USER MANUAL

Note: This manual may also be available in other languages at:
www.digitalgametechology.com

THE CHESS INNOVATORS

Introduction

Congratulations on your purchase of DGT Pi, the world's only all-in-one programmable chess computer with integrated chess clock that turns your USB, Smart Board or DGT Bluetooth e-Board into your best sparring partner. Connected together, the e-Board and DGT Pi offers a unique way to play chess, to train and to analyse games and positions by using a real chess board and pieces.

The DGT Pi is a chess computer that runs various chess engines on a Raspberry Pi, which is built into the DGT 3000, the most advanced chess clock currently available. Many different game settings and playing levels can be selected. The display guides you through the menu settings and informs you during the game, showing clock times, game moves and hints.

To start a game, simply connect DGT Pi to your DGT e-Board and place all the pieces in the starting position. Then just make your first move to start a game. During thinking time, the display shows a countdown timer. When DGT Pi calculated its next move this move will be shown on the display. Now make the computer move on the e-Board and it will again be your turn to move. There is no need to press the clock's lever after each move as you would do in a regular chess game. The countdown clock automatically switches sides when a move is made on the e-Board. Pressing the lever during a game will result in a change of colours allowing you to switch from playing with white pieces to playing with black pieces and vice versa.

DGT Pi can also be used as a DGT3000 chess clock only. Consult the separate DGT3000 manual for instructions. Two batteries (included) should be installed at all times even when the device is used as a chess computer and the external power adapter is connected. When using DGT Pi as a chess clock it is not necessary to connect the power adapter.

The purpose of this manual is to explain the functionality of the dedicated DGT Pi chess computer. It describes how to connect DGT Pi to your DGT e-Board and explains how to pre-define settings and set-up your chess games. You can use DGT Pi for training purposes or experience great chess games against a range of different chess engines with competitive Elo ratings. It is also a valuable self-teaching tool for beginners.

This manual is based on the DGT Pi PicoChess software version 0.9L Free upgrades of implemented features and supported engines will be made available from time to time. Such future software versions and new features may not be covered by this manual. Within this context, also read the disclaimer at the end of this manual. For future software and manual updates, please regularly check our website www.digitalgametechnology.com or register for our mailings at the product registration page of our website.

Contents of the box

Following items are included in the gift box:

1. DGT Pi chess computer
2. Auto range 5 Volt power adapter with micro USB connection
3. Micro SD card (already inserted into the SD slot of the DGT Pi)
4. Micro SD card adapter (for manual update only)
5. Battery set (2 x AA)
6. Manual DGT3000 (6 languages)
7. Manual DGT Pi (5 languages)
8. Power adapter for Euro, USA and UK
9. USB cable

Should any of the above items be missing or defective, please contact your retailer.

Batteries

The clock and menu functions of the DGT Pi operate on two AA batteries that can be easily (re)placed by removing the screw of the battery lid at the bottom. Place both batteries according to the markings visible at the bottom of the battery compartment. It is recommended to remove the batteries when the device is not used for longer periods to avoid possible damage caused by a leaking battery. When the battery symbol 🔋 is shown on the display the DGT Pi can still be used for several long games though it is recommended to replace the batteries for new ones.

Important:
• The batteries included are non-rechargeable and should not be recharged.
• Do not use rechargeable batteries in this product.
• Place the batteries in the battery compartment with the correct polarity.
• A dead battery should be removed from the product immediately.
• Never short circuit a battery.

Performance

This DGT Pi version is based on the Raspberry Pi 3 hardware which has a built-in Bluetooth®- and Wi-Fi® functionality. This product is a stand-alone product with full wireless functionality. No additional dongles are required. The power supply is a 2 Ampere 5 Volt version to be connected to the DGT Pi via the micro USB connector at the rear-side.

Using DGT Pi with your DGT e-Board

DGT Pi is exclusively designed to be used in combination with a DGT e-Board or a DGT Smart Board. With a DGT board you will be able to enjoy playing against a computer using a real wooden chess board. Moves performed on the e-Board are detected by the electronic detection hardware inside the e-Board and communicated to the DGT Pi. DGT has various e-Boards and electronic chess set options available so you can choose a set-up to suit your personal preferences.

DGT Pi can be connected with a USB e-Board using the USB cable (included). To connect DGT Pi with a Bluetooth e-Board there are two options:
- Wired: via the USB cable (included)
- Wireless: via a Bluetooth connection (DGT Pi has a built-in Bluetooth wireless transmitter)

NOTE: To connect a Smart Board use the 3 meter USB-C cable that came with your Smart Board.

USB or Bluetooth connection?
The four USB ports are hidden behind the bottom lid at the left side of the DGT Pi. This lid can easily be removed by pressing on the bottom side marking and simultaneously moving the lid side wards. Use the supplied USB cable and connect it between the USB connector of the DGT e-Board and to one of the free USB ports of the DGT Pi. See below a picture how the DGT Pi, for example, should be connected to a DGT Smart Board:
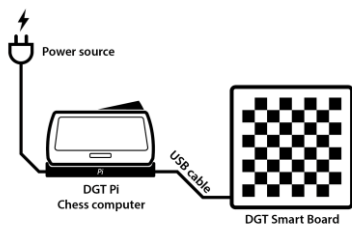
DGT Pi has a built-in Bluetooth transmitter which allows you to connect DGT Pi to a DGT Bluetooth e-Board via a wireless Bluetooth connection. To use your Bluetooth e-Board with DGT Pi please make sure the board is switched on. After powering up DGT Pi, it will start searching for a DGT Bluetooth e-Board and automatically connect to it if the e-Board is free to use. Do note that the Bluetooth e-Board itself will not be charged when connected via Bluetooth only and the e-Board may switch off during a game if its internal battery runs low on power. To prevent this from happening we recommend to always connect your Bluetooth e-Board to the DGT Pi by using the

provided USB cable. If you do not wish to use the USB cable please ensure the battery from your Bluetooth e-Board is fully charged.

