Chronos

Refraction System

Optimise refraction, maximise revenue potential, and save space.

OPTICIAN/ OPTOMETRY

TOPCON Healthcare

COMPACT, RELIABLE REFRACTION SYSTEM that combines binocular refraction and keratometry with binocular subjective visual acuity.

Chronos

Refraction System

Tablet-controlled for flexible operating position

Optimise refraction, maximise revenue potential, and save space with Chronos.

Enhancing customer throughput, empowering staff, and maximising available space are important elements that should not be overlooked. Chronos addresses each of these issues.

OVERVIEW

OPTIMISE REFRACTION

Chronos offers more than objective refraction: it is a single platform that captures the four key datasets foundational to a thorough examination: binocular refraction and keratometry with binocular subjective visual acuity.

MAXIMISE REVENUE POTENTIAL

Chronos has the potential to allow you to see more patients daily, which increases your revenue potential.

SAVE SPACE

Chronos, as an all-in-one platform with a small footprint, avoids the need to factor in the patient-chart distance in the room layout, saving space and boosting cost efficiency, as well as providing flexibility on where refraction takes place.

SAVE TIME

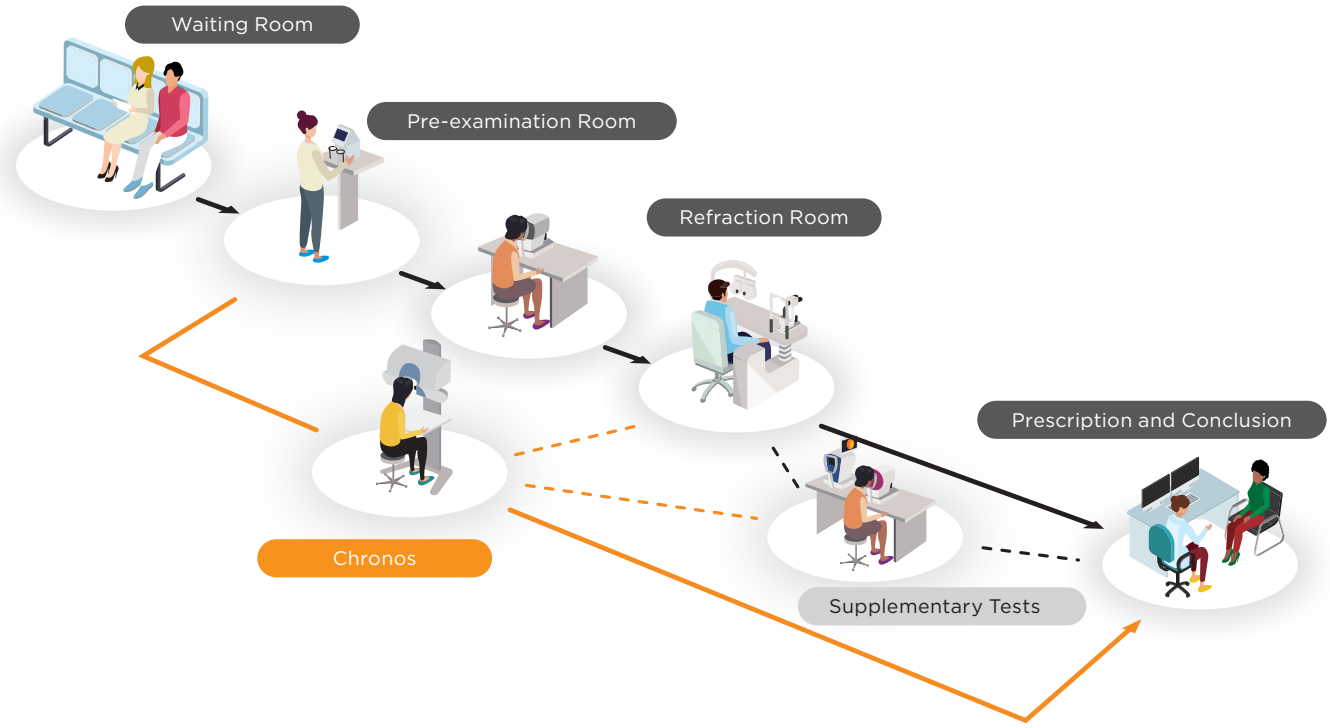
Chronos saves time by optimising the workflow, eliminating the time needed to clean and move between devices.

