NAKANISHI

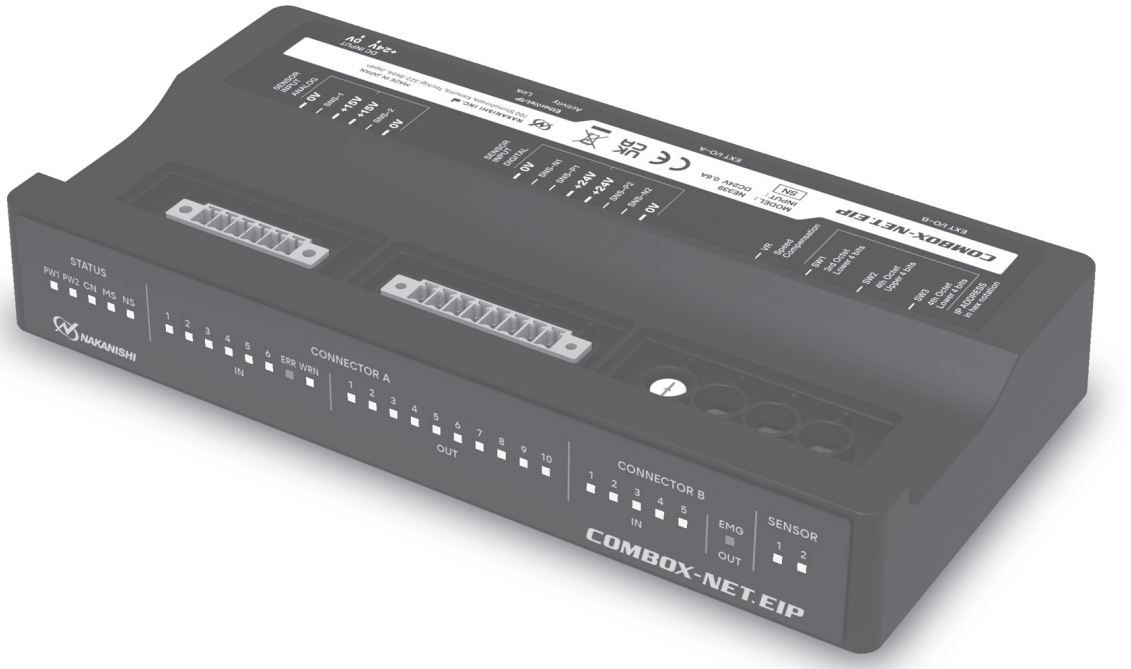
OM-KK0926MA 000

ネットワークインターフェイス / Network Interface

COMBOX-NET.EIP

取扱説明書 / OPERATION MANUAL

日本語 : P1 - P41 / English : P43 - P83



Thank you for purchasing the Network Interface "COMBOX-NET.EIP." The COMBOX-NET.EIP is an interface for controlling and monitoring controllers provided by NAKANISHI by communication by the industrial network "EtherNet/IP™*". Read this and all the Operation Manuals for the controller, CNC, PLC, and PC to be used carefully before use. Always keep this Operation Manual in a place where a user can referred to for reference at any time.

*EtherNet/IP™ is a trademark of ODVA.

CONTENTS

1 CAUTIONS FOR HANDLING AND OPERATION

- Read these warnings and cautions carefully and only use in the manner intended.
- These warnings and cautions are intended to avoid potential hazards that could result in personal injury or damage to the device. These are instructions are classified as follows in accordance with the seriousness of the risk. Be sure to observe warnings and cautions as they are all related to safety.

Class	Degree of Risk
⚠ WARNING	A hazard that could result in bodily injury or damage to the device if the safety instructions are not properly followed.
⚠ CAUTION	A hazard that could result in light or moderate bodily injury or damage to the device if the safety instructions are not followed.
NOTICE	Be sure to keep the usage for your safety.

⚠ WARNING

- The COMBOX-NET.EIP is an interface exclusively for controllers made by NAKANISHI. If the COMBOX-NET.EIP is connected to machines other than the designated controller, the COMBOX-NET.EIP or connected devices might malfunction.
- Before using the COMBOX-NET.EIP, carefully read this Operation Manuals regarding the correct connection, operation and cautions. If the scanner is operated with insufficient understanding and knowledge, damage and/or malfunction to the COMBOX-NET.EIP or controller may occur.
- Check the connected controller and the parameter settings, and match the parameter settings on the COMBOX-NET.EIP to these settings. Failure to do so may cause a malfunction to occur.
- Carry the COMBOX-NET.EIP by holding the main body. Do not carry the COMBOX-NET.EIP by holding its cable. This may damage the cable or cause the COMBOX-NET.EIP to malfunction.
- Never touch the cable or body of the COMBOX-NET.EIP with wet hands. This may cause an electric shock to the operator or damage to the COMBOX-NET.EIP.
- Do not handle the cable connectors of the COMBOX-NET.EIP with wet or oily hands. This may cause malfunction due to a poor connection.
- Never operate or handle the COMBOX-NET.EIP, controller or motor spindle until you have thoroughly read the Operation Manual for each component, and safe operation has been confirmed.
- Before disconnecting the COMBOX-NET.EIP, controller or motor spindle, always turn the control power OFF and turn the compressed air supply to the controller OFF. Then it is safe to remove the COMBOX-NET.EIP, controller and motor spindle.
- Do not use in dangerous environments. Protect the COMBOX-NET.EIP and controller from moisture and other contaminants. Failure to protect the COMBOX-NET.EIP and controller may result in malfunction, fire or electric shock.
- Before connecting the COMBOX-NET.EIP to the controller with the cable connector, be sure to turn the controller OFF.
- When connecting the COMBOX-NET.EIP to the controller with the cable connector, securely tighten by the connector screws. Loose screws may cause a malfunction.
- When connecting the COMBOX-NET.EIP to the terminal block on the machine by the cable terminals, tighten the terminal screws at the specified tightening torque. Loose terminal screws may cause damage or malfunction on the COMBOX-NET.EIP or the machine.
- Before connecting the COMBOX-NET.EIP to the terminal block on the machine by the cable terminals, make sure that the terminals are not electrostically charged. Wiring the cable with the terminals electrostatically charged may cause the COMBOX-NET.EIP or machine to malfunction as a result of the static electricity.
- Before handling the COMBOX-NET.EIP, adopt antistatic measures. Failure to do so may cause a malfunction to occur.

⚠ CAUTION

- Make sure that all input power sources are OFF before installation and wiring of this product to the machine. If the incoming power source is ON, it may cause risk that leads to malfunction of the COMBOX-NET.EIP.
- Be sure to refer to the "Maintenance, Operation and Electrical Manuals" of the machine that is being interfaced to the COMBOX-NET.EIP.
- Do not hit, drop or subject COMBOX-NET.EIP to any type of shock. Doing so may cause a malfunction.
- If an abnormality occurs on the COMBOX-NET.EIP or controller, an error is output and the motor spindle comes to a stop. Remove the cause of the abnormality before resuming use.
- Avoid using the COMBOX-NET.EIP near machines that generate significant amounts of electrical noise. Failure to do so may cause a malfunction to occur.
- When installing the COMBOX-NET.EIP, install on as level a location as possible subject to little impact.
- If smoke, noise or strange odors are emitted from the COMBOX-NET.EIP, immediately turn the power OFF.

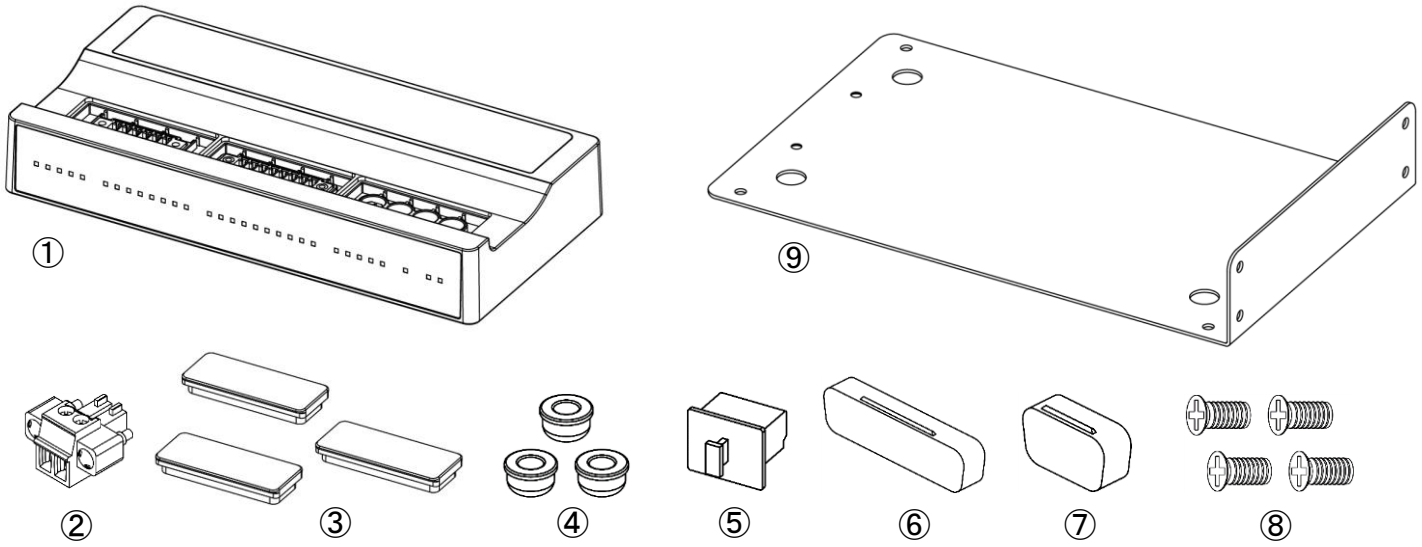
⚠ CAUTION

- Do not place the COMBOX-NET.EIP near any source of heat. The temperature inside the COMBOX-NET.EIP may rise and cause a malfunction.
- When operating the switches of the COMBOX-NET.EIP, do not apply excessive force. Doing so may cause a malfunction.
- Wire the cables of the COMBOX-NET.EIP to the machine as far away as possible from the main power line.
- Do not pull the cables connected to the COMBOX-NET.EIP with excess force. Doing so may cause a wire break or faulty contact.
- When storing the COMBOX-NET.EIP or when cable connectors are not connected to the COMBOX-NET.EIP, attach the covers (provided) to protect against dust.
- Before using the COMBOX-NET.EIP, read all the Operation Manuals for the controller, CNC, PLC and PC to be connected.
- Do not disassemble or modify the COMBOX-NET.EIP. When the COMBOX-NET.EIP has been disassembled or modified performance from then on can no longer be guaranteed. There are no user serviceable parts available.
- Be sure to supply power of the rated power voltage to the COMBOX-NET.EIP. Supplying power outside the rated power voltage range may cause a malfunction to occur.

2 BASIC PACKAGE

When opening the package, check if it includes all items listed in " Packing List Contents ".
In the event of any shortage, please contact either NAKANISHI (see the " 4 CONTACT US " section) or your local dealer.

■ Packing List Contents



No.	Part Name	Quannity
①	COMBOX-NET.EIP Main Body	1
②	Power Connector	1
③	Rubber Cover*	3
④	DIP Switch Cover*	3
⑤	LAN Port Cap*	1

No.	Part Name	Quannity
⑥	External Input/Output A Connector*	1
⑦	External Input/Output B Connector*	1
⑧	Mounting Screw	4
⑨	Bracket	1

*The rubber covers, DIP switch covers, LAN port cap, external input/output A connector cover and external input/output B connector cover are provided with the main body.

3 WARRANTY

We provide a limited warranty for our products. We will repair or replace the products if the cause of failure is due to the following manufactures defects. Please contact us or your local distributor for details.

(1) Defect in manufacturing.

(2) Any shortage of components in the package.

(3) Where damaged components are found when initially opening the package.

(This shall not apply if the damage was caused by the negligence of a customer.)

4 CONTACT US

For your safety and convenience when purchasing our products, we welcome your questions.
If you have any questions about operation, maintenance and repair of the product, please contact us.

Contact Us

● For U.S. Market

Company Name	:	NSK America Corp. Industrial Div.
Business Hours	:	8:00 to 17:00 (CST) (closed Saturday, Sunday and Public Holidays)
U.S. Toll Free No.	:	+1 800 585 4675
Telephone No.	:	+1 847 843 7664
Fax No.	:	+1 847 843 7622
Website	:	www.nskamericacorp.com

● For Other Markets

Company Name	:	NAKANISHI INC.
Business Hours	:	8:00 to 17:00 (JST) (closed Saturday, Sunday and Public Holidays)
Telephone No.	:	+81 289 64 3520
e-mail	:	webmaster-ie@nsk-nakanishi.co.jp

5 FEATURES

- EtherNet/IP communication can be performed with the CNC, PLC and PC so that motors made by NAKANISHI can be operated.
- LEDs on the main body allow motor and controller status to be checked.
- EtherNet/IP communication allows motor and controller status to be monitored.
- Connection of a digital and analog sensor allows various information to be acquired.
- Compact design means that it does not take up space.
- An I/O unit for converting analog or digital input/output signals to communication data is not required. This reduces the number of design man-hours and the amount of wiring.

6 SPECIFICATIONS AND DIMENSIONS

6–1 Communication Specifications

Communication standard		EtherNet/IP
Vendor ID		1564: NAKANISHI INC
Device type		43: Generic Device
Product name		648: COMBOX-NET.EIP
Baud rate		10 Mbps/100 Mbps (Autonegotiation)
Mode of communication		Full duplex/Half duplex (Autonegotiation)
LAN cable specifications		Straight, Category 5 or higher STP cable recommended *
IP address setting method		DIP switches for setting the IP address
Number of assigned bytes	Input (scanner→adapter)	8byte（4word）
	Output (adapter→scanner)	30byte（15word）
Implicit communication	Number of supported connections	1
	Connection type	Exclusive Owner
	Communication cycle (RPI)	4 ms or more
	Connection type (scanner→adapter)	Point-to-Point (151)
	Connection type (adapter→scanner)	Point-to-Point (101)
	Configuration instance	103
	Communication trigger	Implicit (cyclic)

COMBOX-NET.EIP ＝ Adapter
Host control device (CNC, PLC, PC, etc.) = scanner
*Scanner must be grounded.

6–2 Product Specifications

Product Name		COMBOX-NET.EIP
Model		NE339
Rated input voltage		24 VDC±10%
Consumption current		DC 0.6 Amp
Interface	D-Sub 25	Open collector PNP input: 5 to 7 points *
		Open collector NPN output: 7 to 9 points *
		Analog input: 3 points
		Analog output: 1 point (2 points) *
	D-Sub 15	Open collector PNP input: 5 points
		Open collector NPN output: 1 point
	Digital sensor（DC24V）	Open collector PNP/NPN selection input: 2 points
	Analog sensor（DC15V）	Analog input: 2 points
Weight		282g
Dimensions		W180 x D89.1 x H28
Operation Environment	Temperature	0 - 40℃
	Humidity	MAX.75% (No condensation)
Installation Area		Indoor use
Transportation and Storage Environment	Temperature	-10 - 50℃
	Humidity	10 - 85 %
Height above Sea Level		Less than 2000m

*Specifications vary according to the model of connected controller.

6–3 Compatibility

The COMBOX-NET.EIP is compatible with the following overseas safety standard.

