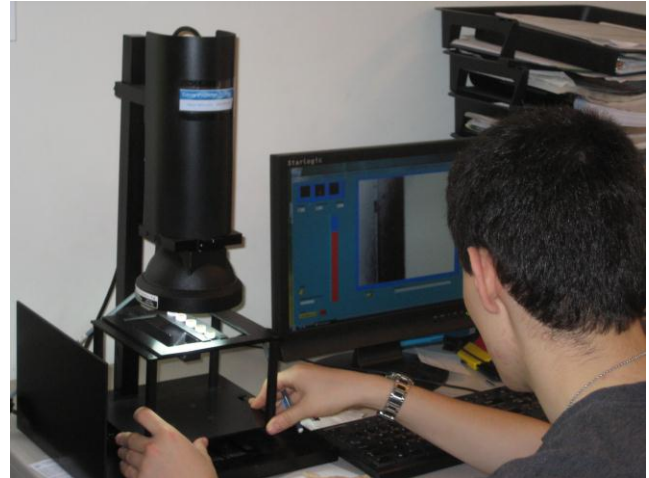


SCRATCH AND DIG INSPECTOR

SavvyInspector™ SIF-4

Introduction

The SavvyInspector™ model SIF-4 provides software assisted scratch/dig evaluation of flat optical surfaces, eliminating the subjectivity of human surface quality inspection. The instrument is designed specifically to reproduce the conditions of an in-reflection visual inspection described in Appendix C of MIL-PRF-13830B, "General specification governing the manufacture, assembly, and inspection of optical components for fire control instruments." The factory calibrated inspection head of the SavvyInspector™ uses invariant illumination and detection optics and propriety analysis software, allowing objective, repeatable, and recordable evaluation of scratch/dig surface quality.



Product Description

SavvyInspector™ SIF-4 is a complete flat-optics inspection system consisting of:

1. A custom LED-based illumination assembly.
2. A detection assembly with a digital high-resolution camera.
3. A manual z-stage for focusing to different part thicknesses.
4. A manual, encoded 100 mm x-y stage platform with rails for part holding and positioning.
5. Light baffles, base-stand assembly, and cabling.
6. A stand-alone computer with proprietary SavvyInspector™ analysis software.

Scratch/Dig Standards Supported

MIL-PRF-13830B

MIL-C-675C

ANSI/OEOSC OP1.002:2009 Visibility Method

System Operation

The SavvyInspector™ operator interface is designed for easy factory-floor operation. Inspection mode allows the operator to perform a surface quality scratch or dig evaluation based on a pre-recorded calibration file. The operator uses the manual x-y stage to locate the desired defect on the real-time viewing screen, and the software reports the scratch grade or dig value automatically. Scratch lengths are measured with the click of the mouse. The resultant image file and data can be stored as a bitmap or csv file for later review or printed to be included in an inspection report. Accumulation rules can be applied using the SavvyAccumulator™ spreadsheet. Custom calibration files can be created for go/nogo evaluation.

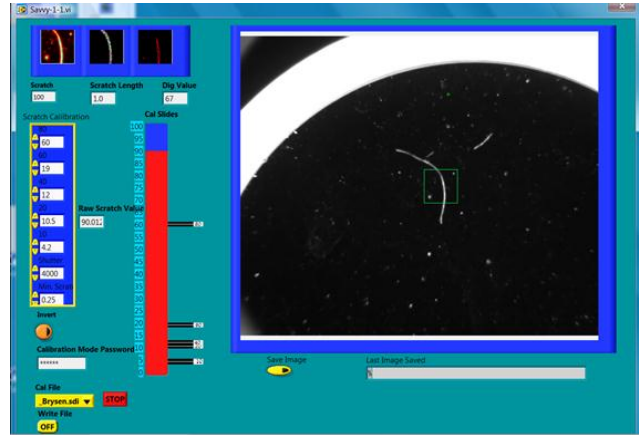
Pricing and Availability

Pricing for the SavvyInspector™ SIF-4 varies depending on location. Delivery is typically six to eight weeks ARO. Call 860-878-0722 or email sales@savvyoptics.com for a detailed quotation.

Instrument Calibration

The SavvyInspector™ software comes from the factory with calibration files based on all the most common and respected comparison standards manufactured by Brysen Optical, Davidson Optronics, and Jenoptik. Sets of these calibration artifacts have been sequestered in order to guarantee instrument to instrument agreement during the manufacture of each SavvyInspector™. Measurement files based on ARDEC limit standards are also provided with every instrument. If the user needs a scratch inspection done to a standard which is not in the factory calibrations library, a custom calibration file can be created in the password protected calibration mode. The operator presents the SavvyInspector™ with the desired comparison artifact, and enters the measured visibility into the appropriate data field for that scratch number.

The calibration data can then be saved and accessed from the inspection mode.



Screen shot of calibration mode

Feature	Specification	Comment
Inspection Head	Fixed illumination and detection simulating reflection inspection for surface quality per MIL-PRF-13830B	Inspection setup is identical to that of MIL-C-675C and the visibility method described in ANSI/OEOSC OP1.002:2009
Camera Field of View	9 x 12 mm, digitally zoomable	Allows rapid location of imperfections
Inspection Area Stage	One mm square in center FOV Manual encoded x, y slide stage with >100mm travel	Allows isolation of specific imperfection for evaluation Encoders read out distance moved since last mouse click allowing rapid evaluation of scratch length
Part Holder	Two movable rails with 1mm edge recession. Can be set up for square or round parts from 10 mm to 80 mm	Allows multiple, small parts to be set up for inspection. Custom part holders available on request
Test surface reflectivity	System can measure coated or uncoated parts, filters, windows, splitters, cubes, and prisms.	Standard calibration files for metalized comparison standards are provided. Some custom calibrations or part fixturing may be required.
Test surface shape	Plano or mild concave surface	Designed for flat parts, but long radius concave parts can also be inspected
Reported Values	Scratch number- 10, 20, 40, 60, 80 Dig value – continuous from 5 to 70	Per MIL-PRF-13830B and ANSI/OEOSC OP1.002, visibility method
Comparison standards	Factory calibrated to FLIR/Brysen, Davidson comparison artifacts, as well as various plastic inspection paddles	Customer can generate and save calibration files for any artifact set
Instrument repeatability	> 95% repeatability of reported scratch or dig grade	Presumes > 20 measurements of a clean surface in a proper environment of a stationary part
Instrument reproducibility	> 90% reproducibility of reported scratch or dig value	Presumes the clean part is removed, replaced and repositioned to the same location > 20 times