

Short description**rev. 2.2**

Introduction: The following concise description is intended to convey a brief overall view of the components. Installation alternatives are briefly depicted herein. This synopsis is no substitute for the detailed technical manual and must not be used as such.

1. Description of functions

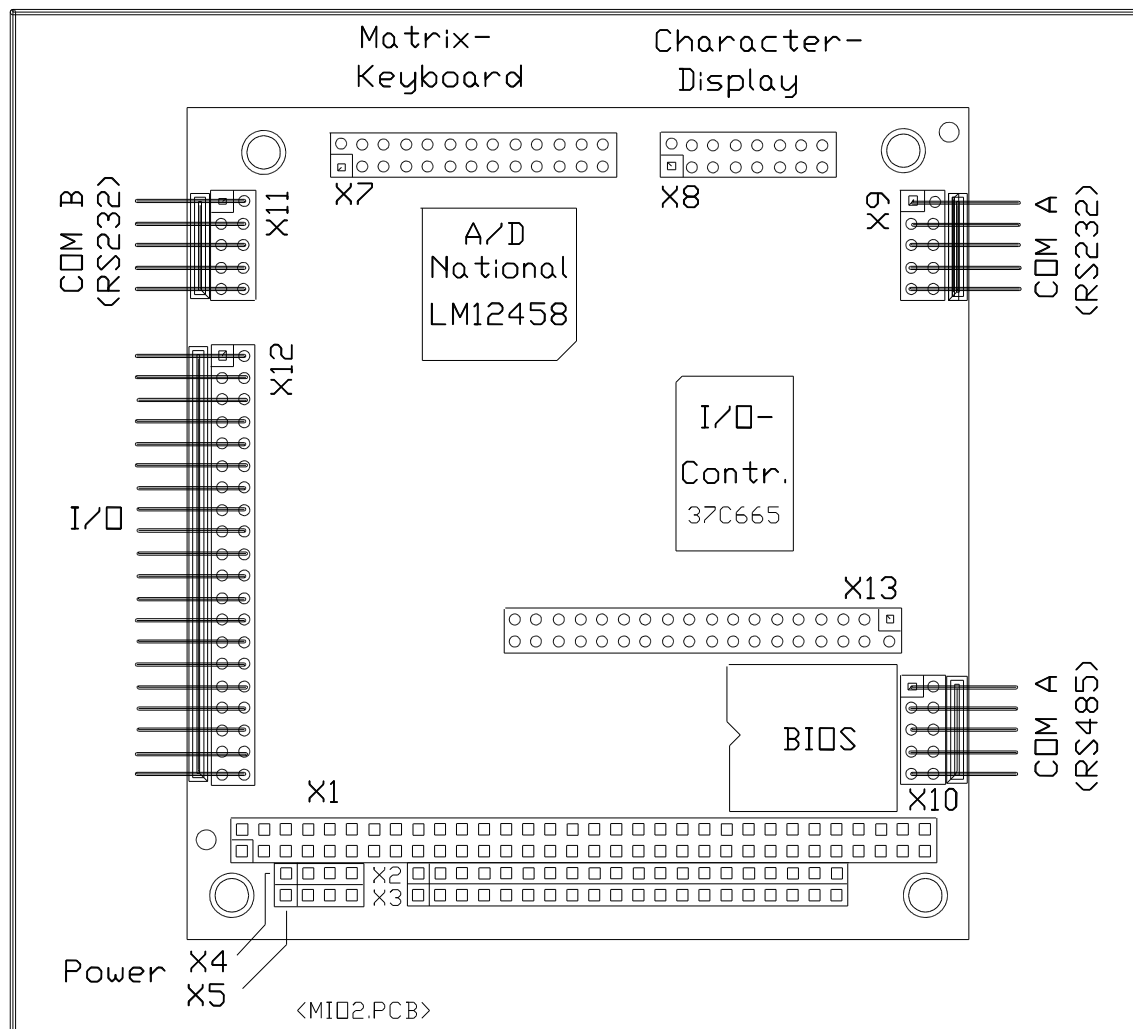
The PC/104-MIO2 is a Multi-I/O PC/104 Component group with the following functions.

