Optidrive Applications Support Library

Application Note	AN-ODV-3-006
Title	Configuring Voltage and Current Reference Inputs
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 many applications, it is common for the speed of the Optidrive Eco to be controlled by an analog signal with either voltage (e.g. 0 – 10 Volts) or current (e.g. 4-20mA) format. These signals can originate from a locally mounted potentiometer or from a remote intelligent control system, such as a PLC or BMS.

This can also be the case when the internal PID controller is used, and the signal format from the feedback device is an analog signal.

This applications note explains how the analog reference values are connected to the drive and how the drive is configured to understand the format of the signal it is receiving.

Parameters

P2-30: Analog Input 1 (Terminal 6) Format:

This parameter allows the user to configure the format of the signal connected to analog input 1. The following formats are supported:

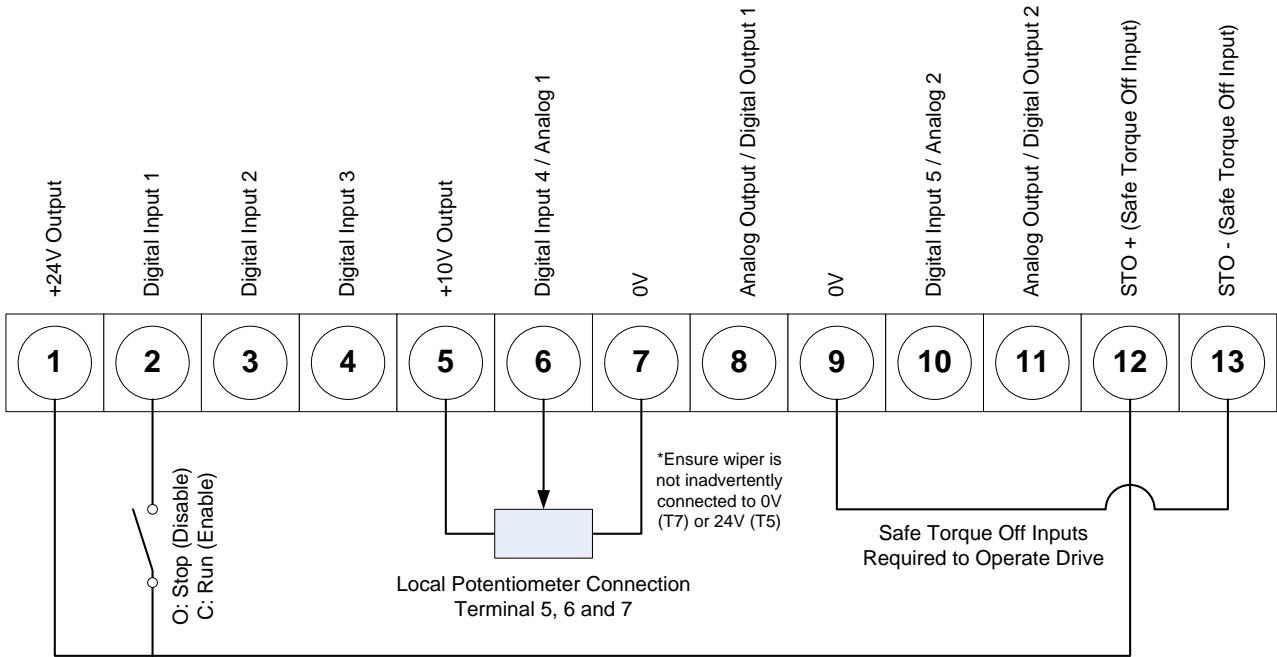| Signal Format	LED Display	Control Direction	Signal Loss Behaviour	
			Speed Control	**PID Control**
0 – 10 Volts	U 0- 10	Forward Only	Minimum Speed	Minimum Feedback
	U 10-0	Forward Only	Maximum Speed	Maximum Feedback
-10 – 10 Volts	- 10- 10	Forward / Reverse	Minimum Speed	N/A
0 – 20mA	A 0-20	Forward Only	Minimum Speed	Minimum Feedback
4-20mA	t 4-20	Forward Only	Trip Below 3mA	Trip Below 3mA
	r 4-20	Forward Only	Drive Runs at Preset Speed 4 (P2-04)	Drive Runs at Preset Speed 4 (P2-04)
	t 20-4	Forward Only	Trip Below 3mA	Trip Below 3mA
	r 20-4	Forward Only	Drive Runs at Preset Speed 4 (P2-04)	Drive Runs at Preset Speed 4 (P2-04)

When set to 0-10V or 10-0V, all negative voltages will give zero speed. When set to -10-10V all negative voltages will result in the drive running with negative (reverse) speed. Speed is proportional to the magnitude of the input voltage in both directions.

