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1 General

1.1 Product Description

Beehive is the main communicate device for LifeSize Lync Room System (LRS). It is a stereo device with two Cardioid Mics. Mic is powered and connected through a signal USB cable. It is required meeting Microsoft Lync Specification Rev. G and designed to be used with Double Black (LRS codec) only.



1.2 Model

LS-0002

1.3 Certifications

The product should comply with CISPR22/CE/IEC 60950-1..

1.4 RoHS

All material of device should comply with Logitech 10 restricted Phthalates, (Restrictions are applicable at homogeneous level, at a threshold of less than 1000ppm for each phthalate)

2.4.1 RoHS II

2.4.2 Reach

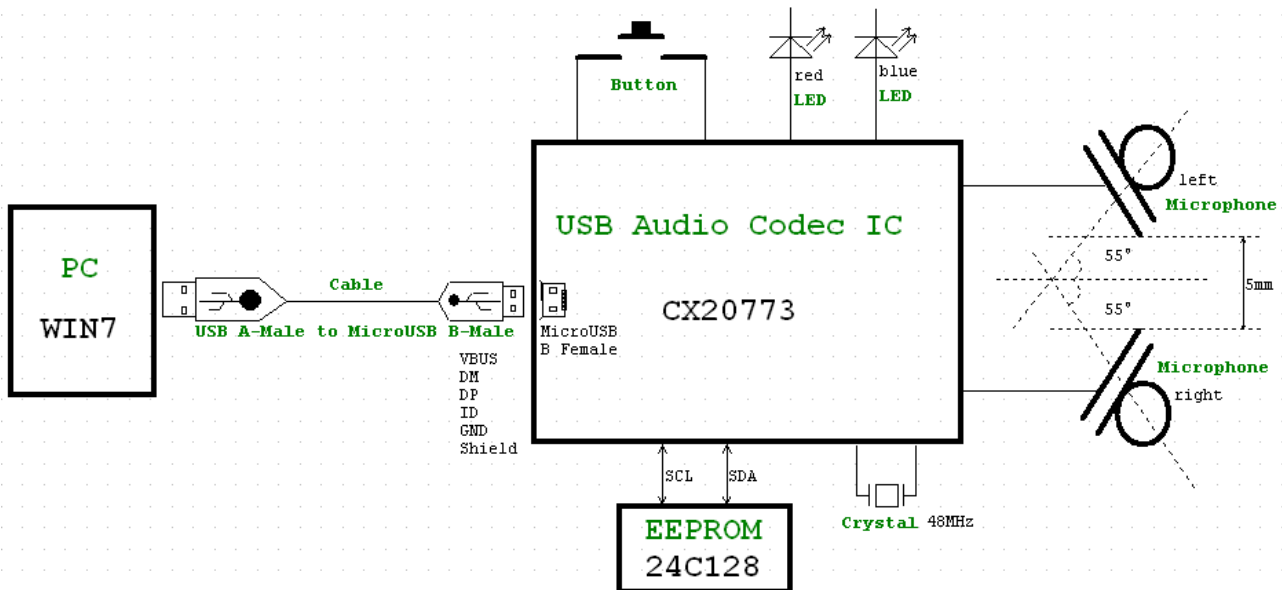
2.4.3 WEEE

2.4.4 Conflicted material

1.5 Product Main special characteristic

2 Electrical Specification

2.1 Block diagram



2.2 Main parameter

Microphone Features	
Item	Description
Microphone Type	Primo EM175 Back Electret Unidirectional Microphone
Directional Characteristic	Uni-directional
Sensitivity	-36dB ± 3dB at 1kHz (0dB=1V/Pa) RL=2K Ω VCC=3V
S/N Ratio	>72dB Typ. at 1kHz (1Pa,A-weighted)
Max Input Sound Level	120dB S.P.L
Microphone Frequency Response Limit	Per Primo EM175 Specification
Button Feature	
Item	Description
Mute Function	Mute
LED Indicator	
Item	Description
Idle	Blue LED off / Red LED off
In-call	Blue LED on / Red LED off
Mute	Blue LED off / Red LED on
Suspend	Blue LED off / Red LED off
USB Features	

