

Uncountable Instrument Connectivity Overview

INSTRUMENT CONNECTIVITY

Seamless connectivity between instruments and laboratory information management systems (LIMS) and Scientific Data Management Systems (SDMS) is pivotal in modern laboratories. When manual data entry is required from users, it increases the risk of errors and often leads to incomplete and missing data capture within the system. To address this, modern platforms must allow labs to connect and integrate their laboratory instruments effortlessly. These connections should be adaptable to various instrument types and network configurations, ensuring that the results and metadata associated with those results can be extracted with minimal effort required from your researchers.

The key question is, how can this seamless connection be done in a system like Uncountable?

CONNECTIONS

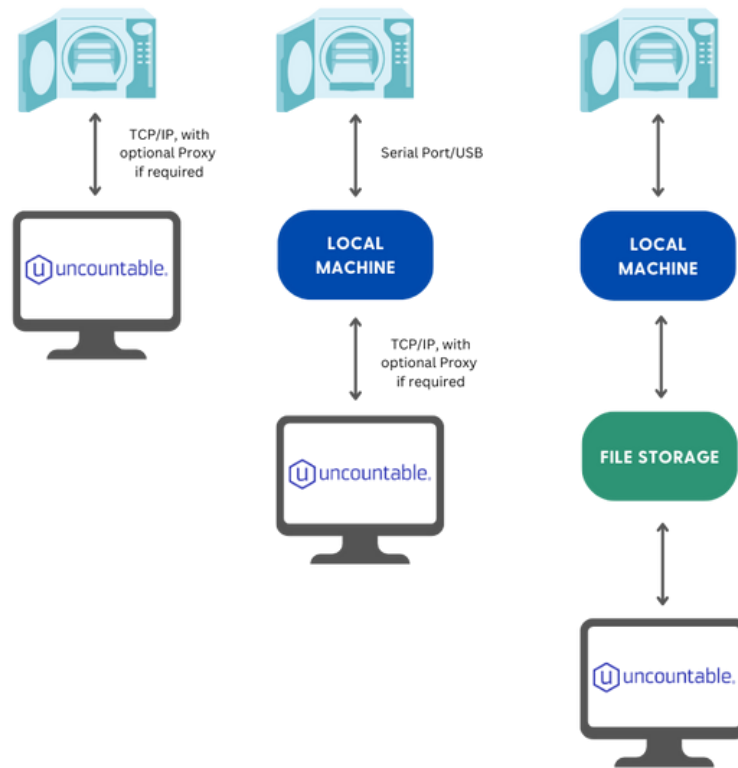
Uncountable supports three primary types of instrument connections:

- 1. Direct API Connection:** The first is a direct connection via API to the instrument (REST or SOAP are common protocols, though others are in use). Here, a “smart” instrument is used, which can directly talk to the Uncountable system, or where a DMZ is in place, can talk to a proxy server that forwards the requests along. This is the preferred method of working with instruments and can support output data from instruments and instructions to instruments. Some labs even run full end-to-end processes in real-time through their countless connections.
- 2. Serial Port / USB Connection:** If this is not possible, a couple of other options are available. If the instrument connects via a serial port or USB, an Uncountable agent may be installed on a local machine. This agent can then connect to Uncountable (again via proxy if located in a DMZ) and perform the same unidirectional or bidirectional communication.
- 3. File-Based Approach:** Lastly, a file-based approach may be used if the instrument writes files to a device but doesn’t communicate otherwise (or an agent-based approach is not preferred). In this instance, the instrument saves files, often based on a unique ID tied to a sample, to a location that Uncountable may read from. This can be hosted by Uncountable or by the customer. This location is inspected regularly, and data is uploaded to the Uncountable system.

These varied methods ensure that regardless of the instrument type or network setup, seamless data integration with Uncountable’s system is achievable.



UNCOUNTABLE'S CONNECTION TYPES



USE CASES

Given these connections, Uncountable offers several use cases:

- 1. Basic Unidirectional Communication:** Automatically capturing simple unidirectional data without accompanying metadata, such as scale readings.
- 2. Advanced Unidirectional Communication:** Handling complex data from instruments like spectrophotometers, including measurement data, associated metadata, and other sample information.
- 3. Bidirectional Instrument Interaction:** Engaging with bidirectional instruments, such as chromatography instruments, where protocols may be sent to the instruments.
- 4. Integrated Orchestration Workflows:** Facilitating high-throughput experimental processes, feeding these into Uncountable's machine learning systems for analysis, and subsequently running new tests based on the analyzed results.



CONFIGURABILITY

Uncountable’s platform is fully configurable by system administrators, who may choose what data to extract, what metadata fields to associate, and what other information is pertinent for each instrument integrated. An example of the interface is shown below, which allows users to pick exactly what information in a standard export is relevant to their needs.

Uploader Name ⓘ

Detection Keyword ⓘ

Notes

Warning: submitting will overwrite the existing uploader.

Tags ⓘ

Skip Empty Outputs ⓘ

Material Families Enabled ⓘ

Some ▾

Default x

▾

Example File ⓘ

GPC_data_table_Polymer_1.txt

Raw File

Parsed File

Refresh

GPC Results				
#	Dist Name	Mn	Mw	M
1		3474	8011	ε

Extracted Data ⓘ

Outputs
Inputs
Condition Parameters
Output Metadata

Experiment Metadata
Annotations
Ingredient Attributes

Transformations
Multiple Inputs

Extract **Mn** from **mn**

Extract **Part Quality** from **mv**

Extract **GPC File** from **USER_UPLOADED_FILE**

Extract **MP** from **mp**



SUPPORTED VENDORS

Uncountable has integrated with over 400 machines and adds new support each week. While there are too many machines to list exhaustively, here are some of the vendors that Uncountable has worked with.

- Agilent
- Ametek
- AMS Alliance
- Ankom
- Arbin
- BatterySpace
- Beckman
- Biologic
- Brabender
- COLLIN Lab
- Copia Scientific
- Datacolor
- Gwyddion
- Hailex
- Hunterlab
- INFORS HT
- Instron
- Konica Minolta
- LabJack
- Litesizer
- Maccor
- Malvern
- Mettler Toledo
- Micromeritics
- Microtrac
- NETZSCH
- Neware
- Sartorius
- Shimadzu
- TA Instruments
- Thermo Fisher
- X-Rite
- ZwickRoell

Don't see a vendor you're looking for? Contact Uncountable at sales@uncountable.com for our comprehensive list of equipment and instrument vendors.

CONCLUSION

Connecting to instruments seamlessly should be a key requirement for any modern lab software you purchase. Moving from manual to automatic processes can save scientists time, reduce error, improve auditability, and better track the provenance of data within your systems.

To learn more, contact Uncountable at sales@uncountable.com, today.