The websocket server is based on the Socket.IO javascript library, and the following is taken from the library documentation (<https://socket.io/docs/>)

*Socket.IO is****NOT****a WebSocket implementation. Although Socket.IO indeed uses WebSocket as a transport when possible, it adds additional metadata to each packet. That is why a WebSocket client will not be able to successfully connect to a Socket.IO server, and a Socket.IO client will not be able to connect to a plain WebSocket server either*

The method typically used to send a message is emit(**‘eventName’[, …args][, ack])** and the following methods document the eventName and any arguments for that method.

# Received Messages

## ACCESSORY\_LONG\_OFF

### Format

‘ACCESSORY\_LONG\_OFF’, {"nodeId": <value>, “eventId”: <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### eventid:

* + - event Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### Behaviour

Transmits the CBUS message ‘ACOF’ with Node Number and Event Number

### Error return

## ACCESSORY\_LONG\_ON

### Format

‘ACCESSORY\_LONG\_ON’, {"nodeId": <value>, “eventId”: <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### eventid:

* + - Event Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### Behaviour

Transmits the CBUS message ‘ACON’ with Node Number and Event Number

### Error return

## CLEAR\_CBUS\_ERRORS

### Format

‘CLEAR\_CBUS\_ERRORS’

### Behaviour

Clears the list of CBUS errors held by the system

### Error return

## CLEAR\_NODE\_EVENTS

### Format

‘CLEAR\_NODE\_EVENTS’

### Behaviour

Clears the list of Node Events held by the system

### Error return

## QUERY\_ALL\_NODES

### Format

‘QUERY\_ALL\_NODES’

### Behaviour

Transmits the CBUS message ‘QNN’ with no other arguments

### Error return

## REFRESH\_EVENTS

### Format

'REFRESH\_EVENTS'

### Behaviour

Requests the list of events held by the system – see ‘events’ for response message

### Error return

## REMOVE\_EVENT

### Format

‘REMOVE\_EVENT’, {"nodeId": <value>, "eventName": <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### eventName:

* + - event Name is comprised of a Node Number and an Event Number
    - Type: integer, 32 bit
    - Range: 0 to 0xFFFFFFFF

### Behaviour

Transmits the CBUS message ‘EVULN’, which ‘unlearns’ an event in the specified module

### Error return

## REQUEST\_ALL\_EVENT\_VARIABLES

### Format

'REQUEST\_ALL\_EVENT\_VARIABLES', {"nodeId": <value>, "eventIndex": <value>, “variables”: <value>, “delay”: <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### eventIndex:

* + - Event Index – position of event in module’s even table
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### variables:

* + - Number of event variables to request
    - Type: integer, 8 bit
    - Range: Range: dependant on target module, but not exceeding 255

### delay:

* + - Time in milliseconds to stagger individual requests to module
    - Optional – defaults to 100 if not present
    - Type: integer
    - Range: ?

### Behaviour

Transmits the CBUS message ‘REVAL’, to request each variable in turn, up to the maximum number of variables requested

### Error return

## REQUEST\_ALL\_NODE\_EVENTS

Read back all events in a node

### Format

' REQUEST\_ALL\_NODE\_EVENTS ', {"NodeId":< value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### Behaviour

Transmits the CBUS message ‘NERD’, to request all stored events for the specified node

### Error return

## REQUEST\_ALL\_NODE\_PARAMETERS

### Format

'REQUEST\_ALL\_NODE\_PARAMETERS', {"nodeId": <value>, "parameters": <value>, >, “delay”: <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### parameters:

* + - Number of parameters to request
    - Type: integer
    - Range: dependant on target module, but not exceeding 255

### delay:

* + - Time in milliseconds to stagger individual requests to module
    - Optional – defaults to 100 if not present
    - Type: integer
    - Range: ?

