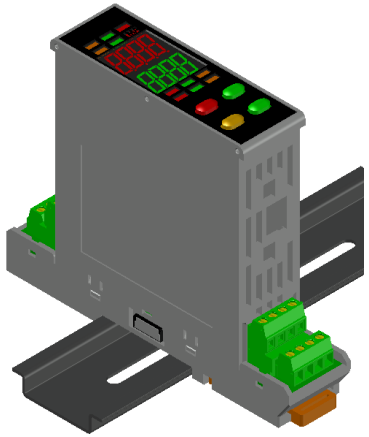
# DMC Temperature Controller

# Installation and Operation Guide



## 1. Introduction

The DMC is a DIN-rail mounted controller, its slim size makes it ideal for in-panel application.

### 1.1 Highlight Features

- Slim size 24 x 110 x 87 (W x H x D)mm
- Removable terminal block, easy for replacement and maintenance
- No power supply and communication wiring required between the DMC unit's connection (Max. connected units : 32)
- Ramp to Set-point or soft start function available.
- One optional DI (digital input) or AI (analog input) available
- Adjustable brightness of LED display
- 2-degree PID algorithm
- Easy to set up without power supply wiring by connecting to PC with the URC-1020 cable

### 1.2 Specification

**Input signal :** User programmable. refer to table 1.

- Thermocouple (T/C) : industry standard thermocouple types, J, K, T, E, B, R, S, N, C (ITS-90).
- Pt100 : Excitation 180uA. 2 or 3 wire connection (ITS-90 α=0.00385).
- Voltage : -60mVdc to 60mVdc or -10Vdc to 10Vdc.
- Current : -24mA to 24mA

**Measuring range :** User programmable. Maximum range refer to table 1.

**Measuring accuracy :** refer to Table 1. the accuracy is tested under the operating condition of 24°C±3°C.



| Input signal | Maximum Range | Accuracy |
|---|---|---|
| Thermocouple J | -50 to 1000°C (-58 to 1832°F) | ±1°C |
| Thermocouple K | -50 to 1370°C (-58 to 2498°F) | ±1°C |
| Thermocouple T | -270 to 400°C (-454 to 752°F) | ±1°C |
| Thermocouple E | -50 to 750°C (-58 to 1382°F) | ±1°C |
| Thermocouple B | 0 to 1800°C (32 to 3272°F) | ±2°C(Note1) |
| Thermocouple R | -50 to 1750°C (-58 to 3182°F) | ±2°C |
| Thermocouple S | -50 to 1750°C (-58 to 3182°F) | ±2°C |
| Thermocouple N | -50 to 1300°C (-58 to 2372°F) | ±2°C |
| Thermocouple C | -50 to 1800°C (-58 to 3272°F) | ±2°C |
| Pt100 (DIN) | -200 to 850°C (-328 to 1562°F) | ±0.2°C |
| Pt100 (JIS) | -200 to 600°C (-328 to 1112°F) | ±0.2°C |
| mA | -24mA~24mA | ±4μA |
| mV | -60mV~60mV | ±0.01mV |
| Voltage | -10V~10V | ±2mV |

***Factory Setting**

**Note 1:** Accuracy is not guaranteed between 0 and 400°C (0 and 752°F) for type B.

**Table 1 Input Signal**

**Sampling rate :** 100mS

**Control Output :**

- Relay output : 3A/240Vac (Resistive load)
- SSR output : 24Vdc pulsed voltage for driving SSR (Max. load current 20 mA)
- Current output : 4~20mA (Resistive load 600 ohms Max.)
- Voltage output : 0~10V (Resistive load 500 ohms Min.)

**Control Mode :** PID with auto-tune, P with manual reset or On/Off with hysteresis available.

- Proportional Band : 0.0~300.0% (0.0 % = On/Off mode)
- Integral Time : 0.0~3000 sec.
- Derivative Time : 0.0~1000 sec.
- Cycle Time : 0~60 sec.
- Hysteresis : 0~9999

**Ramp Function :**

- Ramp rate : 0~9999 unit/minute or unit/second (0 = disable the ramp function)

**Alarm Output :** 3A/240Vac (Resistive load)

**Alarm Function :** Energized / De-energized with 0~30000 Sec. / Min. delay

- Alarm function disable
- Process high alarm
- Process low alarm
- Deviation high alarm
- Deviation low alarm
- Inside deviation band alarm
- Outside deviation band alarm

**Alarm Mode :**

- Normal mode
- Standby mode
- Latch mode
- Standby and Latch mode

**Option :**

■ DI (digital input) – Contact input

■ AI (analog input) – 4~20mA, 0 ~10V

**Communication :**

■ Interface : Half duplex based on EIA RS-485

■ Protocol : Modbus RTU mode

■ Data format :

