



Infrared Remote Decoder Module

User's Guide



INFRARED REMOTE DECODER MODULE USER'S GUIDE

Table of Contents

Chapter 1. Overview	1
1.1 Overview	1
1.2 Features	1
1.3 Applications.....	2
Chapter 2. Hardware Detail	3
2.1 Pin Definition	3
2.2 Parallel Output.....	3
2.3 Asynchronous Serial Output	4
Chapter 3. Electrical Characteristics	5
Chapter 4. NEC Protocol	6
4.1 Features	6
4.2 Modulation	6
Chapter 5. Mechanical Drawing.....	7
Chapter 6. Contact Us	8

Infrared Remote Decoder Module

NOTES:

Product Version : Ver 1.0

Document Version : Ver 1.0

Chapter 1. Overview

1.1 Overview

Thanks for using this infrared decoder module by Sure Electronics. This item can be used to decode signals from any remote control which utilizes NEC IR protocol. Integrating high performance PIC16F690 IC as the decoder makes this module feature high anti-jamming ability and low bit-error rate. Powered by either DC5V or DC3.3V, this module can output signals through either asynchronous serial port or parallel ports so that it can be used in various applications like power control, lighting control, volume control, etc..

FIGURE 1-1 OVERVIEW

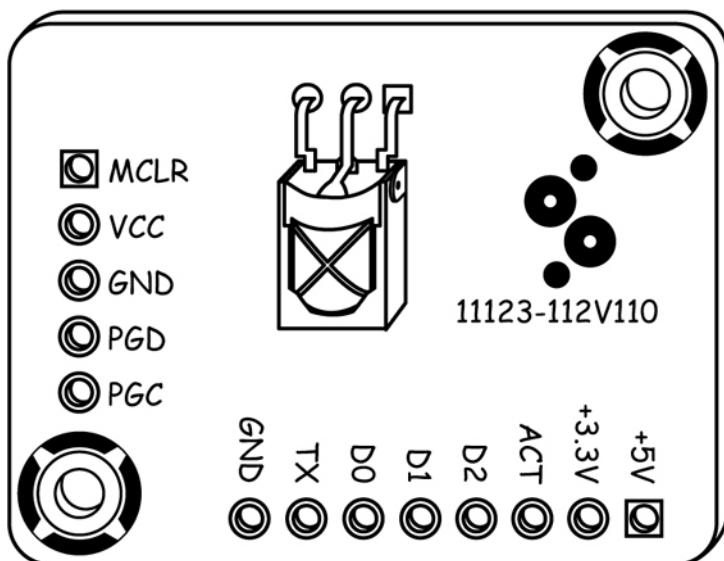
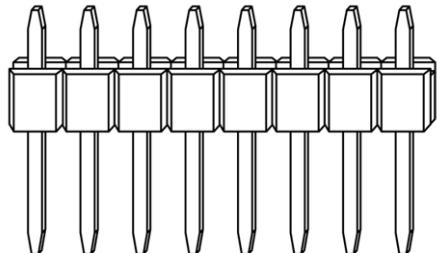


FIGURE 1-2 ACCESSORY



Note: All the diagrams in this manual are for reference only.

1.2 Features

- Minimized size
- Supporting NEC encoding format
- DC5V or DC3.3V supply
- Two kinds of signal output:
Asynchronous serial output

Infrared Remote Decoder Module

Parallel output

- Excellent design for easy integration in kinds of systems
- Save resources, shorten development cycle

1.3 Applications

- DIY Applications
- Remote Control Decoding
- Smart Home
- Volume Control

Chapter 2. Hardware Detail

2.1 Pin Definition

Pin definition is shown as follows.

TABLE 2-1 PIN DEFINITION

Pin	Symbol	Description
1	+5V	DC5V supply
2	+3.3V	DC3.3V supply
3	ACT	Signal indication: "1"- key pressed, "0"- no key pressed
4	D2	Parallel output D2
5	D1	Parallel output D1
6	D0	Parallel output D0
7	TX	Asynchronous serial output
8	GND	Ground

Note: Never use pin 5V and pin 3.3V at the same time.

