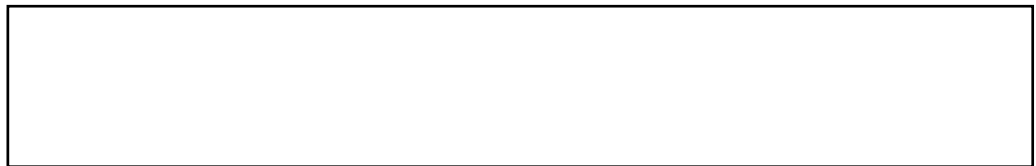


# HYTERA MD78x Series

## Table of contents

1	Appearance and Definition .....	4
1.1	Appearance and Definition of 10-pin Interface.....	4
1.1.1	Appearance.....	4
1.1.2	MMP 10 pin definition .....	5
1.1.3	MMP 10 electrical specifications.....	6
1.1.4	Definition of MMP10 Accessory Identifier:.....	6
1.2	Appearance and Definition of 26-pin Interface.....	7
1.2.1	Appearance.....	7
1.2.2	MAP 26 pin definition .....	7
1.2.3	MAP 26 electrical specifications .....	9
1.2.4	MAP accessory detection definition (rear).....	10
1.3	Note.....	10
1.4	Supplementary .....	10



- 1.5 Programming cable MD78x layout
- 1.6 Programming cable PD78x layout

# 1 Appearance and Definition

## 1.1 Appearance and Definition of 10-pin Interface

### 1.1.1 Appearance

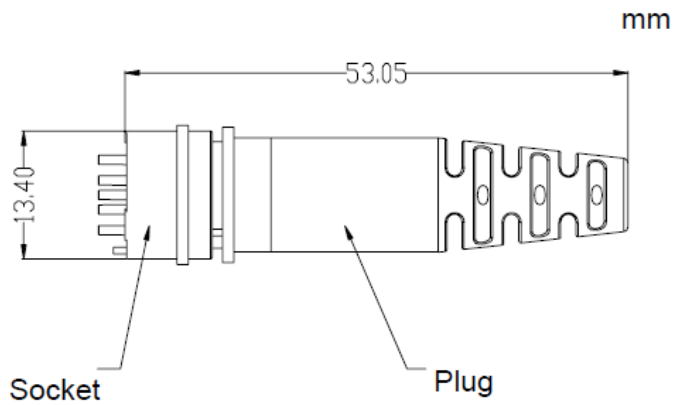


Figure 1: 10-pin MMP Interface on the Front Panel

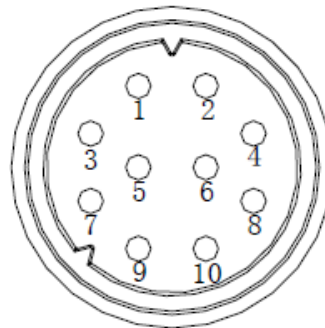


Figure 2: 10-pin Socket

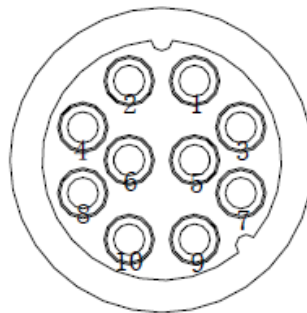


Figure 3: 10-pin Plug

### 1.1.2 MMP 10 pin definition

Item	Name	Type	Description
1	Accessory detection interface 1	Digital input	PIN1 and PIN 10 are both for accessory detection ; for detailed information, see “ accessory detection interface definition”
2	PTT input	Digital input	Palm microphone PTT input; Low level input when pressing PTT
3	Handset audio output	Analogue out	put When accessory detection code is 00/01/10, the audio output is open; When it is 11, the audio output is closed.
4	USB_D $\square$ /serial port RX	USB data cable/input port	Used for DMR USB cable D $\square$
5	GND	Grounding	differential input (together with MIC input)
6	USB_VBUS	Power supply	+5V power supply, limited current 500mA; When the accessory detection code is 00/01/10, it output 5V voltage. When the accessory detection code is 11, it output low level voltage.
7	MIC_INPUT	Analogue input	Palm microphone input, V <sub>rms</sub> =80mV@60% system max. deviation
8	USB_D+/serial port TX	USB data cable/output port	Used for DMR USB cable D+
9	HOOK	HOOK signal input	Default: high level Active : low level Hook or Monitor function: when press monitor on desktop mic or hook the palm microphone, high level will change into low level. If palm microphone/ palm microphone with keypad is detected, it is hook function; if desktop microphone is detected,
10	Accessory detection interface 2	Digital input	PIN1 and PIN 10 are both for accessory detection ; for detailed information, see “ accessory detection interface definition”

