

iScan

New Radio-TLC scanner
with Multi-Channel Analyzer



iScan Features

- ◆ Performs Thin-Layer Chromatography (TLC) using an appropriately shielded high-resolution NaI detector.
- ◆ Allows automatic storing of both PHA spectra and chromatogram (scan).
- ◆ Full automated control (scanner and data acquisition system) via software.
- ◆ Scan can also be run manually.
- ◆ A comprehensive software package with method-driven measurements, for ease of use and high reproducibility.
- ◆ All measurement runs and parameters used are stored in the software. Individual runs can be recalled for viewing and analysis..
- ◆ Windows 2000 and XP platforms supported.

Introduction

Radioactive Thin Layer Chromatography (radio-TLC) is a well-established analytical technique used to identify radioactive components in reaction mixtures. It is widely used in Nuclear Medicine laboratories to provide quality control of the production, compounding and dispensing of radiopharmaceuticals used in nuclear medicine procedures..

Today, radiochemical purity control is absolutely essential to ensure the accuracy of the radiopharmaceutical-based medical analysis.

iScan Components

iScan is supplied with the following components:

Hardware components

- 1) The programmable scanner
- 2) A NaI scintillation detector with suitable shielding and a set of collimators
- 3) A compact multi-channel analyzer (MCA)
- 4) The controlling PC (optional)

Software components

ChromiScan software package:

- 1) ChromiData, a database manager
- 2) ChromiScan, the main control software
- 3) ChromiReview, data review and analysis

The ChromiScan software package has been designed to automate TLC analysis, particularly Medical Chromatography.

Hardware Features

radio-TLC Scanner

The iScan scanner is a fully-programmable instrument which moves a NaI detector across the chromatogram strip. A programmable motor allows several scanning speeds, including user-defined values.

Movement of the detector is completely automatic under software control. A reset button on the front panel is provided so the user can abort the scanning operation at any time.

The sample holder is engraved and measures 5 mm deep, 50 mm wide and 210 mm long. There is a convenient ruler placed along the scanning length.

Communication with the PC is via a RS-485 interface (a RS-485 to RS-232 converter is provided) using a standard 9-pin connector.

A manual scan button is also provided to run a complete scan at a single fixed speed, without the need of the controlling PC.

NaI detector

The iScan uses a high-resolution NaI scintillation detector with a 2" x 2" crystal. This detector provides excellent energy resolution and counting efficiency. Other size crystals can be supplied upon request.

The detector is mounted inside a lead-shielded housing that is 10 mm thick. The front area of the detector is collimated using a standard 3mm aperture.

Collimators with different size apertures can be easily mounted in the scanner. A 1mm and a 5mm collimator is also included.

MCA

The data acquisition system makes use of a compact Multi-Channel Analyzer, **uniSPEC**.

This MCA can operate in two different data acquisition modes: Pulse-Height Analysis (PHA) and Multi-Channel Scaling (MCS). The

PHA mode is used by iScan to acquire the energy spectrum of the radiopharmaceutical or sample being scanned, while the MCS is used to generate the actual chromatogram during the scan.

The MCA is built inside the housing of the NaI detector, providing a compact and light assembly. The MCA communicates with the controlling PC via any available USB port.

The MCA can be set-up to acquire a maximum of 1024 channels. The dwell times may range from a few milliseconds to minutes. The MCA acquisition parameters for both PHA and MCS modes can be set via the software.

Software Features

The software consists of the following modules:

ChromiData

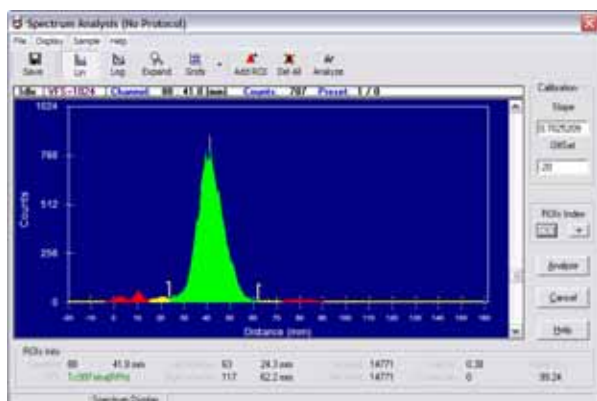
The iScan measurements are method-driven. All of the parameters that make up a method, and the results of all measurements are stored in a relational database.



