

**TITLE: CAN-AIO-UI User Manual**

UI Version: 2023\_04\_03

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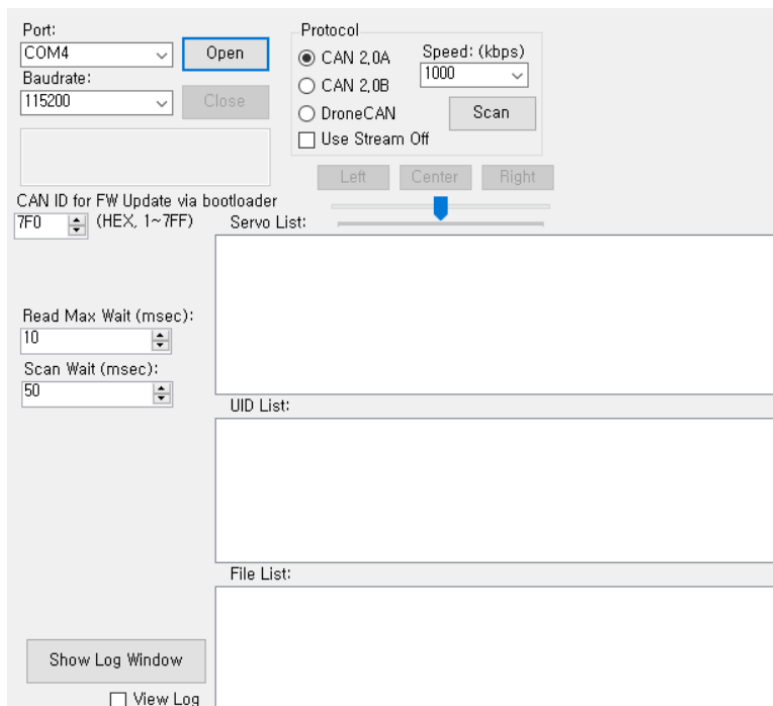
# 1. What is CAN AIO UI?

CAN AIO (All In One) UI allows for simple operation tests and FW updates of HITEC CAN servos.

The CAN interface supports DPC-CAN and DPC-20.

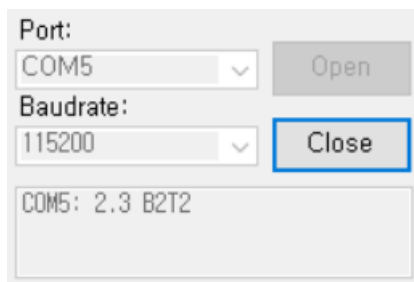
# 2. Run EXE

- 1) Connect the DPC-CAN or DPC-20 to the PC.  
(Hereinafter referred to as DPC)
- 2) Check the COM port.
- 3) When you run the EXE, the following screen will be displayed.



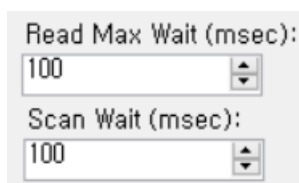
### 3. Connect CAN interface

- 1) Select the COM port to which the DPC is connected. ( example> COM5 )
- 2) Specify the communication speed of the DPC, which is 115200.
- 3) Click the Open button.
- 4) If it is displayed as COM5: 2.3 B2T2, it is connected correctly.
  - 2.3 is the FW version of the DPC.
  - B2T2 is the bootloader information of the DPC device.



### 4. Edit Run time values

- 1) When connecting to a slow PC or multiple servos, change the following two values significantly.



## 5. Scan (Servos)

- 1) Click the Scan button to display all connected servos in the Servo List.
- 2) All open Parametr and Test windows will close.

Servo List:					
Idx	Type	SID	NID	Count	C
1	CAN 2.0A	0	0	1	

UID List:					
Idx	UUID	ID1	ID2		
1	48 43 41 54 C...	0	0		

## 6. Servo List

- 1) All servos confirmed in the Scan will be displayed.
- 2) Servos with either ID1 or ID2 set to 0 must be connected individually to set ID1 and ID2.
  - If the firmware version is 1.7 or higher. Use the Set IDs by UID function.

