

Miniature Force/Torque Sensors

Miniature 6-axis Force Torque Sensor, AFT20/50-D15 (ENG)

Rev. 2026.09.15

FOREWORD

Thank you for purchasing our Force Torque sensor. This manual contains the information necessary for the correct use of the AIDIN ROBOTICS AFT100-D20 sensor. Please carefully read this manual when using this software. Please note that the basic performance of the product will not be exhibited when the robot system is used out of conditions. This manual describes possible dangers and consequences using Force Torque sensor. Be sure to comply with safety precautions written in this manual to use safety and correctly.

NOTICE

This manual Do **NOT** allow copy, reproduction or share without authorization of AIDIN ROBOTICS. Please notify us any errors in this manual or the provided instructions.

MANUFACTURER

AIDIN ROBOTICS

SAFETY PRECAUTIONS

Installation of Force Torque sensor **MUST** be performed by qualified personnel in accordance with national and local codes. Please carefully read this manual when using this software.

WARNING & CAUTION

 This symbol indicates that a danger of possible serious injury or death exists if the associated instructions are not followed properly.

 This symbol indicates that a danger of possible harm to people or physical damage to equipment and facilities exists if the associated instructions are not

followed properly.

✓ AFT20-D15, AFT50-D15 sensors from AIDIN ROBOTICS meet CE-certified "A Class"

1. Introduction

1.1 Miniature 6-axis Force Torque Sensor



1.2 Key features

- Miniature 6-axis force/torque sensor
- All-in-one sensor (No additional amplifier)
- Digital output communications (CAN)
- Easy installation and data collection
- Grippers, robot hands, medical, and VR/haptics

1.3 Specs.

Index	Unit	AFT20-D15	AFT50-D15
Operating voltage	VDC	5	5

Max. safe excitation voltage	VDC	10	10
Force range	N	20	50
Torque range	Nm	0.1	0.25
Break force	N	30	75
Break torque	Nm	0.15	0.35
Force resolution	N	0.05	0.1
Torque resolution	Nm	0.0001	0.0002
Force Noise-free resolution (STD)	N	0.2	0.3
Torque Noise-free resolution (STD)	Nm	0.0005	0.001
Sample rate	Hz	100	100
Dimensions	mm	D15 x H10.5	D15 x H10.5
Weight	g	3.2	3.2
Temperature		10-50°C	10-50°C
Interfaces		CAN	CAN
Connector		FPC: 0.5 pitch, 8pin Length: 50, 100, 200 mm For User: CAN_H / CAN_L / VCC / GND	FPC: 0.5 pitch, 8pin Length: 50, 100, 200 mm For User: CAN_H / CAN_L / VCC / GND

1.4 Flyer

- [AFT20-D15.pdf](#)
- [AFT50-D15.pdf](#)

2. Installation Guide

2.1 Components

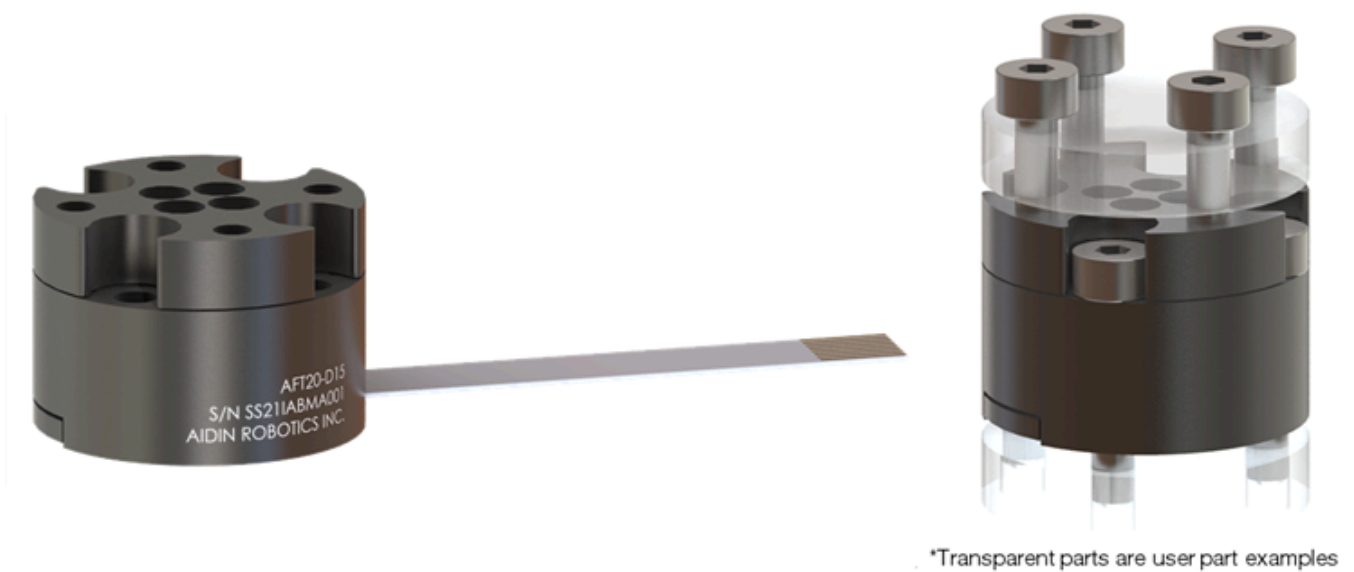
- AFT-MINI x 1 EA (FPC cable integrated, selected when ordering)
- FPC-DIP conversion board (for testing)





