WatchBP O3 Blood Pressure Monitor API Documentation

Content

1. WatchBPO3Hid class

This class enables you to communicate with WatchBP O3 devices over USB.

1.1. Inheritance Hierarchy

WatchBPO3.WatchBPO3Hid
Namespace: WatchBPO3

1.2. Properties

Name	Description
CanCommunication	Gets a value indicating whether the device can communicate or not.

1.3. Methods

Name	Parameters	Description
RegisterHandle (IntPtr)	*Handle* Type: System.IntPtr	Registers the application to let it be notified for the device events.
ParseMessages (ref Message)	*m* Type: System.Windows.Forms.Message	Filters the messages that are passed for the device change messages only. And parse them to take appropriate action.
InitWatchBPSDK(string)	*key* Type: System.String	Registers this SDK to let all APIs be available. If the input key is not valid, an exception will occur.
WriteCmd (CmdEnum)	*commandType* Type: WatchBPO3Hid.CmdEnum The type of command you want to write to the device.	Writes command to the device and returns a byte array that read from the device.
SendPCDateTime	none	Sets the device's date and time and returns a value indicating whether the action is successful or not.

		(27h)
SendABPSetting (ABPSetting)	*abpsetting* Type: WatchBPO3.Decode.ABPSetting	Sends BPM ABP setting to the device and returns a value indicating whether the action is successful or not. (F3h)
SendIDAndClearData (string, bool, bool, bool, bool)	*ID* Type: System.String

clearCasual Type: System.Boolean **true** to clear usual data; otherwise, **false**.

clearDiag Type: System.Boolean **true** to clear diagnostic data; otherwise, **false**.

clearABP Type: System.Boolean **true** to clear ABP data; otherwise, **false**.

clearMemo Type: System.Boolean **true** to clear memo data; otherwise, **false**. | Clears memory and sets the device's ID. Returns a value indicating whether the action is successful or not. (23h) |

1.4. Events

Name	Description
SpecifiedDeviceRemoved	Occurs when a usbhid device with vid: 0x04B4 and pid: 0x5500 is removed.
SpecifiedDeviceArrived	Occurs when a usbhid device with vid: 0x04B4 and pid: 0x5500 is plugged in.

1.5. Enumerations

1.5.1. CmdEnum Enumeration

Name	Value	Description
None	0	
ReadID	1	Read ID string from the device (24h)
RequestDeviceVer	2	Request for the version of the BPM (3Eh)
ReadCasualData	3	Read usual mode memory (28h)
ReadDiagnosticData	4	Read diagnostic mode memory (29h)
ReadABPDataE315	5	Read ABP mode memory from the device (Version E315) (40h)
ReadABPData	6	Read ABP mode memory (30h)
ReadMemoData	7	Read memo memory (31h)
ReadDeviceDateTime	8	Read the device's date and time (26h)
ReadBPMSetting	9	Read BPM setting (F0h)
ReadABPSetting	10	Read BPM ABP setting (F2h)

1.6. Examples

1.6.1 Create WatchBPO3Hid class

The following example shows how to Create **WatchBPO3Hid**, register this SDK and handle the SpecifiedDeviceRemoved and SpecifiedDeviceArrived events.

```
using WatchBPO3;
class MainFrm:Form
{
    private WatchBPO3Hid watchBPO3Hid;
    public MainFrm()
    {
        ...
        watchBPO3Hid = new WatchBPO3Hid();
        // key: a specific string to register this SDK
        watchBPO3Hid.InitWatchBPSDK("key");
        watchBPO3Hid.SpecifiedDeviceRemoved+=watchBPO3_OnspecifiedDevice
Removed;
        watchBPO3Hid.SpecifiedDeviceArrived+=watchBPO3_OnSpecifiedDevic
eArrived;
    }
    protected override void OnHandleCreated(EventArgs e)
    {
        base.OnHandleCreated(e);
        watchBPO3Hid.RegisterHandle(Handle);
    }
    protected override void WndProc(ref Message m)
    {
        base.WndProc(ref m);
        watchBPO3Hid.ParseMessages(ref m);
    }
    private void watchBPO3_OnspecifiedDeviceRemoved(object sender,
EventArgs e)
    {...}
    private void watchBPO3_OnSpecifiedDeviceArrived(object sender,
EventArgs e)
    {...}
}
```