Start bit : 1

Data bit : 8

Parity : None, even, odd

Stop bit : 1 or 2

■ Baud Rate : 9600, 19200, 38400, 57600, 115200 bps

**Power supply :** 24Vdc (19 ~ 32 Vdc)

**Power consumption :** 4.8VA Max.

**Common mode rejection ratio :** >90dB.

**Operating temperature :** 0 to 55°C

**Humidity :** 0 to 85% RH (Non-Condensing)

**Electromagnetic compatibility (EMC) :**

■ EMS : EN 61000-6-2

EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-6

■ EMI : EN61000-6-4

**Dimension :** 24 x 110 x 87 mm (W x H x D).

**Housing material :** ABS/PC plastic. UL 94V0

**Weight :** 100g

### 1.3 Ordering information

**DMC – D –** [1] [2] [3]

**[1] Input Type :**

| Code | Input Type |
|---|---|
| T | Thermocouple |
| D | PT100 |
| L | 0~50 mV |
| V | 0~10 V |
| M | 4~ 20 mA |

**[2] Output 1 :**

| Code | Output |
|---|---|
| R | Relay |
| P | Pulse Voltage to drive SSR |
| M | 4 ~ 20 mA |
| V | 0 ~ 10 V |
| O | Other specified by customer |

**[3] Aux Input :**

| Code | Input Type |
|---|---|
| A | Analog input |
| D | Digit input |
| N | None |



## 2. Installation and wiring

### 2.1 Mounting a unit

1. Hook the upper side of DMC controller on the DIN rail
2. Press the Bottom side of DMC controller toward the DIN rail to lock the clip into DIN rail.

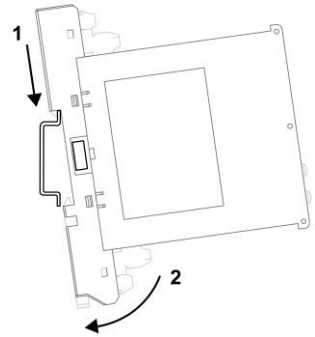



**Figure 1. Mounting**

### 2.2 Removing a unit

Insert a flathead screwdriver into the clip and pull it upward to release the hook as shown in Figure 2, the unit will pop-up from DIN rail by itself.

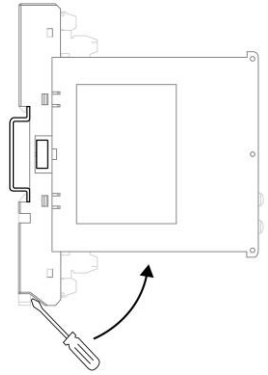


**Figure 2. Removing**

### 2.3 Connections and wiring

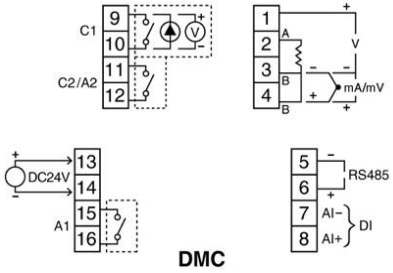



**Figure 3. Terminal connections**

**Wiring precaution :** Inverter, mechanical contact relays, arc welders, and ignition transformers are all common sources of electrical noise in an industrial environment, so always keep input signal and communication wires away from those noise-generating devices.

# 3. Operation

## 3.1 Front panel description

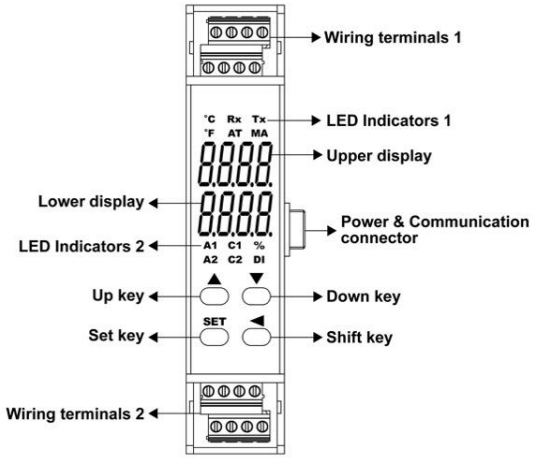



**Figure 4. Front panel description**

- Upper display : Display the Process Value(PV), parameter index code or error code
- Lower display : Display the Set-point Value(SV) or parameter setting value
- °C : Celsius indicator
- °F : Fahrenheit indicator
- Rx : Receive indicator
- Tx : Transmit indicator
- AT : Auto-tuning indicator
- MA : Manual mode indicator
- C1 : Control output 1 indicator
- C2 : Control output 2 indicator
- A1 : Alarm 1 indicator
- A2 : Alarm 2 indicator
- % : Lower display showing output percentage indicator
- DI : Digital input indicator
- SET key : Use to menus navigation and set value registration
- Shift key : Shift the digit of numeral
- Down key : Decreases the parameter value
- Up key : Increases the parameter value
- SET + Shift key for 2 sec. : Enter set up mode
- SET + up key : Return to PV/SV display
- Shift + Down key on powering up : Reset all parameters to default setting