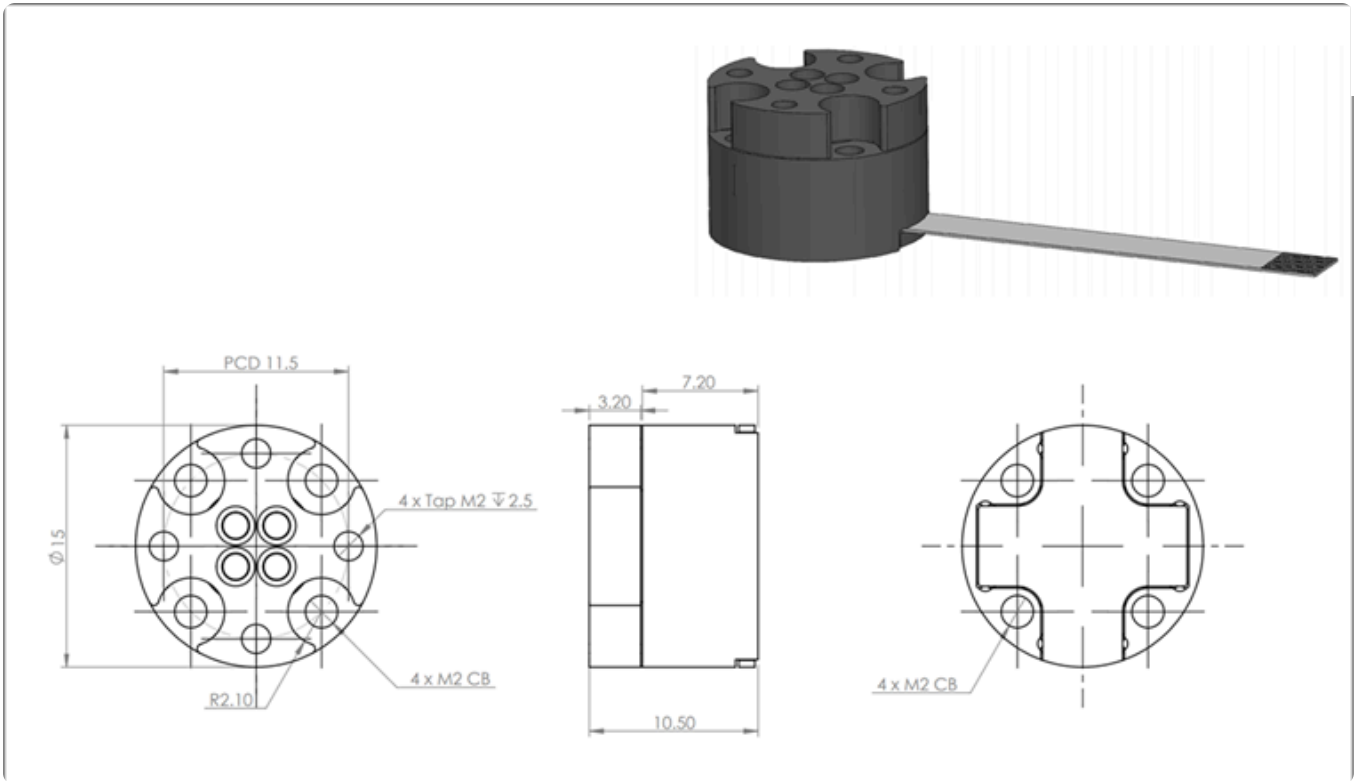
2.2 Mounting

- **Must be fastened with M2 bolt 1kgfcm (0.1Nm)**
- Performance cannot be guaranteed and A/S is not possible when disassembling internal bolts
- Be careful of cable cuts and excessive pulling

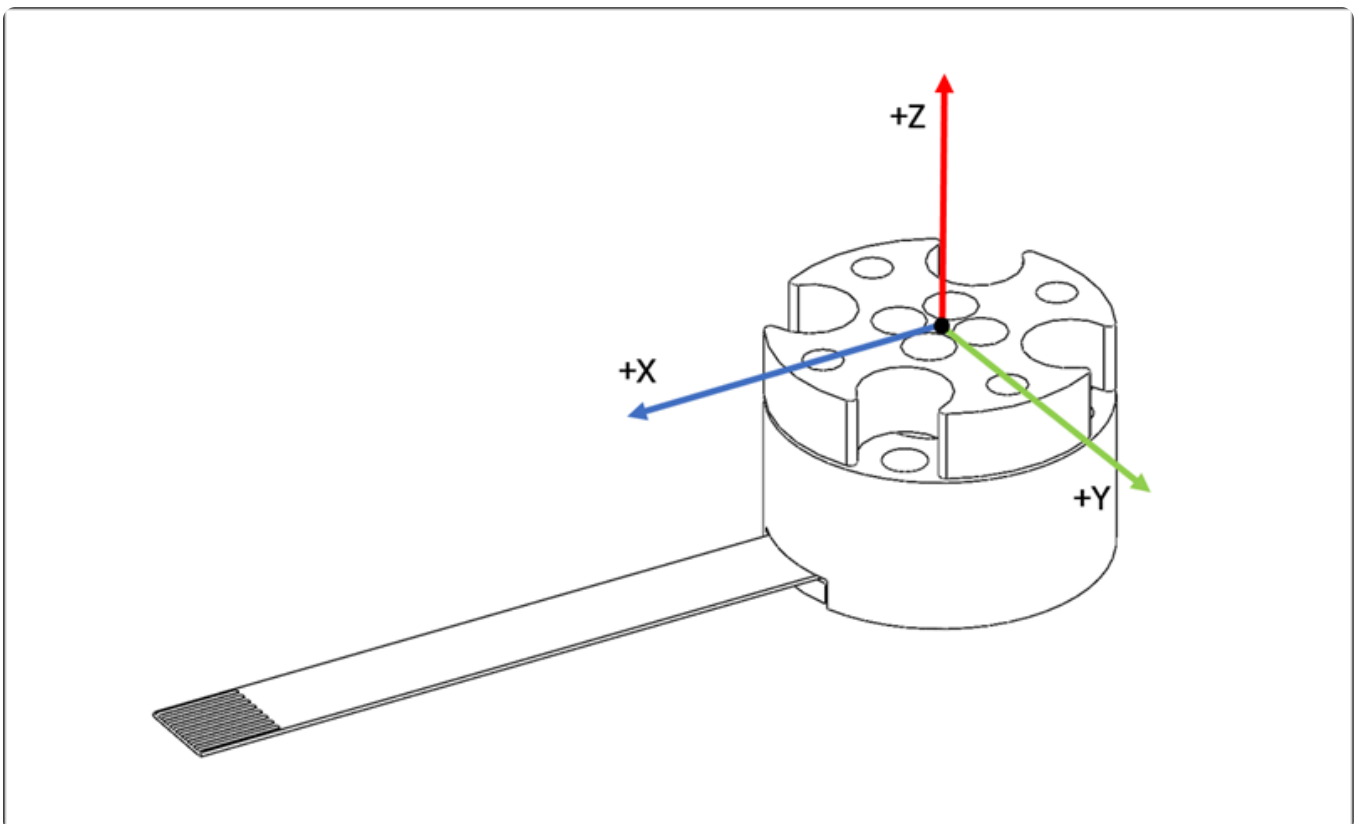


*Transparent parts are user part examples

💡 If the tightening torque is not observed, data may not be output properly.



