

LEOK-41 White Light Optical/Digital Image Processing - Color Encoded Photography



Features

- ▶ Pure optics, optical/digital combination, and digital image processing
- ▶ Comprehensive system
- ▶ Flexible configuration
- ▶ Easy operation
- ▶ Detailed instruction manual

Introduction

White light optical/digital image processing - color encoded photography, is based on the theta modulation theory in optical information processing, Fourier transform theory, and computer-aided digital image processing technique. It combines the techniques of white light optical information processing (color photography with black/white films) and digital decoding of a color encoded image. This experiment kit is composed of color encoded photographing, optical decoding, and digital decoding systems. It covers optical information transferring, transforming, encoding, decoding, filtering, reconstructing, storing, recording, extracting, recognizing, restoring, and operating, as well as photometry, colorimetry, and computer-aided image processing technique.

This experiment kit covers pure optics, optical/digital combination, and real-time digital image processing. It is a comprehensive and flexible system. Through this system, students can get a better understanding

of

- a) the mechanism of geometrical optics and imaging,
- b) the characteristics of the Fourier transform of an optical system,
- c) the concept of the frequency spectrum of optical information processing,
- d) the physical effect of frequency filtering,
- e) the principle of color imaging, and
- f) the realization of the computer-aided color decoding of an optical image.

Specifications

Camera	135-mm Color Film
Light Source	75-W Tungsten-Bromine Lamp (Brightness Adjustable)
Focusing Lens	$f = 70 \text{ mm}$
4f System Lens	$f = 190 \text{ mm}$
Multi-Aperture Plate	0.1 mm ~ 1.5 mm (dia)
Monitor	8" LED (resolution 800 × 600)
Filter	Red, Green, and Blue
CCD	Model: V4400C
	Mode: PAL
	Power Supply: DC 12 V, 1000 mA

Part List

Description	Qty
Optical Rail (2 m)	1
Carrier	10
Lens Holder (LEPO-9)	1
Plate Holder (LEPO-13)	1
White Screen (LEPO-14)	1
Multi-Aperture Plate Holder (LEPO-24)	2
Code Plate Holder	7
Tricolor Plate	3
Tungsten-Bromine Light Source (LLC-18A)	1
Color Camera with Variable Focusing Lens	1 each

Color Monitor	1
Decoding Software	1
Filter Set	1
Flash Lamp	1
Film	5
Dark Bag	1
Film Developing Kit	3
Black & White Film	1
Lens	5



Schematic of system configuration

1. White light 6. Fourier lens
2. Focusing lens 7. Color monitor
3. Aperture 8. Spatial filter
4. Collimating lens 9. Field lens
5. Input plane 10. Color CCD