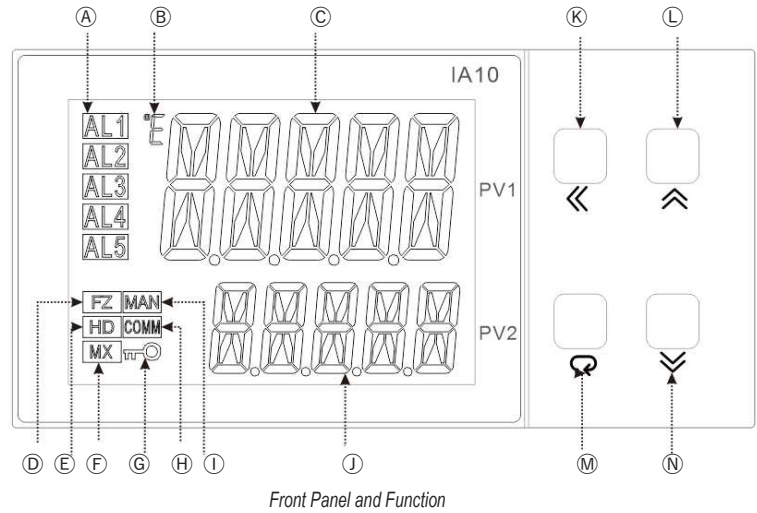


# BrainChild

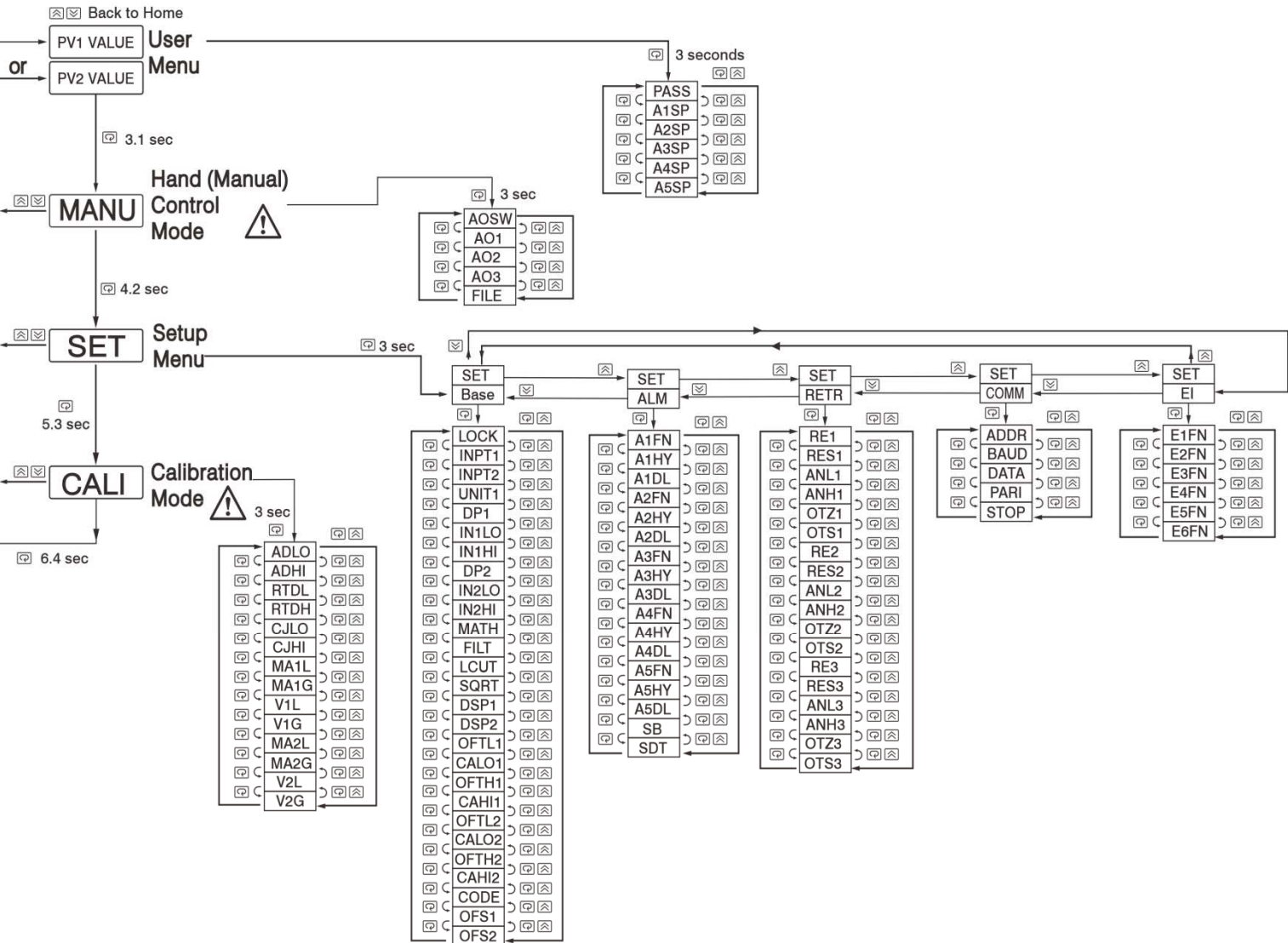
## IA10 Indicator and Alarm Unit Quick Start Guide