DISCOVER HOW YOU CAN STREAMLINE YOUR WORKFLOW WITH CHRONOS

CHRONOS-ENHANCED WORKFLOW

Optimise refraction, maximise revenue potential, and save space with Chronos.

Chronos is a versatile platform that can be positioned according to your needs in different scenarios.



Current workflow

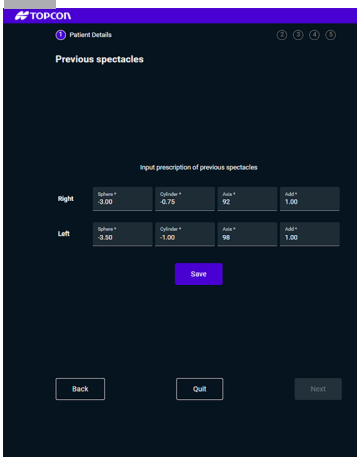
Fast track by adding Chronos

Result-dependent

SightPilot™ is optimised for efficient workflow, maximising revenue potential.

SightPilot™ is an optional user interface that provides a step-by-step guide through the refraction process. At each step, the operator is given instructions on how to proceed with the refraction based on the patient's response.

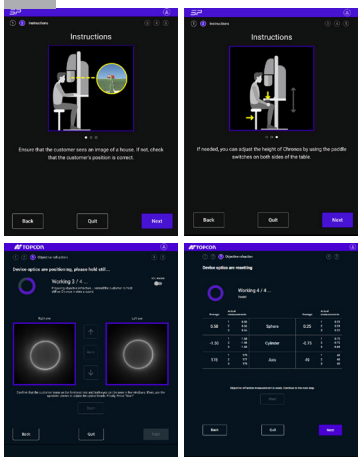
1



Patient Details

Enter the patient information and import/enter the previous spectacle prescription to begin the refraction[1].

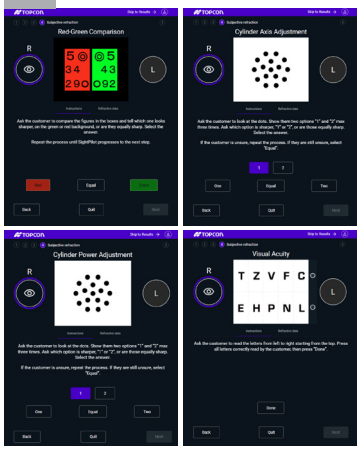
2



Objective Refraction

SightPilot™ provides step-by-step instructions to position the patient and then automatically aligns the optics to complete the objective refraction.

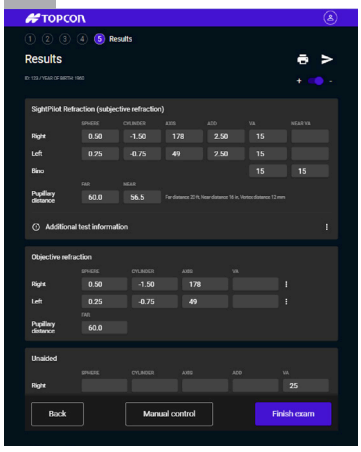
3



Subjective Refraction

SightPilot™ walks the operator through a variety of subjective refraction tests including visual acuity charts, red-green comparison, cylinder adjustment, binocular balancing and near addition charts. On-screen prompts enable quick input of the patient's response, before advancing to the next step.

4



Results

When the refraction is complete, the results are displayed on the screen and may be printed or sent to the patient's EHR file.

