Introduction to Thermal Camera in ABL

1 Introduction

These instructions are to provide information to about how to work with the FLIR T620Bx Thermal Camera in ABL. More information about the systems can be found from FLIR manuals flor "FLIR DVD", which locate in the camera case (AC cabinet).

Thermal camera software are installed on the computers of ABL. Triggering over serial port is implemented for the DC-room, however Thermal Camera can be also used in AC-room and loaned for out-side usage.

1.1) Thermal Imaging

All objects emits radiation at the infrared region, which can be detected in thermal imaging. Thermal imaging measures the temperature of infrared light emitted by different objects and converts it to a visible form. In Thermal Camera, radiated infrared energy is focused by optics to an infrared detector. From the detector, the information goes to sensor electronics for image processing.

Thermal camera can be used in various behavioral studies when making non-contact experiment, for example if measured motions from the faces. Thermal imaging has also been used for example in detecting "small nerve fiber dysfunction" and pain, and in measuring the effectiveness of the local anesthetics.

1.2) Components

Table 1: Components

Product	Image

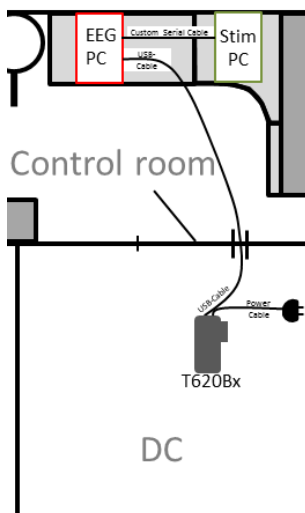| Thermal camera	FLIR, T620Bx S/N: 55905672
Battery charging unit	INFRARED CAMERA S/N: 006531
Camera battery	x2 S/N: PT012968 S/N: PT012969
Camera power supply (2 adapters)	Left: Model S040EM1200300
Tripod and Head	Head: Manfrotto 056

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Camera case	THERMAL CAMERA S/N: 55905672
Custom serial cable	

1.3) Specifications

Table 2: Camera details

IR resolution	640 × 480 pixels
Thermal sensitivity/NETD	<40 mK @ +30°C
Field of view (FOV) / Minimum focus distance	25° × 19° / 0.25 m
Frequency	30 Hz
Temperature range	−40°C to +150°C , +100°C to +650°C
Accuracy	±2°C or ±2% of reading
Focal Plane Array (FPA) / Spectral range	Uncooled microbolometer / 7.5–14 µm
Portable	Yes
Weight	1.3 kg

1.4) Wiring

2 Usage

Thermal camera FLIR T620Bx can be used in the measurement rooms of ABL, or it can be loaned to be used elsewhere.

Before measuring:

- Get the camera case from AC cabinet, and open it
- Place the camera on a tripod or use it on hand-held.
- Connect USB-cable from thermal camera to PC (EEG PC or Biomonitor)
- Connect power cord (you can also use with the battery only)
- Turn on PC and open FLIR software (Research IR or Tools)

3 Data Recording

There are several ways to record data with FLIR.

1. Directly with camera, saves the data on memory card
2. Research IR
3. Flir Tools
4. FlirTools+

3.1) Camera

Camera can be used remotely, when it runs on battery and saves data on a flash disk. Turn on the camera by pressing the "power". Zoom and "shoot" button can be found from the front side of the camera (right image).
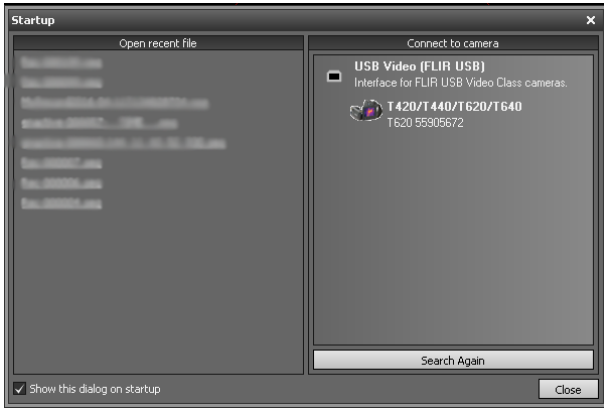

Camera settings panel can be entered by pressing the touch screen icon on top left corner (A). Return from menus by pressing C. Enter to image gallery by pressing D. Calibrate the camera with button B.
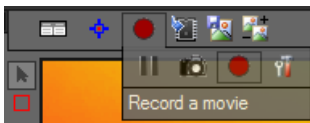
3.2) Research IR Max

Open Research IR by clicking "Research IR (64-bit) icon (on EEG PC). A startup window will appear (camera needs to connected and turned on).


Click available device on the "Connect to camera" -panel. Software connects to the camera and live video should be visible.

Recording can be started by clicking the recording button.

Recording cannot be manually stopped (but only paused), but the length of the recording needs to be set in beforehand on Record Settings window ("Tools" icon, see the image above: rightmost icon).
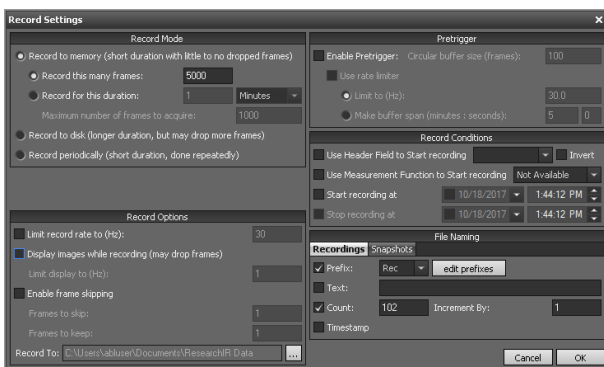
You can choose whether you like to save on disk or memory. Notice that more frames will be dropped when saving on disk.

