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/* DO NOT EDIT THIS FILE.
 * This file is automatically generated by ./generate.sh from cbusdefs.csv
 */
#ifndef __CBUSDEFS
#define __CBUSDEFS

#ifdef __cplusplus
extern "C" {
#endif

//
// Copyright (C) Pete Brownlow 2011-2022 software@upsys.co.uk
// Originally derived from opcodes.h (c) Andrew Crosland.
// CSV version by Ian Hogg inspired by David W Radcliffe
//
// Ver 8w
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//
// Version history:
// Pete Brownlow,6/4/11,Original from spec version 7e
// Roger Healey,6/4/11,Add OPC_CMDERR response codes
// Pete Brownlow,7/6/11,Updated to spec ver 7f and add new module ids
// Pete Brownlow,4/7/11,Updated to spec ver 7g
// Pete Brownlow,14/8/11,Updated to spec ver 7h
// Pete Brownlow,18/2/12,Updated to spec ver 8a, Rocrail and animated modeller
module types added
// Pete Brownlow,10/4/12,Updated to spec ver 8b, extended parameter bytes
// Pete Brownlow,17/4/12,Updated parameter block definitions, added processor type
definitions.
// Roger Healey,13/7/12,Add CANTOTI
// Pete Brownlow,15/9/12,Updated to spec ver 8c, added 0x5D ENUM and 0x75 CANID
// Pete Brownlow,4/1/13,Ver 8d New module types, added 0x5E NNRST
// Roger Healey,15/2/13,Now at version d. Added new Module Ids (as per ModuleIds
Issue 9) and
// Align Processor Ids with constants.inc
// Added .(fullstop) before each processor Id > 9
// Added OPC_NNRST
// Roger Healey,27/4/13,Added CANSIG8 and CANSIG64
// Roger Healey,6/8/13,Added CANCOND8C
// Roger Healey,22/1/14,Added CANPAN, CANACE3C, CANPanel and CANMIO
// Pete Brownlow,22/1/14,Ver 8g New module types, OPC_NNRST & OPC_NNRSM, catch up
with .inc file
// Added parameter definitions for manufacturer's CPU id
// Added extern C so can be included by c++ code
// Fixed CANGC1e type definition
// Phil Wheeler,1/2/14,Corrected some typos. Added PRM_BETA, dotted some more

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decimal numbers
// Phil Wheeler,9/3/14,Corrected CANSIG MTYP definitions
// Pete Brownlow,19/4/14,Ver 8h Added module type defs for CANTOTIMIO, CANACE8MIO,
CANBIP, CANSOL
// Pete Brownlow,06/7/15,Ver 8j Add new module types as per modules definitions
v17 : CANCDU, CANACC4CDU, CANWiBase, WiCAB, CANWiFi, CANFTT
// Add new opcode ALOC, added CPU manufacturer code CPUM_ATMEL
// Mike Bolton,2/3/16,Ver 8k Add module type CANRFID8
// Pete Brownlow,2/7/16,Ver 8m Add new module types CANHNDST, CANTCHNDST, CANmchRFID
and CANPiWi
// Add processor codes for ARM chips used in Raspberry Pi's
// Pete Brownlow,16/2/17,Ver 8n Add module ids to bring it up to module ids document
ver 25
// Pete Brownlow,29/7/17,Ver 8p Add new module ids and new cab signalling opcode
// Pete Brownlow,09/1/18,Ver 8q Add new parameter flag for module can consume its
own events
// Ian Hogg,11/9/18,Ver 8r Added CANACE16CMIO, CANPiNODE, CANDISP, CANCOMPUTE
// Richard Crawshaw,29/02/2020,Fixed order of columns in CbusCabSigAspect2.
// Pete Brownlow,01/09/20,Ver 8s for additional module ids defined in the ModuleIds
file ver 33.
// Updated descriptive comments for some module types
// Updated CABDAT opcode to match RFC0004
// Pete Brownlow,06/09/20,Ver 8t Added module type for CANRCOM. Fixed: Opcode for
CABDAT, names for CANRC522 and CANMAG
// Pete Brownlow,13/10/20,Ver 8u Added module types 67 to 74 including some Arduino
projects
// Added SPROG manufacturer code 44 and new SPROG CBUS
module types
// Additional error code for overload - now removed as
not required after all
// New bus type USB for modules with only USB and no
CAN
// Pete Brownlow,19/02/21,Ver 8u Added manufacturer code 13 for new development -
who don't have a manufacturer id yet
// Added processor identification codes for 18F25k83,
18F26k83 and 18F14K22.
