

# TC007 Process Turbidimeter

## Benefits:

- Real time in-line turbidity measurement
- 0.01 – 4000 NTU/FNU
- Reliable and robust infrared LED light source
- Precision fiber optics
- Maintenance free
- Suitable for hazardous area use
- ISO 7027:1999(E) compliant

The Kemtrak TC007 is a simple to operate industrial fiber optic coupled turbidimeter for high resolution, real time, in-line concentration measurement.

The Kemtrak TC007 utilizes a high performance LED light source with robust fiber optics to ensure maintenance and drift free operation with exceptionally high precision.

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 proprietary algorithm mathematically combines attenuated and scattered light to accurately report the turbidity level in the process stream. Automatic compensation for sample color and fouling of the optical windows ensures trouble free operation.

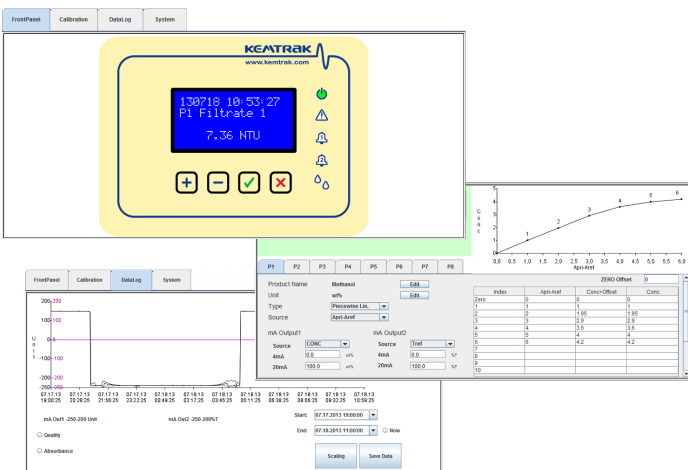


## Typical Applications:

- Filtration monitoring
- Centrifuge control
- Interface detection
- Phase separation
- Leak detection and condensate carryover
- Water in fuel / Oil in water
- Quality control

Standard features include 16 linearization tables for multiple product switching, remote zeroing, automatic cell cleaning cycle and signal filtering. A built-in graphical internet based interface allows remote operation, calibration, validation and data trending using a standard web browser.

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 possible.



**Housing**

Stainless steel EN 1.4301 (X5CrNi18-10), AISI 304 (V2A)  
Captive lid screws & external mounting brackets stainless steel  
244 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: 16 linearization tables for 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**

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

**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, 15min to 2months
- 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 - 999999  
Integral time: 0.0000 - 999999s  
Derivative time: 0.0000 - 999999s

**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 control or light source 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: 850nm  
Typical lamp lifetime: >100000hrs

**Range of Measurement**

RATIO (90°) 0.01 – 4 000 NTU/FNU (0.0025 – 1 000 EBC)  
ATTENUATED (0°) 0 – 5 AU, 10mm OPL (0 - 0.001 %T)  
BACKSCATTER (180°) 0 - 100% total suspended solids  
Other units of measurement available e.g. ASBC-FNU, Helms, ppm etc

**Resolution**

Typically <±0.05% of respective measuring range  
For scattered light (90° RATIO) measurement:  
0.01 – 10 NTU/FNU 0.01 NTU/FNU (0.0025 EBC)  
10 – 100 NTU/FNU 0.1 NTU/FNU (0.025 EBC)  
100 – 1000 NTU/FNU 1 NTU/FNU (0.25 EBC)  
1000 – 10000 NTU/FNU 10 NTU/FNU (2.5 EBC)

**Accuracy**

< ±2% of reading plus stray light

**Repeatability**

< ±1 % of reading or 0.01 NTU/FNU, whichever is greater

**Stray Light**

Typically < 0.05 NTU/FNU (measurement cell / probe dependent)

**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 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 100A breaking capacity  
LED status indicators flash when relays are active

**Fail-Safe:**

Dedicated relay output, 1 A 240 VAC  
mA output value used to signal a system fault (NAMUR <3.6 mA 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**

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

**Power Consumption**

25 VA (max.)

**Certificates**

CE, ISO 9001:2015, IECEx,  
ATEX Ex d IIB + H2 T5 IP66 Category (Ex) II 2 G,  
UL Class I Division I & II Gas Groups B,C,D,  
UL Class II Groups E,F,G and Class III,  
NEMA 479

**Flow Cells and Process Connections**

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  
Line size up to DN200 / 8"

**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®), PPSU

**Window**

Sapphire, UV fused silica

**Surface Finish**

Ra <0.38µm (electropolishing available on hygienic measurement cells)

**Elastomers**

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

**Operating Conditions**

Ambient & process temperatures up to 275°C (527°F)  
Process pressure from 10mbar to 200bar (0,14 – 2900psi)  
Operating conditions subject to material and design in use

**Fibre 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 100m (328feet)

**NIST-Traceability**

NIST-traceable validation accessory (option)

**Protection**

IP66 / EN 60529



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*We reserve the right to make changes  
without previous notice*

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*Kemtrak is a leading manufacturer of fiber optic measuring 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.*