

Tactile Display Manual

For Elitac Tactile Displays
Part 1 of 3

This manual describes the general use of Elitac Tactile Displays. It is part of a suit of three manuals:

Part 1 – this manual

Part 2 – describes the software to be used with Elitac Tactile Displays

Part 3 – it describes the specific use of the Elitac Tactile Display you acquired

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Installation and instructions for use

This manual describes the general use of the Tactile Display and how to control it.

A separate manual is provided with specific information on your set of hardware, as well as instructions for use.

For software developers this manual describes the software interfaces provided to control the tactile hardware, for the different platforms.

Manual

All users should read this manual completely. More experienced users can go directly to the sections of the information they need.

Improvements and changes to this manual necessitated by typographical errors, inaccuracies of current information, or improvements to programs/equipment may be made by Elitac B.V. at any time and without notice. Elitac B.V. gives no guarantees regarding to typographical errors in this document.

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Attention

- Read this manual before using the Elitac Tactile Display.
- The Elitac Tactile Display consists of original parts and accessories, which may only be used in the combinations as described in this manual.

Symbols



Warning! Read instructions for use



Batch number



Manufacturer



Read instructions for use

1. IMPORTANT INFORMATION

1.1. Warranty

Elitac hardware is purchased for evaluation purposes. There are no warranties inhibited in the sale. Technical support is available at cost price. SLA and/or custom work can be agreed separately, upon request.

1.2. Safety instructions

GENERAL NOTES

- THIS MANUAL FORMS AN INTEGRAL PART OF THE ELITAC TACTILE DISPLAY. IT MUST BE KEPT CLOSE TO THE DEVICE AND IN READINESS WHENEVER REQUIRED. PRECISE OBSERVANCE OF THESE INSTRUCTIONS IS TO ENSURE THE SAFE AND EFFICIENT USE OF THE DEVICE AND ITS COMPONENTS;
- USE ONLY ORIGINAL ACCESSORIES (USB-CABLE, TEXTILES) WHICH HAVE BEEN PROVIDED BY THE MANUFACTURER. FAILURE TO DO SO MAY CAUSE DAMAGE, INJURIES OR LOSS OF PERFORMANCE AND WILL VOID THE WARRANTY;
- WEAR THE TACTORS CLOSELY TO THE SKIN FOR OPTIMAL EXPERIENCE AND VIBRATION TRANSMISSION.
- THERE SHOULD NOT BE MORE THAN 1 LAYER OF THIN CLOTHING (E.G. A T-SHIRT) BETWEEN THE SKIN AND THE TACTOR, IN ORDER TO GET A LOCALISED FEELING.
- ALWAYS ATTACH THE TACTOR STRING TO AN ELASTIC FABRIC SO THAT THE ELECTRONICS ARE PRESSED TO THE SKIN.
- WHEN YOU WANT TO CREATE A SPATIAL CONFIGURATION OF TACTORS, MAKE SURE THAT THE TACTORS ARE NOT POSITIONED DIRECTLY OVER LARGE BONES NEAR THE SURFACE OF THE SKIN, BECAUSE THIS WILL MAKE THE SENSATION LESS LOCALISED AND POSSIBLY GENERATE NOISE. FOR THE SAME REASONS DO NOT COVER THE DISPLAY DIRECTLY WITH STIFF MATERIALS.

CAUTIONS

CAUTIONS INDICATE INFORMATION WHICH, IF NOT OBSERVED, COULD RESULT IN DAMAGE TO THE EQUIPMENT;