Model: IA10      Ver. QS0IA101A EN

### 1. OVERVIEW & APPEARANCE



- Indicators:**
- ⒶAL1/ AL2/ AL3/ AL4/ AL5: Alarm 1~5 Indicator
  - ⒹFZ: Hold PV1, frozen to value 0
  - ⒺHD: Hold PV1 to the current value
  - ⒻMX: Hold PV1 to the maximum value
  - ⒾMAN: Manual Mode Indicator
  - ⒽCOMM: Communication Indicator
  - ⒼKey: Lock Indicator
- Process Value/ Unit:**
- ⒷDegree: Process Value Unit, °C or °F
  - ⒸPV1: Process Value 1, 5-digit
  - ⒿPV2: Process Value 2, 5-digit
- User Access Keys:**
- ⓀSHIFT Key
  - ⓁUP Key, Increasing
  - ⓂSCROLL Key, Enter
  - ⓃDOWN Key, Decreasing

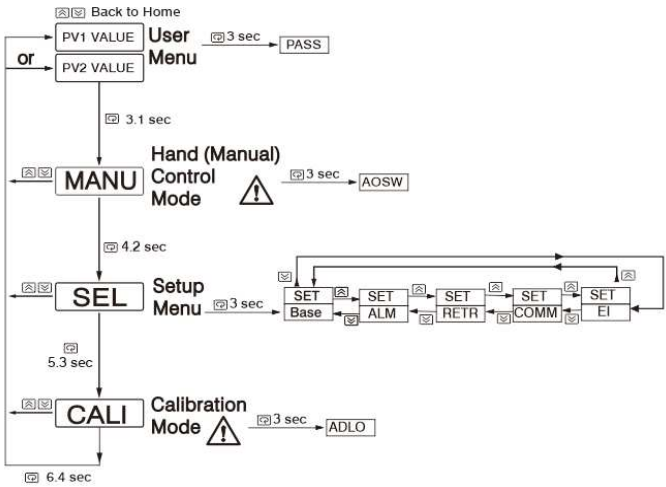


### 2. DISPLAY AND KEYS

- During power-up, the upper display will show PROG and the lower display will show the Firmware version for 6 seconds. There are 4 Keys available in the display board for the user to operate as explained below.
- **SCROLL KEY or ENTER KEY:** This key is used to select a parameter to be viewed or adjusted.
  - **UP KEY:** This key is used to increase the value of the selected parameter.
  - **DOWN KEY:** This key is used to decrease the value of the selected parameter.
  - **SHIFT KEY:** This key is used to move to the digit of the selected parameter and change the value by using up or down key to increase or decrease the value.
  - **RESET KEY:** + Two keys pressed synchronously are used to revert the display to the home screen, the process values screen

### 3 MENU FLOW CHART

The Menu has been divided into 5 groups. They are as follows:



- 1) PV & SetPoint (PV1/ PV2)
- 2) Manual Mode Menu (MANU)
- 3) Setup Menu (SET)
- 4) Calibration Mode Menu (CALI)

### 3.1 USER MENU

Press the key for 3 seconds and release it to get User in the lower display and then use the key to enter into User Mode parameter.

### 3.2 MANUAL MODE MENU (MANU)

Press the key for 3 seconds and release it to get MANU in the lower display and then use the key to enter into Manual Mode parameter.

### 3.3 Setup Menu (SET)

Press the key for 3 seconds and release it to get SET menu in the lower display and then use the key to get SET (Base/ ALM/ RETR/ COMM/ EI) parameters in the second lower display. Use the key to enter into Base/ ALM/ RETR/ COMM/ EI parameters. Press the keys + synchronously anytime to go back to the home.

### 3.4 CALIBRATION MENU (CALI)

Press the key for 3 seconds and release it to get CALI in the lower display and then use the key to enter into Calibration Mode parameter.

**Note:**

The flow chart shows a complete list of all parameters. For actual application, the number of available parameters will vary depending on the setup and will be less than that shown in the flow chart.

