



Durant Preset Operating Procedures

Normal Operation

1. Reset counter by pressing Reset key.
2. To run without changing preset value go to step 7.
3. Press Preset.
4. Enter desire amount via keypad.
5. Press Enter.
6. Press Count.
7. Press start.

Enter a Preset Value

1. Press the PRESET button. [1] The preset will display the current value. If the value is the same as the desired value, go to step 4.
2. Enter the desired value via the keypad.
3. Press the ENTER key.
4. Press the COUNT key to return to normal operation.

Example: To change preset value to 10, press. ⇒ Preset, 1, 0, Enter, Count.

Set-up Procedure

1. Turn to page 19 in the installation and operation manual. The correct values for each relevant programming function codes should be circled. If the function code values are not marked, call Murray Equipment for the correct values or refer to the following chart.

Model 58821-400 (preset with scaler)

Function Code	Value	Description
5	*	Scale factor
60	1	Count up
30	.00	No timeout
36	1	Latch until reset

Model 58820-400 (preset with without scaler)

Function Code	Value	Description
60	1	Count up
62	1	0000.0 decimal display
30	.00	No timeout
36	1	Latch until reset

Preset instructions continued:

Model 58851-400 (dual level preset - pursuit stand)

Function Code	Value	Description
26	1	Totalizer counts in opposite direction.
30	.00	No timeout
31	.00	No timeout
36	3	Latch until reset complete output 1&2
61	1	Totalizer operates in count mode
62	2	0000.00 decimal point display
78	1	Terminal 4 is totalizer reset
80	1	Preset mode

2. To change a function code value, press the Function button on the face of the preset, enter the Function code, and press Enter.
3. Enter the desired new value for the selected function code via the keypad. Press Enter to accept this value.
4. Press Count to return preset to normal operation. This procedure will need to be repeated for each function code you wish to change.

Example: To change count operation mode to 1 press. ⇒ Function, 6, 0, Enter, Count.

Calibration and Scale Factors

1. Obtain an accurate method of measuring the calibration product. This can be a scale or test prover of known volume.
2. Run test product through system for at least a minute to obtain a good sample with no entrapped air.
3. Reset the preset counter to zero, and run a test into the calibration prover.
4. Record the count value on the preset and the actual volume in the prover into the following formula.

$$(\text{Actual amount run} \div \text{Count on preset}) \times \text{Existing scale factor} = \text{New scale factor.}$$

5. Enter new scale factor into preset, and run another test to confirm new calibration. Repeat scale factor calculation if calibration is off.

Display or Change Scale Factor

1. Press the Function button, press 5, press Enter.
2. The current scale factor will display on preset.
3. Press Count to exit with no change or key in a new scale factor value via the keypad.
4. Press Enter to accept new scale factor value.
5. Press Count to return to normal operating mode.

TROUBLESHOOTING

GENERAL

Most problems encountered when applying the control are due to wiring errors, improperly set Function codes, and sensors which are not correctly installed. This section provides guidelines for the detection and correction of these types of problems. Additionally, a description of the diagnostic program included in the control is discussed.

CAUTION

BEFORE APPLYING POWER TO THE EQUIPMENT, RECHECK ALL WIRING TO INSURE PROPER CONNECTIONS. MAKE SURE THE AC LINE VOLTAGE IS CONNECTED ONLY TO SCREW TERMINALS #25, #26, #27 AND #28. CONNECTING AC POWER TO ANY OTHER SIGNAL TERMINALS WILL CAUSE SEVERE DAMAGE TO THE CONTROL.

PROBLEM	POSSIBLE CAUSES	REMEDIES
Display does not light when AC power is turned on	<ol style="list-style-type: none"> 1. No power applied on terminals #25, #26, #27 and #28. 2. Short between terminals #19 or #20 and DC Common 3. Terminals #25, #26, #27 and #28 improperly jumpered. 	<ol style="list-style-type: none"> 1. Check wiring, fuses and primary AC power source 2. Check jumper installation. 3. Immediately disconnect AC power supply, check. <u>wiring</u>.
Counter does not increment or decrement when sensor is activated	<ol style="list-style-type: none"> 1. Sensor malfunction, improperly installed or connected 2. Incorrect count mode selected for type of sensor being used. 3. Reset input (terminal #17) connected to DC Common. 4. Low frequency select terminals (terminals #11 and #13) connected to DC Common when sensor generates count pulses less than 1 msec long 	<ol style="list-style-type: none"> 1. Check sensor wiring, installation and operation 2. Check function Code diagram (Fig. 20) for proper value selection for Func-60 3. Check wiring 4. Disconnect low frequency terminals
Counter counts in wrong direction	<ol style="list-style-type: none"> 1. Quadrature shaft encoder outputs A and B reversed 2. Add and Subtract signals reversed 	<ol style="list-style-type: none"> 1. Reverse wiring on inputs 1 and 2 (terminals #14 and #10). 2. Reverse wiring on inputs 1 and 2 (terminals #14 and #10).

