

GNSS M.2 Cards

ANNA-M Series User Manual

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ANNA-M Series

M.2 2242 B key

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Antzer Tech In-Vehicle Cards User Manual

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Change History

Version	Date	Author	Description
1.0	2020/7/6	Haney Huang	First version release
1.1	2020/7/13	Haney Huang	Added driver information to the document
1.2	2020/7/16	Haney Huang	Fixed the typo in Chapter 8.2
1.3	2020/12/22	Haney Huang	1. Updated the SKU in ordering information 2. Modified the naming rules 3. Added cable P/N in Appendix A
2.1	2021/7/19	Allen Chen	For ANNA-M series version
3.0	2022/7/21	Allen Chen	Add Pin assignment

1. Introduction

ANTZER TECH's ANNA Mini-PCle/M.2 card integrates high performing u-blox M8 module that have concurrent reception of up to 3 GNSS (GPS/Galileo together with GLONASS or BeiDou). ANNA series has optional configurations which support Dead Reckoning Technology: UDR (Untethered Dead Reckoning), ADR (Automotive Dead Reckoning) or Antzer Tech patented CAN-to-ADR solution ^[*]. ANNA Mini-PCle/M.2 card provides outstanding positioning accuracy which is the ideal solution for industrial and automotive applications.

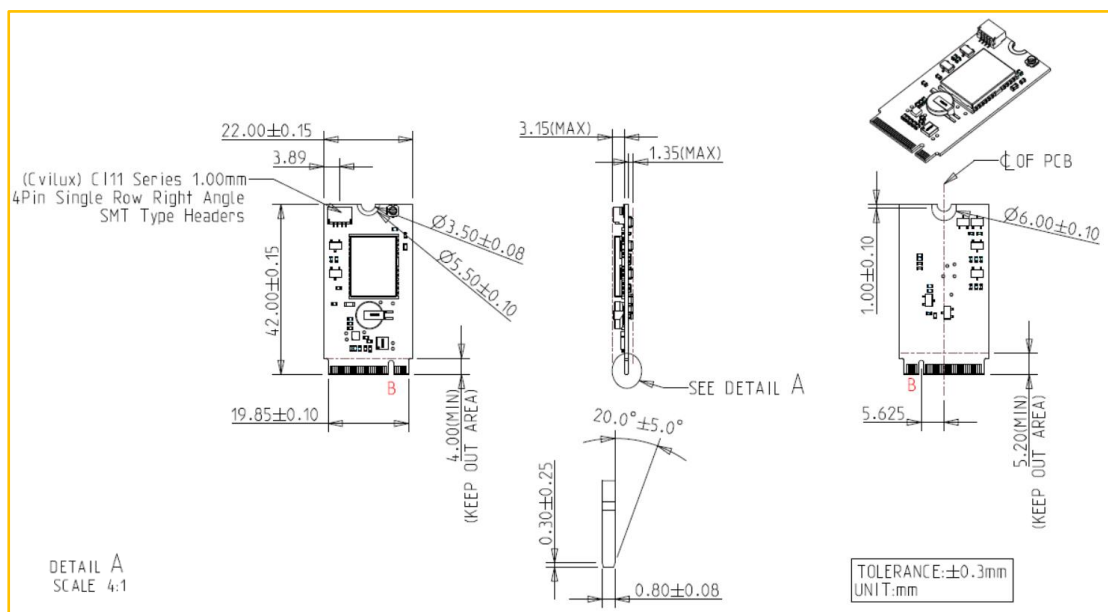
[*] The CAN-to-ADR function is only available on ANNA-F (Mini-PCle) series.

