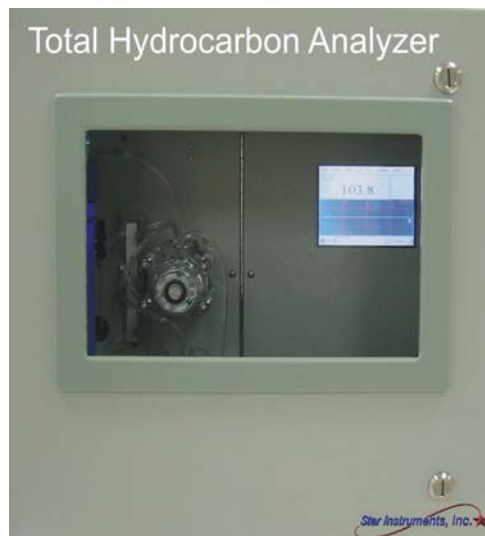


Features

- Microsoft Windows Touch Screen Computer
- Continuous THC
- 2 Alarm Levels
1 Master Fault Alarm
- 4-20 mA Outputs
- RS-232C/485 Outputs
- Separate Electronics & Liquid Compartments
- Powder Coated Steel Enclosure
- Low Maintenance

Options

- Auto-Validation
- Auto-Cal/Auto-Clean
- Automatic Multi-Range
- Multi-Stream Analysis
- Alkalinity Direct Analysis
- Network Ready
- Fiberglass Enclosure



Total Hydrocarbons/Oil in Water

Discussion

Star Instruments, Inc. uniquely offers all methods of hydrocarbon and oil in water analyses. Traditional methods include UV (Ultra-Violet) Absorbance, NDIR (Non-Dispersive Infrared) Absorbance and Oxidation/NDIR CO₂ Detection. Recently, the addition of ASTM Method D7066-04, using chlorotrifluoroethylene (S-316) to extract oil and grease in water with subsequent NDIR detection has been added to approved methods.

By offering multiple analytical methods, Star is able to recommend the best technique for the application in question, without bias.

For THC (Total Hydrocarbons) in water, the Oxidation/NDIR CO₂ Detection is the method of choice. It detects and has stoichiometric recovery for all species of hydrocarbons and conforms to ASTM 5310 CID, 4839-88, 4779-88 and EPA 415.1, 9060.

Only Star offers the features and reliability of operation associated with its team's pioneering experience in TOC and THC analyses since 1969.