// Andrew Crosland,21/09/2021,Ver 8t Added PICs P18F14K22 P18F26K83 P18F27Q84
P18F47Q84 and P18F27Q83
// Andrew Crosland,19/01/2022,Ver 8t, Added OPC_VCVS, Verify CV service mode - used
for CV read hints, update SPROG modules types (PR#13)
// Duncan Greenwood,07/10/2021,Ver 8t Added OPC_DTXC opcode (0xE9) for CBUS long
messages - RFC 0005
// Richard Crawshaw,11/10/2021,Ver 8t Fixed trailing comma in CbusCabSigAspect0
// Pete Brownlow,28/07/2022,Ver 8v Resolve and merge changes in 8u branch with
changes subsequently applied to master, now ver 8v in new branch,
// Add requested module
type ids 75 to 78
// Resolve changes from PR #13, move proposed and/or
agreed opcodes not yet in the published spec to below the others
// Pete Brownlow,5/08/2022, Ver 8w Add module type 79 for CANBUFFER
// Pete Brownlow,5/01/2023, Ver 8w Add module type 80 for CANPMSense
//
// CBUS Manufacturer definitions
// Where the manufacturer already has an NMRA code, this is used
//
#define MANU_DEV 13 // For new manufacturer development - who don't have a manufacturer id
yet
#define MANU_MERG165 // https://www.merg.co.uk
#define MANU_SPROG 44 // https://www.sprog-dcc.co.uk/
#define MANU_ROCRAIL 70 // http://www.rocrail.net
#define MANU_SPECTRUM 80 // http://animatedmodeler.com (Spectrum Engineering)
#define MANU_SYSPIXIE 249 // Konrad Orlowski
#define MANU_RME 248 // http://rmeuk.com (Railway Modelling Experts Limited)
//
//
// MODULE TYPES
//
// Please note that the existence of a module type id does not necessarily mean that firmware has
been implemented
//
// MERG Module types
//
#define MTYP_SLIM0 // default for SLiM nodes
#define MTYP_CANACC4 1 // Solenoid point driver
#define MTYP_CANACC5 2 // Motorised point driver
#define MTYP_CANACC8 3 // 8 digital outputs
#define MTYP_CANACE3 4 // Control panel switch/button encoder
#define MTYP_CANACE8C 5 // 8 digital inputs
#define MTYP_CANLED 6 // 64 led driver
#define MTYP_CANLED64 7 // 64 led driver (multi leds per event)
#define MTYP_CANACC4_2 8 // 12v version of CANACC4
#define MTYP_CANCAB 9 // CANCAB hand throttle
#define MTYP_CANCMD 10 // CANCMD command station
#define MTYP_CANSERVO 11 // 8 servo driver (on canacc8 or similar hardware)
#define MTYP_CANBC 12 // BC1a command station
#define MTYP_CANRPI 13 // RPI and RFID interface
#define MTYP_CANTTCA 14 // Turntable controller (turntable end)
#define MTYP_CANTTCB 15 // Turntable controller (control panel end)

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#define MTYP_CANHS 16 // Handset controller for old BC1a type handsets
#define MTYP_CANTOTI 17 // Track occupancy detector
#define MTYP_CAN8I8O 18 // 8 inputs 8 outputs
#define MTYP_CANSERVO8C 19 // Canservo with servo position feedback
#define MTYP_CANRFID 20 // RFID input
#define MTYP_CANTC4 21 //
#define MTYP_CANACE16C 22 // 16 inputs
#define MTYP_CANIO8 23 // 8 way I/O
#define MTYP_CANSNDX 24 // ??
