

Miniature Force/Torque Sensors

Miniature 6-axis Force Torque Sensor, AFT100-D20 (ENG)

Rev. 2026.10.13

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.

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, CAN-FD)
- Easy installation and data collection
- Grippers, robot hands, medical, and VR/haptics

1.3 Specification

Index	Unit	AFT100-D20-C

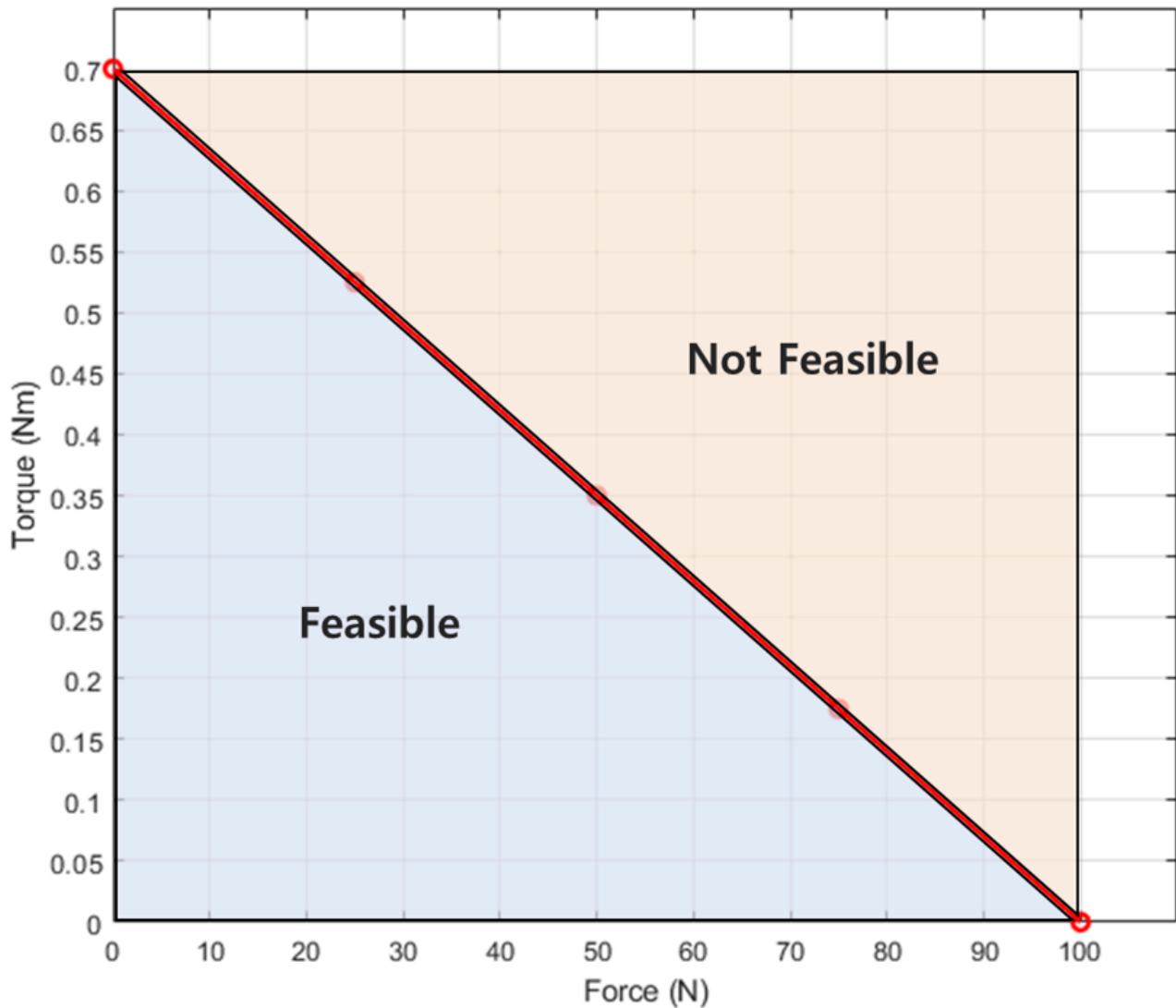
Operating voltage	VDC	5
Max. safe excitation voltage	VDC	10
Force range	N	100
Torque range	Nm	0.75
Break force	N	200
Break torque	Nm	1.5
Force resolution	N	0.13
Torque resolution	Nm	0.0004
Force Noise-free resolution (STD)	N	0.4
Torque Noise-free resolution (STD)	Nm	0.002
Sample rate	Hz	300
Dimensions	mm	D20 x H13
Weight	g	8.1
Temperature		10-50°C
Interfaces		CAN CAN-FD (Available upon request)
Connector		FPC: 0.5 pitch, 8pin Length: 50, 100, 200 mm For User: CAN_H / CAN_L / VCC / GND

1.4 Flyer

- [\[AIDIN ROBOTICS\] Mini_AFT200 Leaflet_EN.pdf](#)

1.5 Feasible sensing range

- The graph shows the usable sensing range under combined force and torque loading
- The sensor operates normally within the feasible region
- When the combined load exceeds the feasible region, the sensor output is fixed at the boundary value