- EC Directive CE
  EMC Directive EMS：EN 61000-6-2:2005/AC:2005
  EMI ：EN 61000-6-4:2007/A1:2011
  RoHS Directive 2011/65/EU, (EU)2015/863
- UKCA marking UKCA

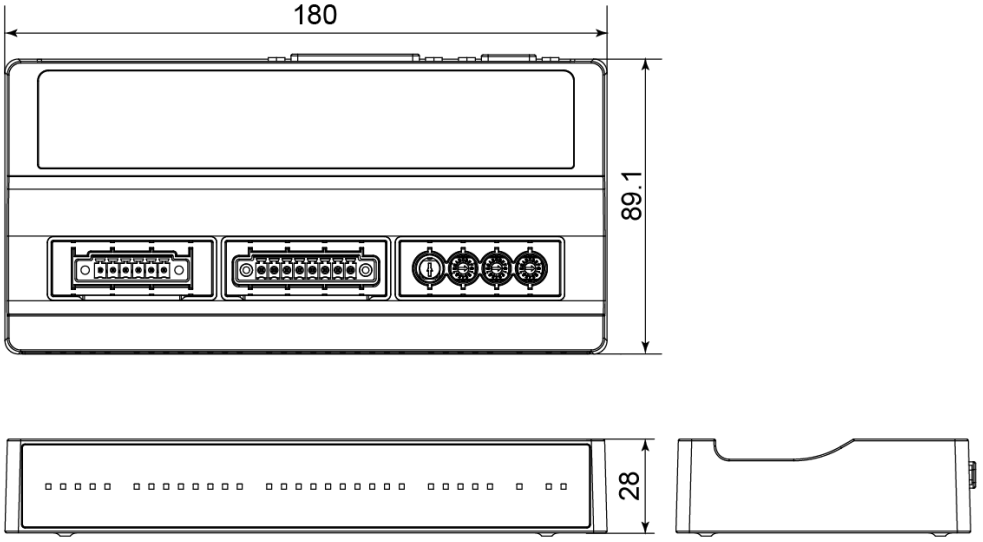
6–4 Downloading EDS File, Icon and Operation Manual

The EDS file is needed to use COMBOX-NET.EIP. An exclusive icon also is needed to display the COMBOX-NET.EIP icon.
The EDS file is described with device-related attribute information (e.g. object addresses of each parameter).
Download the required data from the following.

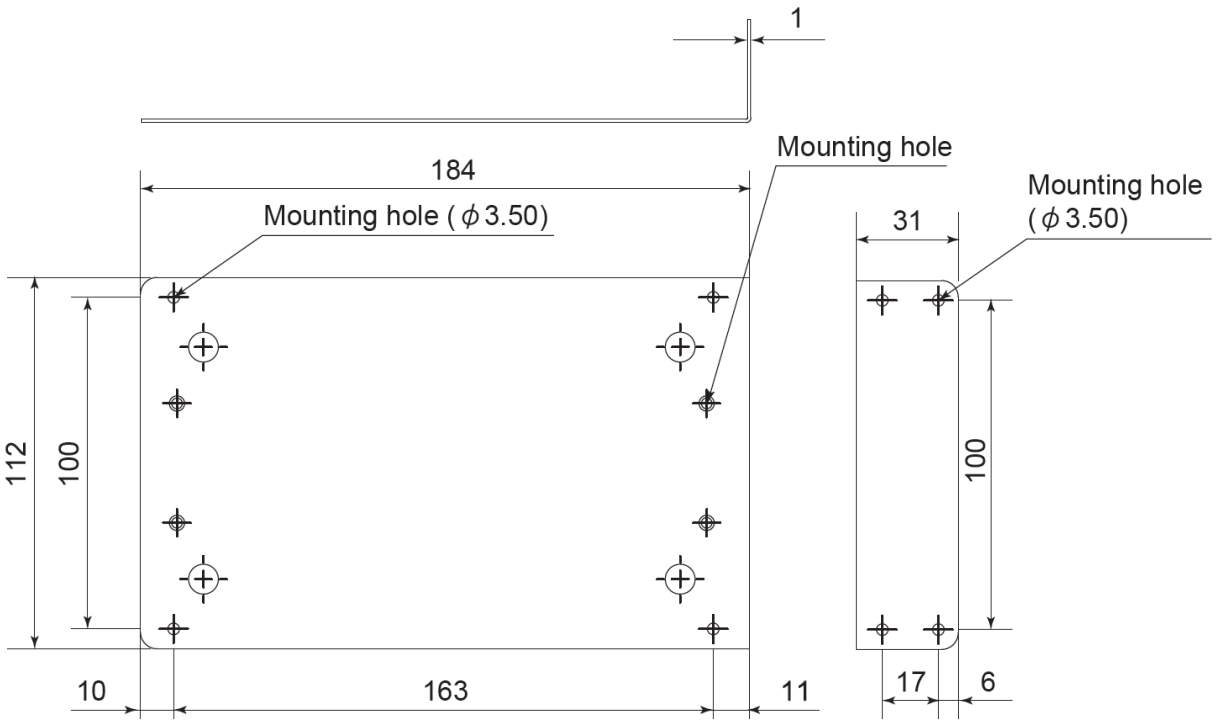
■ https://www.nsk-nakanishi.co.jp/industrial-eng/search/index.php?search=COMBOX-NET.EIP

■ Download files
- COMBOX-NET.EIP Operation Manual
- EDS file : COMBOX-NET.EIP_EDS.eds
- Icon : COMBOX-NET.EIP_icon.ico

6–5 Outside View



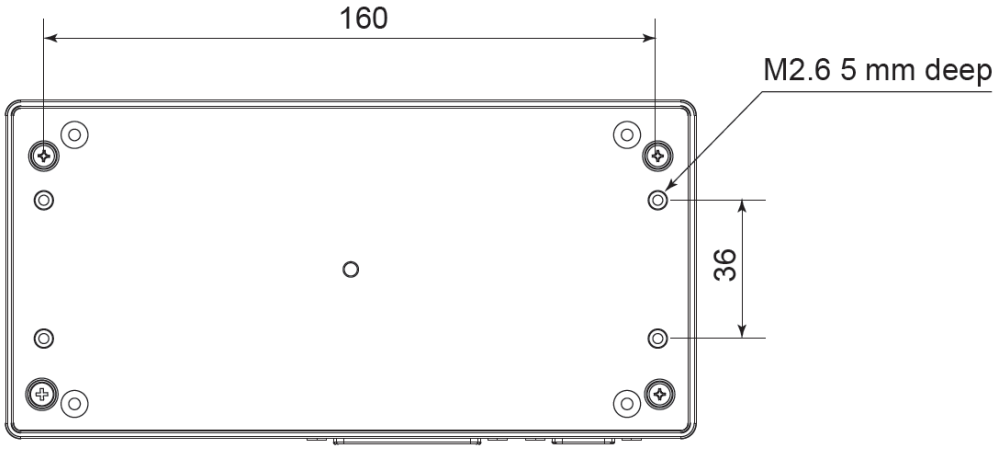
<COMBOX-NET.EIP Main Body>



<Bracket Shared for Horizontal and Vertical Installation>

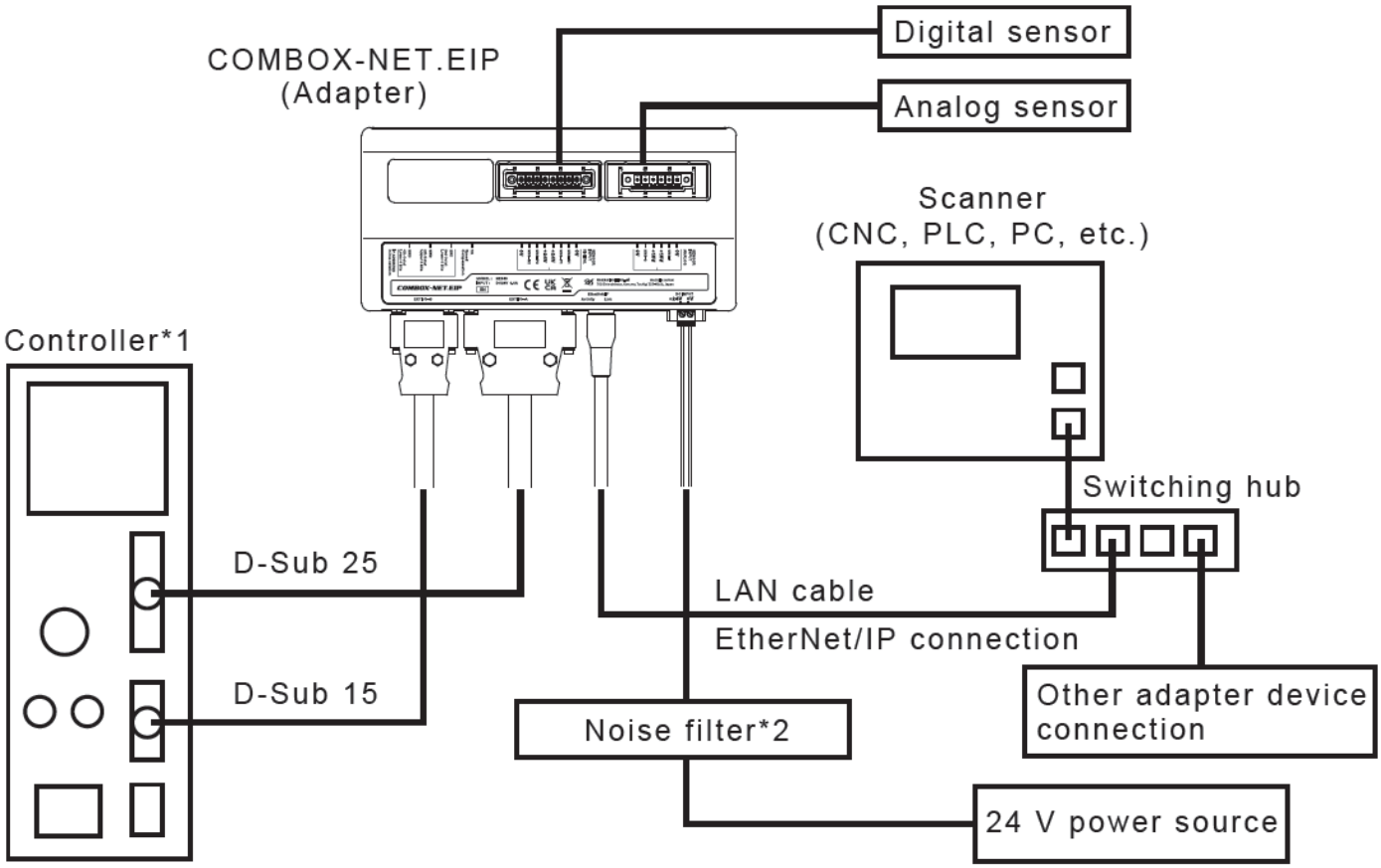
6–6 Installation

Install the COMBOX-NET.EIP at the required location by using the screw holes (M2.6, depth 5 mm) on the bottom of the main body or by a mounting bracket.

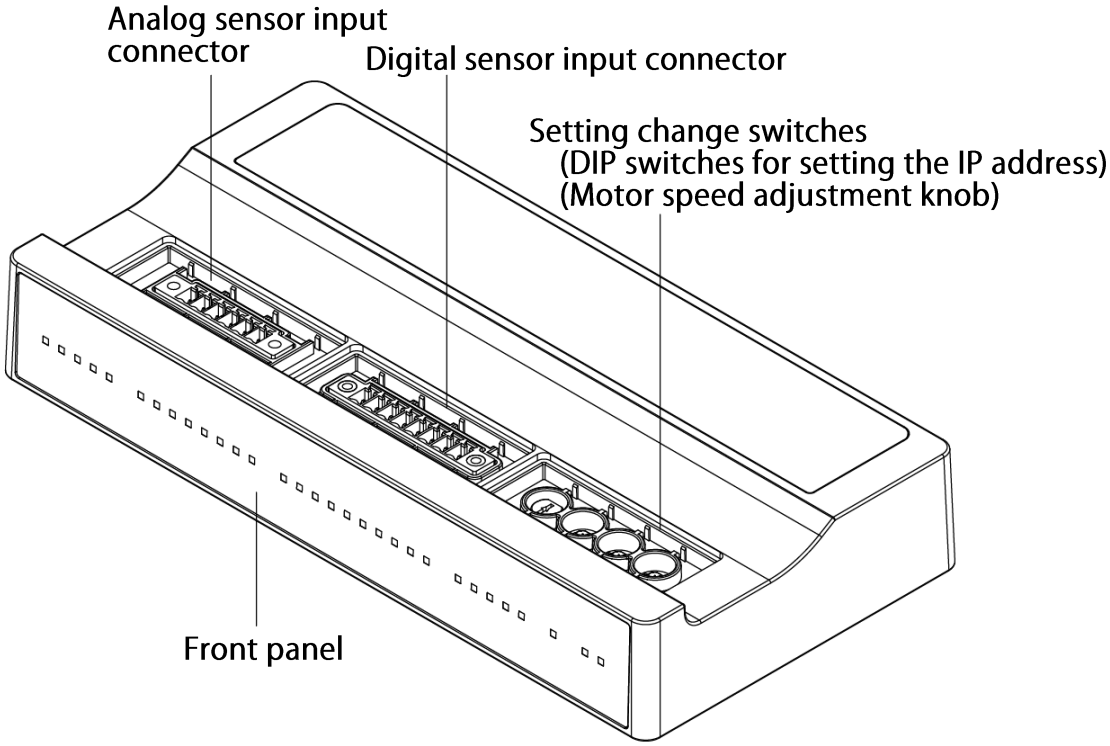


7 SYSTEM CHART

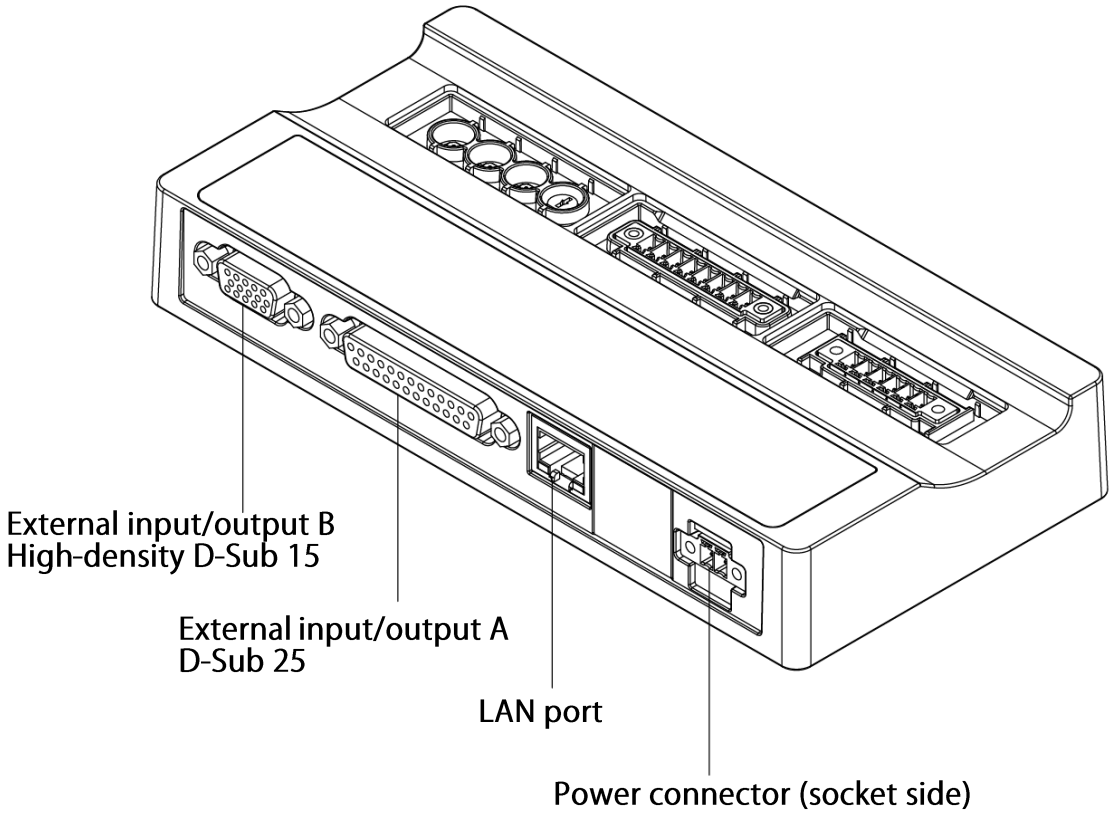
NOTICE
● The following controllers can be connected to the COMBOX-NET.EIP. 　− E3000 　− E4000 　− E2280 　− iSpeed3 　− iSpeed5 ● One controller made by NAKANISHI can be installed on a COMBOX-NET.EIP. ● A digital and analog (0 to 5 V) sensor are each installed on each of the two channels. ● When connecting by EtherNet/IP, configure the network in a star topology. ● COMBOX-NET.EIPs cannot be connected to each other. ● Devices such as proximity sensors and fiber sensors that support open collector output can be installed as digital sensors, and the ON-OFF status of the sensors is transferred to the scanner. ● Devices such as thermometers, flowmeters and pressure gauges that output analog voltage (0 to 5 V) can be installed as analog sensors, and the voltage data (0 to 5000) of these devices is transferred to the scanner.



