

# Au Truck and Bus FMS Interpreter User Manual

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## Chapter 1. Introduction

Au FMS (Fleet Management System) Interpreter (Figure 1-1), a palm-size handheld device with CAN bus Interface and RS232 Interface, is capable of interpret TRUCK-FMS and / or BUS-FMS signals to a RS232 ASCII String (Similar to AT command string). It can be connected to FMS Controller Area Network (CAN) and +12V power supply at the "BUS" side 9-pin male connector.

The pin-out of the "BUS" side DB9 male connector is illustrated in Figure 1-2a.

The pin-out of the "RS232" side DB9 female connector is illustrated in Figure 1-2b".



Figure 1-1 Au Truck and Bus FMS Interpreter



Pin 1: GND                      Pin 6: CAN-L  
Pin 5: +12V DC                Pin 7: CAN-H

Figure 1-2a Pin-out for FMS side DB9 male connector



Pin 2: To PC RXD              Pin 3: from PC TXD  
Pin 5: GND

Figure 1- 2b Pin-out for RS232 side DB9 female connector

A typical FMS network topology with Au FMS Interpreter is illustrated in Figure 1 - 3.

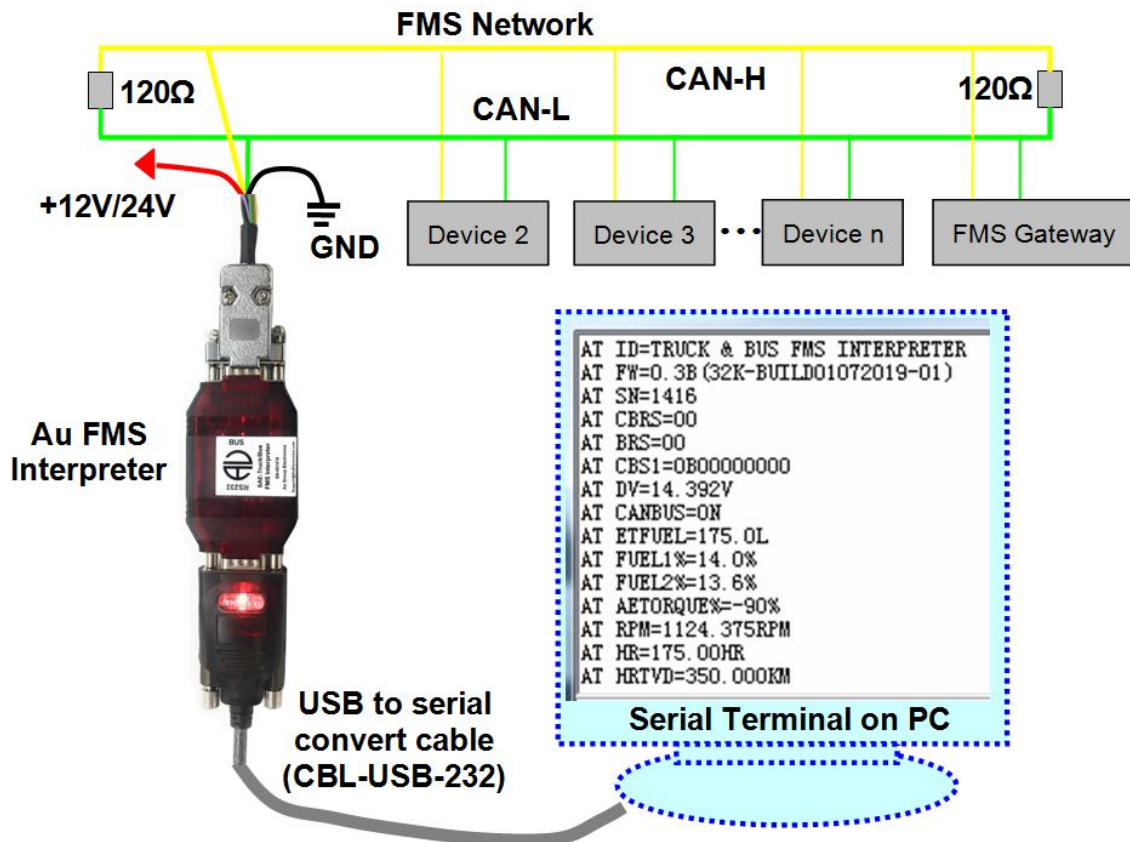


Figure 1-3 A typical FMS Controller Area Network (CAN) topology with Au FMS Interpreter

## 1. 1. Accessories

Table 1-1 Accessories

<p>CBL-CAN-485-01</p> 	<p>A 6-wire color coded cable (part# CBL-CAN-485-01) can be used for Au J1939, FMS, and J1708 devices.</p> <p>One end of the cable is DB9 female connector; it is designed to mate with Au devices on BUS side.</p> <p>The other side of the cable is a pig tail with 3 pairs of twisted color coded wires:</p> <p>Red wire: Power supply, e.g. +12V DC      Black wire: Ground          Yellow wire: CAN High                              Green wire: CAN Low          Violet: J1708A+                                      Brown: J1708B-</p>
<p>CBL-CAN-485-03-G18</p> 	<p>This cable has a DB9 female connector and a 9-way green round threaded plug. The green round plug is for SAE CAN networks (J1939-11: 250K bps , and J1939-14: 500K bps) and SAE J1708 / J1587 networks (9.6K bps). It can be connected to any vehicles (e.g. trucks and school buses) equipped with 9 pin diagnostic connectors. Power, Ground, CAN_H, CAN_L, J1708+ and J1708- are connected from / to the vehicle via this Deutsch connector. The DB9 female connector can be connected with Au J1939 devices. It will supply power, ground, CAN_H, CAN_L, J1708+ and J1708- connection to Au J1939, FMS, and J1708 devices. Standard cable length is 18 inch, it can be customized upon request.</p>
<p>CBL-RS232-01</p> 	<p>RS232 Serial Extension Cable can be used to connect computer Serial port to Au J1939 / J1708 products (on RS232 Side).</p> <p>Major Features:</p> <ul style="list-style-type: none"> <li>* Fully shielded to prevent unwanted EMI/RFI interference</li> <li>* Fully molded connectors with thumbscrews provide a quick and easy connection every time</li> <li>* Connectors: DB9 Male to DB9 Female</li> <li>* All 9 connector pins are wired straight through</li> </ul>
<p>CBL-USB-232</p> 	<p>The USB to Serial Converter cable can be used to connect computer USB port to Au J1939 / J1708 products (on RS232 Side). It acts as a bridge between a USB port and a standard Serial (RS232) port. It is Vista, Win7, and XP compatible.</p> <p>Three LED are included, Power, TX and RX. Power LED is on when USB power is supplied. TX LED will blink when COM port is transmitting. RX LED will blink when COM port is receiving.</p> <p>It is compatible with all Au Group Electronics system products, J1939 Simulators, J1708 Simulators, FMS Simulators, J1939 Interpreters, J1708 Interpreters, J1939 MCS, and J1939 DCS.</p>

## 1. 2. Major Hardware Features

Major hardware features of Au TRUCK/BUS FMS Interpreter are listed below:

- **Power supply:** Nominal voltage: +12V DC or +24V DC, operating range: +10V~+32V DC, 250mA max
- **Operating electric current:** 65mA typical, 250mA max
- **Operating temperature:** -40 °F to 185 °F (-40 °C to 85 °C)
- **Compact size:** 3-1/8" L X 1-5/8"W X 13/16"H
- **Enclosure color:** Black and translucent red
- **TVS (Transient Voltage Suppressor) protection on CAN bus**
- **One LED** indicator for communication event indication
- **One DB9 Male "BUS" Interface:** to connect with FMS network and a power supply (+14.2V /24V DC).



- **One 2500V rms isolated RS232 Interface** (default baud rate: 115.2K): to output received FMS signals in the ASCII String format (Similar to AT Command String). It can also be used for in-field firmware update. Au FMS Interpreter can be connected to RS232 (serial) port of PC either through a RS232 serial extension cable (Part#: CBL-RS232-01, order separately) or through a USB to RS232 serial convert cable (Part #: CBL-USB-232, order separately).

