

## MP300 MT1/C2

The most advanced combi card production and test solution

- ◆ Provides interface for contact and contactless components
- ◆ Electric testing available for both interfaces
- ◆ Contact and contactless interfaces can be accessed simultaneously
- ◆



## OVERVIEW :

### The main features of the MP300 MT1/C2 are :

- Support of the ISO/IEC 7816-3 and &ndash;4 protocols
- Compatible with ISO/IEC 14443-3 and -4, ISO/IEC 15693, Mifare TM, FeliCa TM, Innovatron TM specifications
- Full implementation of the T=0, T=1 and T=CL protocols
- Support of numerous memory chips
- Great flexibility for the physical definition of the test conditions on both interfaces
- Open for implementation of custom protocols
- Endless possibilities of protocolary customisation
- Support of the fastest smartcards
- Compatible with wafers, micro-modules, smartcards, M2M components
- Fast hardware assisted data transmission mechanism, ensuring the maximum throughput for CPU and memory modules
- Advanced electrical test and measurement features (open/short, leakage, chip consumption, chip impedance, resonance frequency of a smartcard ...)
- Open platform : integrate the MP300 MT1/C2 inside your own personalisation environment
- Compatible with the MVPi production machine interface

### This production tester will typically be used in the following contexts :

- OS loading, pre-personalisation, or personalisation of micro-modules and smartcards
- Personalisation of SIM, U-SIM, and banking cards
- Reel to reel test handlers
- Electrical test of micro-modules

## SPECIFICATIONS :

### MP300 C2 : Supported protocols

ISO/IEC 7816-3	
T=0 and T=1 protocols	100% implemented, managed by firmware
Hardware acceleration	Transmission and reception of characters managed by the MicroSmart technology

<b>USB 2.0</b>	
Available speeds	Low speed, full speed
Classes	ISO/IEC 7816-12, mass storage, custom protocols
<b>Synchronous chips (memory chips)</b>	
Available libraries	T2G Eurochip SLE 4442 SLE 4407 AT24CXX
Custom protocols development	Available
Hardware acceleration	Available
<b>Raw mode</b>	
Gives the possibility to exchange frames without any Protocolary encapsulation	
<b>Out of standard chips support</b>	
Benefit from Micropross\'experience in smart card programming	

## MP300 C2 : Programmable parameters

<b>Physical parameters</b>	
<b>Voltages</b>	
Vcc	0V to 10V
Vol	0V to 5V
Voh	1V to 7V
Vil	0,2V to 5V
Vih	1V to 6,8
<b>Frequency</b>	
ISO 7816 clock frequency	10kHz to 20MHz
ISO 7816 clocy duty cycle	30% to 70%
<b>Pin states</b>	
All pins are independent from each other, and can be separately managed	
<b>ISO 7816 communication parameters</b>	
ETU width	From 1 to 4096 clock cycles (bit sampling adjustable)
BGT, initial ETU width	Adjustable in clock cycles
BWT, CWT, EGT, RGT, WWT	Adjustable in ETUs
Clock stop at high or low state	Adjustable
Clock stop tG and tH timings	Adjustable in clock cycles
Parity control	Can be forced to 0, 1, odd, even
Input parity error checking	Can be disabled
Pull-up resistor	5k $\Omega$ ; or 22k $\Omega$ ;

## MP300 C2 : Available tests

<b>Electrical tests</b>	
<b>Open/short test</b>	
Available contacts	Contact C1, C2, C3, C4, C5, C6, C7, C8
Forced current	Adjustable between $\pm 500\mu\text{A}$ and $500\mu\text{A}$
<b>Leakage current measurement</b>	
Available contacts	Contact C1, C2, C3, C4, C6, C7, C8
Measurement ranges	$\pm 5\text{mA}$ $\pm 500\mu\text{A}$

Voltage measurement	
Available contacts	Contacts C1, C2, C3, C4, C6, C7, C8
Range available	+/- 10V
Modes available	Dynamic mode : we give you an analog like vision of the voltage on the pin you chose from the moment you chose Static mode : we give you the instant voltage value
Current measurement	
Available contacts	Contacts C1, C2, C3, C4, C6, C7, C8
Ranges available	+/- 100mA +/- 25mA +/- 5mA +/- 500µA
Modes available	Dynamic mode : we give you an analog like vision of the current on the pin you chose from the moment you chose Static mode : we give you the instant current value on the selected contact
Parametric tests	
Available contacts	Contacts C1, C2, C3, C4, C6, C7, C8
Modes available	Force a current, measure a voltage Force a voltage, measure a current
Logical tests	
Anti tearing test	
Simulate the chip's immunity against tearing from the reader	
Timing measurement	
Measure the chip response to a command	
Personalisation assisted by hardware	
Do not lose a microsecond while sending data to the chip thanks to the hardware assisted data sending mechanism	

