

Application Note

AN-VTC- 27

Master slave network operation

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- **General :**

The Optidrive VTC product range has a unique IR optical communication capability, permitting wireless communications with PDAs and other drives.

When communicating with a drive network, optical (polymer) fibre can be used to interconnect the drives or alternatively a wired RS485 data link via the RJ11 connectors.

Note that if an optical system is used, the maximum length of polymer fibre between drives is 1m. Additionally, a maximum of 1 Master and 2 Slaves can be used. In this case, a fibre must be linked between the Master and each slave, ie not daisy chained slave-to-slave.

For a wired RS485 data link, slave drives can be daisy chained with up to 62 slave drives per Master. For larger numbers of slaves or long 485 cable runs, normal wiring practices must be used to avoid noise pick up (ie avoid running data cable close to power cables)

This document describes how to set up a Master-Slave drive network and how to setup the parameters to implement a 'digital gear box' function.

- **Parameters:**

P2-27 Drive communication address

This parameter specifies the drive network address. Each drive in the network should have a unique drive address number. More than one drive in the network having the same address will cause unreliable operation.

The valid range for the drive address is from 1 to 63.

In any drive network, it is necessary for one of the drives to have drive address 1. Drive 1 has a special function in that it establishes synchronisation between all nodes in a drive network. This includes other communication products such as PDAs or Optiport+ options.

If a drive network has a Master drive, this drive must be set to drive address 1. All other drives are slaves and should have a drive address greater than 1.

P2-28 Master / Slave mode select

This parameter determines decides which operation mode the drive with address 1 should be in.

Normally there will be only one drive in the network should be set as master, and all the other drives should be set as slave.

Note: the master drive must has the address of 1

P2-29 Slave drive speed scaling factor

This parameter specifies a scaling factor which is used to scale the master drive speed information.

This parameter only valid when drive in slave mode with P2-35 > 0

This parameter can be used as a 'digital gear box'. For example, in normal operation, the master drive will send out the run command and master drive speed reference to the other slave drive. If the user wants to have a proportion value between master drive speed and the slave drive speed, then this parameter can be used to set up a scale factor.

For example if the master drive speed is 50Hz and the user set this parameter as 50.0%, then the slave drive speed will be 25Hz, and it will follow the master drive's speed changes at that fixed proportion.

Note that in order to get exactly the same speed proportion; the acceleration ramp time (P1-03) and deceleration ramp time (P1-04) of the slave drive should be the same value as set in the master drive.

P2-35 Digital speed reference scaling control

This parameter is only valid in keypad control mode and is usually used in the slave drive in a Master / Slave network application.

When P2-35 = 1, the drive speed reference will be scaled by the preset value set in P2-29.

When P2-35 = 2, the bipolar analog input value is added as a trim to the speed reference, Where maximum analog input represents P1-01.

$$\text{Speed Ref} = (\text{Digital Speed Ref} \times \text{P2-29}) + \text{Bi-polar analog input}$$

When P2-35 = 3, the analog input value will scale the speed reference from 0% to 200%.

$$\text{Speed Ref} = (\text{Digital Speed Ref} \times \text{P2-29}) \times \text{Bi-polar analog input}$$

- **Special Issue:**

The master drive can be set in any operation mode (P1-12=0, 1, 2, 3 or 4). However the slave drive can be only set in keypad control mode (P1-12=1 or 2). If the parameter P1-12 in the slave drive is set to 1, then any negative speed reference sent by master will be treated as zero.

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