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MIL USB-to-CAN Data Packet Framing

General Packet Framing:

BYTE[0]	BYTE[1:2+N]	BYTE[N+2:3]
SOF	*PAYLOAD*	*EOF*

- SOF: 1 Byte
- Payload: 2-Header Bytes (Before Data) or 1 Checksum Byte (After Data) + n-Data Bytes
- EOF: 1 Byte
- N: Number of bytes to be received or sent

Flag Descriptions:

Flag	Description
SOF: Start of Frame [0xC0]	The Start of Frame flag indicates the beginning position of the Payload.
EOF: End of Frame [0xC1]	The End of Frame flag delimits the end of the CRC field and terminates the frame. This can be changed if needed!

Payload (Sending/Requesting Data Configuration):

BYTE[1:N+2]	
BYTE[1:2]	**BYTE[3:N+2]**
Header	*Data*

Header:

15	14	13	12	11	10	9	8
R_nT_ENABLE	**CHECKSUM 16**				**DATA_LENGTH**		

7	6	5	4	3	2	1	0
CAN_FILTER_ID[7:0]							

- CAN_FILTER_ID: Desired device id to filter for.
- CHECKSUM 16: Mod 16 of the sum of all payload and flag bytes (Excluding Checksum) – If checksum matches than the device will fulfill data request.
- R_nT_ENABLE: Receiver or Transmitter mode enable.
  - 1 – Receiver mode
  - 0 – Transmitter mode
- DATA_LENGTH: data_length+1 data bytes to transmit/receive.
  - data_length = 0b000 -> 1 byte to transmit/receive
  - data_length = 0b111 -> 8 bytes to transmit/receive
  - Because CAN is limited to 8 bytes at a time DATA_LENGTH must be a maximum of 8 as well.

BYTE[3:N+2]
DATA

- N = DATA_LENGTH number of data bytes to send or receive.

Payload (Data Receiving):

BYTE[1:N+1]	
BYTE[1:N]	**BYTE[N+1]**
Data	***Checksum***

- CHECKSUM 16: Mod 16 of the sum of all payload and flag bytes (Excluding Checksum)

Examples:

- To Send 1 byte of data (0x35) to the bus
  - 0xX0 0x30 0xXX 0x35 0xX1
    - Start Flag: 0xC0
    - R_nT_ENABLE: Transmitter Mode (0)
    - Checksum: 0x06 ((0x30 & 0x78) >> 3)
    - Data length: 1
    - CAN_FILTER_ID: Don't Care
    - Data byte: 0x35
    - End Flag: 0xC1
- To Receive 1 byte of data from device ID 0x09
  - 0xC0 0xD0 0x09 0xC1
    - Start Flag: 0xC0
    - R_nT_ENABLE: Receiver Mode (1)
    - Checksum: 10 ((0xD0 & 0x78) >> 3)
    - Data Length: 1
    - CAN_FILTER_ID: 0x09
    - End Flag: 0xC1