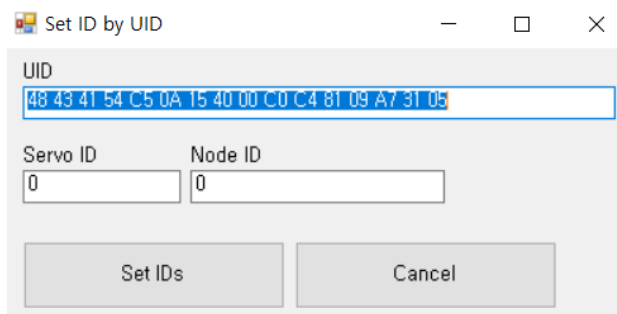
※ In the example above, ID1 and ID2 are set to 0, so they need to be changed to non-zero values.

## 7. UID List

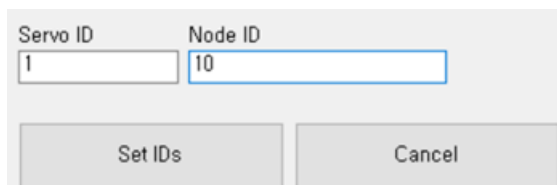
- 1) Servos with firmware version 1.7 or higher periodically broadcast their UID if their ID (ID1 ID2) is not set (value = 0)
- 2) This message is displayed in the UID List.
- 3) It is initialized at the start of Scan.

## 8. Set IDs by UID ( FW Ver 1.7+ )

- 1) Servos displayed in the UID List can be double-clicked to set their IDs (ID1, ID2).



- 2) Enter the desired values for Servo ID (ID1) and Node ID (ID2).
  - Example: Enter 1 and 10.



- 3) Click the Set IDs button and then click the Cancel button.
- 4) Click the SCAN button to display the results below.

Servo List:					
Idx	Type	SID	NID	Count	Connect
1	CAN 2.0A	1	10	1	

## 9. File List

Displays files selected during the App Update process.

## 10. Parameters

- 1) Double-click a servo in the Servo List to display its Parameter window.

Idx	Name	Value	Min	Max	D.
1	Product	MD89			
2	Bootloader	B3 (30000011)			
3	FW Version	2.0(0) /A			
4	FW Date	2023-02-01-01 04-00-00			
5	Param Version	2022-07-27-01			
6	RUN/MODE	SERVO	0	3	
7	CAN/BAUDRATE	1000	0	8	
8	CAN/PROTOCOL	CAN 2.0A	0	2	
9	SERVO_ID	1	0	255	
10	NODE_ID	10	0	255	
11	STREAM/MODE	OFF	0	1	
12	STREAM/TIME	1000	0	65535	
13	STREAM/ADDR/1	0	0	255	
14	STREAM/ADDR/2	0	0	255	
15	STREAM/ADDR/3	0	0	255	
16	STREAM/ADDR/4	0	0	255	
17	STREAM/ADDR/5	0	0	255	
18	STREAM/ADDR/6	0	0	255	
19	STREAM/ADDR/7	0	0	255	
20	STREAM/ADDR/8	0	0	255	

Idx	Name	Value	Min	Max	D.
28	MCU/TEMPER/MAX('C)	0	0	65535	
29	MOTOR/TEMPER/TYPE	Deg	0	1	
30	MOTOR/TEMPER/MAX	0	0	32767	
31	MOTOR/TEMPER/HYST	0	0	65535	
32	VOLTAGE/MIN(10mV)	0	0	65535	
33	VOLTAGE/MAX(10mV)	0	0	65535	
34	VELOCITY/MAX	2978	0	32767	
35	SPEED_VOLTAGE(0.1V)	74	0	65535	
36	TORQUE/MAX	4095	0	4095	
37	OLP/TORQUE(%)	100	0	100	
38	OLP/TIME(sec)	3	0	65535	
39	TIME/SPEED/UP(msec)	0	0	65535	
40	TIME/SPEED/DOWN(msec)	0	0	65535	
41	TIME/SPEED/EMG(msec)	0	0	65535	
42	POSITION/MID	8192	-16384	16384	
43	POSITION/MIN	5462	-16384	16384	
44	POSITION/MAX	10922	-16384	16384	
45	EMG/POSITION/MIN	0	0	16383	
46	EMG/POSITION/MAX	0	0	16383	
47	START_POSITION/ENABLE	OFF	0	1	

- The displayed content may vary depending on the servo version, settings, and UI version.
- Lines 1 to 5 in the above example are servo information and cannot be modified.

