Multicontroller Kit User Manual



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About Multicontroller Development Kit

Multicontroller Development Kit is our oldest product offering.

It has evolved over last 2 years. Initially Kit was designed for only 8051 microcontrollers.

Later the PIC, AVR microcontrollers were supported.

Now Multicontroller Development Kit completes most common microcontroller families by offering support to ARM in addition to classic 8051, AVR and PIC microcontrollers.

Since beginning of our Multiprocessor product range, our emphasis was always on offering multiple microcontroller support on single development board with variety of famous interface circuits. Multicontroller Development Kit has always been a complete set of development system. ISP Programmers, IDEs, Compilers, Sample Source Code, Cables, Connectors and power supply are part of the standard packing. In export shipment, we do not include certain low cost – high weight accessories like cables. Power supplies are also not included as every country has unique wall mounting sockets.

Pin Diagrams of All Sections

The Multiprocessor Trainer kit includes following sections on the Board:

- 1. Power Supply Section
- 2. LED Display
- 3. Seven Segment Display Four multiplexed
- 4. LCD/GLCD Display
- 5. 4x4 Matrix Keypad
- 6. Pulled Up/Pulled Down Push to On Switches
- 7. Relay
- 8. ADC0808 Interface
- 9. ULN2803 Based Stepper Motor Driver
- 10. L298 Based DC Motor Driver
- 11. TSOP1738 Based Object Sensor
- 12. IR Photo Sensor
- 13. LM35 Temperature Sensor
- 14. 2 General Purpose RS232 Interface
- 15. 433Mhz RF Module with Encoder-Decoder
- 16. I2C Based Real time clock
- 17. SPI Based EEPROM
- 18. P89V51RD2BN and other Pin compatible 8051 Microcontrollers Development Board
- 19. ATMega32 & other Pin compatible AVR Microcontrollers Development Board
- 20. PIC18F4550 & other Pin compatible PIC Microcontrollers Development Board
- 21. LPC2148 and other Pin Compatible ARM7 Microcontrollers Development Board

1. Power Supply Section



Note: Use only 9-12VDC ,1A Power Supply

2. LED Display



LED_IN		LED_IN1	
1	L1	1	L5
2	L2	2	L6
3	L3	3	L7
4	L4	4	L8

3. Seven Segment Display



7SEG_DATA		7SEG_CA1	
8	Seg A	4	DIS1
7	Seg B	3	DIS2
6	Seg C	2	DIS3
5	Seg D	1	DIS4
4	Seg E		
3	Seg F		
2	Seg G		
1	DP		

4. LCD/GLCD Display



[A]. Character LCD Connections

LCD_DA	ГА	LCD_CTR	۲L
DB0	1	RS	C/D
DB1	2	RW	R/W
DB2	3	EN	EN
DB3	4	NC	CS1
DB4	5	NC	CS2
DB5	6	NC	RES
DB6	7	NC	V0
DB7	8		

Note: Connect JP3, JP1 & JP2 for LCD Contrast & Back Light

[B]. Graphics LCD Connections

LCD_DATA		LCD_CTRL	
1	DB0	RS	C/D
2	DB1	RW	R/W
3	DB2	EN	EN
4	DB3	CS1	CS1
5	DB4	CS2	CS2
6	DB5	+5V	RES
7	DB6	NC	V0
8	DB7		

Note: Disconnect JP3, JP1 & JP2.

5. <u>4x4 Matrix Keypad</u>



KP_ROW	1	KP_COL	
1	R1	1	C1
2	R2	2	C2
3	R3	3	C3
4	R4	4	C4

6. <u>Pull Up/Pull Down Push to On Switches</u>



Pull Up		Pull Down	
1	S1	1	S5
2	S2	2	S6
3	S3	3	S7
4	S4	4	S8

7. <u>Relay Module</u>



RELAY_OUT		
1	NO	
2	NC	

8. ADC0808 Interface



ADC_IN1		ADC_D	ATA
1	IN3	1	D0
2	IN4	2	D1
3	IN5	3	D2
4	IN6	4	D3
5	IN7	5	D4
AD	ADC_IN		D5
1	IN0	7	D6
2	IN1	8	D7
3	IN2	ADC	CLK
ADC	_ADD	1	SOC
1	ADD_C	2	EOC
2	ADD_B	3	ALE
3	ADD_A	4	OE
		5	CLK

9. ULN2803 Based Stepper Motor Driver



STEP	STEPPER_IN		STEPPER_OUT	
1	IN8	1	01	
2	IN7	2	02	
3	IN6	3	03	
4	IN5	4	04	
5	IN4	5	CD	
6	IN3	STEPPE	R_OUT1	
7	IN2	1	05	
8	IN1	2	06	
		3	07	
		4	08	
		5	CD	

Note: Connect JP4 to

supply 12V to the motor.

