# A&D CO., LTD

# A&D Weighing Indicator AD Series (Command Mode)

# **Computer Link Driver**

Supported version TOP Design Studio

V1.3.3.2 or higher



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We would like to thank our customers for using M2I's "Touch Operation Panel (M2I TOP) Series". Read this manual and familiarize yourself with the connection method and procedures of the "TOP and external device".

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Describes how to set up communication for external devices.

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Describes the cable specifications required for connection.

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# 1. System configuration

The system configuration of TOP and "A&D Co., Ltd – A&D Weighing Indicator AD Series (Command Mode) Computer Link" is as follows.

Series	СРИ	Link I/F	Communication method	System setting	Cable
AD	ad-4401 CB/EK-i	RS-232C I/O Port	RS-232C	3. TOP communication setting 4. External device setting	<u>5. Cable table</u>

#### ■ Connection configuration

• 1:1 (one TOP and one external device) connection – This configuration is available in RS232c communication.





# 2. External device selection

■ Select a TOP model and a port, and then select an external device.

Sector Defice						
PLC select [C	COM1]					
Filter : [All]		$\sim$		Search :		
				۲	Model 🔾 V	endor
Vendor		Model				
A&D	^	Indica	tor AD Series (Com	mand Mode)		
SEHWA CNM		🤣 Indica	tor AD Series (Stre	am Mode)		
SHINHAN Electronics						
BONGSHIN LOADCELL						
FANUC Co., Ltd.						
MINEBEA Co., Ltd.						
Azbil Corporation						
KORO TECHNOLOGY						
ROBOSTAR						
Ebmpapst						
CoDeSys Automation	Alliance					
Ophir Optronics Solution	ons Ltd.					
SERVOMEX						
Tiger Optics II C	~					
PLC Setting[ Indi	cator AD Seri	es (Command	Mode) ]			_
Alias Nam	e: PLC1					
Protoco	e : Computer Link	~		6	Comm Ma	nual
String Save Mod	e : First LH HL	Change			communa	nour
🗌 lleo Rodundar						
Operate Condition :	AND ~					
Change Condition :	TimeOut	5 💲 (Sec	ond)			
	Condition				Edit	)
Primary Option						
Primary Option Timeout	300 🚔	msec				
Primary Option Timeout Send Wait	300 🔹	msec msec				
Primary Option Timeout Send Wait Retry	300 🗭 0 💽 5 📦	msec msec				
Primary Option Timeout Send Wait Retry Model	300 💭 0 💭 5 💭 AD-4401 🗸	msec msec				
Primary Option Timeout Send Wait Retry Model	300 (*) 0 (*) 5 (*) AD-4401 (*)	msec				
Primary Option Timeout Send Wait Retry Model	300 (*) 0 (*) 5 (*) AD-4401 \v	msec msec				
Primary Option Timeout Send Wait Retry Model	300 📦 0 📦 5 💽 AD-4401 v	msec msec				
Primary Option Timeout Send Wait Retry Model	300 💽 0 💽 5 💽 AD-4401 v	msec				
Primary Option Timeout Send Wait Retry Model	300 (*) 0 (*) 5 (*) AD-4401 (*)	msec				

Settings		Contents				
ТОР	Model	Check the display and process of TOP to select the touch model.				
External device	Vendor	Select the vendor of the external device to be connected to TOP.				
		Select "Indicator Series".				
	PLC	Select an external device to connect to TOP.				
		Model	Interface	Protocol		
A&D AD Series (Command Mode) Computer Link			Computer Link	AND Format		
		Please check the system configuration in Chapter 1 to see if the external device you want to connect is a model whose system can be configured.				



# 3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

### 3.1 Communication setting in TOP Design Studio

#### (1) Communication interface setting

- [Project > Project properties > TOP settings] → [Project option > Check "Use HMI settings" > Edit > Serial ]
  - Set the TOP communication interface in TOP Design Studio.



