i-PAN7

Documentation ver. 1.2

1.0 Introduction

The i-PAN7 is a flat panel ready to go solution, which can be easily integrated in customer devices. It consists of a 7" touch-display combined with a thin metal housing including most peripherals needed by todays typical panel-applications. To make it easy for customers to attach their own peripherals or to put connectors on a desired place in a product, the i-PAN7 additionally has extensions connectors.

The device offers the following features:

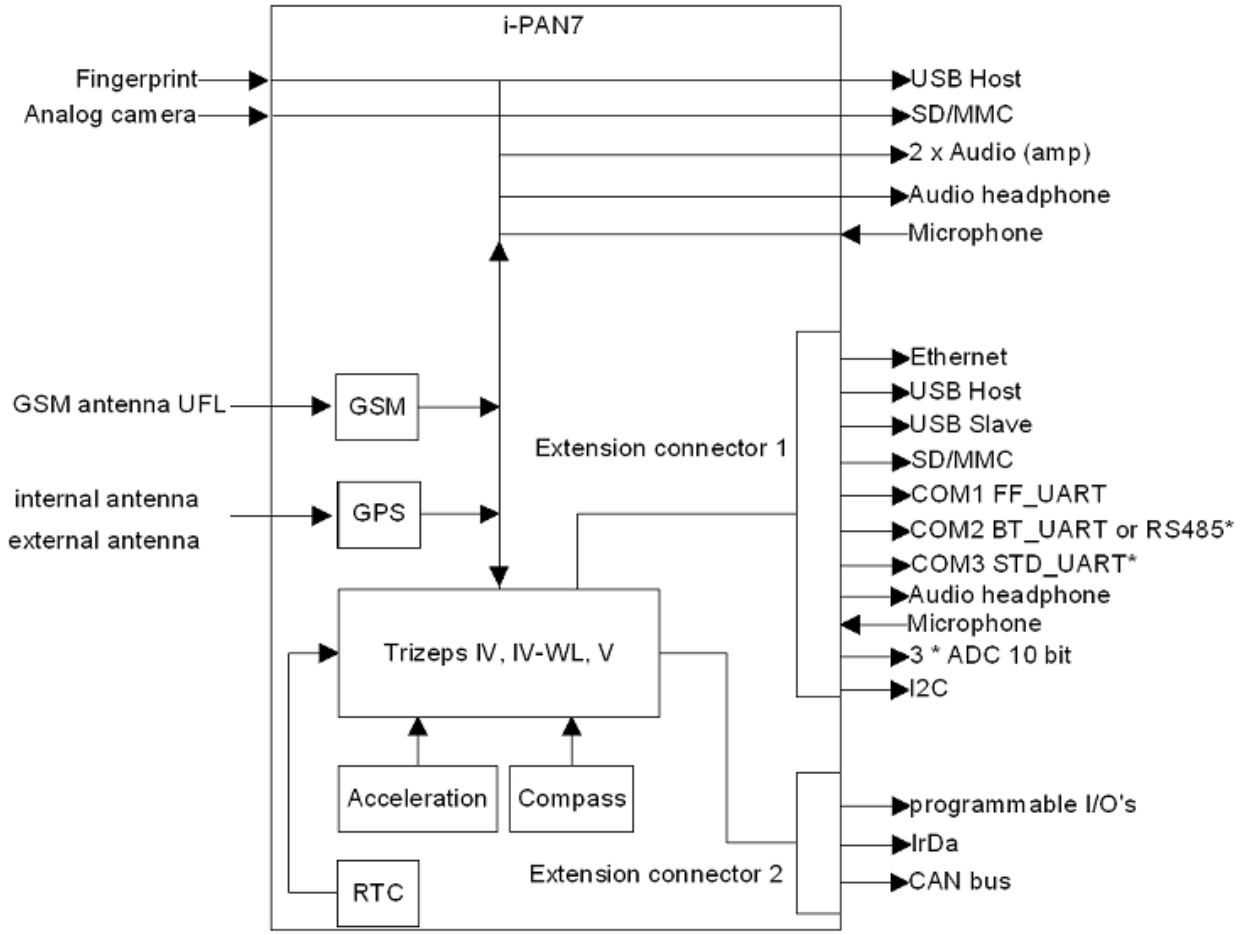
- WVGA (800 x 480) 7" TFT-display with touch
- Small metal housing with mounting possibility
- Single Power supply, 7...16 Volt range
- SDIO/SD/MMC card socket
- USB Host
- 3-axis accelerometer
- Compass module
- 2,6W stereo speaker output
- 20 bit stereo headphone output
- Mic input (mono) for electret-capacitor microphones
- Analog video/camera input via mini BNC
- Quad-band GSM/GPRS modem
- GPS receiver
- Realtime clock

