Tunable Service Program

Contents

Revision History

Rev	Date	Author	Description
00	16.08.2021	Filip	Initial release
01	07.04.2025	Guilherme	Revision 01

Features

The Tunable Service Program is accessible as a web application through a browser. No software installation is necessary. The service program can be used for the following

- See information about the analyzer, including software versions, error codes etc.
- Configure network parameters (IP address, subnet mask etc.)
- Configure serial parameters for RS-485 / Modbus RTU (baud rate, slave address etc.)
- Configure measurement options
- See current measurement results and download measurement logs
- Perform field calibrations
- Update Firmware
- Control Valve setup (If applicable)
- Access analyzer Diagnostic tools

Accessing the Service Program

To access the service program for the first time:

1. Connect the analyzer to a computer via Ethernet
2. On the computer, configure the network settings as shown in Figure 1.
3. Open http://192.168.9.2 in a browser

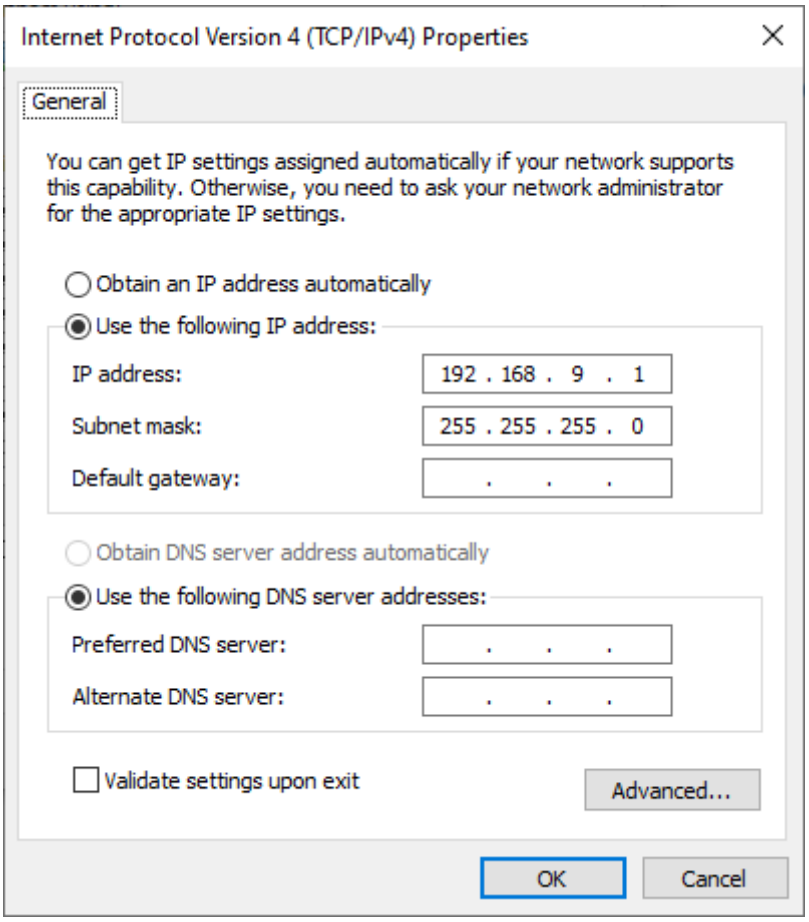

Figure 1: Network settings

Network Configuration

A custom IP can be configured through the Network Configuration page. The instrument can be configured to obtain IP automatically, via DHCP or configured with a static IP. It is also possible to configure DNS and specify an NTP (Network Time Protocol) server, if available.

NOTE

Regardless of the network configuration, the instrument will *always* be available on the IP address 192.168.9.2

