PHYTEC

Development Board for the microMODUL-8051 Low Power and miniMODUL-PPC509

Hardware Manual

Edition November 1998

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Preface

This manual describes only the functions of the PHYTEC Development Board for the 32-bit miniMODUL-PPC505/509 and the microMODUL-8051 Low Power. The controllers and boards are not described herein. Additional controller- and board-level information and technical descriptions can be found in support documentation like "miniMODUL-PPC505/509 Hardware Manual" or "Dallas 83C323 Controller User's Manual". If software is included please also refer to additional documentation for this software.

In this hardware manual and in the attached schematics, low active signals are denoted by a "/" in front of the signal name (i.e.: /RD). A "0" indicates a logic-zero or low-level signal, while a "1" represents a logic-one or high-level signal.

Declaration regarding EMV-Conformity of the PHYTEC Development Board for miniMODUL-PPC509 and the microMODUL-8051 Low Power

PHYTEC Single Board Computers (henceforth products) are designed for installation in electrical appliances or as dedicated Evaluation Boards (i.e.: for use as a test and prototype platform for hardware/software development) in laboratory environments.

Attention!
PHYTEC products lacking protective enclosures are subject to damage by ESD and, hence, may only be unpacked, handled or operated in environments in which sufficient precautionary measures have been taken in respect to ESD-dangers. It is also necessary that only appropriately trained personnel (such as electricians and engineers) handle and/or operate these products. Moreover, PHYTEC products should not be operated without protection circuitry if connections to the product's pin header rows are longer than 3 m.

PHYTEC products fulfil the norms of the EMVG-statute only in accordance to the descriptions and rules of usage indicated in this hardware manual (particularly in respect to the pin header row connectors, power connector and serial interface to a host-PC).

Implementation of PHYTEC products into target devices, as well as user modifications and extensions of PHYTEC products, is subject to renewed establishment of conformity to, and certification of, EMV-Statutes. Only after doing so the devices are allowed to be put into circulation.

This Development Board supports the miniMODUL-PPC509 and the microMODUL-8051 Low Power.

PHYTEC supports all common 8- , 16- and 32-bit controllers in two ways:

(1) as the basis for Starter Kits in which user-designed hardware can be implemented on a wrap-field around the controller and

(2) as insert-ready, fully functional micro- and miniMODULS which can be embedded directly into the user's peripheral hardware design.

PHYTEC's microcontroller modules allow engineers to shorten development horizons, reduce design costs and speed project concepts from design to market. Please contact PHYTEC for additional information:

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1 Introduction

The PHYTEC Development Board, in EURO-card dimensions (160 x 100 mm.), is a universal carrier board for start-up and programming of PHYTECs miniMODULE-8051 Low Power and miniMODUL-PPC509. It is fully equipped with all mechanical and electrical components necessary for the speedy and secure insertion of these PHYTEC modules.

Simple jumper configuration readies the Development Board's connectivity to the modules *(refer to section 3 of this manual)*, which plug pins-down into the pin header contact strips mounted on the Development Board.

A wire wrap (60 x 65 mm) allows the Development Board to serve as an excellent prototyping vehicle for the target hardware into which a stand-alone PHYTEC micro- or miniMODUL can be subsequently inserted. Alternately, PHYTEC can design a customer specific board adding your circuitry to the micro-/miniMODUL-layout.

The Development Board offers the following features:

- Carrier Board in EURO-card format 160 x 100 mm, including wrap-field (60 x 90 mm) for easy layout of user circuitry
- improved interference safety through multi-layer technology
- single power supply via a low voltage socket (unregulated +9 V=/800 mA ±10%), via VG-96 connector (regulated +5 V=) or via an external battery pack at connector X5 (2-6 V= +10%)
- pin header receptacles accommodating both micro- and miniMODULs
- RS-232 interface at the DB-9 connector
- Motorola BDM interface
- Lattice-ISP interface
- switches for Reset and Boot
- two status LEDs and one freely-programmable LED

2 Development Board Connectors

Please note that all connections are not to exceed their expressed maximum voltage or current. Maximum signal input values are indicated in the corresponding controller manuals/data sheets. As damage from improper connections varies according to use and application, it is the user's responsibility to take appropriate safety measures to ensure that the module connections are protected from overloading through connected peripherals.

