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## TSC87C51/C52 Development Tools line card

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### Introduction

At the beginning of the microprocessor era, silicon vendors were poised to develop by themselves a full range of development tools. Nowadays, they are relying on 3rd parties who maintain and customize their standard tools to support various devices. Hence the quality and features of these tools are always increasing as the basic development is reused many times. Furthermore, the users may upgrade their tools to support new devices without learning a completely new Man-Machine Interface (MMI) every time. We, silicon vendors, are relieved from maintenance burden for the entire life of our components while the environment of our customer is continuously changing (new PCs, new OS, etc.) and focus on the introduction and maintenance of our own products.

Thanks to a partnership relation between the major 3rd parties and TEMIC, a full set of tools have been developed before the market introduction of the TSC87C51/52 and are readily available.

### Software Development Tools

The TSC87C51/52 have been designed to be compatible with Intel's 87C51(FX) core. Hence the existing software tools may be used without any change.

### Hardware Development Tools

An In-Circuit Emulator is a must when validating and debugging real-time applications implemented in the internal ROM of a microcontroller. It may also be used in stand-alone instead of an instruction simulator during the early stages of one development. It provides the following features:

- monitoring of internal resources and downloading code,
- step by step execution and breakpoints capability,
- tracing of program execution, I/Os states and other events.

Additionally it may provide a trigger output to control another equipment like a Digital Sampling Oscilloscope. These features allow:

- to evaluate and improve performances (execution profiling),
- to measure the code coverage (a code which is never executed may not be so useful and/or is a nest of bugs).

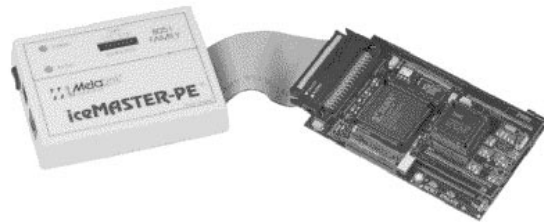
The TSC87C51/52 implement the Enhanced Hooks technology from Metalink Corporation. In ICE mode, the two digital ports (P0/2) and some control signals (ALE, PSEN, EA) of the standard device are used to communicate with the emulator base. These signals are reconstructed with the same timings as in normal operation and with a compatible drive to be connected to the target application. The other I/Os and peripherals are directly connected to the target. The device tells to the emulator base any memory or SFR operation it makes. The emulator base emulates the internal code memory and provides the instruction when a new one is fetched. The code fetching automatically rolls-over to the outside as required.

Any standard 8051 ICE supporting 8 Kbytes of internal program memory may be used to develop an application implementing the TSC87C51/52 but the Enhanced Hooks provides ICE features with several other benefits:

- low cost full-featured emulator
- exactly the same technology and behavior as the standard device
- if damaged, circuit can be replaced directly by the customer
- full speed emulation (33 MHz devices today and more tomorrow, up to 44 MHz)
- fast emulator development: support of a new derivative at the same time it is released to production
- only the probe card need to be changed to support a new derivative

## MetaLink Corp.

Metalink corporation is offering a full line of ICE products for 8-bit microcontrollers. As the Enhanced Hooks technology inventor, they are the natural provider of the TSC87C51/52 Enhanced Hooks Emulators. To date, they are the only providers of probe cards supporting TEMIC products. The same probe card is supporting both the TSC87C51 products and TSC87C52 through enhanced hooks configuration during reset.



### Emulator supporting TSC87C51/C52

- Ice MASTER-RB: IM8051-RB-400-40C
- Probe card PLCC44: PC8352-RB-44

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## Device Programmers

The TSC87C51/52 have been designed to be compatible with Intel's 87C51(FX) core. Hence any device programming instrument already supporting this popular core should support our products as well (please refer to ANM065).

Though components are functionally compatible, their electrical behavior may slightly differ and cause programming trouble. In order to prevent such hazards, Device Programming Vendors validate their algorithm with several samples whenever a new design or new process is used (please refer to our list of Tools Partners). In addition to that, some vendors will provide beta versions to be evaluated before the final release. This may delay the algorithm official availability but provides further insurance to the customer.

Hereafter you can find a first list of Device Programmers vendors supporting the TSC87C51 & TSC87C52.