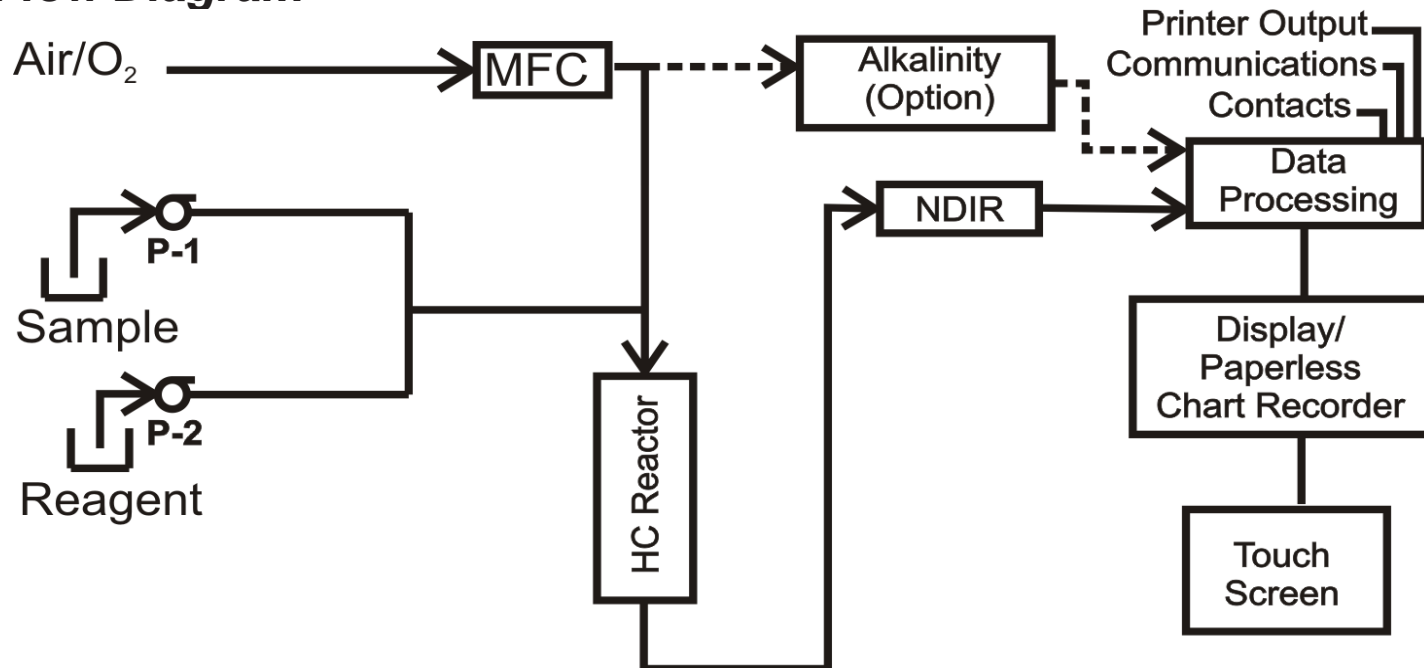
Preferred Applications

Excellent accuracy from low parts-per-million to moderate concentration levels of all hydrocarbons, with minimum maintenance.

*Standard Method 5310 C/D
EPA 415.1
EPA 9060
ASTM D 4839-88
ASTM D 4779-88*

*Boiler Feedwater
Cooling Water
Drinking Water
Wastewater (Limited)
River Water*

Flow Diagram



Analysis

The liquid sample stream is delivered by pump (P-1) and mixed with a reagent delivered by pump (P-2). The mixture is then directed to the Reactor, where the hydrocarbons are oxidized to CO₂. A computer controlled Mass Flow Controller (MFC) provides stable carrier flow which is important for reliable analysis.

The Star NDIR is completely solid state, with no moving parts to wear out or degrade. It uses a dual wavelength ratioing technique with analytical and reference detectors, which compensate for drift.

Star uses the continuous measurements of hydrocarbons, not batch differential analysis, because this method provides a more representative sample for more accurate THC analysis.

For those applications with significant inorganic compounds or require alkalinity analysis, incorporation of the optional Alkalinity Module is suggested.

Total Alkalinity, Hydroxide Alkalinity, Carbonate Alkalinity, Bicarbonate Alkalinity and Free Carbon Dioxide are determined and displayed as Total Alkalinity. In those cases where carbonates would be considered an undesirable background or interference, it can automatically be programmed to be subtracted from the THC analysis.

Benchmark/Auto-Validation

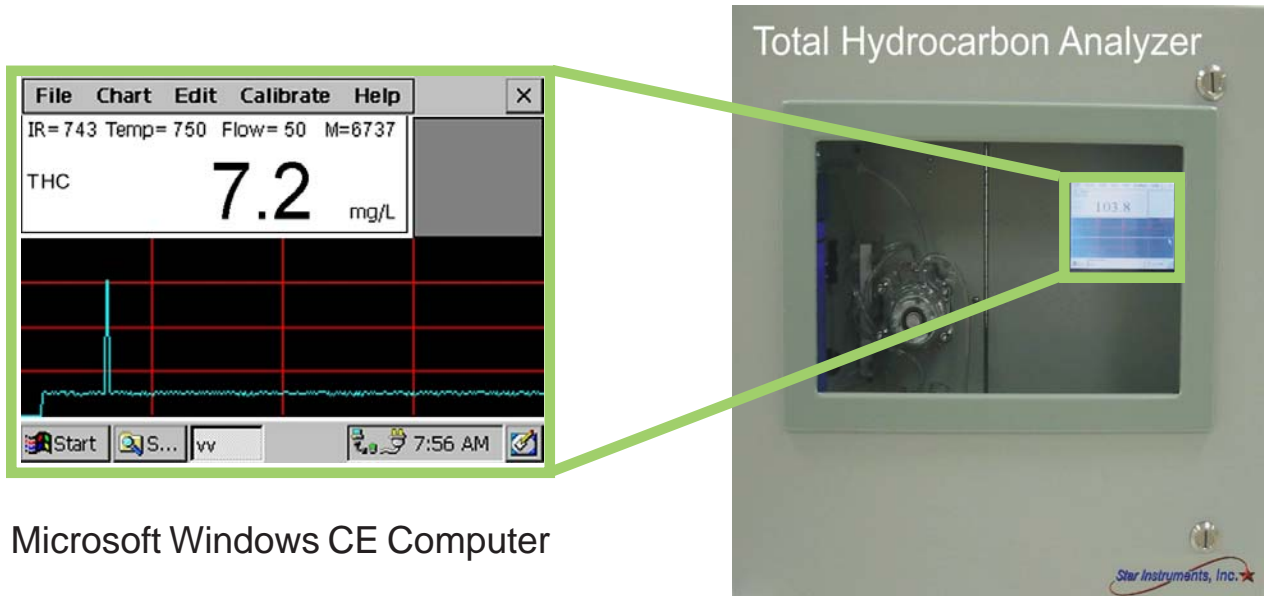
Benchmark is the European NAMUR specified validation technique, whereby on command a chemical calibration standard is automatically introduced to the analyzer and the response is compared to the previous analyzer calibration. If the analyzer response falls within a certain specified limit, the computer/output indicates "Benchmark Passed". If the response falls outside specified performance limits, either a "Maintenance Request" or a "Fault" alarm is activated, depending on preset tolerances.