Interfaces / Signals accessible over extension connectors:

- 10/100 MBit Ethernet
- 2 x USB Host
- USB Slave
- I2C
- SD/MMC Card[1]
- RS232 COM1[2] FF_UART
- RS232 COM2[3] BT_UART (if GSM not used[4])
- COM3[5] STD_UART (if GPS not used[6])
- RS485 (instead of COM2 BT_UART[7])
- Audio out
- Mic input (mono) for electret-capacitor microphones
- 3 x 10 bit ADC
- IrDA
- Programmable input and output pins (CPLD)
- CAN bus

1. **Please do not use the card socket on i-PAN7 and Connector Board at same time ! This can cause data loss on the memory card !**
2. level converter: 24V
3. level converter: 24V
4. if mounted modem uses COM2 for communication with CPU
5. CPU signals: 3,3V
6. if mounted GPS module uses COM3 for communication with CPU
7. customer can choose between RS232 or RS485, see also note 3

FIGURE 1. Simplified Blockdiagram



2.0 Connectors

TABLE 1. Overview of all connectors on top side

Name	Function	Type
J1	LED Backlight	JST - SM02B-BHSS-1-TB
J2	Extension Connector 1	ERNI - SMC-B-80, Part No. 114806
J3	Audio out right	JST - SM02B-SRSS-TB
J4	LED Backlight	JST - SM02B-BHSS-1-TB
J5	Display OSD070TN83/84	40pin 0.5mm pitch bottom contact
J7	Display EDT ET070000DH6	40pin 0.5mm pitch bottom contact
J9	Mic/Audio in	Audio-Jack 3.5mm
J11	Video in	Mini BNC
J12	Extension Connector 2	ERNI - SMC-B-26, Part No. 054595
J13	Power in	Power Jack
J14	Sim Card	Push-push-connector
J15	Fingerprint	JST - 08FHJ-SM1-TB
J16	SD/MMC card	Push-push-connector
J19	CPLD programming	JST - 08FHJ-SM1-TB
J20	Display LG LB070WV1	40pin 0.5mm pitch bottom contact
J21	Headphone	Audio-Jack 3.5mm
J23	USB Host	Standard A
J24	Audio out left	JST - SM02B-SRSS-TB
J25	optional Power in	Phoenix - MSTBA2,5/2-G-5.08
J26	active GPS antenna	MCX
J30	Display touchscreen	JST - 04FMS-1.0SP-TF
J31	Display touchscreen	JST - 04FMS-1.0SP-TF

TABLE 2. Connectors on bottom side

Name	Function	Type
J6	GSM antenna	UFL
J8	alternative extension connector 2	Samtec - FTSH Series, 26 pin
J22	alternative extension connector 1	Samtec - FTSH Series, 80 pin
J27	Ethernet	RJ45

2.1 Extension Connectors

The extension connectors offer a possibility to extend the functionality of the i-PAN7 to a custom specific requirement. All signals are listed in the following tables 3 and 4. Figure 3 shows how to identify the pins of the dual row type connectors. The bottom row is the A-row and the upper is the B-row.

