TC007
Process Turbidimeter

Benefits:

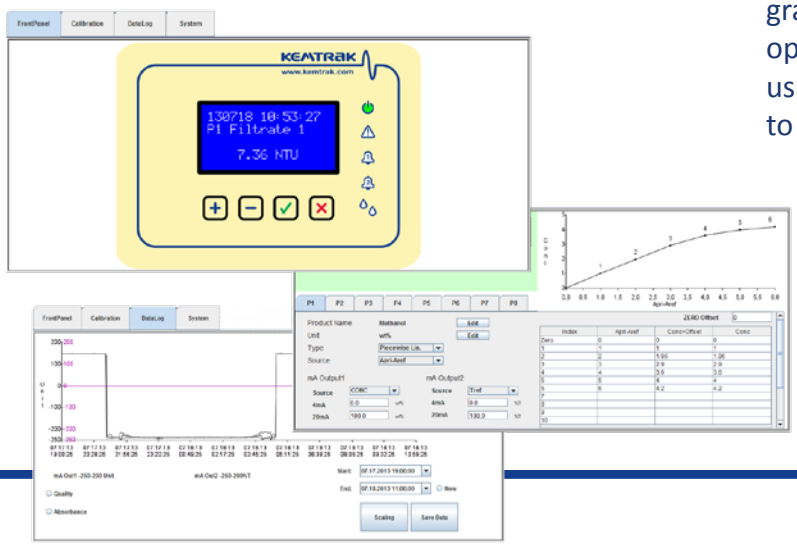
- **Real time in-line turbidity measurement**
- **No maintenance**
- **Reliable and robust infrared LED lamp**
- **Precision fiber optics - suitable for hazardous area use**
- **ISO 7027:1999(E) compliant**

The Kemtrak TC007 is an easy to operate industrial fiber optic turbidimeter designed to accurately measure the concentration of light scattering components. Measurements are real time and in-line.

Long life solid state LED lamps and precision fiber optics are used to provide drift and noise-free measurement at very high precision.

A proprietary algorithm mathematically combines the ratio of attenuated and scattered light to accurately monitor the turbidity of the sample. Automatic compensation of sample color and fouling of the optical windows ensures trouble free operation.

Maintenance free measurement cells with scratch resistant sapphire windows have no electronics or moving parts making the unit suitable for hazardous area use.



Standard features include multiple product switching, signal damping and data logging. A graphical internet based interface allows remote operation, calibration, validation and data trending using a standard web browser eliminating the need to install software.

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

KEMTRAK
www.kemtrak.com

Technical Data
TC007 Process Photometer

Housing
Stainless steel EN 1.4301 (X5CrNi18-10), AISI 304 (V2A)
Captive lid screws & external mounting brackets stainless steel
224 x 215 x 105 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
4 push buttons
Remote HTML/Java interface (TCP/IP connection via Ethernet port)

Software Features:
- Auto gain: Fully automatic photometer gain switching
- Auto zero: Automatically, locally or remotely activated zero
- Calibration: 8 Products, Concentration & mA output
- Damping: From 0 to 9999s with noise (air bubble / particle) filter
- Memory: Nonvolatile - all data retained upon power failure
- Security: Alphanumeric password protection

Data Logger
- >23 000 data points (timestamp, average, max. & min.), ring buffer
- Configurable log time interval 1s to 24hr

Event Logger
- >16 000 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, 15min to 24hr
- Configurable cleaning duration from 0 to 9999s
- Auto-zero after clean option
- Hold value after clean (to equilibrate) 0 to 9999s

PID Controller
Control method: Pulse width modulated relay output or 0/4-20mA output
Control period: 2 - 99s
Proportional gain: 0.0000 - 999 999
Integral time: 0.0000 - 999 999s
Derivative time: 0.0000 - 999 999s

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) or Data log control

Measurement Method
Attenuated light, scattered light or a combination of both using a nephelometric ratio algorithm
ISO7027:1999(E) compliant when measuring scattered light at 90°

Light Source
High performance TS AlGaAs Infrared LED lamp
Wavelength: 850 nm
Typical lamp lifetime: > 100 000 hrs

