Chess GUI with support for electronic chessboards

Lars Nowak

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Abstract

Why yet another chess GUI?

Many GUIs support electronic chessboards, but do not use the full potential that chessboards with piece recognition offer. They could be much better used for training or analysis of games and positions. Read more in chapter **12 Analysis mode** on page 40.

Another feature is the extended engine support. Read more in chapter **16 Extended engine support** on page 50.

So the focus of BearChess is more on exploiting the possibilities of the chessboards than being just another GUI. Of course, you not need an electronic chessboard to use BearChess.

The first version of BearChess supports the chessboards from Certabo and the boards connected via Millennium ChessLink.

As you can see from the version number, this software is still under development. There are still some functions that are not fully implemented and there are certainly still many bugs. But BearChess has now reached a level where it can be used and feedback from other users is welcome.

Some functions are marked with a *. These functions are still under development.

I am a professional programmer and write the software in my spare time and it is free. I am not an employee of Inventhio Srl trading (Certabo) or Millennium 2000 GmbH. If something does not work, Certabo or Millennium is not responsible for it.

Send errors, comments, suggestions for improvement or requests to lars@solanosoft.com.

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1 Quick start

- Simply unpack the file BearChessWin.zip into a new folder.
- Start BearChess with a double-click on BearChessWin.exe
- Connect your electronic chessboard to your computer.
- Set all chessmen to their start position.
- Configure the electronic chessboard connection (**10 Electronic chessboards** on page 27).
- Connect to the electronic chessboard.
- Load a chess engine (**4.1 Install a new engine** on page 12)
- Start a game and make your first move on the eletronic chessboard.

2 Introduction

BearChess offers among others the following functions:

1. Play with Certabo chessboards.
2. Play with Millennium chessboards via ChessLink modul.
3. Play against human beings or UCI engines.
4. Analyze your games or trainings with the help of electronic chessboards.
5. Use multiple chess engines at the same time for playing and analyzing.
6. Support for Polyglot and Arena opening books.
7. Save and load your games
8. Individual chessmen and board fields.

BearChess follows the design of Single Document Interface (SDI). You can place different windows, e.g. chess engine output or chess move list, anywhere on your Windows desktop. If you close them or exit BearChess, the position is saved and set to the same position when reopening.

2.1 Modes

BearChess is running in different modes. The current mode is displayed in the lower left corner.

- **Easy playing** This is the mode in the beginning. You just can simply start making your moves on the screen on your electronic chessboard. In addition to support you can start chess programs or load opening books. But these only give hints, but do not play as opponents. This mode is automatically set if you are not playing in another mode.

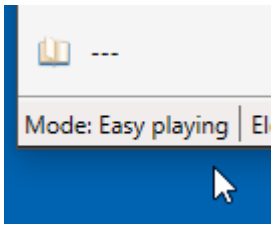

Figure 1: Easy playing

- **Playing a game** This is the mode if you play against a chess engine or another player. Only valid chess moves are allowed and the game is time controlled.

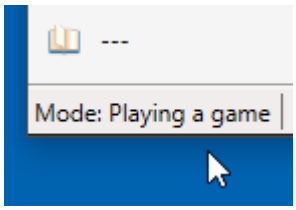

Figure 2: Playing a game

- **Analyzing** If you select this mode you can make any chess moves or place the pieces as you like, almost without regard to the chess rules. This mode is recommended to analyze a game or positions. Try different variants on the board and let several chess programs analyze the positions simultaneously.

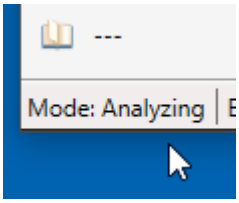

Figure 3: Analyzing

- **Setup Position** Build up a new starting position on the chessboard. It is easiest to set it up on the electronic chessboard.

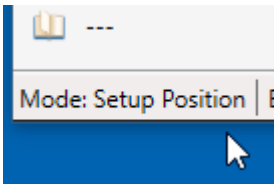

Figure 4: Setup Position

3 Main window

The first start of BearChess shows the following main window:

Figure 5: Main window

Above you have access to different functions of BearChess.

3.1 Actions

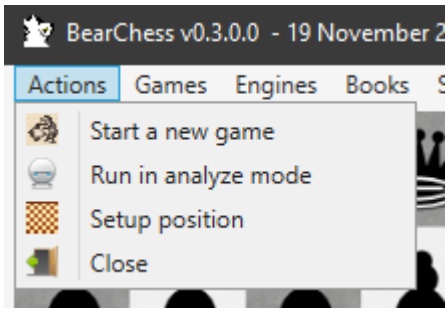

Figure 6: Actions

- **Start a new game** opens a new window to select opponents and time control.
- **Run in analyze mode** allows you to analyze games or positions with suppport of several chess engines.
- **Setup position**
- **Close** exits BearChess

3.2 Games

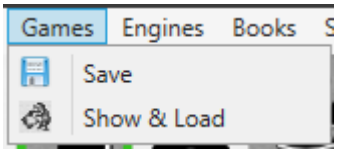

Figure 7: Games

- **Save** your current game.
- **Show & Load** opens a new window in which you can see and load all your previously saved games.

All games are saved in a PGN file.

3.3 Engines

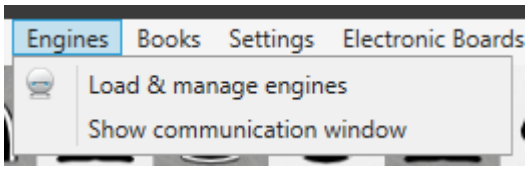

Figure 8: Engines

- **Load & manage engines** opens a new window in which you can install, load or configure your chess engines.
- **Show communication window** opens a new window where you can follow the communication between BearChess and chess engines. It is useful to detect any problems in communication.

3.4 Books

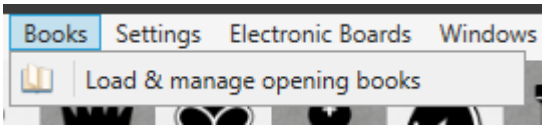

Figure 9: Books

- **Load & manage opening books** opens a new window in which you can install or load your opening books.

BearChess can handle Polyglot and Arena opening books.

3.5 Settings

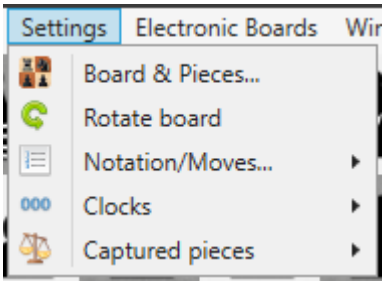

Figure 10: Settings

- **Board & Pieces** opens a window where you can change the appearance of the chessboard and the pieces.
- **Rotate board** if you like to play with black.
- **Notation/Moves** opens a windows where you can change the appearance of the notation, e.g. figurine or letters.
- **Clocks** switches between large and small clocks.
- **Captured pieces** shows the captured pieces window at startup or on demand.

3.6 Electronic Boards

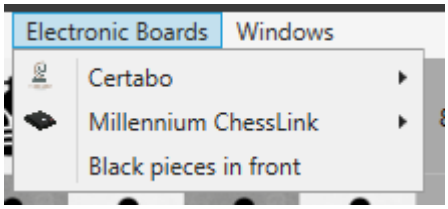

Figure 11: Electronic Boards

- **Certabo** opens a window where you can configure and connect to Certabo chessboards.
- **Millennium ChessLink** opens a window in which you can configure chessboards connected to Millennium ChessLink and connect to them.
- **Black pieces in front** assumes that you have placed the black chessmen in front of you.

3.7 Windows

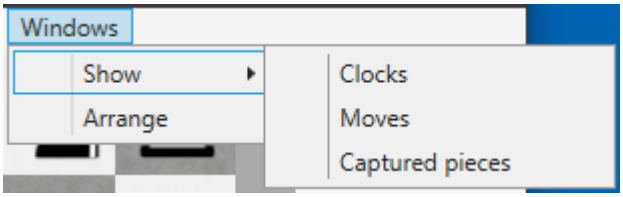

Figure 12: Windows

- **Show** brings clocks or move list windows to the foreground if they are currently not visible.
- **Arrange** auto arange all windows to fit on your screen and not overlapping.
- **Captured pieces** shows the captured pieces. Either all or as a difference.

4 Install, Configure and Load a chess engine

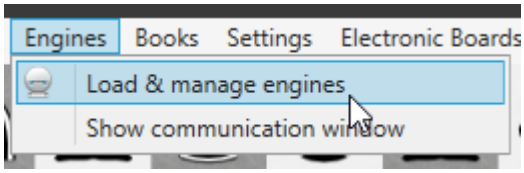

Figure 13: Open Load And Manage UCI Engines window

BearChess does not include a chess engine. Click on "Load & manage engines" to install and configure one. "*Install*" means to make a chess program BearChess known, not to install it on your computer. BearChess supports any UCI engine.

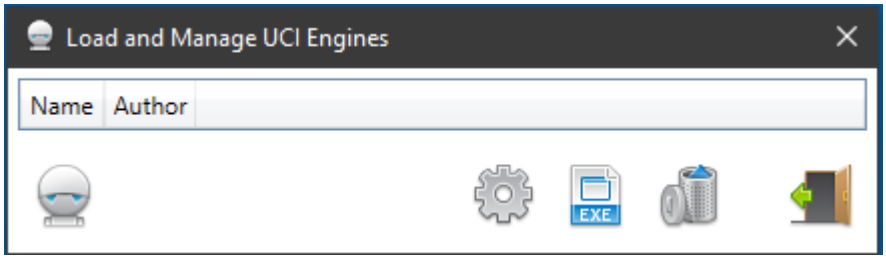

Figure 14: Load And Manage UCI Engines

- Load selected engine
- Configure selected engine
- Install a new engine
- Uninstall selected engine
- Close the window

4.1 Install a new engine

To install a new engine click on and select an UCI engine file, e.g. the latest Stockfish exe file. Or you just drag & drop the exe file onto the button.

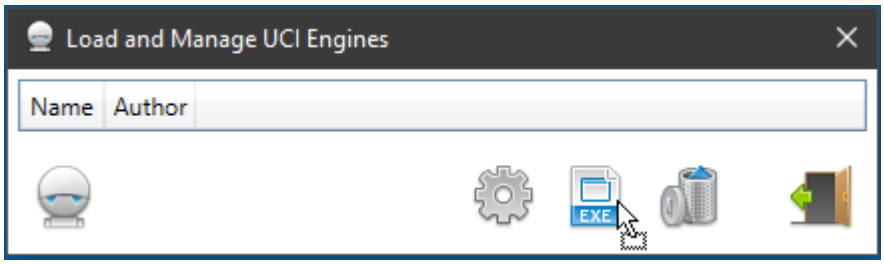

Figure 15: Drop an engine file

If the file detected as UCI engine, confirm your selection.
Next, a configuration dialog box appears where you can configure the engine and give it a name.

