

**AntZer Tech CANbus  
Module Solution**

# OBDII/J1939/ Mobileye® Interpreter

## MART Series USER MANUAL

Version 1.2

Jul. 3, 2018



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Antzer Tech In-Vehicle Module User Manual

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## 1. Product Description

### 1.1. Introduction

MART OBDII/J1939 Interpreter supports OBDII, J1939 and Mobileye® protocols, providing over 20 attributes and pass the data through RS232 or USB interface. Without using additional controllers or programming, the device configuration can be done in an extremely short time with easy-to-use commands. ANTZER TECH's MART Series allows your in-vehicle computer to access CANbus easily. It's the ideal solution for the Fleet Management, Public Transit, Law Enforcement, Digital Signage Player, Vehicle Data Collection, Vehicle Tracking, Telematics System, etc.

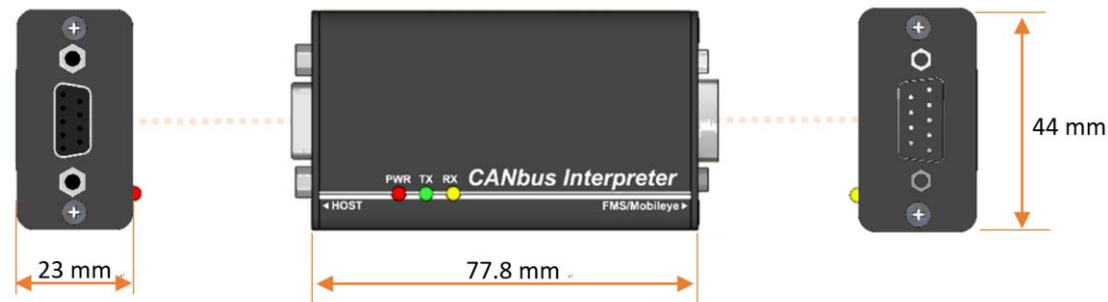
### 1.2. Document History

Version	Date	Author	Description
<b>1.0</b>	2018/5/16	Haney Huang	First released version.
<b>1.1</b>	2018/6/1	Haney Huang	<ol style="list-style-type: none"><li>1. Modified DLC information in Chapter7.</li><li>2. Modified connector pin definition on Chapter 3</li><li>3. Removed Chapter 5.4</li><li>4. Modified ESD protection / Vibration test information</li><li>5. Updated PID list of J1939/OBDII</li></ol>
<b>1.2</b>	2018/7/3	Haney Huang	<ol style="list-style-type: none"><li>1. Updated the PID J1939 supported in standard firmware. (Chapter 6.1)</li></ol>

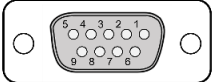
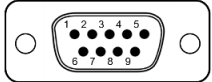
### 1.3. Hardware Specification

Specification	
<b>Host interface</b>	1x RS232 D-Sub 9-Pin Female or 1x USB Type-A Male
<b>CAN interface</b>	1x D-Sub 9-Pin Male
<b>Channel</b>	2 Individual CAN (ISO 11898) Channels
<b>LED Indicator</b>	3x LEDs for Tx, Rx and Power
<b>Voltage Range</b>	Jumper-selectable 5V DC Input from any of D-Sub (Male) or D-Sub (Female) or USB connector
<b>Operating Temp.</b>	-20°C ~ 70°C
<b>ESD Protection</b>	4kV Contact (Direct/Indirect); 8kV Air (Direct)
<b>Certification</b>	CE, FCC Class B
<b>Material</b>	Aluminum
<b>Dimension</b>	77.8mm (L) x 44mm (W) x 23mm (H)
<b>Weight</b>	Net Weight 70g, Gross Weight 225g

## 2. Dimension Drawing



## 3. Connectors and Pin Assignment

 DB-9 Female Connector (Host side)	1	Reserved	 DB-9 Male Connector (Mobileye/FMS side)	1	Reserved
	2	TXR		2	CAN#1 Low
	3	RXD		3	GND
	4	Reserved		4	CAN#2 Low
	5	GND		5	CAN#2 High
	6	Reserved		6	GND
	7	Reserved		7	CAN#1 High
	8	Reserved		8	Reserved
	9	+5VDC IN		9	+5VDC IN (Optional)

## 4. Hardware Installation



Risk of ESD damages caused by improper handling!  
Use ESD protective measures to avoid equipment damage.