Digital I/O: 14 digital input and 8 digital open collector outputs with a switching capability of 24 Volts and 24mA.

Serial Interfaces: Serial Interfaces with FIFO, their Interrupts can be adjusted as required. The two serial Interfaces can be operated as COM1/2 or as COM3/4. COM1 or COM3 can alternatively be connected as RS232 (X9) or RS485 (X10).

Character Display und Matrix Keyboard interface: A character display of several lines, e.g. 4*20 characters can be connected to the MIO2. A Matrix-Keypad of up to 16*10 can be connected in addition.

An A/D-Converter National LM12458 can be optionally be fitted to a PLCC-socket. The area of access consists of 0-2,5V with 8 channels and 12 bit resolution. The A/D-Converter can be fitted by the user.



PC/104-MIO2

JUMPtec®

PC/104-Bus: The PC/104 Bus is attached to a 104 poled Stack through male-female connector.

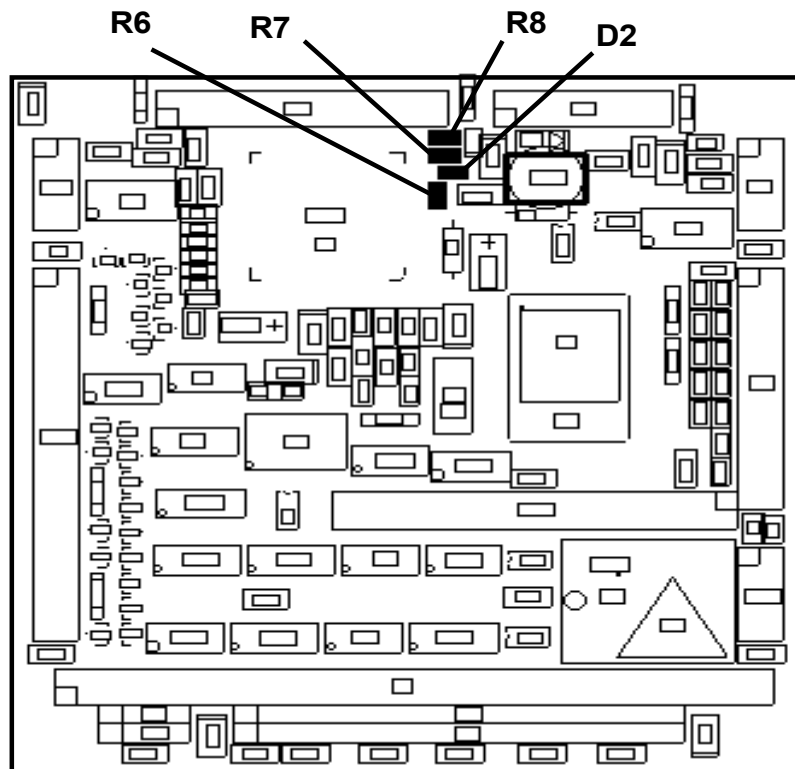
Connecting the power supply: The PC/104-MIO2 can be operated with a power supply of only 5 Volts.