### 1. 3. Major Operating Features

- **Ease of use:** No complicate software setup experience or CAN protocol configuration skill is required.
- **Easy in-field license upgrade feature** with Au License Management Tool. The Value package edition, Truck FMS Edition and Bus FMS Edition can be easily upgraded to Truck+BUS FMS Edition.
- **In-field firmware updating** capability with Au Bootloader technology.
- **Annual support and minor upgrade services** are available (SVS-ITP-FMS).
- **Custom design** is available upon request.
- **MCU chip solution** is available for OEM and third-party integration.

### 1. 4. Supported Truck/Bus FMS Parameters

Au **FMS** Interpreter supports all **106** FMS parameters (including 47 Common FMS parameters, **64** Telltale block ID and status. 8 Truck FMS only parameters, and 51 Bus FMS only parameters).

#### a. List of common FMS parameters (47 SPN)

Au FMS Interpreter supports **47** Common FMS Parameters (SPN: Suspect Parameter Number) .

Table 1-2 47 Common FMS Parameters

Common FMS Parameters	SPN	Common FMS Parameters	SPN
Fuel Level 2	38	Vehicle motion	1611
Parking Brake Switch	70	Driver 1 working state	1612
Wheel Based Speed	84	Driver 2 working state	1613
Accelerator pedal position	91	Vehicle Overspeed	1614
Fuel Level 1	96	Driver 1 card	1615
Engine Coolant temperature	110	Driver 2 card	1616
Ambient Air Temperature	171	Driver 1 time related states	1617
Fuel Rate	183	Driver 2 time related states	1618
Instantaneous Fuel Economy	184	Direction indicator	1619
Engine Speed	190	Tachograph performance	1620
Vehicle identification number	237	Handling information	1621
Engine Total Hours of Operation	247	System event	1622
Engine Total fuel used	250	Tachograph vehicle speed	1624
Actual Engine – Percent Torque	513	Driver 1 identification	1625
Actual Retarder - Percent Torque	<b>520</b>	Driver 2 identification	1626
Brake Pedal Position	521	Retarder selection non-engine	1716
Cruise control states	527	After treatment 1 Diesel Exhaust Fluid Tank 1 level	1761
Cruise control active	595	Diagnostics supported	2804
Brake Switch	597	Requests supported	2805
Clutch Switch	598	SW-version supported	2806
Retarder Torque Mode	900	High resolution engine total fuel used	5054
High Resolution Total vehicle distance	917	Fuel Type	5837
Total Fuel Used (Gaseous)	1040	Telltale Block ID 0-4 *	N/A
Service Brake Air Pressure Circuit #1	1087	Telltale Status 1-15 *	N/A
Service Brake Air Pressure Circuit #2	1088	TP.CM.BAM + TP.DT	N/A



**b. List of truck FMS only parameters(8 SPN)**

Au FMS Interpreter supports the following the following 8 Truck FMS only parameters:

Table 1-4 8 Truck FMS only Parameters

SPN	Truck FMS Parameters
92	Engine Percent Load at Current Speed
582	Axle weight
914	Service distance
928	Axle Location
928	Tire Location
976	PTO state
1760	Gross Combination Vehicle Weight
3948	At least one PTO engaged

**c. List of bus FMS only parameters (51 SPN)**

Au FMS Interpreter supports the following 51 Bus FMS only parameters:

Table 1-3 51 Bus FMS only parameters

Bus FMS Parameters	SPN
Current Gear	523
Selected Gear	524
Seconds	959
Minutes	960
Hours	961
Day	962
Month	963
Year	964
Bellow Pressure Front Axle Left	1725
Bellow Pressure Front Axle Right	1726
Bellow Pressure Rear Axle Left	1727
Bellow Pressure Rear Axle Right	1728
Steering Wheel Angle	1807
Ramp/Wheel chair life	1820
Position of Doors	1821
Alternator Status 1	3353
Alternator Status 2	3354
Alternator Status 3	3355
Alternator Status 4	3356
Status 2 of doors	3411
Hybrid Battery Pack Remaining Charge	5464

Bus FMS Parameters	SPN
Lock Status Door 1	3412
Open Status Door 1	3413
Enable Status Door 1	3414
Lock Status Door 2	3415
Open Status Door 2	3416
Enable Status Door 2	3417
Lock Status Door 3	3418
Open Status Door 3	3419
Enable Status Door 3	3420
Lock Status Door 4	3421
Open Status Door 4	3422
Enable Status Door 4	3423
Lock Status Door 5	3424
Open Status Door 5	3425
Enable Status Door 5	3426
Lock Status Door 6	3427
Open Status Door 6	3428
Enable Status Door 6	3429
Lock Status Door 7	3430
Open Status Door 7	3431
Enable Status Door 7	3432
Lock Status Door 8	3433
Open Status Door 8	3434
Enable Status Door 8	3435
Lock Status Door 9	3436
Open Status Door 9	3437
Enable Status Door 9	3438
Lock Status Door 10	3439
Open Status Door 10	3440
Enable Status Door 10	3441



**d. List of Telltale block ID and status (64 TBIS).**

Au FMS Interpreter supports all the Telltale block ID and status (5x15 matrix), as listed in table 1-3.

Table 1-3 Telltale block ID and status (TBIS) table

Block ID	Telltale Status	Name	Block ID	Telltale Status	Name
0	1	Cooling air conditioning	2	9	Pram request
0	2	High beam, main beam	2	10	Bus stop brake
0	3	Low beam, dipped beam	2	11	Ad blue level
0	4	Turn signals	2	12	Raising
0	5	Hazard warning	2	13	Lowering
0	6	Provision for the disabled or handicapped	2	14	Kneeling
0	7	Parking Brake	2	15	Engine compartment temperature
0	8	Brake failure / brake system malfunction	3	1	Auxiliary air pressure
0	9	Hatch open	3	2	Air filter clogged
0	10	Fuel level	3	3	Fuel filter differential pressure
0	11	Engine coolant temperature	3	4	Seat belt
0	12	Battery charging condition	3	5	EBS
0	13	Engine oil	3	6	Lane departure indication
0	14	Position lights, side lights	3	7	Advanced emergency braking
0	15	Front fog light	3	8	ACC
1	1	Rear fog light	3	9	Trailer connected
1	2	Park Heating	3	10	ABS Trailer 1,2
1	3	Engine	3	11	Airbag
1	4	Service, call for maintenance	3	12	EBS Trailer 1,2
1	5	Transmission fluid temperature	3	13	Tachograph indication
1	6	Transmission failure / malfunction	3	14	ESC switched off
1	7	Anti-lock brake system failure	3	15	Lane departure warning switched
1	8	Worn brake linings	4	1	Engine emission filter (Soot Filter)
1	9	Windscreen/ windshield washer fluid	4	2	Electric motor failures
1	10	Tire failure / malfunction	4	3	AdBlue tampering
1	11	Malfunction / general failure	4	4	Multiplex System
1	12	Engine oil temperature	4	5	Reserved for FMS-Standard
1	13	Engine oil level	4	6	Reserved for FMS-Standard
1	14	Engine coolant level	4	7	Reserved for FMS-Standard
1	15	Steering fluid level	4	8	Reserved for FMS-Standard
2	1	Steering failure	4	9	Reserved for FMS-Standard
2	2	Height Control (Leveling)	4	10	Reserved for FMS-Standard
2	3	Retarder	4	11	Reserved for FMS-Standard
2	4	Engine Emission system failure	4	12	Reserved for FMS-Standard
2	5	ESP indication	4	13	Reserved for FMS-Standard
2	6	Brake lights	4	14	Reserved for FMS-Standard
2	7	Articulation	4	15	Reserved for FMS-Standard
2	8	Stop Request			

## Chapter 2. Description of AT Command for FMS Interpreter

Au FMS Interpreter interprets FMS CAN signal to RS232 ASCII strings according to the **FMS** specifications and **BUS-FMS** specifications. Only Received FMS signals will be interpreted to AT Commands. If the signal is not present on the CAN network, the device will not send the particular parameter string. This approach will maximize the efficiency on the RS232 band width (115.2K baud rate). Each received parameter will be transmitting over RS232 port (115.2K baud rate) in the format of AT command and examples are described in this chapter.

