



Optidrive Applications Support Library

Application Note	AN-ODV-3-011
Title	Using the Display Scaling Function
Related Products	Optidrive Eco
Level 1	1 – Fundamental - No previous experience necessary 2 – Basic – Some Basic drives knowledge recommended 3 – Advanced – Some Basic drives knowledge required 4 – Expert – Good experience in topic of subject matter recommended

Overview

In some applications, it can be desirable to scale the output display of the Optidrive Eco to show different units that are more useful or applicable to the application being performed. E.g. where the motor drives a belt driven fan, the user may wish to display the output speed of the fan rather than that of the motor shaft, or for a pump controlling pressure in a system, the user may wish to display the actual pressure. This can be done by using the display scaling function.

The value to be scaled can be selected between motor speed, motor current, or from an analog input coming into the drive. The analog input setting allows for feedback from various types of sensors to be displayed in relevant units on the drive display.

Parameters

P 2-22 Display Scaling Source

P2-22 defines the initial value (variable) that will be used to scale and show user units on the drive display. The selections for the source variable are as follows:

P2-22 Setting	Source Variable for Scaling
0	Motor Speed
1	Motor Current
2	Analog Input 2
3	P0-80 Value

Note: Setting 3 uses the displayed value of P0-80 as the source for the scaling. The source of this value can be selected using parameter P6-28.

P 2-21 Display speed scaling factor

If this parameter is zero (0.000), the display-scaling function is disabled.

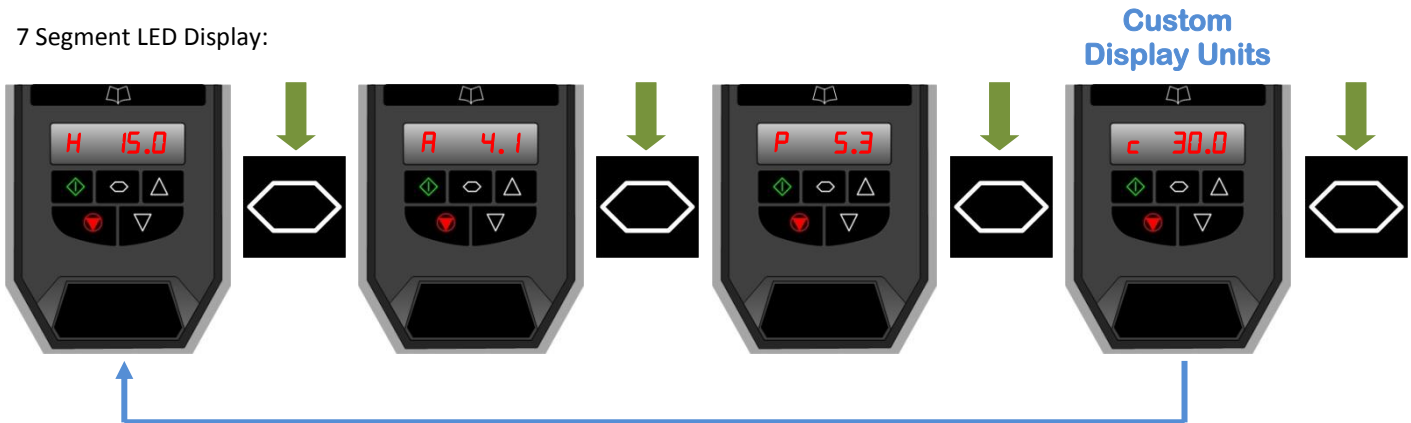
If this parameter is $\neq 0$, the custom display scaling function is enabled, and operates as details in the following table.

Display Scaling Value	Display Scaling Source P2-22	Motor Rated Speed P1-10	Scaled Display
Motor Speed (Hz)	0	= 0	Output Frequency (Hz) x P2-21
Motor Speed (Rpm)	0	> 0	Motor Rpm x P2-21
Motor Current	1	N/A	Motor Current (A) x P2-21
Analog Input 2	2	N/A	Analog input 2 (%) x P2-21

