

# Commandes Bus J1939

## Initialisation de l'ECU

À l'aide de la commande :

1. Mode Maître :

`Master:Speed:Source:Destination`

2. Mode Esclave :

`Slave:Speed:Source:Destination`

Détails des paramètres :

**Mode :**

- Master pour initialiser en mode maître.
- Esclave pour initialiser en mode esclave.

**Speed J1939 :** Vitesse de communication sur le réseau J1939, spécifiée en bps (bits par seconde).

**Source Address :** Adresse source de l'ECU, spécifiée en hexadécimal

**Destination Address :** Adresse de destination de l'ECU, spécifiée en hexadécimal

Guide de Dépannage :

**Error Init : Vérifiez le Mode :** Assurez-vous que vous spécifiez correctement le mode comme étant soit **Master** soit **Slave**.

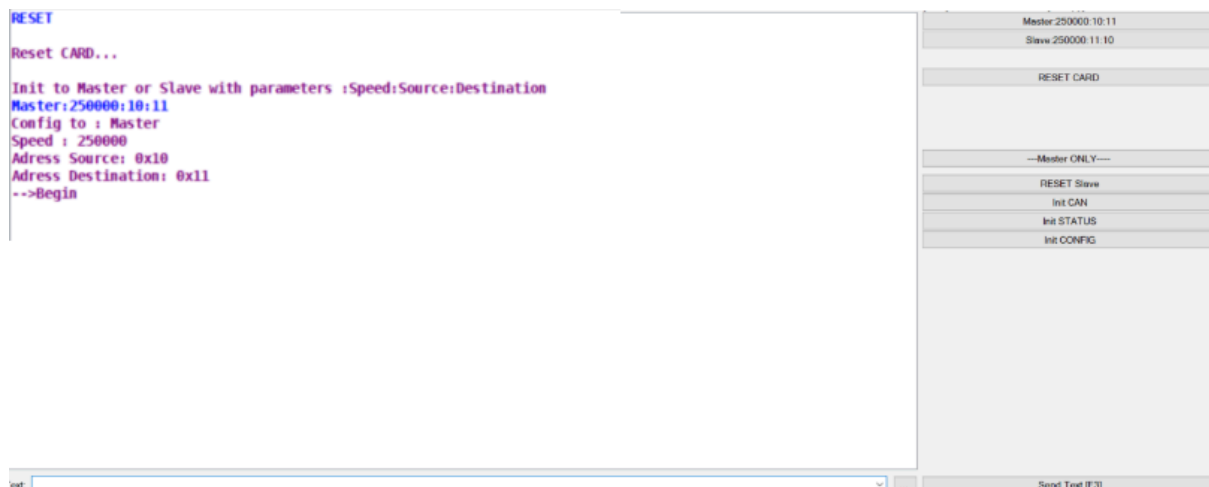
**Error Speed Set : 250K||500K||1M : Validez la Vitesse J1939 :** Confirmez que la vitesse J1939 est l'une des vitesses prises en charge par votre réseau et vos dispositifs J1939.

**Error address :Vérifiez le Format des Adresses :** Assurez-vous que les adresses sont fournies dans un format (hexadécimal)1 octet .

**Confirmez la Plage d'Adresses :** Assurez-vous que les adresses source et destination sont dans la plage acceptable pour le réseau J1939

Mode	Master/Slave
Vitesse J1939	250000,500000,1000000
Format d'Adresses	1 octet , Hexadecimal
Plage d'Adresses	0x00 - 0xFF

