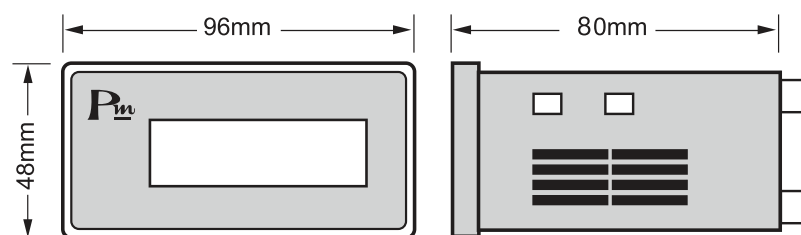




TECHNICAL SPECIFICATION (คุณสมบัติด้านเทคนิค)

Model	TCM-94N-1
Power Supply	100 - 250 VAC 50/60 Hz 24 VAC/VDC $\pm 15\%$
Power consumption	3 VA
Display	7-Segment, Size 0.56 Inch, 5 Digit 3 LED (Show Alarm Relay) 1 LED (Show Communication) 1 LED (Show Peak)
Input	Current AC Current 0 - 5 Amp (Direct) 0 - 20000 Amp (With CT)
Accuracy	$\pm 0.25\%$ of Measurement Range at 25 °C
Output	Relay Alarm 3 Alarm 5A 250VAC Transfer Current 4 - 20 mA Transfer Voltage 0 - 10 VDC Output Impedance Load 500 Ω for 4 - 20 mA Output Load 1 k Ω for 0 - 10 VDC Output Accuracy $\pm 0.25\%$ of Output Range
Communication	Protocol Modbus RTU Address 1 - 127 Baud Rate 2400, 4800, 9600, 19200, 38400, 57600 bps Parity None, even, odd Data Bit 8 bit Stop Bit 1, 2 Support Device Node 32
Ambient operation	Temperature -10 °C to 60 °C Humidity 85 % RH Non-Condensing
Ambient storage	Temperature -20 °C to 80 °C Humidity 85 % RH Non-Condensing
Protection Degree	Front Protection Rating IP52 Case Protection Rating IP30
Installation	Panel, Mounting
Material	ABS-V0
Size	48x96x80 mm.
Weight	240 g.

DIMENSION (ขนาดและรูปร่าง)



DESCRIPTION (คุณสมบัติ)

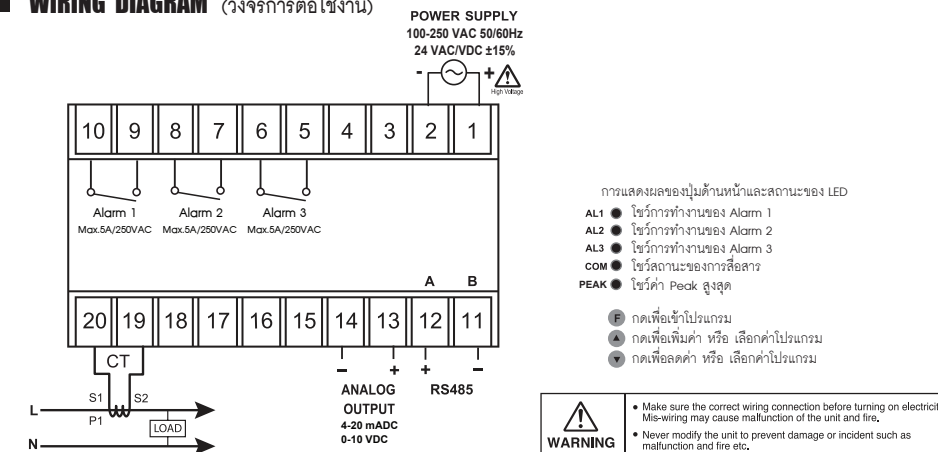
- TCM-94N-1 วัดสัญญาณไฟฟ้ากระแสสลับ ย่านการวัด 0-5 A. ความถี่ 50/60 Hz
- หน้าจอแสดงผล 7-Segment 5 หลัก ขนาด 0.56 นิ้ว
- มี 3 Alarm relay output โดยมี 4 Alarm function. ในการตั้งค่า
- สามารถติดต่อ Computer ได้โดย RS-485 (Modbus RTU protocol)
- มี Transfer output 4-20mA และ 0-10Vdc สำหรับต่อร่วมกับอุปกรณ์อื่นๆ
- มี Lock function เพื่อไม่ให้เปลี่ยนค่า setting ผ่านหน้าจอได้
- มี ON-OFF delay time สำหรับ Alarm output
- มี Manual transfer output Function สามารถสั่งให้จ่ายสัญญาณมากน้อยได้ตามต้องการ

GENERAL DESCRIPTION (คุณสมบัติทั่วไป)

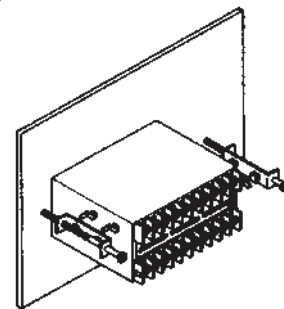
TCM-94N-1 เป็นอุปกรณ์วัดและแสดงผลค่ากระแสไฟฟ้า AC สามารถต่อร่วมกับ CT ย่านการวัด 0-20,000 VAC และสามารถต่อได้โดยตรง ย่านการวัด 0.5 A นอกจากนี้ยังสามารถเก็บและบันทึกข้อมูลลง Computer ผ่านพอร์ทสื่อสาร RS-485 Modbus RTU และสามารถนำสัญญาณอะนาล็อก Transfer output ต่อร่วมเข้ากับอุปกรณ์อื่นๆ ได้ และมี 3 Alarm เอาท์พุท โดยมี 4 Alarm Function ในการตั้งค่าเพื่อสำหรับการติดตั้ง Load ตามที่ต้องการ

TCM-94N เหมาะสำหรับงานติดตั้งที่ตู้ MDB เพื่อแสดงค่ากระแสไฟฟ้าของระบบหรือติดตั้งในเครื่องจักร

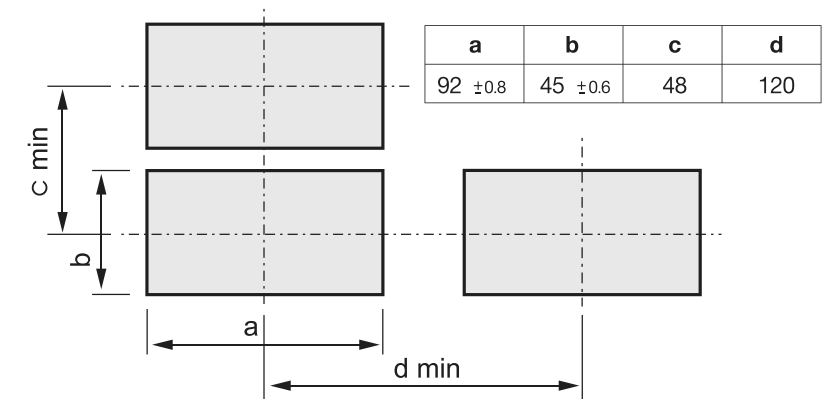
WIRING DIAGRAM (วงจรการต่อใช้งาน)



