

PCB Test System PM-100

APPLICATION NOTE

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1 SYSTEM DESCRIPTION

1.1 Functional Description

BARTH[®] has developed an integrated In-Circuit Programming and Test System for PCB's, named PM-100.

The system contains a customer-tailored adaptor to contact the PCB. It supports both programming and electrical testing routines of the PCB / DUT (Device Under Test).

Therefore the PM-100 features effective one-step operation from an untested and unprogrammed PCB to a fully functional part. The described PM-100 programs and tests a STG-500 PCB and is one of many other PM-100's integrated into the BARTH[®] production lines.

1.2 System Components

The PM-100 is a aluminium profile-based construction with a pneumatic driven linear guide. The pneumatic cylinder is toggled by an 24VDC air valve to ensure the vertical movement of the DUT spring bar holder with contactes both programming interface and electrical connections of the DUT.

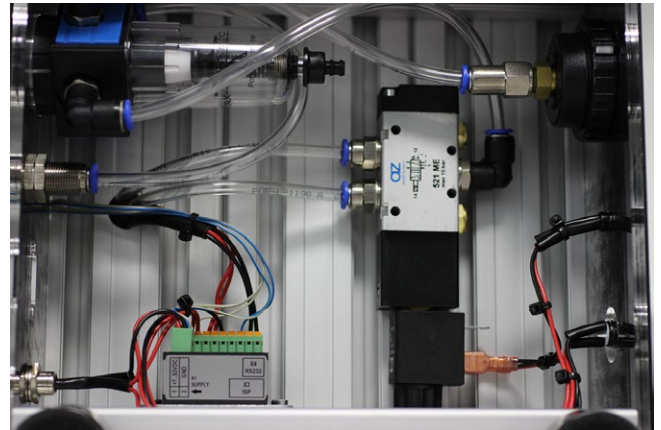
The head of the PM-100 contains:

- Pneumatic driven linear guide
- DUT Contactor plate
- Ultrafast universal USB ISP Programmer



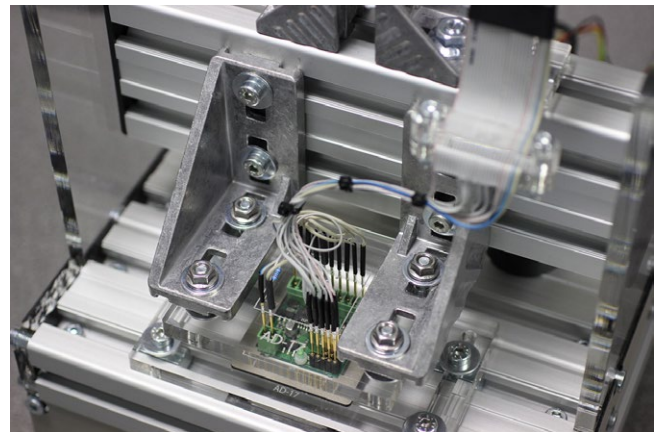
The socket of the PM-100 contains:

- Air strainer
- Air pressure regulator
- Pressure gauge 0-10 bar
- Air valve 24VDC/200mA
- Main power button
- Status LED with resistor
- Graphical programmable STG-500 Mini-PLC
- DC supply connector 24VDC/250mA



The heart of the PM-100 consists of:

- Customer-tailored spring bar holder (head)
- Customer-tailored adaptor plate for DUT (bottom)



2 ELECTRICAL WIRING

The electrical heart of the PM-100 is the graphical programmable Mini-PLC STG-500. It's placed and wired in the socket of the PM-100 system.