- DO NOT EXPOSE THE TACTILE DISPLAY (NOR DEVICE, TEXTILES, TACTORS OR USB-CABLE) TO EXTREME TEMPERATURES OR OPEN FIRE. USE THE DEVICE IN AMBIENT TEMPERATURES BETWEEN +10° CELSIUS AND +60° CELSIUS (50 ° FAHRENHEIT TO 140 ° FAHRENHEIT);
- DO NOT EXPOSE THE TACTILE DISPLAY TO EXCESSIVE FORCES, FOR EXAMPLE CAUSED BY FALL, SHOCK OR IMPACT;
- DO NOT OVER STRETCH THE CABLES OF THE TACTILE DISPLAY, AS IT MAY CAUSE DAMAGE TO THE CABLE OR TACTORS;
- DO NOT SUBMERGE THE CONTROL MODULE, TACTOR OR USB-CABLE IN LIQUID OF ANY KIND. CHAPTER 5 GIVES INSTRUCTIONS ON HOW TO CLEAN THE DEVICE AND ACCESSORIES SAFELY;
- DO NOT SPRAY CLEANING FLUIDS DIRECTLY ONTO THE DEVICE;
- BEFORE CONNECTING THE TACTILE DISPLAY TO THE ELECTRICAL OUTLET: CHECK IF THE CONTROL MODULE, TACTORS OR USB-CABLE HAS NO VISIBLE DAMAGE. IF SO; QUIT USING THE PRODUCT AND IMMEDIATELY CONTACT ELITAC FOR REPLACEMENT OR REPAIR;
- ALWAYS TRANSPORT AND STORE THE TACTILE DISPLAY, TACTOR STRING, TEXTILES, USB-CABLE AND MANUAL IN THE ORIGINAL PACKAGING TO ENSURE THAT NO DAMAGE TO THE COMPONENTS MAY ARISE DURING TRANSPORTATION AND STORAGE;
- PROTECT THE TEXTILE PARTS AGAINST SHARP OBJECTS OR SHARP NAILS;

WARNINGS

WARNINGS INDICATE INFORMATION WHICH, IF NOT OBSERVED, COULD RESULT IN INJURY OF THE USER, AND POSSIBLY DAMAGE THE DEVICE OR ITS ACCESSORIES.

- ! THE TACTILE DISPLAY IS ONLY INTENDED FOR USE AS IS STATED IN THE MANUAL. ANY OTHER USE, OR USE BEYOND THAT SPECIFIED IN THIS MANUAL IS DEEMED AS INCORRECT USE. THE MANUFACTURER ACCEPTS NO LIABILITY FOR DAMAGE RESULTING FROM INCORRECT USAGE. ALL RISKS ASSOCIATED WITH THE USE OF THE DEVICE ARE BORNE SOLELY BY THE USER;
- ! USE ONLY ORIGINAL ACCESSORIES (USB-CABLE, TEXTILES) WHICH HAVE BEEN PROVIDED BY THE MANUFACTURER. FAILURE TO DO SO MAY CAUSE DAMAGE, INJURIES OR LOSS OF PERFORMANCE AND WILL VOID THE WARRANTY;
- ! TO REDUCE THE RISK OF ELECTRIC SHOCK, THE EQUIPMENT SHOULD ONLY BE CONNECTED TO A GROUNDED POWER SUPPLY;
- ! TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT ATTEMPT TO OPEN THE CONTROL MODULE, TACTOR STRING OR USB-CABLE;
- ! TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT ATTEMPT TO CHARGE THE DEVICE ON 220 AC, WHILE IT IS PLACED IN A TEXTILE AROUND THE BODY;
- ! DO NOT ATTACH AN AC ADAPTER THAT PROVIDES MORE THAN 5V DC, BECAUSE THIS WILL DAMAGE THE CONTROL MODULE.

