CONOTEC®
www.conotec.co.kr

ISO 9001:2008

USER GUIDE   FOX-5CH

♦ 5 channels abnormal signal detector
♦ Alarm output : 1a Relay(AC250V 2A)
♦ RS 485 communication support

※ FOX-5CH displays on the screen by detecting a variety of abnormal signal in the five external inputs terminal and delivers information to the top device through RS485 communication. In addition, contact output can be given at detecting abnormal signal by preparing 1 alarm output relay.

※Thanks for purchasing Conotec product.
This user guide is distributed to prevent damage and failure caused by negligence and informs the proper use. Please keep this for future reference if you have any questions on usage. Please visit our web-site to download the latest version of English user guide.

1 Model Configurations

Model	Input	Output	Communication	Input power
FOX-5CH	Static 5CH	1a 250Vac 2A	RS485	AC230V 50/60Hz

2 Safety Precautions

Please read the safety precautions carefully prior to using and ensure the correct use.
※The specifications, outer dimension stated in this guide are subject to change without prior notice to improve the performance of the product.

⚠ Warning

1. This product should be used after installing the double safe device in case of using control purpose such as a device with great concern to personal injury and damage, significant peripheral damage, and property damage as it is not manufactured as safety device.
2. Do not connect, check, repair when at the power supplying state.
3. Must check the terminal number prior to power connecting.
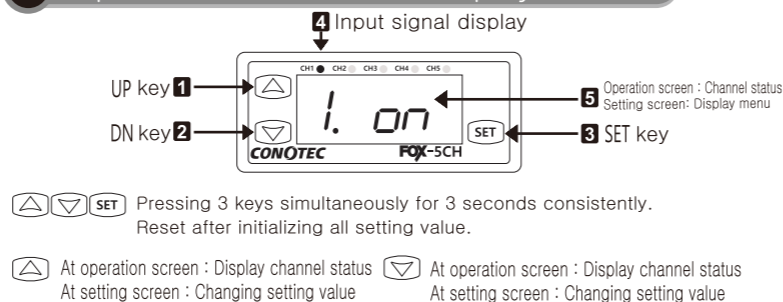4. Never disassemble, operate, improve, and repair of this device.

⚠ Caution

1. Please read carefully about how to use, safety regulations, and warning prior to install this device and must use within defined specification or relevant capacity.
2. Do not make wiring or installing in the big motor has a big inductive load and solenoid.
3. Please use shielding wire at the sensor extension and do not make it unnecessarily long.
4. Do not use the parts that generate the arc at same power or near directly opening and closing.
5. Power line should be kept away from high-voltage line and do not install in the watery, oily, and dusty place.
6. Do not install this device in a place exposed to direct sunlight or rain.
7. Do not install this device in a place with strong magnetism, noise, vibration, and shock.
8. Keep away from the place where strong alkali and acidic substances are detected and use an independent plumbing.
9. Do not spray water directly for the purpose of cleaning at installing it in the kitchen.
10. Do not install in a place that temperature/ humidity exceeds the rating.
11. Use it without disconnecting the sensor line or scratching.
12. Sensor line should be kept away signal, power, and load lines, and use an independent piping.
13. Please note that this product is not follow-up managed at disassemble or remodeling at your discretion.
14. The signal of ⚠ displayed in the terminal wiring diagram is the safety statement of warning or caution.
15. Do not use near where devices generate strong high-frequency noise (high-frequency welders, high-frequency sewing machine, high frequency radios, large SCR controller).
16. If you use this device beyond the method specified by the manufacturer, it may cause injury or property damage.
17. Keep out of reach of children as this device is not a toy.
18. The device only be installed by relevant specialist or qualified worker.
19. The company will not accept any liability in respect of such cases that customer does not comply with the warning or caution wording stated in the above or damages caused by negligence of the customer.
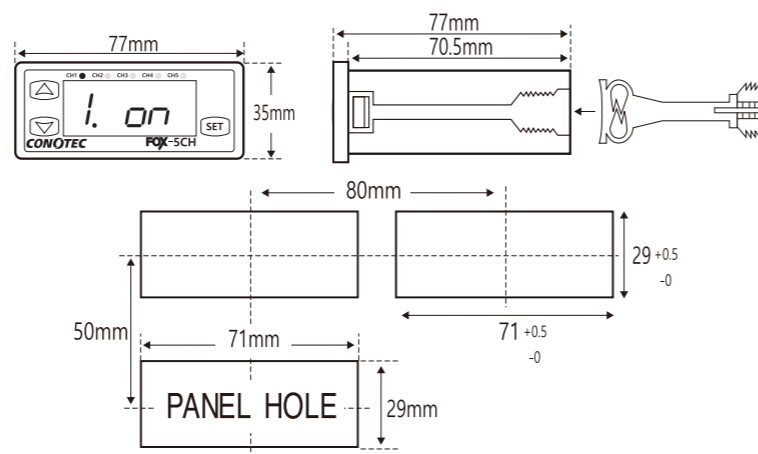
⚠ Risk

