SDK API 使用手册

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微目电子科技

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增加 MSO21 设备支持

增加 DDS ARB 和门控 API

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1. 简介

作为 MOS 混合信号示波器配备的标准 DLL 接口，通过这个接口可以直接控制混合信号示波器。

该接口支持 widows 系统(X86，X64 和 arm64)和 linux 系统(X64，arm-linux-gnueabi，arm-linux-gnueabihf 和 aarch64-linux)。

2. 初始化和结束

调用InitDll()来完成动态库的初始化，初始化的时候会分配内存和资源用于设备监测和数据读取用。

int InitDll(unsigned int en_log , unsigned int en_hard_watchdog);

Description Dll initialization

Input: **log enable** 1 Enable Log
0 Not Enable Log
watchdog enable 1 Enable hard watchdog
0 Not Enable hard watchdog

Output: **Init Status**
Return value 1 Success
0 Failed

调用FinishDll()来完成动态库的结束，结束的时候，会时释放初始化中申请的内存和相关资源。

int FinishDll(void);

Description Dll finished

Input: -

Output: -**Finished Status**
Return value 1 Success
0 Failed

3. 设备 ID

每个设备都有一个 64 位的 ID 码。

int GetOnlyId0(void);

Description This routines return device id(0-31)

Input: -

Output: - **Device ID(0-31)**

int GetOnlyId1(void);

Description This routines return device id(32-63)

Input: -

Output: - **Device ID(32-63)**

4. 设备复位

int ResetDevice(void);

Description This routines reset device

Input: -

Output: - **Return value** 1 success
0 failed

5. 设备监测

当 DLL 检测到有设备接入时，有 3 种方式通知主程序，回掉函数、触发 Event 和主程序循环检测。

5.1. 回调函数

当检测到设备插入时，如果主程序注册了回掉函数**"addcallback"**，它就会被调用；当检测到设备拔出时，如果主程序注册了回掉函数**"rmvcallback"**，它就会被调用。Dll 有一个函数专门用于设置这个 2 个回掉函数

void SetDevNoticeCallBack(void* ppara, AddCallBack addcallback, RemoveCallBack rmvcallback);

Description This routines sets the callback function of equipment status changed.

Input: **ppara** the parameter of the callback function
addcallback a pointer to a function with the following prototype:
void AddCallBack(void * **ppara**)
rmvcallback a pointer to a function with the following prototype:
Void RemoveCallBack(void * **ppara**)

Output -

5.2. Event

当检测到设备插入时，如果主程序注册了 Event 句柄**"addevent"**，它就会被设置；当检测到设备拔出时，如果主程序注册了回掉函数**"rmvevent"**，它就会被设置。需要注意的是，主程序检测到 Event 后，需要将 Event 复位。Dll 有一个函数专门用于设置这 2 个 Event 句柄

void SetDevNoticeEvent(HANDLE addevent, HANDLE rmvevent);

Description This routines set the event handle, these will be set, when equipment status changed.

Input: **addevent** the event handle
rmvevent the event handle

Output -

5.3. 循环检测

int IsDevAvailable();

Description This routines return the device is available or not.

Input: -

Output **Return value** 1 available
0 not available

说明：3 方式只要使用其中的一种就可以了，回掉函数和 Event 都是异步的处理方式，更加的高效；循环检测需要主程序过一定时间就检测设备是否插入或者拔出。

6. 示波器

6.1. 采集范围设置

设备的前级带有程控增益放大器，当采集的信号小于 AD 量程的时候，增益放大器可以把信号放大，更多的利用 AD 的位数，提高采集信号的质量。Dll 会根据设置的采集范围，自动的调整前级的增益放大器。

int SetOscChannelRange(int channel, int minmv, int maxmv);

Description This routines set the range of input signal.

