

# **BASIC Tiger<sup>®</sup> Module E**

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## ***BASIC Tiger<sup>®</sup> Module E***

The BASIC Tiger<sup>®</sup> Modules E are the smallest modules that can be programmed with TINY BASIC<sup>®</sup> or Tiger BASIC<sup>®</sup> software.

Modules in the BASIC Tiger<sup>®</sup> Modules E series differ from the series T modules in double usage of some pins, and the size of their memories. There is no BATT-pin, no PWM-pins, and no internal RTC.

The examples and applications mentioned in this manual are primarily made for the BASIC Tiger<sup>®</sup> A Modules and in some cases not all will run on BASIC Tiger<sup>®</sup> Modules E that only have 32k of RAM. The command line installing the LCD1.TDD device driver must have extra parameters in order to define the sound pin on BASIC Tiger<sup>®</sup> Modules E .

The unused RAM in a 32k BASIC Tiger<sup>®</sup> Modules E containing a program is not much more than 10k bytes. The following hints will help you to get the maximum performance with little RAM:

- The default stack size for every task is 2k bytes. Include the line `'USER_STACK_SIZE nnn'` to reduce the stack of any task down to 512 bytes.
- The default string size is 64 bytes. Set the string size to the required size when declaring the string. This rule applies especially to ARRAYs of STRINGS.
- Include only device drivers you require for your application. Especially buffered drivers like the LCD1.TDD, SER1.TDD, PRN1.TDD need RAM for their buffers.
- In explaining the CALL instruction you find information about the usage of the task stack. Parameters passed to a subroutine, as well as local variables, use the stack according to their size.
- During the development phase of your project, you may determine the runtime stack requirements using the function SYSVARN (function numbers DSTACK\_FILL and DSTACK\_FREE).

# BASIC-Tiger<sup>®</sup> control computer

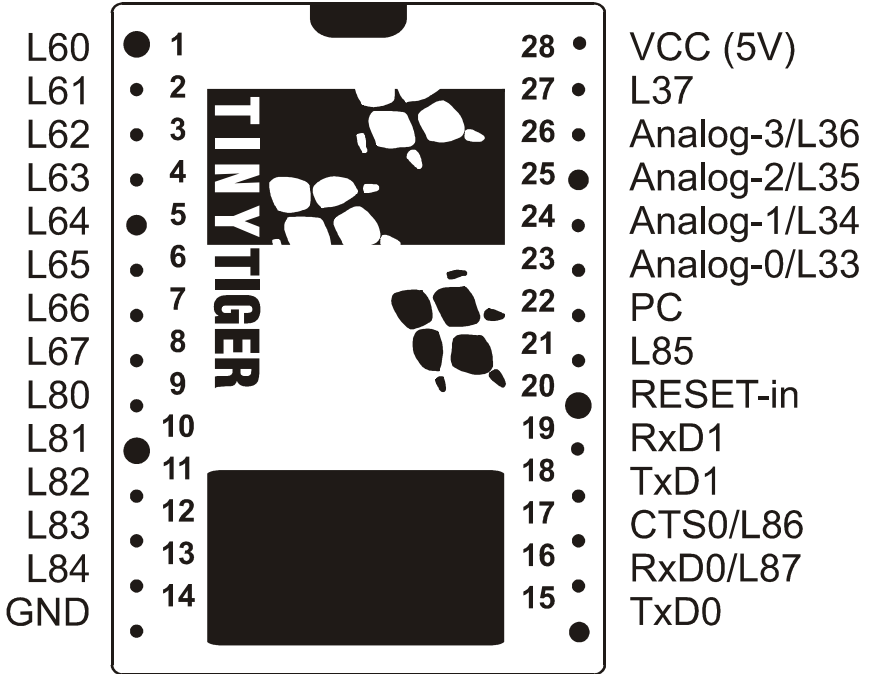
The following technical characteristics apply for all BASIC Tiger<sup>®</sup> Modules E :

Overall size / Weight:	Approx. 39 x 28 x 10,2 mm / approx. 16g
Power supply	4.7V→5.5V / approx. 45 mA
Power rating of the I/O-Pins	All Pins 1.6mA, or max. 8x 3.5mA
Reset	Power-ON-Reset on module and through external input (low=active reset)
2 serial channels	TTL-level (Pin 15→Pin 19) Pins 15→19 can also be used as digital I/Os through software adjustment
A/D-Inputs shared with digital I/O L33→L36	4 channels (Pin 23→Pin 26) Resolution 8, 10-Bit Input voltage 0V→Vref (Vref=3.5V→5V) Input resistance: 1M

Technical data which varies depending on the model:

RAM	32kB, 128kB, 512kB
Flash-ROM	128KB, 512kB

TINY Tiger® Pin configuration



# BASIC-Tiger<sup>®</sup> control computer

## BASIC Tiger<sup>®</sup> Modules E pin description

Pin-No.	Name	Description
1	L60	Port 6 - Pin 0
2	L61	Port 6 - Pin 1
3	L62	Port 6 - Pin 2
4	L63	Port 6 - Pin 3
5	L64	Port 6 - Pin 4
6	L65	Port 6 - Pin 5
7	L66	Port 6 - Pin 6
8	L67	Port 6 - Pin 7
9	L80	Port 8 - Pin 0
10	L81	Port 8 - Pin 1
11	L82	Port 8 - Pin 2
12	L83	Port 8 - Pin 3
13	L84	Port 8 - Pin 4
14	GND	Ground

Pin-No.	Name	Description
15	L90 or TxD0	Port 9 - Pin 0 or send line serial Port 0
16	L91 or RxD0 and L87	Port 9 - Pin 1 or receive line serial Port 0 and Port 8 - Pin 7
17	L92 or CTS0 and L86	Port 9 - Pin 2 or CTS0 and Port 8 - Pin 6
18	L93 or TxD1	Port 9 - Pin 3 or send line serial Port 1
19	L94 or RxD1	Port 9 - Pin 4 or receive line serial Port 1
20	Reset in	Reset input (internal pull-up, low active)
21	L85	Port 8 - Pin 5
22	L41 / PC	PC-Mode-Pin (low=PC, high=RUN)
23	Analog In 0 and L33	Analog input 0 (0V→VCC) and Port 3 - Pin 3
24	Analog In 1 and L34	Analog input 1 (0V→VCC) and Port 3 - Pin 4
25	Analog In 2 and L35	Analog input 2 (0V→VCC) and Port 3 - Pin 5
26	Analog In 3 and L36	Analog input 3 (0V→VCC) and Port 3 - Pin 6
27	L37	Port 3 - Pin 7
28	VCC (5V)	Power supply

# BASIC-Tiger<sup>®</sup> control computer

## Analog inputs and extended I/O at the same time

In order to have Analog inputs and extended I/O at the same time the control lines for extended I/O must be reconfigured. There are USER\_EPORT compiler directives to do so. The command names are symbolic definitions for 'value' (DEFINE\_A.INC).

command	value	meaning – argument
BUSL	2	set port for data bus lines (default = port 6)
CTRL	3	set port for the control lines of extended I/O ports (default = 3)
DCLKBMASK	4	specifies the bit mask for the DCLK line of the extended ports
ACLKBMASK	5	specifies the bit mask for the ACLK line of the extended ports
INEBMASK	6	specifies the bit mask for the INE line of the extended ports

Example: set control lines for extended I/O to port 8, bits 0...2:

```
#include DEFINE_A.INC

user_eport CTRL, 8
user_eport ACLKBMASK, 00000001b
user_eport DCLKBMASK, 00000010b
user_eport INEBMASK, 00000100b
```