#define MTYP_CANether 25 // Ethernet interface
#define MTYP_CANSIG64 26 // Multiple aspect signalling for CANLED module
#define MTYP_CANSIG8 27 // Multiple aspect signalling for CANACC8 module
#define MTYP_CANCOND8C 28 // Conditional event generation
#define MTYP_CANPAN 29 // Control panel 32/32
#define MTYP_CANACE3C 30 // Newer version of CANACE3 firmware
#define MTYP_CANPanel 31 // Control panel 64/64
#define MTYP_CANMIO 32 // Multiple I/O â€œ Universal CANMIO firmware
#define MTYP_CANACE8MIO 33 // Multiple IO module 16 inputs emulating CANACE8C on CANMIO
hardware
#define MTYP_CANSOL 34 // Solenoid driver module
#define MTYP_CANBIP 35 // Universal CANBIP firmware - Bipolar IO module with additional
8 I/O pins (CANMIO family)
#define MTYP_CANCDU 36 // Solenoid driver module with additional 6 I/O pins (CANMIO
family)
#define MTYP_CANACC4CDU 37 // CANACC4 firmware ported to CANCDU
#define MTYP_CANWiBase 38 // CAN to MiWi base station
#define MTYP_WiCAB 39 // Wireless cab using MiWi protocol
#define MTYP_CANWiFi 40 // CAN to WiFi connection with Withrottle to CBUS protocol
conversion
#define MTYP_CANFTT 41 // Turntable controller configured using FLiM
#define MTYP_CANHNDST 42 // Handset (alternative to CANCAB)
#define MTYP_CANTCHNDST 43 // Touchscreen handset
#define MTYP_CANRFID8 44 // multi-channel RFID reader
#define MTYP_CANmchRFID 45 // either a 2ch or 8ch RFID reader
#define MTYP_CANPiWi 46 // a Raspberry Pi based module for WiFi
#define MTYP_CAN4DC 47 // DC train controller
#define MTYP_CANELEV 48 // Nelevator controller
#define MTYP_CANSCAN 49 // 128 switch inputs
#define MTYP_CANMIO_SVO 50 // 16MHz 25k80 version of CANSERVO8c on CANMIO hardware
#define MTYP_CANMIO_INP 51 // 16MHz 25k80 version of CANACE8MIO on CANMIO hardware
#define MTYP_CANMIO_OUT 52 // 16MHz 25k80 version of CANACC8 on CANMIO hardware
#define MTYP_CANBIP_OUT 53 // 16MHz 25k80 version of CANACC5 on CANBIP hardware
#define MTYP_CANASTOP 54 // DCC stop generator
#define MTYP_CANCBS 55 // CANCMD with on board 3A booster
#define MTYP_CANMAG 56 // Magnet on Track detector
#define MTYP_CANACE16CMIO 57 // 16 input equivalent to CANACE8C
#define MTYP_CANPiNODE 58 // CBUS module based on Raspberry Pi
#define MTYP_CANDISP 59 // 25K80 version of CANLED64 (IHart and MB)
#define MTYP_CANCOMPUTE 60 // Compute Event processing engine
#define MTYP_CANRC522 61 // Read/Write from/to RC522 RFID tags
#define MTYP_CANINP 62 // 8 inputs module (2g version of CANACE8c) (Pete Brownlow)
#define MTYP_CANOUT 63 // 8 outputs module (2g version of CANACC8) (Pete Brownlow)
#define MTYP_CANEMIO 64 // Extended CANMIO (24 I/O ports) (Pete Brownlow)
#define MTYP_CANCABDC 65 // DC cab
#define MTYP_CANRCOM 66 // DC Railcom detector/reader
#define MTYP_CANMP3 67 // MP3 sound player in response to events (eg: station
announcements) (Duncan Greenwood)
#define MTYP_CANXMAS 68 // Addressed RGB LED driver (Duncan Greenwood)
#define MTYP_CANSVOSET 69 // Servo setting box (Duncan Greenwood)
#define MTYP_CANCMDDC 70 // DC Command station
#define MTYP_CANTEXT 71 // Text message display
#define MTYP_CANASIGNAL 72 // Signal controller
#define MTYP_CANSLIDER 73 // DCC cab with slider control (Dave Radcliffe)
#define MTYP_CANDCATC 74 // DC ATC module (Dave Harris)
#define MTYP_CANGATE 75 // Logic module using and/or gates (Phil Silver)
#define MTYP_CANSINP 76 // Q series PIC input module (Ian Hart)
#define MTYP_CANSOUT 77 // Q series PIC input module (Ian Hart)
#define MTYP_CANBIP 78 // Q series PIC input module (Ian Hart)
#define MTYP_CANBUFFER 79 // Message buffer (Phil Silver)
//
//
//
// At the time of writing the list of defined MERG module types is maintained by Pete Brownlow
software@upsys.co.uk