2. Installation Guide

2.1 Components

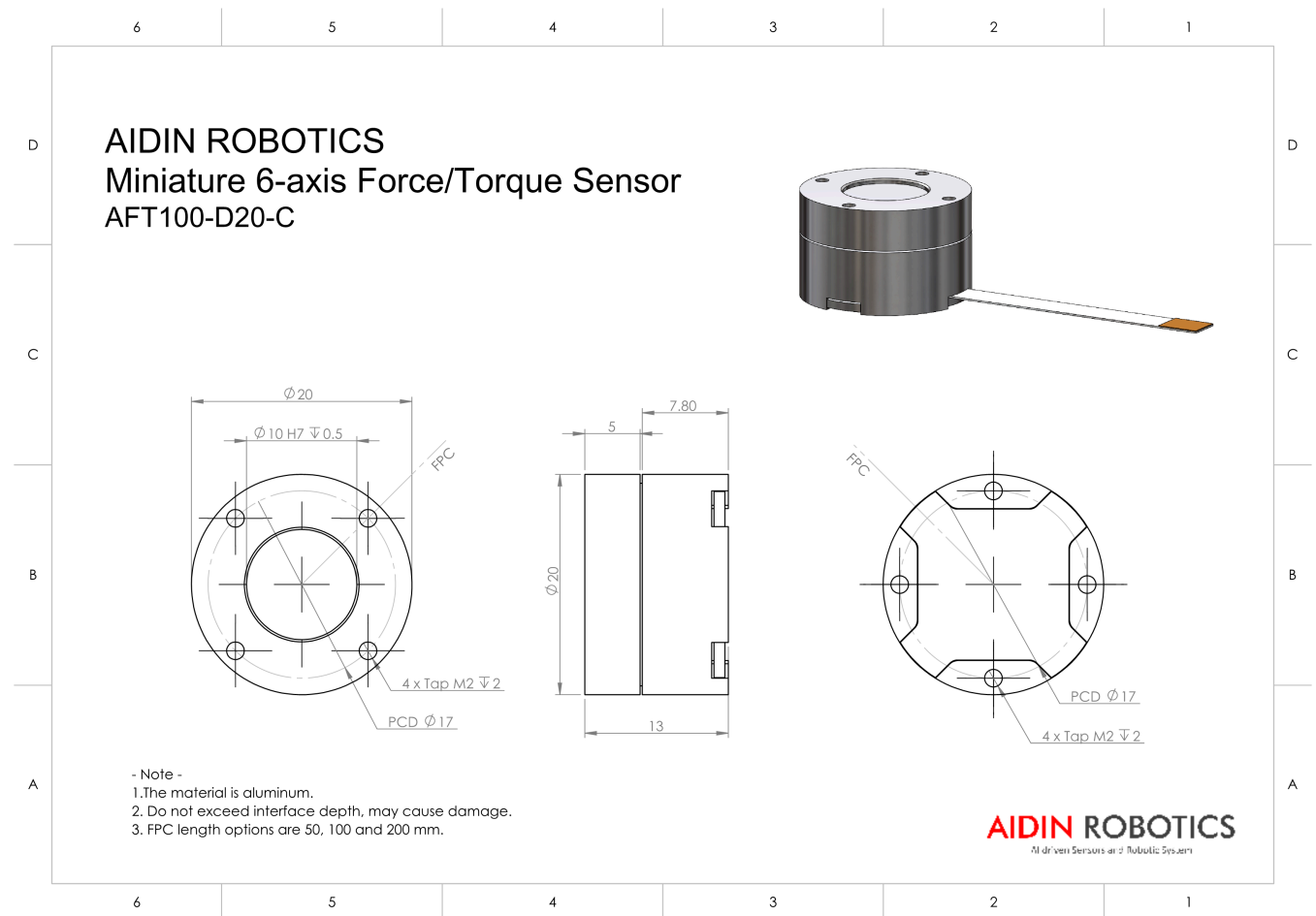
- AFT100-D20 x 1 EA (FPC cable integrated, selected when ordering)

- FPC-DIP conversion board (for testing)