Starting DGT Pi

Power up DGT Pi by connecting the power adapter to the micro USB connection at the back of the DGT Pi and place the AC outlet socket in a free AC wall outlet. Adapters for various international power sockets are included. It is also possible to use an external power bank (not included).

The DGT Pi and the display functions will start automatically and it is not required to start DGT Pi by pressing the bottom power switch.

After starting the DGT Pi the display shows the currently selected pre-set clock times. DGT Pi is now ready for a game, either using default settings or previously made game settings. You can change the settings using the clock buttons or using the extra queens on the e-board. Detailed descriptions on where to place a queen for each option will be discussed later in this manual.

Description of the DGT Pi start-up process:

1. Once the power adapter is connected, DGT Pi will respond with the start-up message: "DGT Pi" followed by "PicoChess" + Software version.
2. The reboot process for the Raspberry Pi computer may take up to 20 seconds.
3. The DGT Pi will start searching for an e-Board. The display might show "no e-Board" when no e-Board is connected. When an e-Board has been found it will show:
     a) The message "BT" + the e-Board serial number when connected to a Bluetooth e-Board.
     b) The message "USB e-Board" when already connected to a USB e-Board or Smart Board.
4. If a connection cannot be established, DGT Pi will continue to search for any nearby e-Board. The message ''no e-Board'' will be shown until a USB board / Smart Board is connected or a Bluetooth e-Board connection is established.
5. Once an e-Board has connected to an e-Board and you have placed all pieces in the starting position, DGT Pi will respond with the default or selected time setting on the display. For example it may show "05.00 05.00".
6. When the starting position has not fully been set up, DGT Pi will regularly display "Set Pieces" and will wait until all pieces are properly set up in the starting position (Please ensure that the extra queens are NOT yet placed on the board).
7. You are now ready to play chess against the DGT Pi. To adjust your chess preferences, you can change the settings by using the clock menu buttons or by placing the extra black or white queen on the board. Details are described elsewhere in this manual.

Playing a game against a DGT Pi engine

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Important notes before starting a game:
1. If you are using an e-Board with indices, we recommend to always placing the white pieces on row 1 and 2 and the black pieces on row 7 and 8. This ensures that the coordinates shown on the DGT Pi display match the coordinates shown on the side of your board.
2. If DGT Pi does not respond to menu keys or game changes within 20 seconds after starting, the device may be locked. Please try to restart it by pressing the ON/OFF key located on the bottom of the DGT Pi.
3. If this does not lead to a correct restart, unplug and reconnect the micro USB power connector to force a full reboot of DGT Pi. Wait approximately 20 seconds for the device to reboot.

Playing and training modes

DGT Pi has several playing and training modes. Below is a summary of the options currently implemented.

- **Normal mode:** You can play against one of the selected DGT Pi engines. The clock displays the remaining thinking time for both sides. Press the ▬ key to show the computer evaluation of the position, expressed in centipawns (see below note for explanation) or press the ✚ key to show a hint ("ponder move").
- **Brain mode:** This is same as Normal mode but the computer is using the permanent brain to think ahead during your thinking time as well.
- **Analysis mode:** DGT Pi is only observing the game and does not play itself. The clock continuously displays the best move for the side to play.
- **Kibitz mode:** DGT Pi is only observing the game and does not play itself. The clock continuously displays the computer evaluation of the position on the board.
- **Observe mode:** DGT Pi is only observing the game and does not play itself. The clock displays the remaining thinking time for both sides. Press the ▬ key once to show the position evaluation. Press the ✚ key to show a hint.
- **Ponder mode:** Ponder mode combines the "Analysis" & "Kibitz" mode alternating every 2 seconds between each mode. In addition to the normal Kibitz mode, the DGT Pi will display brute force depth together will the current value.
- **Remote play mode:** This mode allows you to play against other players or engines over the internet. Be aware that this mode is NOT YET supported in software version 0.9L.

Notes:
Normal mode is the "regular" chess game mode and, after restart, the default setting on DGT Pi. If you have selected one of the other modes, you can return to normal mode using the menu buttons and toggle through the settings or place the extra white queen on a5.

Centipawns are the value of 1/100th of a pawn. It is a theoretical unit most chess engines use to assess positions. The position score is the computer evaluation of the position on the chess board and it is expressed in a number of centipawns. The unit is useful for expressing small advantages or disadvantages between black and white. For example if white is one pawn ahead and black does not have any compensation for the loss of his pawn (usually some positional advantage), an engine will generally consider white to be 100 centipawns better. Often this would be expresses as +1.00 pawns though on DGT Pi it is currently expressed as +100 centipawns. If, on the other hand, black had some compensation, an engine could calculate white to have an advantage of perhaps 29 centipawns (+0.29 pawns). Note that the position score will always be displayed in centipawns from white's perspective. For example, if DGT Pi displays a score of +33, then the white player is 33 centipawns (or 0.33 pawns) ahead. A negative score means that the black player is ahead.