*1 For details on controller connections, refer to the Operation Manual for the respective model of controller.
*2 Use a noise filter to reduce the influence of noise from the power source.

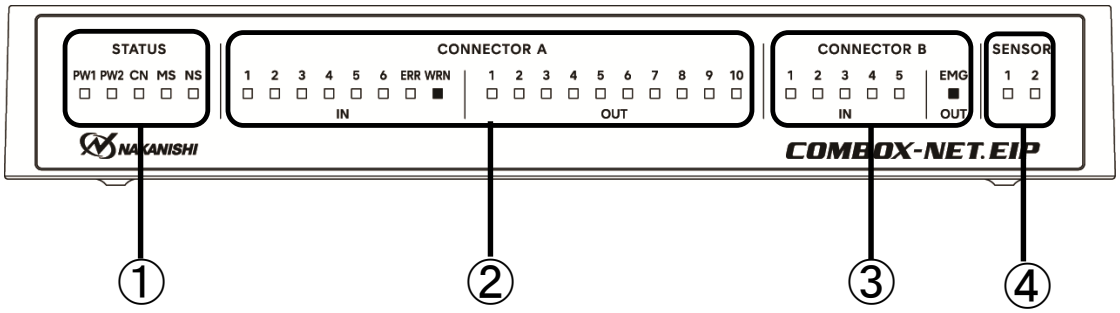


＜COMBOX-NET.EIP Main Body Front＞



＜COMBOX-NET.EIP Main Body Rear＞

8–1 COMBOX-NET.EIP Front Panel LED Display



<Monitor LEDs for STATUS status signal>

No.	Signal Code	Signal Name	LED Lighting Condition
①	PW1	Main power source	24 VDC for main power is applied
	PW2	Sensor power source	24 VDC for sensor power is applied
	CN	Controller connection	D-Sub 25 connector is connected, controller power source is ON
	MS	Device status	According to device operating status
	NS	Network status	According to network communication status

NOTICE
● The MS and NS LEDs light in order MS (green)/NS (green) and MS (red)/NS (red) when the power is turned ON (during the self test).

<Details of MS, NS lighting>

Signal Code	Lighting Status	Status
MS (Module Status)	Lit, green	Normal operation
	Flashing, green	Device not set or setting incomplete
	Lit, red	Non-recoverable abnormality
	Flashing, red	Recoverable abnormality
	Out	Power not supplied
NS (Network Status)	Lit, green	Online, normal communication in progress
	Flashing, green	Online, no communication connection
	Lit, red	IP address duplicated, fatal link error
	Flashing, red	Communication connection time error
	Out	Power not supplied/IP address not set

<Connector A: Monitor LEDs for D-Sub 25 input/output signals>

No.	INPUT	Signal Name	Function	LED Lighting Condition
②	1	RUN	Rotating	Rotating
	2	DIR_OUT	Rotating Direction	Reverse rotation is selected
	3	COIN	Speed Achievement	Setting motor rotation speed is reached
	4	PULSE	Rotating Pulse	Rotating pulse is input (flashing during rotation)
	5	SEL_MT	Motor No.2 selected	Motor No.2 is selected (E2280 in use)
	6	SEL_MT	Motor No.2 selected	Motor No.2 is selected (iSpeed3 in use)
	ERR	ERR	Error	Error occurred (flashing when error code is issued)
	WRN	WRN	WARNING	Warning occurred (flashing when warning code is issued)

No.	OUTPUT	Signal Name	Function	LED Lighting Condition
②	1	START	Rotate Command	Rotation is instructed
	2	DIR_IN	Rotating Direction	Reverse rotation is instructed
	3	RESET	Error Release	Error release is instructed
	4	500min^{-1} (rpm)	500min^{-1} (rpm)	Motor speed 500 min^{-1} is selected
	5	SEL0	Speed Point Select 0	Speed point 0 is selected
		UD_IN/ SEL0	UP/DOWN Signal for Setting Motor Speed Speed Point Select 0	・ Speed setting UP is instructed (E2280 in use) ・ Speed point 0 is selected (E2280 in use)
	6	SEL1	Speed Point Select 1	Speed point 1 is selected
		CNT_IN/ SEL1	Count Pulse Signal for Setting Motor Speed/Speed Point Select 1	・ Count pulse signal setting motor speed is input (E2280 in use) ・ Speed point 1 is selected (E2280 in use)
	7	CNT_IN	Count Pulse Signal for Setting Motor Speed	Count pulse signal for setting motor speed is input
	8	UD_IN	UP/DOWN Signal for Setting Motor Speed	Speed setting UP is instructed
		MT_SEL	Motor Select	Motor 2 is selected (E2280 in use)
	9	MT_SEL	Motor Select	Motor 2 is selected (iSpeed3 in use)
		ID0	Motor Class Signal 0	Motor class No.0 is selected (iSpeed5 in use)
	10	ID1	Motor Class Signal 1	Motor class No.1 is selected (iSpeed5 in use)

<Connector B: Monitor LEDs for D-Sub 15 input/output signals>

No.	INPUT	Signal Name	Function	LED Lighting Condition
③	1	MT-CN	Motor Connect Contact	Motor is disconnected
	2	SAFE1	Safety Relay 1	・ Auxiliary contact is ON ・ Motor 2 is selected (E2280, iSpeed3 in use)
	3	SAFE2	Safety Relay 2	・ Auxiliary contact is ON ・ Motor 1 is selected (E2280, iSpeed3 in use)
	4	AUTO	Control Mode AUTO Signal	In AUTO mode
	5	PWON	CONTROLLER Power Source Monitor	Controller power source is detected

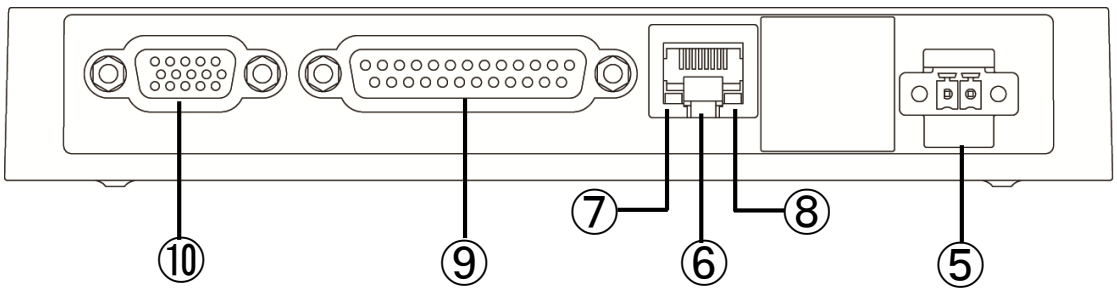
No.	OUTPUT	Signal Name	Function	LED Lighting Condition
③	EMG	EMG	Emergency Stop	Emergency stop is in progress

<Monitor LEDs for SENSOR signal>

No.	SENSOR	Signal Name	Function	LED Lighting Condition
④	1	S-OUT1	Digital sensor 1	Digital sensor 1 is ON
	2	S-OUT2	Digital sensor 2	Digital sensor 2 is ON

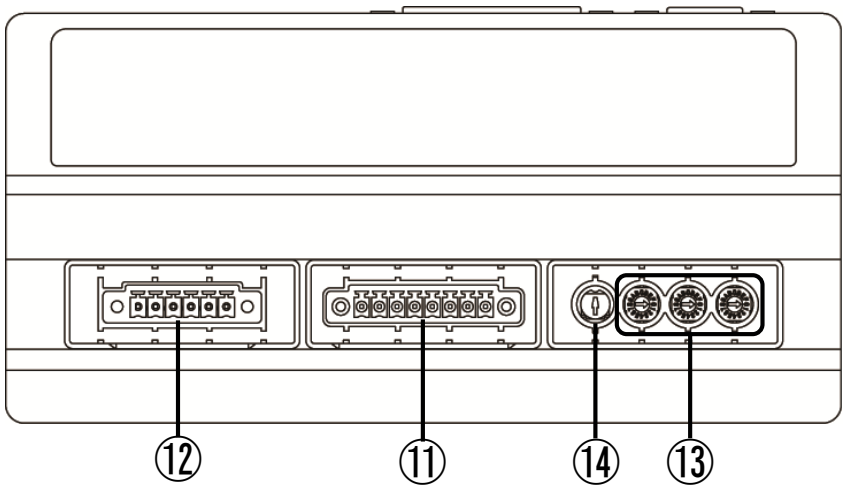
NOTICE
● ②, ③ and ④ input/output signals are sent and received to and from the scanner in EtherNet/IP communications. (Other than PULSE) For details, see signals of the same name in "11 COMBOX-NET.EIP I/O DATA."

8–2 Installation of COMBOX-NET.EIP Rear Input/output Cable



No.	Part Name	Contents
⑤	Power Connector (socket side)	Supplies 24 VDC power.
⑥	LAN port RJ45	Connected to EtherNet/IP network.
⑦	Activity LED (green)	Displays the data send/receive status. Out: No data send/receive, Flashing: Data send/receive in progress
⑧	Link LED (yellow)	Displays the link status with other devices. Out: No link, Lit: Link established
⑨	D-Sub 25 connector 25 poles (socket side)	Connects to controller (E3000, E4000, E2280, iSpeed3, iSpeed5).
⑩	D-Sub 15 connector 15 poles (socket side) (high-density type)	Connects to controller (E3000, E4000, E2280, iSpeed3, iSpeed5).

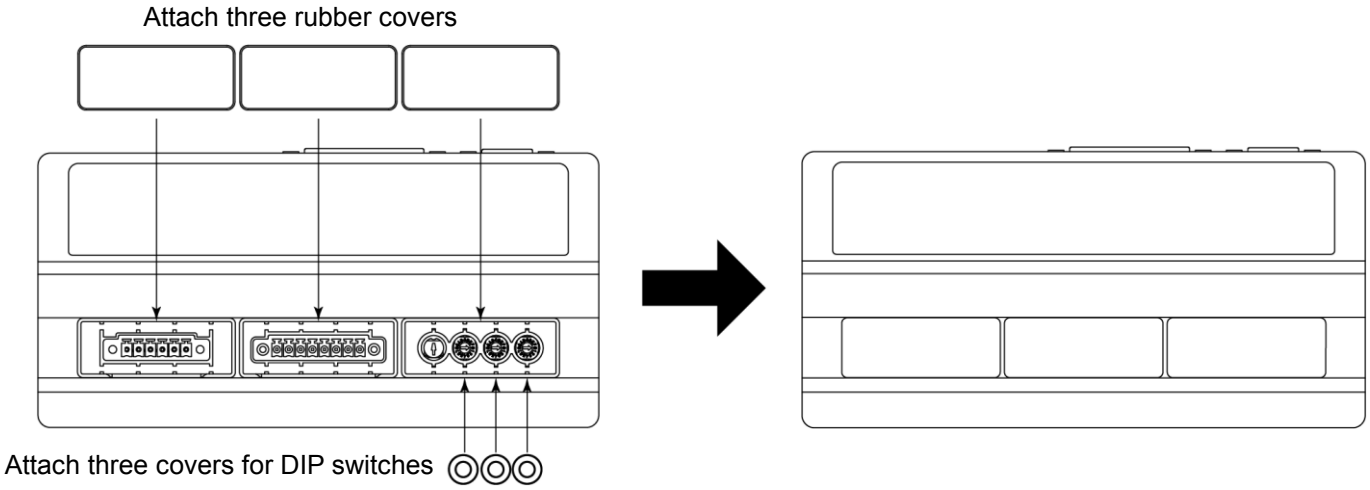
8–3 Installation of Additional Sensor to COMBOX-NET.EIP, Setting Change Switches



No.	Part Name	Contents
⑪	Digital sensor input connector (socket side) DC+24V, Input: ON/OFF, 2 channels NPN and PNP types supported	Devices such as proximity sensors and fiber sensors that support open collector output can be installed.
⑫	Analog sensor input connector(socket side) DC+15V, Input: 0 to 5 V, 2 channels	Devices such as thermometers, flowmeters and pressure gauges that output analog voltage (0 to 5 V) can be installed.
⑬	DIP switches for setting the IP address SW1-SW3	The IP address of the COMBOX-NET.EIP main body can be set.
⑭	Motor speed adjustment knob For adjusting the set motor rotation speed	This knob is for adjusting the motor speed when there is a difference between the motor speed set by the scanner and the set motor speed display on the controller.

8–4 Attaching Covers

Attach the three covers for the DIP switches after using the DIP switches for setting the IP address. Then, attach the rubber covers.
Attach the rubber covers at the required location when analog or digital sensors are not used or after using the motor speed adjustment knob.



