

Configuring DR4311 or DR4312 Recorder Functions

Introduction

The configuration prompts are sequenced in a group/function hierarchy as shown in Figure 4-2. Once you have set the input switches in SW6 as described in 4.3.5, configure all the function parameters that are applicable for your recorder model and application. During configuration some function parameters will not be displayed if they do not apply to your application. For example, if you set the control group function "CONTRL" to "DIS", disabling control, then no other control group prompts will be displayed.

To enter your selections or values, follow the procedure in Table 4-6 and fill in the values or selections on the worksheet in subsection 4.3.17. Keep this worksheet as a record of how your recorder was configured.

This procedure tells you the keys to press to get to any set up group (and any associated function parameters prompt).

Procedure

Follow the procedure listed in Table 4-5 to access the set up groups and function prompts. If you have a 2-pen recorder, be sure to identify individual parameters for each pen and control loop as applicable.

Make sure lock set up group "LOCK" function is set to "NONE" or "CAL." See subsection 4.3.16.

Table 4-5 Configuration Procedure


















Step	Operation	Press	Result
1	Select Set Up mode		<p>Upper Display </p> <p>Lets you know you are in the configuration mode and a set up group title is being displayed in the lower display.</p> <p>Lower Display </p> <p>This is the first set up group title.</p>
2	Select any set up group		<ul style="list-style-type: none"> •Successive presses of the  key will display the other set up group titles shown in the prompt hierarchy in Figure 4-2. •You can also use the [▲] [▼] keys to scan the set up groups in both directions. •Stop at the set up group title which describes the group of parameters you want to configure. Then proceed to the next step.

Table 4-5 is continued on next page

Table 4-5 Configuration Procedure, Continued

Step	Operation	Press	Result
3	Select a function parameter		<p>Upper Display  Shows the current value or selection for the first function prompt of the set up group that you have selected.</p> <p>Lower Display  Shows the first function prompt within the selected set up group.</p> <p>Example displays show chart group function prompt "CHTSPD" and the value selected.</p>
4	Select other function parameters		<ul style="list-style-type: none"> • Successive presses of the  key will sequentially display the other function prompts of the set up group you have selected. • Stop at the function prompt that you want to change, then proceed to the next step.
5	Change the value or selection	 or 	<ul style="list-style-type: none"> • These keys increment or decrement the value or selection that appears for the function prompt you have selected. • See subsection 4.3.4 "Configuration Tips" for instructions to increase or decrease value quickly. • Change the value or selection to meet your needs. • If the display flashes, you are trying to make an unacceptable entry.
6	Enter the value or selection	 or 	<ul style="list-style-type: none"> • This key selects another function prompt. • This key selects another set up group. <p>The value or selection you have made will be entered into memory after another key is pressed.</p>
7	Exit Configuration		<p>This exits configuration mode and returns the recorder to the same state it was in immediately before you entered configuration mode. Any changes made during the configuration session are stored when configuration mode is exited.</p>
8	2-Pen Recorders		<p>For 2-pen recorders, press  key to select INP 2 for display and return to step 1 to configure the parameters for pen 2.</p>

4.3.9 Chart Parameters Set Up Group

Introduction

The functions in this group are used to specify proper chart function. For a 2-pen recorder the desired input channel is displayed on the left side of the operator interface.

Press **FUNC** key to select channel.

Chart group prompts

Table 4-8 lists all the function prompts in the chart parameters set up group.

Press **SET UP** key until "CHART" appears in the lower display.

Press **FUNC** key to display parameters.

Table 4-8 Chart Parameter Definitions

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition
CHTSPD	8HR 12HR 24HR <i>[factory setting]</i> 7DAYS – HR	CHART SPEED —This is the time it will take to drive the chart one complete revolution. ATTENTION This prompt only appears for pen 1 configuration of a two-pen recorder. 8 hour revolution 12 hour revolution 24 hour revolution 7 day revolution – hour revolution—specify Hours per Revolution selection at prompt "HR/REV".
HR/REV	1 to 744 Hours	HOURS PER REVOLUTION —Set the desired chart speed. Appears only if – HR was selected at prompt "CHTSPD".
CHTTYP	LIN <i>[factory setting]</i> NLIN	CHART TYPE —Selection is based on the type of chart. Linear (even) or Non-Linear (i.e., J T/C or RTD) ATTENTION LIN chart type is automatically selected when input type is linear (as defined by value of input set up parameter "INTYP").

