**Get board information:**Get Shuttle ID, Hardware revision and Software revision.

int16\_t coines\_get\_board\_info(struct coines\_board\_info \*data);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x06 | Total length of the command |
| 2 | set/get command | 0x02 | GET command code |
| 3 | Feature | 0x1F | Board information |
| 4-5 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Response |
| 1 | length | 0x0F | Total length of the response |
| 2 | packet number | 0x01 | Always 0x01 for get board info |
| 3 | Return code | 0x00 or 0xFF | 0x00 on success, 0xFF on failure |
| 4 | set/get response | 0x42 | GET response code |
| 5-6 | Feature | 0x1F | Board information Command |
| 7-8 | Shuttle ID (big endian) | 0x---- | Depends on the Shuttle board |
| 9-10 | Hardware ID (big endian) | 0x00-- | Depends on the Application board |
| 11-12 | Software ID (big endian) | 0x00-- | Depends on Application board firmware |
| 13-14 | end word (big endian) | 0x0A0D | End of response(CR-LF) |

**Set pin configuration**

Set pin configuration as input/output and high/low**.**

int16\_t coines\_set\_pin\_config(enum coines\_multi\_io\_pin pin\_number, enum coines\_pin\_direction direction, enum coines\_pin\_value pin\_value);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x0C | Total length of the command |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x15 | GPIO configuration |
| 4-5 | Pin Select bit-field (big-endian) | 0x---- | Bit-field representation of selected GPIOs. |
| 6-7 | Pin Direction bit-field (big-endian) | 0x---- | Bit-field representation of input/output |
| 8-9 | Pin high/low bit-field (big-endian) | 0x---- | Bit-field representation of low/high |
| 10-11 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x08 | Total length of the response |
| 2 | packet number | 0x01 | Always 0x01 for get board info |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x15 | Board information |
| 6-7 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Get pin configuration**

Get pin configuration input/output and high/low

int16\_t coines\_get\_pin\_config(enum coines\_multi\_io\_pin pin\_number, enum coines\_pin\_direction \*pin\_direction, enum coines\_pin\_value \*pin\_value);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x0C | Total length of the command |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x15 | GPIO configuration |
| 4-5 | Pin Select bit-field (big-endian) | 0x---- | Bit-field representation of selected GPIOs. |
| 6-7 | Pin Direction bit-field (big-endian) | 0x---- | Bit-field representation of input/output |
| 8-9 | Pin high/low bit-field (big-endian) | 0x---- | Bit-field representation of low/high |
| 10-11 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x08 | Total length of the response |
| 2 | packet number | 0x01 | Always 0x01 for get board info |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x15 | Board information |
| 6-7 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Set VDD,VDDIO configuration**

int16\_t coines\_set\_shuttleboard\_vdd\_vddio\_config(uint16\_t vdd\_millivolt, uint16\_t vddio\_millivolt);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of command |
| 1 | length | 0x0C | Total length of the command |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x14 | VDD,VDDIO configuration |
| 4-5 | VDD in milli-volts (big-endian) | 0x---- | Only 0mV (0x0000) & 3300mV (0x0ce4) supported |
| 6 | VDD ON or OFF | 0x00 or 0x01 | VDD switch |
| 7-8 | VDDIO in milli-volts (big-endian) | 0x---- | Only 0mV (0x0000) & 3300mV (0x0ce4) supported |
| 9 | VDDIO ON or OFF | 0x00 or 0x01 | VDDIO switch |
| 9-10 | Pin high/low bit-field (big-endian) | 0x---- | Bit-field representation of low/high |
| 11-12 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x0E | Total length of the response |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x14 | VDD,VDDIO configuration |
| 4-5 | VDD in milli-volts (big-endian) | 0x---- | Only 0mV (0x0000) & 3300mV (0x0ce4) supported |
| 6 | VDD ON or OFF | 0x00 or 0x01 | VDD switch |
| 7-8 | VDDIO in milli-volts (big-endian) | 0x---- | Only 0mV (0x0000) & 3300mV (0x0ce4) supported |
| 9 | VDDIO ON or OFF | 0x00 or 0x01 | VDDIO switch |
| 9-10 | Pin high/low bit-field (big-endian) | 0x---- | Bit-field representation of low/high |
| 11-12 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Set I2C configuration**

int16\_t coines\_config\_i2c\_bus(enum coines\_i2c\_bus bus, enum coines\_i2c\_mode i2c\_mode);

Set interface as I2C

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x08 | Total length of the command |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x11 | Interface Setting |
| 4 | Select Interface (SPI/I2C) | 0x01 | I2C |
| 5 | SDO State | 0x00 | SDO Low |
| 6-7 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x08 | Total length of the response |
| 2 | packet number | 0x01 | Always 0x01 for interface setting |
| 3 | Return code | 0x00 / 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x11 | Interface Setting |
| 6-7 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

Speed setting

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x08 | Total length of the command |
| 2 | set/get command | 0x01 | SET command mode |
| 3 | Feature | 0x09 | I2C Speed Setting |
| 4 | I2C Port Select | 0x00/0x01 | I2C0 / I2C1 |
| 5 | Select Speed | 0x00 to 0x03 | |  |  | | --- | --- | | **Value** | **I2C Speed** | | 0x00 | Standard Mode | | 0x01 | Fast Mode | | 0x02 | 3.4 MHz | | 0x03 | 1.7 MHz | |
| 6-7 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x0A | Total length of the command |
| 2 | packet number | 0x01 | Always 0x01 for I2C Speed Setting |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x09 | I2C Speed Setting |
| 6 | I2C Port Selected | 0x00 | Always 0x00 for APP2.0 Board |
| 7 | I2C Speed Selected | 0x00 to 0x03 | |  |  | | --- | --- | | **Value** | **I2C Speed** | | 0x00 | Standard Mode | | 0x01 | Fast Mode | | 0x02 | 3.4 MHz | | 0x03 | 1.7 MHz | |
| 8-9 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Set SPI configuration**

int16\_t coines\_config\_spi\_bus(enum coines\_spi\_bus bus, enum coines\_spi\_speed spi\_speed, enum coines\_spi\_mode spi\_mode);

Set interface as SPI

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x08 | Total length of the command |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x11 | Interface Setting |
| 4 | Select Interface (SPI/I2C) | 0x00 | SPI |
| 5 | SDO State | 0x00 | SDO Low |
| 6-7 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x08 | Total length of the command |
| 2 | packet number | 0x01 | Always 0x01 for interface setting |
| 3 | Return code | 0x00 / 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x11 | Interface Setting |
| 6-7 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

Speed setting

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x0A | Total length of the command |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x19 | SPI Config |
| 4 | SPI Port Select | 0x00 | SPI0 (Always 0x00 for APP2.0 Board) |
| 5 | SPI Mode | 0x00 to 0x03 | SPI Modes - 0,1,2,3 |
| 6 | SPI Transfer Length | 0x08/0x10 | 8-bit/16-bit SPI |
| 7 | SPI Speed |  | Valid SPI speeds for APP2.0 Board:  250kHz, 300kHz, 400kHz, 500kHz, 600kHz, 750kHz, 1MHz, 1.2MHz, 1.25MHz, 1.5MHz, 2MHz, 2.5MHz, 3 MHz, 3.75MHz, 5MHz, 6MHz, 7.5MHz,10 MHz |
| 8-9 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x0C | Total length of the command |
| 2 | packet number | 0x01 | Always 0x01 for SPI Config |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x11 | Interface Setting |
| 6-7 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**I2C Read**

int8\_t coines\_read\_i2c(uint8\_t dev\_addr, uint8\_t reg\_addr, uint8\_t \*reg\_data, uint16\_t count);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x12 | Total length of the command |
| 2 | set/get command | 0x02 | GET command code |
| 3 | Feature | 0x16 | I2C/SPI Bus Read/Write |
| 4 | Mode | 0x01 | Always 0x01 (Burst Mode) |
| 5 | Interface selection | 0x00 | Always 0x00 for I2C |
| 6 | Sensor ID | 0x-- | Indexing provided by application for every sensor. |
| 7 | Analog Switch State | 0x01 | Always 0x01 - Switch Off |
| 8-9 | Device Address(big endian) | 0x---- | Device Address for I2C |
| 10 | Register Address | 0x-- | Starting address for reading the data |
| 11-12 | No of Bytes(big endian) | 0x---- | No. of Bytes to be read |
| 13 | Number of times to read | 0x01 | Always 0x01 |
| 14 | Delay between each read (ms) | 0x00 | Always 0x00 |
| 15 | Response | 0x01 | Always 0x01 (return data) |
| 16-17 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x0E and above | Total length of the response varies based on the no of bytes of data sent with it.(Depends on Byte 9) |
| 2 | packet number | 0x01 | Always 0x01 for I2C/SPI read |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x42 | GET response code |
| 5 | Feature | 0x16 | I2C/SPI Read/Write |
| 6 | Sensor ID | 0x-- | Indexing provided by application for every sensor. |
| 7 | Register Address | 0x-- | Starting address for reading the data |
| 8 | No of Data bytes (**n**) | 0x-- | No of bytes of data that will be sent along with the packet |
| 9 | No of times read | 0x-- | Same as data bytes (**n**) |
| 10 | Delay (ms) | 0x00 | Always 0x00 |
| 11 to 11+(n-1) | Data | 0x-- | n bytes of data that will be appended in this packet |
| n to n+1 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**I2C Write**

int8\_t coines\_write\_i2c(uint8\_t dev\_addr, uint8\_t reg\_addr, uint8\_t \*reg\_data, uint16\_t count);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x13 and above | Total length of the command |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x16 | I2C/SPI Bus Read/Write |
| 4 | Mode | 0x01 | Always 0x01 (Burst Mode) |
| 5 | Interface selection | 0x00 | Always 0x00 for I2C |
| 6 | Sensor ID | 0x-- | Indexing provided by application for every sensor. |
| 7 | Analog Switch State | 0x01 | Always 0x01 - Switch Off |
| 8-9 | Device Address(big endian) | 0x---- | Device Address for I2C |
| 10 | Register Address | 0x-- | Starting address for reading the data |
| 11-12 | No of Bytes(big endian) | 0x---- | No. of Bytes to be written(n bytes) |
| 13 | No of times to write | 0x01 | Always 0x01 |
| 14 | Delay between writes (ms) | 0x00 | Always 0x00 |
| 15 | Response | 0x00 | Echo back data written to registers |
| 16 to 16+(n-1) | Data | 0x-- | Data to be written |
| n to n+1 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x0E and above | Total length of the response varies based on the no of bytes of data sent with it.(Depends on Byte 9) |
| 2 | packet number | 0x01 | Always 0x01 for I2C/SPI write |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x16 | I2C/SPI Bus Read/Write |
| 6 | Sensor ID | 0x-- | Indexing provided by application for every sensor. |
| 7 | Register Address | 0x-- | Starting address for reading the data |
| 8 | No of Data(**n** bytes) | 0x-- | No of bytes of data that will be sent along with the packet |
| 9 | No of times written | 0x01 | Same as data bytes (**n**) |
| 10 | Delay (ms) | 0x00 | Always 0x00 |
| 11 to 11+(n-1) | Data | 0x-- | Echo of data written to registers |
| n to n+1 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**SPI Read**

int8\_t coines\_read\_spi(uint8\_t dev\_addr, uint8\_t reg\_addr, uint8\_t \*reg\_data, uint16\_t count);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x12 | Total length of the command |
| 2 | set/get command | 0x02 | GET command code |
| 3 | Feature | 0x16 | I2C/SPI Bus Read/Write |
| 4 | Mode | 0x01 | Always 0x01 (Burst Mode) |
| 5 | SPI Chip Select | 0x01 ≤ | 0x01 for default CS pin , (x+2) for IO\_x pin |
| 6 | Sensor ID | 0x-- | Indexing provided by application for every sensor. |
| 7 | Analog Switch State | 0x01 | Always 0x01 - Switch Off |
| 8-9 | Device Address(big endian) | 0x0000 | Always 0x0000 for SPI |
| 10 | Register Address | 0x-- | Starting address for reading the data |
| 11-12 | No of Bytes(big endian) | 0x---- | No. of Bytes to be read |
| 13 | Number of times to read | 0x01 | Always 0x01 |
| 14 | Delay between each read (ms) | 0x00 | Always 0x00 |
| 15 | Response | 0x01 | Always 0x01 (return data) |
| 16-17 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x0E and above | Total length of the response varies based on the no of bytes of data sent with it.(Depends on Byte 9) |
| 2 | packet number | 0x01 | Always 0x01 for I2C/SPI read |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x42 | GET response code |
| 5 | Feature | 0x16 | I2C/SPI Read/Write |
| 6 | Sensor ID | 0x-- | Indexing provided by application for every sensor. |
| 7 | Register Address | 0x-- | Starting address for reading the data |
| 8 | No of Data bytes (**n**) | 0x-- | No of bytes of data that will be sent along with the packet |
| 9 | No of times read | 0x00 | Same as data bytes (**n**) |
| 10 | Delay (ms) | 0x00 | Always 0x00 |
| 11 to 11+(n-1) | Data | 0x-- | n bytes of data that will be appended in this packet |
| n to n+1 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**SPI Write**

int8\_t coines\_write\_spi(uint8\_t dev\_addr, uint8\_t reg\_addr, uint8\_t \*reg\_data, uint16\_t count);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x13 and above | Total length of the command |
| 2 | set/get command | 0x01 | SET command code |
| 3 | Feature | 0x16 | I2C/SPI Bus Read/Write |
| 4 | Mode | 0x01 | Always 0x01 (Burst Mode) |
| 5 | SPI Chip Select | 0x00 | 0x01 for default CS pin , (x+2) for IO\_x pin |
| 6 | Sensor ID | 0x-- | Indexing provided by application for every sensor. |
| 7 | Analog Switch State | 0x01 | Always 0x01 - Switch Off |
| 8-9 | Device Address(big endian) | 0x---- | Always 0x0000 for SPI |
| 10 | Register Address | 0x-- | Starting address for reading the data |
| 11-12 | No of Bytes(big endian) | 0x---- | No. of Bytes to be written(n bytes) |
| 13 | No of times to write | 0x01 | Always 0x01 |
| 14 | Delay between writes (ms) | 0x00 | Always 0x00 |
| 15 | Response | 0x00 | Echo back data written to registers |
| 16 to 16+(n-1) | Data | 0x-- | Data to be written |
| n to n+1 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x0E to 0x-- | Total length of the response varies based on the no of bytes of data sent with it.(Depends on Byte 9) |
| 2 | packet number | 0x01 | Always 0x01 for I2C/SPI write |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x16 | I2C/SPI Bus Read/Write |
| 6 | Sensor ID | 0x-- | Indexing provided by application for every sensor. |
| 7 | Register Address | 0x-- | Starting address for reading the data |
| 8 | No of Data(**n** bytes) | 0x-- | No of bytes of data that will be sent along with the packet |
| 9 | No of times written | 0x01 | Same as data bytes (**n**) |
| 10 | Delay (ms) | 0x00 | Always 0x00 |
| 11 to 11+(n-1) | Data | 0x-- | Echo of data written to registers |
| n to n+1 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Configure Streaming**

int16\_t coines\_config\_streaming(uint8\_t channel\_id, struct coines\_streaming\_config \*stream\_config, struct coines\_streaming\_blocks \*data\_blocks);

Polling streaming

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x0A | Total length of the command |
| 2 | Feature | 0x03 | Streaming |
| 3 | No. of sensors | 0x-- | 0x01,0x02 |
| 4 | No. of packets | 0x01 | Always 0x01 |
| 5-6 | Sampling time (big endian) | 0x---- | GCD(polling\_interval1,polling\_interval2,… ) |
| 7 | Sampling time unit | 0x-- | 0x01 – ms , 0x02 – µs |
| 8-9 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x07 | Total length of the response varies based on the no of bytes of data sent with it.(Depends on Byte 9) |
| 2 | packet number | 0x01 | Always 0x01 |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x43 | Polling streaming response code |
| 5 to 6 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x17 ≤ | Total length of the command |
| 2 | Feature | 0x0F | Streaming |
| 3 | Sensor ID | 0x-- | 0x01,0x02 |
| 4 | Size of command | 0x00 | Always 0x00 |
| 5 | I2C / SPI Chip select | 0x---- | I2C – 0x00 ,SPI CS – 0x01 , IO\_x – (x -2) |
| 6 | Analog Switch | 0x01 | Always off |
| 7-8 | Device address (big endian) | 0x---- | 0x0000 in case of SPI |
| 9-10 | Sampling time (big endian) | 0x---- | Polling interval |
| 11 | Sampling time unit | 0x-- | 0x01 – ms , 0x02 – µs |
| 12 | Read mode | 0x01 | Read in ‘n’ chunks |
| 13 | No. of chunks | 0x-- | No. of register blocks (**N**) |
| 14 | Register start address [0] | 0x-- |  |
| 15-16 | No. of registers [0] (big endian) | 0x---- |  |
|  | ……. | …. | ….. |
|  | ……. | …. | ….. |
| 14+3N | Register start address [n] | 0x-- |  |
| (15+3N)  to  (16+3N) | No. of registers [n] (big endian) | 0x---- |  |
| 17+3N to 18+3N | Timeout | 0xF0F0 | Always 0xF0F0 |
| 19+3N to 23+3N | Reserved | 0x00000000 |  |
| (24+3N)  To  (25+3N) | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x07 | Total length of the response varies based on the no of bytes of data sent with it.(Depends on Byte 9) |
| 2 | packet number | 0x01 | Always 0x01 |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x4E | Interrupt Streaming command Response |
| 5 | Sensor ID | 0x-- | 0x01,0x02 |
| 6 to 7 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

Interrupt streaming

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x17 ≤ | Total length of the command |
| 2 | Feature | 0x0E | Interrupt Streaming |
| 3 | Sensor ID | 0x-- | 0x01,0x02 |
| 4 | Timestamp | 0x-- | 0x00 – No Timestamp, 0x01 – µC timestamp |
| 5 | I2C / SPI Chip select | 0x---- | I2C – 0x00 ,SPI CS – 0x01 , IO\_x – (x -2) |
| 6 | Analog Switch | 0x01 | Always off |
| 7 | Data ready line | 0x---- | IO\_x - x |
| 8 | I2C Device address (big endian) | 0x---- |  |
| 9 | Read mode | 0x01 | Read in ‘n’ chunks |
| 10 | No. of chunks | 0x-- | No. of register blocks (**N**) |
| 11 | Register start address [0] | 0x-- |  |
| 11-12 | No. of registers [0] (big endian) | 0x---- |  |
|  | ……. | …. | ….. |
|  | ……. | …. | ….. |
| 11+3N | Register start address [n] | 0x-- |  |
| 12+3N | No. of registers [n] (big endian) | 0x---- |  |
| 13+3N | R | 0x00 |  |
| 14+3N | Reserved | 0x00 |  |
| 15+3N | Reserved | 0x00 |  |
| (16+3N) to (17+3N) | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x08 | Total length of the response varies based on the no of bytes of data sent with it.(Depends on Byte 9) |
| 2 | packet number | 0x01 | Always 0x01 |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x4F | Streaming Settings Response |
| 5 to 6 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Start/Stop streaming**

int16\_t coines\_start\_stop\_streaming(enum coines\_streaming\_mode stream\_mode, enum coines\_stream\_samples samples, uint8\_t start\_stop);

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x06 | Total length of the command |
| 2 | Feature | 0x-- | Interrupt – 0x0A , Polling – 0x06 |
| 3 | No of Samples | 0x-- | 0x00 – Stop ,0xFF - Start |
| 4-5 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x07 | Total length of the response |
| 2 | packet number | 0x01 | Always 0x01 for data streaming |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | Feature | 0x-- | Interrupt - 0x4A ,Polling – 0x46 |
| 5 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Configure timer**

int16\_t coines\_trigger\_timer(enum coines\_timer\_config tmr\_cfg, enum coines\_time\_stamp\_config ts\_cfg);

**Set Timer Configuration**

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x07 | Total length of the command |
| 2 | SET/GET command | 0x01 | Set command |
| 2 | Feature | 0x29 | Timer Configuration |
| 3 | Action | 0x-- | 0x00 – Stop ,0x01 - Start |
| 4-5 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x08 | Total length of the response |
| 2 | packet number | 0x01 | Always 0x01 for timer configuration |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x41 | SET response code |
| 5 | Feature | 0x29 | Timer Configuration |
| 6-7 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Get time stamp**

**Command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Command |
| 1 | length | 0x07 | Total length of the command |
| 2 | SET/GET command | 0x02 | Get command |
| 2 | Feature | 0x29 | Time stamp Configuration |
| 3 | Action | 0x-- | 0x03 – Timestamp enable , 0x04- Timestamp disable |
| 4-5 | end word (big endian) | 0x0A0D | End of command (CR-LF) |

**Response**

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of response |
| 1 | length | 0x0E | Total length of the response |
| 2 | packet number | 0x01 | Always 0x01 for Time stamp configuration |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | set/get command | 0x42 | GET response code |
| 5 | Feature | 0x29 | Time Stamp Configuration |
| 6-11 | Timestamp(big endian) | 0x------ | Time stamp |
| 11-13 | end word (big endian) | 0x0A0D | End of response (CR-LF) |

**Streamed data format**

int16\_t coines\_read\_stream\_sensor\_data(uint8\_t sensor\_id, uint32\_t number\_of\_samples,uint8\_t \*data,uint32\_t \*valid\_samples\_count);

Polling Streaming response

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Packet |
| 1 | length | 0x-- | Total length of the command |
| 2 | packet number | 0x01 | Always 0x01 for packet number |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | Polling streaming indicator | 0x87 |  |
| 5 | Sensor ID | 0x00,0x01 | Indexing provided by application for every sensor. |
| 6-9 | 32-bit Packet counter (big endian) | 0x---- |  |
| 10 to 10+N-1 | Register data |  | Register data ‘N’ bytes |
| 10+N to 11+N | end word (big endian) | 0x0A0D | End of command (CR-LF) |

Interrupt Streaming response

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value** | **Description** |
| 0 | start byte | 0xAA | Start of Packet |
| 1 | length | 0x-- | Total length of the command |
| 2 | packet number | 0x01 | Always 0x01 for timer configuration |
| 3 | Return code | 0x-- | 0x00 on success, negative value on failure |
| 4 | Interrupt streaming indicator | 0x41 | SET response code |
| 5 | Sensor ID | 0x00,0x01 | Indexing provided by application for every sensor. |
| 6-9 | 32-bit Packet count (big endian) | 0x-------- |  |
| 10 to 10+N-1 | Register data |  | Register data ‘N’ bytes |
| 10+N to 15+N | 48-bit Timestamp (big endian) | 0x------------ |  |
| 16+N to 17+N | end word (big endian) | 0x0A0D | End of command (CR-LF) |