P C / 1 0 4 - B u s					Power	I/O- Connector	Charact. Display	Matrix- Keyboard	JUMPER Array
(X1)		(X2)	(X3)						
Pin	A	B	C	D	X5/X4	X12	X8	X7	X13
0			GND	GND					
1	/IOCHCK	GND	/SBHE	/MEMCS16	GND	AGND	GND	GND	IRQ12
2	SD7	RESETDRV	LA23	/IOCS16	VCC	ADC0	Vcc	Y0	IRQ5
3	SD6	VCC	LA22	IRQ10	Codierpin	AGND	VEE	RA0	LPTIRQ
4	SD5	IRQ9	LA21	IRQ11	+12V	ADC1	/AFD	Y1	LPTIRQ
5	SD4	-5V	LA20	IRQ12	-5V	AGND	/SLIN	RA1	IRQ15
6	SD3	DRQ2	LA19	IRQ15	-12V	ADC2	/INIT	Y2	IRQ7
7	SD2	-12V	LA18	IRQ14	GND	AGND	PD0	RA2	IRQ15
8	SD1	/OWS	LA17	/DACK0	VCC	ADC3	PD1	Y3	IRQ11
9	SD0	+12V	/MEMR	DRQ0		SYNC	PD2	RA3	S2IRQ
10	IOCHRDY	GND	/MEMW	/DACK5		ADC4	PD3	Y4	S2IRQ
11	AEN	/SMEMW	SD8	DRQ5		I2CLK	PD4	RA4	IRQ12
12	SA19	/SMEMR	SD9	/DACK6		ADC5	PD5	Y5	IRQ3
13	SA18	/IOW	SD10	DRQ6		I2DAT	PD6	RB0	IRQ12
14	SA17	/IOR	SD11	/DACK7		ADC6	PD7	Y6	IRQ10
15	SA16	/DACK3	SD12	DRQ7		GND	SW_BACK	RB1	S1IRQ
16	SA15	DRQ3	SD13	VCC		ADC7	GND	Y7	S1IRQ
17	SA14	/DACK1	SD14	/MASTER		OC0		RB2	IRQ11
18	SA13	DRQ1	SD15	GND		IN0		/MCLR	IRQ4
19	SA12	/REFRESH	GND	GND		OC1		RB3	IRQ15
20	SA11	SYSCLK				IN1		OC0	IRQ5
21	SA10	IRQ7				OC2		RB4	ADCIRQ
22	SA9	IRQ6				IN2		OC1	ADCIRQ
23	SA8	IRQ5				OC3		RB5	IRQ10
24	SA7	IRQ4				IN3		RB7	NC
25	SA6	IRQ3				OC4		RB6	/ADR-C0
26	SA5	/DACK2				IN4		VCC	/ADR-DC
27	SA4	T/C				OC5			/ADC-CS
28	SA3	BALE				IN5			/ADC-CS
29	SA2	VCC				OC6			/ADR-C4
30	SA1	OSC				IN6			/ADR-D8
31	SA0	GND				OC7			/ADR-C8
32	GND	GND				IN7			/ADR-D8
33						IN9			/ADC-CS
34						IN8			/ADC-CS
35						IN11			/ADR-CC
36						IN10			/ADR-D0
37						IN13			
38						IN12			
39						VCC			
40						VCC			

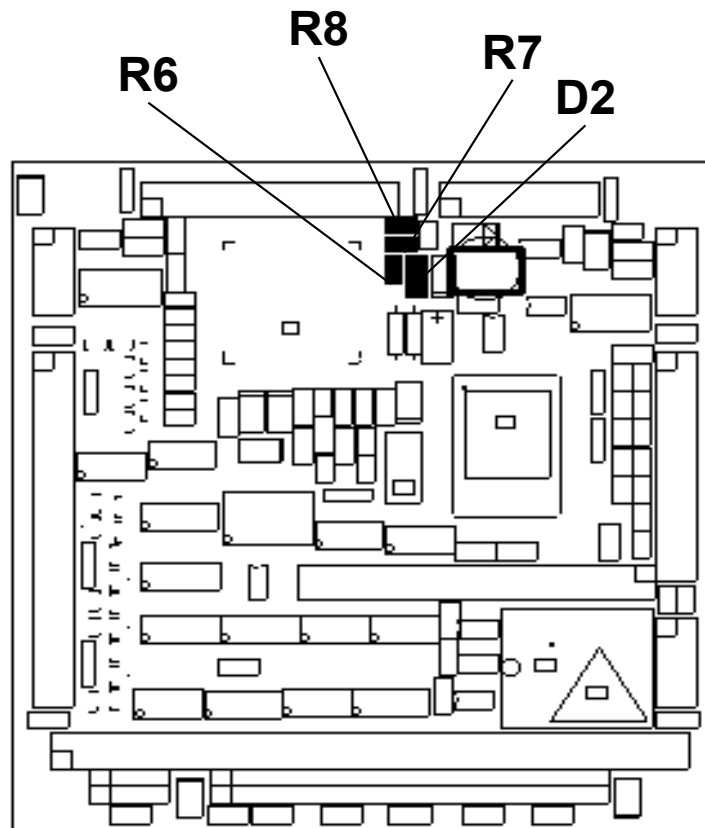
COMA RS485		COMA RS232	COMB RS232
Pin	X10	X9	X11
1	A+	RLSD1	RLSD2
2	B+	DSR1	DSR2
3	ATerm.	SIN1	SIN2
4	BTerm.	RTS1	RTS2
5	A-	SOUT1	SOUT2
6	B-	CTS1	CTS2
7	NC	DTR1	DTR2
8	NC	RI1	RI2
9	GND	GND	GND
10	NC	VCC	VCC