<Before attaching the covers>

<After attaching the covers>

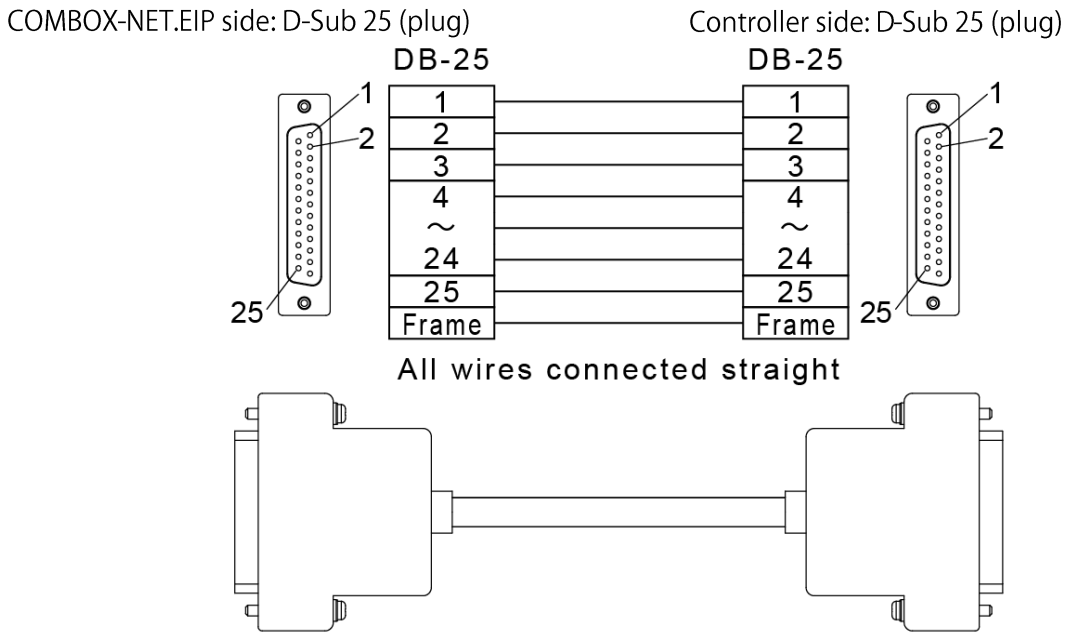
8–5 D-Sub Cable Specifications

⚠ COUTION

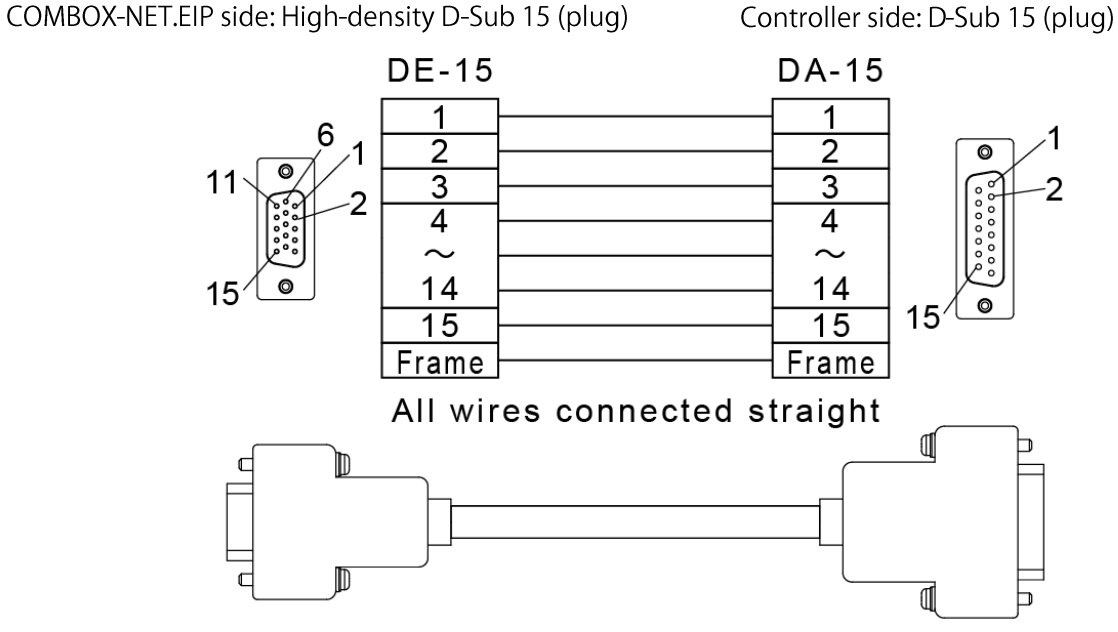
- To minimize RF interference and noise, please keep the length of the cables as short as possible and route them separately or as far away as possible from high voltage electrical cables.
- Use only shielded cables to minimize RF interference and noise. Connect the shield to the plug cover.
- Connect the shielded line to the Input / Output connector (The shielded line is grounded).

Prepare a D-Sub cable and connector hood.

■ For external input/output A (EXIT I/O-A)



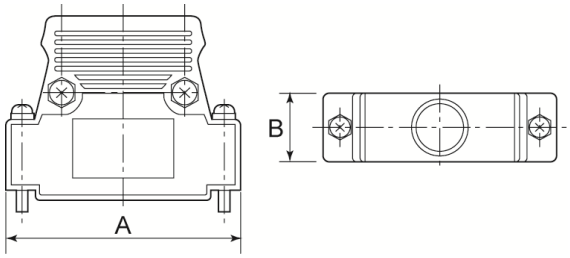
■ For external input/output B (EXIT I/O-B)



■ Connector hood size

<Mountable D-Sub connector hoods>

Connector	A	B
High-density D-Sub 15 pins	33.8 mm or less	16 mm or less
D-Sub 15 pins	42 mm or less	16 mm or less
D-Sub 25 pins	57.8 mm or less	16 mm or less



Use M2.6 mounting screws for D-Sub connectors.

8–6 LAN Cable Specifications

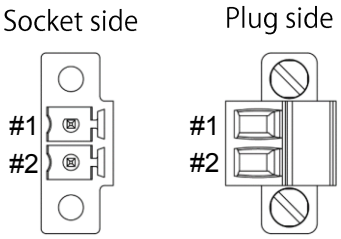
Use a commercially available CAT5 or faster straight cable for the LAN cable.
When there is a noise source nearby, ground the scanner and use am STP cable.

8–7 Power Connector

Prepare a housing for the connector.

Terminal No.	Terminal Code	Part Name
#1	+24 V	External power source input
#2	0 V	Power GND

Connector (provided) (plug side)	MC 1,5/2-STF-3,81 - 1827703 (Phoenix)
Applicable housing	KGG-MC 1,5/2 - 1834343 (Phoenix)

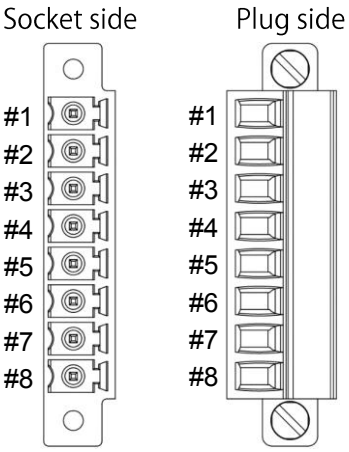


8–8 Digital Sensor Input Connector

Prepare a connector, housing and protective tube.

Terminal No.	Terminal Code	Part Name	Channel
#1	0 V	Power GND 1	1
#2	SNS-N1	NPN External input 1	
#3	SNS-P1	PNP External input 1	
#4	+24 V	Power source for external output 1	
#5	+24 V	Power source for external output 2	2
#6	SNS-P2	PNP External input 2	
#7	SNS-N2	NPN External input 2	
#8	0 V	Power GND 2	

Recommended connector (plug side)	MC 1,5/8-STF-3,81 - 1827761 (Phoenix)
Applicable housing	KGG-MC 1,5/8 - 1834408 (Phoenix)
Applicable protective tube	CUC-DST-ABK-CP7,5 - 1419794 (Phoenix)

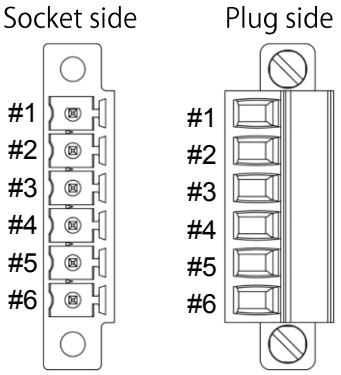


8–9 Analog Sensor Input Connector

Prepare a connector, housing and protective tube.

Terminal No.	Terminal Code	Part Name	Channel
#1	0 V	Power GND 1	1
#2	SNS-1	Analog sensor input 1	
#3	+15 V	Power source for external output 1	
#4	+15 V	Power source for external output 2	2
#5	SNS-2	Analog sensor input 2	
#6	0 V	Power GND 2	

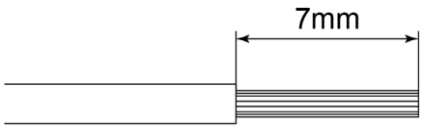
Recommended connector (plug side)	MC 1,5/6-STF-3,81 - 1827745 (Phoenix)
Applicable housing	KGG-MC 1,5/6 - 1834385 (Phoenix)
Applicable protective tube	CUC-DST-ABK-CP7,5 - 1419794 (Phoenix)



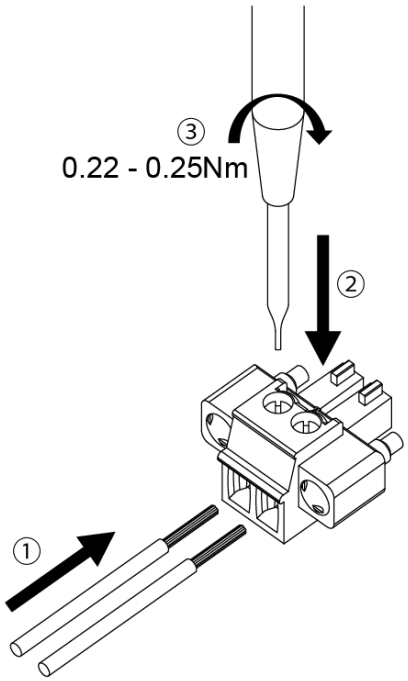
8–10 How To Connect Connectors

■ Power connector

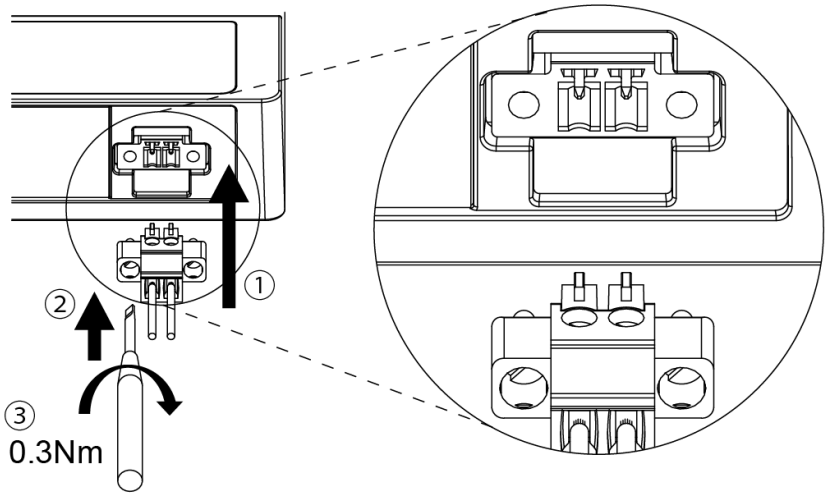
❶ Strip back 7 mm of sheath from the end of AWG16 to 26 wire.



❷ Insert the stripped bare wire into the power connector as far as possible.
Tighten with a flatheaded screwdriver.
Tightening torque: 0.22 - 0.25 Nm



❸ Connect the power connector with the top and bottom aligned so that it fits into the socket.
Tighten with a flatheaded screwdriver.
Tightening torque: 0.3 Nm



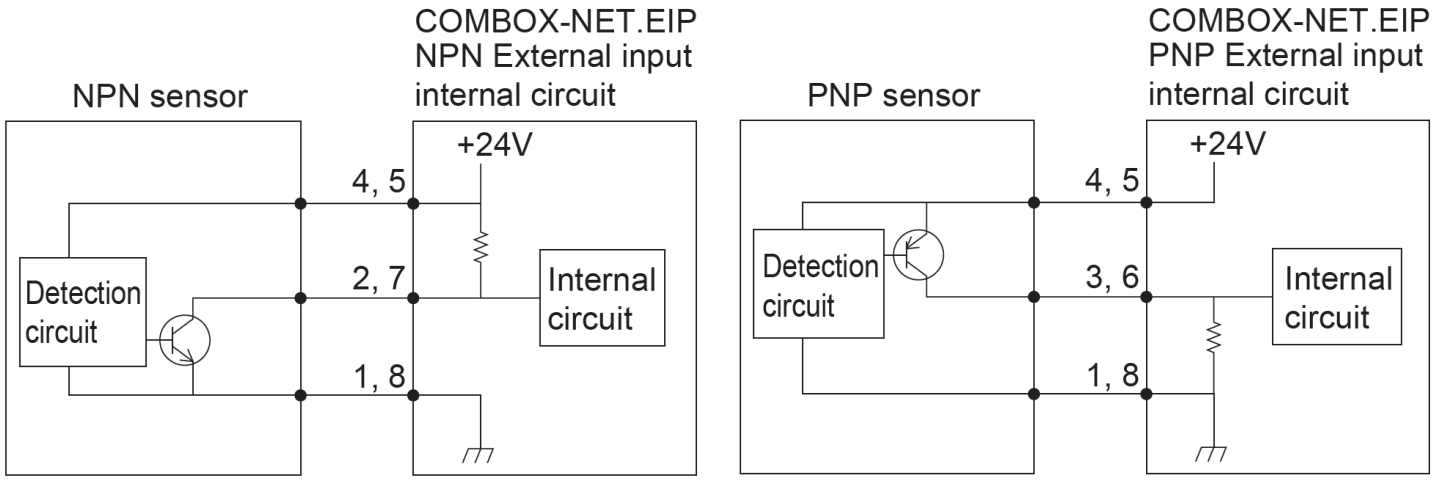
■ Digital sensor input connector, analog sensor input connector

When using a digital sensor input connector and analog sensor input connector, connect each connector in the same way into their respective socket.

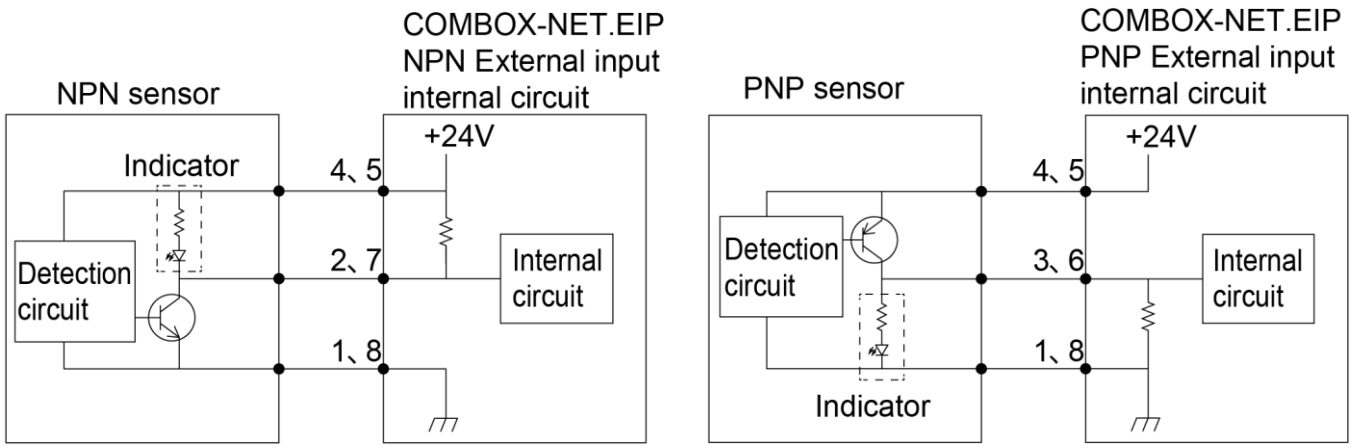
8–11 Sensor Connections

■ Digital sensor

NOTICE
● Wire by referring to the figure below and "8-8 Digital Sensor Input Connector" matched to the type of sensor (NPN, PNP) used. Attaching a different type of sensor to an input may cause a failure or malfunction.