Pen Parameters Set Up Group

Introduction

The functions in this group are used to configure the pen(s). The procedure for configuring each pen is the same. For a 2-pen recorder, the desired input channel is displayed on the left side of the operator interface.

Press **FUNC** key to select channel.

Pen group prompts

Table 4-9 lists all the function prompts in the pen set up group.

Press the **SET UP** key until "PEN" appears in the lower display.

Press **FUNC** key to display parameters.

Table 4-9 Pen Parameter Definitions

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition
PENIN	INP <i>[factory setting]</i> REM1 REM2 OUT* SP*	PEN INPUT —What do you want the pen to record? INPUT—Records the input for given channel. REMOTE SWITCH 1 EVENT —Records the digital input event for given channel. (Event toggles pen between 90 and 95% on chart.) REMOTE SWITCH 2 EVENT —Records the digital input event for given channel. (Event toggles pen between 80 and 85% on chart.) OUTPUT —Records the output for the channel. SETPOINT —Records setpoint for given channel. *Only selectable if hardware supports outputs and function prompt "CONTRL" in Control group is set to "ENAB" (enabled).
CHTHI	-999 to 9999 <i>[factory setting = 780]</i>	CHART HIGH RANGE VALUE —Enter a value that corresponds with the chart high range value for the pen.
CHTLO	-999 to 9999 <i>[factory setting = 730]</i>	CHART RANGE LOW VALUE —Enter a value that corresponds with the chart low range value for the pen.

Input Parameters Set Up Group

Introduction

These are the parameters required to configure the temperature units, decimal location, actuation, high and low range values in engineering units, bias, filter, and burnout. For a 2-pen recorder, the desired input channel is displayed on the left side of the operator interface.

Press **FUNC** key to select channel.

Input group prompts

Table 4-10 lists all the function prompts in the input set up group.

Press **SETUP** key until "INPUT" appears in the lower display.

Press **FUNC** key to display the parameters.

Table 4-10 Input Parameter Definitions

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition
DECIMAL	XXXX [factory setting] XXX.X XX.XX	DECIMAL POINT LOCATION —This selection determines where the decimal point appears in the display. None One Place Two Places NOTE: Be sure the selection agrees with the value to be displayed. If PV requires 4 whole digits, the decimal will not show. Value of "IN TYP" parameter must be for a linear input type for two decimal places to be displayed.
UNITS	NONE [factory setting] F C	TEMPERATURE UNITS —This selection will be indicated on the PV display. No units Degrees Fahrenheit Degrees Celsius