■Caution, risk of electric shock.

1. Electrical shock – Do not touch at the AC terminal during the application of an electric current.
2. Must shut off the input power during the input power check.

3 Operation and name of display

4 Input signal display

UP key 1
DN key 2
5 Operation screen : Channel status / Setting screen: Display menu
3 SET key

CONOTEC FOX-5CH

⚠⚠SET Pressing 3 keys simultaneously for 3 seconds consistently. Reset after initializing all setting value.

▲ At operation screen : Display channel status / At setting screen : Changing setting value

▽ At operation screen : Display channel status / At setting screen : Changing setting value
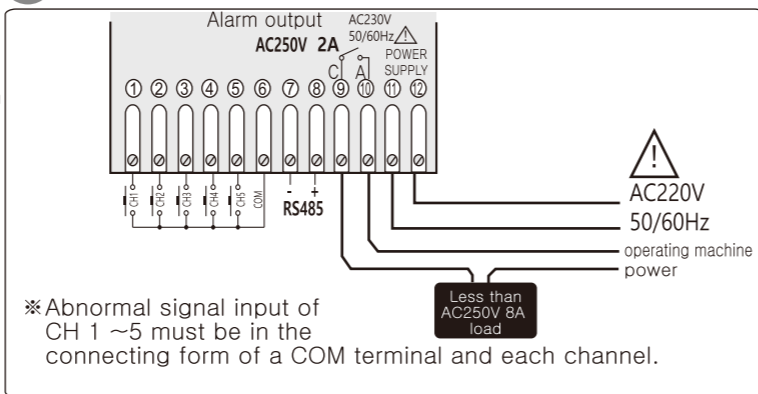
SET PRESS once: changing setting temperature, pressing for 5 seconds consistently: enter into the detail setting change mode.)

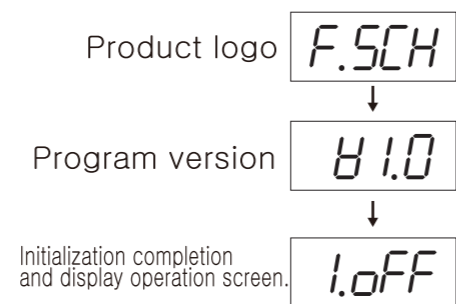## 4 Product appearance specifications and panel cutout dimensions

77mm
77mm
70.5mm
35mm
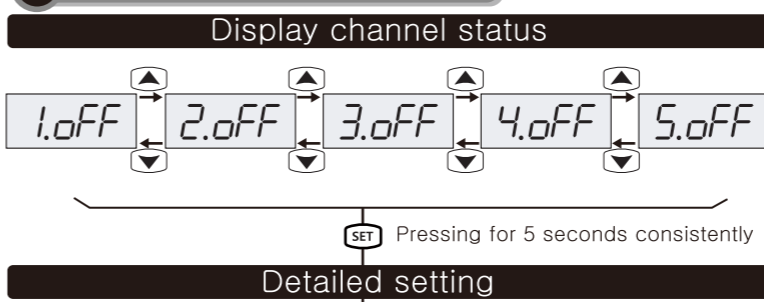
CONOTEC FOX-5CH

80mm
50mm
71mm
29 +0.5 -0
71 +0.5 -0

PANEL HOLE
29mm

5 Terminal wiring diagram

Alarm output
AC250V 2A
AC230V 50/60Hz
C A POWER SUPPLY
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫
RS485
AC220V 50/60Hz
operating machine power
⚠ Less than AC250V 8A load

※Abnormal signal input of CH 1 ~5 must be in the connecting form of a COM terminal and each channel.