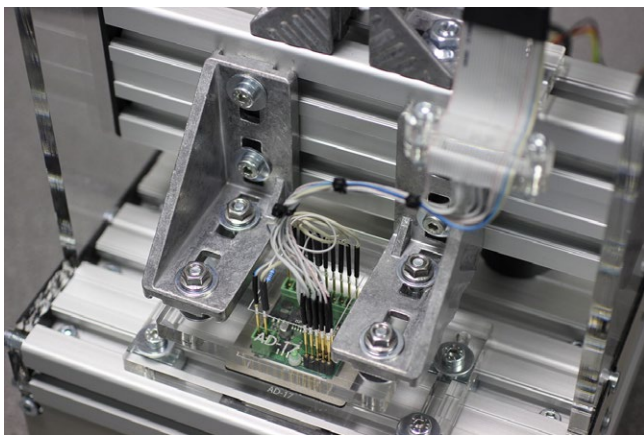
There are electrical connections to the ISP Programmer, the DUT (Mini-PLC STG-500 PCB) and the peripherals. The PLC, part of the PM-100, contains the application to control the functions of the PM-100.

2.1 Inputs wired to the STG-500

- IN1: START button 1 (right)
- IN2: START button 2 (left)



- IN3: DUT OK (Signal from DUT)



- IN5: Power ON/OFF button



2.2 Outputs wired to the STG-500

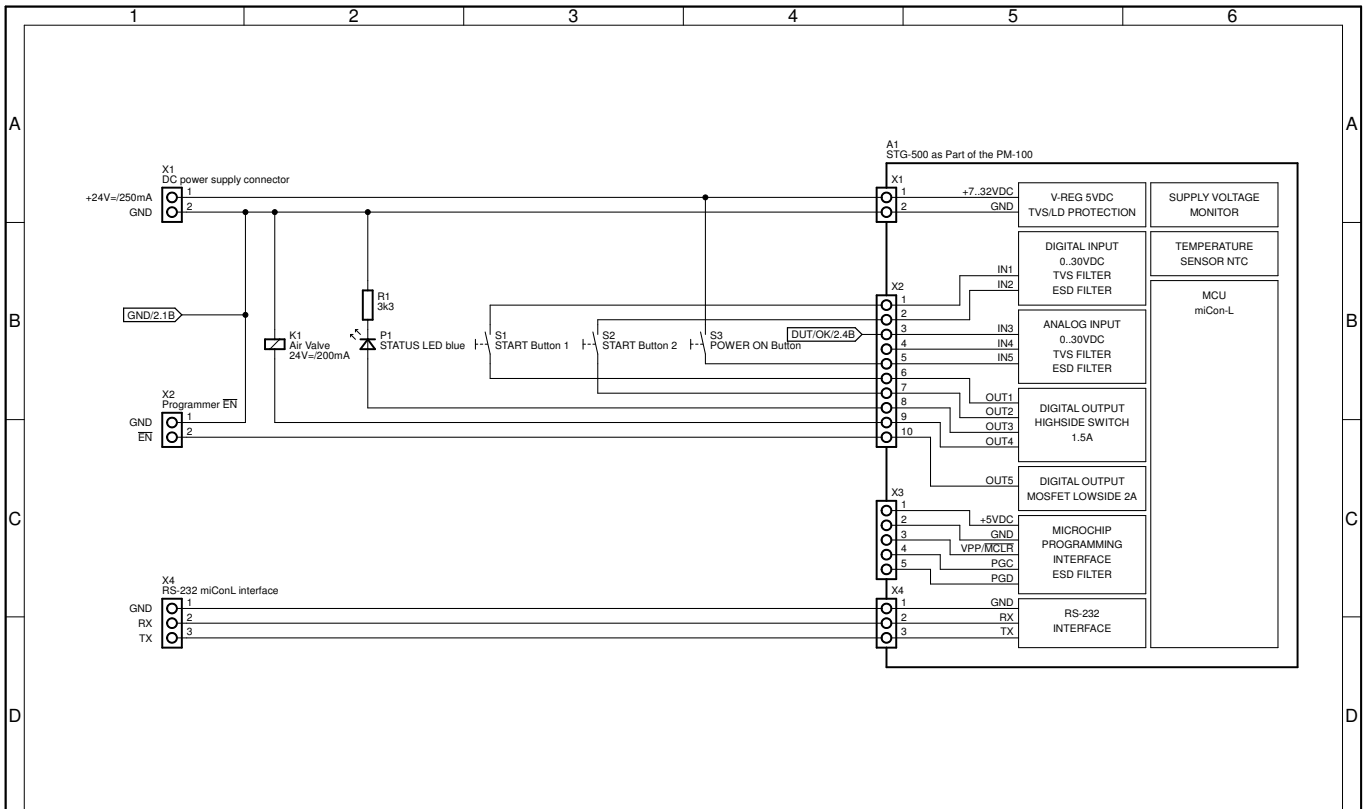
- OUT1: positive supply for button 1
- OUT2: positive supply for button 2
- OUT3: status LED (blue) 24VDC/20mA
- OUT4: air valve solenoid 24V/200mA
- OUT5: ISP programmer enable (low side switch)



