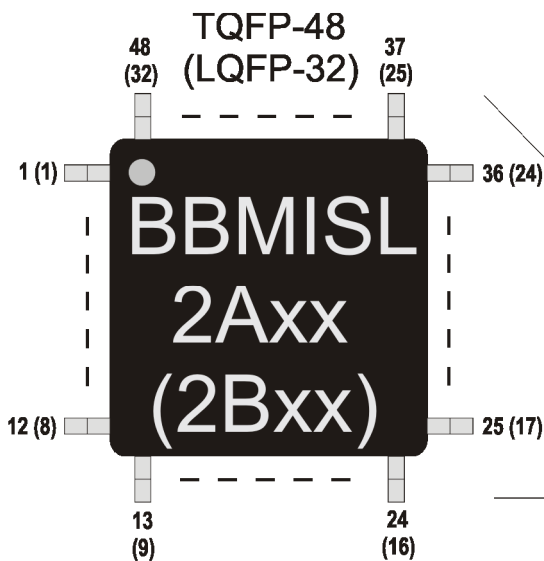


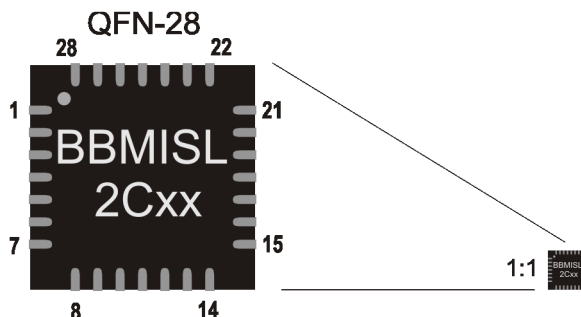
## Miniature Bitbus Slave BBMISL2A,B,C

The Miniature Bitbus Slave's BBMISL2Axx, BBMISL2Bxx, or BBMISL2Cxx are today the worldwide smallest Slave IC's with complete analog- and digital periphery. At the first time there is a part available for using in restricted space applications, like sensors or actors. With this also Bitbus can be used economical in such areas. To get a great type independence the complete SDLC protocol is implemented by software. Variants with up to 56 I/O ports in TQFP-100 package are possible. To minimize the using of resources specially in the RAM area, no multitasking operating system was installed. Also the RAC commands are reduced to the in practice mostly used. Therefore a high flexibility in configuration for the 32, (22), [18] I/O ports, inaccessible in the past, was got. The ADC-Digital inputs, also DAC and Digital outputs can be arranged in any way. The complete configuration is done by RS232 and is permanently stored.

Three packages are available, TQFP-48, LQFP-32 and QFN-28.



32 (22) free I/O Ports,  
configurable as:  
17 (21)x 10 Bit ADC Inp., or  
1x10 Bit DAC Outp. 2mA, or  
32 (22)x Digit. Inp. 0-aktiv, or  
32 (22)x Digit. Outp. 0-aktiv, or  
Individually mixed.  
ADC Ref.: Intern, Extern  
BITBUS: 62.5, 375kBd  
RS232: 9600Bd, for  
configuration  
Supply Voltage: 3-3,6V  
Ext. Clock: 12MHz  
Temp. Range: -40 - +85°C



Data same as BBMISL 3,4xx,  
but only 18 free I/O Ports for  
using.