FIGURE 2. Connectors on i-PAN7

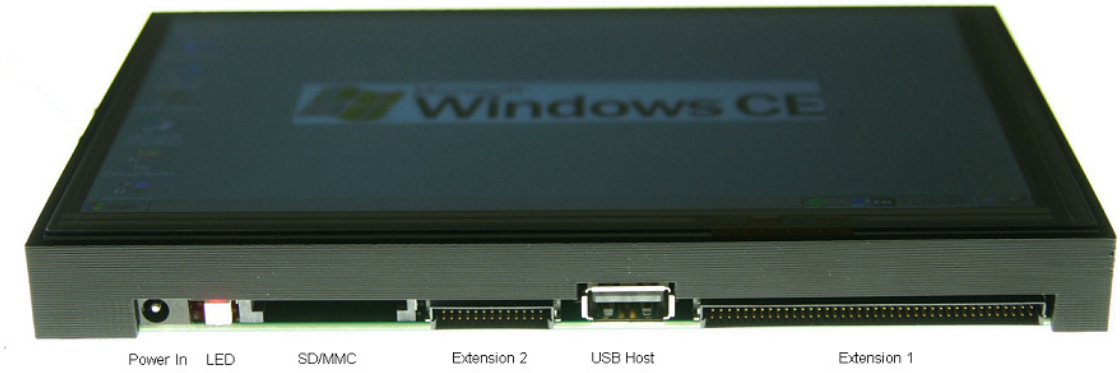
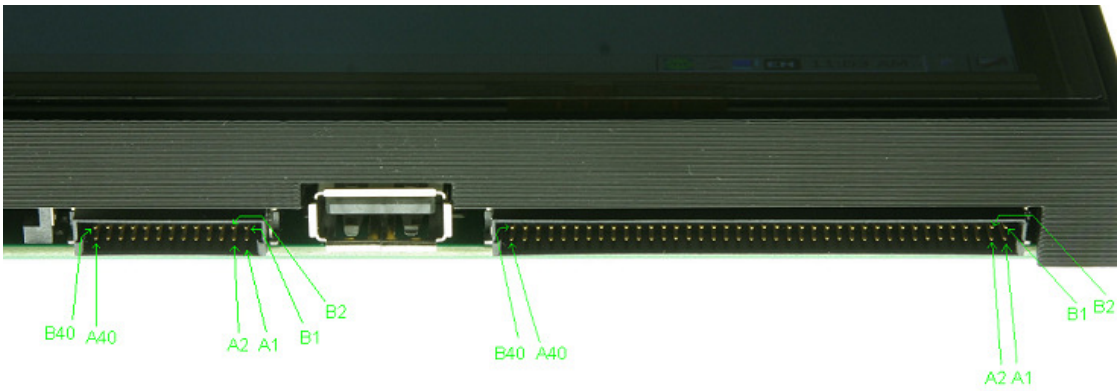


FIGURE 3. Extension connectors pinout



2.1.1 Extension Connector 1 (J2)

Pin	Signal	Pin	Signal	Function
A1	n.c.	B1	RJ45_RXI+	Ethernet
A2	ETH_AGND	B2	RJ45_RXI-	Ethernet
A3	ETH_AGND	B3	ETH_AGND	Ethernet
A4	ETH_AGND	B4	RJ45_TXO+	Ethernet
A5	ETH_AGND	B5	RJ45_TXO-	Ethernet
A6	\ETH_LINK_AKT	B6	\ETH_SPEED100	Ethernet
A7	ETH_GND1	B7	ETH_GND2	Ethernet
A8	GND	B8	GND	
A9	OTG_DP1	B9	OTG_DM1	USB Host 1
A10	OTG_DP2	B10	OTG_DM2	USB Host 2
A11	USB_HOST2_PWR	B11	USB_HOST1_GND	USB Host 1
A12	USB_HOST2_GND	B12	USB_HOST1_PWR	USB Host 2
A13	GND	B13	GND	
A14	I2C_DATA	B14	I2C_CLK	I2C
A15	+3V3	B15	+3V3	max. 500 mA
A16	+5V	B16	+5V	max. 500 mA
A17	HEADPHONE_GND	B17	VSSA_AUDIO	Audio
A18	HEADPHONE_R	B18	LINEIN_L	Audio
A19	HEADPHONE_L	B19	LINEIN_R	Audio
A20	AD0	B20	\RESET_OUT	ADC/Reset
A21	AD1	B21	AD3	ADC
A22	MMC_CMD_CON	B22	MMC_DAT3_CON	SD/MMC
A23	MMC_CLK_CON	B23	MMC_DAT2_CON	SD/MMC
A24	MMC_DET	B24	MMC_DAT1_CON	SD/MMC
A25	SD_WP	B25	MMC_DAT0_CON	SD/MMC
A26	GP00	B26	SD_EXT_PWR	
A27	GP85_HOLD_TR5_ BLPWM	B27	GND	
A28	GND	B28	USB_SL_VCC	USB Slave
A29	USB_SL_D+	B29	USB_SL_D-	USB Slave
A30	COM2_CTS_V24	B30	COM2_RTS_V24	COM2
A31	COM2_TXD_485H	B31	COM2_RXD_485L	COM2/RS485
A32	GND	B32	GND	
A33	FF_RTS_V24X	B33	FF_DTR_V24X	COM1
A34	FF_DSR_V24X	B34	FF_TXD_V24X	COM1
A35	FF_RXD_V24X	B35	FF_CTS_V24X	COM1
A36	FF_RI_V24X	B36	FF_DCD_V24X	COM1
A37	RXD_2	B37	TXD_2	COM3
A38	GND	B38	GND	
A39	V_SUP_N	B39	V_SUP_P	External Power
A40	V_SUP_N	B40	V_SUP_P	External Power