INSTALLATION (การติดตั้ง)



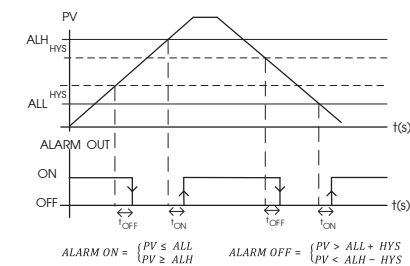
CUTTING PANEL (การเจาะติดตั้ง)



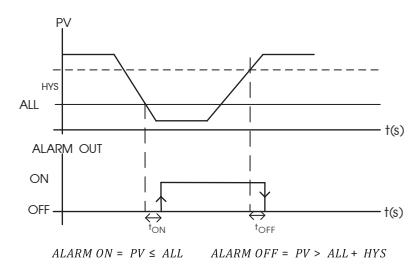
ALARM OUTPUT : Process value (PV) to be used as Alarm Output.

Stand-by Sequence : After Starting Operation of Step, Alarm Output Does not Turn On Unless The Process Value Reach the Value of OFF Position of Alarm Output.

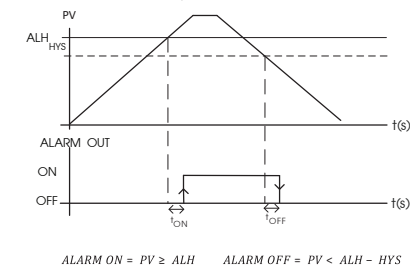
1. Absolute value High Low Band Alarm (ALF = X1)



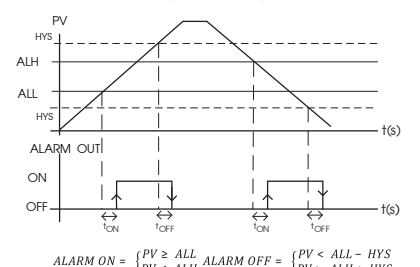
3. Absolute value Low Alarm (ALF = X3)



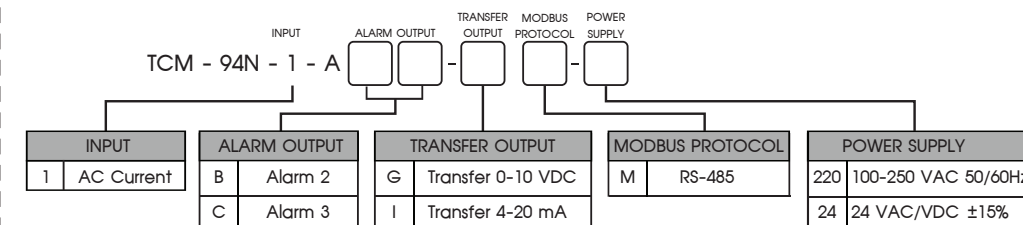
2. Absolute value High Alarm (ALF = X2)



4. Absolute value High Low Range Alarm (ALF = X4)



ORDERING CODE (การติดต่อสั่งซื้อ)



■ OPERATION SETTING

• Power On

888888 Bink Display for start

• Show Version

1.00 Show last Version

• Show Model

TCM-1 Show Model

• Operation Mode Display

500 Show Current Value

Press **[F]** Key
More Than 2 Seconds

[F] for Setting

(Alarm 1 Function > 0) (Alarm 1 Function = 0) >>

• High limit Setting For Alarm 1

RLH1 0 Set high limit value for alarm 1. (ALL1 - 30000)

• Low limit Setting For Alarm 1

RLl1 0 Set Low limit value for alarm 1. (0 - ALH1)

• Hysteresis Setting For Alarm 1

HYS1 0 Set hysteresis when required (0 to ALH-ALL)

• Delay Time On Alarm 1

ton1 0 Set delay time (Alarm on) when required. (0 - 60s)

• Delay Time Off Alarm 1

toFF1 0 Set delay time (Alarm off) when required. (0 - 60s)

[F] Key

(Alarm 2 Function > 0) (Alarm 2 Function = 0) >>

• High limit Setting For Alarm 2

RLH2 0 Set high limit value for alarm 2. (ALL2 - 30000)

• Low limit Setting For Alarm 2

RLl2 0 Set Low limit value for alarm 2. (0 - ALH2)

• Hysteresis Setting For Alarm 2

HYS2 0 Set hysteresis when required (0 to ALH-ALL)

• Delay Time On Alarm 2

ton2 0 Set delay time (Alarm on) when required. (0 - 60s)

• Delay Time Off Alarm 2

toFF2 0 Set delay time (Alarm off) when required. (0 - 60s)

[F] Key

(Alarm 3 Function > 0) (Alarm 3 Function = 0) >>

• High limit Setting For Alarm 2

RLH3 0 Set high limit value for alarm 3. (ALL3 - 30000)

• Low limit Setting For Alarm 2

RLl3 0 Set Low limit value for alarm 3. (0 - ALH3)

• Hysteresis Setting For Alarm 3

HYS3 0 Set hysteresis when required (0 to ALH-ALL)

• Delay Time On Alarm 3

ton3 0 Set delay time (Alarm on) when required. (0 - 60s)

• Delay Time Off Alarm 3

toFF3 0 Set delay time (Alarm off) when required. (0 - 60s)

[F] Key

(Alarm 1 Function > 0) (Alarm 1 Function = 0) >>

• High limit Setting For Alarm 1

RLH1 0 Set high limit value for alarm 1. (ALL1 - 30000)

• Low limit Setting For Alarm 1

RLl1 0 Set Low limit value for alarm 1. (0 - ALH1)

• Hysteresis Setting For Alarm 1

HYS1 0 Set hysteresis when required (0 to ALH-ALL)

• Delay Time On Alarm 1

ton1 0 Set delay time (Alarm on) when required. (0 - 60s)

• Delay Time Off Alarm 1

toFF1 0 Set delay time (Alarm off) when required. (0 - 60s)

[F] Key

(Alarm 2 Function > 0) (Alarm 2 Function = 0) >>

• High limit Setting For Alarm 2

RLH2 0 Set high limit value for alarm 2. (ALL2 - 30000)