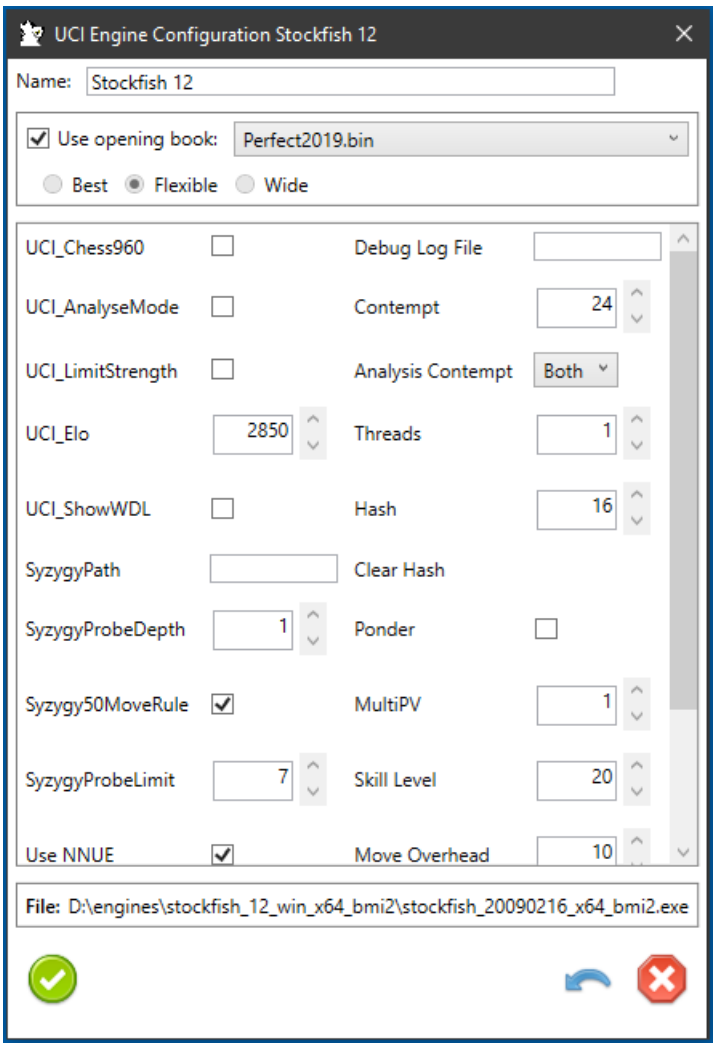

Figure 16: Engine configuration

The name is freely assignable, must be unique across all engines. But this way you can install the same engine several times with different configurations. The configuration values, names and possibilities are given by the engines. The first time these are the default values.

- Accept the changes
- Reset to default values
- Cancel

4.1.1 Use opening book

Some engines comes with there own opening book and you have an option to use them or not. You can also tell BearChess to use an opening book before the moves are calculated by the engines. You can configure how BearChess determines the book move.

- **Best** Always chooses the best move
- **Flexible** Selects one of the best moves
- **Wide** Selects any book move

Look at chapter **5 Load and Manage Opening Books** on page 15 how to install an opening book.

4.2 Configure an engine

To change the configuration of an installed engine click on
The same configuration dialog box as during installation is shown where you can configure the engine or just change the name.

4.3 Load an engine

To load an installed engine, select an engine and click on or just double-click.

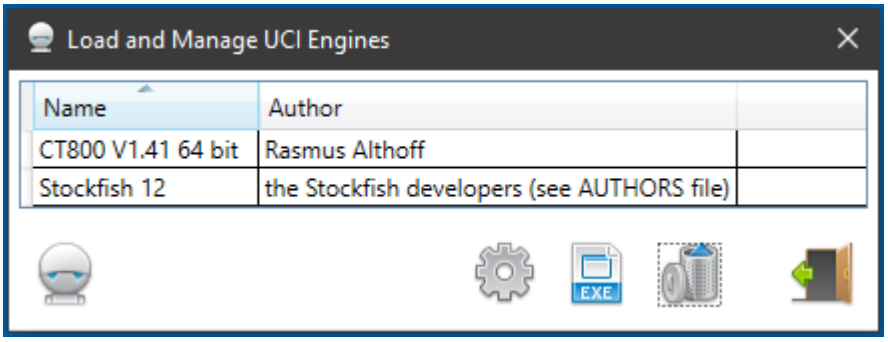

Figure 17: Some installed engines

5 Load and Manage Opening Books

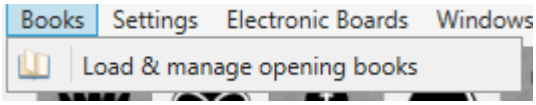

Figure 18: Open Load and Manage Opening Books

BearChess does not include opening books. Click on "Load & manage opening books" to install one. "*Install*" means to make a opening book BearChess known, not to install it on your computer. BearChess supports Polyglot and Arena opening books.

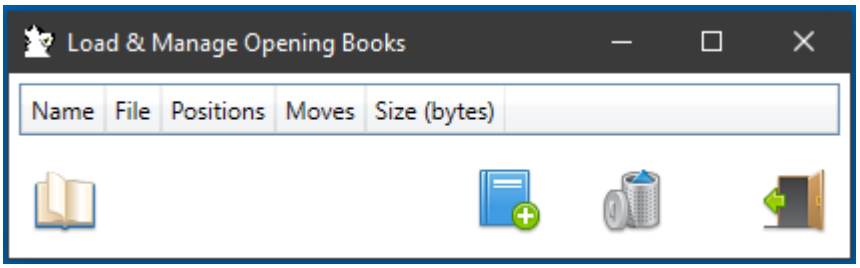

Figure 19: Load and Manage Opening Books

- Load selected book
- Install a new book
- Uninstall selected book
- Close the window

To install a new opening book click on and select a book file. The file extension for Polyglot books is **bin** and for Arena is **abk**.

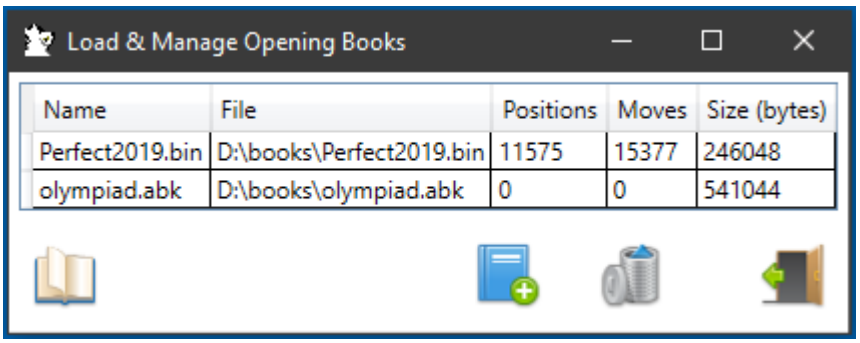

Figure 20: Some installed books

To select an opening book click on or just double-click. A new window opens and shows the current possible moves found in the book.

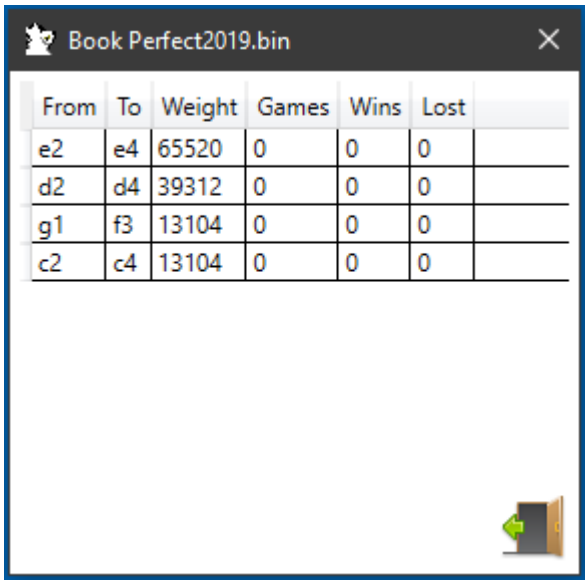

Figure 21: Loaded opening book on base position

You can load more than one book. Every book has their own window and is synchronized with the current position on the chessboard.

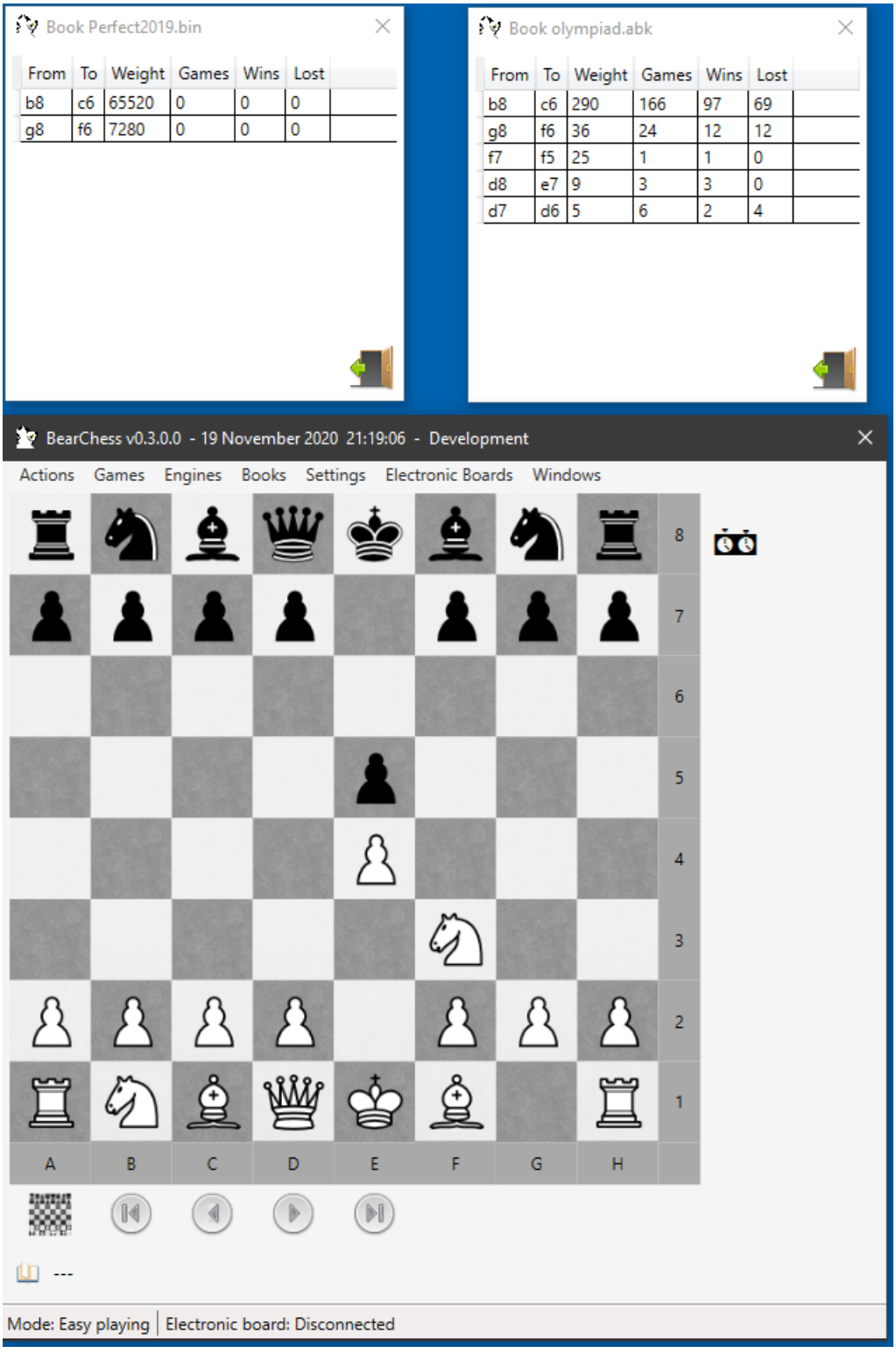

Figure 22: Loaded opening books

* So far, the possibilities are still very limited with the opening books. This will improve in the next versions.

6 Configure Board and Pieces

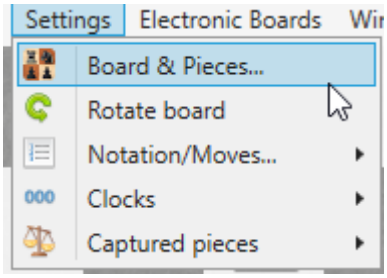

Figure 23: Open window to configure board and pieces

To change the appearance of BearChess select "Board and Pieces". A new window opens where your can configure it. BearChess comes with one set of pieces and board colors.

