Smarty ICD

# Smarty Interface

## Interface Description

nRF – based.

## Protocol Description

The protocol consists of binary messages, both for commands and for periodic status.

The comBrick acts as a gateway and does not change the content of the messages, in both directions, between the host (PC) and the remote smarties.

Each message contains a smarty id (1 byte), opcode (1 byte) and content (6 bytes) for a total of 8 bytes fixed length messages.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | opcode | content | | | | | |

in general:

- NULL byte means 0x00

- all commands opcode start with C, motor control starts with E, sensors data update starts with D

-<uint> byte means a value between 0 and 255.

-<bool>byte means a zero value or non-zero value. zero value (0x00) means false or low, non-zero value (we will use 0x01) means true or high.

For commands: the smarty id contains the destination id:

* The smarty's response to a commands does not depend on the sender
* Upon reception the smarty compares the dest id to its own; if different it transfers the command to the actual smarty (in this case the current smarty acts as a relay)
* Upon reception of first command after power up, the smarty remembers the address of the sender; it will use it to send back the reports. It can be the relay's address.

For reports: the smarty id contains the source id:

* The report is only intended to the comBrick
* Upon reception of a report, if the smarty is not the comBrick then it sends it to it.

## Commands

### Generic Command

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xC0 | cmd# | param1 | param2 | param3 | param4 | param5 |

params are optional. NULL if unused.

### Network Configuration Command

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xCF | netAddr[0] | netAddr[1] | netAddr[2] | netAddr[3] | channel | 0 |

This command updates the network parameters of the smarty.

### Information Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xC1 | req# | 0 | 0 | 0 | 0 | 0 |

This command requests information from the smarty.

req# is the requested report opcode.

### SetAnalog Command

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xCA | analog# | analog val | analog# | analog val | analog# | analog val |

Only first (analog#, analog value) pair is mandatory. Others are optional. If unused put 0xFF in the analog# and NULL in the value.

### SetDigital Command

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xCD | digital# | digital val | digital# | digital val | digital# | digital val |

Only first (digital#, digital value) pair is mandatory. Others are optional. If unused put 0xFF in the digital# and NULL in the value.

### DC Motor Command

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xE0 | speed update | speed value | power update? | power value? | direction update | direction value |

## Reports

### Sensors Data Report

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xD0 |  |  |  |  |  |  |

### Event Report

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xD1 | event | param1 | param2 | param3 | param4 | param5 |

events:

10 – button down

11 – button up

### Debug String Report

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xDD | string[0] | string [1] | string [2] | string [3] | string[4] | string[5] |

### Smarty Configuration Report

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xDE | type | major ver | minor ver | 0 | 0 | 0 |

types:

1 – for testing

effectors:

10 – 4 smd leds

sensors:

100 – push button

combined effector+sensor:

200 – 220v relay + current sensor

### Network Configuration Report

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| byte 0 | byte 1 | byte 2 | byte 3 | byte 4 | byte 5 | byte 6 | byte 7 |
| smarty id | 0xDF | netAddr[0] | netAddr[1] | netAddr[2] | netAddr[3] | channel | 0 |