### 1.1.3 MMP 10 electrical specifications

Item	Name	Type	Description
1	Accessory detection interface 1	Digital input	3.3V CMOS voltage level standard
2	PTT input	Digital input	3.3V CMOS voltage level standard
3	Handset audio output	Analogue out	Load resistor > 1k ohm, Vrms = 600mV
4	USB_D $\square$ /serial port RX	USB data cable/input port	3.3V CMOS voltage level standard
5	GND	Grounding	
6	USB_VBUS	Power supply	5V power supply 500mA
7	MIC_INPUT	Analogue input	Vrms=80mV@60% system max. deviation
8	USB_D+/serial port TX	USB data cable/output port	3.3V CMOS voltage level standard
9	HOOK	HOOK signal input	3.3V CMOS voltage level standard
10	Accessory detection interface 2	Digital input	3.3V CMOS voltage level standard

### 1.1.4 Definition of MMP10 Accessory Identifier:

PIN1	PIN10	Accessory detection definition
0	0	obligated
0	1	Mobile radio is in USB host mode, accessory is in device mode; connect to USB intelligent accessory( such as digital palm microphone)
1	0	Desktop MIC ( including desktop microphone with earpiece)
1	1	Mobile radio is in USB device mode, accessory is in host mode/ not connected to any accessory/connect to palm microphone series (default: ordinary palm microphone)

## 1.2 Appearance and Definition of 26-pin Interface

### 1.2.1 Appearance

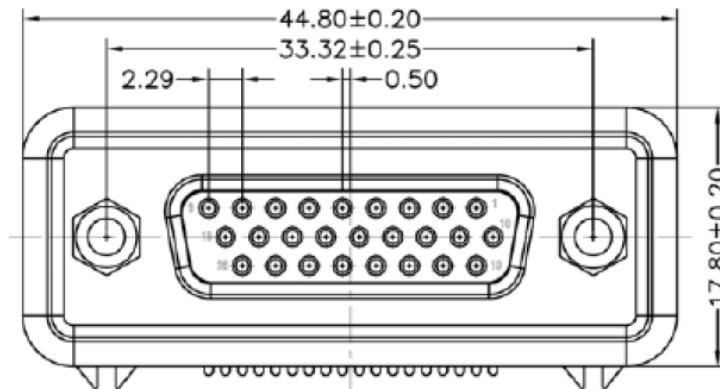


Figure 4: 26-pin connector socket

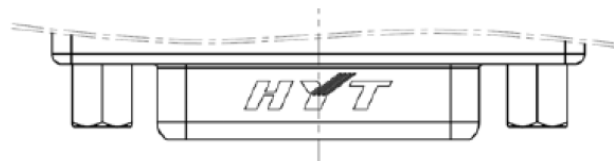


Figure 5: 26 MAP at rear panel

### 1.2.2 MAP 26 pin definition

Item	Name	Type	Description
1	Vbus USB power supply	Power supply	+5V power supply, limited current 500mA; When the accessory detection code is 00/01/10, it output 5V voltage. When the accessory detection code is 11, it output low level voltage.
2	GND	Grounding	
3	GP5_3 universal input/output port (chan_Act)	Digital input/output	Universal input/output port. The functionality is configured by CPS