2.1.2 Extension Connector 2 (J12)

Pin	Signal	Pin	Signal	Function
A1	IN7	B1	OUT7	CPLD I/O
A2	IN6	B2	OUT6	CPLD I/O
A3	IN5	B3	OUT5	CPLD I/O
A4	IN4	B4	OUT4	CPLD I/O
A5	IN3	B5	OUT3	CPLD I/O
A6	IN2	B6	OUT2	CPLD I/O
A7	IN1	B7	OUT1	CPLD I/O
A8	IN0	B8	OUT0	CPLD I/O
A9	IRDA_MODE	B9	IRDA_SD	IrDa
A10	+3V3	B10	+3V3	max. 500 mA
A11	GND	B11	GND	
A12	CAN_L	B12	CAN_H	CAN Bus
A13	GND_ISO	B13	GND_ISO	CAN Bus

3.0 GPIO functionality

TABLE 3. GPIO's for custom use

Signal name	GPIO Trizeps IV	GPIO Trizeps V	Function / location
GP00	0	not usable	GPIO, J2-A26
FP_PWR_EN	13	16	Fingerprint enable, J15-7
GP85_HOLD_TR 5_BLPWM	85	13	GPIO, J2-A27
EN_GPS	107	57	enable GPS (active high)
GSM_POK	106	58	power ok for GSM
BL_PWM	11	17	PWM backlight
LED	50	5	dual color LED, low: red, high: yellow
DISP_EN	104	124	enable Display (active high)
EN_AUDIO	56	8 47k pullup	enable audio amplifier (active high)

4.0 Power supply

The i-PAN7 needs a nominal power supply of 12 Volt. The device will work stable in a power range of 7 ... 12 Volt. Applying a voltage more than 12 Volt will damage electronic components.

Latest versions of i-PAN7 will offer a range up to 24 Volt.

Usually connector J13 is equiped. The polarity is shown in figure 4.

FIGURE 4. Polarity of J13

center pin diameter : 1.65mm, input hole diameter : 4.40mm

For a more ruggedized system or a rough industrial surrounding i-PAN7 can be provided with an alternative power connector (J25, see table 1).