10. L298 Based DC Motor Driver



DC_INPUT		DMD	OUT1
1	IN4	1	01
2	IN3	2	02
3	IN2	DMD_OUT2	
4	IN1	1	04
DC	EN_	2 03	
1	EN B	12V	
2	EN A	1	GND
	J1	2	12V
1	12V		

Note: Connect JP4 to supply 12V to Motor.

11. TSOP1738 Based Object Sensor



J3	
1	IR_OUT

12. IR Photo Sensor



J1	
1	OUT

13. LM35 Temperature Sensor



J2				
1	OUT			

14. General Purpose RS232 Interface



15. 455 MILL RF MOULIE WILL ENCOUEL-DECOUE	15.	<u>433</u>	MHz I	RF	Module	with	Encod	ler-D)ecod	e
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SER	SERIAL_PORT		
1	RX0		
2	TX0		
3	TX1		
4	RX1		

RF-Transmitter



TX_ADD		TX_	DATA
1	A0	1	D8
2	A1	2	D9
3	A2	3	D10
4	A3	4	D11
5	A4		
6	A5		
7	A6		
8	A7		

Note: JP7 needs to be connected To enable transmission else you can connect to MCU.



RX_ADD		RX_DATA		
1	A0	1	D8	
2	A1	2	D9	
3	A2	3	D10	
4	A3	4	D11	
5	A4	5	VT	
6	A5			
7	A6			
8	A7			

16. I2C based Real Time Clock DS1307



RTC1				
1	SQW			
2	SCL			
3	SDA			

Note: Connect JP6 for VBAT Power.

17. <u>SPI EEPROM AT93C46</u>



18. P89V51RD2 & Other Pin Compatible 8051 Development Board



19. ATmega32 & Other Pin Compatible AVR Development Board



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20. PIC18F4550 & Other Pin Compatible PIC Development Board



21. LPC2148 ARM7 Development Board



All Pins are given as per the Pin diagram given in Datasheet of LPC2148.

Programming P89V51RD2BN Microcontroller

- Connect TX0 & RX0 Pin of Serial Communication Section to P3.0 & P3.1 Pin of P89V51RD2BN Microcontroller.
- 2. Open Flash Magic.
- 3. Select 8051 Family

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S6 H	
Cancel OK	
Visit the "Flash Magic" home page for info on the latest revision www.esacademy.com/software/flashmagic	

4. Select 89V51 Microcontroller



5. Select COM Port. This port can be found in Device Manager Of your Windows XP Operating System.

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Step 1 - Communi	ications	Step 2 - Erase
Select Device	89V51RD2	Erase block 0 (0x0000-0xFFFF)
COM Port:	СОМ 1 🗸 🗸	
Baud Rate:	COM 1	
interrace:	COM 4 COM 5 COM 6 COM 7 COM 7	Erase all Flash Erase blocks used by Hex File
Step 3 - Hex File		
Hex File: Z:\R&E)\MCU Programs\ARM Progra	ams\7Seg simple\test2.hex Browse
Modified	d: Friday, May 25, 2012, 5:35:1	04 PM more info
Step 4 - Options		Step 5 - Start!
Verify after prog Fill unused Flas Gen block cher Execute	rramming Set Security Bil h cksums Prog Clocks Bi	t 1 Start
Technical on-line	articles about 8051 and XA pr	rogramming
www.esacademy.	com/fag/docs	
		0

6. Set Baud Rate at 9600



7. Now go to Advance Options from Main Menu.



8. Check Mark Half Duplex Communications Box.

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Step 1 - Communical	tions		Step 2 -	Erase		
Select Device 8	9V51RD2		Erase bl	ock 0 (0x00	00-0xFFFF)	
Advanced Optic	ons					
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Maximum Ba	ud Rate: 230400	~				
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O 12 clock	part					
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9. Uncheck Use DTR to Control RST.

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Step 1 - Communica	tions		Step 2 - Erase	
Select Device 8	9V51RD2		Erase block 0 (0x00	00-0xFFFF)
Advanced Opti	ons			×
Communications	Hardware Config	Security	Just In Time Code	Timeouts Misc
Use DTR to Keep RT T1: 50 Assert DTR	control RST S asserted while CO ms T2: 100 and RTS while COM	IM Port ope	en	
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Gen block check: Execute Rotating, fully custor application!	sums	ocks Bit dated Interr	net links. Embed ther	n in your
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10. Select Hex File which you need to load.

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Select Hex Fil	e			? 🛛
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	File name:		~	Open
My Network	Files of type:	Hex Files (*.hex)	~	Cancel
	-		0	

- 11. Click Start Button.
- 12. It will ask Reset the Device into ISP Mode Now.
- 13. Press Reset Button and release it. Wait until it gets finished.