2. Specification

Interface	Form Factor	ANNA-M: M.2 2242 B-Key
	Host Interface	USB 2.0 via M.2 B-key * Optional SKU with sensors via I ² C interface
GNSS	GNSS Module	u-blox NEO-M8U, NEO-M8L
	Receiver Type	72-channel u-blox M8 engine Concurrent reception of up to 3 GNSS (GPS, Galileo, GLONASS, BeiDou)
	Position Accuracy	2.0m CEP
	Dead Reckoning	UDR / ADR
	Quick Hot Start	Supported (Li-Coin Battery is Required)
	GNSS Antenna	External, IPEX connector onboard (Default Support Active Antenna) * Optional SKU for Passive Antenna
CAN/Sensor	Input Connector	Wheel-tick and Direction Inputs for the ADR SKU
	Sensor (Optional SKU)	3D Gyroscope 3D Accelerometer
	CAN (Only for CAN-to-ADR SKU)	Support ISO15765-4 On-Board Diagnostic or J1939 Protocol to Get Speed from Vehicle CAN Bus for CAN-to-ADR Application.
Environment	Operating Temp	-40°C ~ 85°C (without Li-Coin Battery) -20°C ~ 60°C (with Li-Coin Battery)
	Vibration Test	Pass 7.69G@ 20~2000Hz, compliant with MIL-STD-810G category 24
	ESD Protection	8kV Contact, 15kV air
	Certification	CE, FCC Class B

3. Dimensions

3.1. ANNA-M Series (M.2 2242 B-key)



4. Connectors and Pin Assignment

ANNA-M Series

M.2 2242 B key

USB 2.0: Pin 7 (D+), Pin 9 (D-)

I2C: Pin 40 (CLK), Pin 42 (DAT)
(Optional SKU for sensors)

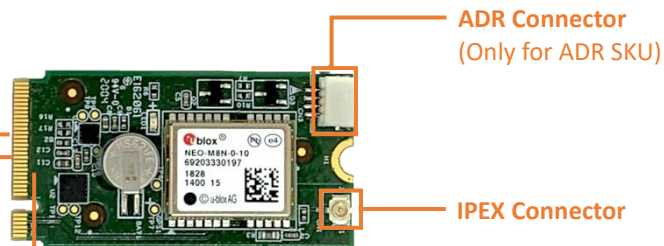
3.3V input:

Pin 2, 4, 70, 72, 74

GND:

Pin 3, 5, 11, 21, 27, 33, 39, 45

Pin 51, 57, 69, 71, 73, 75



Pin	Function	Pin	Function
1	NC	2	+V3.3
3	GND	4	+V3.3
5	GND	6	NC
7	USB_DP	8	NC
9	USB_DM	10	NC
11	GND	12	Mechanical Key
13	Mechanical Key	14	
15		16	
17		18	
19		20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	NC
39	GND	40	SCL
41	NC	42	SDA
43	NC	44	NC
45	GND	46	NC
47	NC	48	NC
49	NC	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	+V3.3
71	GND	72	+V3.3
73	GND	74	+V3.3
75	GND		

4.1. GNSS IPEX Antenna Connector

Coaxial cable connector: 3 pin, 180°, Female, 3V, SMD

Manufacture part number: U.FL-R-SMT-1(10), Hirose

4.2. ADR Connector (only for the SKU with NEO-M8L)

- **ANNA-M Series:**

WAFER BOX, 1x4 pin, pitch: 1.0mm, 90°, Male, SMD

Manufacture part number: Cl1104M1HR0-NH, CviLux

5. Driver

We use CP210x UART to USB bridge IC on our card.

- **Windows driver:**

Please download the driver from the official website of Silicon Labs:

<https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>

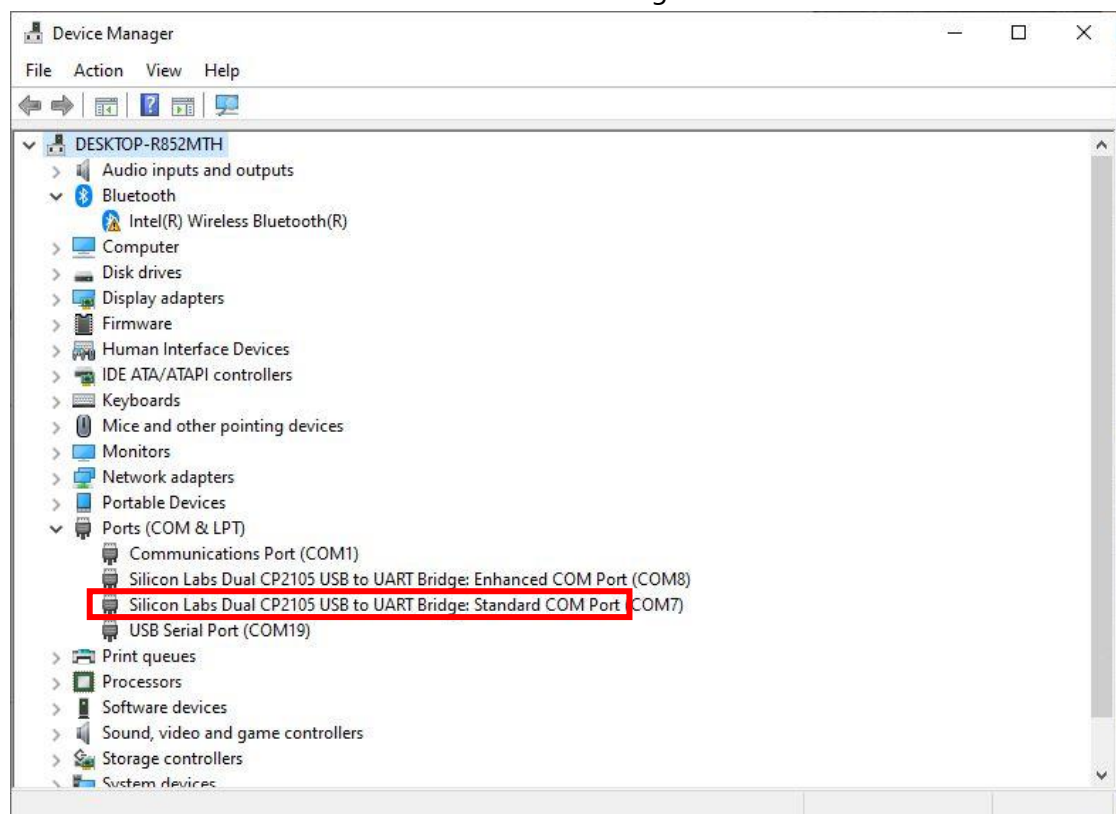
- **Linux driver:**

The driver is already included in Ubuntu 14.04 and later.

The Linux 3.x.x and 4.x.x version of the driver is maintained in the current Linux 3.x.x and 4.x.x tree at www.kernel.org.

- **Find the COM port of the GNSS module:**

The GNSS module is connected to Host PC through “Standard COM Port”.



- **Fix the COM port number on your PC:**

If it is necessary, please execute CP21xWR patch provided by Antzer Tech after the driver installation to fix the COM port number on your PC.

6. Reliability Specifications

6.1. Environmental

Environment	Specifications
Temperature	Operating: -40°C to 85°C (without Li-Coin Battery) Operating: -20°C to 60°C (with Li-Coin Battery)
Vibration	Operating: Random, 7.6g(Grms), 20~2000(Hz) Compliant with MIL-STD-810G