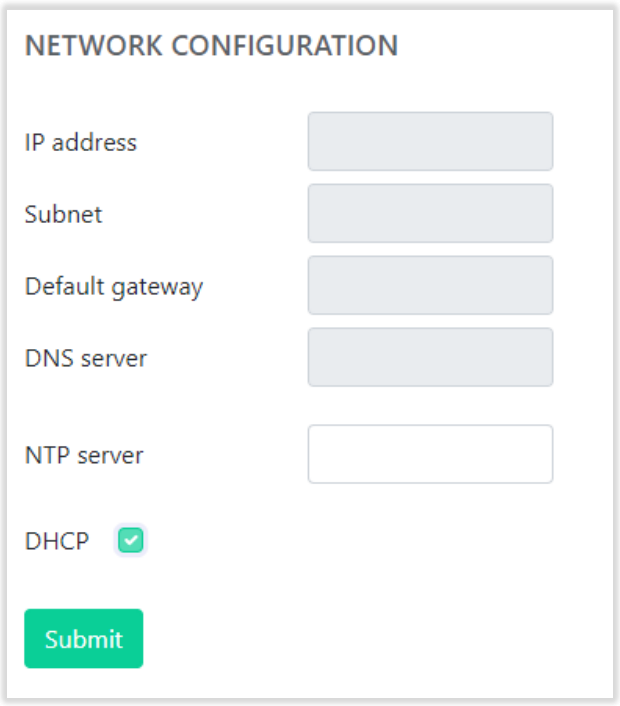

Figure 2: Network configuration page

Serial Configuration

Options for the serial RS-485 Modbus RTU link can be configured on the Serial Configuration page. The available options are:

- Baud rate
- Stop bits
- Parity
- Slave address

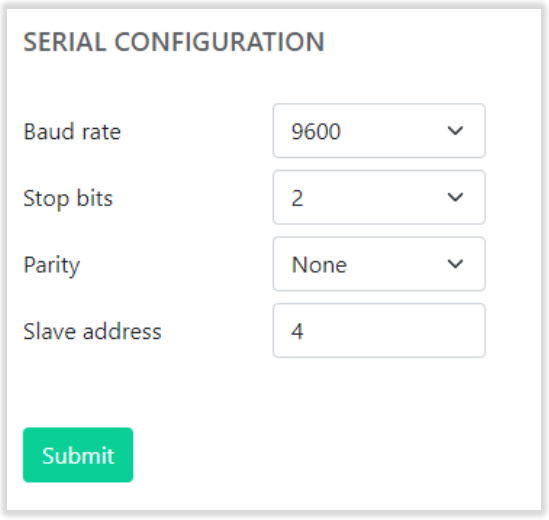

Figure 3: Serial configuration

Measurement Configuration

The Measurement Configuration page can be used to set various parameters that control the measurement cycle.

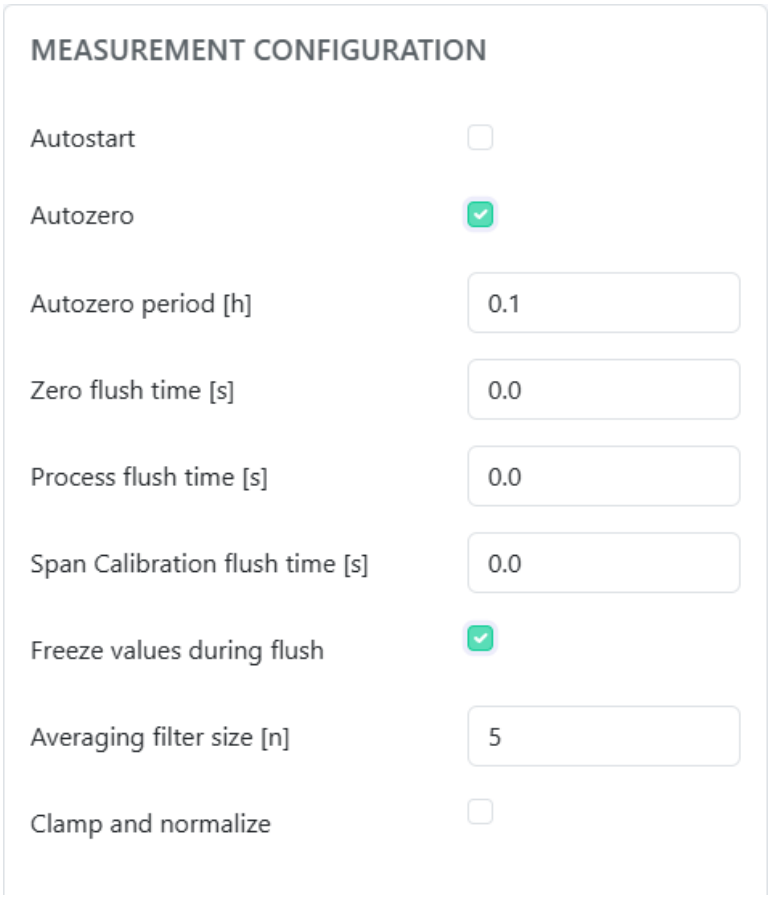

Figure 4: Measurement configuration

If *autostart* is enabled the instrument will start measurements automatically at powerup.