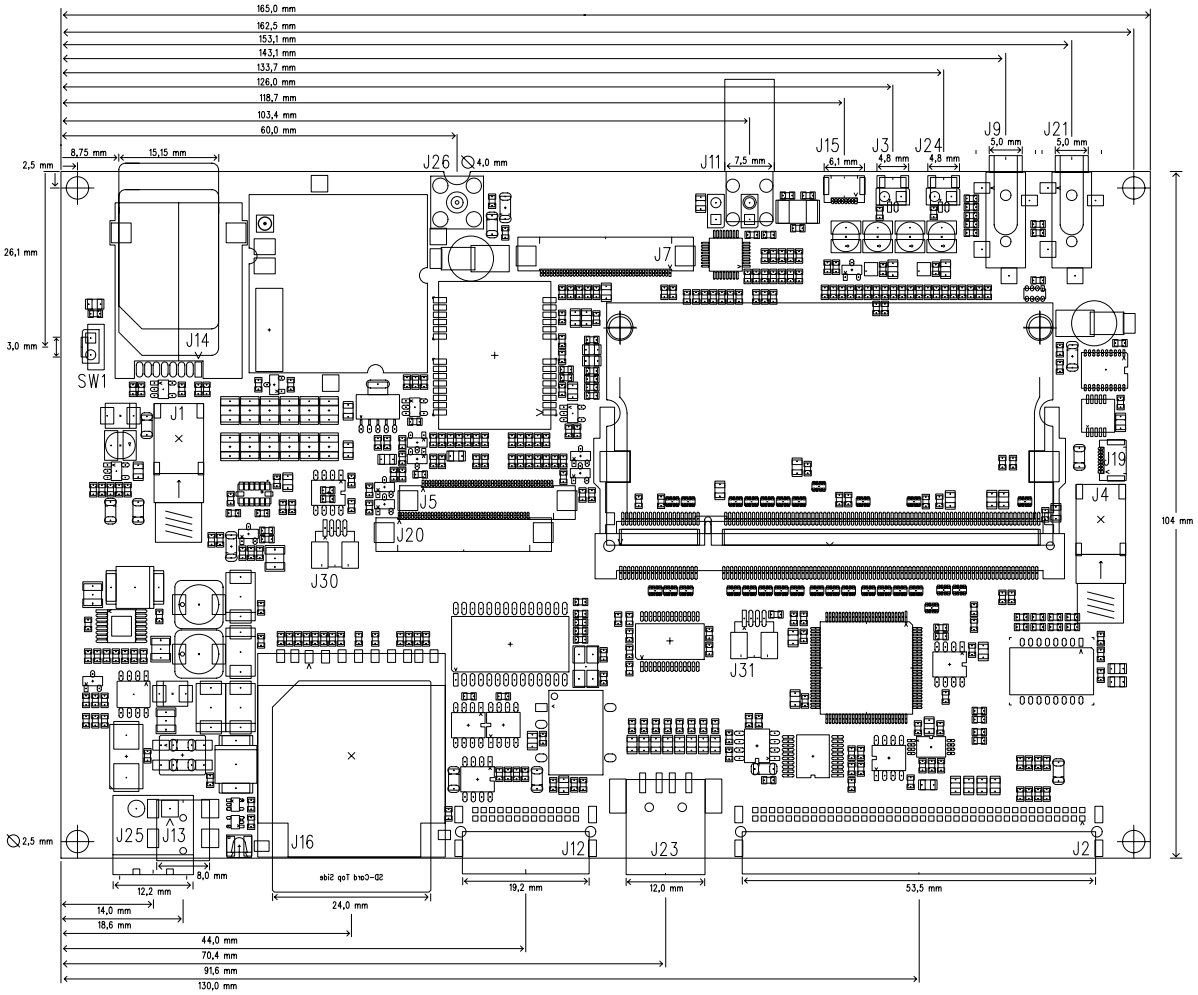
4.1 Power consumption @ 12V

i-PAN7 LC, idle, full backlight: 340 mA
i-PAN7 LC, idle, normal backlight: 240 mA

