



**User manual**

**MODEM**

**for**

**REMOTE SWITCH CONTROL**

**V1.20**

**USAGE NOTICE**

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## INTRODUCTION

Product: Modem for remote switch control

External interface: LVTTL Digital output and RS232 command interface

Configuration: Using SMS

Output: 2Nos LVTTL signal output. Expandable to 16 digital inputs and 16 digital outputs

The remote switch control modem provides a solution to control up to 2 external devices from remote location. If an application requires more number of devices to be controlled, an extension can be connected to the modem to control additional 16 devices and read digital input from 16 devices. The modem is fully configurable and can operate in auto mode once configured fully.

'Automation Research Labs' manufactures different models of such modems. All products are designed for industrial applications and are covered under warranty against manufacturing defect. For details please refer our warranty statement at the end of this document.

### **GSM/GPRS Features:**

- Based on Quectel quad band GSM/GPRS module.
- Quad band 850/900/1800/1900MHz.
- 3V SIM Card Slot.
- Works with off-the-shelf available 50E antenna.
- Aluminum casing with powder coating.

### **External switch controlling features:**

- Independent setting for two separate outputs (On time and off time setting)
- Built in real time clock to keep track of time
- Automatically turns on or off whenever preset time matches with actual time
- Can be configured from anywhere using SMS
- Current status of output signal can be checked using SMS
- Output can be changed for instant operation at any time irrespective of preset time
- Additional 16 outputs can be controlled using SMS or preset time

### **Applications:**

- Street light control
- Water pump control
- Automated door control

### **Specifications:**

- Power supply: 7.5V to 24V DC.
- Dimension:80mm x 55mm x 25mm
- Weight: 142gm approx

## GETTING STARTED

- Power supply range for modem is 7.5VDC to 24VDC. Power source should be capable of sourcing minimum of 1A current.
- Make sure to connect stable power supply to modem with specified polarity. Wrong power supply connections (reverse polarity) for long duration may permanently damage modem.
- Make sure that the SIM card has enough memory space free to receive messages.
- GPRS connectivity is optional. SIM card may or may not have GPRS service activated.
- Supported service providers for GPRS are Airtel, Uninor, Idea, BSNL. (May work with other service providers but not tested for GPRS data connectivity) Product version 3.2 onward supports dynamically adding support for unknown SIM cards.
- Communication settings for RS232 interface are as below
  - Baud rate: 57600
  - Start bit: 1
  - Data bits: 8
  - Parity bit: None
  - Stop bit: 1

### Connections pin-out:

Modem has D sub miniature 9 pin female connector for signal interface and 2pin phoenix two piece right angle screw terminal for power supply connections. Below are pin wise details for both these connectors.

DB9 PIN	SIGNAL NAME
1	NC
2	TXD RS232
3	RXD RS232
4	Digital output 3
5	GND
6	Digital output 2
7	Digital output 1
8	NC
9	NC
Case	Connected to Ground

