

Centre control Protocol

Principle

(Fixed length 12 bytes)

Guidance code	Control code								Checksum		
	Type ID	Number	Item	Value				Start Channel		End Channel	
				V0	V1	V2	V3				
2bytes	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	
0xA5AC	0xab	0x00	0x01	0x00	0x00	0x00	0x00	0x00	0x00	0x00	Total control code
			0x02								
			...								
			...								
			0xmn								

Form 1: Central control protocol form

Instruction:

- Guidance code STX: is “0xA5AC” (invariant) means setting, “0xA5AD” (Invariant) means searching.
- Send setting command if need response.

No need response command: A5AC00000000000000000000

Need response command: A5AC00000001000000000001

- Control code:

Processor Type: Means processor type or scene management, using type ID to modify 0xab.

TYPE ID	Name	Remarks
0x00	Scene management	Scene management not belong to processor, but dealing as special processor. Item is 0x00 means setting need response or not.
0x01	Noise Gate	
0x02	Parameter EQ	OK

0x03	Graphic EQ	OK
0x04	Compressor	OK
0x05	Signal Generation	OK
0x06	Mixer	OK
0x07	Delay	OK
0x08	Cross over	OK
0x0a	Inverted	OK
0x0c	Input source/ Input Ctrl	OK
0x0d	Output/ Output Ctrl	OK
0x0e	Gain Control/ AGC	OK
0x0f	AFC	OK
0x10	Output Level/Meter	OK
0x11	Gain Control/ Gain	OK
0x12	Router	OK
0x13	Ducker	OK
0x14	Auto Mixer	OK
0x17	Expand	OK
0x18	Limiter	OK
0x19	25/ ANC	OK
0x1a	26/ AEC	OK
0x1b	27/ ANS	OK
0xff	Group	Virtual processor OK
0xfe	DCA	Virtual processor OK
0x82	Telephone module	peripheral

Form 2: Processor type ID

Processor Number: This value will be valid if in one TOPO have same processor type. Otherwise, the value is 0x00. According to the data streaming trend, the sequence is (0x00, 0x01, 0x02...). Reversal sequence is (...-0x02, -0x01, 0x00).

Item: Field number in the processor, used for modifying "Oxmn"

value: Item corresponding value modify V0,V1,V2,V3.

- 4、 Initial channel: Default is 0x00。
- 5、 End channel: Default is 0x00。
- 6、 Checking code: Summation of control code byte(byte 3 to byte 11).
- 7、 "0x" is 16 byte code, no need input when program central control.

8、 Byte-order: using network byte order: Bigger-Endian sort method.

9、 Return:

This step is synchronous operation: Send a command and get the response at once.

Regarding setting: If success, return to 0 or positive integer according this protocol.

If fail, return to negative number

Regarding searching: If success, Return to the value within the range.

If fail, return to negative number.

Scene Management

Type 0x00

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Scene upload	V0	[1,8]	unsigned char	write	Scene group normally is 1
		V1	[1,8]	unsigned char	write	Scene Number
0x02	Scene save	V0	[1,8]	unsigned char	write	Save to Scene No. If No. is 1, then save current scene
0x03	Scene reset	V0	[1,8]	unsigned char	write	Save to Scene No. If No. is 0, then save current scene
0x04	Scene reset all				write	
0x04	Current scene				read	Get the scene No.

Remarks: Read/write---blank means readable and writable. Means this field can write by send central control command or DSP.

If read, means this field need send query command, fill in this field by DSP.

If write: Means fill in this field by sending central control command and without query function.

Noise Gate

Processor type: 0x01

Item	Item Name	Modify field	Range	Field type	Read/Write	Remarks
0x01	Bypass or not	V0	0,1	unsigned char		0-No. 1-Yes
0x02	Start time	V0	[1,1000ms]	ushort		
		V1				
0x03	Attenuation time	V0	[5,5000ms]	ushort		
		V1				
0x04	Hold time	V0	[1,5000ms]	ushort		
		V1				
0x05	Basic value	V0	[-0,96db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x06	Threshold	V0	[-48,0db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Parameter EQ

Processor type: 0x02

Processor number need calculate, if number same in the processor, then value's first byte used for distinguish, the rest byte means value and reserve byte.