Thus, in cases of leaks or process spills, when the analyzer performance is questioned, benchmark can rapidly and automatically validate analyzer performance. It eliminates time consuming and unnecessary recalibration cycles, which take the analyzer out of service just when it is most critically needed. Benchmark may be on-demand, or operator programmed for designated day and time activation on a repetitive basis.

Auto-Cal and Auto-Clean utilities are also available.

Advanced Technology, Today and Tomorrow

Star analyzers use a Microsoft Windows CE Computer to ensure that you are always up-to-date with the latest technologies. By incorporating a modular software design, Star is capable of offering advanced options unavailable elsewhere.

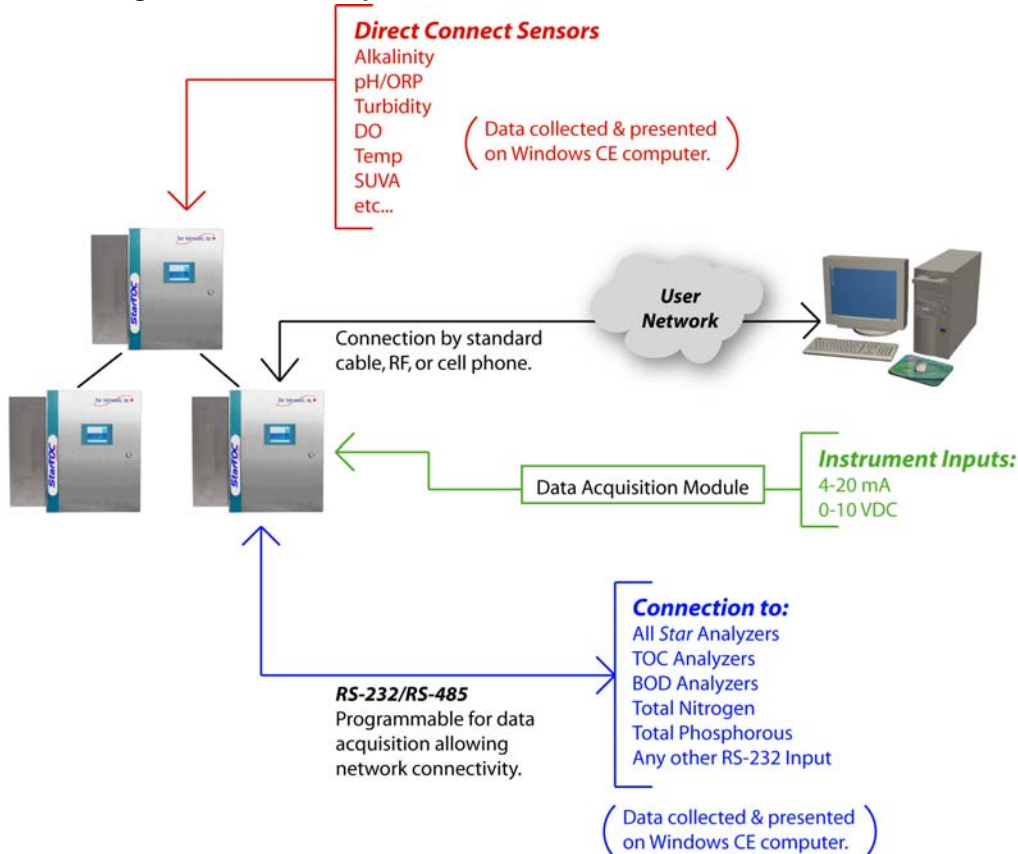


Microsoft Windows CE Computer

- Touch Screen
- VGA Color Display
- Network Ready
- Paperless Chart Recorder
- PCMCIA Slot
- Solid State Data Storage

Network Enabled

Star's utilization of an onboard Windows CE computer allows direct networking. Central control of analyzer operation and data management are easily facilitated.