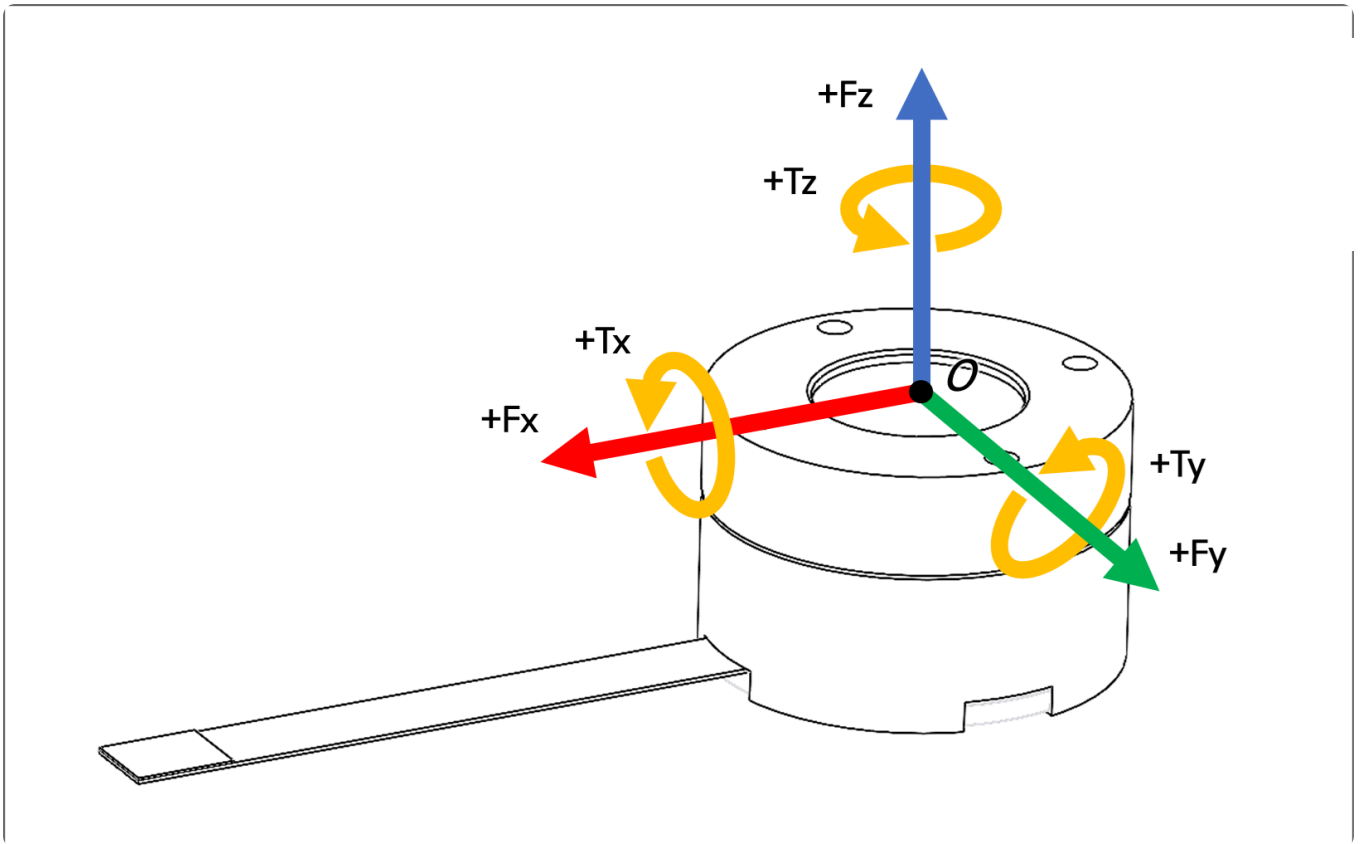


2.2 Mounting

- **Must be fastened with M2 bolt 1.5 kgfcm (0.15Nm)**
- Performance cannot be guaranteed and A/S is not possible when disassembling internal bolts
- Be careful of cable cuts and excessive pulling

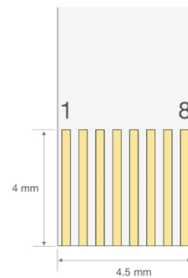


- [AFT100-D20-C.PDF](#)
- [AFT100-D20-C.STEP.zip](#)
- Force torque coordinate system



2.3 Connection

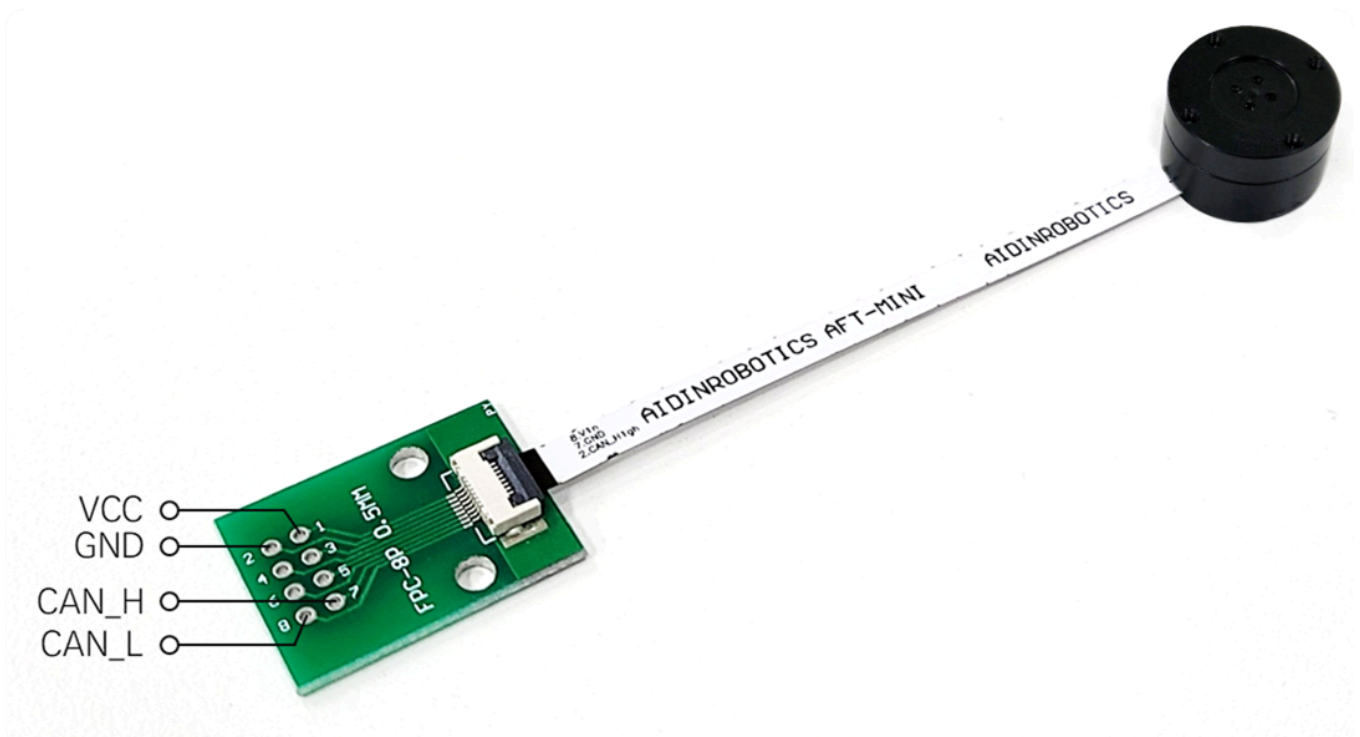
- Cable pinout
 - For user: CAN_H / CAN_L / VCC / GND (4pin)
 - 60 - 120 Ohm termination resistor should be connected between CAN_H and CAN_L
 - Length: 50, 100, 200 mm (order option)
 - FPC 0.5mm Pitch 8P Bottom Contact, 0.3t



