

MR-Servo8 User Manual



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PART 1: MR-Servo8

1. Introduction

MR-Servo8 is a small pre-assembled R/C(Radio Control) servomotor controller, which has 16 R/C servo connectable I/O pins. The MR-Servo8 can control up to 8 R/C servos at the same time. The MR-Servo8 uses an ATmega8(Atmel AVR series) CPU chip as a controller. The ATmega8 has a 4K bytes In-System Programmable Flash memory, 128 bytes SRAM, 256 bytes EEPROM and many other peripherals. The user can download a program to the board without a ROM Writer using the ISP function. A free C-compiler (WinAVR) is available.

2. Features

- ATmega8 (Atmel AVR series, 16MHz X-tal(16 MIPS) but internal 8MHz RC Oscillator setting is required for the RC Servo Source Example. Refer to “Security Bit Settings for ATMega Family.pdf” for the setting.)
- 8K bytes ISP flash, 1K bytes SRAM, 512 bytes EEPROM, three Timers, ADC 8ch, UART
- 16 R/C servos connectable
(16 I/O port pins)
- Controls up to 8 R/C servomotors at the same time
- C source code
- Free Windows C compiler(WinAVR AVR GCC)
- ISP downloader(Optional)
- On board piezo Buzzer

3. Control

The board has sixteen I/O port pins and can control 8 servomotors at the same time. The ATmega8 CPU has three internal counters. The board generates up to eight periodic pulses using the timers. The periodic pulses control R/C servomotors.

PART 2 : BOARD

1. Placement Diagram(Silkscreen)

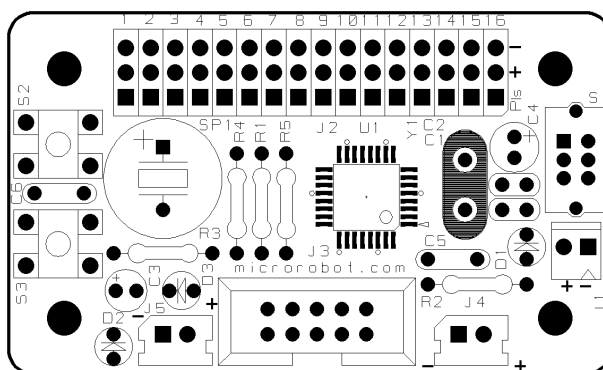
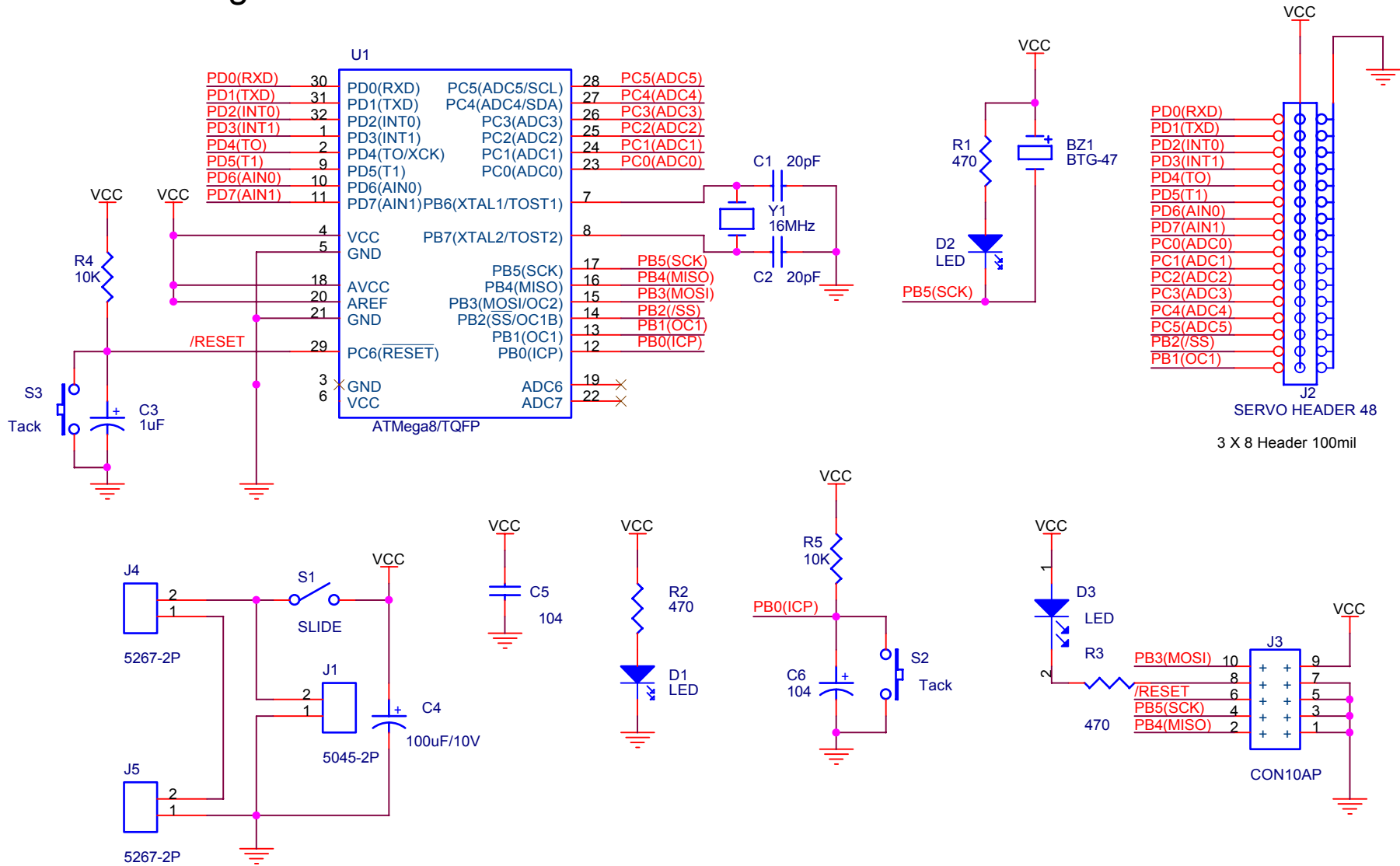