All the translated signals will display in the format as following:

**AT <Abbreviation>=<X.Y><Unit><CR>< LF>**  
 or  
**AT <Abbreviation>=<character><CR>< LF>**

It always started with "AT ", consist of character of "A", "T" and a space character, followed with **space character**, then **Abbreviation** of specific FMS parameter, an equal sign =, then **value** and **unit** for digital parameters or status (such as **ON / OFF** or **Disable / Enabled** or **Claimed / NotClaimed**, etc.). Every single AT Command end with a carriage return "<CR>" and a line feed "<LF>". In this document, "<CR>" and "\r" both represent carriage return; "<LF>" and "\n" both represent Line Feed.

### 2.1. Device Information Parameters:

Connect Au FMS Interpreter to 9 – 24 V DC power supply, under default setting, six device information related parameters will be broadcasted at power on: ID, FW, SN, CBRS, BRS, CBS1. Two other parameters: DV and CANBUS will be broadcasted every second.

Table 2 -1 List of Device Information Parameters (Transmitted)

Parameter	Explanation	
<b>ID</b> (Device ID)	Repetition Example	Broadcast once at Power On, and can be requested during run time (at id=?\r\n) <b>AT ID= TRUCK &amp; BUS FMS INTERPRETER\r\n</b>
<b>FW</b> (Firmware)	Data range Repetition Example	0.1A – 25.6A Broadcast once at Power On, and can be requested during run time (AT FW=?\r\n) <b>AT FW=0.3B\r\n</b> --- Firmware of the device is 0.3B
<b>SN</b> (Serial Number)	Data range Repetition Example	0 - 4294967295 Broadcast once at Power On, and can be requested during run time (AT SN=?\r\n) <b>AT SN=429\r\n</b> --- Serial Number of the device is 429
<b>CBRS</b> (CAN Baud Rate Setting)	Data range Example 1 Example 2 Example 3 Example 4 Example 5	00 – 04; default value is 00; use "AT ID=?\r\n" to pull CBRS value. <b>AT CBRS=00\r\n</b> ---CAN Bus baud rate is 250K (default) <b>AT CBRS=01\r\n</b> --- CAN Bus baud rate is 62.5K <b>AT CBRS=02\r\n</b> --- CAN Bus baud rate is 125K <b>AT CBRS=03\r\n</b> --- CAN Bus baud rate is 500K <b>AT CBRS=04\r\n</b> --- CAN Bus baud rate is 1M
<b>BRS</b> (Serial port baud rate change in-field command)	Data range Example 1 Example 2 Example 3 Example 4 Example 5 Example 6 Example 7 Example 8 Example 9 Example 10 Example 11	00 - 0A; default value is 00; use "AT ID=?\r\n" to pull BRS value. <b>AT BRS=00\r\n</b> ---Serial port baud rate is115200 (default) <b>AT BRS=01\r\n</b> --- Serial port baud rate is300 <b>AT BRS=02\r\n</b> --- Serial port baud rate is 1200 <b>AT BRS=03\r\n</b> --- Serial port baud rate is 2400 <b>AT BRS=04\r\n</b> --- Serial port baud rate is 4800 <b>AT BRS=05\r\n</b> --- Serial port baud rate is 9600 <b>AT BRS=06\r\n</b> --- Serial port baud rate is 14400 <b>AT BRS=07\r\n</b> --- Serial port baud rate is 19200 <b>AT BRS=08\r\n</b> --- Serial port baud rate is 28800 <b>AT BRS=09\r\n</b> --- Serial port baud rate is 38400 <b>AT BRS=0A\r\n</b> --- Serial port baud rate is 57600





<b>CBS1</b> (Control bit status Byte 1)	Data range	0B00000000~11111111; use "AT ID=?\r\n" to pull CBS1 value	
	Example 1	<b>AT CBS1=0B00000010\r\n</b>	--- bit 1: Device standby sleep mode
	Example 2	<b>AT CBS1=0B00000100\r\n</b>	--- bit 2: Device Deep sleep mode
	Example 3	<b>AT CBS1=0B00001000\r\n</b>	--- bit 3: MUTE9E mode
Note:	bit 7~4 and bit 0: not used, bit 1: Device standby sleep mode setting bit, 1=ON, 0=Off; bit 2: Device Deep sleep mode setting bit, 1=ON, 0=Off; bit 3: MUTE9E mode setting bit, 1=ON, 0=Off; Standby sleep mode and Deep sleep mode are mutual exclusive. Turning on one sleep mode, will automatically turning off the other sleep mode.		
<b>DV</b> (Device Voltage)	Data range	9-24V nominal (Application dependent)	
	Resolution	0.001 Volts	
	Repetition	1 S	
	Example	<b>AT DV=12.096V\r\n</b>	--- Device voltage is 12.096 volt
<b>CANBUS</b> (CAN bus status)	Data range	ON or OFF	
	Repetition	1 S	
	Example 1	<b>AT CANBUS=ON\r\n</b>	--- CAN Bus is On
	Example 2	<b>AT CANBUS=OFF\r\n</b>	--- CAN Bus is Off

ID, FW, SN, CBRS, BRS, CBS1 will be broadcasted once when power on, and can be requested during run time by using the following 3 UART commands.

Table 2 – 2 FMS Interpreter UART Commands (Received)

Request	Description and Response
<b>AT ID=?\r\n</b>	FMS interpreter will response with device related information, including ID, FW, SN, CBRS, BRS, CBS1: <b>AT ID= TRUCK &amp; BUS FMS INTERPRETER</b> <b>AT FW=0.3B(32K-BUILD01072019-01)</b> <b>AT SN=360</b> <b>AT CBRS=00</b> <b>AT BRS=00</b> <b>AT CBS1=0B00001000</b>
<b>AT FW=?\r\n</b>	Device firmware edition request command, FMS interpreter will response with device firmware: <b>AT FW=0.3B(32K-BUILD01072019-01)</b>
<b>AT SN=?\r\n</b>	Device SN request command, FMS interpreter will response with device serial number: <b>AT SN=360</b>
<b>AT BRS=00-0A\r\n</b>	commands to set up serial port baud rate. This is a one-time setup, the device will remember the last setting thereafter. <b>AT BRS=00\r\n</b> ---Serial port baud rate change to 115200 (default) <b>AT BRS=01\r\n</b> --- Serial port baud rate change to 300 <b>AT BRS=02\r\n</b> --- Serial port baud rate change to 1200 <b>AT BRS=03\r\n</b> --- Serial port baud rate change to 2400 <b>AT BRS=04\r\n</b> --- Serial port baud rate change to 4800 <b>AT BRS=05\r\n</b> --- Serial port baud rate change to 9600 <b>AT BRS=06\r\n</b> --- Serial port baud rate change to 14400 <b>AT BRS=07\r\n</b> --- Serial port baud rate change to 19200 <b>AT BRS=08\r\n</b> --- Serial port baud rate change to 28800 <b>AT BRS=09\r\n</b> --- Serial port baud rate change to 38400 <b>AT BRS=0A\r\n</b> --- Serial port baud rate change to 57600



