



UDC 3500 Application Note

Output Set Up Group

Introduction

This group deals with various output types in the controller, the Digital Output Status and the Current Output operation.

ATTENTION The Tuning Group is automatically configured to have two PID sets when a Duplex Control Algorithm is selected.

Function Prompts

Table -1 OUTPUT Group Function Prompts

Function Prompt Lower Display	Selections or Range of Setting Upper Display	Parameter Definition
OUT ALG		<p>OUTPUT ALGORITHM—Lets you select the type of output you want. Not applicable with Control algorithm prompt 3PSTEP.</p> <p>Selections are hardware dependent. For example, if the controller does not have a relay output, then none of the prompts that need a relay output will appear.</p> <p>ATTENTION For all Duplex Output forms, PID heat parameters (PID Set 1) apply for controller output greater than 50 %; PID cool parameters (PID Set 2) apply for controller output less than 50 %.</p>
	TIME	<p>TIME SIMPLEX—This output algorithm uses Relay1 for Time Proportional Control. Time Proportional Output has a resolution of 3.33 milliseconds with an adjustable Cycle Time.</p>
	CURRENT	<p>CURRENT SIMPLEX—Type of output using a milliamp signal that can be fed into a positive or negative grounded load. This signal can easily be configured for 4-20 mA or 0-20 mA operation via the C1 RANGE configuration, below.</p>
	POSPROP	<p>POSITION PROPORTIONAL—Type of output using two relays to control a motor with a feedback slidewire.</p> <p>This output algorithm selection forces Input 3 to the SLIDEW selection when the Control Algorithm is any selection other than 3PSTEP.</p> <p>ATTENTION Other prompts affected: DEADBAND.</p>



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Function Prompt Lower Display	Selections or Range of Setting Upper Display	Parameter Definition
	TIME D	<p>TIME DUPLEX—This output algorithm uses Relay 1 and Relay 2 for Duplex Time Proportional Control. Relay 1 is the HEAT output and Relay 2 is the COOL output. Time Proportional Output has a resolution of 3.33 milliseconds. Time Proportional Output has a resolution of 3.33 milliseconds with an adjustable Cycle Time.</p>
	CUR D	<p>CURRENT DUPLEX—Similar to current simplex but uses a second current output. The second output is usually scaled so that zero and span correspond with 0 % and 50 % output (cool zone). When the output is 0 % to 50 %, the controller uses tuning parameter set #2. When the output is 50 % to 100 % it uses set #1.</p> <p>ATTENTION <i>Other prompts affected: OUT RNG</i></p>
	CUR TI	<p>CURRENT/TIME DUPLEX—A variation of duplex with current active for 0 % to 50 % output (tuning set 2) and time is active 50 % to 100 % output (tuning set 1). Relay controls heat, current controls cool.</p> <p>ATTENTION <i>Other prompts affected: OUT RNG</i></p>
	TI CUR	<p>TIME/CURRENT DUPLEX—Similar to CURRENT/TIME except that current is active for 50 % to 100 % and time is active for 0 % to 50 %. Relay controls COOL, current controls HEAT.</p> <p>ATTENTION <i>Other prompts affected: OUT RNG</i></p>
OUT RNG		<p>CURRENT DUPLEX RANGE ALGORITHM—Used with Output Algorithm selections CUR D, CUR TI, or TI CUR.</p>



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Function Prompt Lower Display	Selections or Range of Setting Upper Display	Parameter Definition
RLYSTATE	1OF 2OF 1ON 2OF 1OF 2ON 1ON 2ON	DIGITAL OUTPUT STATUS AT 0 % OUTPUT — Allows the following selections: 1OF 2OF Output 1 de-energized Output 2 de-energized 1ON 2OF Output 1 energized Output 2 de-energized 1OF 2ON Output 1 de-energized Output 2 energized 1ON 2ON Output 1 energized Output 2 energized
RLY TYPE	MECHAN SOL ST	RELAY CYCLE TIME INCREMENT —Used only for Time Simplex and Duplex output configurations. This configuration sets the increment size of the relay cycle times in the Tuning and Tuning 2 Set Up groups. ELECTROMECHANICAL RELAY —Cycle time in one-second increments. SOLID STATE RELAY —Cycle time in 1/3 second increments. This is useful for solid state relay applications that require shorter cycle times. DO NOT use this setting unless cycle times of less than 1 second are required. ATTENTION The Lockout selection must be set to NONE in order to view this selection.
MOTOR TI	5 to 1800 seconds	MOTOR TIME —Appears only when “POSPROP” is selected as the Output algorithm. This is the time it takes the motor to travel from 0 to 100% (fully closed to fully open). This time can usually be found on the nameplate of the motor.
OUT2 ALG	NONE TIME CURRENT TIME D CUR D CUR TI TI CUR	OUTPUT ALGORITHM —Selects the type of output desired for the second control loop. See OUT ALG for definitions. NONE TIME SIMPLEX CURRENT SIMPLEX TIME DUPLEX CURRENT DUPLEX CURRENT/TIME DUPLEX TIME/CURRENT DUPLEX ATTENTION Some of these configurations may not be available on Loop 2 if Loop 1 uses the available outputs.



