

# ePAT

Automated lab reactor with uninterrupted data capture - optimized for 24/7 operation

NEW with Recipe Control



## ePAT logging - online trend & data capture

Process development with the new **ePAT** means uninterrupted data capture, online trend with all measurement data - which can be clearly displayed at any time - and a manual reporting function for logging observations or manual interventions. The automated data export function prevents any loss of data, while also offering you the option of using external applications such as MS Word, Excel etc. to process the laboratory report data further.

## ePAT cost-effective automation in the laboratory

**ePAT** with its Plug & Play technology, combines exceptional ease of operation with the option of integrating a wide array of assimilable laboratory devices - for an almost unlimited number of jacketed reactors in the chemical laboratory.

## ePAT process development

The **ePAT**, as entry-level solution for automation technology enables you to efficiently optimize a huge variety of reactions, procedures, and processes for both scale-up and scale-down. The integral safety concept guarantees you uninterrupted monitoring and has been specially designed for unsupervised operation day and night.

## ePAT SYSTAG Application Manager

It doesn't matter which thermostat, balance, or pump you want to use - **ePAT** is familiar with them all. The implemented "SYSTAG Application Manager" (SAM) guarantees you the option of being able to integrate existing peripheral devices with the greatest of ease. Integral interfaces offer intuitive control of a multitude of standard stirrer motors, thermostats, balances, and pumps, meaning that you can start the application without delay. Design consistency and functional upgrade options guarantee that your investment will be protected, even if your needs change.

## ePAT Screen mit backpack-controller

**ePAT** does not need a conventional computer anymore. The configuration-free integrated **eController** saves space, combines all the virtually benefits of a Windows interface, and takes over all your regulation and protocol tasks.

## Functionality

### The Starter Kit - ALL the ESSENTIALS you need

Even in its basic configuration, the **ePAT** offers you a wide range of functions for performing routine tasks such as tempering, dosing, stirring, or adjusting pH with greater reliability and reproducibility.

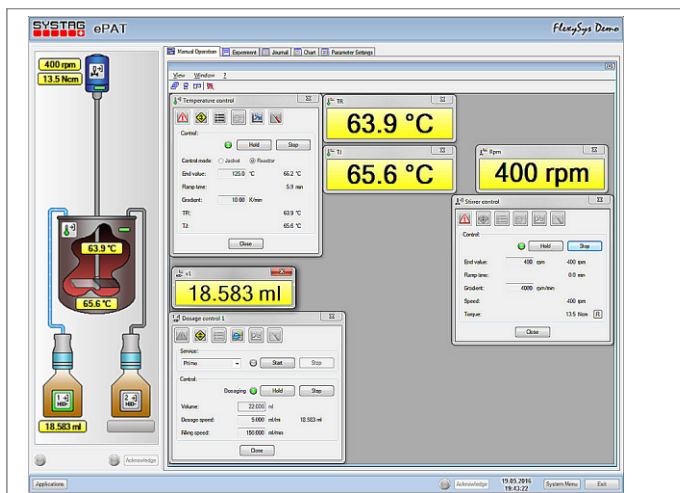
The **ePAT** carries out time-consuming control functions for you - and will fully document all your experiments at the same time.

#### Built in software features

- ✓ Stirring with logging of torque measurement
- ✓ Temperature control loop for reactor- and jacket control mode, with control parameter tuning function
- ✓ Two dosage control loops with temperature-controlled feed rates
- ✓ pH-measurement & control (single-side)
- ✓ Pressure measurement
- ✓ **NEW** Recipe editor and recipe control mode
- ✓ Safety monitoring
- ✓ Integrated function to calibrate the reactor temperature sensor

#### Included components

- ✓ FlexySys application software for controlling one reactor
- ✓ Monitor with backpack **eController**, US keyboard, and mouse
- ✓ Universal I/O module for connecting analog sensors/actuators
- ✓ Cable-Set for the connection of the sensors & actuators



ePAT interface & manual operation

## Intuitive Interface

### Operation

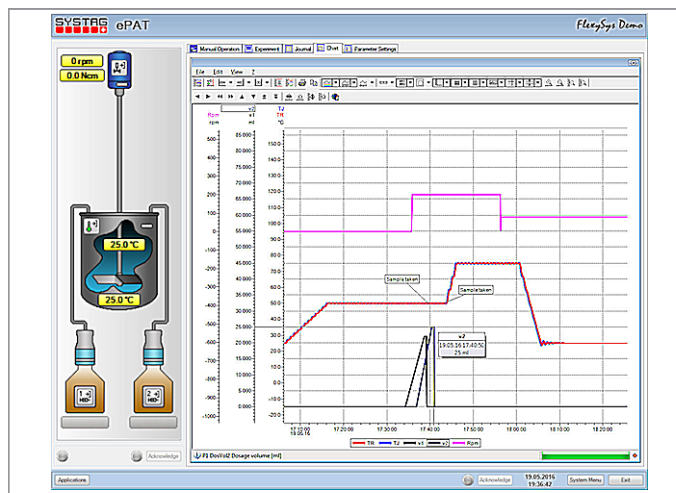
The monitor supplied, complete with the backpack **eController**, carries out the control functions for you. You initialize all tasks from the intuitive and exceptionally user-friendly graphic interface. You may start, stop, or amend your chosen process steps with a simple click of the mouse - and the **ePAT** does everything else for you.

### Online trend & recording

If it isn't logged, it didn't happen. This is our motto for the new **ePAT** concept, with its permanent logging of all process-relevant data. There is simply no risk of lost data.

Once you have configured the large, user-friendly online trend to suit your needs, you will be able to see even complex correlations of your process instantly at any time. The freely scalable axes and multi-stage zoom function mean that you can track the reaction and clearly see all the information you need.