Range: 0 to 0xFF

### Behaviour

Transmits the CBUS message ‘RQNPN’, to request each parameter in turn, up to the maximum number of parameters requested

### Error return

## REQUEST\_ALL\_NODE\_VARIABLES

### Format

' REQUEST\_ALL\_NODE\_VARIABLES ', {"NodeId": <value>, “variables”: <value>, “start”: <value>, “delay”: <value> }

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### variables:

* + - Index of last variable to collect
    - Type: integer, 8 bit
    - Range: Range: dependant on target module, but not exceeding 255

### start:

* + - Index of first variable to request, must be less than or equal to “variables”
    - Optional – defaults to 1 if not present (see note below)
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### delay:

* + - Time in milliseconds to stagger individual requests to module
    - Optional – defaults to 100 if not present
    - Type: integer
    - Range: ?

Note: node variable index 0 typically contains the number of node variables a specific module supports

### Behaviour

### Error return

## REQUEST\_EVENT\_VARIABLE

### Format

'REQUEST\_EVENT\_VARIABLE', {"nodeId": <value>, "eventIndex": <value>, “eventVariableId”: <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### eventIndex:

* + - Event Index – position of event in module’s even table
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### eventVariableId:

* + - Index of event variable to request
    - Type: integer, 8 bit
    - Range: Range: dependant on target module, but not exceeding 255

### Behaviour

Transmits the CBUS message ‘REVAL’, to request event variable at the specified index

### Error return

## REQUEST\_NODE\_VARIABLE

### Format

### ' REQUEST\_NODE\_VARIABLE ', {"nodeId": <value>, "variableId": <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### variableId:

* + - Node Variable Index
    - Type: integer, 8 bit
    - Range: Range: dependant on target module, but not exceeding 255

### Behaviour

Transmits the CBUS message ‘NVRD’, to request Node Variable specified by the Node Variable Index

### Error return

## REQUEST\_VERSION

### Format

### ' REQUEST\_VERSION '

### Behaviour

Requests the version of the system, see the transmitted ‘VERSION’ message for the expected response

### Error return

## RQNPN

### Format

'RQNPN', {"nodeId": <value>, "parameter": <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### parameter:

* + - Node parameter Index
    - Type: integer, 8 bit
    - Range: dependant on target module, but not exceeding 255

### Behaviour

Transmits the CBUS message ‘RQNPN’, to request read of a node parameter by index

### Error return

## TEACH\_EVENT

### Format

'TEACH\_EVENT', {"nodeId": <value>, "eventName": <value>, "eventId": <value>, "eventVal": <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### eventName:

* + - event Name is comprised of a Node Number and an Event Number
    - Type: integer, 32 bit
    - Range: 0 to 0xFFFFFFFF

### eventId:

* + - event Variable Index
    - Type: integer, 8 bit
    - Range: dependant on target module, but not exceeding 255

### eventVal:

* + - event Variable Value
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### Behaviour

Teaches a module an event and/or an associated event variable, and also updates the system records by transmitting the following sequence of CBUS messages

NNLRN(nodeId) put module into learn mode

EVLRN(eventName, eventId, eventVal) send event to be taught

NNULN(nodeId) take module out of learn mode

NNULN(nodeId) take module out of learn mode

NERD(nodeId) read back all stored events

RQEVN(nodeId) read number of stored events

### Error return

## UPDATE\_EVENT\_VARIABLE

### Format

‘UPDATE\_EVENT\_VARIABLE’, {"nodeId": <value>, “eventIndex”: <value>, “eventName”: <value>, “eventVariableId”: <value>, “eventVariableValue”: <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### eventIndex:

* + - event Index
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### eventName:

* + - event Name is comprised of a Node Number and an Event Number
    - Type: integer, 32 bit
    - Range: 0 to 0xFFFFFFFF

### eventVariableId:

* + - event variable Index
    - Type: integer, 8 bit
    - Range: dependant on target module, but not exceeding 255

### eventVariableValue:

* + - event Variable Value
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### Behaviour

Teaches a module an event and/or an associated event variable, and also updates the system records by transmitting the following sequence of CBUS messages

NNLRN(nodeId) put module into learn mode

EVLRN(eventName, eventVariableId, eventVariableValue) send event to be taught

NNULN(nodeId) take module out of learn mode

REVAL(nodeId, eventIndex, eventVariableId) read event variable

NNULN(nodeId) take module out of learn mode

NERD(nodeId) read back all stored events

RQEVN(nodeId) read number of stored events

### Error return

## UPDATE\_LAYOUT\_DETAILS

### Format

‘UPDATE\_LAYOUT\_DETAILS’