## 3.2 Powering up procedure

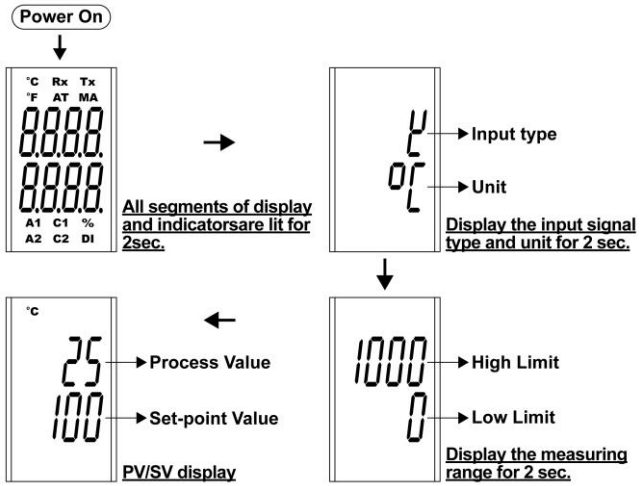



**Figure 5. Powering up procedure**

## 3.3 Configuration

### 3.3.1 Menu Flowchart

After powering up procedure, the controller stays in PV/SV display. The upper display shows the process value (measuring value) and the lower display shows the set-point value (target value). All the configurable parameters are located in different levels and can be accessed by keypad operation as shown in figure 6.

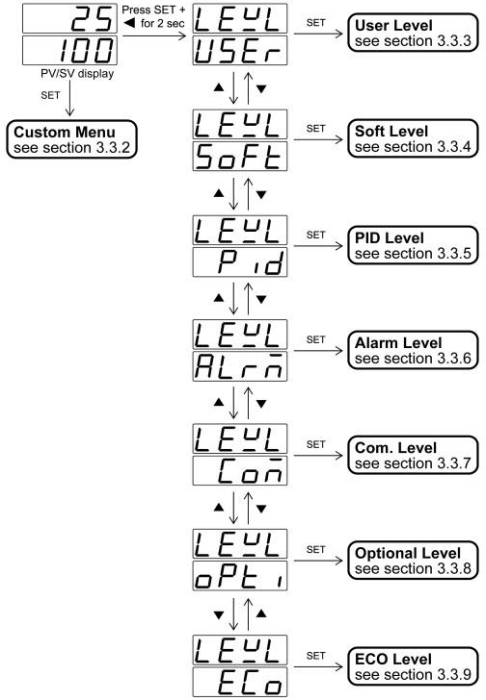



**Figure 6. Menu flowchart**

### 3.3.2 Custom Menu

Through the **DMC Setup Tool,** users may select up to seven of the most frequently used parameters from all parameter levels and add them to the custom menu based on their application requirements. The factory default parameters in the Custom Menu are the parameters from the User Level.

### 3.3.3 User Level

| Display | Description | Range | Default | Unit |
|---|---|---|---|---|
| % | "%" indicator lit, Lower display showing output percentage | 0.0~100.0% | N/A | % |
| rUn | Control mode | oFF : Off<br>on : On<br>At 1 : AT1<br>At2 : AT2<br>nAn : Man | On | N/A |
| br it | Display Brightness | 3~10 | 5 | N/A |

Control output percentage

In Auto mode ( rUn = on ), it shows the percentage of output power applied to the control output.

In Manual mode ( rUn = nAn ), the "MA" indicator is lit. The percentage of output power can be set manually.

Control mode

Select the control mode to be

Off – Standby mode. Both control output and alarm are turned off.

On – Auto mode (closed loop control). In this mode, the control output percentage is determined by PID algorithm or ON/OFF action.

AT1 – Auto-tuning mode 1. In this mode, the controller will tune the PID parameters automatically at SV. The process will oscillate around the SV during AT1 process (Figure 7). Use AT2 mode if overshooting beyond the normal process is likely to cause damage.

AT2 – Auto-tuning mode 2. In this mode, the controller will tune the PID parameters automatically at (SV-10%). The process will oscillate around (SV-10%) during AT2 process (Figure 7).

Man – Manual mode (open loop control). In this mode, the control output can be set manually.