### 4. PARAMETERS DESCRIPTION

| Reg Addr          | Code  | Parameter                      | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Def-ault | Data Type | Scale Low | Scale High |
|-------------------|-------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|------------|
| User Manual, ALSP |       |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |           |           |            |
| 81                | PASS  | Parameter Password             | Low: 0, High: 9999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0        | R/W       | 0         | 65535      |
| 26/27             | A1SP  | Alarm 1 Setpoint               | (°F)Low: -19999, High: 99999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0      | R/W       | -19999    | 99999      |
| 28/29             | A2SP  | Alarm 2 Setpoint               | (°F)Low: -19999, High: 99999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0      | R/W       | -19999    | 99999      |
| 30/31             | A3SP  | Alarm 3 Setpoint               | (°F)Low: -19999, High: 99999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0      | R/W       | -19999    | 99999      |
| 32/33             | A4SP  | Alarm 4 Setpoint               | (°F)Low: -19999, High: 99999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0      | R/W       | -19999    | 99999      |
| 104/ 105          | A5SP  | Alarm 5 Setpoint (H-L)         | (°F)Low: -19999, High: 99999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0      | R/W       | -19999    | 99999      |
| Manual Mode       |       |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |           |           |            |
| 55                | AOSW  | Retransmission output control  | 0) OFF: RE1, RE2 output<br>1) ON: AO1, AO2 output<br>2) Elx: Elx control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1        | R/W       | 0         | 65535      |
| 56                | AO1   | Retransmission output1 %       | Low: 0.00 High: 100.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.0      | R/W       | 0         | 65535      |
| 57                | AO2   | Retransmission output2 %       | Low: 0.00 High: 100.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.0      | R/W       | 0         | 65535      |
| 139               | AO3   | Retransmission output3 %       | Low: 0.00 High: 100.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.0      | R/W       | 0         | 65535      |
| 167               | FILE  | Restore to the factory default | 0) Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0        | R         | 0         | 65535      |
| Setup Menu/ BASE  |       |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |           |           |            |
| 103               | LOCK  | Parameters lock                | 0) oFF: Lock off<br>1) oN: Lock all parameters on                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0        | R/W       | 0         | 65535      |
| 42                | INPT1 | Input sensor selection 1       | 0) J_tC: J type Thermocouple<br>1) K_tC: K type Thermocouple<br>2) T_tC: T type Thermocouple<br>3) E_tC: E type Thermocouple<br>4) B_tC: B type Thermocouple<br>5) R_tC: R type Thermocouple<br>6) S_tC: S type Thermocouple<br>7) N_tC: N type Thermocouple<br>8) L_tC: L type Thermocouple<br>9) U_tC: U type Thermocouple<br>10) P_tC: P type Thermocouple<br>11) C_tC: C type Thermocouple<br>12) D_tC: D type Thermocouple<br>13) Pt.dN: PT100Q DIN curve<br>14) Pt.JS: PT 100Q JIS curve<br>15) 4-20: 4-20 mA linear current<br>16) 0-20: 0-20 mA linear current<br>17) 0-5V: 0-5V linear voltage<br>18) 1-5V: 1-5V linear voltage<br>19) 0-10: 0-10V linear voltage<br>20) 0-1V: 0-1V linear voltage<br>21) 0-50: 0-50mV linear voltage | 15       | R/W       | 0         | 65535      |
| 43                | INPT2 | Input sensor selection 2       | 0) 4-20: 4-20 mA linear current<br>1) 0-20: 0-20 mA linear current<br>2) 0-5V: 0-5V linear voltage<br>3) 1-5V: 1-5V linear voltage<br>4) 0-10: 0-10V linear voltage<br>5) 2-10: 2-10V linear voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0        | R/W       | 0         | 65535      |
| 2                 | UNIT1 | Input 1 unit selection         | 0) oC: °C unit<br>1) oF: °F unit<br>2) Pu: Process value unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0        | R/W       | 0         | 65535      |