Typical configurations for the analog input (Terminal 6) are shown below.

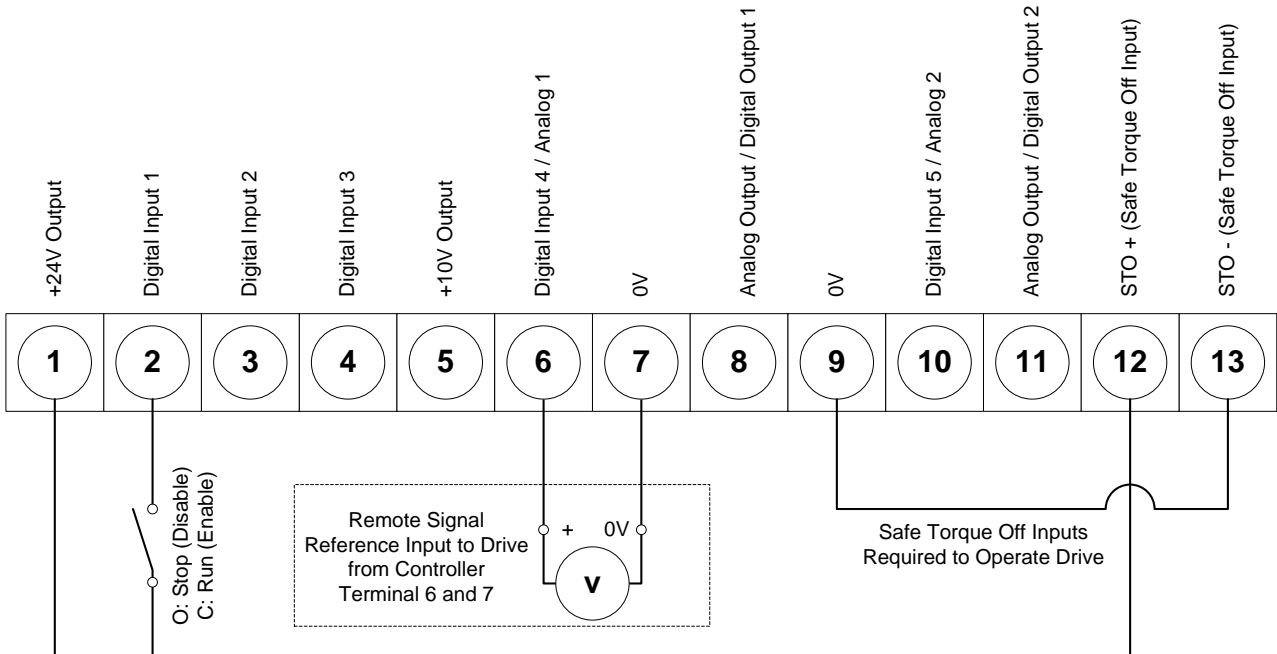## Example 1: Local Potentiometer using drive internal supply voltage.