If *autozero* is enabled the instrument will run automatic zero-calibrations during measurements. The first zero-calibration is run immediately when the measurement is started.

Autozero period specifies the interval for automatic zero calibrations in hours.

Moving average specifies the number of measurement cycles to average. A higher number will reduce the noise but increase the response time.

Zero flush time specifies the number of seconds to flush with zero gas before the zero calibration starts. Process flush time specifies the number of seconds to flush with process gas at the beginning of a measurement. Both autozero and automatic valve control should be enabled for the flush control to work.

If *Freeze values during flush* is set, then the instrument will freeze output values (over Modbus) during flushing. If left unchecked it will report values during the flush period, but the values will be marked with a flag.

Averaging filter size specifies the size of the averaging filter in terms of measurement cycles. The filter will use the history of the last n measurement cycles to reduce the noise at the expense of response time.

If *Clamp and normalize* is checked, the results will be clamped between 0% and 100% and normalized to sum to 100% (if applicable).

If *Automatic Stream Switch* is enabled the analyzer will automatically switch valves to measure from those valves according to the specified time.

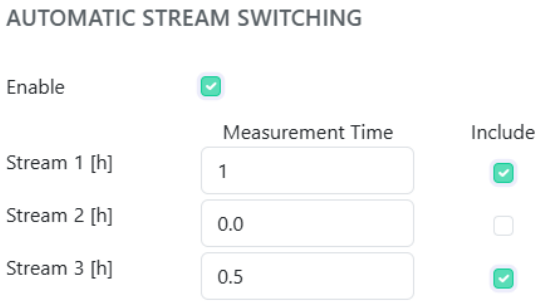

Figure 5: Automatic Stream Switch

For example, in figure 5 the device would measure for 1 hour in the stream the alternate for stream 3 for half an hour then turn back to stream 1 after.

It is also possible to customize how the concentration units will be displayed:

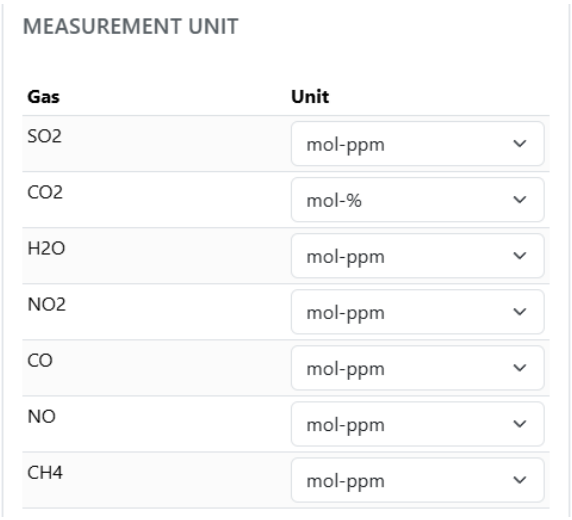

Figure 6: Measurement units' configuration

Diagnostics

The diagnostics page can be used to check and diagnose any issues with the analyzer.

The analyzer state shows which program the analyzer is currently running (measurement, zero calibration etc.).

The error code indicates if any error has occurred. If everything is OK this should read 0 - No error. Note that not all errors are critical. The current error code can be cleared with the Clear Error button. This can be helpful to check if the error occurs again.

The Restart Firmware button will restart the measurement firmware. The Reboot Analyzer button will reboot the analyzer. The Factory Reset button will reset any user settings to factory values (except network configuration).

The last part of the firmware log can be viewed in the Firmware Log pane. The entire log can be downloaded by clicking the Download button.

A simple self-test can be run by clicking the Run self-test button. This will run various check and report the results in the pane below. Note that this may impact measurement results if a measurement is currently running.

Measurement Results

The Live page shows the current output values. The values both printed numerically in a table and shown in live plots below. From this page it is also possible to manually start and stop measurements.

On the History page, measurement logs from previous measurements can be downloaded as CSV files.

If you have a setup that allows multiple streams of measurements, it is possible to manually select which stream you are measuring from with the *Manual stream selection* dropdown, note that doing this will override the *Automatic stream switching*.

Start Finite Measurement will measure for the specified number of cycles then it will return to idle.

