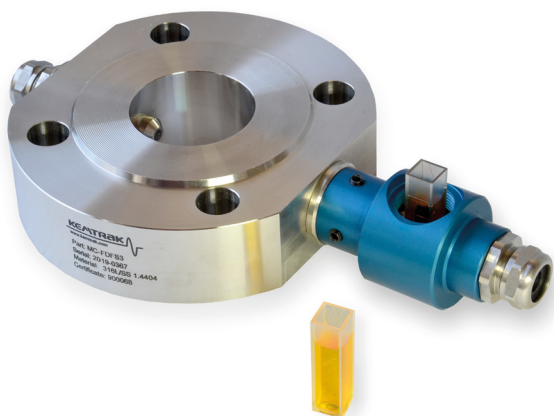# KEMTRAK

DCP007-NIR
Industrial Photometer

FEATURES

- High performance NIR LED light photometer
- Real time inline measurement
- Maintenance free measurement cell
- Dual wavelength drift free operation
- Alarm, 4-20 mA and Modbus TCP communications
- Reagent free alternative to Karl Fischer titration

The Kemtrak DCP007-NIR process analyzer is a high performance fiber optic coupled near-infrared (NIR) photometer for high resolution, real time, inline concentration measurement.

The Kemtrak NIR analyzer utilizes environmentally friendly, mercury-free LED light technology, providing exceptional stability and consistency over time. Measurement drift and the need for periodic recalibration is eliminated. The analyzer simultaneously measures at two optical wavelengths, ensuring accurate and reliable readings unaffected by window fouling or entrained particulates and suspended solids.

Kemtrak industrial-grade measurement cells with scratch-resistant sapphire windows contain no electronics or moving parts, making them ideal for both ordinary and hazardous area use. A verification and calibration accessory, traceable to NIST standards, is available to ensure measurement confidence while saving valuable time and resources.

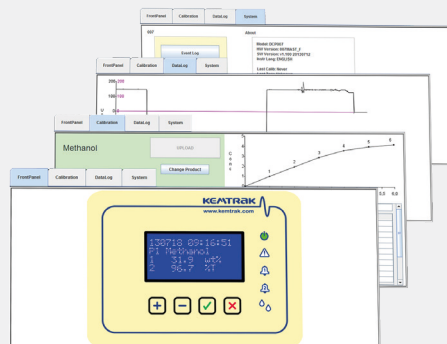Two versions of the Kemtrak DCP007-NIR photometer are available:

1. **NIR-L:** *0.1 – 100 % concentration with a resolution of ±0.05 %*

2. **NIR-H:** *100 – 20 000 ppm trace water with a resolution of ±10 ppm*

Standard features include remote zeroing, automatic cleaning cycle operation and advanced signal filtering. An on-board graphical internet based configuration utility allows remote operation, calibration, validation, and data trending using a standard PC.

All Kemtrak products are designed to meet the most demanding application specifications and are made from the highest quality materials to ensure exceptionally long life and the highest reliability.

TYPICAL APPLICATIONS:

- Water / solvent mixtures (ppm - 100%)
- Alcohol concentration
- Solvent gradient monitoring
- Solvent recovery
- Polymer reaction end point
- Caustic (NaOH) in water
- Acid concentration

DCP007-NIR
Industrial Photometer

TECHNICAL DATA

HOUSING

Stainless steel EN 1.4301 (X5CrNi18-10), AISI 304 (V2A)
Cam lock with double bit insert & external mounting brackets
224 x 215 x 125 mm (L x W x D)
IP 65 / EN 60529

DISPLAY

16 x 4 alphanumeric white on blue dot matrix LCD display
LED background illuminated
Measurement updates every second

LED 1 (green):	Power on
LED 2 (red):	System fault
LED 3 & 4 (orange):	Alarm 1 & Alarm 2
LED 5 (blue):	Clean / Hold

OPERATION

Menu based with 4 operator buttons
Remote HTML/Java interface (TCP/IP connection via Ethernet port)

SOFTWARE FEATURES

Auto gain:	Fully automatic signal gain controller
Auto zero:	Automatically, locally or remotely activated zero
Calibration:	16 linearization tables for concentration & mA output
Damping:	From 0 to 9999 s with noise (air bubble / particle) filter
Memory:	Nonvolatile - all data retained upon power failure
Security:	Alphanumeric password protection

DATA LOGGER

>17000 data points (timestamp, average, max. & min.), ring buffer
Configurable log time interval 1 s to 24 hr

EVENT LOGGER

>16000 events, ring buffer
Timestamp, alarms, zeroing, cleaning, product change, calibration &
system events (power, system warning & error messages)

AUTOMATIC CLEANING CONTROL

Automatic cleaning sequence, triggering dedicated relay output
Manual trigger or external trigger via digital input
Configurable automatic cleaning interval, 15 min to 2 months
Configurable cleaning duration from 0 to 9999 s
Auto-zero after clean option
Hold value during clean 0 to 9999 s
Hold value after clean (to equilibrate) 0 to 9999 s

PID CONTROLLER

Control method: Pulse width modulated relay output or
0/4-20mA output

Control period:	2 - 99 s
Proportional gain:	0.0000 - 999999
Integral time:	0.0000 - 999999 s
Derivative time:	0.0000 - 999999 s