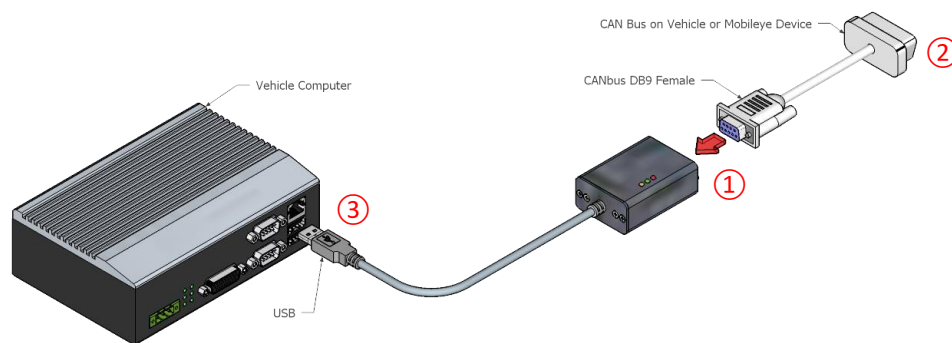
Before hardware installation on the vehicle, please follow software setting instructions (Chapter 5, Page 8) to configure the MART.

### 4.1. MART-R Series



- ▶ Use a cable to connect the MART with CAN Bus (Raw CAN/ J1939/ OBDII / Mobileye®) on the vehicle.
  1. Connect D-Sub9 Female connector to the Mobileye/FMS side on the MART.
  2. Plug the other side of the cable to the vehicle CAN Bus port.
- ▶ Use cable (Appendix A, Antzer P/N: T1700000004) to connect the host computer with the MART.
  3. Connect D-Sub9 male connector to the Host side on the MART.
  4. Using D-sub9 female and USB connectors to connect with the host computer. (The 5V power, which is the power source of the MART, comes from the USB connector.)