## Exemple de visualisation du setup :

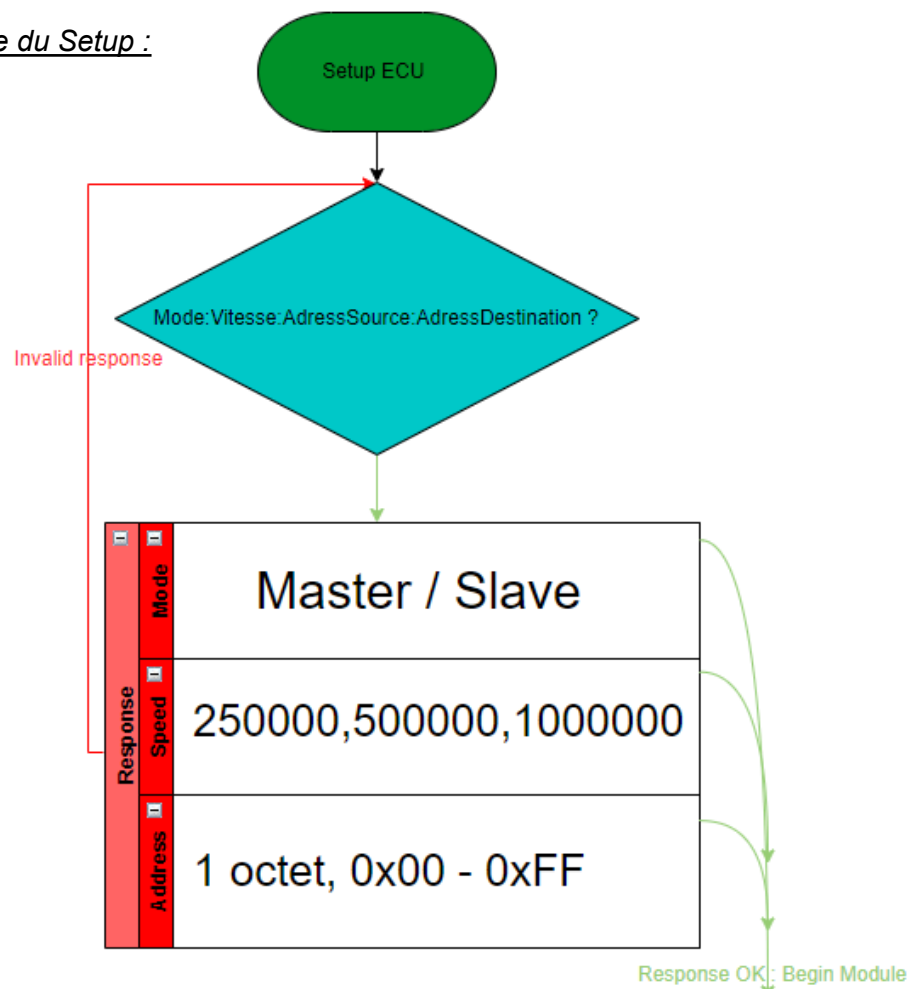


Pour une configuration du programme :

Il faut d'abord effectuer un reset pour éviter toute erreur d'initialisation, en vérifiant bien que le setup de la carte est en cours. Le module demande ensuite quel type de configuration est souhaité, suivant le format de commande de la notice d'utilisation. Il faut répondre avec une commande conforme : Maître:Vitesse:Source:Destination

Il est possible d'utiliser les boutons par défaut à droite de la vue pour un exemple de configuration et l'envoi des commandes d'initialisation.

### Algorithme du Setup :



## Commande de RESET:

Commande RESET : La commande **RESET** réinitialise la carte, que ce soit en mode maître ou esclave.