// Please liaise with Pete before adding new module types,
// and/or create your own GitHub branch, add your proposed new module type(s) and then create a
Pull Request
//
#define MTYP_CAN_SW 0xFF // Software nodes
#define MTYP_EMPTY 0xFE // Empty module, bootloader only
#define MTYP_CANUSB 0xFD // USB interface
//
// Sprog Module types
//
#define MTYP_CANPiSPRG3 1 // Pi-SPROG 3 programmer/command station
#define MTYP_CANSPPROG3P 2 // SPROG 3 Plus programmer/command station
#define MTYP_CANSPPROG 3 // CAN SPROG programmer/command station
#define MTYP_CANSBOOST 4 // System Booster

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#define MTYP_CANPiSPRGP 5 // Pi-SPROG 3 Plus programmer/command station
#define MTYP_CANISB 6 // CAN ISB Isolated CAN USB Interface
#define MTYP_CANIO 7 // 8-channel I/O module
#define MTYP_CANSERVOIO 8 // 8-channel Servo I/O module
#define MTYP_CANSOLIO 9 // 8-channel (4-pairs) Solenoid I/O module
//
//
// Rocrail Module types
//
#define MTYP_CANGC1 1 // RS232 PC interface
#define MTYP_CANGC2 2 // 16 I/O
#define MTYP_CANGC3 3 // Command station (derived from cancmd)
#define MTYP_CANGC4 4 // 8 channel RFID reader
#define MTYP_CANGC5 5 // Cab for fixed panels (derived from cancab)
#define MTYP_CANGC6 6 // 4 channel servo controller
#define MTYP_CANGC7 7 // Fast clock module
#define MTYP_CANGC1e 11 // CAN<->Ethernet interface
//
// Spectrum Engineering Animated Modeller module types
//
#define MTYP_AMCTRLR 1 // Animation controller (firmware derived from cancmd)
#define MTYP_DUALCAB 2 // Dual cab based on cancab
//
//
// SysPixie Module types (Konrad Orlowski)
//
#define MTYP_CANPMSense 1 // Motorised point motor driver with current sense
//
//
// CBUS opcodes list
//
// Packets with no data bytes
//
#define OPC_ACK 0x00 // General ack
#define OPC_NAK 0x01 // General nak
#define OPC_HLT 0x02 // Bus Halt
#define OPC_BON 0x03 // Bus on
#define OPC_TOF 0x04 // Track off
#define OPC_TON 0x05 // Track on
#define OPC_ESTOP 0x06 // Track stopped
#define OPC_ARST 0x07 // System reset
#define OPC_RTOF 0x08 // Request track off
#define OPC_RTON 0x09 // Request track on
#define OPC_RESTP 0x0a // Request emergency stop all
#define OPC_RSTAT 0x0c // Request node status
#define OPC_QNN 0x0d // Query nodes
//
#define OPC_RQNP 0x10 // Read node parameters
#define OPC_RQMN 0x11 // Request name of module type
//
// Packets with 1 data byte
//
#define OPC_KLOC 0x21 // Release engine by handle
#define OPC_QLOC 0x22 // Query engine by handle
#define OPC_DKEEP 0x23 // Keep alive for cab
//
#define OPC_DBG1 0x30 // Debug message with 1 status byte
#define OPC_EXTC 0x3F // Extended opcode
//
// Packets with 2 data bytes
//
#define OPC_RLOC 0x40 // Request session for loco
#define OPC_QCON 0x41 // Query consist
#define OPC_SNN 0x42 // Set node number
#define OPC_ALOC 0x43 // Allocate loco (used to allocate to a shuttle in cancmd)
//
#define OPC_STMOD 0x44 // Set Throttle mode
#define OPC_PCON 0x45 // Consist loco
#define OPC_KCON 0x46 // De-consist loco
#define OPC_DSPD 0x47 // Loco speed/dir
#define OPC_DFLG 0x48 // Set engine flags
#define OPC_DFNON 0x49 // Loco function on
#define OPC_DFNOF 0x4a // Loco function off
#define OPC_SSTAT 0x4c // Service mode status
#define OPC_NNRSMD 0x4f // Reset to manufacturer's defaults
//
#define OPC_RQNN 0x50 // Request Node number in setup mode
#define OPC_NNREL 0x51 // Node number release
#define OPC_NNACK 0x52 // Node number acknowledge
#define OPC_NNLRN 0x53 // Set learn mode
#define OPC_NNULN 0x54 // Release learn mode
#define OPC_NNCLR 0x55 // Clear all events
#define OPC_NNEVN 0x56 // Read available event slots
#define OPC_NERD 0x57 // Read all stored events
#define OPC_RQEVN 0x58 // Read number of stored events
