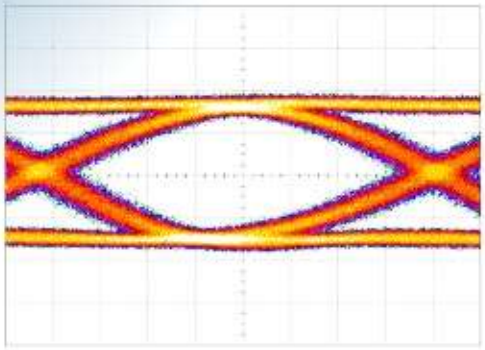
SHF Communication Technologies AG,
Wilhelm-von-Siemens-Str. 23 D • 12277 Berlin • Germany
Phone ++49 30 / 77 20 51 69 • Fax ++49 30 / 77 02 98 48
E-Mail: automation@shf.de • Web: http://www.shf.de



Data sheet

VME Input/Output boards
VME32BOU
32 binary Output Board

Data Sheet

Content

1 Introduction

1.1 Summary

The VME boards are VME devices especially designed for fast reading and writing of peripheral signals.
The acquisition of binary and analog signals is practically without delay by direct access to the VME bus. Therefore the VME boards have important advantages in relation to remote IO's.

1.2 Addressing

Every board uses an address area of 1kByte in the A24:D16 area. The base address is set by DIP-Switches 1 to 5 (1 being LSB and 5 MSB):

DIP-switch. 54321	Base Address
00000	0xEA0000
00001	0xEA0400
00010	0xEA0800
00011	0xEA0C00
00100	0xEA1000
00101	0xEA1400
00110	0xEA1800
00111	0xEA1C00
01000	0xEA2000
01001	0xEA2400
01010	0xEA2800
01011	0xEA2C00
01100	0xEA3000
01101	0xEA3400
01110	0xEA3800
01111	0xEA3C00
10000	0xEA4000
10001	0xEA4400
10010	0xEA4800
10011	0xEA4C00
10100	0xEA5000
:	:
11111	0xEA7C00

Note: ON is equivalent to „0“, OFF is equivalent to „1“. The address area can be optional modified by the exchange of two PLD's, which are obtainable on request.

1.3 Address-modifier lines

Normally the VME boards answer only to user and supervisor data accesses in the A24:D16 and A24:D8 area regarding AM codes of 0x39 and 0x3D. Other AM codes are possible on request.

1.4 Environmental conditions

Ambient temperature:	0°C to +55°C	without air flow
	0°C to +65°C	0.5 m/s air flow
Storage/transport temperature:	-40°C to 85°C	
Humidity:	Class F (DIN 40 040)	

1.5 Electromagnetic compatibility

According to European EMC law (89/336/EWG) the boards comply with EN50081-2 (electromagnetic immunity) and EN50082-2 (electromagnetic emission).

1.6 Accessories

Front connectors: e. g. ERNI, ordering number 594579
Housing for front connectors, e. g. ERNI, ordering number 73002
Switching pins: e. g. Mentor, ordering number 2767.020

2 VME32BOU

2.1 Scope of operation

General
The VME32BOU is used for controlling binary peripheral signals. It is equipped with 32 binary outputs with galvanic isolation. Commonly the outputs are switched by writing the output registers. Every output can drive 24V/500mA.
The outputs are divided into groups with 8 bit (outputs 0-7, Pins a2..a16; outputs 8-15, Pins a18..a32; outputs 16-23, Pins e2..e16; outputs 24-31, Pins e18..e32). Every group has its own enable input. The outputs can switched on if the regarding enable input is activated by a peripheral external signal. Or a group of outputs can be enabled by writing the command register accordingly. All groups are galvanic isolated to each other and to the VME. The connection of the peripheral signals is accomplished by a 48-pole front connector (see chapter 2.3)

Display and simulation
All outputs are equipped with an LED and the possibility of simulation at the front side. Simulation means that the peripheral signals can be simulated by inserting a switching pin into a test jack at the front panel, i. e. the outputs can also be switched by inserting/removing a metal stick into/from the appropriate test jack. Every output has its own test jack. One extra test jack is used for enabling the simulation possibility for all inputs.
Every group of outputs has an additional green LED to signalize the enabling of the group.

Short circuit and overload protection
All outputs are protected against short circuit and overload. If short circuit or overload occurs the according output is switched of. This case is signalized by blinking of the front LED of the output concerned. There is an additional red LED signalizing that any output has a short circuit or overload condition, i. e. it is an additional common LED for all 32 outputs. The fault condition is indicated in the state register also. If the fault condition is eliminated, the fault message can be reset by pressing a push button at the front panel or by writing a certain bit in the command register.

Single bit controlling
Single outputs can be set/reset by using special registers. Therefore several processor boards can share one VME32BOU without using special drivers or semaphores.
The state of the outputs can be read back every time.