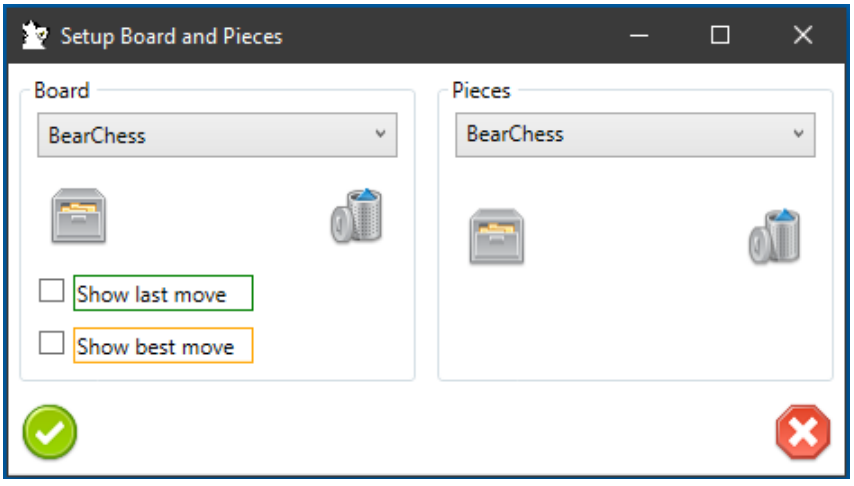

Figure 24: Setup board and pieces

- Install new board colors or pieces
- Uninstall board colors or pieces
- Accept the changes
- Cancel

If the options "Show last move" and "Show best move" are activated, the last move and the currently best analysis move of an engine are marked on the board.

Figure 25: Last move

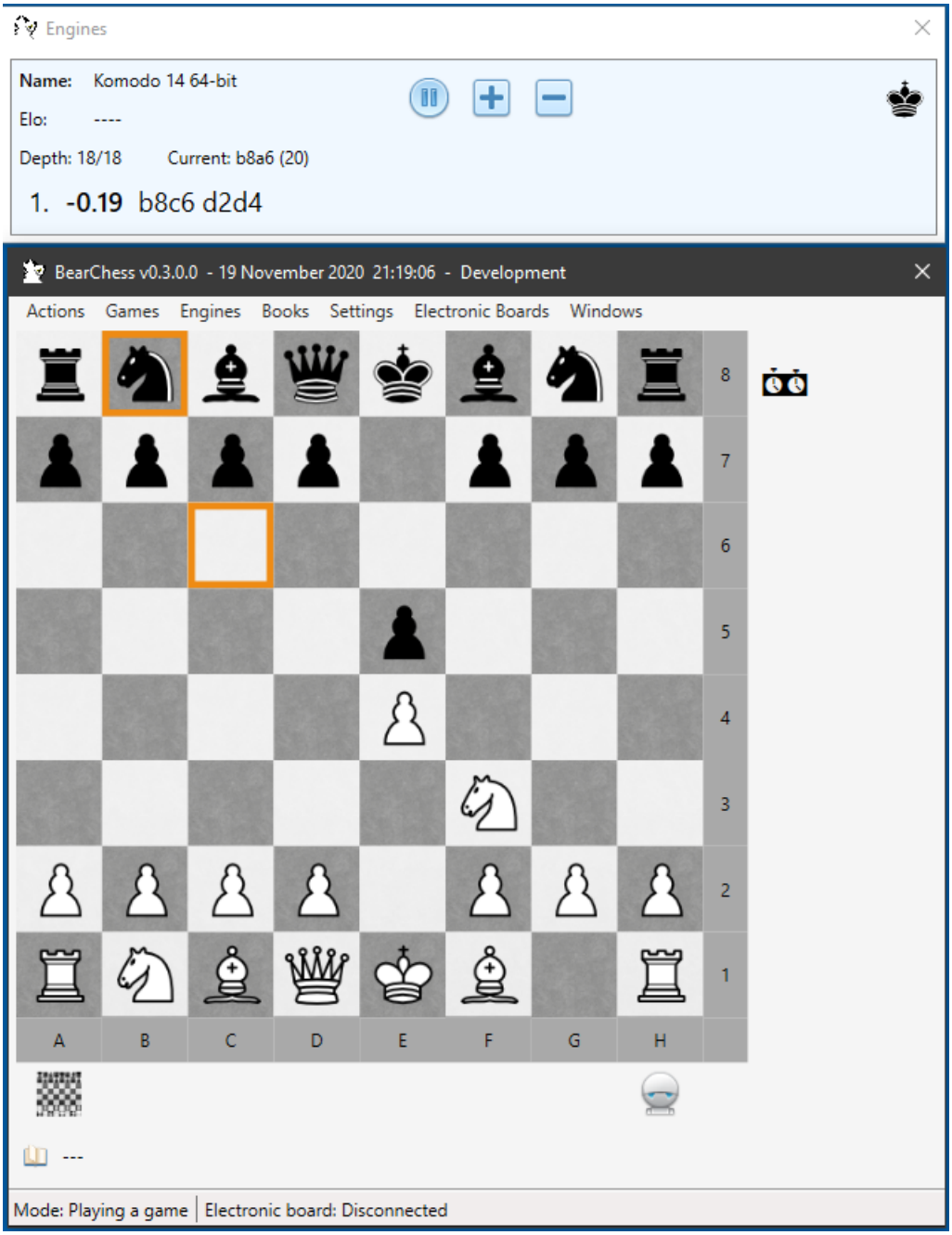

Figure 26: Currently best move

6.1 Install new board colors and pieces

BearChess uses png files for board colors and pieces.

6.1.1 New board colors

Click on to select a directory where the files are located. BearChess accepts `w.png` or `white.png` for white fields and `b.png` or `black.png` for black fields.

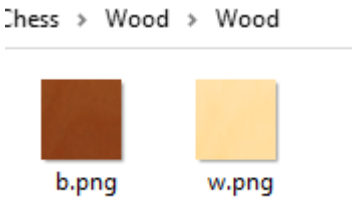

Figure 27: Example for wood fields

If BearChess find both files inside the directory it builds an empty chessboard to confirm your choice. A name for your board is required.

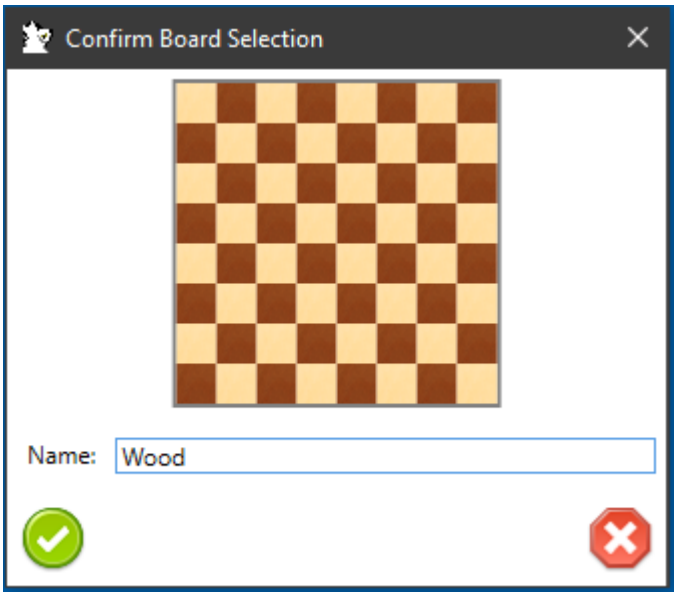

Figure 28: Confirm new board

6.1.2 New pieces

There a two ways to install a new set of pieces. One png file for each piece or one png file with all pieces inside.

Click on to select a directory where the files are located.
Important: The png files must have a transparent background color, oth-

erwise they would paint over the fields. BearChess accepts following names for the different pieces:

- **White king:** `KingW.png`, `WhiteKing.png`, `wk.png`
- **Black king:** `KingB.png`, `BlackKing.png`, `bk.png`
- **White queen:** `QueenW.png`, `WhiteQueen.png`, `wq.png`
- **Black queen:** `QueenB.png`, `BlackQueen.png`, `bq.png`
- **White rook:** `RookW.png`, `WhiteRook.png`, `wr.png`
- **Black rook:** `RookB.png`, `BlackRook.png`, `br.png`
- **White bishop:** `BishopW.png`, `WhiteBishop.png`, `wb.png`
- **Black bishop:** `BishopB.png`, `BlackBishop.png`, `bb.png`
- **White knight:** `KnightW.png`, `WhiteKnight.png`, `wn.png`
- **Black knight:** `KnightB.png`, `BlackKnight.png`, `bn.png`
- **White pawn:** `PawnW.png`, `WhitePawn.png`, `wp.png`
- **Black pawn:** `PawnB.png`, `BlackPawn.png`, `bp.png`

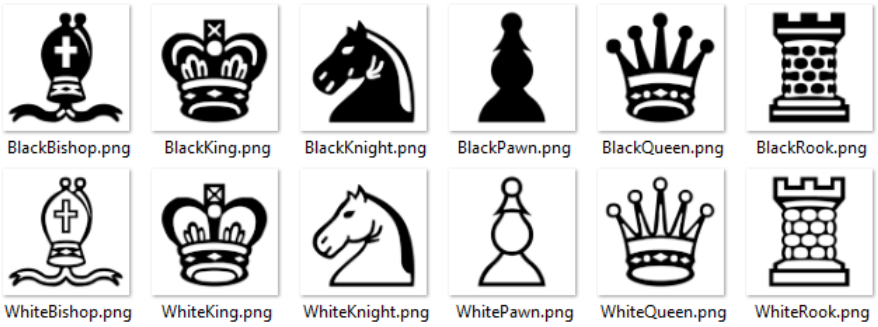

Figure 29: Example one png file for each piece

If BearChess find all files inside the directory it builds an piece set to confirm your choice.

If BearChess find only one png file inside the directory it assumes that this file contains all pieces at once.

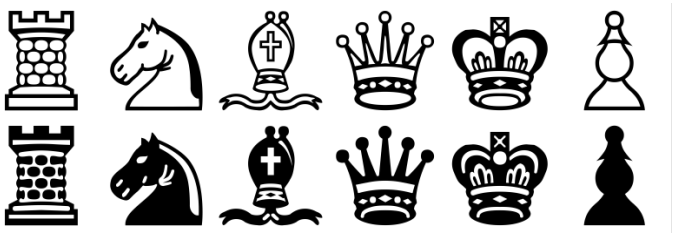

Figure 30: One png file with all pieces

The png must have the pieces in the order and colors shown above. If you have one png file for all pieces, you can just drgp & drop the png file onto the open file dialog icon. It avoids the effort of having to have a separate directory for each file.

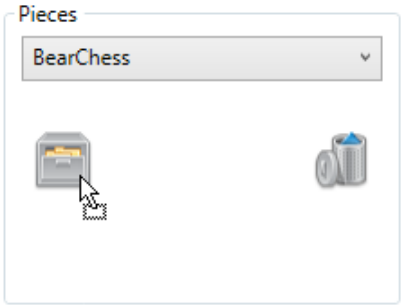

Figure 31: Drop new pieces

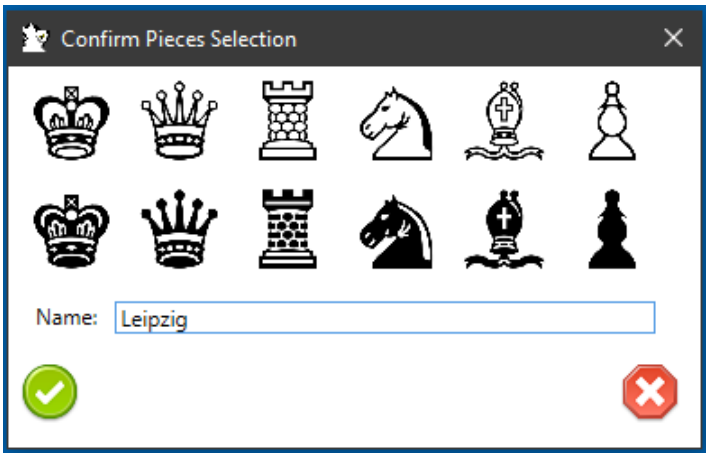

Figure 32: Confirm new pieces

BearChess builds an piece set to confirm your choice. A name for your set is required. Now you can combine your boards with your pieces.

