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VME3XX

VMEbus M-module Carrier Board
Preconfigured with 4 M-modules

User Manual

Version 1.0

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1. INTRODUCTION

Each VME3XX is a 6U VMEbus M-module carrier board preconfigured with four M-modules from AcQuisition Technology's M-module range M300 to M399. The VMEbus M-module carrier board is the i4000/NP2 board. VME3XX VMEbus boards are offered as standard off the shelf products and provided as a package consisting of an i4000 M-module carrier board for the VMEbus and four installed M-modules.

The reason why VME3XX products are offered as an individual product while in fact the product is composed of standard modules which are separately available, is because in practice it seems that system integrators are looking for VMEbus boards and not for M-modules. Since a VME3XX board has all the advantages of a VMEbus board and the advantages of a modular board by using M-modules for the actual I/O, it can compete with dedicated VMEbus boards. Additionally the I/O functionality of each VME3XX board is available on 3U VMEbus cards and other bus architectures such as PCI, CompactPCI and others which makes application software portable over various bus systems with little programming effort.

1.1. VALIDITY OF THE MANUAL

This manual is valid for each VME3XX product which is a combination of the i4000/NP2 VMEbus M-module carrier board and four M-modules of the same type in the range from M300 up to M399. For understanding the functionality of the VME3XX and for the integration of the product in a VMEbus environment both the i4000 user manual and the user manual of the applied M-module are required.

1.2. PURPOSE

The purpose of this document is to provide the reader with the information regarding the assembly of the VME3XX product and completes the information which can be found in the i4000 user manual and the user manual of the applied M-module.

1.3. SCOPE

The scope of this user manual is the VME3XX board composed of an i4000/NP2 and four M-modules. This document contains information specific to the combination of the i4000 and the M-modules mounted on the carrier board. Detailed information regarding the i4000/NP2 and the applied M-module is beyond the scope of this manual, for this please refer to the i4000 user manual and the user manual of the M3XX M-module.

1.4. DEFINITIONS, ACRONYMS AND ABBREVIATIONS

AcQ	AcQuisition Technology bv
APIS	AcQuisition Platform Interface Software
CompactPCI	Adaption of PCI for industrial and/or embedded applications
ESD	Electro Static Discharge
i4000/NP2	M-module carrier board for VMEbus without P2 connector
M-module	Mezzanine I/O concept according to the M-module specification
M3XX	M-module from AcQuisition Technology where XX is any number from 00 to 99
PCI	Peripheral Component Interconnect
VMEbus	Versa Modular Eurocard bus

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2. INSTALLATION AND SETUP

2.1. UNPACKING THE HARDWARE

The hardware is shipped in an ESD protective container. Before unpacking the hardware, make sure that this takes place in an environment with controlled static electricity. The following recommendations should be followed:

- Make sure your body is discharged to the static voltage level on the floor, table and system chassis by wearing a conductive wrist-chain connected to a common reference point.
- If a conductive wrist-chain is not available, touch the surface where the board is to be put (like table, chassis etc.) before unpacking the board.
- Leave the board only on surfaces with controlled static characteristics, i.e. specially designed anti static table covers.
- If handling the board over to another person, touch this persons hand, wrist etc. to discharge any static potential.

IMPORTANT: Never put the hardware on top of the conductive plastic bag in which the hardware is shipped. The external surface of this bag is highly conductive and may cause rapid static discharge causing damage. (The internal surface of the bag is static dissipative.)

Inspect the hardware to verify that no mechanical damage appears to have occurred. Please report any discrepancies or damage to your distributor or to AcQuisition Technology immediately and do not install the hardware.

2.2. CONFIGURATION

A VME3XX combinational product comes in the form of an i4000/NP2 M-module carrier board for VMEbus equipped with four M3XX M-modules. Before usage, board settings such as jumper settings and dipswitch settings of each board must be verified and adapted if required. For changing board settings the M-modules must be removed from the i4000 according to the disassembly instructions, after configuration the M-modules must be mounted on the carrier board according the assembly instructions. Disassembly and assembly instructions can be found in the i4000 user manual. A description of the board settings can be found in the user manuals of the individual components.

2.3. SOFTWARE ISSUES

A VME3XX combination product comes with example software. The example software is available in ANSI-C source code and consists of an APIS compatible function library specific to the type of M-module used, and APIS platform support for a wide variety of operating systems. APIS, AcQ Platform Interface Software, is a software concept which provides a platform abstraction layer. In APIS based example software platform dependent issues such as hardware access, timing function and interrupts are handled by APIS platform support software which is available for various platforms. A platform is defined as a combination of hardware architecture and Operating System. APIS is an open source standard and by using the APIS programmer's manual APIS implementations for unsupported platforms can be developed with little effort.

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The M-module example software is described in the M3XX user manual and APIS is described in the APIS programmer's manual.

The VME3XX features four M-modules, each module must be opened with an APIS open call. Each open call returns a handle which must be used to perform I/O functions on a specific M-module. The code example listed below shows how all M-modules on an i4000 can be opened using APIS calls.

```
void main(void)
{
      APIS_HANDLE mod_hnd[4];       /* handles to M-modules */
      UINT16 result;
      int i;
      UINT32 baddr = VME3XX_BASE;   /* VME3XX base address in standard address
                                    space of the CPU board */
      /* Open M-module 0 - 3 */
      for (i=0; i<4; i++) {
            result = apis_open(baddr + (i*0x200), &mod_hnd[i], 0x100, A08D16);
            if (result != 0) {
                  printf("M-module %d:Could not open path: 0x%04x\n", i, result);
                  exit(0);
            }
      }

      <Application body>

      /* Close M-module 0 - 3 */
      for (i=0; i<4; i++)
      apis_close(mod_handle[i]);
}
```


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3. TECHNICAL DATA

For determining the technical data of a VME3XX combinational product the technical data of both the i4000 and the applied M-module must be consulted.

External bus:

A description of the external bus as well a the connection to the VMEbus can be found in the i4000 user manual.

Connection:

A description of the I/O connections can be found in the M-module user manual.

Power supply:

The required current of the 5V power supply must be determined by adding four times the required current of the 5V supply stated in the M-module manual to the required current of the 5V supply specified in the i4000 manual, the same procedure must be followed for the +12V and the -12V supply.

Temperature range:

The temperature range must be determined comparing the temperature range of the i4000 and the M3XX, for the lower temperature extreme the highest value must be used and for the upper temperature extreme the lowest value must be used. The table below contains an example.

i4000	M-module	VME3XX
Operating: 0..+60°C	Operating: -40..+85°C	Operating: 0..+60°C
Storage: -10..+80°C	Storage: -20..+70°C	Storage: -10..+70°C

Humidity:

Class F, non-condensing unless stated otherwise in both the i4000 manual and the M-module manual.

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4. ANNEX

4.1. BIBLIOGRAPHY

Specification for M-module interface and physical dimensions
M-module specification manual, April 1996, MUMM.
Simon-Schöffel-Strasse 21, D-90427 Nürnberg, Germany.

APIS Programmer's Manual
AcQuisition Technology bv
P.O. Box 627, 5340 AP Oss, The Netherlands.
Downloadable from www.acq.nl

i4000 User Manual
AcQuisition Technologyb bv
P.O. Box 627, 5340 AP Oss, The Netherlands.
Downloadable from www.acq.nl

M3XX User Manuals
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