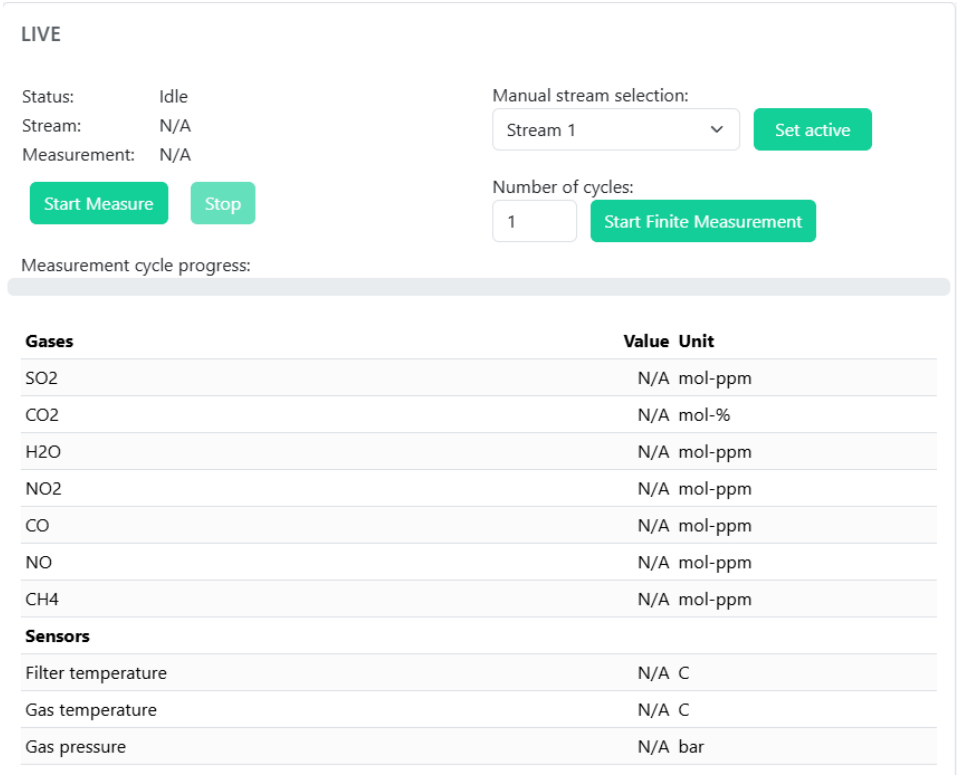

Figure 7: Live page

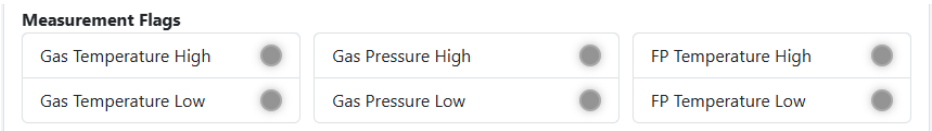

Figure 8: Measurement Flags

Valve Control

The valves can be configured to automatically toggle based on the program running. This allows e.g. switching to Nitrogen input when performing zero calibration.

If *Enable* is checked the analyzer will control the valves. For each program (Idle, Measure, etc.) specify which input should be selected.

If *Manual control* is checked the current input is controlled by the Input select option, regardless of which program is running.

The *Current state* shows the current active input selection.

The input selections shown here depend on the mapping. If you need to use a different mapping, click on *Advanced view* to set the relay configuration directly.

