

API user manual (C#)

v 1.2

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1.Connect / close reader

1.1 Get connection object(Create)

Definition	<i>public static SReader Create(string uriString)</i>
Explain	Get connection object
Parameter	The format of <i>uriString</i> : <i>sId://COMX</i> or <i>tcp://IP</i> Explain: <i>sId://COMX</i> is the connection for serial port, <i>COMX</i> is the number of the serial port <i>TCP://IP</i> is the connection of TCP/IP, <i>IP</i> is the IP address of the reader
Return	<i>Sreader</i> object returned successfully
Example	Serial port: <i>SReader reader = SReader.create("sId://com4");</i> RJ45: <i>SReader reader = SReader.create("tcp://192.168.1.136");</i>

1.2 Connecting the reader(Connect)

Definition	<i>public abstract void Connect();</i>
Explain	Connecting the reader
Parameter	/
Example	<i>reader.Connect();</i>

1.3 Shut down the reader(Shutdown)

Definition	<i>public abstract void ShutDown();</i>
Explain	Shut down the reader
Parameter	/
Example	<i>reader.ShutDown();</i>

2. Instructions for use of the class

2.1 Gen2.InventoryValue

Parameter description	<i>bool isTID</i> : read TID or not. If it is true, it means counting TID; <i>bool isTarget</i> : appoint the Target or not,ant,scanTime; <i>int adrTID</i> : Read the starting word address of tid;
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	<p><i>int lenTID</i>: Read the length of TID, range 0-15, unit: word;</p> <p><i>int target</i>: 0x00 for A, 0x01 for B, other values reserved;</p> <p><i>int ant</i>: Specify the working antenna number, 0x80 antenna 1, 0x81 antenna 2, 0x82 antenna 3, 0x83 antenna 4;</p> <p><i>int scanTime</i>: For this polling time, the reader will set the maximum response time as scantime * 100ms;</p> <p><i>int q</i>: Q value range is 0-15, initial value is 4;</p> <p><i>int session</i>: 0x00 for S0, 0x01 for S1, 0x02 for S2, 0x0 for S3;</p>
Remarks	<p>Two parameters must be specified: Q value and session value;</p> <p><i>AdrTID</i> and <i>lenTID</i> must exist when <i>isTID</i> is true;</p> <p>When <i>isTarget</i> is true, <i>target</i>, <i>ant</i> and <i>scantime</i> must exist;</p>

2.2 Gen2.Select

Parameter description	<p><i>Gen2.Bank bank</i>: tag memory area</p> <p><i>int maskAddr</i>: Starting address, <i>bits</i>;</p> <p><i>int maskLen</i>: Length of filtered data, <i>bits</i>;</p> <p><i>byte[] MaskData</i> : Fill 0 if the filtered data is not enough;</p>
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2.3 Gen2.ReadData

Parameter description	<p><i>Gen2.Bank bank</i>: tag memory area;</p> <p><i>int wordPtr</i>: Starting address, unit word;</p> <p><i>int len</i>: Read length, unit words;</p>
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2.4 Gen2.Bank

Type	Enum enumeration
Value	<i>RESERVED (0x0)</i> , <i>EPC (0x1)</i> , <i>TID (0x2)</i> , <i>USER (0x3)</i> ;

2.5 Gen2.WriteData

Parameter description	<p><i>Gen2.Bank bank</i>: Tag memory area;</p> <p><i>int WordPtr</i>: Starting address, unit word;</p>
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	<p><i>int WordLen</i>: Starting address, unit word;</p> <p><i>byte[] data</i>: Data to write;</p> <p><i>int accessPassword</i>: Access password, if not locked can be 0;</p>
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2.6 Gen2.LockBank

Type	Enum enumeration
Value	<p><i>KILL_LOCK</i> (0x00), //Control kill password read-write protection settings</p> <p><i>ACCESS_LOCK</i> (0x01), //Access password read / write protection settings</p> <p><i>EPC_LOCK</i> (0x02), // EPC storage area read / write protection settings</p> <p><i>TID_LOCK</i> (0x03), //TID storage area read / write protection settings</p> <p><i>USER_LOCK</i> (0x04); //User storage area read / write protection settings</p>

2.7 Gen2.BlockErase

Parameter description	<p><i>Gen2.Bank bank</i>: tag memory area</p> <p><i>int wordPtr</i>: Starting address, unit word</p> <p><i>int len</i>: Length, unit word</p> <p><i>int accessPassword</i>: Access password</p>
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2.8 ReaderInfo

