windows Alarm | OK |
| Workshop | External Door | OK |

Main Menu

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NHP Metroplex - Two Stage Air Conditioning - Microsoft Internet Explorer
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# Two Stage Air Conditioning

| Air Con | Temperature | Mode | Auto/Manual | Manual Override |
|---|---|---|---|---|
| Board Room | 21.18 | Economy | Automatic | Turn On Manually |
| Presentation Room | 21.88 | On | Manual | Return To Automatic |
| Training Room | 23.29 | On | Manual | Return To Automatic |
| Prac Training Room | 22.94 | On | Manual | Return To Automatic |

Note: it takes 10-15 seconds for changes to take effect.
For Advanced settings, please click here. Please be careful.

Return to Control Menu

Main Menu

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Go Links Google Settings

NHP

# Sprinkler System

NHP

The Sprinkler System is now Disabled

Click to Enable Sprinkler System

Note: This the manual override for the sprinkler system. Please use with caution

| Zone | Status | Control |
|---|---|---|
| Zone 1 | Off (Closed) | Turn On (Open) |
| Zone 2 | Off (Closed) | Turn On (Open) |
| Zone 3 | Off (Closed) | Turn On (Open) |
| Zone 4 | Off (Closed) | Turn On (Open) |
| Zone 5 | Off (Closed) | Turn On (Open) |
| Zone 6 | Off (Closed) | Turn On (Open) |
| Zone 7 | Off (Closed) | Turn On (Open) |

Done
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NHP Metroplex - Warehouse Lights - Microsoft Internet Explorer
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NHP

Warehouse Lights

NHP

# Automatic Mode is Now On (Time Controlled Lighting)

Click here to turn Manual Override On

Note: If the System is in **Automatic**, you have **NO control**
The System must be in **Manual Override**, to control it with this page

Current Light Level = 0.10 lux

| Light Bank # | Status | Control | | |
|---|---|---|---|---|
| Bank 1 Office End | Off | Off | Half Power | Full Power |
| Bank 2 | Off | Off | Half Power | Full Power |
| Bank 3 | Off | Off | Half Power | Full Power |
| Bank 4 | Off | Off | Half Power | Full Power |
| Bank 5 | Off | Off | Half Power | Full Power |
| Bank 6 | Off | Off | Half Power | Full Power |

Done
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NHP Metroplex - Front Door Main - Microsoft Internet Explorer