An updated list is available on our web site:

**<http://www.temic.de/semi>**

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## Advantech Equipment Corp.

Advantech Equipment Corp. is offering a PC-based universal device programming instrument which support our DIL packages. PLCC and QFP are supported by adapters.



### Programming Tools supporting TEMIC Devices

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
Labtool-48	Included	SDP-UNIV-44	SDP-UNIV-44Q	2.41D	8, Aug. 97

### Contact

Advantech Equipment Corp.  
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## Advin

Advin is offering a full line of PC-based device programming instruments (universal and gang programmers). All here under listed packages are supported on standard equipment or by using universal or generic add-on modules. They also offer gang add-on modules.



### Programming Tools supporting TSC87C51/C52

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
Pilot-U84+	Included	UPA, UA-44 or PX-44	PX-44Q or U-44Q PX-44TQ or UA-44TQ TBD	10.87G	20, Jul 97
Pilot-U44+	Included	UPA, UA-44 or PX-44	PX-44Q or U-44Q PX-44TQ or UA-44TQ TBD	10.87G	20, Jul 97
Pilot-MVP/40	Included	UPA, UA-44 or PX-44	PX-44Q or U-44Q PX-44TQ or UA-44TQ TBD	10.87G	20, Jul 97
Pilot-145	Included	PX-44	PX-44Q PX-44TQ TBD	10.87G	20, Jul 97
Pilot-U832D (Gang: 8 devices)	AG-51D	AG-51C	-	10.87G	20, Jul 97

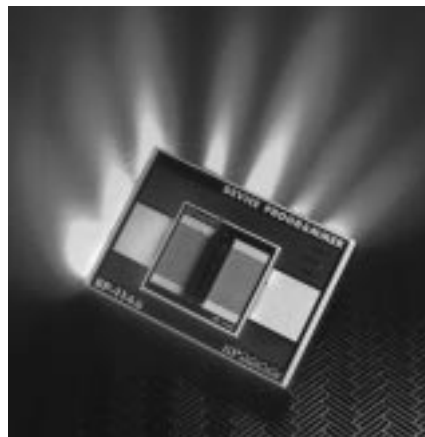
### Contact

Advin  
1050L East Duane Avenue  
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Tel: +1 408 243 7000  
Fax: +1 408 736 2503  
BBS: +1 408 737 9200  
Email: sales@advin.com  
Web: <http://www.advin.com>

## BP microsystems

BP Microsystems is offering a full line of device programming instruments: PC-hosted, PC-based stand-alone or with LAN connection, Automated system. All here under listed packages are supported by package adapters.



### Programming Tools supporting TSC87C51/C52

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
BP-1148	SM48D	SM48UP	TBD	3.28	Oct 97
BP-1200 BP-1400 BP-2100 BP-2200 BP-4100	SM48D	SM48UP	TBD	3.27	Sep 97

### Contact

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Web: <http://www.bpmicro.com>

**Ceibo**

Ceibo is offering a full line of 51 and 251 tools: development boards, emulation boards, ICE, software, programmers and package adapters. The TSC87C51/52 are added in the device list of the MP-51 modular programmer (PC-hosted).



**Programming Tools supporting TSC87C51/C52**

Programmer	Package Adapters			Software	
	PDIP40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
MP-51	ADP87C51D	ADP87C51P	–	4.38	Aug 97

**Contact**

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## Data I/O Corp.

Data I/O is offering a full line of device programming instruments: PC-hosted, stand-alone or Automated systems. All here under listed packages are supported by package adapters.



### Programming Tools supporting TSC87C51/C52

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
3900 2900 Labsite Unisite	DIP base	PLCC base	TBD	5.4	Sep 97

### Contact

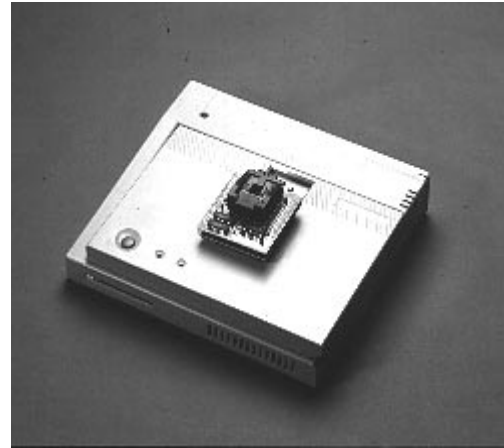
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Web: <http://www.data-io.com>



## Hi-Lo Systems Research

Hi-Lo is offering several PC-hosted universal device programming instruments. All here under listed packages are supported by package adapters.