2.2 Electrical characteristics

Outputs:

Nominal voltage:	24V +20%/-15%
max. Output current:	Iout =500mA

Enable Inputs:

Voltage:	24V (min. 11V, max. 28V)
Input current:	6mA at U =24V

Outputs 0-7, Pins a02..a16:

Ground potential (M0):	c32
Supply voltage (+24V0):	c16
Enable Input (Enable0):	c30
Sum of current for all 8 Outputs:	Isum =2A

Outputs 8-15, Pins a18..a32:

Ground potential (M1):	c28
Supply voltage (+24V1):	c14
Enable input (Enable1):	c26
Sum of current for all 8 Outputs:	Isum =2A

Outputs 16-23, Pins e02..e16:

Ground potential (M2):	c24
Supply voltage (+24V2):	c08
Enable input (Enable2):	c22
Sum of current for all 8 Outputs:	Isum =2A

Outputs 24-31, Pins e18..e32:

Ground potential (M3):	c20
Supply voltage (+24V3):	c06
Enable input (Enable3):	c18
Sum of current for all 8 Outputs:	Isum =2A

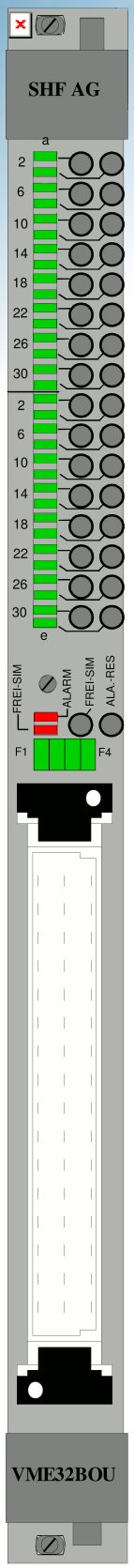
VME connection:

Supply voltage:	+5V ±5%
Supply current:	Imax < 250mA
Power consumption:	11W

Galvanic isolation

The isolation voltage between the input groups among each other and to the VME region is min. 250 Veff.

2.3 Front panel and pin out of the peripheral connector



LED Top/Bottom	Test Jack	Test Jack
Output 0/1	Output 0	Output 1
Output 2/3	Output 2	Output 3
Output 4/5	Output 4	Output 5
Output 6/7	Output 6	Output 7
Output 8/9	Output 8	Output 9
Output 10/11	Output 10	Output 11
Output 12/13	Output 12	Output 13
Output 14/15	Output 14	Output 15
Output 16/17	Output 16	Output 17
Output 18/19	Output 18	Output 19
Output 20/21	Output 20	Output 21
Output 22/23	Output 22	Output 23
Output 24/25	Output 24	Output 25
Output 26/27	Output 26	Output 27
Output 28/29	Output 28	Output 29
Output 30/31	Output 30	Output 31

LED Top/Bottom	Test Jack	Test Jack
fault/Enable	Enable Input	Fault Reset
One green LED per Enable		

Pins	a	c	e
32	Output 15	Ground potential M0	Output 31
30	Output 14	Enable Input Enable 0	Output 30
28	Output 13	Ground potential M1	Output 29
26	Output 12	Enable Input Enable1	Output 28
24	Output 11	Ground potential M2	Output 27
22	Output 10	Enable Input Enable2	Output 26
20	Output 9	Ground potential M3	Output 25
18	Output 8	Enable Input Enable3	Output 24
16	Output 7	Supply voltage +24V0	Output 23
14	Output 6	Supply voltage +24V1	Output 22
12	Output 5	Test loop	Output 21
10	Output 4	Test loop	Output 20
08	Output 3	Supply voltage +24V2	Output 19
06	Output 2	Supply voltage +24V3	Output 18
04	Output 1		Output 17
02	Output 0		Output 16