## 4.2. MART-U Series

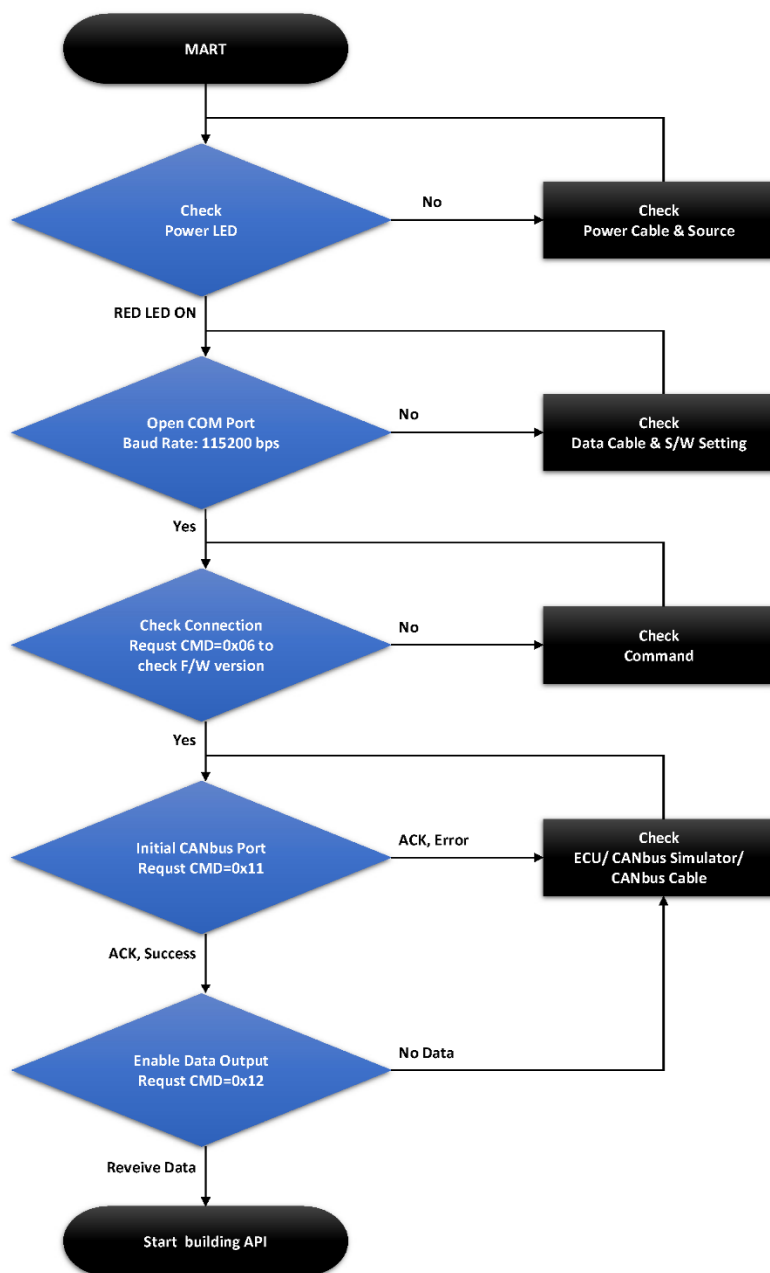


- ▶ Use a cable to connect the MART with CAN Bus (Raw CAN/ J1939/ OBDII / Mobileye) on the vehicle.
  1. Connect D-Sub9 Female connector to the Mobileye/FMS side on the MART.
  2. Plug the other side of the cable to the vehicle CAN Bus port.
- ▶ Use cable on MART to connect the host computer with the MART.
  3. Plug the USB connector to the host computer.



## 5. Software Settings

### 5.1. Workflow Before Building API



[illegible]

- [illegible]

► **Request Firmware Version** (Request: 0x01 - Get F/W version, Response - CMD 0xA1)

- **Response** ( Firmware Version: <MAIN> . <SUB #1> . <SUB #2> . <Minor> . <MCU>)

[illegible]

## 6. PID list

### 6.1. PIDs for OBDII and J1939

#	PID	Acronyms	Name	Remark
1	0x0D	<b>VSS</b>	Vehicle Speed	
2	0x0C	<b>RPM</b>	Engine RPM	
3	0x2F	<b>FLI</b>	Fuel Tank Level Input	
4	0x46	<b>AAT</b>	Ambient Air Temperature	
5	0x5E	<b>EFR</b>	Engine Fuel Rate	
6	0x42	<b>VEP</b>	Control Module Voltage	
7	0x04	<b>PCT</b>	Calculated Engine Load	
8	0x05	<b>ECT</b>	Engine Coolant Temperature	
9	0x10	<b>MAF</b>	Mass Air Flow	
10	0x45	<b>ETP</b>	Throttle Position	
11	0xE1	<b>DIST</b>	Distance	Does not support OBDII
12	0x33	<b>ABP</b>	Absolute Barometric Pressure	
13	0x0F	<b>IAT</b>	Intake Air Temperature	
14	0x0A	<b>FRP</b>	Fuel Pressure	
15	0x5C	<b>EOT1</b>	Engine Oil Temperature	
16	0x5A (*)	<b>APP</b>	Relative Accelerator Pedal Position	
17	0x02	<b>VIN</b>	Vehicle Identification Number(VI)	
18	0xE2 (*)	<b>ABS</b>	Anti-Lock Braking (ABS) Active	Does not support OBDII
19	0xE3 (*)	<b>STA</b>	Steering Wheel Angle	Does not support OBDII
20	0xE5	<b>POD</b>	Position of doors	Does not support OBDII
21	0xE6	<b>TSL</b>	Right/Left Turn Signal Lights	Does not support OBDII
22	0xE7	<b>ABL</b>	Alternate Beam Head Light	Does not support OBDII
23	0xE8	<b>HBL</b>	High Beam Head Light	Does not support OBDII

(\*) Optional PIDs, not included in the standard firmware.