Optidrive Eco is configured with the internal +10V uni-polar supply for connection to a local Potentiometer.
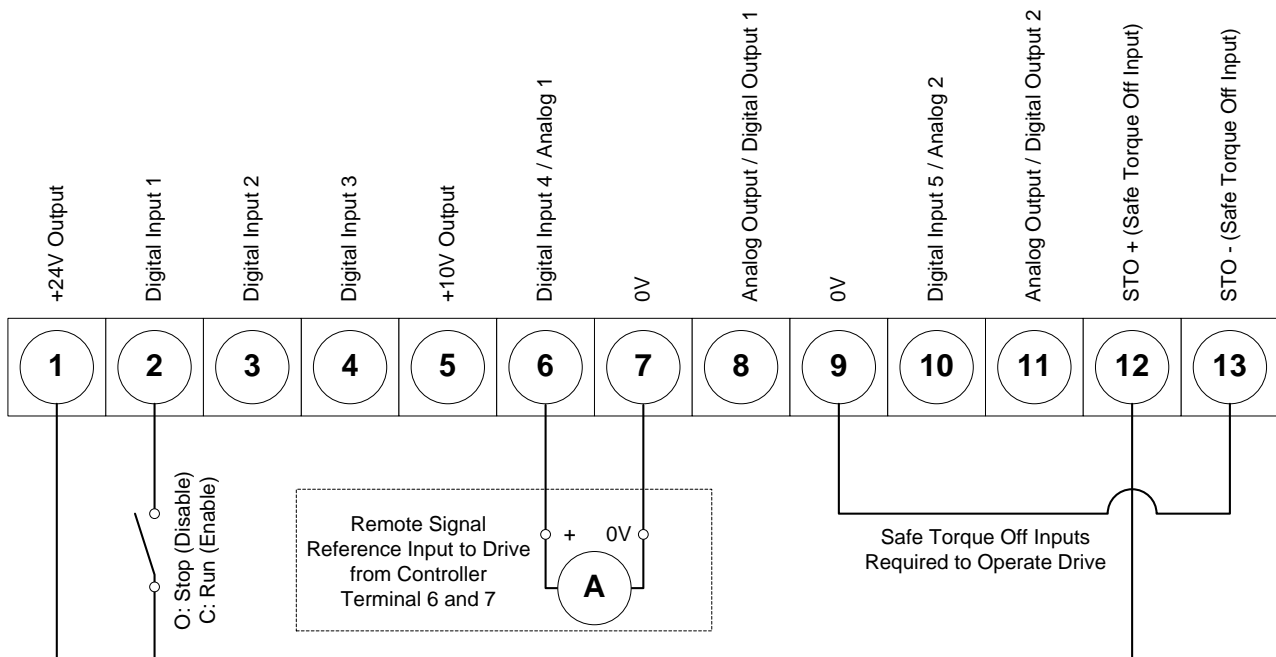
P2-30 = $U\ 0-10$, $U\ 10-0$

Terminal	Label
1	+24V Output
2	Digital Input 1 — O: Stop (Disable) C: Run (Enable)
3	Digital Input 2
4	Digital Input 3
5	+10V Output
6	Digital Input 4 / Analog 1
7	0V
8	Analog Output / Digital Output 1
9	0V
10	Digital Input 5 / Analog 2
11	Analog Output / Digital Output 2
12	STO + (Safe Torque Off Input)
13	STO - (Safe Torque Off Input)

Local Potentiometer Connection
Terminal 5, 6 and 7

*Ensure wiper is not inadvertently connected to 0V (T7) or 24V (T5)

Safe Torque Off Inputs
Required to Operate Drive

Example 2: Remote Speed Signal Reference (voltage Source).

P2-30 = $U\ 0-10$, $U\ 10-0$, $-10-10$ (Matched to source)

Remote Signal
Reference Input to Drive
from Controller
Terminal 6 and 7

Safe Torque Off Inputs
Required to Operate Drive

Example 3: Remote Speed Signal Reference (Current Source).

P2-30 = A 0-20, t 4-20, r 4-20, t 20-4, r 20-4 (Matched to source)

P2-33: Analog Input 2 (Terminal 10) Format:

This parameter allows the user to configure the format of the signal connected to analog input 2. The following formats are supported:

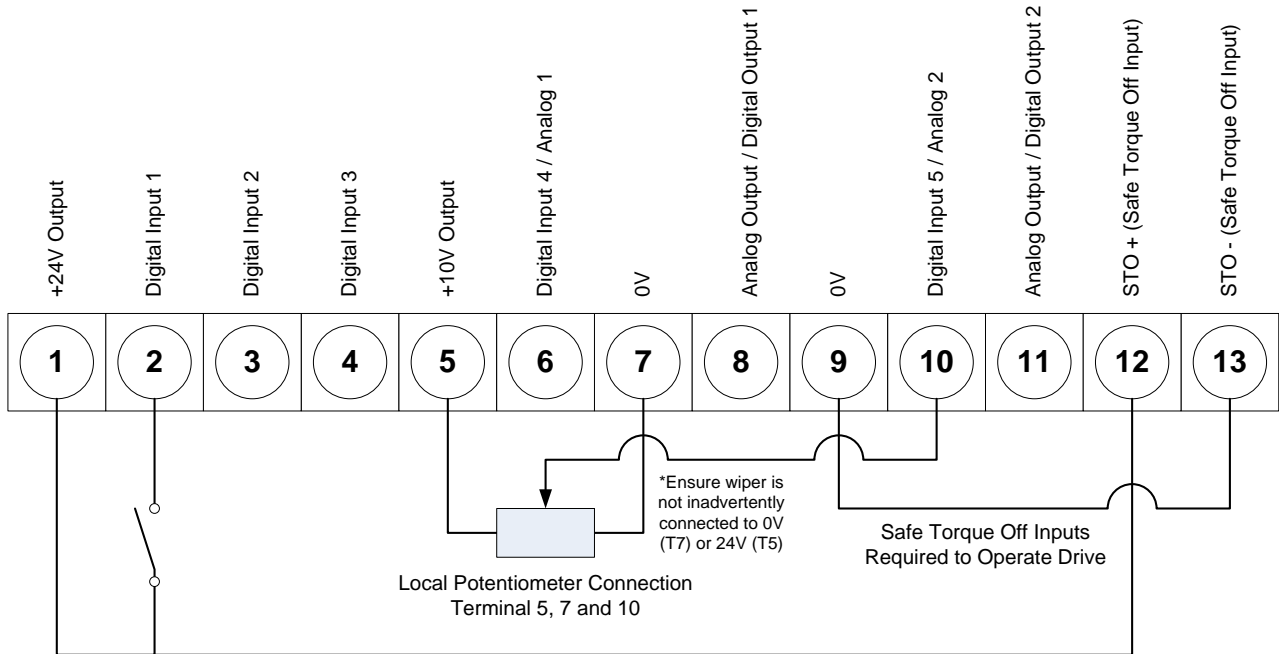|	
U 0- 10	Voltage input, 0V ... 10V (Uni-polar)
U 10-0	Voltage input, 10V ... 0V (Uni-polar)
Ptc-th	Motor PTC Thermistor Input
A 0-20	Current input, 0mA ... 20mA
t 4-20	Current input, 4mA ... 20mA – Drive trip below 3mA
r 4-20	Current input, 4mA ... 20mA – Drive Stop below 3mA
t 20-4	Current input, 20mA ... 4mA – Drive trip below 3mA
r 20-4	Current input, 20mA ... 4mA – Drive Stop below 3mA

When set to 0-10V or 10-0V, all negative voltages will give zero speed.

Typical configurations for the analog input (Terminal 10) are shown below.