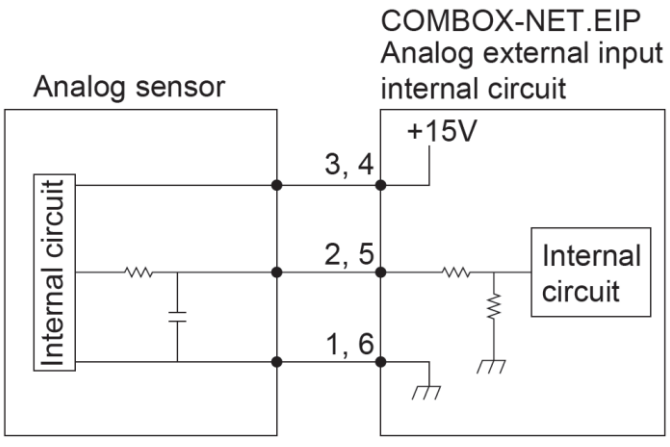


NOTICE
● Note that the indicator is ON at all times regardless of the ON/OFF state of the sensor when a digital sensor is configured in an internal circuit like the one in the figure below. The sensor signal (ON/OFF) is normally recognized.



■ Analog sensor

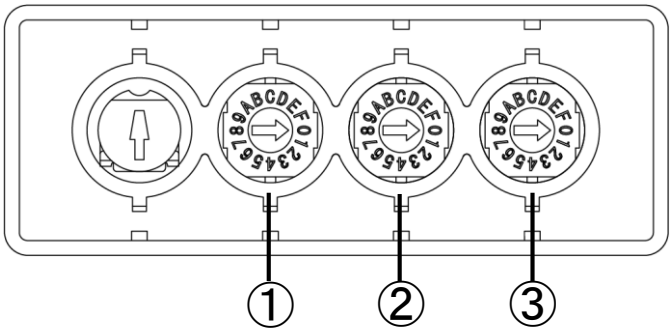
Wire by referring to the figure below and "8-9 Analog Sensor Input Connector."
The analog sensor supports an output voltage of 0 to 5 V.



8–12 Setting the IP Address

NOTICE
● Before setting the IP address, turn the power switch on the COMBOX-NET.EIP OFF. If the IP address is set with the power switch on the COMBOX-NET.EIP still set to ON, settings are not reflected until the COMBOX-NET.EIP is restarted.

The IP address of the COMBOX-NET.EIP can be set by operating the DIP switches for setting the IP address.



No.	Part Name	Description
①	SW1	Operate this switch to set the 3rd octet of the IP address.
②	SW2	Operate both of the SW2 and SW3 switches to set the 4th octet of the IP address.
③	SW3	

1st Octet	2nd Octet	3rd Octet	4th Octet
192.	168.	XXX.	XXX

The 1st Octet (192) and 2nd Octet (168) are fixed.

Set the IP address as desired by referring to the table below.
Up to 4064 addresses (excluding 0 and 255 for the 4th octet) can be set within the range (192).(168).0.1 to (192).(168).15.254 (decimal).

	3rd Octet		4th Octet	
	—	SW1	SW2	SW3
Hex	0	0 to 9, A to F	0 to 9, A to F	0 to 9, A to F
Decimal	0 to 15		1 to 254*	

*0 and 255 cannot be used on the system.

<4th Octet: Relationship Between Setting Values and Decimal Numbers of DIP Switches SW2 and SW3>

		SW3															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
SW2	0	~~0~~	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
	4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
	5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
	6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
	7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	A	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	B	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	C	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	D	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	E	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
	F	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	~~255~~

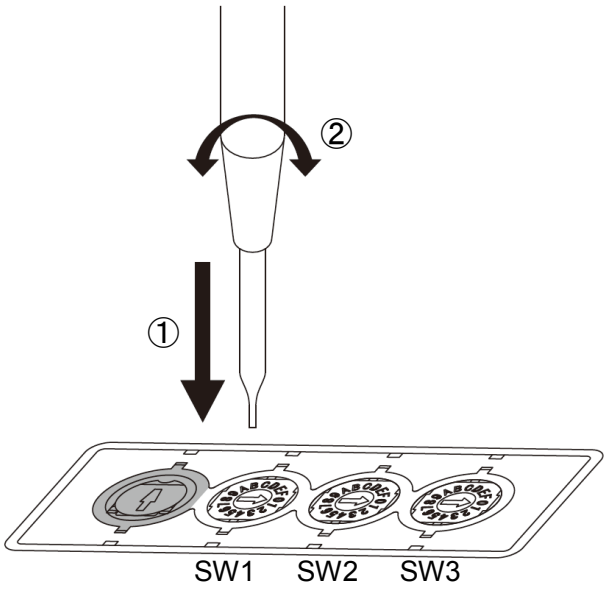
0 and 255 cannot be used on the system.

■ Operation of DIP switches for setting the IP address

⚠ CAUTION

- Turn the switch using an insulated flathead screwdriver. At this time, take sufficient care to prevent static electricity from being generated. Failure to do so may cause a malfunction.

❶ Insert the insulated flathead screwdriver into the DIP switch for setting the IP address of the desired octet, and turn the screwdriver in the desired direction to set the IP address.

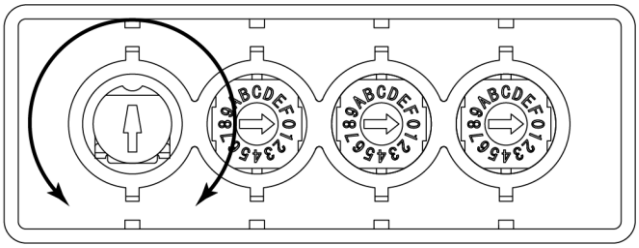


❷ After setting the IP address, install the three covers for the DIP switches and motor speed adjustment knob by referring to "8-4 Attaching Covers."

8–13 Motor Speed Adjustment Knob

This knob is for adjusting the motor speed when there is a difference between the motor speed set by the scanner and the set motor speed display on the controller.

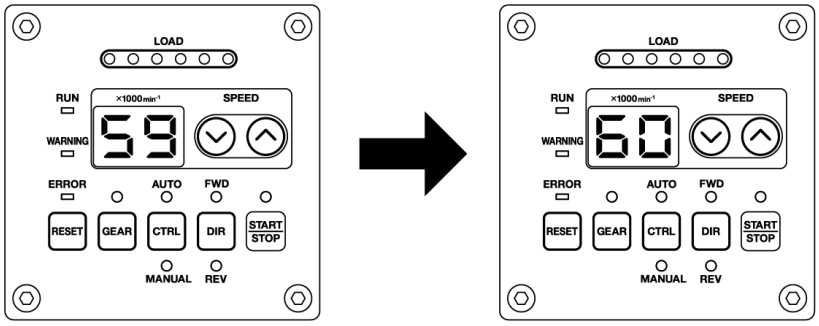
Turning the knob CW increases the set motor speed, and turning the knob CCW decreases the set motor speed.



CCW: Decreases CW: Increases

■ Setting example (when motor speed is lower than setting value)

When the speed display on the controller indicated "59" when the set motor speed was set to 60 (60000 min-1) on the scanner to instruct the motor speed, turn the adjustment knob CW to change the speed display setting to "60".

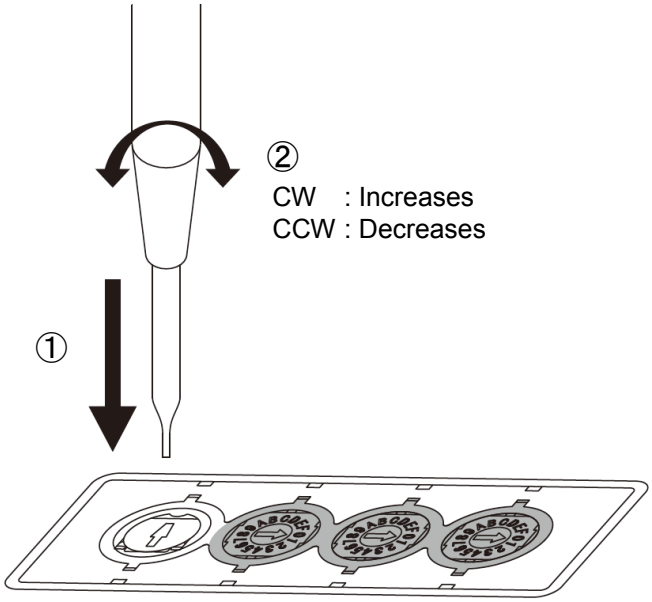


■ How to operate the motor speed adjustment knob

⚠ CAUTION

- Turn the motor speed adjustment knob using an insulated flathead screwdriver. At this time, take sufficient care to prevent static electricity from being generated. Failure to do so may cause a malfunction.

❶ Insert the insulated flathead screwdriver into the motor speed adjustment knob, and turn the screwdriver in the desired direction to adjust the instructed motor speed on the controller.

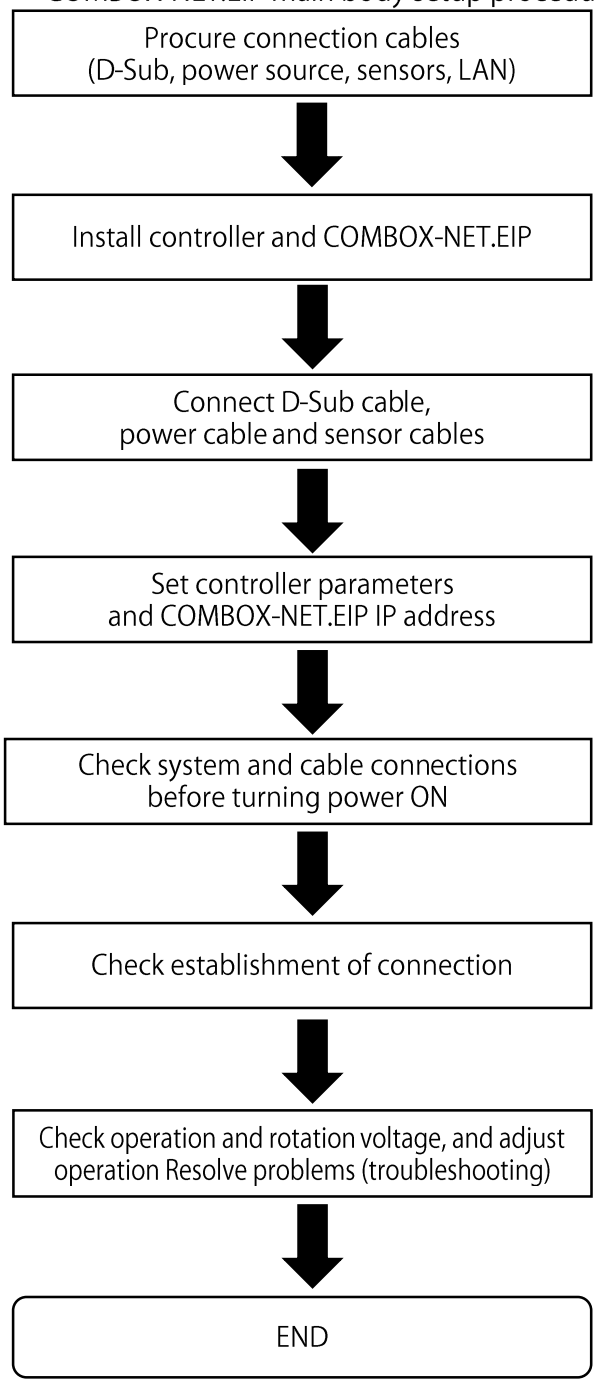


❷ After adjusting the motor speed, install the rubber cover by referring to "8-4 Attaching Covers."

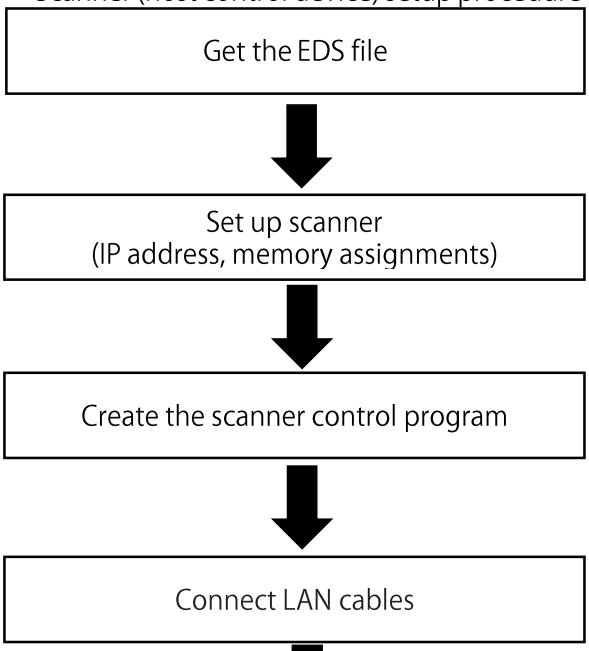
9 COMBOX-NET.EIP INSTALLATION PROCEDURE

NOTICE
● Be sure to refer to the "Maintenance, Operation and Electrical Manuals" of the machine that is being interfaced to the COMBOX-NET.EIP. ● Before using the COMBOX-NET.EIP, read all the Operation Manuals for the controller, CNC, PLC and PC to be connected.

■ COMBOX-NET.EIP main body setup procedure



■ Scanner (host control device) setup procedure



10 OUTLINE OF SCANNER SETTINGS FOR SETTING UP COMBOX-NET.EIP AND EtherNet/IP

NOTICE
● Only the IP address is set to the COMBOX-NET.EIP itself. Nothing else is set. Set the content of the EDS file on the scanner. ● The following briefly describes how to set the content of the EDS file as the setup method differs according to the connection setup software provided with the connected scanner. For details on the setup method, refer to the Operation Manual of the connected scanner.

■ Setup procedure

❶ Registering the adapter device
Register the COMBOX-NET.EIP to connect via EtherNet/IP to the connection setup software.
The EDS file is needed for registration.

❷ Creating variables that are used on the network
On the scanner, the tags (I/O data) that are exchanged on the network are defined as variable names or physical addresses.
Create the variables that are used on the network when the data to exchange is variables.
Variables need not be created when the data to exchange is physical addresses.

❸ Registering tags (I/O data)
Set up the size and type (input, output, integer, etc.) of the tags and assignments with the variables.

❹ Setting the connection
Perform this setting to assure communication in which data is exchanged over EtherNet/IP.
When the registered COMBOX-NET.EIP is imported, the content written to the EDS file is reflected in the connection. However, change the data update cycle (RPI), as necessary.
Link scanner tags with the IP address, node setting and the COMBOX-NET.EIP tag.
Also, change the size and type (input, output, integer etc.) settings of the tags.

❺ Transferring the connection settings to the scanner
Using the data transfer software provided with the connection setup software, transfer the connection settings to the scanner.

❻ Checking operation
Check that the scanner is communicating with COMBOX-NET.EIP.
When the program for checking communications is necessary, transfer it to the scanner beforehand.

11 COMBOX-NET.EIP I/O DATA

This is the I/O data that is exchanged between the COMBOX-NET.EIP and scanner by EtherNet/IP communication.
The I/O functions of the connected controller are sent to and received from the scanner by EtherNet/IP communication.

