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# **MTP Programmer ICP I**



## 1. Introduction

The ICP I from E-LAB is the programmer for Atmel's MARC 4 MTPs M48C893, M48C510 and the U9380. This programmer works together with the PC or stand alone. In the stand alone mode the programmer writes the last stored MARC 4 program to the target chip. The memory inside the programmer is buffered by a accumulator. Two buttons and two LED's on top control the operation of the programmer. It allows single chip as well as in system programming.



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## 2. System Requirements:

Operating system: Windows 9x or Windows NT 4.0 One free COM port

### 3. Hardware:

Connect the programmer to a free COM port with the serial cable delivered with the programmer. The programmer is powered by an integrated accumulator.

The COM port handles the data transfer and charges the accumulator if the COM port is strong enough. If the COM port could drive more the 10 mA it charges the accumulator with nearly 3 mA. This is high enough to keep the state of charge from the accumulator. The charging is only done if the COM port is open. This is automatically done by the software. After the software has recognized the programmer the COM port charges the accumulator till the software is closed.

A faster charge of the integrated accumulator can be done with the delivered power supply. With this power supply the accumulator is charged with 15 mA. Therefore it takes 10 hours to load a empty accumulator. This charging current is not regulated and therefore the power supply should be connected only for charging. If the power supply is connected every time to the programmer the lifetime of the accumulator is degraded. The power supply is connected to the programmer by a 3.5 mm jack plug. The front contact of the jack plug is + 7.5 V, the outer contact is ground.

The connection to the programmer adapter board or the application board is done by a 10 -wire ribbon cable. The pins of the connector on the programmer adapter board or application board are connected as follows:

T48C893 programmer interface:

Pin 1	BP 43	Pin 2	NC
Pin 3	BP 40	Pin 4	BP 42
Pin 5	OSC 1	Pin 6	GND
Pin 7	VDD	Pin 8	BP 20
Pin 9	NC	Pin 10	NC

T48C510 programmer interface:

Pin 1	РМ	Pin 2	VDD
Pin 3	BP 02	Pin 4	BP 01
Pin 5	BP 00	Pin 6	GND
Pin 7	NC	Pin 8	NC
Pin 9	NC	Pin 10	NC

VDD = regulated power for the target.



For in system programming the load on these pins must be low enough. Otherwise correct communication between the programmer and the target will not be possible. Guideline: 200 nF at VDD and 10k at the other pins.



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Please ensure that the connection is in the right position. If the connection is wrong the programmer may be destroyed.



## 4. Software description:

Copy the files from the disk to the hard disk and start the software "ICPTEMIC.exe".

At first a project has to be defined. For a new project type the name of the project in the field "Project Name". The software than asks you for the subdirectory and the filename. The file "TEMIC.INI" keeps the settings after pressing the **Save** button.

With the **Load** button or a doubleclick on a project name the settings for this project and the program data for the MTP are loaded into the PC.





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The button **next** switches to the next windows were the settings for the port options and some special functions, depending on the selected target chip, can be done. All these settings are saved to the project.tipc file. For a detailed

Project loaded	tes	page 2				
M48C893				prev nex		
Port1 Output Driver Pull	Jp / Pull Down	Port2 Output Driv	er Pull Up	/ Pull Down		
0 CMOS 💽 Pull-dowr	n (except Output ''1'') 🛛 📃	0 CMOS	Pull-up (exc	ept Output "0") 🛛 💻		
1		1 CMOS	Pull-up (exc	ept Output "0") 📃 💻		
2		2 CMOS	🖃 Pull-down (e	except Output "1"1 🗾 👻		
3 CMOS 🗾 Pull-up (e	xcept Output "0") 📃 👱	3 CMOS	Pull-up (exc	ept Output "0") 📃 💌		
Port4 0 CMOS V Pull-up fe 1 CMOS V Pull-up fe 2 CMOS Pull-up fe 3 CMOS V Pull-up fe	Jp / Pull Down xcept Output "0") xcept Output "0") xcept Output "0") xcept Output "0")	Port5 Output Driv 0 CMOS 1 CMOS 2 CMOS 3 CMOS	rer Pull Up Pull-up (exc Pull-up (exc Pull-up (exc Pull-up (exc Pull-down (e	/ Pull Down ept Output "0"] ept Output "0"] ept Output "0"] except Output "1"]		
Port6 Output Driver Pull I O [CMOS ] Pull-up (e 3 [CMOS ] Pull-down	Jp / Pull Down xcept Output ''0'')	]				
M480	C893 EEpro	om buffer ok	SW rev: 1.0	HW rev: 1.1		

description of the special functions please see the data sheets from the target chip.

