F4控制器参数帮助

This help project is the parameter help for the Series F4 S and F4 D Ramping controllers. It is part of the WatView help system.

**Model型号**

Identifies the 12-digit Series F4 part number.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

F4xx-xxxx-xxxx

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40001

**Serial Number 1序列号1**

Combined with Serial Number 2 this value identifies the individual controller.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

0 0 to 999999 (Combined range of Serial Number 1 and Serial Number 2)

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40002

**Serial Number 2序列号2**

Combined with Serial Number 1 this value identifies the individual controller.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

0 0 to 999999 (Combined range of Serial Number 1 and Serial Number 2)

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40003

**Software Number软件号**

Combined with the Build Number this identifies the software revision.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

00 to 99

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40004

**Revision版本**

Identifies the hardware revision.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

0.00 to 9.99

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40005

**Mfg Date日期**

Identifies the week and year the unit was manufactured. The date is given as WWYY for week and year.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| 0100 to 5297 | (1st week of 2000 to 52nd week of 2097) |
| 0198 to 5299 | (1st week of 1998 to 52nd week of 1999) |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40006

**Input 1 Type输入1类型**

Displays the type of hardware present supporting analog input 1.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| Univ. Single | Normal value for single or dual input unit |
| Univ. Dual | Normal value for the second or third input when present |
| None | No input hardware present |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40009

**Input 2 Type输入2类型**

Displays the type of hardware present supporting analog input 2.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| Univ. Single | Displayed on the first input of a dual input unit |
| Univ. Dual | Normal value for the second or third input when present |
| None | No input hardware present |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40010

**Input 3 Type输入3类型**

Displays the type of hardware present supporting analog input 3.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| Univ. Single | Displayed on the first input of a dual input unit |
| Univ. Dual | Normal value for the second or third input when present |
| None | No input hardware present |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40011

**Out1A输出1A**

Displays the type of hardware present for output 1A.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| None | No output hardware present |
| DC | Switched DC, open collector output |
| SSR | Solid-state relay |
| Process | 0-20 mA, 4-20 mA, 0-5 Vdc, 1-5 Vdc, and 0-10 Vdc |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40017

**Out1B输出1B**

Displays the type of hardware present for output 1B.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| None | No output hardware present |
| DC | Switched DC, open collector output |
| SSR | Solid-state relay |
| Process | 0-20 mA, 4-20 mA, 0-5 Vdc, 1-5 Vdc, and 0-10 Vdc |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40018

**Out2A输出2A**

Displays the type of hardware present for output 2A.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| None | No output hardware present |
| DC | Switched DC, open collector output |
| SSR | Solid-state relay |
| Process | 0-20 mA, 4-20 mA, 0-5 Vdc, 1-5 Vdc, and 0-10 Vdc |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40019

**Out2B输出2B**

Displays the type of hardware present for output 2B.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| None | No output hardware present |
| DC | Switched DC, open collector output |
| SSR | Solid-state relay |
| Process | 0-20 mA, 4-20 mA, 0-5 Vdc, 1-5 Vdc, and 0-10 Vdc |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40020

**Retrans1转播1**

Displays the type of hardware present for the retransmit 1 output option.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| None | No output hardware present |
| Process | 0-20 mA, 4-20 mA, 0-5 Vdc, 1-5 Vdc, and 0-10 Vdc |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40021

**Retrans2转播2**

Displays the type of hardware present for the retransmit 2 output option.

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

|  |  |
| --- | --- |
| None | No output hardware present |
| Process | 0-20 mA, 4-20 mA, 0-5 Vdc, 1-5 Vdc, and 0-10 Vdc |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40022

**CJC1冷端补偿1**

Displays the ambient temperature of the controller in degrees Farenheit that is used as cold junction compensation for analog input 1.

**Parameter Type(参数类型)**

Diagnostics

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 41501

**CJC2冷端补偿2**

Displays the ambient temperature of the controller in degrees Farenheit that is used as cold junction compensation for analog input 2.

**Parameter Type(参数类型)**

Diagnostics

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 41532

**Line Freq.电源频率**

Display the ac line frequency in Hertz.

**Parameter Type(参数类型)**

Diagnostics

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 41516

**Channel 1 Autotune通道1自动调谐**

Select one of the PID sets to start the autotune and overwrite those parameters. See: Autotuning.

**Parameter Type(参数类型)**

Autotune PID

**Range(参数)**

|  |  |
| --- | --- |
| Tune Off | Not tuning |
| PID Set 1 | Tune set 1 for channel 1 |
| PID Set 2 | Tune set 2 for channel 1 |
| PID Set 3 | Tune set 3 for channel 1 |
| PID Set 4 | Tune set 4 for channel 1 |
| PID Set 5 | Tune set 5 for channel 1 |

**Default(默认)**

Tune Off

**Available(可用)**

Always

**Affects(效果)**

Performing an autotune overwrites the chosen set of parameters (1 to 5).

Proportional Band 1A (1-5)

Integral 1A (1-5)

Reset 1A (1-5)

Derivative 1A (1-5)

Rate 1A (1-5)

Proportional Band 1B (1-5)

Integral 1B (1-5)

Reset 1B (1-5)

Derivative 1B (1-5)

Rate 1B (1-5)

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40306

**Channel 2 Autotune通道2自动调谐**

Select one of the PID sets to start the autotune and overwrite those parameters. See: Autotuning.

**Parameter Type(参数类型)**

Autotune PID

**Range(参数)**

|  |  |
| --- | --- |
| Tune Off | Not tuning |
| PID Set 6 | Tune set 6 for channel 2 |
| PID Set 7 | Tune set 7 for channel 2 |
| PID Set 8 | Tune set 8 for channel 2 |
| PID Set 9 | Tune set 9 for channel 2 |
| PID Set 10 | Tune set 10 for channel 2 |

**Default(默认)**

Tune Off

**Available(可用)**

On dual channel ramping controllers (F4D)

**Affects(效果)**

Performing an autotune overwrites the chosen set of parameters (6 to 10).

Proportional Band 2A (6-10)

Integral 2A (6-10)

Reset 2A (6-10)

Derivative 2A (6-10)

Rate 2A (6-10)

Proportional Band 2B (6-10)

Integral 2B (6-10)

Reset 2B (6-10)

Derivative 2B (6-10)

Rate 2B (6-10)

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40325

**Input Value输入值**

The measured value after scaling and filtering are applied.

**Parameter Type(参数类型)**

Main Page

**Range(参数)**

Determined by the Sensor and Type chosen for the analog input.

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

The fields in which this parameter is displayed are color coded to indicate the alarm status of the corresponding input.

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 40101

**Input Error Status输入错误状态**

Indicates an error reading an analog input.

**Parameter Type(参数类型)**

Main Page

**Range(参数)**

No error

A/D underflow

Sensor under range

Sensor over range

A/D overflow

A/D timeout

Openloop

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40102

**Proportional Band 1A (1 to 5) (F4 S/D)比例边带**

The proportional band for ouput 1A for PID control of channel 1. Set the proportional band to 0 to set the controller to on-off control mode.

See: Proportional Control.

See: Multiple PID Sets.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0° to 30000° (units depend on the setting of °F or °C)

**Default(默认)**

25°F or 14°C

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40501

**Proportional Band 1B (1 to 5) (F4 S/D) 比例边带**

The proportional band for ouput 1B for PID control of channel 1. Set the proportional band to 0 to set the controller to on-off control mode.

See: Proportional Control.

See: Multiple PID Sets.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0° to 30000° (units depend on the setting of °F or °C)

**Default(默认)**

25°F or 14°C

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40551

**Sensor传感器**

Select the type of sensor to be used with the analog input.

A wet bulb at input 2 uses the input 1 value to calculate the relative humidity on channel 2. The humidify and de-humidify outputs (2A and 2B) are disabled when the input 1 temperature is too low (32°F/0°C) or too high (212°F/100°C). The relative humidity display in the Main Page will display “RH Disabled” for a low temperature error and “RH Disabled” for a high temperature error.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

Off

Thermocouple

RTD

Process

Wet Bulb-Dry Bulb (analog input 2 only)

**Default(默认)**

Thermocouple

**Available(可用)**

Always

**Affects(效果)**

Changes to Sensor, Type, Units, Decimals, Scales, Set Point Limits, will delete all profiles stored in the F4’s memory.

Input Value

Scale Low

Scale High

Set Point Low Limit

Set Point High Limit

Proportional Band 1A (1-5)

Proportional Band 1B (1-5)

Dead Band 1A (1-5)

Dead Band 1B (1-5)

Hysteresis 1A (1-5)

Hysteresis 1B (1-5)

Proportional Band 2A (6-10)

Proportional Band 2B (6-10)

Dead Band 2A (6-10)

Dead Band 2B (6-10)

Hysteresis 2A (6-10)

Hysteresis 2B (6-10)

Guarantee Soak Band 1

Guarantee Soak Band 2

Alarm Hysteresis

Alarm Low SP/Deviation

Alarm High SP/Deviation

Low Scale

High Scale

Scale Offset

Set Point Ch1

Set Point Ch2

Calibration Offset

Set Point

**Note(附注)**

Modbus Address: 40601

**Type类型**

**Parameter Type(参数类型)**

Analog Inputs

Select the linearization table to apply to the sensor.

**Range(参数)**

Depends on the setting of the Sensor for the analog input.

|  |  |
| --- | --- |
| **Sensor** | **Options for Type** |
| Thermocouple or | J Thermocouple |
| Wet Bulb-Dry Bulb | K Thermocouple |
| (analog input 2 only) | T Thermocouple |
|  | E Thermocouple |
|  | N Thermocouple |
|  | C Thermocouple |
|  | D Thermocouple |
|  | PT2 Thermocouple |
|  | R Thermocouple |
|  | S Thermocouple |
|  | B Thermocouple |
|  |  |
| RTD or | 100 Ohm DIN |
| Wet Bulb-Dry Bulb | 100 Ohm JIS |
| (analog input 2 only) | 500 Ohm DIN |
|  | 500 Ohm JIS |
|  | 1000 Ohm DIN |
|  | 1000 Ohm JIS |
|  |  |
| Process | 4-20 mA |
|  | 0-20 mA |
|  | 0-5 Vdc |
|  | 1-5 Vdc |
|  | 0-10 Vdc |
|  | 0-50 mV |
|  | Vaisala 0-5 Vdc (analog input 2 only) |
|  | Vaisala 0-10 Vdc (analog input 2 only) |
|  | Vaisala 0-20 mA (analog input 2 only) |
|  | Rotronics 0-5 Vdc (analog input 2 only) |

**Default(默认)**

Depends on the setting of the Sensor for the analog input.

|  |  |
| --- | --- |
| **Sensor** | **Default Type** |
| Thermocouple | J Thermocouple |
|  |  |
| RTD | RTD DIN |
| or Wet Bulb-Dry Bulb |  |
|  |  |
| Process | 4-20 mA |

**Available(可用)**

Always

**Affects(效果)**

Changes to Sensor, Type, Units, Decimals, Scales, Set Point Limits, will delete all profiles stored in the F4’s memory.

Input Value

Scale Low

Scale High

Set Point Low Limit

Set Point High Limit

Proportional Band 1A (1-5)

Proportional Band 1B (1-5)

Dead Band 1A (1-5)

Dead Band 1B (1-5)

Hysteresis 1A (1-5)

Hysteresis 1B (1-5)

Proportional Band 2A (6-10)

Proportional Band 2B (6-10)

Dead Band 2A (6-10)

Dead Band 2B (6-10)

Hysteresis 2A (6-10)

Hysteresis 2B (6-10)

Guarantee Soak Band 1

Guarantee Soak Band 2

Alarm Hysteresis

Alarm Low SP/Deviation

Alarm High SP/Deviation

Low Scale

High Scale

Scale Offset

Set Point Ch1

Set Point Ch2

Calibration Offset

Set Point

**Note(附注)**

Modbus Address: 40602

**Units单位**

Select the units of measure for the input.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

Temperature

%rh

psi

units

**Default(默认)**

Temperature

**Available(可用)**

Active if Sensor Type is set to Process.

**Affects(效果)**

Changes to Sensor, Type, Units, Decimals, Scales, Set Point Limits, will delete all profiles stored in the F4’s memory.