• Low limit Setting For Alarm 2

RLl2 0 Set Low limit value for alarm 2. (0 - ALH2)

• Hysteresis Setting For Alarm 2

HYS2 0 Set hysteresis when required (0 to ALH-ALL)

• Delay Time On Alarm 2

ton2 0 Set delay time (Alarm on) when required. (0 - 60s)

• Delay Time Off Alarm 2

toFF2 0 Set delay time (Alarm off) when required. (0 - 60s)

[F] Key

(Alarm 3 Function > 0) (Alarm 3 Function = 0) >>

• High limit Setting For Alarm 2

RLH3 0 Set high limit value for alarm 3. (ALL3 - 30000)

• Low limit Setting For Alarm 2

RLl3 0 Set Low limit value for alarm 3. (0 - ALH3)

• Hysteresis Setting For Alarm 3

HYS3 0 Set hysteresis when required (0 to ALH-ALL)

• Delay Time On Alarm 3

ton3 0 Set delay time (Alarm on) when required. (0 - 60s)

• Delay Time Off Alarm 3

toFF3 0 Set delay time (Alarm off) when required. (0 - 60s)

[F] Key

[F] Key Operation Mode Display

Select Range Input mV (for TCM-94N-2 only)

INP 0 0 0-75 mV
1 0-150 mV

[F]Next

Multiplier Setting

MUL 1 Set Multiplier 1-4000

[F]Next

Divisor Setting

DIV 1.0 Set Divisor 0.1-100.0

[F]Next

PV Correction

PUS 1 When measurement value error. Set the correction value (-1999 - 1999)

[F]Next

PV Filter

PuF 0 Filter effects operation on software to process value (0 - 15)

[F]Next

Decimal Point Selection

dP 0.0 0 None required
0.0 1 Digit

[F]Next

Key Lock Setting

LoC 0 Set Lock parameter

0 None
1 All Lock
2 Operation mode lock only
3 Except operation mode

[F]Next

Analog Absolute Display Setting

dRbS 0 Set 1 for display absolute value

[F]Next

High Limit Setting In Analog Input Limiter

INH 0 Sets scaling high limit value

[F]Next

Analog Absolute Display Setting

INL 0 Sets scaling low limit value

[F]Next

High Limit Setting

SLH 0 Sets scaling high limit value for setting (0-30000)

[F]Next

Low Limit Setting

SLL 0 Sets scaling Low limit value for setting (0-30000)

[F]Next

Transfer Output Polarity

trP 0 Set 1 for Inverse Transfer Output Value.

[F]Next

High Limit Setting for Transfer Output

trH 0 Set scaling high limit value for transfer output. (Limit follow SLH and SLL)

[F]Next

Low Limit Setting for Transfer Output

trL 0 Set scaling Low limit value for transfer output. (Limit follow SLH and SLL)

[F]Next

Function Setting for Alarm 1

RLF1 0 Select below functions.1

00

PV Alarm Functions
0 : None
1 : Absolute Value High Low Band Alarm
2 : Absolute Value High Alarm
3 : Absolute Value Low Alarm
4 : Absolute Value High Low Range Alarm

Additional Alarm Function
0 : None
1 : Alarm Output Hold
2 : Stand-by Sequence
3 : Stand-by Sequence & Hold

[F]Next

(Alarm 1 Function > 0) (Alarm 1 Function = 0) >>

High limit Setting For Alarm 1

RLH1 0 Set high limit value for alarm 1. (ALL1 - 30000)

[F]Next

Low limit Setting For Alarm 1

RLl1 0 Set Low limit value for alarm 1. (0 - ALH1)

[F]Next

Hysteresis Setting For Alarm 1

HYS1 0 Set hysteresis when required (0 to ALH-ALL)

[F]Next

Delay Time On Alarm 1

ton1 0 Set delay time (Alarm on) when required. (0 - 60s)

[F]Next

Delay Time Off Alarm 1

toFF1 0 Set delay time (Alarm off) when required. (0 - 60s)

[F]Next

Function Setting for Alarm 2

RLF2 0 Select below functions.2

00

PV Alarm Functions
0 : None
1 : Absolute Value High Low Band Alarm
2 : Absolute Value High Alarm
3 : Absolute Value Low Alarm
4 : Absolute Value High Low Range Alarm

Additional Alarm Function
0 : None
1 : Alarm Output Hold
2 : Stand-by Sequence
3 : Stand-by Sequence & Hold

[F]Next

(Alarm 2 Function > 0) (Alarm 2 Function = 0) >>

High limit Setting For Alarm 2

RLH2 0 Set high limit value for alarm 2. (ALL2 - 30000)

[F]Next

Low limit Setting For Alarm 2

RLl2 0 Set Low limit value for alarm 2. (0 - ALH2)

[F]Next

Hysteresis Setting For Alarm 2

HYS2 0 Set hysteresis when required (0 to ALH-ALL)

[F]Next

Delay Time On Alarm 2

ton2 0 Set delay time (Alarm on) when required. (0 - 60s)

[F]Next

Delay Time Off Alarm 2

toFF2 0 Set delay time (Alarm off) when required. (0 - 60s)

[F]Next

Function Setting for Alarm 3

RLF3 0 Select below functions. 3

00

PV Alarm Functions
0 : None
1 : Absolute Value High Low Band Alarm
2 : Absolute Value High Alarm
3 : Absolute Value Low Alarm
4 : Absolute Value High Low Range Alarm

Additional Alarm Function
0 : None
1 : Alarm Output Hold
2 : Stand-by Sequence
3 : Stand-by Sequence & Hold

[F]Next

(Alarm 3 Function > 0) (Alarm 3 Function = 0) >>

High limit Setting For Alarm 2

RLH3 0 Set high limit value for alarm 3. (ALL3 - 30000)

[F]Next

Low limit Setting For Alarm 2

RLl3 0 Set Low limit value for alarm 3. (0 - ALH3)

[F]Next

Hysteresis Setting For Alarm 3

HYS3 0 Set hysteresis when required (0 to ALH-ALL)

[F]Next

Delay Time On Alarm 3

ton3 0 Set delay time (Alarm on) when required. (0 - 60s)

[F]Next

Delay Time Off Alarm 3

toFF3 0 Set delay time (Alarm off) when required. (0 - 60s)

[F]Next

Baud Rate Communication

bPS 9.6 เลือกความเร็วของการสื่อสาร

2.4 2400 bps 19.2 19200 bps
4.8 4800 bps 38.4 38400 bps
9.6 9600 bps 57.6 57600 bps

[F]Next

Communication Setting

LoPi 1 b8n1 เลือก Stop bit / Parity bit

Parity bit
n: None
E: Even
O: Odd

Stop bit
1: 1 stop bit
2: 2 stop bit

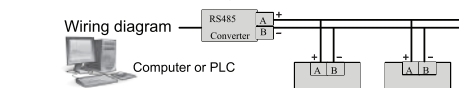
[F]Next

Address Setting

Rdr 1 การตั้งค่า Address ของอุปกรณ์ ตั้งได้ 1-127

■ SERIAL COMMUNICATION

The TCM-94 are equipped with a RS485 serial communications interface to allow connection to computers or PLCs. MODBUS protocol is provided as standard communication. The user can connect TCM-94 as network up to 255 meters.