Input: **channel** the set channel

0 channel 1

1 channel 2

minmv the minimum voltage of the input signal (mV)

maxmv the maximum voltage of the input signal (mV)

Output **Return value** 1 Success

0 Failed

说明：最大的采集范围为探头 X1 的时候，示波器可以采集的最大电压。比如 MSO20 为 [-12000mV,12000mV]。

注意：为了达到更好波形效果，一定要根据自己被测波形的幅度，设置采集范围。必要时，可以动态变化采集范围。

6.2. 采样率

int GetOscSupportSampleNum();

Description This routines get the number of samples that the equipment support.

Input: -

Output **Return value** the support sample number

int GetOscSupportSamples(unsigned int* sample, int maxnum);

Description This routines get support samples of equipment.

Input: **sample** the array store the support samples of the equipment

maxnum the length of the array

Output **Return value** the sample number of array stored

int SetOscSample(unsigned int sample);

Description This routines set the sample.

Input: **sample** the set sample

Output **Return value** 0 Failed

other value new sample

unsigned int GetOscSample();

Description This routines get the sample.

Input: -

Output **Return value** sample

6.3. 触发(硬件触发)

该功能需要设备硬件触发支持。硬件触发的触发点都是采集数据的最中间，比如采集 128K 数据，触发点就是第 64K 的点。

触发模式

```
#define TRIGGER_MODE_AUTO 0
#define TRIGGER_MODE_LIANXU 1
```

触发条件

```
#define TRIGGER_STYLE_NONE 0x0000          //not trigger
#define TRIGGER_STYLE_RISE_EDGE 0x0001     //Rising edge
```

```
#define TRIGGER_STYLE_FALL_EDGE 0x0002     //Falling edge
#define TRIGGER_STYLE_EDGE 0x0004                //Edge
#define TRIGGER_STYLE_P_MORE 0x0008        //Positive Pulse width(>)
#define TRIGGER_STYLE_P_LESS 0x0010        //Positive Pulse width(>)
#define TRIGGER_STYLE_P          0x0020        //Positive Pulse width(<>)
#define TRIGGER_STYLE_N_MORE 0x0040        //Negative Pulse width(>)
#define TRIGGER_STYLE_N_LESS 0x0080        //Negative Pulse width(>)
#define TRIGGER_STYLE_N          0x0100        //Negative Pulse width(<>)
```

int IsSupportHardTrigger();

Description This routines get the equipment support hardware trigger or not .

Input: -

Output **Return value** 1 support hardware trigger
0 not support hardware trigger

unsigned int GetTriggerMode();

Description This routines get the trigger mode.

Input: -

Output **Return value** TRIGGER_MODE_AUTO
TRIGGER_MODE_LIANXU

void SetTriggerMode(unsigned int mode);

Description This routines set the trigger mode.

Input: **mode** TRIGGER_MODE_AUTO
TRIGGER_MODE_LIANXU

Output -

unsigned int GetTriggerStyle();

Description This routines get the trigger style.

Input: -

Output **Return value** TRIGGER_STYLE_NONE
TRIGGER_STYLE_RISE_EDGE
TRIGGER_STYLE_FALL_EDGE
TRIGGER_STYLE_EDGE
TRIGGER_STYLE_P_MORE
TRIGGER_STYLE_P_LESS
TRIGGER_STYLE_P
TRIGGER_STYLE_N_MORE
TRIGGER_STYLE_N_LESS
TRIGGER_STYLE_N

void SetTriggerStyle(unsigned int style);

Description This routines set the trigger style.

Input: **style** TRIGGER_STYLE_NONE

TRIGGER_STYLE_RISE_EDGE
TRIGGER_STYLE_FALL_EDGE
TRIGGER_STYLE_EDGE
TRIGGER_STYLE_P_MORE
TRIGGER_STYLE_P_LESS
TRIGGER_STYLE_P
TRIGGER_STYLE_N_MORE
TRIGGER_STYLE_N_LESS
TRIGGER_STYLE_N

Output -

int GetTriggerPulseWidthNsMin();

Description This routines get the min time of pulse width.