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## Pinout

Name	Pin Nr. BBMISL 2Axx	Pin Nr. BBMISL 2Bxx	Pin Nr. BBMISL 2Cxx	Description
V+ <sup>2</sup>	19	---	---	+ Supply Voltage 3-3,6V
V+ <sup>2</sup>	31	---	---	+ Supply Voltage 3-3,6V
V+	43	4	4	+ Supply Voltage 3-3,6V
AV+ <sup>2</sup>	7	---	---	+ Analog Supply Voltage 3-3,6V
V <sub>REF</sub>	2	2	2	ADC Ref. Voltage, Inp., Outp.
GND <sup>2</sup>	18	---	---	Ground
GND <sup>2</sup>	30	---	---	Ground
GND	42	3	3	Ground
AGND <sup>2</sup>	6	---	---	Analog Ground
RES	8	5	5	Reset Inp. 0-activ.
P1	1	1	1	I/O Port1, DAC, Dig. Inp., Outp.
P2	45	26	22	I/O Port2, ADC <sup>3</sup> , Dig. Inp., Outp.
P3	44	25	21	I/O Port3, ADC <sup>3</sup> , Dig. Inp., Outp.
P4	41	24	20	I/O Port4, ADC <sup>3</sup> , Dig. Inp., Outp.
P5	40	23	19	I/O Port5, ADC <sup>3</sup> , Dig. Inp., Outp.
P6	39	22	18	I/O Port6, ADC, Dig. Inp., Outp.
P7	38	21	17	I/O Port7, ADC, Dig. Inp., Outp.
P8	37	20	16	I/O Port8, ADC, Dig. Inp., Outp.
P9	36	19	15	I/O Port9, ADC, Dig. Inp., Outp.
P10	35	18	14	I/O Port10, ADC, Dig. Inp., Outp.
P11	34	17	13	I/O Port11, ADC, Dig. Inp., Outp.
P12	33	16	12	I/O Port12, ADC, Dig. Inp., Outp.
P13	32	15	11	I/O Port13, ADC, Dig. Inp., Outp.
P14	29	14	10	I/O Port14, ADC, Dig. Inp., Outp.
P15	28	13	9	I/O Port15, ADC, Dig. Inp., Outp.
P16	27	12	8	I/O Port16, ADC, Dig. Inp., Outp.
P17	26	11	7	I/O Port17, ADC, Dig. Inp., Outp.
P18	25	6	6	I/O Port18, ADC, Dig. Inp., Outp.
P19 <sup>1</sup>	24	7	---	I/O Port19, ADC <sup>4</sup> , Dig. Inp., Outp.
P20 <sup>1</sup>	23	8	---	I/O Port20, ADC <sup>4</sup> , Dig. Inp., Outp.
P21 <sup>1</sup>	22	9	---	I/O Port21, ADC <sup>4</sup> , Dig. Inp., Outp.
P22 <sup>1</sup>	21	10	---	I/O Port22, ADC <sup>4</sup> , Dig. Inp., Outp.
P23 <sup>2</sup>	20	---	---	I/O Port23, Dig. Inp., Outp.
P24 <sup>2</sup>	17	---	---	I/O Port24, Dig. Inp., Outp.
P25 <sup>2</sup>	16	---	---	I/O Port25, Dig. Inp., Outp.
P26 <sup>2</sup>	15	---	---	I/O Port26, Dig. Inp., Outp.
P27 <sup>2</sup>	14	---	---	I/O Port27, Dig. Inp., Outp.
P28 <sup>2</sup>	13	---	---	I/O Port28, Dig. Inp., Outp.
P29 <sup>2</sup>	12	---	---	I/O Port29, Dig. Inp., Outp.
P30 <sup>2</sup>	11	---	---	I/O Port30, Dig. Inp., Outp.
P31 <sup>2</sup>	10	---	---	I/O Port31, Dig. Inp., Outp.
P32 <sup>2</sup>	9	---	---	I/O Port32, Dig. Inp., Outp.
CLK	47	31	27	Clk. Inp. 12MHz
RXD	3	29	25	UART RXD Inp. 9600Bd
TXD	4	30	26	UART TXD Outp. 9600Bd
GRXD	46	27	23	GRXD Inp. from BITBUS Transc.
GTXD	48	28	24	GTXD Outp. to BITBUS Transc.
DEN	5	32	28	Transm. enable 1-activ BITBUS Transc.