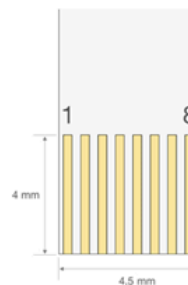
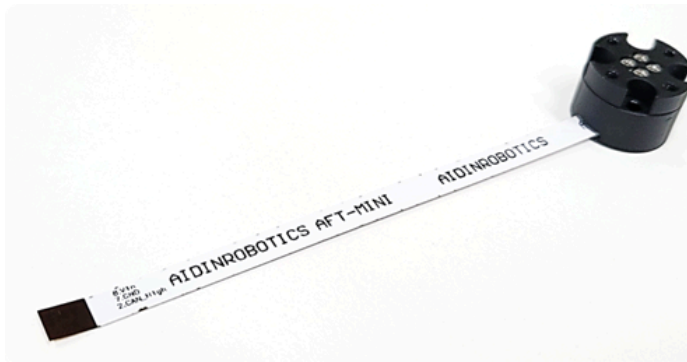
- Force torque coordinate system



- [Miniature 6-axis FT Sensor\(AFT20,50,100\)_STEP.zip](#)
- [AFT20-D15 Drawing.pdf](#)

2.3 Connection

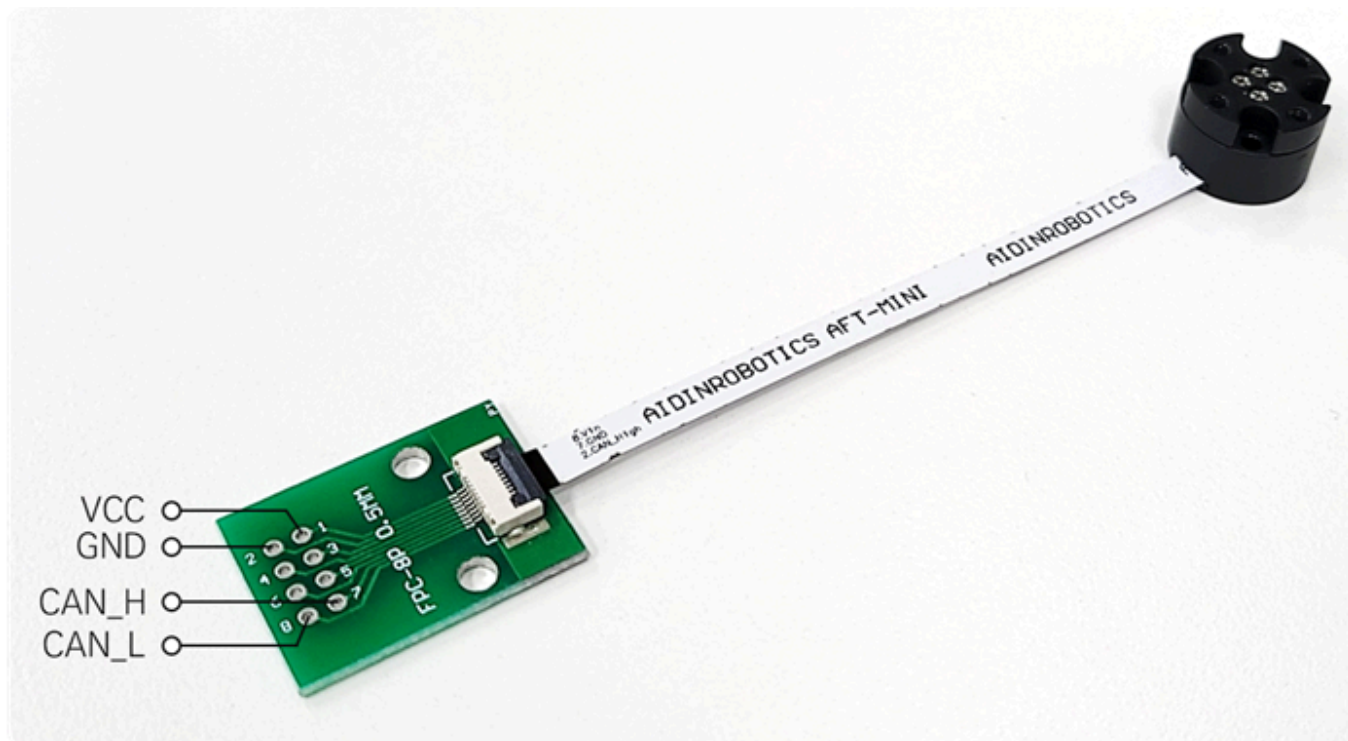
- Cable pinout
 - For user: CAN_H / CAN_L / VCC / GND (4pin)
 - 60 - 120 Ohm termination resistor should be connected between CAN_H and CAN_L
 - Length: 50, 100, 200 mm (order option)