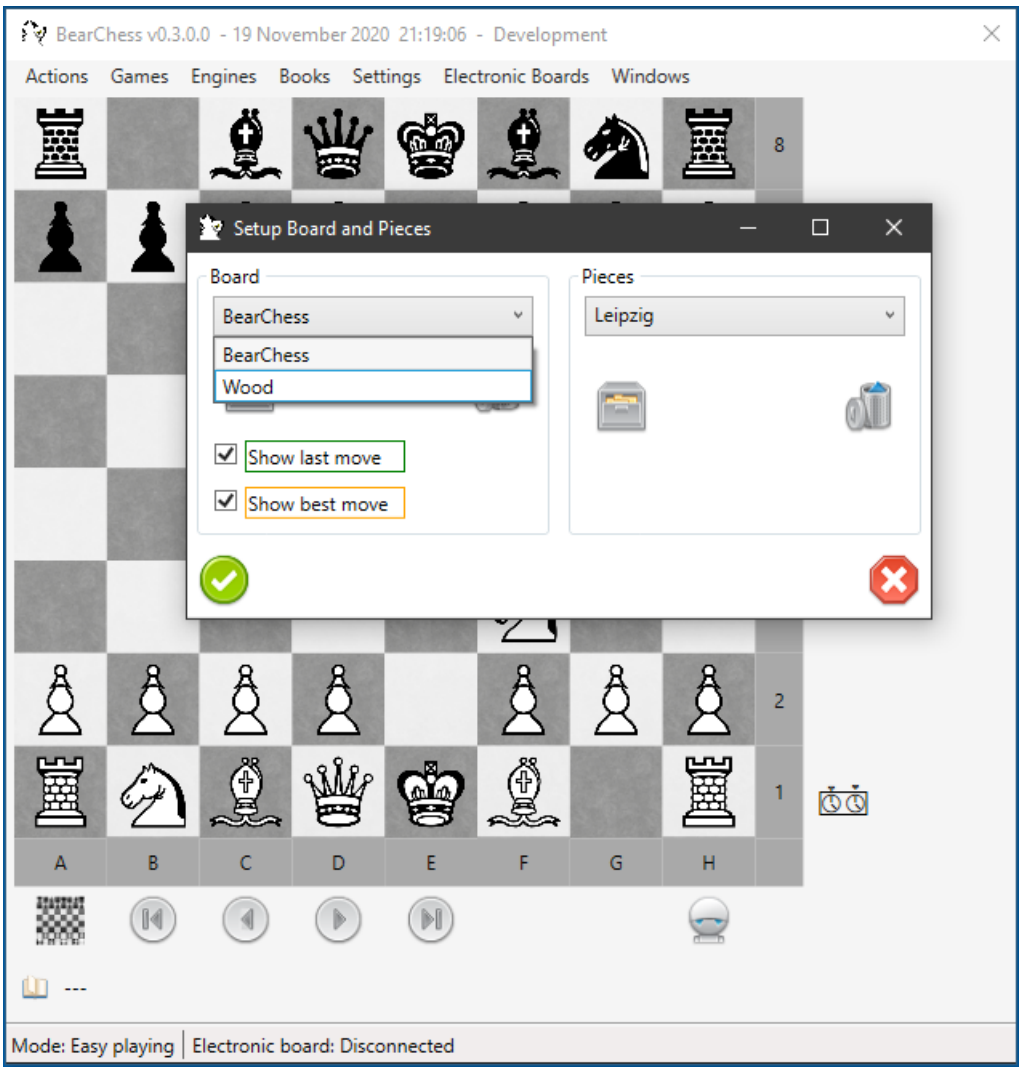

Figure 33: Combine board and pieces

7 Configure Notation and Moves

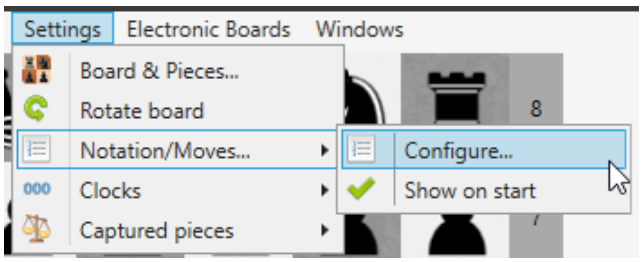

Figure 34: Opens a window to configure notation and moves

BearChess can display moves in different ways.

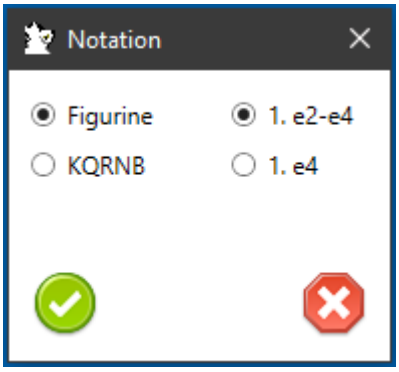

Figure 35: Configure notation and moves

In long and short notation and with symbols or letters for the chessmen.

8 Configure clock style

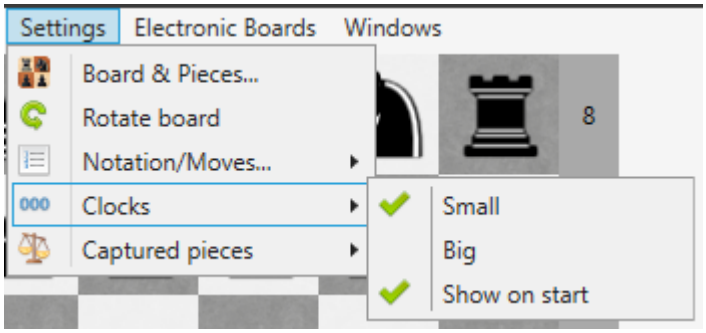

Figure 36: Configure clocks

BearChess offers two different clocks: small and big

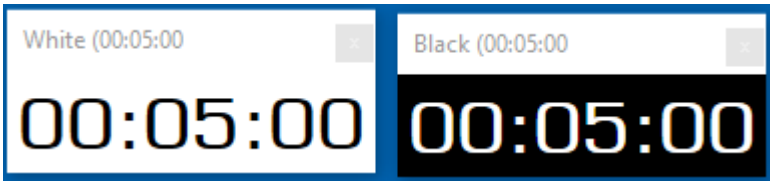

Figure 37: Small clocks

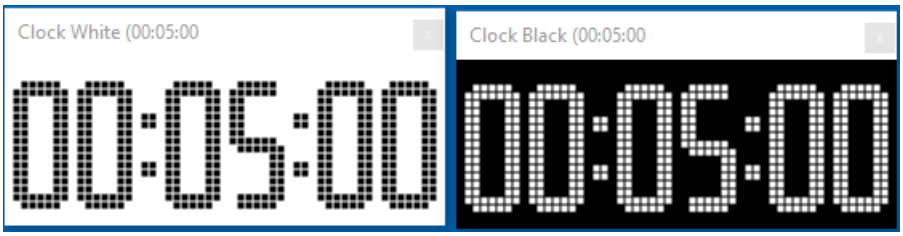

Figure 38: Big clocks

9 Show captured pieces

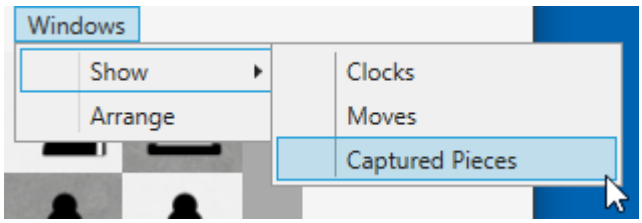

Figure 39: Show captured pieces

Opens a window that shows the captured pieces.

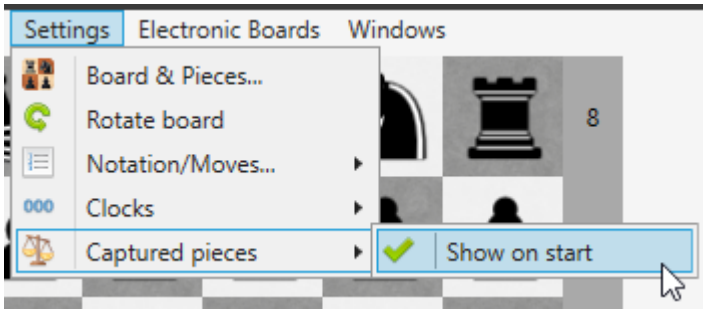

Figure 40: Show captured pieces on start

You can configure this window so that it is displayed at startup.

Figure 41: Show all captured pieces

Figure 41 shows all captured pieces. Black is one queen, one knight a two pawns ahead.

Figure 42: Show captured pieces as difference

Figure 42 shows the same information as difference.
The button switches between both views.

10 Electronic chessboards

BearChess supports two electronic chessboards: Certabo boards and Millennium boards via the ChessLink module. Both boards communicates via an USB port as serial COM port. Which COM port is used is not the same for all computers and can change over time, especially if you have more than one COM port available on your computer.

10.1 Configure Certabo boards

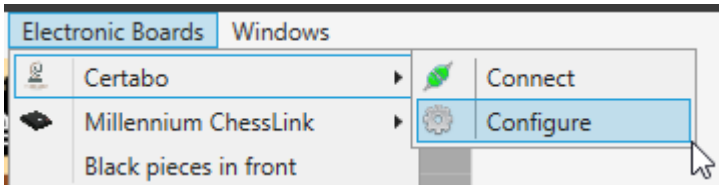

Figure 43: Open a window to configure Certabo boards

Certabo requires two configuration steps. The used COM-port and a calibration to detect the chess pieces.

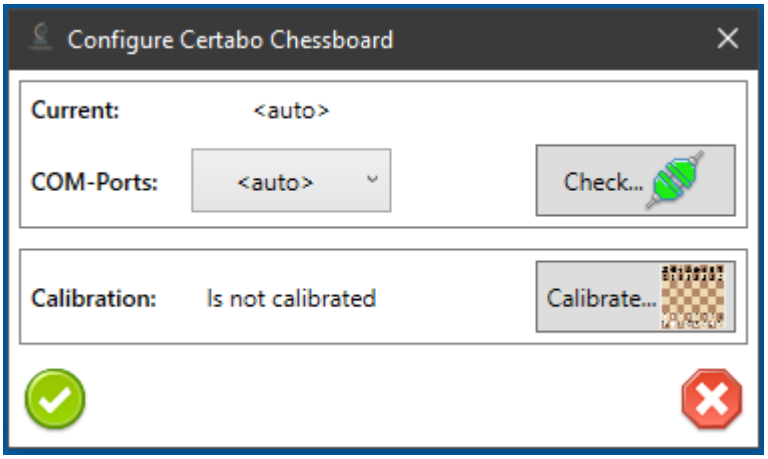

Figure 44: Configure Certabo boards

Select the COM port if you know them or let the <auto> selection. Click on to verify your selection.