Installation Requirements

The Star Total Hydrocarbons Analyzer can handle suspended solids up to 1,000 microns without filtration, thus providing a truly representative sample.

Star furnishes recommended installation drawings. The user must provide the following:

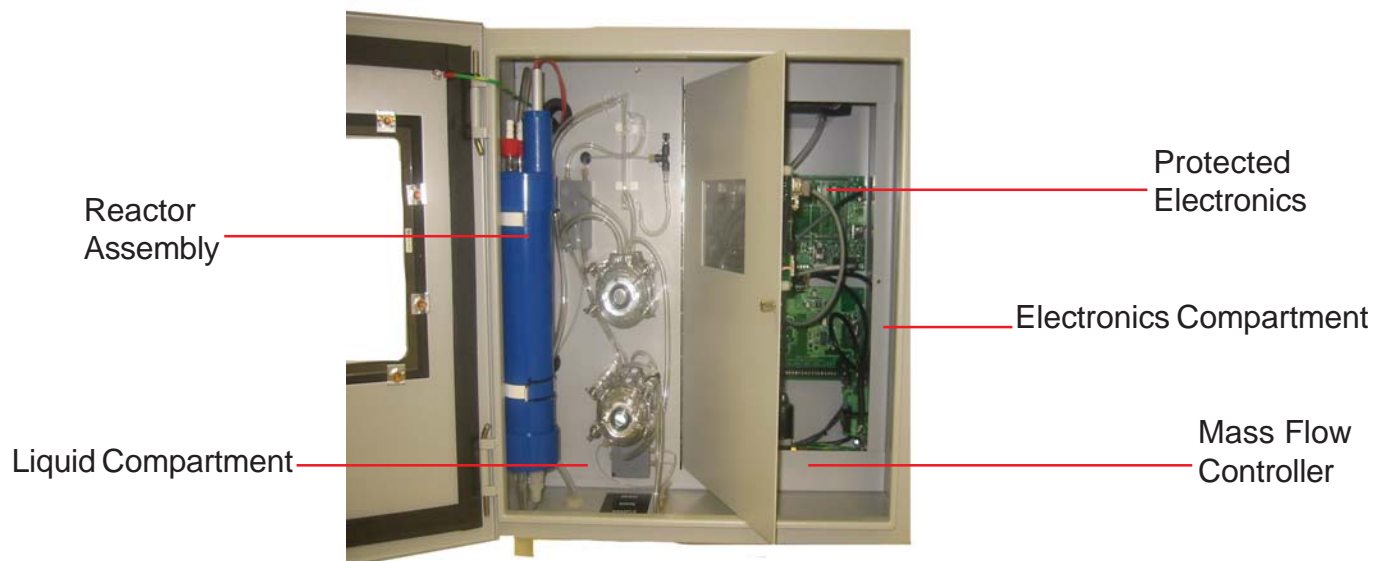
1. *Electrical Source (110/220 VAC 1000 watt service with cutoff switch)*
2. *Sample flow of a minimum of 10 ml/minute. A fast bypass loop is recommended.*
3. *Gravity fed drain with air break.*
4. *A source of CO₂-free air or oxygen with a maximum flow rate of 300 cc/minute at 15 psig. (Optional Star Oxygen Generator requires electricity only.)*

Start-Up Assistance

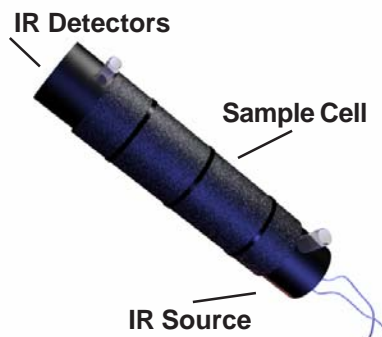
Star's distribution network offers complete installation assistance and stocks ancillary items, such as valves, regulators, fittings, tubing, filters, etc...

Service

Easy Access for Service (Doors Partially Open for viewing.)



NDIR (The key component for reliable THC analysis.)



- Specific Interference-Free CO₂ Detection
- Dual-Wavelength Ratioing Compensates for Drift
- Computer-Controlled for Accuracy
- Sapphire Protected Optics
- Non Corrosive, Non-Reflective Sample Cell (Borosilicate)

- No Moving Parts for Easy Maintenance and Service
- No Critical Realignment Required

Specifications

Nominal at 25°C. Subject to custom application requirements.