Figure 1: *Development Board Overview and Connectors*

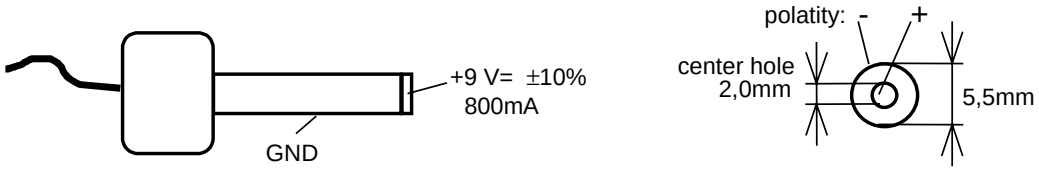

Figure 2: The power connector

2.1 Power Connectors VG1, P3, X5

There are three ways to provide power to the Development Board:

- connection via the VG96 connector at VG1
- connection via the low voltage socket at P3
- connection via the battery pack connector at X5 (only for use with the microMODUL-8051)

Attention:
Please do not use a laboratory or variable power supply, as power spikes during power-up could destroy the PHYTEC module mounted on the Development Board.
Please also avoid changing Jumpers or modules while the Development Board is powered up.

2.1.1 Connecting via VG96-connector VG1

The Jumper JP1 should be connected at pads (1+2) and the Jumper JP4 connected at pads (2+3) in order to enable power supply via the VG96 connector at VG1. A power supply via the VG96 connector requires a constant voltage of + 5V at the following pins:

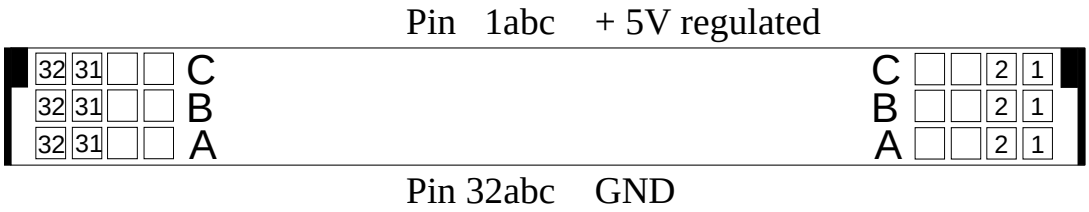

Figure 3: Numbering of the VG96-connector VG1 (front view)

Note, that only pins 1abc and 32abc are preconnected at the VG96 connector. All other connector pins are freely available to the user.

2.1.2 Connection via the Low Voltage Socket P3

An unregulated power supply of +9 V./ ±10% can be connected to the Development Board at the low voltage socket P3. This requires that both Jumpers JP2 and JP4 be set at positions (2+3). Power supplied at P3 has a maximum output current load of 5 V./150 mA. and 3.3 V./400 mA. If a power supply is connected at P3, the regulated + 5V is not available at the VG96 connector.

2.1.3 Connection via an External Battery Pack at X5 (only for use with the microMODUL-8051/Low Power)

A battery pack with a voltage of 2-6V +10% can be used to supply power to the microMODUL-8051 Low Power. We recommend use of the battery holder and cable, optionally available. The cable must be attached to the reverse battery protected connector X5. Setting Jumper JP4 at positions (1+2) correctly routes power from the battery pack to the module. Ensure that the power supply is within an acceptable range from 2 to 6 V. +10%.

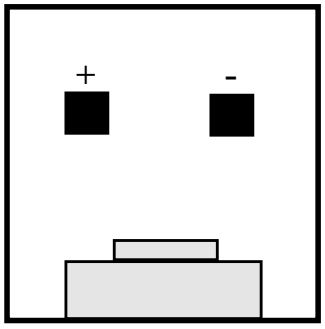

Figure 4: Battery Pack Connector

Attention:
The battery pack is connected directly to the microMODUL-8051/Low Power. Hence it is important to ensure correct connection polarity and maintenance of an acceptable input voltage.

2.2 DB-9 Socket (P1) and the Wire Wrap Row (X6)

The DB-9 socket at P1 and the wire wrap row X6 can be used as RS-232 interfaces. The pinout is shown in *Figure 5*:

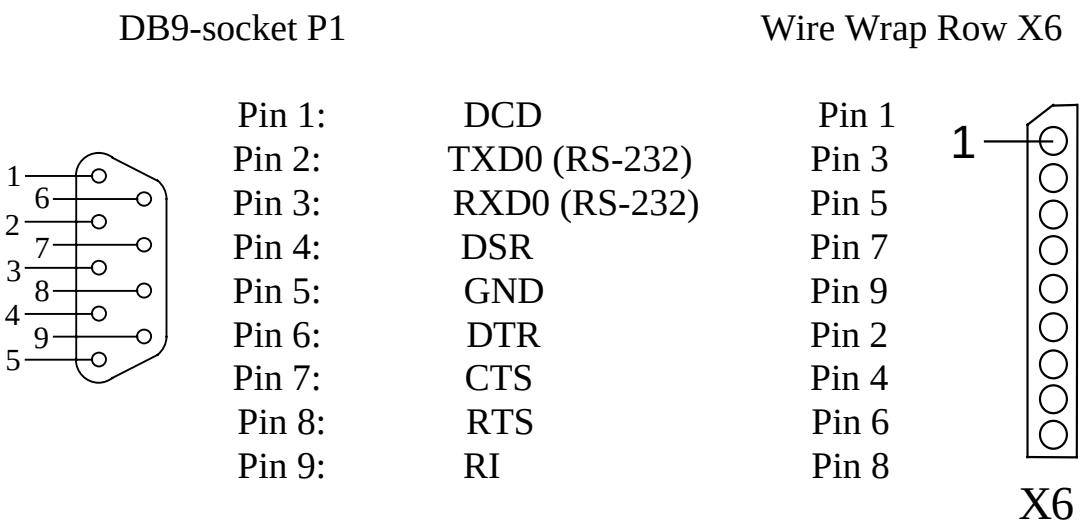

Figure 5: *Pin-out of the DB-9 socket at P1 (front view) and of the Wire Wrap Row X6*

2.3 The Motorola BDM-Interface

When the miniMODUL-PPC509 is mounted on the Development Board, the pin header connector at X2 enables direct interface to the Motorola BDM (Background Debug Mode) port of the MPC509 controller. An appropriate interface cable (such as is included with the Macraigor Wiggler) connects from X2 to the parallel port of a host-PC. *Table 1* provides a description of the BDM signal connection:

Signal	Pin header X2	miniModul-PPC509
VFLSO	1	88
/RESOUT	2	84
GND	3	
DSCK	4	86
GND	5	
VFLSI	6	87
/RES	7	121, 83
DSDI	8	85
VCC-BDM	9	
DSDO	10	89

Table 1: Pinout of the BDM Port

2.4 The Lattice-ISP Connector

The Lattice-ISP pin header connector X3 supports on-board programming of the Lattice EPLD device (ispLSI12032) on the miniMODUL-PPC509. *Table 2* provides a description of the Lattice-ISP pin header connector X3:

Signal	Pin Header X3	miniModul-PPC509
+5V	1	126
SDO	2	82
SDI	3	81
/ISPEN	4	80
NC	5	
MODE	6	79
GND	7	
SCLK	8	78

Table 2: Pinout of the ISP-Port

3 Jumper Layout

The jumpers located between the module receptacles and DB9-connector configure the applicable signals required for operation of the different PHYTEC micro- and miniMODUL Single Board Computers mounted on the Development Board.

The Development Board has 4 insertable jumpers (JP1 through JP4). *Figure 6* shows the numbering of the Jumper-pads, while *Figure 7* illustrates the location of the Jumpers on the board.

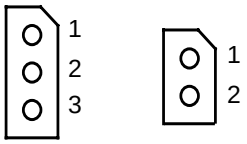

Figure 6: *Numbering of the Jumper-pads*

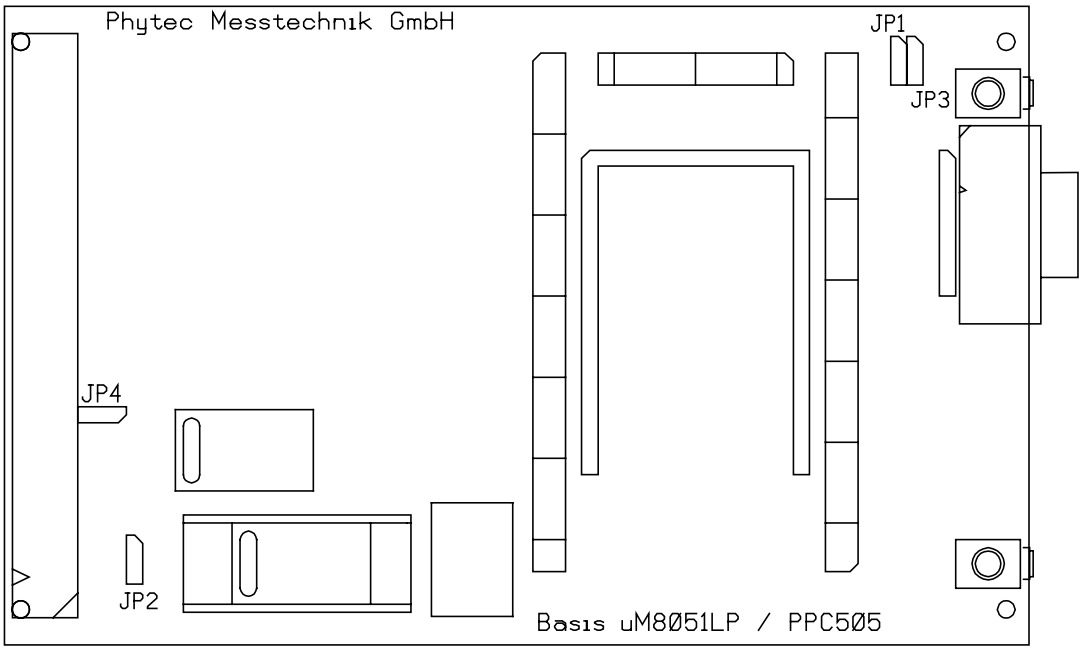

Figure 7: Location of the Jumpers (top side)

3.1 Control of the LED (D1) JP1

This Jumper connects a controller port-pin to the LED at D1. The user can freely configure this LED.