## Commandes Mode Maître

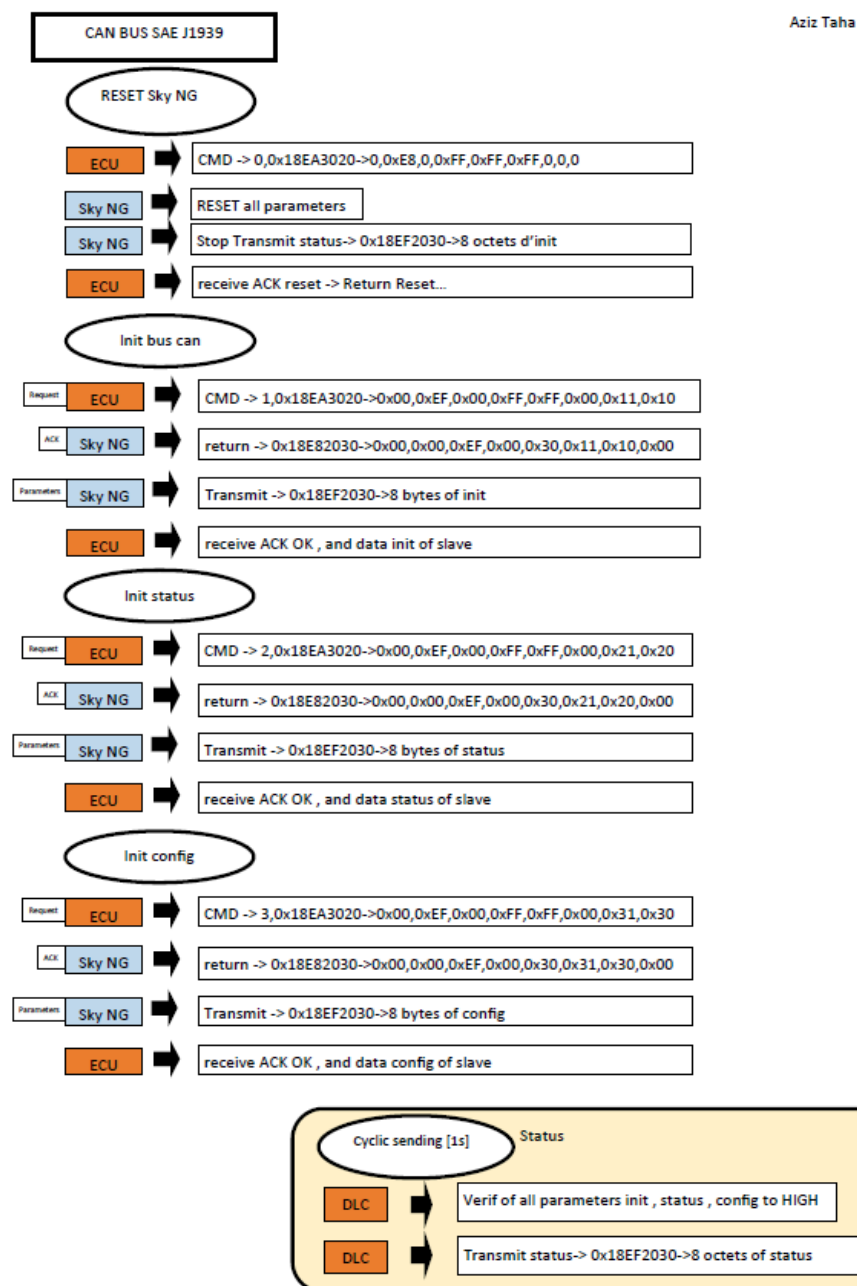
Initialiser le Bus CAN de l'Esclave : " 1 "

Envoyer le Statut d'Initialisation : " 2 "

Envoyer l'Initialisation de la Configuration : " 3 "

Réinitialiser l'Esclave : La commande " 0 " arrête l'envoi cyclique de l'esclave.

### Exemple de communication :



## Exemple de communication :

Lorsque le module renvoie **begin**, cela signifie qu'il est correctement configuré. Dans cet exemple, une communication entre un module configuré avec l'adresse source 0x10 et un autre avec l'adresse source 0x11 sera mise en place.

Le module appelé Maître va envoyer une trame de requête d'acknowledge d'initialisation du bus CAN avec la commande "1" ou en utilisant le bouton situé à droite dans la catégorie "maître seulement".

L'Esclave va renvoyer une trame d'ACK d'initialisation du bus CAN confirmant la réception de la requête du maître, puis envoyer une trame propriétaire A au module maître contenant les données de l'état de son bus CAN.

### Visualisation du module dit Maître :

```
RESET
Reset CARD...

Init to Master or Slave with parameters :Speed:Source:Destination
Master:250000:10:11
Config to : Master
Speed : 250000
Address Source: 0x10
Address Destination: 0x11
-->Begin
1
Envoie INIT
Priority:0x6 PGN: 0xE800 Src: 0x11 Dest: 0x10 Data: (8)0x0 0x0 0xEF 0x0 0x0 0x11 0x10 0x0
Priority:0x6 PGN: 0xEF00 Src: 0x11 Dest: 0x10 Data: (8)0x1 0x2 0x3 0x4 0x5 0x6 0x7 0x8
```

Predefined Commands:

[Ctrl+] Shift+F1..F12 to send [to cop]

