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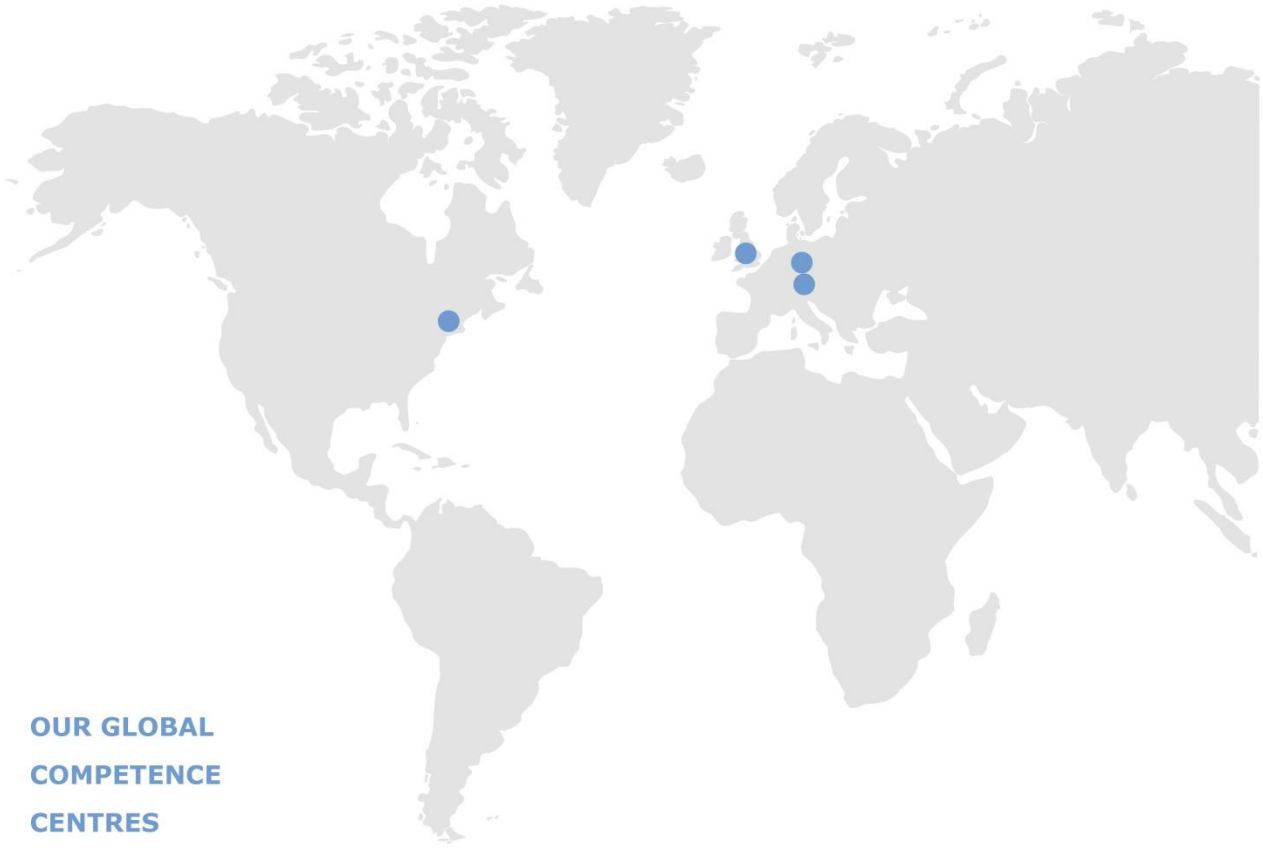

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Datasheet

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IF442

USB Audio Modul

USB Audio Modul 2xSpeaker

ZU-02-510

ZU-02-517

Version 1.1

26.04.2023

Table of Contents

1 Revision History

Date	Rev.No.	Description	Page
22.3.2021	1.0	Initial version	All
26.04.2023	1.1	Picture changed. SAP numbers and product names added. KA-31-342 added. Current consumption changed to 70mA. Drawing of connector positions added. I2C description and jumper settings added	1,5 2,12 5 7 9 5,

2 Overview

This document describes the requirements and technical data of IF 442 USB Audio Module.