- ! DO NOT CONNECT THE USB CABLE OF THE CONTROL MODULE IF IT IS DAMAGED OR IF IT SHOWS LARGE OPENINGS;
- ! DO NOT EXPOSE THE TACTILE DISPLAY AND ACCESSORIES TO TEMPERATURES OVER +60° CELSIUS (140 ° FAHRENHEIT). THIS COULD LEAD TO DANGEROUS SITUATIONS OR TO EARLY WORN-OUT OF THE TACTILE DISPLAY OR ITS ACCESSORIES;
- ! DO NOT REMOVE ANY STICKERS OR LABELS FROM THE CONTROL MODULE, TACTOR, TEXTILES, OR USB-CABLE. THE WARRANTY IS VOID WHEN LABELS OR STICKERS HAVE BEEN REMOVED BY THE USER;
- ! DO NOT EAT, SWALLOW, DROP, HIT, ABUSE, OPEN, INCINERATE, BURN OR SHORT CIRCUIT THE TACTILE DISPLAY OR ITS COMPONENTS;
- ! IMMEDIATELY STOP USING THE TACTILE DISPLAY AND/OR SUPPLIED ACCESSORIES IF THE HOUSING IS DAMAGED AND/OR WHEN ACCUMULATION OF MOISTURE CAN BE EXPECTED IN THE DEVICE OR ITS ACCESSORIES;
- ! AVOID THAT THE USB-PORT OF THE TACTILE DISPLAY BECOMES WET OR DAMP;
- ! PROTECT THE TACTILE DISPLAY AND SUPPLIED ACCESSORIES FROM MOISTURE, DIRT AND DUST;
- ! BEFORE CLEANING: DISCONNECT THE TACTILE DISPLAY FROM THE POWER SOURCE (CONNECTED ADAPTER OR COMPUTER);
- ! DO NOT CLEAN THE DEVICE USING CHEMICALS OR OTHER SUBSTANCES THAT MAY CAUSE DAMAGE TO THE PRODUCT SUCH AS ACETONE, PHENOL OR DISINFECTANTS;
- ! DO NOT IMMERSE THE TACTILE DISPLAY IN WATER, OR THE HARDWARE WILL BE DAMAGED;
- ! ALWAYS REMOVE ALL ELECTRONICS BEFORE WASHING THE TEXTILE PARTS;
- ! ENSURE THAT THE TEXTILE PARTS ARE COMPLETELY DRIED BEFORE PLACING ELECTRONICS BACK;
- ! DO NOT WASH THE TEXTILE IF ELECTRONICS CANNOT BE REMOVED;
- ! CHOKING HAZARD! KEEP THE DEVICE AND ITS ACCESSORIES AWAY FROM CHILDREN;
- ! USERS MAY BE ALLERGIC TO THE MATERIALS USED IN THE PRODUCT OR ITS ACCESSORIES. IF AN ALLERGIC REACTION OCCURS: IMMEDIATELY STOP THE USE AND CONSULT A SPECIALIST.

1.3. What is the Elitac Tactile Display

The Elitac Tactile Display uses the skin to display information using localised vibration. It consists of one or more small vibration elements, called tactors, that are mounted in textile and pressed to the skin. By activating the tactors in spatiotemporal patterns, called tactile patterns, information can be displayed. The Elitac tactile hardware consists of a control module with up to 32 tactors. They can be arranged in many shapes or spatial configuration inside textiles.

The Tactile Display can be controlled through a wired USB or wireless Bluetooth connection with software running on a host device (PC, smartphone, tablet) that runs on either one of the following operating systems: Windows; Mac OS X; or Linux (see [4. Connect the Tactile Display with a computer](#)). The software consists of two components: *Elitac HIDCom* that controls the hardware directly and listens to a UDP port; and your or third party software (e.g. *Elitac_UDPClient_Example.jar*) that sends commands to this UDP port. All this combined makes the Elitac Tactile Display an easily customizable display that can be adapted for a wide range of applications.

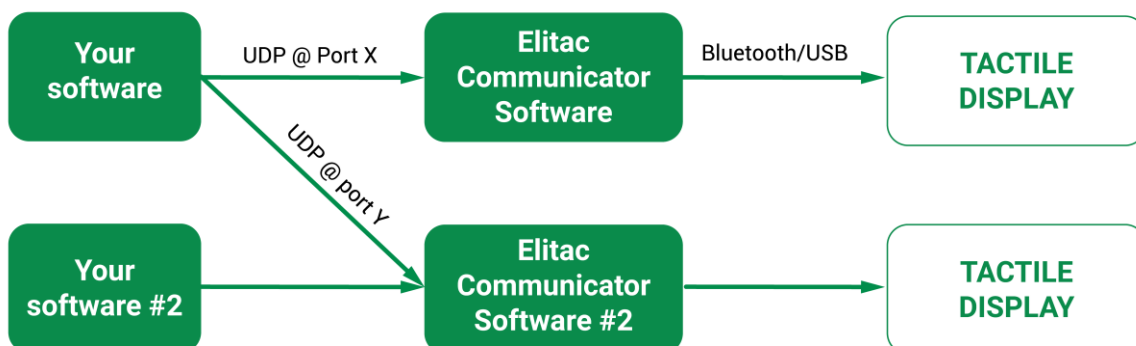


Figure 1 Schematic depicting the control of the Elitac Tactile Display: Your software or third party software sends commands to the Elitac HIDCom software through UDP, which is listening to an adjustable port number. The Elitac HIDCom sends these commands to the control module through either a Bluetooth® or USB connection. Your software can talk simultaneously to more than one copy of Elitac HIDCom through different UDP ports. When these copies run on a single host device Bluetooth® 4.0 or USB connections are required.