Item	Name	Type	Description
4	SW B+ sense power output	Power supply	13V power supply output; output current <=1.5A
5	External alarm	Analogue voltage output	Programmable output pin (default: external alarm, the output pin can be configured by CPS)
6	Power Ground	Power ground	
7	Tx Audio input ( external MIC audio)	Analogue input	External MIC signal input(rear); active when external PTT is pressed
8	Rx Audio output	Analogue output	Rx audio signal output
9	Spkr -	Analogue output	External speaker output -
10	D+ USB	USB data cable +	USB data cable +
11	USB_GROUND	USB_GROUND	USB_GROUND
12	GP5_2 universal input/output pin (Monitor)	Digital input/output	Universal input/output pin ( default: monitor ; the pin can be configured by CPS)
13	ACC_IO2	Digital input	Accessory detection interface (rear); see accessory detection interface definition(rear)
14	Emerg SW	Digital input	When emergency is effective, this pin inputs low level
15	ACC_IO3	Digital input	Accessory detection interface (rear); see accessory detection interface definition(rear)
16	PRGM_IN_PTT	Digital input	Programmable output pin (default: PTT; low level active; the input pin can be configured by CPS)
17	Audio ground	Audio ground	
18	Spkr+	Analogue output	External speaker output +
19	D-USB	USB data cable -	USB data cable -
20	GP5_8 universal input/output pin	output/input	Universal input/output pin
21	Ground	Ground	
22	GP5_7 universal input/output pin	output/input	Universal input/output pin
23	GP5_6 universal input/output pin	output/input	Universal input/output pin
24	AUX audio out 1	Analogue output	
25	AUX audio out 2	Analogue output	
26	Ign Sens	Analogue voltage input	Ignition sense input pin

### 1.2.3 MAP 26 electrical specifications

Item	Name	Type	Description
1	Vbus USB power supply	Power supply	+5V power supply output
2	GND	Grounding	
3	GP5_3 universal input/output port (chan_Act)	Digital input/output	5V TTL level standard
4	SW B+ sense power output	Power supply	13V+□15% power supply output; output current ≤1.5A
5	External alarm	Analogue voltage output	13V emergency alarm output
6	Power Ground	Power ground	
7	Tx Audio input ( external MIC audio)	Analogue input	Vrms = 80mV@60% system max. deviation
8	Rx Audio output	Analogue output	Load resistor > 1k ohm, Vrms =300mV
9	Spkr -	Analogue output	Differential output (together with spl+); Max. output power is 10W (R=8ohm)
10	D+ USB	USB data cable +	USB data cable +
11	USB_GROUND	USB_GROUND	USB_GROUND
12	GP5_2 universal input/output pin (Monitor)	Digital input/output	5V TTL level standard
13	ACC_IO2	Digital input	5V TTL level standard
14	Emerg SW	Digital input	5V TTL level standard
15	ACC_IO3	Digital input	5V TTL level standard
16	PRGM_IN_PTT	Digital input	5V TTL level standard
17	Audio ground	Audio ground	
18	Spkr+	Analogue output	Differential output (together with spl-); Max. output power is 10W (R=8ohm)
19	D-USB	USB data cable -	USB data cable □
20	GP5_8 universal input/output pin	output/input	5V TTL level standard
21	Ground	Ground	
22	GP5_7 universal input/output pin	output/input	5V TTL level standard
23	GP5_6 universal input/output pin	output/input	5V TTL level standard

Item	Name	Type	Description
24	AUX audio out 1	Analogue output	Load resistor >1k ohm, Vrms =300mV
25	AUX audio out 2	Analogue output	Load resistor >1k ohm, Vrms =300mV
26	Ign Sens	Analogue voltage input	Ignition sense input voltage >7V

Note: CPS = computer programming software

### 1.2.4 MAP accessory detection definition (rear)

PIN1	PIN10	Accessory detection definition
0	0	Programming cable
0	1	Mobile radio is in USB host mode, accessory is in device mode; connect to USB intelligent accessory
1	0	External speaker
1	1	Mobile radio is in USB device mode, accessory is in host mode/ not connected to any accessory/connect to palm microphone series (default: ordinary palm microphone)

## 1.3 Note

1. Front panel PTT, rear PTT, front panel MIC and rear MIC can be opened by CPS freely. Default: front panel PTT and front panel MIC is opened

## 1.4 Supplementary

5V TTL level standard

TTL high level: 3.6 – 5V, low level: 0 – 2.4 V

Output L: <0.8V; H: >2.4V

Input L: <1.2V; H: > 2.0V

TTL output low level should be less than 0.8V, while high level should be more than 2.4V.