| Reg Addr | Code   | Parameter                                         | Range                                                                                                                                                                                                                                                                                                                                        | Def-ault | Data Type | Scale Low | Scale High |
|----------|--------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|------------|
| 3        | DP1    | Decimal point selection 1                         | 0) No.dP: No decimal point<br>1) 1-dP: 1 decimal digit<br>2) 2-dP: 2 decimal digits<br>3) 3-dP: 3 decimal digits<br>4) 4-dP: 4 decimal digits                                                                                                                                                                                                | 1        | R/W       | 0         | 65535      |
| 22/23    | IN1LO  | Input1 low scale value (H-L)                      | IN1LO ≠ IN1HI<br>(°F) Low: -19999, High: 99999                                                                                                                                                                                                                                                                                               | 0.0      | R/W       | -19999    | 99999      |
| 24/25    | IN1HI  | Input1 high scale value (H-L)                     | IN1LO ≠ IN1HI<br>(°F) Low: -19999, High: 99999                                                                                                                                                                                                                                                                                               | 200.0    | R/W       | -19999    | 99999      |
| 44       | DP2    | Decimal point selection 2                         | 0) No.dP: No decimal point<br>1) 1-dP: 1 decimal digit<br>2) 2-dP: 2 decimal digits<br>3) 3-dP: 3 decimal digits<br>4) 4-dP: 4 decimal digits                                                                                                                                                                                                | 1        | R/W       | 0         | 65535      |
| 106/ 107 | IN2LO  | Input2 low scale value (H-L)                      | IN2LO ≠ IN2HI<br>(°F) Low: -19999, High: 99999                                                                                                                                                                                                                                                                                               | 0.0      | R/W       | -19999    | 99999      |
| 108/ 109 | IN2HI  | Input2 high scale value (H-L)                     | IN2LO ≠ IN2HI<br>(°F) Low: -19999, High: 99999                                                                                                                                                                                                                                                                                               | 200.0    | R/W       | -19999    | 99999      |
| 45       | MATH   | Value calculation                                 | 0) NONE: no calculation<br>1) Addi: PV1 + PV2<br>2) Subt: PV1 - PV2<br>3) Mult: PV1 x PV2<br>4) Divi: PV1 ÷ PV2                                                                                                                                                                                                                              | 0        | R/W       | 0         | 65535      |
| 6        | FILT   | Filter damping time constant of PV                | 0) 0: 0 second time constant<br>1) 0.2: 0.2 second time constant<br>2) 0.5: 0.5 second time constant<br>3) 1: 1 second time constant<br>4) 2: 2 second time constant<br>5) 5: 5 second time constant<br>6) 10: 10 second time constant<br>7) 20: 20 second time constant<br>8) 30: 30 second time constant<br>9) 60: 60 second time constant | 2        | R/W       | 0         | 65535      |
| 7        | LCUT   | Input low-cut value                               | OFF(-1) or<br>(°F) 0-36000                                                                                                                                                                                                                                                                                                                   | -1       | R/W       | -1        | 45536      |
| 46       | SQRT   | Square root function                              | 0) oFF: Square root disable<br>1) oN: Square root enable                                                                                                                                                                                                                                                                                     | 0        | R/W       | 0         | 65535      |
| 47       | DSP1   | Upper display                                     | 0) INPT1: Display input1 (PV1)<br>1) MATH: Display math calculation                                                                                                                                                                                                                                                                          | 0        | R/W       | 0         | 65535      |
| 48       | DSP2   | Lower display                                     | 0) NoNE: No display<br>1) INPT2: Display input2 (PV2)<br>2) MATH: Display value calculation<br>3) IN1P: Display input1 percentage<br>4) A1SP: Display alarm1 setpoint                                                                                                                                                                        | 4        | R/W       | 0         | 65535      |
| 84       | OFTL1  | Input1 offset value for low point calibration     | Low: -1999 High: 1999                                                                                                                                                                                                                                                                                                                        | 0.0      | R/W       | -19999    | 45536      |
| 110/ 111 | CALO 1 | Input1 signal value during low point calibration  | Low: -19999 High: CAHI1-1                                                                                                                                                                                                                                                                                                                    | 0.0      | R/W       | -19999    | 99999      |
| 85       | OFTH 1 | Input1 offset value for high point calibration    | Low: -1999 High: 1999                                                                                                                                                                                                                                                                                                                        | 0.0      | R/W       | -19999    | 45536      |
| 112 /113 | CAHI1  | Input1 signal value during high point calibration | Low: CALO1+1 High: 99999                                                                                                                                                                                                                                                                                                                     | 100.0    | R/W       | -19999    | 99999      |
| 86       | OFTL2  | Input2 offset value for low point calibration     | Low: -1999 High: 1999                                                                                                                                                                                                                                                                                                                        | 0.0      | R/W       | -19999    | 45536      |
| 114/ 115 | CALO 2 | Input2 signal value during low point calibration  | Low: -19999 High: CAHI2-1                                                                                                                                                                                                                                                                                                                    | 0.0      | R/W       | -19999    | 99999      |
| 87       | OFTH 2 | Input2 offset value for high point calibration    | Low: -1999 High: 1999                                                                                                                                                                                                                                                                                                                        | 0.0      | R/W       | -19999    | 45536      |
| 116/ 117 | CAHI2  | Input2 signal value during high point calibration | Low: CALO2+1 High: 99999                                                                                                                                                                                                                                                                                                                     | 100.0    | R/W       | -19999    | 99999      |
| 19       | CODE   | Security code for parameter protection            | Low: 0 High: 9999                                                                                                                                                                                                                                                                                                                            | 0        | R/W       | 0         | 65535      |
| 94       | OFS1   | Optional function 1 selection                     | 0) NoNE: No selected<br>1) R485: RS-485                                                                                                                                                                                                                                                                                                      | 0        | R/W       | 0         | 65535      |
| 95       | OFS2   | Optional function 2 selection                     | 0) NoNE: No selected<br>1) RE2: Retransmission2 output<br>2) ALM5: Alarm5<br>3) ALM5.RE2: Alarm5, Retransmission2                                                                                                                                                                                                                            | 0        | R/W       | 0         | 65535      |
| SET/ALM  |        |                                                   |                                                                                                                                                                                                                                                                                                                                              |          |           |           |            |
| 96       | A1FN   | Alarm 1 function for alarm output                 | 0) NONE: No alarm function<br>1) PV1Hi: PV1 high alarm<br>2) PV1Lo: PV1 low alarm<br>3) PV1LH: PV1 high latching alarm<br>4) PV1LL: PV1 low latching alarm<br>5) PV2Hi: PV2 high alarm<br>6) PV2Lo: PV2 low alarm<br>7) PV2LH: PV2 high latching alarm<br>8) PV2LL: PV2 low latching alarm                                                   | 0        | R/W       | 0         | 65535      |
| 15       | A1HY   | Hysteresis control of alarm 1                     | (°F) Low: 0.1, High: 90.0<br>(°C) Low: 0.1, High: 90.0                                                                                                                                                                                                                                                                                       | 0.1      | R/W       | 0         | 65535      |
| 9        | A1DL   | Alarm 1 delay time                                | Low: 0, High: 999 sec                                                                                                                                                                                                                                                                                                                        | 0        | R/W       | 0         | 65535      |
| 97       | A2FN   | Alarm 2 function for alarm output                 | 0)~8) Same as A2FN                                                                                                                                                                                                                                                                                                                           | 0        | R/W       | 0         | 65535      |