Position menu

DGT Pi supports several position modes:

- **Switching sides:** DGT Pi has an option to switch sides. You can select to play with white or let DGT Pi start with white. During an active game, sides can be switched by pressing the lever on top of DGT Pi. Doing so allows you to take over the game position from DGT Pi. This can be a good teaching tool to improve your chess skills and learn to play with different, and perhaps, challenging positions.
- **Chess 960**: This option, not supported by all installed engines, is used to set up a Chess 960 position. This is a special feature to play Chess 960 or Fischer Random Chess which is a great alternative way to play chess. Chess 960 is the only other form of chess officially recognized by the International Chess Federation FIDE and it is played by many chess lovers worldwide. In Chess 960 the games do not start from the traditional starting position but instead start from one of 960 random starting positions. It requires players to start thinking about their moves right from the start thus bypassing any advantage a player may have from learned knowledge about particular chess openings. Just give it a try once you are more familiar with the normal play modes.
- **Scan board**: This option allows you to set up any position on the board that you wish to play or analyse. Just set up a position and scan the e-Board. Make sure the position you set up complies with the rules of chess. For example the kings should not be in "check mate" and pawns that reached the opposite side should be promoted before scanning a board position. Set up any position you want for play, analysis, train or problem solving.

Time Menu

DGT Pi supports following timing modes:

- **Move Time:** Select a fixed time per move for the engine between 1 and 90 seconds. DGT Pi will make a move after the selected time has passed. After performing the computer move it

is your turn and the display will show "ok Pico". In this time mode your own thinking time is unlimited.

- **Game Time:** Select a game time between 1 and 90 minutes. Both player and engine receive the same amount of thinking time to complete their moves. Their clocks will count down during their turn. Just like in a regular chess game using a regular chess clock. Note that the lever on top of the clock should not be pressed to indicate the end of each turn; simply moving the pieces on the board will signal the end of a turn and the other player's clock will start counting down automatically.
- **Fischer:** Select a game time for both players between 1 and 60 minutes with a Fischer increment time added for each move between 1 and 30 seconds.

Book Menu

DGT Pi supports a wide range of book modes. Books are databases containing various chess openings. For example: Select "Book" in the menu and then select one of the available books. To play without opening guidance select "No Book"

Note: The current list of books may change in future software versions.

Engine Menu

DGT Pi includes a wide range of chess engines. Most engines have a level selection option allowing you to adapt the engine strength to your personal level. The levels can usually be selected between 0 and 20. Elo rating levels may be given but for most engines the levels are not easily to convert to a comparable Elo rating.
Note: The current list of engines may change in future software versions.

Examples of the estimated Elo strengths for some of the levels of the StockFish8 engine are:
- Level   3 estimates about 1000 Elo (Absolute beginner)
- Level   9 estimates about 1750 Elo (Mediate club player)
- Level 20 estimates about 3100 Elo (Grandmaster)

System Menu

This menu section is used to read out and adjust several DGT Pi system functions.
- You can check your current installed software version.
- It will show your IP address and check the IP connection (Only for future feature upgrades).
- You can select the sound function and vary between three stages. In the beginning you may find it helpful to hear many beeps. As you become more familiar with your DGT Pi and hear too many beeps you can select an option as "Never" or "Sometimes".

- You can select the language. Currently six languages are implemented, English, German, Dutch, French, Italian and Spanish.
- For Phyton software programmers there is a logfile create option. (This is for software developers only and beyond the scope of this document)
- A multi lingual voice option is included for the computer and player.
  Note: An additional amplified loudspeaker should be connected to the audio output at the back of the DGT Pi.
- The display option selects various clock display options like ponder interval, confirmation messages, capital letters and short/long notation.

Setting up a game

To change the settings on DGT Pi there are two methods:
1. Using the menu buttons (**easy method**)
2. Using the extra black and white queens on the e-Board (**fast method**)

Both methods have their advantages and are described below.

## Game settings using the menu buttons (easy) / extra queens (fast)

The **easy method** uses the menu buttons at the front of DGT Pi. All menu options can be accessed and changed by using these buttons. With the easy method it is not necessary to have all chess pieces in the starting position or to use the extra queens. Just go through the menu by pressing the menu buttons. For example you can press the middle menu button to force DGT Pi to make a move. It is possible to change colour by pressing the lever on top of DGT Pi.

Using the extra queens on the e-Board is the **fast method** to change settings but not all options can be selected this way. To change settings by using the extra queens, all 32 chess pieces must first be placed in the starting position. The extra two queens supplied with all DGT electronic chess sets are used to confirm the settings. Move one of the extra queens over the empty squares of the e-Board (Remember the other pieces must be in the starting position) and the display will show the setting option related to that square. The setting will be activated by lifting the extra queen from that square.

Note: We suggest not switching between engines or change time settings during a running game as this may lead into unpredictable behaviour. For example in some situations a change in settings during a game can result in a new game.