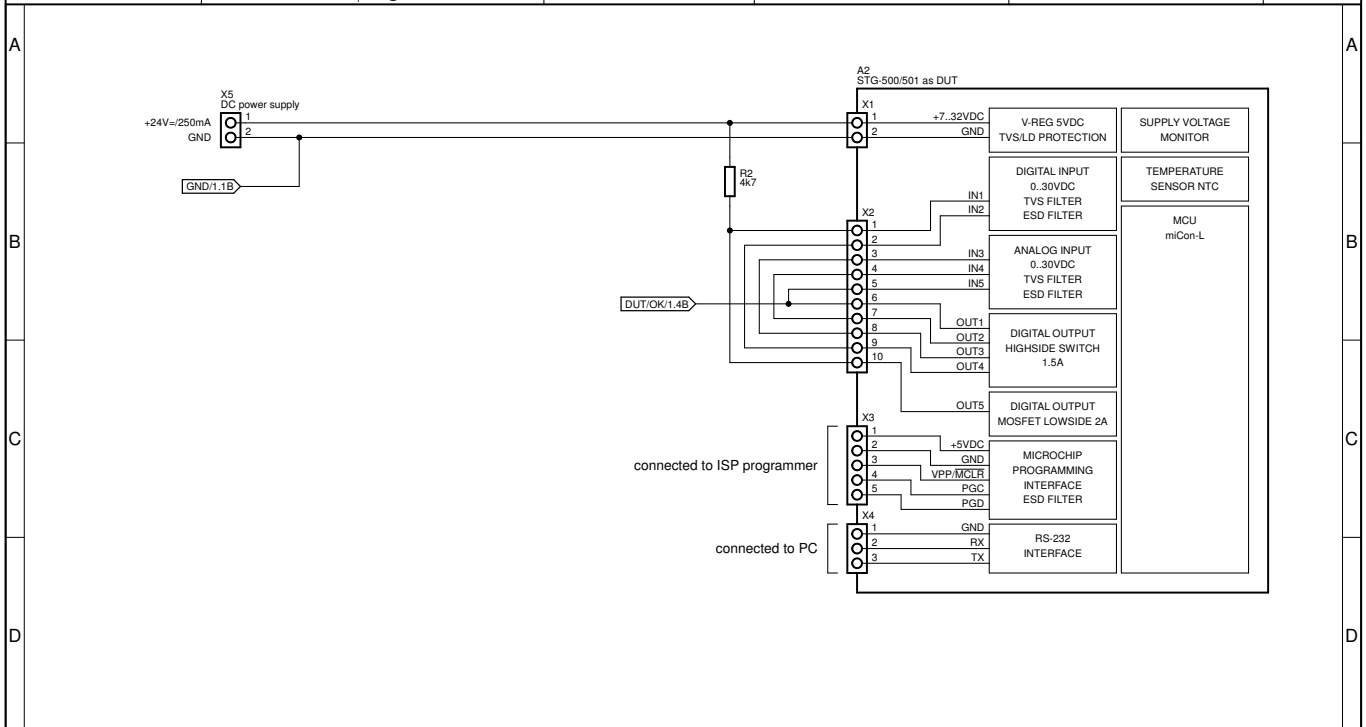
The STG-500's RS-232 interface was made accessible from the rear side of the PM-100. This feature supports an easy connection to the PC with the running ,miCon-L' software suite.