| Reg Addr  | Code | Parameter                                       | Range                                                                                                                                                 | Def-ault | Data Type | Scale Low | Scale High |
|-----------|------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|------------|
| 16        | A2HY | Hysteresis control of alarm 2                   | (*F) Low: 0.1, High: 90.0<br>(*C) Low: 0.1, High: 90.0                                                                                                | 0.1      | R/W       | 0         | 65535      |
| 10        | A2DL | Alarm 2 delay time                              | Low: 0, High: 999 sec                                                                                                                                 | 0        | R/W       | 0         | 65535      |
| 98        | A3FN | Alarm 3 function for alarm output               | <b>0)~8)</b> Same as A1FN<br><b>9) DCPS:</b> 20 VDC Output Supply<br><b>10) RE3:</b> Retransmission3                                                  | 0        | R/W       | 0         | 65535      |
| 17        | A3HY | Hysteresis control of alarm 3                   | (*F) Low: 0.1, High: 90.0<br>(*C) Low: 0.1, High: 90.0                                                                                                | 0.1      | R/W       | 0         | 65535      |
| 11        | A3DL | Alarm 3 delay time                              | Low: 0, High: 999 sec                                                                                                                                 | 0        | R/W       | 0         | 65535      |
| 99        | A4FN | Alarm 4 function for alarm output               | <b>0)~8)</b> Same as A1FN<br><b>9) DCPS:</b> 20 VDC Output Supply<br><b>10) RE1:</b> Retransmission1                                                  | 0        | R/W       | 0         | 65535      |
| 18        | A4HY | Hysteresis control of alarm 4                   | (*F) Low: 0.1, High: 90.0<br>(*C) Low: 0.1, High: 90.0                                                                                                | 0.1      | R/W       | 0         | 65535      |
| 12        | A4DL | Alarm 4 delay time                              | Low: 0, High: 999 sec                                                                                                                                 | 0        | R/W       | 0         | 65535      |
| 100       | A5FN | Alarm 5 function for alarm output               | <b>0)~8)</b> Same as A1FN                                                                                                                             | 0        | R/W       | 0         | 65535      |
| 101       | A5HY | Hysteresis control of alarm 5                   | (*F) Low: 0.1, High: 90.0<br>(*C) Low: 0.1, High: 90.0                                                                                                | 0.1      | R/W       | 0         | 65535      |
| 102       | A5DL | Alarm 5 delay time                              | Low: 0, High: 999 sec                                                                                                                                 | 0        | R/W       | 0         | 65535      |
| 13        | SB   | Delay rang of alarm detection activation (High) | Low: 0, High: 9999                                                                                                                                    | 0        | R/W       | 0         | 65535      |
| 14        | SDT  | Delay time of alarm detection activation        | Low: 0, High: 999 sec                                                                                                                                 | 0        | R/W       | 0         | 65535      |
| SET/ RETR |      |                                                 |                                                                                                                                                       |          |           |           |            |
| 88        | RE1  | Retransmission 1 selection                      | <b>0) INPUT1:</b> Input1 (PV1)<br><b>1) INPUT2:</b> Input2 (PV2)<br><b>2) Math:</b> Math result                                                       | 0        | R/W       | 0         | 65535      |
| 89        | RES1 | Retransmission 1 type                           | <b>0) 4-20:</b> 4-20 mA<br><b>1) 0-20:</b> 0-20 mA<br><b>2) 0-5V:</b> 0-5V<br><b>3) 1-5V:</b> 1-5V<br><b>4) 0-10V:</b> 0-10V<br><b>5) 2-10:</b> 2-10V | 0        | R/W       | 0         | 65535      |
| 34/35     | ANL1 | Output 1 retransmission low value (H-L)         | ANL1 ≠ ANH1<br>Low: -19999, High: 99999                                                                                                               | 0.0      | R/W       | -19999    | 99999      |
| 36/37     | ANH1 | Output 1 retransmission high value (H-L)        | ANL1 ≠ ANH1<br>Low: -19999, High: 99999                                                                                                               | 100.0    | R/W       | -19999    | 99999      |
| 20        | OTZ1 | Output 1 zero adjustment                        | Low: -1.000<br>High 1.000                                                                                                                             | 0        | R/W       | -19999    | 45536      |
| 21        | OTS1 | Output 1 span adjustment                        | Low: -1.000<br>High 1.000                                                                                                                             | 0        | R/W       | -19999    | 45536      |
| 90        | RE2  | Retransmission 2 selection                      | <b>0) INPUT1:</b> Input1 (PV1)<br><b>1) INPUT2:</b> Input2 (PV2)<br><b>2) Math:</b> Math result                                                       | 0        | R/W       | 0         | 65535      |
| 91        | RES2 | Retransmission 2 type                           | <b>0) 4-20:</b> 4-20 mA<br><b>1) 0-20:</b> 0-20 mA<br><b>2) 0-5V:</b> 0-5V<br><b>3) 1-5V:</b> 1-5V<br><b>4) 0-10V:</b> 0-10V<br><b>5) 2-10:</b> 2-10V | 0        | R/W       | 0         | 65535      |
| 118/119   | ANL2 | Output 2 retransmission low value               | ANL2 ≠ ANH2<br>Low: -19999, High: 99999                                                                                                               | 0.0      | R/W       | -19999    | 99999      |
| 120/121   | ANH2 | Output 2 retransmission high value              | ANL2 ≠ ANH2<br>Low: -19999, High: 99999                                                                                                               | 100.0    | R/W       | -19999    | 99999      |
| 92        | OTZ2 | Output 2 zero adjustment                        | Low: -1.000<br>High 1.000                                                                                                                             | 0        | R/W       | -19999    | 45536      |
| 93        | OTS2 | Output 2 span adjustment                        | Low: -1.000<br>High 1.000                                                                                                                             | 0        | R/W       | -19999    | 45536      |
| 141       | RE3  | Retransmission 3 selection                      | <b>0) INPUT1:</b> Input1 (PV1)<br><b>1) INPUT2:</b> Input2 (PV2)<br><b>2) Math:</b> Math result                                                       | 0        | R/W       | 0         | 65535      |
| 164       | RES3 | Retransmission 3 type                           | <b>0) 4-20:</b> 4-20 mA<br><b>1) 0-20:</b> 0-20 mA<br><b>2) 0-5V:</b> 0-5V<br><b>3) 1-5V:</b> 1-5V<br><b>4) 0-10V:</b> 0-10V<br><b>5) 2-10:</b> 2-10V | 0        | R/W       | 0         | 65535      |
| 124/125   | ANL3 | Output 3 low point retransmission value         | ANL3 ≠ ANH3<br>Low: -19999, High: 99999                                                                                                               | 0.0      | R/W       | -19999    | 99999      |
| 126/127   | ANH3 | Output 3 high point temperature                 | ANL3 ≠ ANH3<br>Low: -19999, High: 99999                                                                                                               | 100.0    | R/W       | -19999    | 99999      |
| 165       | OTZ3 | Output 3 zero adjustment (low)                  | Low: -1.000<br>High 1.000                                                                                                                             | 0        | R/W       | -19999    | 45536      |
| 166       | OTS3 | Output 3 span adjustment (high)                 | Low: -1.000<br>High 1.000                                                                                                                             | 0        | R/W       | -19999    | 45536      |
| SET/ COMM |      |                                                 |                                                                                                                                                       |          |           |           |            |
| 8         | ADDR | Address assignment of digital communication     | Low: 1<br>High: 247                                                                                                                                   | 1        | R/W       | 0         | 65535      |