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AXIS COMMUNICATIONS

## AXIS 211 Network Camera

Live View | Setup | Help

View size x½ x1 x2 x4

Video format Motion JPEG

Playing

NHP

Front Door

NHP

Open Door Once

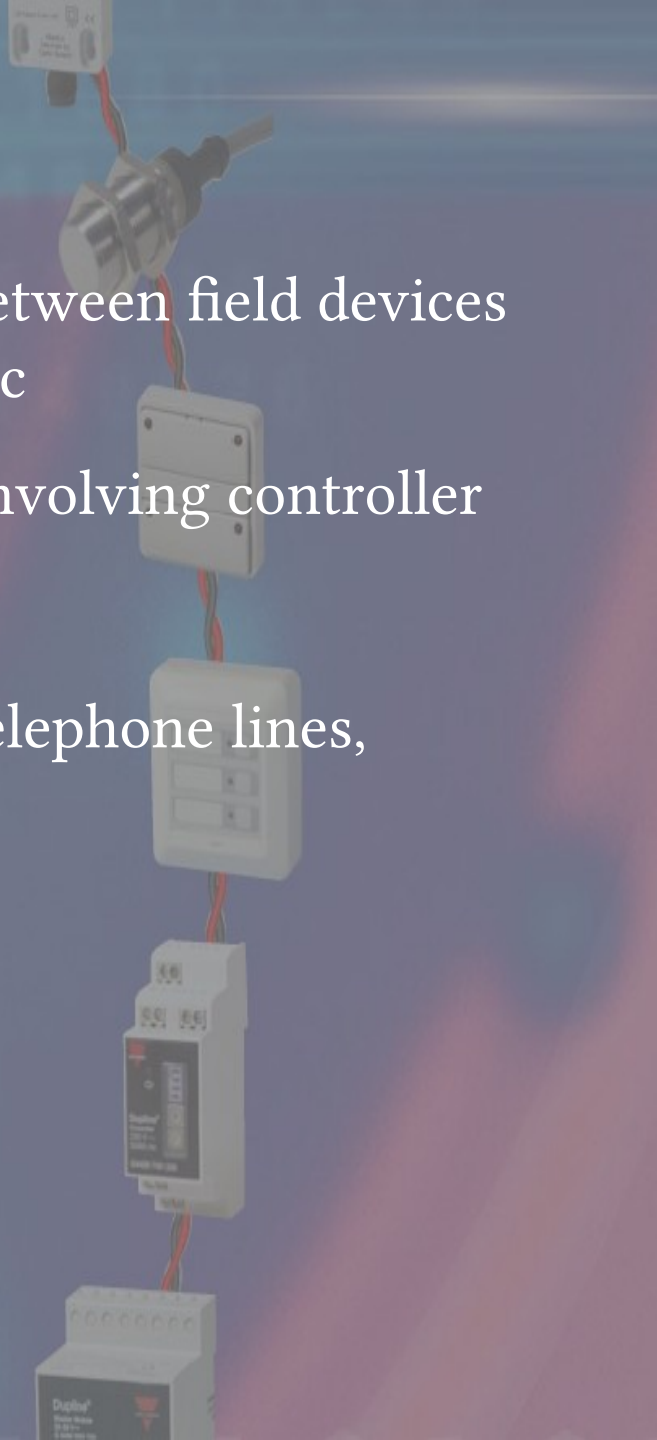
Local intranet

# What is Dupline®

Fieldbus Installationbus

- Used as remote control to create the link between field devices such as Sensors  Contactors  Pushbuttons etc
- Signals transmitted peer to peer with out involving controller
- Signals can be transmitted on copper wire

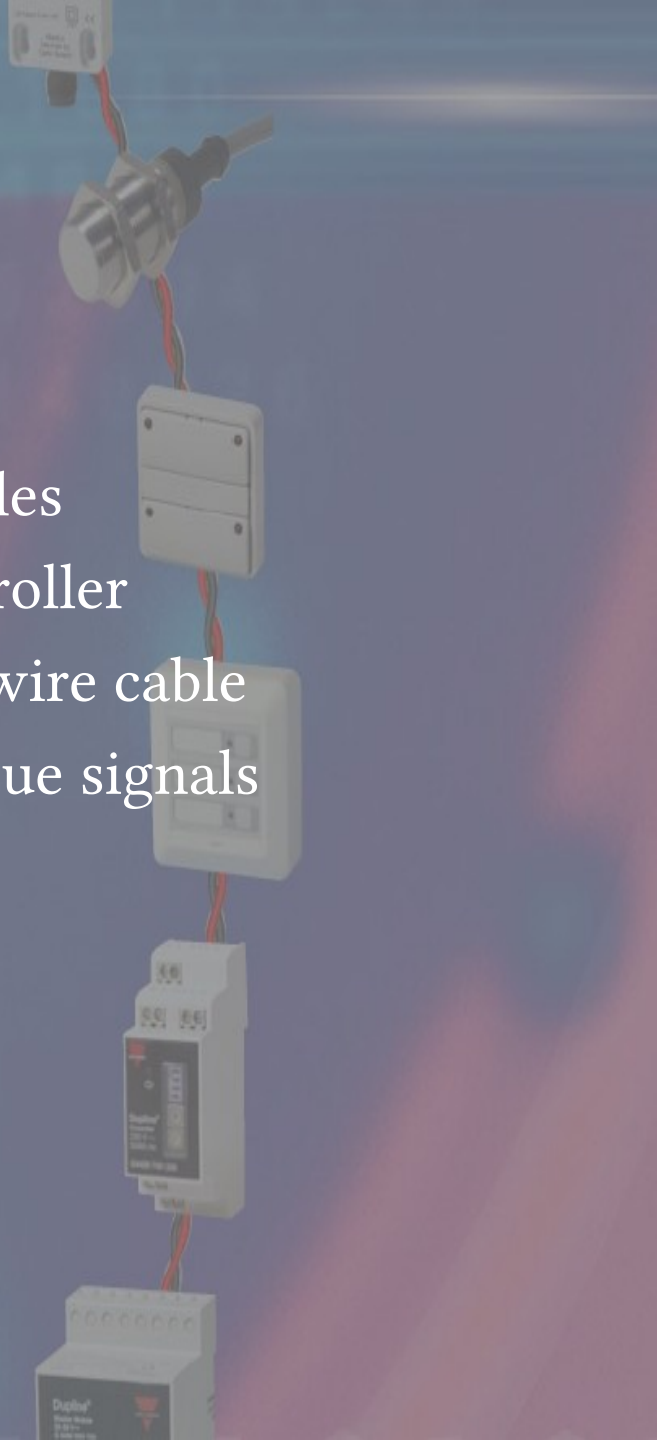
  Fibre optic cable, radio modem, leased telephone lines, GSM modem
- More than 200 000 installations since 1986
- 21 year old modules still compatible today



# What is Dupline®

Fieldbus Installationbus

- A field and Installation bus
  - Used to exchange data between modules
  - Used to exchange data to central controller
  - All modules are connected to same 2 wire cable
  - Transmits multiple digital and  analogue signals
  - Over 10 Km via ordinary 2 wire cable
  - Modular design
  - Simple operating principle
  - New and existing applications
  - Simple to program