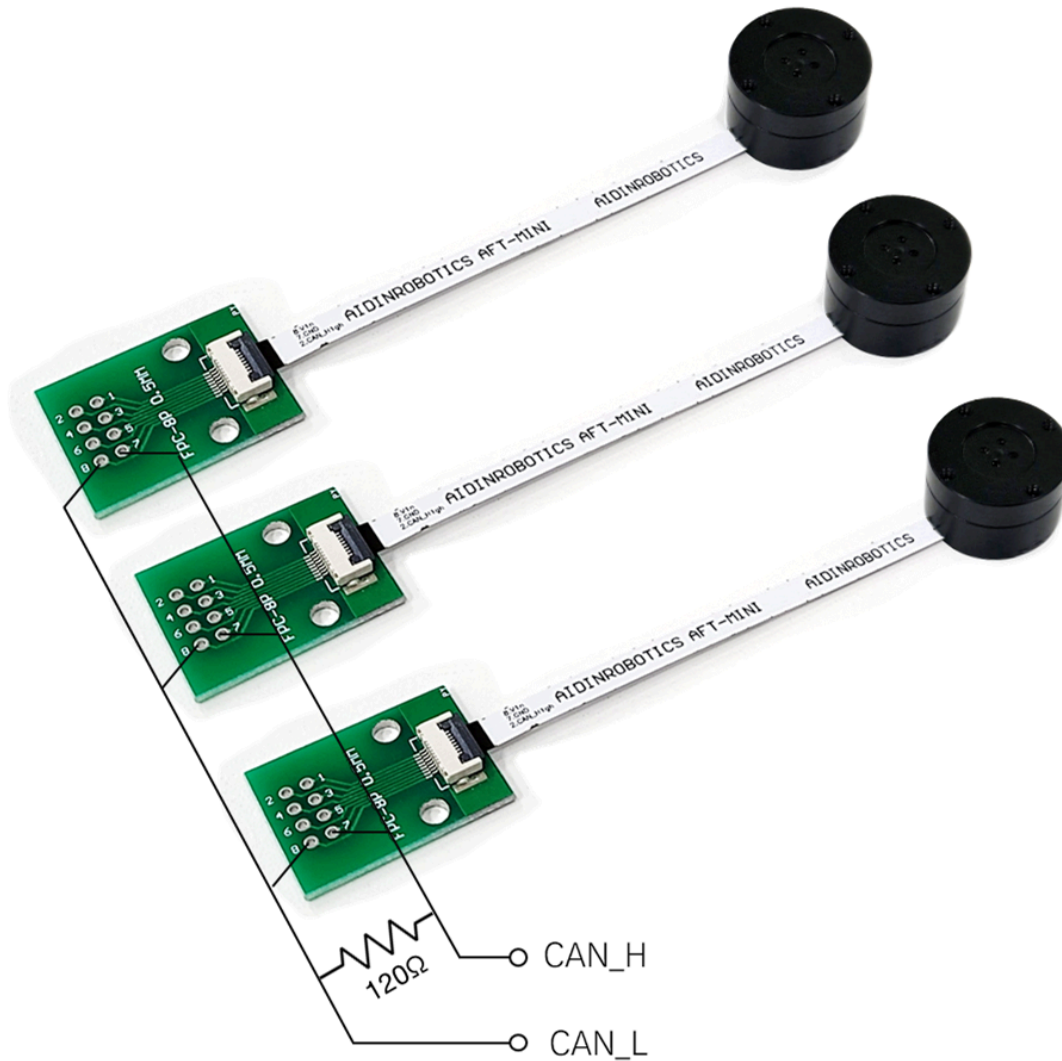
- 1 – CAN_LOW
 - 2 – CAN_HIGH
 - 3 – NC
 - 4 – NC
 - 5 – NC
 - 6 – NC
 - 7 – GND
 - 8 – VCC (5V)
- 120Ω required

FPC 0.5mm Pitch 8P Bottom Contact, 0.3t

- 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

Table 1.3 –Default Value	
Default ID	0x01 / 0x02
Data Output Rate	300 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]	-	-