4.2 Suspend current @ 12V

i-PAN7 LC with Ethernet: 20,5 mA
i-PAN7 LC no Ethernet: 2,8 mA

5.0 Outlines

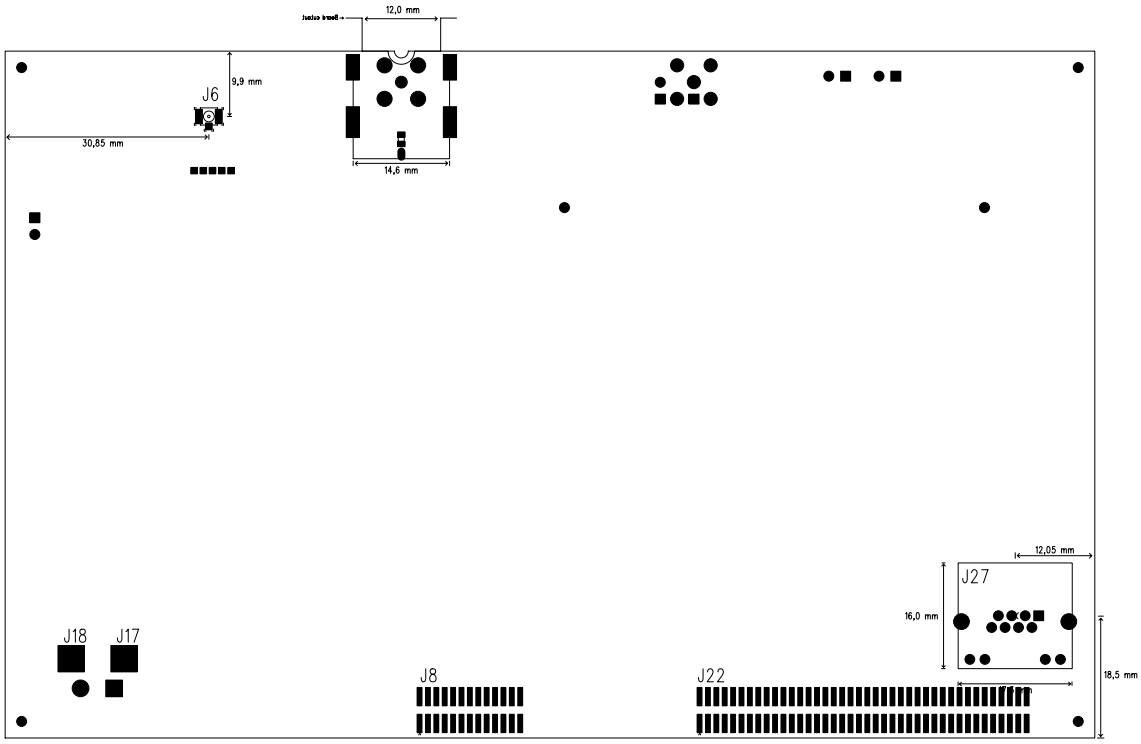


5.1 PCB outlines top side

FIGURE 5. PCB outlines top side

5.2 PCB outlines bottom side

FIGURE 6. PCB outlines bottom side



5.3 Outlines and weight of device

The outlines of the device including the plastic housing are:

169 mm x 108 mm x 17 mm

Weigt (typ): 340 g

6.0 Mounting

The housing of i-PAN7 is a small and thin metal frame. It has four mounting holes for M4 screws. Picture 7 shows the frame.

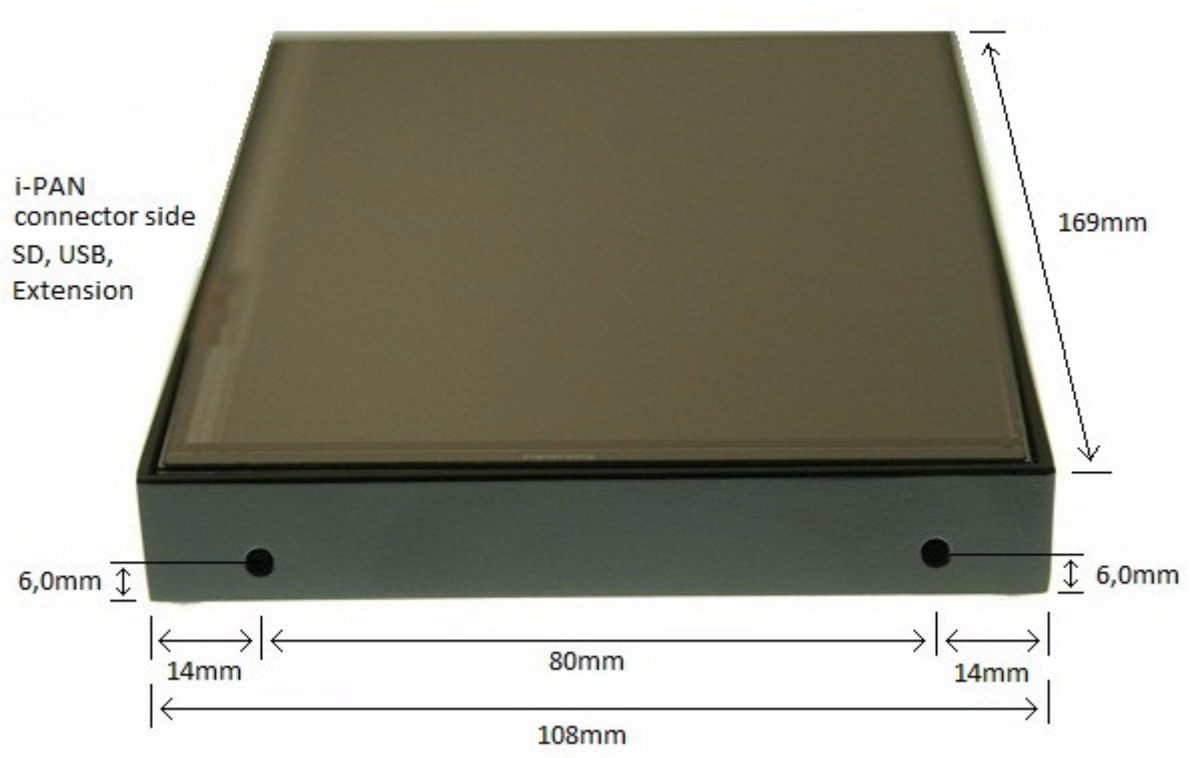


FIGURE 7. Housing with mounting holes

7.0 Revision history

TABLE 4.

Revision	date	changes
1.0	2008.01.27	starting version (preliminary)
1.1	2010.03.25	frame measurement added
1.2	2011.07.15	weight added

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