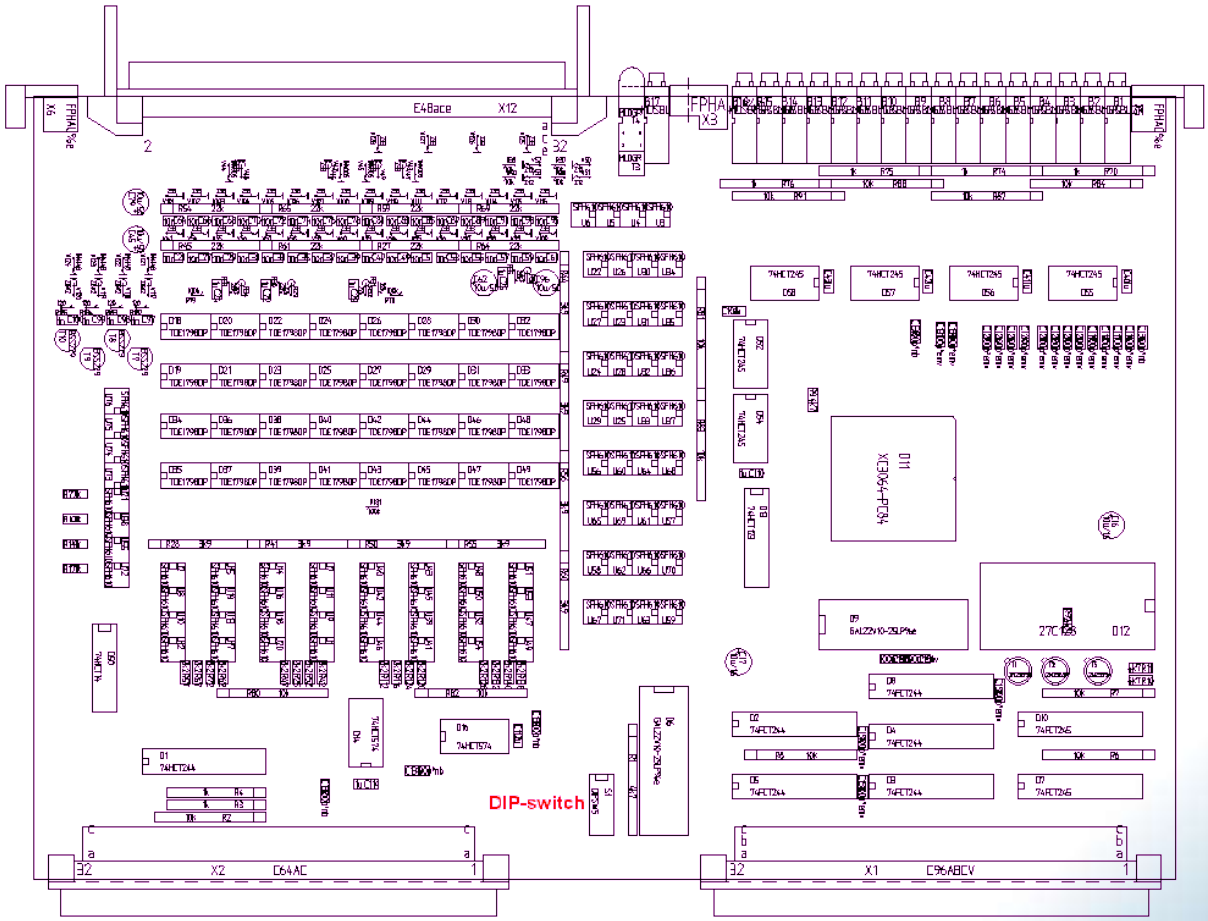
3 Mechanical construction

Front panel
All VME boards are equipped with a front panel made of aluminium. The front side is coated with paint in RAL 7044 and supplied with a marking (font Helvetica normal). The front panel is galvanic isolated from the electronic part.
The boards are equipped with ejector handholds for convenient removing.

Connectors
Connector X1/X2 (VME): E96M-C1A a-, b- and c-row according to VME-Rev.C
Connector X4 (periphery): E48M-C1A

Dimensions
The VME boards are pluggable boards in double-height format (approx. 233,4mm*160mm*20,5mm). Every board needs one slot only.

3.1 Component side of the board with position of the DIP switch



4 Interface Register

The VME board family is accessible in the A24/D16 address area. Every board uses 1kByte address range which is mapped as follows:

Address range:

Address Offset	Function
0	Unique identifier of the board
2	Version number of the board
4	Status register
6..3Fh	Reserved
40..7Fh	In-/Output register
80..1FFh	Control register
200..3FFh	reserved

Unique board identifier

16-bit identifier	Type of board
0002	VME32BOU

4.1 Status register

Bit	Description
D0	0= ready, 1= init/busy
D1	reserved
D2	reserved
D3	1= Simulation active
D4	0= access timeout, 1= Re-trigger okay (min. 100ms, typ. 130ms)
D5	Alarm
D6	Alarm Reset
D7	Failsafe Monoflop enable
D8..D11	Supply Voltage Group 0..3: 1=24V ok, 0=Fail
D12..D15	Group enable 0..3: 1= Enable, 0=Disable

When the failsafe monoflop is enabled, the outputs will be reset automatically when no access to the output registers occurred for more than 100ms (see access timeout).
The failsafe bit cannot be written as zero, once set it is cleared by a system-reset only.

4.2 In/Output register

Offset	Register	Function
44h	r/w Outputs 0-15	1= on = 24V, 0= off = 0V
46h	r/w Outputs 16-31	1= on = 24V, 0= off = 0V
48h	-/w set outputs 0-15	1= set output on, 0= no change
4Ah	-/w set outputs 16-31	1= set output on, 0= no change
4Ch	-/w reset outputs 0-15	1= set output off, 0= no change
4Eh	-/w reset outputs 16-31	1= set output off, 0= no change

Notes:

1. The binary In/Output boards use one bit in the channel registers to control one binary channel.
2. Single outputs can be set or reset by writing to the set/rest registers. Only the outputs where the corresponding bit is logical 1 are influenced.
   Example:
   Writing 0x10 at offset 0x48: only output 4 is set, the other stay unmodified
   Writing 0x03 at offset 0x4E: only outputs 16 and 17 are reset, the other stay unmodified
3. The output values can be read back.