Input: -

Output Return min time value of pulse width(ns)

int GetTriggerPulseWidthNsMax();

Description This routines get the max time of pulse width.

Input: -

Output Return max time value of pulse width(ns)

int GetTriggerPulseWidthDownNs();

Description This routines get the down time of pulse width.

Input: -

Output Return down time value of pulse width(ns)

int GetTriggerPulseWidthUpNs();

Description This routines set the down time of pulse width.

Input: down time value of pulse width(ns)

Output -

void SetTriggerPulseWidthNs(int down_ns, int up_ns);

Description This routines set the up time of pulse width.

Input: up time value of pulse width(ns)

Output _

unsigned int GetTriggerSource();

Description This routines get the trigger source.

Input: -

Output **Return value** TRIGGER_SOURCE_CH1 0 //CH1
TRIGGER_SOURCE_CH2 1 //CH2
TRIGGER_SOURCE_LOGIC0 16 //Logic 0
TRIGGER_SOURCE_LOGIC1 17 //Logic 1
TRIGGER_SOURCE_LOGIC2 18 //Logic 2

TRIGGER_SOURCE_LOGIC3 19 //Logic 3
TRIGGER_SOURCE_LOGIC4 20 //Logic 4
TRIGGER_SOURCE_LOGIC5 21 //Logic 5
TRIGGER_SOURCE_LOGIC6 22 //Logic 6
TRIGGER_SOURCE_LOGIC7 23 //Logic 7

void SetTriggerSource(unsigned int source);

Description This routines set the trigger source.

Input: **source** TRIGGER_SOURCE_CH1 0 //CH1
TRIGGER_SOURCE_CH2 1 //CH2
TRIGGER_SOURCE_LOGIC0 16 //Logic 0
TRIGGER_SOURCE_LOGIC1 17 //Logic 1
TRIGGER_SOURCE_LOGIC2 18 //Logic 2
TRIGGER_SOURCE_LOGIC3 19 //Logic 3
TRIGGER_SOURCE_LOGIC4 20 //Logic 4
TRIGGER_SOURCE_LOGIC5 21 //Logic 5
TRIGGER_SOURCE_LOGIC6 22 //Logic 6
TRIGGER_SOURCE_LOGIC7 23 //Logic 7

Output -

注意：如果逻辑分析仪和 IO 是复用的（例如 MSO20、MSO21），需要将对应的 IO 打开，并设置为输入状态。

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int GetTriggerLevel();

Description This routines get the trigger level.

Input: -

Output **Return value** level (mV)

void SetTriggerLevel(int level);

Description This routines set the trigger level.

Input: level (mV)

Output -

int IsSupportTriggerSense();

Description This routines get the equipment support trigger sense or not.

Input: -

Return value 1 support
0 not support

int GetTriggerSenseDiv();

Description This routines get the trigger sense.

Input: -

Output **Return value** Sense (0-1 div)

void SetTriggerSenseDiv(int sense);

Description This routines set the trigger sense.
Input: Sense (0-1 div)
Output -
说明：触发灵敏度的范围为 0.1 Div-1.0 Div。1 Div =(采集范围设置最大值-采集范围设置最小值)/10.0。比如你设置的采集范围为[-1000,1000]，1Div =(1000--1000)/10.0=200mV。

bool IsSupportPreTriggerPercent();
Description This routines get the equipment support Pre-trigger Percent or not .
Input: -
Output Return value 1 support
0 not support

int GetPreTriggerPercent();
Description This routines get the Pre-trigger Percent.
Input: -
Output Return value Percent (5-95)

void SetPreTriggerPercent(int front);
Description This routines set the Pre-trigger Percent.
Input: Percent (5-95)
Output -

int IsSupportTriggerForce();
Description This routines get the equipment support trigger force or not.
Input: -
Return value 1 support
0 not support

void TriggerForce();
Description This routines force capture once.
Input: -
Output: -