# What is Dupline®

Fieldbus Installationbus

- Solutions engineered by combining products:
  - Digital and analogue I/O modules
  - PLC and PC interfaces
  - HMIs and Modems
  - Used to exchange data between modules
  - Used to exchange data to central controller

# What is Dupline®

Fieldbus Installationbus

## A way to communicate on a pair of wires

**Controller** **Input** **Output**

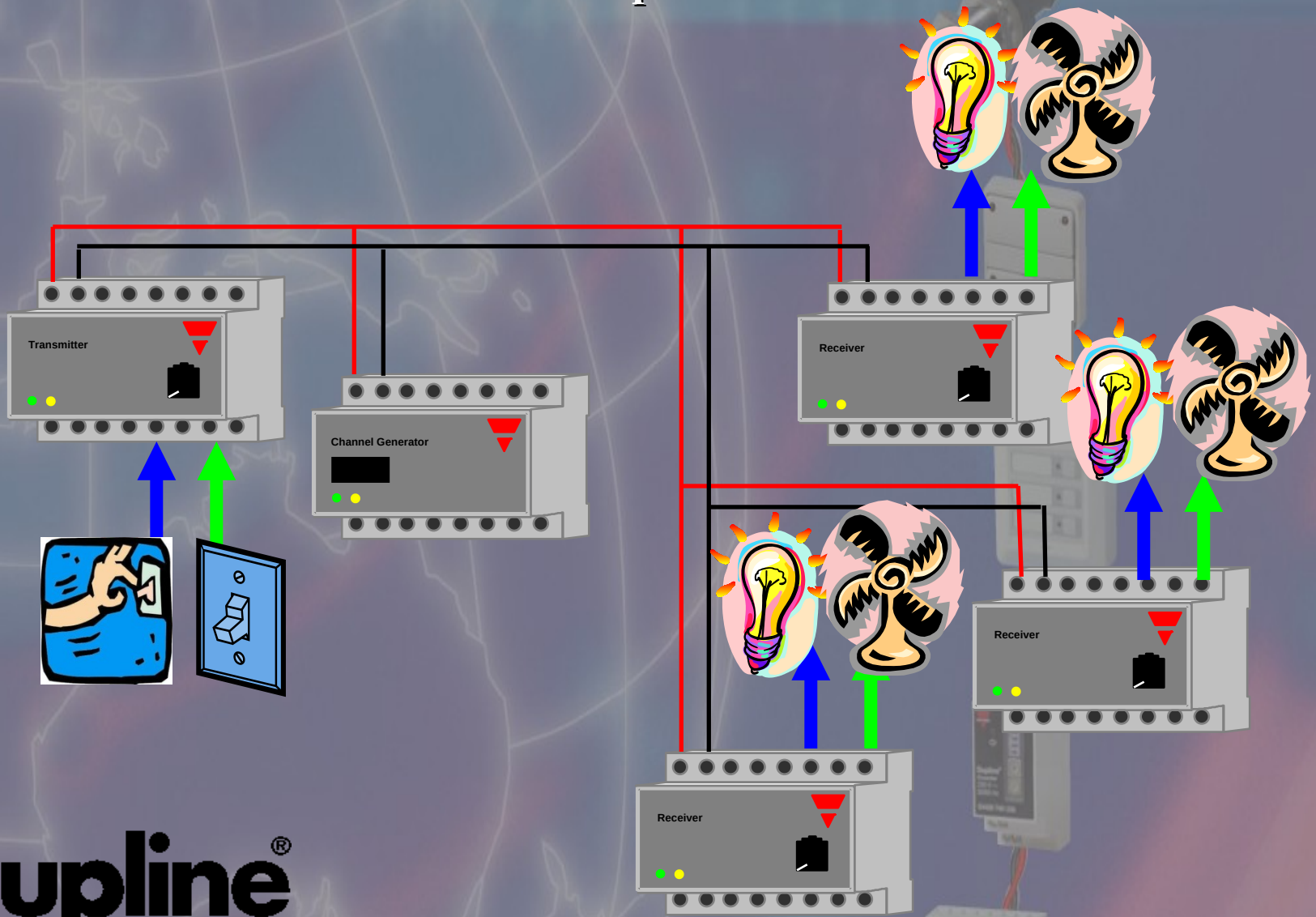
## Allowing for future Expansion with Ease