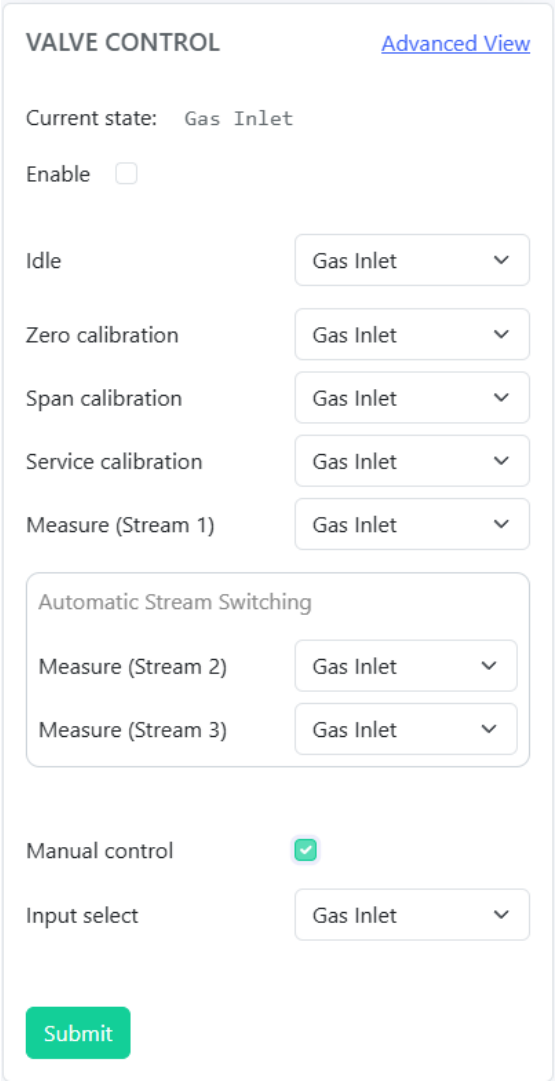

Figure 9: Valve control

Calibration

The Calibration page can be used to trigger zero and span calibrations.

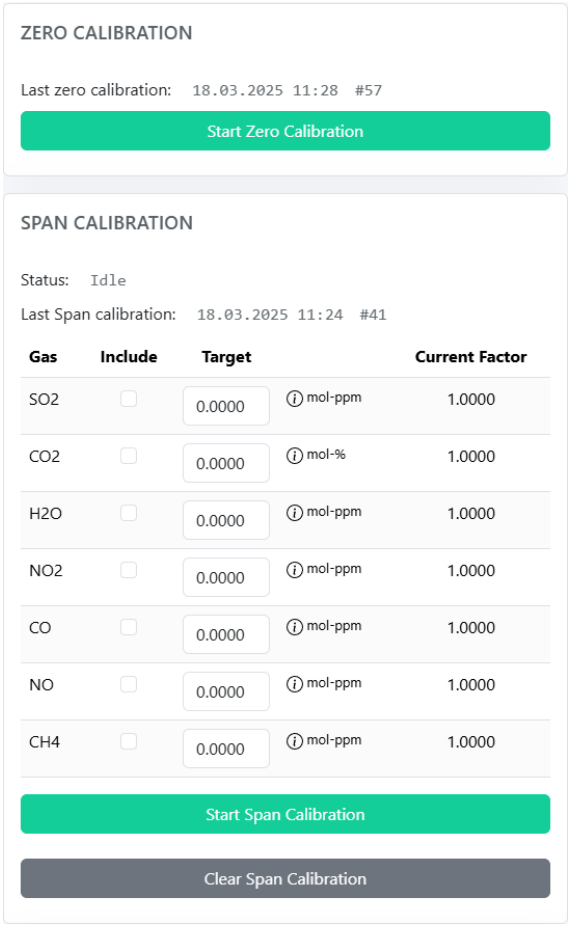

Figure 10: Zero and span calibration

Zero calibration is used to reduce zero-offset. To start a new Zero calibration click the Start Zero Calibration button. Make sure the measurement cell is filled/flushed with Nitrogen for the entire duration of the zero calibration.

Span calibration can be run to calibrate against a known reference. Choose which components should be included in the span calibration by ticking off the Include column. Write the target value (known concentration of the reference) for each component, then click Start Span Calibration. After the calibration is complete, the current factors will be updated. The span factors can be cleared (reset to 1.0) by clicking the Clear Span Calibration button. This will reset the calibration to factory default.

Firmware Update

Upload a firmware image provided by Tunable. The update process will take a couple of minutes, don’t turn off the power of the analyzer during this process.

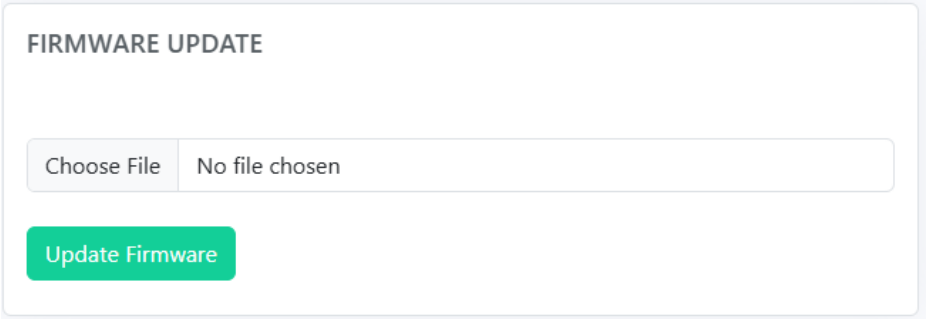

Figure 11: Firmware update