<b>AT CBRS=00-04\r\n</b>	command to set up CAN bus baud rate. This is a one-time setup, the device will remember the last setting thereafter. <b>AT CBRS=00\r\n</b> ---CAN Bus baud rate change to 250K (default) <b>AT CBRS=01\r\n</b> --- CAN Bus baud rate change to 62.5K <b>AT CBRS=02\r\n</b> --- CAN Bus baud rate change to 125K <b>AT CBRS=03\r\n</b> --- CAN Bus baud rate change to 500K <b>AT CBRS=04\r\n</b> --- CAN Bus baud rate change to 1M
<b>AT MUTE9E=0/1\r\n</b>	This is a one-time setup, the device will remember the last setting thereafter. <b>AT MUTE9E=1\r\n</b> : Enable Mute feature for CAN bus parameters, RS232 transmitting of CAN bus related parameters can be turned on/off using AT command START9, <b>AT MUTE9E=0\r\n</b> : Disable mute feature for CAN bus parameters.
<b>AT START9=0/1\r\n</b>	This command only works when "MUTE9E" is enabled (MUTE9E = 1); <b>AT START9=1</b> : , received FMS CAN message will be translate and transmit on RS232. <b>AT START9=0</b> , turn off RS232 events no matter CAN messages received or not. This command will not be remember, by default at power up, it is off. User has to turn it on every time if "MUTE9E=1".
<b>AT SSLEEP=0/1\r\n</b>	Standby Sleep on/off control, 0: off, 1:on; The device will enter standby sleep mode if sleep condition is met, e.g. "CAN bus is off" for more than 10 seconds. When the device enters sleep mode, it consumes less than 1mA (0.4mA nominal) current, it can be waked up by any FMS CAN activities.
<b>AT DSLEEP=0/1\r\n</b>	Deep Sleep on/off control, 0: off, 1: on; The device will enter deep sleep mode if sleep condition is met, e.g. "CAN bus is off" for more than 10 seconds, or "engine RPM is less than 400 RPM" for more than 10 seconds, Once the device is in deep sleep mode, CAN bus events will NOT wake up the device, the only way to wake up the device is engine cranking.

DV and CANBUS will be broadcasted every 1 second, and they will be always available even without connecting to CAN Bus as long as the FMS Interpreter is powered on, it is not necessary to connect the device to CAN bus to display these 2 parameters.

## 2.2. Detail information of common FMS parameters (47 SPN):

Au FMS Interpreter support 177 parameters (SPN), including all the 47 common parameters for both Truck and Bus FMS, 64 Telltale Block ID and Status (TBIS)., 15 Truck FMS only parameters, and 51 Bus FMS only parameters. Please refer to Table 2-3, 2-4, 2-5, 2-7 for detail information.

The following forms will include one or all of the following items: Parameter description, SPN (Suspect Parameter Number), PGN, Data Range with unit (if applicable), resolution, and repetition rate (Rep.), example.

**Note:** These parameters will only be transmitted on the RS232 bus when they are received. The device will keep quiet when the respected parameter is not present on the FMS network.

Table 2 – 3 Details of 47 Common FMS Parameters

Abbreviation	Explanation	
<b>AAT</b>	Description	Ambient Air Temperature
	Repetition Rate	1s
	SPN	171
	PGN	65269
	Data Range	-273-1734.96C
	Unit	C
	Resolution	0.01 C
	Example	<b>AT AAT=1734.96C</b>



<b>ACC%</b>	Description	Accelerator Pedal Position 1
	Repetition Rate	50ms
	SPN	91
	PGN	61443
	Data Range	0-100%
	Unit	%
	Resolution	0.8%
	Example	<b>AT ACC%=100.0%</b>
<b>ACTUAL_RETARDER_%_TORQUE</b>	Description	Actual Retarder-Percent Torque
	Repetition Rate	100ms
	SPN	520
	PGN	61440
	Data Range	from -125% to 125%
	Unit	%
	Resolution	1%
	Example	<b>AT ACTUAL_RETARDER_%_TORQUE=-125%</b>
<b>AETORQUE%</b>	Description	Actual Engine – Percent Torque
	Repetition Rate	20ms
	SPN	513
	PGN	61444
	Data Range	from -125% to 125%
	Resolution	1%
	Example	<b>AT AETORQUE%=125%</b>
<b>AT1DEF1%</b>	Description	After treatment 1 Diesel Exhaust Fluid Tank 1 Level
	Repetition Rate	1S
	SPN	1761
	PGN	65110
	Data Range	0-100%
	Resolution	0.10%
	Example	<b>AT AT1DEF1%=100.0%</b>
<b>BPEDAL%</b>	Description	Brake Pedal Position
	Repetition Rate	100ms
	SPN	521
	PGN	61441
	Data Range	0-100%
	Unit	%
	Resolution	0.10%
	Example	<b>AT BPEDAL%=100.0%</b>
<b>BRAKE</b>	Description	Brake Switch
	Repetition	1s
	SPN	597
	PGN	65265
	Data Range	ON/OFF
	Example	<b>AT BRAKE=ON</b>
<b>CLUTCH</b>	Description	Clutch Switch
	Repetition	1s
	SPN	598
	PGN	65265
	Data Range	ON/OFF
	Example	<b>AT CLUTCH=ON</b>



<b>CRUISE</b>	Description	Cruise Control Active
	Repetition	1s
	SPN	595
	PGN	65265
	Data Range	ON/OFF
	Example	<b>AT CRUISE=ON</b>
<b>CRUISE_CONTROL_STATES</b>	Description	Cruise control states
	Repetition	100ms
	SPN	527
	PGN	65265
	Data Range	000 - Off/Disabled; 001 – Hold; 010 – Accelerate; 011 – Decelerate 100 – Resume; 101 – Set; 110 – Accel. Override; 111 - Not available
	Example	<b>AT CRUISE_CONTROL_STATES=0B000</b>
<b>DIAGNOSTICS</b>	Description	FMS Standard Diagnostics Supported
	Repetition	10s
	SPN	2804
	PGN	64977
	Data Range	NOT SUPPORTED
	Example	<b>AT DIAGNOSTICS =NOT SUPPORTED</b>
<b>DIRECTION</b>	Description	Direction Indicator
	Repetition	50ms
	SPN	1619
	PGN	65132
	Data Range	REVERSE / FORWARD
	Example	<b>AT DIRECTION=FORWARD</b>
<b>DR1CARD</b>	Description	Driver Card Driver 1
	Repetition	50ms
	SPN	1615
	PGN	65132
	Data Range	PRESENT ; NOT PRESENT
	Example	<b>AT DR1CARD=PRESENT</b>
<b>DR1ID</b>	Description	Driver 1 Identification
	Repetition	10s
	SPN	1625
	PGN	65131
	Data Range	16 bytes and ID delimiter “**”
	Example	<b>AT DR1ID=DE_4084852370992000*</b>
<b>DR1TRSTATE</b>	Description	Driver 1 Time Related States
	Repetition	50ms
	SPN	1617
	PGN	65132
	Data Range:	NORMAL; ERROR; NOT AVAILABLE;15 MIN BEF. 4.5H; 4.5H REACHED; 15 MIN BEF. 9H; 9H REACHED; 15 MIN BEF. 16H; 16H REACHED;
	Example	<b>AT DR1TRSTATE=NORMAL</b>
<b>DR1WSTATE</b>	Description	Driver 1 working state
	Repetition Rate	50ms
	SPN	1612
	PGN	65132
	Data Range	DRIVE; ERROR; NOT AVAILABLE; AVAILABLE; WORK; REST;
	Example	<b>AT DR2WSTATE=REST</b>



<b>DR2CARD</b>	Description	Driver Card Driver 2
	Repetition Rate	50ms
	SPN	1616
	PGN	65132
	Data Range	PRESENT ; NOT PRESENT
	Example	<b>AT DR2CARD=PRESENT</b>
<b>DR2ID</b>	Description	Driver 2 Identification
	Repetition Rate	10s
	SPN	1626
	PGN	65131
	Data Range	16 bytes and ID delimiter ""**"
	Example	<b>AT =5324329921546000*</b>
<b>DR2TRSTATE</b>	Description	Driver 2 Time Related States
	Repetition Rate	50ms
	SPN	1618
	PGN	65132
	Data Range:	NORMAL; 15 MIN BEF. 4.5H; 4.5H REACHED; 15 MIN BEF. 9H; 9H REACHED; 15 MIN BEF. 16H; 16H REACHED; ERROR; NOT AVAILABLE;
	Example:	<b>AT DR2TRSTATE=9H REACHED</b> --- Driver 2 reached working limit of 9 hrs
<b>DR2WSTATE</b>	Description	Driver 2 working state
	Repetition Rate	50ms
	SPN	1613
	PGN	65132
	Data Range	DRIVE ; ERROR; NOT AVAILABLE; AVAILABLE; WORK; REST;
	Example	<b>AT DR2WSTATE=REST</b>
<b>ECT</b>	Description	Engine Coolant Temperature
	Repetition Rate	1s
	SPN	110
	PGN	65262
	Data Range	-40 to 210C
	Resolution	1C
	Example	<b>AT ECT=210C</b>
<b>EFUELRATE</b>	Description	Engine Fuel Rate
	Repetition Rate	400ms
	SPN	183
	PGN	65266
	Data Range	0-3212.75 L/h
	Resolution	0.01 L/h
	Example	<b>AT EFUELRATE=3212.75L/H</b>
<b>ETFUEL</b>	Description	Engine Total Fuel Used
	Repetition Rate	1s
	SPN	250
	PGN	65257
	Data Range	0-2,105,540,607.5L
	Resolution	0.1L
	Example	<b>AT ETFUEL=2105540607.0L</b>