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

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

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

$* \text{Force [N]} = \text{Force output} / 100 - 300$

* AFT100-D20 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]	-	-

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

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

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

$* \text{Torque [Nm]} = \text{Torque output} / 10,000 - 3$

* AFT100-D20 model

- Mode setting

RX						
CAN	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	description
ID						
0x102	Current TX CAN ID	0x00				Stop FT Data Transmission

0x102	Current TX CAN ID	0x01	Setting ID			Sensor TX CAN ID setting Setting ID : 0x00~0xFF
0x102	Current TX CAN ID	0x02	0x01			Bias setting
0x102	Current TX CAN ID	0x03	0x01			Continuous FT data Trasmitting
0x102	Current TX CAN ID	0x04	0x01			Single FT data Trasmitting
0x102	Current TX CAN ID	0x05	Sample rate parameter [0]	Sample rate parameter [1]	Sample rate parameter [2]	Sample rate setting Sample rate parameter = Sample rate parameter [0] * 65536 + Sample rate parameter [1] * 256 + Sample rate parameter [0] Sample rate = (1,000,000/Sample rate parameter) ex) 1000Hz, Sample rate parameter = {0x00, 0x03, 0xE8} ex) 300Hz, Sample rate parameter = {0x00, 0x0D, 0x05} ex) 100Hz, Sample rate parameter = {0x00, 0x27, 0x10} ex) 10Hz, Sample rate parameter = {0x01, 0x86, 0xA0}

0x102	Current TX CAN ID	0x06	0x00 ~ 0x04	Average filter mode 0x00 : default 0x01 ~ 0x04 : average filter mode Higher values (up to 0x04) increase the filter level.		
0x102	0xFF	0xFF	Factory Reset (to default) default Current TX CAN ID : 0x01 frequency : 300Hz (continuous mode) filter : 0x00 (default)			

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.



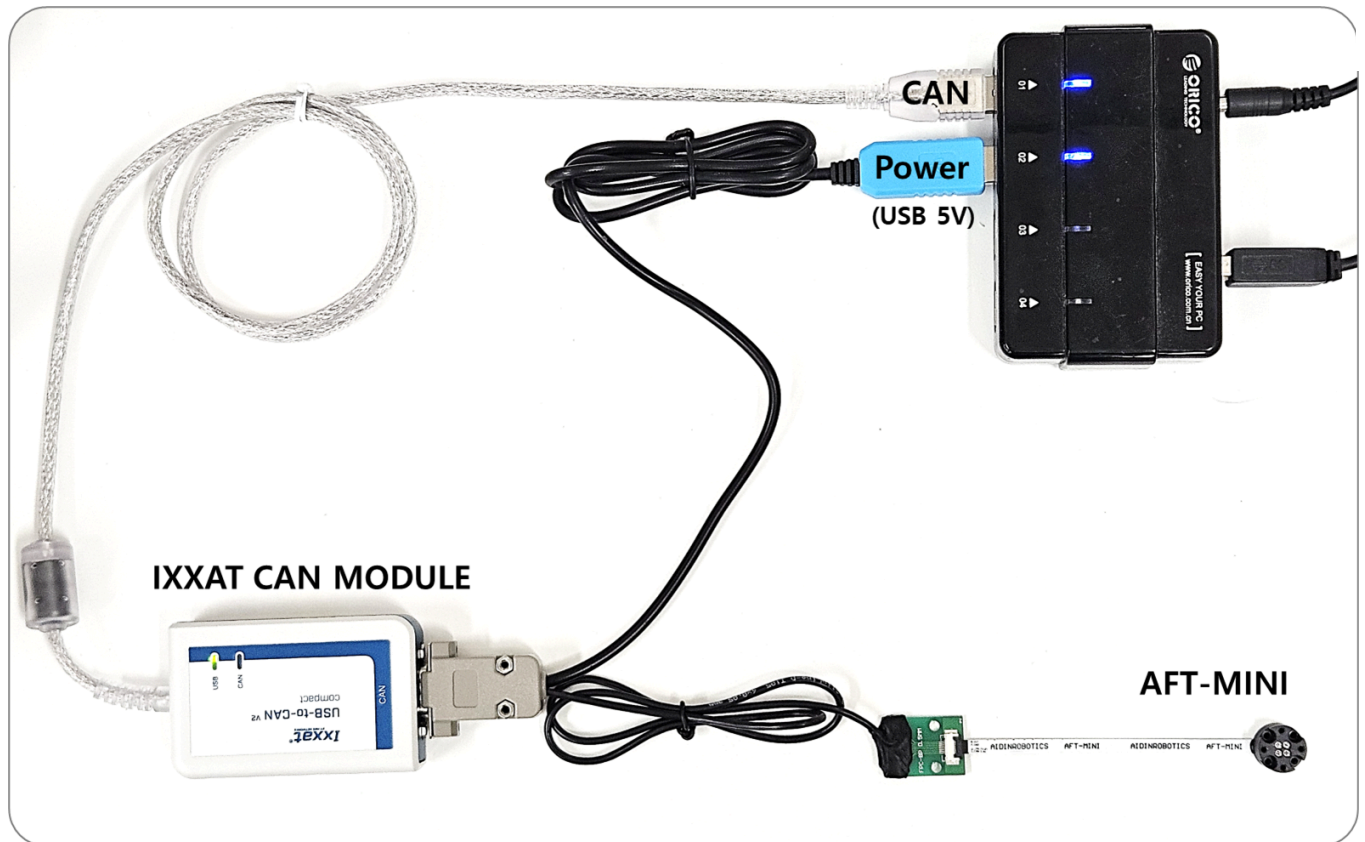
Pin no. X1	Signal
1	-
2	CAN-Low
3	GND
4	-
5	-
6	-
7	CAN-High
8	-
9	-