2.2 Parallel Output

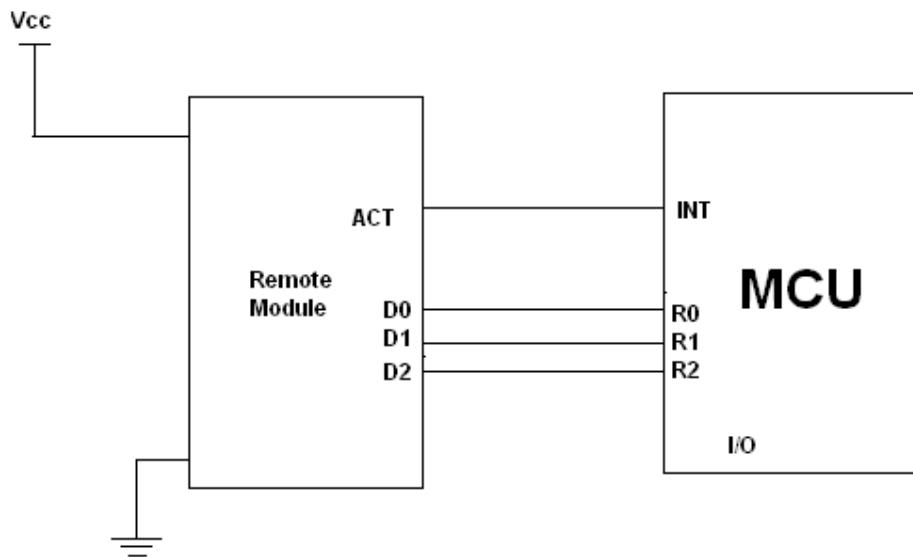
In this mode, parallel ports are used and up to seven keys of a remote control are supported. This module can be used with [MB-CM11111 \(Small 7-key User-definable Remote Control\)](#) by Sure Electronics. Please refer to the following table for the relationship of keys of the remote control and parallel ports.

TABLE 2-2 CORRESPONDING RELATIONSHIP OF KEYS AND PARALLEL PORTS

Decoder Module				Remote Control			
ACT	D2	D1	D0	Key	Function	Address code	Command code
1	0	0	1		ON/OFF	0x20	0x1C
1	0	1	0		Up (+)	0x20	0x10
1	0	1	1		Down (-)	0x20	0x1D
1	1	0	0		SET	0x20	0x11
1	1	0	1		Up (++)	0x20	0x18
1	1	1	0		Down (--)	0x20	0x15
1	1	1	1		SETOFF	0x20	0x19

Infrared Remote Decoder Module

FIGURE 2-1 CONNECTION DIAGRAM



2.3 Asynchronous Serial Output

In this mode, asynchronous serial port is used. When a key of a remote control is pressed, this decoder module will receive the signal and can read the corresponding address code and command code with the help of UART communication software (not provided here).

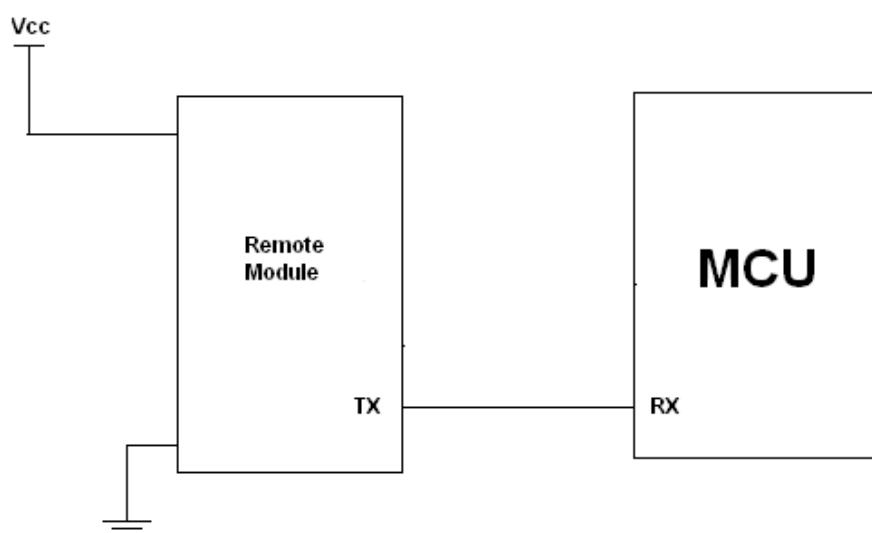
UART properties:

- Baud rate: 9600bps
- Start bit: 1bit
- Data bit: 8bits
- Parity bit: 0bit
- Stop bit: 1bit

Data from serial port:

- Coding: hexadecimal
- Format: address code+ data code

FIGURE 2-2 CONNECTION DIAGRAM



Chapter 3. Electrical Characteristics

FIGURE 3-1 ELECTRICAL CHARACTERISTICS (VDD=3.3V OR 5V)

Parameter	Min.	Typ.	Max.	Unit
V_{OL} (low level output)	GND	-	0.4	V
V_{OH} (high level output)	-	-	V_{DD}	V

Chapter 4. NEC Protocol

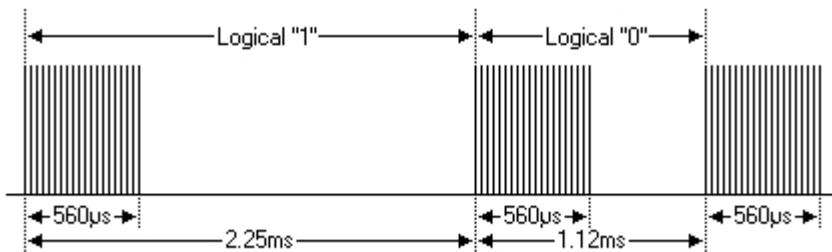
4.1 Features

- 8 bit address and 8 bit command length
- Address and command are transmitted twice for reliability
- Pulse distance modulation
- Carrier frequency of 38KHz
- Bit time of 1.125ms or 2.25ms

4.2 Modulation

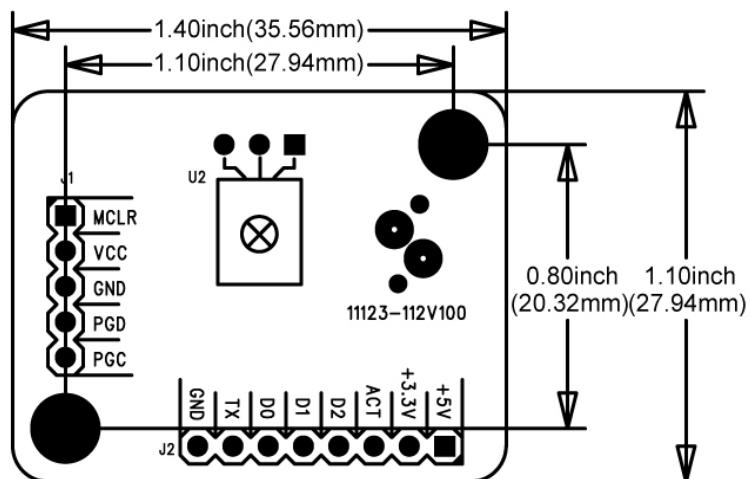
The NEC protocol uses pulse distance encoding of the bits. Each pulse is a 560 μ s long 38KHz carrier burst (about 21 cycles). A logical "1" takes 2.25ms to transmit, while a logical "0" is only half of that, being 1.125ms. The recommended carrier duty-cycle is 1/4 or 1/3.

FIGURE 4-1 MODULATION



Chapter 5. Mechanical Drawing

FIGURE 5-1 MECHANICAL DRAWING





INFRARED REMOTE DECODER MODULE USER'S GUIDE

Chapter 6. Contact Us

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