2.3 Wiring Diagrams

On the following page the wiring diagrams are shown for both the STG-500 as part of the PM-100 and the DUT part STG-500 PCB.



	Kunde / Customer	Bezeichnung / Description	Created	19.05.2015	BARTH GmbH	Revision
	BARTH Elektronik GmbH D-49838 Lengerich Tel. +49 5904 964545 Fax +49 5904 964546 www.barth-elektronik.de info@barth-elektronik.de	Test Adaptor for STG-500 PM-100 Wiring Diagram	Revised	19.05.2015	BARTH GmbH	A
	Artikelnummer / Article Number	Zeichnungsnummer / Drawing Number	Checked	19.05.2015	BARTH GmbH	Seite / Page
	0208-0017	9003-0085-A	Urheberrechtsschutzvermerk nach DIN ISO 16016. Protection notice DIN ISO 16016 observed.			1/2



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	BARTH Elektronik GmbH D-49838 Lengerich Tel. +49 5904 964545 Fax +49 5904 964546 www.barth-elektronik.de info@barth-elektronik.de	Test Adaptor for STG-500 DUT Wiring Diagram	Revised	19.05.2015	BARTH GmbH	A
	Artikelnummer / Article Number	Zeichnungsnummer / Drawing Number	Checked	19.05.2015	BARTH GmbH	Seite / Page
	0208-0017	9003-0085-A	Urheberrechtsschutzvermerk nach DIN ISO 16016. Protection notice DIN ISO 16016 observed.			2/2