<b>FMSSW</b>	Description	FMS-Standard SW-version Supported
	Repetition Rate	10s
	SPN	2806
	PGN	64977
	Data Range	ASCII, e.g. 01.01; 02.00; 00.02, etc.
	Example	<b>AT FMSSW=04.04</b>
<b>FUEL_TYPE</b>	Description	Fuel Type
	Repetition Rate	10S
	SPN	5837
	PGN	64962
	Data Range	0x00 - 0xFF
	Resolution	256 states / 8 bit
Example	<b>AT FUEL_TYPE=0X00</b>	
<b>FUEL1%</b>	Description	Fuel Level 1
	Repetition Rate	1s
	SPN	96
	PGN	65276
	Data Range	0-100%
	Unit	%
Resolution	0.1%	
Example	<b>AT FUEL1%=100.0%</b>	
<b>FUEL2%</b>	Description	Fuel Level 2
	Repetition Rate	1s
	SPN	38
	PGN	65276
	Data Range	0-100%
	Unit	%
Resolution	0.1%	
Example	<b>AT FUEL2%=100.0%</b>	
<b>HANDLINGINFO</b>	Description	Handling Information
	Repetition Rate	50ms
	SPN	1621
	PGN	65132
	Data Range	YES/NO
	Example	<b>AT HANDLINGINFO=NO</b>
<b>HR</b>	Description	Engine Total Hours of Operation
	Repetition Rate	1s
	SPN	247
	PGN	65253
	Data Range	0 to 999999 hr
	Resolution	0.1 hour
Example	<b>AT HR=999999.0HR</b>	
<b>HRETFUEL</b>	Description	High Resolution Engine Total Fuel Used
	Repetition Rate	1s
	SPN	5054
	PGN	64777
	Data Range	0-4,211,081.215L
	Resolution	0.001L
Example	<b>AT HRETFUEL=4211081.215L</b>	



<b>HRTVD</b>	Description	High Resolution Total Vehicle Distance
	Repetition Rate	1s
	SPN	917
	PGN	65217
	Data Range	0-21,055,406.07km
	Resolution	0.01 km
	Example	<b>AT HRTVD=21055406.07KM</b>
<b>IKMPL</b>	Description	Engine Instantaneous Fuel Economy
	Repetition Rate	100ms
	SPN	184
	PGN	65266
	Data Range	0-125.5km/L
	Resolution	0.01 km/L
	Example	AT IKMPL=125.5KM/L
<b>PARKING</b>	Description	Parking Brake Switch
	Repetition	100ms
	SPN	70
	PGN	65265
	Data Range	ON; OFF
	Example	<b>AT PARKING=ON</b> --- Parking brake switch is set <b>AT PARKING=OFF</b> --- Parking brake switch is not set
<b>REQUESTS</b>	Description	FMS Standard Requests Supported
	Repetition Rate	10s
	SPN	2805
	PGN	64977
	Data Range	NOT SUPPORTED
	Example	<b>AT REQUESTS =NOT SUPPORTED</b>
<b>RETARDER_SELECTION_NON_ENGINE</b>	Description	Retarder selection non-engine
	Repetition Rate	100ms
	SPN	1716
	PGN	<b>61440</b>
	Data Range	<b>0.4%</b>
	Example	<b>AT RETARDER_SELECTION_NON_ENGINE=0.0%</b>
<b>RETARDER_TORQUE_MODE</b>	Description	Retarder Torque Mode
	Repetition Rate	100ms
	SPN	900
	PGN	61440
	Data Range	16 states, 0000b means "No request"; 0001b to 1110b indicate that there is either a torque request or the identified function is currently controlling the retarder
	Example	<b>AT RETARDER_TORQUE_MODE=0B0000</b>
<b>RPM</b>	Description	Engine Speed
	Repetition Rate	20ms
	SPN	190
	PGN	61444
	Data Range	0-8,031.87rpm
	Unit	Revolutions per minute
	Resolution	0.01 rpm
	Example	<b>AT RPM=8031.87RPM</b>



<b>SBAIR1</b>	Description	Service Brake Air Pressure Circuit #1
	Repetition Rate	1S
	SPN	1087
	PGN	65198
	Data Range	0-2000kPa
	Unit	kPa
	Resolution	1kPa
	Example	<b>AT SBAIR1=16KPA</b>
<b>SBAIR2</b>	Description	Service Brake Air Pressure Circuit #2
	Repetition Rate	1S
	SPN	1088
	PGN	65198
	Data Range	0-2000kPa
	Unit	kPa
	Resolution	1kPa
	Example	<b>AT SBAIR2=2000KPA</b>
<b>SYSEVENT</b>	Description	System Event
	Repetition Rate	50ms
	SPN	1622
	PGN	65132
	Data Range	TG EVENT; NO TG EVENT
	Example	<b>AT SYSEVENT=NO TG EVENT</b>
<b>TGPERFORMANCE</b>	Description	Tachograph Performance
	Repetition Rate	50ms
	SPN	1620
	PGN	65132
	Data Range	ANALYSIS; NORMAL
	Example	<b>AT TGPERFORMANCE=NORMAL</b>
<b>TGVSPEED</b>	Description	Tachograph Vehicle Speed
	Repetition Rate	50ms
	SPN	1624
	PGN	65132
	Data Range	0-250.996km/h
	Unit	km/h
	Resolution	0.001 km/h
	Example	<b>AT TGVSPEED=250.996KM/H</b>
<b>TOTAL_FUEL_USED_GASEOUS</b>	Description	Total Fuel Used (Gaseous)
	Repetition Rate	1S
	SPN	1040
	PGN	65199
	Data Range	0-2,105,540,607.5 kg
	Resolution	0.5 kg
	Example	<b>AT TOTAL_FUEL_USED_GASEOUS=0KG</b>
<b>VIN</b>	Description	Vehicle Identification Number
	Repetition Rate	10s
	SPN	237
	PGN	65260
	Data Range	17-digital VIN, e.g. 1M8GDM9AXKP042100
	Example	<b>AT VIN=1M8GDM9AXKP042100</b>





<b>VMOTION</b>	Description	Vehicle Motion Drive Recognize FMS01.00
	Repetition Rate	50ms
	SPN	1611
	PGN	65132
	Data Range	DETECTED; NOT DETECTED
	Example	<b>AT VMOTION=DETECTED</b>
<b>VOVERSPEED</b>	Description	Vehicle Overspeed
	Repetition Rate	50ms
	SPN	1614
	PGN	65132
	Data Range	YES; NO
	Example	<b>AT VOVERSPEED=YES</b>
<b>WSPEED</b>	Description	Wheel-Based Vehicle Speed
	Repetition Rate	100ms
	SPN	84
	PGN	65265
	Data Range	0 to 250.996km/h
	Unit	KM/H
	Resolution	0.001 KM/H
	Example	<b>AT WSPEED=250.996KM/H</b>

### 2.3. Detail information of truck FMS only Parameters (15 SPN):

Au FMS Interpreter supports the following 15 Truck FMS only parameters, as listed below in Table 2-4.

