Chronos

Refraction System

Guided Binocular Refraction.

Streamline your workflow and delegate refraction with Chronos

TOPCON Healthcare

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

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Chronos is a multifunctional, space-saving instrument that optimises your workflow.

OVERVIEW

DELEGATE

SightPilot™ is a guided refraction system that simplifies exams and facilitates delegation.

STREAMLINE YOUR WORKFLOW

Divert straightforward patients through Chronos, reserving time for more complex cases. Customise the Chronos exam depending on whether it is pre-operative, post-operative, conventional refraction, etc.

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, and 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.

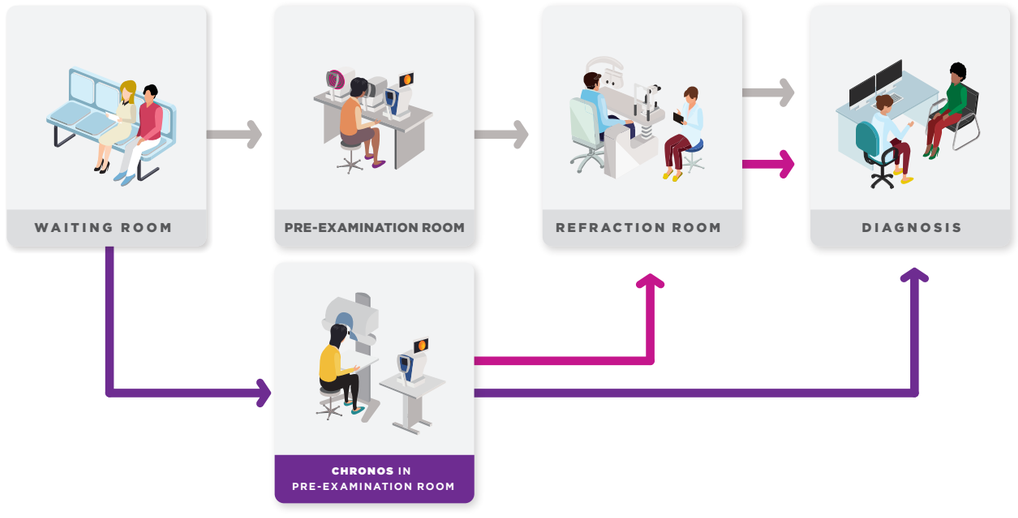
SEE HOW YOU CAN STREAMLINE YOUR WORKFLOW AND DELEGATE REFRACTION WITH CHRONOS

CHRONOS-ENHANCED WORKFLOW

Time Saving

Maximising Resource Allocation

Accuracy of refraction is paramount whether you are refracting pre or post-surgery, or undertaking routine refraction. Chronos allows you to delegate refraction without compromise, for straightforward patients.



Current workflow

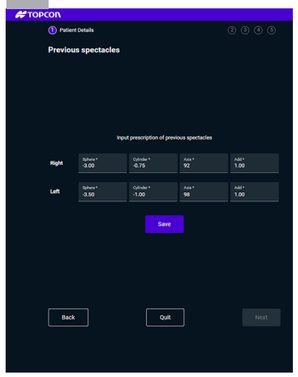
Additional pre-operative workflow option by adding Chronos

Additional post-operative workflow option by adding Chronos

SightPilot™ is optimised for efficient workflow, facilitating delegation

SightPilot™ has a guided user interface which takes you step-by-step through the refraction process. At each step, the operator is given instructions to proceed with the refraction based on the patient's response.

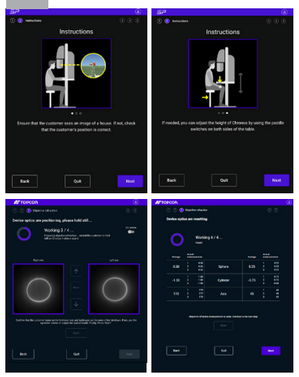
1



Patient Details

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

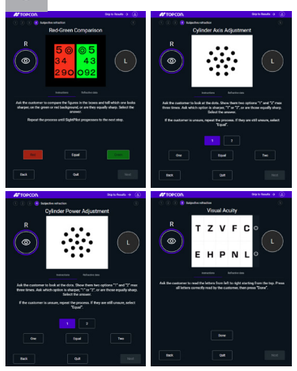
2



Objective Refraction

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

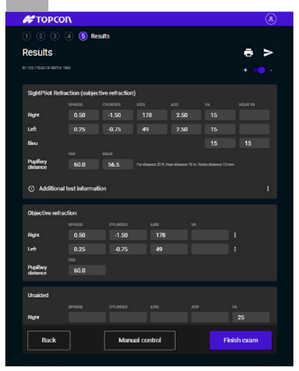
3



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 patient response to advance to the next step in the process.

