

Relay Operated System Get Data & Controlled on Mobile Phone by using Gsm Module

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Abstract— Mobile phone is a revolutionary invention of the century. It was primarily designed for making and receiving calls & text messages, but it has become the whole world after the Smart phone comes into the picture. In this project we are building a relay operated system, when relay operated (shows trip condition) and can control the relay at substation and also get by using the simple GSM based phone, just by sending SMS through his phone. In this project, Smart phone or, just the old GSM phone will work to make trip coil in off condition.

Key words: Relay P3U30, P3T32, P3L30, (Esergy Schneider), P444, P746, P642 (Micom Schneider) Wavcom Fastrack Supreme 20, Cell Phone (Andriod or Without Andriod), RS 485 Serial Converter to TCP/IP, Encoder, Decoder

I. INTRODUCTION

Controlling of electric power substation equipment (Relay) plays an important role in daily maintenance of electric power system. In an extra high voltage substation, the reliability required from substation components is critical. Applications of Relay controlled with the help of GSM based phone of substation Relay could improve the quality of accelerating the process of any substation, When there is predetermined value or fault occurs in control relay panels in 132kv/ 33kv sides. Our aim is when the fault current occurred in relay will get trip and get through on a mobile phone will control at substation (relay) or by using GSM module phone.. Here we are using a GSM Based Modem technology connected end-to-end, with one end to the Control Relay Panel and other to the mobile device. The mobile device used here makes the control of Relay's of the substation on a global basis. Here we are going to control the Relays.

II. COMPONENTS

A. Relay (P3U30, P3T30, P3L30)

The relay communicates with other systems using common protocols, such as the Modbus RTU, ModbusTCP, IEC 60870-5-103, IEC 60870-5-101, IEC 61850, SPA bus, Ethernet / IP and DNP 3.0. User interface The relay can be controlled in three ways: • Locally with the push-buttons on the relay front panel • Locally using a PC connected to the USB port on the front • Via remote control over the optional remote control port on the relay rear panel. Easergy P3U10, P3U20 and P3U30 include all the essential protection functions needed to protect feeders and motors in distribution networks of utilities, industry and power plants for all level of voltage below 132 kV. Further, the relay includes several programmable functions, such as trip circuit supervision and

circuit breaker protection and communication protocols for various protection and communication situations.

B. Presentation

1) Protection Functions

- Universal, adaptive protection functions for user-configurable applications like feeder, motor and voltage protection from basic non-directional to directional overcurrent protection, thermal overload, and auto-recloser
- Neutral voltage displacement, overvoltage and frequency protection including synchrocheck for two breakers
- Single-line diagram, measurements and alarms in the user-machine interface (UMI)
- User-configurable interlocking for primary object control
- Current and voltage injection by manipulating the database of the product by setting tool disturbance recorder file playback through the product's database
- Robust hardware
- User-selectable Ethernet, RS485 or RS232 -based communication interfaces
- Designed for demanding industrial conditions
- Standard USB connection (type B) for Easergy Pro setting software
- Common technology for cost efficiency
- Powerful CPU supporting IEC 61850
- Thanks to four setting groups, adaptation to various protection schemes is convenient User-machine interface (UMI)
- Clear LCD display for alarms and events
- Single-line diagram mimic with control, indication and live measurements
- Programmable function keys and LEDs
- Circuit breaker ON/OFF control
- Common firmware platform with other other Easergy P3 range protection relays

2) Protection Functions

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3) *Robust Hardware*

- User-selectable Ethernet, RS485 or RS232 -based communication interfaces • Designed for demanding industrial conditions • Standard USB connection (type B) for Easergy Pro setting software Common technology for cost efficiency • Powerful CPU supporting IEC 61850 • Thanks to four setting groups, adaptation to various protection schemes is convenient

4) *User-Machine Interface (UMI)*

- Clear LCD display for alarms and events • Single-line diagram mimic with control, indication and live measurements • Programmable function keys and LEDs • Circuit breaker ON/OFF control • Common firmware platform with other other Easergy P3 range protection relays.

5) *Measurement Functions*

- Easergy P3 has various amounts of analog inputs depending on the model in use. Table 3.1 introduces directly measured and calculated quantities for the power system monitoring. See Chapter 2.2 Product selection guide. The relay has two operational modes: feeder and motor. In the feeder mode, the secondary currents are proportional to the CT values whereas in the motor mode, all protection stages use the motor's nominal current values. The current scaling impacts the following functions: • Protection stages • Measurements • Disturbance recorder • Fault location calculation

III. WAVECOM GSM MODEM

Wavecom is the leading provider of embedded wireless technology for M2M (machine-to-machine) communication. It manufactures different types of wireless devices such as GSM, CDMA, EDGE, 3G and wireless CPUs. These devices can be utilized in a wide range of fields of application as automative telematics, smart matering, fleet management, GSM/GOS technologies etc.