Table 4-10 is continued on next page

Table 4-6 Input Parameter Definitions, Continued

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition																																																																																				
<p>IN TYP</p> <p>B EH EL JH JL KH KL NNM NIC</p> <p>R S TH TL W 100 H*[factory setting] 100 L* 100 T** 4-20 0-20 10m 100m 200m 0-1 0-2 1-5 0-5 0-10 2-10</p> <p>* IEC Alpha = 0.00385 **IEC Alpha = 0.00391</p>		<p>INPUT ACTUATION TYPE—This selection specifies what actuation you are going to use for the input. Be sure that the values configured for the high and low chart range, alarm setpoint, etc. are within the measuring range for the selected actuation type.</p> <table border="0"> <tr> <td>B thermocouple</td> <td>105 to 3300°F</td> <td>41 to 1815°C</td> </tr> <tr> <td>E thermocouple high</td> <td>-454 to 1832°F</td> <td>-270 to 1000°C</td> </tr> <tr> <td>E thermocouple low</td> <td>-200 to 1100°F</td> <td>-129 to 593°C</td> </tr> <tr> <td>J thermocouple high</td> <td>0 to 1600°F</td> <td>-18 to 871°C</td> </tr> <tr> <td>J thermocouple low</td> <td>20 to 770°F</td> <td>-7 to 410°C</td> </tr> <tr> <td>K thermocouple high</td> <td>-320 to 2500°F</td> <td>-196 to 1371°C</td> </tr> <tr> <td>K thermocouple low</td> <td>-20 to 1000°F</td> <td>-29 to 538°C</td> </tr> <tr> <td>NiNiMo thermocouple</td> <td>32 to 2500°F</td> <td>0 to 1371°C</td> </tr> <tr> <td>Nicrosil-Nisil thermocouple</td> <td>0 to 2372°F</td> <td>-18.8 to 1300°C</td> </tr> <tr> <td>R thermocouple</td> <td>0 to 3100°F</td> <td>-18 to 1704°C</td> </tr> <tr> <td>S thermocouple</td> <td>0 to 3100°F</td> <td>-18 to 1704°C</td> </tr> <tr> <td>T thermocouple high</td> <td>-300 to 700°F</td> <td>-184 to 371°C</td> </tr> <tr> <td>T thermocouple low</td> <td>-200 to 600°F</td> <td>-129 to 316°C</td> </tr> <tr> <td>W thermocouple</td> <td>0 to 4200°F</td> <td>-18 to 2316°C</td> </tr> <tr> <td>100 Ohm-RTD (high)</td> <td>-300 to 900°F</td> <td>-184 to 482°C</td> </tr> <tr> <td>100 Ohm-RTD (low)</td> <td>-130 to 392°F</td> <td>-90 to 200°C</td> </tr> <tr> <td>100 Ohm-RTD (special)</td> <td>-238 to 482°F</td> <td>-150 to 250°C</td> </tr> <tr> <td>4 to 20 Milliamps</td> <td></td> <td></td> </tr> <tr> <td>0 to 20 Milliamps</td> <td></td> <td></td> </tr> <tr> <td>0 to 10 Millivolts</td> <td></td> <td></td> </tr> <tr> <td>0 to 100 Millivolts</td> <td></td> <td></td> </tr> <tr> <td>0 to 200 Millivolts</td> <td></td> <td></td> </tr> <tr> <td>0 to 1 Volt</td> <td></td> <td></td> </tr> <tr> <td>0 to 2 Volts</td> <td></td> <td></td> </tr> <tr> <td>1 to 5 Volts</td> <td></td> <td></td> </tr> <tr> <td>0 to 5 Volts</td> <td></td> <td></td> </tr> <tr> <td>0 to 10 Volts</td> <td></td> <td></td> </tr> <tr> <td>2 to 10 Volts</td> <td></td> <td></td> </tr> </table>	B thermocouple	105 to 3300°F	41 to 1815°C	E thermocouple high	-454 to 1832°F	-270 to 1000°C	E thermocouple low	-200 to 1100°F	-129 to 593°C	J thermocouple high	0 to 1600°F	-18 to 871°C	J thermocouple low	20 to 770°F	-7 to 410°C	K thermocouple high	-320 to 2500°F	-196 to 1371°C	K thermocouple low	-20 to 1000°F	-29 to 538°C	NiNiMo thermocouple	32 to 2500°F	0 to 1371°C	Nicrosil-Nisil thermocouple	0 to 2372°F	-18.8 to 1300°C	R thermocouple	0 to 3100°F	-18 to 1704°C	S thermocouple	0 to 3100°F	-18 to 1704°C	T thermocouple high	-300 to 700°F	-184 to 371°C	T thermocouple low	-200 to 600°F	-129 to 316°C	W thermocouple	0 to 4200°F	-18 to 2316°C	100 Ohm-RTD (high)	-300 to 900°F	-184 to 482°C	100 Ohm-RTD (low)	-130 to 392°F	-90 to 200°C	100 Ohm-RTD (special)	-238 to 482°F	-150 to 250°C	4 to 20 Milliamps			0 to 20 Milliamps			0 to 10 Millivolts			0 to 100 Millivolts			0 to 200 Millivolts			0 to 1 Volt			0 to 2 Volts			1 to 5 Volts			0 to 5 Volts			0 to 10 Volts			2 to 10 Volts		
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<p>XMITTR</p>	<p>Lin [factory setting] Srt</p>	<p>Transmitter Input Type—Use this parameter to specify whether the input should be used as the PV without characterization (linear) or the square root of the input should be used as the PV.</p> <p>Linear—No characterization applied to input.</p> <p>Square Root—PV is the square root of input. For example: suppose the linear input range is 0 to 5000 and the input type is 0 to 5 volts. Then if input = 2.5 V = 50%,</p> $\sqrt{.50} = .7071 = 70.71\%$ $.7071 \times 5000 = 3535 = PV$																																																																																				

