

TitraSip™ Systems

AquaMulti™ Analyzers
Multi-parameter Systems for Environmental Laboratories



Man-Tech AquaMulti™ Analyzers allow environmental laboratories to analyze multiple parameters from a single sample! All methods follow EPA approved methods and the TitraSip SA™ systems have been verified by the US EPA's Environmental Technology Verification (ETV) program, giving your laboratory the confidence to invest in Man-Tech instruments.

TitraSipSA™ System consists of:

PC-Titrate™ interface
TitraSip™ module
PC-Titrate™ software
48,000 step buret drive

Analyze for:

- pH
- alkalinity
- conductivity
- residual chlorine
- ammonia
- chloride
- fluoride
- hardness
- turbidity
- color
- dissolved oxygen
- phosphate



www.epa.gov/etv



TitraSip SA™ configured for pH, conductivity and alkalinity

Choose the parameters your lab requires and a system is configured specifically for you... It's truly the perfect fit. As needs arise, additional parameters and automation may be added. (See page 2)

Features and Benefits:

- Automated pipetting
- Auto-dilution capabilities for high concentration samples
- Connect directly to flowing sample lines for automated, scheduled near-line analyses
- TitraSip™ module integrates pipettor, rinse pump, analysis vessel and drain system into a single system
- pH/conductivity/alkalinity analysis in 3 minutes or less per sample (total cycle time dependent on alkalinity concentration)
- IntelliRinse™ system ensures system and probes are clean before moving to the next sample
- Capability to add SmartCal™ for scheduled, operator-free calibrations and QC checks
- Follows EPA-approved methods

TitraSip SA™ is the only titration equipment verified by the US EPA ETV program.

Ideal for municipal labs, effluent testing labs, environmental testing labs and more.



AQUAMulti™
A n a l y z e r s

Disclaimer: The EPA Environmental Technology Verification Program (ETV) Name and/or Logo does not imply approval or certification of this product, nor does it make any explicit or implied warranties or guarantees as to product performance. Information on the performance characteristics of TitraSip SA™ can be found at www.epa.gov/etv, or call Man-Tech Associates Inc. at (800) 206-8116 to obtain a copy of the ETV verification report.

Load. Start. Done.

TitraSip™ with AutoMax™ Autosamplers Automated Multi-parameter Systems for Environmental Laboratories

TitraSip™ System

1. Place sample in LOAD position
2. Click START
3. You are DONE!

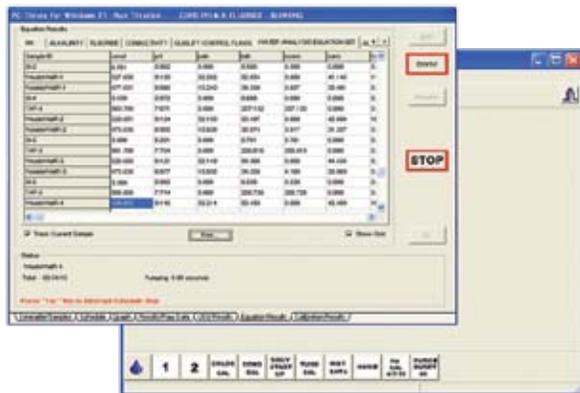


Shown Configured for
RapidDuo™
pH/conductivity/
alkalinity/fluoride in
3 minutes or less
(alkalinity < 500 ppm)

As easy as two clicks of the mouse to operate, TitraSip SA™ may be configured with or without an autosampler, depending on the number of samples you process. Connect directly to stream analysis for scheduled, operator-independent, multi-parameter analysis.

Software

The PC-Titrate software controls all facets of the TitraSip multi-parameter system including the AutoMax samplers, titrations, measurements, decision making (IF/ELSE/WHILE), calibrations, audit trail and import/export from/to LIMS



AUTO**MAX**™ Samplers

Man-Tech continues to exceed the requirements of environmental laboratories with durable and reliable autosamplers that stand the test of time. These systems allow for extended analysis runs during the day and overnight, delivering accurate and precise results each and every day.