## 6.2. Mobileye® Events

Bit	Event	Description
Event 0 (byte 5)		
7	Sound type	0 - disable, 1 - enable
6	Error	0 - disable, 1 - enable
5	Failsafe	0 - disable, 1 - enable
4	Maintenance	0 - disable, 1 - enable
3	FCW ON	0 - disable, 1 - enable
2	Right LDW ON	0 - disable, 1 - enable
1	Left LDW ON	0 - disable, 1 - enable
0	Tamper Alert	0 - disable, 1 - enable
Event 1 (byte 6)		
7	Peds FCW	0 - disable, 1 - enable
6	TSR Warning Level	0 - disable, 1 - enable
5	HW repeatable enabled	0 - disable, 1 - enable
4	HW warning level	0 - disable, 1 - enable
3	Headway measurement	0 - disable, 1 - enable
2	Reserved	0
1	Reserved	0
0	Reserved	0

## 6.3. Limitations on Using 2 CAN ports Simultaneously

Using 2 CAN buses to receive data simultaneously, it might have chance to lose packets.

(Over a long period of stress testing, the probability of losing packet is about 36ppm which depends on transmission repetition rate and the number of PIDs selected as well as RAW CAN data transmission time intervals.)

## 7. Data Output and Examples (OBDII & J1939)

*Note: For Mobileye® protocols, please contact your sales window for more information.*

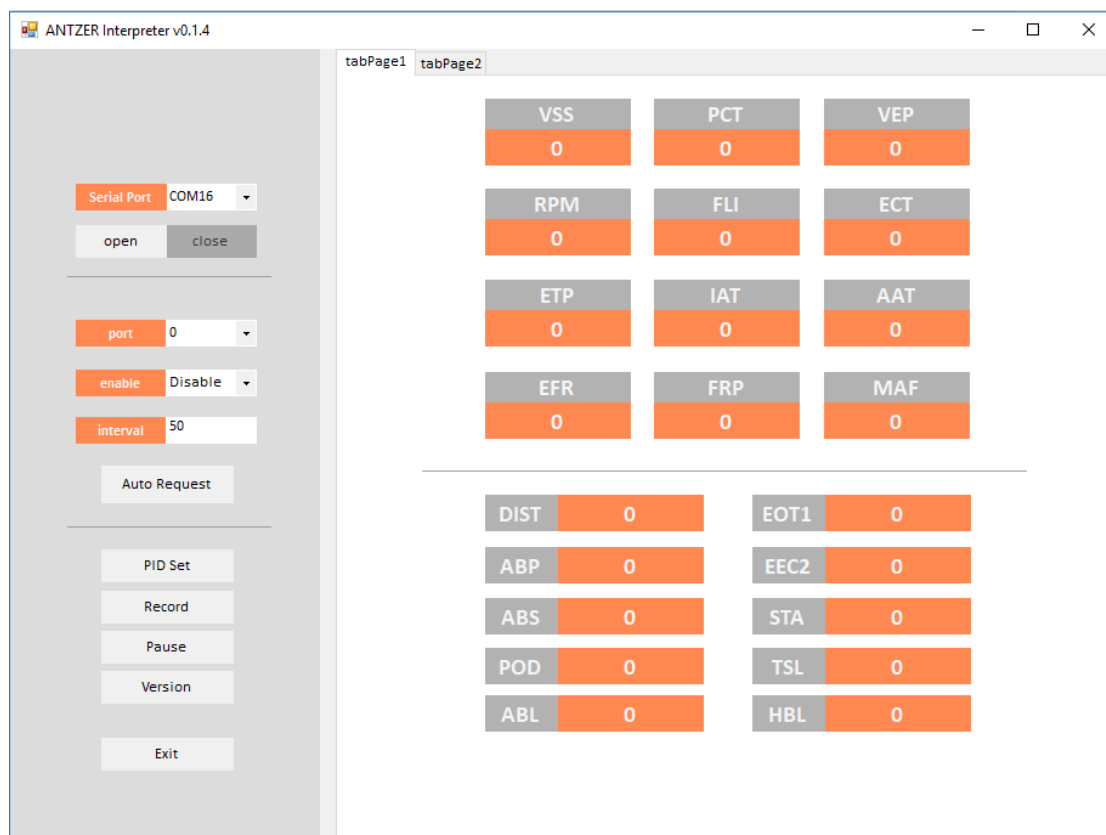
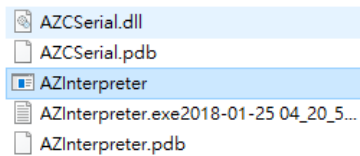
- ▶ **Packet Counter = 1**  
**CMD:** 0xA6  
**PID Acronyms:** VSS + RPM + FLI + AAT + EFR + ABP  
**DLC:** 0x01 ~ 0x0E
  