Fig 1.1 ATmega8 Servomotor control board silkscreen.

2. Circuit Diagram



3. Parts List

NO	Reference	Parts name	Value	Qty.	Remark
1	C1, C2	Capacitor	30pF	2	Ceramic Condenser
2	C3	"	1uF	1	Electrolytic Condenser
3	C4	"	100uF/10V	1	Electrolytic Condenser
4	C5, C6	"	104(0.1uF)	2	Monolithic Condenser
5	D1, D2, D3	LED	RED 3ø	3	
6	J1	Connector	5045	1	5V Power Part
7	J2	"	HEADER PIN(Male)	1	SERVO HEADER 48PIN
8	J3	"	CON10AP	1	HIF3F/10PIN
9	J4, J5	"	5267	2	Battery Power Part
10	R1, R2, R3	Resistor	470Ω	3	
11	R4, R5	"	10K	2	
12	SP1	BUZZER	BTG-47	1	PIEZO
13	S1	S/W	SLIDE S/W	1	
14	S2, S3	"	Tack S/W	2	
15	U1	MCU	ATmega8/TQFP	1	AVR Microcontroller
16	Y1	X-TAL	16MHz	1	ATS type
17		Printed Circuit Board(PCB)		1	Main PCB
18		Battery Holder & Power Connector	5051-2P	1	AA size * 4
19		Pin head Screw		4	3ø
20		Nut		12	3ø
21		Flat head Screw		4	3ø
22		Downloading Adapter		1	Option
23		Ribbon Cable		1	Option (1m)

