

PowerRef 3

SPECIFICATIONS



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Technical specification of PowerRef 3

Measurements

Refraction (vertical meridian)	binocular and monocular
Spherical range	+5.00/-7.00 dpt in 0.01 dpt steps
Pupil size	4.0 – 8.0 mm in 0.1 mm steps ± 10%
Pupil distance	mm in 1.0 mm steps ± 10 %
Time per measurement	0.02 s (i.e. 50 Hz sampling rate)
Measuring distance	1 m (± 5 cm)
Measurement principal	binocular, dynamic photostiascopy

Interfaces and standards

Interfaces	4 x USB, 1 x VGA (1024 x 769)
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Power

Main	100 - 240 VAC (50 - 60Hz), 2.5 A (excl. monitor)
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Environmental requirements

Temperature	operating	10 to 35 °C (50 to 92 °F)
	storage	0 to 50 °C (32 to 122 °F)
Humidity	operating	20 - 80 % not condensing
	storage	10 - 85 % not condensing

Documentation specification of PowerRef 3

PowerRef 3 readings are saved in a csv-file. This file is called “logfile” and contains the following information:

Value	Description
Time [ms]	Time stamp of the measured values. Every 20ms there will be one measured value.
Brightness [%]	LED brightness in percent
PupilFound (L and R)	1: Pupil found; 0: Pupil not found.
PupilsSizeMM(L and R).X() [mm]	Pupil width right eye and left eye
PupilsSizeMM(L and R).Y() [mm]	Pupil height right eye and left eye
PupilBrightness(L and R) [DU]	Qualitative pupil brightness left eye and right eye in values between 0 and 255.
PurkinjeSize(L and R).X() [px]	Horizontal dimension of the purkinje reflex in pixel.
PurkinjeSize(L and R).Y() [px]	Vertical dimension of the purkinje reflex in pixel.
Decentration(L and R).X() [px]	Horizontal distance of the purkinje reflex from the middle of the pupil.
Decentration(L and R).Y() [px]	Vertical distance of the purkinje reflex from the middle of the pupil.
Gaze(L and R).X() [°]	Angle of the horizontal gaze in degrees.
Gaze(L and R).Y() [°]	Angle of the vertical gaze in degrees.
Refraction(L and R).Sphere() [dpt]	Measured refraction in diopters of each frame.
RefractionLeft(resp. Right) Contents()	Value between 0-10. Describes the actual state of the average calculation of the refractionLeft(resp. Right).Mean() [dpt].
RefractionLeft(resp. Right).Mean() [dpt]	Average of the last 10 frames in diopters.
RefractionLeft(resp. Right).StdDeviation() [dpt]	The standard deviation of the last ten frames.
InterpupDist() [mm]	Pupil distance in mm.
InterpupAngle() [°]	Angle of the camera to the horizontal.

PowerRef 3 set-up schematics

Using a hot mirror, PowerRef 3 can be moved out of patient's line of sight. This way visual targets can be presented at any distance.