Input Value

Scale Low

Scale High

Set Point Low Limit

Set Point High Limit

Proportional Band 1A (1-5)

Proportional Band 1B (1-5)

Dead Band 1A (1-5)

Dead Band 1B (1-5)

Hysteresis 1A (1-5)

Hysteresis 1B (1-5)

Proportional Band 2A (6-10)

Proportional Band 2B (6-10)

Dead Band 2A (6-10)

Dead Band 2B (6-10)

Hysteresis 2A (6-10)

Hysteresis 2B (6-10)

Guarantee Soak Band 1

Guarantee Soak Band 2

Alarm Hysteresis

Alarm Low SP/Deviation

Alarm High SP/Deviation

Low Scale

High Scale

Scale Offset

Set Point Ch1

Set Point Ch2

Calibration Offset

Set Point

**Note(附注)**

Modbus Address: 40609

**Decimal十进制小数点**

Set the decimal point for the display of the analog input.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

Depends on the setting of the Sensor for the analog input.

|  |  |
| --- | --- |
| **Sensor** | **Options for Decimal** |
| Thermocouple | 0 |
|  | 0.0 |
| RTD | 0 |
|  | 0.0 |
| Wet Bulb-Dry Bulb | 0 |
|  | 0.0 |
| Process | 0 |
|  | 0.0 |
|  | 0.00 |
|  | 0.000 |

**Default(默认)**

0

**Available(可用)**

Always

**Affects(效果)**

Changes to Sensor, Type, Units, Decimals, Scales, Set Point Limits, will delete all profiles stored in the F4’s memory.

Input Value

Scale Low

Scale High

Set Point Low Limit

Set Point High Limit

Proportional Band 1A (1-5)

Proportional Band 1B (1-5)

Dead Band 1A (1-5)

Dead Band 1B (1-5)

Hysteresis 1A (1-5)

Hysteresis 1B (1-5)

Proportional Band 2A (6-10)

Proportional Band 2B (6-10)

Dead Band 2A (6-10)

Dead Band 2B (6-10)

Hysteresis 2A (6-10)

Hysteresis 2B (6-10)

Guarantee Soak Band 1

Guarantee Soak Band 2

Alarm Hysteresis

Alarm Low SP/Deviation

Alarm High SP/Deviation

Low Scale

High Scale

Scale Offset

Set Point Ch1

Set Point Ch2

Calibration Offset

Set Point

**Note(附注)**

Modbus Address: 40607

**Filter Time滤波器时间**

Set the filter time for input in seconds. See: Filter Time Constant.

A positive value affects only the viewed values. A negative value affects both the viewed and control values.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

-60.0 to 60.0 seconds

**Default(默认)**

0.0 (0)

1.0 if Decimal is set to 0.0 and Sensor Type is set to Thermocouple or RTD. (10)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40605

**Error Latch错误清除**

Select whether error clear is automatic or manual.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

Latching

No Latching

**Default(默认)**

No Latching

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40608

**Calibration Offset校准偏置**

Compensate for sensor errors or other factors. See: Calibration Offset.

A positive offset increases the input value, and a negative offset decreases the input value.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

-19999 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

0

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40606

**Proportional Band 2A (6 to 10) (F4 S/D)比例边带**

The proportional band for ouput 2A for PID control of channel 2. Set the proportional band to 0 to set the controller to on-off control mode.

See: Proportional Control.

See: Multiple PID Sets.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0° to 30000° (units depend on the setting of °F or °C)

**Default(默认)**

25°F or 14°C

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42501

**Proportional Band 2B (6 to 10) (F4 S/D)比例边带**

The proportional band for ouput 2B for PID control of channel 2. Set the proportional band to 0 to set the controller to on-off control mode.

See: Proportional Control.

See: Multiple PID Sets.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0° to 30000° (units depend on the setting of °F or °C)

**Default(默认)**

25°F or 14°C

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42551

**°F or °C温度单位**

Choose temperature scale.

**Parameter Type(参数类型)**

System

**Range(参数)**

°F

°C

**Default(默认)**

°F

**Available(可用)**

Always

**Affects(效果)**

Input Value

Scale Low

Scale High

Set Point Low Limit

Set Point High Limit

Proportional Band 1A (1-5)

Proportional Band 1B (1-5)

Dead Band 1A (1-5)

Dead Band 1B (1-5)

Hysteresis 1A (1-5)

Hysteresis 1B (1-5)

Proportional Band 2A (6-10)

Proportional Band 2B (6-10)

Dead Band 2A (6-10)

Dead Band 2B (6-10)

Hysteresis 2A (6-10)

Hysteresis 2B (6-10)

Guarantee Soak Band 1

Guarantee Soak Band 2

Alarm Hysteresis

Alarm Low SP/Deviation

Alarm High SP/Deviation

Low Scale

High Scale

Scale Offset

Set Point Ch1

Set Point Ch2

Calibration Offset

Set Point

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40902

**Integral 1A (1-5)积分**

Set the integral time in minutes.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 99.99 minutes

**Default(默认)**

0 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 40502

**Integral 1B (1-5)积分**

Set the integral time in minutes.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 99.99 minutes

**Default(默认)**

0 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 40552

**Integral 2A (6-10)积分**

Set the integral time in minutes.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0.00 to 99.99 minutes

**Default(默认)**

0 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42502

**Integral 2B (6-10)积分**

Set the integral time in minutes.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0.00 to 99.99 minutes

**Default(默认)**

0 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42552

**PID Units PID单位**

Choose units for PID control.

**Parameter Type(参数类型)**

System

**Range(参数)**

US(Reset/Rate)

SI(Integral/Derivative)

**Default(默认)**

US(Reset/Rate)

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40901

**Reset 1A (1 to 5) (F4 S/D)重置**

Set the reset time in repeats per minute.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 per minute to 99.99 per minute

**Default(默认)**

0 per minute

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 40503

**Reset 1B (1 to 5) (F4 S/D)重置**

Set the reset time in repeats per minute.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 per minute to 99.99 per minute

**Default(默认)**

0 per minute

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 40553

**Reset 2A (6 to 10) (F4 S/D) 重置**

Set the reset time in repeats per minute.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0.00 per minute to 99.99 per minute

**Default(默认)**

0 per minute

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42503

**Reset 2B (6 to 10) (F4 S/D) 重置**

Set the reset time in repeats per minute.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0.00 per minute to 99.99 per minute

**Default(默认)**

0 per minute

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42553

**Derivative 1A (1-5)微分**

Set the derivative time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 40504

**Derivative 1B (1-5) 微分**

Set the derivative time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 40554

**Derivative 2A (6-10) 微分**

Set the derivative time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42504

**Derivative 2B (6-10) 微分**

Set the derivative time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42554

**Rate 1A (1 to 5) (F4 S/D)比率**

Set the rate time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 40505

**Rate 1B (1 to 5) (F4 S/D) 比率**

Set the rate time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 40555

**Rate 2A (6 to 10) (F4 S/D) 比率**

Set the rate time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42505

**Rate 2B (6 to 10) (F4 S/D) 比率**

Set the rate time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42555

**Dead Band 1A (1-5)死区**

Define the effective shift in the heating and cooling set points to prevent conflict.

See: Dead Band.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

0

**Available(可用)**

Active if Proportional Band is not set to 0 and Function 1A is set to heat and Function 1B to cool.

**Note(附注)**

Modbus Address: 40506

**Dead Band 1B (1-5) 死区**

Define the effective shift in the heating and cooling set point to prevent conflict.

See: Dead Band.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

0

**Available(可用)**

Active if Proportional Band is not set to 0 and Function 1A is set to heat and Function 1B to cool.

**Note(附注)**

Modbus Address: 40556

**Dead Band 2A (6-10) 死区**

Define the effective shift in the heating and cooling set points to prevent conflict.

See: Dead Band.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

0

**Available(可用)**

Active if Proportional Band is not set to 0 and Function 2A is set to heat and Function 2B to cool.

**Note(附注)**

Modbus Address: 42506

**Dead Band 2B (6-10) 死区**

Define the effective shift in the heating and cooling set points to prevent conflict.

See: Dead Band.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

0

**Available(可用)**

Active if Proportional Band is not set to 0 and Function 2A is set to heat and Function 2B to cool.

**Note(附注)**

Modbus Address: 42556

**Hysteresis 1A (1-5)滞后**

Define the process value change from the set point required to re-energize the output (in on-off mode).

See: On-Off Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

3

**Available(可用)**

Active if Proportional Band is set to 0 and Function 1A is set to heat and Function 1B to cool.

**Note(附注)**

Modbus Address: 40508

**Hysteresis 1B (1-5) 滞后**

Define the process value change from the set point required to re-energize the output (in on-off mode).

See: On-Off Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

3

**Available(可用)**

Active if Proportional Band is set to 0 and Function 1A is set to heat and Function 1B to cool.

**Note(附注)**

Modbus Address: 40558

**Hysteresis 2A (6-10) 滞后**

Define the process value change from the set point required to re-energize the output (in on-off mode).

See: On-Off Control.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

3

**Available(可用)**

Active if Proportional Band is set to 0 and Function 2A is set to heat and Function 2B to cool.

**Note(附注)**

Modbus Address: 42508

**Hysteresis 2B (6-10) 滞后**

Define the process value change from the set point required to re-energize the output (in on-off mode).

See: On-Off Control.

**Parameter Type(参数类型)**

PID Set (6-10)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

3

**Available(可用)**

Active if Proportional Band is set to 0 and Function 2A is set to heat and Function 2B to cool.

**Note(附注)**

Modbus Address: 42558

**Alarm Name警报名称**

Set the message associated with the alarm for display on the F4 controller’s front panel.

**Parameter Type(参数类型)**

Alarm Outputs

**Range(参数)**

Enter up to ten of the following characters:

A to Z

a to z

0 to 9

**Default(默认)**

ALARMn (where n is the alarm number: 1 or 2)

**Available(可用)**

Always

**Note(附注)**

This message set for this parameter appears only on the controller front panel and not in WatView’s **Alarm** screen.

Modbus Address: 43201

**Alarm Type警报类型**

Select the alarm type. See: Process or Deviation Alarms (F4 S/D).

**Parameter Type(参数类型)**

Alarm Outputs

**Range(参数)**

Off

Process

Deviation

**Default(默认)**

Off

**Available(可用)**

Always.

**Note(附注)**

Modbus Address: 40703

**Alarm Source警报源**

Select the input that is the source of the alarm.

**Parameter Type(参数类型)**

Alarm Outputs

**Range(参数)**

Input 1

Input 2

Input 3

**Default(默认)**

Input 1

**Available(可用)**

Active if the analog input’s Type parameter is not set to Off.

**Note(附注)**

Modbus Address: 40717

**Alarm Latching警报锁定**

Choose automatic or manual clearing of alarms.

See: Alarm Latching (F4 S/D).

**Parameter Type(参数类型)**

Alarm Outputs

**Latching**

**Range(参数)**

Alarm Self Clears

Alarm Latched

**Default(默认)**

Alarm Self Clears

**Available(可用)**

Active if Alarm Type is not set to Off.

**Note(附注)**

Modbus Address: 40705

**Alarm Silencing警报静音**

Choose whether to mask alarms on power-up.

**Parameter Type(参数类型)**

Alarm Outputs

**Range(参数)**

No

Yes

**Default(默认)**

No

**Available(可用)**

Active if Alarm Type is not set to Off.

**Note(附注)**

Modbus Address: 40706

**Alarm Hysteresis警报延迟**

Set the alarm hysteresis.

See Alarm Hysteresis (F4 S/D).

**Parameter Type(参数类型)**

Alarm Outputs

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

3

**Available(可用)**

Active if Alarm Type is not set to Off.

**Note(附注)**

Modbus Address: 40704

**Alarm Sides警报边界**

Choose to enable Low, High or both alarm set points.

See: Alarm Sides (F4 S/D).

**Parameter Type(参数类型)**

Alarm Outputs

**Range(参数)**

Both

Low

High

**Default(默认)**

Both

**Available(可用)**

Active if Alarm Type is not set to Off.

**Note(附注)**

Modbus Address: 40707

**Alarm Logic警报逻辑**

Select the alarm logic option.

**Parameter Type(参数类型)**

Alarm Outputs

**Range(参数)**

Open on Alarm

Close on Alarm

**Default(默认)**

Open on Alarm

**Available(可用)**

Active if Alarm Output is enabled.

**Note(附注)**

Modbus Address: 40708

**Alarm Messages警报消息**

Select whether or not the alarm message appears on the F4 controller’s Main Page when the alarm occurs.

**Parameter Type(参数类型)**

Alarm Outputs

**Range(参数)**

Yes on Main Page

Not on Main Page

**Default(默认)**

Yes on Main Page

**Available(可用)**

Active if Alarm Type is not set to Off.

**Note(附注)**

Modbus Address: 40709

**Alarm Low SP/Deviation低设置点/微分警报**

Set the deviation below set point that will trigger an alarm if Alarm 1 Type is set to Deviation or Set low value at which alarm is triggered if Alarm 1 Type is set to Process.

See: Alarm Set Points (F4 S/D).

**Parameter Type(参数类型)**

Set Points

**Range(参数)**

|  |  |  |
| --- | --- | --- |
| **Decimal** | **Range(参数) (Low Deviation)** | **Range(参数) (Alarm Low SP)** |
| 0 | -19999 to -1 | <per sensor> to Alarm High SP/Deviation |
| 0.0 | -1999.9 to -0.1 | <per sensor> to Alarm High SP/Deviation |

**Default**

|  |  |  |
| --- | --- | --- |
| **Decimal** | **Default (Low Deviation)** | **Range(参数) (Alarm Low SP)** |
| 0 | -999 | <per sensor> |
| 0.0 | -99.9 | <per sensor> |

**Available(可用)**

Active if Alarm Type is set to Deviation or Process.

