TECHNICAL DETAILS OF WIRE LESS CONTROL SYSTEM FOR ESP APPLICATION

To Control following devices

1. **ESP Rapping motors**
2. **Thermostats**
3. **Ash Level Indicator**

PRODUCT REVIEW

General Physics of radio signals:

RF communication works by creating electromagnetic waves at a source and being able to pick up those electromagnetic waves at a particular destination. These electromagnetic waves travel through the air at speed of light.
The Wavelength of an electromagnetic signal is inversely proportional to the frequency; the higher the frequency, the shorter the wavelength.
Frequency is measured in Hertz (cycles per second) and radio frequencies are measured in kilohertz (KHz or thousands of cycles per second), megahertz (MHz or millions of cycles per second) and gigahertz (GHz or billions of cycles per second). Higher frequencies result in shorter wavelengths. The wavelength for a 900 MHz device is longer than that of a 2.4 GHz device.
In general, signals with longer wavelengths travel a greater distance and penetrate through, and around objects better than signals with shorter wavelengths.

CHOOSING THE RIGHT FREQUENCY

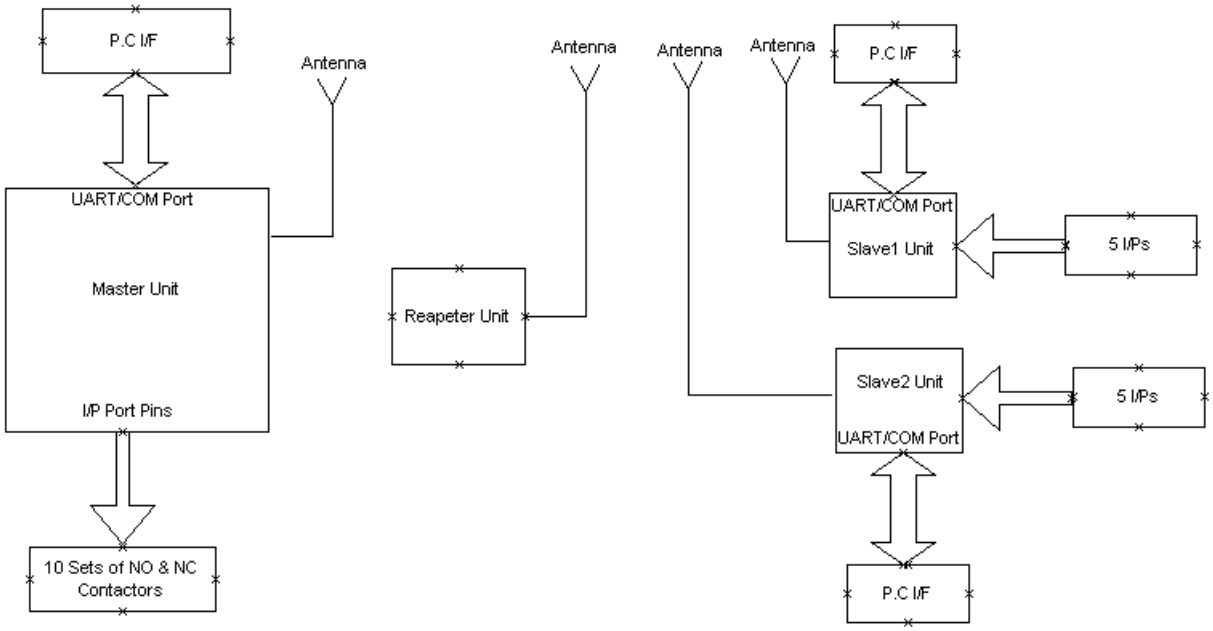
Industrial applications typically operate in "license free" frequency bands, also referred to as ISM (Industrial, Scientific and Medical). The frequencies and power of these bands varies from country to country. The most common frequencies encountered are:

- **2.4 GHz – nearly Worldwide. – our chosen frequency**
- 915 MHz band – North America, South America.
- 868 MHz band – Europe.

RF COMMUNICATION ADVANTAGES

- True Plug and communicate capability
- High Data Reliability through 128 bit AES encryption.
- Unique node identifiers.
- Can handle large network nodes.
- Secure Transmission and channel assessment.
- Link quality indication.
- Ability to operate in license free bands. (no recurring costs to the user)
- Global standard.
- Low latency.
- Superior power management with packet based transmission.
- Support for multiple network topologies (star, mesh, point to multipoint etc.) Ease of use for both new and legacy systems.
- Range extension capability by the use of routers or Repeaters.
- Ability to operate in noisy urban environments
- No need for cables, cable tray, laying time, man power, traceability & trouble shooting etc.

Block Diagram Of Wireless Control System



The purpose of this product is to enhance the control and monitoring devices with the use of the wireless communication. This product is mainly used in the industrial applications where large amount of the wires are used cabling between the device and also in the hazardous environment. This device Control applications can be extended to any device having binary control features.

The scope of this Project is

- Controlling of 10 Motors/Thermostat/Ash level Indicators from the control room with out cables with approximate distance of 300Mts(urban) or 1 KM Line of site
- This system will control two Slave unit (housed in a Junction Box).
- Each Slave unit will control 5 Motors/Thermostat/Ash level Indicator.
- Add Repeater between the Master 7 Slave to extend the operating range.
- No mismatching or malfunction

PRODUCT PERSPECTIVE

This system consists of:-

1. Master unit - 1 No.
2. Slave unit – 2 No. housed in one Junction box
3. Repeater unit – 1No. housed in Junction box

1. MASTER UNIT:-

TECHNICAL SPECIFICATION

- Master will control 2 slaves interm controls 10 Motors
- Flush mounting to the panel
- Panel cut out 147(H) x 226(w) x 120(D)
- Universel Power supply – 75 to 275 V DC/AC
- Redundent power supply
- Communcation between the two point with approximate distance of 300 Mts. In urben range. 1KM in Line of site.
- Shows the RF signal level, communication link.
- Watch dog LED
- RS232 comport
- 1 set of NC & NO contacts per motors
- Terminals are suitable for wiring of 2 no. pvc wire of 2.5 sq.mm
- ABS Plastic enclsoure
- Type tested for EMI & EMC compliences.
- Terminals are shrouded
- Protection – front panel – IP41

2. SLAVE DEVICE (Supplied with FRP Junction Box)

TECHNICAL SPECIFICATION

- Each unit having two slave modules is housed in Junction box
- Each slave module will control 5 Motors
- Universel Power supply – 75 to 275 V DC/AC
- Redundent power supply
- Communcation betwwen the two point with approximate distance of 300 Mts.
- Shows the RF signal level, communication link.
- Watch dog LED
- RS232 comport
- IP 65 degree of protection

3. REPEATER DEVICE (supplied with FRP Junction box)

TECHNICAL SPECIFICATION

- This unit is housed in Junction box
- Universel Power supply – 75 to 275 V DC/AC
- One LED to indicate Repeater unit functioning
- IP 65 degree of protection