#define OPC_WACK 0x59 // Write acknowledge
#define OPC_RQDAT 0x5a // Request node data event

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#define OPC_RQDDS0x5B // Request short data frame
#define OPC_BOOT 0x5C // Put node into boot mode
#define OPC_ENUM 0x5D // Force can_id self enumeration
#define OPC_NNRST0x5E // Reset node (as in restart)
#define OPC_EXTC10x5F // Extended opcode with 1 data byte
//
// Packets with 3 data bytes
//
#define OPC_DFUN 0x60 // Set engine functions
#define OPC_GLOC 0x61 // Get loco (with support for steal/share)
#define OPC_ERR 0x63 // Command station error
#define OPC_CMDERR 0x6F // Errors from nodes during config
//
#define OPC_EVNLF0x70 // Event slots left response
#define OPC_NVRD 0x71 // Request read of node variable
#define OPC_NENRD0x72 // Request read stored event by index
#define OPC_RQNP0x73 // Request read module parameters
#define OPC_NUMEV0x74 // Number of events stored response
#define OPC_CANID0x75 // Set canid
#define OPC_EXTC20x7F // Extended opcode with 2 data bytes
//
// Packets with 4 data bytes
//
#define OPC_RDCC30x80 // 3 byte DCC packet
#define OPC_WCVO 0x82 // Write CV byte Ops mode by handle
#define OPC_WCVB 0x83 // Write CV bit Ops mode by handle
#define OPC_QCVS 0x84 // Read CV
#define OPC_PCVS 0x85 // Report CV
//
#define OPC_ACON 0x90 // on event
#define OPC_ACOF 0x91 // off event
#define OPC_AREQ 0x92 // Accessory Request event
#define OPC_ARON 0x93 // Accessory response event on
#define OPC_AROF 0x94 // Accessory response event off
#define OPC_EVULN0x95 // Unlearn event
#define OPC_NVSET0x96 // Set a node variable
#define OPC_NVANS0x97 // Node variable value response
#define OPC_ASON 0x98 // Short event on
#define OPC_ASOF 0x99 // Short event off
#define OPC_ASQR 0x9A // Short Request event
#define OPC_PARAN0x9B // Single node parameter response
#define OPC_REVAL0x9C // Request read of event variable
#define OPC_ARSN0x9D // Accessory short response on event
#define OPC_ARSOF0x9E // Accessory short response off event
#define OPC_EXTC30x9F // Extended opcode with 3 data bytes
//
// Packets with 5 data bytes
//
#define OPC_RDCC40xA0 // 4 byte DCC packet
#define OPC_WCVS 0xA2 // Write CV service mode
//
#define OPC_ACON10xB0 // On event with one data byte
#define OPC_ACOF10xB1 // Off event with one data byte
#define OPC_REQEV0xB2 // Read event variable in learn mode
#define OPC_ARON10xB3 // Accessory on response (1 data byte)
#define OPC_AROF10xB4 // Accessory off response (1 data byte)
#define OPC_NEVAL0xB5 // Event variable by index read response
#define OPC_PNN 0xB6 // Response to QNN
#define OPC_ASON10xB8 // Accessory short on with 1 data byte
#define OPC_ASOF10xB9 // Accessory short off with 1 data byte
#define OPC_ARSN1 0xBD // Short response event on with one data byte
#define OPC_ARSOF1 0xBE // Short response event off with one data byte
#define OPC_EXTC40xBF // Extended opcode with 4 data bytes
//
// Packets with 6 data bytes
//
#define OPC_RDCC50xC0 // 5 byte DCC packet
#define OPC_WCVOA0xC1 // Write CV ops mode by address
#define OPC_CABDAT 0xC2 // Cab data (cab signalling)
#define OPC_FCLK 0xCF // Fast clock
//
#define OPC_ACON20xD0 // On event with two data bytes
#define OPC_ACOF20xD1 // Off event with two data bytes
#define OPC_EVLRN0xD2 // Teach event
#define OPC_EVANS0xD3 // Event variable read response in learn mode
#define OPC_ARON20xD4 // Accessory on response
#define OPC_AROF20xD5 // Accessory off response
#define OPC_ASON20xD8 // Accessory short on with 2 data bytes
#define OPC_ASOF20xD9 // Accessory short off with 2 data bytes
#define OPC_ARSN2 0xDD // Short response event on with two data bytes
#define OPC_ARSOF2 0xDE // Short response event off with two data bytes