MODBUS PROTOCOL

This MODBUS Protocol has been implement in accordance with MODBUS.ORG MODBUS Application Protocol Specification V1.1 With the following conditions applying.

The following conditions apply

Baudrate can selected refer

22.Speed setting

The format is MODBUS RTU

UART data can selected refer 23.Communication setting

Data is considered to be half duplex using 2 wire.

Modbus Function codes

Function code	Operation	Broadcast
04	Read Multiple Registers	Yes
06	Preset Single Register	Yes
08	Loop Back Diagnostic	No

Modbus Exception codes

Code	Name	Meaning
01	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the server (or slave).
02	ILLEGAL DATAADDRESS	The data address received in the query is not an allowable address for the server (or slave)
03	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for server (or slave).

Example of a client request and server exception response

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	04	Function	84
Starting Address Hi	00	Exception Code	02
Starting Address Lo	00	CRC Hi	C2
Quantity of Input Reg. Hi	00	CRC Lo	C1
Quantity of Input Reg. Lo	1E		
CRC Hi	70		
CRC Lo	02		

Modbus RTU Table TCM-94

Address	Contents	Format	Word	Access	Range
Decimal	Hex				Min Max
0	0	Status of Alarm	Unsignde int	1	Read Only - -
1	1	Amps	Unsignde int	1	Read Only - -
2	2	Amps Peak	Unsignde int	1	Write/Read 0 0
3	3	-	-	-	- -
4	4	Input	Unsignde int	1	Write/Read 0 1
5	5	Multiplier	Unsignde int	1	Write/Read 1 4000
6	6	Divisor	Unsignde int	1	Write/Read 1 1000
7	7	PV Adjust	Unsignde int	1	Write/Read -1999 1999
8	8	PV Filter	Unsignde int	1	Write/Read 0 15
9	9	Decimal Point	Unsignde int	1	Write/Read 0 1.0
10	A	Lock Key	Unsignde int	1	Write/Read 0 3
11	B	Analog Input Absolute	Unsignde int	1	Write/Read 0 1
12	C	Analog Input High Limit	Unsignde int	1	Write/Read 0/0 75/150
13	D	Analog Input Low Limit	Unsignde int	1	Write/Read 0/0 75/150
14	E	Setting Limit High	Unsignde int	1	Write/Read SL 30000
15	F	Setting Limit Low	Unsignde int	1	Write/Read 0 SLH
16	10	-	-	-	- -
17	11	Analog Output Inverse	Unsignde int	1	Write/Read 0 1
18	12	Analog Output High Limit	Unsignde int	1	Write/Read SL SLH
19	13	Analog Output Low Limit	Unsignde int	1	Write/Read SL SLH
20	14	Function Alarm 1	Unsignde int	1	Write/Read 0 34
21	15	High Alarm 1	Unsignde int	1	Write/Read ALL1 30000
22	16	Low Alarm 1	Unsignde int	1	Write/Read 0 ALH1
23	17	Hysteresis Alarm 1	Unsignde int	1	Write/Read 0 ALH1-ALL1
24	18	Delay On Alarm 1	Unsignde int	1	Write/Read 0 60
25	19	Delay Off Alarm 1	Unsignde int	1	Write/Read 0 60
26	1A	Function Alarm 2	Unsignde int	1	Write/Read 0 34
27	1B	High Alarm 2	Unsignde int	1	Write/Read ALL2 30000
28	1C	Low Alarm 2	Unsignde int	1	Write/Read 0 ALH2
29	1D	Hysteresis Alarm 2	Unsignde int	1	Write/Read 0 ALH2-ALL2
30	1E	Delay On Alarm 2	Unsignde int	1	Write/Read 0 60
31	1F	Delay Off Alarm 2	Unsignde int	1	Write/Read 0 60
32	20	Function Alarm 3	Unsignde int	1	Write/Read 0 34
33	21	High Alarm 3	Unsignde int	1	Write/Read ALL3 30000
34	22	Low Alarm 3	Unsignde int	1	Write/Read 0 ALH3
35	23	Hysteresis Alarm 3	Unsignde int	1	Write/Read 0 ALH3-ALL3
36	24	Delay On Alarm 3	Unsignde int	1	Write/Read 0 60
37	25	Delay Off Alarm 3	Unsignde int	1	Write/Read 0 60

Here is an example of a request to read (PV) input register 1-2: (Function code 04)

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	04	Function	04
Starting Address Hi	00	Byte Count	04
Starting Address Lo	00	Input Reg. 1 Hi	00
Quantity of Input Reg. Hi	00	Input Reg. 1 Lo	00
Quantity of Input Reg. Lo	02	Input Reg. 2 Hi	00
CRC Hi	71	Input Reg. 2 Lo	DC
CRC Lo	CB	CRC Hi	FA
		CRC Lo	1D

The contents of input register 1-2 are shown as the 4 bytes values of 00 00 00 DC hex, or 220 decimal.

Here is an example of a request to write input register 5 to 03 E8 hex: (Function 06)

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	06	Function	06
Register Address Hi	00	Register Address Hi	00
Register Address Lo	04	Register Address Lo	00
Register Value Hi	03	Register Value Hi	03
Register Value Lo	E8	Register Value Lo	E8
CRC Hi	C8	CRC Hi	C8
CRC Lo	B5	CRC Lo	B5



TCM-94N-1/TCM-94N-2

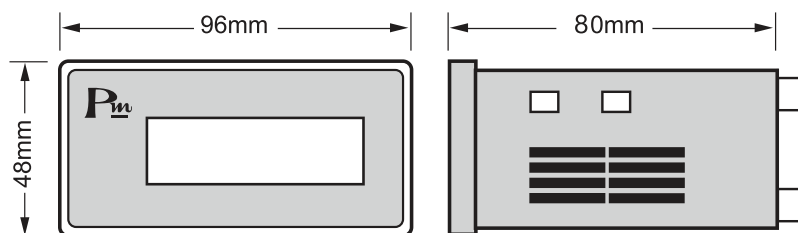
PRIMUS บริษัท โพรมัส จำกัด (สาขา 00012)
เลขประจำตัวผู้เสียภาษี : 0105536011803
118/60 หมู่ที่ 18 ตำบลคลองหนึ่ง อำเภอคลองหลวง จังหวัดปทุมธานี 12120
118/60 Moo 18 Khlong Nuang, Khlong Luang, Pathum Thani 12120
Tel. : 0-2693-7005 Fax. : 02-147-4206 HotLine : 090-197-9601
E-mail : sales@primusthai.com, www.primusthai.com, www.pw.com.th