Table 2 – 4 Truck FMS only Parameters

Abbreviation	Explanation
<b>AX00WT;</b>	Description Axle Location and Axle Weight
<b>AX01WT;</b>	Repetition Rate 1S
<b>AX10WT;</b>	SPN Axle location: 928; Axle Weight: 582
<b>AX11WT;</b>	PGN 65258
<b>AX12WT;</b>	Data Range 0-32,127.5kg
<b>AX13WT;</b>	Unit Kg
<b>AX20WT;</b>	Resolution 0.1Kg
<b>AX21WT;</b>	<b>AT AX00WT=21063.5KG</b> --- The Axle weight for location 00 (1st axle, 1st tire) is 21063.5KG
<b>AX22WT;</b>	<b>AT AX01WT=21068.5KG</b> --- The Axle weight for location 01 (1st axle, 2nd tire ) is 21068.5KG
<b>AX23WT</b>	<b>AT AX10WT=21073.5KG</b> --- The Axle weight for location 10 (2nd axle, 1st tire) is 21073.5KG
	<b>AT AX11WT=21078.5KG</b> --- The Axle weight for location 11 (2nd axle, 2nd tire) is 21078.5KG
	<b>AT AX12WT=21083.5KG</b> --- The Axle weight for location 12 (2nd axle, 3rd tire) is 21083.5KG
	<b>AT AX13WT=21088.5KG</b> --- The Axle weight for location 13 (2nd axle, 4th tire) is 21088.5KG
	<b>AT AX20WT=21093.5KG</b> --- The Axle weight for location 20 (3rd axle, 1st tire) is 21093.5KG
	<b>AT AX21WT=21098.5KG</b> --- The Axle weight for location 21 (3rd axle, 2nd tire) is 21098.5KG
	<b>AT AX22WT=21103.5KG</b> --- The Axle weight for location 22 (3rd axle, 2nd tire) is 21103.5KG
	<b>AT AX23WT=21108.5KG</b> --- The Axle weight for location 23 (3rd, 2nd tire) is 21108.5KG
<b>ELOAD%</b>	Description Engine % Load At Current Speed
	Repetition Rate 50ms
	SPN 92
	PGN 61443
	Data Range 0-125%
	Unit %
	Resolution 1%
	Example <b>AT ELOAD%=125%</b> ---Engine Load at current speed is 125%



<b>HRETFUEL</b>	Description	High Resolution Engine Total Fuel Used
	Repetition Rate	1s
	SPN	5054
	PGN	64777
	Data Range	0-4,211,081.215L
	Unit	L
	Resolution	0.001L
	Example	<b>AT HRETFUEL=4211081.215L</b>
<b>SERVICE</b>	Description	Service Distance
	Repetition Rate	1s
	SPN	914
	PGN	65216
	Data Range	-160,635-160640km
	Unit	KM
	Resolution	1 km
	Example	<b>AT SERVICE=160640KM</b>
<b>AL1PTOENGAGED</b>	Description	At Least One PTO Engaged
	Repetition	1s
	SPN	3948
	PGN	64932
	Data Range	YES; NO; NOT AVAILABLE; ERROR
	Example	<b>AT AL1PTOENGAGED=NO</b> --- No PTO driver is engaged
<b>PTOSTATE</b>	Description	PTO Governor State
	Repetition	
	SPN	976
	PGN	65265
	Data Range	SET; OFF; NOT AVAILABLE
	Example	<b>AT PTOSTATE=OFF</b> --- PTO enable switch is in the off position

## 2.4. Detail information of bus FMS only Pparameters (51 SPN):

Au FMS Interpreter supports 51 Bus FMS only parameters, as listed in Table 2-5 and Table 2-7:

Note: The repetition rate for the following BUS FMS parameters is 1 second.

Table 2 – 5 Supported Bus FMS only Parameters

Abbreviation	Explanation	
<b>FLBELLOW</b>	Description	Bellow Pressure Front Axle Left
	Repetition	1S
	SPN	1725
	PGN	65112
	Data Range	0-6425.5kPa
	Resolution	0.1 kPa
	Example	<b>AT FLBELLOW=6425.5KPA</b>
<b>FRBELLOW</b>	Description	Bellow Pressure Front Axle Right
	Repetition	1S
	SPN	1726
	PGN	65112
	Data Range	0-6425.5kPa
	Unit	kPa
	Resolution	0.1 kPa
	Example	<b>AT FRBELLOW=6425.5KPA</b>



<b>RLBELLOW</b>	Description	Bellow Pressure Rear Axle Left
	Repetition	1S
	SPN	1727
	PGN	65112
	Data Range	0-6425.5kPa
	Resolution	0.1 kPa
	Example	<b>AT RLBELLOW=6425.5KPA</b>
<b>RRBELLOW</b>	Description	Bellow Pressure Rear Axle Right
	Repetition	1S
	SPN	1728
	PGN	65112
	Data Range	0-6425.5kPa
	Resolution	0.1 kPa
	Example	<b>AT RRBELLOW=6425.5KPA</b>
<b>SBAIR1</b>	Description	Service Brake Circuit 1 Air Pressure
	Repetition	1S
	SPN	1087
	PGN	65198
	Data Range	0-2000kPa
	Resolution	1 kPa
	Example	<b>AT SBAIR1=16KPA</b>
<b>SBAIR2</b>	Description	Service Brake Circuit 2 Air Pressure
	Repetition	1S
	SPN	1088
	PGN	65198
	Data Range	0-2000kPa
	Unit	kPa
	Resolution	1 kPa
	Example	<b>AT SBAIR2=2000KPA</b>
<b>TDATE</b>	Description	Year/Month/Hour/Minutes/Seconds
	Repetition	1S
	SPN	959, 960, 961, 962, 963, 964
	PGN	65254
	Data Range	1985/1/1/0:0:0 to 2235/12/31/23:59:59
	Example	<b>AT TDATE=2010/2/4/23:52:44</b> --- It is on February 4, 2010 at 23:52:44
<b>AS1</b>	Description	Alternator Status 1, 2,3,4
<b>AS2</b>	Repetition	1S
<b>AS3</b>	SPN	3353
<b>AS4</b>	PGN	65237
	Data Range	NOT CHARGING; CHARGING; ERROR; NOT AVAILABLE
	Example	<b>AT AS1=CHARGING</b> ---Alternator 1 status is charging <b>AT AS2=NOT CHARGING</b> ---Alternator 2 status is Not charging <b>AT AS3=ERROR</b> ---Alternator 3 status has ERROR <b>AT AS4=NOT AVAILABLE</b> ---Alternator 4 status is not available