| Reg Addr              | Code | Parameter                                          | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Def-ault | Data Type | Scale Low | Scale High |
|-----------------------|------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|------------|
| 4                     | BAUD | Baud rate of digital communication                 | <b>0) 2.4:</b> 2.4 Kbits/s<br><b>1) 4.8:</b> 4.8 Kbits/s<br><b>2) 9.6:</b> 9.6 Kbits/s<br><b>3) 14.4:</b> 14.4 Kbits/s<br><b>4) 19.2:</b> 19.2 Kbits/s<br><b>5) 28.8:</b> 28.8 Kbits/s<br><b>6) 38.4:</b> 38.4 Kbits/s<br><b>7) 57.6:</b> 57.6 Kbits/s<br><b>8) 115.2:</b> 115.2 Kbits/s                                                                                                                                                                                                  | 2        | R/W       | 0         | 65535      |
| 82                    | DATA | Data bit count of digital communication            | <b>0) 7bit:</b> 7 data bits<br><b>1) 8bit:</b> 8 data bits                                                                                                                                                                                                                                                                                                                                                                                                                                | 1        | R/W       | 0         | 65535      |
| 5                     | PARI | Parity bit of digital communication                | <b>0) EVEN:</b> Even Parity<br><b>1) Odd:</b> Odd parity<br><b>2) NoNE:</b> No parity bit                                                                                                                                                                                                                                                                                                                                                                                                 | 0        | R/W       | 0         | 65535      |
| 83                    | STOP | Stop bit count of digital communication            | <b>0) 1bit:</b> One stop bit<br><b>1) 2bit:</b> Two stop bits                                                                                                                                                                                                                                                                                                                                                                                                                             | 0        | R/W       | 0         | 65535      |
| SET/ E (Input 1 only) |      |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |           |            |
| 49                    | E1FN | Event input 1 function                             | <b>0) NONE:</b> No alarm<br><b>1) R.AL1:</b> Reset alarm 1 output<br><b>2) R.AL2:</b> Reset alarm 2 output<br><b>3) R.AL3:</b> Reset alarm 3 output<br><b>4) R.AL4:</b> Reset alarm 4 output<br><b>5) R.AL5:</b> Reset alarm 5 output<br><b>6) R.ALL:</b> Reset all alarm outputs<br><b>7) FR.ZO:</b> Force PV1 to 0<br><b>8) DA.HO:</b> Current PV1 value holding<br><b>9) MX.HO:</b> PV1 max value holding<br><b>10) MANU:</b> Switch all to A0 manual control / retransmission outputs | 0        | R/W       | 0         | 65535      |
| 50                    | E2FN | Event input 2 function                             | Same as E1FN                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0        | R/W       | 0         | 65535      |
| 51                    | E3FN | Event input 3 function                             | Same as E1FN                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0        | R/W       | 0         | 65535      |
| 52                    | E4FN | Event input 4 function                             | Same as E1FN                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0        | R/W       | 0         | 65535      |
| 53                    | E5FN | Event input 5 function                             | Same as E1FN                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0        | R/W       | 0         | 65535      |
| 54                    | E6FN | Event input 6 function                             | Same as E1FN                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0        | R/W       | 0         | 65535      |
| Calibration Mode      |      |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |           |            |
| 58                    | ADLO | ADC calibration low coefficient                    | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 59                    | ADHI | ADC calibration high coefficient                   | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 60                    | RTDL | RTD calibration low coefficient                    | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 61                    | RTDH | RTD calibration high coefficient                   | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 62                    | CJLO | Cold junction calibration low coefficient          | Low: -5.00<br>High: 40.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -----    | R/W       | -19999    | 45536      |
| 63                    | CJHI | Cold junction calibration high coefficient         | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 64                    | MA1L | MA1 calibration low coefficient                    | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 65                    | MA1G | MA1 calibration high coefficient                   | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 66                    | V1L  | V1 calibration low coefficient                     | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 67                    | V1G  | V1 calibration high coefficient                    | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 68                    | MA2L | MA2 calibration low coefficient                    | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 69                    | MA2G | MA2 calibration high coefficient                   | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 70                    | V2L  | V2 calibration low coefficient                     | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| 71                    | V2G  | V2 calibration high coefficient                    | Low: -1999<br>High: 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R/W       | -19999    | 45536      |
| Internal Usage        |      |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |           |           |            |
| 72                    | CJCL | Sense voltage during cold junction calibration low | Low: 0<br>High: 7552                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -----    | R         | 0         | 65535      |
| 73                    | CJCT | Cold Junction Temperature                          | Low: -4000<br>High: 9000                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R         | -19999    | 45536      |
| 38/39                 | PV1  | Process Value 1                                    | Low: -19999, High: 99999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R         | -19999    | 99999      |
| 40/41                 | PV2  | Process Value 2                                    | Low: -19999, High: 99999                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -----    | R         | -19999    | 99999      |
| 74                    | DATE | Date                                               | Low: 0, High: 65535                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -----    | R         | 0         | 65535      |
| 75                    | SRNO | Serial No                                          | Low: 0, High: 65535                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -----    | R         | 0         | 65535      |
| 76                    | EROR | Error code                                         | Low: 0, High: 65535                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -----    | R         | 0         | 65535      |
| 1                     | MODE | Operation/ Alarm mode                              | Low: 0, High: 65535                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -----    | R         | 0         | 65535      |
| 140                   | PROG | Program code                                       | 53. XX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -----    | R         | 0         | 65535      |
| 79                    | CMND | Command code                                       | Low: 0, High: 65535                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -----    | R/W       | 0         | 65535      |
| 80                    | JOB1 | Job code                                           | Low: 0, High: 65535                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -----    | R/W       | 0         | 65535      |
| 81                    | PASS | Parameter Password                                 | Low: 0, High: 9999                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0        | R/W       | 0         | 65535      |

