**Communication Protocol of Serial Port between B3VDU and B3VCU**

# Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Date | Reason For Changes | Version |
| Chen Yong | Feb 22, 2022 | Initial draft | 1.0.1 |
| Chen Yong | Jul 14, 2022 | NUC mode | 1.0.2 |
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# Scope

This document stipulates communication protocol of serial port in-Between B3VDU and B3VCU. This document will be used as a guideline to serial port communication of B3 VDU and B3VCU according to the technical specification requirement.

# Hardware Specification

**Physical link:TIA/EIA-422**

**baudrate:115200 bits/s**

**data bits:8 bits**

**stop bits:1 bit**

**parity: no**

**flow contorl:no**

**mode: duplex**

# **system architecture**

VDU

HOST

(/VCU)

## **Data package**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| header | Package ID | parameters | tail | Checksum | End symbol |
| $ | Ascii code | Ascii code. Insert ‘,’ between parameters | \* | 2 HEX ascii | \r or \n or \0 or (any combination) |

checksum: the two HEX character as the checksum of the package.(the sum of all chracters of package between ‘$’ and ‘\*’, exclude ‘$’ and ‘\*’). It is not a neccesary item. It can be empty.

Example:

$KEY,123,0A,01234567\*10\0

$KEY,123,0A,01234567\*\r\n\0

## Communicaite mechanism

* VDU continuse to send “Key package” per 100 ms.
* VDU will set the HOST error bit if it does not receive the response package of “Key package” within 100ms.
* VDU can recieve the “sysctl” command pacakge.
* VDU will start or stop sending “sysinfo pacakge” per 500ms based on the “sysctl” command.
* VDU can recieve the “dev” command package.
* VDU will send the device information back in the Response of “dev Package”.

# **Data Format**

## Key package(from VDU to HOST)

|  |  |  |
| --- | --- | --- |
| **item** | **value** | **description** |
| $PKGID | $KEY |  |
| PAR1 | Integer: 0 to 255 | Package No |
| PAR2 | Hex: 8bits  bit0: front  bit1: rear  bit2: IR  bit3: NUC  bit7: NUC mode  (note: front and rear cannot be 1 at the same time in the package.) | Key (bit0-bit3)  0=released  1=pressed  NUC mode:  0=auto  1=development |
| PAR3 | Hex: 32bits  Bit0: memory  bit1: logdata  bit2: snsor  bit3: current  bit4: temperature  bit5: pwm0  bit6: pwm1  bit7: keypad  bit8: video out  bit9: video in0  bit10: video in1  bit11: osd  bit12: serial  bit13: host | System error bits.  0: PASS  1: Fail |
| PAR4 | Integer | System Power On timer(unit:s) |
| \*CHK | checksum |  |

## Response of “Key Pacakge”(From Host to VDU)

|  |  |  |
| --- | --- | --- |
| **item** | **value** | **description** |
| $PKGID | $KEYA | Acknowledge of package ‘KEY’ |
| PAR1 | Integer: 0 to 255 | Equal to the PKGNO of the response package |
| PAR2 | KEY  Hex: 8bits  bit0: front  bit1: rear  bit2: IR  bit3: NUC  bit7: IR Mode | Response to a (KEY) package  front:1=VCU Get “front” Key  rear:1=VCU get “rear” key  IR:1=VCU get “IR” key  NUC:1=VCU get “NUC” key  IR Mode:1=IR ON 0=IR OFF |
| PAR3 | String | Osd variant name |
| \*CHK | checksum |  |
|  |  |  |

## **SYSCTL**(from **HOST** to **VDU**)

|  |  |  |
| --- | --- | --- |
| **item** | **value** | **description** |
| $PKGID | $SYS |  |
| PAR1 | 0:disable  1:enable | System information output enable |
| \*CHK | checksum |  |

## **SYSINFO**(from VDU to HOST)

|  |  |  |
| --- | --- | --- |
| **item** | **value** | **description** |
| $PKGID | $SYSA |  |
| PAR1 | float | Power current(unit: 0.001A) |
| PAR2 | float | Cpu temperature (unit: 0.001C) |
| PAR3 | Integer: 0 - 100 | Cpu usage percentage(unit:%) |
| PAR4 | Integer: 0 – 100 | Mem usage percentage(unit:%) |
| \*CHK | checksum |  |

This data package will be send per 500ms when HOST enable the information output in the SYSCTRL pacakge. It will continue to be send until the HOST diable it.

## **DEV Package**

|  |  |  |
| --- | --- | --- |
| **item** | **value** | **description** |
| $PKGID | $DEV |  |
| PAR1 | Integer: 0 to 255 | Package No |
| \*CHK | checksum |  |

## Response of “**DEV** Package”

|  |  |  |
| --- | --- | --- |
| **item** | **value** | **description** |
| $PKGID | $DEVA |  |
| PAR1 | string | System Version |
| PAR2 | string | Serial No |
| PAR3 | string | Manufacturing date |
| \*CHK | checksum |  |