



# S1 TITAN

● Definition of Precision

Handheld XRF

## ● The S1 TITAN Series Handheld XRF Analyzers

The S1 TITAN series is designed to quickly and accurately report the elemental analysis of your sample. Whether you need to analyze large machined parts, children's toys, or small jewelry, the S1 TITAN will deliver fast and accurate results. The ergonomic pistol grip and trigger are designed for all-day use. The color touch-screen LCD is easily seen in all lighting conditions. Weighing in at just 1.5kg (3.3 lbs), the S1 TITAN is among the lightest tube-based XRF analyzers on the market.

Designed as a "point and shoot" analyzer, the S1 TITAN requires minimal setup and operator training. Equipped with both user-level and supervisor-level access, a manager can choose to grant basic operator control or full functionality. This two tier approach and intuitive interface make the S1 TITAN perfect for both beginning users, as well as power users.

Since XRF is a non-destructive technique, it is ideal for analyzing and sorting incoming material, finished goods and in-process production parts. Applications for the S1 TITAN are not limited to clean manufactured parts; scrap metal sorting, geochemical assays and soil testing are also well within the capabilities of the S1 TITAN. Available calibrations are as diverse as the list of applications, but if you don't find a calibration to match your application, we can customize a calibration to perfectly fit your requirements.



**Detector Technology:** With the introduction of the S1 TITAN model 500, Bruker becomes the first company to manufacture all industrial handheld XRF instruments using the latest Silicon Drift Detector (SDD) technology. This important step means that all instruments will have the latest in high resolution and high count rate detectors. As a result, the end user can expect to have fast, precise readings regardless of the model ordered.

The FAST SDD® found in models 600 and 800 operates at very high count rates and thus provides excellent precision at short measurement times. In addition, the SDD allows for measurements of light elements such as magnesium, aluminum, and silicon.



The standard SDD detector, found on model 500, is an excellent value choice. Performance, resolution and analysis speed are far superior to alternative SiPIN detector technology.

**Easy to use:** The S1 TITAN is among the lightest portable tube-based XRF analyzers available on the market today. The user interface has been designed to provide intuitive operation and results presentation. Data management and transfer are exceedingly easy to use.

- Intuitive user interface
- Requires very little operator training
- Multiple fields for sample identification
- Lightweight – only 1.5kg / 3.3 lbs, including battery



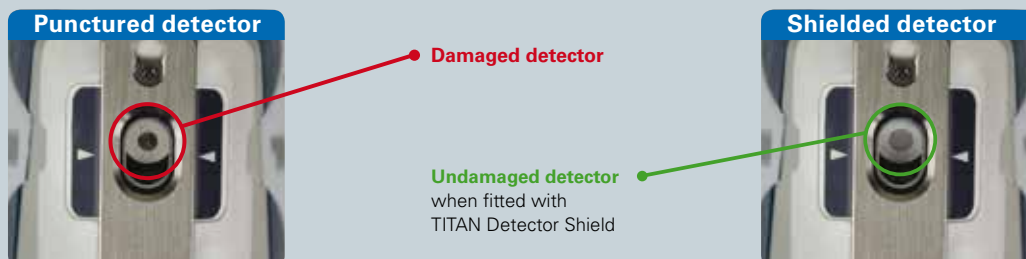
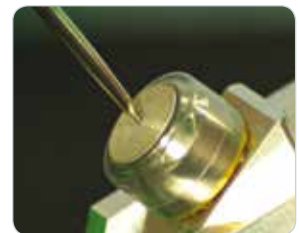
**Environmental conditions:** IP54 rated; the S1 TITAN is designed to withstand field operation in all environments, including humid and dusty conditions.

- Sealed against moisture and dust
- Ruggedized with rubber over-molding
- Protected from dirt and windblown dust
- Sample stand for measurement of small and complex samples
- Operating Temperature: -10°C to +50°C
- Sample Temperature (intermittent use): 150°C for Ultralene® window, 500°C for Kapton® window



**TITAN Detector Shield™:** The ultimate defense against punctured detectors. This unique patent pending S1 TITAN accessory protects the detector window from being punctured by sharp objects like scrap shavings and wire, while still allowing rapid and accurate analysis of almost any material.