<sup>1,4</sup> Only in BBMISL2A,Bxx available

<sup>2</sup> Only in BBMISL2Bxx available

<sup>3</sup> Only in BBMISL2B,Cxx available

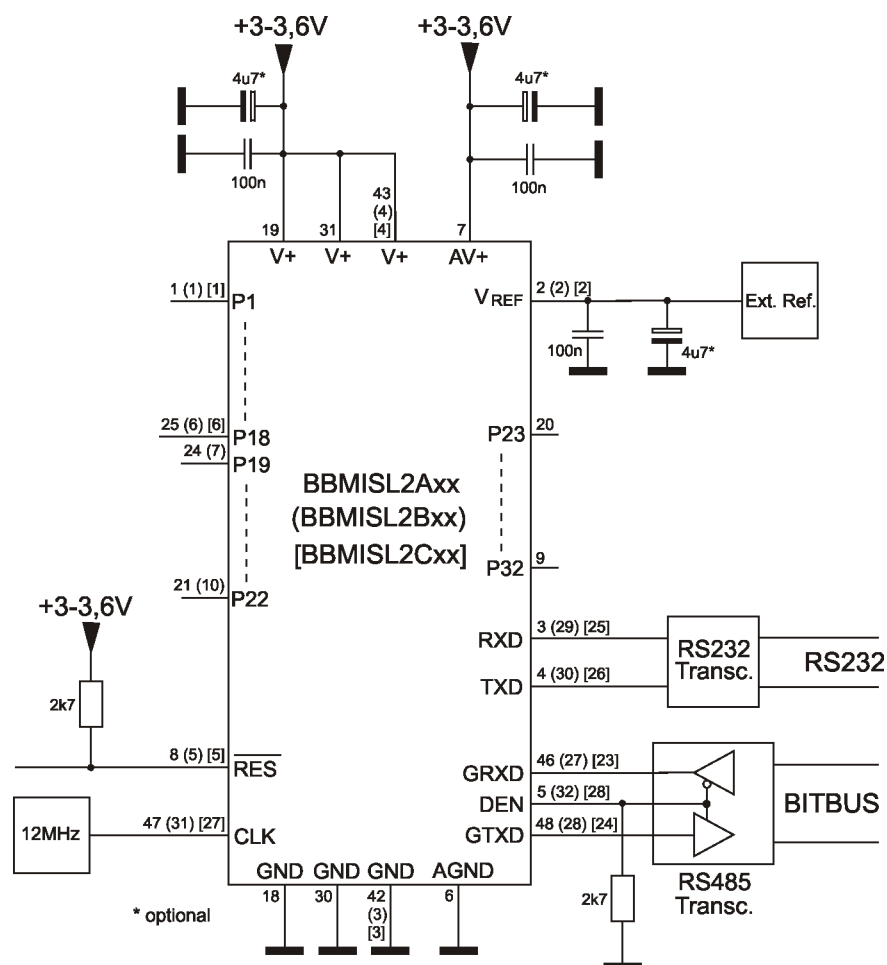
## I/O Port (P1-P32) Configuration

The configuration of the 32 (22) [18] I/O Ports is done by RS232 and can be arranged nearly in any way. The only exception is the DAC output. DAC1 is only useable at Port1. The ADC measurement runs asynchron for all 17, (21), [17] channels in background. The time for actualisation is 5ms.

The I/O Ports can be configured as:

- Digital Input: Weak Pullup 100k  $\Omega$ , 0-activ
- Digital Output: Push Pull,  $\pm 5\text{mA}$ , 0-activ
- ADC Input: 10Bit Resolution, Voltage range 0- $V_{REF}$
- DAC Output: 10 Bit Resolution, 0-2mA, 1%, max. Restistance 900-1200  $\Omega$ , at  $V+$  3-3,6V. (Only Port2)
- ADC Referenz Voltage: Intern 2,42V $\pm 2\%$ , o.  $V_{DD}$  (3,3V), o. Extern max. 3,6V

## Recommended wiring



## Implemented RAC commands:

A Multitasking Operating System is not implemented. One reason is, for the used tasks it is not necessary, another one is to extend the usage of other microcontrollers, because of the limited space of RAM. Therefore it is also not necessary to use all known RAC commands. Experience shows that in a lot of applications only a fraction from the whole spectrum is used.

The implemented RAC commands are:

- Software Reset (0)
- Read I/O (5), only for Ports 1 till 4
- Write I/O (6), only for Ports 1 till 4
- Read and Write I/O (7), only for Ports 1 till 4
- Upload Memory (8), only Address 2000h – 2035h
- Download Memory (9), only Address 2000h – 2005h
- Read Node Info (15)

At all other RAC commands and exceeding of area limits Response Code FEh instead of 0, will be sent.

## Technical Data:

- Message length: max. 255 Bytes
- Datarate: 62.5, 375 kBd
- Number of I/O Ports BBMISL2Axx: 32, BBMISL2Bxx: 22, BBMISL2Cxx: 18, free configuration
- Digital Input Weak Pullup 100k  $\Omega$ , 0-activ
- Digital Output Push Pull,  $\pm 5$ mA, 0-activ
- ADC Input 10Bit resolution, Voltage Range 0- $V_{REF}$
- ADC Reference Intern 2,42V $\pm 3\%$ , o.  $V_{DD}$  (3,3V), o. Extern max. 3,6V
- ADC Clock rate 200 Measurements. /s, at 17, (21), [17] Inputs
- DAC Output 10 Bit resolution, 0-2mA, typ. 1%, max. load resistor 900-1200  $\Omega$  at  $V+$  3-3,6V (Only Port2)
- UART 9600Bd, for configuration of I/O Ports, ADC Ref, Node Address, Datarate
- Voltage Supply 3,3-5V $\approx$ , ap. 70 mA
- Operating Temp. Range -40 - +85°C

Subject to change