6 Logo at the power input

Product logo   F.5CH
↓
Program version   H1.0
↓
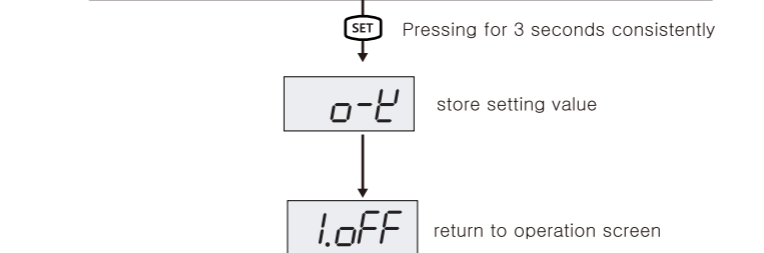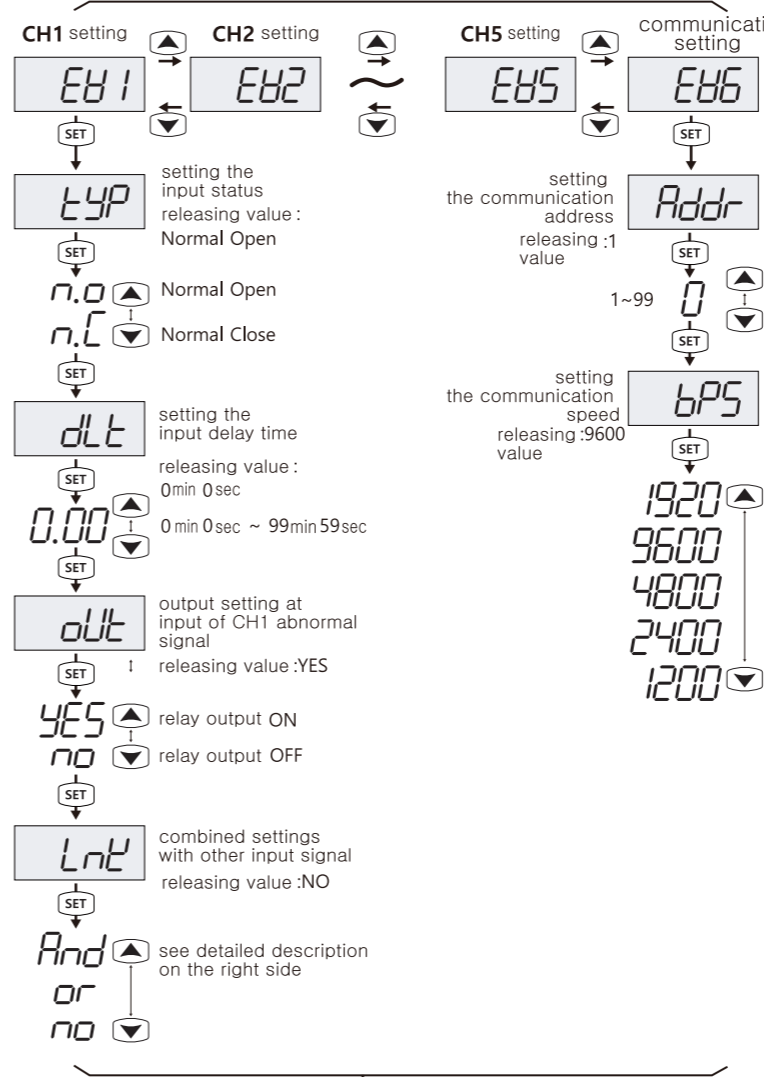Initialization completion and display operation screen.   1.oFF

Please check input power when product logo is continuously displayed as it indicates that power supply is unstable.