1. Previous prescription can be entered manually or imported directly from your Topcon lensmeter (SOLOS [Manufactured by VISIA IMAGING S.R.L] or CL-300)

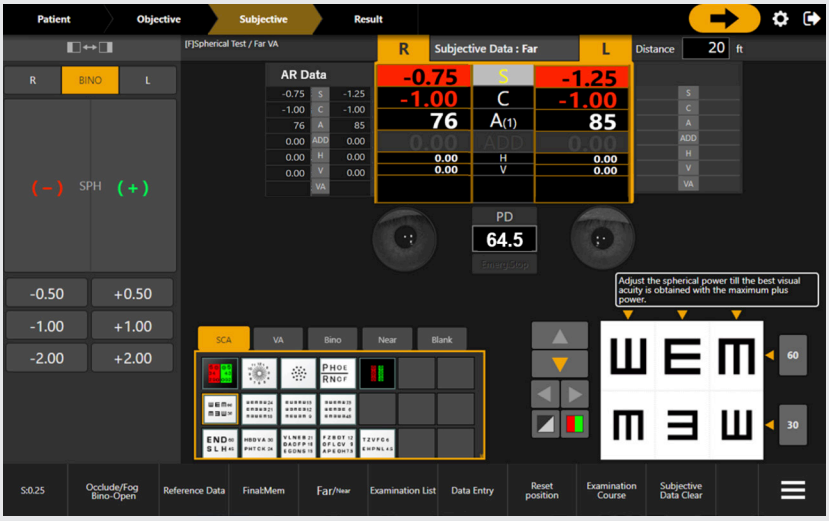
SightPilot™

Simplify Refraction

- Binocular objective refraction
- Measurement of Visual Acuity (VA) with previous prescription or unaided[1]
- VA screening with objective refraction
- Red/green test
- Cross cylinder
- Final monocular VA with subjective result
- Binocular balance
- Final binocular VA with subjective result
- Near addition refinement
- VA at near
- SightPilot refraction vs. Previous Spherical Equivalent
- SightPilot refraction vs. Previous spectacles /unaided

CHRONOS STANDARD INTERFACE

Chronos can be used as a binocular refractometer and digital phoropter, by making use of the standard control interface. It offers full customisation of the refraction routine, a wide range of tests including tests to assess binocular status, and the option to create and save one or more refraction routines to suit your preference, or the needs of certain patient groups.



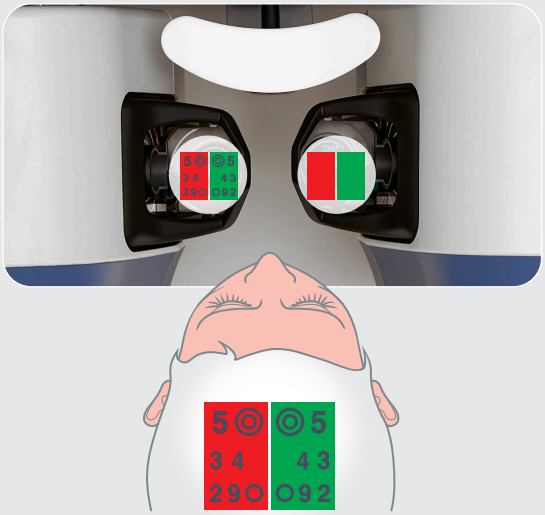
Chronos

Refraction System

With Chronos **automated binocular refraction system**, spend more time on what matters most: your patients.

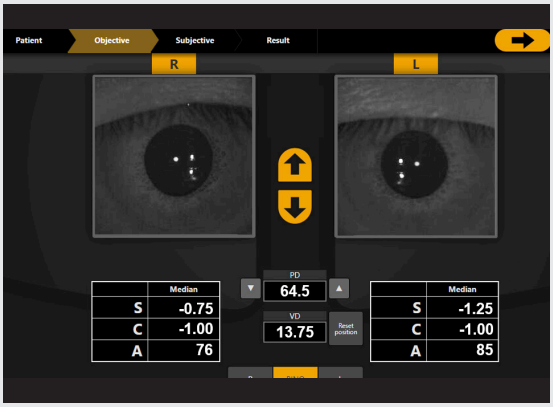
Chronos binocular refraction technology

Chronos measures both autorefraction and subjective refraction under binocular viewing conditions, for a more natural, comfortable visual experience. Binocular refraction has been shown to provide better control of accommodation for objective and subjective end points.