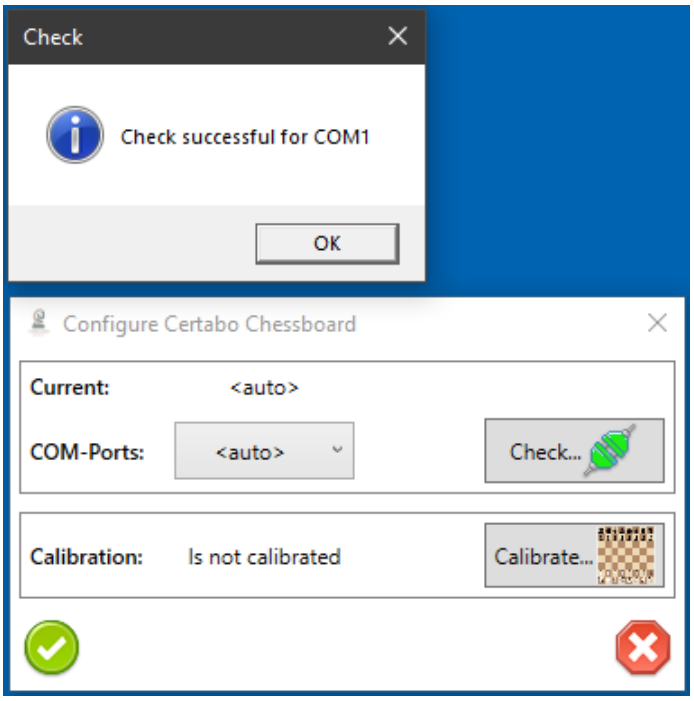

Figure 45: COM port successful detected

If you select an invalid COM port, you will receive the following error

message:

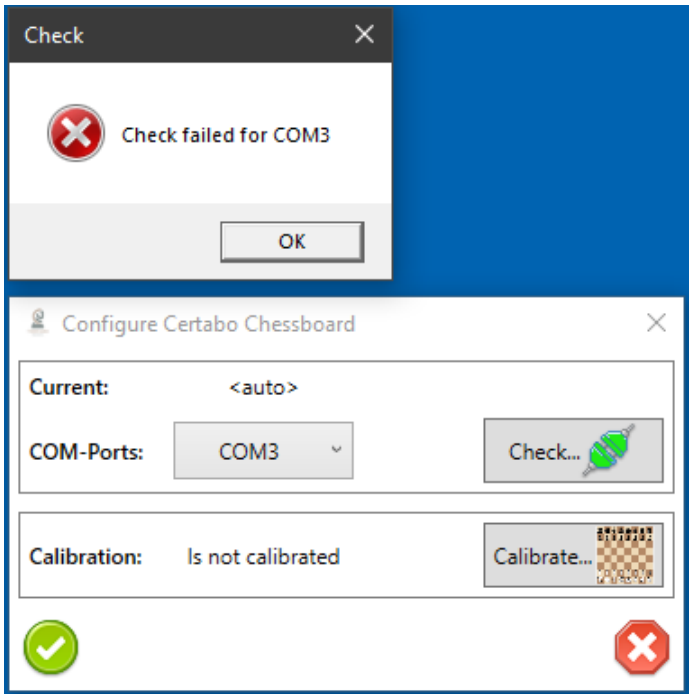

Figure 46: Invalid COM port

If you select <auto> and no board is found, you will receive the following error message:

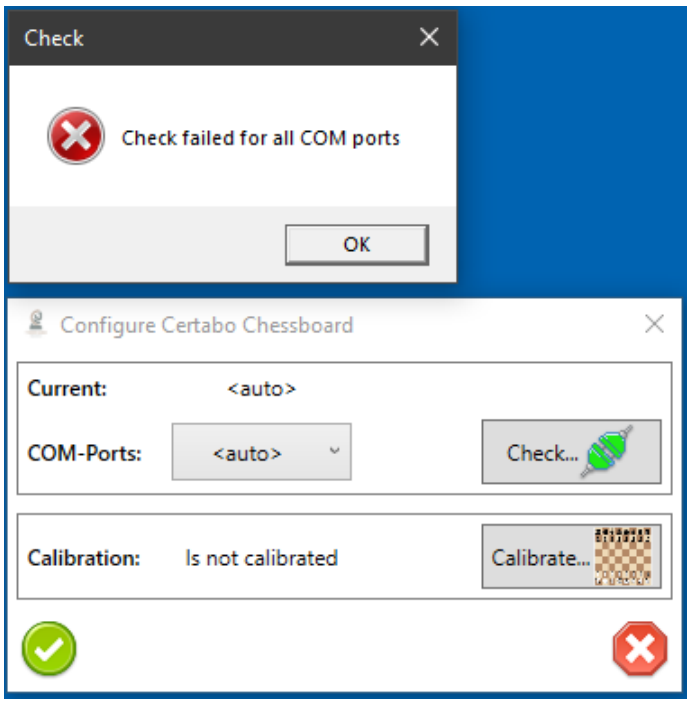

Figure 47: No board found

Hint: You can always use the selection <auto>, but if you have more than one COM port available, it can always take some seconds until the right one is recognized.

10.1.1 Calibration

At the first start, BearChess needs a calibration to identify your chessmen. A new calibration is only required if you use another set of chessmen.

Click on to open the calibration dialog.

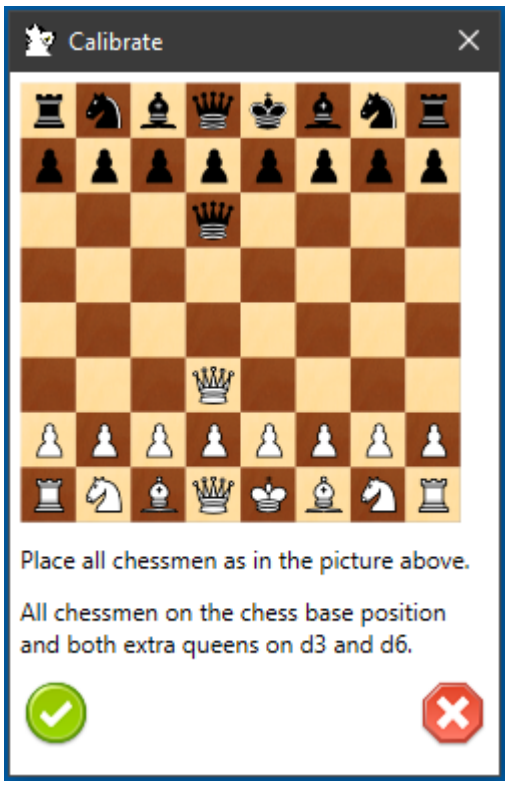

Figure 48: Calibrate base position

If all pieces on the right position click the accept button. When a calibration is running, you will see the chessboard LEDs flashing each row. Please wait until all LEDs are off and the confirm dialog appears.

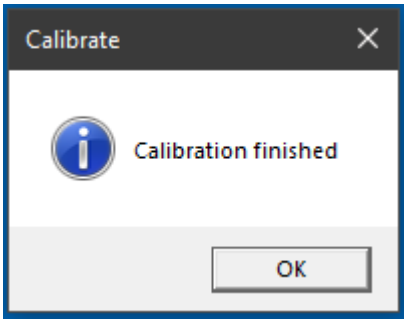

Figure 49: Calibration finished

Hint: If the calibration never seems to end, check that the chessmen are correctly placed in the middle of the squares.

10.1.2 Connect

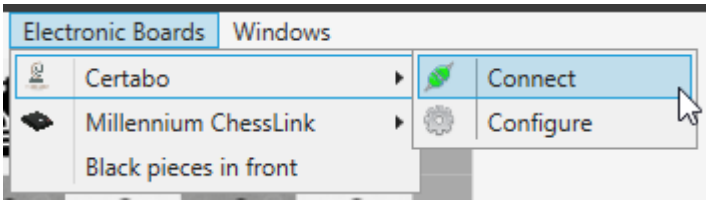

Figure 50: Connect to Certabo

When the configuration is complete, you can connect to your chessboard. In the lower right corner a new button appears, which allows you to easily connect or disconnect your board. The current status is also written.

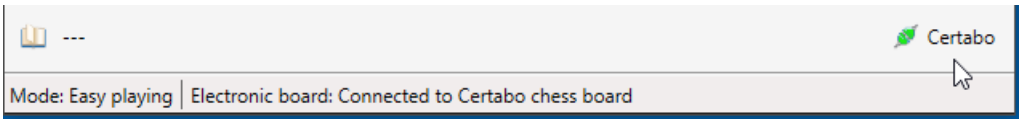

Figure 51: Connected

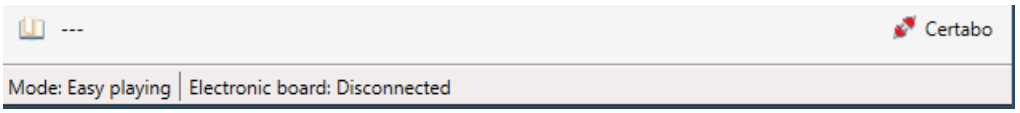

Figure 52: Disconnected

10.2 Configure Millennium ChessLink

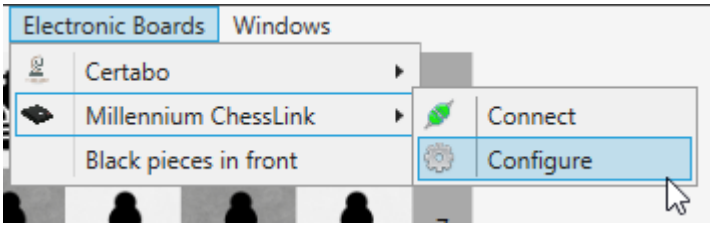

Figure 53: Open a window to configure Millennium boards

For your Millennium ChessLink you may need to configure the COM port used. You can also change how the LEDs should light up.

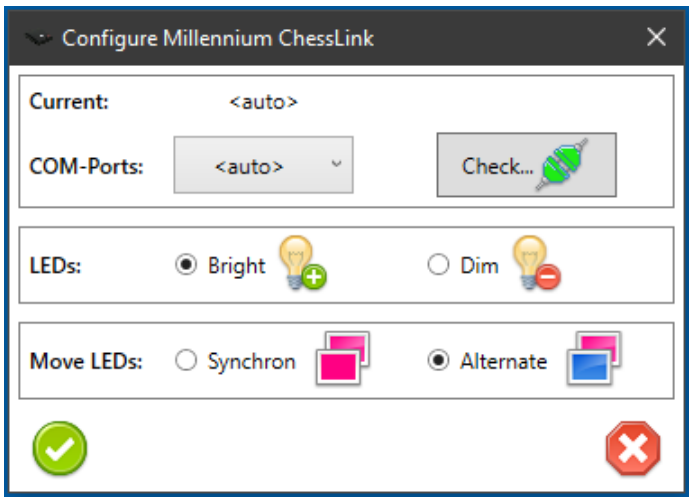

Figure 54: Configure Millennium ChessLink

Select the COM port if you know them or let the <auto> selection. Click on to verify your selection.

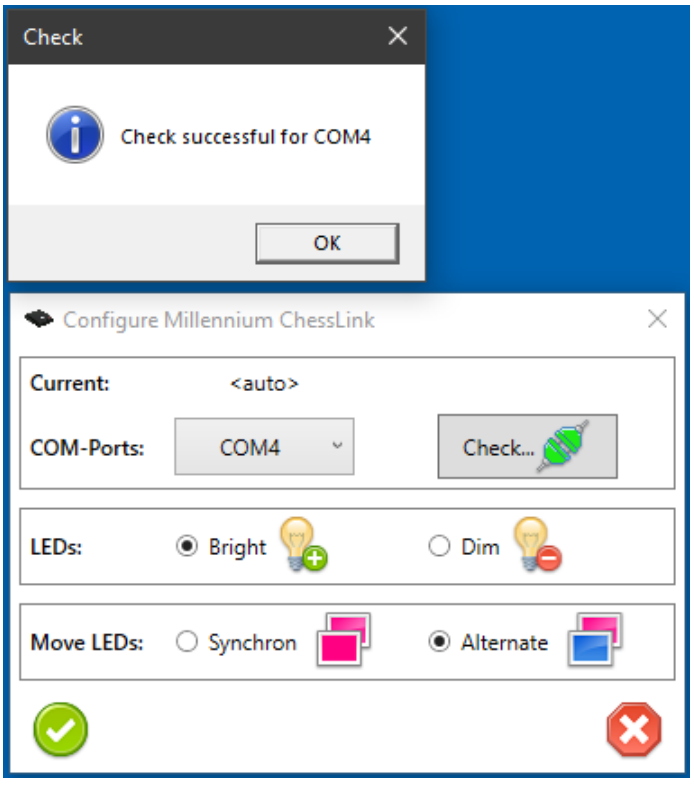

Figure 55: COM port successful detected

If you select an invalid COM port, you will receive the following error message:

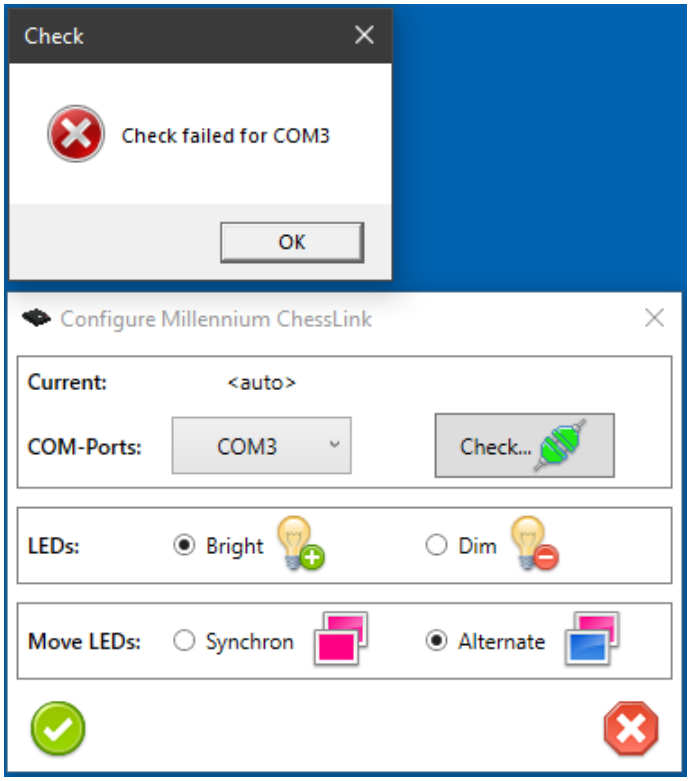

Figure 56: Invalid COM port

If you select <auto> and no board is found, you will receive the following error message:

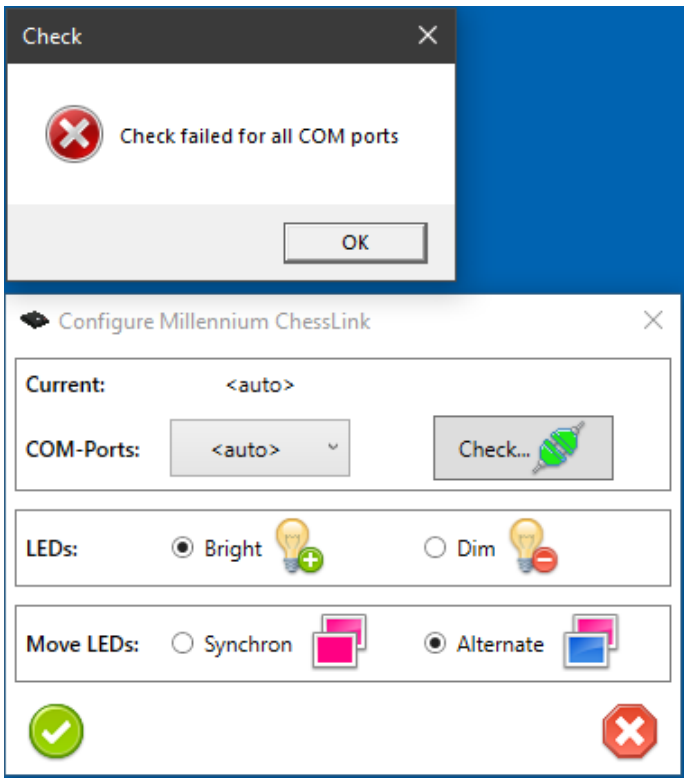

Figure 57: No board found

Hint: You can always use the selection <auto>, but if you have more than one COM port available, it can always take some seconds until the right one is recognized.

You can change how the LEDs should light up. The brightness and whether the LEDs should flash alternately or synchronously when indicating moves.

10.2.1 Connect

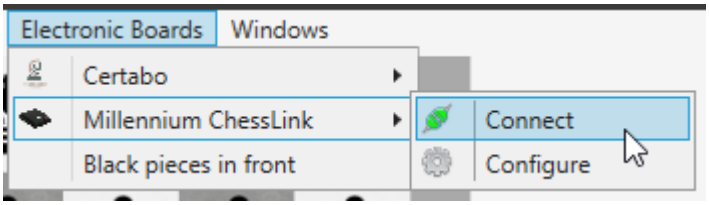

Figure 58: Connect to Millennium ChessLink

When the configuration is complete, you can connect to your chessboard. In the lower right corner a new button appears, which allows you to easily connect or disconnect your board. The current status is also written.

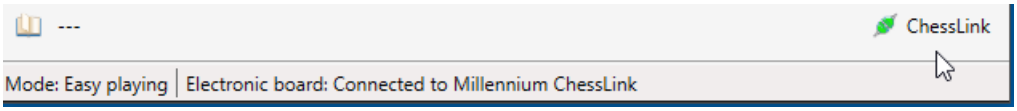

Figure 59: Connected

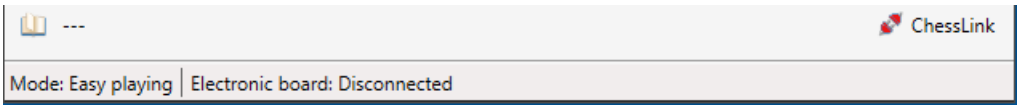

Figure 60: Disconnected

11 Start a game

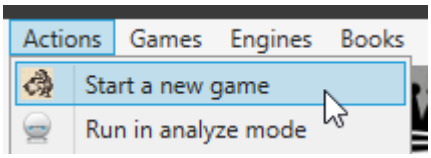

Figure 61: Opens a window to play a new game

If you start a new game you can select the opponents and the time control.

11.1 Select opponent

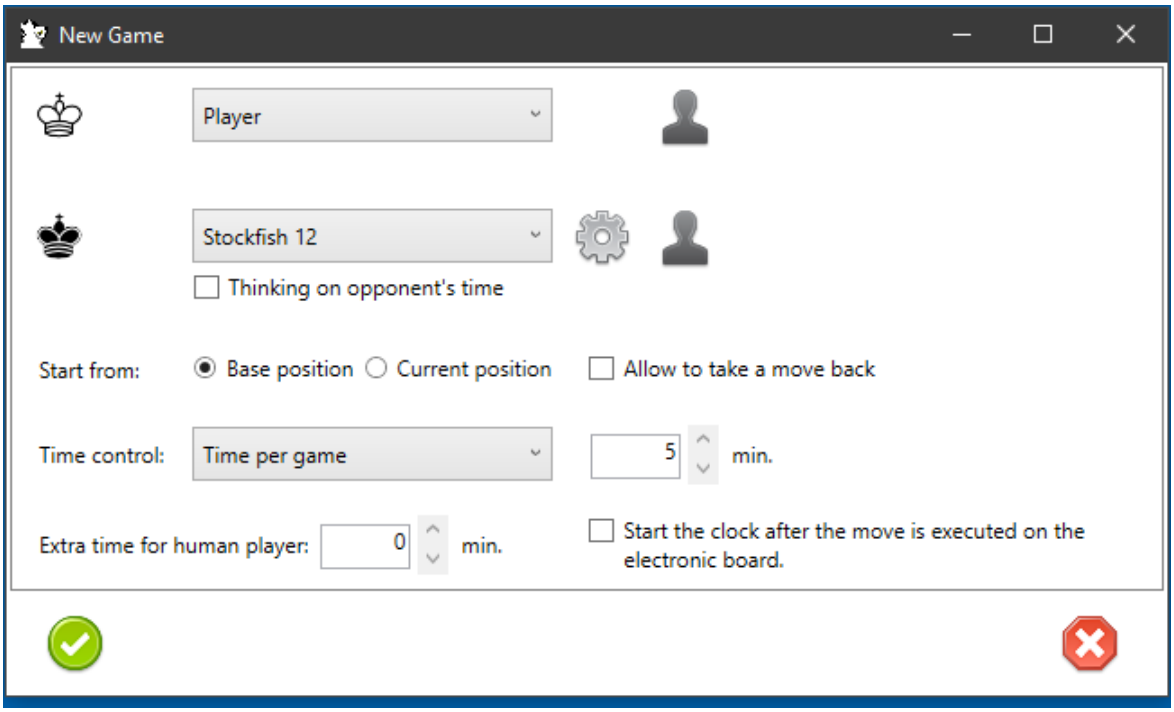

Figure 62: Play a new game

Select the opponents for white and black . "Player" means a human opponent. You can select "Player" for white and black if you want to play a game against another human opponent on your chessboard. You can select an engine for white and black if you want to play a pure engine match.
is a shortcut to select "Player".

* You cannot use an electronic chessboard for a pure engine match. This is still in development.

opens the engine configuration dialog. This is the same dialog as for Load and manage engines. However, all changes are only used for this game and are not saved permanently.
* "Thinking on opponent's time" is also known as ponder. Use the configuration dialog to activate or deactivate it. The checkbox control is still in development.

11.2 Start from

Select your start position. The default is the base position, but you can start from any position on the board.

11.3 Allow to take a move back

It is worth activating this option for a training session or when playing against a strong engine. If you are using an electronic chessboard, just take back the last move. The LEDs show you the next previous move. Follow them until you make the right move.
If you are not using an electronic chessboard, you can use the move controls below the board.

Figure 63: Move controls

11.4 Time control

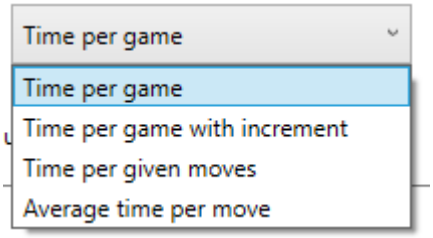

Figure 64: Time control

- **Time per game** limits the entire game to the given minutes.
- **Time per game with increment** limits the entire game to the given minutes but give extra seconds for every move.
- **Time per given move** limits the game for moves in a certain time frame, e.g. 40 moves in 60 minutes.
- **Average time per move** requires the engine to execute the moves in an average time of seconds or minutes.

"Extra time for human player" add extra minutes for human opponents.

* **"Start the clock after the move is executed on the electronic board"** avoids a time gap to execute the moves of the engines on the board.

11.5 Influence of BearChess in engine games

Chess engines generally do not have the ability to give up or to recognize a draw, e.g. by repeating moves. In a match between two engines BearChess checks the moves and the current rating. If a draw is detected, e.g. by a move repetition or insufficient material, the game is ended.

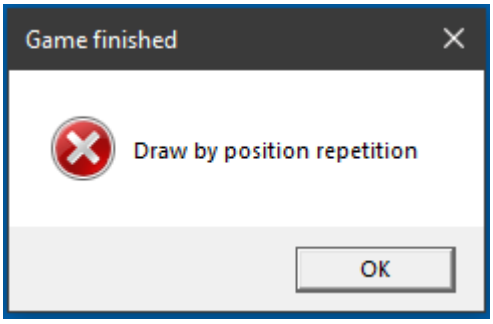

Figure 65: Draw by repetition

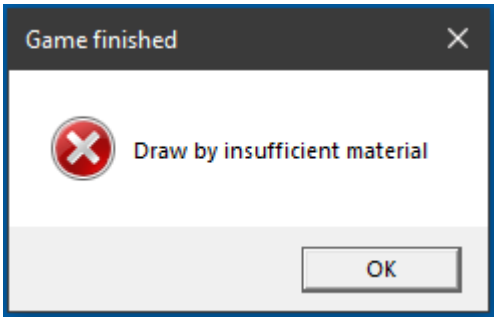

Figure 66: Draw by insufficient material

If both programs give at least a -4 or +4 in their scores over several moves, the game is finished.

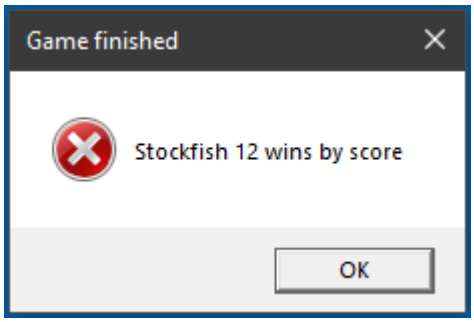

Figure 67: Won by score

12 Analysis mode

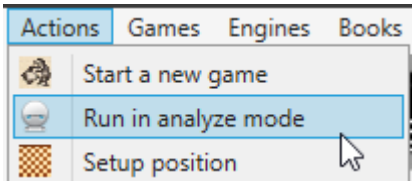

Figure 68: Analysis mode

One outstanding feature compared to other GUIs is the analysis mode. The idea behind it is how a player analyses his games or interesting positions. The figures are quickly rearranged or moves are made that do not always conform to the rules.
For example, the player does not want to go back the last three or four moves to try out a new variant. He sets up the new position directly on the board. Or you are more of a beginner and want to practice a typical endgame, e.g. king and pawn against king. You then want to know quickly if this move leads to a win or if the opponent can draw.
You can achieve all this with the analysis mode.

