AN434: CP2110/4 Interface Specification

The Silicon Laboratories CP2110 and CP2114 are USB devices that comply with the USB-defined HID (Human Interface Device) class specification.

The USB host communicates with HID devices through the use of reports. This document is a specification for the reports supported by the CP2110/4 and it also describes the configurable parameters.

Silicon Laboratories provides dynamic libraries that adhere to this specification for the following operating systems:

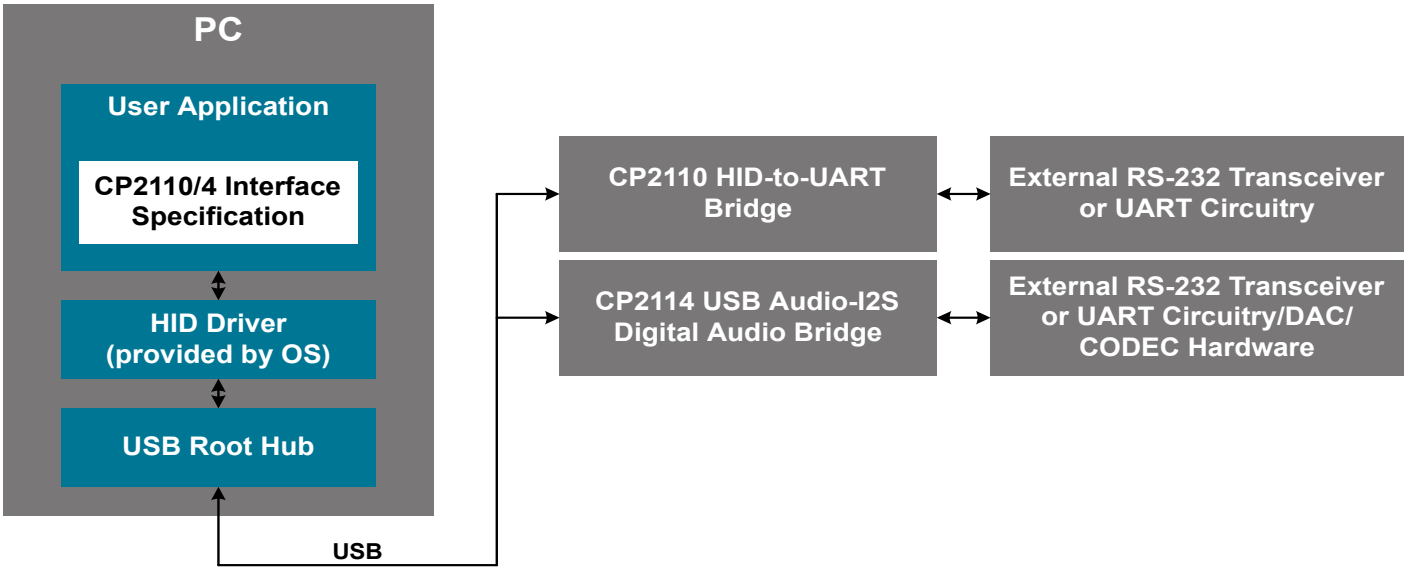
- Windows
- Mac OS X
- Linux

This document is intended for the following:

- Users who are using an operating system that is not supported by the dynamic libraries and therefore need to implement their own interface library.
- Users who want to integrate the device interface functionally into their application.
- Users who wish to examine the USB traffic between the host and CP2110/4 devices for debugging purposes.

KEY POINTS

- The interface described in this document can be used to support non-natively supported operating systems for the CP2110/4.
- Higher level libraries that sit above this interface are available for Windows, Mac OS X, and Linux.



1. Additional Documentation

- *CP2110 and CP2114 Data Sheets*—Available on the Silicon Labs website (www.silabs.com/interface) or in Simplicity Studio.
- *AN433: CP2110 HID-to-UART API Specification*—This document describes the interface library API (Applications Programming Interface). Application notes are available on the Silicon Labs website (www.silabs.com/interface-appnotes) or in Simplicity Studio using the [**Application Notes**] tile.
- *HID Device Class Definition*—Available at http://www.usb.org/developers/hidpage/.

2. Default Values

2.1 Default Values for Parameters Stored in PROM

Table 2.1 CP2110 Default PROM Values on page 3 and Table 2.2 CP2110 Default Pin Settings on page 3 list the default values for the one-time configurable parameters stored in the PROM of the CP2110. Table 2.3 CP2114 Default PROM Values on page 4 and Table 2.4 CP2114 Default Pin Settings on page 4 list the default values for the one-time configurable parameters stored in the PROM of the CP2114.

Table 2.1. CP2110 Default PROM Values

Parameter	Default Value
VID	0x10C4
PID	0xEA80
Power	50 (100 mA)
Power Mode	Bus Powered
Flush Buffers	Flush TX/RX on Open
Manufacturing String	Silicon Laboratories Inc.
Product String	CP2110 HID USB-to-UART Bridge
Serial String	0001
Lock Bytes	0xFF0F [1]

Note:
1. The lock bytes indicate which parameters have already been programmed.

Table 2.2. CP2110 Default Pin Settings

Parameter	Default Value
GPIO0_CLK	0x00 (GPIO–Input)
GPIO1_RTS	0x03 (RTS)
GPIO2_CTS	0x03 (CTS)
GPIO3_RS485	0x03 (RS-485 Transceiver Control)
GPIO4_TXT	0x03 (TX Toggle)
GPIO5_RXT	0x03 (RX Toggle)
GPIO6	0x00 (GPIO–Input)
GPIO7	0x00 (GPIO–Input)
GPIO8	0x02 (GPIO–Push-pull Output)
GPIO9	0x02 (GPIO–Push-pull Output)
TX	0x02 (Push-Pull)
Suspend	0x02 (Push-Pull)
Suspend	0x02 (Push-Pull)
Suspend Latch Mode	0x0000

Parameter	Default Value
Suspend Latch Value	0x0000
RS485 Level	0x01 (Active High)
Clock Out Divider	0x00 (Divide by 1)

Table 2.3. CP2114 Default PROM Values

Parameter	Default Value
VID	0x10C4
PID	0xEAB0
Power	50 (100 mA)
Power Mode	Bus Powered
Release Version (Major)	1
Release Version (Minor)	0
Flush Buffers	Flush TX/RX on Open
Manufacturing String	Silicon Laboratories
Product String	CP2114 USB-to-Audio Bridge
Serial String	(Unique randomized serial number)
Lock Bytes	0xFF0F [1]

Note:
1. The lock bytes indicate which parameters have already been programmed.