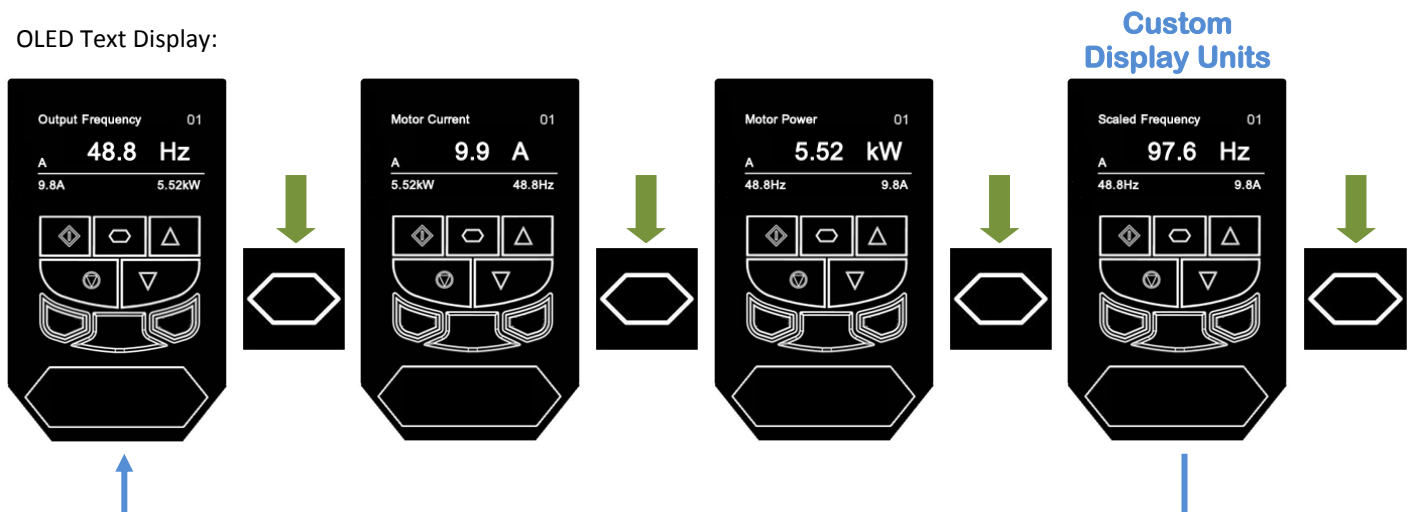
Showing Custom Units on the Drive Display

The scaled display value can be viewed as one of the main real-time values of the drive display whenever the drive is running. The <navigate> key is used to scroll through the available display values. Provided a value has been entered in P2-21 (P2-21 <>0) then the custom user units display will form one of the options scrolled to using the navigate key. A lower case character 'c' will be displayed on the display to distinguish the scaled value from the other real-time values on the 7 segment LED display. A text description is provided on the OLED display. The sequence when scrolling through the drive display is shown below.

7 Segment LED Display:



OLED Text Display:



Examples show source (P2-22) set to motor speed and scaling (P2-21) set to 2.000

When the drive is turned on it will power up with the same display units as shown on the display when the unit was powered off. Hence if custom units are shown on the drive display at power off, then they will be retained on the display at power on.

Example 1 – Displaying Fan speed Output on a Belt Driven Fan (Rpm)

If the controlled motor is connected to via a pulley and belt to a fan shaft and it is desired to display the fan output speed rather than the motor shaft speed, this can be achieved in the following way

Enter the **Motor** nameplate speed into P1-10

Calculate the value of $P2-21 = 1 / \text{Pulley Ratio}$

E.g. Pulley ratio = 4:1, $P2-21 = 1/4 = 0.25$

Set $P2-21 = 0.25$

$P2-21$ remains at the value for motor speed ($P2-22 = 0$)

The scaled display will now show the Fan output Rpm.

Example 2 – Displaying Feedback Pressure

In applications where a pressure feedback transducer is used, this may be connected to the analog input of the drive, to allow the pressure to be directly displayed, negating the need for a separate display or meter. If the drive is operating in PID mode, providing constant pressure, the same transducer may be used for both feedback and display.

Internally within the drive, the feedback is treated as %, and so the scaling factor must be adjusted to correct back to actual units, e.g.

Pressure Transducer Range: 0 – 6 Bar

This range is internally represented as 0 – 100.0%, therefore the scaling factor should be set to $6 / 100 = 0.06$.

P2-21 should be set to 2, and the transducer connected to analog input 2.

Appendix

Revision History			
Version	Comments	Author	Date
01	Document Creation	KB	13/05/15