

## DOUBLE LOOP PID CONTROLLERS 850/1650/1850 PERFORMANCE SERIES



# GEFRAN

## MUCH MORE THAN A DOUBLE LOOP CONTROLLER



Zapper

850 (1/16 DIN)

1650 (1/8 DIN)

1850 (1/8 DIN)

Gefran's Performance series of controllers and programmers, available in models 850 / 1650 / 1850 (in **single and double PID loop with multiple advanced control functions and very simple configuration**) is highly customizable and intuitive.

<b>FLEX VIEW DISPLAY</b>	full customization of the HMI
<b>CLEAR AND EASY READING</b>	bright, high-resolution display
<b>EASY AND INTUITIVE SET UP</b>	both locally and via software tool
<b>PREVENTIVE MAINTENANCE</b>	more efficient operation
<b>ENERGY MONITOR</b>	constant monitoring of consumption

The 850 / 1650 / 1850 series of controllers offers:

<b>DOUBLE LOOP</b>	You can choose the <b>double loop</b> option for every format, with two independent PID control channels for two zones, cascade control, ratio control, and additional custom functions based on configurable math blocks.
<b>DOUBLE PROGRAMMER</b>	The double loop provides <b>two independent setpoint profile generators</b> that can be independent, synchronous or asynchronous.
<b>LOGIC AND MATH BLOCKS</b>	Calculation power with <b>32 logic blocks and 8 math blocks</b> (all configurable) for simple creation of custom interblocks, sequences and calculations that adapt perfectly to every application.
<b>ADDITIONAL INPUTS/OUTPUTS</b>	1/4 DIN format offers up to <b>digital 8IN + 8 OUT / additional relays</b> managed by logic blocks for highly flexible creation of a <b>complete local machine management system</b> with up to 31 I/Os.

## FLEX-VIEW DISPLAY

The new LCD displays on the Performance series are **among the largest and most complete HMIs** available in this segment.

The **front panel** look is **extremely customizable**, adapting the controller to application requirements and integrating perfectly with the machine look.

### CUSTOM LABELING

Machine manufacturer's logo on front panel of controller

### FRAME

Customized front panel colors (RAL standard) based on the customer's esthetic requirements

### MESSAGES ON DISPLAY

Up to 25 customized scrolling messages, 32 Latin characters, 3 languages

### DISPLAY

- three 3-color displays for variable (PV), setpoint (SV) and additional information
- 2 dedicated displays to indicate program number and step number (1/4 DIN)
- 8 + 8 LEDs for additional I/Os (1/4 DIN)

### KEYS

4 or 6 mechanical keys with silicone covers and both tactile and visual feedback for the pressed key

### BARGRAPHS

- Up to 3 bargraphs, customizable in number and look from software:
- PV
  - SV
  - % Power or other configurable parameter



## CLEAR AND EASY TO READ



Up to 10 I/O



Up to 15 I/O



Up to 31 I/O

### INTUITIVE

The green LEDs for the mechanical keys make the use of these controllers intuitive because they:

- provide visual feedback for the pressed key
- guide the operator to the keys to be pressed by showing any inactive keys
- signal if key pressure is not acknowledged



When two control loops are used, simply press the (F) key to call up the monitor page for loop 1 and loop 2: the display for units of measurement will clearly show the number of the loop.



### MAXIMUM VISIBILITY

Large numbers, black-on-white contrast, and different colors guarantee excellent visibility of information even in rooms with low light levels and/or where the device is not near the operator.



## CLEAR AND IMMEDIATE ALPHANUMERIC MESSAGES

The controllers contain more than **300 English text messages that describe the menus and configuration parameters:** help on line that makes configuration easy and intuitive, even without the manual.

You can create **up to 25 custom messages**, each with 32 Latin characters and numbers, savable in 3 different languages on the device. They can be assigned to alarms, external events from digit inputs, controller states, and programmer segments.

- «Help on line» messages

Ex. TYPE › MAIN INPUT TYPE OF PROBE ‹

- Custom messages:

Ex. › PROGRAM 1 - START PREHEATING ‹

- Diagnostics messages:

Ex. › SENSOR BROKEN ‹



## BARGRAPH

The three bargraphs provide an effective analog display of critical variables:

- PV bargraph shows the controlled variable
- SV bargraph shows the Setpoint
- % bargraph shows the Power %

All three bargraphs are configurable and can be assigned to other variables considered important for the process.