REMOTE INPUT

5 x Digital input (potential free contact) for:

Input 1-3:	Product/range selection
Input 4:	Zero, instant zero, clean or clean & Zero
Input 5:	Hold (freeze output), data log or light source control

TEMPERATURE INPUT

mA or 3-wire PT100

Range:	-20 to 200 °C (-4 to 392 °F)
Resolution:	0.07 °C (0.126 °F)

Temperature sensor not included

LIGHT SOURCE & DETECTOR

High performance NIR light emitting diode (LED)
with InGaAs 2-stage peltier TE cooled photodiode (NIR-H)

Wavelength range:	NIR-L	850 - 1550 nm
	NIR-H	850 - 2000 nm
Full Width-Half Maximum (FWHM):		15 nm
Central Wavelength (CWL) Accuracy:		±2 nm
Typical LED lifetime:		>20000 hrs

PHOTOMETRIC RANGE

0.000 - 5.0 AU at 1450 nm, 10 mm OPL
0.000 - 4.0 AU at 1900 nm, 10 mm OPL

PHOTOMETRIC ACCURACY

±0.001 AU at 1 AU

PHOTOMETRIC NOISE

±0.0001 AU at 1AU, 1450 nm
±0.0005 AU at 1AU, 1900 nm

LINEARITY

± 0.5 % of respective measuring range

mA OUTPUT

1 x selectable 0 – 20 mA / 4 - 20 mA
NAMUR NE43 compliant
Galvanically isolated, 500 VDC

Accuracy:	<0.1 %
Resolution:	0.025 %
Load:	0 – 600 Ohm

Optional second mA output

RELAY OUTPUTS

1 x 1 A 240 VAC Failsafe output (active when system is ok)
2 x 1 A 240 VAC User configurable (alarm, PID)
1 x 1 A 240 VAC Automatic cleaning control
Fuses: 4 x 1 A (type: MXT), max 100 A breaking capacity
LED status indicators flash when relays are active

FAIL-SAFE

Dedicated relay output, 1A 240 VAC
mA output value used to signal a system fault
mA outputs compliant to NAMUR NE43

NETWORK INTERFACE
(REMOTE COMMUNICATIONS)

TCP/IP, 10Base-T and 100Base-TX Link
Connector: RJ45
Protocol:
1. HTML interface using native protocol over TCP/IP
   Java® version 8 update 202 or later required
2. MODBUS slave over TCP/IP (V1.1b3 compliant)
   Functions: (0x03, 0x04, 0x2B/0x0E - conformity 0x01)

OPERATING CONDITIONS

Ambient temperature:	0 °C to +50 °C (32 °F to 122 °F)
Transport:	-20 °C to +70 °C (-4 °F to 158 °F)

POWER SUPPLY

100-240 VAC, 50-60 Hz & 22 - 30 VAC/VDC
Mains fuse: 1 A (type MST), Max breaking capacity 35 A

POWER CONSUMPTION

25 VA (max.)

CERTIFICATES

CE & RoHS compliant

PROCESS MEASUREMENT CELL

PROCESS CONNECTION

Standard designs include DIN Flange
(DIN 2633), ANSI (ASME B16.5),
Tri-Clamp® (ISO 2852 & DIN 32676),
Straight pipe thread (DIN ISO 228 BSP),
NPT tapered pipe thread (ANSI B 1.20.1),
single use barbed hose.
Line size up to DN200 / 8".

MATERIALS

Wetted surfaces in stainless steel EN 1.4435
or EN 1.4404 (316L). Other materials include
Titanium Gr 2, Hastelloy C-276 & C-22,
Monel 400 & PTFE C25 (TFMC, carbon filled
Teflon®), PPSU.

WINDOW

Sapphire, UV fused silica.

SURFACE FINISH

Fine machine (smooth).
Ra <0.38 µm (electropolished) wetted
surfaces on hygienic measurement cells.

ELASTOMERS

FPM (FKM/Viton®, FDA), FFKM (Chemraz®/
Kalrez®, FDA), EPDM (FDA).

OPERATING CONDITIONS

Ambient & process temperatures up to
275 °C (527 °F). Process pressure from
10 mbar to 200 bar (0,14 – 2900 psi).

Operating conditions subject to material
and design in use. Higher pressures &
temperatures on request.

FIBER OPTIC CABLE

Silica core photonic fiber with Kevlar®
reinforced flexible LZSH coated stainless
steel jacket. Fully-interlocked stainless steel
conduit for use above 85 °C (185 °F).
Terminated with SMA 905 connectors.
Lengths up to 100 m (328 foot).

PROTECTION

IP66 / EN 60529

Kemtrak is the leading manufacturer of
high performance LED based industrial
photometers and automation products for the
process engineering industry.

Kemtrak provides tailor made solutions to
meet the needs of a wide range of industries
including chemical, petrochemical & offshore,
biotech, pharmaceutical, food & beverage,
pulp and paper and water & environment.

Kemtrak has trained representatives and
support personnel globally and is certified
according to ISO 9001:2015.