12.1 With electronic chessboard

You get the biggest advantage if you have connected an electronic chessboard with a piece recognition. Connect your electronic chessboard before you start the analysis mode.
When you start the analysis mode, you will be asked to select a supporting analysis engine.

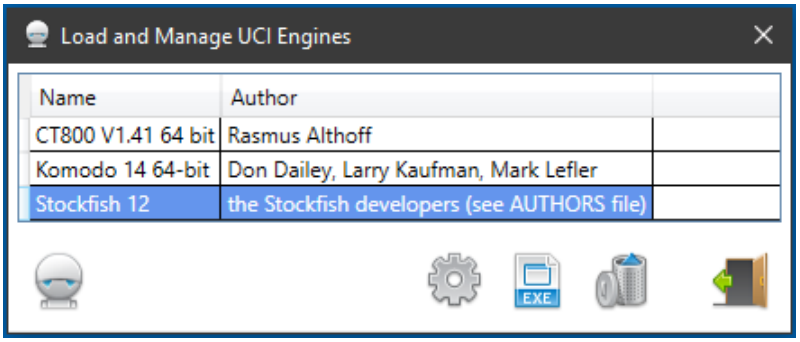

Figure 69: Selection for an analysis engine

The engine immediately starts to analyze the current position. If you want, you can add more engines.

Now you can remove or add figures or make moves on your chessboard as you like. The engine window shows immediately the current analysis. The current color results from which figure was moved last. To change the color, simply lift a figure of the current color and put it back in its place. The analysis will then start for the other color. Especially in endgames it can be important to know which color is on the move. Think of the king and pawn versus king endgame.

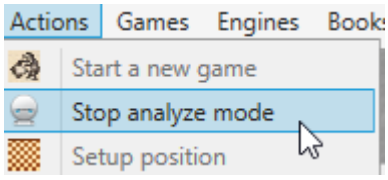

Figure 70: Stop analysis mode

12.2 Without electronic chessboard

You can also use the analysis mode without an electronic chessboard. If you do not want to start from the base position, you should first set up the desired position via Setup position.
When you start the analysis mode, you will be asked to select a supporting analysis engine.

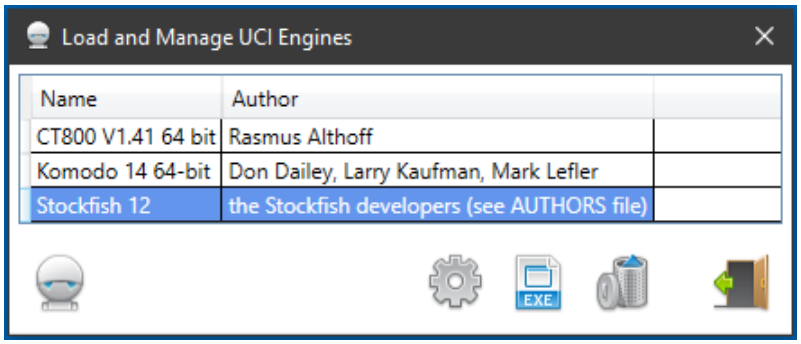

Figure 71: Selection for an analysis engine

The engine immediately starts to analyze the current position. If you want, you can add more engines.
You can rearrange individual figures by clicking on the figure and then on the target field.
If you press the right mouse button on a field, a context menu appears.

Figure 72: Analysis context menu

Click on one the figure to place in on the selected field. If the is a piece on the field, the button removes it from the board. With the two clocks symbol can you switch the current color.

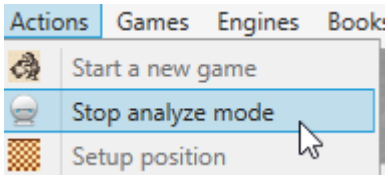

Figure 73: Stop analysis mode

13 Setup position

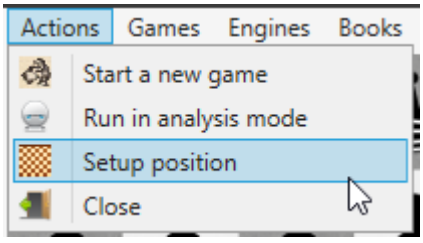

Figure 74: Opens a window for position setup

Setup a new position is very easy. You can do it with or without the support of an electronic chessboard.

13.1 With support of an electronic chessboard

First connect to your electronic chessboard before you run the setup. This is important, because the further behaviour of the program depends on it. The small board starts with the current position.

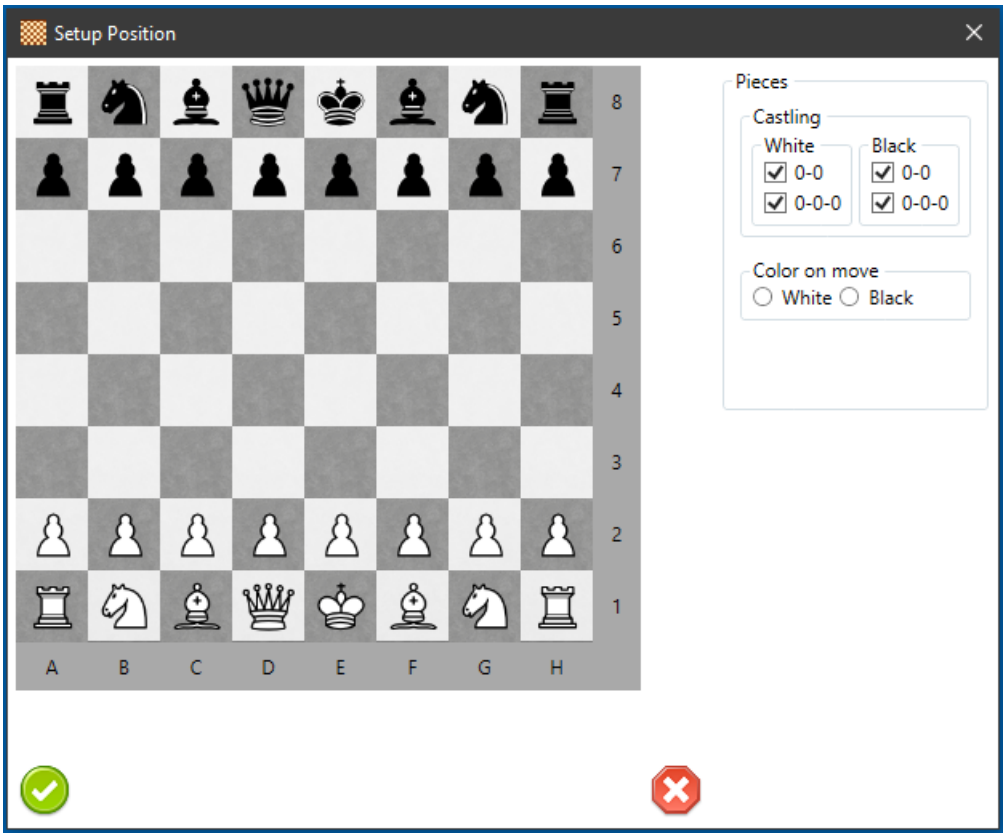

Figure 75: Setup a new position with an electronic chessboard

Now you can also give the electronic chessboard an arbitrary position, which is immediately displayed on the small chessboard.
Don't forget to set the castling rights and current color.

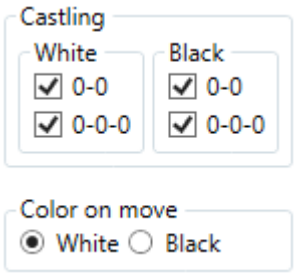

Figure 76: Castling rights and current color

With the button the new position is placed on the chessboard.
* It is not completely checked whether the position is valid. This also applies to castling rights.

13.2 Without support of an electronic chessboard

First ensure you are **not connect** to your electronic chessboard before you run the setup. This is important, because the further behaviour of the program depends on it.
The small board starts with the current position.

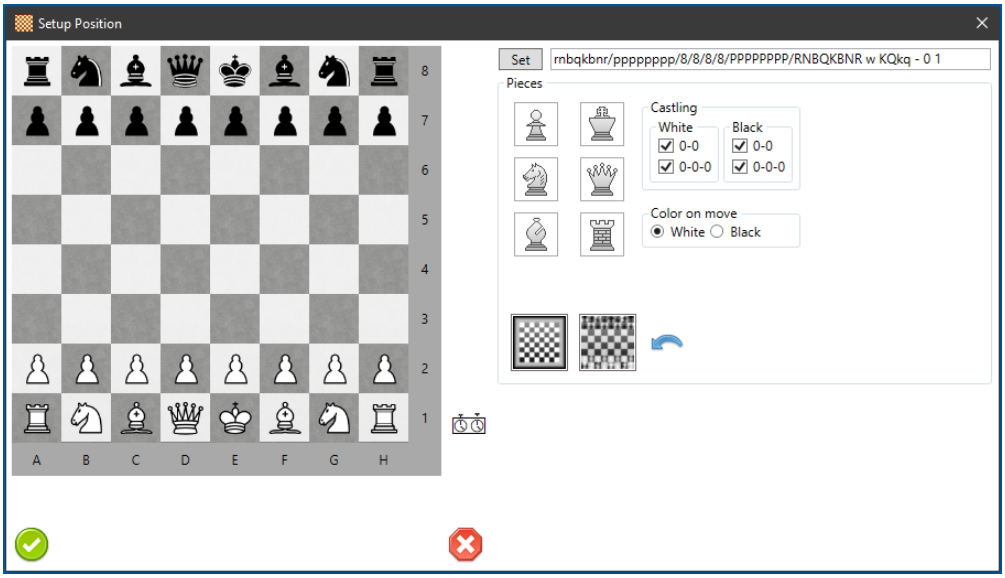

Figure 77: Setup a new position without an electronic chessboard

The input box shows the fen position. You can insert a new position in the input field and click on "Set" to place it on the small board.

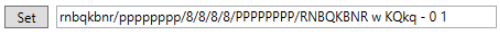

Figure 78: FEN input box

To place a piece on the board, select the corresponding icon. The desired color is not important here.

With a left click on the small board you place a white piece, with a right click a black piece. If you click on field with a piece on it, you remove it. Don't forget to set the castling rights and current color.

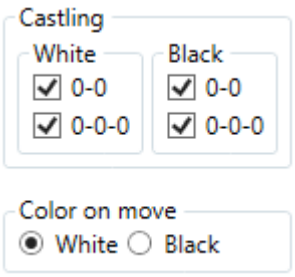

Figure 79: Castling rights and current color

There are three buttons to quickly set the base position or empty the board.

- Remove all pieces from the board.
- Put all pieces on their base position.
- Reset to start position.

With the button the new position is placed on the chessboard.
* It is not completely checked whether the position is valid. This also applies to castling rights.

14 Games

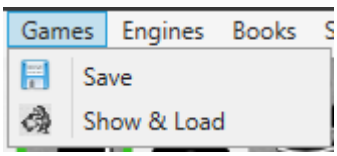

Figure 80: Games

14.1 Save

BearChess stores all games in one PGN file. When you save a game for the first time, you must first select a PGN file.
The save dialog is prefilled with the known data. But you can correct them before saving.