Items	ТОР	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	960	0	
Data Bit	7		
Stop Bit	1		
Parity Bit	Even		

\* The above settings are examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.



#### (2) Communication option setting

- [ Project > Project properties > PLC settings > COM > "PLC1: A&D AD Series (Command Mode)" ]
  - A&D Co,.Ltd A&D Weighing Indicator AD Series (Command Mode) Computer Link

Set the options of the communication driver in TOP Design Studio.

Project Option		×
Change HMI[H] Add P	LC [A] TIT Change PLC[C] Clette PLC[D]	
Change HMI[H] Change HMI[H] Change HMI[H] Constraints Add P Constraints Add P Con	LC [A]       Image PLC[C]       Image PLC[D]         PLC Setting[ Indicator AD Series (Command Mode) ]         Alias Name :       PLC1         Interface :       Computer Link         Protocol :       AND Format         String Save Mode :       First LH HL         Change Condition :       Image         Operate Condition :       Image         Change Condition :       Image         Primary Option       Edit         Timeout       300 Image         Send Wait       Image         Model       AD-4401 V	Comm Manual
		Apply Close

Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device	
	and sending the next command request.	



### 3.2. Communication setting in TOP

\* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

■ Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.



#### (1) Communication interface setting

■ [ Main screen > Control panel > Serial ]

	ŝ		Control Panel			×
	Syste	em 🔽 De	📼 Se	rial	×	
Run			Serial Port: Signal Level RS-232C O RS-	COM1 422(4) O RS-	485(2)	
	PLC	Security I	Baud Rate:	9600	-	
VNC Viewer	Ethernet	Serial	Data Bit: Stop Bit: Parity Bit: Elemi	7 1 Even		
Screen shot	Diagnost ic	File Manager	Auto Search	Loopback	Test Cancel	
	[System	]			Close	
TOPRX - TOPRX080	)OS				A 2021-	08-31 02:00:59 PM
Items		то	P	Ext	ernal device	Remarks

Items	ТОР	External device	Remarks
Signal Level (port)	RS-232C		
Baud Rate	960		
Data Bit	7		
Stop Bit	1		
Parity Bit	Eve		

\* The above settings are setting examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.



### (2) Communication option setting

■ [ Main screen > Control panel > PLC ]

			PLC		×
Run VNC Viewer Screen shot	System System PLC Sec Lthernet Se Diagnostic F	Driver(COM1) Interface Protocol Timeout Send Wait Retry Model Diagnostic	PLC1(Indicator AD Ser Computer Link • AND Format • 300 • msec 0 • msec 5 • AD-44 •	ies (Comman	d Mode) -
	[System]			Close	
Toprx - Toprx0800s				A 2021-08	3-31 02:52:47 PN
Items	Settings				Remarks
Interface	Select "Compute	er Link".			Refer to "2. External
Protocol Select the communication protocol between the TOP and an external device.				device selection".	
TimeOut (ms)	Set the time for	the TOP to wait for	a response from an external de	vice.	
SendWait (ms)	Set the waiting	time between TOP's I	receiving a response from an e	xternal device	
	and sending the	e next command requ	iest.		



#### **3.3 Communication diagnostics**

■ Check the interface setting status between the TOP and an external device.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.
- Check if the COM port settings you want to use in [Control Panel > Serial] are the same as those of the external device.
- Diagnosis of whether the port communication is normal or not
- Touch "Communication diagnostics" in [Control Panel > PLC ].

- The Diagnostics dialog box pops up on the screen and determines the diagnostic status.