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Number of segments	V0		unsigned char	Read	
0x08	Segment by pass	V0		unsigned char	Read	Number of segment
		V1	0,1	unsigned char		0-Non-bypass,1-bypass
0x0a	Frequency	V0		unsigned char	Read	Number of segment
		V1	[20,20000HZ]	ushort		V0,V1 means Frequency
		V2				
0x0b	Gain	V0		unsigned char	Read	Number of segment

		V1	[-15.0,15.0db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V2				
0x0c	Bandwidth	V0		unsigned char	Read	Number of segment
		V1	[0.02,4.00oct]	ushort		2 decimal Before transmission * 100, Analysis / 100.0
		V2				

Setting Initial/End channel

Modify field	Range	Field	Remarks
Initial channel	[1,32]	unsigned char	
End channel	[1,32]	unsigned char	

Graphic EQ

Processor type0x03

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x03	Bandwidth	V0	1,2,3	unsigned char		
0x02	Gain	V0		unsigned char	Read	Number of segment
		V1	[-15,15db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V2				
0x04	Number of segment	V0		unsigned char	Read	

Compressor

Processor type0x04

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Starting time	V0	[1,1000ms]	ushort		
		V1				
0x03	Attenuation time	V0	[1,1000ms]	ushort		
		V1				
0x04	Gain	V0	[-24,30db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x05	Threshold value	V0	[-48,0db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x06	Slope	V0	[1.0~20.0]	ushort		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Setting Initial/End channel

Modify field	Range	Field	Remarks
Initial channel	[1,32]	unsigned char	
End channel	[1,32]	unsigned char	

Singal Generator

Processor type0x05

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Valid or not	V0	0,1	unsigned char		0-Valid,1-Unvalid
0x02	Signal generator type	V0	[0,3]	unsigned char		0-No signal,1-Sine, 2-Pink noise,3-White noise
0x03	Frequency	V0	[20,20000Hz]	ushort		
		V1				

0x04	Level	V0	[-60.0,0.0]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Mixer

Processor type0x06

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Input	V0	[0,255]	unsigned char	Read	Like:4,8,16,32
0x02	Output	V0	[0,255]	unsigned char	Read	
0x03	Control	V0	[0,255]	unsigned char		Input, Start from 0
		V1	[0,255]	unsigned char		Output, Start from 0
		V2	0,1	unsigned char		0-Turn on,1-Turn off
0x04	Gain	V0	[0,255]	unsigned char		Input number
		V1	[-72,12db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V2				
0x06	Gain(0x04 Expand)	V0	[0,255]	unsigned char		Input, Start from 0
		V1	[0,255]	unsigned char		Output, start from 0
		V2	[-72,12db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V3				

Delay

Processor type0x07

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Milli second	V0	[0,2000]	ushort		
		V1				

Cross over

Processor type0x08

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Bypass	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Low pass Gain	V0	[-15,15db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x03	Low pass Filter type	V0	[1,24]	unsigned char		1-8 Butterworth in turn. 6,12,18,24 rank,..., 9-16Bethel, 17-24 Linkwitz
0x04	Low pass end Frequency	V0	[20,20000HZ]	ushort		
		V1				
0x05	High pass filter type	V0	[1,24]	unsigned char		1-8 Butterworth in turn. 6,12,18,24 rank,..., 9-16Bethel, 17-24 Linkwitz
0x06	High pass end Frequency	V0	[20,20000HZ]	ushort		
		V1				
0x07	High pass Gain	V0	[-15,15db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x08	High Bypass	V0	0,1	unsigned char		0-Non-bypass,1-bypass

0x09	Low Bypass	V0	0,1	unsigned char		0-Non-bypass,1-bypass
------	------------	----	-----	---------------	--	-----------------------

Inverted

Processor type 0x0a

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Inverted or not	V0	0,1	unsigned char		0-Normal phase,1-Invert

Setting Initial/End channel

Modify field	Range	Field	Remarks
Initial channel	[1,32]	unsigned char	
End channel	[1,32]	unsigned char	

Input source/Input Ctrl

Processor type 0x0c

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Input type	V0	0,1,2	unsigned char		0---Mic 1---Line Input 2---no Input
0x02	Mute	V0	0,1	unsigned char		0-Mute, 1-Not mute
0x03	Invert	V0	0,1	unsigned char		0-Normal phase,1-Invert
0x04	Channel Gain	V0	[-72,12dB]	short		Channel Gain [-72,12dB]
		V1				
0x05	Phantom or not	V0	0,1	unsigned char		0- Yes, 1-No Valid at Input type is Mic
0x07	Sensitivity	V0	[0,54]	short		
		V1				