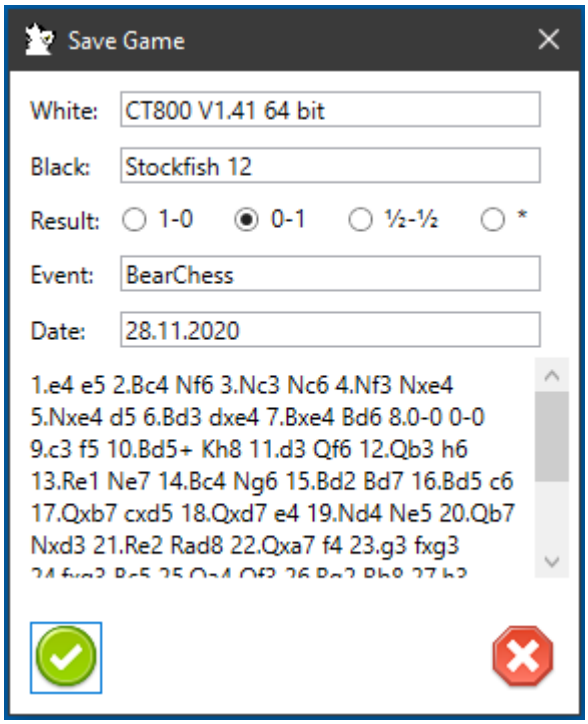

Figure 81: Save a game

* Currently BearChess does not support comments or variants in the PGN notation.

14.2 Show and load

BearChess stores all games in one PGN file. The current name is shown in the title bar.

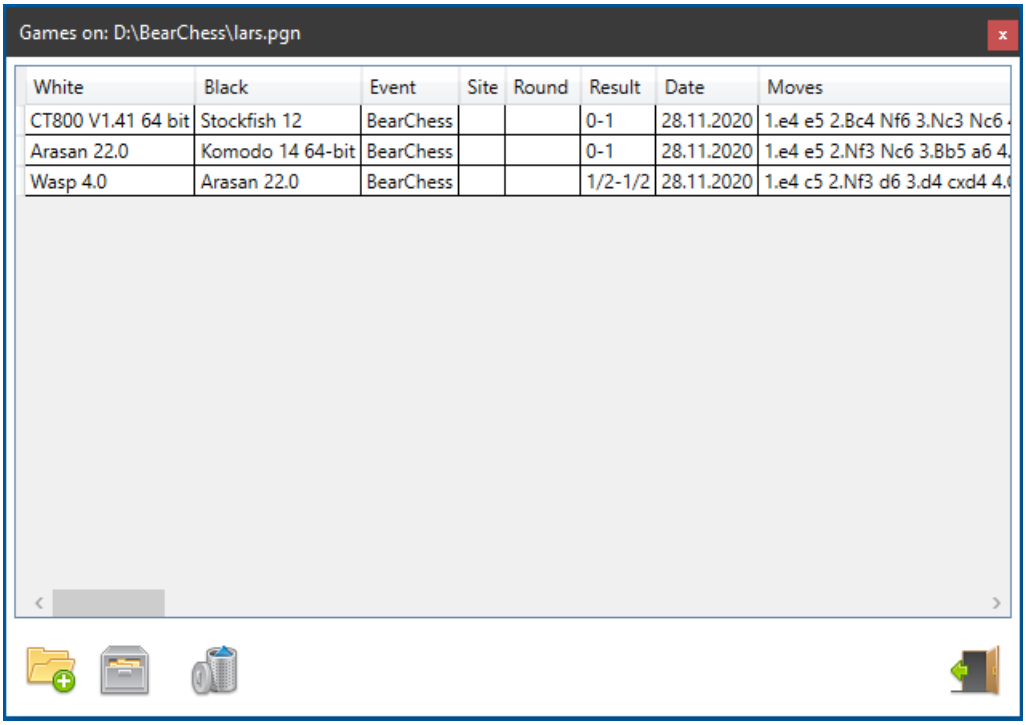

Figure 82: Games window

If you double click on a row, the game is displayed on the board.

- Create a new games file.
- Open an existing games file.
- Delete selected game.
- Close the window.

* Currently BearChess does not support a search a filter function.

15 Engine window

Each loaded engine is listed in the engine window.

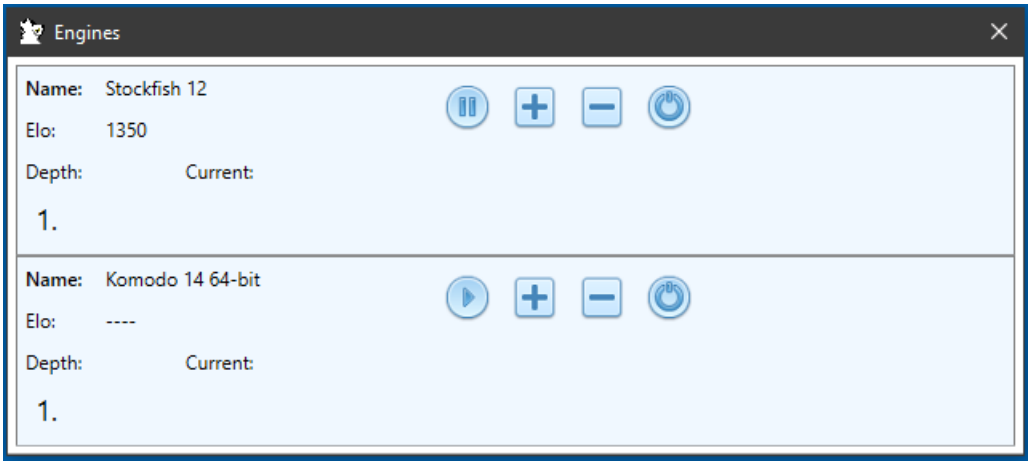

Figure 83: Two loaded engines

If the engine allows to configure its ELO number, it appears under the name.

- Pause the engine or continue.
- Add a info line.
- Remove a info line.
- Close the engine. Not visible if you play a game.

If you have configured that currently the best move should be displayed, the analysis of the topmost engine is taken.

Figure 84: Two loaded engines

16 Extended engine support

Another outstanding feature compared to other GUIs is the extended engine support. You can load one or more engines at any time to assist you in a game against another engine or another player.

1. Start a new game against an engine.
2. Load a second engine for assistent.

The following figure gives you an example. You play a game against Stockfish and Komodo gives hints for the next best move.

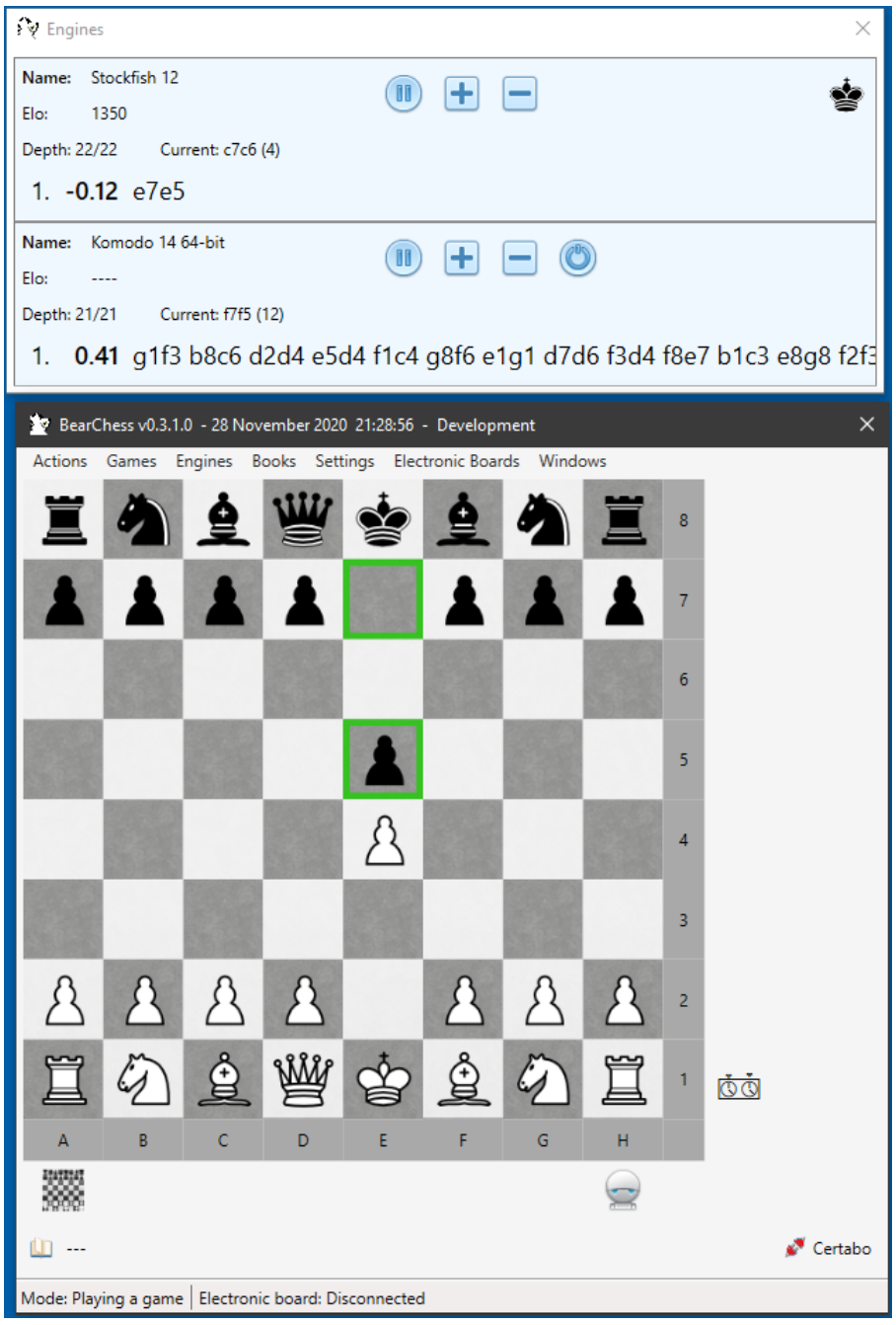

Figure 85: Play against Stockfish with support from Komodo

Even if you are not playing a game and are on mode "Easy playing", just load some engines and make your moves.

17 Important To Know

17.1 Certabo: Calibration

For the first time, the engine assumes that all chessmen are on their initial position and the extra queens on d3 (white queen) and d6 (black queen). You can also perform the calibration without extra queens. But this has an effect on the transformation of a pawn into a queen.

17.2 Certabo: Pawn conversion to a queen

If you have performed the calibration without extra queens and are performing a pawn conversion with a extra queen on your board for the first time, the program needs a few seconds to identify the new piece. Please wait until the LEDs are off. The new piece code is stored. There is no delay next time.

18 Trouble shooting

18.1 The chess moves are not or not correctly displayed

- Check the correct COM port in the configuration dialog.
- Check the position of the chessmen. Moves are only accepted if the chessmen are on the correct square. Fields with missing or wrong figure light up.

19 Known Issues

- **UCI configuration** Buttons are not supported.
- **UCI configuration** Some textual informations are wrong interpreted.
- **Setup position** It is not completely checked whether the position is valid. This also applies to castling rights.
- Some windows may overlap for the first time, e.g. the clocks for white and black.
- If you want to play an engine match with the same engine for black and white you have to install the engine twice with a different name.

20 Next Steps

- Error correction.
- Develop missing functionality *

- Improvements on handling UCI configuration.
- Improvements on handling saved games.

21 Changelog

21.1 Version 0.3.2.0 =>0.3.3.0

- Support of opening books for engines.
- Opening book: When castling, the correct squares are displayed.
- Improvements and bug fixes in "New Game" dialog.
- Minor fixes.

21.2 Version 0.3.1.1 =>0.3.2.0

- Show check and mate signs in move list.
- Show captured pieces.
- Save configuration for "Black pieces in front".
- Improvements in the configuration chessmen.
- Improvements to install a new engine.

21.3 Version 0.3.1.0 =>0.3.1.1

- **Hotfix** Error at pure engine match.
- Improvements in the handling of UCI configuration values.

21.4 Version 0.3.0.0 =>0.3.1.0

- Improvements in the calibration for Certabo chessboards.
- Fixed an error on pawn conversation.
- Fixed an error on position setup via electronic chessboard.