- ▶ **Packet Counter = 2**  
**CMD:** 0xA7  
**PID Acronyms:** VEP + ECT + ETP + EOT1 + DIST  
**DLC:** 0x01 ~ 0x0E
  
- ▶ **Packet Counter = 3**  
**CMD:** 0xA8  
**PID Acronyms:** PCT + IAT + FRP + MAF + APP + ABS  
**DLC:** 0x01 ~ 0x0E
  
- ▶ **Packet Counter = 4**  
**CMD:** 0xA9  
**PID Acronyms:** STA + POD + TSL + ABL + HBL  
**DLC:** 0x01 ~ 0x7

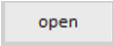
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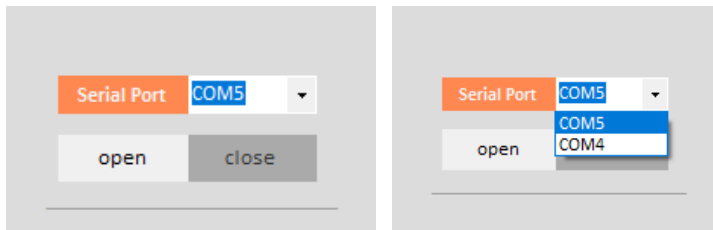


## 8. Antzer-tech Test Application

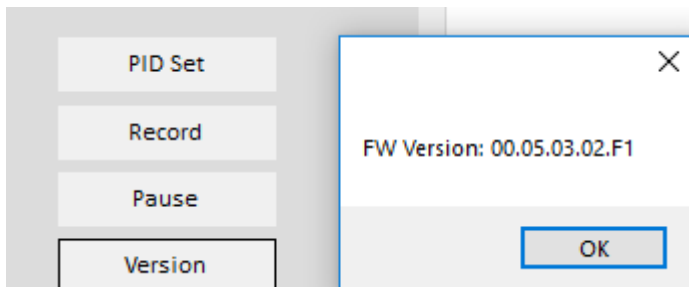
- ▶ Contact your sales representative to get “MART\_Demo Application Tool”
- ▶ Run the execution file named “AZInterpreter”

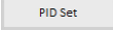


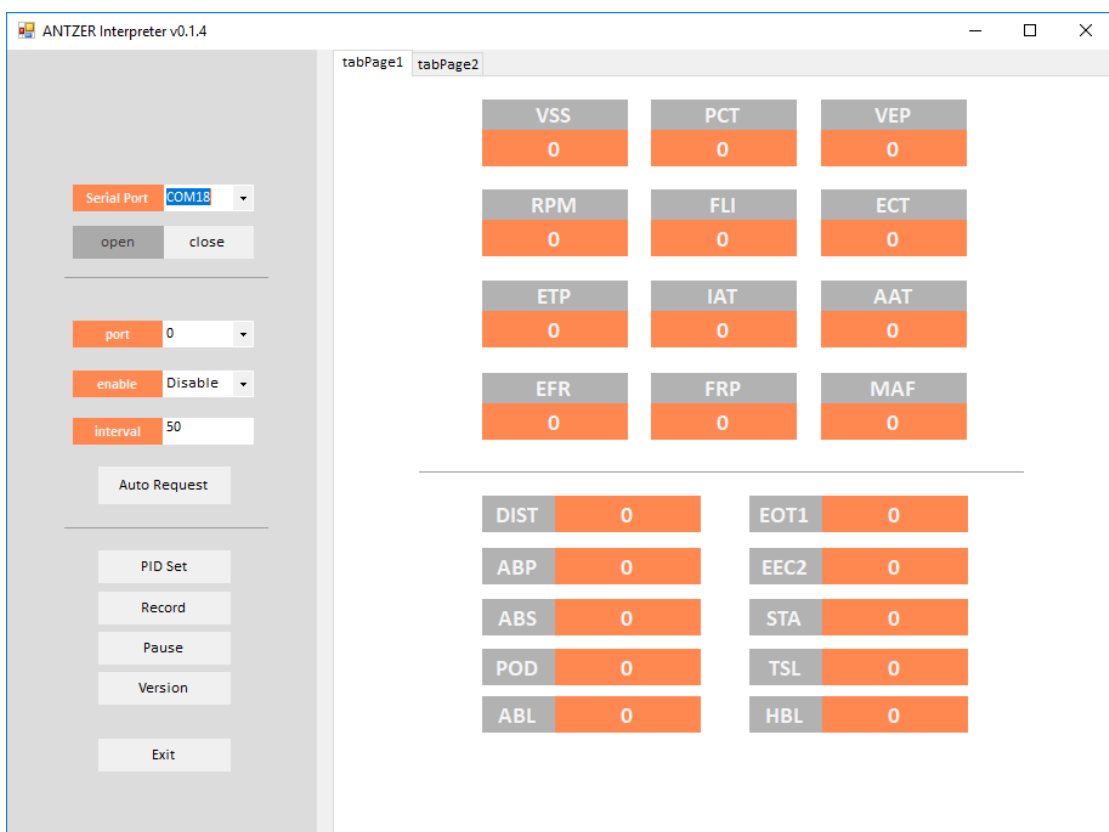
- ▶ Select COM port
- ▶ Click  to build connection with MART