Method	Explain
<i>public int VersionH</i>	Get major version number
<i>public int VersionL</i>	Get subversion number
<i>public int Power</i>	Get read power
<i>public int Scntm</i>	Get query time
<i>public int CheckAnt</i>	Antenna detection parameters, 0-turn off antenna detection, 1-turn on antenna detection
<i>public int Ant</i>	Get antenna configuration information
<i>public int MaxFre</i>	Get the maximum frequency of the current reader
<i>public int MinFre</i>	Get the minimum operating frequency of the current reader
<i>public int getCurrentRegion()</i>	Get current reader frequency
<i>Public String getCurrentRegionString()</i>	Get the current reader band and return string

2.9 Gen2.EmbedTagOp

Parameter description	<pre>public int q; //Q public int session; //0 or 1 public Gen2.Bank bank; //Read area public int ReadAddr; //Start address public int ReadLen; //Length, in words public int PassWord; //Access password public Boolean isTarget; public int Target; //A/B public int ant; public int ScanTime; //Maximum reading time of an antenna</pre>
Instructions	<pre>public EmbedTagOp(int q, int session, Gen2.Bank bank, int ReadAddr, int ReadLen, int PassWord); public EmbedTagOp(int q, int session, Gen2.Bank bank, int ReadAddr, int ReadLen, int PassWord, Boolean isTarget, int target, int ant, int ScanTime);</pre>

3. Basic functions of reader

3.1 Inventory

Definition	<code>public abstract void Inventory(Gen2.InventoryValue value, Gen2.Select filter)</code>
Explain	<p>For tag counting, if four antennas are used, this method needs to be called four times to inventory all. Remark: only one antenna works when this interface is called at a time. For example, if the device is set with four antennas, if all four antennas need to be polled once, it needs to be called four times;</p> <p>Data acquisition and use 3.2;</p> <p>This method will end automatically. If the number of tags is large, the stopping will be slow;</p> <p>If you need to stopping quickly, you can call the 3.2 function. PS: quick stopping only for Impinj R2000 product.</p>
Parameter	<p>Value: counting parameter, see 2.1 for details</p> <p>Filter: filter conditions, see 2.2 for details</p>
Example	<code>int q= 4;</code> <code>int session = 1;</code>

	<pre>Gen2.InventoryValue value = new InventoryValue(q, session); reader.Inventory(value,null);</pre>
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3.2 Stop stocktaking

Definition	<i>public abstract void Inventory_stop();</i>
Explain	Use in cooperation with 3.1
Parameter	/
Example	<i>reader.Inventory_stop()</i>

3.3 Listening method registration

Definition	Tag data callback: <i>protected void OnTagRead(TagData tagData)</i> Abnormal callback: <i>protected void OnReadException(ReaderException exception)</i> GPI status callback: <i>protected void OnReadGpio(Gpio_Pin pin)</i>
Explain	Register the listening method. After registering this method, the exceptions generated in the tag data, GPI status, and tag reading process will call the callback for outgoing. Complex operations cannot be processed in the callback method.
Parameter	<i>tagData:</i> Tag data class
Example	<pre>CountMatchListener listener = new CountMatchListener(); reader.TagRead += listener.TagRead; GPIOListener gpioListener = new GPIOListener(); reader.GpioStatus += gpioListener.GpioStatus; SReadException readException = new SReadException(); reader.ReadException += readException.ReadException; //CountMatchListener Class implementation reference is as follows: class CountMatchListener { public void TagRead(Object sender, TagReadEventArgs e) { string epc = e.TagData.EpcString; int ant = e.TagData.Ant; int rssi = e.TagData.Rssi; } }</pre>

	<pre> } <i>SReadException</i> Class implementation reference is as follows: class SReadException { public void ReadException(object sender, ReaderEventArgs e) { } } <i>GPIOListener</i> Class implementation reference is as follows: class GPIOListener { public void GpioStatus(object sender, GpioStatusEventArgs e) { Console.WriteLine("ID:{0}, High: {1}", e.Gpio_Pin.Id, e.Gpio_Pin.High); } } </pre>
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3.4 Single tag read