ChromiData is the program that manages and organizes the database.

ChromiScan

ChromiScan is the main program used to perform the chromatography analysis based upon previously created methods.

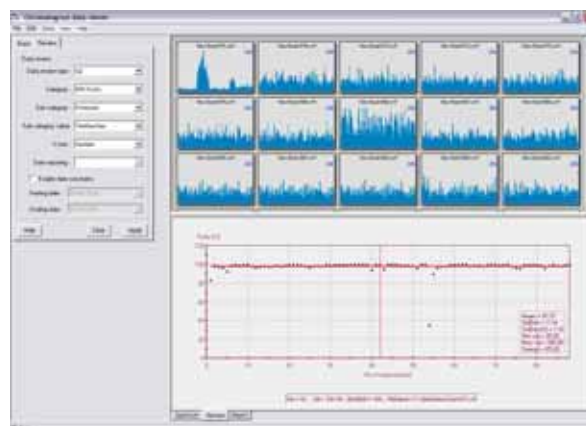


The program automatically controls the scanner and data acquisition, performs the data visualization and analysis of chromatogram spectra (MCS) and, if selected, the energy spectra (PHA). Results of the analysis are stored and logged into the database automatically.

ChromiReview

This software module provides the necessary tools for data extraction, visualization, manipulation, reporting and re-analysis of all chromatogram scans (files) stored in the database.

ChromiReview can produce Quality Control (QC) charts (also known as trending charts) for the measured chromatogram scans of a given method (or other database fields) using several qualifiers (Purity, Rf, Peak area, continuum values, etc.) Date constrains can be specified as well.



Statistical analysis of QC results can be performed using several different parameter values.

Data can also be easily exported to ASCII, CVS, XML files or directly into MS Excel®

Technical Specifications

TLC Scanner	
Model	iScan TLC101
Dimensions, cm (WxHxD)	37 x 22 x 25
Weight, kg	16,5 kgs (without detector and MCA)
Power supply	100 – 240 Volts. 50/60 Hz.
Fuses	250V T2A soldered fuse
Scan area	Strips max 50 x 210 mm
Scan speed	<ul style="list-style-type: none"> • Automatic • 0.1 to 2 cm/sec; Software selectable • Fixed to ~ 0.5 cm/sec when using Manual scan mode.
Scanner control	Via RS485/RS232 protocol
Strip carrier	One provided, 50x200 mm engraved in plastic. Extra units are available as options. Metallic ruler (0-240 mm) mounted along the scanning path.
Front switches, buttons and LEDs	<ul style="list-style-type: none"> • On-Off switch with LED power-on indicator • Manual scan push-button • Scanner reset push-button • Blue LED signaling busy state
Back connectors	3-contact standard 100-240V mains socket 9-pin RS485/RS232 connector
Shielding	10mm (minimum) of lead (Pb) around the detector
Extras	<ul style="list-style-type: none"> • EU (220V) power cord • RS-232/RS485 data cable (RS485-to-RS232 adaptor optional).
Detector	
Type	NaI scintillation detector
Detectable radiation	Photons: Gamma-rays and X-rays
Dimensions	Typically 2"x2" standard crystal. Other sizes are available as options
Typical energy resolution	8 – 7.5 % at 662 keV
Collimators	Set of three collimators of 10 mm-thick Pb with apertures of 1, 3 and 5 mm
Spectrometer	
MCA type	uniSPEC compact MCA (option).
Acquisition modes	<ul style="list-style-type: none"> • PHA (1024 channels) • MCS (1024 channels)
Dwell times	From 0.01 sec to 255 secs, software selectable.
Data communication	USB
Computer	Desktop PC compatible system with the following minimum requirements: <ul style="list-style-type: none"> • 100 MHz Pentium • 16 MB RAM • 1 Serial port RS-232 • 1 free USB connection • Windows™-2000 or Windows-XP
Software	ChromiScan version 3.00 includes the following modules: <ul style="list-style-type: none"> • ChromiData • ChromiScan • ChromiReview Supplied in CD-ROM together with User's Manual.