

410-DHR

PORTABLE EMISSOMETER

The 410-DHR is a product of collaboration between U.S. Naval Air Systems Command and Surface Optics, with vital input from the Naval Research Lab (NRL) and National Institute of Standards and Technology (NIST). It was developed to answer a broad need for a portable device for verification of optical properties of large objects in the field. The 410-DHR measures the integrated surface reflectance of a surface at two angles of incidence (20° and 60°) and for six wavelength bands in the .9 to 12 μm spectral range.



PORTABLE COMMAND MODULE CONFIGURATION

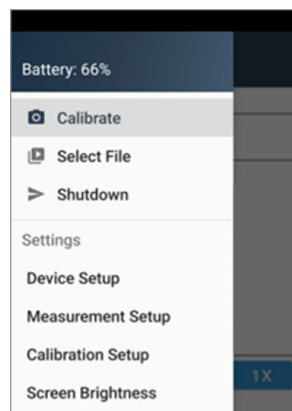
- **In-band reflectance and emittance**
9-11, 1.9-2.4, 3.0-4.0, 3.0-5.0, 4.0-5.0, 8.0-12.0.
- **Measures curved and large objects**
Measurements can be taken without special jigs or fixtures.
- **Two incident angles**
Provides data for 20° and 60° angles of incidence.
- **Grazing angle**
80° incident angle optional model.
- **Immediate data**
Touch screen display for data review and management.
- **Fast calibration**
One minute calibration at start of measurement session.
- **Quick data collection**
Measurements in 10 seconds or less.



APPLICATIONS

- IR Signature
- Stealth Coatings / Low Observables
- Thermal Modeling
- Thermal Camera Calibration
- Emissivity of Wafer Fabrication

The 410-DHR built-in touchscreen display and intuitive operating software enables easy calibration, measurement setup, data review and management in the field or in the lab.



DESKTOP REMOTE CONTROL UNIT (RCU) CONFIGURATION



410-DHR		ET-10		ET-100	
MEASURED DATA					
Measured Parameter		Directional hemispherical reflectance (DHR)			
Method		Integrated total reflectance in a band for a given angle of incidence			
Measured Value		Absolute reflectance (0-1)			
Calculated Value		In-band directional emissivity	Directional in-band emissivity at 20°	Directional total thermal emissivity at 20° and 60° Hemispherical total thermal emissivity	
Wavelength Bands (microns)		.9-1.1, 1.9-2.4, 3.0-4.0, 3.0-5.0, 4.0-5.0, 8.0-12.0	3.0-5.0, 8.0-12.0	1.5-2.0, 2.0-3.5, 3.0-4.0, 4.0-5.0, 5.0-10.5, 10.5-21	
Angle of Incidence		20° & 60° from normal incidence	20° from normal incidence	20° & 60° from normal incidence	
ASTM Standards				E903	
Calibration Coupon		Specular Gold			
PERFORMANCE					
Accuracy		+/- .03			
Repeatability		±.005 units			
Beam Spot Size		0.50 inches			
Measurement Time		10 sec	7 sec	10 sec	
Sample Size & Geometry		Flat: ≥ 0.5 in. diameter Curved: 6 in. convex; 12 in. concave			
Warm Up Time		90 seconds			
Time Between Measurements		2 seconds			
Sample Temperature		Ambient or heated/cooled to 0 - 100° C			
Operating Temp		0° to 40° C			
POWER / ENVIRONMENT / DIMENSIONS					
Run Time		2 hours on one battery. Battery easily replaced with continuous operation after battery replacement.			
Power Source		Rechargeable battery (standard environmentally friendly NiMH)			
Battery Recharge Time		1 hour			
IR Source		Kanthal filament operated at about 1,000°C			
Storage		-25° to 70°C			
Operating		0° to 40° C			
Weight		4.7 lbs			
Form Factor/Size		H 11.54", L 9.04", W 3.27" (29.31 cm x 22.96 cm x 9.44 cm)			
INTERFACE					
Operator Interface		LCD graphics screen, 1/4 VGA, touch screen, software buttons; trigger switch in handle			
Inspection Applications		Pass/fail can be incorporated, user set values			
Diagnostics		On screen status and signals monitor. Signal values stored with data. Raw data collection and display.			
Date Format		Data files can be opened and post processed with Excel or a text processor			
Data Storage		Removable SanDisk (SD) card			

ORDERING INFO

Standard Components		Optional Accessories	
0410-0003	410-DHR Measurement Head	0410-0002 / 0019	Benchtop Remote Control Unit - 120VAC / 220VAC
0410-0053 / 0054	Handheld Command Module - 120VAC / 220VAC	0410-0101	Specular Gold Calibration Coupon (NIST Traceable)
0410-0100	Specular Gold Calibration Coupon (Non-NIST Traceable)	0410-1016	410-Series Maintenance and Calibration Plan (Non-NIST)
		0410-1009	410-Series Maintenance and Calibration Plan (NIST)
		0410-1001 / 1004 / 1003	410-DHR / ET-10 / ET-100 Extended Warranty
		0410-0206 / 0209 / 0204	410-DHR / ET-10 / ET-100 SD Card for Extra Data Storage



Equipment described herein is subject to US export regulations and may require a license prior to export. Diversion contrary to US law is prohibited.