Master:250000:10:11

Slave:250000:11:10

RESET CARD

RESET SLAVE for master only

Init CAN

Init STATUS

Init CONFIG

### Visualisation du module dit Esclave :

```
RESET
Reset CARD...

Init to Master or Slave with parameters :Speed:Source:Destination
Slave:250000:11:10
Config to : Slave
Speed : 250000
Address Source: 0x11
Address Destination: 0x10
-->Begin
Priority:0x6 PGN: 0xEA00 Src: 0x10 Dest: 0x11 Data: (8)0x0 0xEF 0x0 0xFF 0xFF 0xFF 0x11 0x10
```

Predefined Commands:

[Ctrl+] Shift+F1..F12 to send [to cop]

Master:250000:10:11

Slave:250000:11:10

RESET CARD

RESET SLAVE for master only

Init CAN

Init STATUS

Init CONFIG

### Visualisation du sniffer

Receive / Transmit

Trace

PCAN-USB

CAN-ID	Type	Length	Data
18EF1011h		8	01 02 03 04 05 06 07 08
18EA1110h		8	00 EF 00 FF FF FF 11 10
18E81011h		8	00 00 EF 00 00 11 10 00

# Commands Bus J1939

## ECU Initialization

Using the command:

1. Master Mode:

`Master:Speed:Source:Destination`

2. Slave Mode:

`Slave:Speed:Source:Destination`

### Parameter Details

#### Mode:

- Master to initialize in master mode.
- Slave to initialize in slave mode.

**Speed J1939:** Communication speed on the J1939 network, specified in bps (bits per second).

**Source Address:** Source address of the ECU, specified in hexadecimal.

**Destination Address:** Destination address of the ECU, specified in hexadecimal.

### Troubleshooting Guide

**Error Init : Check the Mode:** Ensure you correctly specify the mode as either **Master** or **Slave**.

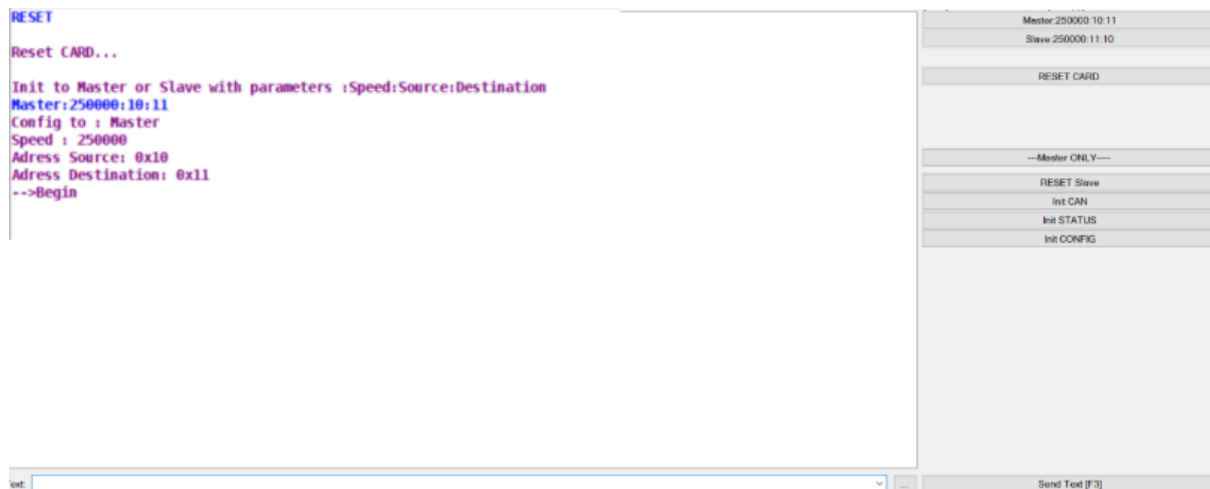
**Error Speed Set : 250K||500K||1M : Validate the J1939 Speed:** Confirm that the J1939 speed is one of the supported rates by your network and J1939 devices.

**Error address : Verify the Address Format:** Ensure addresses are provided in a format (hexadecimal) that is 1 byte.

**Confirm the Address Range:** Make sure that the source and destination addresses are within the acceptable range for the J1939 network.