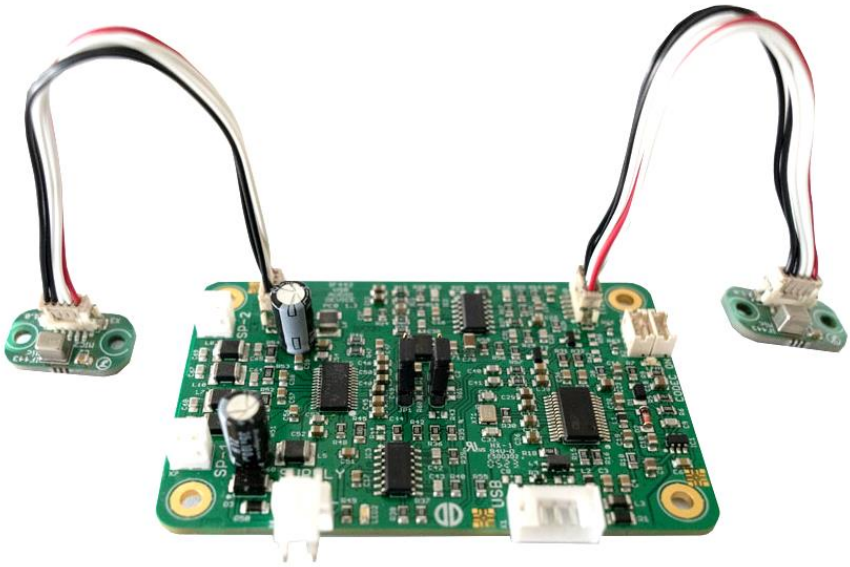
3 General Features

USB-Audio Modul IF 442 is a device to drive standard speaker (8Ohm) with a nominal output power of 3W.
IF 442 is equipped with an USB interface (compliant with USB 2.0 specification)
The USB-controller requires no software protocol.
Additionally, IF 442 is equipped with 2 microphone inputs.
The microphone inputs are optimized for use with IF 443-00 MIC_PCB (ZU-02-511).
The USB controller and the microphone driver are supplied via USB port. (+5V DC)
The output stage to drive the speaker is supplied with DC (+12V~+24V) externally.
Optional usage of I2C Bus to control Volume (activate with jumper)
Optional usage of both speaker outputs/one speaker output according hardware version:

- **USB Audio Modul (**ZU-02-510; IF442-00) only provides one speaker output (X7).
- **USB Audio Modul 2xSpeaker (**ZU-02-517; IF442-01) provides two speaker outputs (X7 and X8)

4 Accessories

Part Number	Description	Comment
ZU-02-511	IF443-00 MIC_PCB/ (additional Board equipped with microphone)	1 pc required for each input
KA-31-342	Cable IF443/IF442 200MM	1 pc required for each input



View of IF442 equipped with 2x IF 443-00

5 Hardware Features

5.1 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Note
Supply Voltage	V_{IN}	-0.3	+30	VDC	
USB Voltage	V_{BUS}	-0.3	+6.5	VDC	

5.2 Environmental Conditions

DESCRIPTION	Signal	Min.	Max.	Unit	Note
Operating Temperature	T_{OP}	-20	+85	°C	
Storage Temperature	T_{ST}	-40	+85	°C	
Relative humidity	R_H	-	90	%	