## DISPLAY BRIGHTNESS

The backlighting level is easy to adjust, ensuring excellent visibility in every workplace.



# EASY AND INTUITIVE SETUP

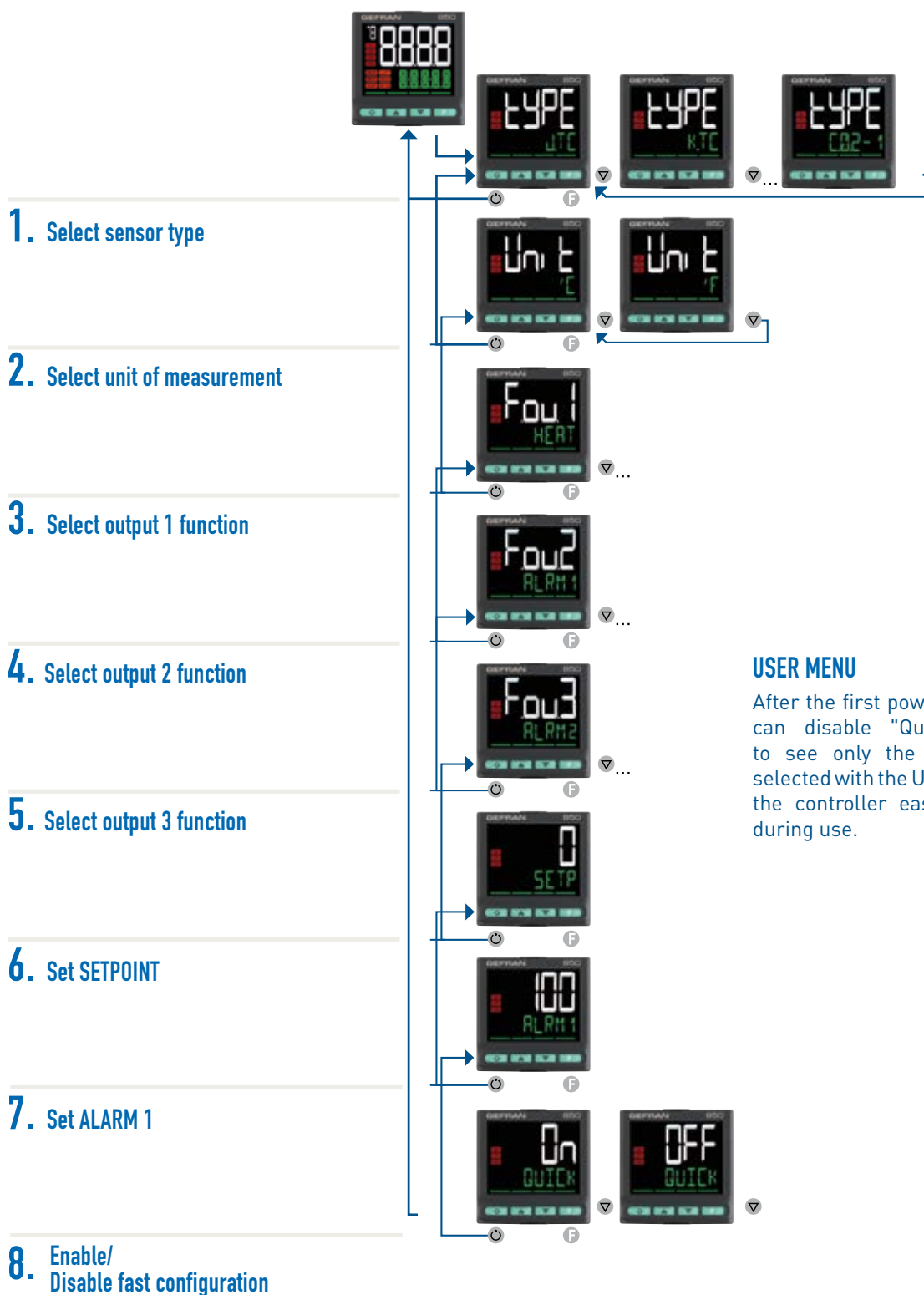
## QUICK CONFIGURATION WITH KEYBOARD IN JUST 8 STEPS (\*)

The 850 / 1650 / 1850 ontrollers are set up at first power-on with a simple procedure from the keyboard.