AUTO**MAX**™ Rack Sizes

Autosampler	Racks (volume required dependent on parameters and system configuration)
AutoMax™73	73 x 50mL 40 x 120mL 30 x 125mL 18 x 300mL
AutoMax™122	122 x 50mL 62 x 120mL 47 x 125mL 23 x 300mL
AutoMax™197	197 x 50mL 97 x 120mL 77 x 125mL 44 x 300mL

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TitraSip SA™

Man-Tech is pleased to announce the release of the **TitraSip SA System**. The **TitraSip SA** is a stand alone multi-parameter titration/ion analysis system designed for environmental and wine laboratories. It is very to easy to use. Simply:

- 1. Place sample in load position**
- 2. Select parameters**
- 3. Click on Start**

The TitraSip SA will automatically pipet the sample, run multi-parameter analyses, drain the analyzed sample waste, automatically rinse the analysis vessel and probes, and perform many different titration and non-titration analyses. The typical stand alone autotitration system cannot do this!

KEY FEATURES and BENEFITS

- **Verified by the US EPA's Environmental Technology Verification (ETV) Program**
- **Automated pipetting/liquid handling**
- **Capability to analyze samples by:**
 - titration,
 - conductivity,
 - ISE analysis (i.e., FI, NH₃)
 - Turbidity
 - color (i.e., color, PO₄)
 - UV (i.e., NO₃, phenols)
 - dissolved oxygen (DO)
- **Measure only the required parameters per sample.**
- **Automatically drain an analyzed sample to waste and rinse the analysis vessel, electrodes, thermistor and probes**
- **Only one system required to analyze multiple parameters.**
- **Multiple results for the sample exported/printed in a single column easy to read and evaluate**
- **Create multiple sample batches easily and the TitraSip SA prompts the chemist when it is ready for the next sample**
- **Connect TitraSip near line to a flowing system for automated scheduled analysis. For example, analyze pH, conductivity, alkalinity and turbidity every 30 minutes unattended!**
- **Conforms to EPA, Standard Methods, ASTM, AOAC and AOCS methods**
- **Add the SmartCal™ System for pre-scheduled, unattended daily calibrations**
- **Capability to upgrade and add an autosampler and/or additional parameters.**
- **Capability to add the Man-Tech PC-BOD SA for BOD analysis**





Review of TitraSip SA for Laboratories

Environmental Laboratories



In a typical Environmental Laboratory, a sample is received, logged and parameters required for analysis recorded. A typical sample, may require, 20 different parameters, inorganic and organic, with different holding times and multiple stations/instruments required for analysis. This sample is then

handles many different times, by different operators logging analysis data manually, automated or both depending upon the station and instrument. Add to this the bench space required to locate these stations/instruments and the overhead cost is large for even the simplest of analyses.

Man-Tech understood the concerns associated with sample handling and data logging and with our experience in inorganic environmental analysis, we sought out to develop the TitraSip SA which would fulfill the needs for small and large environmental laboratories alike.

With the TitraSip SA, the sample will only be handled once for 2-10 inorganic parameters such as pH, conductivity, alkalinity, turbidity, ammonia, chloride, chlorine, color, etc. The data is automatically transferred and transcription errors are eliminated. Since the system is easy and sample handling is reduced, holding times are kept to a minimum. The total bench space is only 21" (excluding the computer) for the TitraSip SA multi-parameter system.

Man-Tech understands that calibrations are time consuming and, as a result, we developed the SmartCal system add-on for pre-scheduled, unattended calibrations. Imagine, you are waking up and the TitraSip SA has also awoken up. It has started to prime the pumps, rinse the system and the SmartCal is calibrating all probes and devices. You arrive in the laboratory and simply review the calibrations. Of course the TitraSip SA highlights any calibration that failed. It will perform the calibration twice with any failure before notification if you like.

The TitraSip SA System was originally developed for the laboratory following EPA approved methods, but the unique sample analysis scheduling feature allowed to be easily used in a near line setting. For the first time, a water plant could use the identical system used by the laboratory following EPA methods. The City of Fort Wayne, Indiana fully realized the benefit of this and quickly adopted the technology for laboratory and near-line plant use. It has saved thousands of dollars and the results are directly comparable. Add to this the Man-Tech automated stream selection (5 stream analysis from one TitraSip SA) and the TitraSip SA may analyses from up to 9 different process streams from one instrument. In addition, the US EPA through the City of Cincinnati evaluated 2 TitraSip SA Systems with SmartCal's gaining the valuable US EPA's Environmental Technology Verification (ETV) statement. These systems ran unattended analyzing samples for 5 different parameters every 30 minutes plus primed and calibrated the system every morning at 9am. The operators loved it!

There are many reasons to invest in the TitraSip SA for environmental laboratories. Be sure, once you invest in the TitraSip SA, results will be quicker, accurate, more precise and the lab will run more efficiently.