4



Results

When the refraction is complete, the results are displayed on 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 [Handled by VISIA IMAGING S.R.L] and CL-300)

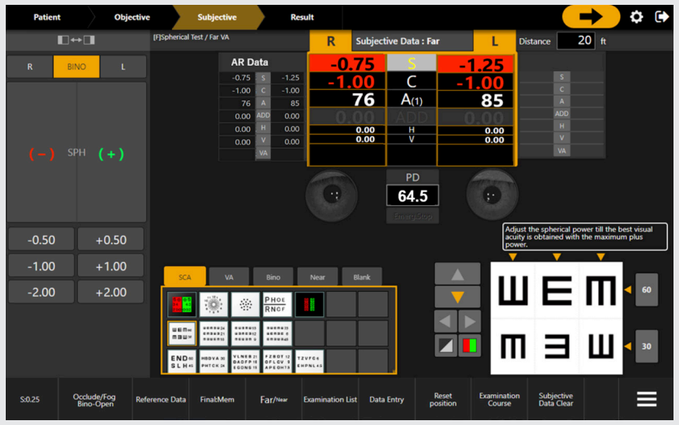
SightPilot

Simplify Refraction

- Measurement of Visual Acuity(VA) with previous prescription or unaided[1]
- VA screening with binocular objective refraction
- Red/green test
- Cross cylinder
- Binocular balance
- Final monocular and binocular VA with subjective result
- Previous VA vs SightPilot™ VA
- Near test
- Binocular VA at near
- Spherical equivalent vs. full cylinder correction to demonstrate the value of astigmatic correction

CHRONOS STANDARD INTERFACE

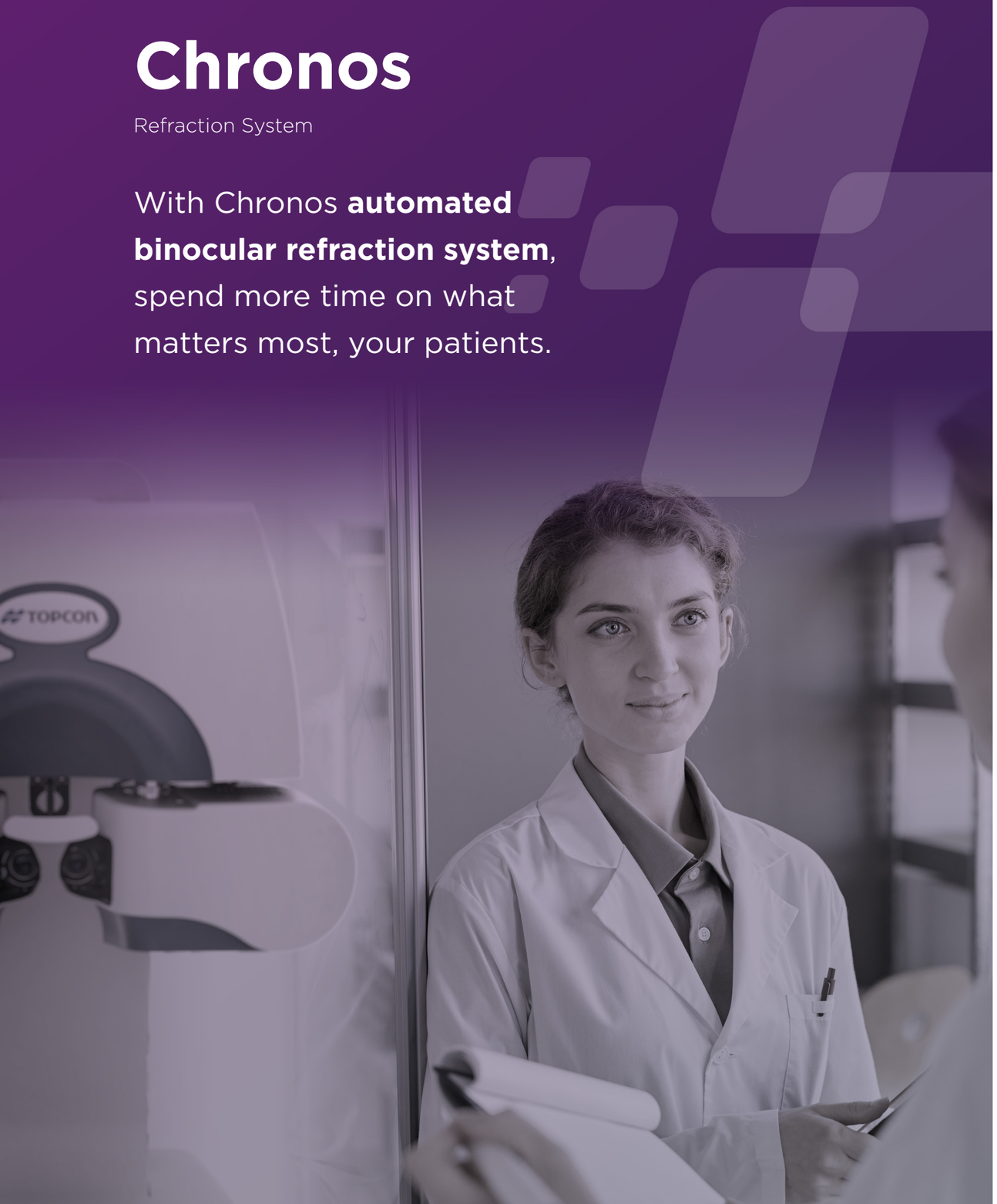
Chronos can be used as a digital phoropter making use of the standard interface. It offers full customisation of the refraction routine, a wide range of tests including tests to assess binocular status, and the option to create and save one or more refraction routines to suit your preference, or the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