<Input Data (Scanner→COMBOX-NET.EIP)>

Item Name	Item Code	Number of bytes	Contents
Model Name	TYPE	2	Sets the name of the model used.
Parameter	PARAM	2	Set to match the controller parameters. *
1BIT control	CTRL	2	Used for operating the controller.
Motor Speed Setting	SPD_SET	2	Used for setting the motor speed.

*For details on how to check controller parameters, refer to the Operation Manual for the respective model of controller.

<Output Data (COMBOX-NET.EIP→Scanner)>

Item Name	Item Code	Number of bytes	Contents
Model Name	TYPE_ACK	2	Input data "TYPE" is output as "TYPE_ACK".
Confirmation of Data/Ready	DATA_READY	2	This is output as an error when there is an abnormality in the input data.
1BIT monitor ①	STATUS1	2	The input signal from the controller and sensor is output.
1BIT monitor ②	STATUS2	2	
Analog monitor voltage	MOTOR_DT	2	The analog monitor voltage (MOTOR_I: current value) is output.
	LOAD_DT	2	The analog monitor voltage (LOAD: Torque Load Monitor) is output.
	SPD_DT	2	The analog monitor voltage (SPEED_V: Rotating Speed Analog Monitor Voltage) is output.
Sensor voltage	SNS1	2	The analog sensor input signal is output.
	SNS2	2	
Motor speed	SPD_PULSE	2	The motor speed is output based on the rotating pulse of the motor.
Error Code(1)	ERR1	2	The error code is output when an error has occurred on the controller. The output format can be changed by the PARAM (bit-0 to 2) setting.
Error Code(2)	ERR2	2	
Error Code(3)	ERR3	2	
Warning Code(1)	WRN1	2	The warning code is output when an error has occurred on the controller. The output format can be changed by the PARAM (bit-0 to 2) setting.
Warning Code(2)	WRN2	2	

NOTICE

- Communication with the scanner is performed in order output data followed by input data.
- Basic I/O data is in byte units. However, it is in 1-bit units or 16-bit (1 word) units, depending on the scanner. Also, a mixed annotation of bit units and word units is possible depending on the setup software provided with the scanner. For details, refer to the Operation Manual of the connected scanner.

11–1 Input Data

Input addresses are annotated in word units. n is the initial address set by the scanner.

<Model Name>

Address	n+0x10	
Item Code	TYPE	
Data	Model Name	Remarks
bit-0	E3000	Set only the bits corresponding to the model of connected controller to ON. A model setting error occurs if this item is not set to ON. A model setting error also occurs if two or more bits are selected or a bit not set with the model name is set to ON.
bit-1	E4000	
bit-2	E2280	
bit-3	iSpeed3	
bit-4	iSpeed5	
to	to	
bit-15	—	

<Parameters>

Address	n+0x11			
Item Code	PARAM			
Data	Contents	Remarks	Controller parameters	
bit-0	Output is OFF when an error occurs, and output is ON when a warning occurs.	Select either of these two settings. Match the setting on the controller. A parameter setting error occurs if this item is not selected.	All models: P1 Setting of Error Output Mode	*1
bit-1	Output is ON when an error occurs, and output is ON when a warning occurs.			
bit-2	Error code, warning code			
bit-3	Analog: Set motor speed at SPD_SET.	Select either of these two settings. Match the setting on the controller. A parameter setting error occurs if this item is not selected.	E2280: P7 Other models: P5 Selection of Motor Speed Control Voltage/DC+10V Signal Method	
bit-4	Pulse: Set motor speed at CNT_IN/UD_IN.			
bit-5	Speed point: Set motor speed at SEL0/SEL1.			
bit-6	Motor Speed Characteristics*2	Select according to the motor used. (Refer to the "Motor Speed Setting" table given later.)	E3000: P8 E2280: PA	*3
bit-7	EM-3030T selection (only when E3000 controller is in use)	ON when EM-3030T is in use	Not set	
to	to			
bit-15	—			

*1 Some parameter P1 error output logic cannot be set to error codes depending on the controller.

*2 Parameters must be set on the controller to match the motor used.
Match the setting of bit-6 to the setting of Motor Speed Control Voltage/DC+10V Signal Method.

*3 E4000, iSpeed3 and iSpeed5 parameters need not be set on the controller.
Set the motor speed characteristics to match the motor used by referring to the "SPD_SET" table.

<1BIT Control>

Address	n+0x12			
Item Code	CTRL			
Data	Signal Name	Function	Contents	
bit-0	START	Rotate Command	OFF: Stop, ON: Start	
bit-1	DIR_IN	Rotating Direction	OFF：FWD, ON：REV	
bit-2	RESET	Error Release	Error is released by input of 1 pulse	
bit-3	EMG	Emergency Stop	OFF: Emergency stop executed ON: Emergency stop standing by	*1, 2
bit-4	CNT_IN	Count Pulse Signal for Setting Motor Speed	Change in 1 speed control value by input of 1 pulse	
bit-5	UD_IN	UP/DOWN Signal for Setting Motor Speed	OFF: Speed DOWN, ON: Speed UP	
bit-6	500min^{-1}	Motor speed 500 min^{-1}	500 min^{-1} when ON, used for E3000, E4000 and E2280	
bit-7	MT_SEL	Motor Select	OFF: Motor 1 selected, ON: Motor 2 selected	*3
bit-8	ID0	Motor Class Signal 0	4 types of motor selected by combination of bit settings (only when iSpeed5 is in use)	
bit-9	ID1	Motor Class Signal 1		
bit-10	SEL0	Speed Point Select 0	Speed 4 point by combination of bit settings 4 motors selected when E3000 selector is in use	
bit-11	SEL1	Speed Point Select 1		
to	to			
bit-15	—			

*1 The Emergency Stop Function is enabled once it is set to ON.
*2 This function cannot be used unless it is set to enabled in the controller parameter settings.
*3 "MT_SEL" can be used only on E2280 and iSpeed3. It cannot be used on other controllers.

<Selection Settings According to iSpeed5 and Motor Used>

Motor Class	CTRL		PARAM*	Motor Class No.
	bit-9 ID1	bit-8 ID0	bit-6	
EM-3060ATC	OFF	OFF	OFF	1
EM-3080ATC	OFF	ON	ON	2
BM-325ATC	ON	OFF	OFF	3
BM-320ATC	ON	ON	ON	4

* When selecting motor, also set PARAM (bit-6).

<Speed Point Selection Settings When PARAM, bit-5, Speed Point Are Selected>

Speed Point	bit-11 SEL1	bit-10 SEL0
U1	OFF	OFF
U2	OFF	ON
U3	ON	OFF
U4	ON	ON

<Motor Selection Setting When E3000 Selector Is In Use>

Select Motor	bit-11 SEL1	bit-10 SEL0
Motor 1	OFF	OFF
Motor 2	OFF	ON
Motor 3	ON	OFF
Motor 4	ON	ON

<Motor Speed Setting>

Address	n+0x13				Controller parameters
Item Code	SPD_SET				
Data	TYPE	PARAM(bit-6)	Motor Speed Control Value*	Motor Used	
2 bytes	E3000	OFF ON	1-60 (x 1,000 min^{-1}) 1-80 (x 1,000 min^{-1})	60,000 min^{-1} 80,000 min^{-1}	P8: OFF P8: ON
	E4000	OFF ON	10-200 (x 100 min^{-1}) 10-400 (x 100 min^{-1})	20,000 min^{-1} 40,000 min^{-1}	Not set
	E2280	OFF ON	1-50 (x 1,000 min^{-1}) 1-30 (x 1,000 min^{-1})	50,000 min^{-1} 30,000 min^{-1}	PA: OFF PA: ON
	iSpeed3	OFF ON	10-600 (x 100 min^{-1}) 10-800 (x 100 min^{-1})	60,000 min^{-1} 80,000 min^{-1}	Not set
	iSpeed5	OFF ON	10-600 (x 100 min^{-1}) 10-800 (x 100 min^{-1})	60,000 min^{-1} 80,000 min^{-1}	Not set

*The range of the Motor Speed Control Value varies according to the combination of TYPE and PARAM (bit-6).
Be sure to match the setting of PARAM (bit-6) to the controller parameter setting. Otherwise, COMBOX-NET.EIP will malfunction.

11–2 Output Data

Output addresses are annotated in word units. n is the initial address set by the scanner.
<Selection Model Name>

Address	n+0x00	
Item Code	TYPE_ACK	
Data	Model Name	Contents
bit-0	E3000	Turns ON when E3000 is selected.
bit-1	E4000	Turns ON when E4000 is selected.
bit-2	E2280	Turns ON when E2280 is selected.
bit-3	iSpeed3	Turns ON when iSpeed3 is selected.
bit-4	iSpeed5	Turns ON when iSpeed5 is selected.
bit-5	—	—
to	to	to
bit-15	—	—

<Confirmation of Data/Ready>

Address	n+0x01	
Item Code	DATA_READY	
Data	Contents	Description
bit-0	Set Model Abnormality	Turns ON when TYPE is not set correctly.
bit-1	Set Parameter Abnormality	Turns ON when PARAM is not set correctly.
bit-2	Set Control Abnormality	Turns ON when the combination of settings is not matching.
bit-3	Set Speed Abnormality	Turns ON when the motor speed control is outside the setting range.
bit-4	COMBOX Power Source Abnormality	Turns ON when the sensor power source is down.
bit-5	Controller Connection Abnormality	Turns ON when the controller is not connected normally.
bit-6	—	—
to	to	to
bit-15	—	—

"START" operation is disabled when one of the above bits turns ON.
For details, see "11-4 Data/Ready Details."

<1BIT Monitor ① Controller Status 1>

Address	n+0x02		
Item Code	STATUS1		
Data	Signal Name	Function	Contents
bit-0	RUN	Rotating	OFF: Stop, ON: Rotating
bit-1	DIR_OUT	Rotating Direction	OFF: FWD, ON: REV
bit-2	COIN	Speed Achievement	OFF: Set speed not achieved, ON: Set speed achieved
bit-3	MT-CN	Motor Connect Contact	OFF: Motor connected, ON: Motor not connected
bit-4	AUTO	Control Mode AUTO Signal	OFF: MANUAL mode, ON: AUTO mode
bit-5	PWON	CONTROLLER Power Source Monitor	OFF: Power source OFF, ON: Power source ON
bit-6	SAFE1	Safety Relay 1	OFF: Auxiliary contact 1 OFF, ON: Auxiliary contact 1 ON
bit-7	SAFE2	Safety Relay 2	OFF: Auxiliary contact 2 OFF, ON: Auxiliary contact 2 ON
to	to	to	to
bit-15	—	—	—

<1BIT Monitor ② Controller Status 2>

Address	n+0x03		
Item Code	STATUS2		
Data	Signal Name	Function	Contents
bit-0	SEL_MT	Motor Select	OFF: Motor 1 selected, ON: Motor 2 selected (E2280)
bit-1	SEL_MT	Motor Select	OFF: Motor 1 selected, ON: Motor 2 selected (iSpeed3)
bit-2	—	—	—
bit-3	—	—	—
bit-4	—	—	—
bit-5	—	—	—
bit-6	S-OUT1	Digital sensor 1	OFF: Sensor 1 OFF, ON: Sensor 1 ON
bit-7	S-OUT2	Digital sensor 2	OFF: Sensor 2 OFF, ON: Sensor 2 ON
to	to	to	to
bit-15	—	—	—

<Motor Current>

Address	n+0x04	
Item Code	MOTOR_DT	
Data	Output Value	Description
2byte	・Other than iSpeed3 0 to 2000 (x10 mA/digit) ・iSpeed3 0 to 1000 (x10 mA/digit)	The analog monitor that is output after conversion of the motor current output from the controller to a voltage value is output as binary data.

<Torque Load Monitor>

Address	n+0x05	
Item Code	LOAD_DT	
Data	Output Value	Description
2byte	・All models 0 to 200 (%/digit)	The analog monitor that is output after conversion of the motor torque load output from the controller to a voltage value is output as binary data.

<Motor Speed (Voltage)>

Address	n+0x06	
Item Code	SPD_DT	
Data	Output Value	Description
2byte	・All models 0 to 10000 (x10 min^{-1}/digit)	The analog monitor that is output after conversion of the motor speed during motor rotation from the controller to a voltage value is output as binary data.

<Sensor Voltage Output 1>

Address	n+0x07	
Item Code	SNS-1	
Data	Output Value	Description
2byte	0 to 5000 (mV/digit)	Voltage 0 to 5 V input to SNS-1 of the analog sensor input connector is output as binary data.

<Sensor Voltage Output 2>

Address	n+0x08	
Item Code	SNS-2	
Data	Output Value	Description
2byte	0 to 5000 (mV/digit)	Voltage 0 to 5 V input to SNS-2 of the analog sensor input connector is output as binary data.

<Motor Speed (Pulse)>

Address	n+0x09	
Item Code	SPD_PULSE	
Data	Output Value	Description
2byte	・All models 0 to 10000 (x10 min^{-1}/digit)	Arithmetic operation is performed on the rotating pulse output from the controller to become the motor speed which is output as binary data.

<Error Code>

Address	n+0x0A	n+0x0B	n+0x0C
Item Code	ERR1	ERR2	ERR3
Data	Contents	Contents	Contents
bit-0	E1 Excess Current	EP Motor Power Line Disconnected	—
bit-1	E2 Over Voltage	Et Motor Overheat	—
bit-2	E3 Motor Sensor Malfunction	EF1 FAN Malfunction (80 Square Type)	—
bit-3	E4 CONTROLLER Overheat	EF2 FAN Malfunction (40 Square Type)	—
bit-4	E5 Break Circuit Trouble	EFP Parameter " P8 " Setting Error	—
bit-5	E6 Rotor Lock	—	—
bit-6	E7 Low Air Pressure	—	—
bit-7	E8 Over Load	—	—
bit-8	E9 Communication Interception	—	—
bit-9	EA External Control Signal Error	—	—
bit-10	—	—	—
bit-11	EC Internal Memory Error	—	—
bit-12	—	—	—
bit-13	EE Emergency Stop Error	—	—
bit-14	EH Over Speed	—	Unknown Error
bit-15	EL Incompatible Motor	—	Error Occurred *

When PARAM (bit-2: ON) is set, the error code is set when an error occurs and the corresponding bit turns ON.
* The bit turns ON when an error occurs regardless of the setting of PARAM (bit-0 to 2).

<Warning Code>

Address	n+0x0D	n+0x0E
Item Code	WRN1	WRN2
Data	Contents	Contents
bit-0	A0 Motor Cord	—
bit-1	A1 Low Air Pressure	—
bit-2	A2 CONTROLLER Overheat	—
bit-3	A3 Over Load	—
bit-4	A4 Emergency Stop Signal	—
bit-5	A5 Over Air Pressure	—
bit-6	A6 Motor Overheat	—
bit-7	A7 Motor Power Line	—
bit-8	AF Temporary Motor / Spindle Operation during FAN malfunction	—
to	to	to
bit-14	—	Unknown Warning
bit-15	—	Warning Occurred *

When PARAM (bit-2: ON) is set, the warning code is set when a warning occurs and the corresponding bit turns ON.
* The bit turns ON when a warning occurs regardless of the setting of PARAM (bit-0 to 2).
When iSpeed5 is selected, the bit does not turn ON as a warning is not sent.

11–3 Error/Warning Code Details

NOTICE
● Error/warning codes cannot be used depending on the version of the controller.