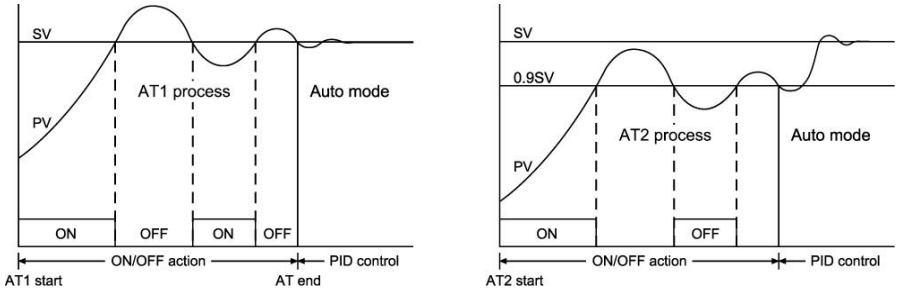



**Figure 7. Auto-tuning Process**

Display Brightness

Set the brightness of LED display.

### 3.3.4 Soft Level

| Display | Description | Range | Default | Unit |
|---|---|---|---|---|
| rAnP | Ramp rate | oFF, 1~9999 (0.1~999.9) | oFF | Unit / sec.(min) |
| SSt | Soft start time | oFF, 00.01~99.59 | oFF | Minutes : Seconds |
| SSo | Soft start output | 0.0~50.0 % | 0.0 | % |



Ramp rate

The controller can act as either a fixed setpoint controller or as a single ramp controller. If the ramp rate is set to a value other than "oFF", the process will increase or decrease at the setting rate during initial power up or with setpoint change. The ramp rate is in degree per min. or sec. depends on the time scale set (PTME) setting.

Soft start time

Soft start function is a feature that gradually heats up a hot runner system to avoid damaging the heater and ensure proper operation. This process involves applying reduced power (set by soft start output) to the heaters for a specific duration (set by soft start time). Typical soft start times range from 30 to 60 minutes. Please note that soft start function is activated when the DMC starting up. If the PV is higher than 120°C at the start or the PV reaches 120°C during soft start time, the soft start function will be ignored and the DMC will go to auto mode. the auto-tuning is prohibited during soft start duration.

Soft start output

Set the output during soft start time.

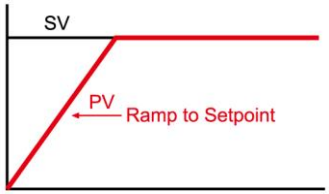



**Figure 8. Ramp Function**

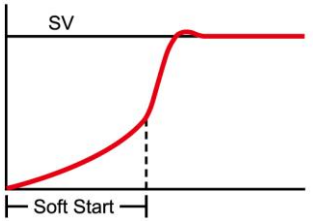



**Figure 9. Soft Start**

### 3.3.5 PID Leve

| Display | Description | Range | Default | Unit |
|---|---|---|---|---|
| Pb | Proportional band | 0.0~300.0 | 5.0 | % |
| t i | Integral time | oFF,1~3000 | 240 | Sec. |
| td | Derivative time | oFF,1~1000 | 60 | Sec. |
| nr | Manual reset | 0.0~51.0 | 0.0 | % |
| HYS | Hysteresis of control output 1 (available only when Pb=0) | 0~1000 (0.0~100.0) | 0 | unit |
| Ct | Cycle time | 0~60 | 15 | Sec. |
| CPb | Cooling proportional band | 0.0~300.0 | 5 | % |
| db | Dead band | -1000~1000 (-100.0~100.0) | 0 | °C,°F or Engineering Unit |
| CCt | Cooling cycle time | 1~60 | 15 | Sec. |
| CHYS | Hysteresis of cooling output | 0~1000 (0.0~100.0) | 0 | unit |

Proportional band

Set the proportional band in percentage of SPAN (High limit - Low limit). It can be set automatically by auto-tuning process.

Integral time

Set the integral time constant in repetitions per second. It can be set automatically by auto-tuning process.

Derivative time

Set the derivative time constant in second. It can be set automatically by auto-tuning process.

Manual reset

For PID control, this value is set automatically after auto-tuning process. For P control, it is used to compensate the deviation between process value and setpoint.

Hysteresis for ON/OFF control

In ON/OFF control (Proportional band set to 0.0%), the control output turns On/Off with respect to the setpoint. Therefore, the control output would change frequently in response to a slight change in process value. This might shorten the service life of the output device. To prevent this, a hysteresis is provided in the ON/OFF control.