Table 2.4. CP2114 Default Pin Settings

Parameter	Default Value
GPIO.0_RMUTE	0x03 (Record Mute control)
GPIO.1_PMUTE	0x03 (Playback Mute control)
GPIO.2_VOL-	0x03 (Volume Decrease control)
GPIO.3_VOL+	0x03 (Volume Increase control)
GPIO.4_RMUTELED	0x03 (Record Mute indicator)
GPIO.5_TXT_CFGSEL0	0x04 (Config Select control)
GPIO.6_RXT_CFGSEL1	0x04 (Config Select control)
GPIO.7_RTS_CFGSEL2	0x04 (Config Select control)
GPIO.8_CTS_CFGSEL3	0x04 (Config Select control)
GPIO.9_CLKOUT	0x03 (Clock Output)
GPIO.10_TX	0x04 (TX output, push-pull)
GPIO.11_RX	0x03 (RX input)
SUSPEND	0x02 (push-pull output)

Parameter	Default Value
/SUSPEND	0x02 (push-pull output)
SUSPEND Latch Value	0x0000
SUSPEND Latch Mode	0x0000
Clock Output Divider	0x00 (Divide by 1)

2.2 Default UART Configuration

The tables below show the default settings for the UART. Upon a device power-up or reset, these settings are used.

Table 2.5. UART Transfer Settings

Parameter	Default Value
UART Enable	0x00 (Disabled)
Baud Rate	115200
Parity	0x00 (None)
Flow Control	0x00 (None)
Data Bits	0x03 (8 bits)
Stop Bits	0x01 (1 bit)

Table 2.6. Other UART Settings

Parameter	Default Value
TX FIFO	0x00 (TX FIFO empty)
RX FIFO	0x00 (RX FIFO empty)
Error Status	0x00 (No Parity or Overrun errors)
Break Status	0x00 (Line Break is inactive)

3. Report Overview

Communication with the CP2110 is performed using HID Reports as defined in the HID Device Class Definition. The class definition is available for download at http://www.usb.org/developers/hidpage/.

3.1 Reports Response

The CP2110 responds to reports in different ways depending on if the report configures a parameter on the device using a Set Report or if it requests data from the device using a Get Report. The list of all supported reports is available in 4. Report ID List.

3.1.1 Set Reports

In response to a Set Report, the CP2110 will not return any report or acknowledgement of a report. To verify that a report has completed successfully, use the corresponding Get Report to obtain the data. The delay imposed by the HID protocol between reports guarantees that there will be no race condition between the execution of a Set Report and Get Report verification. A Set Report will always complete before the device receives the Get Report.

3.1.2 Get Reports

If a report requests data from the device and the report is valid, the device will return a report with the requested data. If the report is invalid, the device will stall.

3.2 Data Format

In all of the reports, the first byte of the data portion of the payload is the Report ID. In the report definitions in this document, the Report ID is stored in index 0 of the payload and is not explicitly listed in the table. All data content in the report starts at index 1. The reports have a maximum length of 64 bytes, indexed from 0–63. Unless explicitly noted otherwise, multibyte values for Set/Get reports are transmitted least-significant byte first.

4. Report ID List

Report IDs 0x01–0x3F are used to transmit UART data across the Interrupt pipes.

Report IDs 0x40–0x66 are reserved for device configuration and customization.

Table 4.1. Report IDs

Report ID	Report Name
UART Data Transfer (Interrupt Transfer)	
0x0–0x3F	Set Send Data and Get Receive Data
Device Configuration (Control Transfer)	
0x40	Set Reset Device
0x41	Get Set UART Enable
0x42	Get UART Status
0x43	Set Purge FIFOs
0x44	Get GPIO Values
0x45	Set GPIO Values
0x46	Get Version Information
0x47	Get Set Lock Byte
UART Configuration (Control Transfer)	
0x50	Get Set UART Config
0x51	Set Transmit Line Break
0x52	Set Stop Line Break
USB Customization (Control Transfer)	
0x60	Get Set USB Configuration
0x61	Get Set Manufacturing String 1
0x62	Get Set Manufacturing String 2
0x63	Get Set Product String 1
0x64	Get Set Product String 2
0x65	Get Set Serial String
0x66	Get Set Pin Configuration
CP2114 Customization and Configuration (Control Transfer)	
0x70	Get Device Status
0x71	Get Device Capabilities
0x72	Get RAM Configuration
0x73	Set RAM Configuration
0x74	Set DAC Registers
0x75	Get DAC Registers
0x76	Get OTP Configuration

Report ID	Report Name
0x77	Get Device Version
0x78	Create OTP Configuration
0x79	Set Boot Configuration
0x7A	Set Parameters For Next Get
0x7B	Get OTP All Configurations
0x7C	Set OTP All Configurations
0x7D	I2C Write Data
0x7E	I2C Read Data

5. Device Configuration Reports

5.1 Set Reset Device

Report ID: 0x40

Direction: Control Out

Name	Offset	Size	Value	Description
Reset Type	1	1	0x00	Reset with re-enumeration

`Set Reset Device` is used to restart the device from the USB host. The device will re-enumerate on the USB bus and all UART configuration settings are reset to their default values.

For certain operating systems such as Windows, initiating a device reset and re-enumerating will make the device's handle stale. The user application is responsible for handling this "surprise disconnect" event. See *AN433: CP2110/4 HID-to-UART API Specification* for more information regarding surprise disconnects.

5.2 Get/Set UART Enable

Report ID: 0x41

Direction: Control In/Out

Name	Offset	Size	Value	Description
UART Enable	1	1	0x00	UART disabled
			0x01	UART enabled

`Get UART Enable` returns the Enable status of the UART. The UART is disabled by default.

`Set UART Enable` checks the FlushBuffers programmed parameter and purges the FIFOs depending on the parameter Enable or Disable, which are treated as Open and Close respectively.

5.3 Get UART Status

Report ID: 0x42

Direction: Control In

Name	Offset	Size	Value	Description
TX FIFO	1	2	See below	Number of bytes in Transmit FIFO
RX FIFO	3	2	See below	Number of bytes in Receive FIFO
Error Status	5	1	See below	Parity and Overrun errors
Break Status	6	1	0x00	Line break is not active
			0x01	Line break is active

`TX FIFO` is the number of bytes left for the device transfer to the UART-based device. The transmit FIFO buffer can hold up to 480 bytes. The value returned is a two-byte, unsigned integer.

`RX FIFO` is the number of bytes left for the device to transfer to the USB host. The receive FIFO buffer can hold up to 480 bytes. The value returned is a two-byte, unsigned integer.

`Error Status` indicates if a Parity error (bit 0) or Overrun error (bit 1) has occurred since the last time Error Status was read by the user. Reading Error Status clears the errors.

`Break Status` indicates if a line break is currently in progress.

5.4 Set Purge FIFOs

Report ID: 0x43

Direction: Control Out

Name	Offset	Size	Value	Description
Purge Type	1	1	0x01	Purge all data in the transmit FIFO
			0x02	Purge all data in the receive FIFO
			0x03	Purge all data in both buffers

This report is used to empty the transmit and receive FIFO buffers on the CP2110/4 device. The host application is responsible for purging any host-side buffer.

If `Purge Type` is set to 0x01, the device will clear all data from the transmit buffer.