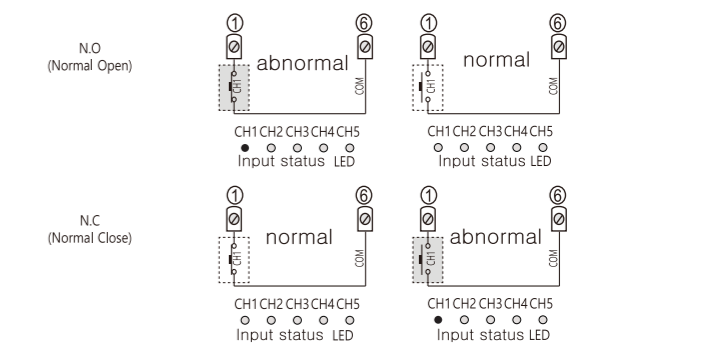⚠ Warning. Unstable power supply can lead to damage of the internal memory.

7 How to set program

Display channel status

1.oFF ↔ 2.oFF ↔ 3.oFF ↔ 4.oFF ↔ 5.oFF

SET Pressing for 5 seconds consistently

Detailed setting

CH1 setting   CH2 setting   CH5 setting   communication setting

EH1   EH2   EH5   EH6

SET

tYP   setting the input status releasing value : Normal Open
SET
n.o   Normal Open
n.C   Normal Close
SET
dLt   setting the input delay time releasing value : 0min 0sec
0.00   0 min 0 sec ~ 99min 59sec
SET
oUt   output setting at input of CH1 abnormal signal releasing value :YES
YES   relay output ON
no   relay output OFF
SET
LnH   combined settings with other input signal releasing value :NO
SET
And
or
no   see detailed description on the right side

Addr   setting the communication address releasing :1 value
SET
0   1~99
SET
bPS   setting the communication speed releasing :9600 value
SET
1920
9600
4800
2400
1200

SET Pressing for 3 seconds consistently

o-H   store setting value
↓
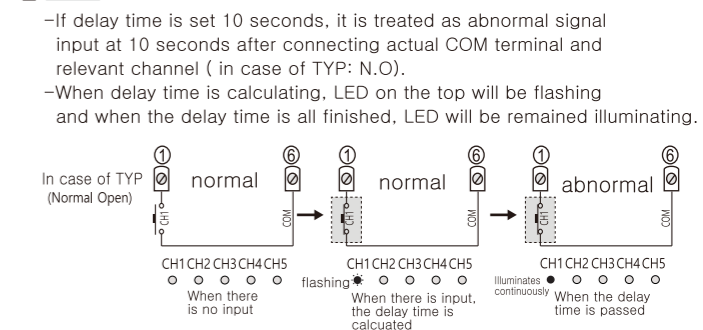1.oFF   return to operation screen

1 EH1 EH2 EH3 EH4 EH5   Setting group by channel from input 1 to 5.

2 EH6   Setting menu group for RS485 communication.

3 tYP Setting the input signal form

- N.O(Normal Open) : When it is connected to the COM terminal, it is treated as abnormal signal input.
- N.C(Normal Close) : When it is not connected to the COM terminal, it is treated as abnormal signal input.

N.O (Normal Open)   abnormal   normal
CH1 CH2 CH3 CH4 CH5   Input status LED

N.C (Normal Close)   normal   abnormal
CH1 CH2 CH3 CH4 CH5   Input status LED

4 dLt Setting the input delay time

- If delay time is set 10 seconds, it is treated as abnormal signal input at 10 seconds after connecting actual COM terminal and relevant channel (in case of TYP: N.O).
- When delay time is calculating, LED on the top will be flashing and when the delay time is all finished, LED will be remained illuminating.

In case of TYP (Normal Open)   normal → normal → abnormal
When there is no input   When there is input, the delay time is calculated   Illuminates continuously When the delay time is passed

5 oUt Setting the output at abnormal signal input

- When the alarm signal is detected by each channel, select whether to output or not through the alarm relay.
- OUT: If there are several input set to YES, relay output is turned ON even if at least one abnormal signal is detected.