- Minimizes costly detector punctures
- Increases equipment up-time
- No need to change window or calibration when measuring light elements
- No sacrifice to analytical performance, even when measuring light elements such as Mg, Al or Si

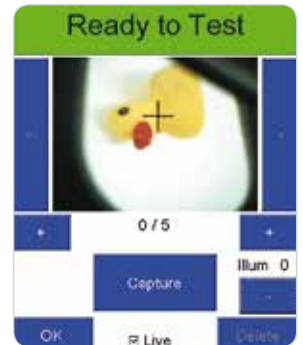




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**Integrated camera & small spot collimator:** The S1 TITAN can be equipped with an integrated camera (640 x 480 pixels) to provide sample visualization and accurate positioning of the measurement spot. The small spot option provides a small measurement area for the isolation of small features to be tested. Thanks to the S1 TITAN's SharpBeam™ optimized geometry, the precision and accuracy of the measurement with small spot collimator are the same as for the normal spot; there is no need to extend the measurement time to achieve the desired precision.

- Small spot isolates specific sampling area
- Camera ensures accurate measurement positioning
- Save up to 5 images per assay (provides record of measurement spot)
- Images easily import into reports
- No loss of accuracy with small spot option



 A screenshot of the PC software interface showing a data table with columns for Element Name, Wt%, and Wt%. The table contains several rows of data for various elements.
 

Element Name	Wt%	Wt%	Wt%	Wt%
Al	0.000	0.000	0.000	0.000
Si	0.000	0.000	0.000	0.000
Fe	0.000	0.000	0.000	0.000
Ca	0.000	0.000	0.000	0.000
Mg	0.000	0.000	0.000	0.000
K	0.000	0.000	0.000	0.000
Na	0.000	0.000	0.000	0.000
Cl	0.000	0.000	0.000	0.000
S	0.000	0.000	0.000	0.000
P	0.000	0.000	0.000	0.000
C	0.000	0.000	0.000	0.000
O	0.000	0.000	0.000	0.000
Ti	0.000	0.000	0.000	0.000
Zn	0.000	0.000	0.000	0.000
Cr	0.000	0.000	0.000	0.000
Mn	0.000	0.000	0.000	0.000
Ni	0.000	0.000	0.000	0.000
Cu	0.000	0.000	0.000	0.000
Ag	0.000	0.000	0.000	0.000
Au	0.000	0.000	0.000	0.000
Pb	0.000	0.000	0.000	0.000
Bi	0.000	0.000	0.000	0.000
As	0.000	0.000	0.000	0.000
Sb	0.000	0.000	0.000	0.000
Sn	0.000	0.000	0.000	0.000
Hg	0.000	0.000	0.000	0.000
Co	0.000	0.000	0.000	0.000
Ni	0.000	0.000	0.000	0.000
Mo	0.000	0.000	0.000	0.000
W	0.000	0.000	0.000	0.000
Re	0.000	0.000	0.000	0.000
Os	0.000	0.000	0.000	0.000
Ir	0.000	0.000	0.000	0.000
Pt	0.000	0.000	0.000	0.000
Au	0.000	0.000	0.000	0.000
Hg	0.000	0.000	0.000	0.000
Pb	0.000	0.000	0.000	0.000
Bi	0.000	0.000	0.000	0.000
As	0.000	0.000	0.000	0.000
Sb	0.000	0.000	0.000	0.000
Sn	0.000	0.000	0.000	0.000
Pb	0.000	0.000	0.000	0.000

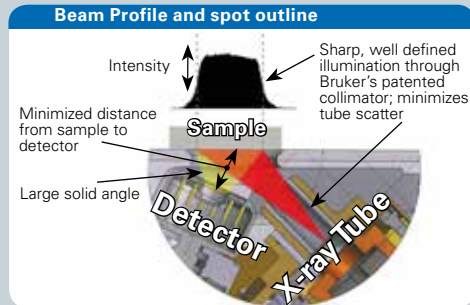
## Data Handling:

- **Data storage**
  - Images, spectra, sample identification, and results are stored in a single protected file for easy storage and access
  - Results are available in both a protected and unprotected file formats
    - The unprotected file format can be imported directly into Excel or other database programs
  - Data may be stored in internal instrument memory or a USB flash drive or both
  - The assay's GPS coordinates can be exported to GIS compatible software
- **Bluetooth® wireless accessories**
  - External GPS receiver providing GPS coordinates to the S1 TITAN
  - Portable, ruggedized thermal printer
  - Bar code reader
- **S1 TITAN Toolbox** - PC software communicates with and controls the S1 TITAN
  - S1 RemoteCtl – Software for remote control of the S1 TITAN
  - S1 SYNC – Software to communicate with the instrument and manipulate data from the S1 TITAN. Features include:
    - Easy to use report generator
    - Grade table editor
    - Spectrum viewer
    - Software & calibration updates



Every S1 TITAN is precision built with Bruker's patented **SharpBeam™ Optimized Geometry** (patent # 8,223,925). Benefits include:

- Produces a sharp, defined measurement spot
- Improved measurement precision
- Reduced power requirements
- Reduces stray scatter
- Increased battery life
- Reduced weight



**SMART Grade™ (System Monitored Automatic Run Time):**

The S1 TITAN 800 and 600, when ordered with an Alloy calibration, are automatically equipped with Bruker's patent pending SMART Grade™ calibration. **This application automatically determines the proper conditions and measurement times for each alloy measured.**

- Pull the trigger and the analyzer does the rest
- Like having an expert operate your analyzer
- Optimum measurement conditions for each alloy
- Multiple condition measurement when required
- Fast measurement (2-3 sec) for standard alloys
- Automatically extended times (10-30 sec) for alloys containing light elements



**Grade Library:** All S1 TITANS ordered with Alloy calibration includes extensive grade libraries (400+ grade definitions) covering various international standards. User selectable libraries: UNS, DIN and others. These libraries cover the following alloy classes:

- Low alloy steels
- Cr-Mo steels
- Tool steels
- Stainless steel
- Specialty alloys
- Nickel alloys
- Zirconium alloys
- Brasses
- Bronzes
- Cobalt alloys
- Zinc alloys
- Aluminum alloys
- Titanium alloys
- Exotic alloys

**304SS**

42 Match 9.6 01-04 22:38  
Time 2.0

El	Min	%	Max	+/-
Fe	66.35	71.80	74.00	0.37
Cr	18.00	18.05	20.00	0.16
Ni	8.00	8.36	10.50	0.16
Mn	0.00	1.22	2.00	0.09
Cu	0.00	0.17	0.50	0.03
Mo	0.00	0.13	0.50	0.01
Co		0.28		0.03

**Inco 792**

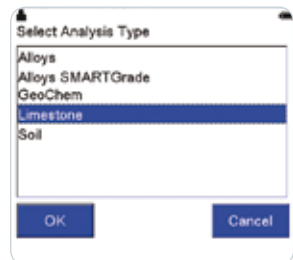
42 Match 9.8 01-04 19:38  
Time 3.0

El	Min	%	Max	+/-
Ni	60.00	62.50	69.00	1.76
Cr	11.00	12.36	13.00	0.32
Co	8.00	8.94	10.00	0.28
W	3.60	3.98	4.59	0.17
Ti	3.50	3.75	4.50	0.20
Ta	3.50	3.60	4.50	0.15
Mo	1.60	2.00	2.40	0.09

## • The S1 TITAN Series Handheld XRF Analyzers

**Calibrations:** Several different calibration options are available for the S1 TITAN, depending upon the model of interest.

- **Alloy:** Fast single phase measurement for standard alloys (Ti - U) with grade ID and nominal light element concentration support (indirect determination of some light elements).
- **Alloy LE:** Dual phase alloy analysis (Mg - U), including direct measurement of light elements (Mg, Al, Si and P) and extended grade ID; Includes high accuracy type-specific calibrations for most alloy groups.
- **Precious Metals:** Optimized for precious metal alloys. Includes alloy grade ID and karat display.
- **Low Lead in Copper:** Detects and measures low concentrations of lead in copper (Pb up to 2%) to comply with the Safe Drinking Water Act and California Prop 65. This calibration is only available for models 800 and 600.
- **Restricted Materials:** For RoHS I/II, consumer product screening. Auto mode and user selectable calibrations for plastics, mid-density materials, and metals with IEC and user defined compliance limit settings.
- **Limestone:** For the cement, construction and building industry to analyze raw and prepared limestone, cement and gypsum. This calibration is only available for models 800 and 600.
- **GeoChem:** Optimized for mining, exploration, grade control and drilling. Includes GeoChem Trace, GeoChem General. For models 800 and 600, this calibration includes full light element support via dual phase measurement.
- **Soil:** Optimized for field testing of contaminated soils and reclamation according to EPA 6200. This calibration can also be used for catalytic converter and e-scrap recycling applications. For models 800 and 600, this calibration includes full light element support via dual phase measurement.