6.4. AC/DC

int IsSupportAcDc(unsigned int channel);
Description This routines get the device support AC/DC switch or not.
Input: channel 0 :channel 1
1 :channel 2
sOutput **Return value** 0 : not support AC/DC switch
1 : support AC/DC switch

void SetAcDc(unsigned int channel, int ac);
Description This routines set the device AC coupling.
Input: channel 0 :channel 1

1 :channel 2

ac 1 : set AC coupling

0 : set DC coupling

Output -

int GetAcDc(unsigned int channel,);

Description This routines get the device AC coupling.

Input: channel 0 :channel 1

1 :channel 2

Output **Return value** 1 : AC coupling

0 : DC coupling

6.5. 采集

调用**Capture**函数开始采集数据，**length**就是你想要采集的长度，以K为单位，比如**length**=10,就是10K 10240个点。对于采样率的大于等于存储深度的采集长度，取**length**和存储深度的最小值；对于采样率小于存储深度，取**length**和1秒采集数据的最小值。函数会返回实际采集数据的长度。**force_length**可以强制取消只能采集1秒的限制。

int Capture(int length, unsigned short capture_channel,char force_length);

Description This routines set the capture length and start capture.

Input: **length** capture length(KB)

capture_channel

ch1=0x0001 ch2=0x0002 ch3=0x0004 ch4=0x0008 logic=0x0100

ch1+ch2 0x0003

ch1+ch2+ch3 0x0007

ch1+logic 0x0101

force_length 1: force using the length, no longer limits the max collection 1 seconds

Output **Return value** the real capture length(KB)

使用正常触发模式（TRIGGER_MODE_LIANXU）的时候。发送了采集命令，还没有收到采集完成数据通知。现在，想要停止软件。

1、推荐方式：你把触发模式改成TRIGGER_MODE_AUTO，等待收到采集完成数据通知，再停止软件。

2、使用 **AbortCapture.**

DLL_API int WINAPI AbortCapture();

Description This routines set the abort capture

Input:

Output Return value 1:success 0:failed

unsigned int GetMemoryLength();

Description This routines get memory depth of equipment (KB).

Input: -

Output memory depth of equipment(KB)

Roll Mode: 该模式下，采样率被固定的设置为最小采样率，采集长度也是固定的设置

为 1 秒采集数据长度。正常的调用 **Capture**，把每次采集的数据连接在一起显示就是完整的波形。

int IsSupportRollMode();

Description　This routines get the equipment support roll mode or not .

Input:　-

Output　**Return value** 1 support roll mode

0 not support roll mode

int SetRollMode(unsigned int en);

Description　This routines enable or disenable the equipment into roll mode.

Input:　-

Output　**Return value** 1 success

0 failed

6.6.采集完成通知

当数据采集完成时，有 3 种方式通知主程序，回掉函数、触发 Event 和主程序循环检测。

6.6.1.回调函数

当数据采集完成时，如果主程序注册了回掉函数**"datacallback"，**它就会被调用。Dll 有一个函数专门用于设置这个回掉函数

void SetDataReadyCallBack(void* ppara, DataReadyCallBack datacallback);

Description　This routines sets the callback function of capture complete.

Input:　**ppara**　the parameter of the callback function

datacallback　a pointer to a function with the following prototype:

void **DataReadyCallBack** (void * **ppara**)

Output　-

6.6.2.Event

当数据采集完成时，如果主程序注册了 Event 句柄**"dataevent"，**它就会被设置。需要注意的是，主程序检测到 Event 后，需要将 Event 复位。Dll 有一个函数专门用于设置这个 Event 句柄

void SetDevDataReadyEvent(HANDLE dataevent);

Description　This routines set the event handle, these will be set, when capture complete

Input:　**dataevent**　the event handle

Output　-

6.6.3.循环检测

int IsDataReady();

Description　This routines return the capture is complete or not.