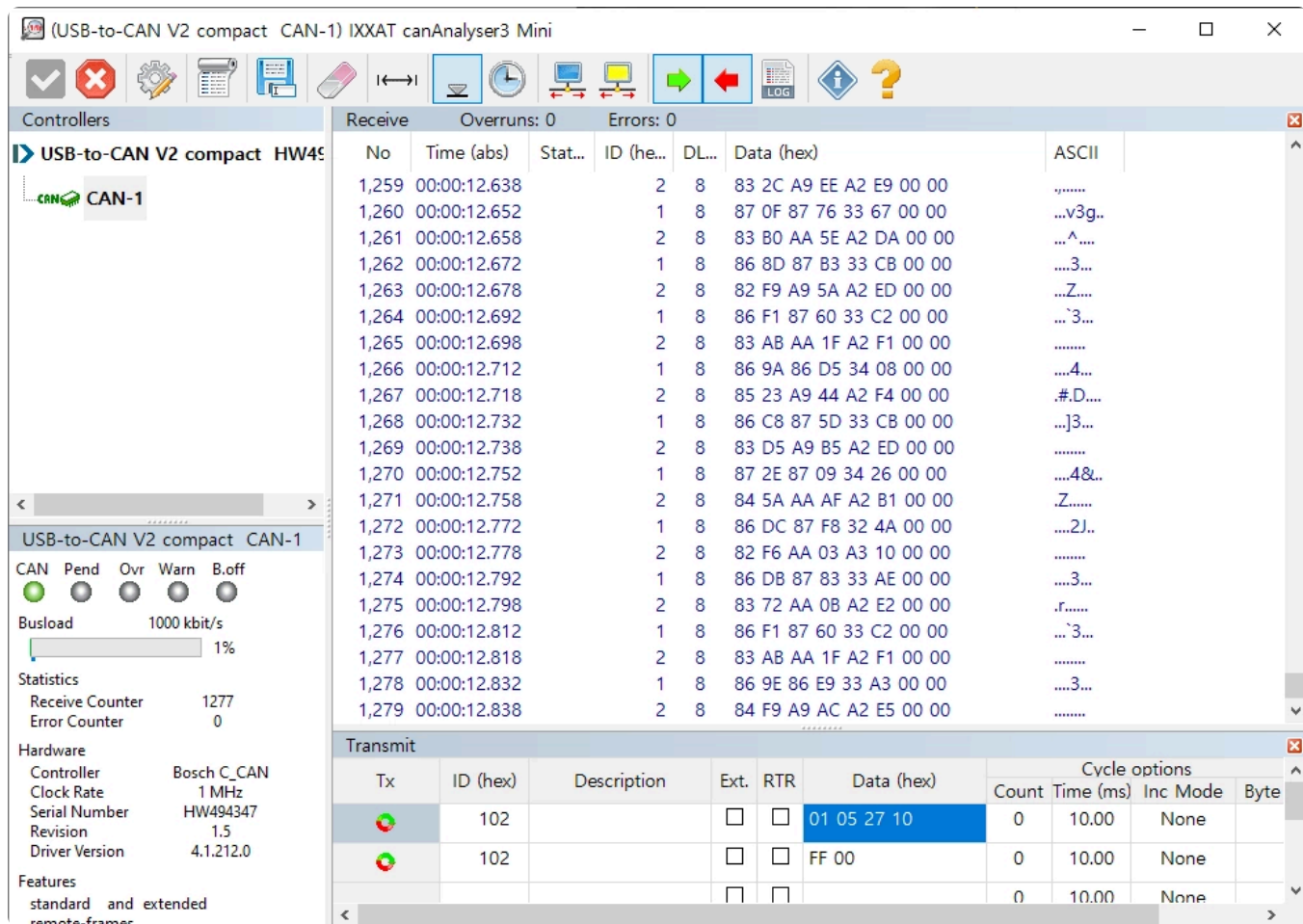
USB-to-CAN V2 (ixxat.com), version used in the manual: 1.01.0281.11001 IXXAT CAN VCI V4 - Windows drivers, **VCI V4** - Windows 11, 10, 8, 7 [Driver, canAnalyser-Mini, Manuals, LabView and

other add-ons]* *When installing, check VCI V4 and reboot the PC after installation (required)