The controller can be configured in jus **8** steps, in a few minutes, and without a user manual.

At first power-on, the controller displays only the parameters needed for the user to start work, based on the model ordered.

Each displayed parameter includes a scrollable Help on Line plain language message describing its meaning.



## CONFIGURATION WITH GF\_eXpress AND WITH ZAPPER

Model 850 / 1650 / 1850 controllers can be configured with a PC and also with Zapper, the battery-powered mobile configurator with micro USB connection cable for safe and easy copying/pasting of complete configurations.

- Copied from other controllers
- Copied from GF\_eXpress

**Configuration can be done with the controller powered and also not powered i.e.,** on controllers just removed from the package or already installed on the machine.

This function is extremely useful for OEMs and End Users who need to program multiple controllers on more than one machine. Configuration operations with the controllers OFF are very quick because the control outputs do not have to be managed.

### CONFIGURATION WITH GF\_eXpress

#### 1. Copy

Parameters are copied to the PC where the GF\_eXpress configuration tool is installed directly from the Controller (even when off) via USB cable.



#### 2. Paste

Parameter are pasted to the controller (even when off) via USB cable.



#### 3. GO!

**GO!**

### CONFIGURATION WITH ON-BOARD RECIPES

Performance series controllers can save (on board) 5 work recipes with 25 selectable parameters.

This ensures **easy, fast, and error-proof change of setup** from one process to another.

You can use the keyboard, digital inputs, or a serial line command for selection.

### CONFIGURATION WITH Zapper

#### 1. Copy

Parameters are copied from the PC where the GF\_eXpress configuration tool is installed (or from another controller) directly to Zapper.



#### 2. Paste

The Zapper connects to the controller via the microUSB connector cable to paste the configuration.



#### 3. GO!

**GO!**



## PREVENTIVE MAINTENANCE AND ENERGY COUNTER

With the energy monitor function you can **count and save the energy consumed by the process.**

In case of deviations from average consumption, the controller signals with a physical output and configurable messages.

These functions accompany the **preventive maintenance function, which monitors the life cycle of the actuators and Short Wave Infrared (SWIR) lamps.**

This lets you:

- predict any potential machine breakdowns
- schedule maintenance in advance
- prevent system shutdowns
- maximize machine up time and limit costly emergency shut downs

### ENERGY MONITOR

Measures and monitors system energy consumption.  
Monitors and signals if system exceeds expected values.



CONSUMPTION  
80 KWH



### PREVENTIVE MAINTENANCE

Cycle counter and alarm messages to monitor actuator life cycles



WARNING:  
CHANGE LAMP 5



## POSITIONER FOR SERVO-VALVES

There are specific «V» models to control motorized «OPEN-CLOSE» servo-valves, with real-time read of valve position and closed-loop position control.

### MESSAGES

You can assign messages to the state of the control output, for example: OPEN and CLOSE for a better description of current operations



OPEN VALVE

### BARGRAPH

Bargraph for current Valve position

### UP DOWN KEYS

With controller in manual, the UP / DOWN keys manually drive valve opening/closing



# SETPOINT PROGRAMMER

## 1 LOOP

The various setpoint profiles with ramps, holds, trigger inputs and event outputs can be configured directly from the device keyboard or with GF\_eXpress in an easy to use by tracing the required profile.