**Note(附注)**

Modbus Address: 40303

**Alarm High SP/Deviation高设置点/微分警报**

Set the deviation above set point that will trigger an alarm if corresponding Alarm Type is set to Deviation or Set high value at which alarm is triggered if corresponding Alarm Type is set to Process. See: Alarm Set Points (F4 S/D).

**Parameter Type(参数类型)**

Set Points

**Range(参数)**

|  |  |  |
| --- | --- | --- |
| **Decimal** | **Range(参数) (High Deviation)** | **Range(参数) (Alarm High SP)** |
| 0 | 1 to 30000 | <per sensor> to Alarm Low SP/Deviation |
| 0.0 | 0.1 to 3000.0 | <per sensor> to Alarm Low SP/Deviation |

**Default**

|  |  |  |
| --- | --- | --- |
| **Decimal** | **Default (High Deviation)** | **Range(参数) (Alarm High SP)** |
| 0 | 999 | <per sensor> |
| 0.0 | 99.9 | <per sensor> |

**Available(可用)**

Active if Alarm Type is set to Deviation or Process.

**Note(附注)**

Modbus Address: 40304

**Guarantee Soak Band 1保证容差带**

Select value above and below set point to define the soak band. This condition is applied to the analog input selected in Guarantee Soak Band 1 Source (F4 S/D).

**Parameter Type(参数类型)**

System

**Range(参数)**

The precison and units depend on the Decimal and Units settings of analog input 1 unless cascade is enabled in which case the precision follows analog input 3.

|  |  |
| --- | --- |
| **Decimal** | **Range(参数)** |
| 0 | 1 to 30,000 |
| 0.0 | 0.1 to 3,000.0 |
| 0.00 | 0.01 to 300.00 |
| 0.000 | 0.001 to 30.000 |

**Default(默认)**

1

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41206

**Guarantee Soak Band 2保证容差带**

Select value above and below set point to define the soak band. This condition is applied to the analog input selected in Guarantee Soak Band 2 Source (F4 S/D).

**Parameter Type(参数类型)**

System

**Range(参数)**

The precison and units depend on the Decimal and Units settings of analog input 2.

|  |  |
| --- | --- |
| **Decimal** | **Range(参数)** |
| 0 | 1 to 30,000 |
| 0.0 | 0.1 to 3,000.0 |
| 0.00 | 0.01 to 300.00 |
| 0.000 | 0.001 to 30.000 |

**Default(默认)**

1

**Available(可用)**

When controller has two channels (F4D).

**Note(附注)**

Modbus Address: 41213

**Show °F or °C显示温标**

Choose whether to display or hide °C or °F in top display.

**Parameter Type(参数类型)**

System

**Range(参数)**

No, Upper Display

Yes, Upper Display

**Default(默认)**

Yes, Upper Display

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 41924

**Channel 1 Autotune Set Point通道自动调谐设置点**

Set percent of set point to auto-tune to.

**CAUTION:** Choose an autotune set point value that will protect your product from possible damage from overshoot or undershoot during the autotuning oscillations. If the product is sensitive, carefully select the autotune set point to prevent product damage.

See: Autotuning.

**Parameter Type(参数类型)**

System

**Range(参数)**

50 to 150%

**Default(默认)**

90%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40305

**Channel 2 Autotune Set Point通道自动调谐设置点**

Set percent of set point to auto-tune to.

**CAUTION:** Choose an autotune set point value that will protect your product from possible damage from overshoot or undershoot during the autotuning oscillations. If the product is sensitive, carefully select the autotune set point to prevent product damage.

See: Autotuning.

**Parameter Type(参数类型)**

System

**Range(参数)**

50 to 150%

**Default(默认)**

90%

**Available(可用)**

When controller has two channels (F4D).

**Note(附注)**

Modbus Address: 40324

**Input 1 Fail输入失败**

Enter percent of power supplied to the output if analog input sensor fails.

**Parameter Type(参数类型)**

System

**Range(参数)**

0 to 100% (Heat only)

0 to 100% (Cool only)

-100% to +100% (Cool/Heat or Heat/Cool)

**Default(默认)**

0%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40904

**Input 2 Fail输入失败**

Enter percent of power supplied to the output if analog input sensor fails.

**Parameter Type(参数类型)**

System

**Range(参数)**

0 to 100% (Heat only)

0 to 100% (Cool only)

-100% to +100% (Cool/Heat or Heat/Cool)

**Default(默认)**

0%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40907

**Open Loop Channel 1开环通道**

Select whether to turn off outputs and display an error message.

**Parameter Type(参数类型)**

System

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40905

**Open Loop Channel 2开环通道**

Select whether to turn off outputs and display an error message.

**Parameter Type(参数类型)**

System

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

When controller has two channels (F4D).

**Note(附注)**

Modbus Address: 40908

**Power-Out Time断电时间**

Define a power outage in seconds.

See: Power-Out Time/Power-Out Action.

**Parameter Type(参数类型)**

System

**Range(参数)**

0 to 9999 seconds

**Default(默认)**

10 seconds

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41214

**Power-Out Action断电动作**

Choose controller response to power out-age while running a profile.

See: Power-Out Time/Power-Out Action.

**Parameter Type(参数类型)**

System

**Range(参数)**

Continue

Hold

Terminate

Reset

Idle Set Point 1

Idle Set Point 2

**Default(默认)**

Continue

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41207

**Altitude海拔**

Select an elevation to compensate for wet bulb evaporation rates.

**Parameter Type(参数类型)**

System

**Range(参数)**

0 to 2499 ft

2500 to 4999 ft

5000 ft and above

**Default(默认)**

0 to 2499 ft

**Available(可用)**

Active if analog input 2 Type is Wet Bulb-Dry Bulb.

**Note(附注)**

Modbus Address: 41903

**Scale Low标定下限**

Set unit value for low end of current or voltage range.

See: Scale High and Scale Low.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

Depends on Sensor and Decimal settings.

**Available(可用)**

Active if the sensor’s Type is set to Process.

**Affects(效果)**

Changes to Sensor, Type, Units, Decimals, Scales, Set Point Limits, will delete all profiles stored in the F4’s memory.

**Note(附注)**

Modbus Address: 40681

**Scale High标定上限**

Set unit value for high end of current or voltage range.

See: Scale High and Scale Low.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

Depends on Sensor and Decimal settings.

**Available(可用)**

Active if the sensor’s Type is set to Process.

**Affects(效果)**

Changes to Sensor, Type, Units, Decimals, Scales, Set Point Limits, will delete all profiles stored in the F4’s memory.

**Note(附注)**

Modbus Address: 40682

**Set Point Low Limit设置点下限**

Set limit for minimum set point.

See: Set Point Low Limit and High Limit.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

From the bottom of the sensor range to the Set Point High Limit.

**Available(可用)**

Always

**Affects(效果)**

Changes to Sensor, Type, Units, Decimals, Scales, Set Point Limits, will delete all profiles stored in the F4’s memory.

**Note(附注)**

Modbus Address: 40603

**Set Point High Limit设置点上限**

Set limit for maximum set point.

See: Set Point Low Limit and High Limit.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

From the Set Point Low Limit to the top of the sensor range.

**Available(可用)**

Always

**Affects(效果)**

Changes to Sensor, Type, Units, Decimals, Scales, Set Point Limits, will delete all profiles stored in the F4’s memory.

**Note(附注)**

Modbus Address: 40604

**Name名称**

Name the input for easy reference.

**Parameter Type(参数类型)**

Digital Inputs

**Range(参数)**

Enter up to ten of the following characters:

A to Z

a to z

0 to 9

**Default(默认)**

DIGIT INx (where x is the number of the digitral input: 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43001

**Function功能**

Select the digital input function. Digital inputs 1 to 4 can be assigned as wait for events, as well as other process control features.

**Parameter Type(参数类型)**

Digital Inputs

**Range(参数)**

Off

Panel Lock

Reset Alarm

Control Outputs Off

All Outputs Off

Digital Outputs Off

Start Profile

Pause Profile

Resume Profile

Terminate Profile

Wait for Event See: Event (F4 S/D).

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

While a profile is running, the controller will not recognize digital inputs programmed to start a profile. Only one profile can be run at a time.

Modbus Address: 41061

**Condition条件**

Select the condition to trigger digital input.

**Parameter Type(参数类型)**

Digital Inputs

**Range(参数)**

Low

High

**Default(默认)**

Low

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41062

**Function 1A功能**

Select type of function for output.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Heat

Cool

**Default(默认)**

Heat

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40701

**Function 1B功能**

Select type of function for output.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Off

Heat

Cool

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40718

**Function 2A功能**

Select type of function for output.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Heat

Cool

**Default(默认)**

Heat

**Available(可用)**

Always.

**Note(附注)**

Modbus Address: 40735

**Function 2B功能**

Select type of function for output.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Off

Heat

Cool

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40752

**Cycle Time 1A循环时间**

Select the duration of cycle.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0.1 to 60.0 seconds

**Default(默认)**

1.0 second

**Available(可用)**

Active if Out1A is not Process and Cycle Time (Burst) Value 1A is set to No.

**Note(附注)**

Modbus Address: 40507

**Cycle Time 1B循环时间**

Select the duration of cycle.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0.1 to 60.0 seconds

**Default(默认)**

1.0 second

**Available(可用)**

Active if Out1B is not Process and Cycle Time (Burst) Value 1B is set to No.

**Note(附注)**

Modbus Address: 40557

**Cycle Time 2A循环时间**

Select the duration of cycle.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0.1 to 60.0 seconds

**Default(默认)**

1.0 second

**Available(可用)**

Active if Out2A is not Process and Cycle Time (Burst) Value 2A is set to No.

**Note(附注)**

Modbus Address: 42507

**Cycle Time 2B循环时间**

Select the duration of cycle.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0.1 to 60.0 seconds

**Default(默认)**

1.0 second

**Available(可用)**

Active if Out2B is not Process and Cycle Time (Burst) Value 2B is set to No.

**Note(附注)**

Modbus Address: 42557

**Process 1A进程**

Set process output type.

**Parameter Type(参数类型)**

Control Outputs

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Range(参数)**

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Default(默认)**

4 to 20mA

**Available(可用)**

Active if Out1A is Process.

**Note(附注)**

Modbus Address: 40702

**Process 1B进程**

Set process output type.

**Parameter Type(参数类型)**

Control Outputs

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Range(参数)**

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Default(默认)**

4 to 20mA

**Available(可用)**

Active if Out1B is Process.

**Note(附注)**

Modbus Address: 40719

**Process 2A进程**

Set process output type.

**Parameter Type(参数类型)**

Control Outputs

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Range(参数)**

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Default(默认)**

4 to 20mA

**Available(可用)**

Active if Out2A is Process.

**Note(附注)**

Modbus Address: 40736

**Process 2B进程**

Set process output type.

**Parameter Type(参数类型)**

Control Outputs

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Range(参数)**

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Default(默认)**

4 to 20mA

**Available(可用)**

Active if Out2B is Process.

**Note(附注)**

Modbus Address: 40753

**High Power Limit 1A功率高限**

Set a high limit on the control output power. This applies to PID control only.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Low Power Limit 1A +1 to 100%

**Default(默认)**

100%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40715

**High Power Limit 1B功率高限**

Set a high limit on the control output power. This applies to PID control only.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Low Power Limit 1B +1 to 100%

**Default(默认)**

100%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40732

**High Power Limit 2A功率高限**

Set a high limit on the control output power. This applies to PID control only.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Low Power Limit 2A +1 to 100%

**Default(默认)**

100%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40749

**High Power Limit 2B功率高限**

Set a high limit on the control output power. This applies to PID control only.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Low Power Limit 2B +1 to 100%

**Default(默认)**

100%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40766

**Low Power Limit 1A功率下限**

Set a low limit on the control output power. This applies to PID control only.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0% to High Power Limit 1A -1

**Default(默认)**

0%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40716

**Low Power Limit 1B功率下限**

Set a low limit on the control output power. This applies to PID control only.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0% to High Power Limit 1B -1

**Default(默认)**

0%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40733

**Low Power Limit 2A功率下限**

Set a low limit on the control output power. This applies to PID control only.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0% to High Power Limit 2A -1

**Default(默认)**

0%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40750

**Low Power Limit 2B功率下限**

Set a low limit on the control output power. This applies to PID control only.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0% to High Power Limit 2B -1

**Default(默认)**

0%

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40767

**Cycle Time (Burst) Value 1A循环时间(爆发)值**

Chose fixed or variable cycle time for the output.

See: Burst Fire.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Variable Burst

Fixed Time

**Default(默认)**

Fixed Time

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40510

**Cycle Time (Burst) Value 1B循环时间(爆发)值**

Chose fixed or variable cycle time for the output.

See: Burst Fire.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Variable Burst

Fixed Time

**Default(默认)**

Fixed Time

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40560

**Cycle Time (Burst) Value 2A循环时间(爆发)值**

Chose fixed or variable cycle time for the output.

