VLCB Versatile Layout Control Bus

CBUS Differences Information Sheet

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Document History

Date	Changed by	Summary of changes
18th October 2022	Ian Hogg M.5144	Initial document
14 March 2023	Ian Hogg M.5144	Latest update
14 April 2023	Ian Hogg M.5144	Changed name to VLCB

1 Introduction

This document attempts to collate the differences between VLCB and CBUS(™). Although every effort is made to ensure that all the differences are captured here it is unfortunately possible that changes made in the VLCB Minimum Node Specification (MNS) and the VLCB Profiles are not reflected within this document. In the case of any discrepancies the VLCB specifications take precedence over this information document.

It is hoped that this document can serve as a useful reference for module developers when upgrading modules from CBUS to VLCB.

2 Changes

Currently a simple list of changes. Need to add a little explanation of each.

2.1 Module versions

Version numbering uses beta as build number. There is no direct indication of a test/released version.

2.2 SLiM

Removal of SLiM from MNS, it may be added as an extension profile. FLiM is now Operational state. There is no longer a requirement for a green SLiM LED.

2.3 Push button and LEDs

Provision for other means of requesting NN and support for other mode indications.

2.4 Setup timeout

Setup mode has a timeout of 30 seconds so that if a SNN is not received within 30 seconds the module shall return to its previous mode. CBUS has no timeout and will potentially wait indefinitely.

2.5 CAN Priority

VLCB assigns a particular message priority to opcodes to ensure well-behaved message handling. Priority ratcheting is not used.

2.6 Message length checking

If a module identifies that a message targeted to itself does not have the specified message length then the module shall respond with GRSP(Invalid command).

2.7 Event teaching???

TBD

2.8 Module (type) parameter

The parameters Manufacturer & ModuleId are used as a 16 bit value to define the module type.

3. New Functionality

3.1 Service concept to aid documentation

The concept of Services has been introduced.

3.2 MNS: Service discovery

VLCB Minimum Node Service employs the concept of Services to describe a module's capabilities. A module may be interrogated to find the set of services supported by a module using the RQSD request. A module shall respond with an ESD message or a set of SD messages.

The use of Service discovery is recommended over any indications of functionality provided by module parameters.

A module developer may request a new service number (Service#) using the service request process.

Services may define additional opcodes or reuse existing opcodes using the opcode request process. They may also define additional error codes and diagnostic information without additional approval.

3.2 MNS: Diagnostics

VLCB Minimum Node Service supports a multitude of diagnostic data. Each service supports its own set of diagnostic parameters. The diagnostic values may be returned for a service using the RDGN request. The value is contained in the DGN response.

3.3 MNS: Module Heartbeat

VLCB modules will generate a regular HEARTB message defined in the Minimum Node Service. The regular heartbeat message may be temporarily disabled by putting the module into NOHEARTB Mode.

The HEARTB message includes a module status byte which is zero under normal conditions otherwise is a time based calculation of error conditions.

In addition a heartbeat health event may be defined. An OFF event indicates that the module is operating normally whereas an ON event indicates a non-normal status. This event may be used, for example, to illuminate an indicator on a module status display panel.

3.4 Event teaching

In addition to the CBUS mechanisms of Learn mode and event Indexes VLCB supports an EV teaching mechanism using tokens. This allows all the EVs of an event to be read in one go, to obtain the EV value actually written in the response to writing an event. It also allows up to 65535 events to be created and allows EVs to be deleted.

3.6 EventAck: Error/Ack Response

The Event Acknowledge service provides a capability for a module to acknowledge a consumed event with the ENACK opcode. The ENACK message includes the module's NN, event opcode and event NN:EN.

3.7 NVRD #0

Requesting a read of NV#0 will return a sequence of messages returning a NVANS message for each NV.

3.8 REQEV #0

Requesting a read of EV#0 will return an EVANS message of EV#0 containing the number of EVs followed by a EVANS message for each of the EV values.

3.9 RQNPN #0

Requesting a read of param #0 will return an PARAN message of param #0 containing the number of parameters followed by a PARAN message for each of the param values.

3.10 GRSP

Modules are now required to respond to requests with a GRSP message to indicate OK or a specific error. Modules should also respond with WRACK and CMDERR for backwards compatibility.

3.11 Mode command

A new MODE request has been introduced to allow switching between each of the module's modes (Normal, Uninitialised, Learn, No-Heartbeat etc.)

4 General and New Requirements

4.1 Auto self canid mandated

The CAN Service now mandates auto CANID self enumeration and auto CANID conflict resolution.

4.2 Mandated testing and Conformance Test Kit

Modules must confirm that they conform to the VLCB specification. There is the intention of supplying a conformance test kit to facilitate this process.

4.3 Mandated documentation

A module must document its I/O, power supply requirements and NV/EV usage. User documentation for the module must also be provided.

4.4 Improved specification documentation

Generally VLCB documentation is intended to remove the ambiguities from the CBUS specification and therefore removes optionality.

5 Clarifications

5.1 Events with Data

CBUS does not specify if modules taught to handle ACON/ACOF/ASON/ASOF events should also handle events with data. VLCB specifies:

a) If a module has been taught an event and requires associated data and that module receives the event without data then it should send a GRSP error (of some kind)
b) If a module handles events with no data then it can optionally handle events with data in the same way. – if DOCUMENTED in the manual.

5.2 Event Actions

Modules should provide actions for Start of Day and General Stop of peripherals.

5.3 ASRQ

A module shall respond to a ASRQ if the specified NN matches its node number OR the specified NN is zero.

6 Opcode changes

6.1 Removals - no longer required

- ACK
- NACK
- HLT
- BON
- EVLRNI ?

6.2 Deprecated - Used for CBUS compatibility

- WRACK
- CMDERR

6.3 Additions

- GRSP - General response to configuration messages
- MODE - Change module operating mode
- NVSETRD - Set NV with Read
- HEARTB - Module heartbeat
- RDGN / DGC - Diagnostics
- RQSD / SD/ ESD - Service discovery
- SQU - Source Quench
- ENACK - Event acknowledge