5.3 Electrical Characteristics

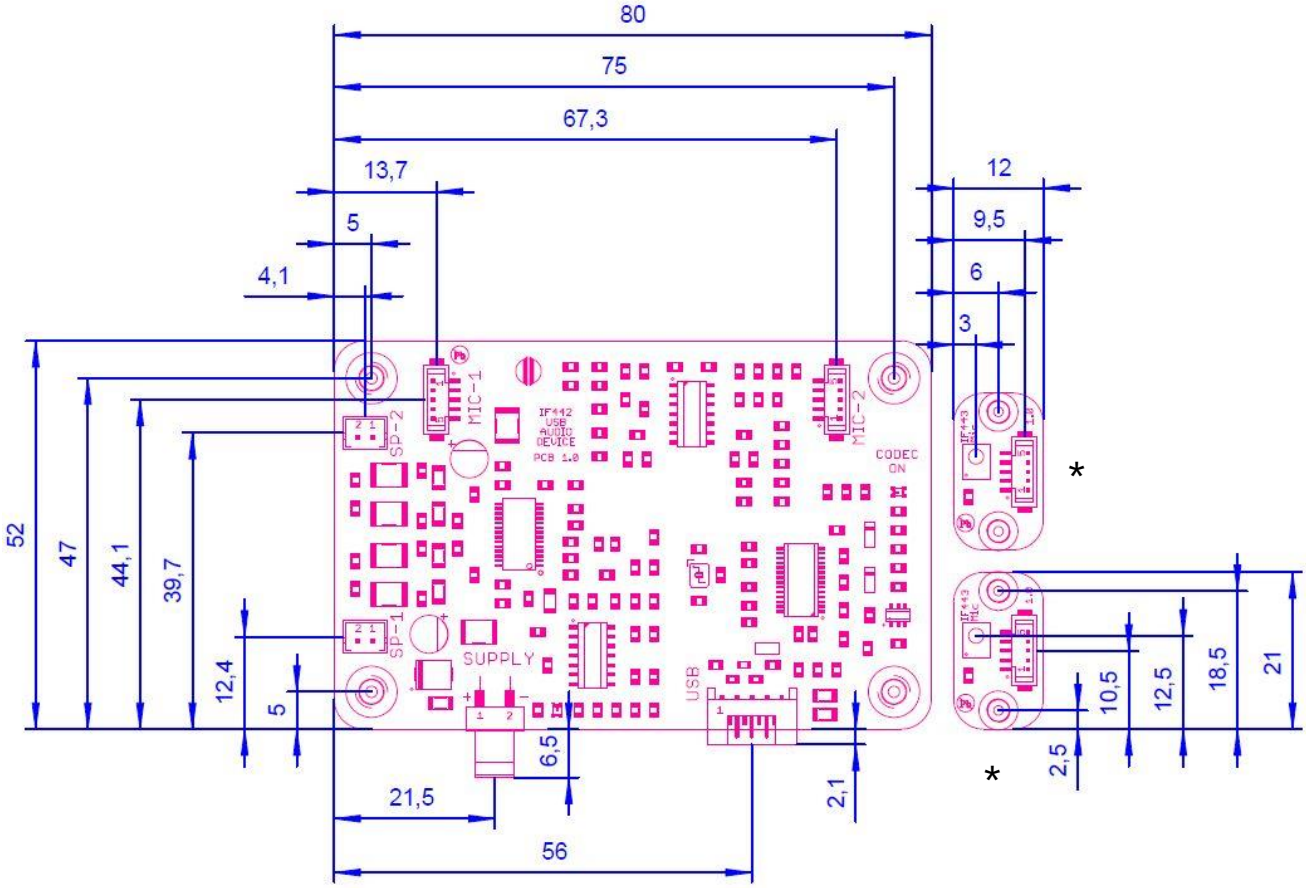
All measurements done:
- 25ºC ambient temperature
-1 kHz Input signal
-8Ohm speaker
(unless otherwise stated)

DESCRIPTION	Condition	MIN.	TYP.	MAX.	Unit	Note
Supply Voltage		8	24	26	VDC	
Current Consumption V_{in} =24V	No Input signal	-	56	-	mA	
	Input signal/ Output:2x3W@8Ohm	-	210	-	mA	
Current Consumption V_{in} =12V	No Input signal	-	32	-	mA	
	Input signal/ Output:2x3W@8Ohm	-	340	-	mA	
Current Consumption V_{BUS} =5V		-	-	70	mA	
Supply Voltage for MEMS Microphone		2.7	2.8	2.9	V	
Input Level Microphone		-	-	-6 ~388	dBu mV RMS	1
Total harmonic distortion plus noise THD+N (micro-Input)				0.006	%	1
Noise Level (micro-Input)	unrated	-	-	-88	dBFS	1
	A-rated	-	-	-90	dBFS	1
Crosstalk (micro-Input)		-	-	-85	db	1
Frequency response (micro-Input)	-3dB	80Hz…15kHz			-	1
Output Power	Input level: -3.6dBFS 1% THD+N	-	5.3	-	W	2
	Input level: -6dBFS 0.1% THD+N	-	3	-	W	2
	Input level: -10.5dBFS 0.1% THD+N	-	1	-	W	2
Noise Level (output stage)	unrated	-	-	-85	dBr	
	A-rated	-	-	-88	dBr	
Crosstalk (output stage)		-	-	-64	dB	
Frequency response (output stage))	-3dB	60Hz…>20kHz			-	

1) In combination with IF 443-00 as microphone device.
2) For each output channel

6 Mechanical Specification

The total PCB size: B52 x L80 x H1.6 mm
Max component high on the top side: 12.0mm
Max component high on the bottom side: 2.5mm
The product- and serial-number labels are assembled to the bottom side.
Weight: 22g.