6 LnH Combined settings with other input signal

- AND: Before all input set to AND does not detect abnormal signal, any input set to AND does not judge as abnormal signal detection.
Ex) When the LINK menu of CH1, CH2, and CH3 are not set to AND.

	signal input	abnormal signal input processing		signal input	abnormal signal input processing
CH1	O	X	CH1	O	O
CH2	X	X	CH2	O	O
CH3	X	X	CH3	O	O

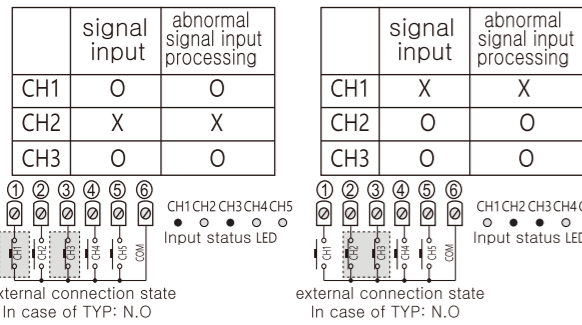external connection state In case of TYP: N.O   external connection state In case of TYP: N.O

- OR: If one of any of input set to OR detects the abnormal signal, all channel set to OR is treated as abnormal signal.
Ex) When the LINK menu of CH1, CH2, and CH3 are not set to OR.

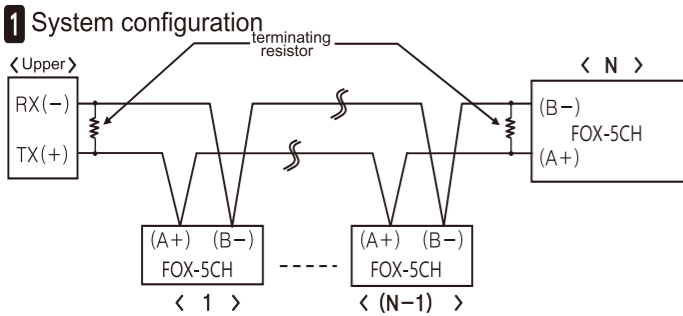|	signal input	abnormal signal input processing		signal input	abnormal signal input processing
CH1	O	O	CH1	X	O
CH2	X	O	CH2	X	O
CH3	X	O	CH3	O	O

-NO: Abnormal signal handling of corresponding input channel does not interlink with other signal and handles independently.
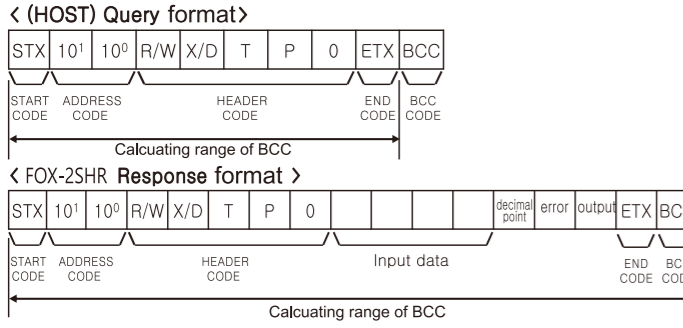Ex) When the LINK menu of CH1, CH2, and CH3 are not set to OR.

	signal input	abnormal signal input processing		signal input	abnormal signal input processing
CH1	O	O	CH1	X	X
CH2	X	X	CH2	O	O
CH3	O	O	CH3	O	O

① ② ③ ④ ⑤ ⑥   CH1 CH2 CH3 CH4 CH5   Input status LED

external connection state In case of TYP: N.O

① ② ③ ④ ⑤ ⑥   CH1 CH2 CH3 CH4 CH5   Input status LED

external connection state In case of TYP: N.O

7 *Addr* RS485 communication address
– A communication address to match when the top device and RS485 are communicated.
– It should be set identical to FOX-5CH address registered in a top device.

8 *bPS* RS485 communication speed
– A communication speed when top device and RS485 are communicated.
– Should set same communication speed of top device and FOX-5CH.