Input:　-

Output　**Return value** 1 complete

0 not complete

说明：3 方式只要使用其中的一种就可以了，回掉函数和 Event 都是异步的处理方式，更加的高效；循环检测需要主程序开始采集以后，过一定时间就检测是否采集完成。

6.7.数据读取

unsigned int ReadVoltageDatas(char channel, double* buffer,unsigned int length);

Description This routines read the voltage datas. (V)
Input: **channel** **read channel** 0 :channel 1
1 :channel 2
buffer the buffer to store voltage datas
length the buffer length
Output **Return value** the read length

int IsVoltageDatasOutRange(char channel);
Description This routines return the voltage datas is out range or not.
Input: **channel** **read channel** 0 :channel 1
1 :channel 2
Output **Return value** 0 :not out range
1 :out range

double GetVoltageResolution(char channel);
Description This routines return the current voltage resolution value
One ADC resolution for the voltage value:
Full scale is 1000mv
the ADC is 8 bits
voltage resolution value = 1000mV/256
Input: **channel** **read channel** 0:channel 1
1:channel 2
Output **Return value** voltage resolution value

unsigned int ReadLogicDatas(unsigned char* buffer, unsigned int length);
Description This routines read the logic data of mso.
Input:
buffer the buffer to store logic datas
length the buffer length
Output Return value the read length

7. DDS

int IsSupportDDSDevice();
Description This routines get support dds or not
Input: -
Output **Return value** support dds or not

int GetDDSDepth();
Description This routines set dds depth
Input:
Output: **Return value** depth

void SetDDSOutMode(unsigned char channel_index, unsigned int out_mode);
Description This routines set dds out mode

Input: **channel_index** 0 :channel 1
1 :channel 2
out_mode DDS_OUT_MODE_CONTINUOUS 0x00
DDS_OUT_MODE_SWEEP 0x01
DDS_OUT_MODE_BURST 0x02

Output

unsigned int GetDDSOutMode(unsigned char channel_index);

Description This routines get dds out mode

Input: channel_index 0 :channel 1
1 :channel 2

Output **mode** DDS_OUT_MODE_CONTINUOUS 0x00
DDS_OUT_MODE_SWEEP 0x01
DDS_OUT_MODE_BURST 0x02

int GetDDSSupportBoxingStyle(int* style);

Description This routines get support wave styles

Input: **style** array to store support wave styles

Output **Return value** if style==NULL return number of support wave styles
else store the styles to array, and return number of wave styles

void SetDDSBoxingStyle(unsigned int boxing);

Description This routines set wave style

Input: **boxing** **W_SINE = 0x0001,**
W_SQUARE = 0x0002,
W_RAMP = 0x0004,
W_PULSE = 0x0008,
W_NOISE = 0x0010,
W_DC = 0x0020,
W_ARB = 0x0040

Output: -

void UpdateDDSArbBuffer(unsigned char channel_index, unsigned short* arb_buffer, uint32_t arb_buffer_length);

Description This routines update arb buffer

Input: **channel_index** 0 :channel 1
1 :channel 2
arb_buffer the dac buffer
arb_buffer_length the dac buffer length need equal to the dds depth

Output: -

void SetDDSPinlv(unsigned int pinlv);

Description This routines set frequence

Input: **pinlv** frequence

Output: -

void SetDDSDutyCycle(int cycle);

Description This routines set duty cycle

Input: **cycle** duty cycle

Output: -

int GetDDSCurBoxingAmplitudeMv(unsigned int boxing);

Description This routines get dds amplitdude of wave

Input: **boxing** BX_SINE~BX_ARB

Output: Return the amplitdude(mV) of wave

void SetDDSAmplitudeMv(unsigned char channel_index, int amplitdude);

Description This routines set dds amplitdude(mV)