1.6.2. Request the device's version

The following example shows how to get the raw data of the 3Eh command (request the device's version).

```
byte[] versionByteAry =
watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.RequestDeviceVer);
```

1.6.3. Read the device's date and time

The following example shows how to get the raw data of the 26h command (read the device's date and time).

```
byte[] dateTimeByteAry =
watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.ReadDeviceDateTime);
```

1.6.4. Set the device's date and time

The following example shows how to set up the device's date and time.

```
if (watchBPO3Hid.CanCommunication)
{
    if (watchBPO3Hid.SendPCDateTime())
        MessageBox.Show("Set up the device successfully!");
}
```

1.6.5. Read usual mode memory

The following example shows how to get the raw data of the 28h command (read usual mode memory).

```
byte[] casualDataByteAry =
watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.ReadCasualData);
```

1.6.6. Read diagnostic mode memory

The following example shows how to get the raw data of the 29h command (read diagnostic mode memory).

```
byte[] diagnosticDataByteAry =
watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.ReadDiagnosticData);
```

1.6.7. Read ambulatory mode memory

The following example shows how to get the raw data of the 30h command (read ambulatory mode memory).

```
byte[] abpDataByteAry =
watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.ReadABPData);
```

1.6.8. Read ambulatory mode memory (Version E315)

The following example shows how to get the raw data of the 40h command (read ambulatory mode memory from the device (Version E315)).

```
byte[] abpDataByteAry =
watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.ReadABPDataE315);
```

1.6.9. Read memo memory

The following example shows how to get the raw data of the 31h command (read memo memory).

```
byte[] memoDataByteAry =
watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.ReadMemoData);
```

1.6.10. Read BPM ambulatory mode setting

The following example shows how to get the raw data of the F2h command (read BPM ABP setting).

```
byte[] abpSettingByteAry =
watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.ReadABPSetting);
```

1.6.11. Set device's ID

The following example shows how to set device's ID.

```
if (watchBPO3Hid.CanCommunication)
{
    if (watchBPO3Hid.SendIDAndClearData("1001",false,false,false,false))
        MessageBox.Show("Set up the device successfully!");
}
```

1.6.12. Read the device's ID

The following example shows how to get the raw data of the 24h command (read ID

string from the device).

```
byte[] idByteAry = watchBPO3Hid.WriteCmd(WatchBPO3Hid.CmdEnum.ReadID);
```

1.6.13. Clear the device's usual data

The following example shows how to clear device's usual data. The device's ID should be get previously.

```
if (watchBPO3Hid.CanCommunication)
{
    if (watchBPO3Hid.SendIDAndClearData("1001",true,false,false,false))
        MessageBox.Show("Set up the device successfully!");
}
```

1.6.14. Clear the device's diagnostic data

The following example shows how to clear device's diagnostic data. The device's ID should be get previously.

```
if (watchBPO3Hid.CanCommunication)
{
    if (watchBPO3Hid.SendIDAndClearData("1001",false,true,false,false))
        MessageBox.Show("Set up the device successfully!");
}
```

1.6.15. Clear the device's memo data

The following example shows how to clear device's memo data. The device's ID should be get previously.

```
if (watchBPO3Hid.CanCommunication)
{
    if (watchBPO3Hid.SendIDAndClearData("1001",false,false,true,false))
        MessageBox.Show("Set up the device successfully!");
}
```

1.6.16. Clear the device's ambulatory mode data

The following example shows how to clear device's ambulatory mode data. The device's ID should be get previously.

```
if (watchBPO3Hid.CanCommunication)
{
    if (watchBPO3Hid.SendIDAndClearData("1001",false,false,false,true))
        MessageBox.Show("Set up the device successfully!");
}
```