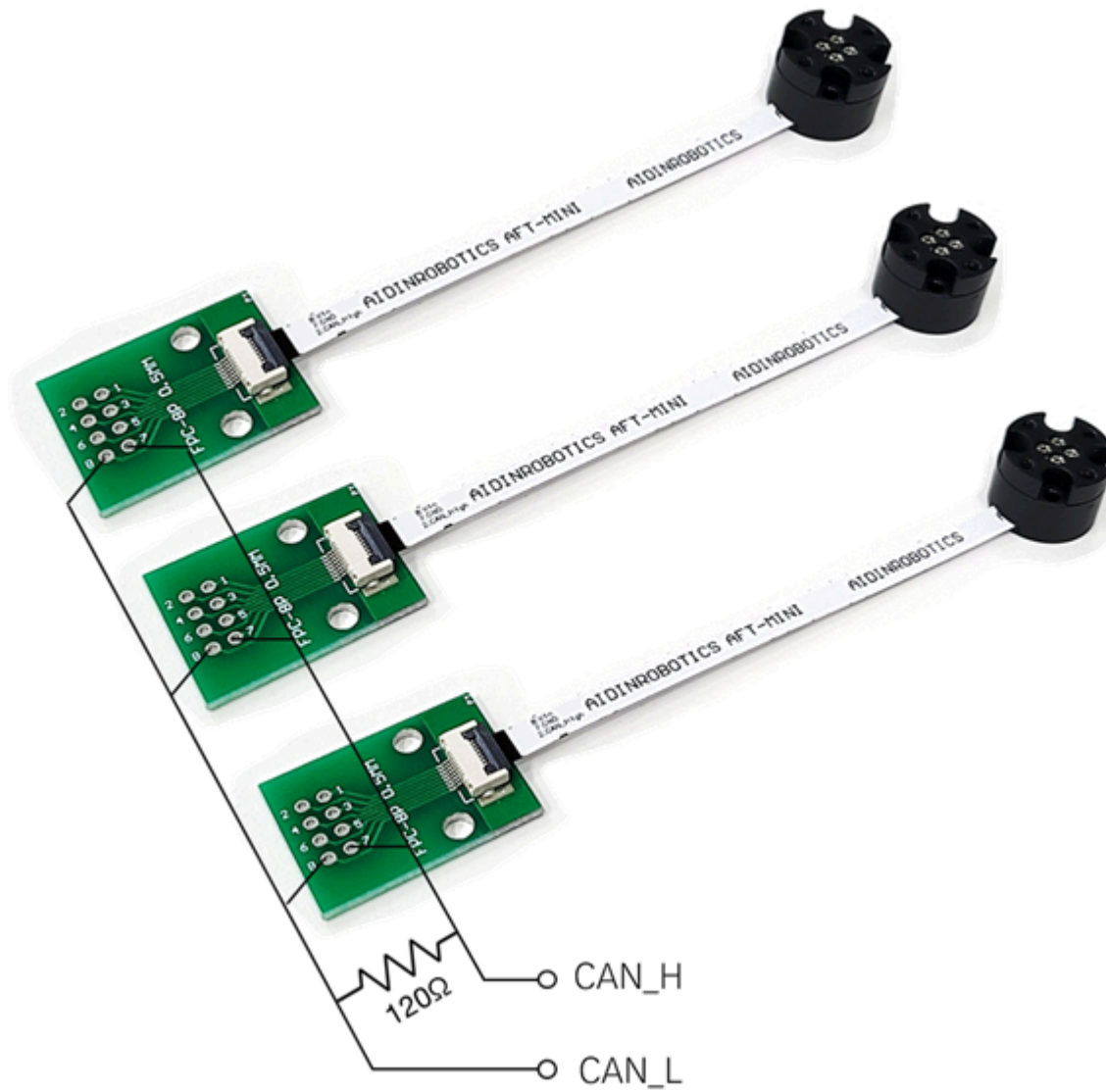
- 1 – CAN_LOW
- 2 – CAN_HIGH
- 3 – NC
- 4 – NC
- 5 – NC
- 6 – NC
- 7 – GND
- 8 – VCC (5V)



- Conversion board connection example
 - FPC 0.5mm pitch to DIP converting board
 - For easy test set-up
 - 60-120 Ohm termination resistance required (between CAN_H and CAN_L)
 - For system integration, it is recommended to have a connector built into the board.
(Connector information: FFC/FPC connector 8P ZIF, R/A, SMT ONE TOUCH FLIP LOCK)



- Example of CAN_H, CAN_L line and terminating resistance configuration for multiple connections (individual ID setting required- factory setting)



- Output data format
 - The default CAN IDs are 0x1A and 0x1B (decimal 26 and 27), and are assigned prior to shipment.
 - If custom CAN ID assignment is required, please specify your request at the time of order.

Table 1.3 –Default Value	
Default ID	0x1A / 0x1B
Data Output Rate	100 Hz

Table 1.4 –transmit								
Index	Data field [0]	Data field [1]	Data field [2]	Data field [3]	Data field [4]	Data field [5]	Data field [6]	Data field [7]
ID	Force output [0]	Force output [1]	Force output [2]	Force output [3]	Force output [4]	Force output [5]	-	-

$F_x \text{ output} = \text{Force output [0]} * 256 + \text{Force output [1]}$

$F_y \text{ output} = \text{Force output [2]} * 256 + \text{Force output [3]}$

$F_z \text{ output} = \text{Force output [4]} * 256 + \text{Force output [5]}$

*Force [N] = Force output /1000 – 30

* AFT20-D15 model

**Force [N] = Force output /300 – 100

** AFT50-D15 model

Table 1.5 –transmit								
Index	Data field [0]	Data field [1]	Data field [2]	Data field [3]	Data field [4]	Data field [5]	Data field [6]	Data field [7]
ID+1	Torque output [0]	Torque output [1]	Torque output [2]	Torque output [3]	Torque output [4]	Torque output [5]	-	-

$T_x \text{ output} = \text{Torque output [0]} * 256 + \text{Torque output [1]}$

$T_y \text{ output} = \text{Torque output [2]} * 256 + \text{Torque output [3]}$

$T_z \text{ output} = \text{Torque output [4]} * 256 + \text{Torque output [5]}$

*Torque [Nm] = Torque output /100,000 – 0.3

* AFT20-D15 model

**Torque [Nm] = Torque output /50,000 – 0.6

** AFT50-D15 model

3. Software

- USB-to-CAN device driver installation
 - You can use other CAN support boards, but use IXXAT's converter to use the provided sample program.