## 11. Set ID(ID1,ID2)

- 1) Set ID settings are mandatory.
- 2) If the firmware version is below 1.7, there is no UID message, so ID must be set by connecting each servo individually. Connect each unit one by one and open the Parameter window to assign the Servo ID and Node ID.

- 3) If servo IDs overlap, Count may be displayed as 2 or more.

Servo List:					
Idx	Type	SID	NID	Count	Cc
1*	CAN 2.0A	1	10	2	

- If Count is 2 or more, the Parameter window will not open.

- 4) Click the line and press the Left/Center/Right button to check the servo.

- Disconnect all but one servo and reset ID1 and ID2.

- 5) If ID1=0 or ID2=0, disconnect all other servos.

- Clicking line 2 will display a message to disconnect other servos.

- Click line 1 with the Left/Center/Right button and disconnect as instructed.

Servo List:					
Idx	Type	SID	NID	Count	Connect
1	CAN 2.0A	1	10	1	Disconnect
2*	CAN 2.0A	0	0	1	NO

- 6) The recommended approach is to set IDs by connecting each servo individually.

## 12. Test Servo

- 1) Click the Test button in the Parameter window to display the Test window for the corresponding servo.

- 2) Pressing the Left, Center, or Right buttons sends a message to move to the respective position.
- 3) To change the Left/Right position, modify the value below the slider bar.
- 4) Press Edit by Deg to activate the angle section and input in degrees.

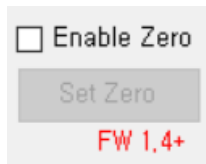


- 5) When Run Mode is Multi-Turn, select Turn Mode on the right for testing.
- 6) Check the Simple Test checkbox to automatically operate the buttons in the order of Left Center Right Center at interval intervals

## 13. Set Zero ( FW Ver 1.4+ )

If the firmware version is 1.4 or higher, the current position can be set as the origin.

- 1) Check the Enable Zero checkbox in the Test window and click Set Zero.
- 2) The current position becomes the Center (position 8192 in Run Mode = Servo).
- 3) Save to completely store the setting.

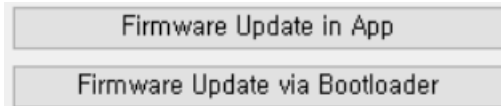


## 14. Update FW of Servo

Firmware updates can be done in two ways:

(A) Method A: Update after setting the servo to Bootloader state.

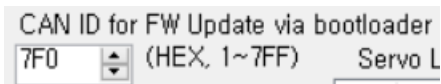
(B) Method B: Update while the servo is operational.



- 1) (A) Method A: Click the Firmware Update via Bootloader button in the Parameter window.
  - The Bootloader Type must be B3.
  - The firmware version must be 1.4 or higher.
- 2) (B) Method B: Click the Firmware Update in App button in the Parameter window.
  - The firmware version must be 1.9 or higher.
  - Both ID1 and ID2 must not be 0.

### **\*\*NOTE\*\***

Method A is slightly faster than Method B but requires setting the CAN ID for FW Update via bootloader on the first screen. Example: 0x7F0.



UID related messages use 0x7FF and 0x7FE, so the recommended range is 1~0x7F0.

Assign a CAN ID that is not used in the current CAN network.

Method B has the advantage of using the configured CAN ID as is.