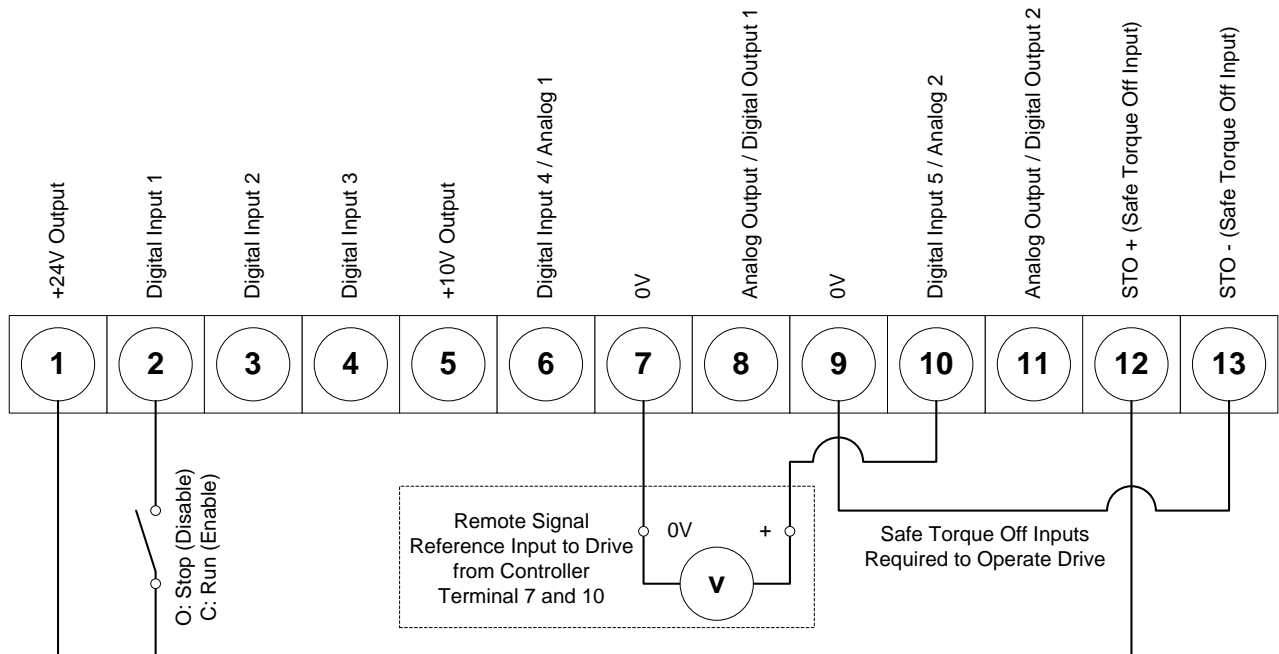## Example 1: Local Potentiometer using drive internal supply voltage.

Optidrive Eco is configured with the internal +10V uni-polar supply for connection to a local Potentiometer.
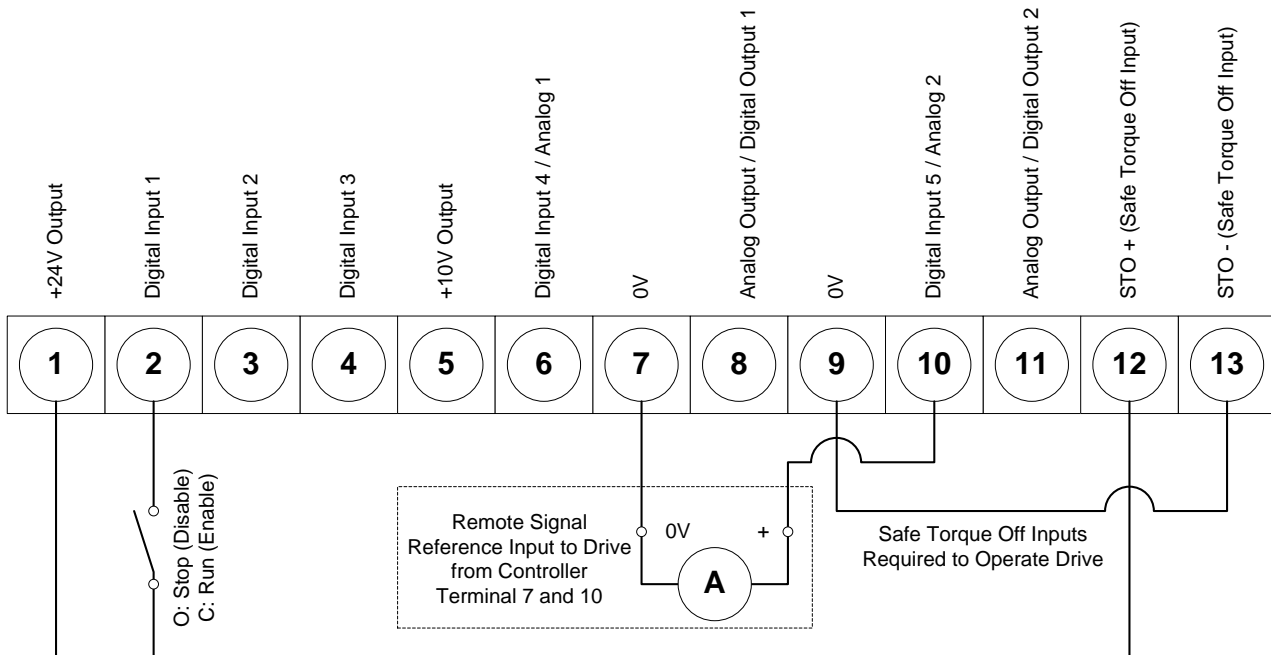
P2-33= $U\ 0-10$, $U\ 10-0$

Local Potentiometer Connection
Terminal 5, 7 and 10

*Ensure wiper is not inadvertently connected to 0V (T7) or 24V (T5)

Safe Torque Off Inputs Required to Operate Drive

Example 2: Remote Speed Signal Reference (voltage Source).