#define OPC_EXTC50xDF // Extended opcode with 5 data bytes
//
// Packets with 7 data bytes
//
#define OPC_RDCC60xE0 // 6 byte DCC packets
#define OPC_PLOC 0xE1 // Loco session report
#define OPC_NAME 0xE2 // Module name response

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#define OPC_STAT 0xE3 // Command station status report
#define OPC_PARAMS 0xEF // Node parameters response
//
#define OPC_ACON30xF0 // On event with 3 data bytes
#define OPC_ACOF30xF1 // Off event with 3 data bytes
#define OPC_ENRSP0xF2 // Read node events response
#define OPC_ARON30xF3 // Accessory on response
#define OPC_AROF30xF4 // Accessory off response
#define OPC_EVLRNI 0xF5 // Teach event using event indexing
#define OPC_ACDAT0xF6 // Accessory data event: 5 bytes of node data (eg: RFID)
#define OPC_ARDAT0xF7 // Accessory data response
#define OPC_ASON30xF8 // Accessory short on with 3 data bytes
#define OPC_ASOF30xF9 // Accessory short off with 3 data bytes
#define OPC_DDES 0xFA // Short data frame aka device data event (device id plus 5 data bytes)
#define OPC_DDRS 0xFB // Short data frame response aka device data response
#define OPC_DDWS 0xFC // Device Data Write Short
#define OPC_ARSON3 0xFD // Short response event on with 3 data bytes
#define OPC_ARSOF3 0xFE // Short response event off with 3 data bytes
#define OPC_EXTC60xFF // Extended opcode with 6 data bytes
//
// Opcodes that are proposed and/or agreed but not yet in the current published specification
//
#define OPC_VCVS 0xA4 // Verify CV service mode - used for CV read hints
#define OPC_DTXC 0xE9 // CBUS long message packet
//
// Modes for STMOD
//
#define TMOD_SPD_MASK 3 //
#define TMOD_SPD_128 0 //
#define TMOD_SPD_14 1 //
#define TMOD_SPD_28I 2 //
#define TMOD_SPD_28 3 //
//
// Error codes for OPC_ERR
//
#define ERR_LOCO_STACK_FULL 1 //
#define ERR_LOCO_ADDR_TAKEN 2 //
#define ERR_SESSION_NOT_PRESENT 3 //
#define ERR_CONSIST_EMPTY 4 //
#define ERR_LOCO_NOT_FOUND 5 //
#define ERR_CMD_RX_BUF_OFLOW 6 //
#define ERR_INVALID_REQUEST 7 //
#define ERR_SESSION_CANCELLED 8 //
//
// Status codes for OPC_SSTAT
//
#define SSTAT_NO_ACK 1 //
#define SSTAT_OVLD 2 //
#define SSTAT_WR_ACK 3 //
#define SSTAT_BUSY 4 //
#define SSTAT_CV_ERROR 5 //
//
// Error codes for OPC_CMDERR
//
#define CMDERR_INV_CMD 1 //
#define CMDERR_NOT_LRN 2 //
#define CMDERR_NOT_SETUP 3 //
#define CMDERR_TOO_MANY_EVENTS 4 //
#define CMDERR_NO_EV 5 //
#define CMDERR_INV_EV_IDX 6 //
#define CMDERR_INVALID_EVENT 7 //
#define CMDERR_INV_EN_IDX 8 // now reserved
#define CMDERR_INV_PARAM_IDX 9 //
#define CMDERR_INV_NV_IDX 10 //
#define CMDERR_INV_EV_VALUE 11 //
#define CMDERR_INV_NV_VALUE 12 //
//
// Additional error codes proposed and/or agreed but not yet in the current published
// specification
//
#define CMDERR_LRN_OTHER 13 // Sent when module in learn mode sees NNLRN for different
// module (also exits learn mode)
//
// Sub opcodes for OPC_CABDAT
//
#define CDAT_CABSIG 1 //
//
// Aspect codes for CDAT_CABSIG
//
// First aspect byte
//
#define SASP_DANGER 0 //
#define SASP_CAUTION 1 //
#define SASP_PRELIM_CAUTION 2 //
#define SASP_PROCEED 3 //
#define SASP_CALLON 4 // Set bit 2 for call-on - main aspect will usually be at danger

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#define SASP_THEATRE      8          // Set bit 3 to 0 for upper nibble is feather lcoation, set 1
for upper nibble is theatre code
//
// Aspect codes for CDAT_CABSIG
//
// Second Aspect byte
//
#define SASP_LIT 0          // Set bit 0 to indicate lit
#define SASP_LUNAR      1          // Set bit 1 for lunar indication
//
// Remaining bits in second aspect byte yet to be defined - can be used for other signalling
systems
//
//