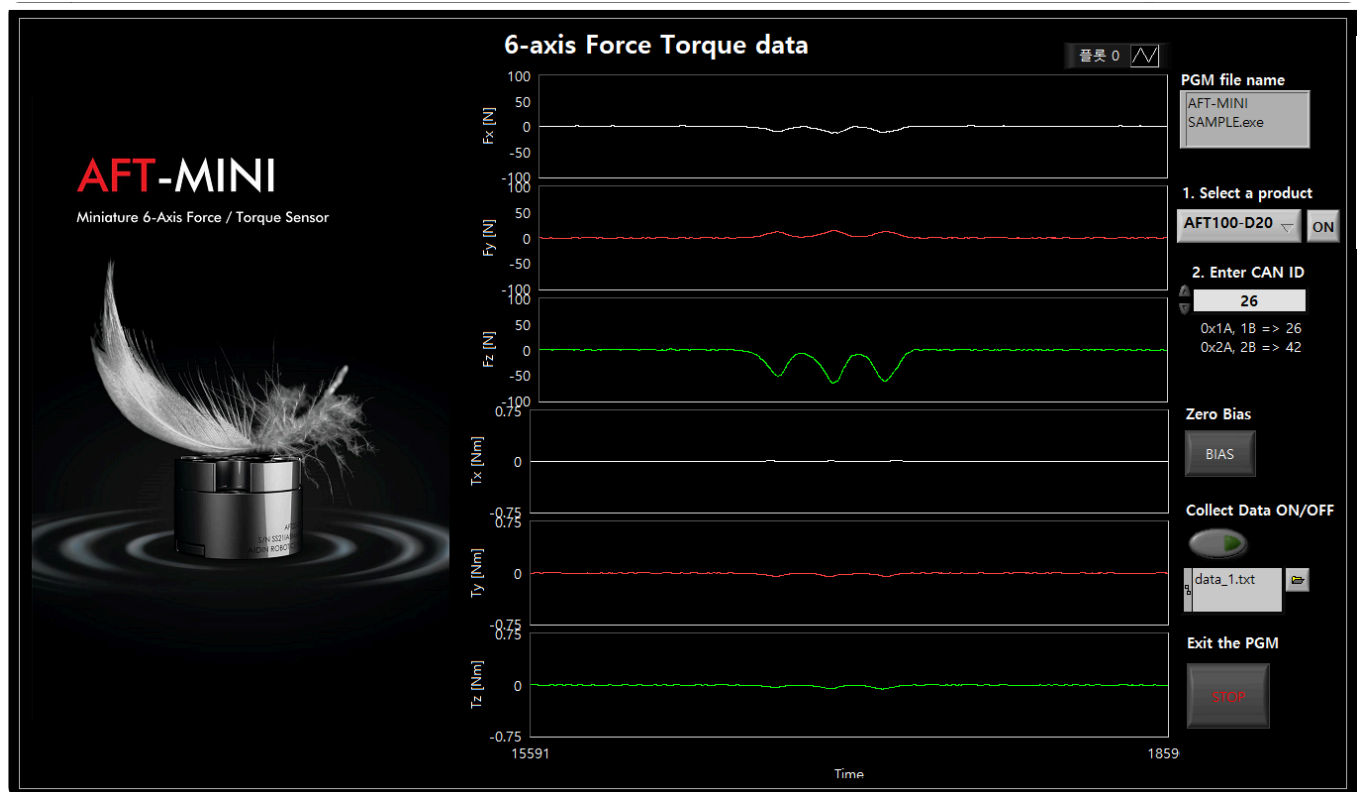
- Test cable connection setup



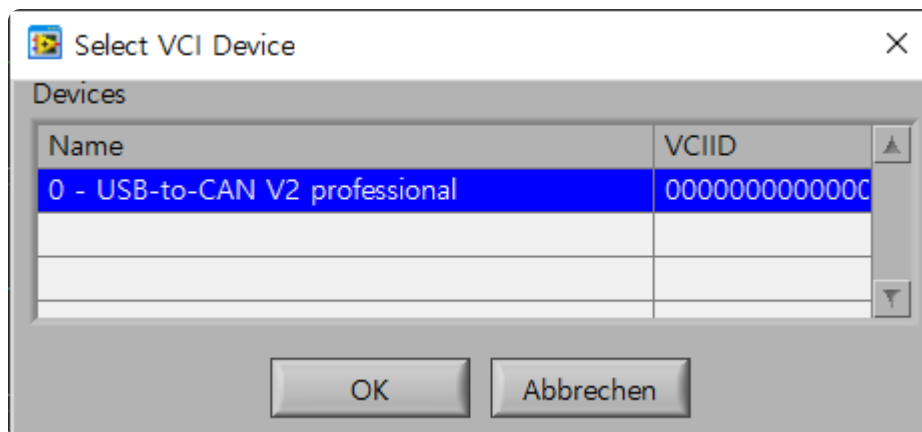
- CAN bus program (provided by IXXAT)
 - CanAnalyzer3 Mini windows→ IXXAT→ IXXAT CanAnalyzer3 Mini