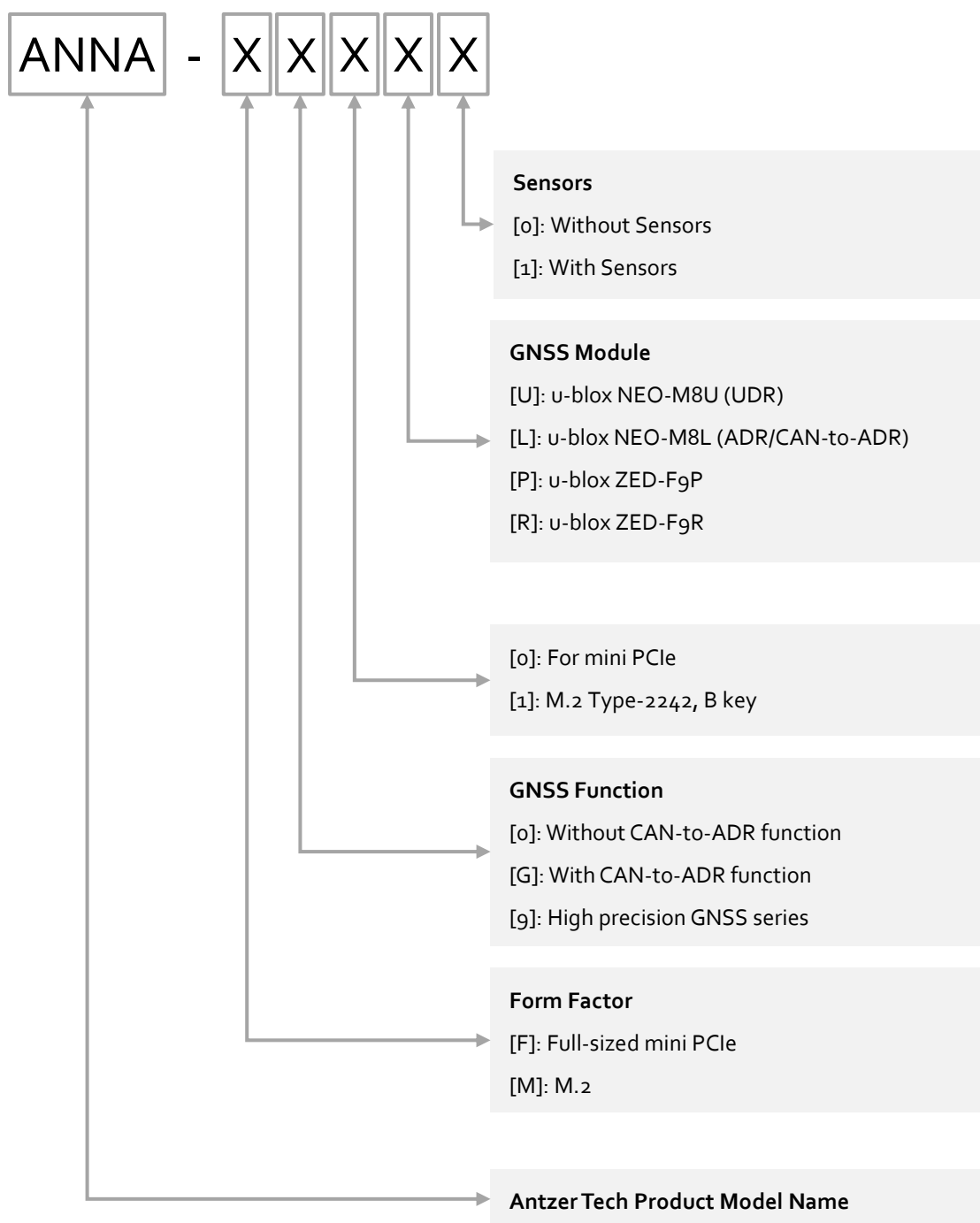
6.2. Certification and Compliance

The ANNA series product complies with the following standards:

- CE
- FCC
- RoHS
- MIL-STD-810G Vibration Compliant

7. Ordering Information

7.1. Naming Rules



7.2. Part Number

GNSS Feature	Model Name	Description
UDR	ANNA-M01U1	NEO-M8U, M.2 Type-2242 B-Key, Gyroscope, Accelerometer with UDR function
ADR	ANNA-M01L1	NEO-M8L, M.2 Type-2242 B-Key, Gyroscope, Accelerometer with ADR function

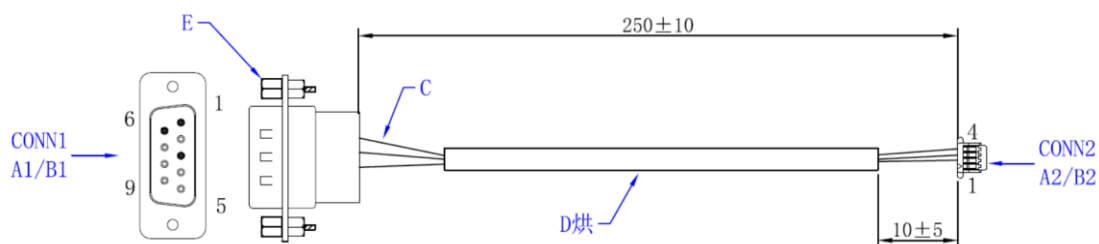
[1]

The interface of the sensors is I2C on the M.2 socket.

Appendix A Optional Cable & Accessory

- Cable: T1700000035

ADR Cable for ANNA-M, Wafer Box 1.0 mm to D-SUB 9 Pin Male, ADR 250mm



CONN1			CONN2	
PIN No.	FUNCTION	COLOR	PIN No.	
1	Wheel-tick Signal	RED	3	
3	GND	BLACK	4	
6	Reverse Signal	BROWN	2	