



Automate the Home

Home Automation System

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INTRODUCTION:

This application note describes a system for home automation based on the PIC12C671. The idea is to have a control to all of the devices in the home via an infrared remote control transmitter with the power line as a media. The system consists of 3 parts: an infrared remote control device, a receiver and the number of terminal devices according to the need.

APPLICATION OPERATION:

The system uses a power line modem ST7537 to transmit data via a power line. The commands are given from the remote control device. The receiver receives infrared signals and transmits the command to the addressed device. Each device in the home, like a light, garage heater, etc., has a unique address. The message from the receiver is addressed to the controlled device. This household scenario is given in Figure 1.

The Receiver

The schematic of the receiver is given in Figure 2. The IR signals are received in the photo-transistor and after amplification are applied to the gp4 to PIC12C671. The PIC12C671 decodes signals from the IR remote control and composes the command to the terminals. The modem modulates the signals, such as 133.05 KHz is '0' and 131.85 KHz is '1'.

The Terminal

The schematic of the terminal is given in Figure 3. The commands are received from the power line and are decoded from the PIC12C671. According to the command the PIC12C671 drives the opto triac driver and triac. The opto U6 senses the phase of the power line.

The IR Remote Control

The IR remote control is shown in Figure 4. The PIC12C671 drives an infrared LED, to transmit the commands in the system. The trick in this scheme is to connect 16 buttons via 4 analog inputs to the PIC12C671. The 'R' ladder gives different levels according to a pushed button. In this way, the device can transmit 16 commands to the terminals.

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Graphical hardware representation:

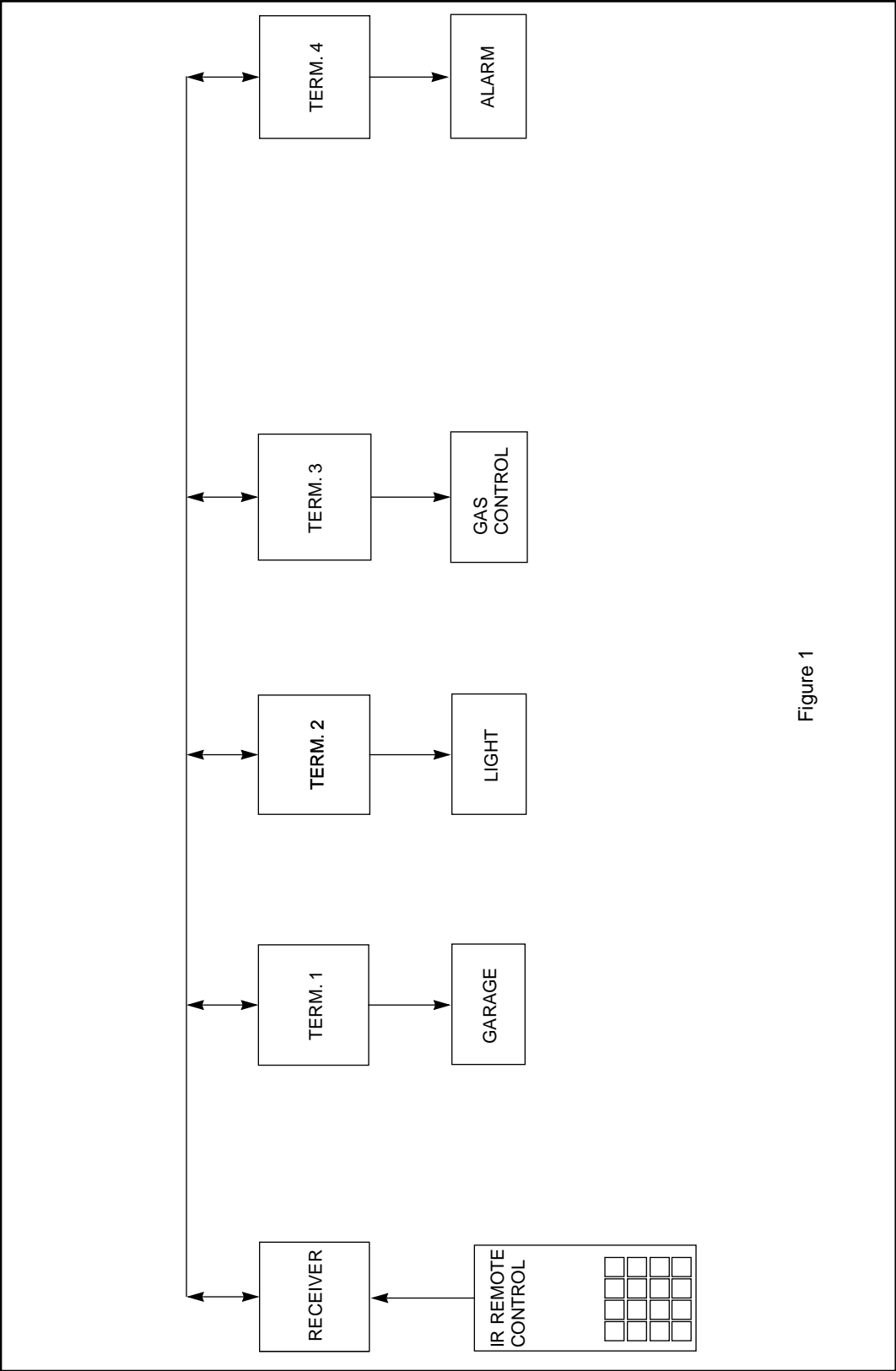


Figure 1





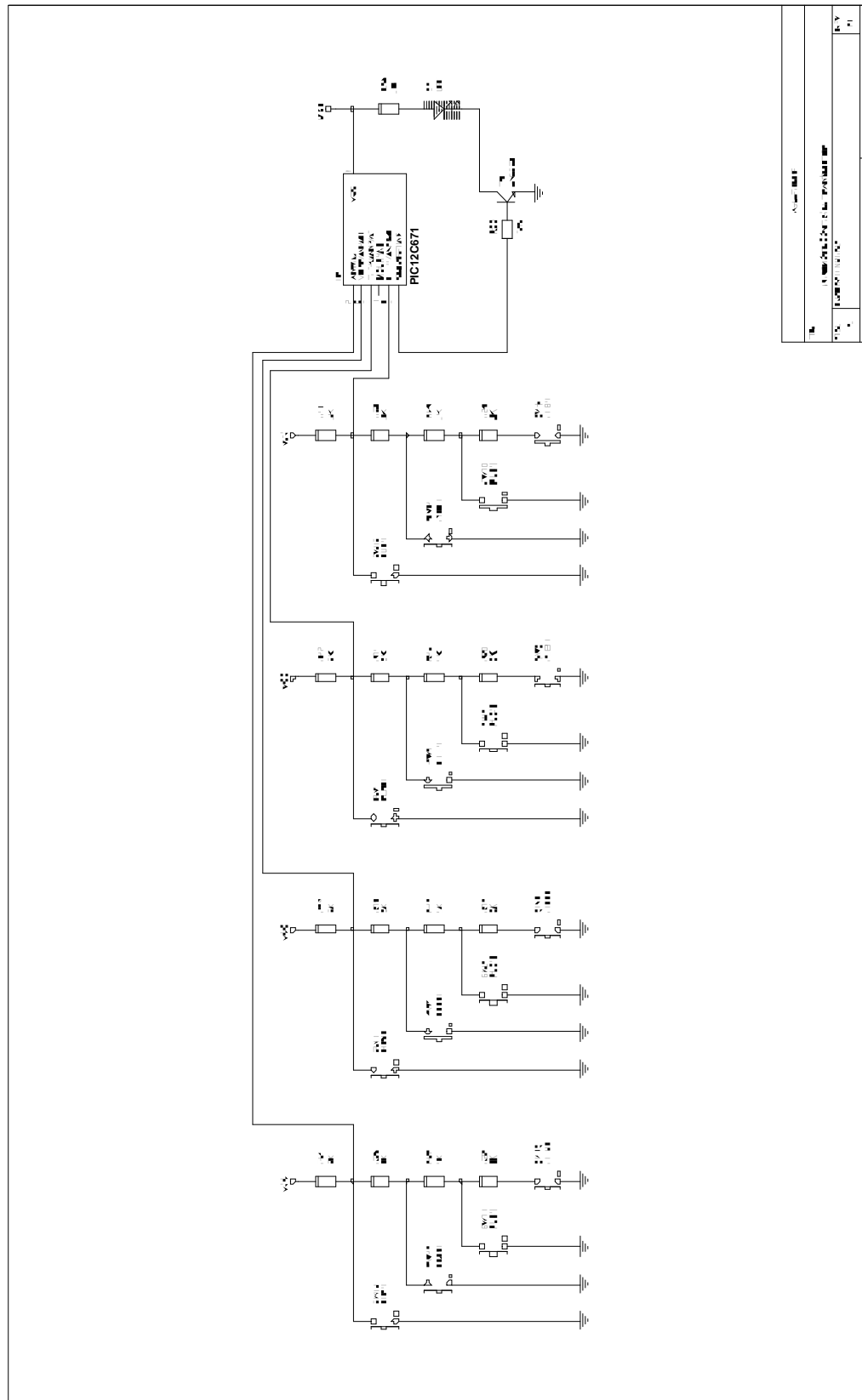


Figure 4

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NOTES: