ICD Smart Brick <---> Helper App

# general message frame

|  |  |  |
| --- | --- | --- |
| Offset | Field Name | Description |
| Byte 0 | SyncWord | Always 0XA3 |
| Byte 1 | message type op code | 0x00 - connection request  0x01 - handshake accepted  0x02 - configuration command  0x03 - ack  0xA0 - custom command  0xA1 - motor comand  0xA2 - sensor report  0xA1 - digital value set command  0xA2 - analog value set command |
| byte 2-30 | the message (described below) |  |
| Byte31 | EndOfMessage | Always 0X0A |

# Helper App ----> Smart Brick

## Command message

Message Size: 29 Bytes

|  |  |  |
| --- | --- | --- |
| Offset | Field Name | Description |
| Byte 0 |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| Byte28 |  |  |

# Smart Brick ----> Helper App

## Sensor Values Report message

Message Size: 32 Bytes

|  |  |  |  |
| --- | --- | --- | --- |
| Offset | | Field Name | Description |
| Byte 0 | | SyncWord | Always 0XA3 |
| Byte 1 | | NumberOfReportingSensors | Representing the Arry Size.  Between 1 To 5 |
| Byte 2 - 26 | Byte 0 - 1 | SmartyID | I think 1 byte should be enough, we will build the nRF network so that each child’s network is physically separated from the others. So up to 255 smarties per child should be enough... |
| Byte 2 | ValueType | 0XA = Analog  0XD = Digital  This is half a byte so we can save 4 bits.  I Dont want to use bitfields  It will complicate things  OK  In fact the ValueType can be omitted: given the SmartyID and its ValueID the type is understood by the Helper or Extension. ValueID is like the pin number, SmartyID is the id of the whole arduino-like little box. |
| Byte 3 - 4 | Value | ?? |
| Byte 27 - 30 | | Sper | For |
| Byte 31 | | EndOfMessage | Always 0X0A |

|  |  |  |  |
| --- | --- | --- | --- |
| Offset | | Field Name | Description |
| Byte 0 | | SyncWord | Always 0XA3 |
| Byte 1 | | SmartyID | Most of the time, each smarty will contain 1 sensor. So insert this field in to the array will save some bendwit. The smart brick can send a report for more then 1 smarty in a single message.  Too complex. Think about the nRF communication between the smart brick (the ‘gateway’) and the remote smarties: it needs a specific ID (or address) for each smarty, and inside it an ID for each sensor. So at any instant the smarty brick handles a single message from/to a single smarty and passes it to/from the handler. |
| Byte 2 | | NumberOfReportingSensors | Representing the Arry Size.  Between 1 To 9 |
| Byte 2 - 26 | Byte 0 | ValueID  SensorID ?  Yes ok |  |
| Byte 1 - 2 | Value | If digital io then 0 or 1  If pwm out then 0 to 255  If raw analog read then 0 to 1023  If more complex status then for example the IMU reports 3 angles, 3 angular speeds and 3 linear speeds. Each with its own ValueID and scale. |
| Byte 27 - 30 | | Sper |  |
| Byte 31 | | EndOfMessage | Always 0X0A |