GSM technologies and GSM modems compose a major part in wireless technology because of their high compatibility, ease of use and cost efficient price. Wavecom Fastrack Supreme with its Wismo wireless CPU based technology is the perfect choice for those who are planning to establish an SMS service with Ozeki NG SMS Gateway software. With this implementation you will be able to forward your messages to the mobile network in a secure way.

A. *Fastrack Supreme GSM Modem*

Fastrack Supreme GSM modem features a powerful central processing unit with an ARM9 32 bit, 26-104MHz core. It comes with an advanced version of Open AT Software Suite which offers VariPowerw (flexible power consumption modes), VariSpeedw (on-the-fly processor speed switching), Real time native execution of embedded multi-tasked C applications plus IDS (Intelligent Device Services) compatibility for secure, cost-effective upgrades, monitoring and maintenance. Thus this device is fully capable of handling Ozeki NG SMS Gateway's superior performance (Figure 1).



Fig. 1: Wavecom Fastrack Supreme GSM Modem

However the unit can be further configured to be able to establish different kind of connections. The modem is equipped with an internal expansion socket (IES) interface which allows to developers to further expand the hardware's capabilities. One can easily add additional connectivity features (examples: GSN, Bluetooth, Zigbee, WiFi and more) thus one also can populate with an expansion card from Wavecom (3 initial Wavecom expansion cards: IO expansion with mini USB connectivity; USB; or IO expansion with USB) or one of your own.

The Supreme GSM modem combines the benefits of ease of use, superior quality and reliable supply, all at a very competitive price and without compromising Ozeki NG SMS Gateway's quality. Therefore this modem is perfect for establishing a professional SMS service.

IV. BLOCK DIAGRAM

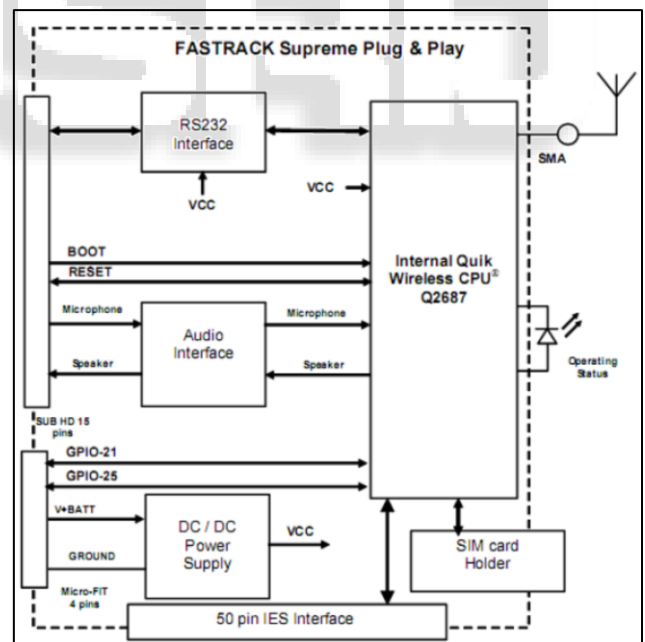


Fig. 1: Function Diagram of Wavecom GSM Modem

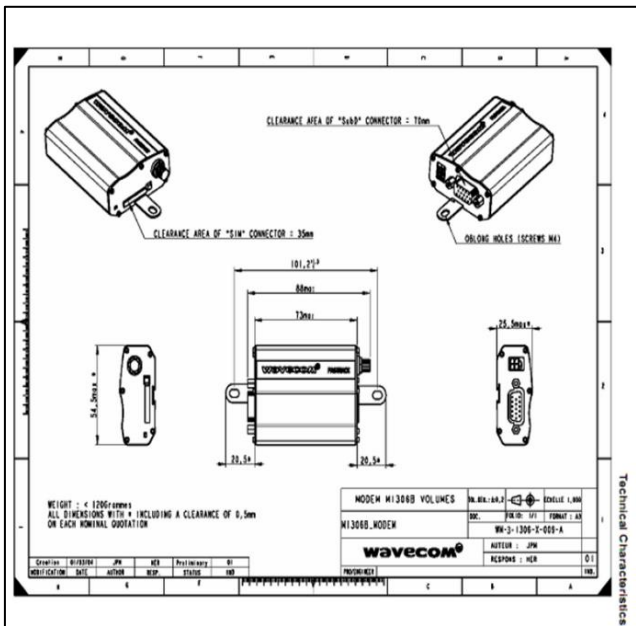


Fig. 2:

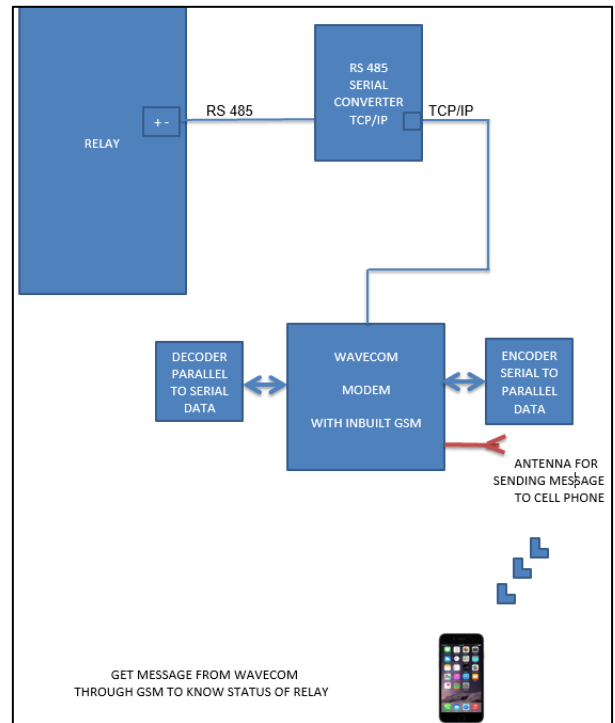


Fig. 5:

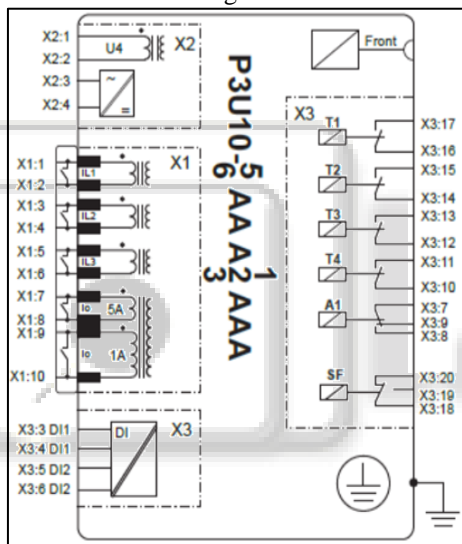


Fig. 3: Block Diagram for Relay ESERGY

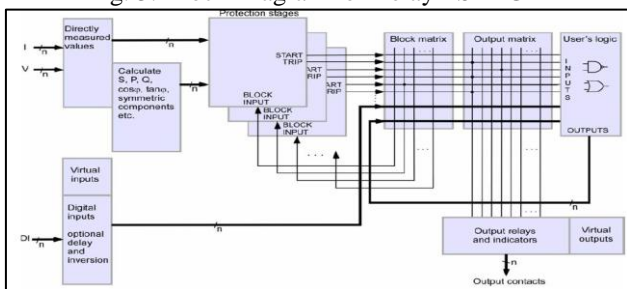


Fig. 4: Block Diagram for Relay and WAVECOM

V. PROGRAMMING OF RELAY

There are virtual inputs and virtual outputs that can in many places be used like their hardware equivalents except that they are located in the memory of the relay. The virtual inputs act like normal digital inputs. The status of the virtual input can be changed via the local display, communication bus and Easergy Pro. For example setting groups can be changed using virtual inputs.

Virtual inputs can be used in many operations. The status of the input can be checked in the Output matrix and Virtual inputs setting views. The status is also visible on local mimic display, if so selected. Virtual inputs can be selected to be operated with the function buttons F1 and F2, the local mimic or simply by using the virtual input menu. Virtual inputs have similar functions as digital inputs: they enable changing groups, block/enable/disable functions, to program logics and other similar to digital inputs.

The activation and reset delay of the input is approximately 5 ms.

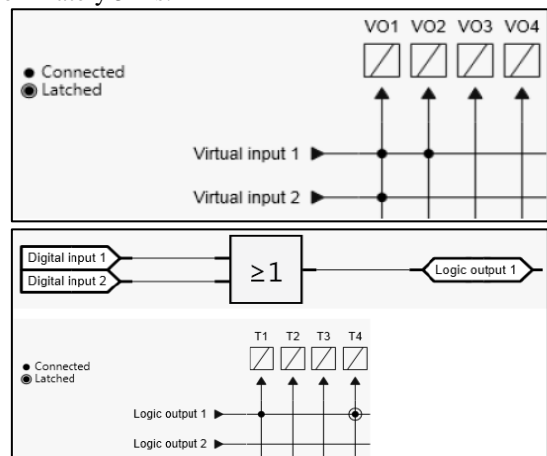


Fig. 6:

VI. CONCLUSION

Our paper presents an inexpensive GSM based interactive control system. A number of to the proposed system, the host can be any cellphone and the client is a controller based on REALY AND WAVE MODEM. The controller (Relay) is connected to a WAVE modem inbuilt GSM through an RS485 cable and RS485 CONVERTER. The paper provided explanation of the circuit diagram of the proposed system. The project circuit diagram was designed using Proteus v7.7 designing software.

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