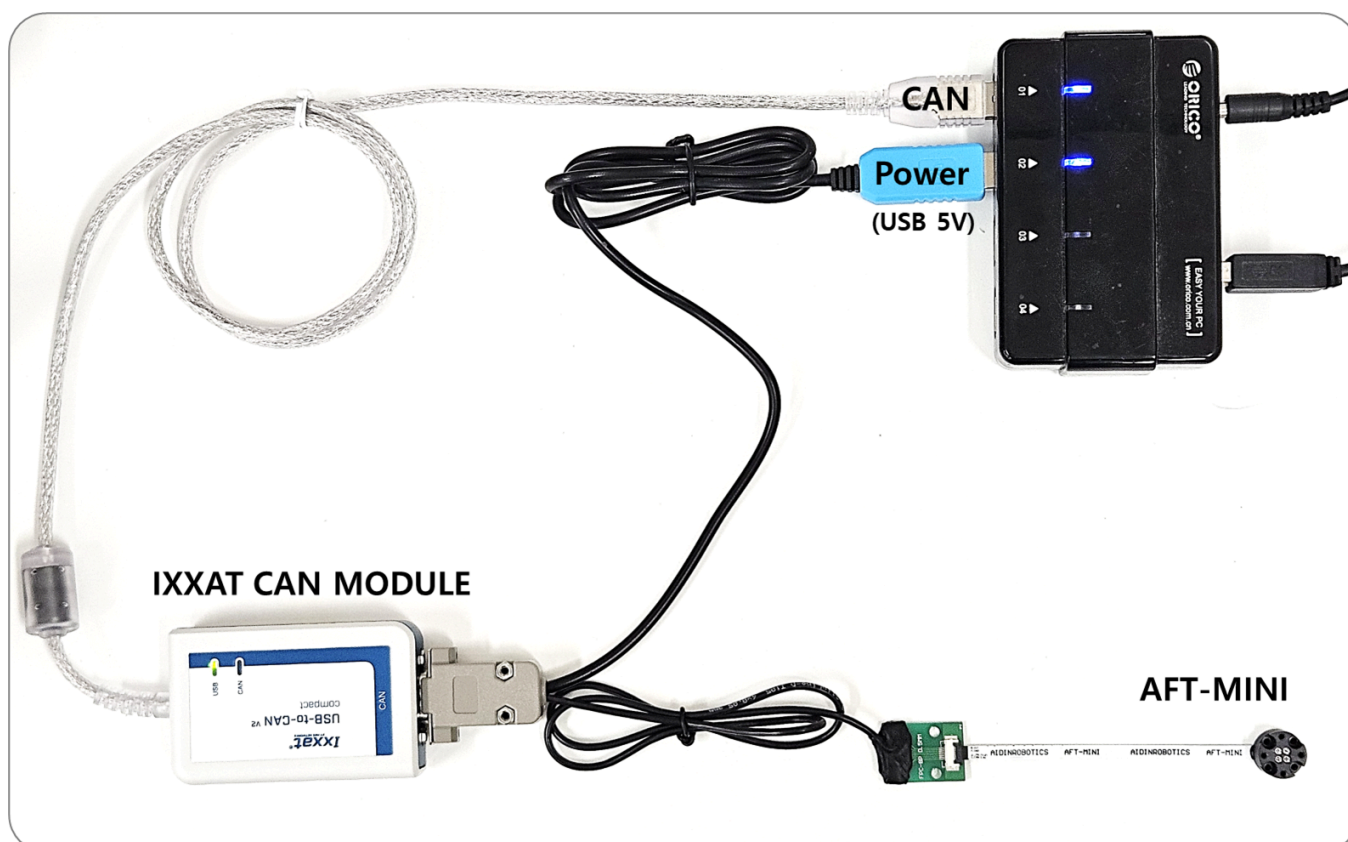


Pin no. X1	Signal
1	-
2	CAN-Low
3	GND
4	-
5	-
6	-
7	CAN-High
8	-
9	-

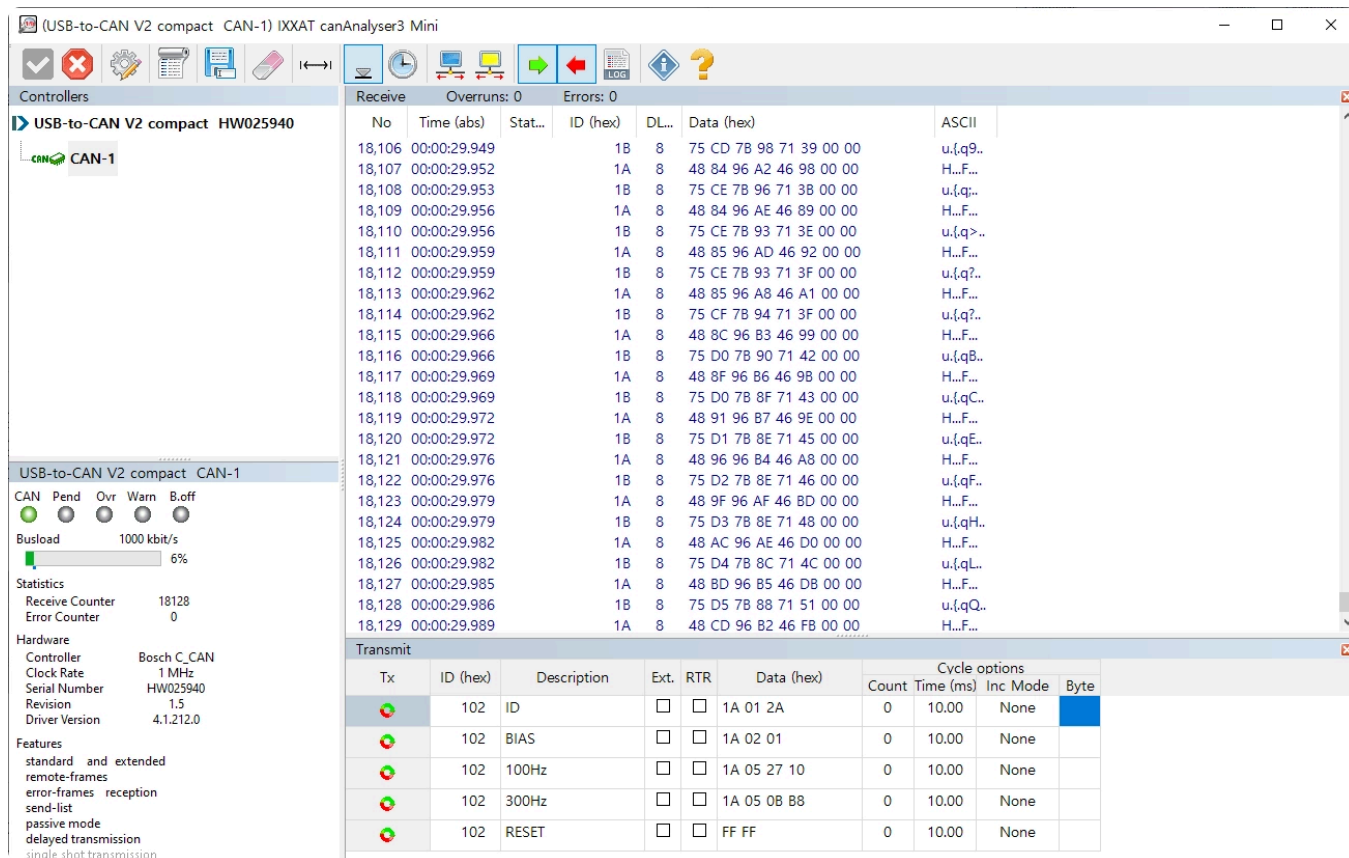


USB-to-CAN V2 (ixxat.com), version used in the manual: 1.01.0281.11001 IXXAT CAN VCI V4 - Windows drivers, **VCI V4** - Windows 11, 10, 8, 7 [Driver, canAnalyser-Mini, Manuals, LabView and other add-ons]* *When installing, check VCI V4 and reboot the PC after installation (required)

