Noldus
Information Technology

DanioVision

Technical Specifications

DanioVision™ is a complete system for the tracking of zebrafish larvae, insect larvae, and other very small animals in a multi-well plate. The system consists of:

- The DanioVision Observation Chamber
- The Temperature Control Unit (optional)
- The Tapping Device (optional device for sound/vibration stimulus)
- Computer
- EthoVision® XT video tracking software (pre-installed)

OBSERVATION CHAMBER

Main features

The Observation Chamber provides a controlled environment for testing. It features:

- An infrared (IR) sensitive high-speed GigE digital camera
- An IR and white light backlit basin with plate/dish holder
- An innovative optical design to prevent image distortion
- Connections for additional stimuli (such as Tapping Device)
- In- and outflow connections for the flow-through of water in the basin

Observation Chamber		
Dimensions	*Closed position:* 61 x 32 x 49 cm (24" x 12.6" x 19.3")	*Door opening:* 35 x 29 cm (13.8" x 11.4")
Power requirements	24 V DC, 2.0 A (max)	
Mains adapter	Input 100-240 V AC Output 24 V DC 3.0 A	
PC interface	USB-2 compatible	
Weight (excl. power supply, external tubes, and cables)	15 kg	

Camera

The DanioVision Observation Chamber includes a GigE digital camera with and IR lens.

- Basler acA1300-60gm
- Gigabit Ethernet (RJ45 connector, CAT5e or higher)
- 1/1.8”Progressive Scan CMOS, monochrome
- 8 mm (default) or 12 mm (optional) lens, F1.4, IR pass filter

The video performance is:

- 800 * 600 at 60 fps (8 mm lens) – default
- 640 * 480 at 60 fps (12 mm lens) – optional
- 1280 * 960 at 30 fps (12 mm lens) – optional

Basin

The backlit water basin allows for the inflow, outflow, and overflow of water and holds several multi-well plates, petri dishes, and other small containers.

Basin	
Dimensions	15.8 x 13.2 cm (6.2" x 5.2")
Microplate holder	
Compatibility	ANSI and SBS compatible
Dimensions	127.76 x 85.48 x ±0.50 mm
Maximum height	27 mm
Water connections	
Inlet/outlet	tube fitting 8 mm
Overflow	tube fitting 10 mm
Tube included	
For inlet	1.5 m Clear PVC Hose, 8 mm OD, 5 mm ID (marked green)
For outlet	1.5 m Clear PVC Hose, 8 mm OD, 5 mm ID (marked yellow)
For overflow	1.5 m Clear PVC Hose, 10 mm OD, 8 mm ID (marked red)

Lights

The backlight unit of the basin combines an IR and white light array. The IR light (Near Infrared at ~950 nm) is invisible and used for tracking only. It is permanently turned on at a constant level to enable accurate detection and tracking of the animals.

The visible white light is meant to be used as a stimulus (light pulse) or to mimic daylight conditions. Changes in white light will not be picked up by the camera. The white light has a color temperature (Tc/°K) of ~5500 and an intensity of minimal ~0 lux and maximal ~5000 lux.

You can program EthoVision XT to turn the light on or off, or build up or decrease the white light gradient. White light levels are measured directly on the bottom of the water basin. For more information on how to use and change the white light settings in your experiment, please refer to the EthoVision XT user manual.

External input/output

You can connect several (stimulus) devices to the DanioVision system using TTL connections:

- TTL input/output (4x module RJ45 connector):
  - 4 x 2 TTL input
  - 4 x 2 TTL output
- TTL expansion port 1:
  - 4 x TTL output (open collector output)
  - 1 x input camera
  - 1 x output camera
- TTL expansion port 2 (1 x modular RJ45 connector)
  - 8 pin feed through

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TEMPERATURE CONTROL UNIT

The Temperature Control Unit is connected to the DanioVision Observation Chamber to control the temperature of the water in the basin that holds the well plate. The temperature is measured at the base of the basin.

MECHANICAL	
Dimensions	460 x 210 x 280 mm
Weight (kg)	7
Hose connectors	8 mm outer diameter tube
ELECTRICAL	
Operating Voltage	24 V DC
TTL port specifications - 2 input - 2 output	 Max. 5 volt Max. 5 volt, open collector
OPERATIONAL	
Temperature accuracy	+/-0.5 °C / 0.9 °F
Temperature set point range	15-40 °C / 59-104 °F (depending on ambient temperature)
Maximum heating capacity	10 °C / 18 °F above ambient temperature
Maximum cooling capacity	2.5 °C / 4.5 °F below ambient temperature
Permissable water temperature range	5-50 °C / 41-122 °F
Water capacity	± 350 ml
Pump water flow rate	± 310 ml/min
Permissable height difference DanioVision chamber and Temperature Control Unit (m)	Temperature Control Unit at same height or max 1.3 m lower than DanioVision chamber

TAPPING DEVICE

The Tapping Device produces a tap at the basin causing a vibration that can be used to evoke a startle response. This tap can be set to a specific force (1 -8) with a maximum tapping rate of 3 taps per second and is programmable with EthoVision XT software.

SPECIFICATIONS	
Dimensions Tapping Device (incl. bracket)	6 x 24 x 7.5 cm (2.4" x 9.4" x 3")
Dimensions Electronics housing	2.5 x 10 x 6.5 cm (1" x 3.9" x 2.6")
Weight	300 g
Power requirements	24 V DC 0.4 A (max)
Connectors	Molex 1 pin – Power (24 V) Molex 4 pin – Tapping device to electronics Blue Multi connector – TTL control signal

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