Table 4-6 is continued on next page

Table 4-6 Input Parameter Definitions, Continued

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition
LD CAL	FAC [factory setting] FLD	<p>LOAD CALIBRATION VALUES—This parameter is used to specify which set of calibration values you want to use.</p> <p>Factory—Uses built-in calibration values (stored in read-only memory).</p> <p>Field—Uses calibration values stored as a result of the field calibration procedure described in Section 5.</p> <p>ATTENTION Until field calibration has been done, FLD uses the same calibration values as FAC. When field calibration is performed, the value of LD CAL is automatically set to FLD at the completion of the field calibration operation.</p>
INP HI	–999 to 9999 [factory setting = 900]	<p>INPUT HIGH RANGE VALUE in engineering units is displayed but can only be configured for linear input type.</p> <p>Otherwise, this is a read-only display of the higher range value for the selected T/C or RTD input type.</p> <ul style="list-style-type: none"> • Scale the input signal to the display value you want for 100%. • EXAMPLE: Actuation (Input) = 4 to 20 mA Process Variable = Flow Range of Flow = 0 to 250 Gal/Min High Range display value = 250 Then 20 mA = 250 Gal/Min
INP LO	–999 to 9999 in Engineering Units [factory setting = –300]	<p>INPUT LOW RANGE VALUE in engineering units is displayed but can only be configured for linear input type.</p> <ul style="list-style-type: none"> • Otherwise, this is a read-only display of the low range value for the selected T/C or RTD input type. • Scale the input signal to the display value you want for 0%. See example in "INPHI".
BIAS	–99.9 to 999.9 [factory setting = 0]	<p>INPUT BIAS—Used to compensate the input for drift of an input value due to deterioration of a sensor, or some other cause; select the value you want on the input.</p>
FILTER	0 to 120 seconds No filter = 0 [factory setting = 0]	<p>FILTER FOR INPUT—A software digital filter is provided for the input to smooth the input signal. You can configure the first order lag time constant from 1 to 120 seconds. If you do not want filtering, enter 0.</p>

Table 4-6 is continued on next page

Table 4-10 Input Parameter Definitions, Continued

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition
BRNOUT		<p>BURNOUT PROTECTION (INPUT FAILURE) provides most input types with upscale or downscale protection if the input fails. Note that if the input fails, error message "INP FL" will be on the lower display.</p>
	NONE <i>[factory setting]</i>	<p>ATTENTION Refer to subsection 4.5 for information about the interaction of the value of this parameter and the setting of switch 2 on SW6.</p>
	UP	<p>NO BURNOUT—Failsafe output applied for failed input.</p>
	DOWN	<p>UPSCALE BURNOUT will make the indicated PV signal go to overrange value when input fails. Control algorithm will use overrange value when calculating output.</p> <p>DOWNSCALE BURNOUT will make the indicated PV signal go to underrange value when input fails. Control algorithm will use underrange value when calculating output.</p>

Totalizer Parameters Set Up Group

Introduction

If the recorder hardware supports totalizer functions, the functions in this group are used to calculate and display the total flow volume as measured by the input. The displayed value is six digits with a configurable scale factor.