"Easy method" using the DGT Pi menu buttons

Below is a quick overview of the DGT Pi button symbols, their related symbols as used in the menu on the display and the action that will follow when pressing that button:

DGT Pi button	◀/☀	—/♪	▶‖/⏲	+/#	▶/❄
Menu symbol	◀	—	▶‖	✚	▶
Menu action	Back or exit (sub-)menu	Move up in current (sub-)menu	No menu function	Move down in current (sub-)menu	Enter menu or confirm selection

Important: Please read following notes before starting DGT Pi and accessing the menu:

1. Power up DGT Pi by connecting the micro USB power connector (DGT Pi will completely reboot).
2. A power up can also be done, if the DGT Pi is already connected to the power adapter by pressing the clock power button at the bottom of the DGT Pi (Only works if DGT Pi was in shutdown stage / sleep mode).
3. Shutdown can be done by pressing the power button at the bottom of DGT Pi.
4. Shutdown can also be done by pressing the ◀ and ▶ buttons simultaneously.
5. Use ◀ and ▶ to go through the menu tree.
6. Use ✚ and — to go through the current menu selection list.
7. **Important:** Future firmware versions may result in menu text and option variations.
8. Text between quote marks " " is as displayed on the DGT Pi display.
9. Text between brackets ( ) is for information only.

Menu structure for the easy method

Below is an overview of the used display menu structure.

▶ Mode	▶ Normal	▶ "ok mode" (mode set, exit menu)
	✚ Brain	▶ "ok mode" (mode set, exit menu)
	✚ Analysis	▶ "ok mode" (mode set, exit menu)
	✚ Kibitz	▶ "ok mode" (mode set, exit menu)
	✚ Observe	▶ "ok mode" (mode set, exit menu)
	✚ Ponder	▶ "ok mode" (mode set, exit menu)
	✚ Remote	▶ "ok mode" (mode set, exit menu)
	✚ (return to Normal)	

✚ Position ▶side move W ▶ ✚/— toggle "W – B" or "B – W"
                        ▶ uci 960   ✚/— Toggle "yes"/"no" **(not all engines)**
                        ▶ "scan board" ▶ "new Game" (game set, exit menu)

✚ Time ▶ Move Time ▶ Movetime 1   ▶ "ok time" (time set, exit menu)
                    ✚ Movetime 3   ▶ "ok time" (time set, exit menu)
                    ✚ Movetime 5   ▶ "ok time" (time set, exit menu)
                    ✚ Movetime 10   ▶ "ok time" (time set, exit menu)
                    ✚ Movetime 15   ▶ "ok time" (time set, exit menu)
                    ✚ Movetime 30   ▶ "ok time" (time set, exit menu)
                    ✚ Movetime 60   ▶ "ok time" (time set, exit menu)
                    ✚ Movetime 90   ▶ "ok time" (time set, exit menu)
                    ✚ (return to Movetime 1)

        ✚ Game Time ✚ Gametime 1   ▶ "ok time" (time set, exit menu)
                    ✚ Gametime 3   ▶ "ok time" (time set, exit menu)
                    ✚ Gametime 5   ▶ "ok time" (time set, exit menu)
                    ✚ Gametime 10   ▶ "ok time" (time set, exit menu)
                    ✚ Gametime 15   ▶ "ok time" (time set, exit menu)
                    ✚ Gametime 30   ▶ "ok time" (time set, exit menu)
                    ✚ Gametime 60   ▶ "ok time" (time set, exit menu)
                    ✚ Gametime 90   ▶ "ok time" (time set, exit menu)
                    ✚ (return to Gametime 1)

        ✚ Fischer   ✚ Fischer 1 1   ▶ "ok time" (time set, exit menu)
                    ✚ Fischer 3 2   ▶ "ok time" (time set, exit menu)
                    ✚ Fischer 5 3   ▶ "ok time" (time set, exit menu)
                    ✚ Fischer 10 5 ▶ "ok time" (time set, exit menu)
                    ✚ Fischer 15 10 ▶ "ok time" (time set, exit menu)
                    ✚ Fischer 30 15 ▶ "ok time" (time set, exit menu)
                    ✚ Fischer 60 20 ▶ "ok time" (time set, exit menu)
                    ✚ Fischer 90 30 ▶ "ok time" (time set, exit menu)
                    ✚ (return to Fischer 1 1)

✚ Book ✚ No book   ▶ "ok book" (book set, exit menu)
       ✚ Flank   ▶ "ok book" (book set, exit menu)
       ✚ Semi-open ▶ "ok book" (book set, exit menu)

✚ Open	▶ "ok book" (book set, exit menu)	
✚ Closed	▶ "ok book" (book set, exit menu)	
✚ Indian	▶ "ok book" (book set, exit menu)	
✚ Fun	▶ "ok book" (book set, exit menu)	
✚ Varied	▶ "ok book" (book set, exit menu)	
✚ GM 1950	▶ "ok book" (book set, exit menu)	
✚ Performance	▶ "ok book" (book set, exit menu)	
✚ StockFish	▶ "ok book" (book set, exit menu)	
✚ Anand	▶ "ok book" (book set, exit menu)	
✚ Korchnoi	▶ "ok book" (book set, exit menu)	
✚ Larsen	▶ "ok book" (book set, exit menu)	
✚ Pro	▶ "ok book" (book set, exit menu)	
✚ GM 2001	▶ "ok book" (book set, exit menu)	
✚ (return to No Book)		