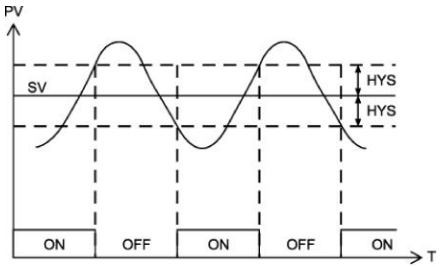



**Figure 10. ON/OFF Control Action**

Cycle time

Set the control output cycle time. It is recommended to set to 15 sec. for Relay output and set to 1 sec. for pulsed voltage output.

Cooling proportional band

Set the cooling proportional band in percentage of SPAN (High limit – Low limit). It can be set automatically by auto-tuning process. Set to 0.0 for ON/OFF control mode.

Dead band

This setting defines the area in which both heating and cooling outputs are inactive, known as dead band, or the area in which they are both active, known as overlap. A positive value results in a dead band, while a negative value results in an overlap.

Cooling cycle time

Set the cooling output cycle time. It is recommended to set to 15 sec. for Relay output.

Hysteresis of cooling output

Available when cooling proportional band set to 0%.

### 3.3.6 Alarm Level

| Display | Description | Range | Default | Unit |
|---|---|---|---|---|
| A1SP | Alarm 1 set-point | -1999~9999 (dP=0000)<br>-199.9~999.9 (dP=000.0)<br>-19.99~99.99 (dP=00.00)<br>-1.999~9.999 (dP=0.000) | 10 | unit |
| A1HY | Alarm 1 hysteresis | 0~9999 (dP=0000)<br>0~999.9 (dP=000.0)<br>0~99.99 (dP=00.00)<br>0~9.999 (dP=0.000) | 0 | unit |



| | | | | |
|---|---|---|---|---|
| A1FU | Alarm 1 function | AoFF : A.oFF<br>AHi : A.Hi<br>ALo : A.Lo<br>AdiH : A.diH<br>AdiL : A.diL<br>AbdH : A.bdH<br>AbdL : A.bdL<br>boFF : b.oFF<br>bHi : b.Hi<br>bLo : b.Lo<br>bdiH : b.diH<br>bdiL : b.diL<br>bbdH : b.bdH<br>bbdL : b.bdL | A.diH | N/A |
| A1md | Alarm 1 mode | nonE : None<br>Stdy : Stdy<br>LAtH : LAtH<br>StLA : StLA | None | N/A |
| A1dt | Alarm 1 delay time | oFF, 00.01~99.59 | oFF | HH.MM/MM.SS |
| A2SP | Alarm 2 set-point* | Same as Alarm1 set-point | 10 | Unit |
| A2HY | Alarm 2 set hysteresis* | Same as Alarm1 set hysteresis | 0 | Unit |
| A2FU | Alarm 2 function | Same as Alarm1 function | A.diL | N/A |
| A2md | Alarm 2 mode* | Same as Alarm1 mode | None | N/A |
| A2dt | Alarm 2 delay time* | Same as Alarm1 delay time | oFF | HH.MM/MM.SS |

Alarm 1 set-point, Alarm 2 set-point

The setpoint of alarm event

Alarm 1 hysteresis, Alarm 2 hysteresis

The hysteresis of alarm action

Alarm 1 function, Alarm 2 function

Select the alarm function

A.oFF – Alarm function disable.

