

LIMS EQUIPMENT REMOTE ACCESS/ INTERACTION

Equipment	Remote Access Protocols	How to interact Remotely	Remote Capabilities	Tools
Gas Chromatograph – GC-2010PLUS (Shimadzu)	RS-232 (serial), Ethernet (with GC-LAN card)	Use a serial-over-TCP converter (e.g., MOXA NPort, Digi Connect) to expose RS-232 port as a network IP port With LAN module: connect directly to the lab network, assign static IP Shimadzu's LabSolutions Chromeleon/OpenLab can remotely control it	Start/stop runs, fetch chromatograms, monitor detector status, receive error logs	<code>pyserial</code> over virtual COM port, vendor SDK (LabSolutions), custom TCP client
Milk Analyzer – Lactoscan COMBO (Milkotronic)	RS-232, USB, (some models: Bluetooth, Ethernet)	Connect via serial-over-LAN device Monitor output stream from serial or USB Bluetooth access (on some models)	Fetch latest sample analysis, limited control; observe activity status	<code>pyserial</code> , Bluetooth Python lib, USB-over-IP (VirtualHere)
Hematology Analyzer – HM5 (Abaxis)	RS-232, USB	Use RS-232-to-TCP adapter to map COM port Poll data stream or issue query commands	Receive test results, basic status reporting	<code>pyserial</code> , serial terminal emulator, USB redirection tools
ELISA Reader – Multiskan FC (Thermo Scientific)	USB, RS-232, optional Ethernet	USB-over-IP for remote operation RS-232 polling via serial-to-Ethernet bridge Use Thermo SDK (if licensed)	Control plate reads, fetch results, get plate position status	Thermo SDK, <code>pyserial</code> , USB Network Gate
Chemistry Analyzer – Vetscan VS2 (Abaxis)	RS-232, USB	Bridge RS-232 via network Monitor output for result strings Capture ASCII data stream	Result stream capture, limited diagnostics	<code>pyserial</code> , serial logger

Mastatest Analyzer	USB (mass storage), SD Card	Monitor USB for exported test files (CSV/PDF) No active command interface known	Pull latest test files, no remote control	<code>watchdog</code> (Python), USB mass storage monitor
NIR Analyzer – DA 7250 (Perten Instruments)	Ethernet, USB, Wi- Fi (on some models)	Connect to NetPlus Reports web interface Access device via REST API or shared folder Remote calibration upload/download	Device status, uptime, calibration updates, logs, test results	NetPlus Web UI, REST API client, JSON parser