<b>CGEAR</b>	Description	Current Gear
	Repetition	100ms
	SPN	523
	PGN	61445
	Data Range	-125 ~ -1; NEUTRAL; 1~125; PARK
	Example	<b>AT CGEAR=-2</b> - The Gear currently engaged in the transmission is reverse gear 2 <b>AT CGEAR=2</b> --- The Gear currently engaged in the transmission is 2 <b>AT CGEAR=NEUTRAL</b> ---The Gear currently engaged in the transmission is neutral <b>AT CGEAR=PARK</b> --- The Gear currently engaged in the transmission is park
<b>SGEAR</b>	Description	Transmission Selected Gear
	Repetition	100ms
	SPN	524
	PGN	61445
	Data Range	-125 ~ -1; NEUTRAL; 1~125; PARK
	Example	<b>AT SGEAR=-3</b> -The gear the transmission will attempt to achieve is reverse gear 3 <b>AT SGEAR=3</b> ---The gear that the transmission will attempt to achieve is 3 <b>AT SGEAR= NEUTRAL</b> ---The gear that the transmission will attempt to achieve is neutral <b>AT SGEAR= PARK</b> ---The gear that the transmission will attempt to achieve is park
<b>ESDOOR1</b>	Description	Enable Status Door 1 - 10
<b>ESDOOR2</b>	Repetition	1S
<b>ESDOOR3</b>	SPN	3414
<b>ESDOOR4</b>	PGN	64933
<b>ESDOOR5</b>	Data Range	ERROR; NOT AVAILABLE; DISABLED; ENABLED
<b>ESDOOR6</b>	Example	<b>AT ESDOOR1=ERROR</b> --- Door 1 Enable status has error
<b>ESDOOR7</b>		<b>AT ESDOOR2=NOT AVAILABLE</b> --- Door 2 Enable status is not available
<b>ESDOOR8</b>		<b>AT ESDOOR3=DISABLED</b> --- Door 3 cannot be operated by a passenger
<b>ESDOOR9</b>		<b>AT ESDOOR4=ENABLED</b> --- Door 4 can be operated by a passenger
<b>ESDOOR10</b>		<b>AT ESDOOR5=ENABLED</b> --- Door 5 can be operated by a passenger
<b>LSDOOR1</b>	Description	Lock Status of Door 1-10
<b>LSDOOR2</b>	Repetition	1S
<b>LSDOOR3</b>	SPN	3412
<b>LSDOOR4</b>	PGN	64933
<b>LSDOOR5</b>	Data Range	ERROR; NOT AVAILABLE; UNLOCKED; LOCKED
<b>LSDOOR6</b>	Example	<b>AT LSDOOR6=ERROR</b> ---Door 6 Lock status has error
<b>LSDOOR7</b>		<b>AT LSDOOR8=NOT AVAILABLE</b> ---Door 8 Lock status is not available
<b>LSDOOR8</b>		<b>AT LSDOOR1=LOCKED</b> ---Door 1 cannot be operated by the driver or a passenger
<b>LSDOOR9</b>		<b>AT LSDOOR2=UNLOCKED</b> ---Door 2 may be operated by the driver or a passenger
<b>LSDOOR10</b>		<b>AT LSDOOR9=UNLOCKED</b> ---Door 9 may be operated by the driver or a passenger
<b>OSDOOR1</b>	Description	Open Status of Door 1 - 10
<b>OSDOOR2</b>	Repetition	1S
<b>OSDOOR3</b>	SPN	3413
<b>OSDOOR4</b>	PGN	64933
<b>OSDOOR5</b>	Data Range	OPEN; CLOSED; ERROR; NOT AVAILABLE
<b>OSDOOR6</b>	Example	<b>AT OSDOOR1=OPEN</b> ---Door 1 is not completely closed
<b>OSDOOR7</b>		<b>AT OSDOOR2=CLOSED</b> ---Door 2 is completely closed
<b>OSDOOR8</b>		<b>AT OSDOOR4=ERROR</b> ---Door 4 open status has error
<b>OSDOOR9</b>		<b>AT OSDOOR7=NOT AVAILABLE</b> ---Door 7 open status is not available
<b>OSDOOR10</b>		<b>AT OSDOOR10=OPEN</b> ---Door 10 is completely closed



<b>PDOORS</b>	Description	Position of Doors
	Repetition	1S
	SPN	1821
	PGN	65102
	Data Range	ALL DOORS CLOSED; ERROR; NOT AVAILABLE; AL1 DOOR IS OPEN; CLOSING LAST DOOR
	Example	<b>AT PDOORS=ERROR</b> ---Position of Doors signal has error <b>AT PDOORS=NOT AVAILABLE</b> ---Position of Doors signal is not available <b>AT PDOORS=ALL DOORS CLOSED</b> ---Position of Doors signal indicates all doors are closed <b>AT PDOORS=AL1 DOOR IS OPEN</b> ---Position of Doors signal indicates at least 1 door is open <b>AT PDOORS=CLOSING LAST DOOR</b> ---Position of Doors signal indicates the last door is closing
<b>S2DOORS</b>	Description	Status 2 of Doors
	Repetition	1S
	SPN	3411
	PGN	65102
	Data Range:	ALL BUS DOORS DISABLED; ERROR; NOT AVAILABLE; ALL BUS DOOR ENABLED
Example:		<b>AT S2DOORS=ERROR</b> ---Bus door status indication has error <b>AT S2DOORS=NOT AVAILABLE</b> ---Bus door status indication is not available <b>AT S2DOORS= AL1 BUS DOOR ENABLED</b> ---At least 1 door can be automatically opened/closed <b>AT S2DOORS=ALL BUS DOORS DISABLED</b> ---No doors can be automatically opened/closed
<b>PARKING</b>	Description	Parking Brake Switch
	Repetition	1S
	SPN	70
	PGN	65265
	Data Range	ON; OFF
	Example	<b>AT PARKING=ON</b> --- Parking brake switch is set <b>AT PARKING=OFF</b> --- Parking brake switch is not set
<b>RWCHAIRLIFT</b>	<b>Description</b>	<b>Ramp /Wheel Chair Lift Position</b>
	Repetition	1S
	SPN	1820
	PGN	65102
	Data Range	INSIDE BUS; ERROR; NOT AVAILABLE; OUTSIDE BUS
	Example	<b>AT RWCHAIRLIFT=INSIDE BUS</b> ---The Ramp/Wheel Chair lift is inside the bus <b>AT RWCHAIRLIFT=OUTSIDE BUS</b> ---The Ramp/Wheel Chair lift is outside the bus <b>AT RWCHAIRLIFT=ERROR</b> ---The Ramp/Wheel Chair lift position signal indicates error <b>AT RWCHAIRLIFT=INSIDE BUS</b> ---The Ramp/Wheel Chair lift position signal is not available
<b>STEERING_WHEEL_ANGLE</b>	<b>Description</b>	<b>Steering Wheel Angle</b>
	Repetition	100ms
	SPN	1807
	PGN	61449
	Data Range	1/1024 rad per bit, -31.374 rad offset
	Example	<b>AT STEERING_WHEEL_ANGLE=-22.590RAD</b>
<b>HBATTERY_REMAINING_CHARGE</b>	Description	Hybrid Battery Pack Remaining Charge
	Repetition	10s
	SPN	5464
	PGN	64695
	Data Range	0 to 160.6375 %
	Example	<b>AT HBATTERY_REMAINING_CHARGE=16.0625%</b>

## 2.5. Detail information of Telltale block ID and status (64 TBIS)

Au FMS Interpreter will output one of the following 6 FMS Tell Tale Statuses: Off, Red, Yellow, Info, Reserved, Not Available (as listed in Table 2-6). The interpretation of the status is manufacturer dependent and might be different.

Table 2 - 6 5 Possible conditions of FMS Tell Tale Status

Au FMS Interpreter output	Explanation
000 = off	FMS Tell Tale Status is <b>OFF</b>
001 = RED	FMS Tell Tale Status is <b>Cond. Red</b>
010 = YELLOW	FMS Tell Tale Status is <b>Cond. Yellow</b>
011 = INFO	FMS Tell Tale Status is <b>Cond. Info.</b>
100 - 110 = Reserved	FMS Tell Tale Status is <b>reserved</b>
111 = NOT AVAILABLE	FMS Tell Tale Status is <b>not available</b>

Detail information of the Supported Telltale Status Parameters by Bus FMS Interpreter is listed in Table 2-7. Each Supported Telltale Status Parameter has 5 possible output, only one example is given for each parameter.

Note: All the following FMS Tell Tale Status parameters have repetition rate at 1 second, and the PGN is 64893.