Definition	<code>public abstract byte[] ReadSingleTag(byte[] epcData, Gen2.ReadData readData, Gen2.Select filter)</code>
Explain	Read single tag memory area
Parameter	<p><i>epcData</i>: Specify the EPC number to read the tag;</p> <p><i>readData</i>: Refer to 2.3 for details of the class reading parameters</p> <p><i>filter</i>: Filter condition</p> <p>Be careful : Epcdata and filter must be one of two choices. They cannot exist at the same time</p>
Example	<pre> byte[] <i>epc</i> = new byte[] {(byte) 0x11, (byte) 0x22, 0x22, 0x33, 0x33, 0x44, 0x00, 0x3C, 0x33, (byte) 0xD4, (byte) 0xDB, (byte) 0xF4}; Gen2.ReadData <i>readData</i> = new ReadData(Gen2.Bank.TID, 0, 6); byte[] <i>data</i> = reader.ReadSingleTag(<i>epc</i>, <i>readData</i>, null); </pre>

3.5 Write the tag

Definition	<code>public abstract void WriteMemory(byte[] epcData, Gen2.WriteData writeData, Gen2.Select filter)</code>
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Explain	Write tag memory
Parameter	<p><i>epcData</i>: Specifies the EPC number of the write tag;</p> <p><i>writeData</i>: Refer to 2.5 for details of the class to write parameters</p> <p><i>filter</i>: Filter condition</p> <p>Be careful : Epcdata and filter must be one of two choices. They cannot exist at the same time</p>
Example	<pre>byte[] newData = new byte[] {0x11,0x22,0x22,0x33,0x33,0x44}; Gen2.WriteData writeData = new WriteData(Gen2.Bank.EPC, 2, 3, newData, 0); reader.WriteMemory(epc, writeData, null);</pre>

3.6 Lock the tag

Definition	<code>public abstract void LockTag(Gen2.LockBank bank, int action,int accessPassword, byte[] epcData, Gen2.Select filter)</code>
Explain	Lock the tag
Parameter	<p>Gen2.LockBank bank: Refer to 2.6 for details ;</p> <p>int action: Refer to table 1 below;</p> <p>byte[] epcData: Specify EPC</p> <p>Gen2.Select filter: Epcdata and filter must be one of two choices. They cannot exist at the same time</p>
Example	<pre>byte[] epc = new byte[] {(byte) 0x11, (byte) 0x22, 0x22, 0x33, 0x33, 0x44, 0x00, 0x3C, 0x33, (byte) 0xD4, (byte) 0xDB, (byte) 0xF4}; Gen2.LockBank bank = Gen2.LockBank.EPC_LOCK; int action = 0x02; int accessPassword = 0x11223344; reader.LockTag(bank, action, accessPassword, epc, null);</pre>

Table 1 :

bank	action	Explain
0x00/0x01	0x00	Unprotected readable and writable
	0x01	Always readable and writable
	0x02	Readable and writable with password
	0x03	Never read or write
0x02/0x03/0x04	0x00	Unprotected writable
	0x01	Always write
	0x02	Write with password
	0x03	Never write

3.7 Destroy the tag

Definition	<code>public abstract void KillTag(byte[] epcData, int killPassword, Gen2.Select filter)</code>
Explain	Destroy tag, invalid tag after destruction
Parameter	<code>byte[] epcData</code> : Specify EPC <code>int killPassword</code> : Destroy password <code>Gen2.Select filter</code> : Epcdata and filter must be one of two choices. They cannot exist at the same time
Example	<code>byte[] epc = new byte[] {(byte) 0x11, (byte) 0x22, 0x22, 0x33, 0x33, 0x44, 0x00, 0x3C, 0x33, (byte) 0xD4, (byte) 0xDB, (byte) 0xF4};</code> <code>int killPassword = 0x11223344;</code> <code>reader.KillTag(epc, killPassword, null);</code>

3.8 Write the EPC

Definition	<code>public abstract void WriteEPC(Gen2.WriteData writeData)</code>
Explain	Write EPC only, only one tag can exist in the antenna field
Parameter	<code>writeData</code> : Refer to 2.5 for details
Example	<code>byte[] newData = {0x11,0x22,0x22,0x33};</code> <code>int len = 2;</code> <code>int accessPassword = 0;</code> <code>Gen2.WriteData data = new WriteData(len, data, accessPassword);</code> <code>reader.WriteEPC(writeData);</code>

3.9 Block erasure

Definition	<code>public abstract void BlockErase(Gen2.BlockErase block, byte[] epcData, Gen2.Select filter)</code>
Explain	Block erasure
Parameter	<code>block</code> : Refer to 2.7 for details; <code>epcData</code> : Specify EPC; <code>filter</code> : Epcdata and filter must be one of two choices. They cannot exist at the same time
Example	<code>byte[] epc = new byte[] {(byte) 0x11, (byte) 0x22, 0x22, 0x33, 0x33, 0x44, 0x00, 0x3C, 0x33, (byte) 0xD4, (byte) 0xDB, (byte) 0xF4};</code> <code>Gen2.Bank bank = Gen2.Bank.USER;</code> <code>int wordPtr = 0;</code> <code>int len = 4;</code>