Mode	Master/Slave
Speed J1939	250kbps,500kbps,1Mbps
Address Format	1 octet , Hexadecimal
Address Range	0x00 - 0xFF

## Example of setup's visualization:

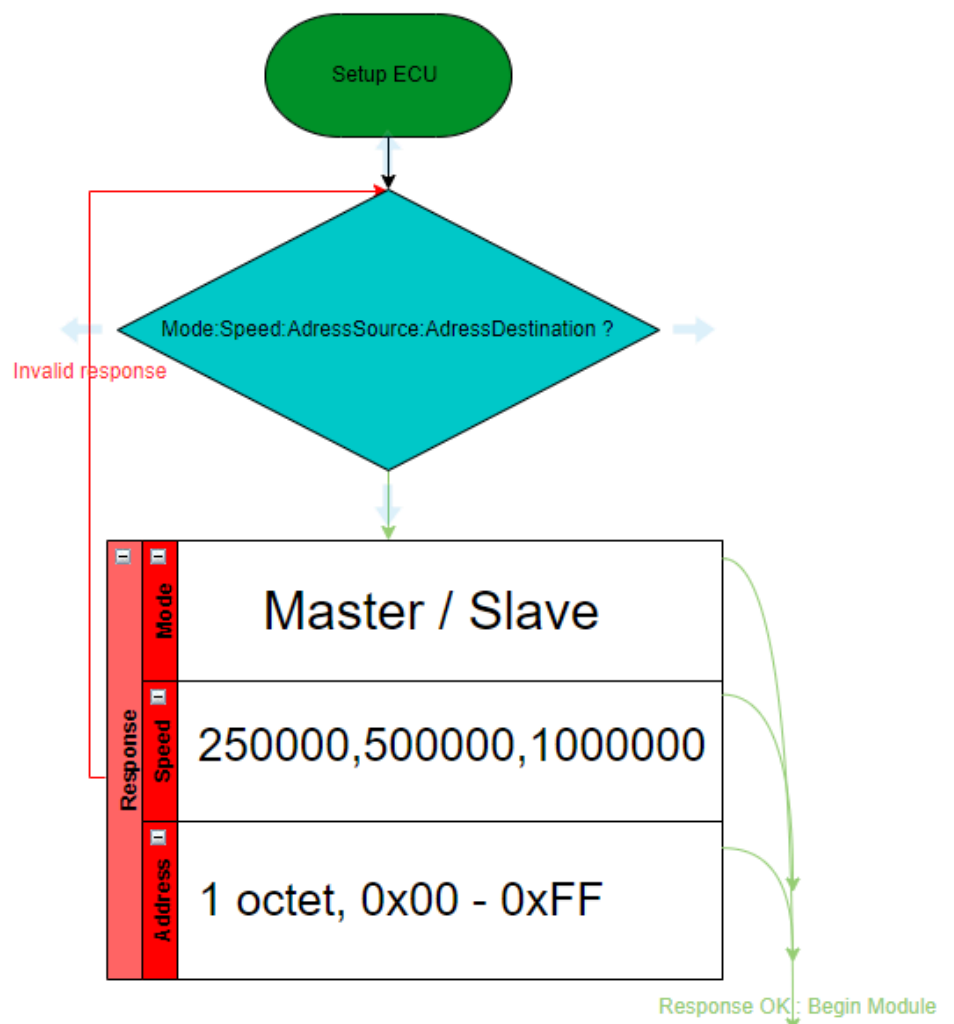


how to setup the program:

First, a reset must be performed to avoid any initialization errors, ensuring that the setup of the board is in progress. The module then asks what type of configuration is desired, following the command format in the user manual. The response must be a command in the format: Master:Speed:Source:Destination.