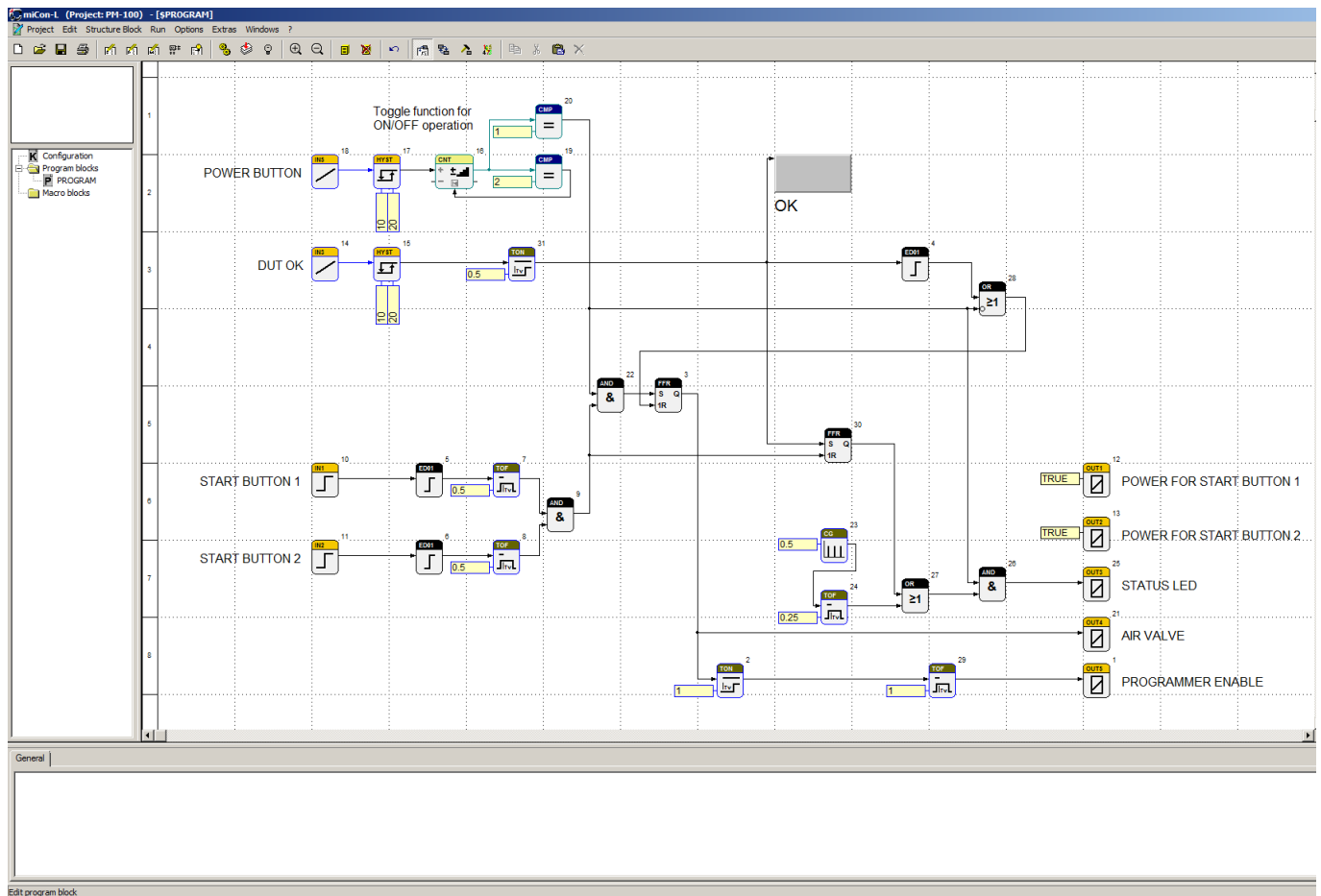
3 OPERATION

There are two 'miCon-L' applications as part of the PM-100 system. The first application controls the main power, air valve, programmer, status-LED etc. and is stored into the STG-500 placed in the PM-100's socket.

The second 'miCon-L' application is loaded into the DUT after successfully ISP programming before the electrical test starts. This application drives and controls outputs and their relating inputs to receive information about their status.

3.1 miCon-L Application on the PM-100

Once the DUT (STG-500 PCB) is positioned in the adaptor bottom plate and ready to contact, the PM-100 is launched by pressing both START buttons within 0.5 seconds. This security feature avoids an one-button-operation due to a bridged button. After triggering the PM-100, the air valve gets a signal from the STG-500. Now the pneumatic cylinder is supplied by pressed air and the DUT contactor plate is initiated to move downwards. Once the internal timer is elapsed (1 second) and the DUT is contacted, the ISP programmer receives the command from the PLC to initiate programming the 'miCon-L' framework to the DUT. After successful programming the test application will be loaded into the DUT and 'miCon-L' will be switched in 'Online Mode' to initiate the functional test routines.



3.2 miCon-L Application on the DUT

The DUT's RS-232 interface is wired to the PC's RS-232 port and ensures the online communication between the DUT and the ,miCon-L' software suite.

Once the ,miCon-L' application is started the ,Online-Mode' provides direct access to the DUT.