TTL input is 0 when input level is less than 1.2, and 1 when input level is more than 2.0.

### 3.3V CMOS level standard

$V_{cc} : 3.3V$

$VOH \geq 3.2V; VOL \leq 0.1V$

$VIH \geq 2.0V; VIL \leq 0.7V$

Note : “VIH” = high level of input voltage

“VIL” = low level of input voltage

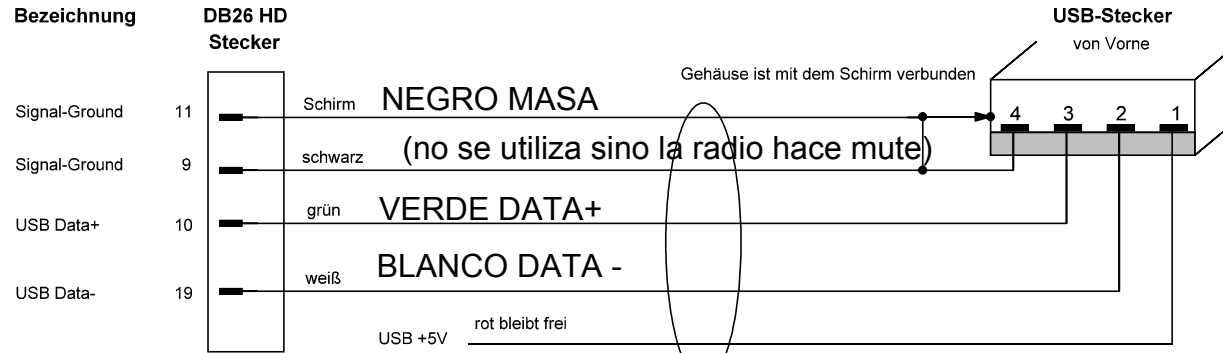
“VOH” = high level of output voltage

“VOL” = low level of output voltage

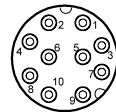
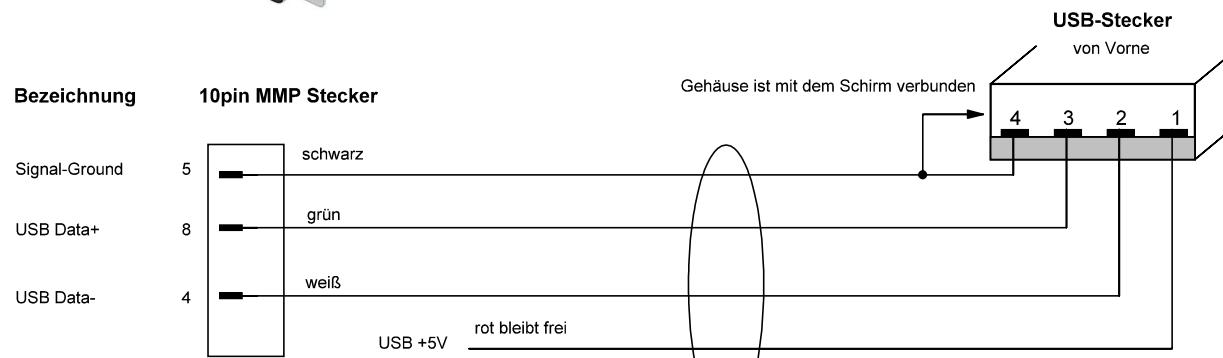
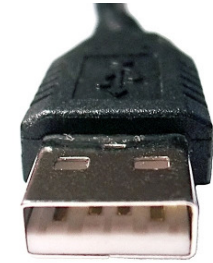
# 1.5