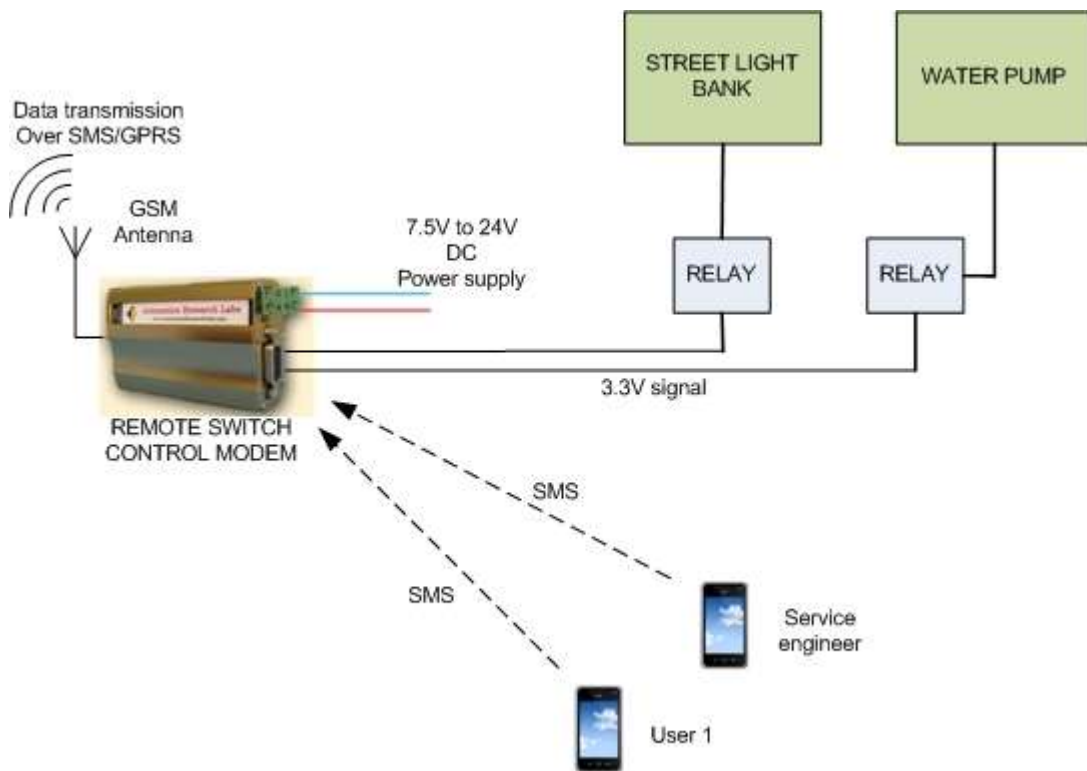
### Table Terminology

NC: Do not make any electrical connection to these pins. Some or all of these pins might be used for internal testing and factory settings.

GND: Supply negative

Warning: Wrong connection or over voltage at any of the D type connector pin may permanently damage the modem.

### Application diagram:



## MODEM CONFIGURATION

Switch control modem is fully configurable using SMS or from RS232 serial port using the accompanying software. Each setting that needs to be changed can be configured using a simple text SMS from a predefined number. Configuration is typically a onetime process and all settings are saved in memory permanently. The configuration commands are entertained from an authorized number only. Any configuration command received from unknown number is discarded.

### SMS Configuration commands

#### a. Setting mobile number of service engineer

Service engineer is a person who can modify all configuration settings of modem and can change mobile number of other users of the modem. Setting service engineer's number is first step since all other settings can be modified by a service engineer only.

**SET<space>SERNUM<space><mobile number>**

Note:

- Make sure that entered mobile number is valid number.
- Mobile number is a 10 digit number. Country code should not be included.

#### b. Setting master user mobile number:

Service engineer can set master user number using following SMS command. Master user can set or modify all settings except service provider number.

**SET<space>MASTER<space><mobile number>**

#### c. Setting user mobile number:

User 1 or user2 is a regular user who can operate remote device or query their status. Regular user cannot change any settings of modem. User can set user 1 number using following SMS command.

**SET<space>USER1NUM<space><mobile number>**

#### **d. Instant operation of output**

User can turn output ON or OFF instantly using following command. It will operate the specified output immediately after receiving the SMS.

**SET<space>TURNON<space><outputnumber>**

**SET<space>TURNOFF<space><outputnumber>**

#### **e. Setting real time clocktime**

Time and date is used for operating outputs if preset time is set. User can set time and date using following SMS command

**SET<space>TIME<space><DD/MM/YYYY><space><HH:MM:SS>**

Note: Single space cannot be replaced by multiple spaces. It is recommended to set time only when required. Normally all products come with factory set time to achieve best accuracy of time. User may use available PC end software to set time in modem for better accuracy.