You can make manual entries in the automatic lab-journal, so that any interventions or visual observations are fully documented too. This information is exported at the same time as all the important process data. The information is available as an ASCII file, meaning that you can use external applications such as Excel or MS Word to process the data further.



ePAT interface & on-line trend

## Configuration

### ePAT configuration using Plug & Play

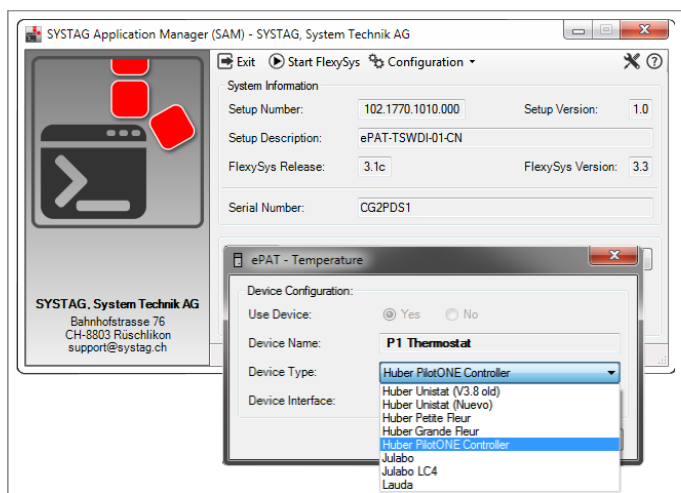
Applications can be started immediately thanks to **ePAT's** integral "SYSTAG Application Manager", which is an extremely user-friendly and hugely efficient tool. The "SYSTAG Application Manager" lets you add new peripheral devices or adapt the existing configuration to suit your needs with just a few clicks.

The list below shows a selection of available drivers to choose from for the most common peripheral devices used in any development laboratory:

- ✓ Huber - thermostats
- ✓ Julabo - thermostats
- ✓ Lauda - thermostats
- ✓ Sartorius - laboratory balances
- ✓ Mettler-Toledo - laboratory balances
- ✓ Metrohm Dosino (volumetric dosing)
- ✓ Heidolph - stirrer motors
- ✓ IKA - stirrer motors

### Additional peripheral devices

Eight standardized 0-10V/4..20mA inputs/outputs are available for pumps and other peripheral devices, such as pressure transducers, pH measurement, turbidity measurement, or other inputs.



ePAT SYSTAG Application Manager

## Signal detection

### Automatic sensor/actuator detection

**F<sub>connect</sub>** takes care of the troublesome signal configuration for you. Thanks to the intelligent and automated Plug & Play technology of **F<sub>connect</sub>**, you don't need to bother about the signal configuration or assignment which can often prove a complex process. Sensors/actuators are automatically detected by the intelligent **ePAT** hardware/software and assigned accordingly.

### Signal list

The new **ePAT** hardware includes an extensive signal list which contains just about everything you could possibly want. There's no need to worry about additional modules or expensive software extensions. Thanks to the **ePAT** concept, you can automate the majority of your reactors without any extra modules at all.

The following interfaces are available with the **ePAT**:

- ✓ 4x Pt-100 (-150°C...+400°C)
- ✓ 6x RS-232 interface
- ✓ 8x analog input/output 0-10V, or
- ✓ 8x analog input/output 4...20mA, or
- ✓ 8x digital input/output 24VDC

**F<sub>connect</sub>** automatically detects the sensors used for your application and displays them automatically in online trend.



ePAT example

## ePAT - The options

### And if that's not enough...

#### Possible options

- ✓ Pressure, vacuum and venting control
- ✓ Additional, third dosage
- ✓ Volumetric dosing (e.g. Metrohm Dosino)
- ✓ Automatic distillation control
- ✓ ... tell us what you need

## ePAT - In the future

### Appetite comes with the eating...

**ePAT** as an integral component of SYSTAG's FlexySys concept with its consistent design, can also be upgraded to the FlexyPAT, complete with integrated recipe control and other customized functions. Investments in laboratory equipment and automation solutions are therefore afforded long-term, future-oriented protection, even when needs change.

## ePAT - technical specifications

Supply voltage .....	100 – 240V ±10%, 50 – 60Hz
Power consumption .....	100W (max)
Temperature range .....	10 – 35°C
Humidity .....	80% (non-condensing)
Protection class .....	IP44
Surface finish .....	stainless electro-polished/powder-coated
Dimensions ePAT Modul .....	<sup>[1]</sup> 140mm (B) x 180mm (H) x 120mm (T)
Weight ePAT Modul .....	1kg
Dimensions ePAT Screen with Controller .....	<sup>[2]</sup> 400mm (B) x 330mm (H) x 180mm (T)
Weight ePAT Screen with Controller .....	6.3kg
Measuring input, temperature .....	x4, resolution 0.01K, range -150 – 400°C
Measuring input, voltage .....	x8 <sup>[3]</sup> , resolution 2.5mV, range 0 – 10V
Measuring input, current .....	x8 <sup>[3]</sup> , resolution 5µA, range 0 (4) – 20mA
Control output, voltage .....	x8 <sup>[3]</sup> , resolution 2.5mV, range 0 – 10V
Control output, current .....	x8 <sup>[3]</sup> , resolution 5µA, range 0 (4) – 20mA
Control output, digital On/Off .....	x8 <sup>[3]</sup> , 24V, 2A
RS-232 interface (for communication with stirrer, thermostat, balances etc.) .....	x6

[1] This correlates with the dimension of ePAT Universal-Module

[2] This correlates with the dimension of ePAT Screen with Controller

[3] Two measuring inputs for current and voltage and three control outputs for current, voltage and "digital On/Off" are available for each socket. The number of inputs and outputs actually accessible when using preassembled cables (recommended) is smaller.