

Measure pulse lengths with high resolution

The device driver 'PLSIN1' measures the length of high pulses at a resolution of up to 0.4 μ sec and writes the value to a buffer so that pulses in quick succession can be recorded. The measuring area is specified during installation of the driver. However, the area can also be altered at a later time through commands to the driver.

File name: PLSIN1.TDD

INSTALL DEVICE #D, "PLSIN1.TDD", Area, InputPinFlag

D is a constant, variable or expression of the data type BYTE, WORD, LONG in the range from 0...63 and stands for the device number of the driver.

Area is a parameter to determine the area.

InputPinFlag is a parameter to determine L37 as input pin. To choose L37 instead of L84, set InputPinFlag to "37"!

Area	Timebase	Resolution	Time area
1	2.500.000 kHz	0.400 μ sec	0.0004...26.214 msec
2	625.000 kHz	1.600 μ sec	0.0016...104.856 msec
3	156.250 kHz	6.400 μ sec	0.0064...419.424 msec

Secondary address 0 selects the channel 0 of the pulse-in-device driver. The input pin is always **Pin L84**. For Tiger-2 with version 0.17 or higher, it is possible to choose **Pin L37** instead of L84. In some applications, L84 is used for graphic LCD. To choose L37, please set the parameter *InputPinFlag* to "37"

The device driver PLSIN1 measures very short pulses at resolutions down to 0.4 μ sec and hereby uses hardware resources of the BASIC-Tiger® or Tiny-Tiger® module. Since other fast drivers may also need these hardware resources, the simultaneous use of a number of drivers is excluded.

Possible uses of the driver PLSIN1.TDD together with PLSOUT1.TDD in BASIC-Tiger® and Tiny-Tiger® modules

PLSOUT1	PLSIN1
1 channel	—
—	1 channel

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The incoming measured values are buffered in a 256 Byte buffer. The measured values are WORD, so that 128 values with a maximum pulse length of 65535 units can be saved. One unit is identical with the resolution of the area, e.g. 1.6 µsec in area 2. The buffer statuses and any errors can be inquired with 'USER-FUNCTION-CODEs', or 'UFC' for short.

Example: read a pulse length measured value from the buffer:

```
GET #11, 2, wVar
```

User-Function-Codes for input (instruction GET):

No	Symbol	Description
1	UFCI_IBU_FILL	Capacity of input buffer (Byte)
2	UFCI_IBU_FREE	Free space in input buffer (Byte)
3	UFCI_IBU_VOL	Size of input buffer (Byte)
65	UFCI_LAST_ERRC	Last Error-Code
99	UFCI_DEV_VERS	Driver version
160	UFCI_IPL_OVL	Number of buffer overflows since this counter was last read. Resets counter to 0.

User-Function-Codes for output (instruction PUT):

No	Symbol Prefix: UFCO_	Description
1	UFCO_IBU_ERASE	Delete input buffer
128	UFCO_IPL_RNG	Set area

Example: inquire version number of driver:

```
GET #11,#0, #UFCI_DEV_VERS, 2, wVersion
```

Example: set area 2:

```
PUT #11,#0, #UFCO_IPL_RNG, 2
```

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Example: inquire full level of pulse length buffer. The command 'UFCI_IBU_FILL' is a byte, but the read reply from the driver is at least a WORD-number:

```
GET #11,#0, #UFCI_IBU_FILL, 2, wVar
```

Program example:

```
-----
'Name: PLSIN1.TIG
'-----
#INCLUDE UFUNC3.INC                                'Define User Function Codes

TASK MAIN                                           'begin task MAIN
    WORD I, PLEN
    'install LCD driver (BASIC-Tiger)
    INSTALL DEVICE #1, "LCD1.TDD"
    'install LCD driver (TINY-Tiger)
    'INSTALL DEVICE #1, "LCD1.TDD", 0, 0, 0, 0, 0, 0, 80h, 8
    INSTALL DEVICE #8, "PLS1IN.TDD", 1 '1 = range

    PRINT #1, "connect pin L80"                    'connect pin L80
    PRINT #1, " with pin L84"                      'with pin L84
    OUT 8, 00000001b, 0                            'Pin L80 low
    DIR_PIN 8, 0, 0                                'Pin L80 output

    PUT #8,#0, #UFCO_IPL_RNG, 1                    'range 1
    WAIT_DURATION 1000
    OUT 8, 00000001b, 1                            '1 pulse on pin L80
    OUT 8, 00000001b, 0
    GET #8, 2, PLEN                                'reads 0 if no pulse
    PRINT #1, "<1>Pulse length:"
    PRINT #1, PLEN;" *0.4microsec"

    PUT #8,#0, #UFCO_IPL_RNG, 2                    'range 2
    WAIT_DURATION 1000
    OUT 8, 00000001b, 1                            '1 pulse on pin L80
    OUT 8, 00000001b, 0
    GET #8, 2, PLEN                                'reads 0 if no pulse
    PRINT #1, PLEN;" *1.6microsec"

    PUT #8,#0, #UFCO_IPL_RNG, 3                    'range 3
    WAIT_DURATION 1000
    OUT 8, 00000001b, 1                            '1 pulse on pin L80
    OUT 8, 00000001b, 0
    GET #8, 2, PLEN                                'reads 0 if no pulse
    PRINT #1, PLEN;" *6.4microsec"
END                                                  'End Task MAIN
```

Documentation History

Version of Documentation	Version of PLSIN1	Description / Changes
001	1.00m	- first version
002	1.00m	- Telephone number changed