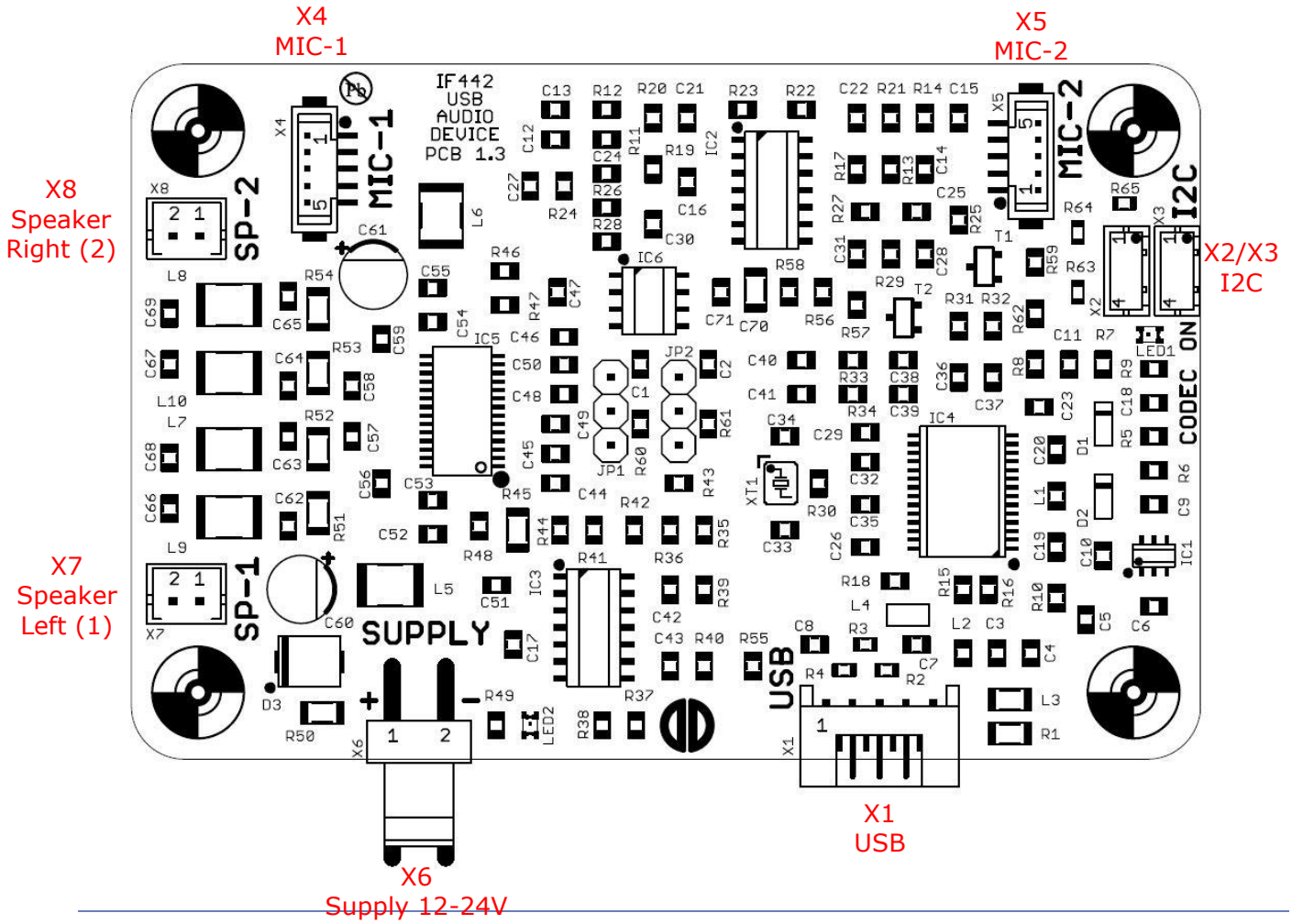


**Drawing includes 2x ZU-02-511(IF433).*

7 Connector Overview

Connector	DESCRIPTION	TYPE	MANUFACTURER	Note
X1	USB 2.0 Connector	S5B-PH-K-S	JST	
X2	I2C connector	DF13-4P-1.25V	Hirose	1
X3	I2C connector	DF13-4P-1.25V	Hirose	1
X4	Microphone 1 Input	DF13-5P-1.25V	Hirose	
X5	Microphone 2 Input	DF13-5P-1.25V	Hirose	
X6	Supply Voltage 12-24V	B2PS-VH	JST	
X7	Speaker Output 1	B2B-PH-K-S	JST	
X8	Speaker Output 2	B2B-PH-K-S	JST	2

1) Connectors X2 and X3 are connected in parallel.Second connector can be used to connect one more I2C component on I2C Bus
2) N.A. on ZU-02-510.



7.1 X1 USB 2.0 Connector

USB 2.0 Connector		
Pin	**Signal**	**Description**
1	+5V	VBUS Input
2	D-	USB Data - Line
3	D+	USB Data + Line
4	GND	Ground
5	Shield	Shielding USB Cable

7.2 X2 I2C Connector

I2C connector		
Pin	**Signal**	**Description**
1	GND	Ground
2	3V3	+3.3V
3	SDA	Data I2C
4	SCL	Clock I2C

7.3 X4 I2C Connector

I2C connector		
Pin	**Signal**	**Description**
1	GND	Ground
2	3V3	+3.3V
3	SDA	Data I2C
4	SCL	Clock I2C

7.4 X4 Microphone 1 Input

Microphone 1 Input		
Pin	**Signal**	**Description**
1	MIC_SUPPLY	Supply Voltage for Microphone 3.8V
2	MIC IN+	Microphone Input +
3	MIC IN-	Microphone Input -
4	GND	Ground
5	GND	Ground

7.5 X5 Microphone 2 Input

Microphone 2 Input		
Pin	**Signal**	**Description**