Input: **channel_index** 0 :channel 1

1 :channel 2

amplitdude amplitdude(mV)

Output: -

int GetDDSAmplitudeMv(unsigned char channel_index);

Description This routines get dds amplitdude(mV)

Input: **channel_index** 0 :channel 1

1 :channel 2

Output: return amplitdude(mV)

int GetDDSCurBoxingBiasMvMin(unsigned int boxing);

int GetDDSCurBoxingBiasMvMax(unsigned int boxing);

Description This routines get dds bias of wave

Input: **boxing** BX_SINE~BX_ARB

Output: Return the bias(mV) range of wave

void SetDDSBiasMv(unsigned char channel_index, int bias);

Description This routines set dds bias(mV)

Input: **channel_index** 0 :channel 1

1 :channel 2

bias bias(mV)

Output: -

int GetDDSBiasMv(unsigned char channel_index);

Description This routines get dds bias(mV)

Input: **channel_index** 0 :channel 1

1 :channel 2

Output: Return the bias(mV) of wave

void SetDDSSweepStartFreq(unsigned char channel_index, double freq);

Description This routines set dds sweep start freq

Input: **channel_index** 0 :channel 1

1 :channel 2

freq

Output: -

double GetDDSSweepStartFreq(unsigned char channel_index);

Description This routines get dds sweep start freq

Input: **channel_index** 0 :channel 1

1 :channel 2

Output: **freq**

void SetDDSSweepStopFreq(unsigned char channel_index, double freq);

Description This routines set dds sweep stop freq

Input: **channel_index** 0 :channel 1

1 :channel 2

freq

Output: -

double GetDDSSweepStopFreq(unsigned char channel_index);

Description This routines get dds sweep stop freq

Input: **channel_index** 0 :channel 1

1 :channel 2

Output: **freq**

void SetDDSSweepTime(unsigned char channel_index, unsigned long long int time_ns);

Description This routines set dds sweep time

Input: **channel_index** 0 :channel 1

1 :channel 2

time/ns

Output: -

unsigned long long int GetDDSSweepTime(unsigned char channel_index);

Description This routines get dds sweep time

Input: **channel_index** 0 :channel 1

1 :channel 2

Output: **time/ns**

void SetDDSTriggerSource(unsigned char channel_index, unsigned int src);

Description This routines set dds trigger source

Input: **channel_index** 0 : channel 1

1 : channel 2

	src	0 : internal
		1 : external
		2 : manual
Output:	-	

unsigned int GetDDSTriggerSource(unsigned char channel_index);

Description	This routines get dds trigger source	
Input:	**channel_index**	0 : channel 1
		1 : channel 2
Output:	**trigger source**	0 : internal
		1 : external
		2 : manual

void SetDDSTriggerSourceIo(unsigned char channel_index, uint32_t io);

Description	This routines set dds trigger source io	
Input:	**channel_index**	0 : channel 1
		1 : channel 2
	io	0 : DIO0
		.....
		7 : DIO7
Output:	-	

Note：需要使用DIO API，将对应的DIO设置为输入/输出状态

uint32_t GetDDSTriggerSourceIo(unsigned char channel_index);

Description	This routines get dds trigger source io	
Input:	**channel_index**	0 : channel 1
		1 : channel 2
Output:	**trigger source io**	0 : DIO0
		.....
		7 : DIO7

void SetDDSTriggerSourceEnge(unsigned char channel_index, unsigned int enge);

Description	This routines set dds trigger source enge	
Input:	**channel_index**	0 : channel 1
		1 : channel 2
	enge	0 : rising
		1 : falling
Output:	-	

unsigned int GetDDSTriggerSourceEnge(unsigned char channel_index);

Description	This routines get dds trigger enge	
Input:	**channel_index**	0 : channel 1
		1 : channel 2
Output:	**enge**	0 : rising