<Error Code Details>

Code	Contents	Description
E1	Excess Current	Motor Current beyond safe limits.
E2	Over Voltage	Motor Voltage beyond safe limits.
E3	Motor Sensor Malfunction	The sensor signal has malfunctioned or Motor Cord Connector is not connected.
E4	CONTROLLER Overheat	CONTROLLER overheat.
E5	Break Circuit Trouble	Trouble with the Brake Circuit.
E6	Rotor Lock	Motor Stalled for more than 3 seconds.
E7	Low Air Pressure	・Inadequate air pressure is supplied at motor startup. ・This inadequate air pressure status continues for four seconds or more during motor rotation.
E8	Over Load	Torque limits are exceeded for too long a period of time.
E9	Communication Interception	Intercept communication with SELECTOR. (Only if using CONTROLLER connect to E3000 SELECTOR.)
EA	External Control Signal Error	・When Control Mode is in AUTO, the Control Command Signal is 'ON (Closed)' before Main Power Switch ⑨ is turned ON. ・When Control Mode is AUTO, the ERROR command is released without stopping the Control Command Signal 'OFF (Open)'.
EC	Internal Memory Error	Internal Memory Problem (EEPROM).
EE	Emergency Stop Error	・Activated when the Emergency Stop Signal is OFF (Open). ・During rotation, an emergency stop occurred by the Emergency Stop Signal turning OFF (Open).
EF1	FAN Malfunction (80 Square Type)	FAN has Stopped (80 Square Type).
EF2	FAN Malfunction (40 Square Type)	FAN has Stopped (40 Square Type).
EH	Over Speed	Rotating Speed is beyond the motors capability.
EL	Incompatible Motor	An unrecognizable motor is connected to the CONTROLLER.
EP	Motor Power Line Disconnected	Motor Cord (Power Line) Connector is not connected.
EFP	Parameter " P8 " Setting Error	A mistake has been made while setting Parameter ” E8 ”.
Et	Motor Overheat	The motors Internal Temperature has risen above an acceptable amount.
—	Unknown Error	An unknown error has occurred.
—	Error Occurred	An error has occurred.

<Warning Code Details>

Code	Contents	Description
A0	Motor Cord	Motor Cord or Connector are not connected or damaged.
A1	Low Air Pressure	Low Air Pressure during motor rotation.
A2	CONTROLLER Overheat	CONTROLLER Overheat.
A3	Over Load	Motor Torque Load exceeding safe limits.
A4	Emergency Stop Signal	Emergency Stop Signal 'OFF (Open) ' in Emergency Stop Mode Condition.
A5	Over Air Pressure	Excessive Air Pressure.
A6	Motor Overheat	The inside temperature of the motor has reached the warning level.
A7	Motor Power Line	Motor Power Line or Connector not connected or damaged.
AF	AF Fan Stopped Spindle Operation during FAN Malfunction	The fan has stopped but the motor is temporarily operational. While the warning code "AF" is displayed, the buzzer will sound.
—	Unknown Warning	An unknown warning has occurred.
—	Warning Occurred	A warning has occurred.

11–4 Data/Ready Details

<Data/Ready Details>

DATA_READY	Occurrence conditions
Set Model Abnormality	・None of model name (bit-0 to 4) is set or two or more are set. ・Unused parts (bit-5 to 15) are set.
Set Parameter Abnormality	・None of PARAM (bit-0 to 2) is set or two or more are set. ・None of PARAM (bit-3 to 5) is set or two or more are set.
Set Control Abnormality	・CTRL (bit-7) is set with the model name set to one of E3000/E4000/iSpeed5. ・A set speed abnormality has occurred. ・CTRL (bit-4, 5) is set when the motor speed setting is other than pulse. ・CTRL (bit-10, 11) is set when the motor speed setting is other than speed point. (excluding E3000)
Set Speed Abnormality	A value outside the allowable range is set for the motor speed control.
COMBOX Power Source Abnormality	The sensor power source (PW2) is down.
Controller Connection Abnormality	・The controller is not connected normally. ・The power source of the controller is not ON.

NOTICE
● "START" operation is disabled and the motor does not operate when the above error occurs. Check the error type, and remove its cause.

12 GLOSSARY

Term	Meaning
100Mbps	A transfer speed that indicates that 100,000,000 bits are transferred in one second.
Decimal number	A method of annotating numerical values with 10 taken as the radix.
Hexadecimal number	A method of annotating numerical values with 16 taken as the radix. With each digit movement, the value weight becomes either 16x or 1/16x.
Binary number	A method of annotating numerical values with 2 taken as the radix.
CNC	CNC stands for "computer numerical control." Computer numerical control.
D-Sub	A connector standard that is in popular use. It is mainly used for connecting peripheral devices to a computer. The connector shell is shaped like a "D".
D-Sub 25	A 25-pin connector with pins arranged in two rows having shell size B.
D-Sub 15	A 15-pin connector with pins arranged in two rows having shell size A.
High Density D-Sub15	A 15-pin connector with pins arranged in three rows having shell size E.
EDS file	File containing the settings required for setting up communication between connected devices.
EtherNet/IP	An industrial network (field network) using LAN cables.
Exclusive Owner	Used when performing input/output communication with output devices and input devices. While this connection is established, other connection requests are denied.
Implicit communication	Communication is performed at fixed cycles at each communication cycle (RPI) set by EtherNet/IP.
IP Address	Signal for identifying devices connected to a TDP/IP network. It comprises a network address and a host address.
LAN	A network in which two or more computers are connected in a limited area by a communication line to mutually transfer and share data.
NPN External input	A mode of inputting sensor signals that use NPN type transistor output for the connection terminals and signal input section on COMBOX-NET.EIP.
NPN sensor	A digital sensor that uses NPN type transistor output for the signal input section.
PC	This stands for "personal computer." Personal computer.
PLC	This stands for "programmable logic controller." A controller that performs sequential control in accordance with logical operations, sequential operation, arithmetic operation, and other types of programs.
PNP External input	A mode of inputting sensor signals that use PNP type transistor output for the connection terminals and signal input section on COMBOX-NET.EIP.
PNP sensor	A digital sensor that uses PNP type transistor output for the signal input section.
RPI	Requested Packet Interval: Transfer interval of input/output signals
STP cable	Stands for shielded twisted pair.
Adapter	A device on the controlled side.
Address	A number that indicates the position where data is stored in computer memory, hard disk or other auxiliary storage.
Analog	A way of expressing physical quantities or states that change continuously as continuous information.
Analog sensor	A sensor that outputs analog values.
Analog sensor input connector	A connector terminal on the COMBOX-NET.EIP for input from sensors that output analog values.
Interface	Connector or standard for connecting devices together.
Autonegotiation	A function that automatically optimizes the communication speed and communication method with connected peer devices.
Open collector	A type of output method on an electronic circuit. Specific voltage or current is not output directly as a single but is output via an NPN transistor like a switch.
Octet	A unit of digital information consisting of eight bits. Octets are used to delimit 32-bit IPv4 addresses into individual 8-bit units.
Category 5	Cable used for communication in the up to 100 MHz band.
Cable	A single electric wire or a bundle of two or more electrical wires that is covered with a sheath of insulating material such as vinyl.
Cable connector	Terminal part attached to a cable (cord) that is used for connection.

Term	Meaning
Code	Conventionally, this refers to an abbreviation, sign or cryptogram. "Cord" also refers to a type of electrical wire. A cord comprises electrical wire made by twisting multiple fine conductors and then covering these wires with a sheath. Generally, a pair of electrical wires comprise a single cord.
Connection	A virtual exclusive communication channel that is established between the software and device that is performing communication.
Connector	Connection terminal block attached to the main body.
Connector hood	Connector case.
Controller	Control unit for industrial turning machines made by Nakanishi.
Scanner	A device on the controlling side. CNC, PLC, PC, etc.
DIP switch	Compact switch having terminals in the same shape as a dual inline package (DIP) in an integrated circuit. There are two types, slide switch and rotary switch type.
Digital	A method where information is handled as a combination of the numbers 0 and 1 or ON and OFF.
Digital sensor	A sensor that outputs either ON or OFF.
Digital sensor input connector	A connector terminal on the COMBOX-NET.EIP for input of ON/OFF output from an NPN type or PNP type sensor.
Device	Unit, peripheral device or I/O device such as a mouse or printer.
Byte	An amount of information (data) expressed as a group of eight binary digits or bits.
Parameter	An externally assigned setting value.
Bit	The minimum unit of amount of information, a binary digit that is either in an ON or OFF (0 or 1) state.
Bit device	A contact for inputting or outputting either ON or OFF states used by the scanner.
Point-to-Point	A network protocol that enables a virtual exclusive transmission line to be established over Ethernet between two devices so that data can be stably sent and received between these two devices.
Motor	Industrial turning machine made by Nakanishi.
Motor spindle	Industrial turning machine made by Nakanishi, either an integrated type comprising a spindle and motor or a spindle and motor combined together.
Word	The number of bits that can be batch-processed as a single unit by a computer's CPU. Typically, on a 16-bit CPU, a word is 16 bits.
Insulated flathead screwdriver	A tool with a for screwing in screws with a straight groove in their head. This screwdriver is sheathed with insulated material.
Full duplex	A type of communication in which data can flow in two directions (i.e. sent and received) at the same time on the same carrier.
Half duplex	A type of communication in which data cannot be received while it is being sent on the same carrier, and vice versa.
Tag	The smallest unit of data that is exchanged on an EtherNet/IP network. Tags are defined as network variable names or physical addresses, and are assigned to memory area in each device.
Node	Controllers and devices are connected to an EtherNet/IP network via the EtherNet/IP port. EtherNet/IP recognizes each EtherNet/IP port connected to the network as a single node. When a device mounted with two EtherNet/IP ports is connected to the EtherNet/IP network, EtherNet/IP recognizes this device as two nodes. EtherNet/IP achieves communication between controllers and between controllers and devices by exchanging data between these nodes connected to the network.
Connection	The unit of data exchange in which data synchrony is assured is called a "connection." When a connection is established, the tags and tag sets that comprise that connection are exchanged synchronously between designated nodes. Connections comprise tags. Starting a synchronous communication between designated nodes is called "establishing a connection."
Star topology	A type of network topology made using LAN cables. With this topology, LAN cables radiate outwards from a connection device in the center called a hub. This topology is called a "star topology" as the connections make it look like a star.

13 TROUBLESHOOTING

If a problem or concern occurs, please check the following prior to consulting your dealer.

	Problem	Description/ Probable Cause	How To Check Cause	Remedy
1	PW1 LED out	Defective power source wiring	Check the connection of the power connector and the cable for wire breaks.	Re-connect the power connector. Replace the cable if there is a wire break.
				Correctly wire the power connector wiring.
		Defective power supply	Check the supply voltage to the power source.	Supply 24 VDC±10%.
		Blow fuse	Check the supply voltage to the power source.	Correct by repair. (Return to NAKANISHI dealer service.)
2	PW2 LED out	Defective power source wiring	Check the connection of the power connector and the cable for wire breaks.	Re-connect the power connector. Replace the cable if there is a wire break.
				Correctly wire the wires of the power connector.
		Defective power supply	Check the supply voltage to the power source.	Supply 24 VDC±10%.
		Blow fuse	Check the supply voltage to the power source.	Correct by repair. (Return to NAKANISHI dealer service.)
3	L/A LED out	Communication error with EtherNet/IP device higher up in network hierarchy.	Check the status of the EtherNet/IP device higher up in network hierarchy.	Turn the EtherNet/IP device higher up in network hierarchy ON again.
			Check the connection of the LAN cable and the cable for wire breaks.	Re-connect the LAN Cable. Replace the cable if there is a wire break.
			Check the LAN cables and scanner, and around the COMBOX-NET.EIP for devices or high-voltage lines that may be sources of noise.	Remove the noise source or adopt measures such as removing the noise source further away.
4	CN LED out	Defective power source wiring	Check the connection of the D-Sub 25 cable and the cable for wire breaks.	Re-connect the D-Sub 25 Cable. Replace the cable if there is a wire break.
				Correctly wire the D-Sub 25 cable wiring.
5	MS LED out (green/red out)	Defective power source wiring	Check the connection of the power connector and the cable for wire breaks.	Re-connect the power connector. Replace the cable if there is a wire break.
				Correctly wire the power connector wiring.
		Defective power supply	Check the supply voltage to the power source.	Supply 24 VDC±10%.
6	MS LED lit (red)	Defective scanner	Replace the scanner, and check if operation is normal.	Replace the scanner.
7	MS LED flashing (red)	Scanner status error	Check around the power source line for devices or high-voltage lines that may be sources of noise.	Remove the noise source or adopt measures such as removing the noise source further away.
8	MS LED flashing (green)	Defective device settings	Check the device settings.	Re-load the EDS file.
9	NS LED out (green/red out)	IP address not set	Check the IP address setting.	Set the IP address.
10	NS LED lit (red)	IP address duplicated error	Check if the IP address is duplicated.	Set a unique IP address.

	Problem	Description/ Probable Cause	How To Check Cause	Remedy
11	NS LED flashing (red)	Communication time-out	Check the connection of the LAN cable and the cable for wire breaks.	Re-connect the LAN Cable. Replace the cable if there is a wire break.
			Check around the communication line for devices or high-voltage lines that may be sources of noise.	Remove the noise source or adopt measures such as removing the noise source further away.
12	NS LED flashing (green)	Connection standing by	Check that the scanner is operating normally.	Referring to the Operation Manual of the scanner, set to the correct settings.
		Defective communication settings	Check if the scanner settings are matched to the settings in "6-1 Communication Specifications."	Review the communication settings.
				Re-load the EDS file.
		Defective communication connection	Check the connection of the LAN cable and the cable for wire breaks.	Re-connect the LAN Cable. Replace the cable if there is a wire break.
13	Motor does not run	Data/ready occurred	Check if one of the data/ready bits is not ON.	Referring to "11-4 Data/Ready Details," remove the cause of the error.
		Defective bit setting	Check if currently set bits are correct.	Correctly set the addresses and the bit arrangement of the I/O data currently set on the scanner.
14	Value displayed on controller does not match the motor speed control value.	Defective bit setting	Check if currently set bits are correct.	Match the TYPE and PARAM settings to the controller parameter settings.
		Motor spindle type does not match	Check if the motor speed range of the currently used motor spindle matches the setting.	Referring to "11 COMBOX-NET.EIP I/O DATA <Motor Speed Setting>", set to the correct combination.

*Also check the Operation Manual of the controller and motor spindle in use in addition to the above.

14 PRODUCT DISPOSAL

When disposal of products is necessary, follow the instructions from your local government agency for proper disposal of industrial components.