	<pre><code>int accessPassword = 0; Gen2.BlockErase block = new BlockErase(bank, wordPtr, len, accesePassword); reader.BlockErase(block, epc, null);</code></pre>
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3.10 Read the EPC of the single tag

Definition	<i>public abstract TagData ReadSingleEPC()</i>
Explain	Read the EPC of the single tag
Parameter	/
Example	<u>TagData tagData = reader.ReadSingleEPC();</u>

3.11 Set GPO output

Definition	<i>public abstract void setGPO(int id, int high, int time)</i>
Explain	Set GPO output high and low level, this method is only applicable to TCP / IP connection
Parameter	<p><i>id</i>: 1-GPO1,2-GPO2,3-GPO3</p> <p><i>high</i>: 0-low level, 1-high level</p> <p><i>time</i>: unit: second, 0 indicates the output low level all the time; other values indicate the duration of high level, when the duration of high level ends, the reader will automatically pull the low level</p>
Example	<pre><code>int id = 0; int high = 1; int time = 2; reader.setGPO(id, high, time);</code></pre>

3.12 Start the monitoring of GPI

Definition	<i>public abstract void Gpi_Listeners_start();</i>
Explain	Start the GPI status monitoring method, which is only applicable to TCP / IP connections
Parameter	/
Example	<u>reader.Gpi_Listeners_start();</u> //GPI data return reference 3.2

3.13 Stop the monitoring of GPI

Definition	<code>public abstract void Gpi_Listeners_stop();</code>
Explain	Stop GPI status listening, this method is only applicable to TCP / IP connections
Parameter	/
Example	<code>reader.Gpi_Listeners_stop();</code>

3.14 EmbedRead

Definition	<code>public abstract void Inventory_mix(Gen2.EmbedTagOp embed, Gen2.Select filter)</code>
Explain	Gen2.EmbedTagOp: 2. 9
Parameter	
Example	<pre>//Read TID Int q = 4; Int session = 1; Gen2.Bank bank = Gen2.Bank.TID; Int readAdr = 0; Int readlen = 6; Int passWord = 0; Int ant = 1; Int time1 = 10; Gen2.EmbedTagOp embedTagOp = new Gen2.EmbedTagOp(q, session, bank, readAdr, readlen, passWord, true, 0, ant, time1);</pre>

4. Parameter setting

4.1 Read power setting

Definition	<code>public abstract void SetReaderPower(int power)</code>
Explain	Read power setting
Parameter	<p>power : The power range of Desktop readers,6db integrated reader are 0-26 (these readers Write power and read power are set uniformly, and cannot be set separately) ;</p> <p>The reader power range of 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader,9db integrated reader is 0-30</p>
Example	<code>reader. SetReaderPower(30);</code>

4.2 Write power setting

Definition	<i>public abstract void SetWritePower(int enable, int power)</i>
Explain	Write power setting, only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader, 9db integrated readers support this function
Parameter	<i>Enable</i> : enable write power setting, 0-off, 1-on; <i>Power</i> : power 0 ~ 30;
Example	<i>reader. SetWritePower(1, 30);</i>

4.3 Frequency band setting

Definition	<i>public abstract void SetRegion(Region region)</i>
Explain	Frequency band setting
Parameter	region: Frequency band, refer to table 2 below
Example	<i>Region region = Region.Chinese2;</i> <i>reader.SetRegion(region);</i>

Table2

Type	Enum enumeration	Explain
value	<i>Chinese2</i>	<i>China 920~925MHz</i>
	<i>US</i>	<i>USA 902~925MHz</i>
	<i>Korean</i>	
	<i>EU</i>	<i>European</i>
	<i>UKraine</i>	
	<i>Peru</i>	
	<i>Chinese1</i>	
	<i>EU3</i>	
	<i>US3</i>	
	<i>Taiwan</i>	

4.4 Scan time settings

Definition	<i>public abstract void SetScanTime(int time)</i>
Explain	Module query time
Parameter	<i>Time</i> : the value range is 0 ~ 255; the query time of the reader is 0 * 100ms ~ 255 * 100ms; if it is 0, there is no upper limit for the query

	time of the reader, and it will not exit until all tags are queried;
Example	<code>int time = 20; reader.SetScanTime(time);</code>