Module	Port-Pin	JP1
microMODUL-8051/Low Power	P1.0	2 + 3
miniMODUL-PPC505/509	PI0	1 + 2

3.2 Selection of the Power Supply JP2

Jumper JP2 enables selection of the desired power supply to the Development Board:

Power Supply	JP2
VG96 Connector	1 + 2
Low Voltage Socket	2 + 3

3.3 Selection of the Power Supply for the BDM-Port JP3

Jumper JP3 enables selection of a 3.3 V or 5 V power supply to the BDM-port of the miniMODUL-PPC509 (at X2.9):

Power Supply for the BDM-Port	JP3
5 V	2 + 3
3.3 V	1 + 2

3.4 Selection of the power supply for the microMODUL-8051/Low Power JP4

Jumper JP4 enables selection of the power supply to the microMODUL-8051/Low Power, as mounted on the Development Board:

Power Supply to the microMODUL	JP4
3.3 V via the Voltage Regulator	2 + 3
2 – 6 V via the Battery Pack	1 + 2

Attention:
When utilizing a version 1141.0 Development Board it is not possible to start FlashTools with the Boot switch S2 while the board is supplied via battery connector X5. This will be possible with later versions of the board.

4 Technical Specifications

The physical dimensions of the Development Board are shown in *Figure 8*.

The height of the Development Board, when mounted with a micro- or miniMODUL, is approximately 16 mm. The Development Board itself is 1.5 mm. thick. It is possible to house this Development Board in a 19" casing.

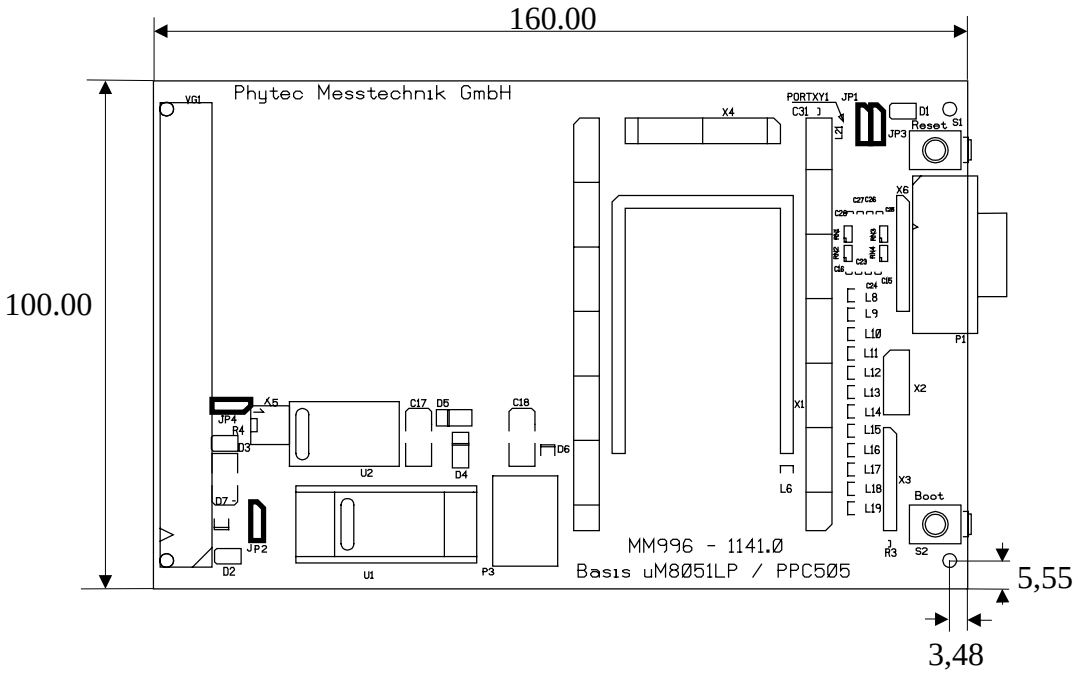

Figure 8: Physical Dimensions

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Did you find any mistakes in this manual? page

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