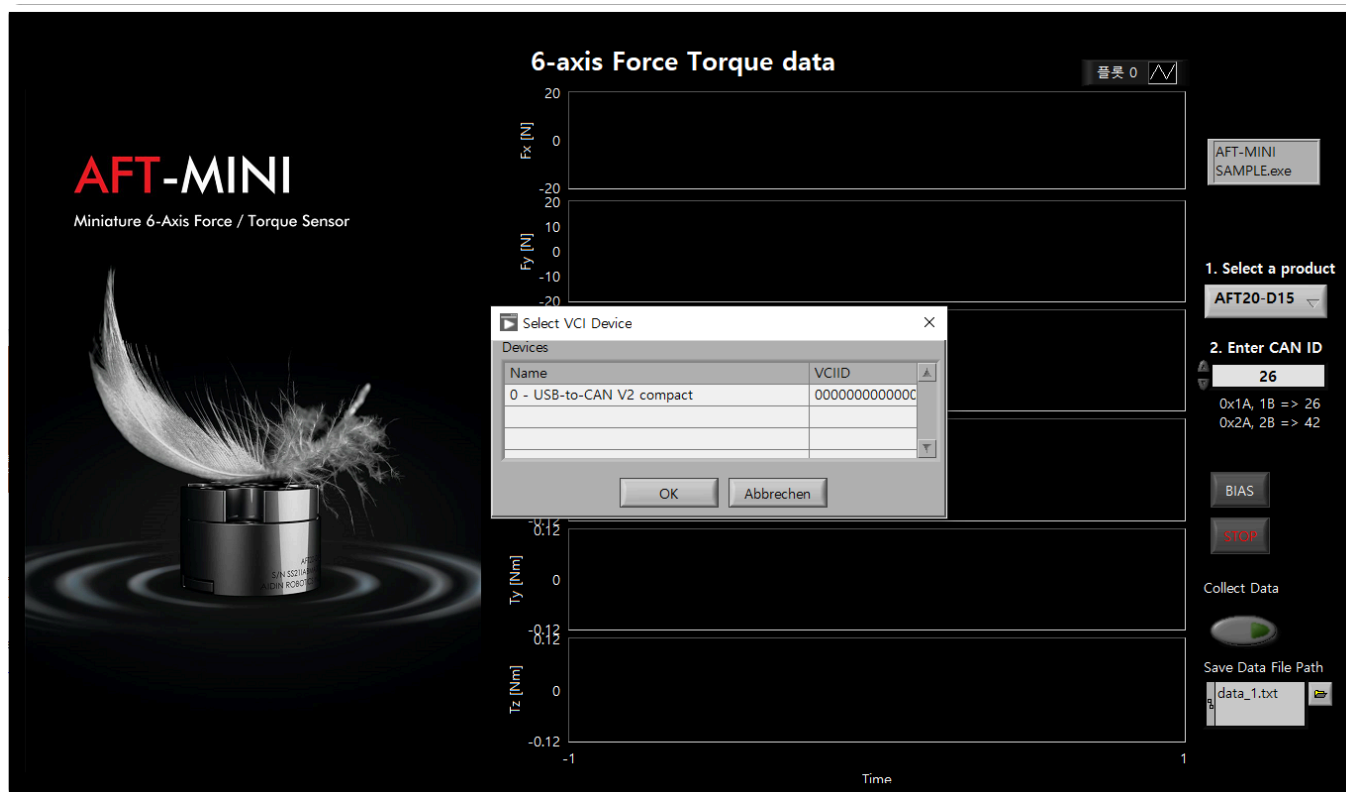
- Test cable connection setup



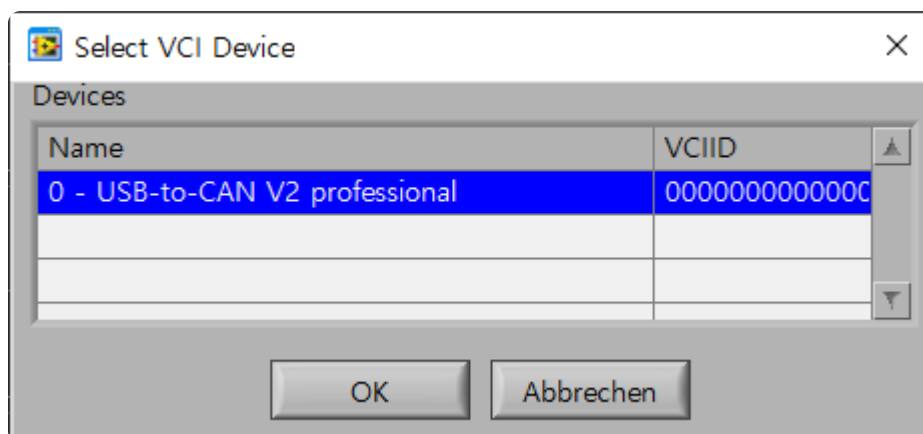
- CAN bus program (provided by IXXAT)
 - CanAnalyzer3 Mini windows → IXXAT → IXXAT CanAnalyzer3 Mini