4.5 Antenna setting

Definition	<code>public abstract void SetAntenna(int[] antList)</code>
Explain	antenna setting, only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader,9db integrated readers support this function
Parameter	<code>antList</code> : Antenna list
Example	<code>int[] antList = {1,2,3,4} //Set the antenna1,2,3,4 reader.SetAntenna(antList);</code>

4.6 Antenna detection on / off

Definition	<code>public abstract void SetCheckAnt(int value)</code>
Explain	antenna detection on / off,only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader,9db integrated readers support this function.
Parameter	<code>Value</code> : 0-off, 1-on
Example	<code>int value = 1; reader.SetCheckAnt(value);</code>

4.7 The setting of rewrite times

Definition	<code>public abstract void SetRetryTimes(int value)</code>
Explain	The number of times to write the tag again when the tag writing fails , only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader,9db integrated readers support this function.
Parameter	<code>Value</code> : Value range 0-7;
Example	<code>int value = 3; reader.SetRetryTimes(value);</code>

4.8 DRM settings

Definition	<code>public abstract void SetDRM(bool enable)</code>
Explain	Enable or disable DRM function,only 4-channel reader, 8-Channel

	reader, 16-channel reader and 32-channel reader,9db integrated readers support this function.
Parameter	<code>enable: false - close DRM, true - enable DRM</code>
Example	<code>reader.SetDRM(true);</code>

4.9 The setting of return loss

Definition	<code>public abstract void SetReturnLoss(int value)</code>
Explain	Set return loss threshold,only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader,9db integrated readers support this function.
Parameter	Value : value range 0 ~ 20;
Example	<code>int value = 20;</code> <code>reader. SetReturnLoss(value);</code>

4.10 Single antenna power setting

Definition	<code>public abstract void SetPortReadPower(int[] antPower)</code>
Explain	The power of each antenna is set separately, only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader,9db integrated readers support this function.If the reader is 4 channels, the array length is 4; the array length of 8 channels is 8; the array length of 16-channels is 16.
Parameter	<code>antPower : Power array</code>
Example	<code>int[] antPower = {30,30,30,28}; //4-channel power setting</code> <code>reader. SetPortReadPower(antPower);</code>

5. Parameter acquisition

5.1 Get the information of the reader

Definition	<code>public abstract ReaderInfo GetReaderInfo()</code>
Explain	Get basic reader information
Return value	<code>ReaderInfo</code> : Refer to 2.8 for details
Example	<code>ReaderInfo info = reader. GetReaderInfo();</code>

5.2 Get the S/N number of the reader

Definition	<i>public abstract string GetSerialNO()</i>
Explain	Get the S/N number of the reader
Return value	Character string
Example	<i>string serialNo = reader. GetSerialNO();</i>

5.3 Acquisition of return loss

Definition	<i>public abstract int GetReturnLoss()</i>
Explain	Acquisition of return loss threshold, only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader, 9db integrated readers support this function.
Return value	int
Example	<i>int value = reader. GetReturnLoss();</i>

5.4 Acquisition of read mode

Definition	<i>public abstract int GetReadMode()</i>
Explain	Acquisition of read mode
Return value	0-answer mode, 1-real time mode
Example	<i>int mode = reader. GetReadMode();</i>

5.5 Acquisition of write power

Definition	<i>public abstract int GetWritePower()</i>
Explain	get write power, only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader, 9db integrated readers support this function.
Return value	int
Example	<i>int power = reader. GetWritePower();</i>

5.6 Get write times

Definition	<i>public abstract int GetRetryTimes()</i>
Explain	get number of rewrites, only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader, 9db integrated readers support this function.
Return value	int
Example	<i>int times = reader. GetRetryTimes();</i>

5.7 Acquisition of real-time mode parameters

Definition	<i>public abstract RealTimeParam GetRealTimeParam()</i>
Explain	acquisition of real-time mode parameters, only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader, 9db integrated readers support this function.
Return value	<i>RealTimeParam</i> : refer to 2.9 for details
Example	<i>RealTimeParam param = reader. GetRealTimeParam();</i>

5.8 Acquisition of single antenna power

Definition	<i>public abstract int[] GetPortReadPower()</i>
Explain	acquisition of single antenna power, only 4-channel reader, 8-Channel reader, 16-channel reader and 32-channel reader, 9db integrated readers support this function.
Return value	int
Example	<i>int[] power = reader. GetPortReadPower();</i>