Reduce alignment errors with Chronos auto-alignment

Chronos uses Topcon's 3D stereo camera technology to optimise alignment throughout testing, pioneered in Topcon's automated OCTs and retinal cameras.



Cutting-edge moving lens system

Chronos incorporates a cutting-edge moving lens system, enabling rapid and smooth changes in a lens power. This provides a more comfortable visual experience for the patient.

Chronos Unique Technology

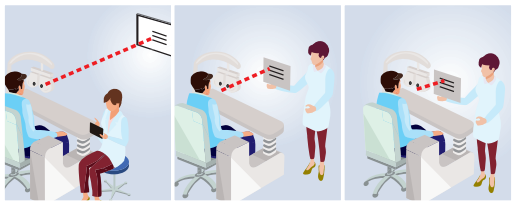
Ease of test distance adjustment

A combination of the built-in θ movement mechanism of the heads and the lens movement, adjusts the convergence angle and allows different testing distances.

TEST DISTANCE

Far-/Near-point test distance can be set

25cm - 609.6cm

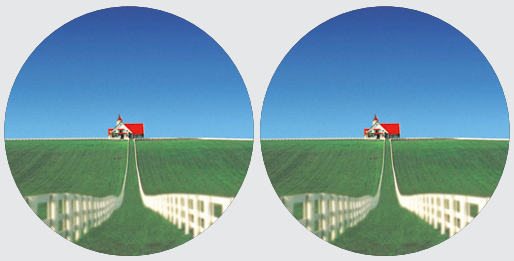


Far Intermediate Near

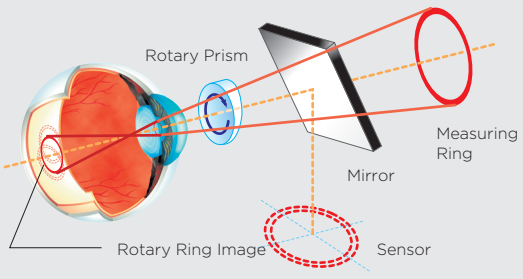
*Conventional refraction set-up, for comparison

Accuracy with Chronos

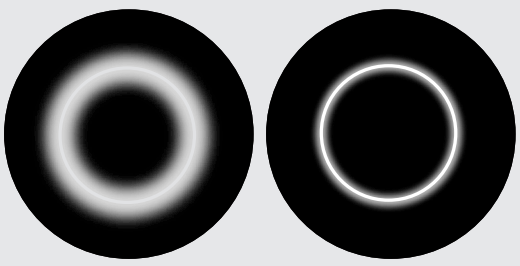
A combination of the super luminescent diode (SLD) ring, rotary prism technology and binocular objective refraction, provides stable measurements, including in patients with a degree of media opacification.