1	MIC_SUPPLY	Supply Voltage for Microphone 3.8V
2	MIC IN+	Microphone Input +
3	MIC IN-	Microphone Input -
4	GND	Ground
5	GND	Ground

7.6 X6 Supply Voltage 12-24V

Supply Voltage 12-24V		
Pin	**Signal**	**Description**
1	V_{in}	Supply Voltage for Audio output stage
2	GND	Ground

7.7 X7 Speaker Output 1

Speaker Output 1		
Pin	**Signal**	**Description**
1	OUTPL	Speaker Output L+
2	OUTNL	Speaker Output L-

7.8 X8 Speaker Output 2

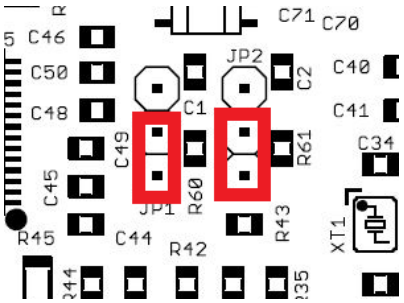
Speaker Output 2		
Pin	**Signal**	**Description**
1	OUTPR	Speaker Output R+
2	OUTNR	Speaker Output R-

8 Volume Control

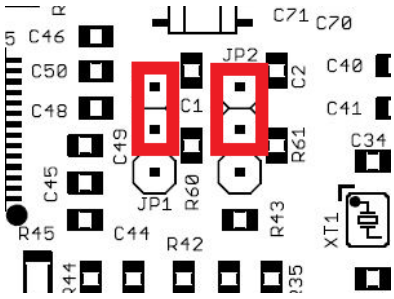
The output volume can be controlled via I2C.
For details (I2C address, Code sequence) please refer to datasheet of following IC:

PT2259-S (Princeton technology Corp.)

8.1 Jumper settings JP1/JP2



Jumper Setting I2C control not used (PT2259S is bypassed)



Jumper setting I2C control is active (PT2259S is active)

9 Hardware Information

Part Number	Description	Comment	Status
ZU-02-510	USB-Audio Modul IF 442-00	X8 deactivated	Inactive (1)
ZU-02-517	USB-Audio Modul 2x speaker IF 442-01	fully assembled board	active
ZU-02-511	IF443-00 MIC_PCB	microphone board (optional accessory)	active

1) Please contact Distec Customer Service if this hardware-version (1 speaker output) is needed.

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