PROBLEM	POSSIBLE CAUSES	REMEDIES
Counter counts in wrong direction. (Continued)	3. Improper count mode selected for sensor configuration utilized. 4. Polarity of up/down control signal reversed when Count With Direction Control mode is selected	3. Check Function Code diagram (Fig. 20) for proper value selection for Function 60. 4. Invert up/down control signal on terminal #10 with an external relay or transistor.
Counter accumulates too many counts.	1. Electrical noise causing extra counts. 2. Loose wires between sensor and count inputs. 3. Sensor generating extra pulses due to vibration, oscillation, chatter or jitter.	1a. Check sensor lead installation to insure they are not bundled with other power wiring. 1b. Connect low frequency select terminals (terminals #11 and #13) to DC Common if pulses from the sensor are longer than 1 msec. 1c. Use shielded cable for wiring sensors to Count Inputs (terminals #10 and #14) and connect the shield to terminal #32. 2. Check external sensor wiring. 3. Check sensor mounting and motion of machine to determine if these characteristics cause extra counts. Use Quadrature encoders where applicable.
No printout or incorrect printout is generated when the control is connected to a printer.	1. No AC power applied to printer. 2. Printer improperly set up. 3. Serial communications output incorrectly set up. 4. Baud rates of control and printer not setup to the same value.	1. Check AC power connections and fuse in printer. 2. Check printer DIP switches for correct setup. (See printer operation manual.) 3. Check the SDO+ (terminal #36) on control is connected to SDI- on printer and SDO- (terminal #35) is connected to SDI+. 4. Check that the Baud rates of the control and the printer are the same.

CHECK-OUT PROCEDURE

If the control does not perform satisfactorily, check all connections, proceed through the troubleshooting chart on the previous pages, and check all function codes for proper set-up according to the table given in Figure 40. If these tests proceed correctly and the control is still not properly functioning, remove ALL wiring from the back of the control and proceed through the following steps. If the control fails to function in any of the steps, contact Murray Equipment, Inc., 2515 Charleston Place, Fort Wayne, Indiana 46808. Enclose a letter describing the malfunction.

Power Input

Connect 120 VAC between terminals #25 and #26. Jumper terminal #25 to terminal #28 and jumper terminal #26 to terminal #27. The display should flash for a short period of time and then remain lit. Place electrical tape over terminals #25 through #28 to prevent electrical shock during the next tests.

Keyboard

Press the "FUNCTION" key, the display should blank. Press "43" which the display should indicate. Press ENTER, the display should show "O". Press "1 " which the display should indicate. Press "ENTER". The display should flash "O" and the "COUNT" indicator for a short period of time then remain lit.

Count Up

Make a momentary connection between terminals #10 and #12. The display should increment several counts. Make a connection with a short piece of wire between terminals #11 and #12 and repeat the count test between terminals #10 and #12. Retain the connection between terminals #11 and #12.

Count Down

Make a momentary connection between terminals #14 and #12. The display should decrement several counts. Make a connection with a short piece of wire between terminals #13 and #12 and repeat the count test between terminals #14 and #12. Retain the connection between terminals #13 and #12. Decrement the counter until the display indicates less than "5".

Preset

Press the "PRESET" key and the display should show "O". Press the "5" key, which the display should indicate. Press the "ENTER" key. The display should blank for one half second then remain

lit. Press the "COUNT" key, the display should indicate the previous count value. Make a momentary connection between terminals #10 and #12 at least five times. You should hear the output relay actuate.

Relay Timeout

Ten seconds after the relay actuates, you should hear it release.

Reset

Press the "RESET" key. The display should show "O".

Unlatch

Again make a momentary connection between terminals #10 and #12 at least five times. Before the ten second timeout elapses, make a momentary connection between terminals #2 and #8. You should hear the output relay release. Press the "RESET" key again.

Latch Until Reset Complete

Press the "FUNCTION" key, press "36", then press "ENTER". The display should indicate "O". Press the "1" key, then "ENTER". The display should show "1", blank for one half second then remain lit. Press the "FUNCTION" key, press 30, then press "ENTER". The display should show "10.00". Press the "O" key, then "ENTER". The display should show "0.00", blank for one half second then remain lit. Press the "COUNT" key. The display should indicate "O" and the COUNT indicator lit. Make a momentary connection between terminals #10 and #12 at least five times. You should hear the output relay activate. Press the "RESET" key. The display should display "O" and you should hear the relay release.

Auto Recycle

Press the "FUNCTION" key, press "81", then press "ENTER". The display should indicate "O". Press the "1 " key, then "ENTER". The display should show "1 ", blank for one half second, then remain lit. Press the "COUNT" key. The display should indicate "O" and the COUNT indicator lit. Make a momentary connection between terminals #10 and #12 five times. You should hear the output relay activate and the display should show "O".

Power Outage

Disconnect the AC power. You should hear the relay release.

