

## New Software Interface permits external control of the Vapourtec R Series system.

Vapourtec have introduced a new API (application programming interface) allowing the popular R Series system to be controlled via a network connection. This adds a whole new set of capabilities, which are described below.

### Access to Simple High level Commands

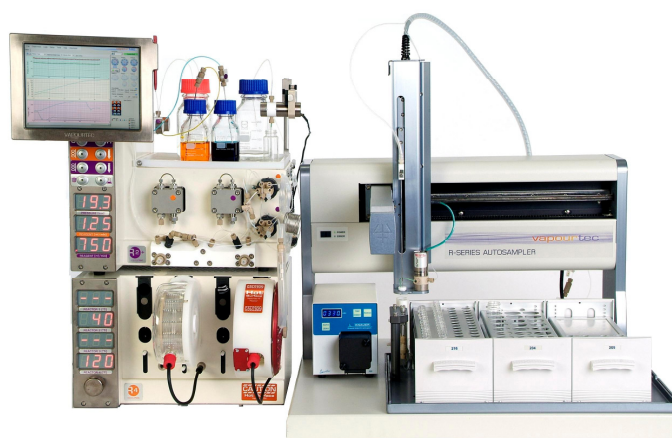
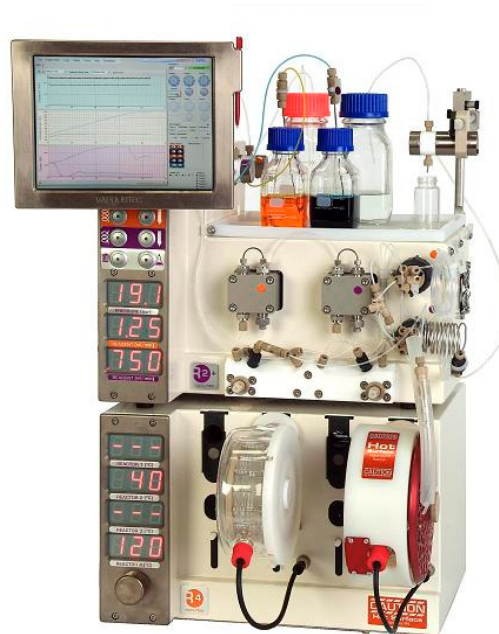
The API permits high level functions to be invoked, while leaving the resulting low level activities such as pump control, valve timing and dispersion modelling to be controlled entirely by the well proven FlowCommander™ software.

For example, a supervisory user program can:

- Add 1 or more reactions to the queue, specifying all parameters for each reaction.
- Start (or stop) the sequence of reactions.
- Monitor status in real-time as reactions are proceeding.

The Vapourtec system being controlled may include a fraction collector or an autosampler (right) which can load different reagents into sample loops for each individual reaction.

Or it can execute a “handshake” when an external piece of non-Vapourtec equipment loads the sample loops under control of the user’s own supervisory software.



## Access to low level commands

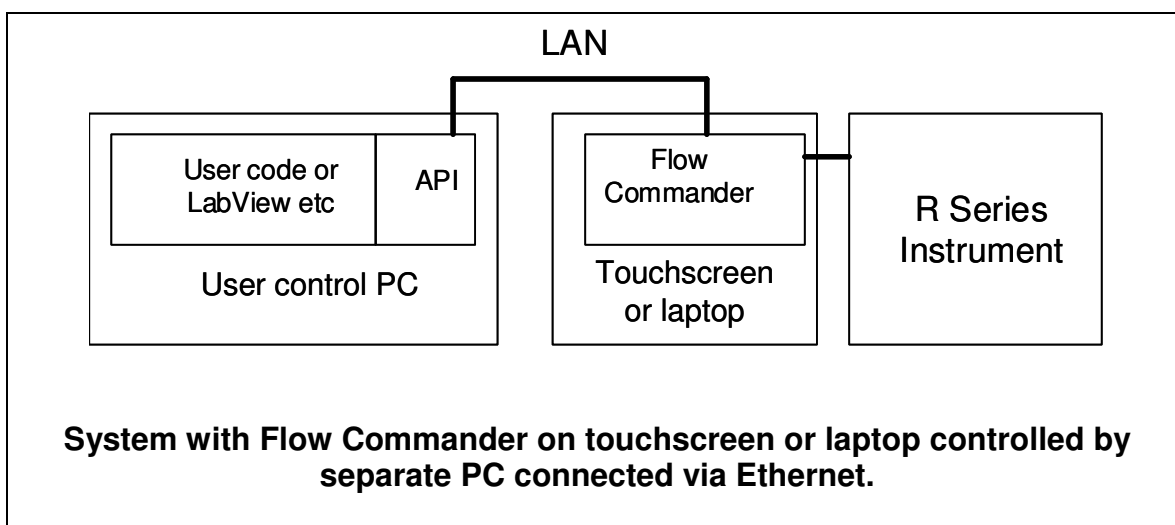
The interface also permits low level access to pump flow rates, valves, temperatures. Low level commands can only be accessed when the system is **not** already running an automated reaction. This permits a range of novel behaviours to be automated, which were formerly not available through FlowCommander™.

## Why ?

There are a number of scenarios which this new API makes possible.