5. Communication Address Full Table v1.2

| Comm. Reg. Address | Parameter Notation | Type           | Comm. Address | Parameter Notation | Type           |
|--------------------|--------------------|----------------|---------------|--------------------|----------------|
| 1                  | MODE               | Internal       | 67            | VIG                | Calibration    |
| 2                  | UNIT1              | Input/ Base    | 68            | MA2L               | Calibration    |
| 3                  | DP1                | Input/ Base    | 69            | MA2G               | Calibration    |
| 4                  | BAUD               | Communication  | 70            | V2L                | Calibration    |
| 5                  | PARI               | Communication  | 71            | V2G                | Calibration    |
| 6                  | FILT               | Base           | 72            | CJCL               | Internal       |
| 7                  | LCUT               | Base           | 73            | CJCT               | Internal       |
| 8                  | ADDR               | Communication  | 74            | DATE               | Internal       |
| 9                  | A1DL               | Alarm          | 75            | SRNO               | Internal       |
| 10                 | A2DL               | Alarm          | 76            | EROR               | Internal       |
| 11                 | A3DL               | Alarm          | 79            | CMND               | Internal       |
| 12                 | A4DL               | Alarm          | 80            | JOB1               | Internal       |
| 13                 | SB                 | Alarm          | 81            | PASS               | Internal       |
| 14                 | SDT                | Alarm          | 82            | DATA               | Communication  |
| 15                 | A1HY               | Alarm          | 83            | STOP               | Communication  |
| 16                 | A2HY               | Alarm          | 84            | OFTL1              | Input/ Base    |
| 17                 | A3HY               | Alarm          | 85            | OFTH1              | Input/ Base    |
| 18                 | A4HY               | Alarm          | 86            | OFTL2              | Input/ Base    |
| 19                 | CODE               | Base           | 87            | OFTH2              | Input/ Base    |
| 20                 | OTZ1               | Retransmission | 88            | RE1                | Retransmission |
| 21                 | OTS1               | Retransmission | 89            | RES1               | Retransmission |
| 22/23              | IN1LO              | Input/ Base    | 90            | RE2                | Retransmission |
| 24/25              | IN1HI              | Input/ Base    | 91            | RES2               | Retransmission |
| 26/27              | A1SP               | Alarm          | 92            | OTZ2               | Retransmission |
| 28/29              | A2SP               | Alarm          | 93            | OTS2               | Retransmission |
| 30/31              | A3SP               | Alarm          | 94            | OFS1               | Base           |
| 32/33              | A4SP               | Alarm          | 95            | OFS2               | Base           |
| 34/35              | ANL1               | Retransmission | 96            | A1FN               | Alarm          |
| 36/37              | ANH1               | Retransmission | 97            | A2FN               | Alarm          |
| 38/39              | PV1                | Internal       | 98            | A3FN               | Alarm          |
| 40/41              | PV2                | Internal       | 99            | A4FN               | Alarm          |
| 42                 | INPT1              | Input/ Base    | 100           | A5FN               | Alarm          |
| 43                 | INPT2              | Input/ Base    | 101           | A5HY               | Alarm          |
| 44                 | DP2                | Input/ Base    | 102           | A5DL               | Alarm          |
| 45                 | MATH               | Base           | 103           | LOCK               | Base           |
| 46                 | SQRT               | Base           | 104/105       | A5SP               | Alarm          |
| 47                 | DSP1               | Input          | 106/107       | IN2LO              | Input/ Base    |
| 48                 | DSP2               | Input          | 108/109       | IN2HI              | Input/ Base    |
| 49                 | E1FN               | Event          | 110/111       | CALO1              | Input/ Base    |
| 50                 | E2FN               | Event          | 112/113       | CAHI1              | Input/ Base    |
| 51                 | E3FN               | Event          | 114/115       | CALO2              | Input/ Base    |
| 52                 | E4FN               | Event          | 116/117       | CAHI2              | Input/ Base    |
| 53                 | E5FN               | Event          | 118/119       | ANL2               | Retransmission |
| 54                 | E6FN               | Event          | 120/121       | ANH2               | Retransmission |
| 55                 | AOSW               | Manual         | 122           | MAT_HD             | Base           |
| 56                 | AO1                | Manual         | 123           | MAT_DL             | Base           |
| 57                 | AO2                | Manual         | 124/125       | ANL3               | Retransmission |
| 58                 | ADLO               | Calibration    | 126/127       | ANH3               | Retransmission |
| 59                 | ADHI               | Calibration    | 139           | AO3                | Alarm          |
| 60                 | RTDL               | Calibration    | 140           | PROG               | Internal       |
| 61                 | RTDH               | Calibration    | 141           | RE3                | Retransmission |
| 62                 | CJLO               | Calibration    | 164           | RES3               | Retransmission |
| 63                 | CJHI               | Calibration    | 165           | OTZ3               | Retransmission |
| 64                 | MAIL               | Calibration    | 166           | OTS3               | Retransmission |
| 65                 | MAIG               | Calibration    | 167           | FILE               | File/ Manual   |
| 66                 | VIL                | Calibration    |               |                    |                |