## Funkgerät

## PC

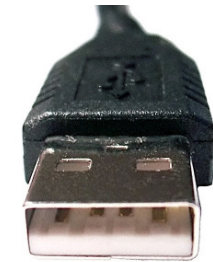


Standart - USB-Kabel



10pin MMP Stecker v.Vorne

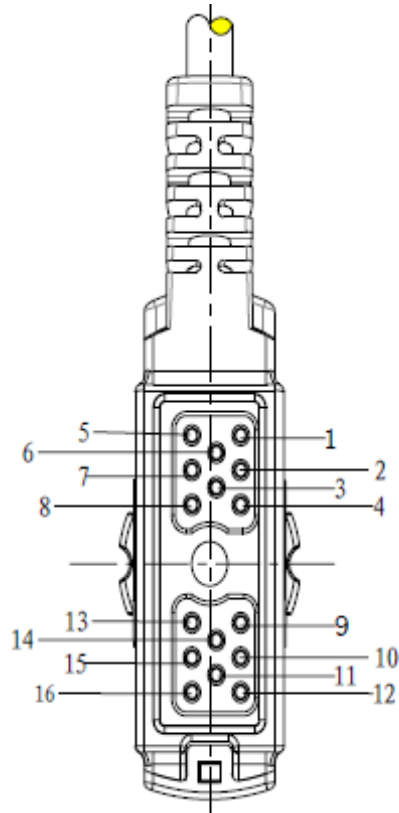
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Zeichnungs-Nr.:				
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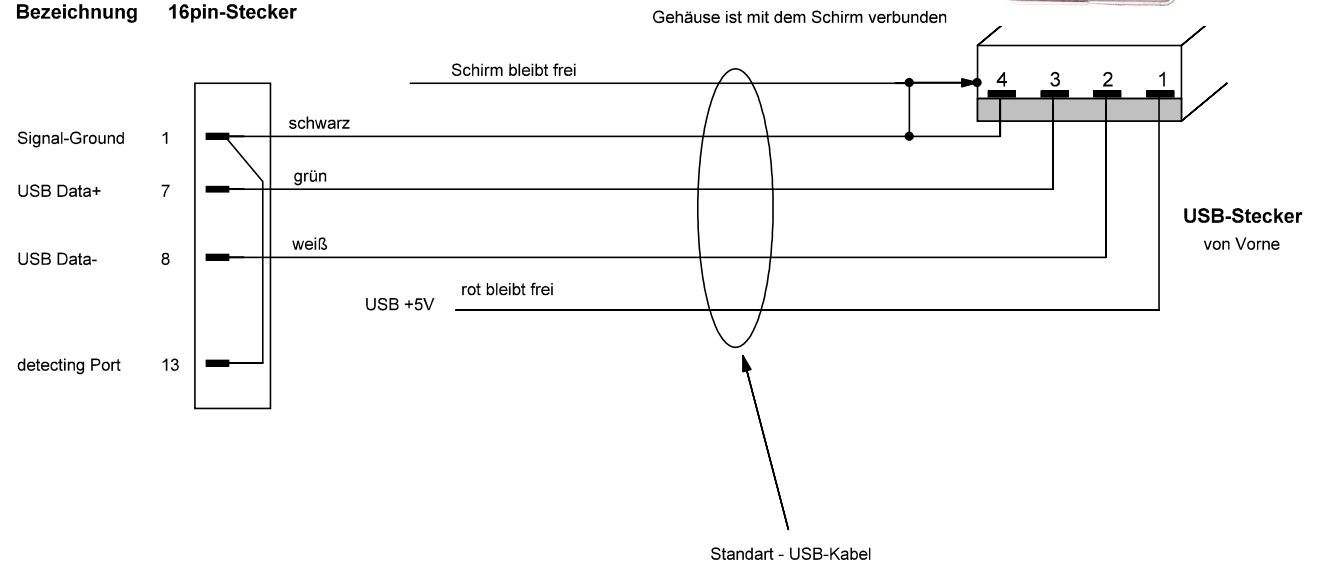
## 16pin Zubehörstecker



PC



Bezeichnung 16pin-Stecker



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