✚ Engine ▶ StockFish 8	▶ (select 0 - 20 and confirm)	▶ "ok engine" (engine set, exit menu)
✚ Texel 1.07	▶ (select 0 - 10 and confirm)	▶ "ok engine" (engine set, exit menu)
✚ Arasan 2030	▶ (select Elo: 1000 – 2600 +)	▶ "ok engine" (engine set, exit menu)
✚ Rodent 3229	▶ (select type and confirm)	▶ "ok engine" (engine set, exit menu)
✚ ZurichChess N	▶ (select 0 - 20 and confirm)	▶ "ok engine" (engine set, exit menu)
✚ WyldChess	▶ (select type and confirm	▶ "ok engine" (engine set, exit menu)
✚ Galjoen 0371	▶ (sel. Elo 1500 -2200+ con)	▶ "ok engine" (engine set, exit menu)
✚ Sayuri		▶ "ok engine" (engine set, exit menu)
✚ Floyd 09		▶ "ok engine" (engine set, exit menu)
✚ Laser 15beta		▶ "ok engine" (engine set, exit menu)
✚ Cinnamon 20		▶ "ok engine" (engine set, exit menu)
✚ Robocide		▶ "ok engine" (engine set, exit menu)
✚ Vajolet2 24		▶ "ok engine" (engine set, exit menu)
✚ (return to StockFish 8)		

✚ System ▶ Information	▶ Version	▶ "PicoChess 0.9l" (or other version, exit menu)
	✚ IP adr	▶ "No IP addres" (exit menu
	✚ BT battery	▶ "Battery NA" or Voltage (exit menu)
	✚ (return to Version)	
✚ Sound	▶ "Sometimes"	▶ "ok beep" (beep set, exit menu)
	✚ "Always"	▶ "ok beep" (beep set, exit menu)
	✚ "Never"	▶ "ok beep" (beep set, exit menu)

Menu button functions during a game

The menu buttons can be used during a game. Their function depends on the status of the game.
Below overview shows the action of DGT Pi when a button is pressed during a game depending on
the status of DGT Pi.

Button	Status	→ DGT Pi action
◀	Players turn	→ Displays last engine move
	Engine thinking	→ Displays last user move
	Engine gave move	→ Displays last user move
▬	Players turn	→ Displays current score (DGT Pi position evaluation in centipawns)
	Engine thinking	→ Displays current score (DGT Pi position evaluation in centipawns)
	Engine gave move	→ Displays current score (DGT Pi position evaluation in centipawns)

▶‖	Players turn	→ Pause game / resume game
	Engine thinking	→ Stops calculating and displays current best move immediately
	Engine gave move	→ Engine calculates alternative move
✚	Players turn	→ Displays hint for player
	Engine thinking	→ Displays "sneak peek" or current best engine move
	Engine gave move	→ Displays hint for player's next move
▶	Players turn	→ Enter menu
	Engine thinking	→ Enter menu
	Engine gave move	→ Enter menu
LEVER	Players turn	→ Switches sides (engine starts thinking about a move)
	Engine thinking	→ Switches sides (engine stops; player can make a move)
	Engine gave move	→ Switches sides (displayed move cancelled; player can make a move)

"Fast method" using the extra queens

For this method you require the two extra queens supplied with any set of electronic DGT chess pieces. By placing and lifting one of these queens you can make your menu selections very quickly. It is not possible to move through all the submenus in the menu. To access all menu- and submenu options the menu buttons on the front of DGT Pi should be used. The fast method to set DGT Pi is only possible if all other 32 chess pieces are placed in the starting position. The display will confirm and show the setting change. Please remove the extra queen to start the game.

Only one of the extra queens (black or white) should be used at the same time. Below is a summary of all options currently available. Future software updates may result in changes in the display, added functionality and new features.

Selecting a playing mode

Selecting a playing mode is done with the extra white queen as follows:

a5 Normal mode
b5 Not used
c5 Analysis mode
d5 Kibitz mode
e5 Observe mode
f5 Ponder

Selecting a time control

DGT Pi supports three different time controls options: Move Time, Game Time and Fischer. You can select a time setting by placing the extra white queen. For more extensive options to select the time control, please use the "Time" menu and the menu buttons.

Move Time Levels

Move time controls are set with the extra white queen as follows:

a6 Movetime 1   (1 second per move)
b6 Movetime 3   (3 seconds per move)
c6 Movetime 5   (5 seconds per move)
d6 Movetime 10 (10 seconds per move)
e6 Movetime 15 (15 seconds per move)
f6 Movetime 30 (30 seconds per move)
g6 Movetime 60 (60 seconds per move)
h6 Movetime 90 (90 seconds per move)

Game Time levels

Game time controls are set with the extra white queen as follows:

a4 Gametime 1   (1 minute game)
b4 Gametime 3   (3 minute game)
c4 Gametime 5   (5 minute game)
d4 Gametime 10 (10 minute game)
e4 Gametime 15 (15 minute game)
f4 Gametime 30 (30 minute game)
g4 Gametime 60 (60 minute game)
h4 Gametime 90 (90 minute game)

Fischer increment Blitz levels

Fischer time controls are set with the extra white queen as follows:

a3 Fischer 1 1   (1 minute game with 1 second Fischer increment)
b3 Fischer 3 2   (3 minute game with 2 seconds Fischer increment)
c3 Fischer 5 3   (5 minute game with 3 seconds Fischer increment)
d3 Fischer 10 5   (10 minute game with 5 seconds Fischer increment)
e3 Fischer 15 10 (15 minute game with 10 seconds Fischer increment)
f3 Fischer 30 15 (30 minute game with 15 seconds Fischer increment)
g3 Fischer 60 20 (60 minute game with 20 seconds Fischer increment)
h3 Fischer 90 30 (90 minute game with 30 seconds Fischer increment)

Selecting a level

Selecting a level is done with the extra black queen as follows:

a5   Level 0
b5   Level 3
c5   Level 6
d5   Level 9
e5   Level 12
e6   Level 15
g5   Level 18
h5   Level 20

Important: Some engines do not have a level option and do not respond if you select a level.
Some engines will respond with an Elo rating while others will respond with a level name.
A more extensive option to choose playing levels is available by accessing the sub level menus via
the menu buttons. A detailed menu overview is already described earlier in this manual.