Chronos

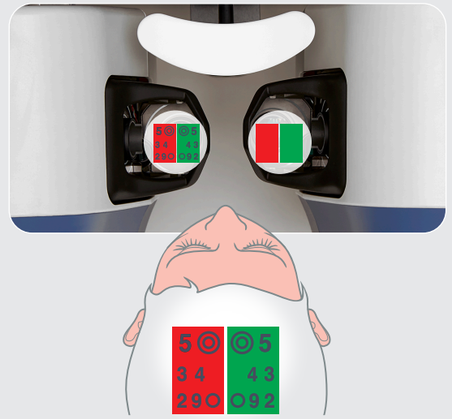
Refraction System

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 spherical lens power. This provides a more comfortable visual experience for the patient.

Ease of test distance adjustment

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

TEST DISTANCE

Far-/Near-point test distance can be set

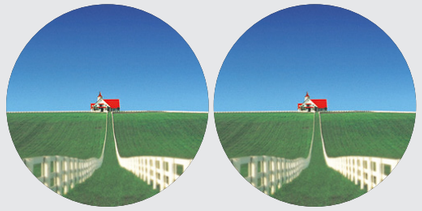
25cm - 609.6cm

Far Intermediate Near

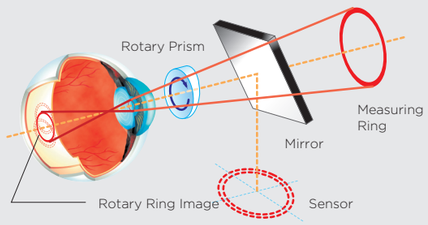
*Conventional refraction set-up, for comparison

Accuracy with Chronos

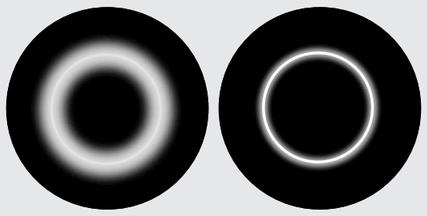
A combination of the super luminescent diode (SLD) ring, rotary prism technology and binocular objective refraction, provides stable measurements, including in patients with some media opacification.



Measured simultaneously



Patented Rotary Prism Technology

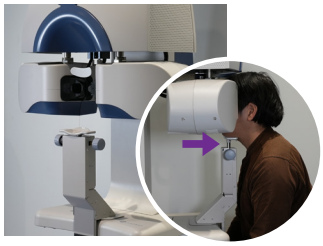


Conventional ring Chronos ring

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 control 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.



CRX-1000

Chronos Chinrest

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

* This product is in conformity with Regulation EU 2017/745 on medical devices (MDR), Class I.

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Medical device MDD Class Im. Manufacturer: Topcon Corporation.

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Contact your local distributor for country-specific information and availability.

This product is in conformity with Directive 93/42/EEC on medical devices (MDD).

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