TECHNICAL SPECIFICATION (คุณสมบัติด้านเทคนิค)

Model	TCM-94N-2
Power Supply	100 - 250 VAC 50/60 Hz
	24 VAC/VDC $\pm 15\%$
Power consumption	3 VA
Display	7-Segment, Size 0.56 Inch, 5 Digit
	3 LED (Show Alarm Relay)
	1 LED (Show Communication)
	1 LED (Show Peak)
Input	Current
	DC Current
	0.02-75 mV
	0.02-150 mV(With RShunt)
	Accuracy $\pm 0.25\%$ of Measurement Range at 25 °C
Output	Relay Alarm
	3 Alarm 5A 250VAC
	Tranfer Current
	4 - 20 mA
	Tranfer Voltage
	0 - 10 VDC
	Output Impedance
	Load 500 Ω for 4 - 20 mA Output
	Load 1 k Ω for 0 - 10 VDC Output
	Accuracy $\pm 0.25\%$ of Output Range
Communication	Protocol
	Modbus RTU
	Address
	1 - 127
	Baud Rate
	2400, 4800, 9600, 19200, 38400, 57600 bps
	Parity
	None, even, odd
	Data Bit
	8 bit
	Stop Bit
	1, 2
	Support Device Node
	32
Ambient operation	Temperature
	-10 °C to 60 °C
	Humidity
	85 % RH Non-Condensing
Ambient storage	Temperature
	-20 °C to 80 °C
	Humidity
	85 % RH Non-Condensing
Protection Degree	Front Protection Rating
	IP52
	Case Protection Rating
	IP30
Installation	Panel, Mounting
Material	ABS-V0
Size	48x96x80 mm.
Weight	240 g.

DIMENSION (ขนาดและรูปร่าง)



DESCRIPTION (คุณสมบัติ)

- TCM-94N-2 วัดสัญญาณไฟฟ้ากระแสตรง ย่านการวัด 0-75 mV และ 0-150 mV จาก R-Shunt
- หน้าจอแสดงผล 7-Segment 5 หลัก ขนาด 0.56 นิ้ว
- มี 3 Alarm relay output โดยมี 4 Alarm function. ในการตั้งค่า
- สามารถติดต่อ Computer ได้โดย RS-485 (Modbus RTU protocol)
- มี Transfer output 4-20mA และ 0-10Vdc สำหรับต่อร่วมกับอุปกรณ์อื่นๆ
- มี Lock function เพื่อไม่ให้เปลี่ยนค่า setting ผ่านหน้าจอได้
- มี ON-OFF delay time สำหรับ Alarm output
- มี Manual transfer output Function สามารถสั่งให้จ่ายสัญญาณมากน้อยได้ตามต้องการ
- มี Absolute input Function แสดงค่าบวกตลอดเวลา ไม่ว่าจะต่อขั้ว +/- Input สลับขั้วหรือไม่ สำหรับ TCM-94N-2

GENERAL DESCRIPTION (คุณสมบัติทั่วไป)

TCM-94N-2 เป็นอุปกรณ์วัดและแสดงผลค่ากระแสไฟฟ้า DC สามารถต่อร่วมกับ Shunt Resistor

ซึ่งมีให้เลือก 2 ย่านการวัด คือ 0-75 mVDC และ 0-150 mVDC โดยสามารถตั้งค่าสเกลจากค่า Shunt Resistor

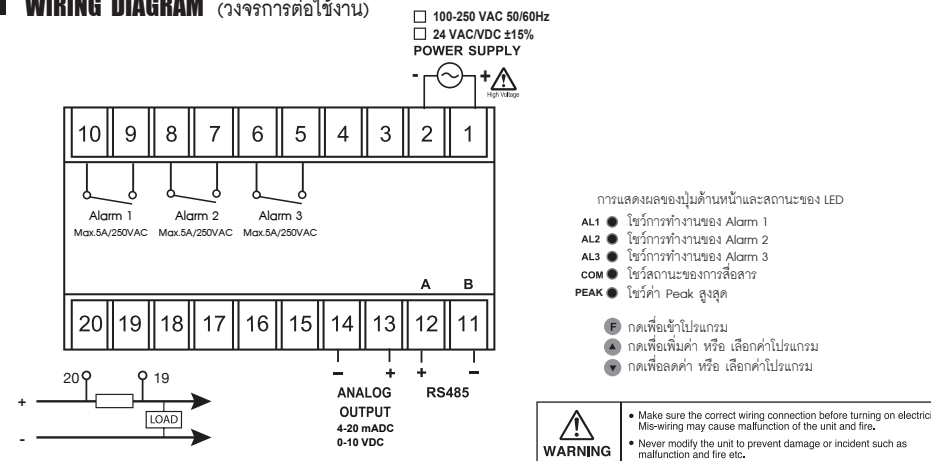
นอกจากนี้ยังสามารถเก็บและบันทึกข้อมูลลง Computer ผ่านพอร์ตสื่อสาร RS-485 Modbus RTU

และสามารถนำสัญญาณอะนาล็อก Transfer output ต่อร่วมเข้ากับอุปกรณ์อื่นๆ ได้ และมี 3 Alarm เอาท์พุท

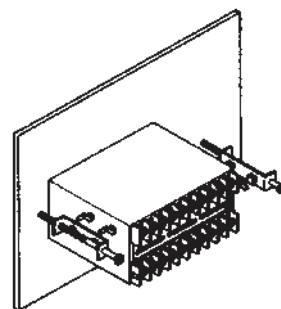
โดยมี 4 Alarm Function ในการตั้งค่าเพื่อสำหรับการติดต่อ Load ตามที่ต้องการ

TCM-94N เหมาะสำหรับงานติดตั้งที่ตู้ MDB เพื่อแสดงค่ากระแสไฟฟ้าของระบบหรือติดตั้งในเครื่องจักร