- 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

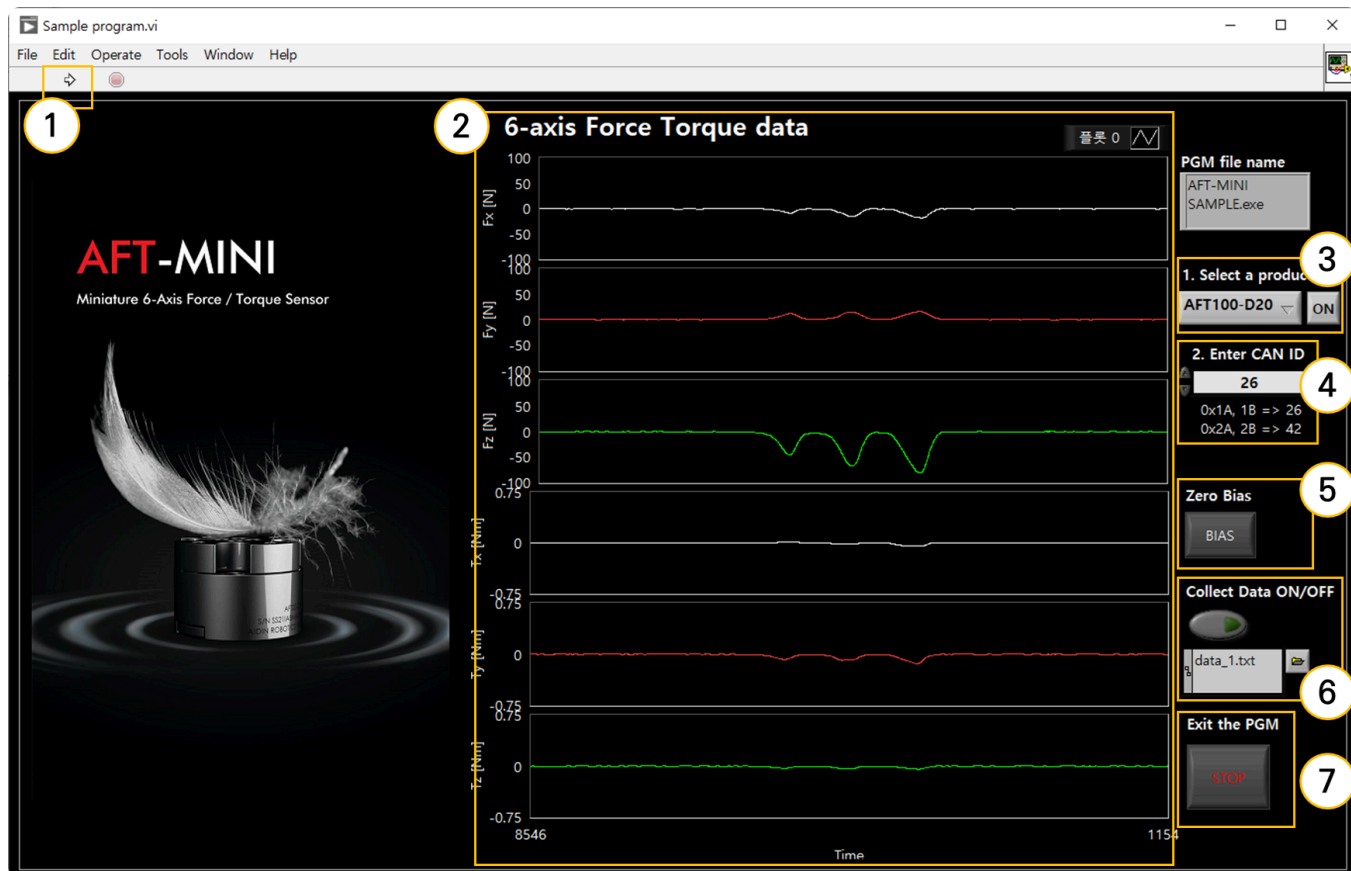


1. **CAN device selection** Select your device. Devices currently connected to the PC are displayed in a list. Click the applicable device and press the OK button. ※ The sample program was created based on IXXAT's USB-to-CAN converter.



1. **Select a product and enter CAN ID** Select the AFT100-D20 and press the ON button. Enter the CAN ID of the sensor you connected. (Default 1A, 1B ⇒ Decimal 26 input, can be checked in IXXAT CanAnalyzer)
2. **Zero Bias** Initialize all 6-axis force/torque data to zero. By eliminating installation and attachment factors, the desired force value can be measured.

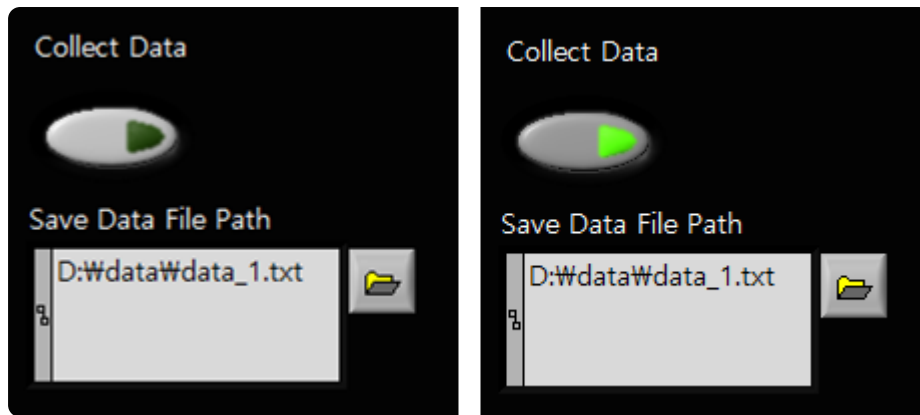
- Interface description



① Program run Run the sample program. ② Graph plot You can check real-time data of 6-axis force/torque data (Fx, Fy, Fz, Tx, Ty, Tz) in graphs. ③ Select a product Select the AFT100-D20 and press the ON button. ④ 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 ⑤ BIAS Initialize all 6-axis force/torque data to zero. By eliminating installation and attachment factors, the desired force value can be measured. ⑥ Collect Data Saves force/torque data logs. Please refer to the explanation regarding data storage on the page below. ⑦ STOP Exit the program. Press both STOP buttons and the program ends in 3 seconds.

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
2026.10.13	Minor revision (Current version)
2026.09.15	Initial release



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