6. PROGRAMMING

Signal Input

INPT: Select the sensor type or signal type for signal input

Range: (Thermocouple) J\_tC, K\_tC, T\_tC, E\_tC, B\_tC, R\_tC, S\_tC, N\_tC, L\_tC, U\_tC, P\_tC, C\_tC, d\_tC(RTD) PT.DN, PT.JS, (Linear) 4-20, 0-20, 0-5V, 1-5V, 0-10V, 0-1V, 0-50mV

Retransmission

The signal conditioner will output (retransmit) PV on its output terminals of output1, output2 and output3. ANL1 and ANH1 are adjusted to specify the low scale and high scale values of output1 retransmission. Similarly, ANL2, ANL3, ANH2 and ANH3 parameters are adjusted for output2 and output3.

Zero and Span adjustment

The signal conditioner has the option to adjust the zero and span of the outputs to meet the required accuracy. The user can adjust the parameters otZ1, otZ2 and otZ3 to adjust the zero value of the output1, output2 and output3 respectively. The user can adjust the parameters otS1, otS2 and otS3 to adjust the span value of the output1, output2 and output3 respectively. The allowable range for zero and span adjustment is from -1.000 to 1.000.

Square Root function (SQRT)

The square root function (SQRT) function will output the square root value of the PV. The square root function will be enabled by setting the parameter SQRT.

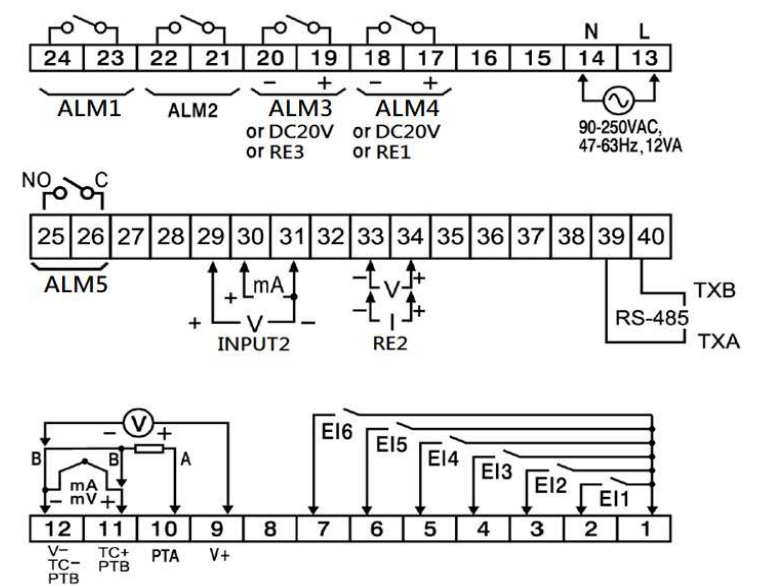
Manual Control

Some application requires to test with the manual output from the signal conditioner. Use key to access the MANU mode, to navigate to the manual mode control parameter AOSW. Set AOSW to ON to start the manual mode output. Use the key to select the desired output parameters AO1, AO2 and AO3. Use the key to move to the digital position. Use the  keys to set the required output values. Set AOSW to OFF to stop the manual output.

7. ERROR CODE

| Error Code | Display Symbol | Description & Reason                                                                                               | Corrective Action                                                     |
|------------|----------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 10         | ER10           | <b>Communication error:</b><br>bad function code                                                                   | Correct the communication software to meet the protocol requirements. |
| 11         | ER11           | <b>Communication error:</b><br>register address out of range                                                       | Do not issue an over-range address of the register to the slave       |
| 14         | ER14           | <b>Communication error:</b><br>attempt to write a read-only data                                                   | Do not write read-only data or protected data to the slave.           |
| 15         | ER15           | <b>Communication error:</b> write a value which is out of range to a register                                      | Do not write an over-range data to the slave register                 |
| 29         | EEPR           | EEPROM can't be written correctly                                                                                  | Return to factory for repair.                                         |
| 30         | CJER           | Cold junction compensation for Thermocouple malfunction                                                            | Return to factory for repair.                                         |
| 39         | SBER           | Input sensor break, or input current below 1 mA if 4-20 mA is used, or input voltage below 0.25V if 1 - 5V is used | Replace the input sensor.                                             |
| 40         | ADER           | A to D converter or related component(s) malfunction                                                               | Return to factory for repair.                                         |

8. WIRING DIAGRAM



Terminal Connection



For assistance contact Tech Support: service@brainchild.com.tw;  
886-2-2786-1299; http:// www.brainchildtw.com  
\*\*This specification is subject to possible change without prior notice.  
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