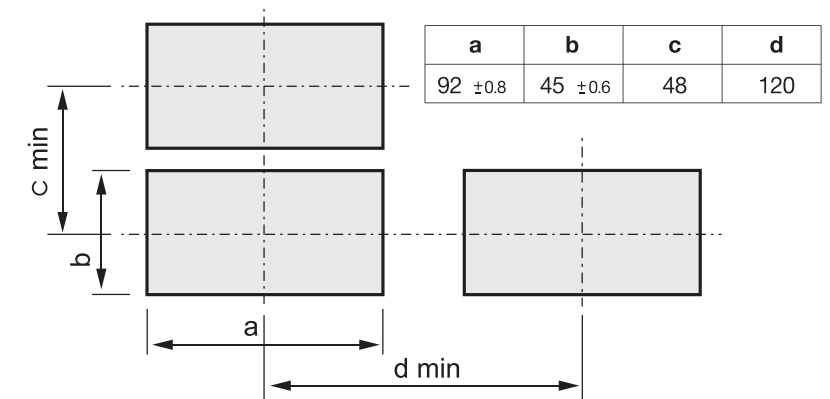
WIRING DIAGRAM (วงจรการต่อใช้งาน)



INSTALLATION (การติดตั้ง)

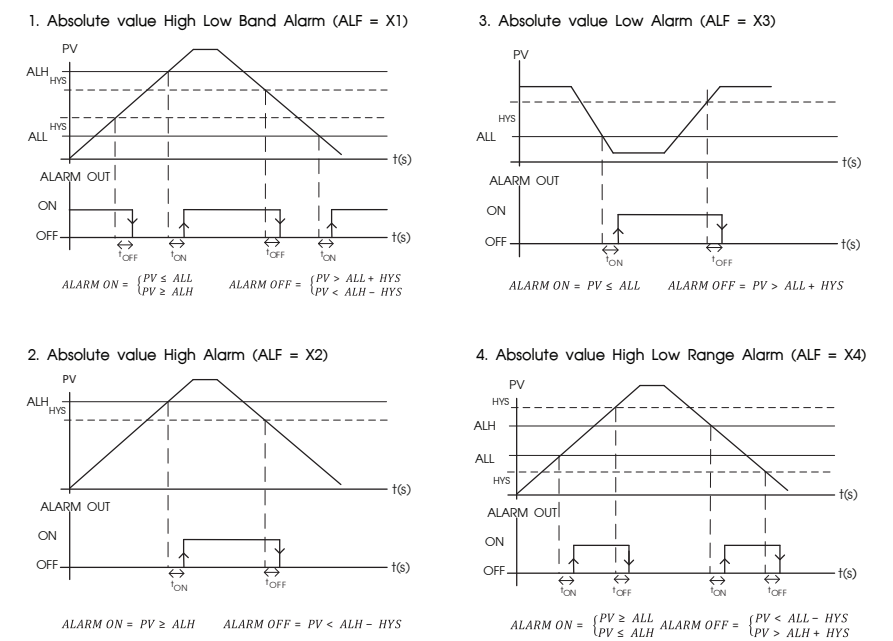


CUTTING PANEL (การเจาะติดตั้ง)

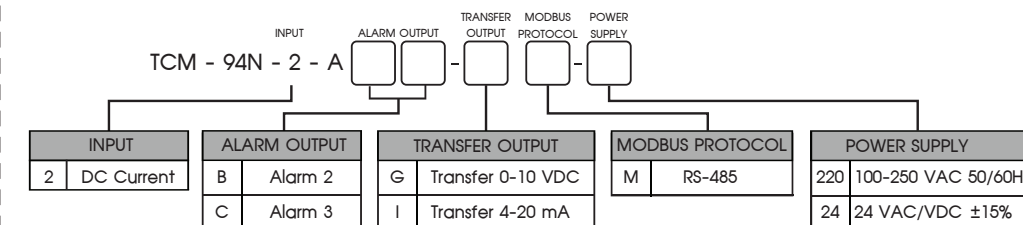


ALARM OUTPUT : Process value (PV) to be used as Alarm Output.