If `Purge Type` is set to 0x02, the device will clear all data from the receive buffer.

If `Purge Type` is set to 0x03, the device will clear the data from both the transmit and receive buffers.

5.5 Get GPIO Values

Report ID: 0x44

Direction: Control In

Name	Offset	Size	Value	Description
Latch Value	1	2	*	Current latch values

*See 10. Appendix A—Pin Configuration Options for details of this 2-byte value.

If a pin is configured as a GPIO input pin or a flow control pin that is an input, the corresponding Latch Value bit represents the input value.

If a pin is configured as a GPIO output pin or a flow control pin that is an output, the corresponding Latch Value bit represents the logic level driven on the pin.

5.6 Set GPIO Values

Report ID: 0x45

Direction: Control Out

Name	Offset	Size	Value	Description
Latch Value	1	2	*	Latch value
Latch Mask	3	2	*	Pin to set to new latch value

*See 10. Appendix A—Pin Configuration Options for details of these 2-byte values.

`Set GPIO Values` sets the values for GPIO pins or Flow Control pins that are configured as outputs.

The desired value for the pin is configured in `Latch Value`. To drive a 1 on an output pin, the corresponding bit should be set to 1. To drive a 0 on an output pin, the corresponding bit should be set to 0.

The Report will set new values only for output pins that have a 1 in the corresponding bit position in `Latch Mask`. If the corresponding bit in Latch Mask is set to 0, a new pin value will not be set, even if the pin is configured as an output pin.

The Report does not affect any pins that are not configured as outputs. This Report is only valid for the GPIO/Flow control pins. Pins TX, RX, Suspend, and /Suspend cannot be configured using this Report. The unused Latch Value and Latch Mask bits can be set to 1 or 0.

5.7 Get Version Information

Report ID: 0x46

Direction: Control In

Name	Offset	Size	Value	Description
Part Number	1	1	0x0A	Device part number
Device Version	2	1	Varies	Device version

`Part Number` indicates the device part number. The CP2110 returns 0x0A.

`Device Version` is the version of the device. This value is not programmable over the HID interface.

5.8 Get/Set Lock Byte

Report ID: 0x47

Direction: Control In/Out

Name	Offset	Size	Value	Description
Lock Status	1	2	See below	Shows which fields have already been programmed.

The device has a 2-byte field which indicates which of the customizable fields have been programmed. The following table shows the values of the bits:

Bit Position	MSB – address[1]	LSB – address[2]
Bit 0	VID	String 2–Part 1
Bit 1	PID	String 2–Part 2
Bit 2	Max Power	String 3
Bit 3	Power Mode	Pin Config
Bit 4	Release Version	(unused)
Bit 5	Flush Buffers	(unused)
Bit 6	String 1–Part 1	(unused)
Bit 7	String 1–Part 2	(unused)

If the bit value is set to 1, the corresponding field has not been customized. If the bit value is set to 0, the field has been customized and can no longer be changed for this device.

Using the `Set Lock Byte Report`, any bit value set to 0 will lock the corresponding field. Send 0x00F0 to lock all parameters and prevent future customization.

6. UART Reports

The device enumerates Report IDs 0x01–0x3F for the Send and Get Data functions. The report ID indicates the number of data bytes being transferred, not including the Report ID itself.

6.1 Set Send Data

Report ID: 0x01 to 0x3F

Direction: Interrupt Out

Name	Offset	Size	Value	Description
Buffer	1	1–63	—	Data to be sent to the UART

`Set Send Data` is used to send data from the USB host to the UART device.

`Buffer` is the data to be transferred. The USB host application can transfer up to 1–63 data bytes using this Report.

6.2 Get Receive Data

Report ID: 0x01 to 0x3F

Direction: Interrupt In

A USB host requests data automatically from an HID device and thus this report is not typically required.This Report can be used to receive any data in between the automatic updates by the device.

Name	Offset	Size	Value	Description
Buffer	1	1–63	—	Data to be sent to the USB Host

`Get Receive Data` is used to receive data from the UART device.

`Buffer` is the data to be transferred. The USB host application can transfer up to 1–63 data bytes using this Report.

6.3 Get/Set UART Config

Report ID: 0x50

Direction: Control In/Out

Name	Offset	Size	Value	Description
Baud Rate	1	4	See below	Baud rate in bits per second
Parity	5	1	0x00	No Parity
			0x01	Odd Parity
			0x02	Even Parity
			0x03	Mark Parity
			0x04	Space Parity
Flow Control	6	1	0x00	No Flow Control
			0x01	Hardware Flow Control
Data Bits	7	1	0x00	5 data bits
			0x01	6 data bits
			0x02	7 data bits
			0x03	8 data bits
Stop Bits	8	1	0x00	Short Stop Bit
			0x01	Long Stop Bit

Note: Values from the Set Report are not stored in PROM. These parameters must be initialized after every power-on or device reset.

`Baud Rate` is the speed in bits per second (bps) at which data is transferred over the UART. It is stored as a 4-byte unsigned number and must be sent with the MSB first (big endian). The minimum baud rate is 300 bps for the CP2110 and 375 bps for the CP2114. The maximum baud rate for the CP2110 and CP2114 is 1 Mbps (1,000,000 bps) when using 7 or 8 data bits, and 500 kbps (500,000 bps) when using 5 or 6 data bits.

The CP2114 maximum usable baud rate and average UART data transfer throughput are highly dependent on the following conditions (see the CP2114 data sheet for details):

- Flow control mechanism (Hardware/None)
- Communication mode (Simplex/Duplex)
- Audio play and/or record streaming (Active/Inactive)

`Parity` is the type of parity bit that is appended to each data byte. The five types of parity available are none, even, odd, mark, and space parity. If `No Parity` is configured, no extra bit is appended to each data byte.

`Flow Control` is the type of handshaking used for the UART communication. The available types of flow control are No Flow Control and Hardware Flow Control. Hardware Flow Control uses the RTS and CTS pins.

`Data Bits` is the number of data bits per UART transfer. The UART can operate at 5, 6, 7, or 8 data bits.

`Stop Bits` is the number of stop bits used after each data byte. If Data Bits is set to 5, a Short Stop Bit is equivalent to 1 bit time, and Long Stop Bit is equivalent to 1.5 bit times. If Data Bits is set to 6, 7, or 8, a Short Stop Bit is equivalent to 1 bit time, and Long Stop Bit is equivalent to 2 bit times.

6.4 Set Transmit Line Break

Report ID: 0x51

Direction: Control Out

Name	Offset	Size	Value	Description
Line Break Time	1	1	See below	Length of line break in ms

`Set Transmit Line Break` is used to transmit a line break on the TX pin. The line break will last for the amount of time specified in Line Break Time. The valid range for Line Break Time is 0 to 125 ms. The TX FIFO buffer is also purged when a line break is started.

If a value of 0 is set for `Line Break Time`, the device will transmit a line break until it receives a `Set Stop Line Break` Report.

6.5 Set Stop Line Break

Report ID: 0x52

Direction: Control Out

Name	Offset	Size	Value	Description
Report ID	0	1	—	(no data bytes)

`Set Stop Line Break` is used to stop a line break if it is in progress. If no line break is currently in progress, this report is ignored.

Set `Report ID` to the report ID of `Set Stop Line Break`. There are no data bytes in the payload other than the Report ID.

7. Programmable USB Parameters

The following parameters are programmable on the device. Seven different reports are provided to program these parameters. Each of those seven reports can only be called once for each device.

Name	Description
VID	USB Vendor ID
PID	USB Product ID
Power	Power request in mA/2
Power Mode	Bus Powered Self Powered–Regulator Off Self Powered–Regulator On
Release Version	Major and Minor release version
Flush Buffers	Purge FIFOs on enable/disable
Manufacturer String	Product Manufacturer
Product String	Product Description
Serial String	Serialization String
Pin Configuration	All pins configuration
Lock Bytes	Indicates programmed values

`VID` is the USB Vendor ID.

`PID` is the USB Product ID.

`Power` is the current requested by the device from the USB host in bus-powered mode. The units for this value is milliamps / 2. For example, if the device is configured to request 200 mA, the value for Power is 100. The maximum setting for Power is 500 mA, or a value of 250. Unpowered USB hubs are limited to providing 100 mA per port.

`Power Mode` indicates whether the device is operating in Bus-powered (0x00), Self-powered (0x01, voltage regulator disabled) or Self-powered (0x02, voltage regulator enabled) mode. If the device is configured for Self-powered mode, the value programmed for Power is not used during USB enumeration.

`Release Version` is a user-programmable value. The most significant byte is the Major revision number. The least significant byte in the report is the Minor revision number. Both bytes can be programmed to any value from 0 to 255.

`Flush Buffers` determines whether the RX and/or TX FIFOs are purged upon a device open and/or close.

- 0x01—Flush Transmit FIFO upon Device Open
- 0x02—Flush Transmit FIFO upon Device Close
- 0x04—Flush Receive FIFO upon Device Open
- 0x08—Flush Receive FIFO upon Device Close

All bitwise-OR combinations of these four values are valid settings for `Flush Buffers`.

`Manufacturing String` is a 126-byte string, where the first two bytes must be set according to the USB specification (length, 0x03).

`Product String` is a 126-byte string, where the first two bytes must be set according to the USB specification (length, 0x03).

`Serial String` is a 63-byte character array used to provide a unique serial number/string for the device. The first two characters must be set according to the USB specification (length, 0x03).

8. PROM Programming Reports

8.1 Get/Set USB Configuration

Report ID: 0x60

Direction: Control In/Out

Name	Offset	Size	Value	Description
VID Low Byte	1	1	—	VID Low Byte
VID High Byte	2	1	—	VID High Byte
PID Low Byte	3	1	—	PID Low Byte
PID High Byte	4	1	—	PID High Byte
Power	5	1	—	Power requested in mA/2
Power Mode	6	1	—	Regulator Configuration
Release Major	7	1	—	Release Version Major Value
Release Minor	8	1	—	Release Version Minor Value
Flush Buffers	9	1	—	Which buffers to flush on open/close
Mask	10	1	—	Mask for what fields to program

`Get USB Configuration` returns the values for the various fields and also the `Mask` value. The Mask value is equal to the most significant byte value that is returned in Report Get Lock Byte. If the corresponding Mask bit is set to '0', the corresponding field has been programmed and any Set USB Configuration function operating on that field is ignored.

`Set USB Configuration` is used to customize these fields. The corresponding `Mask` bit should be set to '1' to program the field. If the field has already been programmed once, an attempt to reprogram it is ignored. If a field is being programmed with the current value, the programmed bit will still be set.

See 5.8 Get/Set Lock Byte for the definition of Mask.

8.2 Get/Set Manufacturing String 1

Report ID: 0x61

Direction: Control In/Out

Name	Offset	Size	Value	Description
String Length	1	1	—	Length of string + 2
USB Required	2	1	0x03	String indicator
Manufacturing String 1	3	61	—	First 61 bytes of string

The `Set Manufacturing String 1` Report can only be used once to set the Manufacturing String. Any subsequent calls to `Set Manufacturing String 1` are ignored.

The maximum value for `String Length` is 126. The first two bytes are allocated for `String Length` and the value 0x03, meaning the actual length of the pstring is 124 bytes. The device will ignore the report if `String Length` is too long. The string must be in Unicode format.

8.3 Get/Set Manufacturing String 2

Report ID: 0x62

Direction: Control In/Out

Name	Offset	Size	Value	Description
Manufacturing String 2	1	63	—	Second 63 bytes of string

The `Set Manufacturing String 2` Report can only be used once to set the Manufacturing String. Any subsequent calls to `Set Manufacturing String 2` are ignored.

`Manufacturing String 2` is the second half of the manufacturer string. If the Manufacturing String does not require the additional bytes, it does not need to be initialized. The string must be in Unicode format.

8.4 Get/Set Product String 1

Report ID: 0x63

Direction: Control In/Out

Name	Offset	Size	Value	Description
String Length	1	1	—	Length of string + 2
USB Required	2	1	0x03	String indicator
Product String 1	3	61	—	First 61 bytes of string

The `Set Product String 1` Report can only be used once to set the Product String. Any subsequent calls to `Set Product String 1` are ignored.

The maximum value for `String Length` is 126. The first two bytes are allocated for `String Length` and the value 0x03, meaning the actual length of the payload part of the string is 124 bytes. The device will ignore the Report if `String Length` is too long. The string must be in Unicode format.

8.5 Get/Set Product String 2

Report ID: 0x64

Direction: Control In/Out

Name	Offset	Size	Value	Description
Product String 2	1	63	—	Second 63 bytes of string

The `Set Product String 2` Report can only be used once to set the Product String. Any subsequent calls to `Set Product String 2` are ignored.

`Product String 2` is the second half of the product string. If the Product String does not require the additional bytes, it does not need to be initialized. The string must be in Unicode format.

8.6 Get/Set Serial String

Report ID: 0x65

Direction: Control In/Out

Name	Offset	Size	Value	Description
String Length	1	1	—	Length of string + 2
USB Required	2	1	0x03	String indicator
Ser String 1	3	61	—	61 bytes of string

The `Set Serial String` Report can only be used once to set the Serial String. Any subsequent calls to `Set Serial String` are ignored.

The maximum value for `String Length` is 63. The first two bytes are allocated for `String Length` and the value 0x03, meaning the actual length of the payload part of the string is 61 bytes. The device will reject the report if `String Length` is too long. The string must be in Unicode format.

8.7 Get/Set Pin Configuration

8.7.1 CP2110 Get/Set Pin Configuration

Report ID: 0x66

Direction: Control In/Out

The values in **bold** are the default values.

Name	Offset	Size	Value	Description
GPIO0_CLK	1	1	**0x00**	**GPIO Input Pin**
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	Clock Output–Push-Pull
GPIO1_RTS	2	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**RTS–Open-Drain**
GPIO2_CTS	3	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**CTS–Open-Drain**
GPIO3_RS485	4	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**RS-485 Transceiver Control**
GPIO4_TXT	5	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**TX LED Toggle–Push-Pull**
GPIO5_RXT	6	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**RX LED Toggle–Push-Pull**
GPIO6	7	1	**0x00**	**GPIO Input Pin**
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
GPIO7	8	1	**0x00**	**GPIO Input Pin**
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull

Name	Offset	Size	Value	Description
GPIO8	9	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	**GPIO Output–Push-Pull**
GPIO9	10	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	**GPIO Output–Push-Pull**
TX	11	1	0x01	TX–Open-Drain
			0x02	**TX–Push-Pull**
Suspend	12	1	0x01	Suspend–Open-Drain
			0x02	**Suspend–Push-Pull**
/Suspend	13	1	0x01	/Suspend–Open-Drain
			0x02	**/Suspend–Push-Pull**
Suspend Pin Latch	14	2	0x0000	Latch values in suspend state
Suspend Pin Mode	16	2	0x0000	Push-pull or open-drain
RS485 Level	18	1	0x00	Active Low
			0x01	**Active High**
Clock Out Divider	19	1	0x00–0xFF	Divider applied to GPIO0_CLK

The `Set Pin Configuration` Report should only be called once. Any further calls to this Report are ignored by the device. If any parameters are outside of their valid range, the report is ignored and no parameters are programmed. In this instance, the report can be called again with the correct values.

`GPIO0_CLK`, `GPIO1_RTS`, `GPIO2_CTS`, `GPIO3_RS485`, `GPIO4_TXT`, `GPIO5_RXT`, `GPIO6`, `GPIO7`, `GPIO8`, `GPIO9`, `TX`, `Suspend`, and `/Suspend` are used to configure the pins to various modes. See 11. Appendix B—CP2110 Pin Variable Definition for more information about each configuration option for each pin.

`Suspend Pin Latch` is the value that will be driven on the pins when the device is in a Suspend state. Suspend Pin Mode is the mode (open-drain or push-pull) the pins will be in when the device is in a Suspend state. See 10. Appendix A—Pin Configuration Options for details on interpreting the 2-byte values returned here.

`RS485 Level` configures the active logic level if GPIO2 is used as the RS485 transceiver control pin.

`Clock Out Divider` determines the divider for the clock output when GPIO0_CLK is configured for clock output function. When the divider is set to 0x00, the output frequency is 24 MHz. When the divider is set to any value between 0x01 and 0xFF, the output frequency is determined by the following formula:

$$\text{Output Frequency} = \frac{24\ \text{MHz}}{2 \times \text{Clock Out Divider}}$$

8.7.2 CP2114 Get/Set Pin Configuration

Report ID: 0x66

Direction: Control In/Out

The values in **bold** are the default values.

Name	Offset	Size	Value	Description
GPIO.0_RMUTE	1	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**Record Mute Input**
GPIO.1_PMUTE	2	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**Playback Mute Input**
GPIO.2_VOL–	3	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**Volume Decrease Input**
GPIO.3_VOL+	4	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**Volume Increase Input**
GPIO.4_RMUTELED	5	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**Record Mute Outputl**
GPIO.5_TXT_CFGSEL0	6	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	TX Toggle Output
			0x04	**Config Select Input**
GPIO.6_RXT_CFGSEL1	7	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	RX Toggle Output
			0x04	**Config Select Input**

Name	Offset	Size	Value	Description
GPIO.7_RTS_CFGSEL2	8	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	RTS–Open-Drain
			0x04	**Config Select Input**
GPIO.8_CTS_CFGSEL3	9	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	CTS–Open-Drain
			0x04	**Config Select Input**
GPIO.9_CLKOUT	10	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**Clock Output–Push-Pull**
GPIO.10_TX	11	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	TX Output–Open Drain
			0x04	**TX Output–Push-Pull**
GPIO.11_RX	12	1	0x00	GPIO Input Pin
			0x01	GPIO Output–Open Drain
			0x02	GPIO Output–Push-Pull
			0x03	**RX Input**
SUSPEND	13	1	0x01	Suspend Output–Open-Drain
			0x02	**Suspend Output–Push-Pull**
/SUSPEND	14	1	0x01	/Suspend Output–Open-Drain
			0x02	**/Suspend Output–Push-Pull**
Suspend Pin Latch	15	2	0x0000	Latch values in suspend state
Suspend Pin Mode	17	2	0x0000	Push-pull or open-drain
Clock Out Divider	19	1	0x00–0xFF	Divider applied to GPIO.9_CLKOUT

The `Set Pin Configuration` Report should only be called once. Any further calls to this Report are ignored by the device. If any parameters are outside of their valid range, the report is ignored and no parameters are programmed. In this instance, the report can be called again with the correct values.

`GPIO.0_RMUTE`, `GPIO.1_PMUTE`, `GPIO.2_VOL–`, `GPIO.3_VOL+`, `GPIO.4_RMUTELED`, `GPIO.5_TXT_DACSEL0`, `GPIO.6_RXT_DACSEL1`, `GPIO.7_RTS_DACSEL2`, `GPIO.8_CTS_DACSEL3`, `GPIO.9_CLKOUT`, `GPIO.10_TX`, `GPIO.11_RX`, `SUSPEND`, and `/SUSPEND` are used to configure the pins to various modes. See 10. Appendix A—Pin Configuration Options for more information about each configuration option for each pin. `Suspend Pin Latch` is the value that will be driven on the pins when the device is in a Suspend state. `Suspend Pin Mode` is the mode (open-drain or push-pull) the pins will be in when the device is in a Suspend state. See 12. Appendix C—CP2114 Pin Variable Definition for details on interpreting the 2-byte values returned here.

`Clock Out Divider` determines the divider for the clock output when GPIO.9_CLKOUT is configured for clock output function. When the divider is set to 0x00, the output frequency is SYSCLK (either 48 MHz or 48.152 MHz). When the divider is set to any value between 0x01 and 0xFF, the output frequency is determined by the following formula:

$$\text{Output Frequency} = \frac{\text{SYSCLK}}{2 \times \text{Clock Out Divider}}$$

9. CP2114 Reports

Report IDs 0x70–0x7C are used for CP2114-specific reports, which are described in the following sections.

