

SerialPundit

HID report descriptor examples

Complete USB device descriptor along with HID report descriptor

Device Descriptor :

Field	Value	Description
bLength	0x12	Size of this descriptor in bytes : 18 bytes
bDescriptorType	0x01	Descriptor type (device descriptor)
bcdUSB	0x0200	USB specification release number: 2.0 (high speed)
bDeviceClass	0x00	Device Class (defined at interface level)
bDeviceSubClass	0x00	Device subclass
bDeviceProtocol	0x00	Device protocol
bMaxPacketSize0	0x40	Max Packet Size of Endpoint 0: 64 bytes
idVendor	0xYYYY	Vendor identifier (fill your USB-IF VID)
idProduct	0xZZZZ	Product identifier (fill your USB PID)
bcdDevice	0x0100	Device release number: 1.00
iManufacturer	0x01	Index of the manufacturer String descriptor: 1
iProduct	0x02	Index of the product String descriptor: 2
iSerialNumber	0x03	Index of the serial number String descriptor : 3
bNumConfigurations	0x01	Number of possible configurations: 1

Configuration Descriptor :

Field	Value	Description
bLength	0x09	Size of this descriptor in bytes : 9
bDescriptorType	0x02	Descriptor type (configuration descriptor)
wTotalLength	0x20	Total length (in bytes) of the returned data by this descriptor (including interfaces and endpoint descriptors) : 32 bytes
bNumInterfaces	0x01	Number of interfaces supported by this configuration
bConfigurationValue	0x01	Value to use as an argument to select this configuration
iConfiguration	0x00	Index of String Descriptor describing this configuration (optional)
bmAttributes	0x40	Self powered
bMaxPower	0x32	Maximum Power Consumption in 2mA units : 100mA

Interface Descriptor :

Field	Value	Description
bLength	0x09	Size of this descriptor in bytes : 9
bDescriptorType	0x04	Descriptor type (interface descriptor)
bInterfaceNumber	0x00	Interface number 0
bAlternateSetting	0x00	Alternate Setting number (single interface/setting)
bNumEndpoints	0x02	Number of Endpoints used for this interface
bInterfaceClass	0x03	Class Code (USB HID)
bInterfaceSubClass	0x00	No Subclass
bInterfaceProtocol	0x00	Protocol Code (none)
iInterface	0x00	Index of String Descriptor Describing this interface : none

Endpoint Descriptor :

Field	Value	Description
bLength	0x07	Size of this descriptor in bytes : 7
bDescriptorType	0x05	Descriptor type (endpoint descriptor)
bEndpointAddress	0x81	Endpoint Address (EP 1 IN)
bmAttributes	0x03	Transfer Type - Interrupt, Sync Type – None, Usage Type - Data
wMaxPacketSize	0x40	Maximum Packet Size this endpoint is capable of sending or receiving (1x 64 bytes)
bInterval	0x0A	Interval for polling endpoint data transfers in units of frame count : 1.25 msec (for high speed 125uS * x)

Endpoint Descriptor :

Field	Value	Description
bLength	0x07	Size of this descriptor in byte : 7
bDescriptorType	0x05	Descriptor type (endpoint descriptor)
bEndpointAddress	0x01	Endpoint Address (EP 1 OUT)
bmAttributes	0x03	Transfer Type - Interrupt, Sync Type – None, Usage Type - Data
wMaxPacketSize	0x40	Maximum Packet Size this endpoint is capable of sending or receiving (1x 64 bytes)
bInterval	0x0A	Interval for polling endpoint data transfers in units of frame count : 1.25 msec (for high speed 125uS * x)

HID Device Descriptor :

Field	Value	Description
bLength	0x09	Size of this descriptor in bytes : 9
bDescriptorType	0x21	Descriptor type (HID device descriptor)
bcdHID	0x0100	HID class specification version : 1.11
bCountryCode	0x00	Not supported
bNumDescriptors	0x01	Number of HID class descriptors
bDescriptorType	0x22	Report descriptor type : report
wDescriptorLength	0x1D	Length of report descriptor : 29 bytes

HID report Descriptor :

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0x06, 0x00, 0xFF,    // Usage Page (Vendor Defined 0xFF00)
0x09, 0x01,          // Usage (0x01)
0xA1, 0x01,          // Collection (Application)
0x19, 0x01,          //   Usage Minimum (0x01)
0x29, 0x10,          //   Usage Maximum (0x10)
0x15, 0x00,          //   Logical Minimum (0)
0x26, 0xFF, 0x00,    //   Logical Maximum (255)
0x75, 0x08,          //   Report Size (8)
0x95, 0x40,          //   Report Count (64)
0x81, 0x00,          //   Input (Data,Array,Abs,No Wrap,Linear,Preferred State,No Null
Position)
0x19, 0x01,          //   Usage Minimum (0x01)
0x29, 0x10,          //   Usage Maximum (0x10)
0x91, 0x00,          //   Output (Data,Array,Abs,No Wrap,Linear,Preferred State,No Null
Position,
                        Non-volatile)
0xC0                  // End Collection

```

This HID report descriptor specifies :

- Size of both input and output reports is 64 bytes.
- Each report is 8 bit wide.
- How to use this device is defined by vendor.
- Report does not uses report ID i.e. non-numbered reports.