8 Communication specifications

Applicable Standards	EIA RS485 Compliance
Communication method	2-wire half-duplex
Synchronous manner	Non-synchronous manner
Communication distance	Within 1.2Km
Communication speed	1200/2400/4800/9600/19200Bps(select)
StartBit	Fix to 1bit
StopBit	Fix to 1bit
ParityBit	N/A
DataBit	Fix to 8bit
Protocol	BCC

1 System configuration

⟨Upper⟩   terminating resistor   ⟨ N ⟩
RX(−)
TX(+)
(B−) FOX-5CH (A+)

(A+) (B−) FOX-5CH ⟨ 1 ⟩ -----   (A+) (B−) FOX-5CH ⟨ (N−1) ⟩

2 Definition of Communication Command and Block

⟨ (HOST) Query format⟩

STX	10¹	10⁰	R/W	X/D	T	P	0	ETX	BCC

START CODE   ADDRESS CODE   HEADER CODE   END CODE   BCC CODE

Calcuating range of BCC

⟨ FOX-2SHR **Response format** ⟩

STX	10¹	10⁰	R/W	X/D	T	P	0	decimal point	error	output	ETX	BCC

START CODE   ADDRESS CODE   HEADER CODE   Input data   END CODE   BCC CODE

Calcuating range of BCC

① START CODE
Indicates the beginning of the BLOCK.
STX → [02H]
② ADDRESS CODE
Top system is the station CODE to identify FOX-5CH and can be set within the range of 01~99(BCD ASCII).

if communication address is | 10¹ | 10⁰ | is 5.
set in the product   0x30   0x35

③ HEADER CODE : Indicates the name of COMMNAD to the character.
RX(reading requirement) → R[52H], X[58H]
IP0(temp. measured value)→>I[49H],P[50H],0[30H]
RX(reading response) → R[52H], D[44H]
WX(writing requirement) → W[57H], X[58H]
WD(writing response) → W[57H], D[44H]
④ DATA Composition : Data is expressed to 16 Hexadecimal.

Abnormal signal detection state of each channel					16 Hexa –decimal	Transfer data column			
CH5	CH4	CH3	CH2	CH1		8	9	10	11
X	X	X	X	X	0000H	0x30	0x30	0x30	0x30
X	X	X	X	O	0001H	0x30	0x30	0x30	0x31
X	X	X	O	X	0002H	0x30	0x30	0x30	0x32
X	X	X	O	O	0003H	0x30	0x30	0x30	0x33
X	X	O	X	X	0004H	0x30	0x30	0x30	0x34
X	X	O	X	O	0005H	0x30	0x30	0x30	0x35
X	X	O	O	X	0006H	0x30	0x30	0x30	0x36
X	X	O	O	O	0007H	0x30	0x30	0x30	0x37
X	O	X	X	X	0008H	0x30	0x30	0x30	0x38
X	O	X	X	O	0009H	0x30	0x30	0x30	0x39
X	O	X	O	X	000AH	0x30	0x30	0x30	0x41
X	O	X	O	O	000BH	0x30	0x30	0x30	0x42
X	O	O	X	X	000CH	0x30	0x30	0x30	0x43
X	O	O	X	O	000DH	0x30	0x30	0x30	0x44
X	O	O	O	X	000EH	0x30	0x30	0x30	0x45
X	O	O	O	O	000FH	0x30	0x30	0x30	0x46
O	X	X	X	X	0010H	0x30	0x30	0x31	0x30
O	X	X	X	O	0011H	0x30	0x30	0x31	0x31
O	X	X	O	X	0012H	0x30	0x30	0x31	0x32
O	X	X	O	O	0013H	0x30	0x30	0x31	0x33
O	X	O	X	X	0014H	0x30	0x30	0x31	0x34
O	X	O	X	O	0015H	0x30	0x30	0x31	0x35
O	X	O	O	X	0016H	0x30	0x30	0x31	0x36
O	X	O	O	O	0017H	0x30	0x30	0x31	0x37
O	O	X	X	X	0018H	0x30	0x30	0x31	0x38
O	O	X	X	O	0019H	0x30	0x30	0x31	0x39
O	O	X	O	X	001AH	0x30	0x30	0x31	0x41
O	O	X	O	O	001BH	0x30	0x30	0x31	0x42
O	O	O	X	X	001CH	0x30	0x30	0x31	0x43
O	O	O	X	O	001DH	0x30	0x30	0x31	0x44
O	O	O	O	X	001EH	0x30	0x30	0x31	0x45
O	O	O	O	O	001FH	0x30	0x30	0x31	0x46