1.6.17. Clear the device's all data

The following example shows how to clear device's all data. The device's ID should be get previously.

```
if (watchBPO3Hid.CanCommunication)
{
    if (watchBPO3Hid.SendIDAndClearData("1001",true,true,true,true))
        MessageBox.Show("Set up the device successfully!");
}
```

1.6.18. Set the device's ambulatory mode configurations

The following example shows how to set device's ambulatory mode configurations.

```
WatchBPO3.Decode.ABPSetting abpSetting = new WatchBPO3.Decode.ABPSetting
{...};
if (watchBPO3Hid.SendABPSetting(abpSetting))
    MessageBox.Show("Set up the device successfully!");
```

2. ABPSetting class

This class stores whole configurations of ambulatory mode.

2.1. Inheritance Hierarchy

WatchBPO3.Decode.ABPSetting
Namespace: WatchBPO3.Decode

2.2. Properties

Name	Description
DayPeriod	Gets or sets day period. The range is from 0 to 23. If you set it out of the range, the day period will be set to 0.
NightPeriod	Gets or sets night period. The range is from 0 to 23. If you set it out of the range, the night period will be set to 0.
DayInterval	Gets or sets the day measurement interval.
NightInterval	Gets or sets the night measurement interval.
MemorySetOfMemo	Gets or sets the memory set of memo.
Hi_infPressure	Gets or sets the highest inflation pressure.
HideABPMData	Gets or sets a value indicating whether to hide ABPM data or not.
Silent	Gets or sets a value indicating whether to enable silence mode or not.
Batteryf	Gets or sets the voltage of the battery.

3. Device class

This class stores whole device's configurations.

3.1. Inheritance Hierarchy

WatchBPO3.Decode.Device
Namespace: WatchBPO3.Decode

3.2. Properties

Name	Properties
ID	Gets or sets the device's ID.
DeviceDateTime	Gets or sets the device's date and time.
DeviceName	Gets or sets the device's name.

4. Data class

This class stores whole records of data.

4.1. Inheritance Hierarchy

WatchBPO3.Decode.Data
Namespace: WatchBPO3.Decode

4.2. Properties

Name	Descriptions
ID	Gets or sets the ID of the data.
MeasureDateTime	Gets or sets the measurement date and time of the data.
Systole	Gets or sets the systole of the data.
Diastole	Gets or sets the diastole of the data.
Pulse	Gets or sets the pulse of the data.
Mam	Gets or sets the mam of the data.
Comments	Gets or sets the comments string of the data.
Arr	Gets or sets the arrhythmia type of the data.
Ampm	Gets or sets am or pm of the data.
DayNight	Gets or sets day or night of the data.
DataType	Gets or sets the datatype of the data.
MAP	Gets or sets the MAP of the data.
Err	Gets or sets the error of the data.
ErrMsg	Gets or sets the error description of the data.

4.3. Enumerations

4.3.1. AMPM Enumeration

Name	Value
none	0
am	1
pm	2

4.3.2. dayNight Enumeration

Name	Value
none	0

day	1
night	2

4.3.3. DataTypeEnum Enumeration

Name	Value
none	0
all	1
usual	2
diagnostic	3
ABP	4
memo	5

4.3.4. ErrMsgEnum Enumeration

Name	Value
none	0
SignalsIsTooWeak	1
ErrorSignal	2
NoPressureInTheCuff	3
AbnormalResult	4
LowBattery	5

4.4. Global Enumerations (WatchBPO3.Decode)

4.4.1. ArrhythmiaEnum Enumeration

Name	Value
noArr	0
PAD	1
AFIB	2

5. DeviceInfoParser class

This class converts the byte representation of raw data to their real data (Device class).