1 : falling

void SetDDSOutputGateEnge(unsigned char channel_index, unsigned int enge);

Description This routines set dds output gate enge

Input: **channel_index** 0 : channel 1
1 : channel 2

enge 0 : close
1 : rising
2 : falling

Output: -

unsigned int GetDDSOutputGateEnge(unsigned char channel_index);

Description This routines get dds output gate enge

Input: **channel_index** 0 : channel 1
1 : channel 2

Output: **enge** 0 : close
1 : rising
2 : falling

void DDSManualTrigger(unsigned char channel_index);

Description This routines manual trigger dds

Input: **channel_index** 0 : channel 1
1 : channel 2

Output: -

void DDSOutputEnable(int enable);

Description This routines enable dds output or not

Input: **enable** 1 enable
0 not enable

Output: -

int IsDDSOutputEnable();

Description This routines get dds output enable or not

Input: -

Output **Return value** dds enable or not

8. IO

int IsSupportIODevice();

Description This routines get support IO ctrl or not

Input: -

Output Return value support io ctrl or not

int GetSupportIoNumber();

Description　This routines get support io nums of equipment.

Output　　Return value　　the sample number of io nums

当 IO 设置为输入时，有 3 种方式读取 IO 状态，回掉函数、触发 Event 和主程序循环检测。

回调函数

SDK 会定时读取 IO 状态，如果主程序注册了回掉函数**"datacallback"**，它就会被调用。Dll 有一个函数专门用于设置这个回掉函数

void SetIOReadStateCallBack(void* ppara, IOReadStateCallBack callback);

Description　　This routines sets the callback function of read io status.

Input:　　**ppara** the parameter of the callback function

callback　a pointer to a function with the following prototype

Event

SDK 会定时读取 IO 状态，如果主程序注册了 Event 句柄**"dataevent"**，它就会被设置。需要注意的是，主程序检测到 Event 后，需要将 Event 复位。Dll 有一个函数专门用于设置这个 Event 句柄

void SetIOReadStateReadyEvent(HANDLE dataevent);

Description　This routines set the event handle, these will be set, when capture complete

Input:　　**dataevent**　the event handle

Output　　-

循环检测

int IsIOReadStateReady();

Description　This routines return read io is complete or not.

Input:　　-

Output　　**Return value** 1 complete

0 not complete

说明：3 方式只要使用其中的一种就可以了，回掉函数和 Event 都是异步的处理方式，更加的高效；循环检测需要主程序开始采集以后，过一定时间就检测是否采集完成。

void IOEnable(unsigned char channel, unsigned char enable);

Description　This routines set io enable or not

Input: **channel**　dio0 0

dio1 1

dio2 2

……

enable not enable 0

enable 1

Output:　　-

unsigned char IsIOEnable(unsigned char channel);

Description　This routines get io enable or not

Input:　**channel** dio0 0

dio1 1

dio2 2

……

Output: **return** not enable 0 or enable 1

void SetIOInOut(unsigned char channel, unsigned char inout);

Description This routines set io in or out

Input: **channel** dio0 0

dio1 1

dio2 2

……

inout in 0

out 1

Output: -

unsigned char GetIOInOut(unsigned char channel);

Description This routines get io in or out

Input: **channel** dio0 0

dio1 1

dio2 2

……

Output: **return** in 0

out 1

void SetIOOutState(unsigned char channel, unsigned char state);

Description This routines set io state

Input: **channel** dio0 0

dio1 1

dio2 2

……

state 0 or 1

Output: -

char GetIOInState(unsigned char channel);

Description This routines get io state

If the SetIOReadStateCallBack setting callback function is used, IOReadStateCallBack will directly notify the IO input status; If use SetIOReadStateReadyEvent and IsIOReadStateReady to read the query, you need to call GetIOState to get the IO input status

Input: channel dio0 0

dio1 1

dio2 2

……

Output: return 0 state

1 state