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Function Prompt Lower Display	Selections or Range of Setting Upper Display	Parameter Definition
	TIME CURRENT TIME D CUR D CUR TI TI CUR	<p>TIME SIMPLEX—This output algorithm uses Relay 3 for Time Proportional Control. Time Proportional Output has a resolution of 3.33 milliseconds with an adjustable Cycle Time.</p> <p>CURRENT SIMPLEX—Type of output using a milliamp signal that can be fed into a positive or negative grounded load. This signal can easily be configured for 4-20 mA or 0-20 mA operation via the C3 RANGE configuration, below.</p> <p>TIME DUPLEX—This output algorithm uses Relay 1 and Relay 2 for Duplex Time Proportional Control. Relay 1 is the HEAT output and Relay 2 is the COOL output. Time Proportional Output has a resolution of 3.33 milliseconds. Time Proportional Output has a resolution of 3.33 milliseconds with an adjustable Cycle Time.</p> <p>CURRENT DUPLEX—Similar to current simplex but uses a second current output. The second output is usually scaled so that zero and span correspond with 0 % and 50 % output (cool zone). When the output is 0 % to 50 %, the controller uses tuning parameter set #2. When the output is 50 % to 100 % it uses set #1.</p> <p>ATTENTION Other prompts affected: <i>OUT RNG</i></p> <p>CURRENT/TIME DUPLEX—A variation of duplex with current active for 0 % to 50 % output (tuning set 2) and time is active 50 % to 100 % output (tuning set 1). Relay controls heat, current controls cool.</p> <p>ATTENTION Other prompts affected: <i>OUT2 RNG</i></p> <p>TIME/CURRENT DUPLEX—Similar to CURRENT/TIME except that current is active for 50 % to 100 % and time is active for 0 % to 50 %. Relay controls COOL, current controls HEAT.</p> <p>ATTENTION Other prompts affected: <i>OUT2 RNG</i></p>
OUT2 RNG		<p>CURRENT DUPLEX RANGE ALGORITHM—Used with Output Algorithm selections CUR D, CUR TI, or TI CUR.</p>



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Function Prompt Lower Display	Selections or Range of Setting Upper Display	Parameter Definition
RLYSTAT2	1OF2OF 1ON2OF 1OF2ON 1ON2ON	DIGITAL OUTPUT STATUS AT 0 % OUTPUT FOR LOOP 2 —Allows the following selections: 1OF2OF Output 1 de-energized Output 2 de-energized 1ON2OF Output 1 energized Output 2 de-energized 1OF2ON Output 1 de-energized Output 2 energized 1ON2ON Output 1 energized Output 2 energized
CUR OUT1		FIRST CURRENT OUTPUT —If the First Current Output is not used to perform one of the above output algorithms, then it may be used to perform an Auxiliary Output function. This prompt will not show up when the First Current Output is used in one of the above output algorithms.
	DISABLE INPUT 1 INPUT 2 INPUT 3 INPUT 4 INPUT 5	NO FIRST CURRENT OUTPUT —Current Output disabled and output set to 0 mA. INPUT 1 —This represents the configured range of Input 1. FOR EXAMPLE: Input 1 Type = J Thermocouple (0 °F to 1600 °F) First Current Output Low Scale Value = 0.0 First Current Output High Scale Value = 1600 C1 Range = 4-20 mA Then: 0 °F display = 0 % output (4 mA) 800 °F display = 50 % output (12 mA) 1600 °F display = 100 % output (20 mA) INPUT 2 —Same as Input 1. INPUT 3 —Same as Input 1. ATTENTION Do not configure Input 3 when input 3 is used for slidewire or slidewire emulation. INPUT 4 —Same as Input 1. INPUT 5 —Same as Input 1.



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Function Prompt Lower Display	Selections or Range of Setting Upper Display	Parameter Definition
HIGH VAL	High Scale Value within the range of the selected variable to represent the maximum output (20 mA)	CURRENT OUTPUT HIGH SCALING FACTOR — Used only when CUR OUT is any selection other than DISABLE. This is a value in engineering units used to represent all CUR OUT parameters except Output. For Output, this is a value in percent and can be any value between -5 % and +105 %. However, keep in mind that relay output types can only be scaled 0 % to 100 %.