AP21 SSI Display Quick Start Guide

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Abstract: POSITAL's AP21 SSI display provides a stand-alone solution for displaying position and velocity of an SSI sensor. This Quick Start Guide is designed to help a new user familiar with the basic position function. Before using the device it is recommended that the user also read the manual.

About Everight Position: Everight Position is an Advanced Sales Partner for POSITAL products in the United States. Everight strives to work side-by-side with customers to understand their position and sensing needs and to provide novel, effective and economical solution.

1. Wiring the Display

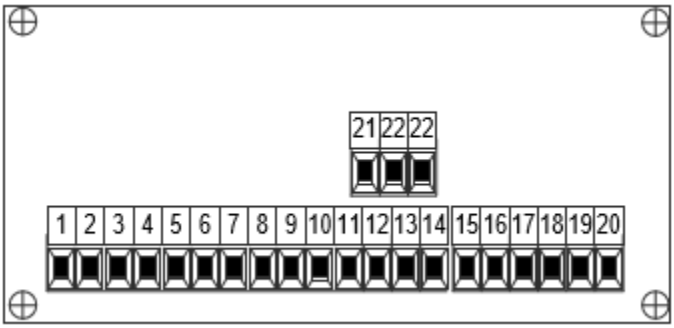


Figure 1. View of the screw terminals at the back of the display

For this Guide we will focus only on displaying the SSI position from the encoder. For further functionality please refer to the manual.

Pin	Function
1	10-30V Supply
2	0V Supply
3	Data+
4	Data-
5	Clock+
6	Clock-
10	10-30V For Sensor
11	0V For Sensor

Figure 2. Pinout for basic SSI position display

2. Programming the Display

With the display powered on enter programming mode by:

- Hold +1
- Press ← five times
- Press P once

- Release 

The display will now show display the first parameter menu

Press 

once to move to the second menu

Once in the second menu press  to enter the submenu

To navigate through the submenu:

Back to menu

Submenu item +1


To parameter number

To navigate through the parameters:

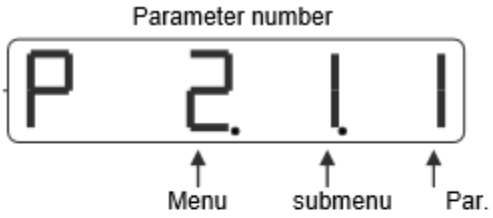
Back to menu/submenu

Parameter number +1

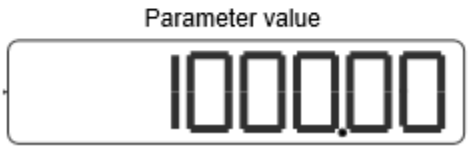

Activate edit mode


Parameter number +1

Note after two seconds when a parameter is shown on the display the parameter value will be shown:



After 2s



To change a parameter

Exit edit mode

Increase digit-value

Move 1 digit to the left

Confirm input

The most common parameters that will need to be set are listed below. The next section will discuss what value to set these to in more detail. For a full list of parameters please refer to the manual.

- 2.2.1 SSI Code
- 2.2.3 SSI Clockpulses
- 2.2.4 SSI Databits
- 2.2.5 Multiplicator Numerator
- 2.2.6 Multiplicator Denominator
- 2.2.10 Offset
- 2.2.14 SSI Monitoring

3. Parameters

The parameters are shown in following layout:

PAR.	PAR Nr:	Possible values (bold is the standard value)
Basic description		
Description of possible values		

PAR: 2.2.1	P[214]	0 ... 1
SSI code		

0 = gray
1 = binary

Defines the output of the encoder for the display

PAR: 2.2.3	P[216]	0 ... **24** ... 30
Number of SSI clockpulses		

XX

Defines the number of SSI clock pulses. The number of clock pulses determine the number of bits that will be read by the AP21. Basically, this will be the number of bits that the encoder transmits.

Example: The SSI-encoder has a resolution of 4096 positions per revolution and 4096 coded revolutions. The number of clock pulses will be 12 (bit) + 12 (bit) = 24 (bit).

PAR: 2.2.4	P[217]	0 ... **24** ... 30
Number of SSI databits		

XX

Defines the number of SSI databits. Generally this will be the same value as the number of SSI clockpulses.

PAR: 2.2.5	P[000]	0 ... **10000** ... 16777215
Multiplicator numerator		

XXXXXXXX

PAR: 2.2.6	P[001]	0 ... **10000** ... 16777215
Multiplicator denominator		

XXXXXXXX

2.2.5 and 2.2.6 are shown together because they are directly related. The position shown on the display is:

$$\text{Actual position} = \text{SSI} \times \text{dir} \times \frac{Mt}{Mn} + N$$

Mt	=	multiplicator numerator	P[000]
Mn	=	multiplicator denominator	P[001]
N	=	offset	P[002]
dir	=	direction (x1 or x –1)	P[211]

Example: A single-turn 12bit SSI encoder has 4096 counts per turn. If it is desired to read the display in degrees rather than counts, the numerator should be changed to 360 and the denominator 4096 because the encoder generates 4096 counts/360 degrees of revolution. For more information on adjusting decimal places refer to parameter 1.0.3 in the manual.

PAR: 2.2.10	P[002]	-9999999 ... **0** ... 99999999
Offset		
-XXXXXXXX (AWE)		

Defines the offset of the position displayed. Note, to make the offset negative use the display buttons and go all the way to the left until you reach the first digit and increase it. The negative sign "-" will then appear.

PAR: 2.2.14	P[221]	0 ... **3**
SSI monitoring		

0 = not active
1 = only wiring
2 = only Delta SSI monitoring
3 = wiring + Delta SSI monitoring

Defines the SSI monitoring. Note in the default state this can cause some unexpected errors to occur on the display. For example, turning the encoder too quickly (and thus a fast change in SSI output) or crossing the 'zero' point for a binary output and having a large number of SSI bits changing at once may result in an error. Depending on the application the Delta SSI monitoring may be needed, but for initial setup turning it off may make it easier to establish communication and basic functionality. For more information on the Delta SSI monitoring and SSI errors please refer to the manual.