2. GETTING STARTED: first time use

Before using the Tactile Display for the first time: Follow the steps in the section 'Installation' in this chapter.

2.1. Installation

1. Unpack all components and check whether the product is complete (see packing slip, or specific product manual for packaging contents.)

2.1.1. Optional: Software installation to control the Tactile Display from your computer

Follow instructions in the Software Manual.

3. Using the Tactile Display

Consult the user manual of your specific hardware set for a full explanation of all elements of the use of the Tactile Display.

4. Connect the Tactile Display to a computer

Consult the Software Manual for information on:

- How to install Elitac HIDCOM (communication software) on different platforms;
- How to connect the Tactile Display using HIDCOM;
- How to control the Tactile Display from your own application;
- How to create Tactile Patterns.

5. Maintenance: Cleaning the Tactile Display

Consult the user manual of your specific hardware set for instructions on how to maintain and clean the Tactile Display.

6. Storage and transport

- Store the Tactile Display and all accompanying accessories such as textiles, patches, Bluetooth Dongle, and USB-cable together with the manual in the original packaging;
- Always transport the Tactile Display, textiles, patches, Bluetooth Dongle, USB-cable and manual in the original packaging, to ensure that no damage to the components can occur during transport;
- Always store the Tactile Display and its accessories between temperatures of +10° C to +40° C (50°F – 104°F);
- Fully recharge the Tactile Display every 6 months to ensure the durability of the battery.

7. Troubleshooting

If any problems occur with the software, view the troubleshooting list in the software manual.

If your problem cannot be solved using this list contact Elitac for support support@elitac.nl.

8. Technical support

If any problems occur during use, use the troubleshooting list in the software manual to find a solution for the problem.

Technical support is available at cost price. SLA and/or custom work can be agreed separately, upon request.

For technical support contact Bram Bicknese, support@elitac.nl

9. Customer service and repairs

For customer service and repairs contact:

Bram Bicknese; support@elitac.nl

10. Disposal

10.1. Control Module and tactor string

When you decide to dispose the Tactile Display, you are advised to return the device to the manufacturer. Here, the device and accessories will be disassembled and hazardous materials will be removed.

Control Module with integrated battery:

The device contains a battery, review technical specifications in your specific hardware manual for the exact type. You are advised to return the device to the manufacturer. The device will be disassembled, hazardous materials will be removed and battery will be disposed according to the regional legislation for disposal.

10.2. Textile parts (strap set, shirts)

The textile parts may be disposed in the waste system for textiles. If this is not available in your region, you can dispose the textiles in the normal waste system.

Textile parts with electronics directly integrated onto the fabrics should be considered as “Control Module and Tactor string” and should be disposed as described in chapter 10.1.

10.3. USB-Cable, USB-stick, Bluetooth Dongle

The USB-cable, USB stick and Bluetooth Dongle need to be returned to the manufacturer. If necessary, the parts will be disassembled and removed according to the regional legislation for disposal.

11. Technical Specifications

Consult the user manual of your specific hardware set for Technical Specifications.

12. Register

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13. Glossary

Cautions

Cautions indicate information which, if not observed, could result in damage to the equipment

Control module

The main control unit of the Tactile Display. This module contains the processor as well as the battery.

C-Type USB-plug

A C-Type USB-plug that connects the USB-cable to the Control Module

Elitac HIDCom

Software that can be used to play (custom) predefined tactile patterns.

Firmware

Software installed on the Tactile Display

Indicator light (if available)

Light on the control module that shows the status of the device using several colors

LED; see indicator light

Manual

Extensive explanation on the (first time) use of the tactile display as well as more advanced functionalities.

ON/OFF-button (if available)

Button on top of the control module to switch the tactile display ON and Off.

Tactile Display

A system that uses the skin to display information using localized vibrations comprising of a control module, tactile string and textiles.

Tactor

A small component that transmits vibrations.

Tactor constellation

A spatial set of related tactors.

USB-Cable

Data cable used to charge the Tactile Display, as well as to read/write the firmware using the *Elitac HIDCom* Software.

Warnings

Warnings indicate information which, if not observed, could result in injury of the user, and possibly damage to the device or its accessories.