S1 TITAN Configurations	Excitation	Detector	Elemental Range	Spot Size	Calibrations						
					Alloy	Alloy LE	Precious Metals	Low Lead in Copper	Restricted Materials	Limestone	GeoChem
<b>Model 800</b> 	6-50kV 4 filters		Mg - U	8, 5 or 3mm	●	●	●	●	●	●	●
<b>Model 600</b> 	15-50kV 4 filters		Mg - U	5mm	●	●	●	●	●	●	●
<b>Model 500</b> 	40kV Fixed filter	SDD	Ti - U	5mm	●	●					

**Optional Accessories:** There are a variety of optional accessories available for the S1 TITAN. Please reference the S1 TITAN Accessories brochure for complete details.

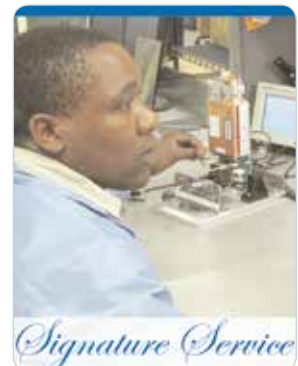
Popular accessories include:

- Benchtop stand with full safety interlock
- Portable desktop stand (small samples)
- Barcode scanner
- Mobile printer
- GPS receiver
- Grinder
- Crusher (impact mortar & pestle)
- Alloy check sample kit
- Weld adapter
- Belt holster



**Signature Service:** Bruker has been in the instrument business for many years and supplied products and services to companies just like yours. We understand the critical importance of post-sales support to our clients. Our Signature Service program provides the highest level of service in the industry.

- Guaranteed loaner program\*
- Extended warranties
- Standard warranty
- Service contracts
- Rental services

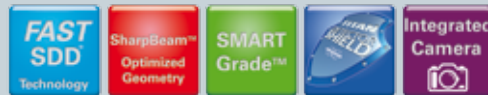


\* Not available in all regions. Ask your local representative about availability

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Bruker (Handheld XRF division), can trace its history back to the early 1980s and the US National Laboratory in Richland, Washington. It was there that a team of scientists from United Nuclear Inc and the US Department of Energy pioneered the early breakthroughs in portable XRF. That led to the formation of Scitec, the company that would later become Bruker.

A lot has changed since those early days. A series of innovations has made handheld XRF technology an indispensable tool in fields as diverse as PMI (Positive Material Identification), art conservation, scrap sorting, petrochemical industries and the NASA space exploration program. S1 TITAN is the latest in a long line of innovations. During this development, Bruker has produced thousands of handheld XRF instruments which have been sold and serviced throughout the world.



**1982**

Scitec Incorporated

**1998**

C-Thru acquires Scitec

**1999**

Keymaster Technologies acquires C-Thru

**2001**

Keymaster introduces the first tube-based portable XRF

**2002**

Keymaster/NASA introduces first light element portable XRF

**2006**

Bruker acquires Keymaster Technologies

**2008**

Bruker introduces first SDD-based XRF

**2013**

Bruker introduces TITAN Detector Shield™



**1982**  
Map 1



**1994**  
Map 4



**2001**  
Tracer 1



**2002**  
NASA vacuum instrument



**2005**  
TRACER III-V



**2006**  
OEM Product



**2008**  
S1 TURBO<sup>SD</sup>



**2009**  
S1 SORTER



**2012**  
S1 TITAN



**2013**  
S1 TITAN  
2<sup>nd</sup> generation

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[www.bruker.com/s1titan](http://www.bruker.com/s1titan)

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