Note for M48C893: If BP42 is configured as open-drain-NMOS output, for verifying or reading the ROM contents a low pull-up resistor (~10k) is necessary.

If OSC2 has been configured to be external clock input, OSC2 has to be used to enter transparent mode: For programming OSC1 and OSC2 can be shortened.

If the read access to the ROM data is disabled the programmer writes this configuration and the program to the target and verifies it. After verifying the read access is disabled and therefor no further read and verify accesses are possible.

The last window shows the contents of the memory. The field called "in PC" shows the name of the source code file which is stored in the PC. The field "in Prog" shows the name of the source code file which is actually stored in the programmer.





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Project loaded							3	tes	t1						page 4					
M48C8	93		in F	°C:		EX/	١MF	LE	.HE	Xi	in P	RO	G:	TE	ST_	ISR	.HEX M48	C893		prev
10000000				1000		1000	1000	1000		1000		1000		100	1000			1000000		
adress	00	01	02	03	04	05	06	07	08	09	OA	OB	0C	OD	OE	OF	ascii			Dune
000000	70	OF	19	80	C1	C1	C1	C1	78	35	79	FC	68	22	70	10	x	5yh"		<b>*</b>
000010	8E	2F	6A	63	lF	65	22	70	10	97	2F	6A	63	С9	C7	60	/jce"	/jc`		downlo
000020	зF	03	60	62	lF	60	62	С9	1D	C1	C1	C1	Cl	C1	C1	C1	?'b'b			
000030	70	70	25	C1	C1	С1	Cl	C1	64	69	FF	6F	68	FF	25	C1	\$d	ioh*.		<b>_</b>
000040	OD	OE	1D	Cl	C1	Cl	Cl	С1	OD	20	2C	2D	1A	68	lF	lF		,,h		uploa
000050	OE	25	Cl	C1	C1	Cl	Cl	С1	Cl	Cl	Cl	Cl	C1	C1	Cl	Cl	\$			
000060	С1	С1	C1	C1	Cl	C1	C1	С1	C1	C1	C1	C1	Cl	C1	C1	C1				<b>A</b> .
000070	Cl	С1	C1	C1	Cl	C1	Cl	C1	Cl	C1	C1	C1	Cl	С1	Cl	C1				1 N
000080	OD	OE	lD	Cl	Cl	Cl	Cl	Cl	Cl	Cl	Cl	Cl	Cl	C1	Cl	Cl				progra
000090	Cl	C1	С1	Cl	Cl	Cl	Cl	С1	Cl	Cl	Сl	Cl	Cl	C1	Cl	Cl				
00000A0	С1	C1	С1	Cl	Cl	Cl	Cl	Cl	Cl	Cl	С1	Cl	Cl	Cl	Cl	Cl				2
0000B0	Cl	C1	Cl	Cl	Cl	Cl	Cl	Cl	сı	Cl	Cl	Cl	Cl	C1	Cl	Cl				vent
0000000	OD	73	37	03	17	2D	30	62	lF	77	OE	1D	Cl	Cl	Cl	Cl	s7 <b< td=""><td>w</td><td></td><td>14</td></b<>	w		14
0000000	сı	Cl	Cl	Cl	Cl	Cl	Cl	Cl	сı	Cl	Cl	Cl	Cl	Cl	Cl	Cl				0
0000000	C1	C1	C1	C1	C1	C1	Cl	C1	C1	C1	C1	C1	C1	C1	C1	C1				erase
0000070	C1	C1	C1	C1	C1	C1	Cl	C1	C1	C1	C1	C1	C1	C1	C1	C1			·	
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The next step is to download the program to the programmer. Selecting the **prog** button starts programming it into the MTP. Programming the MTP takes 3 steps. First the programmer erases the EEPROM, second writes the program to the EEPROM and thired verifies the contents. The software shows the success of the programming in a separate window.

### 5. Stand alone mode

If the programmer is in the power down mode, no LED is blinking, the user can wake up the programmer by pressing the **prog** button one time. The last downloaded program and port settings are programmed to the target by pressing the **prog** button. To erase the target chip press the **era** button. The two LED's above the buttons shows the programmer status.

Normal mode: both LED's are blinking alternate - no error

Programming: the right LED lights during programming

After the programming and verifying the LED's show an error code or if the programming was successful they return to the normal mode and blink alternate.

Error codes :

x blink = power down
 x blink = no response
 x blink = not empty
 x blink = verify error
 Both LED's are blinking together = no data in the internal RAM