9.1 Get Device Status

Report ID: 0x70

Direction: Control In

Name	Offset	Size	Value	Description
Status	1	1	Varies	See below

The possible status values returned by the CP2114 are:

Status	Description
0x00	Last command produced no error.
0x20	Requested configuration number is too large.
0x21	All Device Boot Indexes have been used.
0x22	Pointer to requested Device Configuration is 0xFFFF.
0x23	Configuration invalid or not supported.
0x24	All Configuration Pointer slots have been used.
0x25	Insufficient OTP space to store new configuration.
0x26	The user-specified boot index is already the current boot index.
0x27	The current configuration is already as requested.
0x40	The specified number of cached parameters is too large.
0x41	Invalid cached parameter value(s).

The CP2114 clears the status upon read.

9.2 Get Device Capabilities

Report ID: 0x71

Direction: Control In

The CP2114 returns the following information:

Name	Offset	Size	Value	Description
Available Boot Indices	1	1	Varies	The number of unprogrammed Boot Indices.
Available Configurations	2	1	Varies	The number of unprogrammed Configuration Indices.
Current Boot Configuration	3	1	Varies	The current Boot Configuration index.
Available OTP Configuration Space	4	2	Varies	The number of unprogrammed Configuration bytes.

9.3 Get RAM Configuration

Report ID: 0x72

Direction: Control In

The CP2114 returns this information:

Name	Offset	Size	Value	Description
Current Audio Configuration String in RAM	1	See below	Varies	CP2114-B01: Size is 30 bytes CP2114-B02: Size is 50 bytes

See the CP2114 data sheet for information on the audio configuration string format. This function reads only the fixed-size RAM configuration that is currently loaded. This function does not provide any information that was specified in the Audio Config Area (i.e. variable-sized block of I^2C register settings).

9.4 Set RAM Configuration

Report ID: 0x73

Direction: Control Out

Name	Offset	Size	Value	Description
Configuration to be loaded into RAM	1	See below	Varies	CP2114-B01: Size is 30 bytes CP2114-B02: Size is 50 bytes

See the CP2114 data sheet for information on the audio configuration string format. The intent of the SetRamConfig function is to allow the user to temporarily apply and evaluate minor configuration changes (e.g. codec register settings) before programming the changes into a new OTP EPROM configuration. However, there are some configuration elements that should not be changed using this function.

Changing any of the following clocking options requires that the new configuration be written to OTP EPROM because the clocking options are applied only when the CP2114 comes out of reset. Resetting the CP2114 after applying a new RAM configuration is not an option, because at reset the existing RAM configuration data will be overwritten with data from the specified boot configuration.

- USBCLK source (Internal/External)
- SYSCLK source (Internal/External)
- SYSCLK frequency (48.000 MHz or 49.152 MHz)

Changing certain other configuration options in RAM has been seen to cause problems with some host operating systems. Presumably the problems are due to the host saving information from the CP2114's USB descriptors the first time a unique CP2114 is recognized, but not updating this information when the same device re-enumerates with different capabilities. If improper host behavior is observed after changing these (or any other) configuration options in RAM, a new OTP EPROM configuration should be created instead.

- Audio synchronization mode (Asynchronous/Synchronous)
- CP2114 support for playback volume and mute
- Playback volume parameters (Min/Max/Resolution)

Follow these steps when switching between OTP EPROM configurations:

1. If all the GPIO 8-5 pins remain in their default codec select state, these pins can be used to select the new configuration and the applied logic state can be changed at this time.

   Note: On the CP2114-EK motherboard, JP16 connects GPIO,8 to the CTS output of the RS-232 level shifter device, and so must be disconnected when using GPIO 8 as a codec select line.

2. Otherwise, if any of the GPIO 8-5 pins have been reconfigured to something other than codec select, the configuration utility must be used to program the OTP boot config with the index of the desired configuration.
3. Disconnect the CP2114 from USB and power.
4. For Windows hosts, the CP2114 devices should be uninstalled. The USBDeview utility allows users to uninstall USB devices on Windows, and can be run as a GUI or from the command line. The following command uninstalls all CP2114s on a system: `"C:\<pathname>\USBDeview.exe" /remove_by_pid 10C4;EAB0"`. The `<pathname>` tag represents the actual path to USBDeview.exe file. Quotes are required (as shown) if the pathname contains spaces. The example command specifies the CP2114's default PID (0x10C4) and VID (0xEAB0) values; these arguments must be changed if the VID or PID has been reprogrammed by the user.
5. Reconnect the CP2114 to power and USB.
6. Verify that the CP2114 device enumerates successfully.
7. Use the configuration utility to verify that the CP2114 is using the desired boot configuration.

9.5 Set DAC Registers

Report ID: 0x74

Direction: Control Out

Name	Offset	Size	Value	Description
Number of registers to write	1	1	Varies	Number of register writes to perform.
Payload (see below)	2	Varies	Varies	See below

While the `Set DAC Registers` Report is applicable to both CP2114-B01 and CP2114-B02 devices, the `I2C Write Data` Report supports a wider range of data formats and is recommended for B02 devices.

The following types of data comprise the payload:

- DAC configuration string (address/value pairs that are to be written to the DAC)
- DAC configuration In-Band commands and their corresponding parameters

See the CP2114 data sheet for information on the audio configuration string and in-band commands.

9.6 Get DAC Registers

Report ID: 0x75

Direction: Control In

Note: Immediately preceding one or more `Get DAC Registers` reports, the host must issue the `Set Parameters For Next Get` report with the following information:

- Report ID—0x75 (the Get DAC Registers report ID)
- Number of parameters—2
- Parameter[0]—Starting DAC address
- Parameter[1]—Number of DAC registers to read

If either of the first two condition is not satisfied, for a `Get DAC Registers` report, the CP2114 returns `HID_UART_UNEXPECTED_CACHE_DATA` error (0x41).

For each `Get DAC Registers` report, the CP2114 returns the following information:

Name	Offset	Size	Value	Description
Packet Size	1	1	1–62	Number of bytes in this packet
Register value(s)	2	Varies	Varies	DAC register values

While the `Get DAC Registers` Report is applicable to both CP2114-B01 and CP2114-B02 devices, the `I2C Read Data` Report supports a wider range of data formats and is recommended for B02 devices.

The maximum amount of data that can be returned is 62 bytes. The host should issue `Get DAC Registers` reports until the returned packet size is less than 62.

9.7 Get OTP Configuration

Report ID: 0x76

Direction: Control In

Note: Immediately preceding one or more `Get OTP Configuration` reports, the host must issue the `Set Parameters For Next Get` report with the following information:

- Report ID—0x76 (the Get OTP Configuration report ID)
- Number of parameters—1
- Parameter[0]—Index of the configuration to be read

If either of the first two condition is not satisfied, for a `Get OTP Configuration` report, the CP2114 returns `HID_UART_UNEXPECTED_CACHE_DATA` error (0x41).

For the `Get OTP Configuration` report, the CP2114 returns the following information:

Name	Offset	Size	Value	Description
Packet Size	1	1	1–62	Number of bytes in this packet
Data	2	Varies	Varies	OTP configuration data

The maximum amount of data that can be returned in one packet is 62 bytes. The host should issue `Get OTP Configuration` reports until the returned packet size is less than 62.

