# PT-IM100 – NIR-Based Material Analyzer


## The PT-IM100 Represents an Innovative, Reliable and Flexible Analyzer for the Identification, Qualification and Quantification of Incoming Raw Materials According to EP <2.2.40> and USP <1119>

The NIR instrument PT-IM100 is a fast, reliable and non-invasive technique which is used for the identification, qualification and quantification of a wide range of products such as ointments, creams, powders, tablets and other raw materials.

The wavelength range of 1000 to 1900 nm with high wavelength accuracy and reproducibility allows detecting and analyzing of substances based on the vibrational properties of the molecules very effectively.

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The customizable software packages allow the user to effectively work with complex tasks without professional knowledge of spectroscopy and chemo-metrics. The software bundle offers solutions starting from a routine analysis up to the expert level.

As the method uses a simple Photometric procedure, this results in low cost per analysis methodology for product identification and fingerprinting. There is added security in the fact that identified materials can be authenticated against a reference material list as well as a known reference sample.

For the materials under investigation, you can install a reference library of relevant substances. This guarantees the accurate analysis of incoming raw bulk materials, herbal extracts, raw API materials, orthomolecular substances as well as cream and ointment excipients.

The instrument can be used in production factories as an at-line tester or to be used to identify incoming raw material. Another option for using the PT-IM100 would be in quality control laboratories.

## Get Your Results in Few Steps

The technical operation of the PT-IM100 is based on an innovative development of NIR spectroscopy. At the heart of the system is a patented scanning grating technology developed by the Fraunhofer Institute for Photonic Microsystems in Dresden. Using this all-purpose MEMS-based procedure, the test material is irradiated with light, throughout the depth the sample. This saves any special sample preparation and offers the advantage that the whole sample volume is analyzed, not just the surface. The resulting transmitted energy profile produces a material-specific fingerprint that can be analyzed spectroscopically which is compared to reference spectra from an installed database to give a positive identification result.


Auswahl der Substanz
Stempel-Leermessung
Start der Messung
Ausgabe des Ergebnisses
PHARMA TEST

# Technology

### Measurement

Place a sample of the material in a sample vessel and place it in the measurement cavity, select the model to be identified then using the software predictor, click on the Scan button (the sample is not degraded in any way).

### Qualitative and Quantitative applications

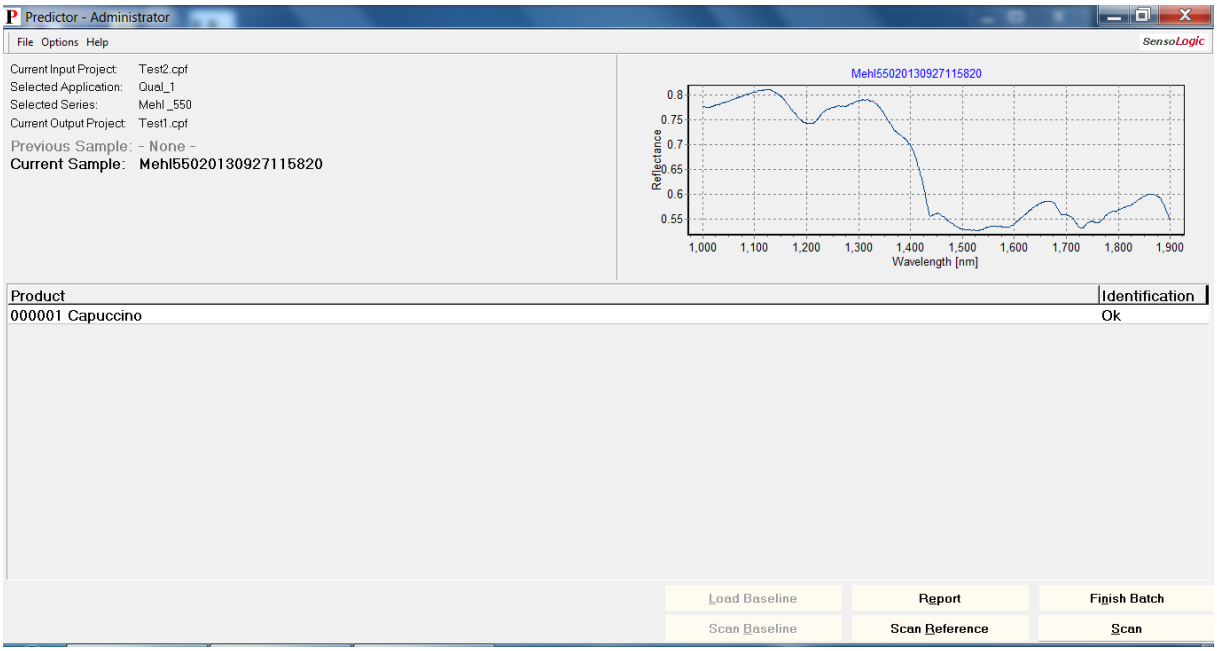
For the specific analysis, select the appropriate working project in order to identify or quantify unknown samples or an excipient respectively. The Models which are needed to be recalled have to be created using another software package which has the advantage for the end-user to use only what is needed.