Wine Laboratories



Wine Analysis Laboratories are routinely required to analyse for pH, total acidity (TA), volatile acidity (VA), free and total SO₂, reducing sugars and more. These different tests require different electrodes, titrant and sample preparation, however, the same wine sample requires most or all of these tests. You will find different stations devoted to each test.

With the TitraSip SA, the chemist simply places the wine sample in the load position, clicks start and the TitraSip SA completes the following tests, unattended.

- pH
- TA
- Free SO₂
- Total SO₂
- Others such as FI, Na, Cl etc.

More parameters may be analyzed, but as VA and reducing sugars require heating, these must be separate samples.

Once the TitraSip SA has completed all the analyses selected, all results for the sample are in a single report and the TitraSip SA notifies the chemist that it is ready for the next sample. It truly is simple and amazing.

Imagine, taking a sample from a barrel/bottle and placing this in the load position and getting a snapshot of the pH, TA, Free SO₂ and Total SO₂ with no extra work! Nothing could be more convenient. The TitraSip SA easily analyzes red wine, white wine and must.

Man-Tech understands that investment capital must be justified, that is why you will find the TitraSip SA comparatively priced to competitor autotitrators that only offer titration and manual pipetting. In addition, the TitraSip SA offers more automation, better precision and trusted accuracy. In terms of multi-parameter analysis, wineries will find there is no competition for Man-Tech's TitraSip SA system. For the large wineries, the Man-Tech TitraSip SA may be upgraded to add an autosampler for true multi-parameter analysis over many samples. It has the capability to run unattended over night for up to 197 samples, 5 parameters each.

Government Agencies, Viticulture Institutes and Wineries have all invested in Man-Tech solutions. There are many reasons to invest in the TitraSip SA for wine laboratories. Be sure, once you invest in the TitraSip SA, results will be quicker, accurate, more precise and the lab will run more efficiently.



TitraSip SA – What does it Include?

The TitraSip SA will include the minimum following components:

- PC-Titrate Software, interface, sample load station, and accessories
- Man-Tech's 4800 step buret drive (the highest resolution in the industry)
- A 10 or 25ml interchangeable buret
- TitraSip Module, integrated components include
 - Pipetting/liquid handling pump
 - Dual channel rinse pump
 - Analysis vessel
 - Drain Valve
- TitraSip SA system organizer

Additional hardware components are added depending on the parameters required.

TitraSip SA System Configurations

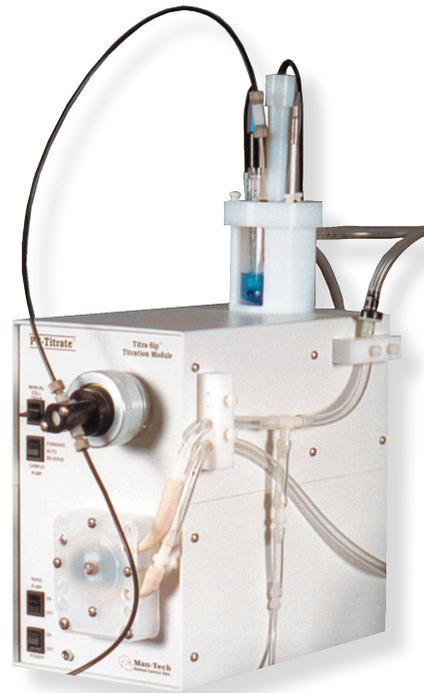
These are a few of the TitraSip SA Systems Available. Please enquire with your distributor for pricing and additional configurations.

Part Number	Description
PCM-QSAT/A	QC-Titrate TitraSip SA for general acid base including pH, alkalinity
PCM-QSAT/TRC	QC-Titrate TitraSip SA for pH, total residual chlorine
PCM-QSAT/AF	QC-Titrate TitraSip SA for pH, alkalinity and fluoride
PCM-PSAT/CAF	TitraSip SA for pH, conductivity, alkalinity, fluoride
PCM-PSAT/CA-CL	TitraSip SA for pH, conductivity, alkalinity, chloride
PCM-PSAT/CAFT	TitraSip SA for pH, conductivity, alkalinity, fluoride, turbidity
PCM-PSAT/CATS	TitraSip SA for pH, conductivity, alkalinity, turbidity, color
PCM-PSAT/CAN	TitraSip SA for pH, conductivity, alkalinity, ammonia
PCM-PSAT/CAH-CL-TRC	TitraSip SA for pH, conductivity, alkalinity, hardness, chloride, total residual chlorine

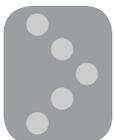
TitraSip SA Systems include the PC-Titrate software which requires a computer with Windows XP Professional operating system.