1. The Vapourtec system can be placed at the heart of an automated system, where the overall controller tells the Vapourtec system what to do next and starts the system. This has applications both in high throughput synthesis, automated optimisation and also for certain analytical processes.
2. New modes of operation can be accessed by invoking low level commands. For example, stop-flow reactions and temperature ramping can be accessed through the API, allowing user code or LabView scripts to control novel system behaviour for research purposes.

## Architecture – Using the API



Only one such connection can be made with the instrument at any time.

## Remote Access

It is also now possible to access the instrument through a “remote desktop” style interface.

This means the instrument touch screen is fully replicated on the remote device.

This makes it possible to

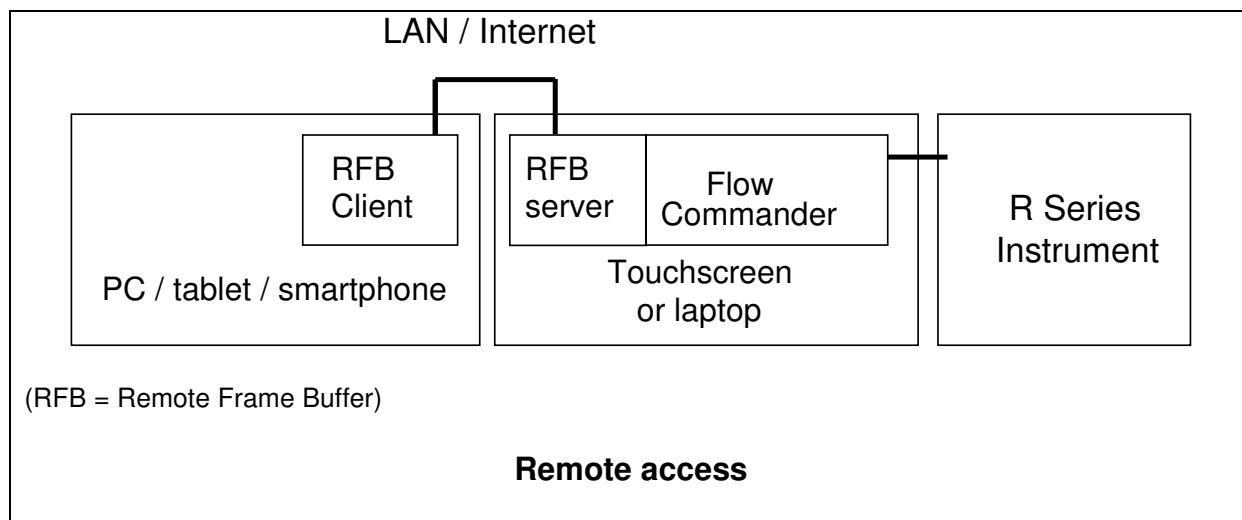
- see if the instrument is free before heading to the lab
- check how much experiment running time remains
- make changes to the schedule of remaining reactions based on analytical data from earlier remaining ones.



It is also of course possible (subject to corporate IT restrictions) to check experiment status from offsite (home, beach, pub etc).

And it is possible to choose whether the remote access user can only see the screen or can also “touch” the screen.

After all, you may prefer that remote users don't actually start an instrument they are not standing in front of.



## FAQ

### General

Q When is this facility available ?

A Immediately

Q Does access via the API work for FlowCommander hosted on either the Touchscreen or on the PC ?

A Yes

Q What exactly do I need ?

A You'll need a license for FlowCommander (if you don't already have it) plus the SDK (software development kit).

Q What version of FlowCommander do I need ?

A The latest version of FlowCommander will be included with the SDK.

Q What can I control it with ?

A Any program that can access a .NET assembly (DLL) and invoke methods should be able to use this interface. This would include

- LabView
- MatLab
- Custom code in .NET or any language that can access a .NET DLL

Q Are there any test programs ?

A The SDK includes a simple graphical user interface (GUI) application that demonstrates all the functions of the API. Source code for the test application is included

Q Will I still be able use my system the conventional way when I choose ?

A Yes.

### Using the API

Q What high level functions will the API let me control ?

A It will allow an external controller to

- select a pre-saved experimental setup
- add any number of reactions to a queue, specifying all reaction parameters
- start / stop the queue of reactions
- monitor the progress/status of the current reaction

Q What about low-level functions

A Full access to valves, pumps and temperature settings is provided.

## Remote Access

Q Do I need to develop software to use remote access ?

A No, this uses off the shelf software.

Q What is required for remote access.

A The client can be a PC, smartphone, tablet. It just needs to have network access and an RFB (Remote Frame Buffer) compliant client program.

Q So is there a Vapourtec "App" ?

Q No, remote access uses standard off the shelf client software. There are inexpensive or free apps for a variety of platforms. (eg VNC for the PC).

Remote access has been demonstrated so far on a Windows PC, Android smartphone, and iPad.

Q Can I set it up so that remote access allows users to see the instrument without actually being able to control it ?

A Yes. This is the default option for remote access but you can also enable remote control is required.

Q Can multiple users remotely access the instrument at one time ?

A No. Only a single connection can be made at any one time.

Q Can I access the instrument from offsite

A Probably not directly, because of in house security rules. However, you may be permitted to access your office desktop using an approved encrypted remote access solution, and then access the instrument through the LAN from there.