# What is Dupline®

Fieldbus Installationbus

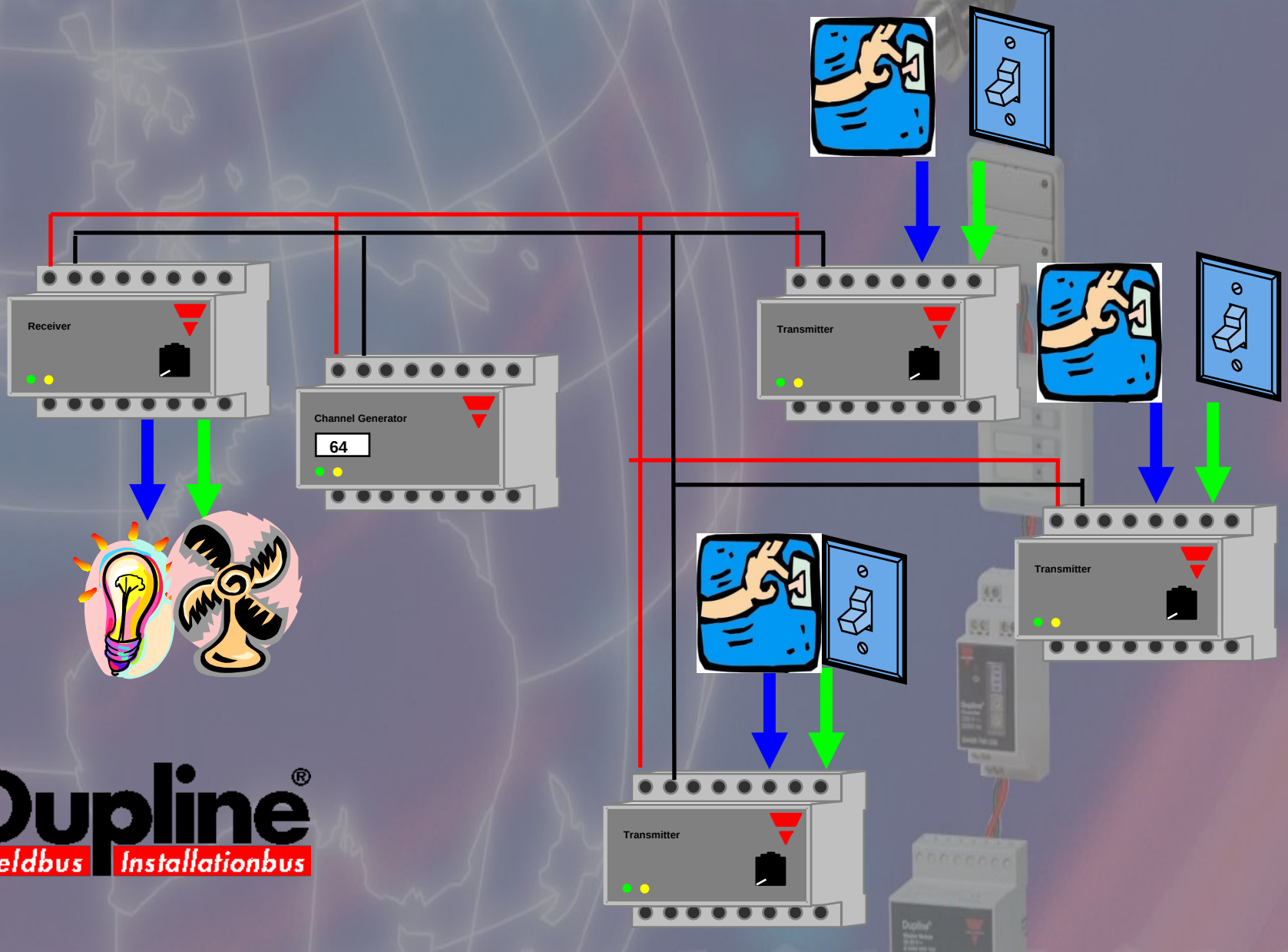
**To this……**

# One Transmitter can send to Multiple Receivers




Dupline®
Fieldbus Installationbus

# Multiple Transmitters can send to one Receiver




Dupline®
Fieldbus Installationbus

The Dupline System is constructed of 4 seperate elements:

1. Channel Generator – Controls the communication
2. INput modules – Digital or Analog.
3. PUTput module – Digital or Analog.
4. 2-wire Cable.

## Digital Input Modules

| Types | G4085 5561 | G4185 5530 |
|---|---|---|
| | | |
| Dimensions (mm) | 155 x 40 x 22.5 | 80 x 80 x 37 |
| Functions | IR Remote control transmitter for control of lights, dimming roller blinds etc. | IR Remote control receiver. |
| Housing type | Handheld | Direct wall mounting |

## Digital Sensors

| G89102116 | G8910 2217 | G8910 1101 | G6110 1145 |
|---|---|---|---|
| | | | |
| 70 x 40 x 16 | Ø 80 x 80 | 55 x 18 | 55 x 18 |
| Water Sensor for detection of water on the floor in a building. | Smoke Detector for detection of smoke in a building. | Magnetic proximity Sensor. Used to monitor the state of windows etc. | Inductive Sensor. Used to monitor the state of doors etc. |
| Direct wall mounting | Direct mounting on ceiling. | Ø 11 or Ø 14 housing. | M18 standard alarm |

## Analogue Sensors

## Digital Sensors

| G4311 1120 | G8611 1010 | G8911 1010 | G8910 1127 |
|---|---|---|---|
| | | | |
| 83 x 40 x 43 | 84 x 84 x 37 | 67 x 35 x 15 | 104 x 55 x 57 |
| Light intensity sensor for indoor and outdoor use. | Temperature sensor for indoor use. | Temperature sensor for outdoor use. | Passive infrared sensor (PIR) for detection of movement of persons. Used for intruder alarm or light control. |
| Direct wall mounting. | ELKO | Flat pack sensor housing. | Direct wall mounting. |

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## Light Switches

### G8210

66 x 66 x 11

Light switch with built-in bus interface and individually adressable pushbuttons and LED's.

