

## Intro

Constant pressure systems requiring a significant range of flow are good candidates for using a Lead/Lag setup. Lead/Lag refers to a master VFD dictating when a lag pump is staged in to maintain a specific pressure. Duplex/Triplex is similar to Lead/Lag with the added function of switching the primary pump at set clock time intervals.

## Lead/Lag

Connect 16–22 AWG control wire from 1NO and 1C from the master to AUX1 and COM of up to 2 Slave VFDs on the SD Series and up to 4 on the 1LH, 3LH, and DX Series. Make sure each individual VFD has its own transducer (if maintaining constant pressure or speed) and is individually set up for the intended application. There can be applications where the lag pump is simply on/off and a sensor not present.

**Step 1:** Set **AUX1 Select** to **0 = RUN/STOP** on all slave units in Interface Parameters.

**Step 2:** Set **Number Lag Pumps** = to the number of lag pumps in Lead/Lag Parameters.

With these two steps complete, the Lead/Lag setup will be operational using default settings.

Figure 1

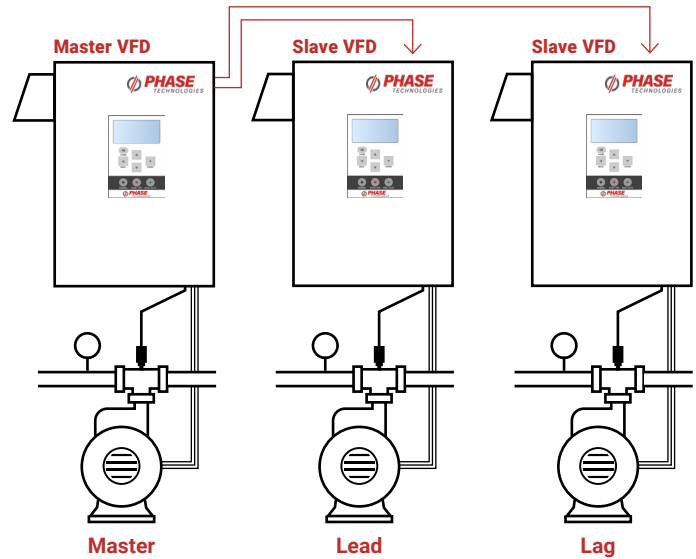
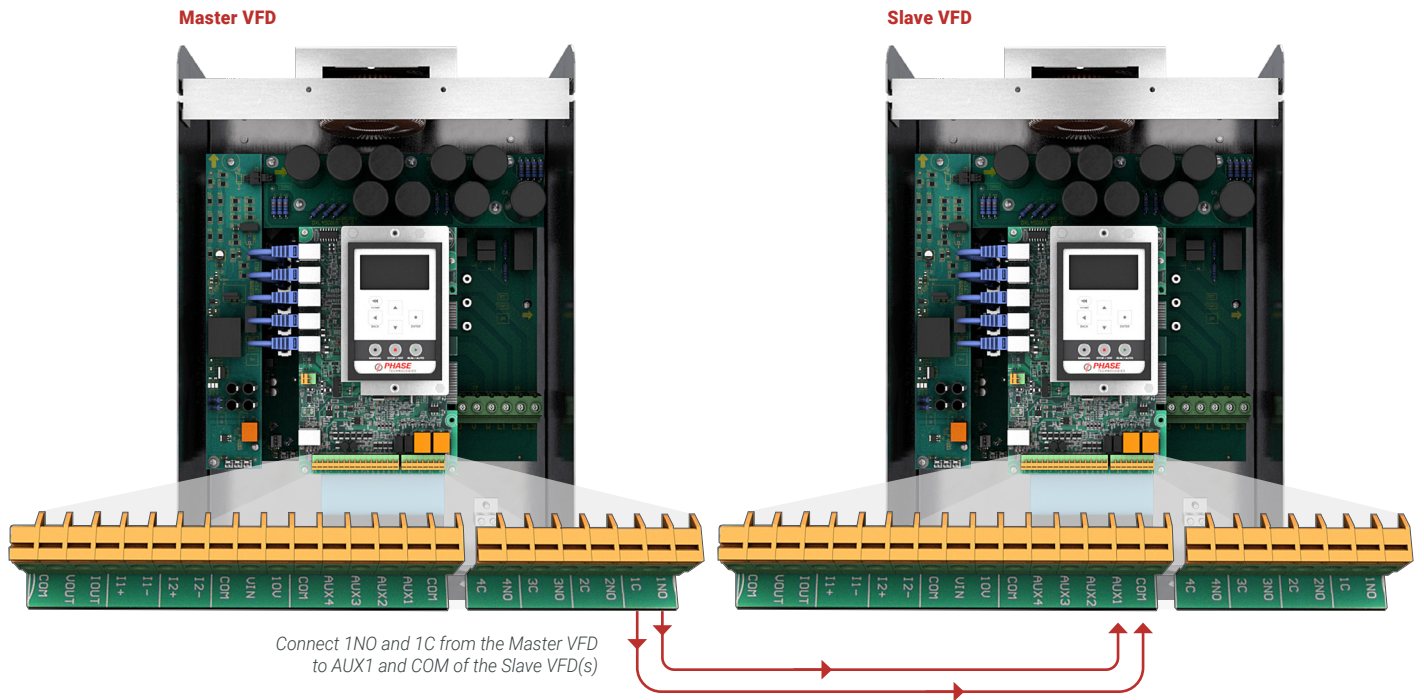


Figure 2



## Lead/Lag Parameters

<b>Destage Pump Delay</b>	Number of seconds the Slave VFD(s) will run once set pressure is maintained and the lead reaches minimum frequency
<b>Stage PSI Lag</b>	The specific PSI that starts the <b>Stage Pump Delay Timer</b> bringing the lag pump online
<b>Destage PSI Lag</b>	This allows the system to exceed the <b>PSI Setpoint</b> before starting the timer for <b>Destage Time</b> <b>Note:</b> If the system is exceeding the PSI Setpoint, the Destage PSI Lag setting is likely the cause. The lead will not go to sleep unless the lag pumps are all destaged
<b>Stage Freq Reduction</b>	In Hz. Reduces frequency of primary pump for the duration of the <b>Stage Time</b> when the specific pump is staged in
<b>Stage Time</b>	In Seconds. This is the interval for which the system will reduce its frequency by <b>Stage Freq Reduction</b> .
<b>Destage Freq Boost</b>	In Hz. Increases frequency of the primary pump for the duration of the <b>Destage Time</b> when the specific pump is destaged.
<b>Destage Time</b>	In Seconds. This is the interval for which the system will increase its frequency by <b>Destage Freq Boost</b>
<b>Destage Min Freq</b>	In Hz. <b>Min Frequency</b> of the primary pump plus this amount to destage

## Duplex/Triplex/Multiplex

**Set Duplex Cycle Time:** Choose the number of hours and minutes the Master VFD will alternate between Slave VFDs in Constant Pressure Parameters. This equals clock time, not pump run time. The Duplex Cycle Time will automatically reset if power is lost or a non-restartable fault occurs on the Master VFD.

Note: The default setting are there to get things up and running. You will need to use the parameters above to tune the system to your specific application.

For a complete list of all available Lead/Lag Parameters, please download the manual at:  
[www.phasetechnologies.com/support/downloads](http://www.phasetechnologies.com/support/downloads)



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