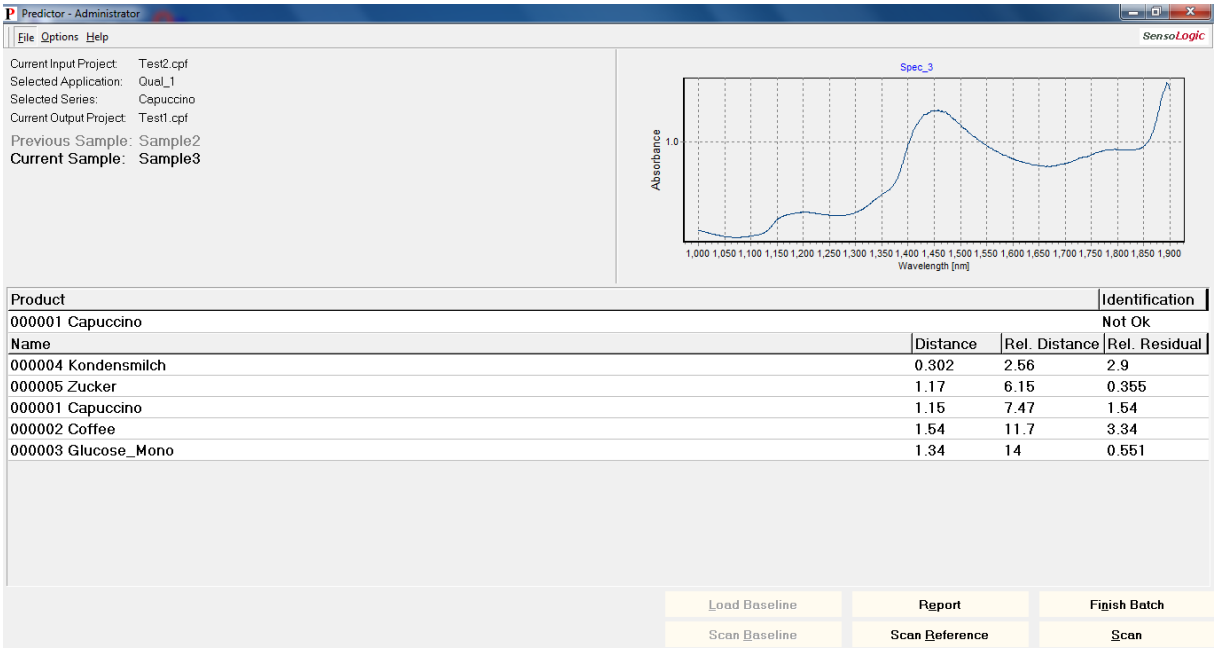
### Result Display

After a few moments of finishing a scan, the results will be displayed on the monitor telling the user if the unknown sample is identified successfully or not in case of qualitative analysis are deployed. The reports can be modified (customized) according to the customer wishes. The reports are saved in the database and can be viewed using another software package.

### Measurement Data

Spectra and datasets are saved in the database and can be recalled anytime to be either displayed on the screen or to be exported in many standard formats. Spectra can be zoomed in, selected using the keyboard, navigated through and be processed for further applications.




Snapshots show the "Hot List" feature of the software. In this upper case, a sample is successfully identified. In the lower snapshot, the most probable substances which have fewer differences to the sample are being suggested (ranked from the less difference to the sample).