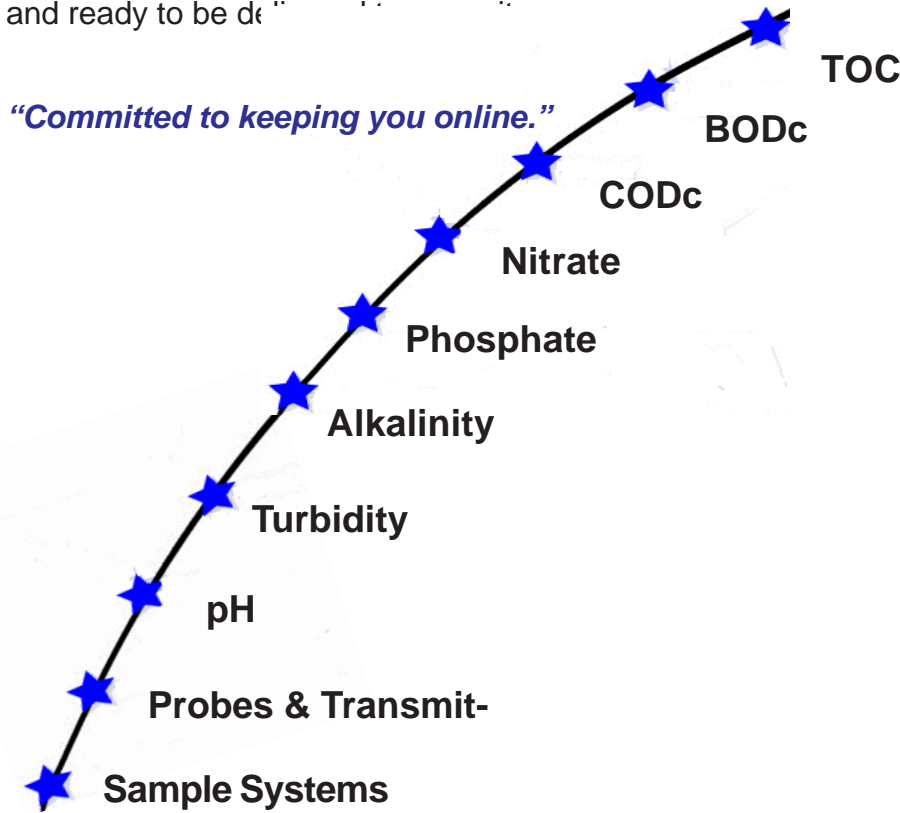
Measuring Range (Std.)	0-10 ppm through 0-1,000 ppm without dilution 0-10,000 ppm with dilution
Repeatability	+/- 1% of Full Scale
Drift	Compensated, self-calibrated NDIR (+/- 2% non-accumulative)
Response Time T₉₀	From 9 minutes, depending on range
Analog Outputs	4-20 mA (2 each)
Relay Outputs	2 TOC adjustable level alarms 1 master fault alarm
Computer/Display	Microsoft Windows CE Touch Screen Computer: Color VGA Display, Solid-State Data Storage, Paperless Chart Recorder, PCMCIA Slot, Network-Ready, RS-485 Modbus - OR - Microprocessor Based System
Power Supply	110/220 VAC 10 Amp service recommended
Enclosure	Powder Coated Steel
Dimensions (HxWxD)	50.8 x 50.8 x 38.1 (cm) 20 x 20 x 15 (in.)
Weight	34 Kg. 75 Lbs.
The analysis range and precision are affected by sample introduction, sample homogeneity, sample container cleanliness, reagent purity, chemical standards preparations, gas purity and operator skill.	

Ordering Information

Description	Order number
Microsoft Windows-CE Computer based, Single Stream Analyzer, Benchmark, Auto-Calibrate, Auto-Clean, Paperless Chart Display, Historical Records Digitally Stored Up to One Year	
THC Configuration	THCW
Multi-Stream Sequencer to Multiplex Up to 6 Streams.	
2-Stream Sequencer	MSS-2
3-Stream Sequencer	MSS-3
4-Stream Sequencer	MSS-4
6-Stream Sequencer	MSS-6
(1) Microsoft is a Registered Trade Mark of Microsoft Corporation	

Pre-Engineered Online System Packages and Enclosures

Star also provides pre-engineered and custom systems, including small shelters with all utilities installed and ready to be delivered.



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Web: www.starinstruments.com
Email: sales@starinstruments.com

Offering Complete Analyzer & Sample Systems

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- Waste Treatment
- Drinking Water
- Process Monitoring
- Panels & Small Shelters
- Custom Packages