It is possible to use the default buttons on the right side of the view for a configuration example and to send initialization commands

Algorithme of the Setup :



## RESET Command:

**RESET Command:** The **RESET** command resets the board, whether it is in master or slave mode.

## Master Mode Commands

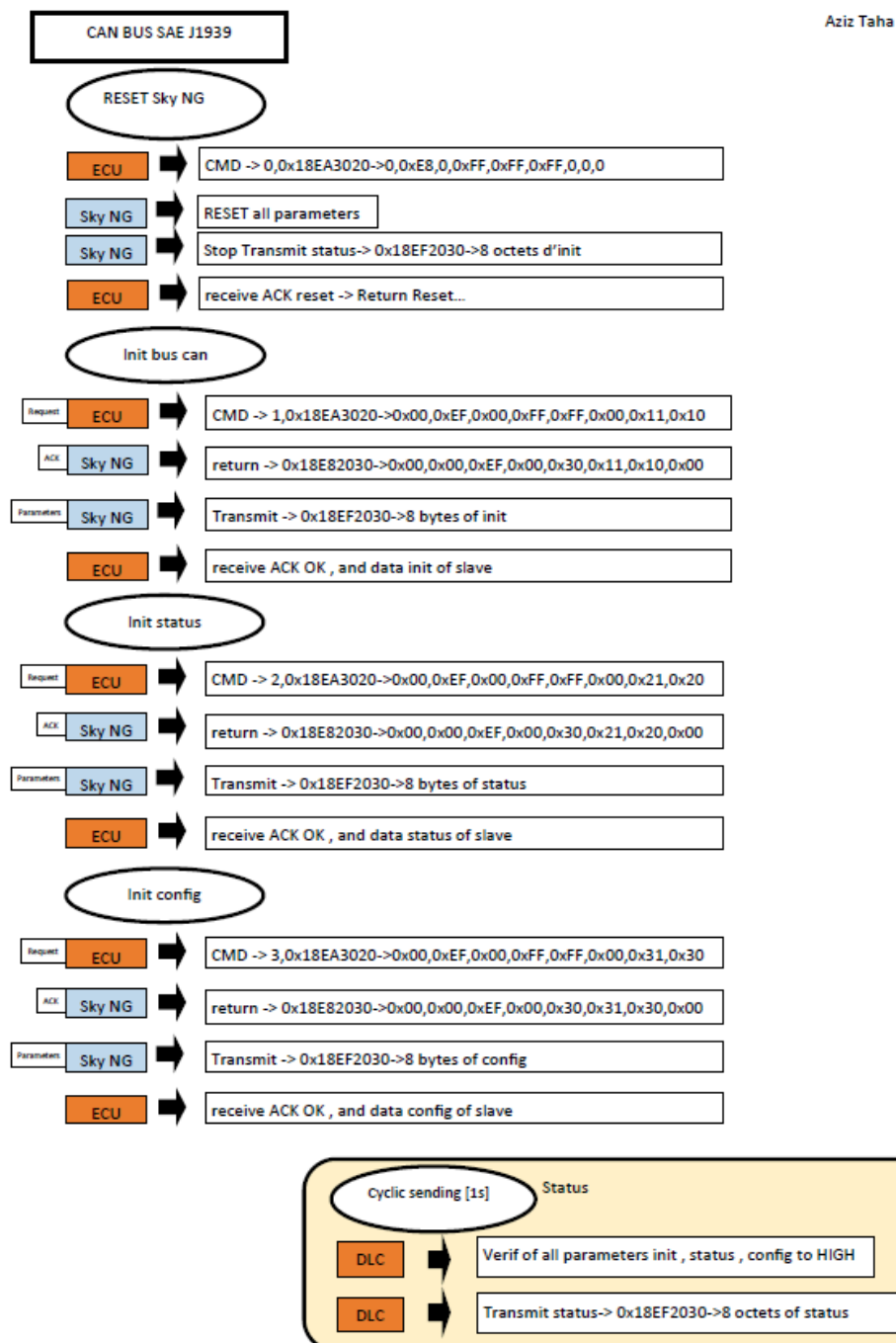
**Initialize the Slave CAN Bus:** " 1 "

**Send Initialization Status:** " 2 "

**Send Configuration Initialization:** " 3 "

*Reset the Slave: The command " 0 " stop the cyclic sending of slave.*

### Example of communication :



## Example of communication :

When the module returns **begin**, it indicates that it is correctly configured. In this example, a communication between a module configured with the source address 0x10 and another with the source address 0x11 will be established.

The module called Master will send a CAN bus initialization acknowledge request frame with command "1" or by using the button located on the right in the "master only" category. The Slave will send back a CAN bus initialization ACK frame confirming the reception of the master's request, and then send a proprietary A frame to the master module containing the data of its CAN bus status.