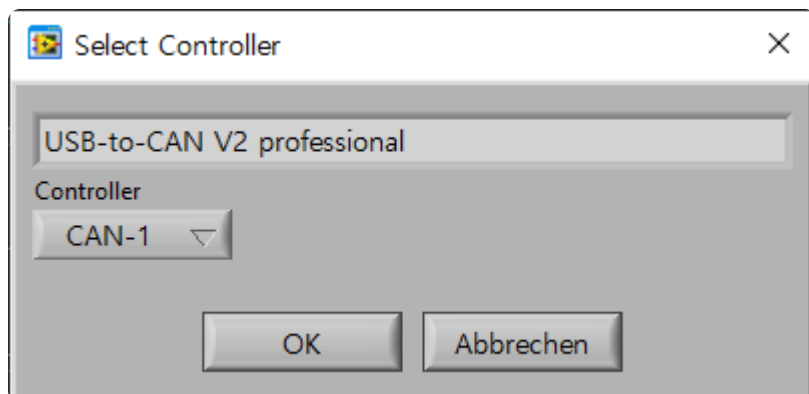
- Sample program provided by Aidin Robotics
 - Install CAN driver and reboot(required) - Skip if already completed above IXXAT CAN VCI V4 - Windows drivers
 - Install sample_installer (run sample_install.exe)
-  sample_Installer.zip (대용량 파일 — 별도 제공)
 - After connecting the sensor, run AFT-MINI SAMPLE.exe
-  AFT-MINI SAMPLE.zip
- Pop-up screen



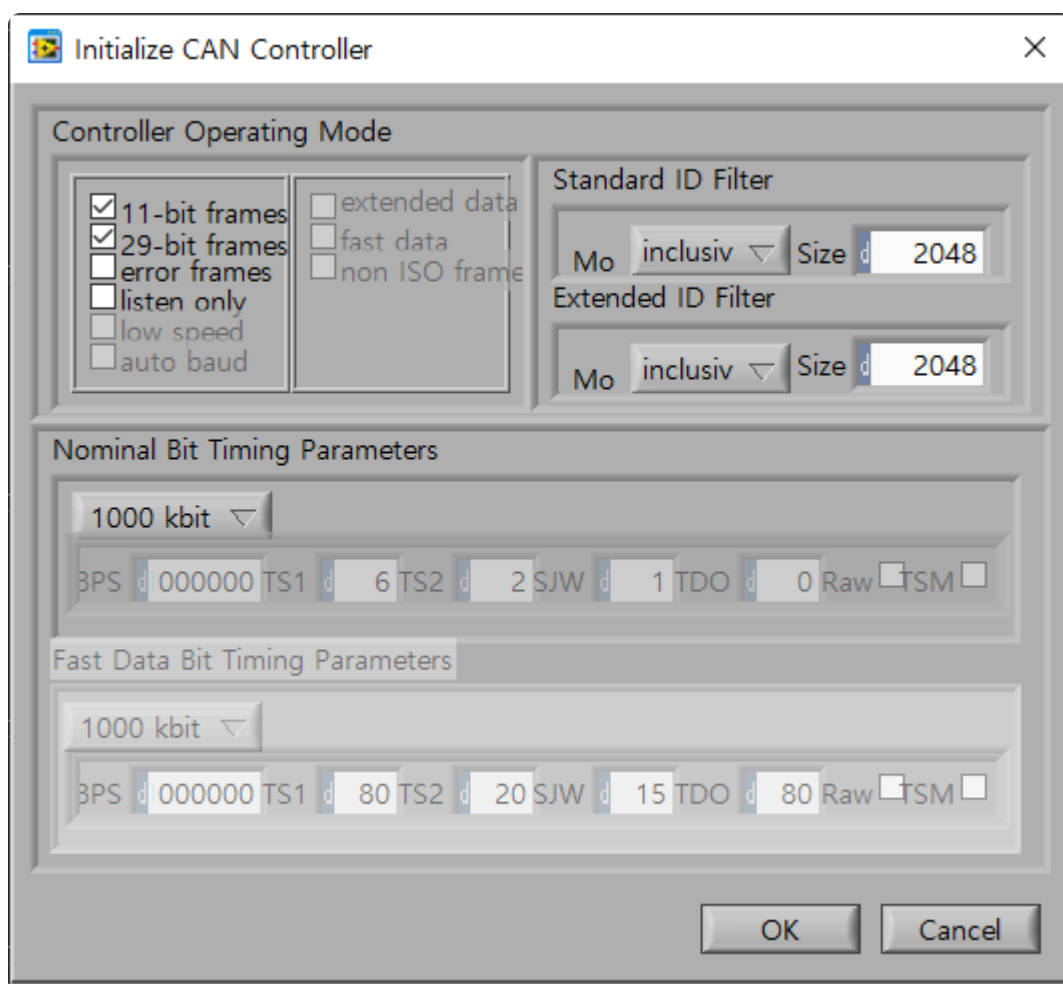
1. CAN device selection Select your device. Devices currently connected to the PC are displayed in a list. Click the applicable device and press the OK button. ※ The sample program was created based on IXXAT's USB-to-CAN converter.



1. CAN Controller Selection The device name selected in the previous step will be displayed. Select the controller channel below and press the OK button.