ОК	Communication setting normal
Time Out Error	Communication setting abnormal
	- Check the cable, TOP, and external device setting status. (Reference: Communication diagnostics sheet)

#### Communication diagnostics sheet

- If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Contents		Check		Remarks
System	How to connect the system		OK	NG	1 System configuration
configuration	Connection cable name		OK	NG	1. System configuration
TOP	Version information		OK	NG	
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed settings		OK	NG	
	Relative prefix	Project setting	OK	NG	
		Communication	OK	NG	2. External device selection
		diagnostics	OK	NG	3. Communication setting
	Serial Parameter	Transmission	OK	NG	
		Speed	ŬK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External device	CPU name	'U name		NG	
	Communication port n	OK	NG		
	Protocol (mode)	OK	NG		
	Setup Prefix	OK	NG		
	Other detailed settings	OK	NG	4. External device setting	
	Serial Parameter	Transmission	OK	OK NG	4. External device setting
		Speed	ÜK		
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
	Check address range				6. Supported addresses
			OK	NG	(For details, please refer to the PLC
					vendor's manual.)



# 4. External device setting

For more detailed setting methods than described in this example, please refer to the user manual of A&D Co., Ltd.

Step 1. While holding down the 'ENTER' key, press the 'SETPOINT' key, and then press the 'ENTER' key again.

**Step 2.** Press the ' $\triangle$ ' or ' $\bigtriangledown$ ' button to change to " rS ", and press the 'ENTER' key.

Step 3. RSF(OP-04 RS-232C) Set the detailed item settings as follows.

Items	Functions	Settings	Settings	Remarks
RSF-01	Output data	1	Command RW contents: Display weight	Only 1 to 4 are available
RSF-02	Data transfer mode	4	Communication method: command mode	Fixed
RSF-03	Transmission Speed	5	Communication speed: 9600 bps	
RSF-04	Parity Bit	2	Parity bit: even	
RSF-05	Character bit	7	Character bit: 7	
RSF-06	Stop Bit	1	Stop Bit: 1	
RSF-07	End code	2	End code: CR + LF	Fixed
RSF-08	Change RS-422/485	1	Invalid when using RS-232C	
RSF-09	Prefix	0	Exchange number: 0	Fixed

Step 4.Press the 'POWER' key (ESC key) to return to the weight display status.



# 5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device. (The cable diagram described in this chapter may differ from the recommendations of "A&D Co., Ltd.")

COM					Externa	l device
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)
15	CD	1		1		1 5
$(\circ \circ)$	RD	2		2	SD	$(\circ \circ)$
	SD	3		3	RD	
6 9 Paced on	DTR	4		4		6 9 Pasad on
communication	SG	5		5		communication
cable connector	DSR	6		6		cable connector
front	RTS	7		7	SG	front
D-SUB 9 Pin male	CTS	8		8		D-SUB 9 Pin male
(male, convex)		9		9		(male, convex)

#### ■ RS-232C (1:1 connection)

\*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.



# 6. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

### • AD-4401

Device	Bit Address	Word Address	Read/Write	Remarks
RW.WEIGHT	_	RW.WEIGHT	Read	*Note 1)
RW.STS	RW.STS0 ~ RW.STS2	RW.STS	Read	*Note 2)
RW.GSNT	RW.GSNT0 ~ RW.GSNT2	RW.GSNT	Read	*Note 3)
RW.UNIT	_	RW.UNIT	Read	*Note 4)
RB.WEIGHT	_	RB.WEIGHT	Read	
RF.WEIGHT	_	RF.WEIGHT	Read	*Note 1)
RF.STS	RF.STS0 ~ RF.STS2	RF.STS	Read	*Note 2)
RF.GSNT	RF.GSNT0 ~ RF.GSNT2	RF.GSNT	Read	*Note 3)
RF.UNIT	_	RF.UNIT	Read	*Note 4)
RT.WEIGHT	_	RT.WEIGHT	Read	*Note 1)
RT.UNIT	_	RT.UNIT	Read	*Note 4)
RT.COUNT	_	RT.COUNT	Read	*Note 5)
DT	DT	DT	Write	*Note 6)
MG	MG	MG	Write	*Note 7)
MN	MN	MN	Write	*Note 8)
MZ	MZ	MZ	Write	*Note 9)
MT	MT	MT	Write	*Note 10)
CT	СТ	CT	Write	*Note 11)
BB	BB	BB	Write	*Note 12)
BD	BD	BD	Write	*Note 13)
НВ	НВ	HB	Write	*Note 14)
SS	SS	SS	Write	*Note 15)
SS.DATA	_	SS.DATA1 ~ SS.DATA7	Read/Write	*Note 16)
RS.DATA	-	RS.DATA1 ~ RS.DATA7	Read	*Note 17)

\*Note1) Float-type data. It is a device that must be registered to read data such as STS, GSNT and UNIT of the same command.