P2-33 = $U\ 0-10$, $U\ 10-0$ (Matched to source)

O: Stop (Disable)
C: Run (Enable)

Remote Signal Reference Input to Drive from Controller Terminal 7 and 10

Safe Torque Off Inputs Required to Operate Drive

Example 3: Remote Speed Signal Reference (Current Source).

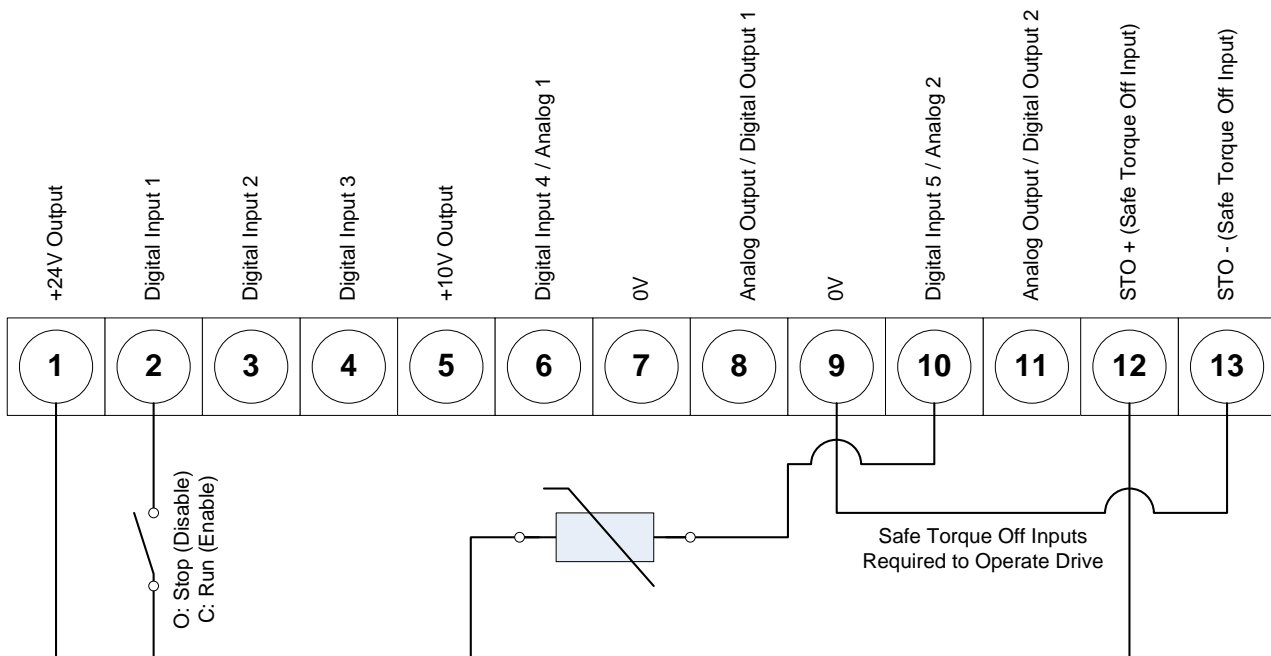P2-33 = A 0-20, t 4-20, r 4-20, t 20-4, r 20-4 (Matched to source)

Example 4: Motor Thermistor Connection

P2-33 = Ptc-th

Compatible Thermistor : PTC Type, 2.5kΩ trip level

Use a setting of P1-13 that have Input 5 function as External Trip, e.g. P1-13 = 6

Appendix

Revision History			
Issue	Comments	Author	Date
01	Document Creation	KB	31/03/15