Table 2 - 7 Details of Telltale ID and Status with Example

Block ID	Telltale Status	Telltale Status Parameters Name	Telltale Status Parameters Abbreviation
0	1	Cooling air conditioning	CAIRCONDI
	Example:	AT CAIRCONDI=INFO	
0	2	High beam, main beam	HMBEAM
	Example:	AT HMBEAM=OFF --- High beam main beam Telltale status is off	
0	3	Low beam, dipped beam	LDBEAM
	Example:	AT LDBEAM=OFF	
0	4	Turn signals	TURNSIGNALS
	Example:	AT TURNSIGNALS=INFO	
0	5	Hazard warning	HAZARD
	Example:	AT HAZARD=INFO	
0	6	Provision for the disabled or handicapped persons	DHPROVISION
	Example:	AT DHPROVISION=NOT AVAILABLE	
0	7	Parking Brake	PARKINGBRAKE
	Example:	AT PARKINGBRAKE=RED ---The Parking brake Telltale status is Red	
0	8	Brake failure / brake system malfunction	BRAKEFM
	Example:	AT BRAKEFM=YELLOW ---The Brake failure/brake system malfunction Telltale status is YELLOW	
0	9	Hatch open	HATCHOPEN
	Example:	AT HATCHOPEN=INFO	
0	10	Fuel level	FUELLEVEL
	Example:	AT FUELLEVEL=OFF	
0	11	Engine coolant temperature	ECTEMP
	Example:	AT ECTEMP=INFO	
0	12	Battery charging condition	BCHARGING
	Example:	AT BCHARGING=INFO	
0	13	Engine oil	EOIL
	Example:	AT EOIL=RED	
0	14	Position lights, side lights	PSLIGHTS
	Example:	AT PSLIGHTS=INFO	



0	15	Front fog light	FFOGLIGHT
	Example:	AT FFOGLIGHT=INFO	
1	1	Rear fog light	RFOGLIGHT
	Example:	AT RFOGLIGHT=INFO	
1	2	Park Heating	PHEATING
	Example:	AT PHEATING=INFO --- Park heating Telltale status is Cond. Info. (firmware 0.2A & Later)	
1	3	Engine	ENGINE_MIL_INDICATOR
	Example:	AT ENGINE=INFO	
1	4	Service, call for maintenance	SCFMaintenance
	Example:	AT SCFMaintenance=INFO	
1	5	Transmission fluid temperature	TFTEMPERATURE
	Example:	AT TFTEMPERATURE=INFO	
1	6	Transmission failure / malfunction	TRANSMISSIONFAILURE
	Example:	AT TRANSMISSIONFAILURE=INFO	
1	7	Anti-lock brake system failure	ABSFAILURE
	Example:	AT ABSFAILURE=INFO	
1	8	Worn brake linings	WORNBRAKELININGS
	Example:	AT WORNBRAKELININGS = INFO --- Worn brake linings Telltale status is Cond. Info. (0.2A & Later)	
1	9	Windscreen/ windshield washer fluid	WWASHERFLUID
	Example:	AT WWASHERFLUID=INFO	
1	10	Tire failure / malfunction	TIREFAILURE
	Example:	AT TIREFAILURE=INFO	
1	11	Malfunction / general failure	GENERALFAILURE
	Example:	AT GENERALFAILURE=INFO	
1	12	Engine oil temperature	ENGOILTEMP
	Example:	AT ENGOILTEMP=INFO	
1	13	Engine oil level	ENGOILLEVEL
	Example:	AT ENGOILLEVEL=INFO	
1	14	Engine coolant level	ENGCOOLANTLEVEL
	Example:	AT ENGCOOLANTLEVEL=INFO	
1	15	Steering fluid level	STFLUIDLEVEL
	Example:	AT STFLUIDLEVEL=INFO	
2	1	Steering failure	STFAILURE
	Example:	AT STFAILURE=INFO	
2	2	Height Control (Leveling)	LEVELLING
	Example:	AT LEVELLING=INFO	
2	3	Retarder	RETARDER
	Example:	AT RETARDER=INFO	
2	4	Engine Emission system failure	EMISSIONFAILURE
	Example:	AT EMISSIONFAILURE=INFO	
2	5	ESC indication	ESC_INDICATION
	Example:	AT ESC_INDICATION=INFO	
2	6	Brake lights	BRAKELIGHTS
	Example:	AT BRAKELIGHTS=INFO	
2	7	Articulation	ARTICULATION
	Example:	AT ARTICULATION=INFO	



2	8	Stop Request	STOPREQUEST
	Example:	AT STOPREQUEST=INFO	
2	9	Pram request	PRAMREQUEST
	Example:	AT PRAMREQUEST=INFO	
2	10	Bus stop brake	BUSSTOPBRAKE
	Example:	AT BUSSTOPBRAKE=INFO	
2	11	Adblue level	ADBLUELEVEL
	Example:	AT ADBLUELEVEL=INFO	
2	12	Raising	RAISING
	Example:	AT RAISING=INFO	
2	13	Lowering	LOWERING
	Example:	AT LOWERING=INFO	
2	14	Kneeling	KNEELING
	Example:	AT KNEELING=INFO, AT KNEELING=OFF	
2	15	Engine compartment temperature	ENG_COMPARTMENT_TEMP
	Example:	AT ENG_COMPARTMENT_TEMP=INFO	
3	1	Auxiliary air pressure	AUXILLARY_AIR_PRESSURE
	Example:	AT AUXILLARY_AIR_PRESSURE=INFO	
3	2	Air filter clogged	AIR_FILTER_CLOGGED
	Example:	AT AIR_FILTER_CLOGGED=INFO	
3	3	Fuel filter differential pressure	FUEL_FILTER_DIFFERENTIAL_PRESSURE
	Example:	AT FUEL_FILTER_DIFFERENTIAL_PRESSURE=INFO	
3	4	Seat belt	SEAT_BELT
	Example:	AT SEAT_BELT=INFO	
3	5	EBS	EBS
	Example:	AT EBS=INFO	
3	6	Lane departure indication	LANE_DEPARTURE_INDICATION
	Example:	AT LANE_DEPARTURE_INDICATION=INFO	
3	7	Advanced emergency braking system	ADVANCED_EMERGENCY_BRAKING_SYSTEM
	Example:	AT ADVANCED_EMERGENCY_BRAKING_SYSTEM=INFO	
3	8	ACC	ACC
	Example:	AT ACC=INFO	
3	9	Trailer connected	TRAILER_CONNECTED
	Example:	AT TRAILER_CONNECTED=INFO	
3	10	ABS Trailer 1,2	ABS_TRAILER_1_2
	Example:	AT ABS_TRAILER_1_2=INFO	
3	11	Airbag	AIRBAG
	Example:	AT AIRBAG=INFO	
3	12	EBS Trailer 1,2	EBS_TRAILER_1_2
	Example:	AT EBS_TRAILER_1_2=INFO	
3	13	Tachograph indication	TACHOGRAPH_INDICATION
	Example:	AT TACHOGRAPH_INDICATION=INFO	
3	14	ESC switched off	ESC_SWITCHED_OFF
	Example:	AT ESC_SWITCHED_OFF=INFO	
3	15	Lane departure warning switched off	LANE_DEPARTURE_WARNING_SWITCHED_OFF
	Example:	AT LANE_DEPARTURE_WARNING_SWITCHED_OFF=INFO	





4	1	Engine emission filter (Soot Filter)	ENGINE_EMISSION_FILTER
		Example: AT ENGINE_EMISSION_FILTER=INFO	
4	2	Electric motor failures	ELECTRIC_MOTOR_FAILURES
		Example: AT ELECTRIC_MOTOR_FAILURES=INFO	
4	3	AdBlue tampering	ADBLUE_TAMPERING
		Example: AT ADBLUE_TAMPERING=INFO	
4	4	Multiplex System	MULTIPLEX_SYSTEM
		Example: AT MULTIPLEX_SYSTEM=INFO	

## 2.6. Summary

The following 3 commands broadcasted once when powered on, and devices information related parameters can also be requested when needed.

```

AT ID= TRUCK & BUS FMS INTERPRETER\r\n
AT FW=0.3B\r\n
AT SN=274\r\n

```

The following 2 parameters will be broadcasted every one second as long as the device is powered on, it is not necessary to connect the device to CAN bus to display these 2 parameters.

```

AT DV=12.365V\r\n
AT CANBUS=OFF\r\n

```

During run time, AT parameters displayed whenever there is FMS data presented on the FMS network, here are a few examples:

```

AT CRUISE=OFF\r\n
AT BRAKE=ON\r\n
AT CLUTCH=OFF\r\n
AT PTOSTATE=NOT AVAILABLE\r\n
AT ETFUEL=250L\r\n
AT FUEL%=20.0%\r\n
AT HR=250.0HR\r\n
AT HRTVD=500.00KM\r\n
AT ECT=10C\r\n
AT AAT=-154.75C\r\n
AT DR1WSTATE=REST\r\n
AT DR2WSTATE=DRIVE\r\n

```