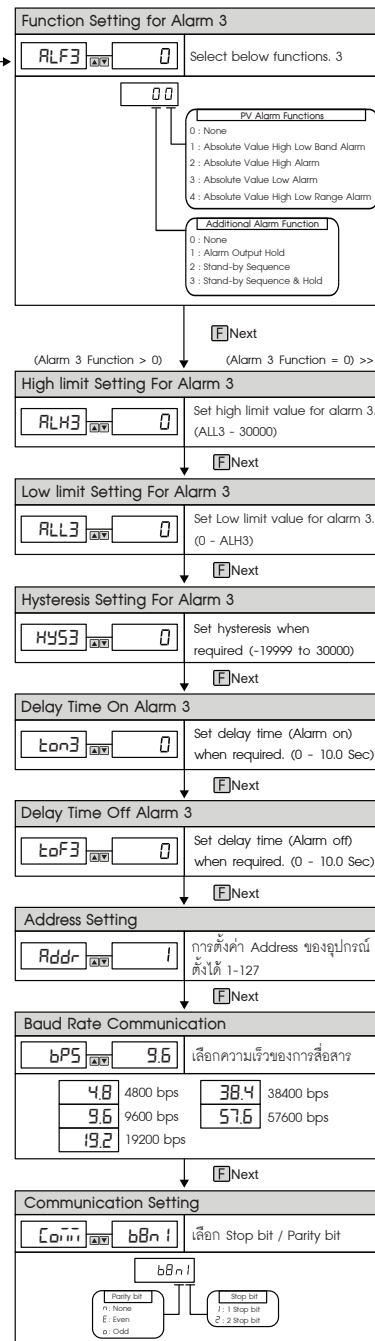
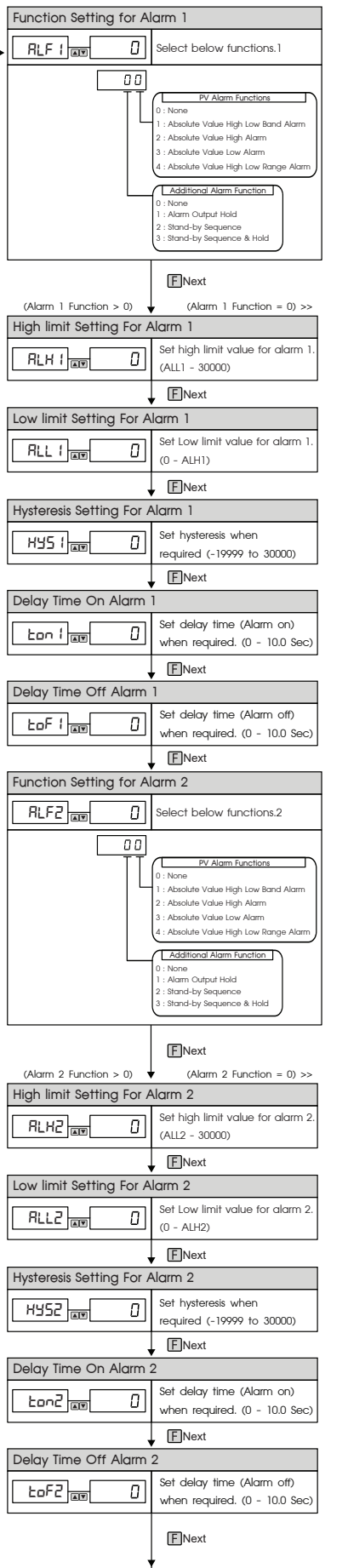
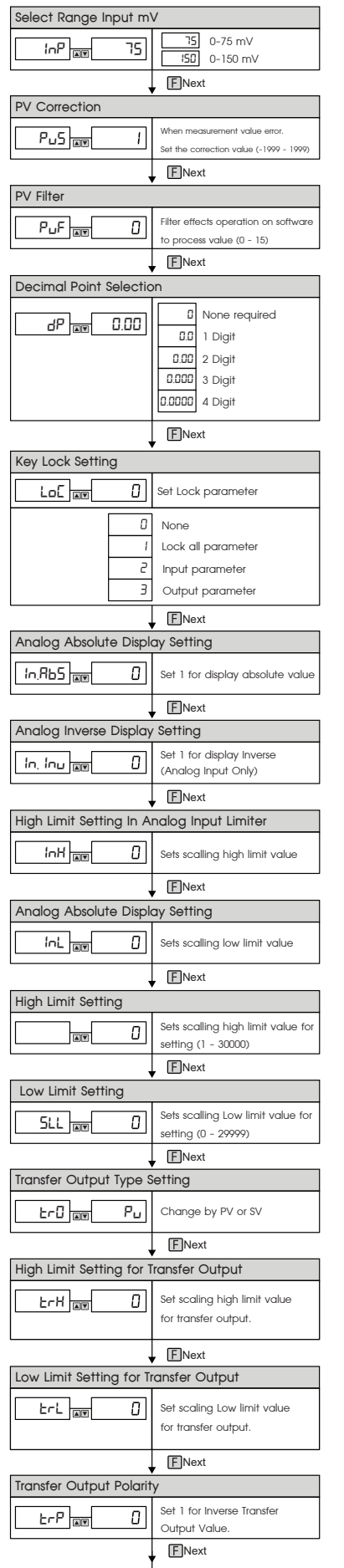
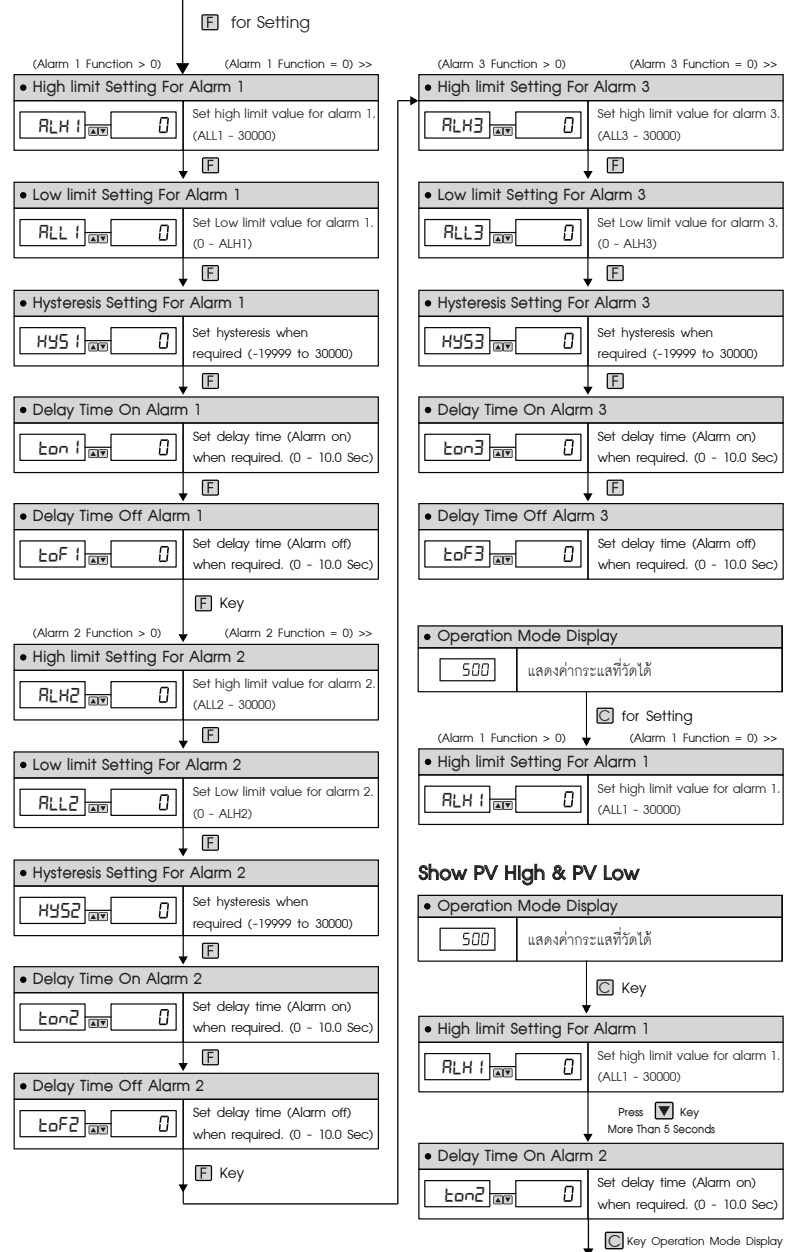
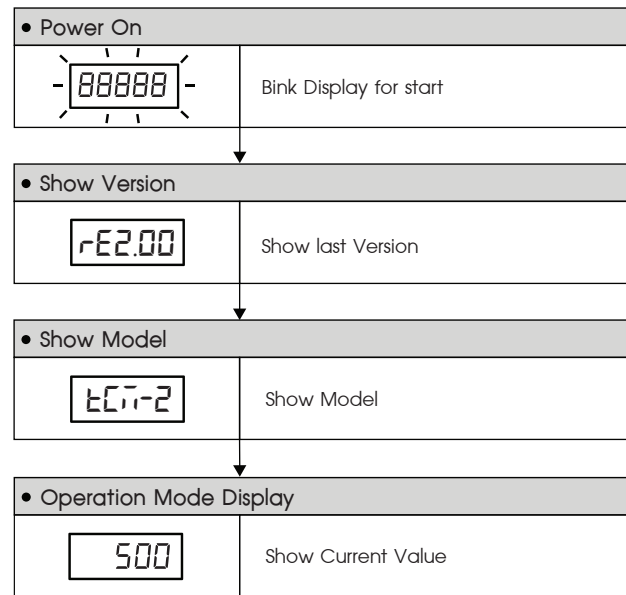
Stand-by Sequence : After Starting Operation of Step, Alarm Output Does not Turn On Unless The Process Value Reach the Value of OFF Position of Alarm Output.



