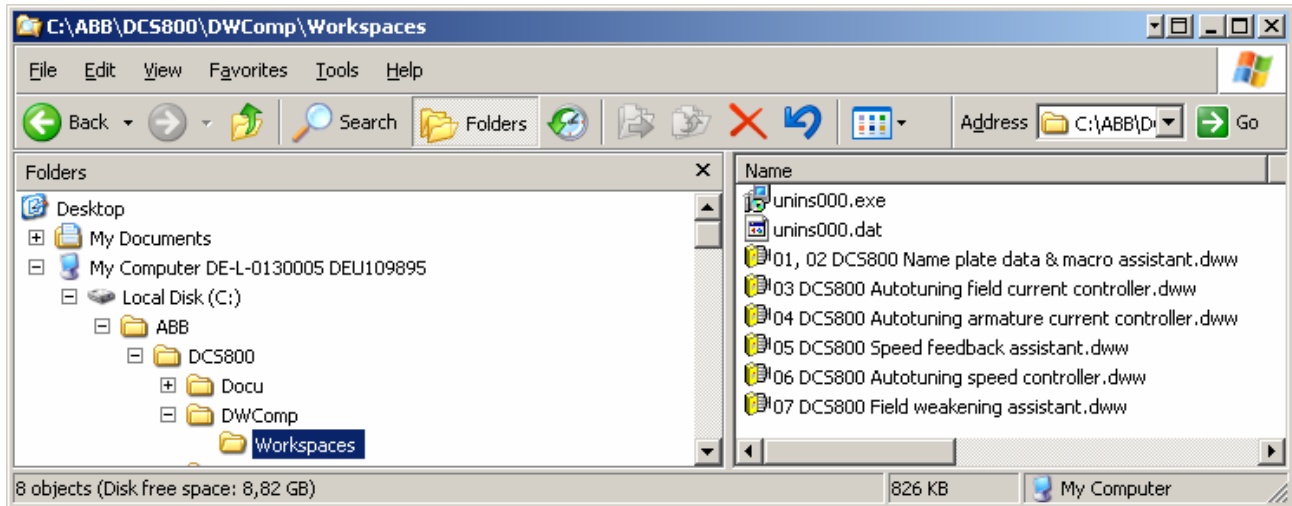


Commissioning a DCS800 with DriveWindow

Requirements

1. Before starting with the commissioning, connect the drive (via Ch3 on SDCS-COM-8) with DriveWindow (via e.g. NDPA-02 and NDPC-12). All workspaces are 'online' workspaces, thus use *Ch3 NodeAddr (70.22) = 1*.
2. The preconfigured workspaces are available from Your local ABB agent or can be found - after the DCS800 CD (tools CD) is installed - under:



Location of workspaces

01, 02 Macro assistant / Name plate data

1. Open the workspace *01, 02 DCS800 Name plate data & macro assistant.dww*¹.
2. Set all parameters to default by means of *AppMacro (99.08) = Factory* and *AppRestore (99.07) = Yes*. Check with *MacroSel (8.10)*.
3. Enter the motor data, the mains (supply) data and the most important protections [*M1SpeedMin (20.01)*, *M1SpeedMax (20.02)*, *ArmOvrCurLev (30.09)*, *M1OvrSpeed (30.16)*, *Language (99.01)*, *M1NomVolt (99.02)*, *M1NomCur (99.03)*, *M1BaseSpeed (99.04)*, *NomMainsVolt (99.10)* and *M1NomFldCur (99.11)*].
4. After filling out the parameters it is - in most cases - possible to turn the motor for the first time.
5. Select an application macro by means of *AppMacro (99.08) = <macro>* and *AppRestore (99.07) = Yes*. Check with *MacroSel (8.10)*.

03 Autotuning field current controller

1. Open the workspace *03 DCS800 Autotuning field current controller.dww*¹.
2. Enter the field circuit data [*FldCtrlMode (44.01)*, *M1NomFldCur (99.11)* and *M1UsedFexType (99.12)*].
3. Switch the drive to local mode (DriveWindow, DCS800 Control Panel or local I/O).
4. Start the autotuning by means of *ServiceMode (99.06) = FieldCurAuto* and set **On** within 20 s.
5. During the autotuning the main respectively field contactor will be closed, the field circuit is measured by means of increasing the field current to nominal field current and the field current control parameters are set. The armature current is not released while the autotuning is active and thus the motor should not turn.

- When the autotuning is finished successfully, check *M1KpFex* (44.02), *M1TiFex* (44.03) and *M1PosLimCtrl* (45.02) - parameters set by the autotuning - for confirmation.
- If the autotuning fails **A121 AutotuneFail** is set. For more details check *Diagnosis* (9.11) and repeat the autotuning.

04 Autotuning armature current controller

- Open the workspace *04 DCS800 Autotuning armature current controller.dww*¹.
- Enter the basic current limitations and the motor nominal current [*TorqMax* (20.05), *TorqMin* (20.06), *M1CurLimBrdg1* (20.12), *M1CurLimBrdg2* (20.13) and *M1NomCur* (99.03)].
- Switch the drive to local mode (DriveWindow, DCS800 Control Panel or local I/O).
- Start the autotuning by means of *ServiceMode* (99.06) = **ArmCurAuto** and set **On** and **Run** within 20 s.
- During the autotuning the main contactor will be closed, the armature circuit is measured by means of armature current bursts and the armature current control parameters are set. The field current is not released while the autotuning is active and thus the motor should not turn, but due to remanence in the field circuit about 40% of all motors will turn (create torque). These motors have to be locked.
- When the autotuning is finished successfully, check *M1KpArmCur* (43.06), *M1TiArmCur* (43.07), *M1DiscontCurLim* (43.08), *M1ArmLim* (43.09) and *M1ArmR* (43.10) - parameters set by the autotuning - for confirmation.
- If the autotuning fails **A121 AutotuneFail** is set. For more details check *Diagnosis* (9.11) and repeat the autotuning.