Measured simultaneously



Patented Rotary Prism Technology



Conventional ring Chronos ring

Objective measurement

Refraction measurement range	Spherical refractive power	-25D – +22D *1, 2
	Cylindrical refractive power	-10D – 0D *1, 2
	Cylinder axis angle	1° – 180°
Corneal curvature measurement range	Corneal curvature radius	5.00mm – 10.00mm
	Corneal refractive power	67.50D – 33.75D (Conversion value when the corneal refractive ratio is 1.3375)
	Corneal principal meridian angle	1° – 180°
Minimum measurement unit	Spherical/cylindrical refractive power	0.12D
	Cylinder axis angle	1°
	Corneal curvature radius	0.01mm
	Corneal refractive power	0.12D
	Corneal principal meridian angle	1°
Display of measured value	Displayed on the screen of the operation controller	
Minimum measurable pupil diameter	Φ2.0mm	
PD measurement range	50mm – 80mm	
Minimum PD measurement unit	0.5mm	
Subjective measurement		
Refraction measurement range	Spherical refractive power Cylindrical refractive power *All conditions stated on the right must be met*5	-18.00D ≤ Equivalent spherical power ≤ +18.00D *3 -8.00D ≤ Cylindrical refractive power (Cylindrical power) ≤ 0.00D *4
	Cylinder axis angle	1° – 180°
	Horizontal prism (one eye movable range)	±15.0Δ *6
	Vertical prism (one eye movable range)	±2.5Δ
Minimum measurement unit	Spherical/ADD refractive power	0.25D
	Cylindrical refractive power	0.25D
	Cylinder axis angle	1°
	Prism refractive power	0.1Δ
Test distance	Far-/Near-point test distance can be set between 25cm and 6.096m	
Visual acuity measurement range*7	0.05 – 1.6 (decimal notation)	
Chart	Visual acuity test chart, spherical power correction test chart, astigmatism test chart and binocular function test chart	
Background luminance	155±15cd/m^2	
Display of measured value	Displayed on the screen of the operation controller	
Record of measured value	Printing by thermal printer/external printer, data output	
Measuring head movement	Right-and-left direction	Inside 9mm to Outside 12.5mm
	Up-and-down direction	Down 15mm to Up 15mm
	Back-and-forth direction	Forward: 20mm - Backward: 20mm
Measuring head rotary angle	Convergence 17.5° to divergence 8.5° (eyeball torsion axis centre)	
Other Specifications		
Dimensions and Weight	Main unit	Dimensions: 510-540mm (H) × 671-766mm (W) × 278-357mm (D) Weight: 31.2 kg
	Power supply unit	Dimensions: 276mm (H) x 117mm (W) x 197mm (D) Weight: 3.5 kg
Electric Rating	Source voltage	AC100 - 240V
	Frequency	50 - 60Hz
	Power input	160VA

*1 The dioptric powers are indicated with reference wavelength λ_d = 587.56 nm
*2 Spherical refractive power + Cylindrical refractive power ≤ +22D or Spherical refractive power + Cylindrical refractive power ≥ -25D
*3 The conversion value with "VD=12mm" is described here.
*4 The conversion value with "VD=-3mm" is described here.
*5 The value described here is the maximum value. The measurement range is smaller according to the test distance setting for executing a test or the setting conditions of VD during measurement.
*6 The value described here is the maximum value. The measurable range is smaller according to the combination of the patient's PD and the test distance.
*7 0.1 – 1.6 complies with ISO 10938. ETDRS chart using Landolt ring (visual acuity 0.25 – 1.6) complies with ANSI Z80.21.

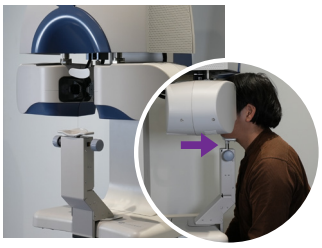
Optional Accessories

SNi-1

SightPilot NAVi™ Controller SNi-1 for REFRACTION SYSTEM Chronos

SightPilot NAVi™ Patient-Guided Refraction
with Voice Prompts and a Simple Controller SNi-1.

* The external speaker or headphones are not included and must be purchased locally. Please check with your local distributor for details.



CRX-1000

Chronos Chinrest

For more stable measurement,
an optional chinrest attachment is available.

Chronos Refraction System

CE 0123

CLASS 1 LASER PRODUCT (IEC60825-1:2014) PRODUIT LASER DE CLASSE 1 (CEI60825-1:2014)

SNi-1 and CRX-1000

CE

IMPORTANT In order to obtain the best results with this instrument, please be sure to review all user instructions prior to operation.

Not all products, services, or offers are available in all markets. Contact your local distributor for country-specific information and availability.

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Item code: xx-xxxxxxx_XxxXXX / Distributed in Europe 11.25

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Chronos Refraction Unit: This product is in conformity with Directive 93/42/EEC on medical devices (MDD)
SNi-1 and CRX-1000: This product is in conformity with Regulation EU 2017/745 on medical devices (MDR)