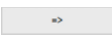

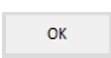


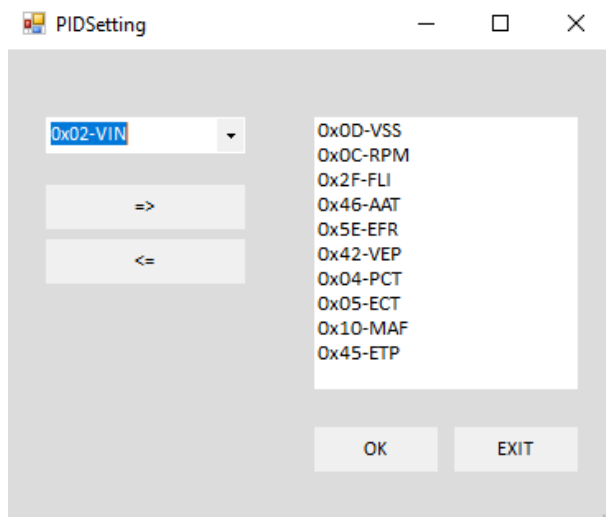
- ▶ Click  to check F/W version



- ▶ Click  to open PID setting window



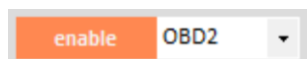
- ▶ Select the PID and click  to add it to the PID list
- ▶ To remove PID, choose the PID in the right column (PID list) and click 
- ▶ **Please be noted that 0x0D-VSS and 0x0C-RPM are the default settings in PID list which could not be removed.**
- ▶ Click  to finish PID setting



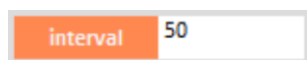
- ▶ Choose the CAN Port on MART. (default Port 0)



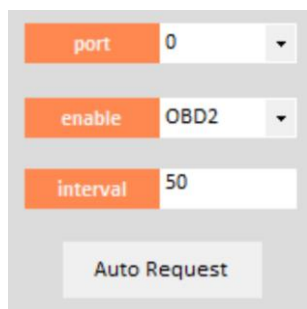
- ▶ Select the Protocol (OBDII/J1939)

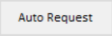


- ▶ Set data transmission interval (ms)

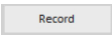
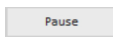