Selecting an opening book

Opening books are set with the extra black queen as follows:

a3   No book
b3   Flank
c3   Semi-open
d3   Open
e3   Closed
f3   Indian
g3   Fun
h3   Varied
a4   GM 1950
b4   Performance
c4   StockFish
d4   Anand
e4   Korchnoi
f4   Larsen
g4   Pro
h4   GM 2001

Selecting an engine

Engines are set with the extra black queen as follows:

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a6   StockFish 8

b6   Texel 1.07

c6   Arasan 2030

d6   Rodent 3229

e6   Zurichchess N

f6   Wildchess

g6   Galjoen 371

h6   Sayuri

Using DGT Pi as a regular DGT3000 clock

DGT Pi can also be used as a normal stand-alone DGT3000 chess clock. It is not necessary to connect the power adapter when using DGT Pi as a chess clock. To save power we recommend disconnecting the adapter. It is however necessary to insert the batteries.

You may use DGT Pi as a regular DGT3000 clock when you are playing a regular chess game or when you play via a chess program on your computer. For more details please read the instructions supplied with your e-Board. The clock cable that came with your e-Board is required if you wish to use DGT Pi in combination with the regular DGT e-Board functions and without the DGT Pi functions. Please note that when using the DGT Pi as a chess computer the clock cable should be removed.

Software update or re-installation of DGT Pi software

DGT Pi comes with a pre-installed 8Mb SD card which is placed in a slot at the bottom. DGT Pi is ready to play and normally it is not required to reprogram the installed software. If DGT Pi does not function properly or a software update is available, reprogramming of the SD card may be required. To update or re-install the software follow below instructions which require some minor computer knowledge. If you are not comfortable to do this please ask someone to assist you. Feel free to check the FAQ section on the DGT website or contact DGT support if you have any questions or comments.

Copying a (new) DGT Pi software image onto the SD Card (Windows)

1.   Shut down and disconnect DGT Pi from the power by unplugging the power cable.
2.   Place DGT Pi upside down and press at 45 degrees a mini screwdriver into the SD card slot.
3.   Gently slide the SD card out of the SD card holder. See following picture how to take out the SD card (On the SD card there is small edge where you can place the screwdriver behind and then slide the SD card out).
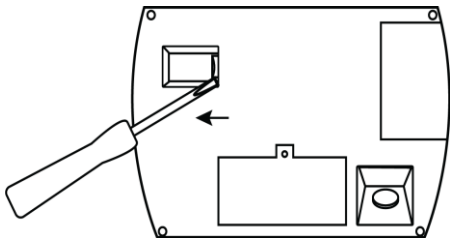
Note: Do not touch the metal contacts of the SD card after removing it from the slot!

4. If required for your computer, insert the SD card into the Micro SD adapter (included) and place the adapter into a free SD slot of your computer.
5. Check via ''my computer'' which drive letter the SD card was assigned to. You can also easily see the drive letter (for example G) within the left column of your Windows Explorer.
6. If not already installed on your computer, download the Win32DiskImager utility from: https://sourceforge.net/projects/win32diskimager/
7. Extract and install the Win32DiskImager executable from the downloaded zip file.
8. Download the latest DGT Pi image file from our website at the DGT software section / DGT Chess computers.
9. Extract this .zip file. The DGT Pi image file should end with .img after extraction.
10. Run the Win32DiskImager utility. Note: You may need to run the utility as Administrator on your PC.
11. Select the "DGT Pi-x.xx.img" image file you extracted earlier.
12. Select the drive letter of the SD card in the device box. Be careful to select the correct drive. If you select the wrong drive letter, you may destroy your hard disk content!
13. Click "Write" and wait for the write process to finish.
14. Exit the imager program, eject the SD card and take the SD card out of the adapter.
15. Place the SD card gently back into your DGT Pi and power up the device.
16. Be aware that due to implemented software improvements and added features after this update, the behaviour of your DGT Pi may have changed.

Copying a (new) DGT Pi software image onto the SD Card (Mac OS X)

1. Shut down and disconnect DGT Pi from the power by unplugging the USB power cable.
2. Place DGT Pi upside down and remove the SD card as described in above section point 2.
3. If required for your computer, insert the SD card into the Micro SD adapter (included) and place it in a free SD slot of your computer.

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4. If not already installed, download the ApplePi-Baker utility from: http://www.tweaking4all.com/hardware/raspberry-pi/macosx-apple-pi-baker/
5. Download the latest DGT Pi image file from our website at the DGT software section /DGT Chess computers.
6. Extract this .zip file. The DGT Pi image file should end in .img after extraction.
7. Run the ApplePi-Baker utility. You may be asked for your administrator password.
8. Select the "DGT Pi-x.xx.img" image file you extracted earlier.
9. Under "Pi-Crust", select the SD card.
10. Select the drive letter of the SD card in the device box.
11. Under "Pi-Ingredients", select the "DGT Pi-x.xx.img" file you extracted earlier (press the "**...**" button to locate the image file).
12. Press "Restore Backup" to start writing the PicoChess image file to the SD card. Wait for the write process to finish.
13. Exit ApplePi-Baker and eject the SD card. If needed, remove the SD card from the adapter.
14. Place the SD card gently back into your DGT Pi and power up the device.
15. Be aware that due to implemented software improvements and added features after this update, the behaviour of your DGT Pi may have changed.