9.8 Get Device Version

Report ID: 0x77

Direction: Control In

The CP2114 returns the following information:

Name	Offset	Size	Value	Description
API version	1	1	CP2114-B01: 0x05 CP2114-B02: 0x06	Device interface format version number
Firmware version	2	1	CP2114-B01: 0x07 CP2114-B02: 0x08	Firmware version number
Config version	3	1	CP2114-B01: 0x01 CP2114-B02: 0x02	Configuration format version number

These version numbers are read-only values and cannot be changed by the customer. The customer-configurable version numbers are accessed via the `Get/Set USB Configuration` reports.

9.9 Create OTP Configuration

Report ID: 0x78

Direction: Control Out

If the OTP configuration to be programmed is larger than 62 bytes, the host must send multiple `Create OTP Configuration` reports. The first report should contain the following data:

Name	Offset	Size	Value	Description
Packet length	1	1	Varies	Length of the current packet
Configuration size (LSB)	2	1	Varies	—
Configuration size (MSB)	3	1	Varies	—
Configuration data	4	Varies	Varies	Configuration data

Subsequent reports (if necessary) should contain the following data:

Name	Offset	Size	Value	Description
Packet length	1	1	Varies	Length of the current packet
Configuration data	2	Varies	Varies	Configuration data

9.10 Set Boot Configuration

Report ID: 0x79

Direction: Control Out

Name	Offset	Size	Value	Description
Configuration index	1	1	Varies	Index of the configuration to be assigned as the boot configuration.

9.11 Set Parameters For Next Get

Report ID: 0x7A

Direction: Control Out

This report specifies parameters that are necessary for a subsequent Get report, and must be issued immediately prior to the following Get reports:

- Get DAC Registers
- Get OTP Configuration
- Get OTP All Configuration
- I^2C Read Data

The number of parameters depends on the Get report to follow. Refer to the appropriate Get report for the specific parameter format.

Name	Offset	Size	Value	Description
Get Report ID	1	1	Varies	Report ID of the Get report to follow
Number of parameters	2	1	Varies	The number of parameters in this report
Parameter(s)	3	Varies	Varies	The parameter(s).

9.12 Get OTP All Configurations

Report ID: 0x7B

Direction: Control In

Note: Immediately preceding the first `Get OTP All Configuration` report, the host must issue the `Set Parameters For Next Get` report with the following information:

- Report ID—0x7B (the Get OTP All Configuration report ID)
- Number of parameters—4
- Parameter[0]—Length (MSB)
- Parameter[1]—Length (LSB)
- Parameter[2]—Start address (MSB)
- Parameter[3]—Start address (LSB)

For the `Get OTP All Configuration`* report, the CP2114 returns the following information:

Name	Offset	Size	Value	Description
Reset Type	1	1	0x00	Reset with re-enumeration

The size of the entire CP2114 OTP is 6 KB (0x1800, 6144 bytes); therefore the host must send a total of 100 `Set OTP All Configuration` reports. The CP2114 will return 62 bytes in each of the first 99 reports; the last report will contain 6 bytes:

(99 × 62) + 6 = 61

* The CP2114 returns the `HID_UART_UNEXPECTED_CACHE_DATA` error (0x41) if the host previously issues the `Set Parameters For Next Get` report with any of the following information:

- Report ID not equal to 0x7B
- Number of parameters not equal to 4
- Start Address is less than 0x6800
- Start Address + Length is greater than 0xE800 (for CP2114-B02) or 0x8000 (for CP2114-B01)

9.13 Set OTP All Configurations

Report ID: 0x7C

Direction: Control Out

The size of the entire CP2114 OTP is 6 KB (0x1800, 6144 bytes); therefore the host must send 100 `Set OTP All Configuration*` reports.

60 + (98 × 62)+ 8 = 6144

The reports contain the following data:

Table 9.1. Report 1

Name	Offset	Size	Value	Description
Packet length	1	1	62 (0x3E)	Length of the current packet
Configuration size (LSB)	2	1	0x00	Total size of OTP block (LSB)
Configuration size (MSB)	3	1	0x18	Total size of OTP block (MSB)
Configuration data	4	60	Varies	Configuration data

Table 9.2. Reports 2–99 (98 Total)

Name	Offset	Size	Value	Description
Packet length	1	1	62 (0x3E)	Length of the current packet
Configuration data	2	62	Varies	Configuration data

Table 9.3. Report 100

Name	Offset	Size	Value	Description
Packet length	1	1	8	Length of the current packet
Configuration data	2	8	Varies	Configuration data

* For the `Set OTP All Configurations` report, the CP2114 returns the `HID_UART_UNEXPECTED_CACHE_DATA` error (0x41) if either of the following happens:

- Start Address is less than 0x6800
- Start Address + Length is greater than 0xE800 (for CP2114-B02) or 0x8000 (for CP2114-B01)

9.14 I²C Write Data

Report ID: 0x7D

Direction: Control Out

Name	Offset	Size	Value	Description
I²C Slave Address	1	1	Varies	Left-justified slave address b0 == 0: Do not send stop condition after transfer. b0 == 1: Send stop condition after transfer.
Number of Bytes	2	1	Varies	Number of bytes to be written (not including the address).
Write data	3–63	Varies	Varies	Data to be written

9.15 I²C Read Data

Report ID: 0x7E

Direction: Control In

Note: Immediately preceding one or more `I²C Read Data` reports, the host must issue the `Set Parameters For Next Get` report with the following information:

- Report ID—0x7E (the I²C Read Data report ID)
- Number of parameters—5
- Parameter[0]—Left-justified Slave Address.
  - b0 == 0—Do not send Stop condition between write and read cycles.
  - b0 == 1—Send Stop condition between write and read cycles.
- Parameter[1]—Number of bytes to read (maximum: 60)
- Parameter[2]—Number of bytes to write (maximum: 2)
- Parameter[3]—Register address (first byte)
- Parameter[4]—Register address (second byte, if necessary)

For the `I²C Read Data`* report, the CP2114 returns the following information:

Name	Offset	Size	Value	Description
I²C Slave Address	1	1	Varies	I²C Slave Address that was used.
Transfer Status	2	1	Varies	Zero: Success Nonzero: Error
Number of bytes read	3	1	Varies	—
Read Data	4–63	Varies	Varies	Data that was read

* The CP2114 returns the `HID_UART_UNEXPECTED_CACHE_DATA` error (0x41) if the host previously issues the `Set Parameters For Next Get` report with any of the following information:

- Report ID not equal to 0x7E
- Number of parameters not equal to 5
- Number of bytes to read is zero, or greater than 60
- Number of bytes to write is greater than 2

10. Appendix A—Pin Configuration Options

Introduction

Some of the pins of the CP2110 are configurable as inputs, open-drain outputs, or push-pull outputs. These options are configured when the device has enumerated and is operating in a normal mode. When the CP2110 is in USB suspend, all of the configurable pins are limited to be open-drain or push-pull outputs. The following describes the differences between open-drain and push-pull, and the difference in behavior in Suspend mode. See the CP2110 data sheet for the electrical specifications of the GPIO pins.