### Visualization of the Master Module:

```
RESET

Reset CARD...

Init to Master or Slave with parameters :Speed:Source:Destination
Master:250000:10:11
Config to : Master
Speed : 250000
Address Source: 0x10
Address Destination: 0x11
-->Begin
1
Envoie INIT
Priority:0x6 PGN: 0xE800 Src: 0x11 Dest: 0x10 Data: (8)0x0 0x0 0xEF 0x0 0x0 0x11 0x10 0x0
Priority:0x6 PGN: 0xEF00 Src: 0x11 Dest: 0x10 Data: (8)0x1 0x2 0x3 0x4 0x5 0x6 0x7 0x8
```

Predefined Commands:

[Ctrl+] Shift+F1..F12 to send [to cop]

Master:250000:10:11

Slave:250000:11:10

RESET CARD

RESET SLAVE for master only

Init CAN

Init STATUS

Init CONFIG

### Visualization of the Master Module:

```
RESET

Reset CARD...

Init to Master or Slave with parameters :Speed:Source:Destination
Slave:250000:11:10
Config to : Slave
Speed : 250000
Address Source: 0x11
Address Destination: 0x10
-->Begin
Priority:0x6 PGN: 0xEA00 Src: 0x10 Dest: 0x11 Data: (8)0x0 0xEF 0x0 0xFF 0xFF 0xFF 0x11 0x10
```

Predefined Commands:

[Ctrl+] Shift+F1..F12 to send [to cop]

Master:250000:10:11

Slave:250000:11:10

RESET CARD

RESET SLAVE for master only

Init CAN

Init STATUS

Init CONFIG

### Visualization of the sniffer

Receive / Transmit

Trace

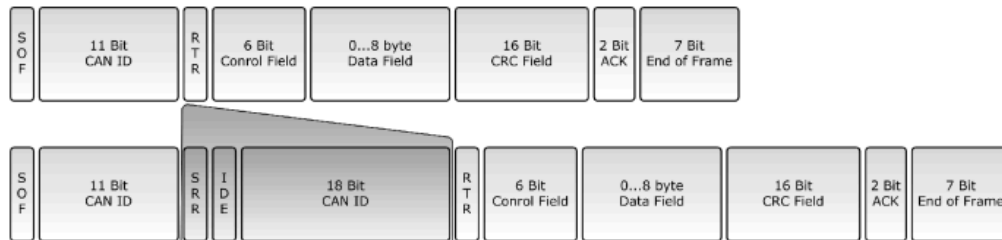
PCAN-USB

	CAN-ID	Type	Length	Data
	18EF1011h		8	01 02 03 04 05 06 07 08
	18EA1110h		8	00 EF 00 FF FF FF 11 10
	18E81011h		8	00 00 EF 00 00 11 10 00



# SAE J1939 :

## SAE J1939 – Message Format (J1939/21)



- CAN Standard 2.0A was extended to 2.0B to allow a 29-Bit Identifier according to J1708 and J1587.
- IDE Bit indicates 11-Bit or 29-Bit Message Identifier
- Both formats can co-exist on the same CAN bus
- MilCAN uses J1939 29-Bit Message ID and CANopen 11-Bit Message ID
- J1939/21 also defines the segmentation of messages larger than 8 bytes.

## SAE J1939 – Parameter Group Number

- Parameters embedded in the 29-Bit message identifier are divided into three sections:
  - Priority
  - PGN (Parameter Group Number)
  - 8 Bit Source Address
- PGN identifies the Parameter Group (PG)
- PGs point to information of parameter assignments within 8 byte CAN data field, repetition rate and priority
- 8672 different Parameter Groups per page – 2 pages are available

## **SAE J1939 – Communication Methods**

### **Destination Specific Communications:**

- Use PDU1 (PF values 0 to 239)
- Destination address required

### **Broadcast Communications:**

- Use PDU2 (PF values 240 to 255)
- Sending a message from single or multiple sources to single destination.
- Sending a message from single or multiple sources to multiple destinations.