	FOX-5CH	HOST
input state	CH5 CH4 CH3 CH2 CH1 On On On On On	CH5 CH4 CH3 CH2 CH1 On On On On On
16 Hexa-decimal transfer buffer	0 0 1 F 0x30 0x30 0x31 0x46	0 0 1 F 0x30 0x30 0x31 0x46

⑤ decimal point— '0' [30H]: there is no decimal point.
⑥ error — '0' [30H]: there is no error
⑦ output – '0' [30H]:there is no output   '1' [31]H: there is output

⑧ END CODE : Indicates the termination of BLOCK contents. ETX → [03H]
⑨ BCC : As an abbreviation of Black Check Character, it indicates the XOR calculating value from the beginning of protocol (STX) to ETX.

※ Other
• If there is no ACK response
① If station of STX receive does not match.
② If the Receive Buffer Overflow has occurred.
③ If the baud rate or other communication setpoint does not match.

• Treatment when there is no ACK response
① Check the track status first.
② Check the communication condition (setpoint)
③ If communication error is occurred by noise, attempting the communication execution for 3 times until abnormality is recovered.
④ If frequent communication error occurs, adjust the communication speed.

10 Setting range & set value at factory

Menu		Set menu	Set range	Set value at factory
EH1 CH1 Group	*tYP*	Set input type	*n.o / n.C*	*n.o*
	dLt	Input delay time	0 min 00 sec ~99 min 59 sec	0 min 00 sec
	oUt	Set output	*YES / no*	*YES*
	LnK	Link with other channel	*And/or/no*	*no*
EH2 CH2 Group	*tYP*	Set input type	*n.o / n.C*	*n.o*
	dLt	Input delay time	0 min 00 sec ~99 min 59 sec	0 min 00 sec
	oUt	Set output	*YES / no*	*YES*
	LnK	Link with other channel	*And/or/no*	*no*
EH3 CH3 Group	*tYP*	Set input type	*n.o / n.C*	*n.o*
	dLt	Input delay time	0 min 00 sec ~99 min 59 sec	0 min 00 sec
	oUt	Set output	*YES / no*	*YES*
	LnK	Link with other channel	*And/or/no*	*no*
EH4 CH4 Group	*tYP*	Set input type	*n.o / n.C*	*n.o*
	dLt	Input delay time	0 min 00 sec ~99 min 59 sec	0 min 00 sec
	oUt	Set output	*YES / no*	*YES*
	LnK	Link with other channel	*And/or/no*	*no*
EH5 CH5 Group	*tYP*	Set input type	*n.o / n.C*	*n.o*
	dLt	Input delay time	0 min 00 sec ~99 min 59 sec	0 min 00 sec
	oUt	Set output	*YES / no*	*YES*
	LnK	Link with other channel	*And/or/no*	*no*
EH6	*Addr*	Set address	1~99	1
	bPS	Set speed	1200~19200	9600

Memo

■ Although our controller is designed as the complementary measures regarding these noise from outside, if noise(2KV) disordering become an inflow, the inner-part will be damaged.

■ Warranty period : 1 year from the date of purchase.

■ The specifications of the product are subject to change without a prior notice to improve the performance of the product. Please comprehend the contents specified in the above precautions, and observe them without fail.

Regarding the manual in English, please download it at our website.

■ This device works proper operation with;
surrounding Temp. : 0℃ ~ 60℃
surrounding Humi : below 80%Rh
Regular : AC230V 50/60Hz

CONOTEC CONOTEC CO., LTD.