

1600 & 1630 Controllers With Milliamp Output

If you want to use the milliamp (ma) function to control a process, you will have to experiment with various settings, to get the desired results. Or you can use the self tune function. If you want to use the milliamp output not for control, but for data logging or recording, then you can set the band width to any value that serves your needs. For example, if you want to control a process with a set point of 75, it is unlikely that you would choose a band width of 75. With such a band width, you have 20 ma at 0% signal and 4 ma at 75% signal (reverse acting setup). A smaller band width would most likely work best for control purposes. With a band width of 20, the controller would provide full signal (20 ma) out from 0% to 55%. From 56% to 75%, the output signal would decline from 20 ma to 4 ma.

If you want to use the controller's output signal for recording and not controlling, then you have the freedom to set the band width to any value. For example, if you have a situation where the oxygen level (DO or O₂) will not exceed 20% and you want to record the process, you would make set point 1 read 20 and set the band width to 20.

Definitions

- PB1** *Proportional Band - PB1* sets the range of control around set point 1 (**SP1**). For example: If you want to have full signal out (20 ma) at 50% O₂ with a proportional band of 15, set **PB1** to 15.
- SP1** *Set Point One - SP1* sets the desired control value.
- S1OH** *Set Point 1 Output High Limit* (maximum is 20 ma). **S1OH** sets the high limit % for current output. 20 ma output = 100%. If you want 10 ma as the high limit, take the High Limit / Max. Limit or 10 ma / 20 ma = .5 or 50%. Set **S1OH** to 50 to limit the high output current to a maximum of 10 ma.
- S1OL** *Set Point 1 Output Low Limit* (minimum is 0 ma). **S1OL** sets the low limit % for current output. 4 ma output = 20%. If you want 4 ma as the low limit, take the Low Limit / Max. Limit or 4 ma / 20 ma = .2 or 20%. Set **S1OL** to 20 to limit the output current to a minimum of 4 ma. If you desire a 0 - 20 ma output range, set **S1OL** to 0.
- S1ST** *Sep Point 1 State:* Select dir or rE (Direct or Reverse Acting)

(Continued On Next Page)



Engineered Systems & Designs, Inc.

119 A Sandy Drive, Newark, DE 19713-1148 U.S.A.

ph 302-456-046 fx 302-456-0441 esd@esdinc.com www.esdinc.com

Setting Up the Band Width and Choosing 0-20 or 4-20 ma Output

The controller has three menus: primary, secondary and secure (further details are available in the instructions book). To set the band width, follow these steps:

Go to: *Secondary Menu* (page 5 of instructions)

Advance to: *TunE* (tune)

Set *TunE* to *Pid* (press *Enter Key* to register your choice)

Advance to: *Pb1* (Proportional Band)

Set *Pb1* to desired band width value (press *Enter Key* to register your choice)

Go To: *Secure Menu* (page 6, column 2 at bottom)

Advance to: *S1ST* (Set to DIR of Re, press enter), page 7, column 2

Advance to: *S1OL* (enter 0 or 20, press enter)

Advance to: *S1OH* (enter 100 or any value desired, press enter)

Examples of Different Setups

1. To set up a controller to output 20 ma at 100% O₂ and 4 ma at 0% O₂:

SP1 = 0.0
PB1 = 100.0
S1ST = DIR Direct Acting
S1OL = 20
S1OH = 100

2. To set up a controller to output 20 ma at 0% O₂ and 4 ma at 100% O₂:

SP1 = 100.0
PB1 = 100.0
S1ST = RE Reverse Acting
S1OL = 20
S1OH = 100

3. To set up a controller to output 20 ma at 100% O₂ and 0 ma at 0% O₂:

SP1 = 0.0
PB1 = 100.0
S1ST = DIR Direct Acting
S1OL = 0
S1OH = 100

4. To set up a controller to output 20 ma at 0% O₂ and 0 ma at 100% O₂:

SP1 = 100.0
PB1 = 100.0
S1ST = RE Reverse Acting
S1OL = 0
S1OH = 100