qtNE installation instructions

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Installation of supporting software:

1. Download and install NI MAX following the instructions in https://knowledge.ni.com/KnowledgeArticleDetails?id=kA03q000000YGQwCAO&l=nl-NL
2. Download and install NI-488.2 drivers from https://www.ni.com/en/support/downloads/drivers/download.ni-488-2.html

Installation of Anaconda + Python + qtNE:

1. Install Anaconda. I recommending installing for the current user only**.**
2. Note the location of the installation:
    a. For local user installation: (likely) \anaconda3 in the current user folder.
    b. For all users installation: (likely) \anaconda3 in C:\ProgramData (hidden folder)
3. Open Anaconda Prompt
    a. Enter the command "**conda create -n "qtNE" python=3.10**" to create new environment with python v>=10 (named qtNE)
    b. Enter the command "**conda activate qtNE**" to activate the environment qtNE
    c. Enter the command "**conda install ipython**"
    d. Enter the command "**ipython**"
4. From ipython:
    a. Enter the command "**pip install [package name]**" for each of the packages below:
        i. Qcodes*
        ii. pyqtgraph
        iii. pyqt6
        iv. qcodes[loop]
        v. scipy
        vi. opencv_python
        vii. qtpy
        viii. qcodes_contrib_drivers
        ix. jupyter

* for installations in the dipstick and probestation computers, install a version of qcodes <=0.38.1 Do this using the command pip install qcodes==0.38.1

    b. Enter the command "**exit**" to exit ipython and close the Anaconda prompt
5. Copy folder containing the qtNE software to a location in the C:\ disk:
    a. New qtNE installation: copy qtNE folder located in the same folder as this manual
    b. Transfer qtNE installation: copy qtNE folder installed in the computer to be replaced. Then copy the file 'run_qtNE.bat' from the folder 'bat_fix' located in the same folder as this manual.
6. Open file 'run_qtNE.bat' in a text editor:
    a. In **line 3** 'SET CONDA_INSTALL =' enter GLOBAL or LOCAL if you installed Anaconda for all users or the current user, respectively
    b. In **line 4** 'SET PATH_CONDA = ' enter the location of the anaconda installation

    c. In **line 5** 'SET ENV =' enter the name of the environment created in step 2
7. Open file 'qtNE.cfg' in a text editor and set the parameters in the dictionary to match your preferences:
    a. 'datadir': directory where data is saved
    b. 'measurementdir': directory where measurement scripts are stored
    c. 'default_user': name of the default user
    d. 'temp_dir': directory for storage of temporary files
    e. 'external_modules': directory to store other python modules to be used in qtNE
    f. 'dataviewer_type': "**db**" for reading native qcodes databases or "**txt**" for reading ascii .dat files stored by qtNE

<u>Setup and initialization of instruments in qtNE:</u>

1. Open the file \init\02_create_instruments.py in a text editor
2. Import the package/class containing the driver for the instrument that you want to use.
    a. Example: "**from qcodes_contrib_drivers.drivers.QuTech.IVVI import IVVI**"
3. Add the line "**station = qcodes.Station()"**
4. Create an instance of the instrument by initializing the class of the driver of interest. Check the documentation of the specific driver for initialization details.
    a. Example: "**ivvi = IVVI(name='ivvi', dac_step=10, dac_delay=0, address='COM3', numdacs=16, polarity = ['BIP', 'BIP', 'BIP', 'POS'], use_locks=False)"**
5. Add the created instrument to the qcodes station.
    a. Example "**station.add_component(ivvi)**"

<u>To use standalone parts of qtNE:</u>

Start in a python environment with a qcodes station initialized and the instruments that you want to control added to it

1. Start anaconda prompt
2. Activate qtNE environment
3. Browser to folder where standalone part is installed
4. Start ipython
5. Dataviewer (for ascii files stored by qtNE):
    a. from dataviewer import dataviewer
    b. dataviewer.DataViewer(data_directory=[directory where data is stored])
6. Dataviewer_db (dataviewer for qcodes databases):
    a. from dataviewer_db import dataviewer_db
    b. Dataviewer_db.DataViewer(data_directory=[directory where data is stored])
7. autoSF. Run the following commands:
    a. import autoSF
    b. autoSF.autoSF(instrument=[instrument object initialized in qcodes station])