GPIO Input

When a pin is configured as a GPIO input, the pin can read a logic high or logic low value. Internally, the GPIO pin is connected to the VIO pin through a resistor. If the pin is not connected externally, it will return a logic high or '1'. Any voltages connected to the pin should conform to data sheet specifications.

Open-Drain Output

When a pin is configured as a GPIO open-drain output, the pin can output a logic high or logic low value. The default value is logic high and a logic high value is created by internally connecting the GPIO pin to the VIO pin through a resistor. In this mode, the pin is unable to source much current when driving a logic high. If the Set GPIO Values Report is used to change the output to a logic low, the pin is internally connected to GND.

Push-Pull Output

When a pin is configured as a GPIO push-pull output, the pin can output a logic high or logic low value. When driving a logic high value, the pin is directly connected to the VIO pin internally and can source current for devices such as LEDs. When driving a logic low value, the pin is internally connected to GND.

Suspend Mode

When the device is in Suspend mode, all of the GPIO pins are forced to be open-drain or push-pull outputs. The mode of each GPIO pin (open-drain or push-pull) and output value (logic-high or logic-low) is a PROM configurable value which is set using the Set Pin Configuration Report. The modes and values of the pins during Suspend can be the same or different as when the device is in Normal mode. To maintain the same electrical characteristics of a GPIO Input Pin during Suspend, configure the pin for open-drain mode with the output latch value set to logic-high or 1.

11. Appendix B—CP2110 Pin Variable Definition

The CP2110 has 14 pins that have configurable behavior. In some of the reports, the CP2110 returns the configuration of these pins in a two-byte value, or the report requires the pins to be configured using a two-byte value.

These tables show which bit of the two-byte value corresponds to which pin.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
GPIO	Use	SUS	9	8	7	6	X	/SUS	5	4	RX	TX	3	2	1	0

Bit Position in 2-byte Word	Pin Name	CP2110 Pin Number
0	GPIO.0_CLK	1
1	GPIO.1_RTS	24
2	GPIO.2_CTS	23
3	GPIO.3_RS485	22
6	GPIO.4_TXT	19
7	GPIO.5_RXT	18
10	GPIO.6	15
11	GPIO.7	14
12	GPIO.8	13
13	GPIO.9	12
4	TX	21
5	RX	20
14	Suspend	11
8	Suspend	17
9	Not Used	Not Used
15	Use_Suspend[1]	Not Used

Note:

1. Use_Suspend, Bit 15 of the Suspend_Pin_Mode, is configured using the Get/Set Pin Configuration Report and does not correspond to a CP2110 pin. When this bit is cleared to 0, the GPIO pins remain in their current state in Suspend and the values for Suspend_Pin_Mode and Suspend_Pin_Latch are unused. When Use_Suspend is set to 1, the values for Suspend_Pin_Mode and Suspend_Pin_Latch are used in Suspend Mode. The exceptions are GPIO.0_CLK and GPIO.3_RS485. If these pins are configured for their special functionality, the Clock Output is always disabled and the RS485 pin is set to the inactive level in suspend mode. Bit 15 is unused in the two-byte fields other than Suspend_Pin_Mode and can be set to 1 or 0.

See the individual report definitions in the UART Reports section for the meaning of a bit being set to 1 or 0.

Not all configuration data applies to every pin. See the individual report definitions in the UART Reports section to determine if a certain configuration is applicable to a pin.

12. Appendix C—CP2114 Pin Variable Definition

The CP2114 has 14 pins that have configurable behavior. In some of the reports, the CP2114 returns the configuration of these pins in a two-byte value, or the report requires the pins to be configured using a two-byte value.

These tables show which bit of the two-byte value corresponds to which pin.

Bit Position in 2-byte Word	CP2114 Pin Name	CP2114 Pin Number
0	GPIO.0_RMUTE	30
1	GPIO.1_PMUTE	29
2	GPIO.2_VOL–	14
3	GPIO.3_VOL+	13
4	GPIO.4_RMUTELED	12
5	GPIO.5_TXT_DACSEL0	28
6	GPIO.6_RXT_DACSEL1	11
7	GPIO.7_RTS_DACSEL2	19
8	GPIO.8_CTS_DACSEL3	20
9	GPIO.9_CLKOUT	22
10	GPIO.10_TX	16
11	GPIO.11_RX	15
12	SUSPEND	18
13	/SUSPEND	17
14	Not Used	Not Used
15	Use_Suspend[1]	Not Used

Note:

1. Use_Suspend, Bit 15 of the Suspend_Pin_Mode, is configured using the Get/Set Pin Configuration Report and does not correspond to a CP2114 pin. When this bit is cleared to 0, the GPIO pins remain in their current state in Suspend and the values for Suspend_Pin_Mode and Suspend_Pin_Latch are unused. When Use_Suspend is set to 1, the values for Suspend_Pin_Mode and Suspend_Pin_Latch are used in Suspend Mode. The exception is GPIO.0_CLK. If this pin is configured for as a Clock Output, the Clock Output is always disabled in suspend mode. Bit 15 is unused in the two-byte fields other than Suspend_Pin_Mode and can be set to 1 or 0.

See the individual report definitions in the UART Reports section for the meaning of a bit being set to 1 or 0.

Not all configuration data applies to every pin. See the individual report definitions to determine if a certain configuration is applicable to a pin.

13. Revision History

Revision 0.6

August, 2021

- Updated format in Table 2.2 CP2110 Default Pin Settings on page 3.
- Added error description for 9.6 Get DAC Registers, 9.7 Get OTP Configuration, 9.12 Get OTP All Configurations, 9.13 Set OTP All Configurations, and 9.15 I²C Read Data.

Revision 0.5

May, 2016

- Updated formatting.
- Corrected the values for Data Bits and Parity and clarified the description of Baud Rate in 6.3 Get/Set UART Config.
- Corrected the default Data Bits value in 2.2 Default UART Configuration.
- Clarified the language in 3.2 Data Format.
- Added CP2114-B02.
  - Updated pin names in 2.1 Default Values for Parameters Stored in PROM and 8.7.2 CP2114 Get/Set Pin Configuration.
  - Added two new CP2114 reports: 9.14 I²C Write Data and 9.15 I²C Read Data.
  - Updated the size information for 9.3 Get RAM Configuration and 9.4 Set RAM Configuration.
  - Updated the description for 9.4 Set RAM Configuration.
  - Updated the description for 9.5 Set DAC Registers and 9.6 Get DAC Registers.
  - Added the `I²C Read Data` Report as requiring a preceding call from 9.11 Set Parameters For Next Get.
  - Updated 9.8 Get Device Version.

Revision 0.4

October, 2012

- Added support for CP2114.

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