0x09	Level Step length	V0	[-84,84dB]	short		
		V1				
0x0d	Telephone input	V0	0,1	unsigned char		0-No, 1-Yes
0x0e	Panel paging	V0	0,1	unsigned char		0-No, 1-Yes
0x0f	Channel Valid Gain	V0	[-72,12dB]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Setting Initial/End channel

Modify field	Range	Field	Remarks
Initial channel	[1,32]	unsigned char	
End channel	[1,32]	unsigned char	

Output Control

Processor type 0x0d

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Mute	V0	0,1	unsigned char		0-Mute, 1-Not mute
0x03	Channel Gain	V0	[-72,12dB]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x04	Level Step length	V0	[-84,84dB]	short		
		V1				
0x06	Output Sensitivity	V0	[0,54]	short		
		V1				
0x07	Telephone Output	V0	0,1	unsigned char		0-No,1-Access

Setting Initial/End channel

Modify field	Range	Field	Remarks
--------------	-------	-------	---------

Initial channel	[1,32]	unsigned char	
End channel	[1,32]	unsigned char	

Auto Gain Control/AGC

Processor type 0x0e

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Starting time	V0	[1,1000ms]	ushort		
		V1				
0x03	Attenuation time	V0	[1,1000ms]	ushort		
		V1				
0x04	Target Level	V0	[-48dBFS, 0dBFS]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x06	Noise Threshold value	V0	[-60.0db,-20.0db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x07	Rate	V0	[1.0, 20.0]	ushort		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Setting Initial/End channel

Modify field	Range	Field	Remarks
Initial channel	[1,32]	unsigned char	
End channel	[1,32]	unsigned char	

Anti-Feedback cancellation (AFC)

Processor type 0x0f

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Oct option	V0	0,1,2,3	unsigned char		0
0x03	Filters number	V0	0,1	unsigned char		0 means 12 filters 1 means 16 filters
0x05	Clear the filters	V0	0,65535	ushort		Calculate by bit. 1 means clear 0 means don't clear
		V1				
0x06	Feedback test type	V0	0~15	unsigned char		Filter No.
		V1	0,1,2	unsigned char		0 means auto 1 means fixed 2 means manual
0x07	Feedback test frequency	V0	0~15	unsigned char		Filter No.
		V1	20~2000	ushort		Feedback point frequency
		V2				
0x08	Feedback test gain	V0	0~15	unsigned char		Filter No.
		V1	20~2000	ushort		Test gain
		V2				
0x0A	Maximum depth	V0	0~20	ushort		
0x0C	Feedback point	V0	0,65535	ushort		Calculate by bit. 1 means detected the feedback point. 0 means doesn't detect the feedback point.
		V1				

Level sheet/Meter

Processor type 0x10

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Level channel number	V0	[0,255]	unsigned char	Read	

Gain Controller

Processor type0x11

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Mute	V0	0,1	unsigned char		0-Mute, 1-Not Mute
0x02	Total Gain	V0	[-15,15db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x03	Channel Gain	V0	[-15,15db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Router

Processor type0x12

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Input Number	V0		unsigned char	Read	
0x02	Output Number	V0		unsigned char	Read	
0x03	Input Channel status	V0		char		Output number, Start from 0, No Output is-1
		V1		char		Input Number, Start from 0

Ducker

Processor type0x13

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Gain	V0	[-72,12db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x03	Threshold value	V0	[-60,0db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x04	Starting time	V0	[10,500ms]	ushort		
		V1				
0x05	Hold time	V0	[10,10000ms]	ushort		
		V1				
0x06	Attenuation time	V0	[10,60000ms]	ushort		Occupy 3 bytes
		V1				
		V2				
0x07	Signal attenuation depth	V0	[0.0,96.0db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Auto Mixer

Processor type0x14

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Slope	V0	[1,3]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x03	Response time	V0	[5,5000]	ushort		ms
		V1				

0x04	Mixer Input Number	V0		unsigned char	Read	
0x05	Total mixer Output Gain	V0	[-72,12db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x06	Involved in mixing	V0		Unsigned char		Channel sequence number
		V1		Unsigned char		Reserve
		V2	0,1	unsigned char		0-Not involved, 1-Involved
0x07	Input Channel Mute	V0		Unsigned char		Channel sequence number
		V1		Unsigned char		Reserve
		V2	0,1	unsigned char		0-Mute, 1-Not Mute
0x08	Input Channel priority	V0		Unsigned char		Channel sequence number
		V1		Unsigned char		Reserve
		V2	[0,10]	unsigned char		
0x09	Input Channel Gain	V0		unsigned char		Channel sequence number
		V1	[-72,12db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V2				

