

i-CHROMA™ Reader

General Information

The *i*-CHROMA™ reader is a portable instrument dedicated to scan, detect and process the signal from the diagnostic testing devices provided by Boditech Med Inc. Once the testing device cartridge is loaded into this reader after the preprocessing procedure, the cartridge is sent to a designated location where it is irradiated with a beam of laser with 647nm wavelength. The fluorescence signal generated by fluorophores labeled onto capture molecules are optically collected and converted into clinically meaningful quantities by proprietary firmware stored in the onboard processor automatically. This result is displayed on the face plate of the reader. The *i*-CHROMA™ reader can forward this information to a receipt printer, to an external PC or even to the LIS via optional accessories.

The *i*-CHROMA™ reader is equipped with a set of self-diagnostic routines that continuously monitor the system integrity. The built-in interlocking error-prevention system consists of a coded ID Chip provided with the Test Device and the barcode on each test device. Any discrepancy among them would produce a warning message and prevents further operation until the problem is resolved.

The firmware on *i*-CHROMA™ reader can be upgraded easily by the user. The user can use the proprietary firmware upgrade kit from Boditech Med or download the binary file from Boditech homepage and execute the upgrade process.

Key Features of the *i*-CHROMA™ reader



Figure 1. *i*-CHROMA™ reader

- Quantitative results
- Closed system
- One-dimensional scanner geometry
- High throughput: up to 45 samples per hour
- Simple user interface
- Supports up to 50 parameters (customizable)
- Automatically identifies sample types
(Whole blood or Serum/Plasma): no user input necessary
- Simplified firmware upgrade
- Supports remote technical service
- Flexible communications via a RS232C port (printer, PC, LIS).
- Optional scanner and keypad connection interface available
- Enhanced mobility: can be retrofitted for battery operation in a travel package
- Comparable performance with high end reference analyzers
- Power requirement: 100~240VAC 50~60Hz, 12V battery pack available.
- Weight 1.2 kg, Dimension 185x80x 250 mm (WHL)

Principle

Laser energy irradiating the scan line on the test device induces the emission of characteristic fluorescence off the fluorophores immobilized on the detection biomaterials, which were captured by capture molecules previously immobilized on the test device. The amount of this fluorescent energy is closely correlated with the relative amount of the analyte under measurement. *i*-CHROMA™ reader is equipped with the confocal optical arrangement widely adopted and proven in most confocal fluorescence microscopes. This guarantees the best possible background rejection, which is of crucial importance when one wants to increase the detection sensitivity. The firmware takes care of the whole operation after accepting the test device into the carriage. The user inputs via keys located on the faceplate or via external commands from externally connected control computer.

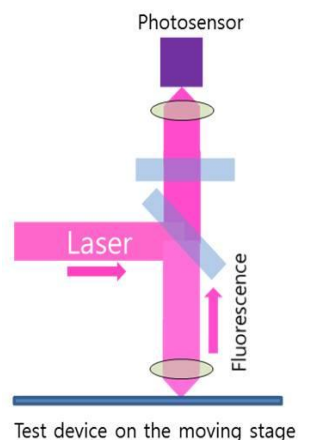


Figure 2 *i*-CHROMA optical sensor layout

Connectivity

The *i*-CHROMA™ reader can be networked indirectly through its communication port (RS232c). One may use off-the-shelf serial receipt printers for immediate printout. An external computer will be handy in controlling and managing the accumulated data from the reader and in establishing and maintaining the connection to other networks, most likely a LIS server. An interface module is also available that enables the entry of the patient ID via a keyboard and/or a hand-held barcode scanner.