// Parameter index numbers (readable by OPC_RQNPN, returned in OPC_PARAN)
// Index numbers count from 1, subtract 1 for offset into parameter block
// Note that RQNPN with index 0 returns the parameter count
//
#define PAR_MANU 1          // Manufacturer id
#define PAR_MINVER      2          // Minor version letter
#define PAR_MTYPE 3          // Module type code
#define PAR_EVTNUM      4          // Number of events supported
#define PAR_EVNUM5      // Event variables per event
#define PAR_NVNUM6      // Number of Node variables
#define PAR_MAJVER      7          // Major version number
#define PAR_FLAGS8      // Node flags
#define PAR_CPUID9      // Processor type
#define PAR_BUSTYPE     10         // Bus type
#define PAR_LOAD 11        // load address, 4 bytes
#define PAR_CPUMID      15         // CPU manufacturer's id as read from the chip config space, 4
bytes (note - read from cpu at runtime, so not included in checksum)
#define PAR_CPUMAN      19         // CPU manufacturer code
#define PAR_BETA 20        // Beta revision (numeric), or 0 if release
//
// Offsets to other values stored at the top of the parameter block.
// These are not returned by opcode PARAN, but are present in the hex
// file for FCU.
//
#define PAR_COUNT0x18    // Number of parameters implemented
#define PAR_NAME 0x1A     // 4 byte Address of Module type name, up to 8 characters null terminated
#define PAR_CKSUM0x1E    // Checksum word at end of parameters
//
// Flags in PAR_FLAGS
//
#define PF_NOEVENTS      0          // Module doesn't support events
#define PF_CONSUMER      1          // Module is a consumer of events
#define PF_PRODUCER      2          // Module is a producer of events
#define PF_COMBI 3        // Module is both a consumer and producer of events
#define PF_FLiM 4         // Module is in FLiM
#define PF_BOOT 8         // Module supports the FCU bootloader protocol
#define PF_COE 16         // Module can consume its own events
#define PF_LRN 32         // Module is in learn mode
//
// BUS type that module is connected to
//
#define PB_CAN 1          //
#define PB_ETH 2          //
#define PB_MIWI 3         //
#define PB_USB 4          //
//
// Processor manufacturer codes
//
#define CPUM_MICROCHIP 1    //
#define CPUM_ATMEL 2        //
#define CPUM_ARM 3         //
//
// Microchip Processor type codes (identifies to FCU for bootload compatibility)
//
#define P18F2480 1         //
#define P18F4480 2         //
#define P18F2580 3         //
#define P18F4580 4         //
#define P18F2585 5         //
#define P18F4585 6         //
#define P18F2680 7         //
#define P18F4680 8         //
#define P18F2682 9         //
#define P18F4682 10        //
#define P18F2685 11        //
#define P18F4685 12        //
//
#define P18F25K8013        //
#define P18F45K8014        //
#define P18F26K8015        //
#define P18F46K8016        //
#define P18F65K8017        //
#define P18F66K8018        //
#define P18F25K8319        //

```

```

#define P18F26K8320    //
#define P18F27Q8421    //
#define P18F47Q8422    //
#define P18F27Q8323    //
#define P18F14K2225    //
//
#define P32MX534F064    30    //
#define P32MX564F064    31    //
#define P32MX564F128    32    //
#define P32MX575F256    33    //
#define P32MX575F512    34    //
#define P32MX764F128    35    //
#define P32MX775F256    36    //
#define P32MX775F512    37    //
#define P32MX795F512    38    //
//
// ARM Processor type codes (identifies to FCU for bootload compatibility)
//
#define ARM1176JZF S      1      // As used in Raspberry Pi
#define ARMCortex_A7      2      // As Used in Raspberry Pi 2
#define ARMCortex_A53     3      // As used in Raspberry Pi 3

#ifdef __cplusplus
}
#endif

#endif // __CBUSDEFS

```