The 1850 (1/4 DIN) model offers **the largest and most complete operator interface in its class: a real “control panel” that simultaneously displays the variable, setpoint, 7-figure scrolling messages, step number, and current program number, plus the 3 bargraphs that simultaneously show PV, SV, and current step time.**

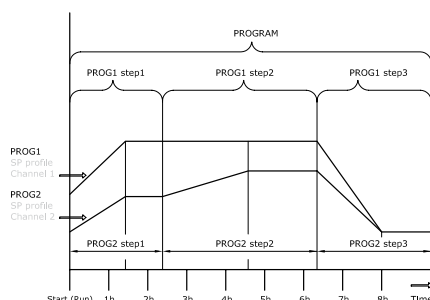
### SETPOINT PROGRAMMING

128 Segments with time-configurable ramps and holds, groupable in 16 Programs.



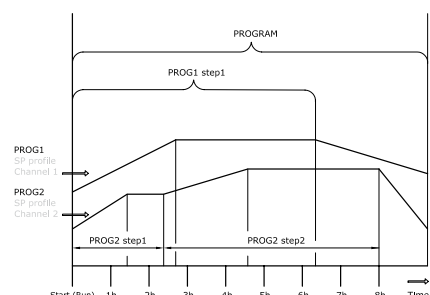
## 2 SYNCHRONOUS LOOPS

The synchronous dual programmer for double loop models can manage **applications in which a pair of physical quantities follows different profiles that are synchronized in time**, such as (for example) temperature and humidity in climate test chambers.



## 2 ASYNCHRONOUS LOOPS

The asynchronous dual programmer for double loop models can manage **applications in which a pair of physical quantities follows different profiles that differ in both values and time**, such as (for example) temperature and pressure/vacuum in heat-treatment furnaces.



# LOGIC AND MATH BLOCKS

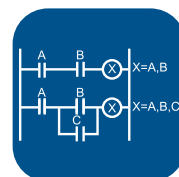
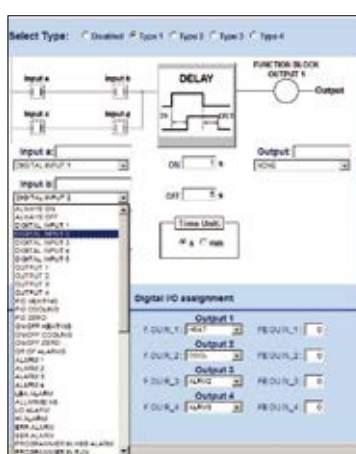
- 32 AND, OR, NOT, TIMER logic blocks let you create logics and interblocks from external events acquired from digital inputs and internal controller states.
- 8 math blocks to calculate averages, differences, select min-max value, extract square roots and calculate logarithms on analog input and output variables.

This provides great flexibility and simplifies the control system by integrating multiple hardware components in a single device.

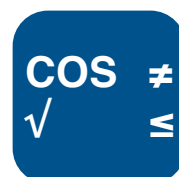
## ALL IN ONE SOLUTION



### Logic Functions



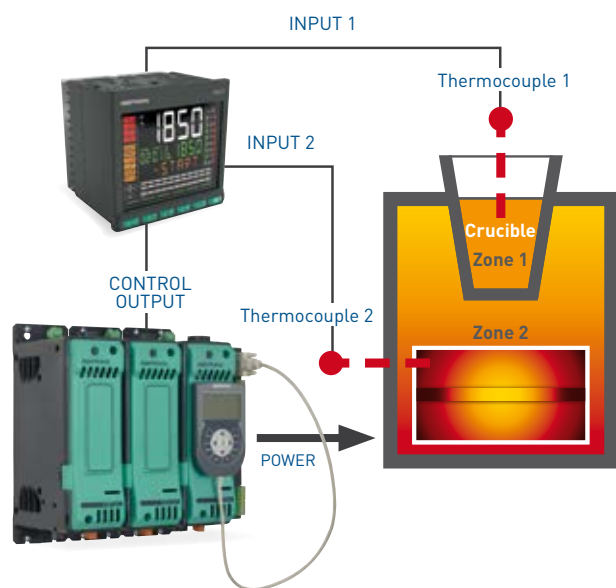
### Math functions



## EXAMPLES OF APPLICATIONS

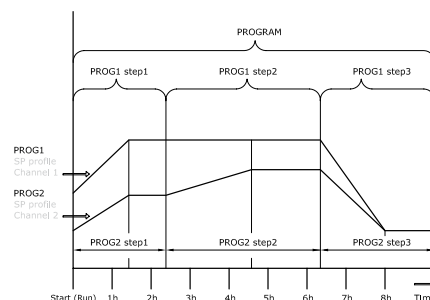
### CASCADE CONTROL AND TEMPERATURE STABILIZATION IN SMELTING FURNACES

The double loop controller with cascade control ensures stable temperature of the melt material in the crucible and keeps the heating elements from reaching critical temperatures, thereby extending their life.