5.1. Inheritance Hierarchy

WatchBPO3.Decode.DeviceInfoParser
Namespace: WatchBPO3.Decode

5.2. Extension Methods

Name	Parameters	Description
ParseDeviceID(byte[], out string)	*dataAry* Type: System.Byte[] *deviceID* Type: System.String	Converts the byte array to the string and returns it. Returns a value indicating whether the checksum is correct or not.
ParseDeviceName(byte[], out string)	*dataAry* Type: System.Byte[] *deviceName* Type: System.String	Converts the byte array to the string and returns it. Returns a value indicating whether the checksum is correct or not.
ParseDeviceDateTime(byte[], out string)	*dataAry* Type: System.Byte[] *deviceDateTime* Type: System.String	Converts the byte array to the string and returns it. Returns a value indicating whether the checksum is correct or not.
ParseABPSetting(byte[], out ABPSetting)	*dataAry* Type: System.Byte[] *abpSetting* Type: WatchBPO3.Decode.ABPSetting	Converts the byte array to the ABPSetting class and returns it. Returns a value indicating whether the checksum is correct or not.

5.3. Examples

5.3.1. Parse the raw data of device's name

The following example shows how to parse the raw data of device's name.

```
using WatchBPO3.Decode;
...
    byte[] dataAry;        // raw data received from the device
    ...
    string deviceName;
    if (DeviceInfoParser.ParseDeviceName(dataAry, out deviceName))
        MessageBox.Show("The device's version is {0}",deviceName);
```

5.3.2. Parse the raw data of device's ID

The following example shows how to parse the raw data of device's ID.

```
using WatchBPO3.Decode;
...
    byte[] dataAry;        // raw data received from the device
    ...
    string id;
    if (DeviceInfoParser.ParseDeviceID(dataAry, out id))
        MessageBox.Show("The device's ID is {0}",id);
```

5.3.3. Parse the raw data of device's date and time

The following example shows how to parse the raw data of device's date and time.

```
using WatchBPO3.Decode;
...
    byte[] dataAry;        // raw data received from the device
    ...
    string deviceDateTime;
    if (DeviceInfoParser.ParseDeviceDateTime(dataAry,out deviceDateTime))
        MessageBox.Show("The device's datetime is {0}",deviceDateTime);
```

5.3.4. Parse the raw data of device's ambulatory mode setting

The following example shows how to parse the raw data of device's ambulatory mode setting.

```csharp
using WatchBPO3.Decode;
...
    byte[] dataAry;        // raw data received from the device
    ...
    ABPSetting abpSetting;
    if (DeviceInfoParser.ParseDeviceDateTime(dataAry, out abpSetting))
    {
        MessageBox.Show("Battery: {0}V",abpSetting.Batteryf);
        MessageBox.Show("Day Interval: {0}",abpSetting.DayInterval);
        MessageBox.Show("Day Period: {0}",abpSetting.DayPeriod);
        MessageBox.Show("Night Interval: {0}",abpSetting.NightInterval);
        MessageBox.Show("Night Period: {0}",abpSetting.NightPeriod);
        MessageBox.Show("The highest inflation pressure:
{0}",abpSetting.Hi_infPressure);
        MessageBox.Show("Hide ABP data: {0}",abpSetting.HideABPMData);
        MessageBox.Show("Silent: {0}",abpSetting.Silent);
    }
```

6. DataParser class

This class converts the byte representation of raw data to their real data (Data class).

6.1. Inheritance Hierarchy

WatchBPO3.Decode.DataParser
Namespace: WatchBPO3.Decode

6.2. Extension Methods

Name	Parameters	Description
ParseUsuData(byte[], out List<Data>)	*dataAry* Type: System.Byte[] *usuData* Type: System.Collections.Generic.List<Data>	Converts the byte array to the List<Data> and returns it. Returns a value indicating whether the checksum is correct or not.
ParseDiagData(byte[], out List<Data>)	*dataAry* Type: System.Byte[] *diagData* Type: System.Collections.Generic.List<Data>	Converts the byte array to the List<Data> and returns it. Returns a value indicating whether the checksum is correct or not.
ParseMemoData(byte[], out List<string>)	*dataAry* Type: System.Byte[] *memoData* Type: System.Collections.Generic.List<string>	Converts the byte array to the List<Data> and returns it. Returns a value indicating whether the checksum is correct or not.
ParseABPData(byte[], out	*dataAry* Type: System.Byte[]	Converts the byte array to the List<Data> and

		returns it. Returns a value indicating whether the checksum is correct or not.
List<Data>)	*abpData* Type: System.Collections.Generic.List<Data>	
ParseABPDataE315(byte[], out List<Data>)	*dataAry* Type: System.Byte[] *abpDataE315* Type: System.Collections.Generic.List<Data>	Converts the byte array to the List<Data> (E315 version) and returns it. Returns a value indicating whether the checksum is correct or not.