OPUS design

### G8810 4401

28 x 28 x 10

Universal light switch interface for use with standard mechanical light switchs.

Ultrasmall size fo

## Digital Output Mod.

### G8810 1143

26 x 29 x 17

Decentral relay module with 1 x SPST relay for control of lights.

### G3430 5545

77 x 72 x 70

Central relay module with 8 x SPST relay for resistive loads.

## Digital Output Mod.

### G3430 4249

77 x 72 x 70

Relay module with Interlocking relay for control of 2 rollerblind motors.

DIN-Rail, H4

## Dimmer Modules

### G4248 4134

72 x 72 x 85

Dimmer module with scenario (6 memory) functions.

DIN-Rail, H4

## Digital Input Modules

### G8810 1102

26 x 29 x 17

Decentral voltage input module for use with external PIR sensors.

Compact regular with solid cable.

### G2110 4401

66 x 66 x 23

Alarm input module for use with external sensors in windows, doors etc.

Open PCB with standard alarm junction box enclosure.

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## Analog Output Mod.

| G3439 6470 |
|---|
| |
| 77 x 36 x 70 |
| Universal analog output module for external supply. |
| DIN-Rail, H4 |

## Digital Sensors

| G6110 1145 | G8910 1101 |
|---|---|
| | |
| M18 x 55 | Ø11 x 68 |
| Dupline powered inductive proximity switch. | Dupline powered magnet proximity switch. |
| M18 | Cylindrical |

## Analog Sensors

| G8911 1010 |
|---|
| |
| 67 x 35 x 15 |
| Dupline powered temperature sensor with built-in Pt1000 transducer. |
| Flat-pack |

## Digital I/O Modules

| G3440 4443 | GH34404412 | GH6440 4412 |
|---|---|---|
| | | |
| 77 x 72 x 70 | 77 x 72 x 70 | 80 x 77 x 50 |
| Combined I/O module for external supply with optoisolated inputs and relay outputs. | I/O module for irrigation valve control. | I/O module for irrigation valve control. |
| DIN-Rail, H4 | DIN-Rail, H4 | Fully molded housing for underground installation |