- This is the FW Update Log for Method A. At the beginning, select the XHY file.

```

frmLog
2024-06-10 오전 9:59:57: [SID=1,NID=10,L=7] SCAN recommended
2024-06-10 오전 9:59:57: [SID=1,NID=10,L=7] Restart Servo
2024-06-10 오전 9:59:57: [SID=1,NID=10,L=7] Update F/W - OK
2024-06-10 오전 9:59:55: [SID=1,NID=10,L=7] Check written status
2024-06-10 오전 9:59:55: [SID=1,NID=10,L=7] Write Done
2024-06-10 오전 9:59:55: [SID=1,NID=10,L=7] Write 61440/63408
2024-06-10 오전 9:59:54: [SID=1,NID=10,L=7] Write 57348/63408
2024-06-10 오전 9:59:53: [SID=1,NID=10,L=7] Write 53250/63408
2024-06-10 오전 9:59:52: [SID=1,NID=10,L=7] Write 49152/63408
2024-06-10 오전 9:59:51: [SID=1,NID=10,L=7] Write 45060/63408
2024-06-10 오전 9:59:51: [SID=1,NID=10,L=7] Write 40962/63408
2024-06-10 오전 9:59:50: [SID=1,NID=10,L=7] Write 36864/63408
2024-06-10 오전 9:59:49: [SID=1,NID=10,L=7] Write 32772/63408
2024-06-10 오전 9:59:48: [SID=1,NID=10,L=7] Write 28674/63408
2024-06-10 오전 9:59:47: [SID=1,NID=10,L=7] Write 24576/63408
2024-06-10 오전 9:59:46: [SID=1,NID=10,L=7] Write 20484/63408
2024-06-10 오전 9:59:45: [SID=1,NID=10,L=7] Write 16386/63408
2024-06-10 오전 9:59:44: [SID=1,NID=10,L=7] Write 12288/63408
2024-06-10 오전 9:59:43: [SID=1,NID=10,L=7] Write 8196/63408
2024-06-10 오전 9:59:43: [SID=1,NID=10,L=7] Write 4098/63408
2024-06-10 오전 9:59:42: [SID=1,NID=10,L=7] Write Begin
2024-06-10 오전 9:59:42: [SID=1,NID=10,L=7] erase done
2024-06-10 오전 9:59:39: [SID=1,NID=10,L=7] erase sectors
2024-06-10 오전 9:59:39: [SID=1,NID=10,L=7] Update F/W
2024-06-10 오전 9:59:39: [SID=1,NID=10,L=7] Servo has different F/W
2024-06-10 오전 9:59:39: [SID=1,NID=10,L=7] Servo has valid F/W
2024-06-10 오전 9:59:36: [SID=1,NID=10,L=7] Switch to Bootloader
2024-06-10 오전 9:59:36: [SID=1,NID=10,L=7] Servo not found in bootloader
2024-06-10 오전 9:59:35: [SID=1,NID=10,L=7] Check Servo already in Bootloader mode

```

- This is the FW Update Log for Method B. At the beginning, select the XHY file.

```

frmLog
2024-06-10 오전 10:02:44: [SID=1,NID=10,L=1] (0999) Update: Done
2024-06-10 오전 10:02:19: [SID=1,NID=10,L=1] (e066) Forever FileRead Request
2024-06-10 오전 10:02:18: [SID=1,NID=10,L=1] (0020) Write: Begin
2024-06-10 오전 10:02:18: [SID=1,NID=10,L=1] (0010) Valid app image
2024-06-10 오전 10:01:52: [SID=1,NID=10,L=1] (0009) App need update
2024-06-10 오전 10:01:52: [SID=1,NID=10,L=1] (0002) XHY app image checking
2024-06-10 오전 10:01:52: [SID=1,NID=10,L=1] (0000) Update: Begin
2024-06-10 오전 9:59:57: [SID=1,NID=10,L=7] SCAN recommended

```

- ※ The e066 message on the second line indicates that the File Request was retried.
- ※ It is recommended to perform a SCAN again after the FW Update.
- ※ After starting FW Write, if FW Update is not completed, the servo will be in an abnormal state. In this case, use the Emergency FW UPDATE UI to update the firmware again.

## 15. Reference

### **Servo Default Setup**

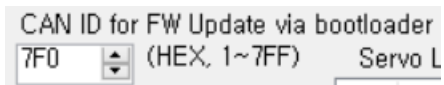
- To reset the servo settings, click Default Save Reset in the Parameter window and then click the SCAN button.

## 16. Future Updates

1) If Count is 2 or more in the Servo List, the Parameter window may display abnormal values. Future versions will prevent the Parameter window from opening in such cases.

2) Rename "Servo ID Node ID" to "ID1 ID2".

3) Modify 1~7FF to 1~7F0.



4) Modify the display of Show1 in the Parameter window to appear when a special option is specified.

5) Ensure the SCAN button only works when the state is normally Open.

END