Expander

Processor type0x17

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Starting time	V0	[1,1000ms]	ushort		
		V1				
0x03		V0	[1,1000ms]	ushort		

	Recovery time	V1				
0x04	Compression ratio	V0	[1,0,20]	ushort		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x06	Threshold value	V0	[-56.0,0.0]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Setting Initial /End channel

Modify field	Range	Field	Remarks
Initial channel	[1,32]	unsigned char	
End channel	[1,32]	unsigned char	

Limiters

Processor type 0x18

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Starting time	V0	[1,1000ms]	ushort		
		V1				
0x03	Attenuation time	V0	[1,1000ms]	ushort		
		V1				
0x04	Gain	V0		short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x05	Threshold value	V0	[-48,0db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				

Setting Initial/End channel

Modify field	Range	Field	Remarks
Initial channel	[1,32]	unsigned char	
End channel	[1,32]	unsigned char	

Auto noise cancellation(ANC)

Processor type0x19

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass
0x02	Gain Threshold value	V0	[-60,12db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x03	Max. Gain	V0	[-30,20db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x04	Min. Gain	V0	[-30,20db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x05	Gain Rate	V0	[0.5,2]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x06	Gain rate of change (s)	V0	[1,60]	ushort		
		V1				
0x07	Gap Threshold value	V0	[-60,-20db]	short		1 decimal Before transmission * 100, Analysis / 100.0
		V1				
0x08	Gap length	V0	[1,2000ms]	ushort		
		V1				
0x09	Gap interval	V0	[1,60min]	ushort		
		V1				

0x80	Fixed interval or not	V0	0,1	unsigned char	Write	0-No,1-Yes
0x81	Calibration	V0	0,1	unsigned char	Write	0-No,1-Yes
0x82	All restoration	V0	0,1	unsigned char	Write	0-No,1-Yes

Auto Echo cancellation (AEC)

Processor type0x1a

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass

Auto Noise Eliminator(ANS)

Processor type0x1b

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	By pass or not	V0	0,1	unsigned char		0-Non-bypass,1-bypass

Group

Processor type0xff

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Valid Gain	Processor number	[1,127]	Unsigned char		Group number
		V0	[-84.0,0.0]	float		Gain 1 decimals
		V1				
0x02	Mute switch	Processor number	[1, 127]	Unsigned char		Group number

		V0	0,1	Unsigned char		0---no 1---Yes
0x03	Add group	V0	1,2	Unsigned char		1---Input, 2--- Output。
		Processor number	[1, 127]	Unsigned char		Add to which Group
		Initial channel	[1,32]	Unsigned char		Which processor need group
		End channel	[1,32]	Unsigned char		Which processor need group
0x04	Cancel group	V0	1,2	Unsigned char		1---Input, 2--- Output。
		Processor number	[1, 127]	Unsigned char		Need cancelled Group
		Initial channel	[1,32]	Unsigned char		Which processor need cancel group
		End channel	[1,32]	Unsigned char		Which processor need cancel group

DCA Group

Processor type0xfe

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Percentage	Processor number	[1, 127]	Unsigned char		DCA group number
		V0	[0,100]	Unsigned char		Percentage
0x02	Mute switch	Processor number	[1, 127]	Unsigned char		DCA group number
		V0	0,1	Unsigned char		0---No 1---Yes
0x03	Add group	V0	1,2	Unsigned char		1---Input, 2--- Output。
		Processor number	[1, 127]	Unsigned char		Add to which DCA group
		Initial channel	[1,32]	Unsigned char		Which processor need group
		End channel	[1,32]	Unsigned char		Which processor need group

0x04	Cancel group	V0	1,2	Unsigned char		1---Input, 2---Output。
		Processor number	[1, 127]	Unsigned char		Need cancel DCA group
		Initial channel	[1,32]	Unsigned char		Which processor need cancel group
		End channel	[1,32]	Unsigned char		Which processor need cancel group

Telephone Module

Processor type: 0x82

Range [1,127]。

Item	Item Name	Modify Field	Range	Field type	Read/write	Remarks
0x01	Answer the phone					
0x02	Hang up telephone					
0x03	Reject the phone					
0x04	Dial	V0...V5				Max. 20 byte