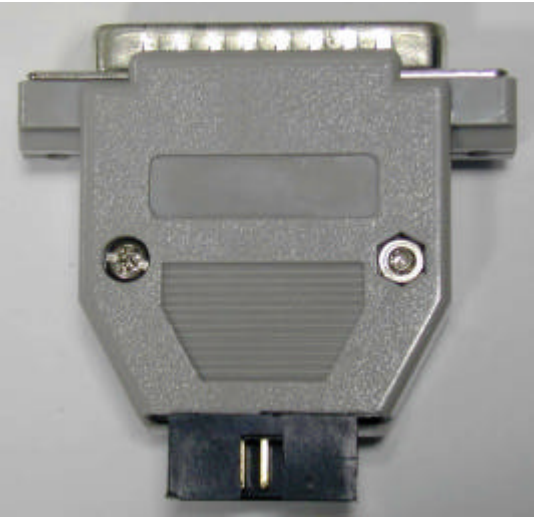


Fig 2.1 Downloading Adapter



Fig 2.2 Ribbon cable

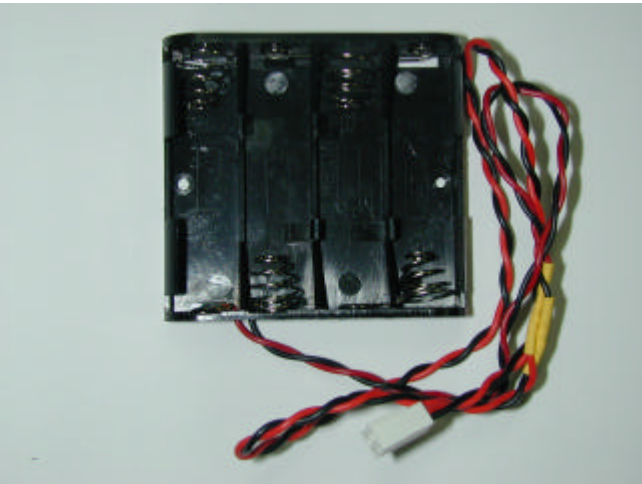


Fig 2.3 Battery Holder & Power Connector

PART 3 : Software Tools

1. AVR Development Program Installation

AVR Development Tools

There are many different kinds of development tools for AVR microcontrollers. Atmel, the AVR CPU manufacturer, provides some AVR development tools free. WinAVR GCC is a free Windows C-compiler.

Wavrasn : AVR assembler, Atmel.

AVR Studio : AVR Emulator/Simulator, Atmel.

AVR ISP : ISP downloading program, Atmel.

PonyProg2000 : ISP downloading program, Lancos. **(Recommended)**

WinAVR GCC : C-compiler, GNU. **(Recommended)**

System requirements for AVR development tools

- Windows 9X/ME or NT/2000/XP
- Pentium-133 or higher
- At least 4 Mbytes of RAM
- CD-ROM Drive

AVR ISP installation:

Run setup.exe in the CD's avr_isp folder.

WinAVR GCC installation

Refer to "How to use WinAVR for Microrobot AVR Products(Eng).pdf".

2. How to use WinAVR Gcc

Refer to "How to use WinAVR for Microrobot AVR Products(Eng).pdf".

3. How to use PongProg2000

Refer to the 'PonyProg Manual for Microrobot AVR Products.pdf' and the 'Security Bit Setting for ATMega Family.pdf' files.

PART 4 : Compile and Download

1. Compile and Download

Compile the source file and download the executable file in the following order.

- Put four batteries into the battery holder and insert the power connector to J1 of the Main PCB.
- Connect the downloading adapter to the PC printer port. Then connect the downloading adapter to the CPU board by using the ribbon cable.
- Turn on the power switch S1 on the control board. LED D1 turns on.
- Download sample code from our website (“How to use WinAVR for Microrobot AVR Products(Eng).pdf”).
- Create a source folder and copy the prototype sample code, including the makefile, from the file you’ve downloaded.
- Type “make all” on the DOS command line platform to compile it.
- Debug and recompile if there are any errors or warnings.
- If there are no errors, the ‘Errors: none’ message appears.
- Run PonyProg2000.
- Do “I/O port setup” properly. Refer to ‘PonyProg Manual for Microrobot AVR Products.pdf’.
- Select ‘Device → AVR micro → ATmega8’.
- Select ‘File → Open Program File’ and load the hex file.
- Select ‘Command → Program’ or press Ctrl + P to start downloading. If a ‘Program Failed’ message appears, select ‘Command → Erase’ or press Ctrl + E to erase the flash memory, and then try to program it again.
- Remove the ribbon cable from the CPU board and restart the board.

PART 5 : Source Codes

Refer to "OWL ROBOT User Manual(Eng, mega8).pdf".

www.microrobot.com