## MP300 MT1 : Supported protocols

ISO/IEC 14443-3 (proximity cards)	
Type A	Supported
Type B	Supported
Anticollision	Managed by firmware
T=CL protocol	Managed by firmware
Supported baudrates	106, 212, 424, 828 kbps Asymmetrical baudrates supported
B <sup>V</sup> (Innovatron)	
Supported	
ISO/IEC 15693 (vicinity cards)	
Coding type	Manchester
Encoding modes	1 out of 4 1 out of 256
ISO 18000-3 Mode 1	
Supported	
Mifare TM	

Types supported	Classic Light Ultra Light Ultra Light C Many more
Encryption	Assisted by hardware
<b>FeliCa™</b>	
Available baudrates	212 and 424 kbps
Encryption	Available through an external device
<b>Raw mode</b>	
Gives the possibility to exchange frames without any Protocolary encapsulation	
<b>Out of standard chips</b>	
Benefit from Micropross\experience in smartcard programming	
<b>ISO/IEC 7816-3</b>	
T=0 and T=1 protocols	100% implemented, managed by firmware
Hardware acceleration	Transmission and reception of characters managed by the MicroSmart technology

### MP300 MT1 : Programmable parameters

<b>Physical parameters (contactless interface)</b>	
Field strength	Adjustable
Modulation index	From 0% to 100%
Field rise time	0ms to 5ms
Carrier frequency	12.56MHz to 14.56MHz
Modulation rise and fall times	0µs to 10µs
<b>Logical parameters (contact interface)</b>	
Type A pause width	0 to 4.4µs
Frame waiting time	Adjustable in ETU
Type B framing (SOF, EGT, EOF, bit duration)	Adjustable in clock cycles
Communication speed	106, 212, 424, 848 kbps
<b>Physical parameters (contact interface)</b>	
<b>Voltages</b>	
Vcc	0V to 6V
Vol	0V
Voh	Fixed to Vcc
Vil	30% of Voh
Vih	70% of Voh
<b>Frequency</b>	
ISO 7816 clock frequency	100Hz to 10MHz
ISO 7816 clock duty cycle	50%
<b>Pin states</b>	
All pins are independent from each other, and can be separately managed	
<b>ISO 7816 communication parameters</b>	
ETU width	From 1 to 4096 clock cycles (bit sampling adjustable)
ETU width	From 1 to 4096 clock cycles (bit sampling adjustable)
BGT, initial ETU width	Adjustable in clock cycles
BWT, CWT, EGT, RGT, WWT	Adjustable in ETUs
Clock stop at high or low state	Adjustable

Clock stop tG and tH timings	Adjustable in clock cycles
Parity control	Can be forced to 0, 1, odd, even
Input parity error checking	Can be disabled
Pull-up resistor	4.7k $\Omega$ ; or 22k $\Omega$ ;

### MP300 MT1 : Available tests

<b>Electrical measurement</b>	
Resonance frequency measurement	
Range	11 to 24 MHz
Chip impedance	
Done at 13.56 MHz	
<b>Logical testing</b>	
Automatic testing	
Send type A command, wait, send type B command and receive answer (for type B cards)	
Send type B command, wait, send type A command and receive answer (for type A cards)	
Switch on field, wait, send request command (A or B), receive answer	
Send request, wait, send request, receive the answer	
Antitearing	
PICC reset characterization	
Check minimum FDT (frame delay time)	
Testing through API manipulation	
Response time measurement	
Sending of out of standard frames	
Sending misformed blocks (wrong number of bits)	
Retro modulation ratio measurement	
Distance simulation checking	

### MP300 MT1 : Communication parameters

USB 2.0	
TCP/IP 10/100 Mbps	
RS 232	

### MP300 MT1 : Software development

<b>Remote development (the code is executed from the PC)</b>	
Elements available	MPSDK .NET library available on demand Communication Dll supplied
Supported programming languages	C, C++, VB, Java, .NET Any language that supports Dll
<b>Embedded development (the code is executed directly by the MP300)</b>	
Recommended cross compiler	Windriver compiler (preferred version : 4.4b)

### MP300 MT1 : User Interface

MPManager, MVPI	
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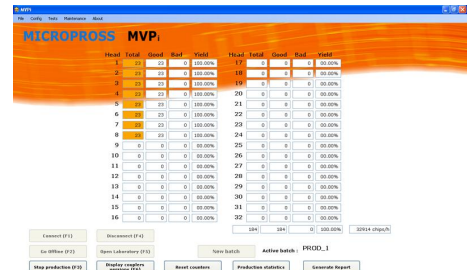
## SOFTWARES :

The MP300 MT1/C2 can be accessed using several ways :

First, using the driver dll that we supply, which enables the user to access all functionalities of the MP300 MT1/C2 from any programming language that supports Dll

For users preferring to embed their code directly inside the MP300 MT1/C2, Micropross has designed the SORB interface, which completely encapsulates all programming tasks related to the management of embedded applications, and lets the user focus on the smartcard oriented code  
Finally, we can also supply our own user interface, MVPi, which elegantly conciliates convenience of use, high throughput and stability.