6.3. Fields

Name	Description
ErrCount	Shows the total counts of error in the data.

6.4. Examples

6.4.1. Parse the raw data of device's usual data

The following example shows how to parse the raw data of device's usual data.

```csharp
using WatchBPO3.Decode;
...
    byte[] dataAry;        // raw data received from the device
    ...
    List<Data> usualData;
    if (DataParser.ParseUsuData(dataAry, out usualData))
    {
        for (int i = 0; i < usualData.Count; i++)
        {
            string usualDataStr = string.Format(
            "MeasureDatetime: {0}, DataType: {1}, Sys: {2}, Dia: {3},
        Pulse: {4}", usualData[i].MeasureDateTime, usualData[i].DataType,
        usualData[i].Systole, usualData[i].Diastole, usualData[i].Pulse
            );
            listBox.Items.Add(usualDataStr);
        }
    }
```

6.4.2. Parse the raw data of device's diagnostic data

The following example shows how to parse the raw data of device's diagnostic data.

```csharp
using WatchBPO3.Decode;
...
    byte[] dataAry;         // raw data received from the device

    ...

    List<Data> diagnosticData;
    if (DataParser.ParseDiagData(dataAry, out diagnosticData))
    {
        for (int i = 0; i < diagnosticData.Count; i++)
        {
            string diagDataStr = string.Format(
            "MeasureDatetime: {0}, DataType: {1}, Sys: {2}, Dia: {3},
        Pulse: {4}", diagnosticData[i].MeasureDateTime,
        diagnosticData[i].DataType, diagnosticData[i].Systole,
        diagnosticData[i].Diastole, diagnosticData[i].Pulse
            );
            listBox.Items.Add(diagDataStr);
        }
    }
```

6.4.3. Parse the raw data of device's ambulatory mode data

The following example shows how to parse the raw data of device's ambulatory mode data.

```csharp
using WatchBPO3.Decode;
...
    byte[] dataAry;        // raw data received from the device
    ...
    List<Data> abpData;
    bool decodeErr = false;
    switch(deviceName)     // current device version
    {
        case "WH022":
            decodeErr = !DataParser.ParseABPData(dataAry, out abpData);
            break;
        case "WH023":
            decodeErr = !DataParser.ParseABPDataE315(dataAry, out
abpData);
        case "WH025":
            decodeErr = !DataParser.ParseABPDataE315(dataAry, out
abpData);
            break;
    }
    if (!decodeErr)
    {
        for (int i = 0; i < abpData.Count; i++)
        {
            string abpDataStr;
            if (abpData[i].ErrMsg != Data.ErrMsgEnum.none)
                abpDataStr = string.Format("MeasureDatetime: {0}, Error:
{1}",abpData[i].MeasureDateTime,abpData[i].ErrMsg);
            else
                abpDataStr = string.Format("MeasureDatetime: {0}, DataType:
{1}, Sys: {2}, Dia: {3}, Pulse: {4}", abpData[i].MeasureDateTime,
abpData[i].DataType, abpData[i].Systole, abpData[i].Diastole,
abpData[i].Pulse );
            listBox.Items.Add(abpDataStr);
        }
    }
```

6.4.4. Parse the raw data of device's pill memo data

The following example shows how to parse the raw data of device's pill memo data.

```csharp
using WatchBPO3.Decode;
...
    byte[] dataAry;        // raw data received from the device

    ...

    List<string> memoData;
    if (DataParser.ParseMemoData(dataAry, out memoData))
    {
        for (int i = 0; i < memoData.Count; i++)
        {
            listBox.Items.Add(memoData[i]);
        }
    }
```