Display-Connection:

Important for the determining of the contrast voltage are the resistances, itemised in the diagrams below, R6, R7 and R8 as well as the diode D2 whereby D2 can either be fitted with a Z-diode or with a resistance, according to the contrast voltage required.

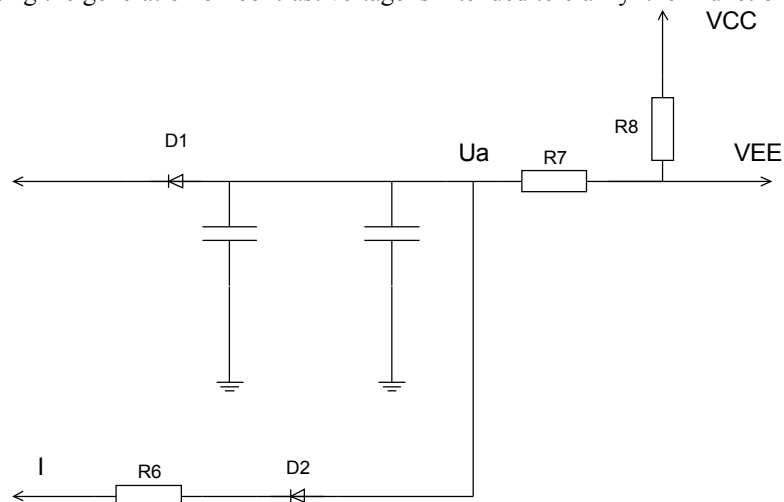


Platinen-revision MIO2L112



Platinenrevision MIO2L111

A circuit diagram depicting the generation of contrast voltage is intended to clarify their functioning.



The power I is adjusted via a MAX749. It is regulated within an area of $6,6\mu\text{A}$ to $20\mu\text{A}$. In this way, the voltage U_a is determined via the two components R_6 and D_2 according to Ohm's Law.

If one wants to generate a negative Contrast voltage VEE , the resistance R_8 is not fitted and the resistance R_7 is fixed on 120Ω . In this case, VEE results directly from $I \cdot (R_6 + D_2)$.

Example 1:

Generation of an average Contrast Voltage of $V_{EE} = -8V$.

The average Power $-I_{mid}$ of the MAX749 is:

$$-I_{mid} = (I_{min} + I_{max})/2 = 13,3 \mu A$$

The Overall-Resistance R consists of $R7 + R6 + D2$ and is

$$R = V_{EE}/-I_m = \text{ca. } 601K \text{ groß.}$$

The following Values are important: $R7 = 120R$, $R6 = 1K$ and $D2 = 600K$. $R8$ is not used.

In this case, $D2$ is a Resistance.

Beware: In this Configuration V_{EE} is from $I_{min} \cdot R = -3,97V$ to

$I_{max} \cdot R = -12V$, this can destroy an LCD with a differing Contrast Voltage Area.