A.Hi – Process high alarm with Form A contact

A.Lo – Process low alarm with Form A contact

A.diH – Deviation high alarm with Form A contact

A.diL – Deviation low alarm with Form A contact

A.bdH – Deviation band high alarm with Form A contact

A.bdL – Deviation band low alarm with Form A contact

b.oFF – Alarm function disablef

b.Hi – Process high alarm with Form B contact

b.Lo – Process low alarm with Form B contact

b.diH – Deviation high alarm with Form B contact

b.diL – Deviation low alarm with Form B contact

b.bdH – Deviation band high alarm with Form B contact

b.bdL – Deviation band low alarm with Form B contact

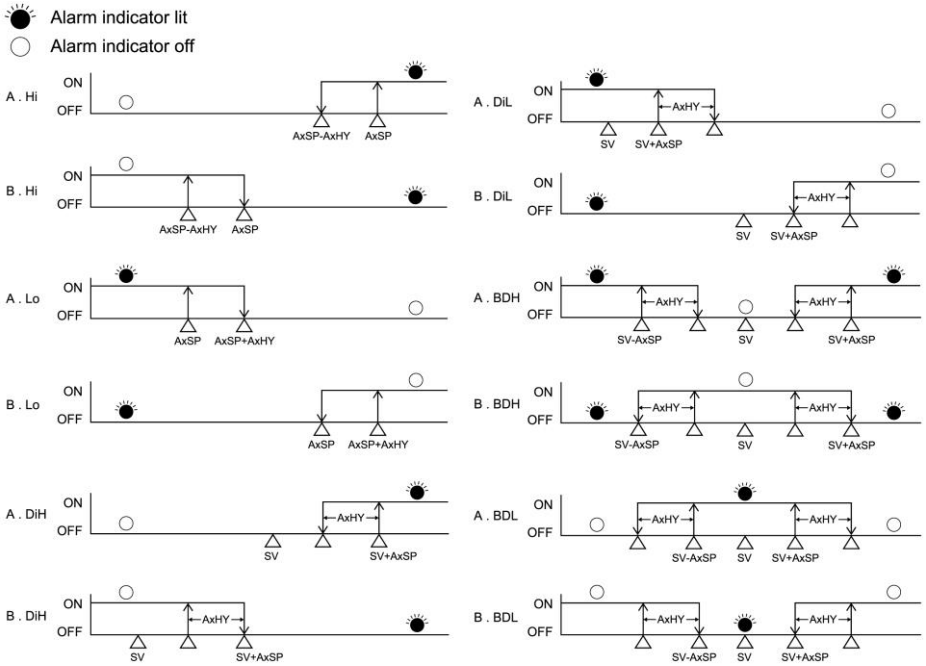



**Figure 11. Alarm function**

Alarm 1 mode, Alarm 2 mode
Select the alarm mode as
None – Disable the alarm mode
Stdy – Standby mode prevents an alarm event while powering up. The alarm is active only after alarm event has been cleared and then occurs again.



LAtH – Latch mode. the alarm output and indicator will be latched as the alarm event occurs. The alarm output and indicator will not change its state even if the alarm event has been cleared unless the power is off.
StLA – Both standby and Latch mode are applied. Figure 12 shows the result of different alarm modes applied on Deviation Band High Alarm with alarm hysteresis set to 0.

Alarm 1 delay time, Alarm 2 delay time
Alarm delay time is set to postpone the alarm action by the setting time.

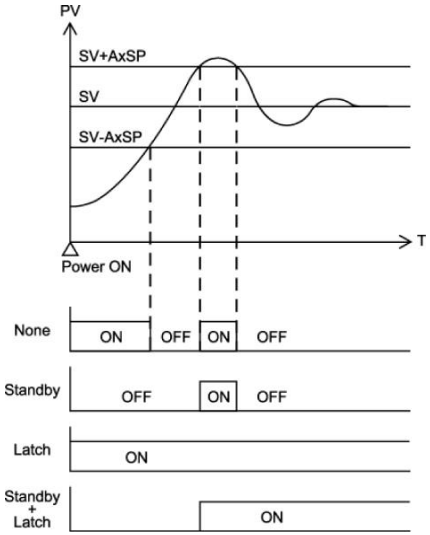



**Figure 12. Alarm Mode**

### 3.3.7 Communication Level

| Display | Description | Range | Default | Unit |
|---|---|---|---|---|
| id | Communication ID | 1~247 | 247 | N/A |
| bAUd | Baud rate | 9.6 : 9.6K<br>19.2 : 19.2K<br>38.4 : 38.4K<br>57.6 : 57.6K<br>115 : 115.2K | 19.2K | bps |
| rtU | Parity and Stop bit | n81 : None, 1 stop bit<br>n82 : None, 2 stop bit<br>o81 : Odd, 1 stop bit<br>E81 : Even, 1 stop bit | | |

Communication ID
Set the ID number in the communication network.

Baud rate
Set the communication baud rate.

Parity and Stop bit
Select the parity and stop bit combination.

### 3.3.8 Option Level

| Display | Description | Range | Default | Unit |
|---|---|---|---|---|
| tYPE | Input signal type | J : J type<br>K : K type<br>t : T type<br>E : E type<br>b : B type<br>r : R type<br>S : S type<br>n : N type<br>C : C type<br>d-Pt : PT100 (DIN)<br>J-Pt : PT100 (JIS)<br>nA : mA<br>nU : mV<br>U : V<br>rSP : External | K type | N/A |
| SCAL | Low scale for linear input | -1999~9999 | 0 | Unit |
| SCAH | High scale for linear input | -1999~9999 | 1000 | Unit |
| CUt | Cut-off function | nonE : None<br>Lo : Low<br>Hi : High<br>HiLo : High/Low | None | N/A |
| Unit | Unit | °C : °C<br>°F : °F<br>EnG : Engineer | ˚C | N/A |
| dP | Decimal point | 0000<br>000.0<br>00.00 (for linear input signal only)<br>0.000 (for linear input signal only) | 0000 | N/A |
| ACt | Control action | dir : Dir<br>rEU : Rev | Rev | N/A |
| LoLt | Low limit | Refer to table 1. | 0 | Unit |
| HiLt | High limit | Refer to table 1. | 1000 | Unit |
| FiLt | Digit filter | 0.0~99.9 | 0.0 | Sec. |
| PtnE | Time scale | HH.nn : HH.MM<br>nn.SS : MM.SS | HH.MM | N/A |