### Programming Tools supporting TSC87C51/C52

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
ALL-07	Included	CNV-PLCC-MPU51	CNV-QFP-MPU51	3.43	Jul 97
ALL-11	Included	CNV-PLCC-MPU51	CNV-QFP-MPU51	1.02	Jul 97

### Contact

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## Needham's Electronics

Needhams is offering several inexpensive PC-hosted universal device programming instruments. All here under listed packages are supported by package adapters.



### Programming Tools supporting TSC87C51/C52

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
EMP30	Included	PD4	–	3.70	20 Aug, 97
EMP20	02A	07B	–	3.71	28 Aug, 97
EMP10	Micro Adapter	–	–		TBD

### Contact

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Web: <http://www.needhams.com>

## System General

System General is offering a full line of device programming instruments including a modular asynchronous gang programmer for development and production. All here under listed packages are supported by package adapters.



### Programming Tools supporting TSC87C51/C52

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
Multi-Apro	D40 adapter	P44 adapter	D40 + TQFP44 converter	2.07	Aug 97
Apro					TBD
Turpro-840					TBD
Turpro-1					TBD
Turpro-1/FX					TBD

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## SMS

SMS is offering a full line of device programming instruments: Engineering, Production and Automatic systems. All here under listed packages are supported by TOP adapters.



### Programming Tools supporting TSC87C51/C52

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
Sprint Optima	TOP48DIP	TOPIPLC	–	B4/97	4 Sep. 97
Sprint Expert	TOP48DIP	TOPIPLC	–	B4/97	4 Sep. 97
Sprint Plus48	Included	S493	–	B4/97	4 Sep. 97

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## Xeltek

Xeltek is offering several inexpensive PC-hosted universal device programming instruments. All here under listed packages are supported by package adapters.



### Programming Tools supporting TSC87C51/C52

Programmer	Package Adapters			Software	
	PDIL40 CDIL40	PLCC44 CQPJ44	PQFP44 (F2) TQFP44 (1.0) VQFP44 (1.4)	Version	Release Date
SuperproII	Included	X44PL/40D-I	TBD	2.5D	Aug 97
SuperproIII	Included	XPLCC44/48D	XQFP44/48D	2.0	Sep 97

### Contact

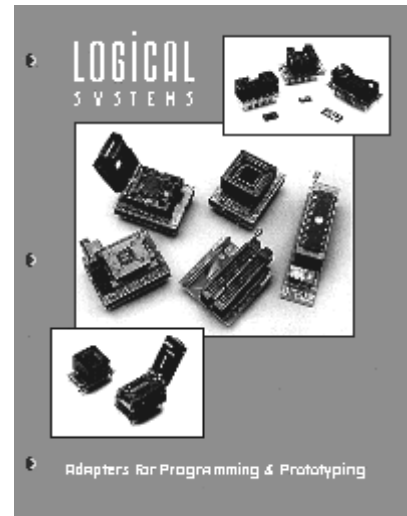
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## Package Adapters

## Logical Systems

Logical Systems provides various package adapters compatible with TSC87C51/52 devices. They can be used for prototyping and programming of PLCC, CQFPJ and QFP.



## Tools supporting TSC87C51/C52

Adapter	Description
PA51-44(Z)	For 44 pin PLCC and CQPJ devices. Available with an auto-eject or lidded ZIF (Z) style socket. Has a 40 pins DIL plug. Use the lidded ZIF socket for LCC devices.
PA51-QD-06T	For 44 pin QFP devices in Temics's PQFP44 (F2), TQFP44 (1.0) and VQFP44 (1.4) packages. Has a lidded socket and a 40 pins DIL plug.
PA51-DP(-PP)	For prototyping of DIL devices. Has a DIL ZIF or DIL production (-PP) socket and a 44 pins PLCC plug.

## Contact

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