INTERNAL DIAGNOSTICS

The control has several internal diagnostic routines, which allow it to self-test various operational characteristics. When power is applied, the control tests its memory to determine if it has retained all of the values and function code parameters previously entered. It also tests to insure that all of the internal memory is functional. During these self-tests, the display is blanked. Since the tests are performed very quickly, the user usually does not notice the short delay on power-up

The user also has the ability to initiate the control self-test diagnostics at any time. Function code 40 is used to initiate the diagnostics. If the control fails any of the diagnostic routines, either on power-up or upon manual command, the display will flash a number indicating which of the six self-tests failed. If no failures are found, the control returns automatically to normal operation.

NOTE

The self-diagnostics should not be performed while the process being controlled is running. The control responds to count pulses but ignores any incoming control signals while the diagnostics are operating.

Description Of The Diagnostics

The diagnostics which are included and their related test numbers are as follows.

- #1 -ROM (Read Only Memory) 16 Bit Checksum
- #2 -Internal RAM (Random Access Memory) Bit Test
- #3 -Non-Volatile RAM Read/Write Bit Test
- #4 -Non Volatile RAM Store Test
- #5 -Non-Volatile RAM 8 Bit Checksum
- #6 -Watch Dog Timer (1.3 Seconds) Timeout

ROM (Read Only Memory) 16 Bit Checksum - Test #1

This test determines if the permanent memory, which controls how the control operates, is good.

Internal RAM (Random Access Memory) Bit Test -Test #2

This routine tests the temporary workspace memory used for normal operation and communication. If a failure occurs, the counter may change or lose values or operating characteristics unexpectedly.

Non-Volatile RAM Read/Write Bit Test - Test #3

This test checks the memory which permanently stores the operating characteristics and values when a power outage occurs.

Non-Volatile RAM Store Test - Test #4

This test insures that the non-volatile memory accurately stores and retrieves the programmed operating characteristics and values upon a power outage. If a failure of this type occurs, the counter will operate correctly but could change its values or operating characteristics upon a power failure or power drop-out.

CAUTION

**TO INSURE PROPER OPERATION
CHECK ALL FUNCTION CODE VALUES
BEFORE STARTING THE PROCESS.
NOTE THAT A TEMPORARY POWER
INTERRUPTION MAY CHANGE THE
VALUES OF FUNCTION CODES DURING
THE PROCESS IF TEST #4 HAS FAILED.**

Non-Volatile Ram 8 Bit Checksum Test - Test #5

A checksum test is performed on the non-volatile memory to insure that none of the information stored was changed while the control was un-powered. If this test fails, check all function code values and the values of the counter and preset to insure they are correct. Then disconnect and re-connect power to perform this test again. If the test fails the second time, return the counter for repair.

Watch Dog Timer (1.3 Seconds) - Test #6

While the control is operating, an internal Watch Dog Timer is incremented every millisecond. Under normal operation, the control automatically resets the Watch Dog Timer at least once per second. If the control would malfunction during operation, the Watch Dog Timer may time out (depending on the type of malfunction) and an error code of "6" flashes on the display. If this type of failure occurs, run the diagnostics using Function 40. Excessive electrical interference may cause this type of failure without damage to the control or the operating characteristics. If the diagnostics find no other fault, it is reasonable to assume that the control is fully operational, unless this failure is recurring.

OPERATION OF DIAGNOSTICS

When power is applied, the control begins by performing tests #1, #2, #3 and #5. If all of these pass, the counter is ready to operate as indicated by flashing the count value on the display at one half second intervals for four seconds, then remaining lit.

To select the self-diagnostic mode, specify Function code 40 and enter a value of "1". The control immediately turns on all display segments and LED indicators for 2 seconds. The displays blanks. The control steps through all five tests. If all five pass, the control begins a display and LED test routine. This routine sequences through flashing the numbers "0" through "9" on the displays, alternates the Preset and Count LED indicators and moving the decimal point from digit to digit. When the display sequence is finished, the control shows the count value and the Count indicator is lit.

NOTE

The self-diagnostics should not be performed while the process being controlled is running. The control responds to count pulses but ignores any incoming control signals while the diagnostics are operating.

Performing the diagnostic routines does not affect the Function code parameters. Thus, when the diagnostics are finished, the control retains all of the operational characteristics previously programmed.

WHAT TO DO IF THE CONTROL FAILS A DIAGNOSTIC TEST

If the control flashes a single digit number continuously on power-up or when the self-diagnostics are performed, it indicates which one of the tests has failed. When the number displayed is "4", "5", or "6", the control can be allowed to operate by pressing the FUNCTION key to clear the display.

WARNING

RUNNING THE COUNTER AFTER A FAILURE HAS BEEN DETECTED CREATES A SERIOUS RISK TO THE OPERATOR AND/- OR MACHINERY.

As a minimum safety precaution, the Function code Default mode (Function 43) should be selected (enter a value of "1") and the Function codes reprogrammed. This will insure that the failure has not altered any of the operating characteristics of the counter. Selecting the default parameters with Function 43 also performs the power-up self-test, which could give another failure indication (for tests #1, #2or#3). If this occurs, return the control for repair immediately.

Address units to be repaired to:

Murray Equipment, Inc.
2515 Charleston Place
Fort Wayne, Indiana, 46808