Open source software

Digital Game Technology BV (DGT) developed and released this great new product to chess lovers around the world. The source code included is only related to this product. The source code has been made available and subject to the conditions of the license terms specifically referred to the Open Source Software Notices. The open source software, the source code and the implemented engines are provided to you on an "as is" basis.

DGT and the PicoChess team, its affiliates and subsidiaries, disclaim all and any warranties and representations with respect to such software and related source code, whether express, implied, and statutory or otherwise, including without limitation, any implied warranties of title, non-infringement, merchantability, satisfactory quality, accuracy or fitness for a particular purpose. DGT and the PicoChess team shall not be held liable to make, now or in the future, any corrections to the open source software, the source code, the engine software nor to provide any development or assistance with respect to this open source software.

This software is written according the regulations defined in: Free Software (GPLv3). It means that it is free to use and to be modified. The source code is available for modification or enhancement by anyone. All changes made are at your own risk and will not be supported by DGT. For details see: https://www.gnu.org/philosophy/free-sw.html. If any problem arises we strongly advise to reinstall the latest DGT Pi SD card image which can be downloaded from the DGT website in the Support/Software/Chess Computer section.

Thanks to the contributors

DGT Pi uses a recent version of the PicoChess software to handle chess rules, opening books and PGN files. For more information feel free to visit the PicoChess team at: http://www.picochess.com. We thank the PicoChess team for their cooperation to develop this great product with DGT. We also thank the various engine developer teams for making their engine available for DGT Pi.

Warranty conditions

Digital Game Technology BV (DGT) guarantees that DGT Pi complies with our highest quality standards. If despite our care in choosing components, materials, production and transport, your DGT Pi nevertheless shows a hardware defect during the first two years after purchase, please contact DGT support for assistance through the web form at the support section of our website. Please give a detailed description of the fault and the serial number of your DGT Pi. If DGT support is unable to solve the issue, please return the product to the retailer where you obtained the product. The device will then be exchanged or returned for repair to a DGT service centre. Original proof of purchase is required for any warranty claims.

The warranty is only valid if DGT Pi has been used in a reasonable and prudent manner as intended to be used. The warranty does not apply if the DGT Pi has been misused or if any unauthorized repair attempts or software modifications have been undertaken without express written consent from DGT support or one of the DGT approved service centres.

If the software of the DGT Pi is damaged, it can be recovered as described in this manual. The DGT Pi is only covered under warranty if there is hardware defect on the SD card, the power adapter or the DGT Pi unit assembly.

Important: The included manual of the DGT3000 states a warranty period of five years for the DGT3000. This period only applies for a regular stand-alone DGT3000 clock and is not applicable to the DGT Pi. The DGT Pi is covered with a warranty period of two years and according the warranty statements stated above.

Technical specifications

Batteries	2 AA (penlight) batteries for the DGT Pi clock section
Adapter	110 -240V AC to 5 Volt DC power adapter to power the internal Raspberry Pi computer electronics (The Adapter can also charge the Bluetooth e-Board battery when DGT Pi is switched on and connected to the Bluetooth e-Board via the USB cable)
Int. plug	Euro, UK and USA plug converters for this adapter are included (For other countries, please use a separate AC plug converter when needed)
Accuracy	Better than 1 second per hour (DGT3000 clock specifications only)
Housing	ABS plastic (various colours)

| Display | 35 x 120 mm (1.38'' x 4.72'') |
| Weight | 320 gram (including 2 AA batteries) |

Hardware disclaimer

Digital Game Technology spared no efforts to ensure that the information in this manual is correct and complete. However there shall be no liability for any errors or omissions. Digital Game Technology reserves the right to change the specifications of the hardware and software described in this manual without prior notice.

No part of this manual may be reproduced, transmitted nor translated in any language in any form, by any means, without the prior written permission of Digital Game Technology.

CE   DGT Pi complies with the directives: 2004/108/EC and 2011/65/EU.

This product is marked with the recycling symbol indicating that, at the end of its life, the product must be disposed at an appropriate waste collection point according local regulations. Do not dispose the product in the normal domestic unsorted waste stream.

This product is not suitable for children of 0 – 3 years of age. Includes small parts. Choking hazard.

DGT Pi complies with the regulation of the German "Der Grüne Punkt" Trademark of Duales System Deutschland GmbH.

Appendix: Installed DGT Chess Engines

Below is an overview of the currently installed DGT Pi chess engines (Software version 0.9L)

StockFish 8

StockFish is universally recognized as the strongest open source chess engine in the world. Even on the relatively modest hardware of a Raspberry Pi 3 it easily beats even super Grandmasters. The amount of chess knowledge programmed into StockFish makes it a perfect engine to analyse your games. You can set the engine at a lower skill level to have a chance of winning, or increase to a next skill level once you are able to defeat the current skill level.

Authors	Tord Romstad, Marco Costalba, Joona Kiiski and Gary Linscott
Version date	October 2017
Elo	up to 3360

Levels	yes
Chess960	yes
License	gplv3
Source	https://stockfishchess.org

Texel 1.07

Texel is the successor of Cuckoo Chess. It is a very strong engine that will beat every human Grandmaster. Thanks to its many different skill levels Texel appeals to chess players of all strengths. For absolute beginners there is even a level 0 which lets the engine play random legal moves.