### **Proprietary Communications:**

- Use either PDU1 or PDU2
- CAN be either Destination Specific or Broadcast
- Use proprietary PGNs

## **SAE J1939 – Parameter Group Number**

### **DP – Data Page**

- Page selector for PDU (Protocol Data Unit) Format (PF) field
- Currently at 0, pointing to Page 0
- Page 1 for future purposes

### **PDU Format (PF)**

- PF = 0 - 239 (PDU1) indicates a destination address in PS
- PF = 240 - 255 (PDU2) indicates extension to PDU Format (PF)

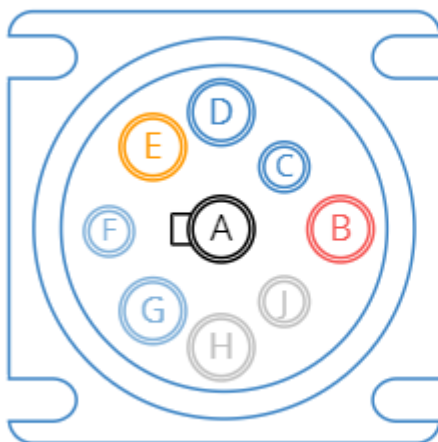
### **PDU Specific (PS)**

- Content interpreted according to information in PDU Format (PF)

## SAE J1939 – Preferred Addresses

Industry Group	Preferred Address Range
Global (Applies to all industry groups)	0 – 84 Assigned 85 – 127 Reserved 248, 252 - 255 Reserved
Industry Group #1 – On-Highway Equipment	128 – 160 Dynamic 161 – 247 Assigned
Industry Group #2 – Agricultural and Forestry Equipment	128 – 207 Dynamic 208 – 247 Reserved
Industry Group #3 – Construction Equipment	128 – 207 Dynamic 208 – 247 Reserved
Industry Group #4 – Marine Equipment	128 – 207 Dynamic 208 – 247 Reserved
Industry Group #5 – Industrial, Process Control, Stationary Equipment	128 – 207 Dynamic 208 – 247 Reserved

### SAE J1939 Connector Pinout



- A** Ground
- B** Battery power
- C** CAN 1 H
- D** CAN 1 L
- E** CAN shield
- F** J1708 (+) / CAN 2 H
- G** J1708 (-) / CAN 2 L
- H** OEM specific
- J** OEM specific

Type 1 (black): CAN 1 = 250K

Type 2 (green): CAN 1 = 500K

## SAE J1939 – Request Message

Parameter Group Name	Request
Parameter Group Number	59904 (00EA00 <sub>hex</sub> )
Definition	Requests a Parameter Group from a single device or all devices in the network.
Transmission Rate	User defined (no more than 2 to 3 times a second is recommended)
Data Length	3 bytes (CAN DLC = 3)
Extended Data Page (R)	0
Data Page	0
PDU Format	234
PDU Specific	Destination Address (Global or Specific)
Default Priority	6
Data Description	Byte 1, 2, 3 = Requested Parameter Group Number

## SAE J1939 – Acknowledgement Message

Parameter Group Name	Acknowledgement
Parameter Group Number	59392 (00E800 <sub>hex</sub> )
Definition	Provides handshake between transmitting and responding nodes.
Transmission Rate	Upon reception of a command or request.
Data Length	8 bytes (as described in the following)
Extended Data Page (R)	0
Data Page	0
PDU Format	232
PDU Specific	Destination Address (Global = 255)
Default Priority	6
Data Description	Bytes 1...8 = Positive Acknowledgement, Negative Acknowledgement, Access Denied or Cannot Respond

## SAE J1939 – Proprietary Parameter Groups

Proprietary Parameter Groups and their numbers are designed using the exact same structure as Parameter Group and their numbers defined by the SAE.

Parameter Group Name	Proprietary A
Parameter Group Number	61184 (00EF00 <sub>hex</sub> )
Definition	Proprietary PG using the PDU1 Format for Peer-to-Peer communication.
Transmission Rate	Manufacturer Specific
Data Length	0 – 1785 bytes (multi-packet supported)
Extended Data Page (R)	0
Data Page	0
PDU Format	239
PDU Specific	8 bit Destination Address – Manufacturer Assigned
Default Priority	6
Data Description	Manufacturer Specific