05 Speed feedback assistant

- Open the workspace *05 DCS800 Speed feedback assistant.dww*¹.
- Enter the EMF speed feedback parameters and - if applicable - the parameters for pulse encoder 1, pulse encoder 2 or the analog tacho [*M1SpeedMin* (20.01), *M1SpeedMax* (20.02), *M1EncMeasMode* (50.02), *M1SpeedFbSel* (50.03), *M1EncPulseNo* (50.04), *M1TachoVolt1000* (50.13), *M1NomVolt* (99.02) and *M1BaseSpeed* (99.04)].
- Switch the drive to local mode (DriveWindow, DCS800 Control Panel or local I/O).
- Start the autotuning by means of *ServiceMode* (99.06) = **SpdFbAssist** and set **On** and **Run** within 20 s.
- The speed feedback assistant detects the kind of speed feedback - EMF, pulse encoder 1, pulse encoder 2 or analog tacho - the drive is using.
- During the autotuning the main contactor and the field contactor - if existing - will be closed and the motor will run up to base speed [*M1BaseSpeed* (99.04)]. During the whole procedure the drive will be in EMF speed control despite the setting of *M1SpeedFbSel* (50.03).
- When the autotuning is finished successfully, check *M1SpeedFbSel* (50.03) - parameter set by the autotuning - for confirmation.
- If the autotuning fails **A121 AutotuneFail** is set. For more details check *Diagnosis* (9.11) and repeat the autotuning.

Analog tacho fine tune procedure

- In case an analog tacho is detected [*M1SpeedFbSel* (50.03) = **Tacho**] it is recommended to fine tune the analog tacho.
- Switch the drive to local mode (DriveWindow, DCS800 Control Panel or local I/O).
- Start the autotuning by means of *ServiceMode* (99.06) = **TachFineTune**

- and set **On** and **Run** within 20 s.
4. Measure the motor speed with a hand held tachometer and write the value into *M1TachoAdjust* (50.12).
 5. Check *SpeedActTach* (1.05) against *SpeedRef4* (2.18).
 6. Stop the autotuning by removing **Run** and **On** via the DriveWindow control panel.

06 Autotuning speed controller

1. Open the workspace *06 DCS800 Autotuning speed controller.dww*¹.
 2. Enter the basic speed, torque and current limits, the speed filter times and the motor base speed [*M1SpeedMin* (20.01), *M1SpeedMax* (20.02), *TorqMax* (20.05), *TorqMin* (20.06), *M1CurLimBrdg1* (20.12), *M1CurLimBrdg2* (20.13), *SpeedErrFilt* (23.06), *SpeedErrFilt2* (23.11), *SpeedFiltTime* (50.06) and *M1BaseSpeed* (99.04)].
- Attention:**
For better results set the filters, especially when using EMF speed feedback.
3. Switch the drive to local mode (DriveWindow, DCS800 Control Panel or local I/O).
 4. Start the autotuning by means of *ServiceMode* (99.06) = **SpdCtrlAuto** and set **On** and **Run** within 20 s.
 5. During the autotuning the main contactor and the field contactor - if existing - will be closed, the ramp is bypassed and torque respectively current limits are valid. The speed controller is tuned by means of speed bursts up to base speed [*M1BaseSpeed* (99.04)] and the speed controller parameters are set.
- Attention:**
During the autotuning the torque and/or current limits will be reached.
6. When the autotuning is finished successfully, check *KpS* (24.03) and *TiS* (24.09) - parameters set by the autotuning - for confirmation.
 7. If the autotuning fails **A121 AutotuneFail** is set. For more details check *Diagnosis* (9.11) and repeat the autotuning.

Attention:

The assistant is using the setting of *M1SpeedFbSel* (50.03). If using setting **Encoder**, **Encoder2** or **Tacho** make sure the speed feedback is working properly!

07 Field weakening assistant

1. Open the workspace *07 DCS800 Field weakening assistant.dww*¹.
2. Enter the motor data and the field circuit data [*M1SpeedMin* (20.01), *M1SpeedMax* (20.02), *M1FldMinTrip* (30.12), *FldCtrlMode* (44.01), *M1NomVolt* (99.02), *M1BaseSpeed* (99.04) and *M1NomFldCur* (99.11)].
3. Switch the drive to local mode (DriveWindow, DCS800 Control Panel or local I/O).
4. Start the autotuning by means of *ServiceMode* (99.06) = **EMF FluxAuto** and set **On** and **Run** within 20 s.
5. During the autotuning the main contactor and the field contactor - if existing - will be closed and the motor will run up to base speed [*M1BaseSpeed* (99.04)]. The EMF controller data are calculated, the flux linearization is tuned by means of a constant speed while decreasing the field current and the EMF controller respectively flux linearization parameters are set.
6. When the autotuning is finished successfully, check *KpEMF* (44.09), *TiEMF* (44.10), *FldCurFlux40* (44.12), *FldCurFlux70* (44.13) and *FldCurFlux90* (44.14) - parameters set by the autotuning - for confirmation.
7. If the autotuning fails **A121 AutotuneFail** is set. For more details check

Diagnosis (9.11) and repeat the autotuning.

¹: before opening the workspaces, the drive has to be connected to DriveWindow