ORDERING CODE (การติดต่อสั่งซื้อ)

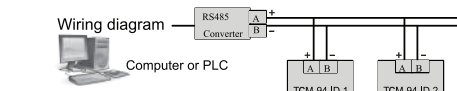


■ OPERATION SETTING



■ SERIAL COMMUNICATION

The TCM-94 are equipped with a RS485 serial communications interface to allow connection to computers or PLCs. MODBUS protocol is provided as standard communication. The user can connect TCM-94 as network up to 255 meters.



MODBUS PROTOCOL

This MODBUS Protocol has been implement in accordance with MODBUS.ORG MODBUS Application Protocol Specification V1.1 With the following conditions applying.

The following conditions apply

Baudrate can selected refer

22.Speed setting
The format is MODBUS RTU
UART data can selected refer **23.Communication setting**
Data is considered to be half duplex using 2 wire.

Modbus Function codes

Function code	Operation	Broadcast
04	Read Multiple Registers	Yes
06	Preset Single Register	Yes
08	Loop Back Diagnostic	No

Modbus Exception codes

Code	Name	Meaning
01	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the server (or slave).
02	ILLEGAL DATA ADDRESS	The data address received in the query is not an allowable address for the server (or slave).
03	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for server (or slave).

Example of a client request and server exception response

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	04	Function	84
Starting Address Hi	00	Exception Code	02
Starting Address Lo	00	CRC Hi	C2
Quantity of Input Reg. Hi	00	CRC Lo	C1
Quantity of Input Reg. Lo	1E		
CRC Hi	70		
CRC Lo	02		

Modbus RTU Table TCM-94

Address		Contents	Format	Word	Access	Range	
Decimal	Hex					Min	Max
0	0	Status of Alarm	Unsigned int	1	Read Only	-	-
1	1	Current	Unsigned int	1	Read Only	-	-
2	2	Current Peak	Unsigned int	1	Read Only	-	-
3	3	-	-	-	-	-	-
4	4	Type Input	Unsigned int	1	Write/Read	0	1
5	5	-	-	-	-	-	-
6	6	-	-	-	-	-	-
7	7	PV Correction	Unsigned int	1	Write/Read	-19999	30000
8	8	PV Filter	Unsigned int	1	Write/Read	0	15
9	9	Decimal Point	Unsigned int	1	Write/Read	0	4
10	A	Lock Key	Unsigned int	1	Write/Read	0	3
11	B	Analog Input Absolute	Unsigned int	1	Write/Read	0	1
12	C	Analog Input High Limit	Unsigned int	1	Write/Read	0/0	75/150
13	D	Analog Input Low Limit	Unsigned int	1	Write/Read	0/0	75/150
14	E	Settling Limit High	Unsigned int	1	Write/Read	1	30000
15	F	Settling Limit Low	Unsigned int	1	Write/Read	0	29999
16	10	Analog Input Inverse	Unsigned int	1	Write/Read	0	1
17	11	Analog Output Inverse	Unsigned int	1	Write/Read	0	1
18	12	Analog Output High Limit	Unsigned int	1	Write/Read	0	2000
19	13	Analog Output Low Limit	Unsigned int	1	Write/Read	0	2000
20	14	Function Alarm 1	Unsigned int	1	Write/Read	0	34
21	15	High Alarm 1	Unsigned int	1	Write/Read	1	30000
22	16	Low Alarm 1	Unsigned int	1	Write/Read	0	29999
23	17	Hysteresis Alarm 1	Unsigned int	1	Write/Read	-19999	30000
24	18	Delay On Alarm 1	Unsigned int	1	Write/Read	0	100
25	19	Delay Off Alarm 1	Unsigned int	1	Write/Read	0	100
26	1A	Function Alarm 2	Unsigned int	1	Write/Read	0	34
27	1B	High Alarm 2	Unsigned int	1	Write/Read	1	30000
28	1C	Low Alarm 2	Unsigned int	1	Write/Read	0	29999
29	1D	Hysteresis Alarm 2	Unsigned int	1	Write/Read	-19999	30000
30	1E	Delay On Alarm 2	Unsigned int	1	Write/Read	0	100
31	1F	Delay Off Alarm 2	Unsigned int	1	Write/Read	0	100
32	20	Function Alarm 3	Unsigned int	1	Write/Read	0	34
33	21	High Alarm 3	Unsigned int	1	Write/Read	1	30000
34	22	Low Alarm 3	Unsigned int	1	Write/Read	0	29999
35	23	Hysteresis Alarm 3	Unsigned int	1	Write/Read	-19999	30000
36	24	Delay On Alarm 3	Unsigned int	1	Write/Read	0	100
37	25	Delay Off Alarm 3	Unsigned int	1	Write/Read	0	100

Here is an example of a request to read (PV) input register 1-2: (Function code 04)

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	04	Function	04
Starting Address HI	00	Byte Count	04
Starting Address Lo	00	Input Reg. 1 HI	00
Quantity of Input Reg. HI	00	Input Reg. 1 Lo	00
Quantity of Input Reg. Lo	02	Input Reg. 2 HI	00
CRC HI	71	Input Reg. 2 Lo	DC
CRC Lo	CB	CRC HI	FA
		CRC Lo	1D

The contents of input register 1-2 are shown as the 4 bytes values of 00 00 00 DC hex, or 220 decimal.

Here is an example of a request to write input register 5 to 03 E8 hex: (Function 06)

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	06	Function	06
Register Address Hi	00	Register Address Hi	00
Register Address Lo	04	Register Address Lo	00
Register Value Hi	03	Register Value Hi	03
Register Value Lo	E8	Register Value Lo	E8
CRC Hi	C8	CRC Hi	C8
CRC Lo	B5	CRC Lo	B5



PRIMUS บริษัท ไพรมัส จำกัด (สาขา 00012)
เลขประจำตัวผู้เสียภาษี : 0105536011803
118/6 หมู่ 18 ตำบลคลองหนึ่ง อำเภอคลองหลวง จังหวัดปทุมธานี 12120
118/6 Moo 18 Khlong Nueng, Khlong Luang, Pathum Thani 12120
Tel.: 0-2693-7805 Fax.: 02-147-4206 HotLine : 090-197-9601
E-mail: sales@primusthai.com, www.primusthai.com, www.prm.co.th