| | | | | |
|---|---|---|---|---|
| EroP | Error protection | 0000<br>0001<br>0010<br>0011<br>0100<br>0101<br>0110<br>0111 | 0000 | N/A |
| SUoF | Setpoint offset | -1999~9999 (dP=0000)<br>-199.9~999.9 (dP =000.0)<br>-19.99~99.99 (dP=00.00)<br>-1.999~9.999 (dP=0.000) | 0 | Unit |
| PUoF | Process value offset correction | -1000~1000 (dP=0000)<br>-100.0~100.0 (dP=000.0)<br>-10.00~10.00 (dP=00.00)<br>-1.000~1.000 (dP=0.000) | 0 | Unit |
| LoCU | Security lock | 0000<br>0001<br>0010<br>0011<br>0100<br>0101<br>0110 | 0110 | N/A |

Input signal type

Select the input signal type. The available input signal types are :
Thermocouple : J K T E B R S N C
RTD : PT100 (JIS standard) or PT100 (DIN standard)
Linear :±24mA, ±60mV, ±10V
External : Process Value is set by RS485
Please note that the DIP switch on the terminal block of DMC controller should be configured in accordance with input signal.

| | 1 | 2 |
|---|---|---|
| **Thermocouple/PT100/±60mV** | Off | Off |
| **±24mA** | On | Off |
| **±10V** | Off | On |

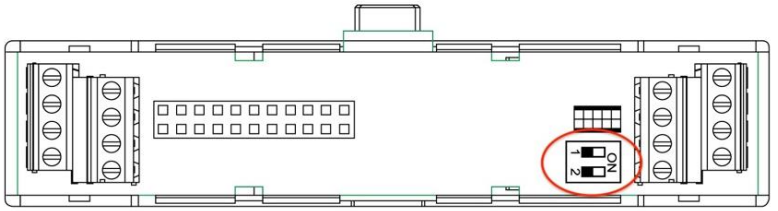



**Figure 13. Input signal hardware setting**

Low scale for linear input

Select the low scale corresponding to low linear input signal (INL). The default low linear input signal for mA, mV and V is 4.00mA, 0.00mV and 0.00V separately. This parameter is only showed when the input signal type is set to mA, mV or V. (See also the cut-off function for further detail)

High scale for linear input
Select the high scale corresponding to high linear input signal (INH). The default low linear input signal for mA, mV and V is 20.00mA, 50.00mV and 10.00V separately. This parameter is only showed when the input signal type is set to mA, mV or V. (See also the cut-off function for further detail)

Cut-off function
The Cut-off function is used to limit the process value of linear input signal (mA, mV or V) within the boundary whenever the input signal is out of the high/low limit range (set by Hilt and LoLt). The cut-off function can be set to “Low”, “High” or “High/Low”, set to “None” disables the cut-off function. The cut-off function has no effect for input signal other than linear input.

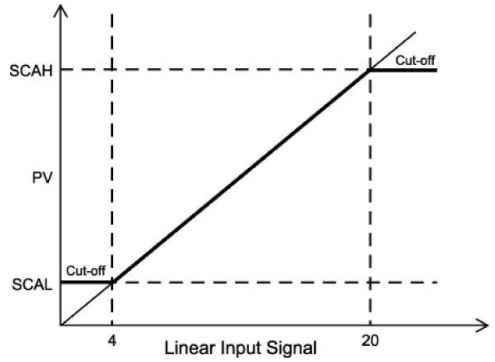



**Figure 14. Scale and Cut-off Function**

PV scale calculation : $$PV = \frac{IN-INL}{INH-INL}(SCAH - SCAL) + SCAL$$

where
IN: the linear input signal.
INH: the high calibration of linear input signal. It is set in calibration parameters (the factory default is mAH=20.00, mVH=50.00 and VH=10.00).
INL: the low calibration of linear input signal. It is set in calibration parameters (the factory default is mAL=4.00, mVL=0.00 and VL=0.00).
Example :
For a 4~20mA input signal, the INL is set by mAL=4.00mA and the INH is set by mAH=20.00mA. Set SCAL=0.0 SCAH=100.0 (Of course, you may select other scale value and decimal point to alter the resolution) and LoLt=0.0 HiLt=100.0.
For a 12mA input, the PV will be 50.0.
For a 22mA input, the PV will be 112.5 with cut-off function set to “None” or 100.0 with cut-off function set to “High” or “High/Low”.
For a 0mA input, the PV will be -25.0 with cut-off function set to “None” or 0.0 with cut-off function set to “Low” or “High/Low”.