See: Burst Fire.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Variable Burst

Fixed Time

**Default(默认)**

Fixed Time

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42510

**Cycle Time (Burst) Value 2B循环时间(爆发)值**

Chose fixed or variable cycle time for the output.

See: Burst Fire.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

Variable Burst

Fixed Time

**Default(默认)**

Fixed Time

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42560

**Retransmit Source转播源**

Choose a source for retransmit signal.

See: Retransmit.

**Parameter Type(参数类型)**

Retrans Outputs

isPlottable=False

**Range(参数)**

Input 1

Input 2

Input 3

Set Point 1

Set Point 2

Channel 1 Power

Channel 2 Power

**Default(默认)**

Input 1

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40710

**Analog Range模拟范围**

Select voltage or current range to retransmit.

See: Retransmit.

**Parameter Type(参数类型)**

Retrans Outputs

**Range(参数)**

4 to 20mA

0 to 20mA

0 to 5V

1 to 5V

1 to 10V

**Default(默认)**

4 to 20mA

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40837

**Low Scale比例下限**

Set low end of current or voltage range to retransmit.

See: Retransmit.

**Parameter Type(参数类型)**

Retrans Outputs

Range(参数) Min=-19999

Range(参数) Max=29999

**Range(参数)**

Low end of sensor range to High Scale -1

**Default(默认)**

Low end of sensor range

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40711

**High Scale比例上限**

Set high end of current or voltage range to retransmit.

See: Retransmit.

**Parameter Type(参数类型)**

Retrans Outputs

**Range(参数)**

Low Scale +1 to high end of sensor range

**Default(默认)**

High end of sensor range

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40712

**Scale Offset比例偏置**

Shift the scale up (+) or down (-) to agree with source signal.

See: Retransmit.

**Parameter Type(参数类型)**

Retrans Outputs

**Range(参数)**

Low Scale to High Scale

**Default(默认)**

0

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40713

**Current Time当前时间**

Displays the actual time. (24-hour-clock)

**Parameter Type(参数类型)**

System

**Range(参数)**

hh:mm:ss

00:00:00 to 23:59:59

**Default(默认)**

current time

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

Use the **Set F4 date and Time** option on the **Tools** menu in WatView to set the time.

Modbus Address: 41917

**Current Date当前日期**

Displays the current date setting in the F4 controller.

**Parameter Type(参数类型)**

System

**Range(参数)**

|  |  |
| --- | --- |
| mm/dd/yy | 01/01/98 to 12/31/35 (2035) |

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

Use the **Set F4 date and Time** option on the **Tools** menu in WatView to set the date.

Modbus Address: 41920

**Name 1名称**

Name the digital output for easy reference.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

A to Z, a to z, 0 to 9

**Default(默认)**

DIGIT OUT# (Where # is the digital output number, 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43101

**Name 2名称**

Name the digital output for easy reference.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

A to Z, a to z, 0 to 9

**Default(默认)**

DIGIT OUT# (Where # is the digital output number, 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43111

**Name 3名称**

Name the digital output for easy reference.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

A to Z, a to z, 0 to 9

**Default(默认)**

DIGIT OUT# (Where # is the digital output number, 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43121

**Name 4名称**

Name the digital output for easy reference.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

A to Z, a to z, 0 to 9

**Default(默认)**

DIGIT OUT# (Where # is the digital output number, 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43131

**Name 5名称**

Name the digital output for easy reference.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

A to Z, a to z, 0 to 9

**Default(默认)**

DIGIT OUT# (Where # is the digital output number, 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43141

**Name 6名称**

Name the digital output for easy reference.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

A to Z, a to z, 0 to 9

**Default(默认)**

DIGIT OUT# (Where # is the digital output number, 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43151

**Name 7名称**

Name the digital output for easy reference.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

A to Z, a to z, 0 to 9

**Default(默认)**

DIGIT OUT# (Where # is the digital output number, 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43161

**Name 8名称**

Name the digital output for easy reference.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

A to Z, a to z, 0 to 9

**Default(默认)**

DIGIT OUT# (Where # is the digital output number, 1 to 8)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 43171

**Function 1功能**

Choose a function for digital output 1.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

Event Output

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42002

**Function 2功能**

Choose a function for digital output 2.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

Event Output

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42012

**Function 3功能**

Choose a function for digital output 3.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

Event Output

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42022

**Function 4功能**

Choose a function for digital output 4.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

Event Output

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42032

**Function 5功能**

Choose a function for digital output 5. When set as a complementary output to a control output this output is on whenever the control output is off and off whenever the control output is on.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

Event Output

Complementary Output

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42042

**Function 6功能**

Choose a function for digital output 6.

See: Boost Heat and Boost Cool.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

Event Output

Boost Heat

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42052

**Function 7功能**

Choose a function for digital output 7.

See: Boost Heat and Boost Cool.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

Event Output

Boost Cool

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42062

**Function 8功能**

Choose a function for digital output 8.

See: Compressor Control.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

Event Output

Compressor

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42072

**Complementary Output, Digital 5补充输出**

Choose the control output to complement.

When digital output 5 is set as a complementary output it is on whenever the control output it complements is off and off whenever the control output is on.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

|  |  |
| --- | --- |
| 1A | Output 1A |
| 1B | Output 1B |
| 2A | Output 2A |
| 2B | Output 2B |

**Default(默认)**

1A

**Available(可用)**

When Function 5 is set to Complementary Output.

**Note(附注)**

Modbus Address: 42047

**Boost Percent Power, Digital 6爆发功率比例**

Enable boost above chosen power level.

See: Boost Heat and Boost Cool.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

0% to 100%

**Default(默认)**

100%

**Available(可用)**

Active if Function 6 is set to Boost Heat.

**Note(附注)**

Modbus Address: 42053

**Boost Percent Power, Digital 7爆发功率比例**

Enable boost above chosen power level.

See: Boost Heat and Boost Cool.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

-100% to 0% for Cool

**Default(默认)**

-100%

**Available(可用)**

Active if Function 7 is set to Boost Cool.

**Note(附注)**

Modbus Address: 42063

**Boost Time Delay, Digital 6爆发时间延迟**

Set time to delay boost.

See: Boost Heat and Boost Cool.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

0 to 9999 seconds

**Default(默认)**

30 seconds

**Available(可用)**

Active if Function 6 is set to Boost Heat.

**Note(附注)**

Modbus Address: 42055

**Boost Time Delay, Digital 7爆发时间延迟**

Set time to delay boost.

See: Boost Heat and Boost Cool.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

0 to 9999 seconds

**Default(默认)**

30 seconds

**Available(可用)**

Active if Function 7 is set to Boost Cool.

**Note(附注)**

Modbus Address: 42065

**Compressor On % Power压缩机开启功率**

The compressor will be on below the power level you set here.

See: Compressor Control.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

-100% to 100%

**Default(默认)**

0%

**Available(可用)**

Active if Function 8 is set to Compressor.

**Note(附注)**

Modbus Address: 42073

**Compressor Off % Power压缩机关闭功率**

The compressor will be off above the power level you set here.

See: Compressor Control.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Compressor On % Power to 100%

**Default(默认)**

Compressor On % Power

**Available(可用)**

Active if Function 8 is set to Compressor.

**Note(附注)**

Modbus Address: 42074

**Compressor Off Delay压缩机关闭延迟**

Set the time to delay turning off the compressor.

See: Compressor Control.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

0 to 9999 seconds

**Default(默认)**

10 seconds

**Available(可用)**

Active if Function 8 is set to Compressor.

**Note(附注)**

Modbus Address: 42076

**Compressor On Delay压缩机开启延迟**

Set the time to delay turning on the compressor.

See: Compressor Control.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

1 to 9999 seconds

**Default(默认)**

30 seconds

**Available(可用)**

Active if Function 8 is set to Compressor.

**Note(附注)**

Modbus Address: 42075

**P x参数显示**

Select the parameter to displayed in each position on the custom main page. These settings only affect the front panel display of the controller.

**Parameter Type(参数类型)**

Custom Main Pg

**Range(参数)**

|  |  |
| --- | --- |
| **Option** | **Description** |
| None | Position not used. |
| Input 1 Value | Input Value for analog input 1 |
| Input 2 Value | Input Value for analog input 2 |
| Input 3 Value | Input Value for analog input 3 |
| Set Point 1 | Set Point corresponding to analog input 1 |
| Set Point 2 | Set Point corresponding to analog input 2 |
| % Power 1 | % Power Output 1A and % Power Output 1B |
| % Power 2 | % Power Output 2A and % Power Output 2B |
| Tune Status 1 |  |
| Tune Status 2 |  |
| Time | Current Time |
| Date | Current Date |
| Digital Inputs | Status |
| Digital Outputs | Status of each digital output:  Status 1,  Status 2,  Status 3,  Status 4,  Status 5,  Status 6,  Status 7,  Status 8 |
| Time Remaining | Hours Remaining + Minutes Remaining + Seconds Remaining |
| Current File | Profile File |
| Current Step | Step Number |
| Active Ch1 PID Set | Ch1 PID Set |
| Active Ch2 PID Set | Ch2 PID Set |
| Last Jump Step | Last Jump File + Jump Step |
| Jump Count | Last Jump Count (F4 S/D) |
| WaitFor Status | Lists for which values a profile is waiting. |
| Step Type | Step Type |
| Target SP1 | Set Point Ch1 |
| Target SP2 | Set Point Ch2 |
| Inner Set Point | Inner Set Point |
| Custom Message 1 | Custom Message 1 |
| Custom Message 2 | Custom Message 2 |
| Custom Message 3 | Custom Message 3 |
| Custom Message 4 | Custom Message 4 |
| Input1 Cal. Offset | Calibration Offset for analog input 1 |
| Input2 Cal. Offset | Calibration Offset for analog input 2 |
| Input3 Cal. Offset | Calibration Offset for analog input 3 |

**Default**

|  |  |
| --- | --- |
| **Position** | **Default Parameter** |
| 1 | Current File |
| 2 | Current Step |
| 3 | Input 2 Value |
| 4 | Set Point 1 |
| 5 | Set Point 2 |
| 6 | Step Type |
| 7 | Target SP1 |
| 8 | Target SP2 |
| 9 | WaitFor Status |
| 10 | Time Remaining |
| 11 | Digital Inputs |
| 12 | Digital Outputs |
| 13 | % Power 1 |
| 14 | % Power 2 |
| 15 | Date |
| 16 | Time |

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41401

**Alternating Display备用显示**

Select the process value to display in the 7-segment display on the controller. This setting afects only the controller display.

**Parameter Type(参数类型)**

Process Display

**Range(参数)**

Input 1 Only

Alternating

**Default(默认)**

**Protection(保护)**

**Available(可用)**

Active if Sensor for analog inputs 2 or 3 is not set to Off.

**Note(附注)**

Modbus Address: 45501

**Input 1 Display Time输入显示时间**

Set the time that the Input Value for analog input 1 will be displayed in the upper 7-segment display. Set the time to zero to skip displaying analog input 1.

**Parameter Type(参数类型)**

Process Display

**Range(参数)**

0 to 999 seconds

**Default(默认)**

2 seconds

**Protection(保护)**

**Available(可用)**

Active if Sensor for analog inputs 2 or 3 is not set to Off.

**Note(附注)**

Modbus Address: 45502

**Input 2 Display Time输入显示时间**

Set the time that the Input Value for analog input 2 will be displayed in the upper 7-segment display. Set the time to zero to skip displaying analog input 2.

**Parameter Type(参数类型)**

Process Display

**Range(参数)**

0 to 999 seconds

**Default(默认)**

2 seconds

**Protection(保护)**

**Available(可用)**

Active if Sensor for analog inputs 2 or 3 is not set to Off.

**Note(附注)**

Modbus Address: 45503

**Input 3 Display Time输入显示时间**

Set the time that the Input Value for analog input 3 will be displayed in the upper 7-segment display. Set the time to zero to skip displaying analog input 3.

**Parameter Type(参数类型)**

Process Display

**Range(参数)**

0 to 999 seconds

**Default(默认)**

2 seconds

**Protection(保护)**

**Available(可用)**

Active if Sensor for analog inputs 2 or 3 is not set to Off.

**Note(附注)**

Modbus Address: 45504

**Set Point (Lockout) (F4 S/D)设置点**

Set the set point access level. This lockout affects using the front panel of the controller only.

See: Prevent User Access to Controller Parameters for information on limiting access to parameters through WatView.

**Parameter Type(参数类型)**

Set Lockout

**Range(参数)**

Full Access

Read Only

**Default(默认)**

Full Access

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 41301

**Operations, Autotune PID自动调谐PID**

Limit access to the Autotune PID menu. This lockout affects using the front panel of the controller only.

See: Prevent User Access to Controller Parameters for information on limiting access to parameters through WatView.

**Parameter Type(参数类型)**

Set Lockout

**Range(参数)**

Full Access

Read Only

Password

Hidden

**Default(默认)**

Full Access

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41307

**Operations, Edit PID编辑PID**

Limit access to the Edit PID menu. This lockout affects using the front panel of the controller only.