3.2.1 Remote control

Recording can be set remotely from external PC via Serial Port. To able to receive "Start recording" command, check the "Enable Serial Remote Start" tick box in preferences window (Edit->Preferences..), and choose COM1 as serial port.
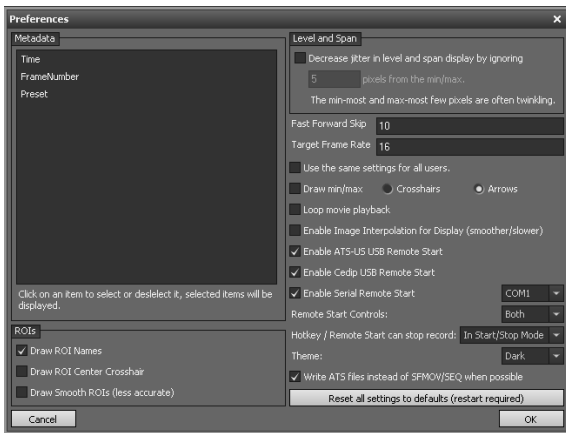

Recording starts when TTL pulse is sent from the parallel port of external PC (Stimulus PC, COM1). For example you can use *Presentation* software to do this.

Connect customized cable called "Thermal Camera Trigger" to a BNC connector on parallel box. Customized cable should be connected on COM1 port of the Biomonitor PC.
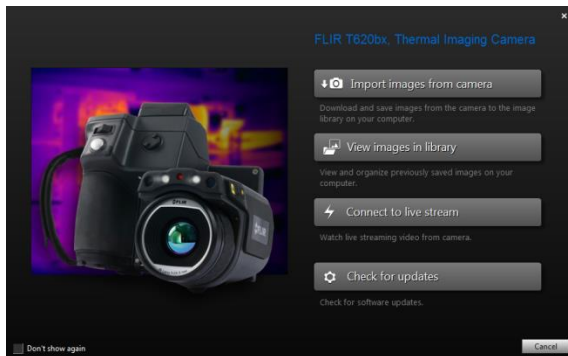
3.2.2 Object parameters

In case you want to have absolute measurements of objects, "Object parameters" should be defined very carefully, as they effect heavily on absolute value.
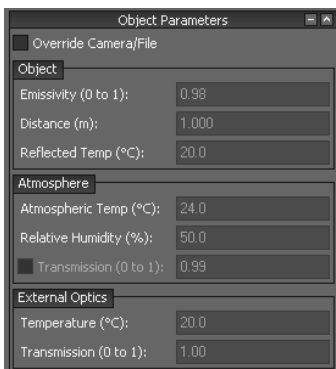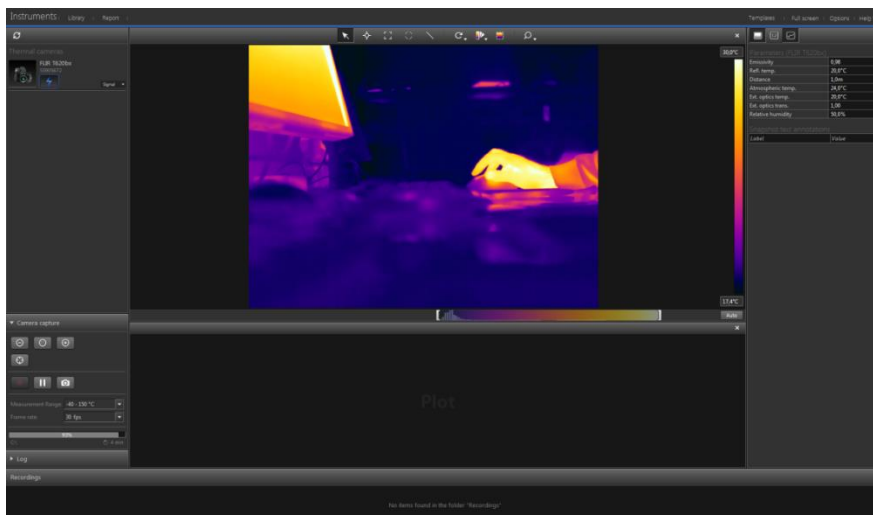

3.3) Flir Tools

Flir Tools can be downloaded onto any computer without a license. The software is though quite limited and doesn't enable video recording, although you can stream live video.

Press "Connect to live stream", this will enable the camera view.

Camera can be controlled from the "Camera control" panel (focus, color adjustments, taking snap-shots). Video recording option is only available in licensed or trial versions.

3.4) Flir Tools+

Not supported in ABL, though you can get 30 day trial of the software.
Enables video recording.

4 Subject preparation

Few things that need to be noticed when measuring humans:

- Ventilation. Place subject far from the ventilation of the ceiling (which are close to the door mechanics in DC room).
- Avoid too warm or cold clothes.
- Place subject on a chair about 10-20 minutes before measurement to acclimatize the room.
- Remove eye glasses (because reflections). Notice that nosepiece leaves marks for minutes
- Keep the same distance from camera to head across the subjects

- Measure all the subjects at the same time and season, as skin temperature varies through the day and year.

5 Analysis

In Research IR Max, which is installed on ANI Analysis Corner, you can do versatile analysis and export in different formats.

Thermal Imaging data can be stored as image or video. From Research IR you can export (File -> Export) video into arrays files, which includes the thermal information. Different formats include Matlab, SAF image, JPEG, TIFF, FITS.