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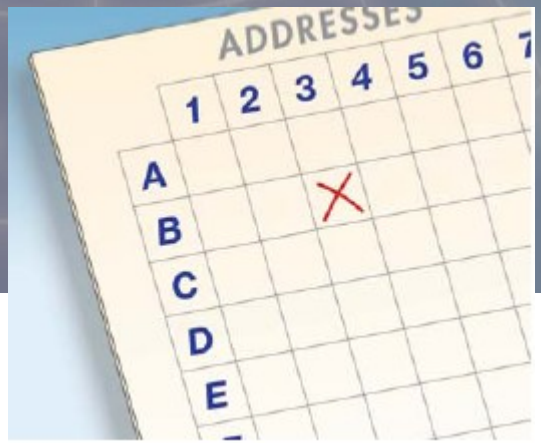
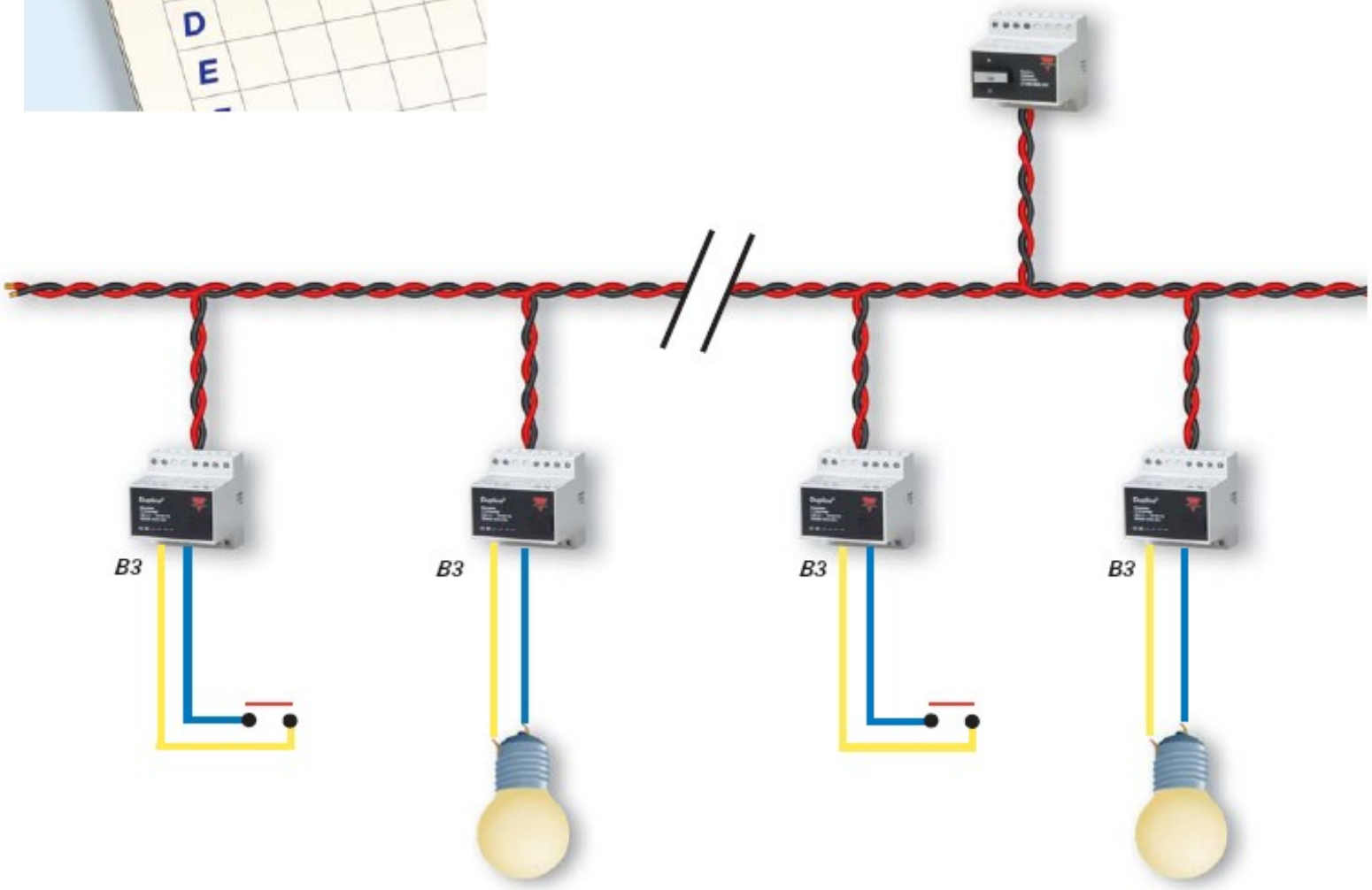
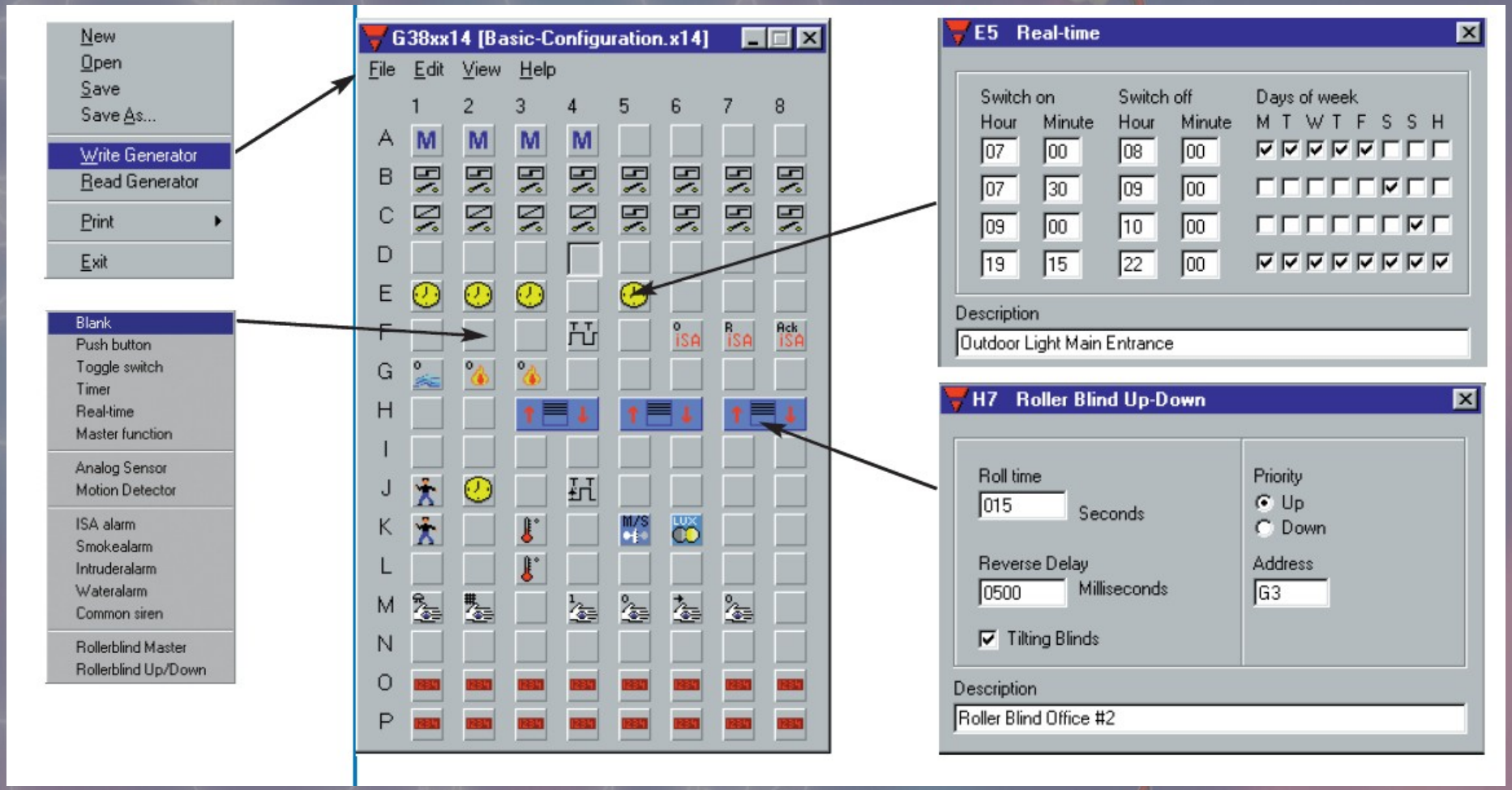
G50101106
Bus-Powered
single input module
G34296470
Analogue inputs
INPUT MODULES
G88104401
Self-powered
light switch
input module
G4420740
Counter module
G34205501
Digital inputs
ADDRESS
CONFIGURATION
GAP1506
Handheld
coding unit
GTS377S
Touch screen
GTD50
Text Display
DISPLAY MODULES
G54606606
LED status
indicator
G38000015
Central unit and interface
Direct Interface to PLCs
and PCs via
•Modbus (RS 232, RS 485)
•Dedicated PLC protocols
•Profibus-DP
•DeviceNet
TEST UNIT
GTU8
Handheld
Bus-powered
test unit
G34910040
Private line modem
SATELLINE-3AS
Radio modem
G88301143
Bus-powered
single relay
output
G34404443
Digital
inputs/outputs
OUTPUT MODULES
G34485324230
Light dimmer
G34396470
Analogue outputs
G34305545
Digital outputs
G34930000
Optical converter
MODEMS AND
CONVERTERS
D389200
Repeater