Unit
Select the process value indication in °C or °F when the input signal type is set to thermocouple or PT100. Select engineer unit for linear input (mA, mV or V).

Decimal point
Select the decimal point position. The setting 00.00 and 0.000 is available for linear input only.

Control action
Dir – Direct action used for cooling process
Rev – Reverse action used for heating process



Low limit
Set the low limit of measuring range. When the PV goes below the low limit, the PV display flashing indicates a low limit error. The control output and alarm will be set according to the Error Protection.

High limit
Set the high limit of measuring range. When the PV goes beyond the high limit, the PV display flashing indicates a high limit error. The control output and alarm will be set according to the Error Protection.

Digit filter
Set the time constant for digit filter (the first order filter). It is useful when the process value is too unstable to be read.

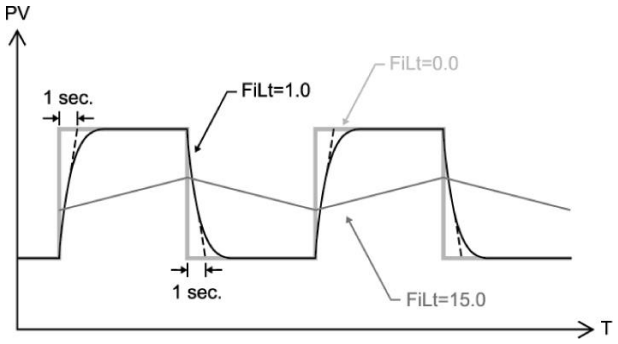



**Figure 15. Digit Filter**

Time scale
Set the time scale used for alarm delay time and ramp rate.
HH.MM – The alarm delay time is in hour and minute / The ramp rate is in per minute.
MM.SS – The alarm delay time is in minute and second / The ramp rate is in per second.

Error protection
Set the control output and alarm status whenever an error occurred. (refer to 4 Error Message)

| Error protection | C1 | A1 | C2 / A2 |
|---|---|---|---|
| 0000 | OFF | OFF | OFF |
| 0001 | OFF | OFF | ON |
| 0010 | OFF | ON | OFF |
| 0011 | OFF | ON | ON |
| 0100 | ON | OFF | OFF |
| 0101 | ON | OFF | ON |
| 0110 | ON | ON | OFF |
| 0111 | ON | ON | ON |

Setpoint offset
Shift the setpoint value with an offset. The actual control target is shifted with this offset from setpoint value but not added to SV display.

Process value offset correction
A value to be added to PV to correct the sensor offset error

Security lock

The security lock is useful to lock out the parameters from unauthorized changed

| Security lock | |
|---|---|
| 0000 | Only the security lock is open to change, all other parameters are locked |
| 0001 | Only the security lock and setpoint value is changeable. all the other parameters are locked |
| 0010 | The user level is open to change. |
| 0011 | The user and alarm levels are open to change. |
| 0100 | The user, alarm, and soft levels are open to change. |
| 0101 | The user, alarm soft and PID levels are open to change. |
| 0110 | All parameters are open to change. |

### 3.3.9 ECO level

| Display | Description | Range | Default | Unit |
|---|---|---|---|---|
| SEt | Turn On or Off ECO mode | On or Off | On | N/A |
| t inE | Time to enter ECO mode | 10~60 | 30 | Sec. |
| br i | Display brightness of ECO mode | 0 ~ 2 | 2 | N/A |

Turn On or Off ECO mode

ECO mode is useful to saving power consumption by reducing the brightness of LED display.

Time to enter ECO mode

Set the time duration to enter ECO mode when there is no any key operation

Display brightness of ECO mode

Set the display brightness of ECO mode. Set to 0, the display will turn off and the LED indicators are lit with lowest brightness

## 4. Error Message

| Display | Error Description | Correction |
|---|---|---|
| oPEn | Sensor break or open | 1. Check the sensor is connected and input signal type is selected correctly.<br>2. Replace the sensor |
| AdEr | Input signal has out of A/D converter range | 1. Check the sensor is connected and input signal type is selected correctly.<br>2. Replace the sensor.<br>3. Return to the supplier for repairing |
| EPEr | The content of EEPROM is corrupt | 1. Return to default setting by pressing shift and down keys simultaneously while power on. And reconfigure the parameters<br>2. Return to the supplier for repairing |
| AtEr | Fail to complete the auto-tuning process within 2 hours | 1. Retry the auto-tuning again.<br>2. Improve the control process to have fast response or use manual tuning instead of auto-tuning |
| Flashing | The PV is out of range | 1. Check the sensor is connected and input signal type is selected correctly<br>2. Check the polarity of sensor is connected correctly<br>3. Check the high/low limit is set properly.<br>4. Replace the sensor |