Control group prompts

Table 4- 11 lists all the function prompts in the totalizer function group.

For a 2-pen recorder, the desired input channel is displayed on the left side of the operator interface. Press **FUNC** to select channel.

Press **SETUP** key until "TOTAL" appears in the lower display.

Press **FUNC** key to select the parameters.

Table 4-11 Totalizer Function Definitions

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition
(actual current totalized value)	(current scale factor) Example: E1	VIEW CURRENT TOTALIZED VALUE —This selection lets you view the current totalized value. In the example shown, E1 represents the exponential value that applies to the total (total times 10^1). See "SCALER" function prompt in this group for choices.
RESET	YES NO [factory setting]	RESET TOTALIZER TO ZERO —This parameter is used to reset the totalizer to zero. Selecting YES will reset the totalizer to zero. When the reset action has been performed, the parameter will be set to NO automatically. ATTENTION In order for this prompt to appear, the "RSTABL" function (described later in this table) must be set to "KEY".
TOTAL	ENAB DIS [factory setting]	TOTALIZATION FOR INPUT —This parameter is used to enable or disable the totalizer function. This prompt appears first if "DIS" is the current choice. ENABLE allows configuration of the rest of the prompts associated with totalization.

Table 4-11 is continued on next page.

Table 4-11 Totalizer Function Definitions, Continued

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition
RATE	SEC <i>[factory setting]</i> MIN HOUR DAY MDAY	<p>RATE OF INTEGRATION—This parameter is used to select the desired rate of integration.</p> <p>SECOND - EU (Engineering Units) per second MINUTE - EU per minute HOUR - EU per hour DAY - EU per DAY MDAY - Millions of units per day</p>
SCALER	1 (displays as E0) <i>[factory setting]</i> 10 (displays as E1) 100 (displays as E2) 1000 (displays as E3) 1E4 (displays as E4) 1E5 (displays as E5) 1E6 (displays as E6) 1E7 (displays as E7) 1E8 (displays as E8)	<p>TOTALIZER SCALE FACTOR—The totalizer displays the current totalized flow value (up to six digits maximum). The scaling factor selected here is applied to the totalized value when it is displayed.</p> <p>1E4 equals 1 times 10⁴ (10,000) 1E5 equals 1 times 10⁵ (100,000) 1E6 equals 1 times 10⁶ (1,000,000) 1E7 equals 1 times 10⁷ (10,000,000) 1E8 equals 1 times 10⁸ (100,000,000)</p>
RSTABL	NO <i>[factory setting]</i> KEY REM1* REM2*	<p>TOTALIZER RESETTABLE—This parameter is used to specify whether and how the totalizer value can be reset.</p> <p>NO - Totalizer value can not be reset</p> <p>KEY - Totalizer can be reset from the keypad by setting the "RESET" parameter to "YES".</p> <p>REM1 - Totalizer will be reset when remote (external) switch (digital input 1) goes to ON (contact closure). This totalizer reset is independent of any set up of "REMSW1" in the remote switch set up group.</p> <p>REM2 - Totalizer will be reset when remote (external) switch (digital input 2) goes to ON (contact closure). This totalizer reset is independent of any set up of "REMSW2" in the remote switch set up group.</p>

*Digital input card must be installed.

Lock Out Parameter Set Up Group

Introduction

This is the parameter used to lockout any unauthorized changes to the recorder's configuration, calibration, and pen alignment parameters. Calibration group functions are described in *Section 5 – Input and Output Calibration for Recorder with Display*. Pen alignment group functions are described in *Section 8 – Troubleshooting and Pen Alignment for Recorder with Display*.

Set this group last

Because this group contains functions that have to do with security and lockout, we recommend that you configure this group last, after all the other configuration data has been entered.

Lockout group prompts

Table 4-15 lists the function prompt in the lock out set up group.