### Behaviour

Writes current layout to file

### Error return

## UPDATE\_NODE\_VARIABLE

### Format

' UPDATE\_NODE\_VARIABLE', {"nodeId": <value>, "variableId": <value>, "variableValue": <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### variableId:

* + - Node Variable Index
    - Type: integer, 8 bit
    - Range: Range: dependant on target module, but not exceeding 255

### variableValue:

* + - Node Variable Value
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### Behaviour

Sets Node Variable, specified by the Node Variable Index, with the Variable value in the specified module

NVSET (nodeId, variableId, variableValue)

NVRD (nodeId, variableId)

### Error return

## UPDATE\_NODE\_VARIABLE\_IN\_LEARN\_MODE

### Format

'UPDATE\_NODE\_VARIABLE\_IN\_LEARN\_MODE', {"nodeId": <value>, "variableId": <value>, "variableValue": <value>}

#### Where

### nodeId:

* + - Node Number
    - Type: integer, 16 bit
    - Range: 0 to 0xFFFF

### variableId:

* + - Node Variable Index
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### variableValue:

* + - Node Variable Value
    - Type: integer, 8 bit
    - Range: 0 to 0xFF

### Behaviour

Sets Node Variable, specified by the Node Variable Index, with the Variable value in the specified module

NNLRN (nodeId)

NVSET (nodeId, variableId, variableValue)

NNULN (nodeId)

NVRD (nodeId, variableId)

NNULN (nodeId)

### Error return

# Transmitted Messages

## cbusError

### Format

‘cbusError’ <json data>

#### Where

An example of the json data follows

{

"1-2": {

"id": "1-2",

"type": "CBUS",

"Error": 2,

"Message": "Not in Learn Mode",

"node": 1,

"count": 1

}

}

## cbusNoSupport

### Format

‘cbusNoSupport’ <json data>

#### Where

An example of the json data follows

{

"FC": {

"opCode": "FC",

"msg": {

"message": ":SB780NFC0001"

},

"count": 1

}

}

## dccError

### Format

‘dccError’ <json data>

#### Where

An example of the json data follows

{

"type": "DCC",

"Error": 1,

"Message": "Loco Stack Full",

"data": "0000"

}

## dccSessions

### Format

‘dccSessions’ <json data>

#### Where

An example of the json data follows

{

"0": {

"count": 0,

"F1": 8,

"functions": [

4,

8,

12,

20,

28

],

"F2": 8,

"F3": 8,

"F4": 128,

"F5": 128

},

"1": {

"count": 0,

"F1": 2,

"functions": [

2

]

}

}

## events

### Format

‘events’ <json data>

#### Where

An example of the json data follows

[

{

"id": "00000000",

"nodeId": 0,

"eventId": 0,

"status": "on",

"type": "long",

"count": 2

},

{

"id": "00000001",

"nodeId": 0,

"eventId": 1,

"status": "on",

"type": "long",

"count": 2

}

]

## nodes

### Format

‘nodes’ <json data>

#### Where

An example of the json data follows

{

"0": {

"node": 0,

"manuf": 165,

"module": "CANACC8",

"flags": 7,

"consumer": true,

"producer": true,

"flim": true,

"bootloader": false,

"coe": false,

"parameters": [],

"variables": [],

"actions": {},

"status": true,

"component": "merg-canacc8",

"learn": false,

"EvCount": 3

},

"1": {

"node": 1,

"manuf": 165,

"module": "CANSERVO8C",

"flags": 7,

"consumer": true,

"producer": true,

"flim": true,

"bootloader": false,

"coe": false,

"parameters": [],

"variables": [],

"actions": {},

"status": true,

"component": "merg-canservo8c",

"learn": false,

"EvCount": 3

}

}

## VERSION

### Format

‘VERSION’ <json data>

#### Where

An example of the json data follows

{

"major": "1",

"minor": "0",

"patch": "2"

}