APPENDICES

<List of Front Panel LEDs>

	Code	Signal Code	Signal Name	LED Lighting Condition	
STATUS	PW1	PW1	Main power source	24 VDC for main power is applied	
	PW2	PW2	Sensor power source	24 VDC for sensor power is applied	
	CN	CN	Controller connection	D-Sub 25 connector is connected	
	MS	MS	Device status	According to device operating status	*
	NS	NS	Network status	According to network communication status	*
CONNECTOR A IN	1	RUN	Rotating	Rotating	
	2	DIR_OUT	Rotating Direction	Reverse rotation is selected	
	3	COIN	Speed Achievement	Speed Achievement	
	4	PULSE	Rotating Pulse	Rotating pulse is input (flashing during rotation)	
	5	SEL_MT	Select Motor	Motor No.2 is selected (E2280 in use)	
	6	SEL_MT	Select Motor	Motor No.2 is selected (iSpeed3 in use)	
	ERR	ERR	Error	Error occurred, flashing when code is selected	
	WRN	WRN	WARNING	Warning occurred, flashing when code is selected	
CONNECTOR A OUT	1	START	Rotate Command	Rotation is instructed	
	2	DIR_IN	Rotating Direction	Reverse rotation is instructed	
	3	RESET	Error Release	Error release is instructed	
	4	500min^{-1}	500min^{-1}	Motor speed 500 min^{-1} is selected	
	5	SEL0	Speed Point Select 0	Speed point 0 is selected	
		UD_IN	UP/DOWN Signal for Setting Motor Speed	Speed setting UP is instructed (E2280 in use)	
	6	SEL1	Speed Point Select 1	Speed point 1 is selected	
		CNT_IN	Count Pulse Signal for Setting Motor Speed	Count pulse signal setting motor speed is input (E2280 in use)	
	7	CNT_IN	Count Pulse Signal for Setting Motor Speed	Count pulse signal for setting motor speed is input	
	8	UD_IN	UP/DOWN Signal for Setting Motor Speed	Speed setting UP is instructed	
		MT_SEL	Motor Select	Motor No.2 is selected (E2280 in use)	
	9	MT_SEL	Motor Select	Motor No.2 is selected (iSpeed3 in use)	
		ID0	Motor Class Signal 0	Motor class No.1 is selected (iSpeed5 in use)	
	10	ID1	Motor Class Signal 1	Motor class No.2 is selected (iSpeed5 in use)	
CONNECTOR B	1	MT-CN	Motor Connect Contact	Motor is disconnected	
	2	SAFE1	Safety Relay 1	・Auxiliary contact is ON ・Motor 2 is selected (E2280, iSpeed3 in use)	
	3	SAFE2	Safety Relay 2	・Auxiliary contact is ON ・Motor 1 is selected (E2280, iSpeed3 in use)	
	4	AUTO	Control Mode AUTO Signal	Control Mode AUTO Signal	
	5	PWON	CONTROLLER Power Source Monitor	Controller power source is detected	
	EMG	EMG	Emergency Stop	Emergency stop is in progress	
SENSOR	1	S-OUT1	Digital sensor 1	Digital sensor 1 is ON	
	2	S-OUT2	Digital sensor 2	Digital sensor 2 is ON	

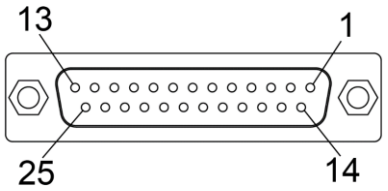
*For details, see "8-1 COMBOX-NET.EIP Front Panel LED Display <Details of MS, NS lighting>."

■ Details of COMBOX-NET.EIP D-Sub Terminals

<External Input/Output A (EXIT I/O-A) D-Sub 25 Connection>

Terminal No.	Terminal Code	Part Name	Remarks
1	COM_1	External Power Source for External Output	+24 V
2	DIR_IN	Rotating Direction Setting	—
3	CNT_IN	Count Pulse Signal for Setting Motor Speed	Other than E2280
	VR2	Motor No. 2 Speed Control Voltage	E2280
4	RESET	Error Release	—
5	SEL1	Speed Point Select 1	All models + point settings
		Count Pulse Signal for Setting Motor Speed	E2280 + pulse settings
		Motor Select 1	E3000 + selector
6	RUN	Rotating	—
7	DIR_OUT	Rotating Direction	—
8	ERR	Error	—
9	SEL_MT	Select Motor Signal	E2280
	MT_SEL	Motor Select Signal	iSpeed3
	ID0	Motor Class Signal 0	iSpeed5
10	GND	Internal GND for Motor Speed Control Voltage	—
	SEL_MT	Select Motor Signal	iSpeed3
11	Vcc	Internal Power Source for Motor Speed Control Voltage	10 V Input
12	MOTOR_I	Motor Current Monitor	—
13	GND	Internal GND for Analog Monitor	—
14	START	Rotate Command	—
15	UD_IN	UP/DOWN Signal for Setting Motor Speed	Other than E2280
	MT_SEL	Motor Select	E2280
16	500min^{-1}	Motor speed 500 min^{-1}	E3000, E4000, E2280
17	SEL0	Speed Point Select 0	All models + point settings
		UP/DOWN Signal for Setting Motor Speed	E2280 + pulse settings
		Motor Select 0	E3000 + selector
18	COM_2	External Power Source for External Output	+24 V
19	PULSE	Rotating Pulse	—
20	WARNING	WARNING	—
21	COIN	Speed Achievement	—
22	VR2	Motor No. 2 Speed Control Voltage	iSpeed3
	ID1	Motor Class Signal 1	iSpeed5
23	VR(1)	(Motor No. 1) Speed Control Voltage	—
24	LOAD	Torque Load Monitor	—
25	SPEED_V	Rotating Speed Analog Monitor Voltage	—

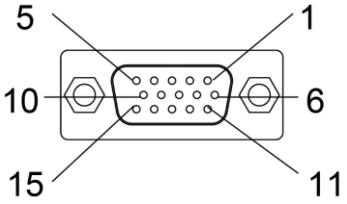
External Input/Output A (EXIT I/O-A)
D-Sub 25 Socket



<External Input/Output B (EXIT I/O-A) High-density Type D-Sub 15 Connection>

Terminal No.	Terminal Code	Part Name	Remarks
1	EMG-INA	Emergency Stop A	+24 V
2	MT-CNA	Motor Connect Contact A	+24 V
3	SAFE-1A	Safety Relay Contact 1A	+24 V
4	SAFE-2A	Safety Relay Contact 2A	+24 V
5	AUTO+	Control Mode AUTO Signal (+)	+24 V
6	PWON+	CONTROLLER Power Source Monitor (+)	+24 V
7	—	—	—
8	—	—	—
9	EMG-INB	Emergency Stop B	—
10	MT-CNB	Motor Connect Contact B	—
11	SAFE-1B	Safety Relay Contact 1B	—
12	SAFE-2B	Safety Relay Contact 2B	—
13	AUTO-	Control Mode AUTO Signal (-)	—
14	PWON-	CONTROLLER Power Source Monitor (-)	—
15	—	—	—

External Input/Output B (EXIT I/O-B)
High-density Type D-Sub 15 Socket



<COMBOX-NET.EIP Parameter Settings of Connected Controller>

Types	Setting	Set Contents	Setting	Set Contents	Setting	Set Contents	E3000		E4000		E2280		iSpeed3		iSpeed5	
							Parameter	Value	Parameter	Value	Parameter	Value	Parameter	Value	Parameter	Value
Setting of Error Output Mode	OFF	Error Occurred : Signal is 'OFF'.	ON	Error Occurred : Signal is 'ON'.	Cd	Error Code	P1	Select	P1	Select	P1	Select	P1	Select	P1	Select
Setting AUTO Mode for Motor Speed Control	OFF	External Input/Output Connector	ON	Control Panel	—	—	P2	OFF	P2	OFF	P2	OFF	P2	OFF	P2	OFF
(Motor No.1) Setting Fixed Motor Speed	OFF	Fixed Motor Speed is enabled.	ON	Fixed Motor Speed is not enabled.	—	—	P3	OFF	P3	OFF	P3	OFF	P3	OFF	P3	OFF
Motor No.2 Setting Fixed Motor Speed	OFF	Fixed Motor Speed is enabled.	ON	Fixed Motor Speed is not enabled.	—	—	—	—	—	—	P4	OFF	—	—	—	—
(Motor No.1) Setting Maximum Motor Speed	OFF	Setting of Maximum Motor Speed is not enabled.	ON	Setting of Maximum Motor Speed is enabled.	—	—	P4	OFF	P4	OFF	P5	OFF	P4	OFF	P4	OFF
Motor No.2 Setting Maximum Motor Speed	OFF	Setting of Maximum Motor Speed is not enabled.	ON	Setting of Maximum Motor Speed is enabled.	—	—	—	—	—	—	P6	OFF	—	—	—	—
Selection of External Speed Control Mode	An	Set speed by Analog Signal.	Cn	Set speed by Pulse Signal.	Po	Set speed by Speed Point Signal.	P5	Select	P5	Select	P7	Select	P5	Select	P5	Select
Selection of External Motor Start Signal Control Mode	OFF	Motor startup and rotating direction is not commanded by signal.	ON	The startup motor with FWD. rotation or the startup motor with REV. rotation.	—	—	P6	OFF	P6	OFF	P8	OFF	P6	OFF	P6	OFF
Selection of Air Input Monitoring Override	OFF	Air pressure is supplied.	ON	Air pressure is not supplied.	—	—	P7	OFF	—	—	P9	OFF	—	—	—	—
Selection of Motor Speed Control Voltage / DC+10V Signal Method	OFF	The characteristics of the motor's maximum rotation speed 60,000 min^{-1} (rpm).	ON	The characteristics of the motor's maximum rotation speed 80,000 min^{-1} (rpm).	—	—	P8	Select	—	—	—	—	—	—	—	—
Selection of Motor Speed Control Voltage/DC+10V Signal Method	OFF	The characteristics of the motor's maximum rotation speed 50,000 min^{-1} (rpm).	ON	The characteristics of the motor's maximum rotation speed 30,000 min^{-1} (rpm).	—	—	—	—	—	—	PA	Select	—	—	—	—
Setting of Motor Acceleration and Deceleration Time	OFF	Default	ON	Desired Acceleration and Deceleration Time	—	—	—	—	P7	OFF	—	—	P7	OFF	P7	OFF

Types	Setting	Set Contents	Setting	Set Contents	Setting	Set Contents	E3000		E4000		E2280		iSpeed3		iSpeed5	
							Parameter	Value	Parameter	Value	Parameter	Value	Parameter	Value	Parameter	Value
Selection of Emergency Stop Function	OFF	Emergency Stop Function is deactivated.	ON	Emergency Stop Function is activated.	—	—	P9	Select	—	Option	Pb	Select	P8	Select	P8	Select
Speed Achievement Level Setting	OFF	Default	ON	Desired Speed Achievement Level	—	—	—	—	—	—	—	—	P9	OFF	P9	OFF
Temporary Motor/Spindle Operation if FAN has Stopped (80 Square Type)	OFF	Motor Stop	F1	Motor operation (w/o warning)	F2	Motor operation (w/ warning)	—	—	P8	OFF	—	—	—	—	—	—
Error History	—	—	—	—	—	—	PA	—	P10	—	PE	—	P10	—	—	—
Confirmation of Parameter Setting	—	—	—	—	—	—	Pb	—	P9	—	Pd	—	P11	—	—	—
Selection Illumination	—	—	—	—	—	—	—	—	—	—	Pc	—	—	—	—	—
Confirmation of Program Version	—	—	—	—	—	—	—	—	—	—	Pn	—	—	—	—	—

NOTICE

- This is the specification for only the rotation ON/OFF function unless the motor speed setting is set to OFF in the AUTO mode. When the motor speed is fixed, rotation does not change even if the motor speed is instructed by COMBOX-NET.EIP.
- When Air Input Monitoring is set to OFF, the Maximum Motor Speed is limited, and control by COMBOX-NET.EIP is no longer possible.
- When Selection of External Motor Start Signal Control Mode is set to ON, rotation can no longer be controlled

■ COMBOX-NET.EIP Output/Input List

I/O addresses are annotated every 16 bits. n is the initial address set by the scanner.

< Output Data (COMBOX-NET.EIP→Scanner) >

Bit								Contents	Initial Address (Every 16 bits)
7	6	5	4	3	2	1	0		
—	—	—	iSpeed5	iSpeed3	E2280	E4000	E3000	Model Name 2 byte	n+0x00
—	—	—	—	—	—	—	—		
—	—	Controller Connection Abnormality	COMBOX Power Source Abnormality	Set Speed Abnormality	Set Control Abnormality	Set Parameter Abnormality	Set Model Abnormality	Confirmation of Data/Ready 2 byte	n+0x01
—	—	—	—	—	—	—	—		
SAFE2	SAFE1	PWON (PWOFF)	AUTO (MANUAL)	MT-CN	COIN	DIR_OUT (FWD,REV)	RUN(STOP)	Monitor① 2 byte	n+0x02
—	—	—	—	—	—	—	—		
S-OUT2	S-OUT1	—	—	—	—	SEL_MT (iSpeed3)	SEL_MT (E2280)	Monitor② 2 byte	n+0x03
—	—	—	—	—	—	—	—		
Other than iSpeed3, 0-2000x10 mA (binary) iSpeed3, 0-1000x10 mA (binary)					MOTOR _DT			Motor Current Monitor 2 byte	n+0x04
0-200% (binary)					LOAD_DT			Torque Load Monitor 2 byte	n+0x05
0-10000x10 min^{-1} (binary)					SPD_DT			Motor Speed (Voltage) 2 byte	n+0x06
0-5000 mV (binary)					SNS1			Sensor Voltage Output 1 2 byte	n+0x07
0-5000 mV (binary)					SNS2			Sensor Voltage Output 2 2 byte	n+0x08
0-10000x10 min^{-1} (binary)					SPD_PULSE			Motor Speed (Pulse) 2 byte	n+0x09
E8 Torque Over Load	E7 Low Air Pressure	E6 Rotor Lock	E5 Break Circuit Trouble	E4 CONTROLLER overheat	E3 Motor Sensor Malfunction	E2 Over Voltage	E1 Excess Current	Error Code(1) 2 byte	n+0x0A
EL Incompatible Motor	EH Over Speed	EE Emergency Stop Error	—	EC Internal Memory Error	—	EA External Control Signal Error	E9 Communication Interception		
—	—	—	EFP Parameter "P8" Setting Error	EF2 FAN Malfunction (40 Square Type)	EF1 FAN Malfunction (80 Square Type)	ET Motor Overheat	EP Motor Power Line Disconnected	Error Code(2) 2 byte	n+0x0B
—	—	—	—	—	—	—	—		
—	—	—	—	—	—	—	—	Error Code(3) 2 byte	n+0x0C
Error Occurred	Unknown Error	—	—	—	—	—	—		
A7 Motor Power Line	A6 Motor Overheat	A5 Over Air Pressure	A4 Emergency Stop Signal	A3 Over Load	A2 CONTROLLER Overheat	A1 Low Air Pressure	A0 Motor Cord	Warning Code(1) 2 byte	n+0x0D
—	—	—	—	—	—	—	AF Fan Stopped		
—	—	—	—	—	—	—	—	Warning Code(2) 2 byte	n+0x0E
Warning Occurred	Unknown Warning	—	—	—	—	—	—		

< Input Data (Scanner→COMBOX-NET.EIP) >

Bit								Contents	Initial Address (Every 16 bits)
7	6	5	4	3	2	1	0		
—	—	—	iSpeed5	iSpeed3	E2280	E4000	E3000	Model Name 2 byte	n+0x10
—	—	—	—	—	—	—	—		
EM-3030T Selection	Motor Speed Characteristics	Speed Point	Pulse	Analog	Error Code	Signal 'ON' at Error	Signal 'OFF' at Error	Parameter 2 byte	n+0x11
—	—	—	—	—	—	—	—		
MT_SEL	500min^{-1}	UD_IN/ SEL0	CNT_IN/ SEL1	EMG	RESET	DIR_IN	START	Command Data 1	n+0x12
—	—	—	—	SEL1	SEL0	ID1	ID0	Command Data 2	
E3000, E2280, Motor Speed Control 1-80 (binary) E4000, iSpeed3, iSpeed5, Motor Speed Control 10-800 (binary)								Motor Speed Control 2 byte	n+0x13

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