See: Prevent User Access to Controller Parameters for information on limiting access to parameters through WatView.

**Parameter Type(参数类型)**

Set Lockout

**Range(参数)**

Full Access

Read Only

Password

Hidden

**Default(默认)**

Full Access

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41308

**Operations, Alarm Set Point警报设置点**

Limit access to the Alarm Set Point menu. This lockout affects using the front panel of the controller only.

See: Prevent User Access to Controller Parameters for information on limiting access to parameters through WatView.

**Parameter Type(参数类型)**

Set Lockout

**Range(参数)**

Full Access

Read Only

Password

Hidden

**Default(默认)**

Full Access

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41309

**Profile Page剖面**

Limit access to the Profiles menu. This lockout affects using the front panel of the controller only.

See: Prevent User Access to Controller Parameters for information on limiting access to parameters through WatView.

**Parameter Type(参数类型)**

Set Lockout

**Range(参数)**

Full Access

Read Only

Password

Hidden

**Default(默认)**

Full Access

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41310

**Setup Page设置**

Limit access to the Setup menu. This lockout affects using the front panel of the controller only.

See: Prevent User Access to Controller Parameters for information on limiting access to parameters through WatView.

**Parameter Type(参数类型)**

Set Lockout

**Range(参数)**

Full Access

Read Only

Password

Hidden

**Default(默认)**

Full Access

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41303

**Factory Page工厂**

Limit access to the Factory menu. This lockout affects using the front panel of the controller only.

See: Prevent User Access to Controller Parameters for information on limiting access to parameters through WatView.

**Parameter Type(参数类型)**

Set Lockout

**Range(参数)**

Full Access

Read Only

Password

Hidden

**Default(默认)**

Full Access

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41304

**Profile File剖面**

Displays the name of the profile currently running or last run.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Any profile in the controller.

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44101

**Step Number步骤号**

Displays the current step number.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

1 to 256

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44102

**Step Type步骤类型**

Displays the type of step currently running or last run.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

None

Ramp Time

Ramp Rate

Soak

Jump

End

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44103

**Ramp Waiting Status升温等待状态**

Displays whether or not a ramp step is waiting for

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

False

True

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44104

**Waiting for Event 1 Status等待事件状态**

Displays whether or not the profile is waiting for digital input 1’s Status to change.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Not Waiting

Waiting

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44105

**Waiting for Event 2 Status等待事件状态**

Displays whether or not the profile is waiting for digital input 2’s Status to change.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Not Waiting

Waiting

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44106

**Waiting for Event 3 Status等待事件状态**

Displays whether or not the profile is waiting for digital input 3’s Status to change.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Not Waiting

Waiting

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44107

**Waiting for Event 4 Status等待事件状态**

Displays whether or not the profile is waiting for digital input 4’s Status to change.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Not Waiting

Waiting

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44108

**Waiting Analog Input 1等待模拟输入**

Displays whether or not the profile is waiting for the Input Value of analog input 1 to meet the wait-for condition.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Not Waiting

Waiting

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44109

**Waiting Analog Input 2等待模拟输入**

Displays whether or not the profile is waiting for the Input Value of analog input 2 to meet the wait-for condition.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Not Waiting

Waiting

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44110

**Waiting Analog Input 3等待模拟输入**

Displays whether or not the profile is waiting for the Input Value of analog input 3 to meet the wait-for condition.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Not Waiting

Waiting

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44111

**Digital Output 1, Status数字输出状态**

Displays whether or not digital output 1 is on.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Off

On

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44112

**Digital Output 2, Status数字输出状态**

Displays whether or not digital output 2 is on.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Off

On

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44113

**Digital Output 3, Status数字输出状态**

Displays whether or not digital output 3 is on.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Off

On

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44114

**Digital Output 4, Status数字输出状态**

Displays whether or not digital output 4 is on.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Off

On

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44115

**Digital Output 5, Status数字输出状态**

Displays whether or not digital output 5 is on.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Off

On

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44116

**Digital Output 6, Status数字输出状态**

Displays whether or not digital output 6 is on.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Off

On

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44117

**Digital Output 7, Status数字输出状态**

Displays whether or not digital output 7 is on.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Off

On

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44118

**Digital Output 8, Status数字输出状态**

Displays whether or not digital output 8 is on.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Off

On

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44119

**Hours Remaining剩余小时**

Displays the number of hours in the time remining for the current step. This plus the Minutes Remaining and Seconds Remaining is the total time remaining for the step.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

0 to 99 hours

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44120

**Minutes Remaining剩余分钟**

Displays the number of minutes in the time remining for the current step. This plus the Hours Remaining and Seconds Remaining is the total time remaining for the step.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

0 to 59 minutes

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44121

**Seconds Remaining剩余秒**

Displays the number of seconds in the time remining for the current step. This plus the Hours Remaining and Minutes Remaining is the total time remaining for the step.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

0 to 59 seconds

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44122

**Set Point Ch1设置点**

Displays the set point for channel 1 set by the profile.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Set Point Low Limit to Set Point High Limit

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 44123

**Set Point Ch2设置点**

Displays the set point for channel 2 set by the profile.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Set Point Low Limit to Set Point High Limit

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 44124

**Ch1 PID Set通道PID设置**

Displays which PID set is used for channel 1 in the current profile step.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

PID Set 1

PID Set 2

PID Set 3

PID Set 4

PID Set 5

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44125

**Ch2 PID Set通道PID设置**

Displays which PID set is used for channel 1 in the current profile step.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

PID Set 6

PID Set 7

PID Set 8

PID Set 9

PID Set 10

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44126

**Last Jump Count跳转计数**

Displays the number of times a profile has jumpped since a profile was last started.

**Parameter Type(参数类型)**

Current Step

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44127

**Last Jump File跳转文件**

Displays the name of the profile that contains the last jump step executed since a profile was last started.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Any profile in the controller. Or None, if no jumps have been executed.

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44128

**Jump Step跳转步骤**

Displays the number of the the last jump step executed since a profile was last started.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

1-256 or 0 if no jumps have been executed.

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44129

**End Set Point Ch1结束设置点**

Displays the set point for channel 1 at which the current step will end.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Set Point Low Limit to Set Point High Limit

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44130

**End Set Point Ch2结束设置点**

Displays the set point for channel 2 at which the current step will end.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Set Point Low Limit to Set Point High Limit

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 44131

**Hold a Profile保持剖面**

Set this parameter to hold a profile. It can be included in a recipe type along with other Profile Control parameters and used to start a profile by downloading a recipe.

**Parameter Type(参数类型)**

Profile Control

**Range(参数)**

Hold Profile

**Available(可用)**

When a profile is running

**Note(附注)**

Modbus Address: 41211

**Resume a Profile继续剖面**

Set this parameter to resume a profile. It can be included in a recipe type along with other Profile Control parameters and used to start a profile by downloading a recipe.

**Parameter Type(参数类型)**

Profile Control

**Range(参数)**

Resume Profile

**Available(可用)**

When a profile is holding

**Note(附注)**

Modbus Address: 41210

**Terminate a Profile结束剖面**

Set this parameter to terminate a profile. It can be included in a recipe type along with other Profile Control parameters and used to start a profile by downloading a recipe.

**Parameter Type(参数类型)**

Profile Control

**Range(参数)**

Terminate Profile

**Available(可用)**

When a profile is running

**Note(附注)**

Modbus Address: 41218

**Cascade Type堆叠类型**

Choose a type of cascade to enagble cascade control.

See: Cascade

**Parameter Type(参数类型)**

Cascade

**Range(参数)**

No Cascade

Process Cascade

Deviation Cascade

**Default(默认)**

No Cascade

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 41926

**Alarm Status 1警告状态**

This parameter indicates when alarm output 1 is reporting a high or low alarm and idicates wheter or not the alarm is latched. This parameters is also used to determine which alarm message should appear in the **Alarm** screen in WatView. The following messages can appear:

|  |  |
| --- | --- |
| **Message** | **Description** |
| High Process | Input Value for channel 1 has exceeded the Alarm High SP/Deviation setting |
| Low Process | Input Value for channel 1 has dropped below the Alarm Low SP/Deviation setting |
| High Deviation | Input Value for channel 1 has exceeded the Alarm High SP/Deviation setting |
| Low Deviation | Input Value for channel 1 has dropped below the Alarm Low SP/Deviation setting |
| Input Error | Input Error on analog input 1 |

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

No Alarms

Hi Unlatched

Low Unlatched

Hi Latched

Low Latched

**Protection(保护)**

This parameter is read-only.

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter does not appear in the Spreadsheet Overview.

Modbus Address: 40103

**Clear Alarms 1清除警告**

This parameter is used by WatView to clear alarms.

**Parameter Type(参数类型)**

Set Points

**Protection(保护)**

This is a write only parameter.

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter does not appear in the Spreadsheet Overview.

Modbus Address: 40313

**Operation Mode, Status模式状态**

Displays the current status of the profle.

**Parameter Type(参数类型)**

Current Step

**Range(参数)**

Stopped

Pre Run

Running

Holding

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40201

**Set Point设置点**

Use this parameter to set the desired process value for a channel when a profile is not running.

**Parameter Type(参数类型)**

Set Points

**Range(参数)**

Set Point Low Limit to Set Point High Limit

**Default(默认)**

75° F or 24° C

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph and logged in a data log.

Modbus Address: 40301

**Alarm Status 2警报状态**

This parameter indicates when alarm output 2 is reporting a high or low alarm and idicates wheter or not the alarm is latched. This parameters is also used to determine which alarm message should appear in the **Alarm** screen in WatView. The following messages can appear:

|  |  |
| --- | --- |
| **Message** | **Description** |
| High Process | Input Value for channel 2 has exceeded the Alarm High SP/Deviation setting |
| Low Process | Input Value for channel 2 has dropped below the Alarm Low SP/Deviation setting |
| High Deviation | Input Value for channel 2 has exceeded the Alarm High SP/Deviation setting |
| Low Deviation | Input Value for channel 2 has dropped below the Alarm Low SP/Deviation setting |
| Input Error | Input Error on analog input 2 |

**Parameter Type(参数类型)**

Diagnostics

**Range(参数)**

No Alarms

Hi Unlatched

Low Unlatched

Hi Latched

Low Latched

**Protection(保护)**

This parameter is read-only.

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter does not appear in the Spreadsheet Overview.

Modbus Address: 40107

**Cleared (Output 2)清除**

**Parameter Type(参数类型)**

Diagnostics

**Protection(保护)**

This is a write-only parameter.

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter does not appear in the Spreadsheet Overview.

Modbus Address: 40332

**Start a Profile开始剖面**

This parameter is used to start a profile. It can be included in a recipe type along with the other Profile Control parameters and used to start a profile by downloading a recipe.

**Parameter Type(参数类型)**

Profile Control

**Range(参数)**

Start Profile

**Note(附注)**

Modbus Address: 44003

**Profile Name剖面名称**

This parameter is used by WatView to name a profile. It can be included in a recipe type along with other Profile Control parameters and used to start a profile by downloading a recipe.

**Parameter Type(参数类型)**

Profile Control

**Range(参数)**

Any profile in the controller.

**Note(附注)**

The list of profiles is not updated automatically when profiles are added or deleted using the controller’s front panel. You must read up the profiles from the controller using the F4 Profile Editor Tool to update the list.

Modbus Address: 44001

**Step Number步骤编号**

This parameter is used by WatView to number a profile step. It can be included in a recipe type along with other Profile Control parameters and used to start a profile by downloading a recipe.

**Parameter Type(参数类型)**

Profile Control

**Range(参数)**

1 to 256 (the step number in the profile)

**Note(附注)**

The list of step numbers is not updated automatically when profiles are added or deleted using the controller’s front panel. You must read up the profiles from the controller using the F4 Profile Editor Tool to update the list.

Modbus Address: 44002

**Status 1状态**

Read or set the state of digital ouput 1.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 42001

**Status 2状态**

Read or set the state of digital ouput 2.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 42011

**Status 3状态**

Read or set the state of digital ouput 3.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 42021

**Status 4状态**

Read or set the state of digital ouput 4.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 42031

**Status 5状态**

Read or set the state of digital ouput 5.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 42041

**Status 6状态**

Read or set the state of digital ouput 6.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 42051

**Status 7状态**

Read or set the state of digital ouput 7.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 42061

**Status 8状态**

Read or set the state of digital ouput 1.

**Parameter Type(参数类型)**

Digital Outputs

**Range(参数)**

Off

On

**Default(默认)**

Off

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 42071

**Status状态**

Displays the status of a digital input.

**Parameter Type(参数类型)**

Digital Inputs

**Range(参数)**

|  |  |
| --- | --- |
| Low | Input is pulled low. |
| High | Input is pulled high or is an open circuit. |

**Default(默认)**

High with no connections to hardware input.