# Peer to Peer programming



# Peer to Peer programming



# Coding of addresses :

- All output modules, pushbuttons, and LED´s etc. which belong to each group is coded to the same Dupline address
- This is done by means of the GAP 1605 coding unit
- For units with multible input or outputs it is possible to select and modify each one individually

# Test of coding and wiring :

- A test to check wether the component is wired and coded correctly can be performed on the spot by means of the GTU8 test unit
- This ensure th at any fault is detected immidiately and eliminate the need for a fault-finding process throughout the network at a later state

# Configure the controller :

- The configuration of the intelligent functions in the c ontroller is performed on a PC by means of a Windows-based SW with a graphically oriented user interface
- The process simply consists of defining a function for each of the used addresses, since the corresponding in- and outputs of the object / group has already been defined in the address coding phase

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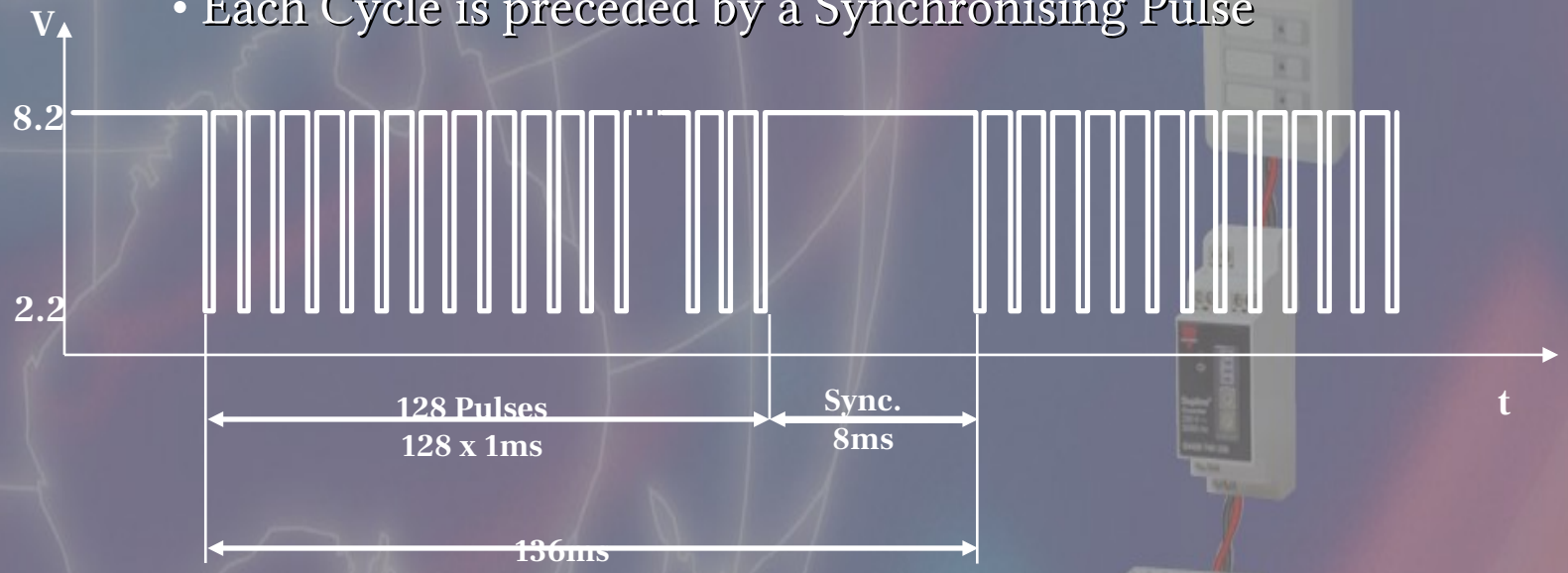
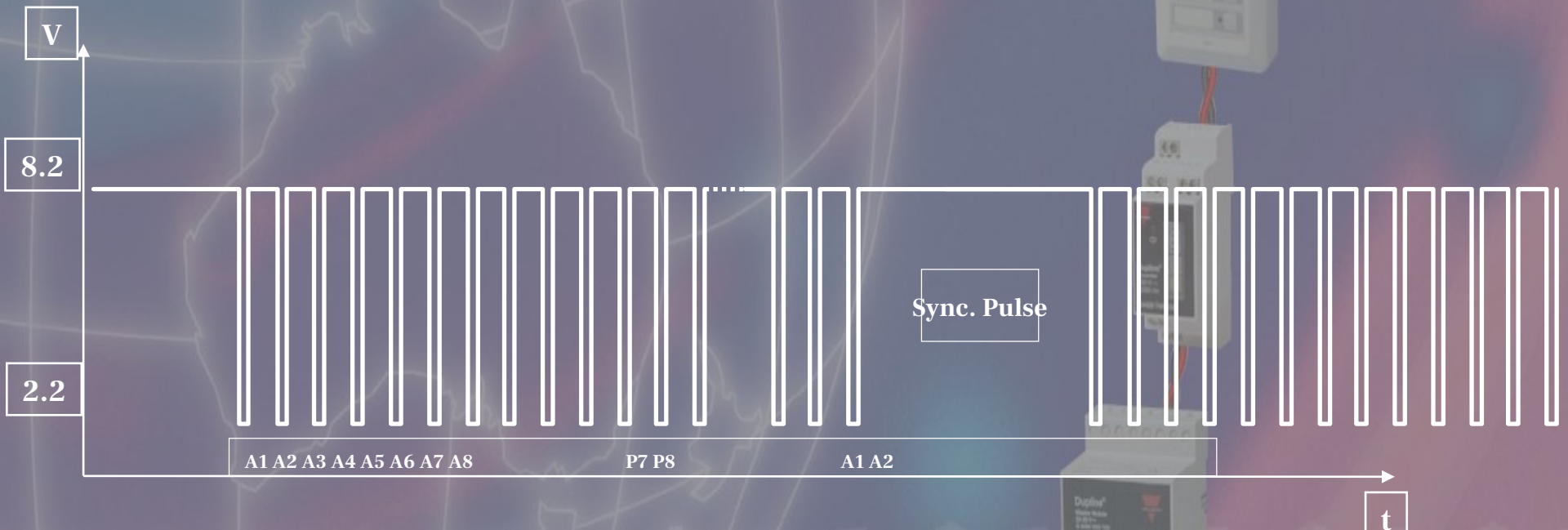
- The Output of the Channel Generator is a Square Wave signal
- The Channel Generator continually generates Cycle after Cycle of 128 Square Waves
- Each Cycle is preceded by a Synchronising Pulse



- Each Pulse represents a Dupline Address
- The Device compares the Addresses (pulse numbers) which have been assigned to its individual I/O-pins with the actual Pulse number on the bus.
- The Dupline Information is present everywhere on the communication line
- All 128 Channels are available for all connected devices – all the time



- Cost effective
- Easy to program
- Expanding
- Wire reducing
- Modular system
- Wide range of applications
- Think !!!!

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