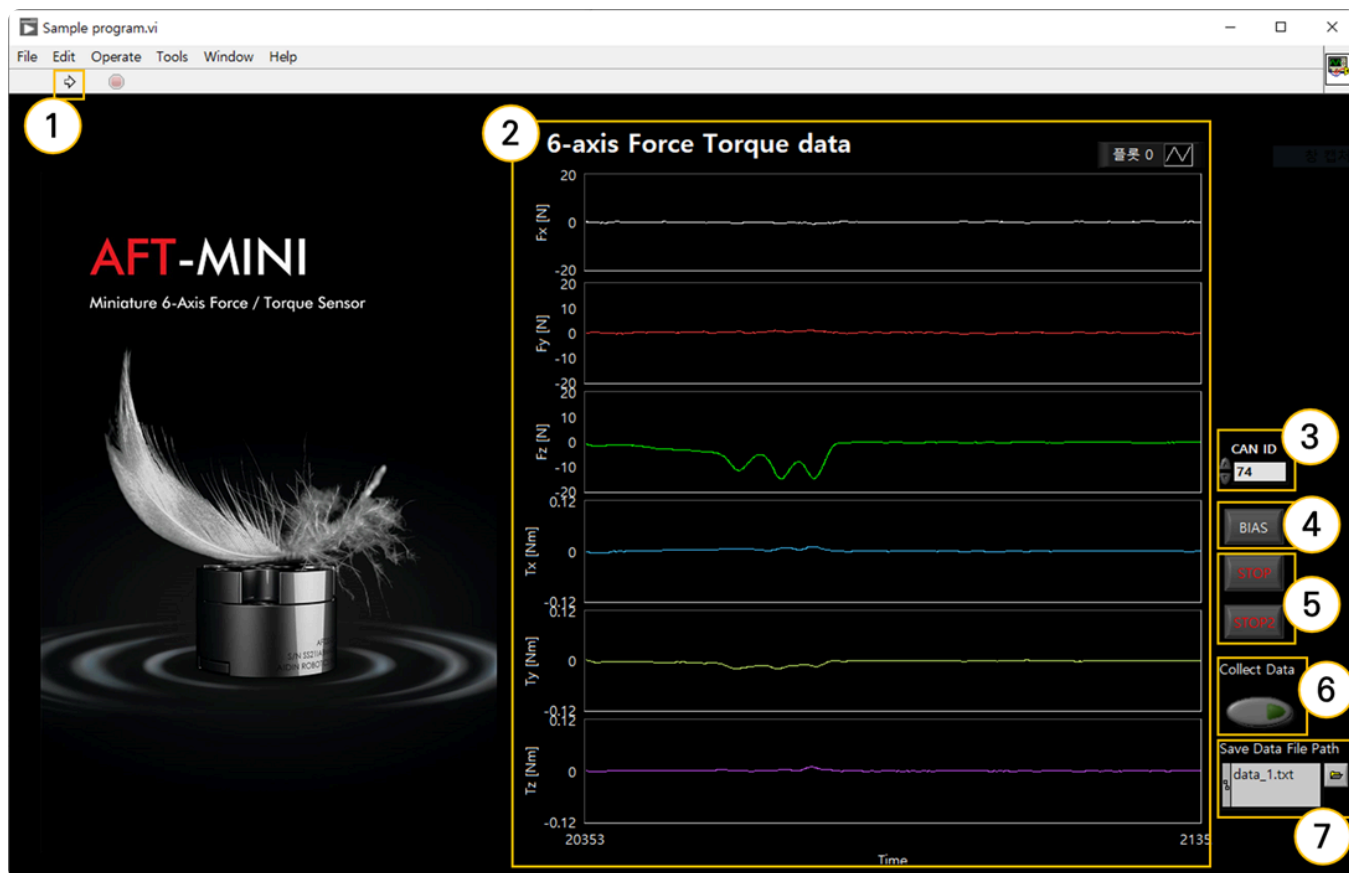


1. CAN controller initial setup This is the step to initialize the controller. Check the baudrate and press the OK button.



1. **Select product and enter CAN ID** Choose the product you are using between AFT20-D15 and AFT50-D15. Enter the CAN ID of the sensor you connected. (Default 1A, 1B ⇒ Decimal 26 input, can be checked in IXXAT CanAnalyzer)

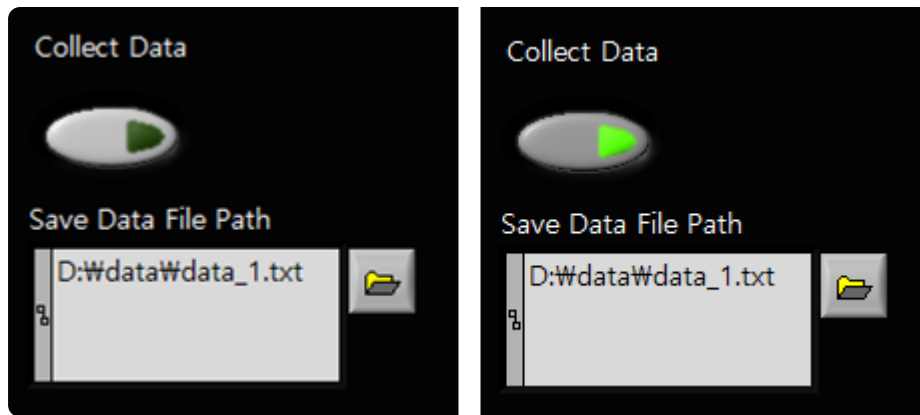
- Interface description



① Program run Run the sample program. ② Graph plot You can check real-time data of 6-axis force/torque data (F_x , F_y , F_z , T_x , T_y , T_z) in graphs. ③ CAN ID Set the CAN ID of the connected sensor. If there is more than one ID, enter the lowest ID. ex) In case of 0x1A(26), 0x1B(27), input 26 ④ BIAS Initialize all 6-axis force/torque data to zero. By eliminating installation and attachment factors, the desired force value can be measured. ⑤ STOP Exit the program. Press both STOP buttons and the program ends in 3 seconds. ⑥ Collect Data Saves force/torque data logs. Please refer to the explanation regarding data storage on the page below. ⑦ Save Data File Path Set the file name to save force/torque data logs. Please refer to the explanation regarding data storage on the page below.

3.1 Save data log

1. Save directory settings Set the name of the file to save the data. The file will be saved in the folder where the executable program is located, and if there is no file with that name, it will be automatically created. Since the data is accumulated in the file, we recommend that you save it by specifying a new file each time you save it.
2. Collect data Click the button below Collect Data to start saving. The button lights up when saving. To end saving, press the button again. Data is stored cumulatively in files, so it is recommended that you specify a new file for each save.



1. Check data log You can check the saved force/torque data by opening the files in that directory. Data is stored in each column in the following order: Fx, Fy, Fz, Tx, Ty, and Tz.

data_1 - Windows 메모장

파일(F) 편집(E) 서식(O) 보기(V) 도움말(H)

-0.031	0.146	0.195	-0.000	0.001	0.000
-0.037	0.040	0.240	-0.001	0.001	0.001
-0.037	0.040	0.240	-0.001	0.001	0.001
0.015	0.059	0.139	0.000	-0.002	0.001
0.015	0.059	0.139	0.000	-0.002	0.001
0.015	0.059	0.139	0.000	-0.002	0.001
-0.029	0.155	0.263	-0.000	0.001	0.001
-0.029	0.155	0.263	-0.000	0.001	0.001
-0.029	0.155	0.263	-0.000	0.001	0.001
-0.011	0.093	0.116	0.000	0.000	0.001
-0.011	0.093	0.116	0.000	0.000	0.001

Ln 11, Col 38 100% Windows (CRLF) UTF-8

FAQ

(내용 준비 중)

Revision History

Date	Description
2026.09.15	Initial release (Current version)



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