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 40202

**Idle Set Point, Power Out Action空闲设置点，断电操作**

Set or read the set point used for the Idle Set Point option of Power-Out Action.

See: Power-Out Time/Power-Out Action.

**Parameter Type(参数类型)**

Set Points

**Range(参数)**

Set Point Low Limit to Set Point High Limit

**Default(默认)**

75° F or 24° C

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40309

**Cascade Autotune堆叠自动调谐**

Select one of the PID sets to start the autotune and overwrite those parameters.

See: Autotuning.

**Parameter Type(参数类型)**

Autotune PID

**Range(参数)**

Tune Off

PID Set 1

PID Set 2

PID Set 3

PID Set 4

PID Set 5

**Default(默认)**

Tune Off

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 40344

**Cascade Range Low堆叠下限**

The low end of the set point range for the inner loop.

See: Cascade

**Parameter Type(参数类型)**

Cascade

**Range(参数)**

Depends on the range of the sensor selected in Type for analog input 1.

**Default(默认)**

Scale Low for analog input 1.

**Available(可用)**

When Cascade Type is not set to No Cascade.

**Affects(效果)**

Limits the range of the Inner Set Point

**Note(附注)**

Modbus Address: 41927

**Cascade Range High堆叠上限**

The high end of the set point range for the inner loop.

See: Cascade

**Parameter Type(参数类型)**

Cascade

**Range(参数)**

Depends on the range of the sensor selected in Type for analog input 1.

**Default(默认)**

Scale High for analog input 1.

**Available(可用)**

When Cascade Type is not set to No Cascade.

**Affects(效果)**

Limits the range of the Inner Set Point

**Note(附注)**

Modbus Address: 41928

**Profile to Start开始剖面**

The name of the profile to start when a digital input is received and its Function is set to Start Profile.

**Parameter Type(参数类型)**

Digital Inputs

**Range(参数)**

Any profile in the controller.

**Default(默认)**

Unknown

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41076

**Step to Start开始步骤**

The step at which to start when a digital input is received and its Function is set to Start Profile.

**Parameter Type(参数类型)**

Digital Inputs

**Range(参数)**

1 to 256 or -1 if no step has been selected.

**Default(默认)**

-1

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41077

**Dead Band 1A, Cascade (1-5)死区，堆叠**

Define the effective shift in the heating and cooling set point to prevent conflict.

See: Dead Band.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

0

**Available(可用)**

Active if Proportional Band is not set to 0 and Function 1A is set to heat and Function 1B to cool.

**Note(附注)**

Modbus Address: 42606

**Dead Band 1B, Cascade (1-5) 死区，堆叠**

Define the effective shift in the heating and cooling set point to prevent conflict.

See: Dead Band.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

0

**Available(可用)**

Active if Proportional Band is not set to 0 and Function 1A is set to heat and Function 1B to cool.

**Note(附注)**

Modbus Address: 42656

**Derivative 1A, Cascade (1-5)微分，堆叠**

Set the derivative time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42604

**Derivative 1B, Cascade (1-5) 微分，堆叠**

Set the derivative time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42654

**Hysteresis 1A, Cascade (1-5)延迟，堆叠**

Define the process value change from the set point required to re-energize the output (in on-off mode).

See: On-Off Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

3

**Available(可用)**

Active if Proportional Band is set to 0 and Function 1A is set to heat and Function 1B to cool.

**Note(附注)**

Modbus Address: 42608

**Hysteresis 1B, Cascade (1-5) 延迟，堆叠**

Define the process value change from the set point required to re-energize the output (in on-off mode).

See: On-Off Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0 to 30000 (Units and Decimal placment determined by those parameters)

**Default(默认)**

3

**Available(可用)**

Active if Proportional Band is set to 0 and Function 1A is set to heat and Function 1B to cool.

**Note(附注)**

Modbus Address: 42658

**Integral 1A, Cascade (1-5) 积分，堆叠**

Set the integral time in minutes.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 99.99 minutes

**Default(默认)**

0 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42602

**Integral 1B, Cascade (1-5) 积分，堆叠**

Set the integral time in minutes.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 99.99 minutes

**Default(默认)**

0 minutes

**Available(可用)**

When PID Units is set to SI(Integral/Derivative) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42652

**Proportional Band 1A, Cascade (1 to 5) (F4 S/D)比例边带，堆叠**

The outer loop 1A proportional band used for cascade control.

See: Proportional Control.

See: Cascade

See: Multiple PID Sets.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0° to 30000° (units depend on the setting of °F or °C)

**Default(默认)**

25°F or 14°C

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42601

**Proportional Band 1B, Cascade (1 to 5) (F4 S/D) 比例边带，堆叠**

The outer loop 1B proportional band used for cascade control.

See: Proportional Control.

See: Cascade

See: Multiple PID Sets.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0° to 30000° (units depend on the setting of °F or °C)

**Default(默认)**

25°F or 14°C

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 42651

**Rate 1A, Cascade (1 to 5) (F4 S/D)比率，堆叠**

Set the rate time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42605

**Rate 1B, Cascade (1 to 5) (F4 S/D) 比率，堆叠**

Set the rate time.

See: Proportional Integral and Derivative Control.

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 to 9.99 minutes

**Default(默认)**

0.00 minutes

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42606

**Reset 1A, Cascade (1 to 5) (F4 S/D)重置，堆叠**

Set the reset time in repeats per minute.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 per minute to 99.99 per minute

**Default(默认)**

0 per minute

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42603

**Reset 1B, Cascade (1 to 5) (F4 S/D) 重置，堆叠**

Set the reset time in repeats per minute.

See: Proportional plus Integral (PI Control).

**Parameter Type(参数类型)**

PID Set (1-5)

**Range(参数)**

0.00 per minute to 99.99 per minute

**Default(默认)**

0 per minute

**Available(可用)**

When PID Units is set to US(Reset/Rate) and Proportional Band is not set to 0.

**Note(附注)**

Modbus Address: 42653

**Build Number版本号**

Combined with the Software Number this identifies the software revision.

**Parameter Type(参数类型)**

Diagnostics

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

Modbus Address: 40031

**Password密码**

The password required to access locked menus. This lockout affects using the front panel of the controller only.

See: Prevent User Access to Controller Parameters for information on limiting access to parameters through WatView.

**Parameter Type(参数类型)**

Set Lockout

**Range(参数)**

Enter up to four of the following characters:

A to Z

a to z

0 to 9

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41331

**% Power Output 1A功率输出**

The current percent output power on control output 1A.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0 to 100% when Function 1A is set to Heat.

-100 to 0% when Function 1A is set to Cool

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 40104

**% Power Output 1B功率输出**

The current percent output power on control output 1AB

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0 to 100% when Function 1B is set to Heat.

-100 to 0% when Function 1B is set to Cool

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 40108

**% Power Output 2A功率输出**

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0 to 100% when Function 2A is set to Heat.

-100 to 0% when Function 2A is set to Cool

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 40112

**% Power Output 2B功率输出**

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

0 to 100% when Function 2B is set to Heat.

-100 to 0% when Function 2B is set to Cool

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 40116

**Custom Message自定义消息**

**Parameter Type(参数类型)**

Custom Msgs

**Range(参数)**

Enter up to 18 of the following characters:

A to Z

a to z

0 to 9

**Default(默认)**

MESSAGE x (where x is the number of the message: 1 to 4)

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 4502

**Inner Set Point内部设置点**

Displays the set point for the inner loop when the controller is performing cascade control.

See: Cascade

**Parameter Type(参数类型)**

Cascade

**Range(参数)**

Cascade Range(参数) Low to Cascade Range(参数) High

**Protection(保护)**

This parameter is read-only.

**Available(可用)**

Always

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter may be plotted on the trend plot graph (see: Set Up a Graph).

Modbus Address: 41923

**Guarantee Soak Band 1 Source容差带源**

Select the analog input to which to apply the Guarantee Soak Band 1 setting.

**Parameter Type(参数类型)**

System

**Range(参数)**

|  |  |
| --- | --- |
| Input 1 | Typical setting when cascade is **not** enabled. |
| Input 2 |  |
| Input 3 | Typical setting when cascade is enabled. |

**Default(默认)**

Input 1

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41221

**Guarantee Soak Band 2 Source容差带源**

Select the analog input to which to apply the Guarantee Soak Band 2 1 setting.

**Parameter Type(参数类型)**

System

**Range(参数)**

|  |  |
| --- | --- |
| Input 1 |  |
| Input 2 | Typical setting. |
| Input 3 |  |

**Default(默认)**

Input 2

**Available(可用)**

Always

**Note(附注)**

Modbus Address: 41222

**Active PID Set 1活动PID设置**

Indicates the PID set in use for channel 1.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

PID Set 1

PID Set 2

PID Set 3

PID Set 4

PID Set 5

**Protection(保护)**

This parameter is read-only.

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter is not supported in firmware versions prior to 2.10.

Modbus Address: 40251

**Active PID Set 2活动PID设置**

Indicates the PID set in use for channel 2.

**Parameter Type(参数类型)**

Control Outputs

**Range(参数)**

PID Set 6

PID Set 7

PID Set 8

PID Set 9

PID Set 10

**Protection(保护)**

This parameter is read-only.

**Note(附注)**

This parameter cannot be included in a recipe type.

This parameter is not supported in firmware versions prior to 2.10.

Modbus Address: 40252

**Scale Inversion标定倒置**

Select whether or not to invert the input scaling for a Process input.

**Parameter Type(参数类型)**

Analog Inputs

**Range(参数)**

|  |  |
| --- | --- |
| Normal Scaling | Scale Low correlates to the lowest analog input signal and Scale High correlates to the highest analog input signal |
| Scale Inversion | Scale Low correlates to the highest analog input signal and Scale High correlates to the lowest analog input signal |

**Default(默认)**

Normal Scaling

**Note(附注)**

This parameter is not supported in firmware versions prior to 2.10.

Modbus Address: 40694

**On-Off Cool**

**Burst Fire 100%**

**Burst Fire 66%**

**Burst Fire 50%**

**Boost Cool**

**Vaisala 0-5 Vdc**

The Series F4 provides temperature compensation for the Vaisala HMM-30C Solid-state Humidity Sensor to calculate relative humidity on channel 2. The humidify and dehumidify outputs (2A and 2B) are disabled when the input 1 temperature is too low (-40°F/-40°C) or too high (320°F/160°C). The relative humidity display in the Main Page will display “Error 2” for a low temperature error and “Error 3” for a high temperature error.

**Vaisala 0-20 mA**

The Series F4 provides temperature compensation for the Vaisala HMM-30C Solid-state Humidity Sensor to calculate relative humidity on channel 2. The humidify and dehumidify outputs (2A and 2B) are disabled when the input 1 temperature is too low (-40°F/-40°C) or too high (320°F/160°C). The relative humidity display in the Main Page will display “Error 2” for a low temperature error and “Error 3” for a high temperature error.

**Rotronics 0-5 Vdc**

The Series F4 provides temperature compensation for the Rotronic Model H260 Capacitive Relative Humidity Sensor to calculate relative humidity on channel 2. The humidify and dehumidify outputs (2A and 2B) are disabled when the input 1 temperature is too low (-5°F/-20°C) or too high (320°F/160°C). The relative humidity display in the Main Page will display “Error 2” for a low temperature error and “Error 3” for a high temperature error.

**Features**

To learn more about how to use the features of the Series F4 Ramping controller read these topics. The topics are organized by subject:

Inputs

Control

Alarms

Advanced Features

**Calibration Offset**

{button ,AL("F4\_Concept\_Inputs",0,`',`')} Related Topics

Calibration offset allows a device to compensate for an inaccurate sensor, lead resistance or other factors that affect the input value. A positive offset increases the input value, and a negative offset decreases the input value.

You can view or change the offset value of inputs 1, 2 or 3 with Calibration Offset.

**Filter Time Constant**

{button ,AL("F4\_Concept\_Inputs",0,`',`')} Related Topics

A time filter smoothes an input signal by applying a first-order filter time constant to the signal. Either the displayed value or both the displayed and control values can be filtered. Filtering the displayed value makes it easier to monitor. Filtering the signal may improve the performance of PID control in a noisy or very dynamic system.

A positive value affects only the viewed values. A negative value affects both the viewed and control values.

Location in software: Setup Page > Analog Inputs x (1 to 3).

**Set Point Low Limit and High Limit**

{button ,AL("F4\_Concept\_Inputs",0,`',`')} Related Topics

The controller constrains the set point to a value between a low limit and a high limit. The high limit cannot be set higher than the sensor high limit or lower than the low limit. The low limit cannot be set lower than the sensor low limit or higher than the high limit.

You can view or change the Set Point Low Limit and Set Point High Limit for analog inputs 1, 2 or 3.

**Scale High and Scale Low**

{button ,AL("F4\_Concept\_Inputs",0,`',`')} Related Topics

When Process is selected as the Sensor setting for an analog input, you must choose a value to represent the low and high ends of the current or voltage range. For example, if an analog input with a process sensor Type 4 to 20mA is selected and the Units are % Relative Humidity, then 4mA may represent 0% and 20mA may represent 100%. The set point is limited to the range between Scale Low and Scale High.

