SIEMENS

FAQ for SINAMICS DCM

Question:
How can I implement a 12-pulse parallel circuit using a via peer-to-peer link?

Answer:
The 12-pulse mode is described in detail in the application notes (except Chapter 3.3.2.; 4; 5) The parallel connection interface is used to link the two units.
For some applications it is desired to do the device-device coupling between the 12-puls Master and the 12-pulse Slave via peer-to-peer and not use the parallel connection interface for the communication

The first DCM is the master drive for speed control, current control and field power supply. The second DCM is the slave drive and is operated in current-control mode. It receives the current setpoint from the master. Both units are operated at half motor current. For higher power ratings, DCM can be connected in parallel at the master and slave.

This FAQ describes the required parameter settings.

The peer-to-peer interface:

DCM Master   DCM Slave

X177.37 TX +
X177.38 TX -
X177.39 RX +
X177.40 RX –
X177.36 M
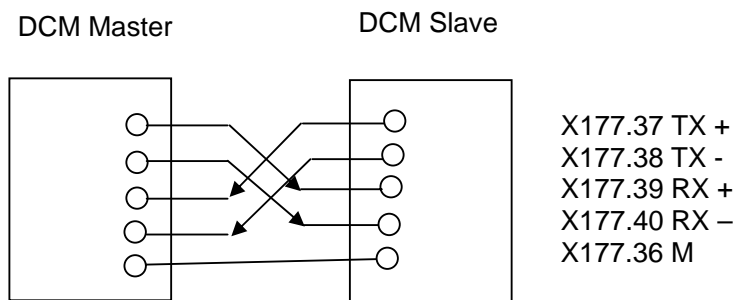
Parameter settings for data exchange at the master

The peer-to-peer link

p50790 = 5	Peer-to-peer ON
p50791 = 2	2 data word via peer-to-peer
p50793 = 13	Baud rate 187.5 kBd
p50794[0] = 52620	Binector/connector converter as first send word

p50794[1] = 52125	Armature current setpoint upstream of the current controller as second send word
p50795 = 1	Bus termination ON
p50797 = 0.1	Telegram failure time 0.1 s

Further parameters

p50100 = xxx	Set to half the rated motor current
p50110 = yyy	Set to $R_S + 2*R_A$ [Ohm]
p50111 = zzz	Set to $L_S + 2*L_A$ [mH]
p50165[0] = 52606.00	Signaling of command stage from slave to master, only necessary for 4Q
p50153 =2	Pre-control partially active
p51117[0] = 53190.00	Status of command stage bit 0 to binector/connector converter bit 0
p51117[1] = 2138.07	Acknowledge fault bit from master to binector/connector converter bit 1
p2106[0] = 52606.01	Fault at slave triggers External fault 1, F07860 at master

R_S = Resistance Smoothing reactor, R_A = Resistance armature motor
L_S = Inductivity Smoothing reactor, L_A = Inductivity armature motor

Parameter settings for data exchange at the slave

The peer-to-peer link

p50790 = 5	Peer-to-peer ON
p50791 = 2	2 data word via peer-to-peer
p50793 = 13	Baud rate 187.5 kBd
p50794[0] = 52620	Binector/connector converter as first send word
p50795 = 1	Bus termination ON
p50797 = 0.1	Telegram failure time 0.1 s

Further parameters

p50082 = 0	Field in slave not used
p50100 = xxx	Same as Master
p50110 = yyy	Same as Master
p50111 = zzz	Same as Master
p50165[0] = 52606.00	Signaling of command stage from master to slave, only necessary for 4Q
p50153 =2	Pre-control partially active
p50601[4] = 52602	Current setpoint from master to current controller input of the slave; the slave is operated purely as current-controlled, speed control is carried out in the master
p51117[0] = 53190.00	Status of command stage bit 0 to binector/connector converter bit 0

p51117[1] = 2139.03	Fault at slave bit after inversion to binector/connector converter bit 1
p51118.1 = 1	Fault at slave bit is inverted and then forwarded to the binector/connector converter
p2118[0]= 60042	Preselect tachometer fault to disable
p2119[0] = 3	Dlisable tachometer fault
p2102 = 52606.01	Fault acknowledgement at slave via master

Notes on commissioning

The On command and operation enable are specified at the master and slave.
Stop should not be specified at the slave until the stop command is completed at the master.
A fault message at the slave produces External fault 1, F07860 at the master.

Perform current controller optimization (p50051 = 25) independently on both units.
Then set the above parameters.
Speed control is optimized when 12-pulse mode is active.

Literature:

SINAMICS DCM DC Converter, Application: 12-pulse-applications
http://support.automation.siemens.com/WW/view/en/59383636