Range of Measurement

RATIO (90°)	0.01 – 1 000 NTU/FNU	(0.0025 – 250 EBC)
ATTENUATED (0°)	20 – 4 000 NTU/FNU	(5 – 1 000 EBC)
BACKSCATTER (180°)	100 – >5 000 NTU/FNU	(25 – >1 250 EBC)

Other units of measurement available e.g. ASBC-FNU, Helms, ppm etc

Resolution

0.01 – 10	NTU/FNU	0.01	NTU/FNU	(0.0025 EBC)
10 – 100	NTU/FNU	0.1	NTU/FNU	(0.025 EBC)
100 – 1 000	NTU/FNU	1	NTU/FNU	(0.25 EBC)
1 000 – 10 000	NTU/FNU	10	NTU/FNU	(2.5 EBC)

Repeatability
Typically <1% of respective measuring range

Accuracy
Typically <±2% of reading

mA Output
1 x selectable 0 – 20 mA / 4 - 20 mA (NAMUR, max 21.6mA)
Optional second mA output
Galvanically isolated, tested during final inspection to 500 VDC
Accuracy: < 0.1 %
Resolution: 0.025 %
Load: 0 – 600 Ohm

Relay Outputs
1 x 1A 240 VAC Failsafe output (active when system is ok)
2 x 1A 240 VAC User configurable (alarm, PID)
1 x 1A 240 VAC Automatic cleaning control
Fuses: 4x 1A (type: MXT), max 100A 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 (NAMUR <3.6mA or >21.0 mA)

Network interface (remote communications):
TCP/IP, 10Base-T and 100Base-TX Link
Connector: RJ45
Protocol:
1) HTML/Java interface using native protocol over TCP/IP
Software: Web browser with Java version 6 or later
2) MODBUS server (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 - 240V AC, 50-60Hz, 1A
Mains fuse: 1A (type MST), Max breaking capacity 35A

Power Consumption
25 VA (max.)

Certificates
ISO 9001:2000, CE, ATEX Exd IIB + H2 T6 IP66 Category Ⓔx II 2 G (*option*)

Process measurement cell

Manifolds
Standard designs include DIN Flange (DIN EN 1092-1), ANSI (ANSI B 16.5 and BS3293) Tri-Clamp® (ISO 2852 & DIN 32676), Straight pipe thread (DIN ISO 228 BSP), NPT tapered pipe thread. Line size up to DN100.

Materials
Standard material stainless steel 316L (EN 1.4435 or EN 1.4404)
Other materials include Titanium Gr 2, Hastelloy C-276 & C-22, Monel 400, PTFE C25 (TFMC, carbon filled Teflon) & PVDF (Kynar)

Window
Sapphire, UV Fused silica

Surface Finish
Ra < 0.4 µm *(on hygienic measurement cells)*

Elastomers
FPM (FKM, Viton®, Fluorel®), EPDM (FDA), NBR (nitrile), Silicone, FFKM (Kalrez® Spectrum 6375, Kalrez® 6230 FDA) and others

Operating Conditions
Ambient & process temperatures up to 250°C (482°F)
Process pressure from 10 mbar to 200 bar (0,14 – 2900 psi)
Operating conditions subject to material and design in use
Higher temperatures available on request.

Fibre Optic cable
Silica core photonic fiber with fully-interlocked flexible stainless steel jacket and Kevlar® reinforcement.
Terminated with SMA 905 connectors.
Lengths up to 100m (328 foot)

Operating Temperature
Normal: –60°C to +125°C (-76°F to +257°F), Autoclave.
Higher temperature option: - 60°C to 250°C (-76°F to +482°F)

Protection
IP66 / EN 60529

KEMTRAK
www.kemtrak.com

Kemtrak AB • Box 2940 • SE-187 29 Stockholm • Sweden
Info@kemtrak.com • www.kemtrak.com

Distributor

Kemtrak is a leading manufacturer of fiber optic measuring and automation products for the process engineering industry. The Company provides tailor made solutions to meet the needs of a wide range of industries including chemical, petrochemical & offshore, pharmaceutical, food & beverage, pulp and paper and water & environment. With its headquarters in Stockholm Sweden, Kemtrak has trained representatives and support personnel globally. The main manufacturing facility in Gothenburg, Sweden is certified according to ISO 9001:2000.