**Event**

{button ,AL("F4\_Concept\_Inputs",0,`',`')} Related Topics

With an event input an operator can perform certain operations on a system by opening or closing a switch or applying a dc logic signal to the controller. This feature can add convenience, safety or security to a system.

In the Series F4, digital inputs 1 to 4 can be assigned as wait for events, as well as other process control features.

**Retransmit**

{button ,AL("F4\_Concept\_Inputs",0,`',`')} Related Topics

Retransmit outputs 1 and 2 can retransmit an analog signal to serve as an input variable for another device. The signal may serve as a remote set point for another controller or as input for a chart recorder to document system performance over time.

**On-Off Control**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

On-off control switches the output either full on or full off, depending on the input, set point and hysteresis values. The hysteresis value indicates the amount the process value must deviate from the set point to turn on the output. Increasing the value decreases the number of times the output will cycle. Decreasing hysteresis improves controllability. With hysteresis set to 0 the process value would stay closer to the set point, but the output would switch on and off more frequently, causing “chattering.”

Set the proportional band to 0 to set the controller to on-off control mode.

**On-Off Heat Only**

Cool Illustration

**Proportional Control**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

Some processes need to maintain a temperature or process value closer to the set point than on-off control can provide. Proportional control provides closer control by adjusting the output when the temperature or process value is within a proportional band. When the value is in the band, the controller adjusts the output based on how close the process value is to the set point; the closer to set point the lower the output. This is similar to backing off on the gas pedal of a car as you approach a stop sign. It keeps the temperature or process value from swinging as widely as it would with simple on-off control. However, when a system settles down, the temperature or process value tends to “droop” short of the set point.

With proportional control the output power level equals (set point minus input value) divided by proportional band.

**Proportional plus Integral (PI) Control**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

The droop caused by proportional control can be corrected by adding integral control (reset). When the system settles down the integral value is tuned to bring the temperature or process value closer to the set point. Integral determines the speed of the correction, but this may increase the overshoot at startup or when the set point is changed. Too much integral action will make the system unstable. Integral is cleared when the process value is outside of the proportional band.

Integral (if PID Units is set to SI) is measured in minutes per repeat. A low integral value causes a fast integrating action.

Reset (if PID Units is set to U.S.) is measured in repeats per minute. A high reset value causes a fast integrating action.

**Proportional Integral and Derivative Control**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

Use derivative control to minimize overshoot in a PI-controlled system. Derivative adjusts the output based on the rate of change in the temperature or process value. Too much derivative will make the system sluggish.

Set Derivative in minutes when PID Units is set to SI.

Set Rate in minutes if PID Units is set to US .

**Dead Band**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

In a multiple PID application the dead bands above and below the set point can save an application's energy and wear by maintaining process temperature within acceptable ranges. Shifting the effective cooling set point and heating set point keeps the two systems from fighting each other.

Proportional action ceases when the process value is within the dead band. Integral action continues to bring the process temperature to the set point. When the dead band value is zero, the heating element activates when the temperature drops below the set point, and the cooling element switches on when the temperature exceeds the set point.

Set the corresponding dead band.

**Cooling Dead Band**

**Multiple PID Sets**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

The Series F4 has five PID sets available for each channel, sets 1 to 5 for Channel 1 and sets 6 to 10 for Channel 2, allowing optimal performance under different conditions, loads and temperatures. In the Static Set Point mode, PID Set 1 is used for Channel 1 and PID Set 6 is used for Channel 2 control. When programming a profile, you can assign different sets to each ramp step and Soak step.

A PID set includes proportional, integral and derivative settings for outputs A and B. It also includes dead band, as long as the proportional band is not set to 0.

**Burst Fire**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

Burst firing provides even output power with the lowest level of noise generation (RFI). Burst fire is the preferred method for controlling a resistive load, providing a very short time base for longer heater life.

The controller determines when the ac sine wave will cross the 0-volts point, then switches the load on or off only at this point, minimizing RFI.

To use burst fire, set the corresponding Cycle Time (Burst) Value to Variable Burst.

**Burst fire illustrations**

100% output

66% output

50% output

**Autotuning**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

The autotuning feature allows the controller to measure the system response to determine effective settings for PID control. When autotuning is initiated the controller reverts to on-off control. The temperature must cross the autotune set point four times to complete the autotuning process.

Once complete, the controller controls at the normal set point, using the new parameters. The F4 stores the value in the PID set specified.

Choose a PID set to voverwrite in the corresponding Autotune parameter to start autotuning a channel.

**CAUTION:** Choose an autotune set point value that will protect your product from possible damage from overshoot or undershoot during the autotuning oscillations. If the product is sensitive, carefully select the autotune set point to prevent product damage.

**Power-Out Time/Power-Out Action**

{button ,AL("F4\_Concepts\_Control",0,`',`')} Related Topics

Power-Out Time and Power-Out Action direct the F4’s response to the interruption of electrical power while running a profile. The F4’s battery-powered real-time clock tracks the amount of time the power is out. When power is restored, the controller compares this amount of time to the Power-Out Time setting and takes whatever action is selected in the Power-Out Action setting.

First, determine how long the power can be interrupted without adversely affecting results. Set the Power-Out Time to this time. If power is returned in less time than this setting, the profile will resume running. (The profile run time stops while the power is off.) If power is returned after a time longer than this setting, the F4 will take action based on the Power-Out Action.

|  |  |
| --- | --- |
| **If set to…** | **The profile will…** |
| Continue | Resume at the point that power was interrupted |
| Hold | Hold at the point that power was interrupted |
| Terminate | Stop using the End step conditions |
| Reset | Restart from Step 1 |
| Idle | Stop and transfer to an idle set point |

**Note:** The Power Out Action occurs only if a profile was running when the power went out. If a profile was on hold, it will return to its Hold status when the power returns.

**Alarms**

{button ,AL("F4\_Concepts\_Alarms",0,`',`')} Related Topics

Alarms are activated when the input value leaves a defined range. A user can configure how and when an alarm is triggered, what action it takes and whether it turns off automatically when the alarm condition is over.

Configure alarm outputs before setting alarm set points.

**Alarm Set Points**

{button ,AL("F4\_Concepts\_Alarms",0,`',`')} Related Topics

The alarm high set point defines the process value or temperature that will trigger a high side alarm. It must be higher than the alarm low set point and lower than the high limit of the sensor range.

The alarm low set point defines the temperature that will trigger a low side alarm. It must be lower than the alarm high set point and higher than the low limit of the sensor range.

**Alarm Hysteresis**

{button ,AL("F4\_Concepts\_Alarms",0,`',`')} Related Topics

An alarm state is triggered when the input value reaches the alarm high set point or the alarm low set point. Alarm hysteresis defines how far the process value must return into the normal operating range before the alarm can be cleared.

Alarm hysteresis is a zone inside each alarm set point. This zone is defined by adding the hysteresis value to the alarm low set point or subtracting the hysteresis value from the alarm high set point.

**Process or Deviation Alarms**

{button ,AL("F4\_Concepts\_Alarms",0,`',`')} Related Topics

A process alarm uses one or two absolute set points to define an alarm condition. A deviation alarm uses one or two set points that are defined relative to the control set point. High and low alarm set points are calculated by adding and/or subtracting offset values from the control set point. If the set point changes, the window defined by the alarm set points automatically changes with it.

In the Series F4 you must configure each alarm outputs as either a process or deviation alarm.

**Alarm Latching**

{button ,AL("F4\_Concepts\_Alarms",0,`',`')} Related Topics

A latched alarm will remain active after the alarm condition has passed. It can only be deactivated by the user. An alarm that is not latched (self-clearing) will deactivate automatically when the alarm condition has passed. See: Alarm Latching (F4 S/D).

**Alarm Silencing**

{button ,AL("F4\_Concepts\_Alarms",0,`',`')} Related Topics

Alarm silencing has two uses:

It is often used to allow a system to warm up after it has been started up. With alarm silencing on, an alarm is not triggered when the input value is initially lower than the alarm low set point. The process temperature has to enter the normal operating range beyond the hysteresis zone to activate the alarm function.

Alarm silencing also allows the operator to disable the alarm output while the controller is in an alarm state. The process temperature has to enter the normal operating range beyond the hysteresis zone to activate the alarm output function.

If the Series F4 has an output that is functioning as a deviation alarm, the alarm is silenced when the set point is changed, until the process value reenters the normal operating range.

**Alarm Sides**

{button ,AL("F4\_Concepts\_Alarms",0,`',`')} Related Topics

alarm can be configured to trigger when the process value exceeds the high alarm set point, the low alarm set point or both. Make your choice by setting Alarm Sides.

**Boost Heat and Boost Cool**

{button ,AL("F4\_Concepts\_Advanced",0,`',`')} Related Topics

The boost heat feature uses a digital output to turn on an additional heater to speed up the heating. As the process temperature approaches the set point, the boost heat output switches off so that the process temperature doesn’t overshoot the set point.

Boost cool uses a digital output to speed up the cooling process, typically by activating a solenoid valve that releases liquid nitrogen.

For either boost heat or boost cool, set Boost % Power to define the power level that must be exceeded before the boost output is activated. Use a positive value for heating, a negative value for cooling.

To prevent the output from cycling and to extend hardware life, define Boost Time Delay in seconds to set the minimum period of time that the output will remain off after an on cycle.

The Series F4 uses digital output 6 for boost heat and digital output 7 for boost cool. Hysteresis for boost heat and cool is fixed at 5%.

Cool Illustration

**Compressor Control**

{button ,AL("F4\_Concepts\_Advanced",0,`',`')} Related Topics

The compressor control can save wear on a compressor and prevent it from locking up from short cycling. A bypass valve operated by a control output regulates how the process is cooled, while a digital output switches the compressor on and off.

The Series F4 uses digital output 8 for compressor control. Compressor On % Power sets the power level that will switch the compressor on. Compressor Off % Power sets the power level that will switch the compressor off.

The compressor will not turn on until the output power exceeds the Compressor On % Power for a time longer than the Compressor On Delay. The compressor will not turn off until the output power exceeds the Compressor Off % Power for a time longer than the Compressor Off Delay.

**Cascade**

{button ,AL("F4\_Cascade;F4\_Concepts\_Advanced",0,`',`')} Related Topics

Cascade control is a control strategy in which one control loop provides the set point for another loop. It allows the process or part temperature to be reached quickly while minimizing overshoot. Cascade is used to optimize the performance of thermal systems with long lag times.

The graph below illustrates a thermal system with a long lag time. Curve A represents a single-loop control system with PID parameters that allow a maximum heat-up rate. Too much energy is introduced and the set point is overshot. In most systems with long lag time, the process value may never settle out to an acceptable error. Curve C represents a single-control system tuned to minimize overshoot. This results in unacceptable heat-up rates, taking hours to reach the final value. Curve B shows a cascade system that limits the energy introduced into the system, allowing an optimal heat-up rate with minimal over-shoot.

**Cascade Algorithm**

{button ,AL("F4\_Cascade",0,`',`')} Related Topics

Cascade control uses two control loops (outer and inner) to control the process. The outer loop monitors the process or part temperature, which is then compared to the set point. The result of the comparison, the error signal, is acted on by the settings in a cascade PID set (1 to 5), which then generates a power level for the outer loop. The inner set point is determined by the outer-loop power level and the set point low limit and set point high limit settings for analog input 1.

The inner loop monitors the energy source (heating and cooling), which is compared to the internal set point generated by the outer loop. The result of the comparison, the error signal, is acted on by the settings in a cascade PID set (1 to 5), which generates an output power level between -100% to +100%. If the power level is positive the heat will be on; if the power level is negative the cool will come on.

In Series F4 controller’s, cascade control is available on channel 1. Analog input 3 is used to measure the outer-loop process while analog input 1 is used to measure the energy source. Power from the energy sources are supplied by outputs 1A and 1B.

When tuning a cascade system, the inner loop must be tuned first. In a thermal system, the inner loop comprises outputs 1A and 1B and the Analog Input 1 sensor, which usually measures the energy source temperature. The output device controls a power switching device, which in turn switches the heating and cooling. The set point for the inner loop is generated by the outer loop and will have a range between the Cascade Range(参数) Low and Cascade Range(参数) High.

Before tuning the inner loop you must make sure Analog Input 1, Cascade Low Range(参数) and Cascade High Range(参数) are properly configured.

To set up and tune a system for cascade control, see:

Set Up Cascade Control

Cascade Autotuning Procedure

**Series F4 S/D Controller Help**

This help file provides descriptions of the parameters used to operate maintain and troubleshoot the both the F4S and F4D models of the Series F4 Ramping controller.

Help is provided for:

Controller Parameters

Features

Procedures.