Press **SETUP** key until "LOCK" appears in the lower display.

Press **FUNC** key to select the parameter.

Table 4-15 Lockout Parameter Definitions

Lower Display Prompt	Upper Display Range of Setting or Selection	Parameter Definition
LOCK	NONE <i>[factory setting]</i>	LOCK limits access to one or more types of set up groups. Do not configure until all configuration is complete.
	CAL	NO LOCKOUT —All groups read/write.
	CONF	CAL —Locks out calibration and pen alignment groups; they will not even be displayed. All other groups are available for read/write.
	FULL	CONF —Tuning and cycle parameters are read/write. All other configuration groups (except lock) are read only. Calibration and pen alignment groups are not displayed.
		FULL — All configuration groups (except lock) are read only. Calibration and pen alignment groups are not displayed.

RECORDER TAG NAME _____

Group Prompt	Function Prompt	Pen 1 Value or Selection	Pen 2 Value or Selection	Group Prompt	Function Prompt	Pen 1 Value or Selection	Pen 2 Value or Selection	
INPUT	DECIMAL	_____	_____	TUNING (cont'd)	1 MIN or 1 RPM	_____	_____	
	UNITS	_____	_____		MANRST	_____	_____	
	IN TYP	_____	_____		PB2 or GAIN 2	_____	_____	
	XMITTR	_____	_____		RATE2T	_____	_____	
	LD CAL	_____	_____		I2 MIN or I2 RPM	_____	_____	
	INP HI	_____	_____		CYCTI	_____	_____	
	INP LO	_____	_____		CYCTI2	_____	_____	
	BIAS	_____	_____		SPRAMP	SPRAMP	_____	_____
	FILTER	_____	_____			TI MIN	_____	_____
BRNOUT	_____	_____	FINLSP	_____		_____		
			SPPROG	_____		_____		
PEN	PEN IN	_____	_____	TIMER	TIMER	_____	_____	
	CHT HI	_____	_____		PERIOD	_____	_____	
	CHT LO	_____	_____		START	_____	_____	
CHART	CHTSPD	_____	n/a	L DISP	_____	_____		
	HR/REV	_____	n/a	ALARMS	A1S1TY	_____	_____	
	CHTTYP	_____	n/a		A1S2TY	_____	_____	
			A1S1VA		_____	_____		
TOTAL	[value]	_____	_____		A1S2VA	_____	_____	
	RESET	_____	_____		A1S1HL	_____	_____	
	TOTAL	_____	_____		A1S2 HL	_____	_____	
	RATE	_____	_____		A2S1TY	_____	_____	
	SCALER	_____	_____		A2S2TY	_____	_____	
	RSTABL	_____	_____		A2S1VA	_____	_____	
CONTROL	CONTRL	_____	_____		A2S2VA	_____	_____	
	NumSPs	_____	_____		A2S1HL	_____	_____	
	OUTALG	_____	_____		A2S2HL	_____	_____	
	CURRNG	_____	_____	AL HYS	_____	_____		
	CTRALG	_____	_____	AUXOUT	AUXOUT	_____	_____	
	PWR UP	_____	_____		4mA VA	_____	_____	
	DEFDSP	_____	_____		20mA V	_____	_____	
	SP HI	_____	_____	COMM	COMM	_____	_____	
	SP LO	_____	_____		ADDRES	_____	_____	
	ACTION	_____	_____		BAUD	_____	_____	
	OUT HI	_____	_____		XmtDLY	_____	_____	
	OUT LO	_____	_____		REM SW	REMSW1	_____	_____
	DBAND	_____	_____	REMSW2		_____	_____	
	HYST	_____	_____	LOCK	LOCK	_____	_____	
	FAILSF	_____	_____					
FSMODE	_____	_____						
PBorGN	_____	_____						
MINRPM	_____	_____						
TUNING	FUZZY	_____	_____					
	TUNE	_____	_____					
	AT ERR	_____	_____					
	PB or GAIN	_____	_____					
	RATE T	_____	_____					