The Application Note is pertinent to the Focus Family

**Controlling Multiple Focus Non-Regenerative Drives With a Single Speed Command**

There are applications where multiple drives are required to follow a single master speed command. The simple example shown below is a fiberglass line where the material enters the line having a low density and is fairly thick and is then progressively compressed to a much thinner higher density format which allows it to packaged more compactly. Each set of “pinch rolls are run at a slightly higher speed to compensate for the elongation created by compressing the fiberglass. In this application it is desirable that the entire line accelerates and decelerated together. The drives would be set up for a 0 to 10 vdc speed command with the maximum speed settings (@ 10 vdc) for each drive set slightly higher for each progressive section.
Since the Focus 1 and the Focus 3 non-regenerative dc motor controllers are classified as non-isolated drives, their control circuit connections must not be tied together. This is due to the fact that circuit common on the drive is connected directly to the motors A+ terminal. At any point in time, each drive circuit commons may be at different voltage potentials with respect to ground. If the connections are tied together, large currents will flow through the drives control board causing component and circuit trace damage (see CTAN #215). This problem may be approached in three different ways and the correct choice should be based on the application.

1. Use an Isolation Transformer on EACH drive.
2. Use a Focus Isolator Card (F3NSBD) on EACH drive.
3. Use the Focus Master Isolator Board to control all drives.

**Approach 1** can end up being fairly expensive depending on the size of the drives being used. The main advantage of this method (besides achieving isolation) is reliability since the power to the drive is somewhat conditioned by the transformer, thus reducing the harmful effects of line transients. A disadvantage to this configuration is that a single speed potentiometer cannot be used. You could utilize a “ganged pot” (two or more pots on a single shaft). Even so the drives would still follow their own internal accel and decel rates therefore would not track together in tandem as desired. The diagram below shows this approach for an example of two drives.
Approach 2 is to use a Focus Isolator card (P/N F3NSBD) on each of the drives. This card may be used with Focus 1 (see CTAN #228) or Focus 3N non-regenerative drives. A common speed command can be sent to all of the drives. This signal must be capable of driving 5 milliamps per isolator card at 10vdc. With this approach the drives will follow their own internal accel and decel rates therefore would not track together in tandem as desired. Another disadvantage of this configuration is that a single speed potentiometer cannot be used. Below shows a diagram of two drives with isolator cards and a common speed command.
**Approach 3** is to use the Focus Isolated Master Reference board (P/N 2450-4004). This circuit board can provide a common isolated speed command and start contact for up to six Focus DC motor controllers. The board provides a Master Start circuit, which can be configured as a three-wire latching (Start/Stop) arrangement or a two-wire (On/Off) control. The master speed command can be either a Speed Potentiometer (supplied with the circuit board) or a 0 to 10-vdc external voltage signal. A single acceleration / deceleration circuit ensures that all drives in the system accelerate and decelerate together in tandem. Multiple circuit boards may be cascaded to provide more than 6 outputs. Refer to [CTAN #244](#) for more comprehensive details on the Focus Master Reference Board.

The **2450-4004 Isolated Master Reference Board** is available from:

**Control Techniques Service Center @ 1-800-367-8067**

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