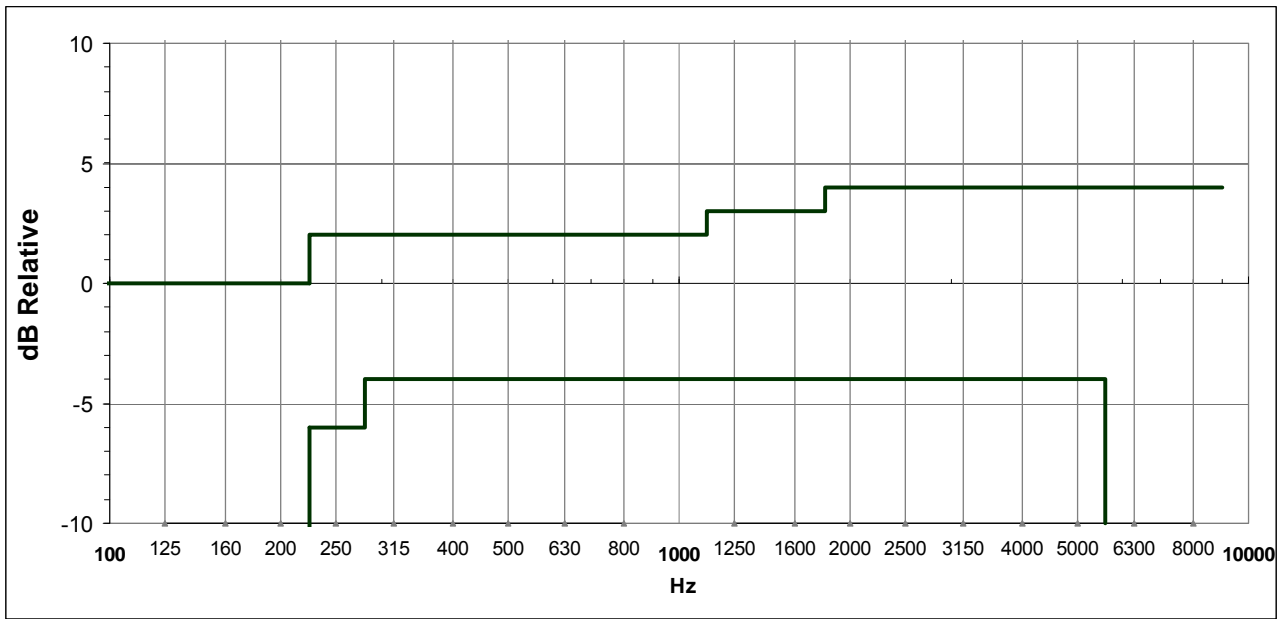
Item	Description
USB Type	Micro USB
USB Compliant	USB 2.0
USB Cable Length	4m
VID	046D
PID	0A4B
Power Features	
Item	Description
Connection Type	Micro USB Female
USB Voltage	5V±0.25V
Working Current	≤100mA
Suspend Current	≤2mA
System Features	
Item	Description
Stereophonic Function	Support via two Mics
AGC Function	Disable
Noise Reduction	Disable
Sensitivity	-21 dB DFS ± 3 dB DFS = Peak Sine Wave Measured with an artificial mouth outputting 94 SPL at 1 kHz at the Mouth Ref Point (MRP). The microphone is on a 1 square meter table, The artificial mouth is 1 meter away from the microphone and 30 cm above the table. Measured under anechoic conditions. Note: Microphone must meet noise and sensitivity requirements of Lync Room Specification Rev G.
Frequency Response Limit	See Frequency Response Limits below.
Sampling Rate	48KHz
Sampling Rate Accuracy	<0.04%
Mic EQ Setting	Support
Bit Depth	16 bits
Capture Latency	<10ms
Capture glitch count per 5 minutes	≤2
DC offset	<±15%
Send Noise	< -66 dB DFS, A-weighted. DFS = Peak Sine Wave
Send single frequency interference	≤-70 dBm0, A-weighted

Send Harmonic distortion	<2%, 250-4000 Hz
Drift between microphone signals	The ADCs for the two microphones need to be phase locked with 0 sample offset between the mics.
Microphone sensitivity mismatch	Less than 3dB between the two microphones (including preamp and ADC)
Microphone phase mismatch	Less than 10 degrees between the two microphones (including preamp and ADC)
Crosstalk between microphone channels	<-90dB
Capture stream timestamp	The maximum timestamp error must be <0.5ms and the timestamp error standard deviation must be <0.04ms
PC Operation System	WIN7

2.2.1 System Frequency Response Limits

The on axis response measured at the front of the microphone, with the microphone setting on a table in anechoic room and using artificial mouth sound source located 1 meter away from the microphone and 30 cm above the surface of the table the frequency response shall be within the following limits:

Upper Limit		Lower Limit	
Hz	dB	Hz	dB
90	0	224	-99
224	0	224	-6
224	2	280	-6
1120	2	280	-4
1120	3	1000	-4
1800	3	1000	-4
1800	4	5600	-4
9000	4	5600	-10



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3 Software function feature

3.1 Button function Desc.

Button name	Function
Mute button	Mute

3.2 Indicator Desc.

Work status	Blue LED	Red LED
Mute		√
Call	√	

4. FCC WARNING

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radiofrequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Warning

This equipment has been tested and found to comply with the regulations for a Class B digital device, pursuant to Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received including interference that may cause undesired operation.