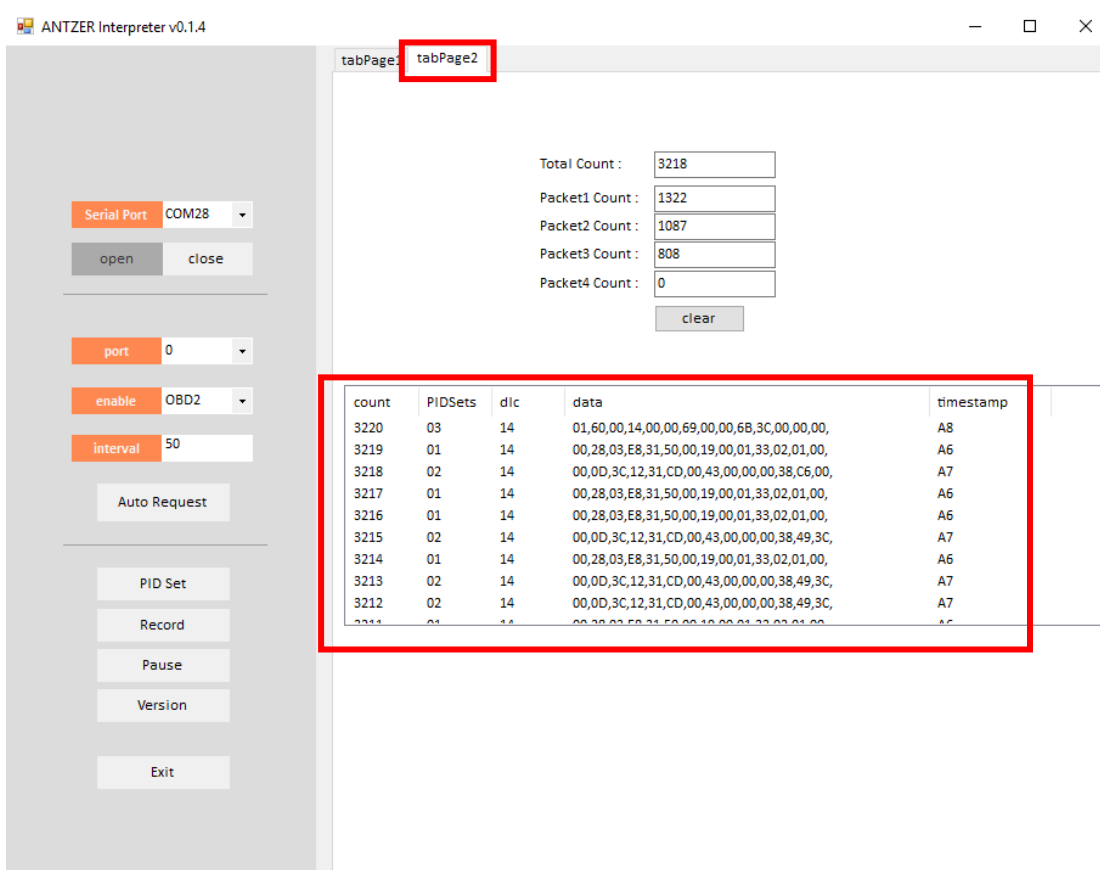
- ▶ Click  to start receiving data from CAN

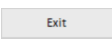


- Choose disable and click  if you want to stop receiving data



- Click  to save the log file and the  to stop recording data
- The log file will be saved in the same folder of AP
- Besides the log file, you could also review the raw data in tabPage2



- Click  to close the application

## 9. Reliability Specification

### 9.1. Environmental

Environment	Specifications
Operating Temperature	-20°C to 70°C
Vibration	MIL-STD-810G Category 4 (Figure 514.6C-1, Common Carrier, US Highway Truck Vibration Exposure) 10 Hz~500Hz; 1.04g rms; 3 axis