## System Requirements

- PC with the following OS: XP, Vista, Windows 7 (32 or 64 Bit) or current Windows OS version
- Intel or AMD processor (recommended > 1 GHz)
- Minimum 256 MB RAM
- Minimum 20 MB free disk space
- CD-ROM drive
- Printer port
- PT-IM Software Packages: SL- Predictor and SL-Utilities

## System Advantages

Some of the highlights the PT-IM100 system offers are:

- Rapid scan
- Sample carousel
- Customized software packages
- Calibration Wizard (no professional knowledge is required to establish models)
- Hot list for unknown samples
- Calibration procedure (white and black calibration standards)
- Ensure formulation security
- Simple sample handling and ease of use
- No sample preparation required
- Non-destructive sample analysis (re-usage of samples)
- Secure sample evaluation
- Low cost per analysis methodology

## System Features

The main features of the PT-IM100 are:

- Fully EP <2.2.40> and USP <1119> compliant
- Based on NIR technology with patented scanning grating technology
- MEMS technology developed by the Fraunhofer institute
- Measurement time less than 15 seconds
- Spectral range of 1,000 – 1,900nm

## Software Features

Main features of the SL-Predictor:

- Rapid identification of samples
- User friendly design
- Easy to scan with / without data saving
- Offers online information about Scan, Series, Batch and Reference
- Reports can be configured according to the task
- Scan / Load baseline
- Integrated user management system
- Warning messages for scanning of reference
- Data export / import
- Automatic Name Creation based on date/time or prefix to be entered by the user
- Selecting output modules (Printer, ASCII, CSV, etc)
- Allows measurement configuration for Qualitative / Quantitative measurement
- Instrument configuration made easy

Features of Calibration Wizard software package include:

- Processing of up to 50 models in parallel
- 10-fold computation speed compared to SL Calibration Workshop
- Multivariate modeling with PLS regression and MLR combination search
- Variance- and covariance-based ranking of all pre-processing transformations in the database
- Significance test for comparison of alternative models
- Automated outlier removal capability
- Automated processing is individually configured for each wizard-step
- Prediction with uncertainty and outlier diagnostics
- Significance tests for bias and skew
- User administration with customized default settings

# SL Calibration Workshop (CWS)

A calibration is necessary to establish a correlation between variations in the sample's spectra and the parameters of interest, i.e. quantifiable properties in a quantitative calibration, or the identity of a sample in a qualitative calibration.

This package is designed to be used as calibration software independent of the instrument used for routine measurement. It provides comprehensive and easy-to-use tools to import, calculate, and evaluate calibrations and set up applications for routine analysis.

The Data option of the CWS Main Menu provides comprehensive possibilities to work with spectral data.

**Quantitative Calibrations:**
Quantitative calibrations are used to determine quantifiable properties of a product.

The following mathematical models for quantitative applications:

1. Multiple Linear Regression (MLR) - Combination Search
2. Multiple Linear Regression (MLR) - Step-up Search
3. Partial Least Squares Regression (PLSR)
4. Principal Component Regression (PCR)

**Qualitative Calibrations**:
Qualitative calibrations allow to determine or to confirm the identity of samples. Series of spectra must be measured for each substance or class to be distinguished and these series must be compiled to form one library. A mathematical model can then be set up that calculates the criteria for the identification of substances or classes.

The package provides two types of qualitative calibrations:

1. **Library calibration:**
   Library calibrations are mainly used to confirm the identity of samples, e.g.

   - Raw materials arriving at the plant
   - Materials before they are used in production
   - End products before they are sent to the customer.

2. **Cluster calibration**
   A Cluster calibration is a more elaborate mathematical model that allows distinguishing between more subtle differences in the spectral data. It is mainly used to determine the quality of a different classes or qualities of a product

## SL Utilities Software Package

It is a collection of helpful tools, e.g. editing spectra, format conversion, batch import and an input utility for touchscreens.

**Functions:**

(1) Database Operations
- Database Viewer
- Offline Prediction
- Transfer between Databases
- Wavelength Range Conversion
- Subset Selection
- Spectra Comparison and Filtering
- Bias and Skew Adjustment

(2) JCAMP Files
- JCAMP Single to Multi-files
- CSV Single to JCAMP Multi-files
- JCM Multi to JCAMP Multi-file
- JCAMP Import

(3) ISI Files
- ISI ASCII File Import
- ISI ASCII File Export

(4) SPC Files
- SPC File Info
- SPC File Import
- SPC File Export

## Technical Data

| Parameter | Specification |
|---|---|
| Measurement principle | Near Infrared spectroscopy (NIR) |
| Measurement time | < 15 seconds |
| Spectral range | 1,000 – 1,900nm |
| Spectral resolution | 10nm |
| Wavelength stability | ± 1nm |
| Working temperature | 15-35°C |
| Interface | USB 1.1 |
| Dimensions (Packaging) | 61 x 56 x 61cm |
| Net Weight | 11kg |
| Gross Weight | 19kg |

We reserve the right to make technical changes without any prior notice.