Example 2:

The Contrast voltage area extends from $V_{EE} = -7,8V$ to $-8,2V$.

The max. Contrast Voltage Area is: $V_{EEmin} = I_{min} \cdot R$

The max. Contrast Voltage Area is defined by means of a Zener Diode:

So here, $D2$ a Zener diode $Z8,2$ and $R7 = 120R$. $R8$ is not used.

The resistance $R6 = V_{EEmin}/I_{min} = 1,18M$ generates the min. V_{EE} with power I_{min} .

Example 3:

Generates a positive contrast voltage:

This example represents the standard adjustment of the PC/104-MIO2 :

$$R6 = 120R, R7 = 4k7, R8 = 1k \text{ and } D2 = 1M$$

$$U_a \text{ max} = 1000120R \cdot (-6,66) \mu A = -6,66V \text{ and } U_a \text{ min} = 1000120R \cdot (-20) \mu A = -20V$$

in other words: with the anode $D1$ is max. $-6.66V$ and min. $-20V$

The resistance of $R7$ and $R8$ generates V_{EE} :

$$V_{EE} \text{ min} = V_{CC} - (U_e \cdot R8 / (R7 + R8)) = 5V - (25V \cdot 1k / 5k7) = 0,61V$$

$$\text{with } U_e = V_{CC} - (-20V)$$

$$V_{EE} \text{ max} = V_{CC} - (U_e \cdot R8 / (R7 + R8)) = 5V - (11V \cdot 1k / 5k7) = 3,07V$$

$$\text{with } U_e = V_{CC} - (-6.6V)$$

The power $I_e \text{ max} = U_e \text{ max} / (R7 + R8) = 25V / 5k7 = 4mA$ can flow through $R7$ and $R8$

Beware: When $R7$ is open, $V_{EE} \text{ max} = 5V$ and can be no longer steered,

whereas with ever shrinking $R7$ the adjusting area grows bigger, the positive voltage however shrinks.

Example: With $R8 = 100R$ in place of $1K$ and $R7 = 470R$ in place of $4k7$;

$$V_{EEmin} = -0,32V \text{ and } V_{EEmax} = 2,65V$$

Important! To ensure smooth operation, the stage *Enable LCD Support* must be adjusted when using MIO2 Set-Utility under *LCD-Settings*, otherwise 4.1V will be constantly used!

The values according to those calculated in the examples do not utterly correspond to the real results. It is therefore always wise to check the contrast voltage by technical means of measurement and if necessary, to correct the resistant values until the desired result is obtained.

Displays with positive Contrast voltage:

The following displays have a positive contrast voltage and should contain Values according to example 3:

Datavision:	DV 16100 (16*1 rows) sold by the company Ettinger in Munich
	DV 16200 (16*2 rows)
	DV 16400 (16*4 rows)
	DV 20200 (20*2 rows)
	DV 24200 (24*2 rows)
	DV 40200 (40*2 rows)
	DV 40400 (40*4 rows)
Sharp	LM 16152E sold by the company Jermyn in Munich
	LM 16155
	LM 16255

Technical Data

Measurements (LxB):	96*90mm.
Temperature:	Operation: 0 to 60 °C
Voltage:	+5V +/- 5%
Storage:	-10 to +85 °C
Power consumption:	200mA typ.
max. Humidity:	Operation: 10% to 90% with 5 V
Storage:	5% to 95% (do not condense)

Accessories (not contained in delivery)

* Detailed technical manual

Order No.: MIO23D01.DOC

All cited Data are no assured qualities in the sense of the Law. <MIO2K121.ENG> 09.04.97

History:

12.05.96	Newly constructed	Be	Rev. 1.0
05.09.96	Diagram of MIO2L112 expanded	HB	Rev. 1.1
09.04.97	changed to english	Be	rev. 2.1
02.08.98	Exchanged Jump to Jumptec	SG	rev. 2.2