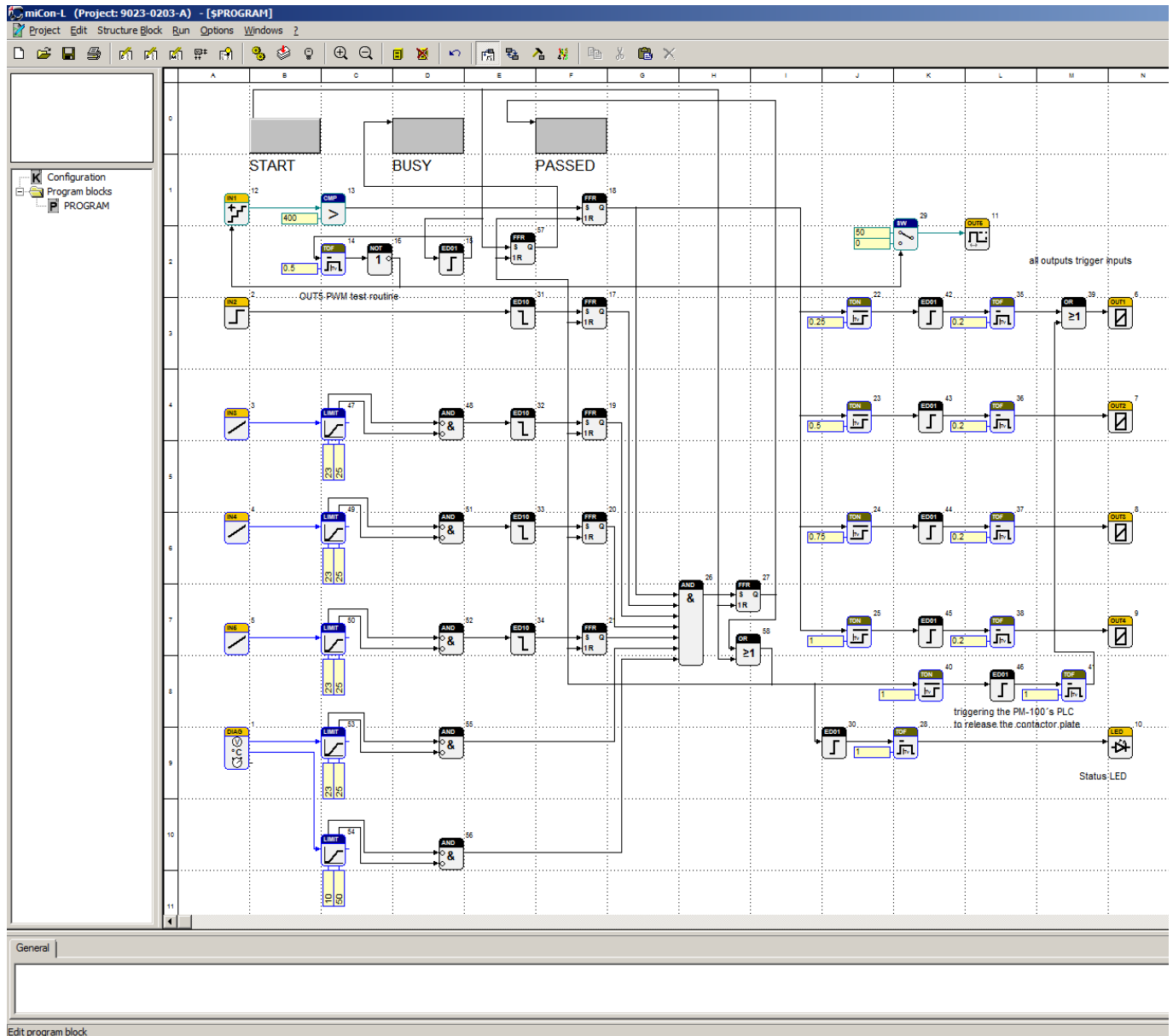
A click on the interactive ,START' button within the ,miCon-L' software suite initiates and runs the test program.

Now the application switches outputs and analyses the received input signals and voltage levels.

Once the signals passed all testing routines successfully the DUT sends a 1 second OK signal to the PM-100's PLC.

Only this signal unlocks the DUT contactor and initiates the upward movement of the pneumatic driven linear guide.

The product passed the functional quality check !



4 CONCLUSION

The PM-100 features in combination with its integrated Mini-PLC STG-500 an outstanding system flexibility by a extremely small form factor and a minimal number of peripheral components. With the ,miCon-L' software suite there is opened up an easy way to realize complex functions for PCB testing and many other applications.

BARTH® provides comprehensive customer support relating to their popular Mini-PLC product line.

BARTH® also supplies the PM-100 as standard product for PCB ISP programming and PCB testing applications with customer-tailored adaptors and both in-house engineering and manufacturing.