

Substation Data Monitoring & Control System

RF Arrays has designed & developed an unmanned substation data acquisition solution consisting of RF Arrays 'RDAB 31' Board with a hybrid network of RF Arrays High Power Modules & GSM/GPRS. 'RDAB 31' data acquisition board can measure, monitor, and transmit parameters like Voltage, Current, Frequency, PF, KV, KW to a central control room. The Solution has a facility to preset current control on each output branch. The current and time lag can be preset to trip the feeder in overload conditions automatically. The solution senses the transformer parameters like KV, tap position, temperature of the transformer, oil temperature, buck trip, buck alarm, oil temperature trip, winding temperature alarm, auto tap position control etc. The solution also provides Power Factor Capacitor bank ON/OFF, depending on the preset power factor reading. This real time wireless monitoring and control solution provides a powerful tool to the utility companies to effectively measure, monitor, analyze, control, manage & maintain the power distribution system. The Data analysis helps to pinpoint areas of losses and measures to prevent them.

FEATURES

- ✓ The data is sent from distribution substation to the central data Collection Center at every customized interval. If a priority parameter is triggered at the substation, the data is sent instantaneously through the wireless network.
- ✓ The Transmission of data is through a wireless ZigBee GSM/GPRS link where this data is viewed through the front end software on a computer/ laptop. Each Substation has identification protocols to segregate the collected data.
- ✓ The data is stored on a computer/ Laptop at the central monitoring unit. We provide the Front End Software which displays the various Data Parameters collected from each substation. This software also displays the status of various processes being monitored and is able to control some of these processes.
- ✓ If a fault is detected at any of the substations, it will show up on the display allowing appropriate action to be taken.

Voltage levels (65V – 230 V AC) at three phases (R, Y, B)

9 current Levels up to 5 Amperes

16 digital Inputs which can be used to monitor various processes at the substation..

8 Digital Relays (125 V AC,7A). These can be used to control processes within the substation.

Priority Input Feedback – based on an out of tolerance reading parameter, priority inputs are provided through which an instantaneous message will be sent to the Central Control Unit.

Alarm system if any of the parameter goes out of tolerance range.



**RF Arrays
Provide
Innovative
Solutions to
the Market by
Designing,
Selling, &
Striving to
Exceed our
customers'
Expectations in
Design, Service
& Value for
Money.**

System Description

The System designed by RF Arrays, transmits various data parameters from the distribution substation units wirelessly to the central control room.

Data that can be monitored:

- ✓ Total power distributed in the Unit
- ✓ Temperature in the sub station
- ✓ Frequency at the sub station

The Data is transmitted using the new ZigBee Technology. A ZigBee Radio Frequency Mesh Network is established by using RF Arrays Modules in the license free band of 2.4 GHz. This network collects data from the different feeders of the substations and transmits to central monitoring unit. The Network is made compatible to facilitate the data communication With GSM through which data can be sent to other locations.

In addition to monitors at required central location, the data can also be seen on the Mobiles Phones of key persons at any time on demand through the short message service (SMS)

GUI (Graphical User Interface)

- ✓ The user friendly software that runs on a controller PC/Laptop, communicates with Hardware units at the substations.
- ✓ Polling time for each substation can be defined by user.
- ✓ The data like voltage, current and power etc. is displayed on the GUI.
- ✓ It shows the status of the digital inputs and outputs.
- ✓ The breakers at the substation can be made ON/OFF from central control room.

Technologies used

- ZigBee Mesh Network
- GSM wireless technology
- GPRS technique



Our Wireless Data Monitoring System has the following advantages:

- Low Cost: It does not need wired connection to each end. Thus reducing the cost.
- Low maintenance.
- Flexible and easy to customize systems: Designed to support a wide range of customer requirement.
- High Operating Range: Operates better than 1Km LOS, using our own designed RF Front End Chip.
- Auto Alarming: It warns about any fault immediately. Immediate fault detection saves the time.
- Long Battery Life: Low power consumption of RF modules projects the battery life.
- Co -Existence: Designed and tested to operate in the same area and coexist with 802.11b/g, Bluetooth, and other 2.4 GHz networks.
- Customer support - Technical and general support are offered throughout the installation and working of the system.

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