### CONTROL OF CLIMATE TEST CHAMBERS AND INCUBATORS WITH SYNCHRONOUS DUAL PROGRAMMER

Temperature and relative humidity are programmed with independent setpoint profiles synchronized in time with common start, stop, reset commands. Each step can be described by custom scrolling text messages.



### PROPORTIONAL VALVE CONTROLLER

Isolated analog control outputs, 3 bargraphs, and 2 auxiliary power supplies for signal transmitters make Performance series controllers ideal for complex systems such as industrial and civil steam generation and distribution plants.

One auxiliary input is dedicated to valve position feedback, shown on the display and bargraph and available on the serial line.

#### Valve control in industrial processes



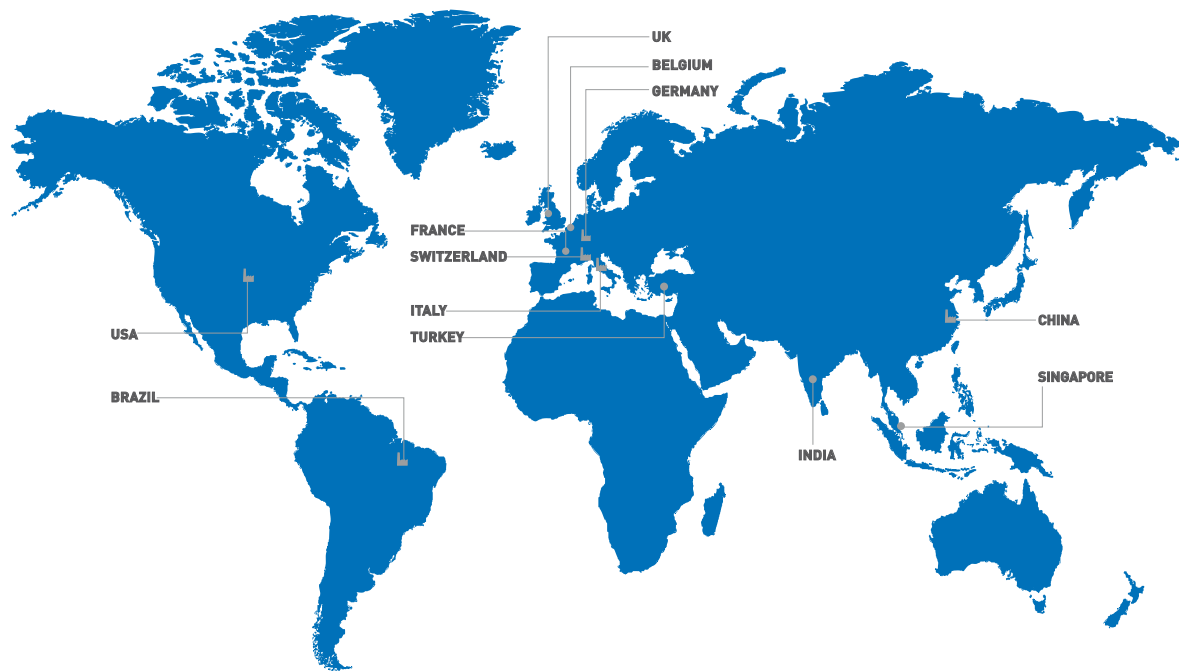
### THERMOREFRIGERATORS WITH LOAD ROTATION CONTROL

In addition to heat/cool PID functions, Performance series controllers have numerous digital I/Os and 32 logic blocks to manage a wide range of auxiliary functions.

On thermorefrigeration systems, they can manage power-ons and power-offs from keyboard or external inputs, temperature and level alarms, and manual/automatic starts.

In addition, logic blocks and timers can be linked for smart management of fan rotation to evenly distribute working hours and balance wear on individual loads.





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