Using the Series F4 S/D with WatView

**Using the Series F4 S/D with WatView**

{button ,AL("F4\_Procedures",0,`',`')} Related Topics

The Series F4 S/D controller is a sophisticated ramping controller with a full feature set. Its four-line text display provides it with a complete yet easy-to-use interface. WatView also offers a wide range of features including datalogging, trending, alarm management, and recipe management. See: WatView Using WatView with one or more F4 controllers makes many additional features available to users. Look for specific tools for the F4 on the **Tools** menu.

**Setting up an Series F4**

WatView supplies screens specifically designed to help you view and edit all the F4’s parameter settings other than profiles.

See: F4 Setup (Operation),   
F4 Setup (Alarms),   
F4 Setup (Inputs),   
F4 Setup (Outputs),   
F4 Setup (PID Sets),   
F4 Setup (Cascade) and   
F4 Setup (Current Step)

The setup of one F4 can be copied to another using the snapshot feature. See: Save a Snapshot and Restore a Snapshot.

Use the F4 Date and Time Tool to set the clock and calendar in the F4. See: F4 Date and Time Tool.

Use the F4 Save Changes to EE Tool after setting up a controller to preserve the parameter settings even when the controller’s power is off. See: F4 Save Changes to EE Tool.

**Managing Profiles**

The F4 Profile Editor tool allows you to read the profiles from any F4 and save them on a computer hard drive or floppy disk. It allows you to edit those profiles and download them to any F4 that is similarly configured. The profile editor also allows you to convert profiles that were set up on one F4 for use with an F4 set up differently. Online help for the F4 Profile Editor provides complete instructions and explanations for doing all this and more. See: F4 Profile Editor Tool.

**Running Profiles**

After setting up the controller and downloading profiles, you can run a profile using the controller front panel, or the F4 Profile Control Tool. See; F4 Profile Control Tool.

**Series F4 S/D Parameter Types**

This help file contains descriptions of the following types of parameters:

Main Page

Diagnostics

Autotune PID

Analog Inputs

PID Set (1-5)

PID Set (6-10)

System

Alarm Outputs

Set Points

Digital Inputs

Control Outputs

Retrans Outputs

Digital Outputs

Custom Main Pg

Process Display

Set Lockout

Current Step

Profile Control

Cascade

Custom Msgs

**Sensor Range(参数)s**

The following table lists the sensor ranges for each analog input Type. Some ranges depend on the setting of Decimal.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Type** | **Decimal** | **Fahrenheit** | | |  | **Celsius** | | |
| J | 0 | 32 | to | 1500 |  | 0 | to | 815 |
|  | 0.0 | 32.0 | to | 1500.0 |  | 0.0 | to | 815.0 |
| K | 0 | -328 | to | 2500 |  | -200 | to | 1370 |
|  | 0.0 | -328.0 | to | 2500.0 |  | -200.0 | to | 1370.0 |
| T | 0 | -328 | to | 750 |  | -200 | to | 400 |
|  | 0.0 | -328.0 | to | 750.0 |  | -200.0 | to | 400.0 |
| E | 0 | -328 | to | 1470 |  | -200 | to | 800 |
|  | 0.0 | -328.0 | to | 1470.0 |  | -200.0 | to | 800.0 |
| N | 0 | 32 | to | 2372 |  | 0 | to | 1300 |
|  | 0.0 | 32.0 | to | 2372.0 |  | 0.0 | to | 1300.0 |
| C | 0 | 32 | to | 4200 |  | 0 | to | 2315 |
|  | 0.0 | 32.0 | to | 3000.0 |  | 0.0 | to | 2315.0 |
| D | 0 | 32 | to | 4200 |  | 0 | to | 2315 |
|  | 0.0 | 32.0 | to | 3000.0 |  | 0.0 | to | 2315.0 |
| PT2 | 0 | 32 | to | 2543 |  | 0 | to | 1395 |
|  | 0.0 | 32.0 | to | 2543.0 |  | 0.0 | to | 1395.0 |
| R | 0 | 32 | to | 3200 |  | 0 | to | 1760 |
|  | 0.0 | 32.0 | to | 3000.0 |  | 0.0 | to | 1760.0 |
| S | 0 | 32 | to | 3200 |  | 0 | to | 1760 |
|  | 0.0 | 32.0 | to | 3000.0 |  | 0.0 | to | 1760.0 |
| B | 0 | 32 | to | 3300 |  | 0 | to | 1816 |
|  | 0.0 | 32.0 | to | 3000.0 |  | 0.0 | to | 1816.0 |
| RTD DIN | 0 | -328 | to | 1472 |  | -200 | to | 800 |
|  | 0.0 | -328.0 | to | 1472.0 |  | -200.0 | to | 800.0 |
| RTD JIS | 0 | -328 | to | 1166 |  | -200 | to | 630 |
|  | 0.0 | -328.0 | to | 1166.0 |  | -200.0 | to | 630.0 |

**Cascade Autotuning Procedure**

{button ,AL("F4\_Cascade",0,`',`')} Related Topics

**To tune cascade control:**

1 From the **View** menu, choose **SpreadSheet**.

2 Select the **F4** tab if it is not already in front.

3 Click **Autotune PID**.

4 For **Channel 1 Autotune**, select the PID set you want to tune.

**Note:** While autotuning, the F4 controller will control the energy source in an on-off mode to a temperature equal to the Cascade Range(参数) High setting x Channel 1 Autotune Set Point.

5 Wait until the **Channel 1 Autotune** reads Tune Off.

6 For **Cascade Autotune**, select the PID set you want to tune.

**Set Controller Address and Baud Rate**

**To set the Controller Address and baud rate:**

1 On the **Main Page** on the controller front panel, choose **Go to Setup**.

2 On the **Setup Page**, choose **Communications**.

3 Choose the **Baud Rate** at which WatView is configured to communicate.

4 Choose the **Controller** **Address** at which WatView is configured to communicate with the controller.

5 Press (left) to return to the Main Page.

6 Save the settings.

**Set Up Cascade Control**

{button ,AL("F4\_Cascade",0,`',`')} Related Topics

**To set up cascade control:**

1 From the **View** menu, choose **F4 Setup (Operation)**.

2 Set the **Cascade Type** to Process Cascade or Deviation Cascade.

3 Set the **Range(参数) Low**.

**Note:** If you chose Process Cascade and it is a heat/cool system, set **Low Range(参数)** slightly lower than the lowest desired temperature. For heat-only systems, set **Low Range(参数)** slightly lower than the ambient temperature; otherwise the heat output will never turn full off.

4 Set the **High Range(参数)**.

**Note:** For heat/cool systems, set the **High Range(参数)** slightly higher than the highest desired temperature. For cool-only systems, set the **Low Range(参数)** to a value slightly higher than the ambient temperature; otherwise the cooling will never turn full off.

5 To tune the cascade process see: Cascade Autotuning Procedure.

**Use a Recipe to Operate a Profile**

**To create and download a recipe that starts a profile:**

1 From the **Tools** menu, choose **F4 Profile Editor**.

2 Select the controller you will operate with the recipe.

3 Click **OK**.

4 If the F4 Profile Editor says you have never read up the settings of the controller, click **Yes**.

5 Make sure the correct profiles are loaded in the controller. Refer to one of the following procedures to read the profiles from a controller or download profiles to a controller:  
Read the Profile Image from a Controller   
-or-  
Send a Profile Image to a Controller

6 To close the F4 Profile Editor:

 From the **File** menu, choose **Exit**.

 Click **Yes**.

7 Create and save a recipe type that includes the required parameters from the Profile Control type for the controller you want to operate.

|  |  |
| --- | --- |
| **To use a recipe to:** | **Include these parameters:** |
| Start a profile | Profile Name |
|  | Step Number |
|  | Start a Profile |
| Hold a Profile | Hold a Profile |
| Resume a Profile | Resume a Profile |
| Terminate a Profile | Terminate a Profile |

**Note:** Refer to Create a Recipe Type for instructions on using the Recipe Type Builder.

8 Create and save a recipe based on the type you created. In the recipe set:

 **Profile Name** to the profile you want to run.

 **Step Number** to 1, or the step at which you want the profile to start.

**Note:** Refer to Create a Recipe for instructions on using the Recipe Editor.

9 Download the recipe. See: Download a Recipe or Download a Recipe Automatically .

**Alarm**

An abnormal condition detected by the controller and reported on the **Alarm** screen. Alarms may be caused by the process variable exceeding user set limits or by the failure of a sensor.

**Baud Rate**

The rate at which communications transmissions are made and are expected to be received. For transmissions to occur correctly the baud rate setting must be the same in the controller and the software.

**Channel**

A channel, or loop, is a relationship a controller establishes between the input from a sensor and the output to a device, such as a heater. A single-channel, or single-loop, controller manages one such channel, or loop. "Loop" is often used interchangeably with "channel."

**Controller**

A device designed to vary an output such that a measured process variable is kept at the desired value, the set point. A ramping controller includes the provision for automatically changing that set point over time. WatView is designed to allow users to operate and monitor several such controllers from a computer terminal.

**Controller Address**

The network address of a specific controller.

**Data Log**

A file in which the values of user-selected parameters can be saved regularly according to a user-set frequency. The data logs are tab-delimited, text files that may be imported into most spreadsheet or database programs. A new file is created for each day that data logging is turned on.

**Download**

The transmission of a recipe from WatView to one or more controllers. A recipe can be downloaded by an operator. Alternatively, it can be downloaded automatically when the program is launched or when a calendar recipe download event occurs.

**End**

The type of step always in the final position in a profile. An end step is automatically created when you create a profile. The end step specifies what the outputs should do after the profile is done.

**F4 Profile Editor program**

A program that may be used to create and manage ramp and soak profiles for the Series F4 Ramping Controller (F4S/F4D). Launch this tool by choosing **F4 Profile Editor** from the **Tools** menu in WatView.

**Jump**

A type of step that specifies which step the profile should execute next. The jump step is used to cause a profile to repeat a series of steps or to link one profile to another. When inserting a jump, you specify a step to which to jump and a number of times to repeat the jump.

To execute steps in a sequence other than they appear in the profile.

**Loop**

A loop, or channel, is a relationship a controller establishes between the input from a sensor and the output to a device, such as a heater. A single-loop, or single-channel, controller manages one such loop, or channel. “Loop” is often used interchangeably with “channel”.

**Parameter**

A parameter is a value stored in a controller that affects the controller’s operation or indicates the state of the process. Parameters are read and displayed on various screens in WatView. Each cell in the **Overview Spreadsheet** screen contains the value of a parameter. Editable parameter values can be changed by double-clicking the field or spreadsheet cell and editing the value in the **Parameter Editor** dialog box.

**Parameter Type(参数类型)**

A group of parameters. Parameters of a type are typically associated by function. The **Spreadsheet Overview**, **Recipe Editor**, and **Recipe Type Builder**screens feature a tab for each controller type. Each tab has buttons for each parameter type associated with that controller. Pressing one of these buttons displays a spreadsheet. Each spreadsheet has a column for each parameter of the type and a row for each index.

Recipe screens have tabs and buttons only for the controllers and parameter types defined in the recipe type. Recipe screens have an additional parameter type called “custom.” Any parameter can be included in a recipe type as a custom parameter.

Parameter Types that have the same number of indexes can be associated such that they share index names and update together based on the selection in a Remote Control on a custom overview screen

**Process Value**

The quantity measured by a sensor such as a thermocouple. Sometimes called process variable. Under closed-loop control, the controller attempts to make the process value equal to the set point by adjusting the control output.

**Profile**

A set of instructions programmed as a sequence of steps. The controller handles the profile steps automatically, in sequence. As many as 40 different profiles and a total of 256 steps can be stored in the Series F4’s non-volatile memory.

**Ramp**

A programmed change from one set point to another.

**Ramp Rate**

A type of step that changes the set point at a specified rate (for example 5° C per minute) from the set point in the previous step until reaching the end set point. A ramp rate step can only be used with controllers that have one channel.

**Ramp Time**

A type of step that changes the set point from the previous step’s set point to a new end set point over a user specified amount of time.

**Recipe**

A collection of parameter settings saved in a file. A recipe may be downloaded from the computer to one or more controllers in order to change the operating conditions of the system.

**Recipe Type**

The recipe type specifies which parameters will be saved in recipes. You must create at least one recipe type and may create as many as you find useful.

**Set Point**

The desired value for a process variable. The set point may be set directly by the user or by a profile. The profile varies the set point and the controller’s closed-loop control action attempts to keep the process value equal to the set point.

**Soak**

A programmed step that maintains the set point over a period of time.

**Step**

A part of a profile consisting of a single set of instructions. There are six types of steps. Depending on the type of step the instructions may include one or more of the following: a set point for each channel, a duration for the step, a ramp rate, wait for conditions for digital and analog inputs, and event outputs.

**Trend Plot Graph**

A graphical depiction of process data. Multiple graph setups can be created, named, and saved. These graph setups specify which parameters to graph, what time period and vertical axis limits to display, and the other graph options specified in the **Plot Settings** dialog box.

**WatView**

WatView is the part of the interface package used by operators to monitor and edit the values of controller parameters, to monitor and manage alarms, to manage recipes, and to log and graph process data.