Programming AVR Atmega32 Microcontroller

- 1. Open Pony Prog Software.
- 2. Connect AVRISP programmer's Pins to ISP Header for AVR on the Board.
- 3. Connect Serial Cable to AVRISP programmer.
- 4. Go to Setup Option from Main Menu.
- 5. Go to Interface Setup.

PonyProg2000 - Serial Device Programmer	
File Edit Device Command Script Utility Setup ? Window	
Image: Second	ATmega32
6 6 6 3 3 3 6 6 6 11 0	
Sy No Name	

- 6. Select Serial IO option.
- 7. Select SIProg API and COM Port.

PonyProg2000 - Serial Device Programmer	
File Edit Device Command Script Utility Setup 7 Window	
	r
1/O port setup	
(• Serial Parallel	
SI Prog API	
COM1 C COM3 C LPT1 C LPT3	
COM2 C COM4 C LPT2	
Select Polarity of the Control lines	
Invert Reset Invert D-IN	
Invert SCKL Invert D-OUT	
Cancel OK Probe	

- 8. Click Probe Button it should Display Test OK.
- 9. Now Select Calibration option from Setup Menu.

Image: Port of the programmer Image: Port of the			etup menu.		
le Edit Device Command Script Utility Setup ? Window Interface Setup Catheration AVR micro ATmega32 P OP De	PonyProg2000 - Serial De	vice Programmer			
AVR micro	File Edit Device Command Scr	ript Utility Setup ? Window			
	e ss	Calibration	AVR micro	ATmega32 💌	
∑, No Name		28 . •			
	🔄 No Name				

10. Click on Yes and wait until it Displays Calibration Ok.

DonyProg2000 - Serial Device Programmer	
File Edit Device Command Script Utility Setup ? Window	
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🕅 No Name	
Notice Notice Calibration OK UK	

- 11. Now select ATmega32 from Device Menu.
- 12. Open Device File(Hex File) from file Menu.

PonyProg2000 - Ser	ial Device Programmer			
File Edit Device Comman	nd Script Utility Setup ? Window			
		8 AVR micro	▼ ATmega32 ▼	
	83 🔏 8 🎟 🗢 📝 🗌			
Open program (FLASH	l) content file		? 🛛	
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My Network File nam	ne: I2C	• 0	Ipen	
Files of Fil	type: *.hex	_	ancel	

- 13. Click Program option from Command Menu and wait until it finishes.
- 14. You can also change Fuse Bits from Command Menu -> Security & Configuration Bits. For fuse settings please refer to device datasheets.

Programming PIC18F4550 Microcontroller

- 1. Connect PIC ICSP Programmer's 6pin connector to ICSP header on board.
- 2. Now Open PicPgm Software. It will detect current Programmer as JDM Programmer and Microcontroller PIC18F4550.



3. Now browse the Hex file that you need to Load.



4. Set Fuse Bits as per your requirements from the Configuration Bits Tab. Please refer to device datasheet for Setting Fuse Bits.



5. Click on Program button and wail until it finishes programming.

🥔 PICPgm	Development Programmer 1.5.1.0	
File Comman	nd Hardware Extras Help	
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300003		ир
300004 300005 300006 300007	Close	CAL:
300008 300009 30000A		
30000B	FF 🔽	
JDM Programm	er (Autodetect)	COM1

Programming LPC2148 Microcontroller

- 1. Connect Serial Cable to UART0 Connector.
- 2. Set Auto_RST Jumper on Board.
- 3. Select Device Family of ARM7



4. Select LPC2148 Microcontroller



5. Select COM Port. Normally its COM1 in most Computers. Please check Device Manager for Available COM Ports.



6. Select 38400 Baud Rate.



7. Set Crystal Frequency to 12MHz.



- 8. Go to Option-> Advance Options.
- 9. Check Mark High Speed Communications and Half Duplex Communications.



10. Go to Hardware Config Tab. Check Mark Use DTR & RTSto Control RST & ISP Pin and Keep RTS asserted while COM Port Open. Enter T1=100 & T2=200.

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File ISP Options Tools Help				
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Step 1 - Communications Step 2 - Erase				
Select Device LPC2148 Erase block 0 (0x000000-0x000FFF)				
Advanced Options				
Communications Hardware Config Security Just In Time Code Timeouts Misc				
Use DTR and RTS to control RST and ISP pin				
Keep RTS asserted while COM Port open				
T1: 100 ms T2: 200 ms				
Assert DTR and RTS while CUM Port open				
Cancel OK				
Gen block checksums				
Execute				
Visit the "Flash Magic" home page for info on the latest revision				
www.esacademy.com/software/flashmagic				
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11. Browse Hex File.

Se Flast File ISP	n Magic - NON I Options Tools	PRODUCTION USE ONLY Help				
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Click Start Button and wait until it finishes.