\*Note 2)

Response data when the next bit is ON			
STS0		Stable	
STS1		Unstable	
STS2		Overload	

#### \*Note 3)

Response data when the next bit is ON				
GSNT0	Gross			
GSNT1	Net			
GSNT2	Tare			

\*Note 4) It indicates the unit being displayed by the indicator. Use only as a string (length: 2).

\*Note 5) Data representing the total number of times.



% For details on the commands below, refer to the user manual of A&D Co., Ltd.

- \*Note 6) DT (Delete Total): Total number of times clear.
- \*Note 7) MG (Make Gross): Mark as gross weight.
- \*Note 8) MN (Make Net): Mark as net weight.
- \*Note 9) MZ (Make Zero): Zero.
- \*Note 10) MT (Make Tare): Remove the container.
- \*Note 11) CT (Clear Tare): Clear container.
- \*Note 12) BB (Begin Batch): Start input.
- \*Note 13) BD (Begin Discharged): Start discharging.
- \*Note 14) HB (Halt Batch): Emergency stop.
- \*Note 15) SS (Set Setpoints): Set SETPOINT.
- \*Note 16) Data to set SETPOINT using SS command.
- \*Note 17) Request Setpoint: SETPOINT data currently in use.

#### **% Write-only Device** Use Method

(1) Pop-up window for object's property  $\rightarrow$  (2) Effect and action $\rightarrow$  (3) Setting Conditions  $\rightarrow$  (4) Action setting Set to input data to the device when a condition occurs in the action settings.

Rectangle Property		u	IP M			_	×
PREVIEW	Shape	Text	Effect & Action				
	No		Condition		Effect	Action	
Delte Total	1		Touch Down		None	[PLC1:DT:1:DEC]=ON group:0	
ID : <b>1</b> SEQ : <b>0</b> X : 108 ♀ Y : 111 ♥ Width : 64 ♥ Height : 63 ♥ Security Level : 0 ♥	Condi Max Exc Bit	tion E ute Count	Down [0] Effect Action :: 1 (0=∞) PLC1 ∨ DT □ □ □ □ □ □ □ □ □ □ □ □ □	Interval : 0	€ (100m	Add [A]      Modify [M]      X Delete  s) Delay Time : 0     (100ms)  Group Index : 0  Pulse Time : 10     (100ms)	₽ + *
If Security level is low then Hide Object							
Visible InterLock Icon							
✓ Visible Pemission Icon							
Display on top when changed							
						OK Cancel	



# • CB/EK – I Series

Device	Bit Address	Word Address	Read/Write	Remarks
Q.WEIGHT	_	Q.WEIGHT	Read	*Note 1)
Z	Z00~Z15	-	Write	*Note 3)
U	U00~U15	-	Write	*Note 3)
Q.STS	Q.STS0 ~ Q.STS3	Q.STS	Read	*Note 2)
Q.UNIT	_	Q.UNIT	Read	*Note 4)

\*Note 1) Float-type data. It is a device that must be registered to read data such as STS, GSNT and UNIT of the same command. \*Note 2)

Response data when the next bit is ON				
Q.STS0	Stable			
Q.STS1	Stable in a counting mode			
Q.STS2	Unstable			
Q.STS3	Overload			

\*Note 4) It indicates the unit being displayed by the indicator. Use only as a string (length: 2).

\*Note 3) Z : Set Zero

 $\cup$  : Unit change