#### **f. Setting SMS enable or disable**

This is command is used to set the SMS facility is enable or disable.

**SMS<space>ENABLE**

Using this command user can set the SMS facility is enable. So user can receive each & every SMS from modem.

**SMS<space>DISABLE**

Using this command user can set the SMS facility is disable. So user does not receive any SMS from modem.



## ACCESSORIES

Following accessories are available along with the switch control modem. These may be ordered at extra cost if required.

### a. Power supply for modem

A 12V, 1A adapter is available for powering the modem. Any standard power supply can be used along with the modem. The power supply should incorporate transient suppressors and line filters to prevent the modem from getting damaged in case of surge voltage.

### b. Relay board

A board containing two relays of 10A contact rating, snubber circuit and relay driving circuit is available for ready connection with the switch control modem.

### c. Digital input output extension board



## APPENDIX

### Troubleshooting notes

In normal operation, the modem's status LED blinks continuously. If the blue LED is in OFF state, the modem is in power down state. Following table provides various blink rates of LED for different situations.

LED STATUS	MODEM STATUS
OFF	The modem is in power down state
64mSec on / 800mSec off	The modem is not synchronized with GSM network.
64mSec on / 2000mSec off	The modem is synchronized with GSM network and is working normally.
64mSec on / 600mSec off	GPRS data transfer is ongoing

In case of GPRS data communication, modem requires considerable power during actual data transmission. Hence power supply is critical for reliable data communication. It is strongly recommended to use an industry grade power supply (SMPS) of at least 2Amp current rating for powering the modem. Also make sure that the antenna is properly connected to modem and placed at an elevated place where the modem can receive strong signal for communication.

Some more troubleshooting points are mentioned below.

**Symptom:** Modem not working at all

**Reason:** Check power supply. In many cases, bad power supply is main reason for modem to malfunction. Required power supply specifications are mentioned in relevant sections above. Make sure the modem has been connected with proper power supply with proper polarity.

**Symptom:** Modem powered on but not responding to any SMS queries

**Reason:** Check modem without connecting any device on bus. Many times wrong bus connections make the modem receive garbage data over bus and this result in modem continuously resetting itself trying to recover from the situation.

Also check if SIM card has sufficient space free to receive SMS. Check if antenna is properly connected and placed at elevated location.

## Warranty statement

All the products mentioned in this manual are covered under warranty for a period of 12 months against manufacturing defects, workmanship and malfunction under normal operating conditions. The warranty is subject to the terms and conditions mentioned below.

1. The warranty commences from the date of sale for a period of 12 months irrespective of the actual installation date.
2. The warranty is against manufacturing defects and any subsequent malfunction of the instrument during the normal operation. The warranty shall not be applicable in case of accidental damage, damage due to wrong operation, connection or conditions that are out of normal operating specifications.
3. KARL PL, at its discretion may repair or replace the product depending on the condition of instrument, availability of spare parts and type of failure.
4. In case of warranty claim, the warranty period will not be extended and remains same as stated earlier from the date of sale.
5. Maximum liability of KARL PL remains up to repair or replacement of the product only. Any damages or losses raised out of use of the instrument are not covered by this warranty. In any case, cost of the product will not be refunded.
6. In case of warranty claim, the product should be sent over to KARL PL immediately after noticing the defect or failure. A detailed note of operating conditions in which fault occurred will be helpful in rectifying the defect.
7. Do not try to open or repair the instrument on your own. Warranty will stand null and void in such case. Products with tampered warranty seal will not be considered for warranty claims and regular service charges will be applicable.
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Kurolikar Automation Research Labs Pvt Ltd  
#226, Laxmi colony, Behindmanish market,  
Hadapsar, Pune – 411028.  
[www.AutomationResearchLabs.com](http://www.AutomationResearchLabs.com)  
Email: [sales@AutomationResearchLabs.com](mailto:sales@AutomationResearchLabs.com)