Author	Peter Österlund
Version date	September 2017
Elo	900 - 3050
Levels	yes
Chess960	no
License	gplv3
Source	http://web.comhem.se/petero2home/javachess/index.html#texel

Arasan 20.30

Arasan, or "King" in the Tamil language, is an older chess engine that has been around since 1994. It greatly evolved over the years and is now a very attractive Grandmaster level engine. Arasan includes many features and skill levels, making it an attractive opponent for players of all strengths.

Author	Jon Dart
Version date	November 2017
Elo	1000 - 2980
Levels	yes
Chess960	no
License	mit
Source	http://arasanchess.org/

Rodent 3 (Version 2.29)

Rodent II is one of the few chess engines in the world that can adopt over 60 different personalities. It offers different playing styles rather than different strength levels. Rodent II can just as easily be turned into a strong and experienced Grandmaster as it can impersonate a beginning youth player. It has both serious and funny personalities, such as the "positional defender" and the "crazy attacker".

| Author | Paweł Kozioł |
| Version date | November 2017 |

Elo	up to 2920
Levels	Personalities
Chess960	no
License	gplv3
Source	https://github.com/nescitus/Rodent_III/

Zurichess N (Version Neuchatel)

Texel is the successor to Cuckoo Chess. It is a very strong engine that will beat every human GM. But thanks to its different skill levels, Texel will appeal to chess players of every strength. For absolute beginners there is even a level 0, which lets the engine play random legal moves.

Author	Peter Österlund
Version date	Oktober2017
Elo	up to 2790
Levels	yes (called ''Skills'')
Chess960	no
License	bsd
Source	http://www.zurichess.xyz/

WyldChess

WyldChess offers something similar to Rodent III with personalities and also supports Chess960 ('Fischer Random Chess'). The evaluation is compared to the other top chess engines not as detailed, but its tactics is very strong.

Author	Manik Charan
Version	1.5
Date	September 2017
Elo	up to 2630
Levels	Called 'Personalities'
Chess 960	yes
License	gplv3
Source:	https://github.com/Mk-Chan/WyldChess

Galjoen (0.37.1)

Galjoen is a chess engine that plays at a (stronger) club level and has an active playing style. Together with its support for strength levels and Chess960 ('Fischer Random Chess') makes Galjoen an ideal opponent for club players to practice their tactical and strategical skills. The program has its own graphical user interface, which is, of course, not used by the DGT Pi software.

Author	Werner Taelemans
Date	December 2017
Elo	up to 2150
Levels	yes
Chess960	yes
License	gplv3
Source:	http://www.goudengaljoen.be/

Sayuri

Sayuri is a weaker chess engine than the other famous engines. It is a customizable UCI chess engine with Sayulisp (=Scheme-like Lisp interpreter) which allows you to customize the search algorithm or adjust the evaluation weights. If you are looking for a beatable engine that can teach you a thing or two about chess, then Sayuri is a good choice.

Author	Hironori Ishibashi
Version	2017.12.16
Date	December 2017
Elo	1840
Levels	no
Chess960	no
License	mit
Source	https://github.com/MetalPhaeton/sayuri

Floyd 0.9

Originally arisen as a study in chess engine writing, Floyd has quickly become one of the best Master strength engines. It was not written for speed or strength, but rather for "clarity and ease of change". Nevertheless, the engine has an attractive style of play. Unfortunately for human players, Floyd cannot be forced to play at a lower level.

Author	Marcel van Kervinck
Version date	August 2017
Elo	2730
Levels	no
Chess960	no
License	bds
Source	https://github.com/kervinck/floyd/

Laser 15 beta

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Laser is a new engine that started as a project from scratch in July 2015 as a hobby engine between two brothers, Jeffrey and Michael An. It had its first 1.0 release in December 2015. The early parts of the engine were influenced by the Chess Programming Wiki, and more recent changes have drawn influence from Stockfish.

Author	Jeffrey and Michael An
Version date	December 2017
Elo	2960
Levels	no
Chess960	no
License	gnu
Source	https://github.com/jeffreyan11/uci-chess-engine

Cinnamon 20

Cinnamon is the successor to Butterfly. It is an attractive opponent for experienced club players. This engine is not too strong but is not very easy to beat either. If you have no FM (Fide Master) or IM (International Master) title and you are looking for a beatable engine that can teach you a thing or two about chess, then Cinnamon is a good choice.

Author	Giuseppe Cannella
Version date	May 2016
Elo	2060
Levels	no
Chess960	no
License	gplv3
Source	https://github.com/gekomad/Cinnamon/

Robocide

Robocide is a free, open-source UCI chess engine written in C from scratch. It is not a complete chess playing program and requires an interface supporting the UCI protocol. In addition to the usual features of modern chess engines such as a transposition table and null-move-pruning, Robocide also tries to implement much special case knowledge.

Author	Daniel White
Version date	January 2016
Elo	1800
Levels	no
Chess960	no

| License | gplv3 |
| Source | https://github.com/DanielWhite94/robocide |

Vajolet 2.24

Vajolet is an open source chess engines written by Marco Belli. It is named after the Vajolet Towers in the Dolomites. When Marco worked through Stef Luijten's tutorial on Winglet, Writing a Chess Program in 99 Steps, he rewrote Vajolet in C++. Vajolet 2.03 played the International Gsei Web Tournament 2013 and was qualified for the final of 8 Italian and 8 non Italian engines.

Author	Marco Belli
Version date	November 2017
Elo	2600
Levels	no
Chess960	no
License	gplv3
Source	https://github.com/elcabesa/vajolet