Load. Start. Done.



The Titrasip™ Module



The TitrasiP™ Module

The TitrasiP is the evolution of titration automation and still true to its goal of delivering accurate, precise results that stand the test of time.

- Single stand alone module, use with autosampler, stand alone or near-line
- Integrated pipet pump, dual rinse pump, analysis vessel and drain valve in one
- The TitrasiP pipet pump is a patented, valveless, ceramic, piston design that is precise and inert
- Measured over millions of pipets, the TitrasiP delivers according to Class A pipet specifications

Man-Tech introduced and developed the concept of liquid handling/pipetting automation to titration systems. Early in the development stage, Man-Tech decided to develop a self contained liquid handling module that could be connected to an autosampler, connected near line, or used as a stand alone. This offered a number of important advantages:

- Laboratories with multi-parameter analysis requirements choose the configuration that best fits their needs and workflow
- With an autosampler, the entire bed is used for samples. There is no need to allocate space for the analysis vessel
- Connected direct to a process stream, the near line configuration offers the operator free, scheduled analysis over 24 hours, a week, etc.
- Invest with ease, start with a stand alone option and upgrade by adding the autosampler
- Autosampler movements are kept to minimum since the pipet probe(s) enters the sample once for multi-parameter analysis. There is no need to move from sample cup to analysis cup to transfer the sample
- Choose from 3 different analysis vessels:
 - 35ml – multi-parameter with FAST analysis times
 - 85ml – multi-parameter with 4 electrode capability
 - 145ml – multi-parameter, 4 electrode with large volume capability

A very important consideration when developing liquid handling devices with analysis vessels, is the elimination of carry-over from samples or from rinse water (dilution effects). The TitrasiP utilizes a gravity and or pump activated drain, versus aspiration, a propeller stirrer versus a magnetic stirrer, and a high flow dual rinse action pump. These offer the following advantages:

- The drain action ensures all sample and rinse water is drained from the analysis vessel. There is nothing left! Aspiration of sample and rinse water may lead to cross contamination and/or dilution effects.
- The use of the propeller stirrer ensures there is no sample/water trapped as with magnetic stirrers that lay at the bottom of the vessel.
- The dual action rinse pump rinses the analysis vessel with swirling action ensuring complete rinse of the analysis vessel and pipet probe at the same time. Effective draining eliminates any potential for dilution effects.
- Add in Man-Tech's IntelliRinse, and there is proof that the entire system is clean and ready for the next sample.

In our continued evolution, the TitrasiP is now available in the RapidDuo™ format (2 x TitrasiPs), allowing for quicker analysis times when running multi-parameter analysis.



Company Info

Man-Tech Associates Inc. was formed as the result of an idea to develop a software-based autotitration system. When the idea became a reality, we had introduced the first autotitration system with PC-based software in the world. We quickly recognized the need for automation capabilities and flexibility. Our strength in software and automation, coupled with our focus on customer service, has led to the installation of hundreds of systems throughout the world and the continued growth of the company.

Man-Tech dedicates considerable resources towards product and applications development. Our fully operational laboratory is staffed with highly qualified individuals, who develop new applications and provide customer support on a continual basis. Customer support is a key ingredient to our success, and will continue to gain new investment. Our sales and support personnel have university degrees in science and understand your applications, thus ensuring effective and knowledgeable client support.

Innovation has also been a trademark of our company. Continued evaluation of the autotitration system has led to the development of methods for ion analysis, turbidity assays, BOD analysis and more, and will continue as Man-Tech progresses. We continually strive to understand our customers' requirements in order to determine how we can best fulfill their needs with new product features. Our aim is to make your laboratory more productive, while maintaining quality results, and to minimize the cost of analyses while maximizing personnel time.

The Man-Tech manufacturing facility is located in Guelph, Ontario, just 60 km southwest of Toronto's Pearson International Airport. Our products are available in the USA through our sister company Man-Sci Inc. and throughout the world, by an ever increasing network of distributors.

At Man-Tech, our goal is to become a valued manufacturer of titration and ion analysis products for analytical laboratories by meeting our clients' needs with quality people, quality products and quality service through continuous quality improvement.



Load. Start. Done.

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