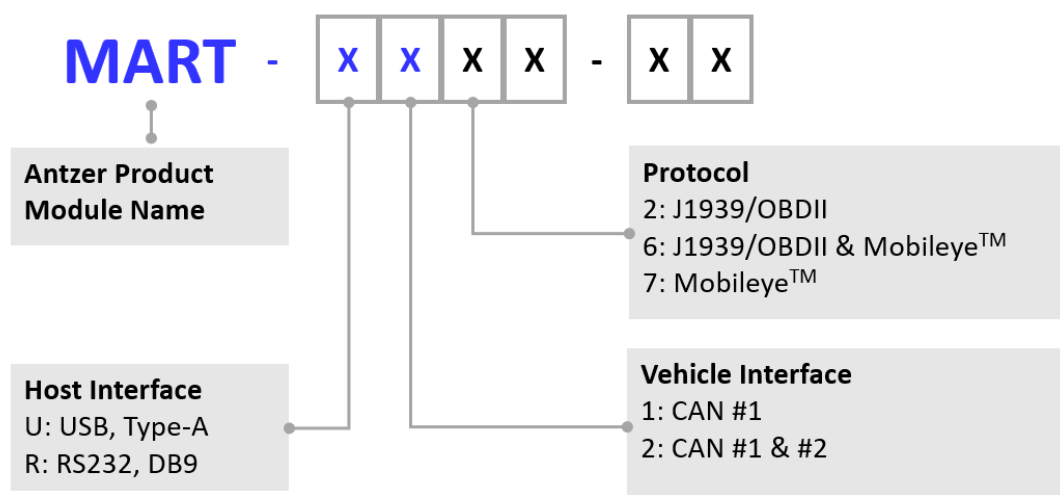
### 9.2. Certification and Compliance

Antzer-Tech MART complies with the following standards:

- CE
- FCC Class B
- RoHS
- MIL-STD-810G Category 4, Figure 514.6C-1 Vibration Compliant

## 10. Ordering Information

### 10.1. Product Code Principles



### 10.2. Part Number List

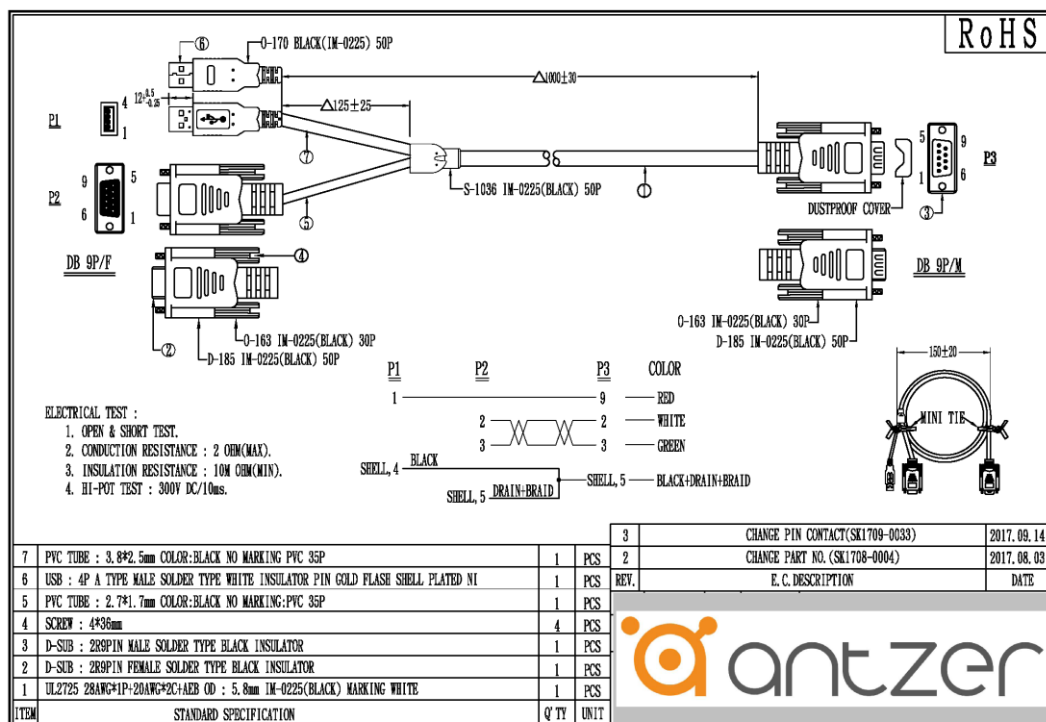
Part Number	Description
MART-R220-A0	RS232-to-CANbus Interpreter, 2 channels support OBDII and J1939
MART-R260-A0	RS232-to-CANbus Interpreter, 2 channels support Mobileye® and OBDII/J1939
MART-U220-A0	USB-to-CANbus Interpreter, 2 channels support OBDII and J1939
MART-U260-A0	USB-to-CANbus Interpreter, 2 channels support Mobileye® and OBDII/J1939

## Appendix A Optional Cable & Accessory

### 1. Cable, DB9M-to-DB9F/USB Y-Cable, L=1.0M, STD

(Antzer P/N: T17000000004)

MART Cable DB9(M)/DB9(F)/USB-A(M) Y-Cable RS232/+5VDC BLACK 100CM



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