MVPi is able to handle up to 32 test heads at the same time, but upgrades are easily possible.



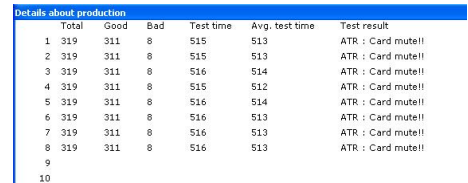
Head	Tested	Good	Bad	yield	Head	Tested	Good	Bad	yield
1	21	21	0	100.00%	17	0	0	0	0.00%
2	21	21	0	100.00%	18	0	0	0	0.00%
3	21	21	0	100.00%	19	0	0	0	0.00%
4	21	21	0	100.00%	20	0	0	0	0.00%
5	21	21	0	100.00%	21	0	0	0	0.00%
6	21	21	0	100.00%	22	0	0	0	0.00%
7	21	21	0	100.00%	23	0	0	0	0.00%
8	21	21	0	100.00%	24	0	0	0	0.00%
9	0	0	0	0.00%	25	0	0	0	0.00%
10	0	0	0	0.00%	26	0	0	0	0.00%
11	0	0	0	0.00%	27	0	0	0	0.00%
12	0	0	0	0.00%	28	0	0	0	0.00%
13	0	0	0	0.00%	29	0	0	0	0.00%
14	0	0	0	0.00%	30	0	0	0	0.00%
15	0	0	0	0.00%	31	0	0	0	0.00%
16	0	0	0	0.00%	32	0	0	0	0.00%

Statistics are available, either separated between all test heads, or displayed for the whole system



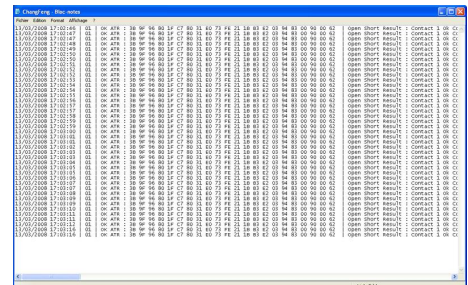
Value details - Head 3	Count	Percentage
217 (Carte mute)	4	100.00%

More statistics are available, showing the current test time, as well as the average one.



Total	Good	Bad	Test time	Avg. test time	Test result	
1	319	311	8	515	513	ATR : Card mute!!
2	319	311	8	515	513	ATR : Card mute!!
3	319	311	8	516	514	ATR : Card mute!!
4	319	311	8	515	512	ATR : Card mute!!
5	319	311	8	516	514	ATR : Card mute!!
6	319	311	8	516	513	ATR : Card mute!!
7	319	311	8	516	513	ATR : Card mute!!
8	319	311	8	516	513	ATR : Card mute!!
9						
10						

As smartcards are being produced, logfiles are also generated, that allow to keep track of the produced components. The content of this logfile is controlled by the user.



Time	Head	Tested	Good	Bad	Test time	Avg. test time	Test result
11/01/2011 11:01:01	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:02	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:03	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:04	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:05	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:06	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:07	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:08	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:09	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:10	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:11	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:12	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:13	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:14	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:15	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:16	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:17	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:18	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:19	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:20	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:21	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:22	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:23	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:24	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:25	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:26	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:27	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:28	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:29	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:30	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:31	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:32	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:33	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:34	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:35	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:36	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:37	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:38	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:39	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:40	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:41	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:42	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:43	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:44	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:45	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:46	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:47	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:48	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:49	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:50	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:51	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:52	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:53	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:54	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:55	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:56	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:57	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:58	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:01:59	1	217	217	0	515	513	ATR : Card mute!!
11/01/2011 11:02:00	1	217	217	0	515	513	ATR : Card mute!!

## ACCESSORIES :

Micropross supplies a complete range of accessories for the MP300 MT1/C2, that include :

Various sizes of rack housing, who allow to protect the Micropross testers from any kind of danger

Different types of antennas  
External smartcard readers  
Software for production machines (MVPi)

We also supply packages to extend the warranty of the tester. Please ask us for the maintenance contracts available